Cambium Assessment

New Jersey Next Generation Statewide Assessment

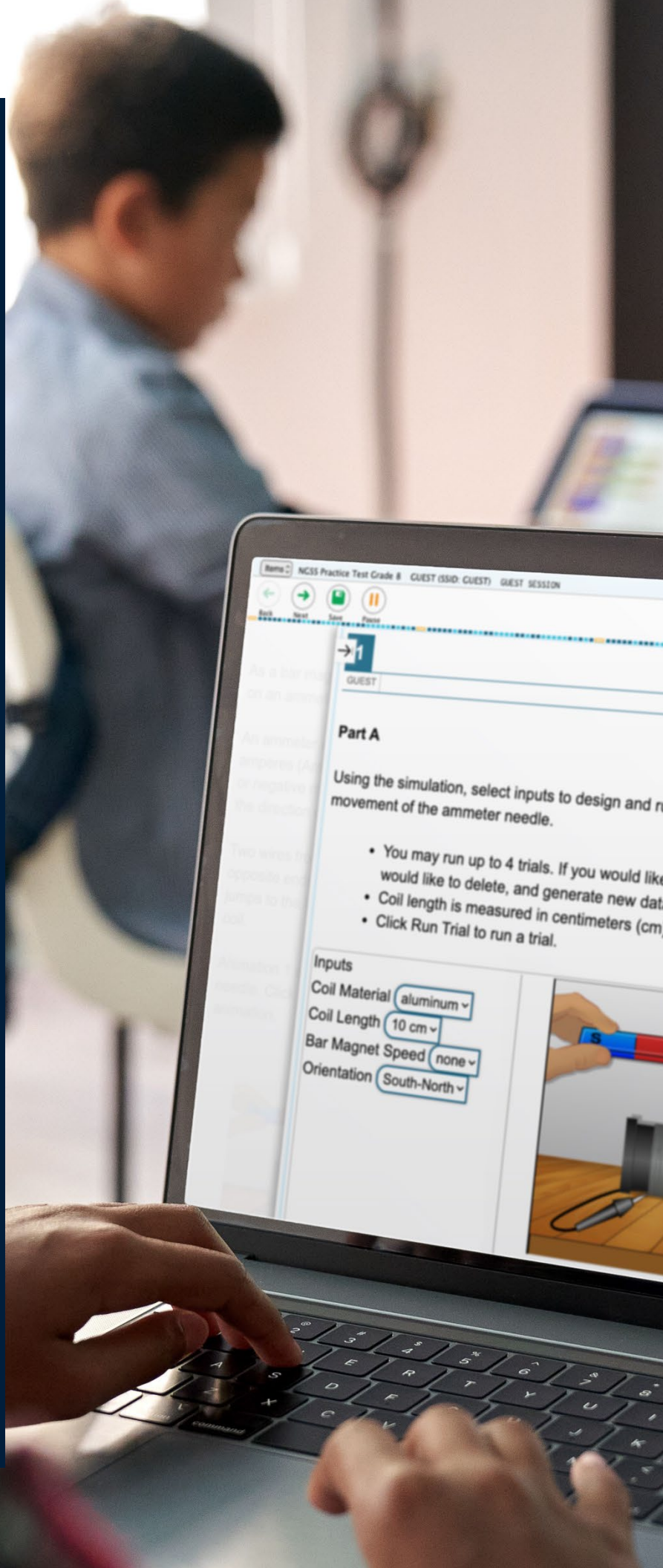
TECHNICAL PROPOSAL
(CLARIFIED BID)

Submitted To:
New Jersey Department of Education
Office of Budget and Accounting
100 Riverview Plaza
Trenton, NJ 08625-0500

Submitted By:
Cambium Assessment, Inc. (CAI)
4200 Wilson Blvd, Suite 610
Arlington, VA 22203

RFQ #: 25-004

Due Date: February 11, 2025



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Cover Letters

December 4, 2024

New Jersey Department of Education
Office of Budget and Accounting
100 Riverview Plaza
Trenton, NJ 08625-0500

Re: RFQ # 25-004 – New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

To Whom It May Concern:

Cambium Assessment, Inc. (CAI) is pleased to submit this proposal to provide a comprehensive and robust online solution for the development, production, administration, scoring, and reporting of New Jersey's Student Learning Assessments for English Language Arts and Mathematics (NJSLA-ELA/M) and the New Jersey Graduation Proficiency Assessment (NJGPA).

CAI utilizes state-of-the-art practices to produce innovative models, materials, and strategies that advance the field of education measurement and improve the validity of student scores. In the 2023–2024 school year, we delivered more than 124 million online tests, all of which were processed with the rapid scoring and reporting turnaround essential for educators to promptly identify their students' strengths and needs.

We currently provide assessments to clients in 27 U.S. states and jurisdictions and deliver the core grades 3–8 English language arts (ELA) and mathematics tests in 20 states and territories, serving more than 41% of American students. We also have statewide contracts for alternate, end-of-course, science, social studies, and K–3 early literacy assessments, as well as English Language Proficiency testing programs.

CAI will be partnering with the following subcontractors:

- Measurement Incorporated (MI) for handscoring constructed-response items; and printing and distribution of paper versions of the NJSLA-ELA/M and NJGPA
- Caveon for web/social media monitoring
- Human Resources Research Organization (HumRRO) for psychometric analyses; external psychometric and scoring checks; and validity studies
- Lambert Global for marketing/communications support; social media content development; and media relations and training services
- Metimur for fulfilling the role of Stakeholder Communication Representative, including representing services to New Jersey stakeholders, conducting media interviews, and answering questions at New Jersey State Board of Education meetings
- Tri-Lin Integrated Services for Spanish language translation for existing and new items and text-to-speech tasks

We believe that our teams' collective efforts bring all the capabilities that the state of New Jersey will need to deliver its statewide assessments successfully.

CAI has read, understands, and agrees to all terms, conditions, and specifications set forth in the RFQ and the State of New Jersey Standard Terms and Conditions and agrees to furnish the goods, products, and/or services in compliance with those terms.

Should you have any questions or require any clarification, please do not hesitate to contact me.

Sincerely,

Steve Kromer, President
(202) 926-2227
steve.kromer@cambiumassessment.com

November 12, 2024

Mr. Steve Kromer
President
Cambium Assessment, Inc.
4200 Wilson Boulevard, Suite 610
Arlington, VA 22203

RE: Letter of Commitment

Dear Mr. Kromer,

Caveon looks forward to the opportunity to work with Cambium Assessment, Inc. on Web/Social Media Monitoring for the New Jersey Department of Education suite of assessments outlined in RFQ Solicitation #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program, issued by the New Jersey Department of Education. We are pleased to offer support to Cambium Assessment, Inc. for this project and authorize Cambium Assessment, Inc. to list Caveon as a potential subcontractor in your RFQ response.

Caveon agrees to work with Cambium Assessment, Inc. to provide web/social media monitoring and management associated with the New Jersey Department of Education suite of assessments outlined in RFQ Solicitation #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program, should the bid be awarded to Cambium Assessment, Inc.

We appreciate the opportunity to work with Cambium Assessment, Inc. on this project and look forward to servicing the needs of Cambium Assessment, Inc. and the New Jersey Department of Education.

Sincerely,

Benjamin Hunter
Vice President of Sales
Caveon Test Security

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November 20, 2024

Steve Kromer
President
Cambium Assessment, Inc.
4200 Wilson Boulevard, Suite 610
Arlington, VA 22203

RE: Letter of Commitment to Serve as Subcontractor

Dear Mr. Kromer:

The Human Resources Research Organization (HumRRO) looks forward to the opportunity to work with Cambium Assessment, Inc. (Cambium) as a subcontractor for the *New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program (RFP Number 25-004*). In our education sector, HumRRO has had a successful partnership with Cambium for more than 15 years providing validity research, psychometric quality assurance of scores, checks of classical and item response theory test statistics, and alignment.

For this project, HumRRO commits to providing the following services, if Cambium is the successful vendor:

General Program Management

- Schedule a kick-off meeting to discuss data security, data handoffs, and points of comparison.
- Meet with Cambium psychometric team on a weekly basis during operational calibrating, scaling, and equating of tests.

Scoring and Reporting Verification

- Replicate and verify the calibrating, scaling, and equating of the New Jersey Next Generation Assessments in English Language Arts and Mathematics (NJSLA-ELA; NJSLA-M) in Grades 3-9 and 3-8, respectively; the End-of-Course Assessments (EOCA) in Algebra I, Algebra II, and Geometry; the New Jersey Graduation Proficiency Assessment (NJGPA) in English Language Arts and Mathematics.
- Replicate and verify student scores on the NJSLA-ELA, NJSLA-M, EOCA, and NJGPA.

Equating Consultants

- Replicate and verify the calibrating, scaling, and equating process.
- Prepare a report regarding outcomes of the calibrating, scoring, and equating verification, and be available to answer questions from New Jersey Department of Education (NJDOE).

Equating Consultants – Accommodated Forms

- Review and verify the development of accommodated forms.
- Review and verify the item order of the Braille, large print, screen-reader, text-to-speech, American Sign Language, and Closed-Captioned forms to the test map for correct item ordering.
- Prepare a report regarding outcomes of the calibrating, scoring, and equating replication and verification, and be available to answer questions from NJDOE.

Alignment Studies

- Develop and submit an alignment plan to NJDOE and Cambium outlining the alignment method; educator recruitment needs and workshop logistics, which NJDOE and Cambium will be responsible for; criterion thresholds; and timeline
- Conduct an in-person alignment workshop in Summer 2026 for the NJSLA-ELA grades 3-9; NJSLA-M grades 3-8; EOCA in Algebra I, Algebra II, and Geometry; NJGPA in English Language Arts and Mathematics. (Please note, our current design includes all grades and content areas being reviewed at an in-person workshop in the spring/summer of 2026. As an option, HumRRO can conduct these workshops remotely and/or use natural language processing to support the alignment study. We are able to revise our design and corresponding costs based on NJDOE's preference for method and grades/content areas for inclusion in the alignment if needed.)
- Prepare a report with alignment results suitable for peer review submission, and be available to answer questions from New Jersey Department of Education (NJDOE).

To accomplish this work, we have identified three key personnel who will be directly involved with the day-to-day communication, management, project planning, data collection, analyses, and reporting. They are listed below:

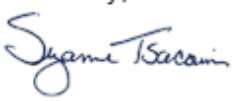
EMPLOYEE NAME	ROLE ON PROJECT	YEARS OF EXPERIENCE	ANTICIPATED DUTIES
Kuo-Feng Chang, Ph.D.*	Project Director & Lead Psychometrician	4	- POC for contract technical work; lead psychometrician conducting analyses; responsible for psychometric reports
Emre Gonulates, Ph.D.*	Psychometric Technical Advisor	10	- Provide guidance, consult on psychometric activities, and conduct psychometric analyses as a quality assurance check
Emily Borawski, M.S.*	Alignment Task Lead	12	- Coordinate and lead the alignment studies; write the alignment plan and final report

*Indicates Key Personnel

For more information about each of the named key personnel listed above including relevant qualifications and capabilities, please see their resume.

We appreciate the opportunity to work with Cambium on this project and look forward to supporting the needs of Cambium and the New Jersey Department of Education. If you have questions or need additional information, please do not hesitate to contact me at 703-706-5660 or by email at contracts@humrro.org.

Sincerely,



Suzanne Tsacoumis, PhD
President & CEO

LAMBERT

by LLYC

November 7, 2024

Steve Kromer, President
Cambium Assessment, Inc.
4200 Wilson Boulevard, Suite 610
Arlington, VA 22203

Dear Mr. Kromer,

Lambert Global looks forward to the opportunity to work with Cambium Assessment, Inc. (CAI) on the New Jersey English Language Arts and Mathematics Next Generation Assessments proposal for RFQ# 25-004. We are pleased to offer support to CAI for this project and authorize CAI to list Lambert Global as a subcontractor in your RFQ response. We want to assure you that Lambert Global will extend all necessary resources to successfully complete the tasks assigned to us.

Lambert is a strategic communications firm that specializes in public relations, investor relations, and integrated marketing. For more than 25 years, Lambert has partnered with clients across the globe to build brand awareness, drive sales, and scale business. Our portfolio of clients spans a broad spectrum of industries including education, automotive and mobility, aerospace & defense, consumer brands, food and beverage, social impact, and financial and investor relations.

To support Cambium Assessment, Lambert will provide integrated communications support, from developing social media content to managing media relations efforts. Additionally, we will be responsible for providing media training for the project's spokesperson.

We appreciate the opportunity to work with CAI on this project and look forward to servicing the needs of CAI and the state of New Jersey. If you have any questions, please feel free to contact me at the number below.

Sincerely,

Joseph C DiBenedetto
Managing Director
Lambert Global
516.637.0597

MEASUREMENT INCORPORATED

423 Morris Street
Durham, NC 27701
TEL 919-683-2413
FAX 919-765-8945
www.measurementinc.com

December 6, 2024

Steve Kromer
President
Cambium Assessment, Inc.
4200 Wilson Boulevard, Suite 610
Arlington, VA 22203
(202) 926-2227

RE: #25-004: New Jersey Next Generation Assessments in English Language Arts and Mathematics (NJSLA-ELA/M) and New Jersey Graduation Proficiency Assessment (NJGPA)

Dear Mr. Kromer,

Measurement Incorporated (MI) is pleased to partner with Cambium Assessment, Inc. (CAI) in responding to the Request for Proposal from the New Jersey Department of Education (NJDOE) for the New Jersey Next Generation Assessments in English Language Arts and Mathematics (NJSLA-ELA/M) and New Jersey Graduation Proficiency Assessment (NJGPA) project. MI is a recognized leader in educational assessment and offers CAI our professional services in the hand scoring of constructed response items and production, distribution, collection, and storage of paper test materials.

MI is an employee-owned, full-service corporation specializing in the development, administration, scoring, and reporting of results for educational assessments. MI has more than four decades of experience providing accurate and efficient development and scoring services for statewide assessments and is a recognized leader in hand scoring and automated scoring.

Our collaboration with CAI offers the NJDOE both quality work completed by experienced staff and flexibility throughout the project. Our approach offers a cost-competitive plan that will meet CAI's needs and ultimately support NJDOE's vision for NJSLA-ELA/M and NJGPA.

Please let me know if you need additional information. You may contact me by phone at (919) 683-2413 or by email at nandroes@measinc.com.

Sincerely,

Nelson Androes
President

METIMUR LLC
EDUCATIONAL MEASUREMENT

559.221.2560
Info@MetimurEd.com
516 W Shaw Ave, Fresno CA 93704

November 21, 2024

Steve Kromer, President
Cambium Assessment, Inc.
4200 Wilson Boulevard, Suite 610
Arlington, VA 22203

Re: Letter of Intent for RFQ #25-004 - New Jersey English Language Arts and Mathematics Next Generation Assessments

Dear Mr. Kromer,

I am writing to express Metimur's intent to serve as a subcontractor for the New Jersey Next Generation Assessments, as outlined in RFQ #25-004. Metimur, a reputable educational measurement consulting company, is eager to collaborate and contribute our expertise to enhance the proposed training modules and provide a skilled spokesperson for this initiative.

Metimur will significantly contribute to the success of the training modules outlined in your proposal. Our expertise in statewide assessment systems and implementation at the school and classroom levels aligns seamlessly with the outlined topics. Specifically, we propose to enhance the training modules by providing additional insights, real-world examples, and interactive elements to ensure optimal participant engagement. Our commitment is to elevate the training experience, making it more impactful for educators and stakeholders.

Dr. Mary Cochron, founder of Metimur LLC and former Director of Assessment at the Oregon Department of Education, will serve as the designated spokesperson for all stakeholder communications under this proposal. Dr. Cochron brings a wealth of experience in presenting to various stakeholders, including school boards, media outlets, and community forums. Her proficiency in articulating complex educational and measurement concepts with clarity and precision aligns perfectly with the goals of the Next Generation Assessments.

Leveraging Dr. Mary Cochron as the designated spokesperson seamlessly integrates public-facing communication strategies with the enhanced training modules. This cohesive approach to offering valuable insights to both educators and stakeholders guarantees a unified and effective communication strategy for the initiative.

Metimur LLC is enthusiastic about the opportunity to contribute to the success of the New Jersey Next Generation Assessments. We are confident that Metimur's mission and Dr. Cochron's extensive background surpasses the requirements outlined in the RFP. We look forward to the opportunity to discuss this collaboration in more detail and provide any additional information you may require.

Thank you for considering Metimur LLC as a valued subcontractor for the Next Generation Assessments project.

Sincerely,

Allyson Wall
Allyson Wall
Administrative Assistant
Metimur, LLC

November 18, 2024

Mr. Steve Kromer, President
Cambium Assessment, Inc.
4200 Wilson Boulevard, Suite 610
Arlington, VA 22203

Re: RFQ #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

Dear Mr. Kromer:

Tri-Lin Integrated Services, Inc. looks forward to the opportunity to work with Cambium Assessment, Inc. on its response to the New Jersey Next Generation Assessments RFQ #25-004. As a New Jersey-certified Minority Woman-Owned Business Enterprise (MWBE), we are especially pleased to offer support to Cambium in response of this RFQ. Tri-Lin looks forward to Spanish services for the Mathematics Assessment Program. Tri-Lin also will provide other required language services while working closely with Cambium as described in the proposal.

Tri-Lin and Cambium have had an effective partnership in assessment services since 2013. We are eager to apply our assessment experience and knowledge gained over many years to all the work and services associated to the contract with New Jersey Department of Education.

Tri-Lin's proposed team of native Spanish speakers and assessment specialist have been successfully working with various education agencies around the nation for more than 15 years. We welcome the opportunity to continue this service through a partnership with Cambium.

If you have any questions, please contact me.

Sincerely,

Amarilys Galindo
President and CEO

15310 Huebner Rd, San Antonio, Texas 78248-0986
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Forms

Offer and Acceptance Page

OFFER AND ACCEPTANCE PAGE

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

TO THE STATE OF NEW JERSEY:

Name of Bidder/Contractor	Cambium Assessment, Inc.
Address	4200 Wilson Boulevard, Suite 610
City, State, Zip Code	Arlington, VA 22203
Phone Number	(202) 247-6196
Fax Number	N/A
Email Address	Snehal.Pathak@cambiumassessment.com
FEIN	84-3272684
Print Name & Title of Authorized Representative	Christopher Lowe, Senior Director
Signature Authorized Representative	

By submitting a Quote the Bidder certifies and confirms that:

1. It has read, understands, and agrees to all terms, conditions, and specifications set forth in the Bid Solicitation and the State of New Jersey Standard Terms and Conditions and agrees to furnish the goods, products, and/or services in compliance with those terms;
2. It has complied, and will continue to comply, with all applicable laws and regulations governing the provision of State goods and services, including the New Jersey Conflicts of Interest Law, N.J.S.A. 52:13D-12 to 28;
3. The price(s) and amount of its Quote have been arrived at independently and without consultation, communication or agreement with any other Contractor/Bidder or any other party;
4. Neither the price(s) nor the amount of its Quote, and neither the approximate price(s) nor approximate amount of this Quote, have been disclosed to any other firm or person who is a Bidder or potential Bidder, and they will not be disclosed before the Quote submission;
5. No attempt has been made or will be made to induce any firm or person to refrain from bidding on this Contract, or to submit a Quote higher than this Quote, or to submit any intentionally high or noncompetitive Quote or other form of complementary Quote;
6. The Quote is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive Quote;
7. The Bidder, its affiliates, subsidiaries, officers, directors, and employees are not, to Bidder's knowledge, currently under investigation by any governmental agency for alleged conspiracy or collusion with respect to bidding on any Contract and have not in the last five (5) years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction involving conspiracy or collusion with respect to bidding on any Contract;
8. The Bidder's failure to meet any of the terms and conditions of the Contract shall constitute a breach and may result in suspension or debarment from further State bidding; and
9. A defaulting Contractor may also be liable, at the option of the State, for the difference between the Blanket P.O. price and the price bid by an alternate Vendor {Bidder} of the goods or services in addition to other remedies available.

ACCEPTANCE OF OFFER *(For State Use Only)*

The Offer above is hereby accepted and now constitutes a Contract with the State of New Jersey. The Contractor is now bound to sell the goods, products, or services in accordance with the terms of the Bid Solicitation and the State of New Jersey Standard Terms and Conditions. The Contractor shall not commence any work or provide any good, product, or service under this Contract until the Vendor Contractor complies with all requirements set forth in the Bid Solicitation and receives written notice to proceed.

Contract/Master Blanket Purchase Order Number _____

Award Date _____ Effective Date _____

State of New Jersey Authorized Signature _____

Print Name and Title _____

Ownership Disclosure Form

OWNERSHIP DISCLOSURE FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

VENDOR NAME: Cambium Assessment, Inc.

PURSUANT TO N.J.S.A. 52:25-24.2, ALL PARTIES ENTERING INTO A CONTRACT WITH THE STATE ARE REQUIRED TO PROVIDE A STATEMENT OF OWNERSHIP.
Please answer all questions and complete the information requested.

		YES	NO
1.	The vendor is a **Non-Profit Entity**; and therefore, no disclosure is necessary.	☐	☑
2.	The vendor is a **Sole Proprietor**; and therefore, no other disclosure is necessary. A Sole Proprietor is a person who owns an unincorporated business by himself or her-self. A limited liability company with a single member is not a Sole Proprietor.	☐	☑
3.	The vendor is a **corporation, partnership, or limited liability company** with individuals, partners, members, stockholders, corporations, partnerships, or limited liability companies owning a 10% or greater interest; and therefore, disclosure is necessary.	☑	☐

If you answered **YES** to Question 3, you must disclose the information requested in the space below:*
(a) the names and addresses of all stockholders in the corporation who own 10% or more of its stock, of any class;
(b) all individual partners in the partnership who own a 10% or greater interest therein; or,
(c) all members in the limited liability company who own a 10% or greater interest therein.

NAME	Cambium Intermediate Holdings, LLC		NAME		
ADDRESS	17855 Dallas Parkway, Suite 400		ADDRESS		
ADDRESS			ADDRESS		
CITY	Dallas	STATE TX ZIP 75287	CITY		STATE ZIP
NAME			NAME		
ADDRESS			ADDRESS		
ADDRESS			ADDRESS		
CITY		STATE ZIP	CITY		STATE ZIP

		YES	NO
4.	For each of the corporations, partnerships, or limited liability companies identified in response to Question #3 above, are there any individuals, partners, members, stockholders, corporations, partnerships, or limited liability companies owning a 10% or greater interest of those listed business entities?	☑	☐

If you answered **YES** to Question 4, you must disclose the information requested in the space below:*
(a) the names and addresses of all stockholders in the corporation who own 10% or more of its stock, of any class;
(b) all individual partners in the partnership who own a 10% or greater interest therein; or,
(c) all members in the limited liability company who own a 10% or greater interest therein. The disclosure(s) shall be continued until the names and addresses of every non-corporate stockholder, individual partner, and/or member a 10% or greater interest has been identified.

NAME	Cambium Holdings LLC c/o Veritas Capital Fund Management, LLC		NAME	The Veritas Capital Fund VI, LP	
ADDRESS	9 West 57th Street		ADDRESS	9 West 57th Street	
ADDRESS	32nd Floor		ADDRESS	32nd Floor	
CITY	New York	STATE NY ZIP 10019	CITY	New York	STATE NY ZIP 10019
NAME			NAME		
ADDRESS			ADDRESS		
ADDRESS			ADDRESS		
CITY		STATE ZIP	CITY		STATE ZIP

5. As an alternative to completing this form, a Vendor with any direct or indirect parent entity which is publicly traded, may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10% or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10% or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10% or greater beneficial interest.*

* *Attach additional sheets if necessary*

Disclosure of Investment Activities in Iran Form

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

VENDOR NAME: Cambium Assessment, Inc.

Pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4) any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must certify that neither the person nor entity, nor any of its parents, subsidiaries, or affiliates, is identified on the New Jersey Department of the Treasury's Chapter 25 List as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found on the Division's website at https://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Vendors/Bidders must review this list prior to completing the below certification. If the Director of the Division of Purchase and Property finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

☑ I certify, pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4), that neither the Vendor/Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List of entities determined to be engaged in prohibited activities in Iran.

OR

☐ I am unable to certify as above because the Vendor/Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List. I will provide a detailed, accurate and precise description of the activities of the Vendor/Bidder, or one of its parents, subsidiaries or affiliates, has engaged in regarding investment activities in Iran by completing the information requested below.

Entity Engaged in Investment Activities _____
Relationship to Vendor/ Bidder _____
Description of Activities _____
_____
_____
Duration of Engagement _____
Anticipated Cessation Date _____

**Attach Additional Sheets If Necessary.*

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the State of New Jersey is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the State to notify the State in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Signature

12/02/2024
Date

Christopher Lowe, Senior Director
Print Name and Title

Disclosure of Investigations and Other Actions Involving Bidder Form

DISCLOSURE OF INVESTIGATIONS AND OTHER ACTIONS INVOLVING THE VENDOR FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

VENDOR NAME: Cambium Assessment, Inc.

PART 1
PLEASE LIST ALL OFFICERS/DIRECTORS OF THE VENDOR BELOW.

NAME	Ashley Anderson Zantop
TITLE	Chair - Director and Chief Executive Officer
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington STATE VA ZIP 22203

NAME	Ramzi Musallam
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington STATE VA ZIP 22203

NAME	Hugh Evans
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington STATE VA ZIP 22203

NAME	Benjamin Polk
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington STATE VA ZIP 22203

**Attach Additional Sheets If Necessary.*

PART 2
PLEASE REFER TO THE PERSONS LISTED ABOVE AND/OR THE PERSONS AND/OR ENTITIES LISTED ON THE OWNERSHIP DISCLOSURE FORM WHEN ANSWERING THESE QUESTIONS.

1. Has any person or entity listed on this form or its attachments ever been arrested, charged, indicted, or convicted in a criminal or disorderly persons matter by the State of New Jersey (or political subdivision thereof), or by any other state or the U.S. Government? NO
2. Has any person or entity listed on this form or its attachments ever been suspended, debarred or otherwise declared ineligible by any government agency from bidding or contracting to provide services, labor, materials or supplies? NO
3. Are there currently any pending criminal matters or debarment proceedings in which the firm and/or its officers and/or managers are involved? NO
4. Has any person or entity listed on this form or its attachments been denied any license, permit or similar authorization required to engage in the work applied for herein, or has any such license, permit or similar authorization been revoked by any agency of federal, state or local government? NO
5. Has any person or entity listed on this form or its attachments been involved as an adverse party to a public sector client in any civil litigation or administrative proceeding in the past five (5) years? NO

IF ANY OF THE ANSWERS TO QUESTIONS 1-5 ARE "YES", PLEASE PROVIDE THE REQUESTED INFORMATION IN PART 3.
IF ALL OF THE ANSWERS TO QUESTIONS 1-5 ARE "NO", NO FURTHER ACTION IS NEEDED; PLEASE SIGN AND DATE THE FORM.

PART 3
DESCRIPTION OF THE INVESTIGATION OR LITIGATION, ETC.

If you answered "YES" to any of questions 1 - 5 above, you must provide a detailed description of any investigation or litigation, including, but not limited to, administrative complaints or other administrative proceedings involving public sector clients during the past five (5) years. The description must include the nature and status of the investigation, and for any litigation, the caption and a brief description of the action, the date of inception, current status, and if applicable, the disposition.

PERSON OR ENTITY NAME			
CONTACT NAME		PHONE NUMBER	
CASE CAPTION			
INCEPTION OF THE INVESTIGATION		CURRENT STATUS	
SUMMARY OF INVESTIGATION			

**Attach Additional Sheets If Necessary.*

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the State of New Jersey is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the State to notify the State in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Signature

12/2/2024
Date

Christopher Lowe, Senior Director
Print Name and Title

DISCLOSURE OF INVESTIGATIONS AND OTHER ACTIONS INVOLVING THE VENDOR FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

VENDOR NAME: Cambium Assessment, Inc.

PART 1 (continued)
PLEASE LIST ALL OFFICERS/DIRECTORS OF THE VENDOR BELOW.

NAME	Daniel Sugar
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Alice Li
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	John Campbell
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Margery Mayer
TITLE	Director
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Steve Kromer
TITLE	President
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Kemi Akinsanya-Rose
TITLE	Chief Operating Officer
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Barbara Benson
TITLE	Chief Financial Officer and Treasurer
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Ryan Brown
TITLE	Secretary
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Bridget Coyne
TITLE	Assistant Secretary
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

NAME	Brad Horn
TITLE	Vice President, Tax
ADDRESS	4200 Wilson Boulevard, Suite 610
ADDRESS	
CITY	Arlington
STATE	VA
ZIP	22203

MacBride Principles Form

MACBRIDE PRINCIPLES FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

VENDOR NAME: Cambium Assessment, Inc.

Pursuant to Public Law 1995, c. 134, a responsible Vendor/Bidder is required to provide a certification in compliance with the MacBride Principles and Northern Ireland Act of 1989. Pursuant to N.J.S.A. 52:34-12.2, Vendor/Bidder must complete the certification below by checking one of the two options listed below and signing where indicated. If a Vendor/Bidder that would otherwise be awarded a purchase, contract or agreement does not complete the certification, then the Director may determine, in accordance with applicable law and rules, that it is in the best interest of the State to award the purchase, contract or agreement to another Vendor/ Bidder that has completed the certification and has submitted a bid within five (5) percent of the most advantageous bid. If the Director finds contractors to be in violation of the principles that are the subject of this law, he/she shall take such action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

I, the undersigned, on behalf the Vendor/Bidder, certify pursuant to N.J.S.A. 52:34-12.2 that:

CHECK THE APPROPRIATE BOX

☑ The Vendor/Bidder has no business operations in Northern Ireland; or

OR

☐ The Vendor/Bidder will take lawful steps in good faith to conduct any business operations it has in Northern Ireland in accordance with the MacBride principles of nondiscrimination in employment as set forth in section 2 of P.L. 1987, c. 177 (N.J.S.A. 52:18A-89.5) and in conformance with the United Kingdom's Fair Employment (Northern Ireland) Act of 1989, and permit independent monitoring of its compliance with those principles.

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the State of New Jersey is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the State to notify the State in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Signature

12/02/2024
Date

Christopher Lowe, Senior Director
Print Name and Title

Service Performance Within the United States

SOURCE DISCLOSURE FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

VENDOR NAME: Cambium Assessment, Inc.

The Vendor/Bidder submits this Form in response to a Bid Solicitation issued by the State of New Jersey, Department of the Treasury, Division of Purchase and Property, in accordance with the requirements of N.J.S.A. 52:34-13.2.

PART 1

☑ All services will be performed by the Contractor and Subcontractors in the United States. Skip Part 2.

☐ Services will be performed by the Contractor and/or Subcontractors outside of the United States. **Complete Part 2.**

PART 2

Where services will be performed outside of the United States, please list every country where services will be performed by the Contractor and all Subcontractors. If any of the services cannot be performed within the United States, the Contractor shall state, with specificity, the reasons why the services cannot be performed in the United States. The Director of the Division of Purchase and Property will review this justification and if deemed sufficient, the Director may seek the Treasurer's approval.

Name of Contractor / Sub-contractor	Performance Location by Country	Description of Service(s) to be Performed Outside of the United States *	Reason Why the Service(s) Cannot be Performed in the United States *

Attach additional sheets if necessary to describe which service(s), if any, will be performed outside of the U.S. and the reason(s) why the service(s) cannot be performed in the U.S.

Any changes to the information set forth in this Form during the term of any Contract awarded under the referenced Bid Solicitation or extension thereof shall be immediately reported by the Contractor to the Director of the Division of Purchase and Property. If during the term of the Contract, the Contractor shifts the location of services outside the United States, without a prior written determination by the Director, the Contractor shall be deemed in breach of Contract, and the Contract will be subject to termination for cause pursuant to the State of New Jersey Standard Terms and Conditions.

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the State of New Jersey is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the State to notify the State in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

Signature

12/02/2024
Date

Christopher Lowe, Senior Director
Print Name and Title

Confidentiality/Commitment to Defend

CONFIDENTIALITY AND COMMITMENT TO DEFEND

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # & TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

The Bid Solicitation advises Bidders (hereinafter "Company") that the submitted "Quotes can be released to the public pursuant to N.J.A.C. 17:12-1.2(b) and (c), or under the New Jersey Open Public Records Act (OPRA), N.J.S.A. 47:1A-1.1 et seq., or the common law right to know." In the event that the Division receives a request for documents related to above referenced Bid Solicitation, in accordance with its statutory obligations under the New Jersey Open Public Records Act and/or the common law right to know, it is the Division's intent to fulfill the request for records which may include a copy of the Company's Quote.

If Company objects to the disclosure of any portions of the Quote, the Company must advise the Division and must attach a detailed statement clearly identifying those sections of the Quote that Company claims are exempt from disclosure. In requesting any exemption, Company must identify the specific statutory or other legal justification for each requested exemption and the factual basis that supports said exemption. In addition, if Company requests any exemption to disclosure of the Quote based upon claims of confidential/proprietary information and trade secrets (setting forth the nature of the formula, process, pattern, device or compilation), in accordance with *Ingersoll-Rand Co. v. Ciavatta*, 110 N.J. 609 (1988), Company must also indicate the following with respect to the requested exemption:

(1) the extent to which the information is known outside the owner's business;
(2) the extent to which it is known by employees and others involved with your business;
(3) the extent of the measures taken by your firm to guard the secrecy of the information;
(4) the value of the information to your firm and your competitors;
(5) the amount of effort or money expended by your firm in developing the information; and
(6) the ease or difficulty with which the information could be properly acquired or duplicated by others.

Further, if the Quote includes any copyright notices, within five business days, the Division will be permitted to release a copy of the Quote document(s) unless Company serves the Division with an order from a court of competent jurisdiction precluding such release.

The State reserves the right to make the final determination as to what is and is not subject to public disclosure under OPRA and/or the common law right to know, and will advise the Company accordingly. Please note that the State will not honor any claim of confidential, proprietary, trade secret, and/or copyright material that is not supported by a specific statutory or legal justification provided by the Company. The State will not honor any attempts by the Company to designate the entire Quote as proprietary, confidential and/or to claim copyright protection for its entire Quote.

Accordingly, in order to assist the Division with the fulfillment of potential document requests, please select **one** of the following:

☐ The Company's Quote **does not include** any confidential, proprietary and/or trade secrets; and therefore, the Company does not request any redactions be made prior to the release of the documents.

OR

☑ The Company's Quote **does include** confidential, proprietary and/or trade secrets; and therefore, the Company requests that certain portions of the Quote be redacted prior to the release of the documents.

The requested redactions are set forth in the attached statement which specifically identifies the portions of the Quote by section, page number, paragraph and or line; and identifies the specific statutory or other legal reason for each requested exemption.

In the event of any challenge to the Company's assertion of confidential/proprietary information, the Company shall be solely responsible for defending its designation. Company agrees that it shall defend and cooperate in the defense of an action against the State of New Jersey arising from or related to the non-disclosure, due to the Company's request, of documents submitted to the State of New Jersey, and relating to a Quote submitted by the Company in response to the above referenced Bid Solicitation, which was the subject of a request for government records under the New Jersey Open Public Records Act, N.J.S.A. 47:1A-1 et seq. ("OPRA"), or the common law right to know. The Company further agrees to indemnify and hold harmless the State against any judgments, costs, or attorneys' fees assessed against the State in connection with any action arising from, or related to, the non-disclosure, due to the Company's request, of documents submitted to the State, which are the subject of a request for government records under OPRA.

The Company makes the forgoing agreement with the understanding that the State may immediately disclose any documents withheld without further notice if the Company ceases to cooperate in the defense of an action against the State arising from or related to the above described non-disclosure due to the Company's request, and will disclose such documents withheld if so ordered by a court of competent jurisdiction.

The undersigned certifies that s/he is duly authorized to make this commitment on behalf of the Company.

Cambium Assessment, Inc.
Company Name

Signature

12/02/2024
Date

Christopher Lowe, Senior Director
Print Name and Title

New Jersey Is an Equal Opportunity Employer • Printed on Recycled and Recyclable Paper

Attached Statement for Confidential Information

DESCRIPTION OF VENDOR-REQUESTED QUOTE REDACTIONS*				
Quote Section, Form, or Document	**Page Number**	**Paragraph and/or Line**	**Description of Item to Be Redacted**	**Statutory or Other Legal Reason for Each Requested Exemption**
Appendix G: Business Continuity Plan	Appendix G of Technical Proposal	Appendix G of Technical Proposal	Business Continuity Plan	This document is exempt for disclosure under the New Jersey Public Records Act, P.L.1963, c.73 (C.47:1A-1 et seq.), for the following reasons: (1) Trade secrets and proprietary commercial information—The document contains commercial information which is non-public and proprietary. It contains important, confidential information related to the continuity of the business. Disclosure of this document would create competitive harm, as well as provide threat actors with access to company security and continuity protocols. (2) Administrative or technical information regarding computer hardware, software, and networks which, if disclosed, would jeopardize computer security—This document contains non-public, confidential technical information regarding the company's computer systems that would both disadvantage the company if publicly disclosed and provide information that would assist cybersecurity threat actors to conduct malicious activities against the company. (3) Document contains specific and sensitive business plans and business information that may cause serious impacts if disclosed. We have taken reasonable efforts under the circumstances to keep this information secret, including only sharing with employees and others on a need-to-know basis and only after a nondisclosure agreement (NDA) has been executed.

DESCRIPTION OF VENDOR-REQUESTED QUOTE REDACTIONS*				
Quote Section, Form, or Document	**Page Number**	**Paragraph and/or Line**	**Description of Item to Be Redacted**	**Statutory or Other Legal Reason for Each Requested Exemption**
Exhibit 3.16-2 List of Issues CAI Has Remedied	Pages 91–94 of Technical Proposal	Section 3.16 of Technical Proposal	Exhibit 3.16-2: List of Issues CAI Has Remedied	This document is exempt for disclosure under the New Jersey Public Records Act, P.L.1963, c.73 (C.47:1A-1 et seq.), for the following reasons: (1) Trade secrets and proprietary commercial information—The document contains commercial information which is non-public and proprietary. It contains important, confidential commercial information related to the performance of the business. Disclosure of this exhibit would create competitive harm, as well as provide threat actors with access to company proprietary information. (2) Exhibit contains confidential, specific, and sensitive business operations information that may cause serious impacts and harm our competitive standing if disclosed. We have taken reasonable efforts under the circumstances to keep this information secret, including only sharing with employees and others on a need-to-know basis and only after an NDA has been executed.

DESCRIPTION OF VENDOR-REQUESTED QUOTE REDACTIONS*				
Quote Section, Form, or Document	**Page Number**	**Paragraph and/or Line**	**Description of Item to Be Redacted**	**Statutory or Other Legal Reason for Each Requested Exemption**
Appendix P: Financial Statements	Appendix P of Technical Proposal	Section 3.17 and Appendix P of Technical Proposal	Financial Statements	This document is exempt for disclosure under the New Jersey Public Records Act, P.L.1963, c.73 (C.47:1A-1 et seq.), for the following reasons: (1) Trade secrets and proprietary commercial or financial information—The document contains commercial and financial information which is non-public and proprietary. It contains important, confidential commercial and financial information related to the performance of the business. Disclosure would create competitive harm, as well as provide threat actors with access to company proprietary information. (2) Exhibit contains specific and sensitive business plans and financial information that may cause serious impacts if disclosed. We have taken reasonable efforts under the circumstances to keep this information secret, including only sharing it with employees and others on a need-to-know basis and only after an NDA has been executed.
Appendix Q: State of New Jersey Security Due Diligence Third-Party Information Security Questionnaire	Appendix Q of Technical Proposal	Appendix Q of Technical Proposal	State of New Jersey Security Due Diligence Third-Party Information Security Questionnaire and Supporting Documentation	Fully Executed Confidentiality/NDA dated December 2, 2024.

**Home address and/or unlisted telephone/cell phone numbers must be listed on this form if they are to be redacted.*

Subcontractor Utilization Plan

SUBCONTRACTOR UTILIZATION FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program

VENDOR NAME: **Cambium Assessment, Inc.**

List All Businesses To Be Used As Subcontractors. Attach Additional Sheets If Necessary.
If the Bid Solicitation has subcontracting set-aside goals, and the Vendor has not achieved the goals,
Vendor must attach information documenting its good faith effort to achieve the goals.

SUBCONTRACTOR'S NAME: Caveon, LLC
ADDRESS: 6905 S 1300 E #468
Midvale, UT 84047
PHONE NUMBER: (801) 208-0103 FEIN: 35-2201680
EMAIL: Walt.Drane@caveon.com
ESTIMATED VALUE OF WORK TO BE SUBCONTRACTED: $210,203.00
DESCRIPTION OF WORK TO BE SUBCONTRACTED: Web/Social Media Monitoring; ongoing web monitoring; threat analysis for exam content online; real-time reporting alerts; threat removal consultation tools; ongoing expert security support and advice.

IS THE SUBCONTRACTOR IS A SMALL BUSINESS? NO

IF YES, SMALL BUSINESS CATEGORY:

IS THE SUBCONTRACTOR IS A DISABLED VETERAN-OWNED BUSINESS? NO

SUBCONTRACTOR'S NAME: Human Resources Research Organization (HumRRO)
ADDRESS: 66 Canal Center Plaza, Suite 700
Alexandria, VA 22314
PHONE NUMBER: (703) 549-3611 FEIN: 23-7029310
EMAIL: Contracts@humrro.org
ESTIMATED VALUE OF WORK TO BE SUBCONTRACTED: $555,907.00
DESCRIPTION OF WORK TO BE SUBCONTRACTED: Will serve as an external, independent, third-party vendor to CAI and review test specifications and test blueprints and verify calibrating, equating, and scoring analysis.

IS THE SUBCONTRACTOR IS A SMALL BUSINESS? NO

IF YES, SMALL BUSINESS CATEGORY:

IS THE SUBCONTRACTOR IS A DISABLED VETERAN-OWNED BUSINESS? NO

SUBCONTRACTOR'S NAME: Lambert Global, LLC
ADDRESS: 47 Commerce Ave SW
Grand Rapids, MI 49503
PHONE NUMBER: (616) 233-0500 FEIN: 38-3428160
EMAIL: jdibenedetto@lambert.com
ESTIMATED VALUE OF WORK TO BE SUBCONTRACTED: $126,000.00
DESCRIPTION OF WORK TO BE SUBCONTRACTED: Marketing/communications support, providing social media content development, media relations, and media training.

IS THE SUBCONTRACTOR IS A SMALL BUSINESS? NO

IF YES, SMALL BUSINESS CATEGORY:

IS THE SUBCONTRACTOR IS A DISABLED VETERAN-OWNED BUSINESS? NO

SUBCONTRACTOR UTILIZATION FORM

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY - DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230 TRENTON, NEW JERSEY 08625-0230

BID SOLICITATION # AND TITLE: **Request for Quotes #25-004 New Jersey English Language Arts and Mathematics Next Generation Statewide Assessment Program**

VENDOR NAME: **Cambium Assessment, Inc.**

List All Businesses To Be Used As Subcontractors. Attach Additional Sheets If Necessary.
If the Bid Solicitation has subcontracting set-aside goals, and the Vendor has not achieved the goals,
Vendor must attach information documenting its good faith effort to achieve the goals.

SUBCONTRACTOR'S NAME: **Measurement, Incorporated (MI)**
ADDRESS: **423 Morris Street**
Durham, NC 27701
PHONE NUMBER: (919) 683-2413 FEIN: 56-1264255
EMAIL: nadroes@measinc.com
ESTIMATED VALUE OF WORK TO BE SUBCONTRACTED: **$16,734,575.00**
DESCRIPTION OF WORK TO BE SUBCONTRACTED: **Hand-scoring of constructed response items and production of paper student test materials.**

IS THE SUBCONTRACTOR IS A SMALL BUSINESS? NO

IF YES, SMALL BUSINESS CATEGORY:

IS THE SUBCONTRACTOR IS A DISABLED VETERAN-OWNED BUSINESS? NO

SUBCONTRACTOR'S NAME: **Metimur, LLC**
ADDRESS: **516 West Shaw Avenue, Suite 200**
Fresno, CA 93704
PHONE NUMBER: (559) 221-2560 FEIN: 88-3709504
EMAIL: mary@metimured.com
ESTIMATED VALUE OF WORK TO BE SUBCONTRACTED: **$186,000.00**
DESCRIPTION OF WORK TO BE SUBCONTRACTED: **To serve as the Stakeholder Communication Representative for the NJ Department of Education and to be utilized for the Assessment literacy trainings.**

IS THE SUBCONTRACTOR IS A SMALL BUSINESS? NO

IF YES, SMALL BUSINESS CATEGORY:

IS THE SUBCONTRACTOR IS A DISABLED VETERAN-OWNED BUSINESS? NO

SUBCONTRACTOR'S NAME: **Tri-Lin Integrated Services, Inc.**
ADDRESS: **145310 Huebner Rd.**
San Antonio, TX 78249
PHONE NUMBER: (210) 348-6212 ext. 211 FEIN: 90-0193787
EMAIL: agalindo@tri-lin.com
ESTIMATED VALUE OF WORK TO BE SUBCONTRACTED: **$63,750.00**
DESCRIPTION OF WORK TO BE SUBCONTRACTED: **On-site translation and support during the educator meeting.**

IS THE SUBCONTRACTOR IS A SMALL BUSINESS? NO

IF YES, SMALL BUSINESS CATEGORY:

IS THE SUBCONTRACTOR IS A DISABLED VETERAN-OWNED BUSINESS? NO

Affirmative Action

Certification **72395**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Dec-2023** to **15-Dec-2026**

CAMBIUM ASSESSMENT INC.
1000 THOMAS JEFFERSON ST NW
WASHINGTON, DC DC 20007

ELIZABETH MAHER MUOIO
State Treasurer

Certification **72525**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT **INITIAL**

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Jan-2024** to **15-Jan-2027**

CAVEON, LLC
6905 SOUTH 1300 EAST, #468
MIDVALE **UT** **84047**

ELIZABETH MAHER MUOIO
State Treasurer

Certification **72587**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Jan-2024** to **15-Jan-2027**

HUMAN RESOURCES RESEARCH ORGAN
66 CANAL CENTER PLAZA SUITE 700
ALEXANDRIA VA 22314

ELIZABETH MAHER MUOIO
State Treasurer

Certification **72571**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Jan-2024** to **15-Jan-2027**

LAMBERT GLOBAL
47 COMMERCE AVE SW
GRAND RAPIDS MI 49503

ELIZABETH MAHER MUOIO
State Treasurer

Certification **31501**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Oct-2022** to **15-Oct-2025**

MEASUREMENT INCORPORATED
423 MORRIS STREET
DURHAM **NC** **27701**

ELIZABETH MAHER MUOIO
State Treasurer

Certification **72555**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Jan-2024** to **15-Jan-2031**

METIMUR LLC
498 W VARTIKIAN AVE
FRESNO **CA** **93704**

ELIZABETH MAHER MUOIO
State Treasurer

Certification **63213**

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of **15-Aug-2020** to **15-Aug-2027**

TRI-LIN INTEGRATED SERVICES INC

15310 HUEBIN RD

SAN ANTONIO **TX** **78248**

ELIZABETH MAHER MUOIO
State Treasurer

State of New Jersey Security Due Diligence Third-Party Information Security Questionnaire

3.5.12. State of New Jersey Security Due Diligence Third-Party Information Security Questionnaire

CAI has completed the State of New Jersey Security Due Diligence Third-Party Information Security Questionnaire. Per Section 3.4 of the RFQ, we have included the Questionnaire at the end of our proposal (please refer to Appendix Q, where the Questionnaire can be located).

Business Registration

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	CAMBIUM ASSESSMENT, INC.
Trade Name:	
Address:	17855 DALLAS PKWY STE 400 DALLAS, TX 75287
Certificate Number:	2401965
Effective Date:	November 25, 2019
Date of Issuance:	January 22, 2024

For Office Use Only:

20240122095443624

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	CAVEON LIMITED LIABILITY COMPANY
Trade Name:	
Address:	6905 SOUTH 1300 EAST, NO.468 MIDVALE, UT 84047
Certificate Number:	1173403
Effective Date:	November 20, 2014
Date of Issuance:	January 10, 2024

For Office Use Only:

20240110125300762

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	HUMAN RESOURCES RESEARCH ORG (HUMRRO)
Trade Name:	
Address:	133 FRANKLIN CORNER RD LAWRENCEVILLE, NJ 08648-2531
Certificate Number:	1073649
Effective Date:	July 06, 2004
Date of Issuance:	January 22, 2024

For Office Use Only:

20240122095145996

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	LAMBERT & CO.
Trade Name:	
Address:	47 COMMERCE AVE SW GRAND RAPIDS, MI 49503-4950
Certificate Number:	2943100
Effective Date:	January 24, 2024
Date of Issuance:	January 24, 2024

For Office Use Only:

20240124105034538

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	MEASUREMENT INCORPORATED
Trade Name:	
Address:	423 MORRIS ST DURHAM, NC 27701-2128
Certificate Number:	0940243
Effective Date:	April 01, 1980
Date of Issuance:	January 22, 2024

For Office Use Only:

20240122095539347

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	METIMUR LLC
Trade Name:	
Address:	FIVE GREENTREE CENTRE 525 ROUTE 73 MARLTON, NJ 08053
Certificate Number:	2962837
Effective Date:	March 12, 2024
Date of Issuance:	November 13, 2024

For Office Use Only:

20241113101456991

STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name:	TRI-LIN INTEGRATED SERVICES INC.
Trade Name:	
Address:	15310 HUEBNER RD SAN ANTONIO, TX 78248-7824
Certificate Number:	2936463
Effective Date:	January 12, 2024
Date of Issuance:	January 22, 2024

For Office Use Only:

20240122094712455

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
11/05/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Aon Risk Services Southwest, Inc.
Dallas TX Office
5005 Lyndon B Johnson Freeway
Suite 1500
Dallas TX 75244 USA

CONTACT NAME:
PHONE (A/C. No. Ext): (866) 283-7122 **FAX (A/C. No.):** (800) 363-0105
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A:	Berkley National Insurance Company	38911
INSURER B:	Endurance American Insurance Company	10641
INSURER C:	Underwriters At Lloyds London	15792
INSURER D:		
INSURER E:		
INSURER F:		

INSURED
Cambium Assessment, Inc.
17855 Dallas Pkwy
Ste 400
Dallas TX 75287-6857 USA

COVERAGES **CERTIFICATE NUMBER:** 570109283801 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS,

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE / X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY / PRO-JECT / LOC OTHER:	Y		TCP701596514	04/15/2024	04/15/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$1,000,000 $1,000,000 $15,000 $1,000,000 $2,000,000 $2,000,000
A	AUTOMOBILE LIABILITY ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY	Y		TCP 7015965-14	04/15/2024	04/15/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$1,000,000
A	X UMBRELLA LIAB / X OCCUR EXCESS LIAB / CLAIMS-MADE DED / RETENTION			TCP701596514	04/15/2024	04/15/2025	EACH OCCURRENCE AGGREGATE	$25,000,000 $25,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER (Mandatory in NH) N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		TWC701596615	04/15/2024	04/15/2025	X PER STATUTE / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE-EA EMPLOYEE E.L. DISEASE-POLICY LIMIT	$1,000,000 $1,000,000 $1,000,000
B	Cyber Liability			NRO30057891400 Cyber/E&O - Claims Made SIR applies per policy terms & conditions	04/15/2024	04/15/2025	Aggregate	$5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: RFQ #25-004 - New Jersey English Language Arts and Mathemetics Next Generations Statewide Assessment Program. The State of New Jersey, its officers and employees are included as Additional Insured in accordance with the policy provisions of the General Liability and Automobile Liability policies.

CERTIFICATE HOLDER

State of New Jersey
Dept. of the Treasury
Division of Purchase & Property
Contract Compliance & Audit Unit
PO Box 236
Trenton NJ 08625 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Southwest, Inc.

Holder Identifier :

Certificate No : 570109283801

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

GENERAL LIABILITY EXTENSION FOR TECHNOLOGY COMPANIES ENDORSEMENT

This Endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE FORM

This endorsement broadens coverage. The following schedule of coverage extensions is a general coverage description only. Limitations and exclusions may apply to these coverages. Read all the provisions of this endorsement along with your entire policy carefully to determine the extent of coverage afforded.

SCHEDULE OF COVERAGE EXTENSIONS

A.	Additional Insured – Lessors of Leased Equipment	L.	Duties in the Event of Occurrence, Offense, Claim or Suit
B.	Additional Insured – Owners, Managers or Lessors of Premises	M.	Expected or Intended Injury or Damage (Property Damage)
C.	Additional Insured - Primary and Non-contributory	N.	Damage to Premises Rented To You
D.	Additional Insured – Vendors	O.	Medical Payments
E.	Additional Insured – Written Contract or Agreement	P.	Non-owned Aircraft
F.	Aggregate Limit Per Location	Q.	Non-owned Watercraft
G.	Amateur Athletic Participants	R.	Newly Acquired or Formed Organizations
H.	Bodily Injury Definition	S.	Supplementary Payments
I.	Broadened Named Insured	T.	Unintentional Omission
J.	Damage to Property – Borrowed Equipment, Customer Goods, Use of Elevators	U.	Waiver of Subrogation - Blanket
K.	Good Samaritan Services		

A. ADDITIONAL INSURED - LESSORS OF LEASED EQUIPMENT

Under **Section II - Who Is An Insured**, the following is added:

Any person or organization that is an equipment lessor is an insured, but only with respect to liability for "bodily injury", "property damage", "personal and advertising injury" caused, in whole or in part, by your acts or omissions in the maintenance, operation or use by you of equipment leased to you by such equipment lessor.

The insurance provided to such equipment lessor does not apply to any "bodily injury" or "property damage" caused by an "occurrence" that takes place, or "personal and advertising injury" caused by an offense that is committed after the equipment lease expires.

B. ADDITIONAL INSURED - OWNERS, MANAGERS OR LESSORS OF PREMISES

Under **Section II - Who Is An Insured**, the following is added:

Any person or organization that is a premises owner, manager or lessor is an insured, but only with respect to liability arising out of the ownership, maintenance or use of that part of any premises leased to you.

The insurance provided to such premises owner, manager or lessor does not apply to:

1. Any "bodily injury" or "property damage" caused by an "occurrence" that takes place, or "personal and advertising injury" caused by an offense that is committed, after you cease to be a tenant in that premises; or
2. Structural alterations, new construction or demolition operations performed by or on behalf of such premises owner, manager or lessor.

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C. ADDITIONAL INSURED - PRIMARY AND NON-CONTRIBUTORY

The following is added to the **Other Insurance** Condition and supersedes any provision to the contrary:

This insurance is primary to and will not seek contribution from any other insurance available to an additional insured under your policy provided that:

1. The additional insured is a Named Insured under such other insurance; and
2. You have agreed in writing in a contract or agreement that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

D. ADDITIONAL INSURED - VENDORS

Under **Section II - Who Is An Insured**, the following is added:

Any person or organization that is a vendor and that you have agreed in a written contract or agreement to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury" or "property damage" that:

1. Is caused by an "occurrence" that takes place after you have signed and executed that contract or agreement; and
2. Arises out of "your products" which are distributed or sold in the regular course of such vendor's business.

The insurance provided to such vendor is subject to the following provisions:

1. The limits of insurance provided to such vendor will be the limits which you agreed to provide in the written contract or agreement, or the limits shown in the Declarations, whichever are less.
2. The insurance provided to such vendor does not apply to:
   a. Any express warranty not authorized by you;
   b. Any change in "your products" made by such vendor;
   c. Repackaging, unless unpacked solely for the purpose of inspection, demonstration, testing, or the substitution of part under instructions from the manufacturer, and then repackaged in the original container;
   d. Any failure to make such inspections, adjustments, tests or servicing as vendors agree to perform or normally undertake to perform in the regular course of business, in connection with the distribution or sale of "your products";
   e. Demonstration, installation, servicing or repair operations, except such operations performed at such vendor's premises in connection with the sale of "your products"; or
   f. "Your products" which, after distribution or sale by you, have been labeled or relabeled or used as a container, part or ingredient of any other thing or substance by or on behalf of such vendor.

Coverage under this provision does not apply to:

1. Any person or organization from whom you have acquired "your products", or any ingredient, part or container entering into, accompanying or containing such products; or
2. Any vendor for which coverage as an additional insured specifically is scheduled by endorsement.

E. ADDITIONAL INSURED - WRITTEN CONTRACT OR AGREEMENT

Under **Section II - Who Is An Insured**, the following is added:

Any person or organization that is not otherwise an insured under this Coverage Part and that you have agreed in a written contract or agreement to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury" or "property damage" that:

1. Is caused by an "occurrence" that takes place after you have signed and executed that contract or agreement; and
2. Is caused, in whole or in part, by your acts or omissions in performance of your ongoing operations to which that contract or agreement applies or the acts or omissions of any person or organization performing such operations on your behalf.

The limits of insurance provided to such insured will be the limits which you agreed to provide in the written contract or agreement, or the limits shown in the Declarations, whichever are less.

F. AGGREGATE LIMIT PER LOCATION

1. Under **Section III - Limits Of Insurance,** the following is added:

   The General Aggregate Limit applies separately to each of your "locations" owned by or rented or leased to you.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

BUSINESS AUTO BROADENING ENDORSEMENT

This endorsement modifies insurance provided under the following form:

BUSINESS AUTO COVERAGE FORM

To the extent that the provisions of this endorsement provide broader benefits to the "insured" than other provisions of the policy, the provisions of this endorsement apply.

This is a summary of the various additional coverages and coverage modifications provided by this endorsement. For complete details on specific coverages, consult the actual policy wording.

SCHEDULE

Coverage	**Limit of Insurance**
Who is an Insured - Employees, Partners, Members, Volunteers and Board Members	Included
Automatic Additional Insureds - By Contract and Primary and Non-Contributory Provision	Included
Leased Auto Coverage	Included
Owned Subsidiaries and Newly Acquired or Formed Organizations	Included
Supplementary Payments - Bail Bonds	$5,000
Supplementary Payments - Loss of Earnings	$1,000 - Per Day
Fellow Employee	Included
Physical Damage Coverage Extensions - Towing	$200 - Any Auto
Physical Damage Coverage Extensions - Glass Breakage	No Deductible
Physical Damage Coverage Extensions - Transportation Expenses	$100 - Per Day $3,000 - Maximum
Hired Auto Physical Damage Coverage	$100 - Per Day $3,000 - Maximum
Total Theft of a Covered Auto	$500 - Personal Items $1,000 - Reasonable Expenses to Return Stolen Auto
Auto Loan / Lease Gap Protection	Included
Customization Coverage	$2,000
Newly Acquired Owned Autos and Donated Autos Physical Damage Coverage	$100,000
Rental Reimbursement Coverage	$100 per day up to 30 days $500 for reasonable expenses to remove and replace your materials and equipment
Accidental Discharge - Airbag Coverage	Included
Original Equipment Manufacturer OEM Part Replacement	Included
Multiple Deductibles	Included

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SCHEDULE (Continued)

Coverage	Limit of Insurance
Notice and Knowledge of Occurrence - Duties in the Event of Accident, Claim, Suit or Loss	Included
Blanket Waiver of Subrogation By Written Contract	Included
Unintentional Errors And Omissions	Included
Mental Anguish	Included

A. WHO IS AN INSURED - EMPLOYEES, PARTNERS, MEMBERS, VOLUNTEERS AND BOARD MEMBERS

The following is added to **Section II - Covered Autos Liability Coverage**, Paragraph **A.1. Who Is An Insured**:

d. Any "employee", partner or member of yours while using a covered "auto" you don't own, hire or borrow in your business or your personal affairs.

e. Anyone volunteering services to you while using a covered "auto" you don't own, hire or borrow in activities necessary to your business. Anyone else who furnishes that "auto" is also an "insured".

f. Board members (or their spouses) while renting a vehicle while on business for the named insured.

B. AUTOMATIC ADDITIONAL INSUREDS BY CONTRACT AND PRIMARY AND NON-CONTRIBUTORY PROVISION

1. **Section II - Covered Autos Liability Coverage**, Paragraph **A.1. Who is An Insured** is amended to include as an Insured any person or organization whom you are required to add as an Additional Insured on this policy under a written contract or written agreement in effect on the date of the "accident"; and signed by all parties prior to the "accident."

2. This person or organization is an Additional Insured only to the extent you are liable for an "accident" caused, in whole or in part, by the use of a covered "auto" being driven by you or any "insured." However:

a. The insurance afforded to such Additional Insured only applies to the extent permitted by law; and

b. If coverage provided to the Additional Insured is required by a written contract or written agreement, the insurance afforded to such Additional Insured will not be broader than that which you are required by the written contract or written agreement to provide for such Additional Insured.

3. With respect to insurance provided to an Additional Insured the following provisions apply:

a. This insurance is primary to and will not seek contribution from any other insurance available to an Additional Insured under your policy provided that:

(1) The Additional Insured is a Named Insured under such other insurance; and

(2) You have agreed in writing in a contract or agreement that this insurance would be primary and would not seek contribution from any other insurance available to the Additional Insured.

b. When a written contract or written agreement does not require this insurance to be primary or primary and non-contributory, this insurance is excess over any other insurance for which the Additional Insured is designated as a Named Insured.

c. Regardless of the written contract or written agreement between you and an Additional Insured, this insurance is excess over any other insurance whether primary, excess, contingent or any other basis for which the Additional Insured has been added as an additional insured on other policies.

d. If coverage provided to the additional insured is required by a written contract or written agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

(1) Required by the written contract or written agreement; or

(2) Available under the applicable Limits of Insurance show in the Declarations;

whichever is less.

C. LEASED AUTO COVERAGE

With respect to insurance provided to an Additional Insured who is a lessor of a "leased auto" the following provisions apply:

1. **Section II - Covered Autos Liability Coverage**, Paragraph **A. Coverage** is amended by adding the following:

a. Any "leased auto" designated or described in the Schedule will be considered a covered "auto" you own and not covered "auto" you hire or borrow.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

NOTICE OF CANCELLATION TO THIRD PARTIES

This endorsement modifies insurance provided under the following:

ABUSE OR MOLESTATION LIABILITY COVERAGE FORM
COMMERCIAL AUTOMOBILE COVERAGE PART
COMMERCIAL CRIME COVERAGE PART
COMMERCIAL EXCESS LIABILITY COVERAGE PART
COMMERCIAL GENERAL LIABILITY COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
COMMERCIAL LIABILITY UMBRELLA COVERAGE PART
COMMERCIAL OUTPUT PROGRAM
COMMERCIAL PROPERTY COVERAGE PART
PROFESSIONAL LIABILITY COVERAGE FORM

SCHEDULE

Schedule of Person(s) or Organization(s): Any person or Organization required by written contract to receive such notice, as evidenced by list on file with Company.
Number of Days Notice: 30
(If no entry appears above, information required to complete this Schedule will be shown in the Declarations as applicable to this endorsement.)

Common Policy Conditions Condition A, Cancellation, is amended to include the following:

Notice of cancellation will be also be provided to the person(s) or organization(s) listed in the schedule above.

Certification of Non-Involvement in Prohibited Activities in Russia or Belarus Pursuant to P.L.2022, C.3

CERTIFICATION OF NON-INVOLVEMENT IN PROHIBITED ACTIVITIES IN RUSSIA OR BELARUS

Pursuant to N.J.S.A. 52:32-60.1, et seq. (L. 2022, c. 3) any person or entity (hereinafter "Vendor[i]") that seeks to enter into or renew a contract with a State agency for the provision of goods or services, or the purchase of bonds or other obligations, must complete the certification below indicating whether or not the Vendor is identified on the Office of Foreign Assets Control (OFAC) Specially Designated Nationals and Blocked Persons list, available here: https://sanctionssearch.ofac.treas.gov/. If the Department of the Treasury finds that a Vendor has made a certification in violation of the law, it shall take any action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

I, the undersigned, certify that I have read the definition of "Vendor" below, and have reviewed the Office of Foreign Assets Control (OFAC) Specially Designated Nationals and Blocked Persons list, and having done so certify:

(Check the Appropriate Box)

(●) A. That the Vendor is not identified on the OFAC Specially Designated Nationals and Blocked Persons list on account of activity related to Russia and/or Belarus.

OR

( ) B. That I am unable to certify as to "A" above, because the Vendor is identified on the OFAC Specially Designated Nationals and Blocked Persons list on account of activity related to Russia and/or Belarus.

OR

( ) C. That I am unable to certify as to "A" above, because the Vendor is identified on the OFAC Specially Designated Nationals and Blocked Persons list. However, the Vendor is engaged in activity related to Russia and/or Belarus consistent with federal law, regulation, license or exemption. A detailed description of how the Vendor's activity related to Russia and/or Belarus is consistent with federal law is set forth below.

_____

_____

_____

_____

_____

_____

(Attach Additional Sheets If Necessary.)

Signature of Vendor's Authorized Representative	December 2, 2024 Date
Christopher Lowe, Senior Director Print Name and Title of Vendor's Authorized Representative	84-3272684 Vendor's FEIN
Cambium Assessment, Inc. Vendor's Name	(202) 247-6196 Vendor's Phone Number
4200 Wilson Blvd, Suite 610 Vendor's Address (Street Address)	N/A Vendor's Fax Number
Arlington, VA 22203 Vendor's Address (City/State/Zip Code)	snehal.pathak@cambiumassessment.com Vendor's Email Address

[i] Vendor means: (1) A natural person, corporation, company, limited partnership, limited liability partnership, limited liability company, business association, sole proprietorship, joint venture, partnership, society, trust, or any other nongovernmental entity, organization, or group; (2) Any governmental entity or instrumentality of a government, including a multilateral development institution, as defined in Section 1701(c)(3) of the International Financial Institutions Act, 22 U.S.C. 262r(c)(3); or (3) Any parent, successor, subunit, direct or indirect subsidiary, or any entity under common ownership or control with, any entity described in paragraph (1) or (2).

Technical Quote

3.6. Technical Quote

Cambium Assessment, Inc.'s (CAI) technical quote is a compilation of our technical proposal along with the documents described in the sections that follow. Sections 3.7 through 3.17 and Sections 4.1 through 4.14 of our proposal include details on all project requirements necessary to accomplish the scope of work defined in this RFQ.

3.6.1. Preliminary Work Plan

The Preliminary Work Plan describing our proposed approach and plans for accomplishing the work outlined in this RFQ can be found in Appendix K of our proposal.

3.6.2. Preliminary Yearly Schedule

CAI has included a Preliminary Yearly Schedule in Appendix L of our proposal. This will serve as CAI's initial draft of the initial Operational Yearly Schedule, as defined in Section 4.3.1.1.

3.7. Management Overview

Introduction

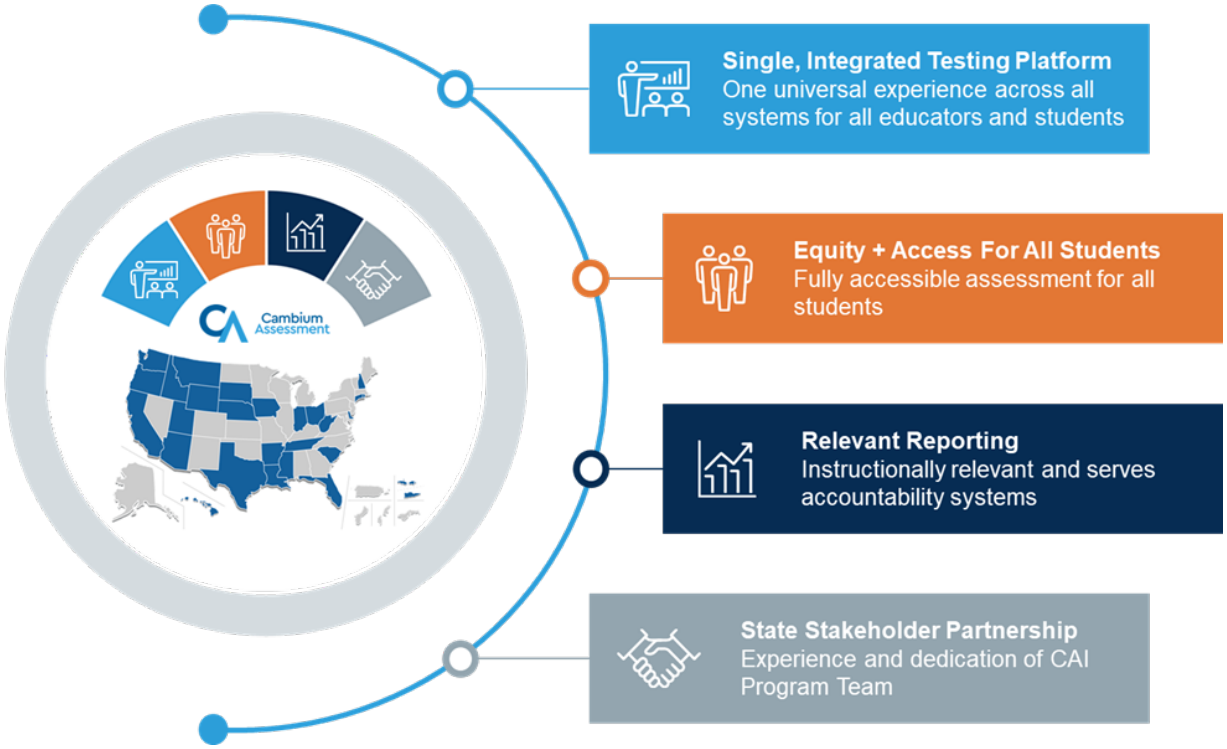
The New Jersey Department of Education (NJDOE) is clearly focused on advancing its assessment program to improve efficiency, accessibility, and actionable insights from testing data. Centered on rigorous standards that guide curriculum and instruction, this approach emphasizes equitable access and ensures that every student has the opportunity to meet high expectations, regardless of their background or resources.

With a focus on balanced accountability, NJDOE recognizes that assessments must be part of a larger system that fosters quality instruction and encourages continuous improvement. The New Jersey Next Generation Assessment (New Jersey's Student Learning Assessments for English Language Arts and Mathematics [NJSLA-ELA/M] and New Jersey Graduation Proficiency Assessment [NJGPA]) will continue to evolve, and NJDOE seeks to provide meaningful, professional learning opportunities for educators, helping them interpret assessment results and use data to enhance classroom practices so they can better support every student's growth and achievement.

This RFQ envisions a relationship with an assessment partner that supports the diverse and complex technical needs of a large-scale program, while also supporting NJDOE in making decisions on how to best achieve its objectives. In this spirit, we set forth our approach to providing NJDOE with a partnership that will exceed the requirements of this RFQ in the sections that follow. Exhibit 3.7-1 highlights CAI's commitment to providing intuitive and equitable assessment platforms that provide clear and actionable information about student performance.

Our partnership promises a stable and transparent assessment system which keeps the focus where it should be—on New Jersey students—by removing the technical complexities that often fall to local personnel to navigate in competing assessment implementations. Our system is lean, highly scalable, and quickly becomes part of the integrated educational landscape in classrooms large and small across the K–12 spectrum.

Exhibit 3.7-1: CAI's Comprehensive Assessment System



CAI is committed to partnering with our clients to ensure the following:

- A single, integrated testing platform that emphasizes ease of use and is designed to respond to both NJDOE's and the students' changing needs
- The production of high-quality and standards-aligned assessments that measure all students' achievement levels and learning gains, as well as their educational strengths and opportunities; also, a seamless, systemic, and intuitive approach to delivering assessments of all types that compliment everyday instruction, while minimizing the operational burden on educators and administrators
- Equitable access for all students by providing the tools and supports they need to test effectively and without distraction
- Timely reporting and immediately actionable data to inform personalized learning, instruction, and intervention in classrooms and schools
- Meaningful and targeted training and professional development materials to support quality instruction
- Quality service that is deeply rooted in a spirit of partnership and shared ownership

CAI's technology platform is highly scaled and has been load-tested to demonstrate its ability to support more than three million concurrent test takers. We delivered more than 124 million online assessments in the 2023–2024 school year, with a peak of more than 1.5 million students simultaneously testing across all CAI client programs on April 16, 2024.

CAI currently delivers customized computer-adaptive or fixed-form assessments in 27 states and jurisdictions. Our online management, assessment delivery, and reporting applications are seamlessly integrated to provide a powerful solution to meet the requirements in the RFQ. We offer these applications and the expertise that supports them in response to NJDOE's request to support the planning, development, administration, data analysis, scoring, and reporting of the assessment programs and activities that we discuss in this section.

Our response to the RFQ requirements is comprehensive, underscoring the importance of several different program areas and competencies in ensuring on-time and error-free delivery. In particular, we emphasize the following CAI services to be included as part of this proposal:

- Deployment of a large-scale, dedicated, and experienced Project Management Team with a clear understanding of NJDOE's required schedule and program goals and expert knowledge of CAI system integration points with internal systems and external collaborators; management and maintenance of a master schedule across programs by an experienced project manager
- Implementation of a reliable, architecturally sound, and highly fault-tolerant online administration platform that emphasizes the seamlessness of the student experience, accessibility, and system security, alongside accurate and efficient machine-scoring and automated scoring services
- Implementation of a dynamic, Single Sign-On (SSO)-supported online management system that permits users to manage and fully administer the different facets of the assessment program for their students, inclusive of materials and contact management, online test session creation and management, reporting and data corrections, and access to historical data and informational family and research portals
- Provision of a dynamic item bank, CAI's Item Tracking System (ITS), which permits the application of accessibility supports and houses the final configuration files needed to generate both online and paper test packages; robust support for passage and item development, leasing activities, and committee review meetings
- Administration support services for the printing, packaging, and distribution of paper test materials, student reports, and other printed collateral
- Industry-leading psychometric and analytical services to ensure that requirements are being met in all aspects of test development, validation, administration, scaling and equating, scoring, reporting, and score interpretation
- A flexible and visually dynamic reporting application that provides users with access to student data in various on-screen configurations and downloadable reports
- Approachable and knowledgeable district outreach support staff and Help Desk services, with agents recognized for their responsiveness and close collaboration with district partners
- Experienced technical writers, publication editors, training personnel, and professional development personnel
- Integrated and thorough quality assurance (QA) testing within each application team

CAI's teams possess unmatched experience in each of these program areas. We deliver more online statewide accountability assessments than any other organization, and we lead the field in expanding the potential of online testing. As described in the sections that follow, we present a plan that draws upon our organizational strengths and capacity to offer a solution that supports NJDOE's vision to produce the nation's leading assessment program for New Jersey students.

Leading the Way in Online Assessment

The online assessment platform must support the capabilities that make an assessment look more like a good lesson. CAI leads the online assessment industry, and we continue to produce the third generation of online testing capabilities.

The first generation of online tests simply put paper-pencil tests online. The second generation incorporated some technology-enhanced features, including machine-scored graphic-response items, machine-scored equation items, a variety of selected-response input types, and some

level of automated scoring of written responses, including essays and shorter written responses. The second generation also began to take advantage of computer-provided assistive technology by offering increased accessibility features.

The second generation of tests offered many lessons in online assessment. Some selected-response technology-enhanced items (TEIs), such as drag-and-drop, measured information in the same way as multiple-choice items, but did so at the expense of accessibility, making it more difficult for visually impaired students and students with certain mobility impairments to test. As a result, some items had longer response times without yielding a corresponding increase in information.

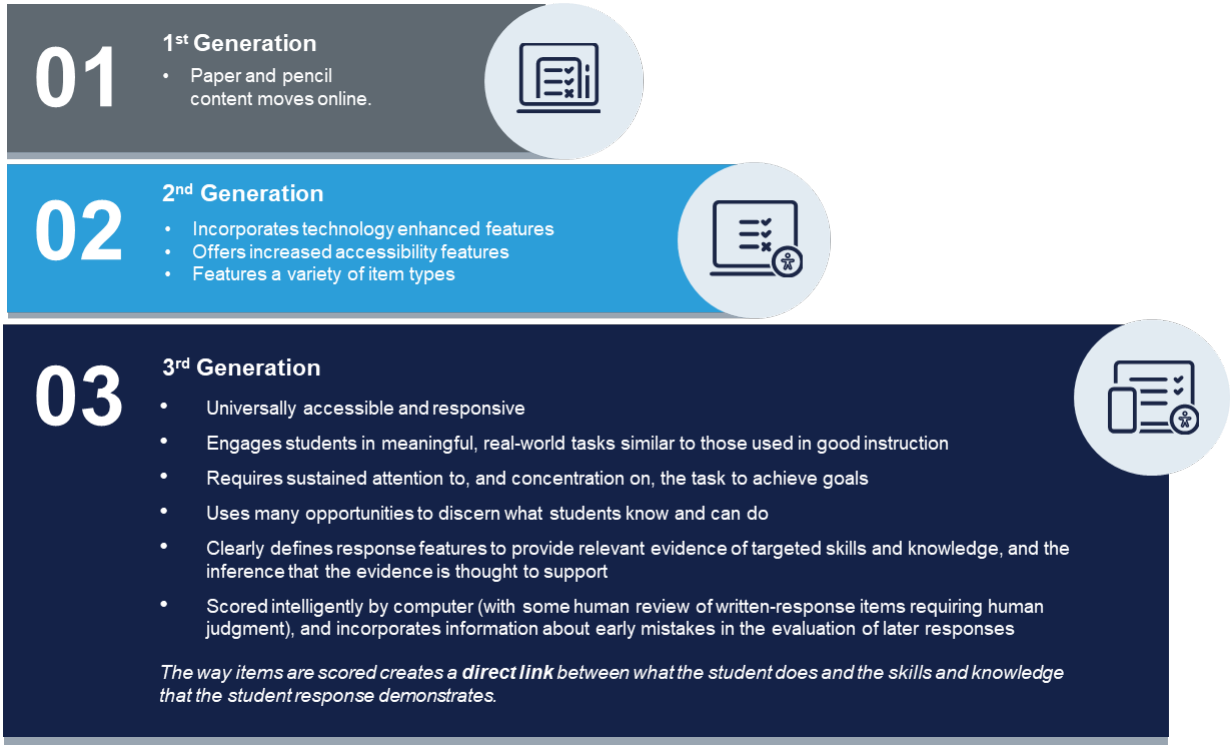
CAI built upon these lessons, and our clients are now benefiting from our third-generation technologies that make more use of modern device capabilities. Third-generation assessment tasks are universally accessible and

- engage students in meaningful, real-world tasks similar to those used in good instruction;
- require sustained attention to, and concentration on, the task to achieve goals;
- are intelligently scored by computer (with some human review of written-response items requiring human judgment), incorporating information about early mistakes in the evaluation of later responses;
- create and use many opportunities to discern what students know and can do as they work through the tasks; and
- clearly define response features that are thought to provide relevant evidence of targeted skills and knowledge, as well as the inference that the evidence is thought to support.

The way items are scored creates a direct link between what the student does and the skills and knowledge that the student response demonstrates. This approach provides a physical embodiment of *evidence-centered design*, which is Mislevy and Haertel's well-regarded approach to cognitive measurement (Mislevy & Haertel, 2006). This approach provides a structure for ensuring and reviewing alignment during test development and, when tests are scored and reported, a clear explanation of what was measured, how it was measured, and why it was measured.

Exhibit 3.7-2 illustrates this evolution of online testing and item development.

Exhibit 3.7-2: Evolution of Item Development

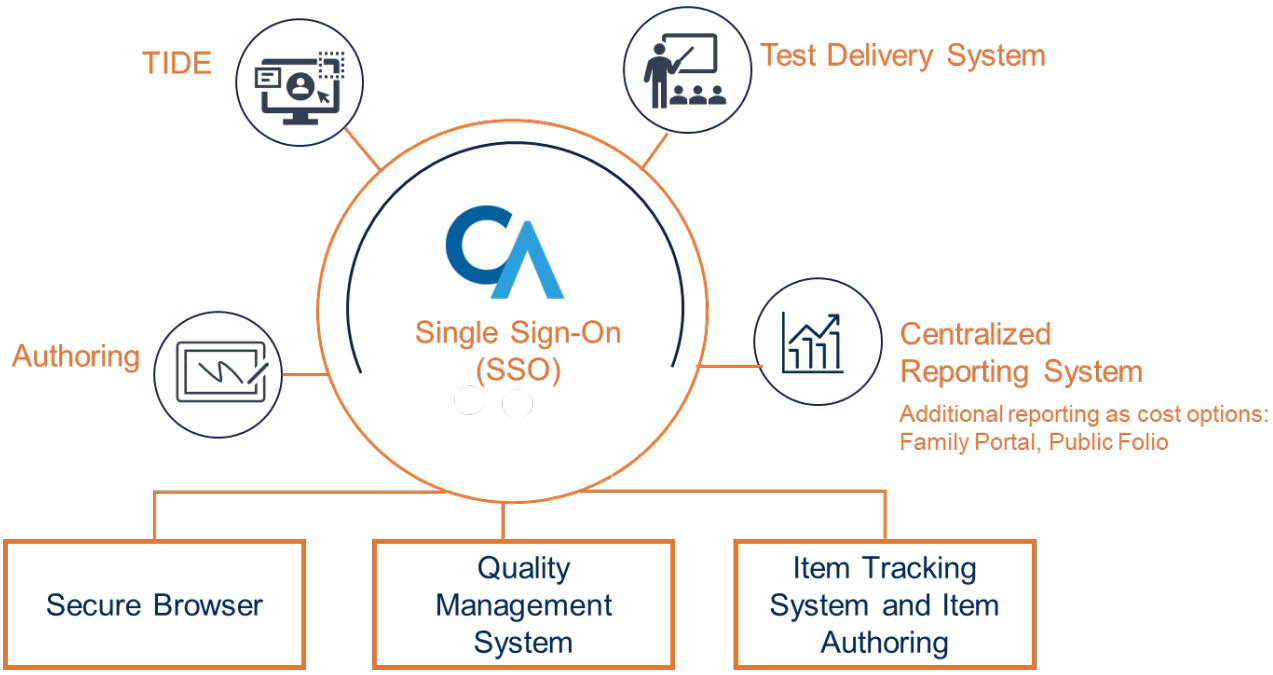


Overview of Core CAI Systems and Applications

CAI's end-to-end assessment solution offers a powerful response to the requirements in the RFQ because all project components are seamlessly interconnected with one another, with configurability at the core of each implementation. In demonstrating our understanding of the project and confirming our ability to deliver against its requirements, we offer a high-level overview of the different project components that comprise our solution. CAI is an experienced industry partner with core systems specifically designed to meet the needs of a large-scale assessment program with technological rigor, uniformity, and clarity.

Exhibit 3.7-3 provides a simplified view of some of CAI's core systems. In the sections that follow, we will provide an overview of each system, detailing their core functions within CAI's application ecosystem, as well as outlining the advantages that each offers to students, educators, and administrators in organizing, delivering, and reporting New Jersey assessments.

Exhibit 3.7-3: High-Level Overview of CAI Core Systems



Test Information Distribution Engine

The Test Information Distribution Engine (TIDE) is a fully integrated student registration, data, and materials management module. TIDE serves as the core component of CAI's user-facing online management system. Across CAI implementations, TIDE has demonstrated its ability to adapt and competently manage complex system requirements supporting the import and management of student data, student score codes and testing appeals, materials management and ordering, and secure communications management. CAI also partners with local school districts in pilot programs, which inform future module development and ensure that districts are using a system that meets them where they are and does not impose onerous requirements for transforming or manipulating sensitive student data.

Real-Time Administration Information

Being able to monitor activity in the online management and test delivery systems is one of the top priorities for district and school personnel when administering student assessments. CAI's administration process is straightforward and intuitive, and users generally find that they are not required to intervene in test administration once it has begun; the system is transparent and there are a variety of tools available to help users obtain information about overall testing progress.

Data updated in TIDE are made available in near-real time to CAI's other interconnected assessment systems, including the Test Delivery System (TDS) and the Centralized Reporting System (CRS). This means that students can be transmitted to TIDE immediately prior to joining a test session in TDS, and updates to student demographic data and district/school enrollment information can be made before, during, or after testing, and immediately be available in CRS for reporting purposes.

TIDE also provides a series of participation report options, which detail individual student progress as information is saved to CAI servers in real time. Nightly reports (which provide session-level information) and test completion rates at individual districts and campuses are also provided to help administrators plan as testing progresses at their sites.

Seamless and Secure Data Management

TIDE currently supports many different data transfer options for student registration, including direct integration with state Student Information System (SIS) platforms via application programming interface (API) and/or regular file-based transfers and web-based file uploads through the TIDE interface. CAI currently supports each of these options in production for existing contracts. CAI can also support a combination of two or more options, such as an API-based exchange for most student registration updates, with an option for web-based user interface (UI) additions and/or file uploads for last-minute or emergency use by authorized user roles to upload students to the testing system.

TIDE is built to ensure data integrity from start to finish to streamline administration and reporting processes. TIDE streamlines student registration and reporting processes in the following ways:

- TIDE has worked with various data transmission methods across a substantial number of clients, districts, and schools. Its infrastructure is highly flexible, so its integration can be customized to suit the specific needs of New Jersey districts and schools.
- Some students move many times throughout the year. TIDE's architecture includes using the Roster Tracking System (RTS), a centralized database that records and tracks the historical and latest relationships a student has to a school, then sends this update downstream to all CAI systems. This process ensures the highest data security regarding which jurisdictions have access to personally identifiable information (PII).
- In addition to near-real-time integration, all data loaded into TIDE, whether from district student information systems, user uploads, or within the TIDE user interface, are extensively validated. Validation rules prevent the creation of duplicate student records and ensure that student data are accurate and consistent, minimizing the need for data correction activities during reporting.
- Test eligibility for paper-pencil and online test administrations is based directly on student demographic and accommodation information using clear rules defined in conjunction with NJDOE to ensure that students take their appropriate tests with limited administrative oversight.
- TIDE provides extensive search and reporting capabilities for student data, which allow for the quick review and update of student data, as needed.

Data updated in TIDE are made available in near-real time to CAI's other assessment systems, including TDS and CRS. This means that students can be transmitted to TIDE immediately before they are going to test in TDS, and updates to student demographic data and district/school of enrollment can be made before, during, or after testing and be available immediately in CRS for reporting purposes.

Test Delivery System

The TDS supports student testing volumes at scale with the ability to continue to expand. The near-infinite scalability of the platform is a key differentiator, ensuring that our proposed solution can comfortably accommodate all New Jersey students without any performance degradation or capacity constraints.

Across CAI implementations, TDS has demonstrated a singular capacity to deliver a reliable and seamless student testing experience that features a high degree of configurability and reliability while emphasizing low fault tolerance and imposing a minimal technical footprint. CAI's system architecture model is a rigorously tested, time-proven, and rapidly scalable solution that can be quickly adapted to meet the needs of New Jersey school districts. Our implementation model allows the focus of the assessment and accountability system to remain on student performance and not on the delivery platform.

Universal Design for Learning

CAI adheres to the *Standards for Educational and Psychological Testing* (American Education Research Association [AERA], American Psychological Association [APA], and National Council on Measurement in Education [NCME], 2014) for the development and implementation of all state assessments. These standards include: (1) developing items and tests that measure the intended construct while minimizing construct-irrelevant barriers that may impact test performance, and (2) developing and providing appropriate accommodations to remove construct-irrelevant barriers where they exist. The principles of universal design provide guidelines for test design to minimize the impact of construct-irrelevant factors in assessing student achievement. Universal design removes barriers to reach the widest range of students possible.

Universally designed tests include, but are not limited to, clear visuals, clear formatting, concise and readable text, and respect for a diverse population. CAI employs a series of automated validation checks and human platform reviews as part of the item development process to guarantee high-quality content delivery and proper performance of assistive technology, such as screen readers.

CAI also has a variety of embedded online testing tools to support student accessibility needs. These custom settings allow the assessments to be adapted to each student's individualized needs. The following are examples of the custom accessibility settings available within TDS:

- *Auditory Assistance Tools*: These tools allow audio transcriptions and closed captioning.
- *Cognitive Assistance Tool*: This tool allows voice guidance during assessments, as permitted by state testing regulations and policy.
- *Concentration Assistance Tools*: These are a group of tools that allow students to expand passages and items, use a full-screen view, and employ a line reader for on-screen reading; this includes other tools that help students stay focused.
- *General Testing Tools*: All items are equipped with an item tutorial, video playback controls, and font sizes/font types that can be adjusted.
- *Presentation Tools*: Using these tools, language settings may be adjusted in items and passages to meet the needs of English learners (ELs).
- *Reading Tools*: Using these tools, text-to-speech (TTS) may be enabled; a thesaurus and a series of English and foreign language glossaries are included among these tools.
- *Visual Tools*: Using these tools, text color and contrast may be adjusted, and mouse pointer color and shape may be altered.

Centralized Reporting System

The success of an assessment program depends on the ability to provide meaningful data and reports to teachers, schools, and districts in ways that each user group can easily access and understand. CAI's CRS is a single, integrated reporting system for all student assessments. Data displays in CRS are intuitive and easy to understand, and the system is fully integrated with TIDE—a core component of CAI's online management system—enabling each student's scores to follow the student as he or she moves across educational jurisdictions. For formative assessments or assessments where state approval of preliminary results is not required, CRS will provide access to scores in near-real time as students submit their tests.

CRS is currently used by 25 states to report their statewide assessments in near-real time. In Texas, which is one of CAI's largest program implementations, CRS is presently used to report 13 separate administrations of eight separate test instruments. This means that teachers can access student and aggregate results for each of their state assessments in a single, centralized

location throughout the year. As an example of the reporting module's ability to deliver this volume of information at scale, Exhibits 3.7-4, 3.7-5, and 3.7-6 indicate the total number of Texas tests that were reported in CRS for the 2021–2022, 2022–2023, and 2023–2024 school years, respectively.

Exhibit 3.7-4: Single Platform to Report Assessments (Texas, 2021–2022)

Test Instruments	Number of Tests Reported in CRS (2021–2022)
STAAR EOC Spring 2022	979,553
STAAR EOC June 2022	222,986
STAAR 3–8 May 2022	5.8 million
STAAR EOC May 2022	1.3 million
STAAR Alternate 2 2022	126,772
Beginning of Year Tests 2021	458,934
STAAR Interim Window 1	1.2 million
STAAR Interim Window 2	634,644
STAAR Interim Window 3	1.9 million
Fall EOC 2021	507,990
TELPAS 2022	1.1 million
TELPAS Alternate 2022	9,842
TFAR (Formative)	639

Exhibit 3.7-5: Single Platform to Report Assessments (Texas, 2022–2023)

Test Instruments	Number of Tests Reported in CRS (2022–2023)
STAAR EOC Spring 2023	2.3 million
STAAR EOC June 2023	154,094
STAAR 3–8 May 2023	5.8 million
STAAR Alternate 3–8 2023	99,801
STAAR Alternate EOC 2023	29,063
STAAR Interim Window 1	2.2 million
STAAR Interim Window 2	1.1 million
STAAR Interim Window 3	3.5 million
Fall EOC 2022	423,378
TELPAS 2023	1.2 million
TELPAS Alternate 2023	11,285
TFAR (Pre-Canned)	216,897
TFAR (Educator Authored)	2.8 million
TTAP	61,837

Exhibit 3.7-6: Single Platform to Report Assessments (Texas, 2023–2024)

Test Instruments	Number of Tests Reported in CRS (2023–2024)
STAAR EOC Spring 2024	2.3 million
STAAR EOC June 2024	154,975
STAAR 3–8 May 2024	5.9 million
STAAR Alternate 3–8 2024	89,872
STAAR Alternate EOC 2024	25,797
STAAR Interim Window 1	2 million
STAAR Interim Window 2	1 million
STAAR Interim Window 3	2.8 million
Fall EOC 2023	412,563
TELPAS 2024	1.3 million
TELPAS Alternate 2024	10,924
TFAR (Pre-Canned)	621,560
TFAR (Educator Authored)	281,9474
TTAP	15,1930

Standard Reports

In addition to the CRS's dynamic reporting capabilities, CAI has several years of experience designing and producing the informational reports that are delivered to districts at the end of each test administration. Additionally, CAI has an extensive history of producing high-quality data files that are securely delivered in an electronic format, alongside the printed deliverables that are shipped to districts for dissemination to local campuses. CAI has produced, among others, the following standard report examples:

- Student Report Card
- Student Report Card Labels
- School and District Summary/Aggregate Reports
- District Data Files
- Statewide Data File
- Student Item Analysis Reports
- Item Analysis Summary Reports

CAI understands the need to produce administration data in a timely fashion and further appreciates the time constraints under which NJDOE must operate to satisfy legislative mandates and other stakeholder data needs. Nimble and responsive systems have resulted in the production of on-time and error-free reporting deliveries to states and districts across the country. CAI offers this partnership by engaging NJDOE in a methodical review of program reporting specifications and developing and reviewing schedules that carefully balance quality against known time constraints.

Cost Option: Historical Data and Performance Data Portals

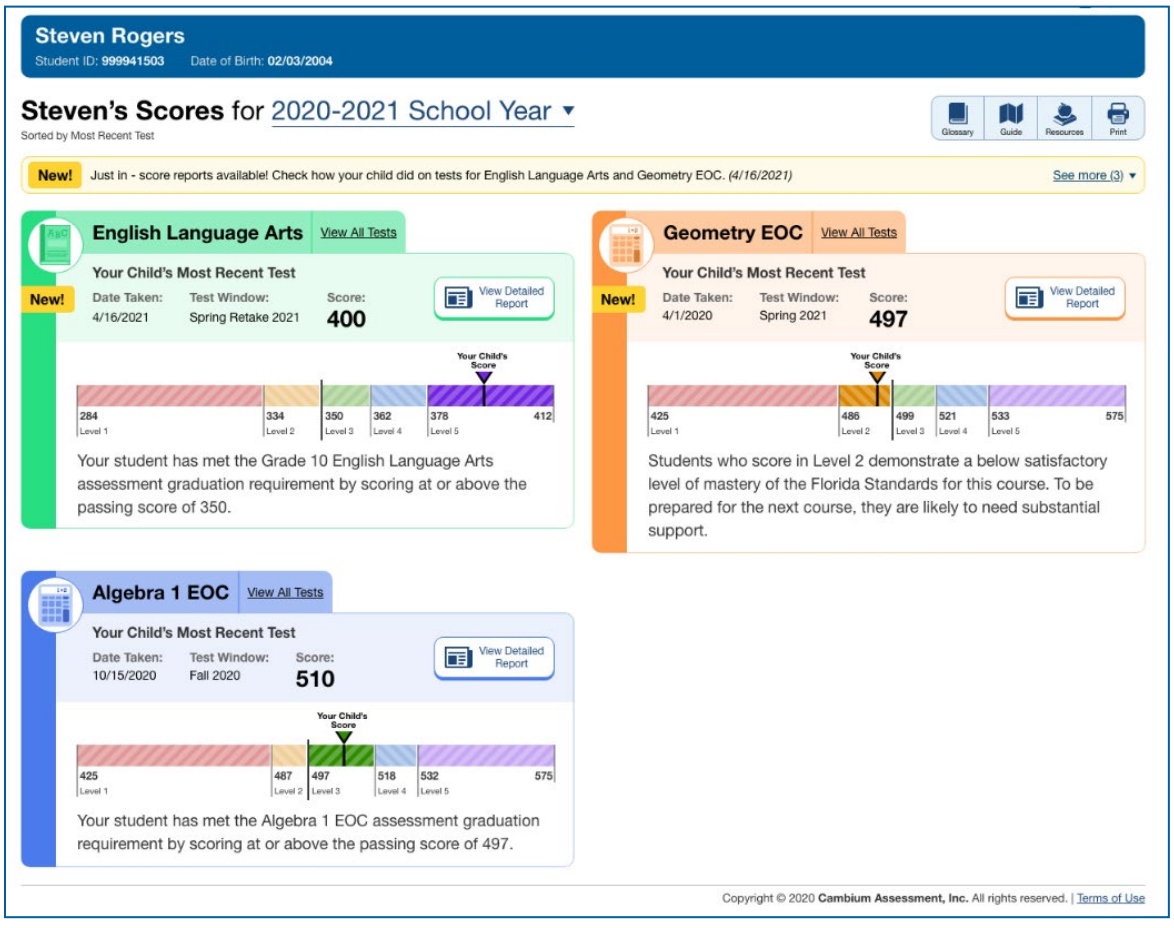
Providing easily understood and actionable assessment data that tell us about how our students are performing is the primary reason why we partner to build comprehensive assessment systems. Families are key stakeholders in this system, and CAI offers its Family Portal to

quickly and efficiently report score information to families in an accessible format in their preferred language. The Family Portal is designed to

- provide rapid, flexible reports to parents in a highly secure environment;
- reduce the burden on districts and schools to distribute printed individual student reports (ISRs) to families;
- give NJDOE the ability to report both summative and end-of-course scores to families throughout the year as soon as these data are available;
- give NJDOE the ability to distribute student results to families in the same time frame as the data are available in CRS;
- enable educators or administrators to generate access codes through TIDE for Family Portal credentials on behalf of parents and guardians, who can then use those credentials to sign in to the portal and view their student's performance reports; and
- provide a platform to share a range of interpretive information with families to help them understand the purpose of the assessments, assessment terminology, and the elements and measures reported in the ISR.

The Family Portal is integrated with CAI's suite of online systems so that updates performed in one system will be reflected in near-real time in the Family Portal, based on the rules established in collaboration with the State. The Family Portal has many features that can support parents, such as a glossary, an interactive guide, resources, and a print option. Exhibit 3.7-7 shows a sample Family Portal page.

Exhibit 3.7-7: Sample Page in the Family Portal



CAI has also produced a Public Folio, or Research Portal, to house assessment data from prior test administrations. The Research Portal provides aggregate-level results at the state, district, and school levels for public review. Student data are generated from the same data, which populate the student-level data file deliverables and reside in CAI's Database of Record (DOR). The portal aggregates these data at multiple levels and provides users with the ability to filter and break down the data by specific student attributes.

CAI continues to add new and dynamic features to the Public Folio, creating a comprehensive self-service archive for prior-year assessment data, thereby reducing NJDOE's burden to respond to public record requests for the same information.

If these options are of interest as value-added program components to the New Jersey assessments, CAI is pleased to discuss implementation options and associated costs with NJDOE.

Secure Browser

CAI's Secure Browser provides a locked-down environment for administering secure assessments, ensuring that no external or unauthorized application can be accessed or launched when the Secure Browser is deployed on the student machine. The Secure Browser also prevents copying, storing test items, and capturing screen images. The Secure Browser locks down devices for the duration of the testing session, disabling access to all other applications, and prohibits students from navigating away from the assessment. The browser also deploys advanced security features in the item display field, helping CAI to identify anyone who photographs test items using external devices, such as a cell phone.

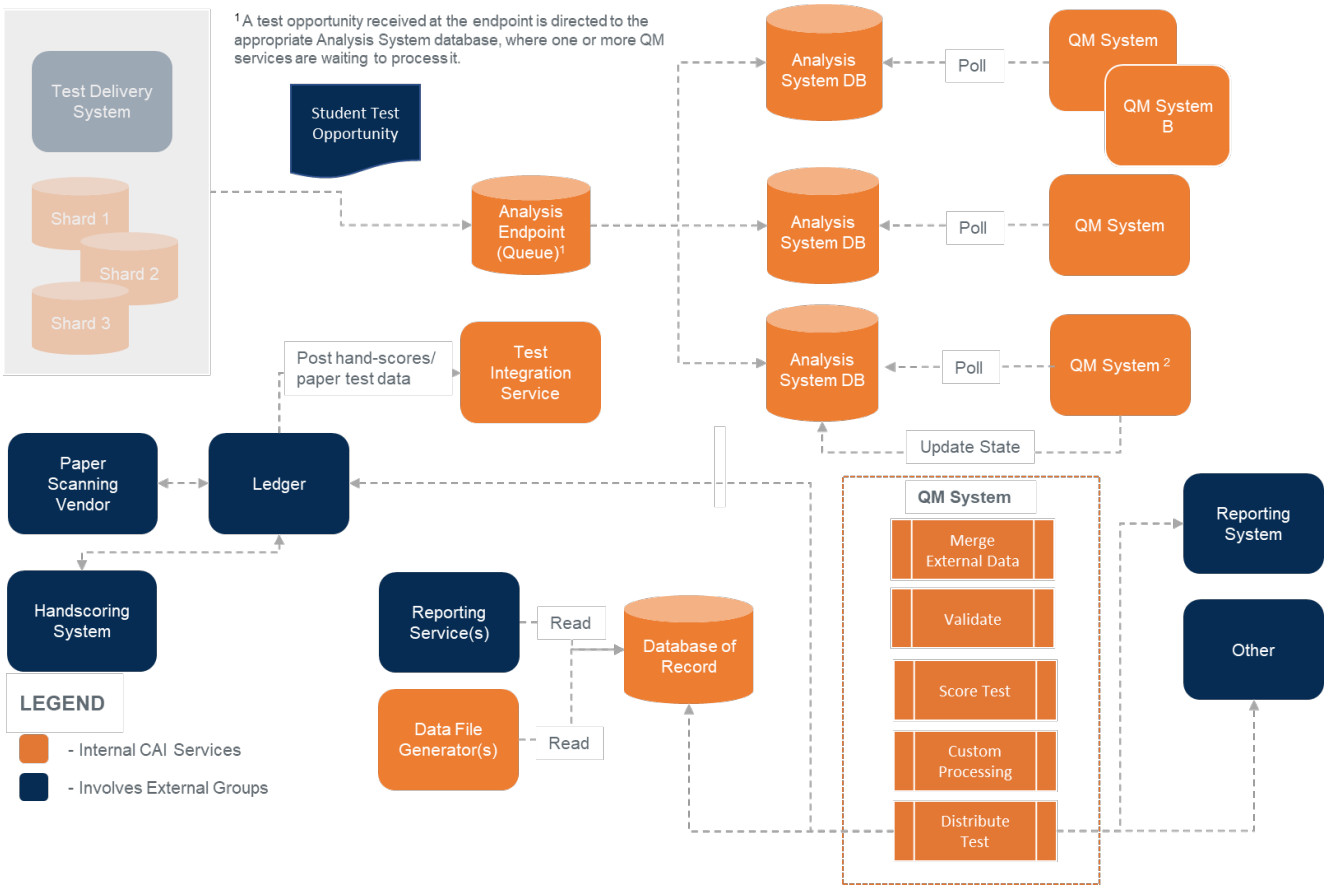
The CAI Secure Browser further prevents all unauthorized access to computer resources, including the hard drive, local network, and Internet. Should a student attempt to circumvent the built-in browser protections, the Secure Browser immediately terminates the student's test, notifies the proctor of the issue, and logs the event as part of the student test data.

The browser locks down the students' testing machines by presenting the testing interface in full-screen/kiosk mode and blocking operating system shortcut keys. The Secure Browser is constantly tested and updated to ensure that it is compatible with supported testing devices and the latest operating system version releases from third parties.

Quality Management System

CAI manages testing data flows using mature and rigorously tested analysis systems, which have been proven across many states to be effective, accurate, and fast. Exhibit 3.7-8 provides a schematic illustration of the automated flow of data through our scoring and reporting systems.

Exhibit 3.7-8: Automated Flow of Data Through CAI Scoring and Reporting Systems



Completed student tests enter the system through a secure transfer protocol with our Quality Monitor (QM) System software. The QM System is the intersection point between our online platform and our analysis systems. The QM System examines every test document for completeness, match to blueprint, and many other quality indicators. Any anomalies raise an alert and hold the data, prompting staff members to investigate and resolve any noted issues. While conducting these checks, the QM System also compiles aggregate data to support real-time quality checks similar to the classical and item response theory (IRT) analyses typically conducted on field-test data, as well as checks for potential evidence of cheating. Automated systems process the validated test records and produce reports, which our psychometricians monitor throughout the testing window.

If a test requires any human scoring, the QM System routes it to our Ledger system, which provides complete visibility into the scoring process and supports reconciliation of tests started with tests reported at the end of the testing window.

Scanned paper test results enter the system through Ledger and are passed through our Key Verification System (KVS) to score machine-scored items. Most online item types can be adapted to paper, and KVS ensures that the resulting (complex) scoring is always correct.

Data flows through the test scoring engine to endpoints, including CAI's CRS and DOR, from which data deliveries to NJDOE are automated.

Item Tracking System and Item Authoring

CAI's content development processes and item bank are managed using ITS, which serves the following key functions:

- A customizable content development and management tool
- An item bank
- A publication system that supports both online and paper publications

ITS relies upon a series of distinct and specific review levels throughout the content development process. ITS will direct content entities through each step in a detailed workflow, from inception to final publication. It does so by forcing these entities to pass through targeted review, editing, and management status levels, in which specific actions are taken, or reviews are conducted. ITS enforces process standardization within content areas on all entities developed within those areas; in doing so, it additionally facilitates version control, management oversight, and preservation of the entity's development history. It also supports both NJDOE's participation in the review cycle and CAI's internal content development process.

CAI's ITS is a full-featured item development, test development, test management, and item banking system that ensures that content developers and reviewers know exactly where an item is in the development and revision process from start to finish. During item development, items travel through a customizable, structured review sequence. ITS includes automated audit procedures and a substantial reporting capability designed to track item development progress and item quality.

ITS supports a rigorous item review process that puts items through multiple levels of internal and external review. This sequence can be customized to support New Jersey's content development and review requirements. At each internal stage of the review process, CAI test developers check items to ensure that they are aligned to the standards, are clearly and succinctly worded, are grade-appropriate, contain appropriate graphics, have accurate and fact-checked content, are free of bias and sensitivity issues, follow the style guide, follow universal design principles, and can be adapted for use on a paper-pencil form. Each step in the review process corresponds to a level in ITS.

The item writing and review process, as well as ITS review levels and workflows, are addressed in more detail in Section 4.3.10 of this submission.

Additional Key Program Support Services

At CAI, we know that the success of a complex assessment program is determined by much more than the systems employed to organize, deliver, and report those assessments. It takes a team of well-trained and qualified individuals to execute against the comprehensive program vision outlined in this solicitation. CAI asserts our understanding of the NJDOE's program scope and our ability to deliver against those requirements as a highly qualified partner by outlining additional key program support areas where CAI excels in delivering exceptional service as a trusted and effective partner.

Project Management

The CAI project management roster boasts an experienced team whose ranks include former educators, administrators, assessment directors, and a cross-section of project management industry professionals. Our proposed project manager will lead a talented team of project managers, project coordinators, and project assistants in the delivery of the project, placing clarity, quality, and efficiency at the center of CAI's approach.

CAI's project manager will be responsible for coordinating complex technical work across our internal teams and external project stakeholders. These teams will handle the external coordination the same way that we handle it internally: with a well-defined and well-managed set of version-controlled specifications documents. Our specifications documents prescribe the technical setup of systems, data transfers, analysis, and reporting specifications, as well as the aesthetic aspects of the project.

When these specifications are approved by NJDOE, changes are submitted through a formal change management process, detailed in the Preliminary Work Plan (PWP). This process is intended to formalize cross-team reviews to help mitigate potential risks and identify changes that are materially impactful to project scope. The specifications documents formalize decisions in sufficient detail so that implied system configurations are reproducible by any of our technical experts.

The CAI Project Management Team will develop a comprehensive project plan that

- outlines the priority deliverables and services for each administration year;
- identifies schedule and resources constraints;
- establishes points of intersection and hand-off; and
- establishes acceptance criteria.

CAI will deploy a variety of project tools to aid in the direction and monitoring of project activities. We will develop project schedules using Smartsheet, provide critical path analyses, create Gantt charts, and access resource views that will help paint a complete picture of the work required to deliver project tasks and subtasks in a timely manner. The data generated in these schedules will inform additional internal planning tools, which in turn will allow the Project Management Team to appropriately align resources and highlight key incoming and outgoing project deliveries. These data allow CAI to effectively communicate with NJDOE, as well as analyze project performance in different contexts as a means of evaluating overall project health and ensuring compliance with scheduled deliverables. CAI's project managers will work with NJDOE to secure approval of all processes and products at milestone stages. Additionally, CAI will employ an ISO 9001-compliant quality-control software package for the management and oversight of all contract requirements.

Along with the master project schedule, specifications documents are foremost among CAI's standard management tools, and they encompass everything from system requirements to scoring rules. Our Project Management Team will work with NJDOE to develop specifications documents that will serve as the detailed requirements documents for each program phase. NJDOE and the designated State Contract Manager (SCM) will be document stakeholders, and CAI will ensure that documents are kept current and reviewed and approved by the appropriate parties.

Schedule Development and Management

A comprehensive project schedule provides a clear roadmap for successful program delivery. CAI will develop and maintain overall responsibility for elaborating a detailed annual project schedule that fully encompasses all tasks, transfers of information, and program milestones.

CAI uses Smartsheet to develop and analyze project schedules, provide critical-path analyses, develop Gantt charts, and access resource views that help paint a complete picture of the work required to deliver project tasks and subtasks in a timely manner. A draft schedule of program activities is included as part of the PWP and will be finalized following the initial planning meeting.

Effective project schedules are generally produced at the following three levels:

1. At the highest level is the overall project schedule, which documents the work start, completion, and delivery dates for key activities, milestones, and deliverables.
2. At the next level are team schedules that help to define specific work packages within each of the functional teams supporting the project. For example, our Project Management Team will work to develop detailed user acceptance testing (UAT) schedules that document the dates on which system reviews are expected to begin and conclude. Some of these schedules are entirely internal, designed to enable CAI staff to achieve the milestones defined in the integrated master project schedule, which is the authoritative source of agreed-on program dates.
3. Finally, task-specific schedules capture each step required to deliver a specific, complex task or deliverable calling for collaboration across multiple teams. This schedule includes tasks that necessitate direct interaction and collaboration with NJDOE; ongoing input from the SCM will help to ensure that all schedules remain aligned as tasks are completed or changes are implemented.

The data generated from these schedules inform additional internal planning tools, which allow the Project Management Team to appropriately align resources and highlight key dependencies. These data also enable CAI to effectively communicate with clients and subcontractors, as well as analyze project performance in different contexts as a means of evaluating overall project health and ensuring superior project performance.

Stakeholder Engagement

Throughout the year, project managers actively elicit feedback from their state counterparts to ensure that we are meeting the needs of the students we serve. For example, teachers of the blind, visually impaired, and deaf frequently provide feedback to CAI on the assistive devices that students are using, and they help to identify specific challenges encountered during the student testing experience. CAI uses this feedback to inform future system enhancements and updates to the tools and interfaces we support, as well as inform our collaboration with third-party accessibility providers.

CAI is passionate and proud of our long history as a champion for making assessments accessible to all students, and for creating user-friendly and intuitive online systems. Our tools allow each item to be accessible and optimally compatible with assistive technologies. We offer the industry's largest operational selection of accommodations and embedded accessibility supports, and our understanding of how these tools are used as part of everyday instruction and assessment are bolstered by our ongoing participation in annual district accessibility workgroups hosted by districts in many of the states we serve. The proceeds from these forums are an important part of maintaining a current system development and improvement roadmap that addresses New Jersey-specific concerns and maintains a student-centered focus on the industry's most accessible online testing platform.

Training and Professional Development

Local administrators and educators have a complex array of responsibilities to keep track of, and many are stepping into their roles for the first time. Changes to online testing programs also generate questions about how to use the systems we provide to support the goals of the assessment program and how to emulate best practices in using the resulting data to inform classroom instruction. CAI has developed a comprehensive training regimen intended to bridge potential gaps in understanding and help users feel comfortable with the applications provided to support the program. CAI's training offerings are dynamic and interactive, designed to engage participants and test their knowledge of important training topics as they are delivered.

Communications and Publications

CAI employs an experienced team of technical writers and editors who work together to create high-quality program publications and district-facing communications. In addition to administration manuals and technical user guides, this team will be responsible for maintaining the New Jersey Assessment Portal, a one-stop informational site that will contain detailed information about each of the assessment programs.

CAI has a structured and effective process for producing error-free publications, minimizing review times, and improving the overall quality of the document production and review process. Additionally, our teams will develop ancillary materials that are

- fully customizable to include policies and procedures unique to New Jersey;
- compliant with NJDOE's review processes as defined in this solicitation;
- scheduled to ensure on-time printing and delivery to districts ahead of test administration windows;
- designed in consultation with layout and graphic design experts to create a look and feel that is aesthetically pleasing and reflective of the New Jersey assessment programs; and
- reviewed by accessibility experts to ensure that they are fully Section 508 compliant.

CAI's quality-assurance process for producing print and electronic ancillary materials is iterative and includes NJDOE review. It is divided into the following two general phases:

1. A drafting phase, during which we obtain agreement on the content and design of the document
2. A production phase, during which we produce the document to the required specifications, accommodate final edits and adjustments, and ensure that camera-ready proofs are error-free

Our production processes include multiple editorial reviews, and each document must receive senior staff sign-off before the document is delivered for SCM review. Scheduling the tasks and timelines for producing and delivering publications is part of CAI's annual planning. Tasks and deliverables will be submitted for NJDOE review and approval before inclusion in the master project schedule.

Program Security and Monitoring Support

All CAI systems are built to meet stringent security and privacy requirements. CAI is an ISO 27001- and ISO 27018-certified organization. Our information security team works closely with our software development team to ensure that security considerations are integrated into our entire software development lifecycle. Our systems undergo vigorous internal and external security audits. Third-party security firms conduct periodic penetration tests to further assess and verify our security posture and ensure that CAI platforms meet the highest standards in application security.

CAI's program security approach includes the following measures:

- **Encrypted data exchanges.** All data exchanges between the student testing device and our central servers run over encrypted HTTPS sessions with Transport Layer Security (TLS) 1.2 or higher. Furthermore, all secure data are encrypted at rest and in transit.
- **No cache is stored or downloaded.** CAI's TDS ensures that all secure content is delivered in real time to the students as they take their assessments, and all responses are stored directly to our central testing servers. No secure item content or student responses are ever stored on disk on the student's testing device. The system temporarily retrieves items for a

student before they are presented, but these items are only cached briefly in memory and are cleared at logout or when the browser closes; they are never written to disk. Nothing is ever pre-downloaded to schools. Students who need to move from one device to another during their testing can do so and resume where they left off, even if they change schools in the middle of the testing window, because all their work is securely stored on our servers, and content is served from there.

- **Caching is accomplished in the browser memory of each student's machine.** No proctor-caching servers or other proxies are necessary. Therefore, there is no test content on local systems to be deleted, eliminating the burden on local staff.
- **Strict user role functions combined with jurisdictional limitations.** Role-based access control is used in all our applications to enable or disable functions based on assigned user roles. We will work with NJDOE and the SCM to define the different roles that are permitted and what each role enables a user to do in our systems.
- **Jurisdictional checks further ensure that valid users can see and operate on data for their own school or district only.** Each access and all operations performed by a user are logged and available for auditing. CAI will provide periodic reports to the SCM to support system access and usage auditing needs.
- **The ability to proctor test sessions is configured based on the user's assigned role.** CAI provides the option to limit access to proctor-specific tests to designated individuals using an eligibility model similar to that used for students. Test sessions are specific to individual proctors. A proctor cannot access a test session started by another user.
- **Students will log in to a secure assessment using an NJDOE-specified unique student ID and proctor-generated session ID.** As an additional layer of security, proctors will approve students to join test sessions before a student can start testing.
- **The browser is locked down.** As noted in our core systems overview, the CAI Secure Browser locks down the students' testing machine by presenting the testing interface in full-screen/kiosk mode, blocking operating system shortcut keys, and preventing any access to other websites or applications, copy and paste, printing, and screen capture. The Secure Browser is constantly tested to ensure that it provides a locked-down, secure testing environment. Electronic copying of test content and unauthorized access of locally stored information is not possible while the browser is in use.

CAI's security plan is holistic and incorporates steps across our infrastructure and processes to protect the integrity of computer-based testing, including the following:

- **Secured server infrastructure.** Servers holding New Jersey content are secured against unauthorized access and protect student information and test data. Security controls include two-factor authentication for administrative access to servers, firewalls to restrict external access, and intrusion detection systems to detect potential breaches and enable a rapid response to protect online test data.
- **Encrypted content storage.** Test content is encrypted during content development and on test delivery servers prior to distribution to students. Content is decrypted only for transmission to test devices. Bad actors are not able to access New Jersey test content by compromising CAI servers.
- **Active monitoring to detect potential cheating.** Our systems aggregate information and make available reports of potential irregularities in real time.
- **Support for security incident reporting.** TIDE supports the collection of irregularity reports to assist in identifying potential security breaches. Reporting processes and data to be collected can be customized to meet NJDOE specifications.

- **Validation of security controls.** CAI conducts regular penetration tests of our Secure Browser, TDS, and the rest of CAI's systems to verify that our security controls are adequate and effective in the face of constantly evolving security threats. Requirements for our penetration testing program are reviewed every six months to test for advanced application vulnerabilities.
- **Continuous improvement on mitigating threat vectors.** CAI performs regular threat modeling to guide our security priorities. Our process is iterative and includes evaluations of how our people, processes, and technology assets perform against threats during observed incident-response engagements for other organizations and scenarios tailored specifically to our business operations. The results of our modeling and assessment activities continually inform and improve our security processes and practices.

Printing, Packing, and Distributing Paper Materials

CAI's successful history of collaboration and integration with industry partners spans decades, and these partnerships create comprehensive program solutions that are unmatched in service and quality among our competitors. Measurement Incorporated (MI) has the capacity to provide high-quality services for the printing, packaging, distribution, and processing of paper materials for New Jersey assessments. As a partner on several CAI assessment programs, MI is intimately familiar with the requirements for creating and managing paper test components.

Having worked with us for many years, MI has a clear understanding and ability to meet NJDOE preferences in warehousing, packaging, and distribution; inbound and outbound materials shipping; and scanning, editing, and scoring activities for the assessment program. As with all facets of their program operations, warehouse processes and procedures are ISO-9001 certified.

While assessment programs are increasingly moving online, the continued quality production of paper materials is no less important. Students requiring a paper administration or an accommodated test form version must have access to error-free materials that are thoughtfully produced and processed. Our partnership with MI provides NJDOE with personalized and innovative service and an unmatched capacity to produce and process materials according to NJDOE's required timelines.

Psychometric Services

As the assessment program continues to evolve, it must do so while preserving the reliability of the test and ensuring that the assessment continues to validly support the claims made on its findings. CAI recognizes both the gravity of this responsibility and the opportunity it presents to bring the best science to improving education for New Jersey's students. We understand the importance of clear and concise communication in this space to support NJDOE's decision-making and informational needs.

Dr. Gary Phillips, Vice President and Chief Psychometrician, leads the psychometrics division at CAI, which includes more than 40 psychometricians with doctoral degrees, statistical programmers, research associates, and other supporting staff. Dr. Phillips brings more than 30 years of experience, with distinctions such as having overseen the National Assessment of Educational Progress (NAEP) for the federal government and having served as acting commissioner of the National Center for Education Statistics (NCES). He is the author of several hundred conference paper presentations and publications in journals such as *Educational Researcher*, *Educational Measurement: Issues and Practice*, *Education Leadership*, *Applied Psychological Measurement*, *International Journal of Educational Research*, *Journal of Multiple Linear Regression Viewpoints*, and *Phi Delta Kappa*. Dr. Phillips holds a Ph.D. with an emphasis in statistics and psychometrics from the University of Kentucky. He will oversee CAI's work on this project, drawing upon a pool of talented staff members to meet the needs of the NJDOE.

CAI offers a vibrant workplan and knowledgeable team with invaluable expertise in large-scale assessment and directly relevant experience with evolving online assessment programs. We offer the full breadth of our psychometric staff experience to support this work, and we are proposing familiar, mature, and innovative systems and processes that support successful assessment programs across many states.

Human Scoring and Automated/Machine Scoring

The assessment vendor will be responsible for item scoring, including machine-scorable items scored with keys or rules, as well as typically human-scored items that may also be scored by automated scoring systems. CAI and MI provide extensive experience in scoring student responses across a wide range of item types. Importantly, our organizations have developed and offer software systems and processes inspired by our experience with these various scoring methods. CAI and MI's collaborative approach to item scoring therefore permits the organizations to uncover opportunities and operationalize efficiencies afforded the program via the use of electronic scoring while squarely addressing the challenges these approaches present.

Machine Item Scoring—Key and Rule-Based

As assessment programs have moved primarily online, the entire assessment system has benefited greatly from the measurement benefits, schedule efficiencies, and informational potential that online testing offers. Even so, the assessment solution must account for the need to simultaneously support robust paper versions of these assessments for students requiring accommodated versions/special administrations, or those students testing on paper as the result of a parent or guardian request. The move portends a paradigm shift for item development approaches as items are increasingly developed primarily for online test administration.

Porting items from computer versions to paper is substantially more challenging than the familiar inverse process. Computers make it possible, for example, to have students respond to a mathematics equation by entering their response in an online equation editor. Scoring engines based on symbolic algebra processors can score these equations, considering the potentially infinite number of response entries that may appear. When ported to paper test versions, these items appear as gridded-response items, but comparability (and fairness) demands the same flexibility in paper scoring that is found in these online methods. CAI's test development system automates the process of generating draft paper answer spaces for items developed online. This ensures that the transformation from online versions is always consistent, following the same pattern for each item type.

We have also developed a system to ensure that sophisticated computer-based items are scored correctly when administered and scored on paper. CAI's Key Verification System (KVS) empowers our content experts to efficiently and accurately check and refine the scoring of online items delivered on paper test versions. This system effectively generates every possible response for most item types (and has powerful pattern-based mechanisms for other types) that might be captured by a scanner given the response space. It then transforms these responses from their scanner-generated format to the format that would result from the online system and passes the result through the scoring engine. The KVS interface enables our team to efficiently review and revise scores for any responses that are not scored correctly. In the end, the system produces a "key" file that maps every possible scanned result to its resulting score, and this key is used in scoring the tests. Where pattern-based response generation is used, any responses captured in the field that are not present in the key are reviewed and scored by experts in real time.

Human Scoring

Our partner, MI, offers exemplary handscoring services with a capacity that stands alone among assessment partners. CAI and MI work closely with their constituents to develop scoring solutions that measure students' real-world knowledge and readiness for college and careers.

Our proposed solution blends comprehensive knowledge of New Jersey standards and NJDOE expectations with proven scoring processes and deep content and scoring expertise. From rangefinding to successful field-test and operational scoring, MI scoring staff will work with CAI and NJDOE to anticipate and adapt to program changes and provide reliable scoring services.

CAI's Ledger system captures responses requiring handscoring in real time as students complete their tests. These responses are automatically routed to MI for scoring, where our integrated systems track the progress of each response through the scoring system. Ledger's management component tracks the backlog of responses to score for each item, enabling CAI and MI to reassign scorers to where they are most needed to meet rapid-turnaround deadlines for handscoring.

Automated Scoring of Written and Spoken Student Responses

CAI provides the industry's most advanced automated scoring technologies for written and spoken responses. In Section 4.8, we describe our approach to automated scoring, which provides more accurate and reliable scores than humans alone. We accomplish this by targeting more intensive human resources to the items that are the hardest to score.

Our engines calculate a confidence index associated with each assigned score. We have extensive data showing that, when the engine is confident in its score, it matches validated handscores better than humans match one another—usually about 85%–90% of papers. Just as important, the responses flagged as 'low confidence' by the scoring engine are also the responses that humans have the hardest time scoring; because this is a small number of responses, it is possible to have multiple people handscore these difficult responses, generating better results by focusing the humans where they are needed.

In the end, the bulk of responses are scored more accurately by the machine than by humans, and the remaining hard-to-score responses may proceed through a more intensive, reliable handscoring process to produce a better result. Each stratum ends up with better scores than those that would result with a machine- or human-only process. Using this automated scoring process, more accurate results can be returned more quickly and for a lower cost. CAI is pleased to share existing evidence from other states to help inform NJDOE's policy and communication approaches in this space.

Test Scoring

Once the items are scored, the test scoring engine must estimate theta scores for the overall scale and subscales; make proficiency calculations; calculate other indicators that New Jersey may choose to report; identify tests that have and have not met the attemptedness rules; and make many other calculations according to NJDOE business rules. CAI will be responsible for calculating these scores and for maintaining the data flows that support them.

Here, again, CAI's foundation in online assessment supports immediate, accurate test scoring. In many states, we report student scores as soon as the student completes the test, delivering these results to our CRS, which calculates aggregates in real time. We do this by automating the entire scoring process.

Our process begins with the collection of detailed scoring specifications. The specifications identify the scoring rules with sufficient specificity, such that two independent analysts implementing the same rules in different software systems always arrive at the same estimates. Our analysis team uses these specifications to configure our operational analysis system to implement these rules.

Over the years, we have accumulated a vast library of parameterized rules used in various state assessment programs. Because the basic endeavor is effectively the same across states (score tests), it is rare that we must write new software; rather, we simply call existing functions with parameters that match the specifications. Of course, where necessary, we will write new functions while also ensuring that they are parameterized for subsequent reuse.

At the same time, scoring is configured in a separate system by our psychometrics staff using software written in a different programming language. This work is completed by an independent program at CAI. This program, known as *CAIcometrics*, is used to verify that all student scores are accurate via a completely independent replication process. All students are scored under two independent systems, first under CAI's test scoring engine, and second using CAIcometrics. All student scores are compared for 100% match rates before any test scores are published.

Robust testing and replication by two different teams provides confidence that scores that flow from the system are always accurate. This is a necessity in the online world in which we live—many of our clients demand instant scoring for their pre-equated tests (as are all adaptive tests), and all our clients require perfect accuracy.

Even when tests are not pre-equated, this test-scoring system provides rapid, accurate results. We configure the system with preliminary item parameters before testing. After testing, when final calibrations are available, we load these into both systems and score the data twice, conducting automated comparisons. This enables us to report almost immediately after calibrations are completed and confirmed and provides further assurance that the results are correct.

Help Desk and District Outreach Services

CAI provides exemplary district support services via our Tier 1 and Tier 2 Help Desks, and our District Outreach teams have been recognized and awarded for their unique role in supporting program operations and local assessment professional networks. The experience, program knowledge, and professionalism of our support agents, along with the training and tools we provide, come together as a critical and public-facing component of the program.

CAI's Help Desk will ensure that schools, districts, staff, and educators receive prompt and accurate responses to their questions and requests related to user and student data management, test administration, test scoring, and reporting systems. We have a proven track record of supporting many complex and nuanced assessment programs across our 27 current state clients. Our Help Desk provides technical and logistical support to anyone requiring assistance with program operations or simply navigating our systems. Client service agents assist users in moving through the full testing experience with the express purpose of minimizing burden, disruption, and inconvenience.

CAI will support access to services via a dedicated toll-free telephone line, website, email, and online chat feature. We will staff for necessary peak call volumes during key program periods, including test administration windows, test registration cycles, and other important scheduled program events. The Help Desk will operate year-round, providing full service Monday–Friday, 6:30 a.m. to 7:30 p.m. (ET). We align our staffing and coverage plans to meet the program schedules of each state client and their district/school calendars. CAI's Help Desk holiday schedule will be provided to NJDOE at the start of each school year, but Help Desk closures will ultimately be aligned with New Jersey school and district closure dates. Our standard practice is to provide a Service and Staffing Plan for client review and approval during each test administration planning period. This plan will fully document the dates, times, and staffing plan for the New Jersey Help Desk.

We believe in establishing personal relationships with the districts and campuses we serve, and we will participate in NJDOE-sponsored informational forums as outlined in this solicitation to ensure that testing sites have the support they need to effectively administer their programs. CAI works collaboratively with our state partners to identify training opportunities, provide system overviews and updates about new features and enhancements, and outline best practices for test administration. Additionally, CAI is an active participant at our clients' statewide assessment conferences and provides subject-matter experts (SMEs) to support assessment-related presentations.

The following are some of the additional support activities supported by CAI's Help Desk:

- Development and delivery of Tier 1/Tier 2 Help Desk training seminars
- Generation of reports to help districts track the return of paper test materials
- Management of the Secure Item Response Viewing Environment (SIRVE) for parent requests to view student test responses
- Development of post-administration (look-back) reports for each test administration window
- Management of targeted district call campaigns
- Management/triage of Help Desk queues

Data Security

CAI understands the important responsibility we hold as stewards of student information and secure test items, and we take clearly defined precautions to protect these data. We protect data assets from intrusion through our applications, as well as through other human and automated controls throughout all phases of the project. CAI is ISO-27001 certified to protect student PII and test data according to industry-standard security controls, and we are audited annually to demonstrate compliance with these controls. We are also certified for successful implementation of CIS Top 20 controls.

Exhibit 3.7-9 illustrates CAI's data security.

Exhibit 3.7-9: CAI Data Security

A Systems

- Systems are accessed via single sign-on (SSO)
- Systems maintain detailed access logs
- All networks have firewalls, automated intrusion detection systems, and extensive network monitoring

B User Authentication

- All network authentication to our systems is controlled through our SSO application
- User authentication methods do not transmit credentials as plain text

C Personally Identifiable Information (PII)

- Responsible stewards of student data
- Two-part procedure to restrict access to student PII
- All systems carry a CAI-assigned, arbitrary identifier for each student
- Identifiers are encrypted using strong ciphers that meet FIPS-140 guidelines
- Student PII is stored in AES256-encrypted form within CAI's demographics databases
- Transmission of secure data uses SFTP or TLS 1.2

D Secure Architecture

- Set up to prevent network-based attacks
- Access logging and intruder detection
- Protects against Distributed Denial-of-Service (DDoS) attacks
- All items and PII are encrypted both at rest and in transit

E Physical Plant Security

- At CAI facilities, card-controlled access monitored by a guard
- At AWS Facilities, industry leading security demonstrated by **ISO 27001** certification in alignment with **ISO 27002** and **NIST 800-53**

F Threat Modeling & Vulnerability

- CAI performs regular threat modeling to guide our security priorities
- CAI conducts rigorous tabletop exercises, penetration testing, and constant review of intrusion detection, DDoS, and threat alerting systems

G Certifications

- **ISO 27001 and ISO 27018** certified
- Certified for successful implementation of **CIS Top 20 controls**
- Privacy certifications include **iKeepSafe's FERPA, COPPA,** and **CSPC**
- **We hold TX-RAMP Level 2** certification

A host of application-level security controls safeguard against unauthorized access to test items. Across all systems, including our item bank repository and TDS, our applications are password-protected; password complexity requirements are enforced, routinely audited, and periodically revised. Role-based and jurisdiction-based permissions restrict authorized users' access to functionality and data.

Our systems maintain detailed access logs so that we can determine which accounts were used to access each system, at what time, and the data to which the account had access.

All our networks are protected by firewalls, automated intrusion detection systems, and extensive network monitoring. These safeguards protect against bad actors who might attempt to bypass our applications, hack into our systems, and steal data. All our systems—including servers, firewalls, and load balancers—are regularly updated with security patches. These systems have proven effective in protecting our clients' secure data. Exhibit 3.7-10 summarizes our compliance with several key security requirements.

Exhibit 3.7-10: System Security

System Security Requirements
General Requirements
Student authentication is performed through a secure administrative system.
Administrative authentication is necessary to gain access to administer tests.
Each user's access privileges are evaluated at login with automatic disable/enable functions based on the user's profile.
Security of Test Content and Student Data
Security of test content is device-specific and device-appropriate.
Only valid authentication information enables test content to be viewed.
Test content is displayed only while the student is taking the test.
Security of test content and student data is provided.
Cached content is secured, managed, and purged.
Transmission of student data is secure.
Desktop Security
Decrypted test content is protected through control of the desktop computer while students are testing.
Access to other applications is disabled while a test is being accessed.
An authentication sign-on process between the test administrator (TA) and the student is built in.
Immediate security updates to all CAI systems are provided via the integrated TIDE system.
The test administration environment is secured through prevention of forbidden applications, the CAI Secure Browser, and built-in security features of the TA Interface and Student Interface.

CAI recognizes the crucial importance of protecting user and student data in all states, whether these data are being transmitted, stored, or converted. All our systems protect individual privacy and confidentiality in a manner consistent with NJDOE privacy requirements, the Family Educational Rights and Privacy Act (FERPA), and other state and federal laws. All secure data transmitted across the public internet are encrypted using secure shell (SSH) Advanced Encryption Standard (AES) or an Internet Protocol Security (IPsec) virtual private network (VPN). All PII and FERPA-protected information are encrypted at rest using Federal Information Processing Standards (FIPS-140)-compliant encryption technologies. File server information is encrypted with 256-bit AES, and database PII is encrypted with SQL Server AES256. All data in

motion are encrypted using HTTPS TLS 1.2. Data are securely stored on database servers behind multiple firewalls and are secured through an encrypted connection.

Our systems implement sophisticated, configurable privacy rules that strictly limit data access to authorized personnel. Our systems can support customized interpretations of data access in accordance with state and NJDOE policy. For example, when a student moves from School A to School B, some states believe that School A should lose access to the student data collected before the move, while others believe that School A maintains an interest in these data for legitimate work and reporting needs. Our systems are configurable and capable of supporting NJDOE's policy needs. CAI is committed to working with NJDOE to maintain data security according to its specifications.

In addition to the online protection of test items, we have policies and procedures in place to prevent accidental item disclosure. All our personnel undergo background checks and participate in our extensive security training, which is periodically updated and revised. CAI maintains a company-wide policy against copying secure materials onto portable storage, such as flash drives. Every staff member's laptop has an encrypted hard drive so that files stored in temporary folders or work in progress will never be at risk if a portable computer is lost. All our personnel are required to sign a nondisclosure agreement (NDA), and NDA language is used in all contracts with third parties that involve the handling of confidential information.

Security of Personally Identifiable Information

CAI recognizes the gravity of our responsibility as stewards of student data, and we take every available precaution to protect these data from cyber intrusions into our application or into the host systems themselves. We implement a two-part procedure to restrict access to student PII, even in the unlikely event of a breach. Our strategy is to limit data exposure and to encrypt that information where it absolutely must appear. Most of our systems carry only a CAI-assigned, arbitrary identifier for each student. Only a single system links that arbitrary identifier to the student's Statewide Student Identifier (SSID) and name and encrypts those fields. Systems that require this information request the encryption data. The key needed to decrypt these data is stored on a server without any external access and is accessible only to the servers running our systems because our systems never write the key anywhere. Internally, only a few engineers have access to this key.

Identifiers are encrypted using strong ciphers that meet FIPS-140 guidelines. Student PII is stored in AES256-encrypted form within CAI's demographics databases. For each student identity imported through TIDE, we generate a unique internal key that is used in CAI systems to track students' test progress and testing history. This ensures that student PII is never duplicated in any of our other system databases and remains centralized in our demographics servers. The keys used to encrypt and decrypt the demographic data are secured and stored on a different set of dedicated servers that can be accessed only through a secure interface. Whenever an application requires any student PII (e.g., to present test scores with student names on the reporting interface to authorized users), it must fetch a passcode from our key servers through a secure protocol and then access the demographic servers to decrypt the relevant pieces of data.

When decrypted identifiers are required for files delivered to clients, the files are temporarily written to a disk (in a protected environment, behind firewalls, and accessible only from CAI addresses) in decrypted form. Once the files are fully created, they are moved to an encrypted location where the server encrypts the files at rest. Temporary files are deleted upon transfer; in short, we stop bad actors from entering our system. Even if bad actors breach these defenses and succeed in stealing data, they cannot identify the students to whom the data refer. If they somehow manage to access the data file with student PII, they will find the data encrypted and they will not find the key anywhere.

All transmission of secure data takes place using SFTP or TLS 1.2. When the transferred data include student PII, the transfer software encrypts the files upon upload to the site. The files remain encrypted while they are at rest, and Secure Sockets Layer (SSL) encrypts the data in transit. We recommend that our clients use similar SFTP software when the data arrive at their site to re-encrypt data when they are at rest on client servers.

Employee and Contractor Vetting

Employee and contractor vetting are part of our human resources security policies. The process includes pre-engagement criminal and professional background screening, NDAs, and adherence to additional policies during and up to termination. Access is controlled through established access control policy and processes for access management, user registration and deregistration, and access privilege reviews.

NDA language is used in all contracts with third parties that involve confidential information. The confidentiality section of third-party agreements continues through every modification extension.

User Authentication Process

Per our policies, all network authentication to our systems is controlled through our SSO application. User authentication methods do not transmit credentials as plain text. Remote connections for employee access are protected with VPN and multi-factor authentication (MFA) mechanisms.

Role Management and User Authorization

CAI uses role-based access to manage all critical systems and data, and established processes are effectively enforced and logged. Access is controlled through established access-control policy and processes for access management, user registration and deregistration, and access privilege reviews.

TIDE is the central system for managing client users. CAI works with clients to identify the user role hierarchy appropriate to its online suite of systems that matches the roles existing in the field. A typical hierarchy specification will include defining different roles, such as state-level user, district coordinator, teacher, proctor, etc. It will also include defining the levels of access for each user role across each system.

CAI access to client-level roles and server resources are managed by a defined team and logged in our Jira Service Desk. No access is granted until approval is documented from an individual with designated approval authority for that specific role. Client-facing system roles include ADMIN, HELPDESK, STATE, and VIEWONLY. Requests for access to server resources require explicit information regarding the resource and level of access.

CAI has defined policies and a process for removing employee access upon employee departure. The process is coordinated with our Human Resources department and includes notifications and actions for the authorized-access-control team.

Annual account privilege reviews are conducted to verify account statuses and access permissions. This includes verifying the account status of all departed employees.

Security of Physical Plants

Physical Security at CAI Facilities

Every CAI location has card-controlled access, and a guard monitors building entrance. In our main office, card access is required for entrance to the building during business hours and is necessary for entry to any of the floors where work is performed. A CAI staff member is always present when visitors are on site. Test items in printed form are kept in locked cabinets. No

digital data, including PII and test items or application servers, are hosted in CAI office locations.

Physical Security at AWS Facilities

CAI's assessment applications and data are hosted in the Amazon Web Services (AWS) regional cloud-data centers located in the continental United States. AWS provides a robust array of physical, logistical, and environmental controls to secure all their facilities. Each location undergoes site evaluation for environmental and geographic risk with enough backup power, network, and compute capacity to ensure high availability. Data center access is restricted to authorized personnel only, and through the adoption of the principle of least privilege, access is further limited to specific areas by need only. All data center access is logged and regularly audited, with additional monitoring through CCTVs and sensors to detect any unauthorized access. All device inventory is centrally managed and regularly audited. The AWS security operations center performs regular threat and vulnerability reviews, and external auditors are used to test for compliance.

Threat Modeling and Vulnerability Assessments

CAI performs regular threat modeling to guide our security priorities. Our process is iterative and includes evaluations of how our people, processes, and technology assets perform against threats during observed incident-response engagements for other organizations and scenarios that are tailored specifically to our business operations. CAI conducts rigorous tabletop exercises planned with the assistance of third-party security experts who are knowledgeable about CAI's security posture and the current threat environment. We include specifically crafted threat models of sensitive data being stolen from CAI, such as zero-day web exploits, advanced threats from attackers moving laterally within our environment, and privilege-escalation pathways.

Inputs to our threat modeling include vulnerability results from specific assessments performed against CAI's operational assets. We conduct comprehensive, organization-wide vulnerability assessments and audits against our implementation of ISO 27001 security controls and CIS Top 20 controls, which include transparency into specific vulnerabilities identified through our risk identification and management processes.

The results of our modeling and assessment activities continually inform and improve our security processes. CAI policies, procedures, processes, and metrics used to measure the effectiveness of our security systems are updated at least annually. CAI regularly updates a security checklist required for all code changes. Requirements for our penetration testing program are reviewed every six months to test for advanced application vulnerabilities. We reconfigure vulnerability scanning on our systems at AWS based on assessment inputs and risk-rated and statistically compared results. Our Intrusion Detection System (IDS), distributed denial of service (DDoS), and threat alerting systems are updated.

Penetration Testing Program

CAI considers test items and student PII to be critical assets that must be protected in a manner that mitigates data security risks. Our penetration testing program is designed to safeguard CAI's mission objectives by providing assurance that critical information assets are adequately protected against malicious actors.

Security of Electronic Files

All data are housed in facilities with strong physical security. Our networks are protected by multiple layers of security and monitoring, including firewalls, intrusion detection, and application-layer security implementing industry best practices regarding role-based and

jurisdiction-based security. Every employee undergoes background checks and security training. Users' access to data is restricted by role and by jurisdiction.

Data Disposition

CAI has archival and retention policies for data in the TIDE, RTS, TDS, and Analysis applications. Policies include schedules for purging data from files and databases based on what is to be purged and when. These policies specify which tables and data repositories can be deleted and at what intervals. Student demographic data are maintained across years until the end of the contract. At the start of every school year, TIDE attributes and relationships logs and data tables from past school years are deleted unless required for specific program functions. Analysis data are retained for three school years. When a storage device has reached the end of its useful life, AWS decommissions media using techniques detailed in NIST 800-88.

As part of our ongoing work in several states, CAI has implemented state-specific data policies that provide access to archived data from prior test administration years. In these states, data that are to be made available to districts may be downloaded from CAI systems by properly credentialed users or requested from the Help Desk. These data are transmitted to the Secure File Center; data are never transmitted via email or other non-secure means.

CAI actively complies with all archival requirements and maintains clear internal policies for the retrieval of archived data, should it need to be retrieved for an internal or NJDOE-requested business purpose.

Secure Architecture to Protect from Network-Based Attacks

All our systems are protected by AWS Network Access Control Lists and firewalls. We employ AWS Shield Advance to detect and block DDoS attacks. The security around our isolated environment within AWS prevents malicious actors from accessing the network.

Access Logging and Intruder Detection

Our processes and configurations are in alignment with our validated ISO 27001 and CIS Top 20 industry-standard practices.

CAI sends all our server logs to a central log server system. A log review is used to scan the logs both by automated software and by people. If suspicious activity is evident in the logs, an alert is sent to CAI system engineers with details on the activity. Those details are reviewed to see if the activity is a potential threat. CAI also monitors desktops and mobile devices per policies mapped to ISO 27001 controls against malware.

Protection Against Distributed Denial-of-Service Attacks

CAI uses AWS Shield Advance to detect and mitigate DDoS attacks. CAI defines appropriate rules to detect and mitigate attacks; if the rules are triggered, CAI receives an alert notification that a suspected attack is occurring. The alert provides the details of the attack vector and the target of the attack.

DDoS mitigation begins to address the attack. If an attack is confirmed, traffic is blocked before reaching CAI systems.

Data Encryption

All items and PII are encrypted both at rest and in transit. We do not encrypt all data, but instead de-identify them and encrypt the identifiers, which are stored in a single system. With this model, sensitive data are not disclosed even in a breach. Similarly, all test content is encrypted at rest and in transit.

All secure data transmitted across the public Internet are encrypted using SSH, AES, or an IPsec VPN. All PII and FERPA-protected information is encrypted at rest using FIPS-140-compliant encryption technologies.

Monitoring, Detecting, and Evaluating Potential Cheating

Our systems aggregate information and make available reports of potential irregularities in real time. Psychometricians generate a series of quality-assurance reports that allow them to monitor the quality of test administrations. The forensic analysis component of the quality-assurance reports is geared toward detection of possible cheating, aggregating unusual responses at the student level to detect possible group-level testing anomalies. Specific procedures for evaluating test records for irregularities and possible cheating are described in Section 4.3.5.

Security Breach Procedures/Online Security Forms

Each state we work with has different procedures for reporting irregularities and collects slightly different data. CAI can configure TIDE to house administration and security forms, which may be used to document items (such as testing irregularities) or collect test security affidavits for testing personnel and coordinators. Reporting irregularities online is standard functionality in TIDE, and we can configure irregularity reporting to NJDOE specifications to ensure that the desired information is collected.

Cyber Incident Response and Notification Plan

We have an approved Cyber Incident Response and Notification Plan compliant with the requirements of ISO 27001. We have performed training and tabletop exercises based on the plan. Any security incident is immediately escalated to our Production Control Board (PCB). The response plan involves the following seven steps:

1. Identification
2. Classification (e.g., process violation, breach, system compromise)
3. Triage (identify extent of damage and immediate response options)
4. Evidence preservation
5. Forensics
6. Threat eradication
7. Eradication verification

Client communication protocols depend on incident classification and client-specific communication protocols.

Annual Security Plan Updates

CAI will review and update the security plan annually or as required by NJDOE to ensure that it remains effective and in line with NJDOE's requirements. CAI is ISO-27001 certified, and in accordance with ISO requirements, all our information security policies are reviewed at least once a year or whenever significant changes occur that justify its review. We have included CAI's Business Continuity Plan in Appendix G of our proposal.

Vendor Certifications

CAI is ISO-27001 certified to protect student PII and test data, and we are audited annually. We are also certified for successful implementation of CIS Top 20 controls. AWS is ISO-27001 certified, aligned with ISO 27002 and NIST 800-53, and has System and Organization Controls (SOC) 2 audit reports available upon request.

Summary

Proper and effective implementation of a large-scale and consequential assessment system is difficult work, and there are few industry partners who share the breadth or depth of experience that CAI offers to the states we serve. We are trusted by more than half of the jurisdictions across the country to provide assessment services to students across the K–12 spectrum. Our systems are intuitive, engaging, require a minimal technological footprint, and our clients trust them to work at scale. We combine expertly developed and industry-leading systems with knowledgeable and passionate personnel who send their children to school in the states we serve, and who are committed to their work in a spirit of partnership and shared ownership.

CAI is committed to providing intuitive and equitable assessment platforms that provide clear and actionable information about student performance, and we believe the outlined services offer a transformative opportunity in the evolution of the New Jersey Next Generation Assessment Program.

3.8. Contract Management

Managing any complex project requires a project management team with extensive experience effectively planning and directing resources, identifying priority deliverables, managing risk, and communicating effectively about the status of project operations. The CAI Project Management Team will be responsible for maintaining accurate, open, and frequent communication with the SCM and NJDOE's staff about the overall health of the project and managing communications and coordination with partner vendors.

A common understanding with the SCM as to the scope and cost of the work is a prerequisite to finalizing the Project Management Plan at the beginning of the project. Once finalized, this key project management artifact ensures clear requirements and common assumptions and serves as the scope baseline. It describes how we will manage facilities, contract transition, communication, weekly status reporting, requirements, change, issues, risk, training, maintenance and operations, and administrative completion reporting, among other essential operational elements of the program. Section 4.2.3 outlines our project management approach.

As part of the Project Management Plan, the Project Management Team will also produce and deliver a Preliminary Work Plan (PWP) that complies with the requirements outlined in the RFQ and represents the detailed plans and process associated with the approach and methodology described in the Project Management Plan. We know that a comprehensive PWP provides a clear roadmap for successful program delivery. Our proposed PWP is offered in Appendix K, and a proposed Operational Yearly Schedule can be found in Appendix L.

The Project Management Team carefully monitors the status of the project against the established baseline throughout the project lifecycle, routinely meeting with stakeholders to review assumptions and progress. Our standard processes include collecting documents that track progress on various aspects of the program. In addition, the weekly project meeting agendas outline current activities and provide updates. Weekly meetings provide a forum for addressing complicated issues and monitoring the progress of each program activity, ensuring that all stakeholders stay up to date and on track to meet goals. These meetings provide a time to regroup with stakeholders and address items that need to be discussed to keep the project successfully moving forward. During such meetings, we routinely review the following:

- Status updates
- Blockers or scope creep issues that need to be addressed and potential solutions
- Upcoming deadlines
- Issues logs, risk registers, and change logs as needed

Meetings minutes are taken that document outcomes, decisions, and action items. They are made available to all stakeholders as a reference for production plans and tasks. CAI utilizes Smartsheet as the primary repository for shared management documentation, program schedules, and program meeting minutes so that each project stakeholder can reference them.

CAI's project manager will proactively communicate with NJDOE staff, informing them of any project change that might impact the State's schedule or deliverables. CAI's proposed communication strategy will ensure that NJDOE is informed in advance of emergent issues.

Management Meetings and Communication

Meetings are an important and routine element of effective internal and external communication. The assembly of key stakeholders provides a forum for solving complicated issues and ensuring that CAI's approach coincides with NJDOE's vision for your assessment program. Section 4.9 provides a detailed description of CAI's meeting planning.

As noted throughout our response, CAI considers weekly conference calls and web-based meetings to be an important and routine element of effective communication. CAI is committed to fully participating in all project meetings described in the RFQ, including, but not limited to, weekly management meetings, collaboration meetings with project partners, weekly team meetings, and all other meetings determined necessary by NJDOE to ensure effective program communication, integration, and cooperation.

Project Launch Meeting

As required by Section 4.2.1, upon award of the contract, CAI will schedule a project launch meeting with NJDOE to discuss transition activities and refine the mobilization schedule for the project. CAI recognizes that the composition of the meeting may focus more heavily on the continuity of current program activities and collaboration with the existing vendor to ensure that materials are properly transitioned with minimal impact to the field.

During the project launch meeting, CAI will review proposed schedules for the upcoming year with NJDOE and confirm the baseline plan. Attendees will include the project director and leads in each program area. CAI will draft an agenda for review, revision, and approval by the SCM and present all required delivery elements as part of a single master schedule.

The following CAI staff members will attend the initial planning meeting:

- CAI program director
- CAI project manager
- CAI software project managers
- As needed, additional CAI staff based on the final meeting agenda, and/or members of the CAI assessment executive team (president or vice president)

A well-organized and detailed agenda is key to keeping the meeting focused on important issues. The CAI program director will collaborate with SCM and NJDOE staff members for their input on topics to be added to the agenda for the kickoff meeting. Based on their feedback, the CAI program director will revise the draft agenda included with this proposal and share the revised agenda ahead of the meeting.

Annual Planning Meeting

During the annual planning meeting, CAI will provide an overview of schedules for the upcoming year, establish the baseline plan, and work through Scope of Work (SOW) modifications or enhancements. Attendees will include the project director and leads in each program area, along with SCM and NJDOE staff members. CAI will draft an agenda for review, revision, and approval by the SCM. We will discuss any challenges encountered while performing the work under this contract and changes to processes and procedures as needed to allow the project to run more smoothly.

Weekly Management Meeting

CAI will host the weekly project management meeting, which will be led by the CAI program director in conjunction with SCM and designated NJDOE project team leadership. This assembly of key stakeholders provides a weekly opportunity to solve complicated issues and ensure that CAI's approach coincides with NJDOE's vision for its assessment program and closely aligns with elaborated project plans and specifications. The progress of project tasks and services will be discussed to resolve outstanding issues. The weekly project management report, distributed before the meeting, will frame a discussion on the week's progress and identify upcoming deadlines and possible challenges. The report will be modified in consultation with the SCM, but it will typically include the following sections:

- Upcoming Activities
- Summary of Key Issues
- Milestone and Delivery Dates
- Upcoming Deadlines
- Specific Action Steps
- Resolutions for Any Potential Identified Risks

During peak intervals in the project schedule, CAI proposes to host the meetings more frequently, if necessary. Attendee lists will expand as needed, depending on the topics, to ensure the ability to address issues with those responsible for resolution. This will include attendance of leadership and staff of other program vendors as needed (to be determined by CAI and the SCM). CAI will provide meeting minutes within two days of the meetings and will coordinate with the administration vendor to make sure that all agendas and minutes are available for review. A sample weekly management report is provided in Exhibit 3.8-1 and is also included as part of the Preliminary and Operational Work Plans. (The dates are for illustration only.) Smaller meetings will be scheduled as needed to address specific issues in a more efficient and time-sensitive fashion.

Exhibit 3.8-1: Sample Weekly Management Report

Weekly Conference Call Attendees

CAI		

NJDOE		

Contract Partner / Other		

Weekly Status Meeting Report

Status Updates		
Event	**Start**	**Finish**
Meetings		
1. All Vendor Program Kickoff Meeting	09/23/2020	09/24/2020
2. Technical Advisory Committee (TAC) Meeting	10/07/2020	10/08/2020
Materials from NJDOE		
1. Item Writing Style Guide	09/30/2020	09/30/2020
2. Test Blueprints	09/30/2020	09/30/2020
3. Item Bank Information	09/30/2020	09/30/2020
4. Contact and Shipping Information for All Districts	09/30/2020	09/30/2020
5. Ancillary Materials from Previous Administration	09/30/2020	09/30/2020
Communication		
1. Sample System Configuration • CAI sends final specifications to SCM for review • SCM provides feedback • CAI updates mockups based on feedback • SCM reviews and approves specs/mockups • System design user acceptance testing (UAT) • Go live	 10/28/2020 10/29/2020 11/05/2020 11/10/2020 11/17/2020 01/07/2021	 10/28/2020 11/04/2020 11/10/2020 11/12/2020 12/17/2020 01/07/2021
2. Implementation Outreach Meetings • Finalize initial training session and dates • Develop training materials • SCM reviews training materials • CAI updates training materials • SCM reviews and approves training materials	 09/01/2021 09/02/2021 09/11/2021 09/18/2021 09/28/2021	 09/01/2021 09/09/2021 09/17/2021 09/20/2021 10/02/2021
User Acceptance Testing—Sample Test		
1. Final specification development and approval	09/24/2020	10/13/2020
2. Test Delivery System (TDS) configuration and QC	10/14/2020	11/04/2020
3. CAI internal UAT review	11/05/2020	11/12/2020
4. Review UAT feedback	11/13/2020	11/13/2020
5. Apply internal UAT edits	11/16/2020	11/16/2020
6. Client demo/begin UAT Round 1	11/23/2020	11/23/2020
7. Round 1 UAT review	11/30/2020	12/14/2020
8. Round 1 UAT feedback due	12/15/2020	12/15/2020
9. Apply UAT Round 1 edits (incl. holiday break)	12/16/2020	01/06/2021

CAI Internal Meeting Structure

In addition to communication with NJDOE, it is essential to have proper internal channels of communication to accomplish project work. CAI conducts several efficient, agenda-driven meetings across teams. All team leaders also have communication channels within their staff. Team leaders meet with their staff or senior staff members to share relevant information from the weekly team leaders' meeting and discuss team-specific issues. CAI team leaders include partner vendors in these meetings where appropriate to ensure a continuity of workflow. Each team is linked by a project calendar maintained by CAI's Project Management Team. The calendar is accessible to all project members. CAI encourages collaboration among and within teams.

To ensure message consistency, staff members regularly participate in other team or breakout meetings and attend the program update conference calls. The goals of the project and overall project health are communicated to the staff on a weekly basis. The result is a cohesive, project-wide plan that incorporates the aims and needs of each contributing organization.

Partner Vendor Meetings

CAI leadership and staff will coordinate and lead meetings with partner vendors as required. CAI will contribute feedback to schedules, specifications, and program communications as needed to ensure that program partners receive the information needed to effectively deliver and hand off their portion of the project according to NJDOE's specifications. CAI will participate in the following meetings:

- Weekly management meetings with partner vendors
- Weekly team/scrum meetings with all CAI and partner vendor leads
- Other team meetings, as scheduled, to discuss specific program deliverables

CAI is prepared to attend other meetings as requested by NJDOE and CAI partners to address specific cross-vendor needs as they may arise.

3.9. Contract Schedule

CAI offers a preliminary schedule plan, which attempts to cohesively represent key program deliverables while understanding that key tasks and dates may shift as a result of the contract start date or the subsequent Project Launch Meeting (PLM).

Our software development teams adhere to Agile scheduling, employing sprints (i.e., short, defined periods of work) to break projects into smaller, manageable tasks. This allows teams to adapt the schedule as the project evolves, focusing on incremental delivery and iterative progress.

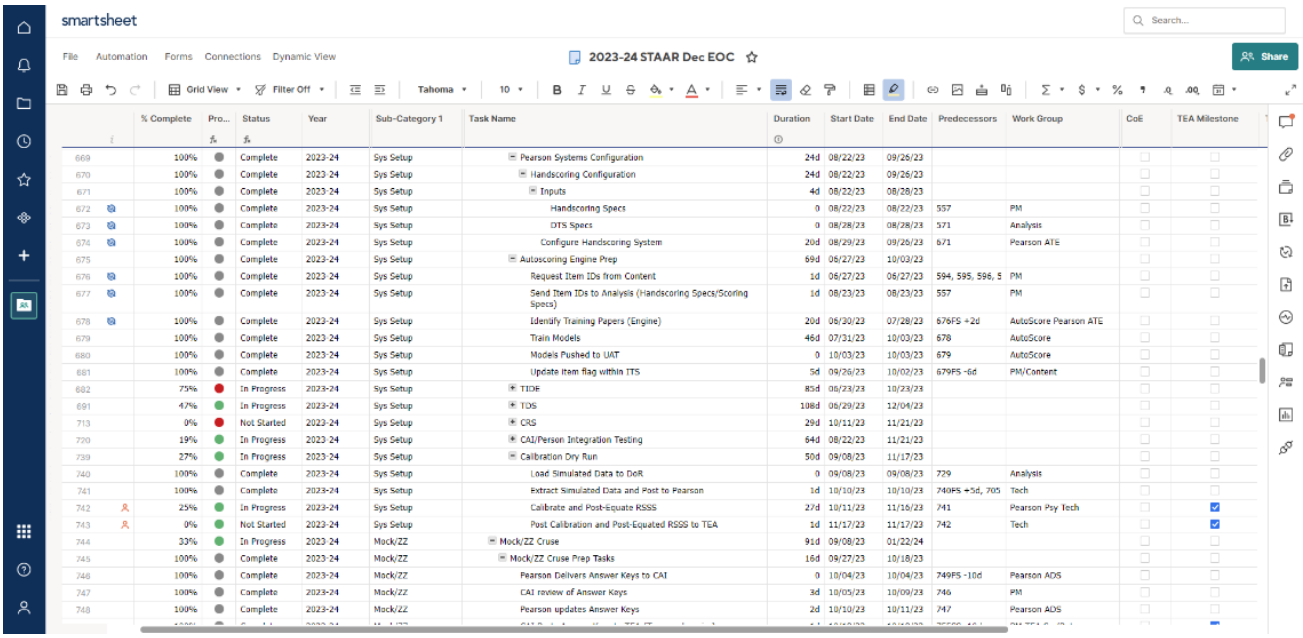
Our Project Management Team utilizes the Critical Path Method (CPM) to determine the longest sequence of dependent tasks, otherwise known as the *critical path*. By identifying and highlighting these tasks, CPM allows CAI's project managers to make informed decisions about resource allocations, potential delays, and maintain focus on tasks that are the most critical to project completion.

We utilize Smartsheet to manage our project schedules and share flexible data views with the Department and assessment partners. Smartsheet allows project managers to visualize their work quickly and effectively with a variety of flexible data views. Some work packages in the assessment program schedule are more effectively viewed as a task list in a grid, whereas a Gantt chart provides insight into potential task and resource conflicts. Having the ability to quickly move between different data views allows for dynamic management of a complex and interconnected project. Smartsheet provides the following viewing configurations for project schedules: Grid, Card, Gantt, or Calendar.

Grid View

The *grid view* is the standard view when the project schedule is initially created. The project is arranged in rows as in a typical spreadsheet, and users can move and update the rows and columns in the sheet, as well as adding as many rows as are required to capture critical project information. The sheets also support the application of formulas to calculate dates and other important project values. Exhibit 3.9-1 provides a sample Smartsheet schedule grid view.

Exhibit 3.9-1: Sample Schedule Grid View in Smartsheet

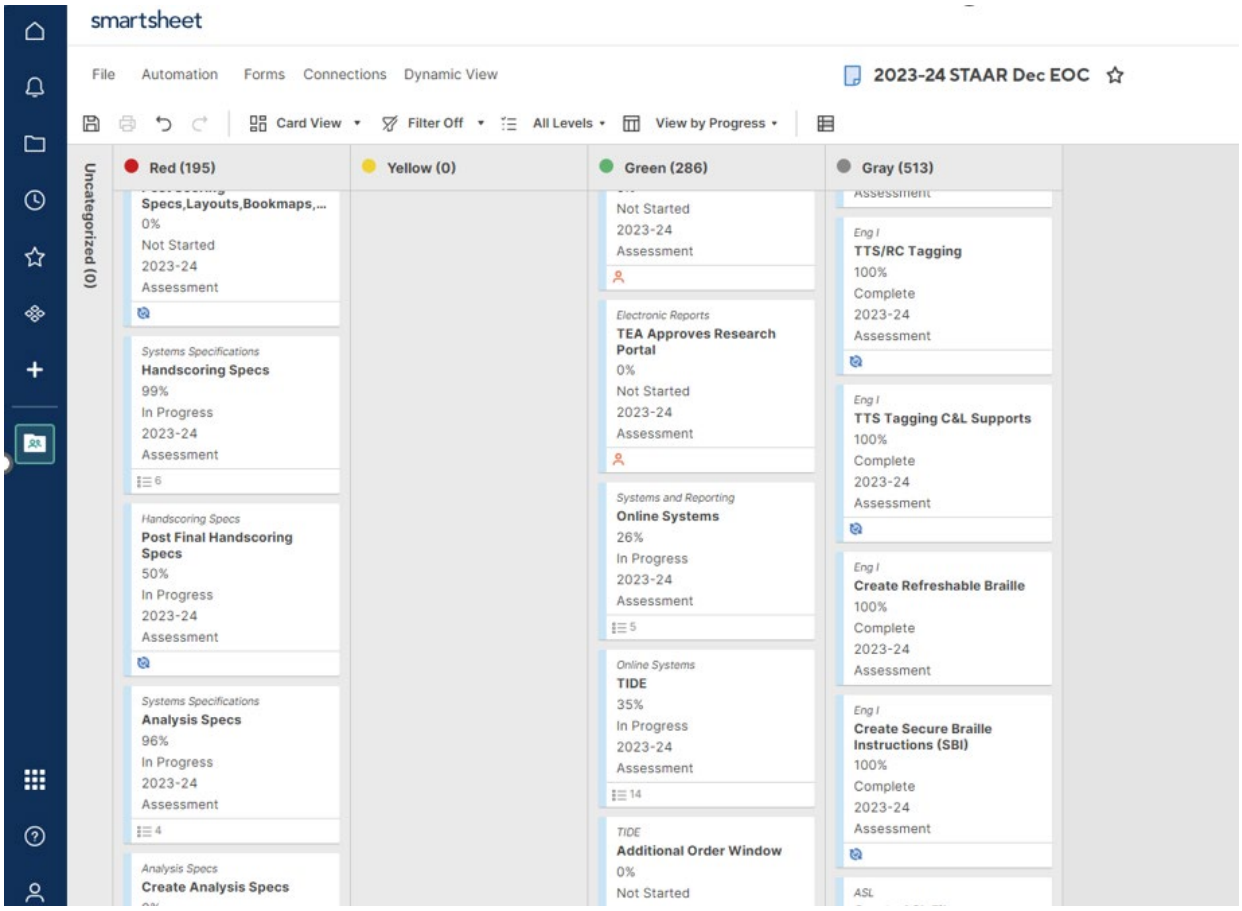


	% Complete	Pro...	Status	Year	Sub-Category 1	Task Name	Duration	Start Date	End Date	Predecessors	Work Group	CoE	TEA Milestone
669	100%		Complete	2023-24	Sys Setup	Pearson Systems Configuration	24d	08/22/23	09/26/23				
670	100%		Complete	2023-24	Sys Setup	Handscoring Configuration	24d	08/22/23	09/26/23				
671	100%		Complete	2023-24	Sys Setup	Inputs	4d	08/22/23	08/28/23				
672	100%		Complete	2023-24	Sys Setup	Handscoring Specs	0	08/22/23	08/22/23	557	PM		
673	100%		Complete	2023-24	Sys Setup	DTS Specs	0	08/28/23	08/28/23	571	Analysis		
674	100%		Complete	2023-24	Sys Setup	Configure Handscoring System	20d	08/29/23	09/25/23	671	Pearson ATE		
675	100%		Complete	2023-24	Sys Setup	Autoscoring Engine Prep	69d	06/27/23	10/03/23				
676	100%		Complete	2023-24	Sys Setup	Request Item IDs from Content	1d	06/27/23	06/27/23	594, 595, 596, 5	PM		
677	100%		Complete	2023-24	Sys Setup	Send Item IDs to Analysis (Handscoring Specs/Scoring Specs)	1d	08/23/23	08/23/23	557	PM		
678	100%		Complete	2023-24	Sys Setup	Identify Training Papers (Engine)	20d	06/30/23	07/28/23	676FS +2d	AutoScore Pearson ATE		
679	100%		Complete	2023-24	Sys Setup	Train Models	46d	07/31/23	10/03/23	678	AutoScore		
680	100%		Complete	2023-24	Sys Setup	Models Pushed to UAT	0	10/03/23	10/03/23	679	AutoScore		
681	100%		Complete	2023-24	Sys Setup	Update item flag within ITS	5d	09/26/23	10/02/23	679FS -6d	PM/Content		
682	75%		In Progress	2023-24	Sys Setup	TIDE	85d	06/23/23	10/23/23				
691	47%		In Progress	2023-24	Sys Setup	TDS	108d	06/29/23	12/04/23				
713	0%		Not Started	2023-24	Sys Setup	CRS	29d	10/11/23	11/21/23				
720	19%		In Progress	2023-24	Sys Setup	CAI/Person Integration Testing	64d	08/22/23	11/21/23				
739	27%		In Progress	2023-24	Sys Setup	Calibration Dry Run	50d	09/08/23	11/17/23				
740	100%		Complete	2023-24	Sys Setup	Load Simulated Data to DoR	0	09/08/23	09/08/23	729	Analysis		
741	100%		Complete	2023-24	Sys Setup	Extract Simulated Data and Post to Pearson	1d	10/10/23	10/10/23	740FS +5d, 705	Tech		
742	25%		In Progress	2023-24	Sys Setup	Calibrate and Post-Equate RSSS	27d	10/11/23	11/16/23	741	Pearson Psy Tech		☑
743	0%		Not Started	2023-24	Sys Setup	Post Calibration and Post-Equated RSSS to TEA	1d	11/17/23	11/17/23	742	Tech		☑
744	33%		In Progress	2023-24	Mock/ZZ	Mock/ZZ Cruse	91d	09/08/23	01/22/24				
745	100%		Complete	2023-24	Mock/ZZ	Mock/ZZ Cruse Prep Tasks	16d	09/27/23	10/18/23				
746	100%		Complete	2023-24	Mock/ZZ	Pearson Delivers Answer Keys to CAI	0	10/04/23	10/04/23	749FS -10d	Pearson ADS		
747	100%		Complete	2023-24	Mock/ZZ	CAI review of Answer Keys	3d	10/05/23	10/09/23	746	PM		
748	100%		Complete	2023-24	Mock/ZZ	Pearson updates Answer Keys	2d	10/10/23	10/11/23	747	Pearson ADS		

Card View

The *card view* displays the schedule in a kanban board, which is an agile project management tool used to improve work efficiency and help visualize work tasks in progress. Work tasks are sorted into status lanes where users can easily determine progress against established targets. Exhibit 3.9-2 provides a sample view.

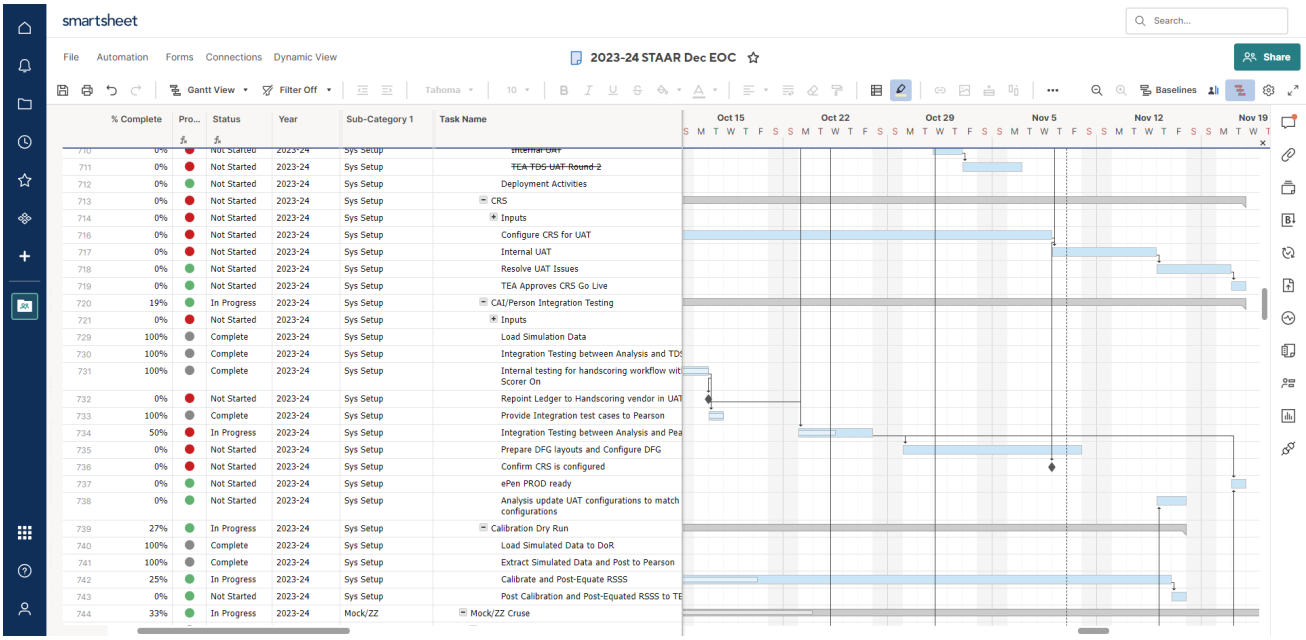
Exhibit 3.9-2: Sample Schedule Card View in Smartsheet



Gantt View

A *Gantt chart* tracks the duration of, and the correlation between, tasks in a project schedule. This view, as seen in Exhibit 3.9-3, is commonly found in most project scheduling applications and demonstrates how tasks in a schedule are progressing against the overall time allocated for that work.

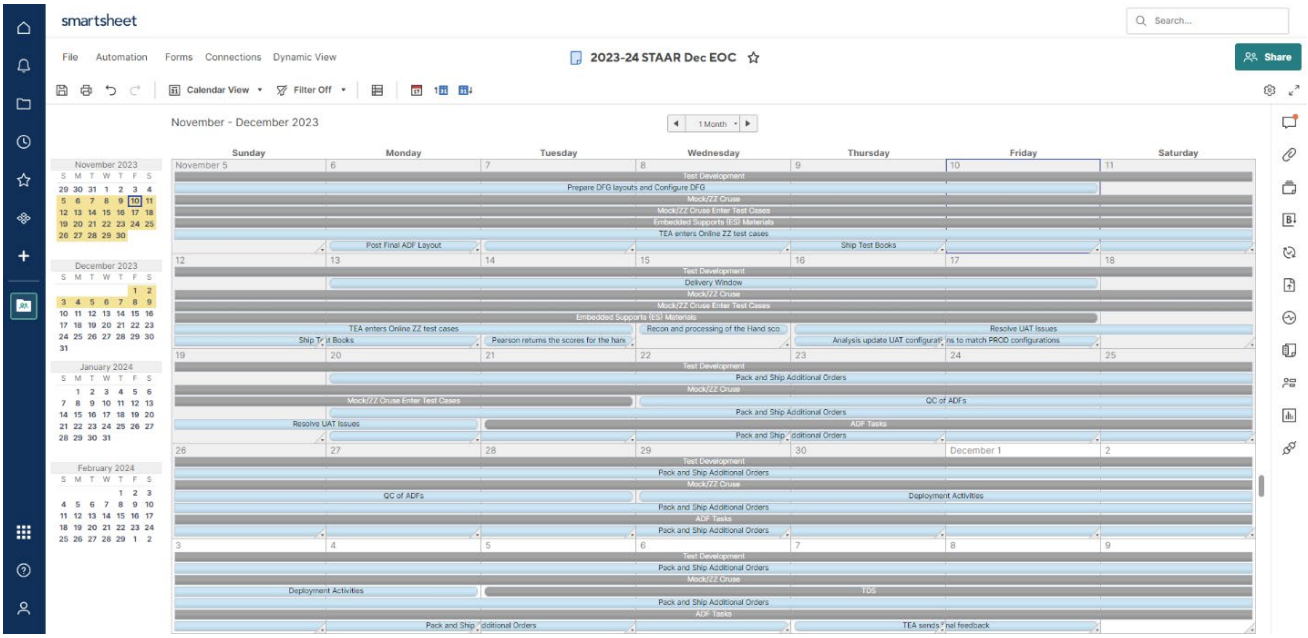
Exhibit 3.9-3: Sample Schedule Gantt View in Smartsheet



Calendar View

The calendar view illustrated in Exhibit 3.9-4 is the easiest way to see how many project tasks are running concurrently across a specific period of time. Overlapping work is easily identified in this view, and the color bars representing the work packages can be color-coded for grouping and identification of tasks. Smartsheet also permits users to publish the calendar and subscribe to it from any calendar which supports the iCal format (e.g., Microsoft Outlook).

Exhibit 3.9-4: Sample Schedule Calendar View in Smartsheet



A draft of the preliminary project schedule is provided in Appendix L of our proposal. When accessed online, the Smartsheet view may be changed using the Views buttons in the toolbar at the top of the page.

Preliminary Project Schedule

A preliminary draft of the school year 2025–2026 project schedule can be found in Appendix L. Tasks have been sequenced according to the provided scope and CAI standard development and configuration processes, acknowledging that some refinement of dates and tasks will occur as a result of the Project Launch Meeting (PLM) and further discussions between the CAI project manager and the State Contract Manager (SCM). The contract start date will further inform the schedule adjustments needed to deliver the required program scope as outlined in the RFQ.

3.10. Mobilization Plan

Project Mobilization

The successful transition of a testing program entails transferring all required data, products, institutional knowledge, and other state-owned assets. The transfer must be complete and correct, avoiding disruption of services or support during the transition period. The goal is to ensure that NJDOE has access to, and control of, the necessary products at all times.

CAI has learned from experience that a successful transition has four core requirements:

1. **Identification.** The first step in developing a transition plan is to clearly identify all requisite transition information, as well as the data and format in which the materials will be delivered.
2. **Planning.** Highly detailed plans chronicling specific delivery deadlines for transferred information facilitate a smooth transition.
3. **Delivery.** Once critical transition elements are identified and delivery timelines are established, the actual information transfer must be monitored to ensure that all delivered information is both accurate and timely.
4. **Quality Control.** To ensure successful completion, the transitioning contractor must support the new contractor to replicate work and run analyses to ensure that data and trends are accurate.

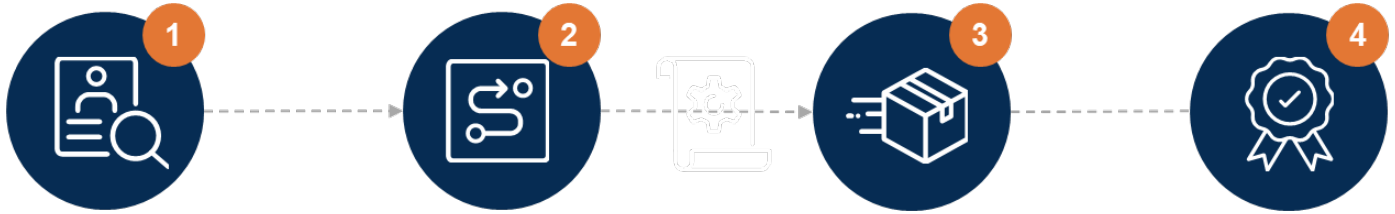
In beginning its partnership with NJDOE, CAI understands that it will be responsible for transitioning and receiving all materials, products, and assets developed for, and used in conjunction with, this program, including test books, answer documents (paper and PDF format), final electronic source files of interpretive products, software source code for New Jersey-owned development, ancillary materials, PDF files, and a detailed inventory of the item bank repository containing all parameters required for test and item specifications.

Our transition plan follows these five general steps:

1. We will hold an initial meeting to identify the critical information that needs to be transferred and to discuss the quality assurance plans that will ensure accurate transfer.
2. CAI will complete a draft of its transition specifications document, which includes details about the format of the information to be delivered and the delivery schedule.
3. CAI will meet with the SCM to review the transition specifications document, refine it as needed, and negotiate any changes.
4. CAI completes the final transition specifications document by outlining the exact approach to be taken to incorporate the transferred information into our workflow and systems and to refine the quality assurance plan associated with each item.
5. CAI implements the plan as outlined in an approved transition specifications document.

Exhibit 3.10-1 summarizes our transition plan and process.

Exhibit 3.10-1: Transition Plan and Process



Identification

Clearly identify all requisite transition information, as well as the data and format in which the materials will be delivered.

Planning

Chronicle specific delivery deadlines in highly detailed plans. This facilitates a smooth transition for transferred information.

Delivery

Once critical transition elements are identified and delivery timelines are established, the actual information transfer is monitored to ensure that delivered information is both accurate and timely.

Quality Control

To ensure successful completion, the transitioning contractor must support the new contractor to replicate work and run analyses to ensure that data and trends are accurate.

Transition Plan:

1. Initial meeting to identify critical information to transfer.
2. CAI will complete a draft of its transition specifications.
3. CAI will meet with the SCM to review the transition specifications document.
4. CAI completes the final transition specifications.
5. CAI implements the plan as outlined in an approved transition specifications document.

CAI's management process relies on detailed specifications documents for virtually every element of the program. We use these documents to ensure clear and uncomplicated communication of specifications within our organization and between CAI and our clients. In Exhibit 3.10-2, we illustrate that for each area of activity, we will complete the full transition specifications and track each segment of the program throughout the transition process. This transition document will similarly inform the timeline discussed in additional detail later in this section.

Exhibit 3.10-2: Transition Specifications

Element	Description
Item Number	Number assigned to each element for inventory purposes
Team	Subject-matter team that ultimately generates the material (e.g., psychometrics / technical, reporting, scoring, customer service)
Item / Material	Data, knowledge, or other information required
Description	Detailed information about the item/material
Origination Entity / Person	Name of the person or entity responsible for ensuring delivery
Reference or Source	Source of the information known to be accurate
Preferred Format	New contractor's preferred format in which to receive the information
Best Available Format	Format in which we will deliver the information
Backup Format	Alternate format in which data are also available in case a backup is necessary, and the best available format that differs from the preferred format
Quality Control Plan	Where possible, the plan for ensuring information accuracy
Delivery Date	Agreed-upon delivery date
Actual Delivery Date	Actual delivery date
Provided By	Name of the person who delivered the material
Receiving Entity / Person	Name of the person or entity at the new contractor who will receive the material
Completion Date	Date that the full transition of the material was complete
Status	1 = complete; 0 = incomplete

We note that the final transition specifications document will include quality assurance steps for every element to ensure that the information received is as expected. This may include identifying sources or formats for information that may be less convenient to utilize but more reliable and accurate as the materials are transferred. A sample transition document listing examples of the types of documents and materials we would expect to receive can be found in Appendix O of our proposal.

Mobilization Timeline

CAI offers the timetable in Exhibit 3.10-3 to illustrate how we will manage the mobilization activities required to begin work on the New Jersey project and position it for success following a vendor transition. This plan assumes the date of award as April 15, 2025, but CAI understands that the date will be modified based on the actual award date. The dates referenced in this plan are illustrative, and additional tasks may be added resulting from meetings with NJDOE during the transition phase.

Exhibit 3.10-3: Timetable for Mobilization Activities

Task	Start Date	End Date
New Jersey—School Year 2025–2026 Mobilization Plan	04/15/25	08/06/25
Contract Award/Transition Start Date	04/15/25	04/15/25
Contract Award Notification—Mobilization Start Date	04/15/25	04/15/25
Project Management	04/16/25	08/06/25
Identify Key Staff, Assess Required Roles and/or Skills	04/16/25	05/06/25
Identify CSSC Technical Leads and Shared Service Assignments	04/16/25	05/06/25
Confirm Communication Channels/Roles with the SCM/NJDOE	04/16/25	04/29/25
Complete List of User Guides and Ancillary Publications Submitted to Technical Writers	04/16/25	05/13/25
Update Preliminary Work Plan Draft	05/14/25	06/10/25
Complete and Submit Initial Operational Work Plan Draft to the SCM	06/11/25	06/24/25
Complete Communication and Escalation Plans; SCM Review	06/04/25	06/17/25
Submit Final PM/Technical Lead Organization Chart	06/04/25	06/04/25
Submit Risk Management Plan Draft to the SCM; Include Risks/Issues from Transition Period	07/16/25	07/16/25
Final User Guides/Ancillary Publications Submitted for Approval	07/30/25	07/30/25
Approval of Operational Work Plan and Supporting Project Management Plan Documentation	07/30/25	08/04/25
Final 2025–2026 Program Schedule Approved by the SCM and Baselined	07/30/25	08/04/25
Provide Report of Legacy Data Transfer from Prior Vendor	08/06/25	08/06/25
CSSC/Technical System Specifications	04/16/25	08/04/25
Complete Initial ITS Specifications	04/16/25	05/14/25
Collect and Create Specifications Package to Be Completed (CAI PM/NJDOE leads)	04/16/25	05/14/25
Begin Technical Specification Collection Meetings with NJDOE	05/28/25	06/24/25
Complete Specification Review Meetings	06/25/25	06/25/25
Submit Initial Drafts to Technical Project Managers (TIDE/TDS/CRS)	06/26/25	06/26/25

Task	Start Date	End Date
Technical Configurations Begin in TEST/UAT; Iterative Review with Project Managers	07/02/25	07/15/25
Quality Assurance Testing of New Configurations Begins in TEST/UAT	07/02/25	07/22/25
Review Initial Drafts of User Guides/Ancillary Publications	07/02/25	07/15/25
Final 2025–2026 Program Schedule Draft Submitted to the SCM	07/09/25	07/09/25
Begin Internal CAI UAT	07/16/25	07/22/25
NJDOE Systems UAT (TIDE/TDS/CRS) and Final Approvals	07/25/25	08/04/25
Prior Vendor Engagement	04/16/25	05/02/25
Designate Data Transfer Point of Contact for Prior Contractor Materials	04/16/25	04/22/25
Hold Initial Transition Meeting with Prior Contract Vendor	04/24/25	04/25/25
Establish Communication Channels Between Key Prior/New Contractor Staff	04/28/25	05/02/25
Initial Planning Meeting	04/16/25	06/09/25
Develop Initial Planning Meeting Agenda	04/16/25	05/13/25
Conduct Initial Planning Meeting with NJDOE	05/28/25	05/29/25
Initial Planning Meeting Minutes Submitted to the SCM for Approval	06/09/25	06/09/25
Implementation Outreach Meetings	04/23/25	06/18/25
Prepare Implementation Outreach Meeting Presentation Drafts	04/23/25	05/13/25
Submit Presentations to SCM for Feedback/Approval	05/14/25	05/20/25
Begin Implementation Outreach Meetings in New Jersey	05/21/25	05/21/25
Complete Implementation Outreach Meetings	07/14/25	07/14/25
Item Bank and Content Management Activities	05/01/25	07/16/25
Complete Draft Item Bank Specifications	05/01/25	05/14/25
Configure New NJ Item Bank in ITS	05/15/25	07/16/25
Collecting Transition Materials (non-content)	04/28/25	08/04/25
First Round of Transition Materials	04/25/25	06/09/25
Items and Forms	04/25/25	06/09/25
Item and Test Development Specifications (e.g., item and item cluster development specifications, test development specifications/blueprints, and the New Jersey style guide)	04/25/25	06/09/25

Task	Start Date	End Date
Test Items and Item Clusters, Including Text, Art, Graphics, Accessibility Tagging, Interactions, and Scoring Logic	04/25/25	06/09/25
Item Metadata Needed to Process, Store, and Report Test Results	04/25/25	06/09/25
Sample Copies of All Guides and Manuals (hard copy and electronic) for the Operational Test Administrations	04/25/25	06/09/25
Test Map and Form Information Needed to Deliver a Full Test Form	04/25/25	06/09/25
Samples of All Paper-Pencil and Electronic Test Booklets and Electronic Answer Documents from the Previous Year's Test Administrations	04/25/25	06/09/25
Handscoring	04/25/25	06/09/25
Rubrics	04/25/25	06/09/25
Scorer Training Material Protocols	04/25/25	06/09/25
Anchor Papers, Training Sets, and Calibration Sets	04/25/25	06/09/25
Constructed-Response Scoring Rules	04/25/25	06/09/25
Previous Year's Score Distributions for Each Item	04/25/25	06/09/25
Documents and Materials Used in the Scoring Process	04/25/25	06/09/25
Status Meeting	05/21/25	05/21/25
First Round of Transition Materials Check-In Meeting	05/20/25	05/20/25
Second Round of Transition Materials	05/21/25	07/03/25
Data Files	05/21/25	07/03/25
File Layouts	05/21/25	07/03/25
At Least One Past Data File (redacted if needed)	05/21/25	07/03/25
PreID File	05/21/25	07/03/25
Reporting	05/21/25	07/03/25
Documentation of Aggregation Rules and Tables Used to Calculate Student, School, District, and State Results	05/21/25	07/03/25
Technical Reports (at least two recent reports)	05/21/25	07/03/25
Sample Copies of All Reports Provided to Districts and Schools from Previous Test Administrations as Necessary	05/21/25	07/03/25

Task	Start Date	End Date
Notes and Minutes from Recent TAC Meetings	05/21/25	07/03/25
Existing ISR Translations in Electronic Format (for each language, all translated text)	05/21/25	07/03/25
Status Meeting	06/24/25	06/24/25
Second Round of Transition Materials Check-In Meeting	06/24/25	06/24/25
Third Round of Transition Materials	06/25/25	08/06/25
Administration	06/25/25	08/06/25
Historical Student Registration Files	06/25/25	08/06/25
Current State Profiles for All States	06/25/25	08/06/25
Client Service	06/25/25	08/06/25
Existing Client Service Training Materials Used by Current Vendor	06/25/25	08/06/25
Annual Case Reports	06/25/25	08/06/25
Status Meeting	07/25/25	07/25/25
Third Round of Transition Materials Check-In Meeting	07/25/25	07/25/25

Mobilization Staffing Plan

In addition to the staff specifically allocated to the New Jersey program, CAI will assign several key staff members to a mobilization task force. These individuals will serve as a force multiplier to ensure that the tasks that need to be accomplished during the 16-week transition period receive the support necessary so the New Jersey program starts on time and on a proper and stable footing.

CAI proposes to engage the staff resources in the following list as part of the mobilization task force.

Transition Leads and Support Staff

- Tom Glorfield, Program Implementation Support
- Julie Benson, Content Import and Asset Transfer Lead
- Myung Hee Im, Psychometrics Lead
- Paul Ciprich, Technical Transition Lead (TIDE)
- David Sanchez, Technical Transition Lead (TDS)
- Brett Harris, Technical Transition Lead (CRS)
- Piyush Sharma, Technical Transition Lead (Analysis)
- Sirisha Nagabhairava, Technical Transition Lead (ITS)
- Eugenia Kim, Technical Transition Lead (Reporting)

At the end of the 16-week transition period, transition staff will meet with the assigned Project Management Team to ensure that all transition-related activities and responsibilities have been appropriately completed or transferred to the primary project resources.

Planned Project Staffing

At the time of this proposal submission, CAI has determined that enough experienced staff members are available in our existing project management and technical depth to achieve NJDOE's goals. These individuals have been explicitly named as part of our response, in their expected roles. They are expected to be available to contribute to transition activities during the 16-week period leading up to the contract start date. CAI works proactively with members of its Human Resources team to evaluate available talent pools regularly and recruit new hires at all levels of the organization. This creates the depth necessary to respond to a solicitation with specific staff members already in place and eliminates the need for a staffing recruitment period at the start of the contract.

If an individual departs unexpectedly, CAI will seek to fill the role temporarily to address any immediate operational shortfalls and adapt the expected hiring and/or transition timeline for a permanent project replacement.

Required Equipment and Materials

As part of its existing contractual relationship and service model with organizations such as Amazon Web Services, which provision the servers and satellites required to operate CAI modules at scale, CAI can immediately leverage the on-demand assets needed to operationalize the New Jersey project. Specific equipment purchases are not required for project launch, and CAI staff are in prior possession of the equipment and machines needed to access and configure the systems supporting the New Jersey project.

3.11. Additional Plans

As a demonstrated leader in online testing, CAI's mission and reputation rely on uninterrupted critical business and system processes. To this end, we have designed our technical infrastructure to be resilient in the event of technical issues. Our top priority is, of course, to prevent problems through solid engineering and operating processes supported by capable staff. However, we recognize that problems can occur despite best efforts, so we also have plans and processes in place to quickly detect and mitigate issues and reduce their impact on our clients and testing programs.

CAI has been audited and certified to operate in accordance with ISO 27001. As part of the ISO 27001 compliance process, CAI developed and maintains a business continuity plan (BCP). The BCP addresses backup and recovery strategies, continuity of operations, disaster recovery, and crisis management as summarized here:

Backup and recovery strategies. All databases and key servers have incremental backups taken nightly and full backups taken weekly. Databases run with full transaction logging and the logs are backed up every 10 minutes to support data restoration. Backups are verified regularly to ensure recoverability.

Continuity of operations. CAI systems are engineered for reliability and are highly redundant to ensure continuous operations. Web servers operate in load-balanced pools, and databases are configured in failover clusters with redundant storage to protect against outages caused by system failures. CAI leverages Amazon Web Services (AWS) availability zones to protect against data center failures.

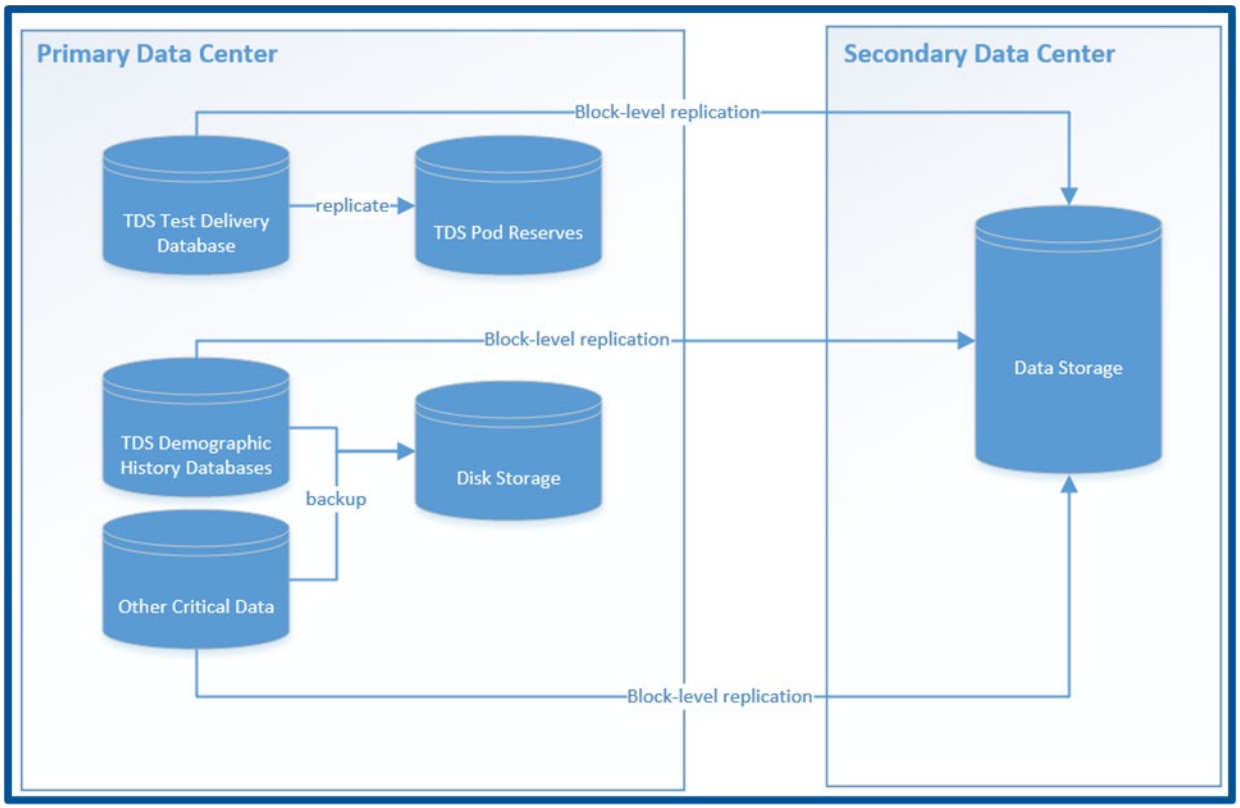
Disaster recovery. CAI maintains detailed disaster recovery plans that identify failure scenarios, from the loss of single devices to the loss of an entire data center. The plan includes recovery plans for each scenario, which drives operating strategies. In Appendix G of our proposal, we include CAI's BCP.

Crisis management. CAI has a documented process for identifying, reporting, analyzing, and resolving critical incidents. The process ensures rapid response to engage key staff to reach a rapid resolution. The process includes ongoing and complete communication with clients to coordinate information distribution and approvals for mitigation efforts.

CAI maintains a full Disaster Recovery plan. We have built a comprehensive, holistic design of backup, replication, off-site storage, and recovery. Please see Exhibit 3.11-1 for a detailed diagram of this plan. Our approach is not just to plan around the disaster scenarios that are most likely to happen. Instead, we have a plan that targets a wide variety of scenarios with a dual approach:

1. For any disaster recovery scenario that happens locally within the data center, we will restore from local backups and local SQL Server-level data replications.
2. For a disaster recovery scenario that involves the entire data center, where data are unrecoverable in that center, we will restore from off-site storage in another data center. Off-site storage is performed through block-level replication, where data are posted synchronously in real time as data changes in the source data center.

Exhibit 3.11-1: Dual Approach for Disaster Recovery



This dual approach covers all bases. If there is a local incident of data loss, for example, the most efficient way to restore the data will be from the local backup. On the other hand, if there is a catastrophic failure causing an entire data center to go down, we will recover from the off-site storage in a different location. Because block-level replication posts data in real time, it plays a critical role in restoring data after a catastrophic failure, especially if that failure occurs during peak testing time. We can restore data from the time immediately before the incident occurred, minimizing the amount of data lost that day.

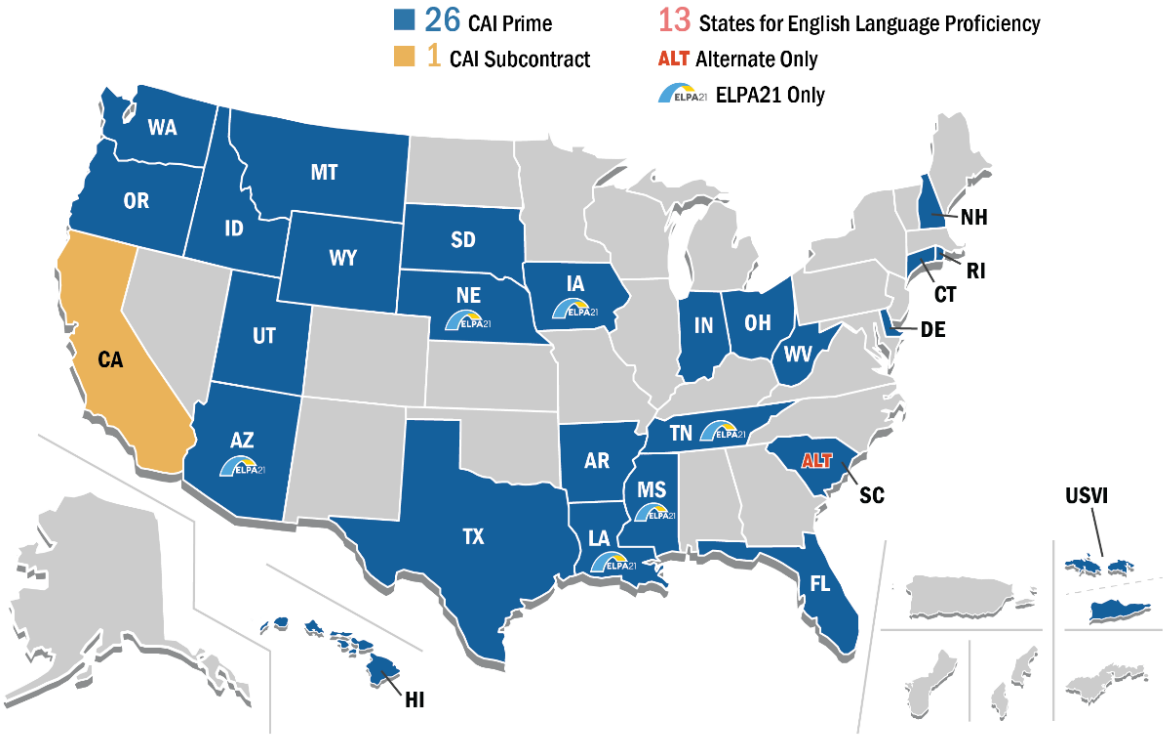
Upon contract award, CAI will work with NJDOE to review our contingency plans and refine them as needed to ensure the ongoing success of the testing program.

3.12. Organizational Experience

CAI offers a testing management system that has successfully supported state testing programs since the early 2000s, developing innovative and customized standards-based assessments and utilizing a variety of test designs, test administration plans, and other program-specific factors. We currently deliver customized fixed-form or computer-adaptive tests (CATs) in 27 states and jurisdictions. For 23 of these clients, we deliver customized adaptive tests, including tests in English language arts (ELA) and mathematics and, for one client, a stage-adaptive test. We deliver statewide assessments in several large states, including California where we test more than 99.99% of the state's 3.2 million grade-eligible students online with adaptive tests. CAI's workforce encompasses approximately 744 full-time employees and 290 part-time staff members and contractors during peak production, providing enough capacity to support New Jersey's assessment program along with our other state assessment clients.

Exhibit 3.12-1 presents a map of CAI's statewide assessment projects.

Exhibit 3.12-1: CAI Map of Statewide Assessment Projects



Highlights of CAI's experience supporting high-stakes assessments include the following:

- CAI has successfully delivered online statewide summative ELA and mathematics assessments in Oregon since 2007; in Delaware and Hawaii since 2009; in Utah since 2012; in California, Connecticut, Florida, Idaho, New Hampshire, Ohio, South Dakota, the U.S. Virgin Islands, Washington, and West Virginia since 2015; in Montana since 2016; in Indiana and Wyoming since 2017; in Texas since 2020; in Arkansas since 2022; in Arizona (2015–2020); in Vermont (2015–2023); and in North Dakota (2016–2024).
- CAI works with a consortium of states to administer innovative new assessments designed to evaluate the three-dimensional science standards modeled after the Next Generation Science Standards (NGSS). States in this group include Arkansas, Connecticut, Hawaii,

Idaho, Indiana, Montana, New Hampshire, Rhode Island, Oregon, Utah, West Virginia, and Wyoming. In addition, CAI administers more traditional assessments of state science standards in Indiana and Ohio.

- CAI has successfully delivered social studies assessments in Ohio (including graduation testing) since 2004; Hawaii since 2009; Florida and Indiana since 2019; and Texas since 2020.
- CAI has successfully delivered alternate assessments based on our unique model in Delaware, Florida, Hawaii, Idaho, Montana, New Mexico, Ohio, Oregon, South Carolina, South Dakota, Texas, Vermont, and Wyoming. We also support the delivery of California's and Indiana's alternate assessments, as well as the National Center and State Collaborative (NCSC) test in Connecticut.
- CAI has delivered more than 200,000 online SATs for the College Board.
- CAI has successfully delivered English Language Proficiency (ELP) assessments in Ohio since 2006 and Oregon since 2007. We have delivered the English Language Proficiency Assessment for the 21st Century (ELPA21) in online, paper-pencil, and braille formats in Arkansas, Iowa, Louisiana, Nebraska, Ohio, Oregon, and West Virginia since 2015. CAI also provides the ELP assessments in California and Texas. In addition, we were awarded the Tennessee ELPA contract in 2023 and the Mississippi English Learner Screener contract in 2024. CAI has also successfully delivered ELPA21's Alternate ELP assessments since 2022 in Arizona, Arkansas, Connecticut, Iowa, Louisiana, Nebraska, Ohio, Oregon, and West Virginia.

CAI delivered more than 100 million online assessments in the 2021–2022 school year, more than 115 million online assessments in the 2022–2023 school year, and more than 124 million online assessments in the 2023–2024 school year. On April 16, 2024, CAI reached a peak load of more than 1.5 million students testing concurrently across all our clients. Our technology platform is highly scaled and has been load-tested to show that it can support more than 3,000,000 concurrent test takers. CAI has supported more than six states as they rapidly transitioned from a paper-pencil testing system to a virtually all-online assessment, including rural states (e.g., New Hampshire, Vermont), isolated states (e.g., Hawaii), and large states (e.g., California).

CAI has the most mature, well-tested, and scalable online test delivery platform in the industry. We delivered the first statewide, online adaptive test in the country to receive a Substantially Meets status under the 2005 U.S. Department of Education (USDE) Peer Review.

CAI has the most accessible system available. We provide online testing for almost all students in California, Connecticut, Delaware, Hawaii, Idaho, Indiana, Montana, New Hampshire, Ohio, Oregon, South Dakota, Texas, Utah, Washington, and West Virginia. This includes not only ELA and mathematics, but often science and social studies assessments, as well.

CAI's Test Delivery System (TDS) has the smallest technology footprint in schools, supports the assessment community's broadest array of item types, and offers the most robust selection of accommodations and embedded supports available in the industry. Our online TDS is accessible to all students. We have received Web Content Accessibility Guidelines (WCAG) 2.1 AA compliance, which is a very high level of compliance for accessible web applications. Moreover, our system boasts the most comprehensive set of tools, embedded supports, and accommodations currently in operational use across the nation. We are committed to accessibility for all students.

We refer readers to Section 3.16 for a list of CAI's assessment contracts that demonstrate our experience in development, management, administration, scoring, and reporting for state assessment programs.

Client References

Here, we provide the contact information of three client references to demonstrate CAI's successful completion of similar programs.

Client: Indiana Department of Education
Contact Information: Lynn Schemel, Chief Academic Officer/Director of Assessment Phone: (317) 232-9050 Email Address: lschemel@doe.in.gov
Client: Ohio Department of Education
Contact Information: Lisa Chandler, Director, Office of Assessment Office: (614) 387-2218 | Toll-free: (877) 644-6338 Email Address: lisa.chandler@education.ohio.gov
Client: New Hampshire Department of Education
Contact Information: Dr. Nate Greene, Bureau Administrator, Bureau of Assessment and Accountability Cell: (603) 573-6556 Email Address: Nathaniel.Greene@doe.nh.gov

3.13. Location

CAI is headquartered in Arlington, VA.; a contact for the facility is Steve Kromer at (202) 631-2669.

3.14. Organization Charts

In this section, we include organization charts for the following companies:

- Cambium Assessment, Inc. (CAI)—Exhibit 3.14-1
- Measurement Incorporated (MI)—Exhibit 3.14-2
- Caveon, LLC—Exhibit 3.14.3
- Human Resources Research Organization (HumRRO)—Exhibit 3.14-4
- Lambert Global, LLC—Exhibit 3.14-5
- Metimur—Exhibit 3.14-6
- Tri-Lin Integrated Services, Inc.—Exhibit 3.14-7

Exhibit 3.14-1: CAI Project Organization Chart

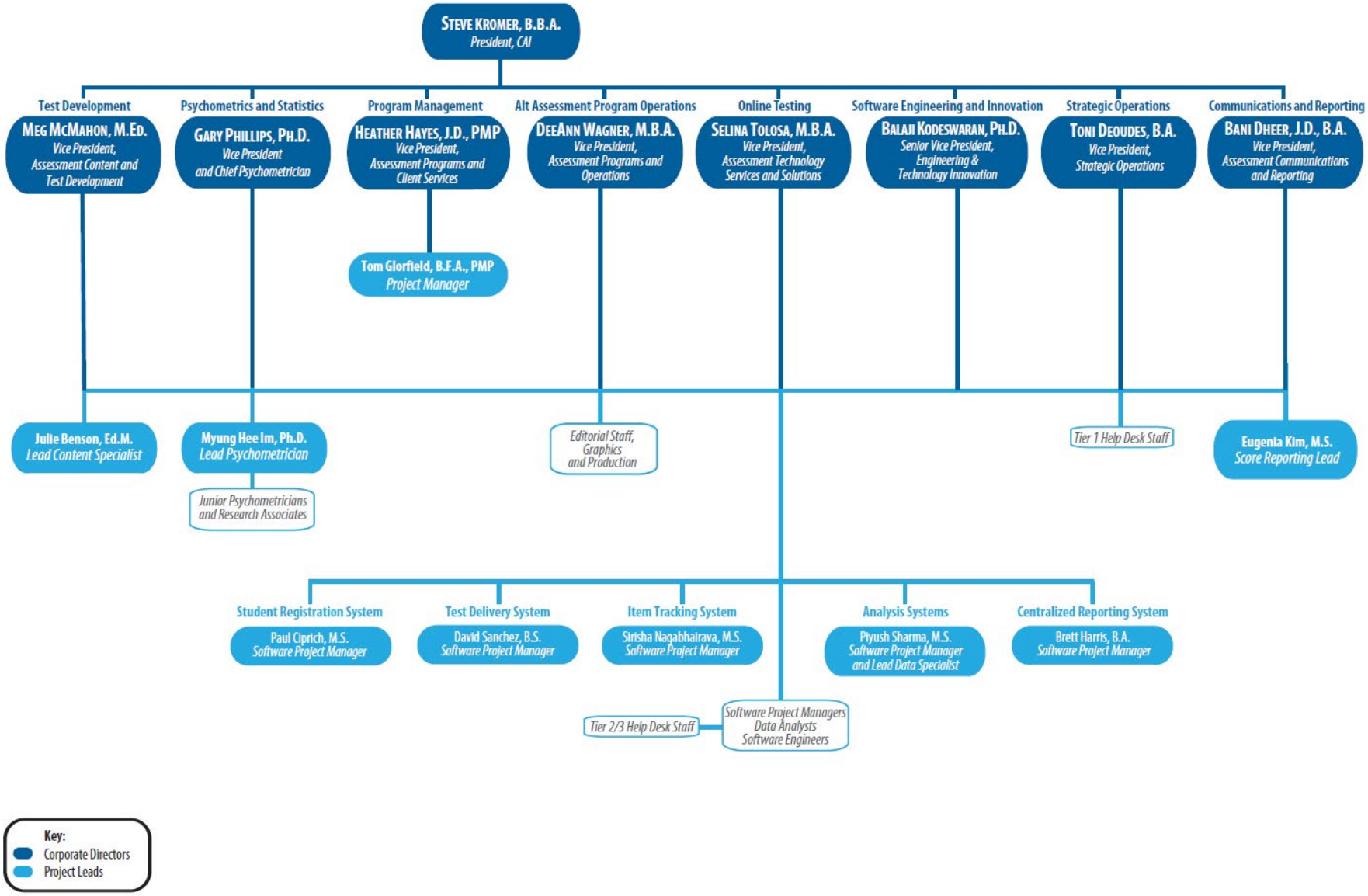


Exhibit 3.14-2: MI Project Organization Chart

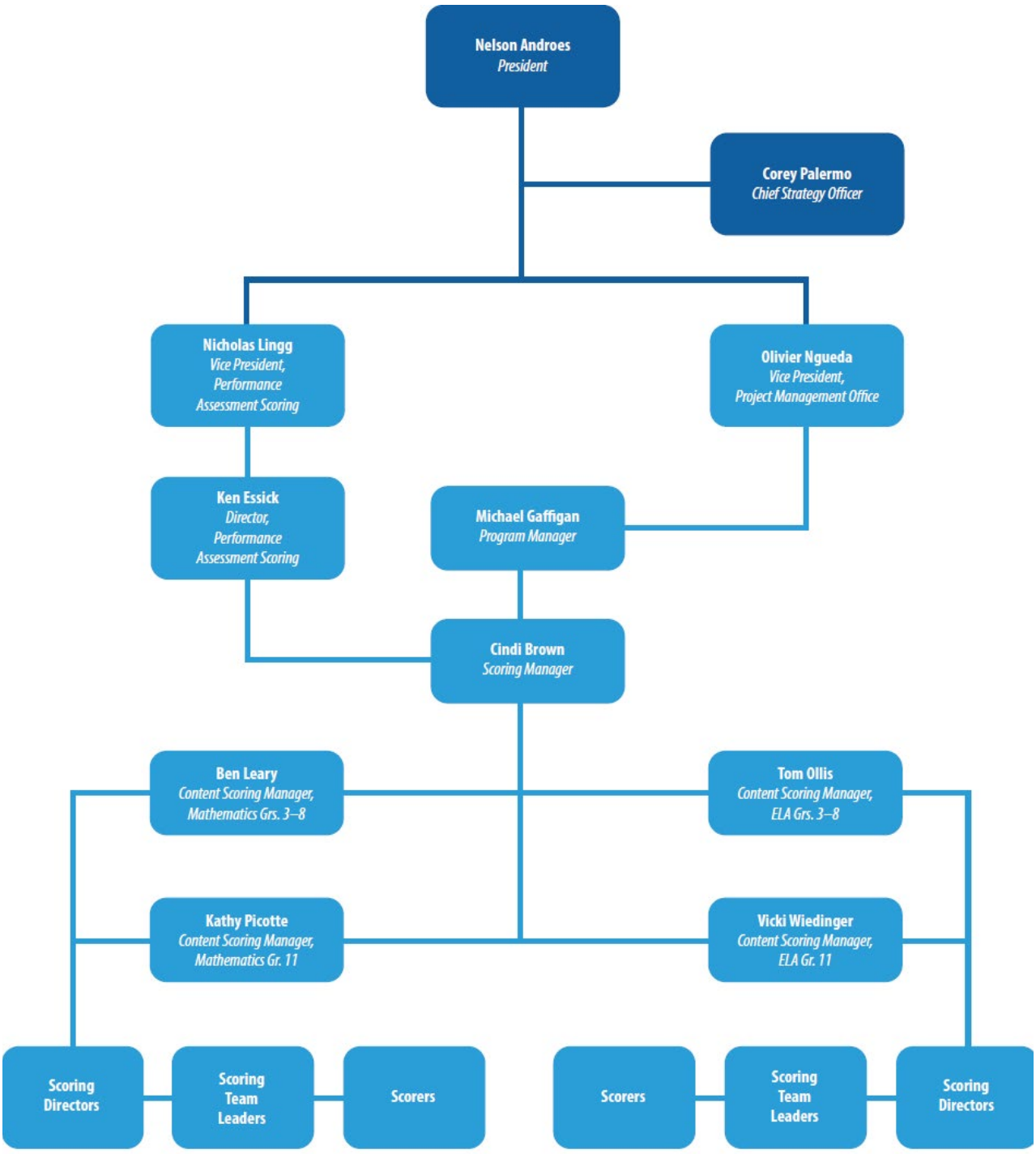


Exhibit 3.14-3: Caveon Project Organization Chart

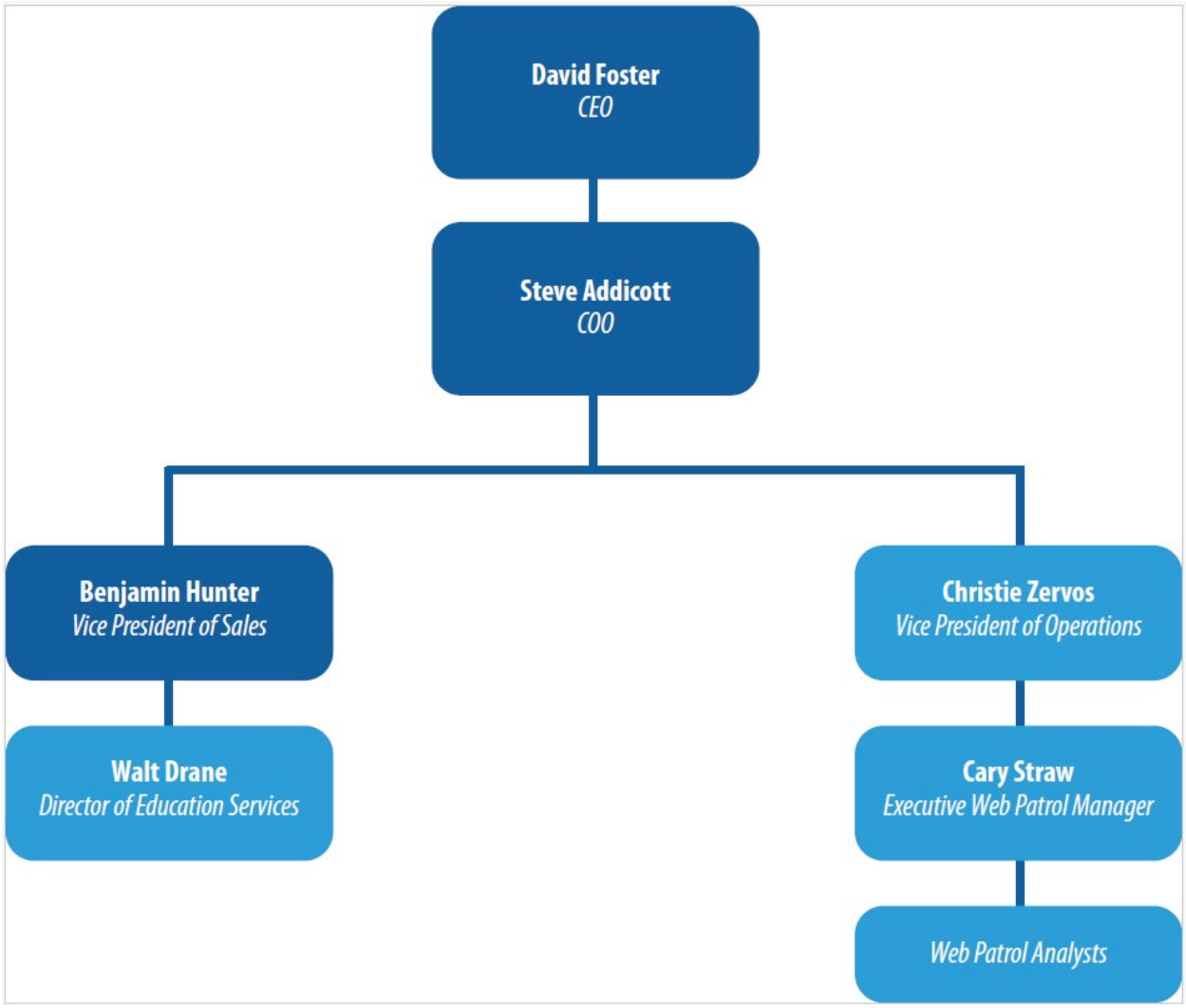


Exhibit 3.14-4: HumRRO Project Organization Chart

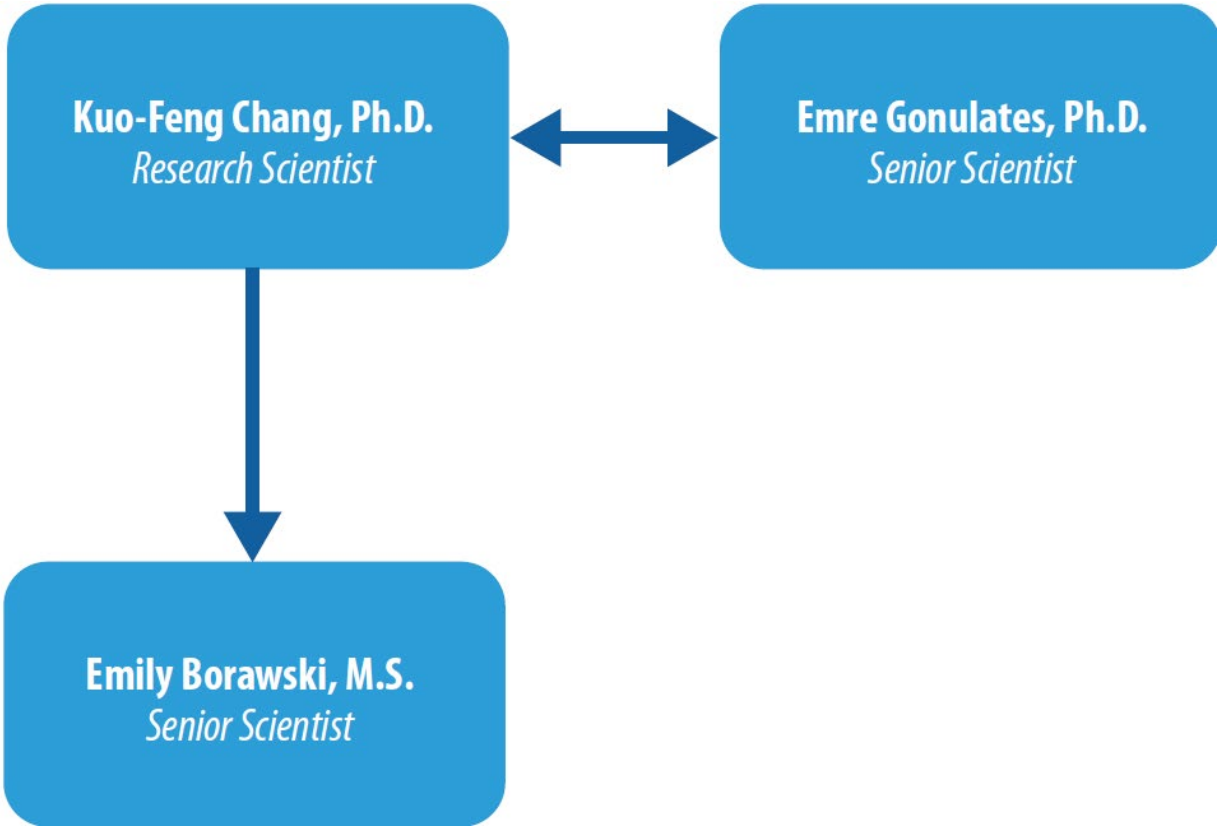


Exhibit 3.14-5: Lambert Project Organization Chart

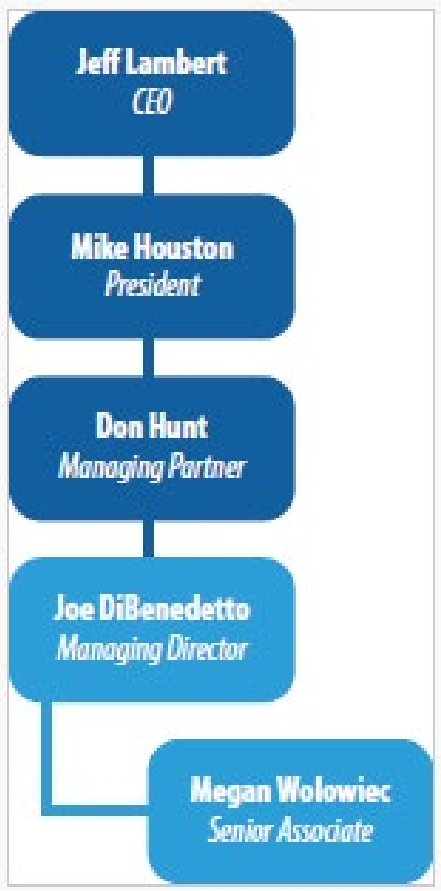


Exhibit 3.14-6: Metimur Project Organization Chart

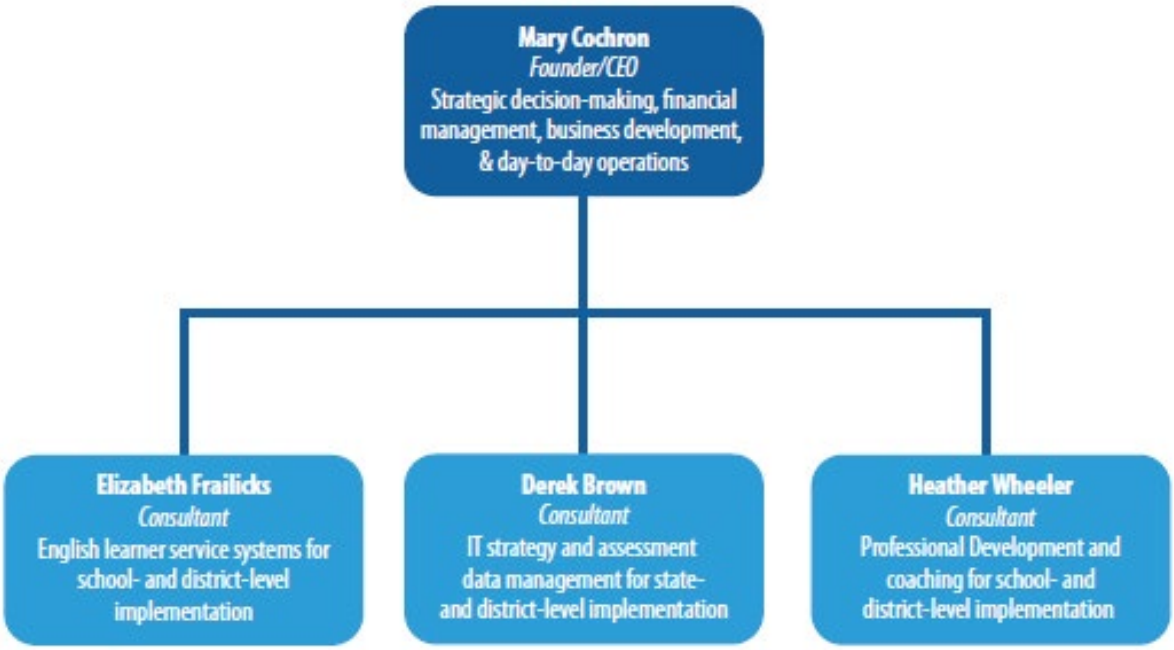
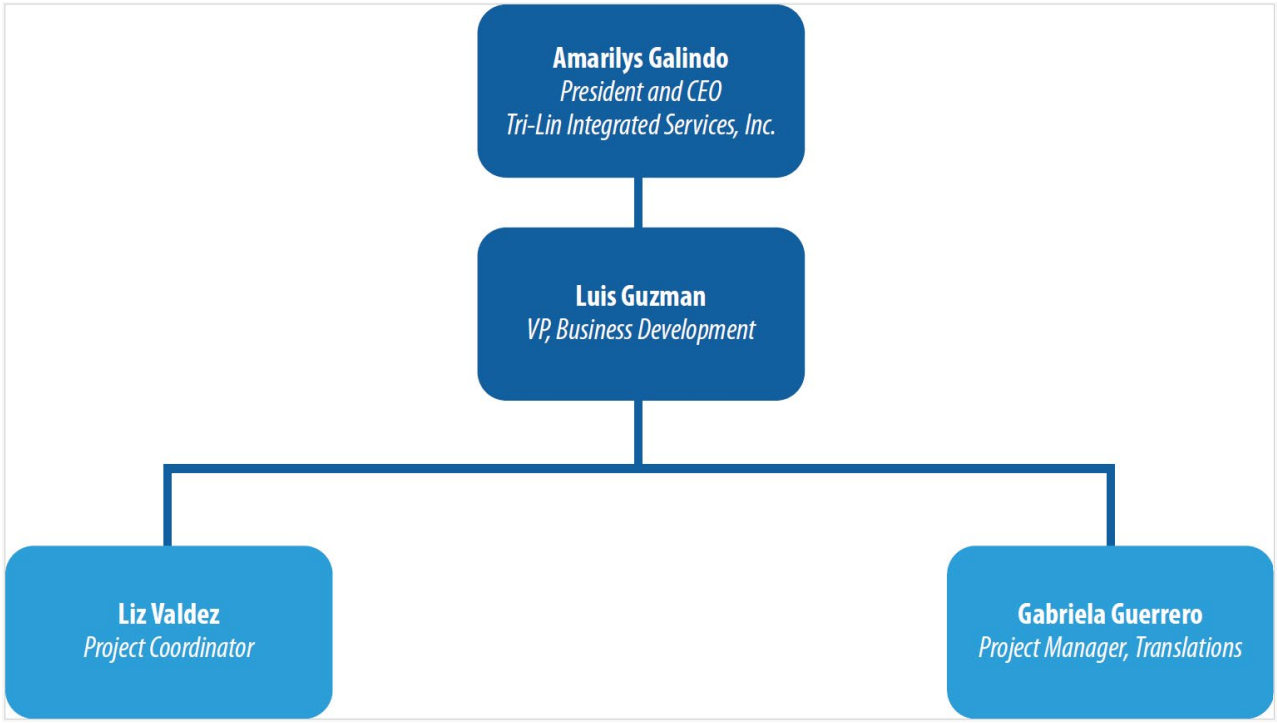


Exhibit 3.14-7: Tri-Lin Project Organization Chart



3.15. Résumés

CAI recognizes the key role that statewide assessments play in states' educational systems and the high stakes involved for districts, schools, educators, and students. CAI's management approach is designed to support such high-impact, high-visibility programs.

CAI operates under the direction of our president, Steve Kromer, and our vice president of Assessment Programs and Client Service, Heather Hayes, directs all of CAI's online testing projects. Mr. Kromer and Ms. Hayes have the authority to make corporate decisions related to this project and, along with additional CAI senior managers within their functional areas, are actively involved in project operations and attend key planning meetings, progress meetings, and even technical meetings.

Policy decisions can and should be informed by technical guidance where appropriate, and the final setting of policies will always remain in the purview of the State. If technical or technological issues could potentially impact policy, CAI will inform NJDOE so it can make the final decision. It is CAI's role and responsibility to provide NJDOE with our technical expertise and support while working toward established contract deliverables.

Project Team Structure

Each of CAI's projects conforms to our organizational structure. CAI is organized by function, and each functional area is led by a member of CAI's senior management team. Within each area and for each project, a team leader is designated and teams are formed. The team leader takes first-line responsibility for the project team's products and services, while the corporate director is responsible for the relevant functional area. Given the specialized nature of our work and CAI's unique approach, staff are expected to master their capabilities through an apprenticeship system predicated on the gradual increase of individual responsibility. Group training sessions and collaborative interaction that encourage and promote mentoring and supervision are at the core of our methodology.

CAI's approach to managing personnel and staff ensures that there is a team to support each contract requirement and that critical information never resides with a single person. CAI's corporate culture fosters a project team that is knowledgeable and empowered to make decisions, modify scope through a documented change-control process, engage additional resources, and collaborate across the organization to suggest and employ creative solutions to project challenges.

We achieve these goals by organizing work into structured teams, each with well-defined specifications and work processes. We refer readers to Section 3.14 for project organizational charts.

CAI Project Staffing

In this section, we identify proposed key CAI staff for the New Jersey Next Generation Assessment Program. For key personnel, we include brief staff biographies describing relevant experience on similar contracts and expertise that will contribute to the success of the New Jersey assessment program. In Appendix A of our proposal, we provide résumés accompanied by summary tables with client references for CAI's key personnel and the start/end dates of their work on the relevant contracts.

Key Staff Names	Roles
Tom Glorfield	Project Manager
Julie Benson	Lead Content Specialist
Myung Hee Im	Lead Psychometrician
Paul Ciprich	Software Project Manager, Student Registration System
David Sanchez	Software Project Manager, Test Delivery System
Brett Harris	Software Project Manager, Centralized Reporting System
Piyush Sharma	Software Project Manager, Analysis Systems and Lead Data Specialist
Sirisha Nagabhairava	Software Project Manager, Item Tracking System
Eugenia Kim	Score Reporting Lead

Project Management

Project Manager
Tom Glorfield, B.F.A., PMP

Project Management

State assessment contracts are large and complex, involving many different skills, client management staff, school staff, vendors, systems, data sets, schedules, and other resources and stakeholders to operate efficiently.

We propose **Tom Glorfield, B.F.A., PMP,** as **Project Manager**. Mr. Glorfield brings more than 19 years of project management experience in educational assessment, including managing multi-million-dollar accounts. He currently oversees the New Hampshire Statewide Assessment System as CAI's main point of contact for the New Hampshire Education Department. Mr. Glorfield previously managed the Vermont Smarter Balanced Assessment, the Maine Educational Assessment, and the Delaware Comprehensive Assessment System. He also managed the Montana Comprehensive Assessment System and the North Dakota State Assessment Program as CAI's main point of contact with the prime contractor in those states, as well as managing the subcontract relationship between CAI and the prime contractor for the Tennessee Comprehensive Assessment Program. Previously, Mr. Glorfield managed the Hawaii State Alternate Assessment, the New Jersey Alternate Proficiency Assessment, the New Jersey Grade Eight Proficiency Assessment, the New Jersey Assessment of Skills and Knowledge Grades 3–4, and the New York State Assessments. In each of these management roles, he coordinated seamlessly with all support and functional teams, maintaining productive and positive relationships with various members of multiple state boards of education. Mr. Glorfield earned his bachelor of fine arts degree (with a minor in English) from Iowa State University.

Test Development

Lead Content Specialist
Julie Benson, Ed.M.

Test Development

Producing more than 10,000 items annually, CAI's Test Development Team has been developing items and aligning existing ones to adopted state content standards since its inception. This team includes more than 140 staff members, 10 with doctoral degrees and 59 with masters degrees.

We propose **Julie Benson, Ed.M.,** as **Lead Content Specialist**. Ms. Benson has more than 20 years of experience in teaching and developing large-scale assessments and serves as overall content lead for four states. Before joining CAI, Ms. Benson was the senior director of content for the Smarter Balanced Assessment Consortium (SBAC), where she managed a multi-million-dollar budget,

supervised staff, and directed content work for the Consortium. Before joining SBAC, she held the position of assessment development coordinator for the Utah State Office of Education. She previously taught grades 1–6 and led educator training and professional development programs district-wide for grades K–12. Ms. Benson holds a B.A. from Utah State University and received her Ed.M. from Southern Utah University.

Psychometrics and Statistics

Psychometrics and Statistics

Lead Psychometrician

Myung Hee Im, Ph.D.

CAI offers psychometric and statistical services that stand alone in terms of quality and innovation. The integration of psychometrics with statistics and sampling sets CAI apart from the competition. Although testing firms often bring expertise in psychometrics, the quality of these services depends on the samples on which the data are based. Typical samples used in state testing programs can undercut the best psychometrics, leading to volatile test results from year to year and inaccurate test-taker classification. CAI combines expertise in sampling and psychometrics to optimize student samples, and our statistics accurately reflect the complexities of the sample designs.

We propose **Myung Hee Im, Ph.D.,** as **Lead Psychometrician**. Dr. Im has eight years of experience working with various assessment programs, including statewide assessments, end-of-course assessments, interim assessments, and formative assessments. Dr. Im is currently leading the Ohio's State Tests program by providing psychometric leadership for statewide assessments and overseeing psychometric and statistical activities, including item calibration; equating; adaptive simulations; conducting research studies related to data forensics, test mode, item fit, autoscoring, and student growth; and using various statistical programming tools to implement quality control procedures for test development and psychometric activities. Dr. Im also served as a program consultant and postdoctoral research associate at Project Achieve in the Educational Psychology Department at Texas A&M University, where she provided statistical consulting to graduate students and faculties on research design and the development of publications using large-scale longitudinal data and applied quantitative research methods such as hierarchical linear models (HLM), Structural Equation Modeling (SEM), propensity score matching, and multiple imputation to substantive problems in psychology and education. During her time at Project Achieve, she established productive collaborations with faculties and doctoral students and produced 15 publications in peer-reviewed journals. Dr. Im received a Ph.D. in educational research, measurement, and statistics in educational psychology from Texas A&M University.

Online Testing

Online Testing

Software Project Managers

Paul Ciprich, M.S. (TIDE)

David Sanchez, B.S., PMP (TDS)

Brett Harris, B.A. (CRS)

Piyush Sharma, M.S. (Analysis Systems and Lead Data Specialist)

Sirisha Nagabhairava, M.S. (ITS)

CAI's Computer and Statistical Sciences Center (CSSC) is responsible for overseeing our software infrastructure and software products, including technology and support for CAI's student registration, online testing, reporting, learning management, and related systems.

CSSC's mission is to develop innovative products and systems that will keep CAI at the forefront of the assessment field. To accomplish this, CSSC combines a structured software development unit (developers and project directors) with a team of statisticians, psychometricians, and mathematicians. It is organized into groups supporting families of software systems, including the following:

- Pre-production systems are responsible for supporting assessments before they are delivered, including test development, publication, and user management.
- Test delivery and reporting systems are responsible for our high-demand, public-facing systems that deliver tests and reports, as well as other curricular and educational supports.
- Data analysis systems are responsible for test data processing, analysis, and data deliveries.

Each family of systems has a technical lead, and together, these individuals form a committee responsible for overseeing peer review of key documents such as requirements, design documents, test plans, and program code peer review. CSSC's interdisciplinary team includes more than 160 staff members, 11 of whom have doctoral degrees in areas ranging from computer science to statistics and engineering. Eighty-nine of the software project directors and other engineers have M.B.A.s and other advanced degrees.

CSSC also includes shared services covering network engineering, software quality assurance (QA), security, configuration management, and graphic design and animation that support all our systems. Close interdisciplinary collaboration enables CSSC to develop remarkable technical products that effectively turn raw data into useful information and manage complex human processes to support test development, psychometrics, and score reporting efficiently.

Paul Ciprich, M.S., Software Project Manager, Student Registration System (Test Information Distribution Engine, TIDE). Mr. Ciprich has more than five years of experience as a technical program manager for six state-level clients. He has a strong background in software development and leads the development and configuration of TIDE for multiple CAI clients. He is an Agile-certified project manager with more than 16 years' experience designing and developing software solutions. He ensures that projects are completed on time and within budget and that all deliverables are of the highest quality; conducts presentations for clients and resolves any issues related to TIDE; establishes milestones, identifies potential issues, and monitors adherence to project scope, requirements, and design documents; and maintains client relations and communications, including status reporting. Formerly, Mr. Ciprich led the development of multi-million-dollar web-based financial management systems for the U.S. Department of Treasury's Community Development Financial Institutions (CDFI) Fund. Relevant projects under CIIS included the State Small Business Credit Initiative, the Capital Magnet Fund, and the New Markets Tax Credit Program. Mr. Ciprich holds an M.S. in computer science from the University of Maryland, College Park.

David Sanchez, B.S., Software Project Manager, Test Delivery System (TDS). Mr. Sanchez has been involved in software management, design, and development for more than 14 years. He has achieved leadership positions such as program manager, software architect, and IT director, working with multicultural and cross-functional teams under contemporary world-class and company-standard methodologies, such as Kanban/Kaizen, ISO, PMI, and ITIL/Prince2, and specializing in multinational projects and clients with high strategic importance and budgets. Mr. Sanchez has successfully delivered projects for household and recognized brands, such as Walmart, Discovery Channel, and Hilton Suites. He earned his B.S. in computer science from Nueva Esparta University in Venezuela.

Brett Harris, B.A., Software Project Manager, Centralized Reporting System (CRS). Mr. Harris is a senior technical project manager for CAI's CRS. His responsibilities include tracking schedules, managing testing and deployment cycles, overseeing integration with related systems, and managing documentation for client-facing production system deployments. Mr. Harris has more than 10 years of assessment experience at CAI managing multiple clients for the reporting system. He has experience working with both online and paper-pencil test reporting systems. He received his B.A. in political science from American University.

Piyush Sharma, M.S., Software Project Manager, Analysis Systems and Lead Data Specialist. Mr. Sharma is responsible for test data processing, analysis systems, and data deliveries. He manages the delivery of state data files, data extracts, schedules, and test scores. Mr. Sharma also manages analysis product releases to develop new features for all CAI clients. Prior to joining CAI, Mr. Sharma was the team lead for development and support of liquidity management and payment settlement systems for a banking client. He brings experience in managing high-visibility, time-critical projects with in-depth knowledge of analyzing large-scale data and distributed computing. Mr. Sharma received his M.S. in information systems management from Carnegie Mellon University.

Sirisha Nagabhairava, M.S., Software Project Manager, Item Tracking System (ITS). Ms. Nagabhairava has more than 15 years of experience in information technology strategy, management consulting, and new product development, with a track record of building high-performance teams and delivering successful initiatives on a wide range of technology platforms (e.g., mobile, cloud, distributed, client server, social) and industry verticals (e.g., airline, telecommunications, domain maintenance, travel). She has worked on numerous strategic projects involving extensive customization, as well as smaller, out-of-the-box implementations. Ms. Nagabhairava earned her M.S. from Fairleigh Dickinson University and her B.S. from the Gokaraju Rangaraju Institute of Engineering and Technology in India.

Communications and Reporting

Score Reporting Lead
Eugenia Kim, M.S.

Communications and Reporting

CAI goes beyond simply reporting scores and other numbers to providing deep analyses of the data, reported in a clear, appealing, and actionable way. CAI is perhaps alone in the industry in delivering this information, often in full color, with variable text and graphics. The reports begin with the same basic data that have been traditionally reported, but they extend much further. The basic data are reported using tested data displays that facilitate correct interpretation and mitigate misinterpretation. The implications, as well as limitations, of additional analyses are presented both graphically and in text that is customized for each individual report, including the increasingly popular value-added analyses. Our professional development services focus on test administration and data use, helping our clients facilitate assessment literacy in their states.

We propose **Eugenia Kim, M.S.,** as the **Score Reporting Lead**. Ms. Kim brings more than 15 years of experience with CAI leading reporting for many large state assessment contracts, including delivering online and paper reports for Florida, Indiana, Ohio, and Texas. Ms. Kim is equipped with a deep understanding of the unique requirements involved in designing and delivering reports to educators, schools, and families for a comprehensive assessment program. Ms. Kim holds a master's degree in applied mathematics and statistics from Georgetown University and a master's degree in applied economics from Johns Hopkins University. Ms. Kim's prior reporting work on CAI's contracts with education agencies in Florida, Indiana, Ohio, and Texas demonstrate her ability to fulfill the requirements of this contract and lead all New Jersey reporting. Ms. Kim has performed the work described here:

1. *Project Management:* Ms. Kim has created workplans and schedules for the development of all reports, managing a team of graphic designers, application developers, statistical programmers, content specialists, and print specialists throughout the development and production cycles.
2. *Report Design, Configuration, and Delivery Management:* Ms. Kim has managed the design of paper reports as well as the specifications process to configure the CRS for each of these state reporting deliverables.

3. *Quality Control:* Ms. Kim has developed and implemented quality control systems to ensure the accuracy and timeliness of reporting deliverables (e.g., paper reports, CRS, Family Portal), supervising the team through QA activities.
4. *Technical Oversight:* Ms. Kim has directed programmers in the development of new features and the configuration of CAI's CRS for online and paper-based testing.
5. *Process Implementation:* Ms. Kim has established and implemented processes to effectively design, produce, and deliver print score reports under tight deadlines.

3.16. Experience with Contracts of Similar Size and Scope

Cambium Assessment, Inc., Experience

Exhibit 3.16-1 includes a comprehensive list of contracts of similar size and scope that CAI has successfully completed.

Exhibit 3.16-1: Comprehensive List of CAI Contracts

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Arkansas Statewide Assessment Program *Prime Contractor*	• Develops, administers, scores, and reports on statewide summative assessments in grades 3–8 and high school in English language arts (ELA), mathematics, and science • Develops, administers, scores, and reports on state-offered interim assessments that are similar in item types and design to the state's summative assessments • Develops curriculum materials and professional learning resources to support assessment literacy	4600050249	7/2022 – 6/2026 (plus three 1-year renewal options)	Michelle Johnson Director of Assessment Michelle.Johnson@ade.arkansas.gov 501-404-6234 Hope Worsham Asst. Commissioner, Public School Accountability Hope.Worsham@ade.arkansas.gov 501-682-1298
Arkansas Literacy Screener Program *Prime Contractor*	• Design, development, implementation, and administration of a K–3 literacy screener system	4600053978	2/2024 – 2/2028 (plus three 1-year renewal options)	Michelle Johnson Director of Assessment Michelle.Johnson@ade.arkansas.gov 501-404-6234 Hope Worsham Asst. Commissioner, Public School Accountability Hope.Worsham@ade.arkansas.gov 501-682-1298

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
California Assessment of Student Performance and Progress (CAASPP) *Subcontractor*	• Computer-based state adaptive tests (summative) in ELA and mathematics (grades 3–8 and 11 beginning in 2015) • Fixed-form interim assessments in ELA and mathematics in grades 3–8 and 11 (students in all grades are eligible to participate) • Segment adaptive discrete item blocks and performance tasks (grades 5, 8, and 10–12 beginning in 2017) • Fixed-form Spanish-language assessments for achievement of biliterate designation (optional) • Fixed-form ELPA-style screeners administered in both GenEd and alternate assessment formats • Fixed-form ELPA style full-length assessments administered in both GenEd and alternate assessment formats • Local educator scoring module support for interim assessment and ELPAC screener constructed-response items	CAI Subcontractor for Services Under the ETS Prime CAASPP Contract CN150012	7/2015 – 12/2022	Jackie Strasz Senior Director of Operations jstrasz@ets.org 732-710-2972 Linda Hooper State Contract Monitor LHooper@cde.ca.gov 916-319-0373
		CAI Subcontractor for Services Under the ETS Prime CAASPP Contract CN220002	7/2022 – 12/2027	

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Connecticut Assessment of the Connecticut Master Test (CMT), the Connecticut Academic Performance Test (CAPT) (2015–2018), and the NGSS Assessments (2019–Present) *Prime Contractor*	• Development, administration, scoring, analysis, and reporting of the results of the CMT and CAPT Science assessment (2015–2018) • Administered in grades 5, 8, and 10 • Transitioned the state to the new Next Generation Science Standards (NGSS) assessment in 2019 • Development, administration, scoring, analysis, and reporting of the results of the new NGSS assessments • Administered in grades 5, 8, and 11 • Development and administered new NGSS interim assessments	15SDE0170AA	10/2015 – 9/2025	Abe Krisst Bureau Chief Abe.Krisst@ct.gov 860-713-6894 Ajit Gopalakrishnan Chief Performance Officer Ajit.Gopalakrishnan@ct.gov 860-713-6888
Connecticut Smarter Balanced Assessment *Prime Contractor*	• Provides system, scoring methodology and related services for the Smarter Balanced Assessment Consortium • Smarter Balanced summative and interim assessments (ELA and mathematics) in grades 3–8 • Provides automated scoring using AutoScore for the Smarter Balanced interim assessments	15SDE0018AA	12/2014 – 9/2025	Abe Krisst Bureau Chief Abe.Krisst@ct.gov 860-713-6894 Ajit Gopalakrishnan Chief Performance Officer Ajit.Gopalakrishnan@ct.gov 860-713-6888

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Connecticut Alternate Assessment (CTAA and CTAS) *Prime Contractor*	• Grades 3–8 and 11 ELA and mathematics beginning in 2016 • Science Skills Checklist (2016 and 2017). Used to assist in planning instruction, monitoring student growth and progress, and documenting achievement on grade-level science content • Administered New Science Alt Assessment. Aligned with NGSS beginning in 2018; field tested in spring 2018; operational test administered 2019–present	16SDE0039AA	2/2016 – 9/2025	Abe Krisst Bureau Chief Abe.Krisst@ct.gov 860-713-6894 Ajit Gopalakrishnan Chief Performance Officer Ajit.Gopalakrishnan@ct.gov 860-713-6888
Delaware DeSSA Smarter Balanced Assessment *Prime Contractor*	• Provides system, scoring methodology and related services for the Smarter Balanced Assessment Consortium • Smarter Balanced summative and interim assessments (ELA and mathematics) in grades 3–8 • Provides automated scoring using AutoScore for the Smarter Balanced interim and summative assessments • Provides parents online access to student score reports through a Family Portal	Contract No. DOE RFP#2019-09	7/2019 – 6/2024	Theresa Bennett Director, Office of Assessment Theresa.Bennett@doe.k12.de.us 302-735-4040 Kim D. Klein Associate Secretary, Operations Support 302-735-4040
		DOE2024-02	7/2024 – 6/2029 (plus three 1-year renewal options)	

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Florida Statewide Assessments (FSA) *Prime Contractor*	• Computer-based and paper-based statewide summative assessments in science and social studies • Biology, U.S. history, and civics EOC assessments	20-652	10/2019 – 8/2025	Vince Verges Assistant Deputy Commissioner Vince.Verges@fldoe.org 850-245-7862 Teresa Millan Director, Office of Assessment Teresa.Millan@fldoe.org 850-245-0801
Florida Coordinated Screening and Progress Monitoring System for VPK-Grade 10 *Prime Contractor*	• Administration of the statewide, standardized Coordinated Screening and Progress Monitoring System for the Voluntary Prekindergarten (VPK) Education Program and public schools serving kindergarten through grade 10 • Grades 4–10 ELA/writing • End-of-course assessments in Algebra 1 and geometry • Algebra 1 and ELA retake assessments • Paper-based accommodations, including braille, are also provided for all assessments.	22-679	6/2022 – 6/2025 (plus three 1-year renewal options)	Vince Verges Assistant Deputy Commissioner Vince.Verges@fldoe.org 850-245-7862 Teresa Millan Director, Office of Assessment Teresa.Millan@fldoe.org 850-245-0801

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Florida Standards Alternate Assessments (FSAA) *Subcontractor*	• Item banking and form builder platform (ITS) • ITS training and support • Paper form production • Draft, develop, and deliver ancillary materials • Student registration and user management platform • Test delivery platform • Delivers student data files • Provides parents online access to student score reports through a Family Portal	Master Services Agreement dated 9/1/2020	9/2020 – 8/2025 (plus two 1-year options)	Angela Nathaniel Florida Alternate Assessment, Bureau of K–12 Student Assessment Angela.Nathaniel@fldoe.org 850-245-0972 Vince Verges Assistant Deputy Commissioner Vince.Verges@fldoe.org 850-245-7862
Hawaii State General Assessments Program *Prime Contractor*	• Smarter Balanced Assessments in grades 3–8 and 11 for ELA and mathematics • State assessment in NGSS science for grades 5 and 8 • End-of-course assessments in biology and Algebra 1 and 2 • Hawaii authoring program	CO-20529	9/2019 – 9/2024	Brian D. Reiter Contract Administrator Brian.Reiter@k12.hi.us 808-307-3636 Nicole Agena Contract Administrator Nicole.Agena@k12.hi.us 808-675-0130
		CO-20529	10/2024 – 9/2027 (plus three 1-year renewal options)	
Hawaii State Alternate Assessment (HSA-Alt)	• Delivered alternate assessments since 2012 • Researched administering alternate assessments using an iPad in 2013	CO-10930	7/2018 – 6/2024	Brian D. Reiter Contract Administrator Brian.Reiter@k12.hi.us 808-307-3636

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Prime Contractor	• Administered task-based, grade-band alternate assessment on iPad beginning in 2014 (ELA and mathematics) and task-based, grade-level alternate assessment (science) • Delivered item-based, grade-level computer-adaptive test in science in 2017 • Delivered item-based, grade-level computer-adaptive test (ELA, mathematics, and science) since 2019	CO-20513	8/2024 – 6/2027 (plus three 1-year renewal options)	Nicole Agena Contract Administrator Nicole.Agena@k12.hi.us 808-675-0130
Hawaii State Artificial Intelligence (AI) Stakeholder Development for Classroom-Based Assessments *Prime Contractor*	• Use generative AI to obtain on-the-fly item calibrations and test scores for teacher-authored tests by ○ simulating student test takers who represent the breadth of behaviors, characteristics, and abilities of Hawaii's public schools ○ calibrating items on scored simulated responses to produce test scores that are aligned with the Smarter Balanced (or other) scale ○ placing students into achievement-level categories ○ providing teachers and students with AI-driven tools for immediate feedback	CO-20502	6/2024 – 6/2025 (plus two 1-year options)	Brian D. Reiter, Contract Administrator Brian.Reiter@k12.hi.us 808-307-3636

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Idaho Standards Achievement Test (ISAT) *Prime Contractor*	• Smarter Balanced interim assessments in grades 3–11 and summative assessments in grades 3–8 and 11 • Science assessments in grades 5, 8, and 11 • Additional Smarter Balanced ELA and mathematics interim assessments (shorter ICAs) in grades 3–11	20-2001	6/2019 – 2/2026	Ayaka Nukui Director, Assessment and Accountability anukui@sde.idaho.gov 208-332-6926 Karren Streagle, Ph.D. Alternate Assessment, Low Incidence Disabilities, and Medicaid Coordinator kstreagle@sde.idaho.gov 208-332-6824
Idaho Alternate Assessment (IDAA) *Prime Contractor*	• Delivered NCSC assessments through CAI's online test delivery platform (grades 3–10 and 11 ELA and mathematics) • Administered a fully computer-adaptive operational field test (ELA and mathematics) through an item-sharing agreement with Hawaii, Montana, South Carolina, South Dakota, and Wyoming • Science was added as an independent field test in 2021 and was fully computer adaptive in 2023	20-2001	6/2019 – 2/2026	Ayaka Nukui Director, Assessment and Accountability anukui@sde.idaho.gov 208-332-6926 Karren Streagle, Ph.D. Alternate Assessment, Low Incidence Disabilities, and Medicaid Coordinator kstreagle@sde.idaho.gov 208-332-6824

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Indiana ILEARN, IREAD-3 *Prime Contractor*	• Indiana's Learning Evaluation Assessment Readiness Network (ILEARN): - Computer-adaptive testing (CAT) for summative assessments - Grades 3–8: mathematics and ELA (adaptive and accommodated fixed forms) - Grades 4 and 6: science (adaptive and accommodated fixed forms) - Grade 5: social studies (fixed forms) - End-of-course assessments (ECAs): biology (adaptive and accommodated fixed forms) and U.S. government (fixed forms) • Indiana Reading Evaluation and Determination (IREAD-3): - Online adaptive and fixed-form testing and paper accommodated fixed forms for reading at grade 3 (and grades 4 and 5 as a retest) - Annual assessment offered near the end of grade 3 and providing proficiency data on students' mastery of foundational reading skills. It is also offered as a retest in the summer for students who do not pass in the spring	48438 (ILEARN/ IREAD) 65981 (ILEARN/ IREAD-3)	10/2017 – 2/2023 4/2022 – 12/2025 (plus two 1-year renewal options)	Lynn Schemel Chief Academic Officer/Director of Assessment LSchemel@doe.in.gov 317-232-9050 Sholonda Trice Director of Academic Planning and Operations STrice@doe.in.gov 317-232-0547

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Indiana ISTEP *Prime Contractor*	• Online and paper accommodated fixed-form testing for ELA and mathematics at grade 11 (and grades 12 and 13 as retest opportunities) • ISTEP+ was offered twice per year and served as a Graduation Qualifying Examination (GQE) for students in cohorts 2019–2022	42228	4/2019 – 12/2022	Lynn Schemel Chief Academic Officer/Director of Assessment LSchemel@doe.in.gov 317-232-9050 Sholonda Trice Director of Academic Planning and Operations STrice@doe.in.gov 317-232-0547
Montana Science Assessment (MSA) *Prime Contractor*	• Development, administration, scoring, analysis, and reporting of results • Interim assessments for science in grades 5, 8, and 11 • Item writing workshop designed to have Montana educators develop science phenomena and place contexts to enrich the MSA item development process	10981	8/2019 – 6/2024	Cedar Rose Assessment Director Cedar.Rose@mt.gov 406-444-0733 Heather Davidson Contract and Purchasing Manager Heather.Davidson@mt.gov 406-444-4402
		11649	7/2024 – 6/2025 (plus three 1-year renewal options)	
Montana Smarter Balanced Assessment (SBAC) *Prime Contractor*	• Provides test delivery, scoring, and reporting services to support Montana's implementation of the Smarter Balanced summative assessment program for grades 3–8 • Supports administration, scoring, and reporting for Smarter Balanced interim assessments for grades 3–8 and 11, including AutoScore engine	10980	8/2019 – 6/2024	Cedar Rose Assessment Director Cedar.Rose@mt.gov 406-444-0733 Heather Davidson Contract and Purchasing Manager Heather.Davidson@mt.gov 406-444-4402

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Alternate Montana Science Assessment (AMSA) *Prime Contractor*	• Development, administration, scoring, analysis, and reporting of the results of the AMSA • AMSA has been delivered as on online test since 2019 • Online AMSA is currently computer adaptive for all grades 5, 8, and 11	10982	8/2019 – 6/2024	Cedar Rose Assessment Director Cedar.Rose@mt.gov 406-444-0733 Heather Davidson Contract and Purchasing Manager Heather.Davidson@mt.gov 406-444-4402
		11640	7/2024 – 6/2025 (plus three 1-year renewal options)	
New Hampshire Statewide Assessment System (NH SAS) *Prime Contractor*	• Statewide assessment in ELA and mathematics for grades 3–8 • Statewide assessment in science for grades 5, 8, and 11	2017-073	8/2017 – 6/2024	Dr. Nate Greene Bureau Administrator Nathaniel.T.Greene@doe.nh.gov 603-573-6556 Shireen Meskoob Program Specialist Shireen.Meskoob@doe.nh.gov 603-271-2831
		2024-102	4/2024 – 6/2029	
New Hampshire U.S. Citizenship and Immigration (USCIS) Assessment *Prime Contractor*	• Delivers an electronic version of the U.S. Citizenship and Immigration (USCIS) assessment	2024-062	12/2023 – 6/2025	Dr. Nate Greene Bureau Administrator Nathaniel.T.Greene@doe.nh.gov 603-573-6556 Shireen Meskoob Program Specialist Shireen.Meskoob@doe.nh.gov 603-271-2831

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
North Dakota State Assessment (NDSA) *Prime Contractor*	• ELA/literacy and mathematics summative assessments for grades 3–8 and 10 • North Dakota completed a revision to the content standards before the contract; the assessment supports the accountability system and provides information that contributes to instructional improvement	3358	11/2017 – 11/2024	Stanley E. Schauer Assessment Director SESchauer@nd.gov 701-328-2224 Kara Welk Assistant Director of Assessment KWelk@nd.gov 701-328-1838
	• Science summative assessment for grades 4, 8, and 10	3484	12/2019 – 11/2024	
Ohio State Tests (OST) *Prime Contractor*	• Computer-based and paper-based statewide summative assessments in the following: - ELA for grades 3–8, ELA I and II - Mathematics for grades 3–8, Algebra I, geometry, integrated mathematics I and II - Science for grades 5 and 8, biology, and physical science - Social studies: American history and American government	CSP903714	11/2013 – 6/2022	Shawn Carter State Procurement Analyst Shawn.Carter@das.ohio.gov 614-466-0539 Lisa Chandler Director, Office of Assessment Lisa.Chandler@education.ohio.gov 614-387-2218
		CSP009655	7/2022 – 9/2026 (plus four 1-year renewal options)	
Ohio's English Language Proficiency Assessment (ELPA) *Prime Contractor*	• Production, Administration, Scoring, and Reporting	CSP903022	8/2021 – 6/2025 (plus four 1-year renewal options)	Shawn Carter State Procurement Analyst Shawn.Carter@das.ohio.gov 614-466-0539 Lisa Chandler Director, Office of Assessment Lisa.Chandler@education.ohio.gov 614-387-2218

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Ohio's Alternate Assessment for Students with Significant Cognitive Disabilities (AASCD) *Prime Contractor*	• Delivered a paper-based, grade-band assessment with stage-adaptive, task-based design from 2003 through spring 2019 • Transitioned to a grade-level, computer-adaptive assessment (ELA, mathematics, science, and high school social studies) in spring 2020	CSP906614	12/2013 – 6/2022	Shawn Carter State Procurement Analyst Shawn.Carter@das.ohio.gov 614-466-0539 Lisa Chandler Director, Office of Assessment Lisa.Chandler@education.ohio.gov 614-387-2218
		CSP009542	7/2022 – 9/2026 (plus four 1-year renewal options)	
Oregon *Prime Contractor*	• Online testing services to conduct the required assessment tests for grades 3–8 and 11 in ELA and mathematics; grades 5, 8, and 11 in science; and grades K–12 in English Language Proficiency • Oregon's English Language Proficiency Assessment (ELPA) screener, summative, and alternate assessments • Summative and interim assessments for ELA, mathematics, and NGSS science for grades 3–8 and high school • Student Educational Equity Development (SEED) Survey at grades 3–12 to gather information about the educational experiences of students in Oregon	9573	4/2014 – 6/2026	Tim Beaver Senior Contracting Officer Tim.Beaver@ode.oregon.gov 917-208-0222 Holly Carter Operations & Policy Analyst Holly.Carter@state.or.us 503-947-5739

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Rhode Island Next Generation Science Assessment (MSSA) *Prime Contractor*	• Statewide on-demand summative assessments administered annually to grades 5, 8, and 11 in English, Spanish, and braille • Aligned with the NGSS • Meets the assessment requirements set forth in the Every Student Succeeds Act (ESSA) and corresponding United States Department of Education (USDE) regulations • Single item interim assessments for the NGSS in 21 districts (up to 30,000 tests administered) • Scoring, online reporting, and paper reports shipped to districts	N/A	7/2017 – 6/2027 (plus two 1-year renewal options)	Heather Heineke, Assessment Specialist Heather.Heineke@ride.ri.gov 401-222-8493 Kristen Cole Senior Finance Officer Kristen.Cole@ride.ri.gov 401-222-4681
South Carolina Alternate Assessment (SC-Alt) *Prime Contractor*	• Developed a paper-based assessment in 2005 • Transitioned to a fully online, computer-adaptive test from 2017 to 2020	4400014646	11/2016 – 11/2021	Roberta Ford Program Manager REFord@ed.sc.gov 803-734-0564 Nakendra Perry Procurement Manager NPerry@mmo.sc.gov 803-896-0022
		5400021282	9/2021 – 8/2025 (plus three 1-year renewal options)	

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
South Dakota *Prime Contractor*	• Summative computer-adaptive assessments in ELA and mathematics for grades 3–8 and 11 • Summative computer-adaptive assessment in science for grades 5, 8, and 11 • Interim assessments for ELA and mathematics using the Smarter Balanced item bank and science interim assessments aligned to the ICCR item bank	2019C-447	4/2019 – 7/2025 (plus three 1-year renewal options)	Matthew Gill Administrator, Office of Assessment and Accountability Matthew.Gill@state.sd.us 605-773-3246 Christina Booth Program Specialist, Office of Assessment and Accountability Christina.Booth@state.sd.us 605-773-6156
South Dakota Science Alternate (SD-Alt) *Prime Contractor*	• Supported South Dakota in preparation for the online administration of the science assessments across three grade bands starting in the school year 2018–2019 • Assisted with test design, blueprint design, item development, and committee reviews • Facilitated South Dakota and six other states in an item-sharing agreement to support an alternate online computer-adaptive test for spring 2020	2019C-447	4/2019 – 4/2025 (plus three 1-year renewal options)	Matthew Gill Administrator, Office of Assessment and Accountability Matthew.Gill@state.sd.us 605-773-3246 Christina Booth Program Specialist, Office of Assessment and Accountability Christina.Booth@state.sd.us 605-773-6156

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Tennessee English Language Proficiency Assessment (ELP) and English Language Proficiency Assessment (Alt-ELP) *Prime Contractor*	• Comprehensive English language proficiency assessment package that provides screening of potential English language learners and an annual summative assessment for identified English language learners	81068	1/2024 – 12/2028	Nancy E. Williams Special Populations Coordinator Nancy.E.Williams@tn.gov 615-795-7981 Brian DiCarlo Fiscal Director Brian.DiCarlo@tn.gov 615-290-6715

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Texas Student Assessment Program *Prime Contractor*	• Administration, online platform, scoring, and reporting for the Texas Student Assessment Program • STAAR for grades 3–8 (including Spanish versions in grades 3–5) • STAAR for end-of-course (EOC) • STAAR Alternate 2 in grades 3–8 (RLA, mathematics, science, and social studies) • STAAR Alternate 2 EOC (Algebra 1, biology, U.S. history, and English I and II) • TELPAS K–12 (Texas English Language Proficiency Assessment System) • TELPAS Alternate Assessment grades 2–12 • Early grades (prekindergarten through grade 2) assessments and/or performance measures • Student instructional instruments such as formative item banks and testlets, interim assessments, and other educator resources • Educator instructional instruments such as educator training and professional development	4152	11/2020 – 8/2025	Iris Tian Associate Commissioner Iris.Tian@tea.texas.gov 512-463-9536 Neal Fowler Contract Specialist Neal.Fowler@tea.texas.gov 512-463-0792

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Texas Assessment Item, Test Form, and Instructional Instruments Development *Subcontractor*	• Item development and associated tasks for summative/interim ELA and mathematics • Passage, stimuli, and item development including art for formative assessment • Performs scoring validation review • Prepares item development plans and item bank analyses • Facilitates customer and educator item reviews	Master Services Agreement dated 10/14/2020	9/2020 – 8/2025	Karen Monroe Porter Program Director School Assessment and Qualifications karen.monroe-porter@pearson.com 512-269-6178 Elizabeth Hana Vice President, School Assessment Elizabeth.hana@pearson.com 512-905-0500
U.S. Virgin Islands *Prime Contractor*	• Provides system, scoring methodology and related services for the Smarter Balanced Assessment Consortium • Smarter Balanced Summative and Interim Assessments (ELA and mathematics) in grades 3–8 and 10–11 • Provides automated scoring using AutoScore for the Smarter Balanced interim assessments • Development, administration, scoring, analysis, and reporting of the results of the new NGSS assessments • Administered in grades 5, 8, and 11 • Developed and administered NGSS interim assessments	P054DOET21	1/2021 – 12/2024 (plus one 1-year renewal option)	Dr. Renee Charleswell Deputy Commissioner Curriculum and Instruction Renee.Charleswell@vide.vi 340-774-0100 ext. 8800 Vickie Vasquez-Liburd Contract Administrator Vickie.Vasquez@vide.vi 340-774-0100 ext. 8040

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Utah Readiness. Improvement. Success. Empower-ment. (RISE) Assessment *Prime Contractor*	• Computer-adaptive statewide assessment for grades 3–8 • Benchmarks: ELA grades 3–8; writing grades 3–8; mathematics grades 3–8 and SM1; science grades 4–8 • Interim assessments: ELA grades 3–8; mathematics grades 3–8 and SM1 • Summative assessments: ELA grades 3–8; writing grades 5 and 8; mathematics grades 3–8 and SM1; science grades 4–8	USBE200004 MA	7/2019 – 6/2022	Darin Nielsen Assistant Superintendent of Student Learning Darin.Nielsen@ schools.utah.gov 801-538-781 Adam Herd Director of Purchasing and Contracts Adam.Herd@ schools.utah.gov 801-538-7879
		USBE220001 MA	11/2021 – 11/2031	
Washington *Prime Contractor*	• Provide test administration, scoring, and reporting services for the following state assessments: - Smarter Balanced ELA and Mathematics - Washington Comprehensive Assessment of Science (WCAS) - English Language Proficiency Assessment for the 21st Century (ELPA21), through the 2020–2021 administration year	20200079	7/2019 – 12/2024	Troi Williams Business Manager/ Contract Manager asicontracts@k12.wa.us 360-725-4479 Deb Came Assistant Superintendent Deb.Came@k12.wa.us 360-725-6336
		20250046	6/2024 – 12/2027 (plus three 1-year renewal options)	
West Virginia Grade 3–8 Assessment *Prime Contractor*	• ELA/mathematics online test delivery: computer-based adaptive tests grades 3–8 • Science: computer-adaptive tests grades 5 and 8	AMA EDD 2000000022	9/2017 – 9/2022	Vaughn Rhudy, Ed.D. Director of Assessment VRhudy@k12.wv.us 304-957-9833 ext. 53205 Michelle Childers Coordinator, CPPB Michelle.Childers@k12.wv.us 833-627-2833
		AMA EDD 2200000030	7/2022 – /2027 (plus five 1-year renewal options)	

Client Name	Description of Services	Contract Reference Number	Contract Period and Renewals	Contacts
Wyoming Test of Proficiency and Progress (WY-TOPP) *Prime Contractor*	• Provides test administration, scoring, and reporting services for the following state assessments: ○ ELA, mathematics, science modular assessments ○ ELA, mathematics interim assessments in grades K–10; science interim assessments in grades 4, 8, 10 ○ ELA, mathematics summative assessments in grades 3–10; science summative assessments in grades 4, 8, 10	199386	8/2017 – 10/2026	Laurie Hernandez Project Representative Laurie.Hernandez@wyo.gov 307-777-3469 Becca Velikaneye WDE Assessment Supervisor Rebecca.Velikaneye@wyo.gov 307-777-6804
Wyoming Alternate Assessment (WY-ALT) *Prime Contractor*	• Has supported Wyoming's task-based alternate assessment (ELA, mathematics, and science across three grade bands) since 2015 • Supported an online, grade-level independent field test beginning in 2018 • Developed items in ELA, mathematics, and science for an operational field test in 2019 • Facilitated Wyoming and six other states in an item-sharing agreement to support a grade-level alternate online computer-adaptive test for spring 2020	206395	1/2021 – 10/2026 (plus one 2-year renewal options)	Laurie Hernandez Project Representative Laurie.Hernandez@wyo.gov 307-777-3469 Becca Velikaneye WDE Assessment Supervisor Rebecca.Velikaneye@wyo.gov 307-777-6804

Negative Actions

The information contained herein is confidential and proprietary to CAI. In Exhibit 3.16-2, we present a list of issues that CAI's clients have asked our assessment programs to rectify. In all cases, CAI worked closely with the client to remedy the situation.

Exhibit 3.16-2: List of Issues CAI Has Remedied

Client Name and Contract Number	Date/Issue/Concern	Documentation/Resolution
Florida; FSA Contract No. 20-652	April 2015: There was a login system outage for approximately three hours. The problem was attributed to a CAI staff member who, while working on a non-production system, accidentally disturbed the database functioning of a production system.	The staff member was removed, and our formal production control processes and policies were clarified. We held several meetings with all staff who had access to the production environment to retrain them on the clarified policies. We now repeat these trainings at the beginning of each testing season.
	March 2015: There were Distributed Denial of Service (DDoS) attacks.	Our immediate response was to block the source of the DDoS and restore the load balancers to normal operations for testing to continue without interruption. Additionally, we updated the IDS policy to both alert and auto-mitigate by shunning the offending source IPs.
Indiana; ILEARN Contract No. 48438	February 2019: A system outage occurred. Schools were unable to access the CAI Secure Browser for Chromebooks and iOS for science and mathematics assessments.	System Tier 2 and 3 teams identified the issue and resumed Secure Browser access for Chromebooks and iOS. Checks were put into place to ensure this would not occur again. New decisions were made by IDOE and CAI to reorganize how the information, items, and scripts were presented in the materials for the following year. In addition, manuals and scripts were reevaluated by multiple AIR staff including experienced program team members from non-Indiana programs. CAI provided monetary compensation.
	Spring 2019: Scripts, manuals, and item issues occurred. Some errors and incorrect information were included in the manuals, scripts, and test materials.	

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Client Name and Contract Number	Date/Issue/Concern	Documentation/Resolution
Indiana; IREAD Contract No. 48438	Spring 2019: Text-to-speech (TTS) spring forms were not created with the embedded text to match the previous deployment of the form for both general education and TTS student populations.	Scripts were immediately created for the TTS accommodation for those items. For the subsequent year, specifications were written with more details and TTS was added for the items on each form. CAI provided monetary compensation.
Indiana; ISTEP+ Contract No. 42228	February 2021: The system malfunctioned due to unscheduled adjustments to the Test Delivery System (TDS).	System Tier 2 and 3 teams identified the issue and rolled coding back to quickly resolve the issue. Testing resumed for students within four hours. CAI provided a monetary credit.
Ohio; OST Contract No. CSP903714	Spring 2021: When district users downloaded results data from the spring 2021 Ohio State Tests (OST), the fields for the grade 5 ELA/writing item dimension scores were not populated. Student test scores and performance levels were not affected. A total of 789 districts, including community schools, downloaded data files, which may have contained grade 5 ELA students' records. A district user noticed the blank fields in the file and contacted the CAI Help Desk.	The root cause was identified and corrected within approximately 12 hours. Users were notified that they could generate a new file with these fields populated. A new enhanced reporting system was put in place that automated and eliminated the manual step that introduced this issue. Additional quality control measures were also established to identify such issues before data were released.
Oregon; Contract No. 9573	Spring 2018: Text-to-speech (TTS) was not enabled in the TDS for mathematics tests for students assigned the Spanish/English stacked presentation. American Sign Language (ASL) and foreign language glossaries for items on the mathematics tests were not presented to the students assigned these supports.	TTS, ASL, and foreign language glossaries were enabled for students assigned these supports during the test window as soon as the issue was identified. CAI implemented a more robust quality control process, including enhancing UAT test cases so that all items on each test are checked for TTS, ASL, and foreign language glossaries. CAI provided services in kind.

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Client Name and Contract Number	Date/Issue/Concern	Documentation/Resolution
Texas; Contract No. 4152	Fall 2021: Users were unable to access the student management pages in the Test Information Distribution Engine (TIDE) to search for and view students or add/upload students. TIDE itself loaded without error and other modules, such as user management, were not affected.	The issue was resolved within one hour by deploying updated student settings that were displayed in TIDE. A process improvement was implemented to deploy these student message settings in a defined sequence. Additionally, a compare utility was updated to verify that these configurations always matched before deployment to production environments. CAI provided monetary compensation.
	Spring 2022: For one school day, plus two hours and 35 minutes of the following school day, some students taking the stand-alone field test received outdated versions of stimuli due to earlier versions being loaded from the Item Tracking System (ITS) into the TDS.	CAI updated code to eliminate the need for item bank configurations to be loaded into the production environment to allow advance session scheduling. CAI provided monetary compensation.
Utah; Contract No. USBE220001MA	April 2024: Login issues prevented some students from accessing the TDS successfully.	CAI immediately recompiled the stored procedure that creates a record every time a student starts or resumes a test. This stored procedure exhibited slowness. After recompilation, the CPU dropped, and students could continue testing. The issue was reported shortly before 10:25 a.m. ET and resolved by 12:00 p.m. ET.
Utah; Contract No. USBE220001MA	April 2024: Utah experienced intermittent student login and test session issues across districts.	The issue was due to four new additional satellite instances being created that morning, which had an insufficient execution plan related to certain processes. CAI recompiled the execution plan and removed the four satellites to resolve. The issue was reported shortly before 11:00 a.m. ET and was resolved by 12:00 p.m. ET.

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Client Name and Contract Number	Date/Issue/Concern	Documentation/Resolution
Washington; Contract No. 20200079	Spring 2015: Smarter Balanced experienced scoring delays. CAI was committed to a two-week rolling scoring window for the first administration of Smarter Balanced adaptive assessments. The longer scoring times were due to scorers being available at the wrong times, with too many available early in the testing window and too few later; scorers were also allocated evenly across items even though items were administered at divergent rates.	In 2016, CAI reliably met the scoring deadlines. Data from the previous administration allowed us to know when students in each state were going to test, and a series of simulations indicated the exposure rate of each item. Consequently, we were able to appropriately train and allocate scoring staff. We also built a new system to track the progress of each individual response and provided reports to aid in re-allocating resources.
System cloud servicing Arkansas, Connecticut, Delaware, Indiana, Iowa, Louisiana, Nebraska, New Hampshire, Ohio, Rhode Island, and South Carolina	April 2024: CAI's TDS experienced an issue that prevented proctors from starting new test sessions on the East cloud.	To mitigate the issue immediately, CAI removed from view all teacher-authored tests for clients who use the Authoring system. This provided the relief needed. Summative assessments were still available to proctors, and they were able to start new sessions. The first Help Desk report was at 7:45 a.m. ET. The issue was resolved for all states at 11:15 a.m. ET.

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Subcontractor Documented Experience

Measurement Incorporated

Measurement Incorporated (MI) will print and distribute paper versions of the NJSLA-ELA/M and NJGPA. Following test administration, MI will collect these materials, verify their receipt, and store and securely destroy them. MI will handscore constructed-response items following each administration of the NJSLA-ELA/M and NJGPA. They will gather a team of professional scorers to handscore student responses, monitor progress, and provide training and feedback to scorers. MI will conduct operational and field-test rangefinding meetings for the NJSLA-ELA/M and NJGPA. They will also provide missing shipment reports, missing test booklet reports, secured materials reports, and scoring status reports to the SCM. Exhibit 3.16-3 includes MI's documented experience.

Exhibit 3.16-3: MI Experience

Customer Name	Services Provided	Program Type	Approx. No. Students Tested Annually	Customer Since
California	Handscoring, automated scoring	Summative ELA and Mathematics Grades 3–HS	7.5M	2014
ELPA 21 (Includes AR, IA, LA, NE, OH, OR, and WV)	Handscoring, paper processing	Summative ELA and Screener ELA	435K	2017
Education Records Bureau	Item development, scanning, paper processing, handscoring, reporting	Entrance Examination ELA and Mathematics Grades 1–HS; Summative Writing Grades 3–HS	50K	2003
Louisiana	Automated scoring; psychometric services, project management	Summative U.S. History at HS and Social Studies at Grade 5 and Grade 8 Summative ELA and Mathematics Grades 3–HS, Alternate Assessment	256K	2013
Multi-Agency Assessment Cooperative (MAAC) (Includes DE, HI, MT, VI, and WA)	Handscoring, automated scoring, paper processing	Summative ELA and Mathematics Grades 3–HS	800K	2014

Customer Name	Services Provided	Program Type	Approx. No. Students Tested Annually	Customer Since
Idaho	Handscoring, automated scoring, paper processing	Summative ELA and Mathematics Grades 3–HS	175K	2014
South Dakota	Handscoring, automated scoring, paper processing	Summative ELA and Mathematics Grades 3–HS	75K	2014
West Virginia	Handscoring, paper processing	Summative ELA Grades 3–HS	30K	2014
Michigan	Handscoring, paper printing and shipping, scanning, automated scoring, data files, paper and online reporting, psychometric services, test observations, and social media monitoring	Summative and Alternative (1%) Assessments Grades 3–HS	750K	2008
North Dakota	Handscoring	Summative	12K	2023
Connecticut	Handscoring, paper processing	Summative ELA and Mathematics Grades 3–8	225K	2014
New Hampshire	Handscoring	Summative ELA and Mathematics Grades 3–HS	14K	2014
New Jersey	Item development, psychometric services, handscoring, program management	Science Grade 5, 8, and 11	290K	2007
Oklahoma	Automated scoring	Summative ELA Grades 3–8	300K	2017
Oregon	Handscoring, paper processing	Summative ELA and Mathematics Grades 3–HS	250K	

Customer Name	Services Provided	Program Type	Approx. No. Students Tested Annually	Customer Since
U.S. Department of Education	Handscoring	Trends in International Mathematics and Science Study (TIMSS) Grades 4 and 8	20K	2020
Smarter Balanced	Data analysis, item development	Summative ELA 7 and Mathematics Grades 3–HS	NA	2014
Utah	Automated writing evaluation program	Formative online writing assessment system for Grades 3–12	500K	2009
Wisconsin	Automated scoring	Summative ELA Grades 3–8	390K	2016
Wyoming	Handscoring	Summative	7K	2023
XQ Institute	Item development, test construction	Concept and Skills Assessment for HS Mathematics Badging System	TBD	2022

Caveon

Caveon will be responsible for web/social media monitoring for the New Jersey Assessment Program. Caveon's Web Patrol leverages technology tools and human expertise to identify, prioritize, and monitor websites, discussion forums, peer-to-peer servers, etc., where sensitive test information may be disclosed or at risk of disclosure. In Exhibit 3.16-4, we include Caveon's demonstrated experience.

Exhibit 3.16-4: Caveon Experience

Client Name	Department(s) Represented	Description of Services	Contact Information	Timeframe
Cambium Assessment	Indiana DOE Ohio DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Teresa Hall 888-749-6178 Robert Migliavacca 888-749-6178	July 2022–Present (*Indiana*) June 2020–2022 (*Ohio—Special Web Monitoring Project*)
Cambium Core ICCR Items	Arkansas DOE Connecticut DOE Hawaii DOE Idaho DOE Montana DOE North Dakota DOE New Hampshire DOE Oregon DOE Rhode Island DOE South Dakota DOE Utah DOE Virgin Islands DOE West Virginia DOE Wyoming DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Maggie Lindsay 888-749-6178 Tom Glorfield 319-594-5329	March 2018–Present *(Originally AIR Core)*

Client Name	Department(s) Represented	Description of Services	Contact Information	Timeframe
Cognia	Massachusetts DOE Maryland DOE Rhode Island DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Stephen Murphy 678-392-2285 ext. 7205 Jaimie Rissin 888-413-3669 ext. 7626	November 2017–Present *(Originally Measured Progress, then AdvancedED)*
DRC	Louisiana DOE Mississippi DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Tom Boatman 763-268-2052 Christy Bowlus 763-268-2107	November 2017–Present
Measurement Incorporated	New Jersey DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Michael Gaffigan 919-360-8745 Julie Vinson-Clark 919-683-2413 ext. 1226	April 2020–Present

Client Name	Department(s) Represented	Description of Services	Contact Information	Timeframe
New Meridian Corporation	BoIE DC OSSE DoDEA Louisiana DOE Maine DOE Montana DOE New Jersey DOE New Mexico DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Christy Sassman 210-659-7688 Caroline Lang 703-867-0108	November 2018–Present
NWEA	Mississippi DOE Nebraska DOE	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Hakan Bergon 831-601-0265 Aaron Brock 320-224-1400	July 2015–Present (*Mississippi*) July 2016–2022 (*Nebraska*)
Smarter Balanced Assessment Consortium	Smarter Balanced	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Christyan Mitchell 310-210-8594 Marty Mineck 319-800-9032	May 2020–Present

Client Name	Department(s) Represented	Description of Services	Contact Information	Timeframe
WIDA	WIDA	Comprehensive and consistent web/social media monitoring to identify threats to the client's intellectual property (test items). Once the threat has been identified and verified, Caveon consults with the client to recommend steps to have the infringing content removed. Web/social media monitoring is conducted one week before, during, and one week after the test administration.	Kim Varnell 608-509-3011 Michele Furman 866-276-7735	February 2020–Present

Human Resources Research Organization (HumRRO)

HumRRO has worked in the education sector since 1998. Their first contracts with states included projects involving psychometric analyses, external psychometric and scoring checks, and validity and alignment studies. Exhibit 3.16-5 includes several current and recent state contracts highlighting HumRRO's psychometric consulting and quality assurance work, as well as their alignment studies and workshop portfolio. In 2024, focusing only on state partners, HumRRO designed, led, and analyzed data from eight alignment panels across two states. They conducted quality assurance psychometric replication for 10 states and a total of 250 state assessments.

Exhibit 3.16-5: HumRRO Experience

Project Name	Contract Dates	Brief Description	Contact Information
Arkansas Statewide Assessment Replication as a Subcontractor to Cambium Assessment, Inc.	1/19/2024–9/30/2024	As a subcontractor, HumRRO replicated all classical and item response theory statistics, student scores, and performance levels for Arkansas's Statewide Assessment.	Primary: Name: Antonia Deoudes 202-403-5000 antonia.deoudes@cambiumassessment.com Alternate: Name: Lindsay Booker 202-403-5000 lindsay.booker@cambiumassessment.com
Delaware Department of Education Social Studies Alignment Study	6/7/2024–6/30/2025	HumRRO is conducting an alignment study of the Delaware Social Studies through-year assessment, including leading focus groups, to determine how to improve the new assessment system. The first phase of the work has been completed. The second alignment study that includes two grades occurred in spring 2024. The last phase will be completed in spring 2025.	Primary: Name: Preston (Dusty) Shockley 302-857-3391 preston.shockley@doe.k12.de.us Alternate: Name: April McCrae 302-735-4093 april.mccrae@doe.k12.de.us

Project Name	Contract Dates	Brief Description	Contact Information
Florida Department of Education	7/1/2024–6/30/2025	HumRRO is conducting research and evaluation on Florida's Coordinated Screening and Progress Monitoring System. This includes research into several areas including investigation of the impact of their new assessment system on Florida's student learning growth model.	Primary: Name: Vince Verges 850-245-0513 vince.verges@fldoe.org Alternate: Name: Teresa Millan 850-245-0513 teresa.millan@fldoe.org
Florida Department of Education Quality Assurance as a Subcontractor to Cambium Assessment, Inc.	9/1/2023–8/31/2024	As a subcontractor, HumRRO was a psychometric consultant and an independent third-party reviewer of the Florida general education state assessments in English language arts (ELA), mathematics, science, and social studies. This work included replicating the calibration, scaling, and equating of all tests and checking the accuracy of scores and performance levels for all students.	Primary: Name: Kevin Murphy 202-744-7762 kevin.murphy@cambiumassessment.com Alternate: Name: Monica Bell 202-926-2481 monica.bell@cambiumassessment.com
Florida Standards Alternative Assessment Quality Assurance and Alignment as a Subcontractor to Pearson	11/1/2021–12/1/2024	As a subcontractor, HumRRO is the independent third-party reviewer of all scoring for the Florida Standards Alternate Assessment (FSAA) program.	Primary: Name: Andrew Messenger 319-358-4439 andrew.messenger@pearson.com Alternate: Name: Leann Hermanson Spaight 319-339-6416 leann.spaight@pearson.com

Project Name	Contract Dates	Brief Description	Contact Information
Illinois Quality Assurance for ELA and Math Assessments as a Subcontractor to Pearson	11/27/2023–7/31/2024	As a subcontractor, HumRRO performed calibration, assessment, and replication tasks supporting the Illinois Assessment of Readiness ELA and Math Content.	Primary: Name: Mary Allen 319-354-9200 mary.allen@pearson.com Alternate: Name: Pam Parmer 210-339-5312 pam.parmer@pearson.com
Institute of Educational Assessment, IP (IAVE) Psychometric Consulting Services as a Subcontractor to Pearson	11/1/2024–6/27/2025	As a subcontractor to Pearson, HumRRO provides consultation services for educational assessment development projects related to the Portugal IAVE procurement. They provide advice for improving student success in national and international assessments for the betterment of themselves, the local workforce, and the local economy. HumRRO prepares for and participates in discussions with the Portugal Ministry of Education regarding skills gaps and training needs to inform training programs leading to knowledge transfer and upskilling of local workforces so that they become self-sustaining. Our consultative program leadership provides technical expertise to ensure a joined-up strategy, planning, communication, and operational delivery of their assessments.	Primary: Name: Adam Henderson +44 1865 632813 adam.henderson@pearson.com Alternate: Name: David McVeigh +44 7880 414089 david.mcveigh@pearson.com

Project Name	Contract Dates	Brief Description	Contact Information
Third-Party Replication of Illinois Science Assessment as a Subcontractor to Pearson	11/3/2023–9/30/2024	As a subcontractor, HumRRO conducted third-party psychometric replications of grades 5, 8, and 11 of the Illinois Science Assessment, including item calibrations, test equating, and score verifications.	Primary: Name: Cynthia Galindo 319-354-9200 cynthia.galindo@pearson.com Alternate: Name: Pam Parmer 210-339-5312 pam.parmer@pearson.com
Kentucky Department of Education Quality Assurance and Research Support, Including Alignment Studies	7/1/2024–6/30/26	HumRRO conducts psychometric research, consulting, and third- party psychometric replication, validity studies, and ad hoc research to support the Kentucky Department of Education in accumulating validity evidence for its assessment and accountability program. For school year 2023, their work included several alignment studies.	Primary: Name: Kevin O'Hair 502-564-2256 kevin.ohair@education.ky.gov Alternate: Name: Tonya Hartley (502) 564-1979 ext. 4345 tonya.hartley@education.ky.gov
Minnesota Department of Education Quality Assurance and Control for the Large-Scale Testing and Accountability Program	10/1/2020–11/4/2025	HumRRO is the independent third party that verifies all scores of Minnesota state assessments. In addition, they lead the observations of testing throughout the state to report on the consistency of test administrations and identify testing irregularities. They also conduct other validity studies, such as alignment studies and an in-depth check of scoring information available on the Minnesota Department of Education website.	Primary: Name: Jennifer Burton 651-582-8622 jennifer.burton@state.mn.us Alternate: Name: Mai Vang 651-582-8200 mai.kia.vang@state.mn.us

Project Name	Contract Dates	Brief Description	Contact Information
Nebraska ELA Alignment Studies as a Subcontractor to NWEA, a division of HMH	3/22/2024–11/15/2024	As a subcontractor, HumRRO designed and conducted virtual alignment workshops for the Nebraska summative assessment in mathematics to meet Peer Review requirements in grades 3–8 and high school. They also provide psychometric quality assurance in ELA and mathematics grades 3–8 and high school.	Primary: Name: Jami Wireman 971-394-6103 jami.wireman@nwea.org Alternate: Name: Laura Ann Kump 971-394-6103 laura.ann.kump@nwea.org
Psychometric Quality Control Support for Illinois and New Jersey (WO 12) as a Subcontractor to New Meridian	11/1/2024–10/31/2027	As a subcontractor, HumRRO provides quality control and psychometric support for the Illinois and New Jersey statewide student assessments. This includes data clearing, replication of item calibration, and drift analysis.	Primary: Name: Christy Sassman 210-659-7688 csassman@newmeridiancorp.org Alternate: Name: Marie Cammack 405-201-3756 mcammack@newmeridiancorp.org
Ohio State Testing Program Psychometric Replication as a Subcontractor to Cambium Assessment, Inc.	10/1/2022–8/23/2025	As a subcontractor, HumRRO provides quality assurance psychometric verification for Ohio's statewide student assessments.	Primary: Name: Antonia Deoudes 202-403-5000 antonia.deoudes@cambiumassessment.com Alternate: Name: Dee Ann Wagner 202-403-5000 deeann.wagner@cambiumassessment.com

Project Name	Contract Dates	Brief Description	Contact Information
Virginia Standards of Learning Psychometric Verification and Alignment Studies	1/1/2024–12/31/2025	As a subcontractor, HumRRO provides psychometric verification of all content areas and designed and led virtual alignment studies.	Primary: Name: Mary Beth Hayes 319-383-4805 marybeth.hayes@pearson.com Alternate: Name: Pam Parmer 210-339-5312 pam.parmer@pearson.com

Lambert Global

Lambert Global will be providing marketing/communications support; social media content development; and media relations and training services for the New Jersey assessment program. In Exhibit 3.16-6 we include Lambert's demonstrated experience.

Exhibit 3.16-6: Lambert Experience

Client	Challenge	Solution, Deliverables, and Results/Tactics
Detroit Public Schools	During a tumultuous year caused by the COVID-19 pandemic, Detroit Public Community Schools District needed support launching a return-to-school campaign that raised awareness of the district's plans, increased enrollment and retention efforts, and instilled confidence and boosted morale among teachers and staff.	**Solution** We launched the Detroit Public Schools Community District's return to school initiative "Preparing For Your Rise" by providing strategic counsel, community engagement, media relations support, and the development of more than 90 creative assets. **Deliverables** We developed campaign core messaging and produced communications elements for ad copy, social media posts, web copy, an email newsletter, scripts, and talking points. We created and finalized print ads, outdoor boards, radio scripts, pre-roll web ads, e-blasts, digital display, social media posts, public service announcements, and videos. We provided crisis counsel and strategic planning and generated media pitches, op-eds, and byline articles regarding new and critical initiatives. **Results** Thirteen videos were produced, including pre-production planning, onsite video shoots, and post-production. We created 18 social media graphics and developed more than 25 pieces of print collateral that provided resources and information to more than 50,000 children throughout Detroit.

Client	Challenge	Solution, Deliverables, and Results/Tactics
National Heritage Academies	National Heritage Academies needed public relations/communications counsel to strengthen community relations and board relations and reinforce their brand with media outlets.	**Solution** During our 12-year tenure as the Agency of Record for National Heritage Academies, Lambert served as the organization's PR/communications team, providing critical support in a wide array of areas including communications, media relations, board communications, crisis communications, and media training. **Strategies** • Local market and national public relations outreach (both proactive and reactive) • Internal and external corporate communications • Parent, board, and authorizer communications • Strategic counsel to the leadership team • Media coaching and training
University Research Corridor	At a time when state funding was increasingly scrutinized, Lambert began working with University Research Corridor (URC) to show the organization's value to Michigan's economy and its bottom line. The three URC universities (Michigan State University, University of Michigan, and Wayne State University) were responsible for more than 90% of the research dollars being spent in the state and award more than 30,000 degrees annually. Lambert used media relations and marketing activities to reach a wide variety of interests, from educators and researchers to students, policymakers, and business leaders.	**Solution** Lambert developed an aggressive and comprehensive communications plan to raise awareness of URC and its vital role as the engine that drives innovation for Michigan and the Great Lakes region, increasing economic prosperity and connecting Michigan to the world. **Strategies** • Our team tied research being done at the three universities to the North American International Auto Show, gaining national attention for the URC. • We garnered stories in a variety of media the day the URC's annual economic impact report was released, then followed up with op-eds written by the three university presidents and Michigan business leaders. • Created an infographic for lawmakers and policymakers to bring home the URC's economic role and used the infographic to promote the URC on social media.

Metimur

Metimur's spokesperson, Mary Cochron, will fulfill the role of Stakeholder Communication Representative as outlined in the RFQ, including representing services to New Jersey stakeholders, conducting media interviews, and answering questions at State Board of Education meetings. Deliverables may include the following:

- Stakeholder communications plan
- Media interview schedule and transcripts
- Documentation of State Board of Education meeting interactions
- Regular status reports on communication initiatives

We include Metimur's demonstrated experience in Exhibit 3.16-7.

Exhibit 3.16-7: Metimur Experience (Mary Cochron)

Client	Description of Services	Dates
Cambium Assessment, Inc. (CAI; formerly American Institutes for Research)	**Program Director (October 2019–July 2022)** • Managed day-to-day operations of six statewide programs and supervised 14 program management staff • Established and monitored contract scope and budget for all programs under my supervision, with a total annual budget of 29.6 million dollars in 2021–2022 • Drove complex conversations with internal staff and external clients, with an emphasis on handling sensitive issues or challenging client discussions; de-escalated conflict and reoriented involved parties toward productive discourse and solutions • Led process audits, provided actionable feedback, and created roadmaps for improvement; repurposed best practices from one client or program to another to leverage efficiencies and share successful approaches to common challenges	July 2017–July 2022

Client	Description of Services	Dates
	Senior Program Manager (July 2017–September 2019) • Managed day-to-day operations of one statewide program; expanded a project team from one full-time direct report to three staff and expanded the number of contracts under my management • Responsible for the overall work quality of the program, considering client requirements and larger assessment division and CAI business objectives • Influenced and informed client decisions by providing pertinent data, relevant background, options, and analyses in designing a new statewide assessment system	
Oregon Department of Education	**Director of Assessment** • Supervised and managed a state assessment team of nine staff members • Developed and managed a $27 million biennial budget, including preparing and presenting budget and program information to Oregon State Legislature • Collaborated with the state of Oregon's Deputy Superintendent and the Governor's advisory council (Chief Education Office) to align the organizational structure with agency priorities, resulting in the integration of the assessment unit into the Office of Teaching and Learning • Facilitated cross-departmental collaboration in the development of a balanced assessment system, from statewide professional development of formative classroom assessment practices to reevaluation of the statewide summative assessment system • Restructured the assessment team to align position descriptions with agency goals and improve efficiency by balancing distribution of responsibilities and developing career ladders for growth as well as promoting improved communication and transparent decision making across the team • Directed the development of technical documentation, training materials, and web-based applications associated with the statewide assessment program and the "Essential Skills" high school graduation requirements for implementation and federal peer review	May 2016–June 2017

Client	Description of Services	Dates
	• Provided analyses of proposed legislation and evaluated and implemented adopted laws, including development of regulation and guidance for local, school, and district implementation • Engaged stakeholders to identify and prioritize assessment needs, including senior agency executives, school district leadership, lateral state agency leadership, the Oregon Governor's office, external educational consortia, state and national educational professional associations and unions, public and parent advocacy groups, press, and Oregon state legislators	
Portland Public Schools	**Senior Manager of Educational Measurement and Assessment (June 2015–May 2016)** • Supervised and managed the district assessment team of four staff and an annual budget of $1.2 million • Managed the development and implementation of system-wide assessment and academic data collection framework, including appropriate administration processes, scoring and reporting, and design evaluation of assessments, observational and data collection instruments, and academic program evaluation techniques • Coordinated with other district departments, such as Instruction, Curriculum and Assessment, Information Technology (IT), and Office of School Performance to develop, oversee, and create trainings, processes, and procedures for assessment and data literacy **District Assessment Coordinator (November 2014–June 2015)** • Collaborated with school board members, district leadership, and school leadership to develop and implement a comprehensive communications and operations transition plan for the first operational year of the Smarter Balanced Assessments during a challenging political climate for assessment and Common Core State Standards (CCSS) • Managed processes and procedures for state and district required assessments including test security and administration training, supported school staff before and during testing, and communicated state regulations and district expectations	November 2014–May 2016

Client	Description of Services	Dates
	• Delivered engaging and informative professional development and informational presentations for a variety of audiences including the school board, district leaders, school leaders and staff, parents, community partners, and press • Primary investigator on an evaluation of implementation of the first year of Smarter Balanced Assessments; utilized surveys, interviews, and student focus groups that resulted in a comprehensive, operationally focused report presented publicly and to the school board	
Fresno Unified School District	**Assessment Analyst, District Office (June 2012–November 2014)** • Served as the project lead for a district assessment development project that included managing more than 112 teachers in creating quarterly local assessments aligned to the CCSS for core subjects in grades K–12 • Created and delivered professional learning on assessment development, facilitated teacher workgroups in the building and evaluation of assessments, and coordinated the formatting and standardization of assessments for administration • Provided institutional research support for the Extended Learning Summer Program department, including student data management, assessment administration for multiple programs, and annual evaluation of all summer programs impacting more than 18,000 students annually • Provided institutional research support for the English Learner Services department, serving more than 16,800 students annually • Provided instructional and program placement data management, internal and external reporting, student data support to school sites, and program evaluations to district leadership and board meetings **Coordinator of Small Learning Communities, Herbert Hoover High School (August 2011–June 2012)** • Managed the school-wide Small Learning Communities (SLC) program, including developing the grant budget and the design of student course assignment framework; developed SLC cross-content learning progressions; and collaborated with community-based organization to develop relationships	August 2007–November 2014

Client	Description of Services	Dates
	with external stakeholders to incorporate experiential learning opportunities for students • Managed the culminating program evaluation that included collection, analysis, and summary of the final report of school-wide results of grant-funded efforts to create small learning communities over five years • Served as focus group leader for the Western Association of Schools and Colleges (WASC) High School accreditation review; also served as an editor of the final report • Served as the school test coordinator and proctor for all local and statewide assessments, including California English Language Development Test (CELDT), California High School Exit Exam (CAHSEE), Advanced Placement (AP) tests, and California Alternate Performance Assessment (CAPA) **AP Human Geography and English Language Arts Teacher, Herbert Hoover High School (August 2010–July 2011)** • Piloted the new Advanced Placement Gateway course for grade 9 at a comprehensive high school • Served as a core academic teacher for the Advancement via Individual Determination (AVID) program **World History Teacher, Tehipite Middle School (August 2007–July 2010)** • Served as a district demonstration teacher and master teacher • Served as a grade 7 World History Gifted and Talented Education (GATE) teacher • Served as an AVID program core academic teacher and contributed to the creation of an academic strand designed specifically for students in AVID	

Tri-Lin Integrated Services

Tri-Lin will be providing Spanish-language translation for existing and new Spanish-translation items and TTS tasks. In Exhibit 3.16-8, we include Tri-Lin's demonstrated experience with large-scale translation projects.

Exhibit 3.16-8: Tri-Lin Experience

Client/Program	Description of Services	Dates of Service
New York State and Minnesota	Tri-Lin has provided accessibility services for school administration manuals and ancillary documents.	April 2023–Present
Texas State Assessment	Tri-Lin has been partnering with Pearson to provide all services related to the development of a Spanish assessment in grades 3–5 in ELA and transadaptation for the Spanish version of mathematics and science assessments. Tri-Lin supports Educational Testing Services (ETS) in all tasks related to the Spanish version of the STAAR assessment. Tri-Lin translates student reports and the family website portal into different languages.	September 1994–Present
Cambium Assessment	Tri-Lin transadapted several states' ELA, science, social studies, and mathematics assessments to Spanish. Tri-Lin works directly in CAI's ITS. Tri-Lin provides transadaptation, audio, ASL, and production support to CAI clients.	September 2013–Present
Colorado Spanish Language Arts	Tri-Lin partners with Pearson to provide the first-ever CCSS-aligned Spanish language arts (SLA) assessment for the state of Colorado. Pearson contacted Tri-Lin in fall 2014 about the client's urgent need to assess the English as a second language (ESL) population in Spanish. Tri-Lin was able to work with the vendor and find quick solutions that allowed the client to have a field test of test forms in both grades 3 and 4 by spring 2015. Since then, Tri-Lin has provided content, production, and psychometric support to the client and Pearson. In spring 2016, the first operational administration went live, along with an embedded field test to build the bank. Tri-Lin also provides transadaptation services for all science and social studies assessments.	September 2014–Present

Client/Program	Description of Services	Dates of Service
Puerto Rico State Assessment	Tri-Lin worked with Pearson to author assets aligned to the Puerto Rico Core Standards. Tri-Lin's duties included item and passage authoring, training of on-island authors, maintenance of the item bank, content editing, art creation, and final editing for the SLA assessment. Tri-Lin also provided content alignment and key-check support for ESL, Spanish, mathematics, and science assessments. Tri-Lin worked with the Inclusive Large-Scale Standards and Assessment (ILSSA) group in developing the Puerto Rico Alternate Assessment (PIPPA).	September 2013–September 2015
Texas Region 13 Educational Center	Over six months, Tri-Lin authored 3,450 mathematics items for Texas Region 13 in English. These items were then transadapted into Spanish.	February–June 2014
Smarter Balanced Assessment Consortium	Tri-Lin delivers full Spanish translations of mathematics CAT items and mathematics performance tasks. Tri-Lin identifies terms in selected test items for pop-up glossaries and translates them into 11 spoken languages. These languages are Spanish, Vietnamese, Arabic, Mandarin, Cantonese, Tagalog, Ilocano, Eastern Punjabi, Western Punjabi, Korean, and Russian. Tri-Lin translates 6,000 items, 70 stimuli, 800 ELA/listening items, and approximately 1,000 rubrics as a part of the project. We also produce ASL videos to accompany the mathematics and ELA items and stimuli. In addition, we create 600,000 audio clips, one for each glossed term in all the languages. Tri-Lin provides content, editorial, and cultural review based on the translation model presented in the original proposal. All translations are conducted in the client's item banking system. This includes downloading items, performing full translation, providing content review, providing cultural review, providing editorial review, uploading and attaching to the item, and viewing the item in ITS to ensure that the translation upload is correct. To meet the client's internal deadline, Tri-Lin trains and manages a group of more than 50 subcontractors. Tri-Lin sources and provides external reviewers for quality assurance of deliverable as per the contract. Tri-Lin continues to work with Smarter Balanced as needed for additional translation, ASL videos, and illustrations.	October 2013–Present

Client/Program	Description of Services	Dates of Service
New Mexico Standards-Based Assessments	Tri-Lin served the following subject areas and grade levels: ELA, grades 3–9 and 11; mathematics, grades 3–9 and 11; and science grades 3–9. Tri-Lin has worked as a subcontractor with Pearson and now Cognia on development for this program. Tri-Lin has created new passages and items in Spanish, and has built multiple forms for the ELA tests. Transadaptations of the mathematics and science tests have also been completed, supplementing these tests with new content developed in Spanish when required. Tri-Lin has provided hundreds of ASL videos for New Mexico's ELA and mathematics operational and practice forms. Tri-Lin staff have shepherded new passages and items through content review meetings with committees of New Mexico teachers. We have also served as resources during standard-setting activities. Our work on the grade 11 tests began in 2005.	2003–2009; 2019–Present
Minnesota Science and Mathematics Glossaries	Tri-Lin provides the services of selecting words appropriate for glossary, translation, and audio for the glossary words in Hmong and Somali, under a subcontract with Pearson.	2017–Present
CAST-California Science Assessment	Tri-Lin provides the services of full Spanish translation, glossary translation, and audio for the glossary words in Hmong and Somali under a subcontract with ETS. Tri-Lin has an excellent track record of meeting client demands regarding timeline. We are willing to work with the client to meet mutually agreeable timeframes for the phases of the project. The timeframes heavily rely on the volume of work. Tri-Lin prides ourselves on the ability to meet client needs. Because we are a smaller company, many of our in-house processes are more streamlined, which allows for a quicker turnaround to the client. Tri-Lin can increase staffing to meet higher volumes as needed, as we have done for previous projects.	2017–Present

3.17. Financial Capability of the Bidder

To demonstrate CAI's ability to undertake and successfully complete the New Jersey Next Generation Assessment contract, we have included CAI's financial statements in Appendix P of our proposal.

4.1. The Summary Statement

CAI is pleased to submit our response to the RFQ issued on behalf of NJDOE for a customized assessment program that encompasses the development, administration, and reporting of the NJSLA-ELA/M and NJGPA. Our proposal includes high-quality content development from experienced personnel, easy-to-use summative and end-of-course computer-adaptive assessments, opportunities to shape the direction of the assessment program by integrating input from New Jersey stakeholders, and the provision of timely, actionable data in an intuitive reporting system.

CAI is the industry leader in the development and implementation of online, computer-adaptive assessments, delivering more than 124 million online assessments to 15 million students in the 2023–2024 academic year. Our suite of online management, assessment delivery, and reporting applications is seamlessly integrated to provide a powerful response to New Jersey's requirements, and configurability is at the core of each implementation. These systems are intuitive and easy to use, and require a minimal technology footprint, thereby reducing the burden on administrators and students alike. The lightweight and straightforward nature of the assessment platform allows us to keep the focus where it should be—on an engaging and interruption-free student experience—rather than on the systems themselves. CAI seeks to reduce the complexity of online administration during a contract transition period by offering to transition the NJSLA-S to our Test Delivery System (TDS) platform at no cost to the State. We would be happy to import the NJSLA-S items and test forms at no charge to NJDOE. Administering all tests on a single platform eliminates the administrative requirements of working on multiple platforms, reduces the workload of test administrators, and allows students to have a consistent and stable testing experience throughout the administration year.

Moreover, we believe that we are ideally situated to help New Jersey achieve its assessment goals by offering our bank of high-quality ClearSight items, augmented by custom developed items, to deliver adaptive and fixed-form assessments that align to the New Jersey Student Learning Standards (NJSLS); yield test scores that are valid and reliable, both overall and for all domain reporting categories; and ensure that test administration times remain within desired limits. CAI's ClearSight item banks have been developed to measure college- and career-readiness standards in numerous statewide assessments, including item-adaptive summative assessments in Arkansas, New Hampshire, North Dakota, West Virginia, and Wyoming. Additionally, the ClearSight item banks have seeded custom state item banks, including Arizona, Florida, and Ohio. ClearSight item banks also supplement the Utah item banks. Our item banks are robust and aligned to the Common Core State Standards (CCSS) for English language arts (ELA) and mathematics. We believe our ClearSight item banks, along with yearly custom item development, will provide a pathway to a high-quality adaptive item pool owned by New Jersey.

In the following sections, we address each requirement outlined in the RFQ. We are fully prepared to assume responsibility for all services and products, and we share New Jersey's vision of a testing program that emphasizes the following goals and requirements:

- High-quality assessments that are aligned to the NJSLS for ELA and mathematics, measured via computer-adaptive tests (CATs) for most assessments, including online accommodated assessments as well as fixed-form/paper-pencil assessments for students requiring such an accommodation.
- Item banks that are developed in collaboration with NJDOE and exceed the technical standards of the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014) using strict quality assurance

item review procedures and item and test specifications that ensure consistency across assessments and alignment of the assessments to the NJSLS.

- Test blueprints that are as short as possible while still allowing for reporting of subscale score performance.
- Timely reporting and immediately actionable data for making decisions at the classroom and school levels.
- A dedicated and experienced Project Management Team with a clear understanding of NJDOE's required schedule and program goals, and expert knowledge of CAI system integration points with internal systems and external collaborators.
- Support for a historical comparison of assessment results and delivery to NJDOE of assessment results on the current scale to monitor changes in performance.

We hope to partner with NJDOE to improve the capacity of the state assessment system to provide New Jersey educators with the most actionable reporting possible. CAI's teams possess unmatched experience in all program areas. CAI delivers more online statewide accountability assessments than any other organization, and we lead the field in expanding the potential of online testing. We are excited about the possibility of working with NJDOE and New Jersey educators, and we hope that our proposal demonstrates the ways in which CAI can help NJDOE to continuously improve its assessment system and ultimately improve educational outcomes for New Jersey students.

As described in the following sections, we present a plan that draws upon our organizational strengths and capacity to offer a solution that supports the State's vision to produce the nation's leading assessment program for New Jersey students.

4.2. Essential Requirements

4.2.1. Project Launch Meeting

Upon award of the contract, CAI will schedule an in-person project launch meeting with the State Contract Manager (SCM) to discuss project intent and scope and to review plans and schedules.

The meeting will occur within 15 days of contract award. We will draft an agenda for review, revision, and approval by the SCM and coordinate with other vendors to incorporate all required delivery elements into a single master schedule.

An intentionally planned and detailed agenda is key to keeping the meeting focused on important issues that need discussion. The CAI program director will collaborate with the SCM and NJDOE staff to get their input on the topics to be added to the agenda for the kickoff meeting. Based on their feedback, the CAI program director will revise the draft agenda included with this proposal.

CAI recognizes that the planning meeting may also focus on the continuity of current program activities and collaboration with current vendors.

4.2.2. Assessment Standards

CAI is committed to the successful development and implementation of New Jersey's Next Generation Assessment, including supporting NJDOE through all phases of peer review. Our approach to the design of New Jersey's assessments is described in this section, which includes New Jersey educator participation throughout the entire process. At the core of our solutions, CAI proposes our ClearSight item banks, which comprise high-quality content to support summative and interim computer-adaptive tests (CATs). We propose to utilize the ClearSight item banks as we aggressively develop New Jersey custom items to assess New Jersey-specific content standards and item types. As part of this custom item development, CAI will develop custom handscored items for the construct being measured, as required by the RFQ. Arizona, Florida, Ohio, and Utah have all utilized our ClearSight item bank as we developed custom state-owned item banks. We believe this approach will work for New Jersey as well.

All test items, including both ClearSight and custom items, will be developed and reviewed in a process that incorporates inputs from New Jersey educators at multiple points in the item development and review process. In this brief section, we provide references to sections that detail our proposed solution for meeting the requirements of the RFQ and how we plan to achieve the following goals:

- We will develop high-quality assessments that are aligned to the New Jersey Student Learning Standards (NJSLS) for mathematics and English language arts (ELA), including any future iterations of the standards. Standards are assessed via CATs for most assessments, including online accommodated assessments; standards can also be assessed via paper-pencil fixed-form assessments for students requiring such an accommodation.
- Item banks will be developed in collaboration with NJDOE and exceed the technical standards of the *Standards for Educational and Psychological Testing* (developed by American Educational Research Association [AERA], American Psychological Association [APA], and National Council on Measurement in Education [NCME]) using strict

quality-assurance item-review procedures. Throughout our item development process, we will focus on evidence-centered design to ensure the validity of the assessments.

- We will conduct item development and field testing prior to the operational assessment, which allow cut scores to be set for the spring 2026 operational assessment.
- Item and test specifications will be utilized to guide all aspects of item and test development to ensure consistency across assessments and alignment of the assessments to the NJSLS.
- We will ensure flexibility in adapting to changes to the NJSLS or other critical program elements of the New Jersey assessments that may occur after execution of the contract.

Further, CAI will ensure that all requirements detailed in Section 4.2.2. sub-letters A–L of the RFQ are met. Once again, our plans for meeting these requirements are detailed in the sections that follow.

4.2.3. Project Management

Complex, large-scale assessment programs demand organized, collaborative project management. CAI offers a streamlined project management system that has successfully supported assessment programs since the early 2000s in more than half the nation's states and jurisdictions, along with a fully invested team that will work with NJDOE to create clear goals and outcomes for program success. At our core is the belief that we must constantly implement incremental improvements to our services, processes, and products by applying lessons learned and building on our experience.

Our management approach is designed to support high-stakes, high-profile assessment programs in a manner that reduces risk through careful documentation of project requirements. This section describes the Project Management Team, methodology, specifications, and processes that together will comprise the overall project plan and support the successful delivery of New Jersey's assessment program.

Project Management Team

Managing any complex project requires a Project Management Team that is experienced at effectively planning and directing resources, identifying priority deliverables, and managing project issues within each portion of the assessment development and delivery life cycle. The Project Management Team will be responsible for maintaining the required specification documents, plans, and schedules, allowing for accurate, open, and frequent communication with NJDOE staff about the overall health of the project. Team members will use these documents and communication tools to provide regular updates on project status, key accomplishments, upcoming activities, and identified risks or issues.

Our dedicated Project Management Team will provide the following:

- Direct management in every area of the program, using a set of mature management tools and documents designed to facilitate solid planning, tracking, and change management
- Efficient processes, clearly defined and consistently applied to areas of work
- Foresight in assessing, managing, and reducing the risks inherent in such a complex project
- Clear and ongoing communications, training, and client support for educators and administrators to reassure and educate stakeholders about everything involved in administering the New Jersey assessments
- An Operational Work Plan and Operational Yearly Schedule (OYS) created by program staff experienced in state assessments and made fully visible to NJDOE staff

- Management and/or facilitation of all program-level meetings (in person and virtual, as appropriate), including meeting agendas, virtual meeting platforms, meeting notes, and tracking of resulting action items
- A structured change management process that ensures risks and program impacts are understood, communicated, and support the evolving needs of large-scale projects

We are committed to working constructively and collaboratively with NJDOE to realize its vision. Our team will ensure that all aspects of the program are consistently operating with fidelity to program design and requirements.

Sections 3.14 and 3.15 provide detailed information about the highly qualified personnel that CAI proposes to work closely with NJDOE to manage the program and describe activities they will be responsible for supporting.

Project Management Plan Approach and Methodology

Our project management approach adheres to the principles in the *Project Management Body of Knowledge (PMBOK) Guide* by the Project Management Institute (PMI) and ensures direct management of all phases of the program. The Project Management Team uses mature management tools to orchestrate project activities, keep tasks on track, control change, and mitigate risk. Our success in partnering with state departments of education and delivering on their visions testifies to the effectiveness of our management processes.

In conjunction with NJDOE, CAI will create a detailed Project Management Plan at the beginning of the contract. This key project management artifact ensures clear requirements and common assumptions and serves as the scope baseline. It describes how we will manage facilities, contract transition, communication, weekly status reporting, requirements, change, issues, risk, training, maintenance and operations, and administrative completion reporting, among other essential operational elements of the program.

We are pleased to commit to incorporating in our Project Management Plan all requirements outlined in this RFQ and set forth in the Project Management Guidelines Appendix, including the first four elements of Cover Page, Table of Contents, Document Change History, and Executive Summary. We offer the following outline of our approach and methodology for critical sections.

Project Workplan Management

CAI's work is supported by professional project managers who implement industry-recognized project management methodologies and use standard project management tools to oversee assessment delivery. The dedicated Project Management Team will produce and deliver a Preliminary Work Plan (PWP) that complies with the requirements outlined in the RFQ and represents the detailed plans and process associated with the approach and methodology described in the Project Management Plan. We know that a comprehensive PWP provides a clear roadmap for successful program delivery. Our proposed PWP is offered in Appendix K, and a proposed OYS can be found in Appendix L.

CAI prioritizes communication and collaboration in project management, and we work diligently to ensure that our workplans and schedules fit client needs. We value thoroughness and transparency and, as a result, our workplans and schedules are detailed and robust, with hundreds—often thousands—of task lines. Typically, we use Microsoft Project or Smartsheet to develop and analyze project schedules, provide critical-path analyses, develop Gantt charts, and access resource views that will help paint a complete picture of the work required to deliver project tasks and subtasks in a timely manner and to coordinate cross-vendor assignments. We use various views of our master project schedule to provide built-in progress reporting, and we document issues and risks.

The data generated from these schedules inform additional internal planning tools, which support the Project Management Team in appropriately aligning resources and highlighting key dependencies. These data also enable CAI to effectively communicate with clients and subcontractors, as well as analyze project performance in different contexts as a means of evaluating overall project health and ensuring superior project performance.

Project schedules are generally produced at the following three levels:

1. At the highest level is the overall project schedule, which documents all deliverables, tasks, subtasks, and milestones. For each task, we designate the duration, a start date and completion date, applicable dependencies/predecessors, responsible parties, a status indicator or graphical method to identify the completion status of each task and milestone, and a section for notes.
2. At the next level are team schedules that help to define specific work packages within each of the functional teams supporting the project. For example, our Test Development Team will work to develop detailed committee review meeting schedules that document the dates on which meeting materials will be delivered for review. Some of these schedules are entirely internal, designed to enable CAI staff to achieve the milestones defined in the integrated master project schedule.
3. Finally, task-specific schedules capture each step required to deliver a specific, complex task or deliverable calling for collaboration across multiple teams. This schedule includes tasks that necessitate direct interaction and collaboration with the SCM and NJDOE staff. Ongoing NJDOE input will help to ensure that all schedules remain aligned as tasks are completed or changes are implemented.

We use project management software that allows for easy, effective, and user-friendly sharing and tracking of robust plans and schedules. Constant communication and tracking of workplans and project schedules are the key to success. Status updates on the activities currently flowing will be discussed during weekly and monthly management meetings and included in monthly management reports. CAI will monitor the PWP and schedule daily to ensure that activities are on track and flowing as expected. Daily tracking allows CAI to identify any project risk that may arise pre-emptively. If such a risk arises, CAI will immediately inform the SCM and relay the mitigation strategies for that risk according to CAI's Risk Management Plan. The PWP and OYS will be updated to document any such risks and mitigation strategies for reference and record.

Facility Management

The goal of facility management at CAI is to ensure that all services delivered are efficient, on time, and of appropriate quality. In accordance with industry best practices, our strategic facility management plan will provide a comprehensive overview of the vital components that govern our facilities during the System Development Life Cycle, from ensuring appropriate maintenance activities to safeguarding security. Using the plan as a roadmap, professional facility managers at all locations—including those of vendors and subcontractors—work to increase productivity and efficiency, lower operating costs, and plan for the future.

All CAI systems supporting New Jersey's Next Generation Assessment will be housed in Amazon Web Services (AWS) data centers. AWS provides state-of-the-art facilities managed by dedicated facilities and operations teams. These facilities are designed for security, provide fully redundant infrastructures and business continuity/disaster recovery, and employ 24/7 surveillance with restricted physical access.

Transition Management

CAI has learned through experience that a successful transition entails transferring all required data, products, knowledge, and other state-owned assets securely and cost-effectively. A

transition manager will be appointed to ensure that transition activities do not interfere with normal business operations during the project transition period.

Our transition plan follows these five general steps:

1. An initial meeting is convened between NJDOE and CAI to reconfirm the critical information that needs to be transferred and to discuss the quality assurance (QA) plans that will ensure accurate transfer.
2. CAI completes a draft of the transition specifications document, which includes details about the format of the information to be delivered and the delivery schedule.
3. NJDOE, the previous contractor, and CAI meet to review the workplan and transition specifications document, refine them as needed, and negotiate any changes.
4. CAI completes the final transition specifications document by outlining the approach to be taken to incorporate the transferred information into our workflow and systems and to refine the QA plan associated with each item.
5. CAI implements the plan as outlined in NJDOE-approved documents, with regular progress reporting and checkpoint auditing.

Transition Materials and Knowledge

The most effective transitions have resulted from the following meeting structure, which we propose for both the receipt of material upon contract execution and the transfer of materials to a subsequent supplier:

- **Initial Planning Meeting**. In collaboration with the State's technical staff, CAI will draft a transition specifications document that identifies all relevant data, testing information, and other materials needed for a successful transition. The meeting should include the State's entire technical staff, who have specific, relevant knowledge.
- **Vendor Meeting**. A follow-up meeting will be held with State administrators and the outgoing or incoming vendor. During this meeting, both project leadership and technical/operations staff from the new contractor will work with CAI and the State to define information format and delivery schedules and to finalize the transition specifications document.
- **Transition Meetings**. These meetings will be specific to relevant functional areas. Staff from CAI, the State, and the outgoing/incoming contractor will monitor transition timelines and delivery compliance as defined in the transition specifications document. All three types of meetings work best when participants attend in person.

For the transfer of materials, CAI proposes using our transition specifications document (see Exhibit 4.2.3-1 for an example) to guide the data transfer, keep track of progress, and plan for contingencies regarding what may or may not be available. For each area of activity, we will complete the full transition specification for each item and track it throughout the transition process. These specifications are quite detailed, as this process requires particular focus.

We note that the final transition specifications document will include QA steps for every element to ensure that the information delivered is correct. This may include identifying information sources or formats that may be less convenient for the new contractor to use but more reliable and accurate.

Exhibit 4.2.3-1: Sample Transition Specifications

Element	Description
Item Number	A number assigned to each element for inventory purposes
Team	The subject-matter team that ultimately generates the material (e.g., content, psychometric, reporting, scoring, Help Desk)
Item/Material	The data, knowledge, or other information required
Description	Detailed information about the item/material
Origination Entity/Person	The name of the person or entity responsible for ensuring delivery
Reference or Source	An information source known to be accurate
Preferred Format	The new contractor's preferred format in which to receive the information
Best Available Format	The actual format in which we will deliver the information
Backup Format	An alternate format in which the data are also available in case a backup is necessary and where the best available format differs from the preferred format
Quality Control Plan	Where possible, the plan for ensuring information accuracy
Delivery Date	The agreed-on delivery date
Actual Delivery Date	The actual delivery date
Provided By	The name of the person or entity at CAI who delivered the material
Receiving Entity/Person	The name of the person or entity at the new contractor who received the material
Completion Date	The date that the full transition of the material was complete
Status	1 = complete; 0 = incomplete

CAI has a long history of transferring data from other contractors' systems. CAI has successfully transitioned a dozen separate testing programs, including Arizona, Delaware, Florida, Hawaii, Indiana, Minnesota, New Mexico, Ohio, Oregon, South Carolina, Utah, and Texas. In addition, CAI has worked with 15 states to transition from their state-administered assessments in ELA and mathematics to the Smarter Balanced assessments. These projects demanded aggressive transition timelines, massive item and item bank development, new standards or assessment designs, extensive field testing, and delivery of robust online testing systems. During each implementation, we had the opportunity to establish best practices for effective transitions from one contractor to the next.

We feel confident that our process will fully meet the needs of NJDOE and expect the transition to be a smooth one. We will work closely with NJDOE and their current vendor during the transition period to map out the differences between features and functionality in each system. Our systems are highly configurable, enabling us to meet NJDOE specifications.

Transition to New Vendor

Should the transition to a new vendor become necessary, we will support the incoming contractor as we would hope to be supported ourselves, as our primary concern is the success of New Jersey students and teachers. The transfer will be complete and correct and will avoid disruption of services or support during the transition period. The goal is to ensure that NJDOE has access to, and control of, the products required to operate its assessment system. We have been on both sides of assessment program transitions, each of which has demanded aggressive timelines and careful planning.

Communication Management

Effective communication is a critical element of any project. To ensure clear and ongoing communication throughout the assessment life cycle, CAI's Project Management Team will provide a detailed plan or communications matrix that includes the following elements:

1. *Contact information* for team members and stakeholders who are involved in communicating deliverables, leading strategic discussions, or handling technical conversations; business title and area of responsibility are also captured
2. The *type of information* that should be shared with each team member and stakeholder; a distinction is made between the primary points of contact and those who should simply be kept in the loop
3. Preferred *communication methods*, such as email, text, and direct telephone calls, as well as preferred tools for video meetings, conference calls, collaborative document sharing, and any other*s*
4. *Meeting schedules* for standing meetings, including meeting purpose, attendees, and expectations for agendas and meeting minutes
5. *Escalation protocol* for urgent risks and issues

Communication Between CAI and NJDOE

In addition to the formal Communications Plan, the project manager will proactively communicate with NJDOE staff, informing them of any project change that might impact the State's schedule or deliverables. CAI's proposed communication strategy will ensure that NJDOE is informed in advance of emergent issues.

Meetings are an important and routine element of effective internal (CAI) and external (NJDOE and CAI) communication. The assembly of key stakeholders provides a forum for problem-solving complicated issues and ensuring that CAI's approach coincides with NJDOE's vision for its assessment program. Section 4.9 provides a detailed description of CAI's meetings plan.

Communication Between CAI and Other Vendors

CAI's successful subcontracting is based on three critical components:

1. Clear delineation of responsibility and expectations
2. Accountability mechanisms
3. Trust and integrity on the part of each player

CAI's formal subcontract agreements outline its commitments, which include an acknowledgment of the required documents, areas of responsibility, and products for which the subcontractor is responsible. CAI staff review subcontractor work and hold it to the same high standards as CAI holds itself. This formal, clear communication of expectations details the means by which developed products will be deemed acceptable.

Communication Tools

CAI maintains a suite of communication tools and services to support project communication. We use Microsoft Teams for all project-related conference calls and find that the software is largely available for use by most departments and vendors. CAI offers all the communication services listed in Exhibit 4.2.3-2. Because CAI has offices across the country and works with stakeholders in multiple locations, CAI staff are very familiar with these solutions. CAI will create a shared site for all project communication, to include access for NJDOE representatives. The site will contain a comprehensive record of program communications, including communication with any program subcontractors.

Exhibit 4.2.3-2: Communication Tools

Tool	Description
Microsoft Teams	Microsoft Teams provides the best option for facilitating meetings involving attendees in multiple locations. CAI will adapt to existing conference services solutions, as needed. Microsoft Teams connects users with real-time, online video, audio, and web-sharing capabilities. Whether we are meeting with NJDOE staff or assisting in training State personnel or local staff, Microsoft Teams will assist us in connecting. In addition to sharing presentation slides, participating in live video, and recording events, attendees can interact regardless of the size of the meeting using live chat.
Seismic Site	CAI will maintain a Seismic site for NJDOE to house technical documentation used by teams to configure online systems. Before deploying documents to the site, CAI will propose a list of users and their access rights. NJDOE will have an opportunity to modify this list before providing final approval.
Smartsheet	CAI will maintain a Smartsheet site for NJDOE to house program schedules, performance metrics, meeting minutes, and other proceeds from program meetings. CAI will propose a list of users and their access rights. NJDOE will have an opportunity to modify the list before providing final approval.
Secure File Transfer Protocol Site	CAI uses a Secure File Transfer Protocol (SFTP) site for the transfer of large databases and secure materials. The SFTP site offers an efficient mechanism for transferring large-scale data. An SFTP site will also be available for the transfer of documents and data that do not require the version control of Seismic. This site will be available to both NJDOE and the field, as needed. Such transfers do not require the workflow or overhead associated with the Seismic site. CAI will maintain the same users across systems.

Weekly Status Reporting

Weekly status meetings are an important and routine element of effective communication. CAI will host weekly and ad hoc meetings to address time-sensitive issues, review status reports and risk logs, and identify agenda items for monthly and quarterly planning meetings.

These weekly meetings will be opportunities to exchange information about the overall program status and to review upcoming milestones and deliverables. The CAI project manager will draft a meeting agenda and action item log in the agreed-on formats that will be used to assess the status of the following elements during each status meeting:

- Description of the task and a status update
- Schedule updates
- Current or anticipated issues
- Action items for different functional teams

Decisions made and outcomes discussed during the meeting will be documented in the appropriate project management artifact, which will be available to NJDOE in our document repository. A sample client communications management plan can be found in Appendix B of our proposal. CAI is pleased to work with NJDOE on the final format.

Requirements Management

CAI has developed tools and processes that enable our Project Management Team to analyze and implement New Jersey's project requirements efficiently. These tools form the basis for clear, open, and accessible communication about the project schedule, deliverables, and specific requirements.

Specifications Documents

Our Project Management Team works with our internal teams to develop detailed specifications documents for each program phase. CAI's online testing system is highly configurable. We have a well-defined process for configuring our systems and work streams to meet detailed client specifications. Formal documents for each system enumerate the various capabilities and preferences available. Every aspect of the system—from the configuration of our Test Information Distribution Engine (TIDE) to accept data exports and input student accommodations to how the items appear to students—is covered within one of our specifications documents. CAI's program director and technical project managers will work with NJDOE staff to complete each specifications document in each test administration cycle. The specifications documents enter our version-controlled knowledge management system, which manages updates and ensures that appropriate stakeholders are notified of any changes in the specifications documents.

Our system implementation work phase ensures that the system is ready for the end user. We ensure that all related documentation and training information are complete and thorough. This documentation is reviewed internally and externally before the release of the system. Prior to release, we offer three confirmations of accurate configuration:

1. The configuration data are independently compared against the specifications document to identify any errors or oversights.
2. Knowledgeable project staff compare the functioning of the system to the specifications document and note any deviations from their expectations (if, for example, the specification is correctly implemented but the behavior was not what was envisioned).
3. During review of the online pieces, NJDOE staff will be offered a user-acceptance period to review the adherence of the system to the specifications and experience the implied behavior of the system. NJDOE reviews will always follow an internal user-acceptance period resulting in project staff approval of the configurations for client review.

Exhibit 4.2.3-3 summarizes our standard specifications documents.

Exhibit 4.2.3-3: Standard Specifications Documents

Team	Document	Description	Owner
Psychometrics and Statistics	Analysis Specifications	Describes the details of analyses, including software settings and locations of data files	Lead Psychometrician
Psychometrics and Statistics	QC Specifications	Identifies quality-control (QC)-specific analyses and comparisons to be undertaken	Lead Psychometrician
Psychometrics and Statistics	Scoring Engine Specifications	Summarizes scores to be reported at various levels, attemptedness rules, and scoring computations that are performed by the test scoring engine for all tests	Lead Psychometrician

Team	Document	Description	Owner
Psychometrics and Statistics and Test Development	Test Specifications	Includes test blueprints, item specifications, and style guides	Lead Psychometrician, Test Development Project Manager
Test Development	Field-Test Summary	Shows numbers and types of items to be field-tested each year and form construction details	Test Development Project Manager
Test Development	Item Tracking System (ITS) Specifications	Defines the attributes to be collected for each item, the content review sequences, and the item layout templates	Test Development Project Manager
Operations	Packaging Specifications	Describes materials to be packed, materials to be shipped, shipping carrier, expected packing list format, and packaging details	Packaging and Shipping Manager
Operations	Receipt Specifications	Details secure and nonsecure documents to be received, expected quantity, receipt start and end dates, and special instructions	Packaging and Shipping Manager
Computer and Statistical Sciences Center (CSSC)	Requirement Documents	Defines the detailed requirements for the software or software modification to be implemented	Software Project Manager
CSSC	Test Information Distribution Engine (TIDE) Specifications	Defines detailed requirements for materials ordering, student management, and user management, including user roles within the suite of online testing applications	Software Project Manager
CSSC	Data File Generator Specifications	Defines detailed requirements for student and item-score files delivered after testing	Software Project Manager
CSSC	Online Administrative Portal	Defines the layout, skin/theme, user cards, and content sections	Software Project Manager
CSSC	Test Delivery System (TDS) Specifications	Defines the test settings for the Test Administrator (TA) and Student Interfaces and the business rules that govern test opportunities	Software Project Manager
CSSC	Centralized Reporting System (CRS) Specifications	Lists the reporting settings for student and aggregate reports	Software Project Manager

Team	Document	Description	Owner
Reporting	Paper Reporting Specifications	Details the reports, data elements to be included, calculation rules for each data element, special rules for merging and cleaning data, and other similar items	Reporting Lead
Reporting	Report Mock-Ups	Presents an annotated graphic mock-up of reports, providing the look and feel, and identifying the critical elements of their appearance	Reporting Lead

Tracking Documents

Our Project Management Team relies on several tracking documents to monitor projects, coordinate work among internal teams, and communicate progress toward milestones for NJDOE and program partners.

The issues log provides a weekly status report that includes a list of issues needing correction and includes all information needed for problem resolution as required by the RFQ. The priority list identifies the document name, the responsible party, the date the document is due to be returned, and the date the document is due to be finalized. The tracking document also assigns a priority level to help clients manage and prioritize work during busier times in the schedule.

Each document has an owner and a list of stakeholders. A responsible, accountable, support, consult, inform (RASCI) chart will be used to help guide discussion and decisions for all deliverables. The owner of the document is the person responsible for keeping the document up to date and ensuring that all stakeholders sign off on any changes. Stakeholders include project team members whose work depends directly or indirectly on the work described in the document. In almost every case, client staff members are stakeholders in these documents, as well. Exhibit 4.2.3-4 summarizes our standard tracking documents.

Exhibit 4.2.3-4: Standard Tracking Documents

Team	Document	Description	Owner
Project Management	Issues Log	Updated weekly; tracks issues and near-term deliverables and notes progress, problems, risks, assignment, and agreed-on changes to scope or progress	Project Manager
Project Management	Priority List	Lists the testing and administration documents currently being exchanged between CAI and NJDOE; assigns a priority level to each document; identifies the document's review-level due dates	Project Manager
Project Management	Risk Register	Identifies and classifies project risks organized by function and area; summarizes proposed mitigation strategies	Project Manager
Test Development	Item Release List	Lists specific items to be released each year for each subject	Lead Psychometrician,

Team	Document	Description	Owner
			Test Development Project Manager
Test Development	Batch Delivery Tracking Sheet	Tracks item batches by grade and subject, including the number of items in each batch, number of items accepted, and number of items accepted with revisions; tracks due dates	Test Development Project Manager

Change Management

A common understanding with NJDOE as to the scope and cost of the work is a prerequisite to finalizing the Project Management Plan, which occurs in the very early stages of the project life cycle. CAI has a structured change management plan that establishes an orderly and effective process for tracking the submission, coordination, review, evaluation, and authorization of all changes to the project's baselines. In this way, we ensure control in budget, schedule, scope, communication, and resources.

We believe it is critical to implement NJDOE's assessment program in a way that is as cost-effective and efficient as possible, without sacrificing schedules, quality, or the benefit of innovative ideas. CAI continues to innovate, whether it is enhancing the user experience of our applications or finding new ways to best measure what students know and can do.

Change Management Roles and Process Flow

The process to request, log, evaluate, and authorize change requests will follow a standard formula. Five primary roles facilitate CAI's change management process through its five primary phases. Refer to Exhibit 4.2.3-5 for the roles and the typical order of the process.

Exhibit 4.2.3-5: Change Management Roles and Process

Phase	Role	Description
Request Change	Change Initiator	A submitter completes a Change Request Form.
Log and Report Updated Status	Change Manager	Change Request Form is logged, and status is updated and tracked throughout the process.
Evaluate	Subject-Matter Experts (SMEs)	Impact analysis, estimated level of effort, proposed solution, estimated costs.
Authorize	State Authorizer	Approval to move forward (or denial, which ends the process).
Implement	Change Implementation Team	Make the necessary adjustments to carry out the requested change and communicate change request status to stakeholders.

Change Request Form and Log

Change requests are initiated by completing a Change Request Form in Smartsheet. Change requests may come from State staff, CAI staff, and subcontractor staff. Typically, a Change Request Form will be completed only after consultation with NJDOE.

The project manager serves as the change manager, facilitating the completion of change requests, updating the change control log, assigning an internal SME, and reporting to stakeholders throughout the process.

Impact Evaluation

When a change is requested, CAI will carefully analyze its impacts on the project's schedule, cost, and overall quality. Analysis includes the feasibility of making the proposed change and any dependencies and risks associated with it. In some instances, it may be necessary to define the impact if the change is *not* made.

In this evaluation phase, the project manager will engage SMEs and key stakeholders, including State staff, who can ensure that all changes are adequately assessed from both a contract and technical perspective. SMEs may include technical project managers, senior software engineers, Help Desk managers, senior content developers, and QA staff.

Most changes will require updates to the Scope of Work (SOW), change control log, and risk register. Additionally, to incorporate changes to deliverables, expectations, or completion dates, project schedules at all levels may need to be reviewed and adjusted. Technical specifications, test plans, and quality management plans may require updates. Each document owner is responsible for ensuring that the changes are accurately drafted, reviewed, and accepted by each stakeholder, including NJDOE.

When a change has a financial impact, the SOW will be updated, and an amendment will be executed with NJDOE. If NJDOE prefers to use a document other than an amendment, CAI will coordinate a process to accommodate that preference. In any case, CAI will manage and track state-specific options and associated costs that NJDOE has approved.

State Authorization

After reviewing potential impacts, NJDOE will approve or reject the change request. CAI will not implement a change until NJDOE has confirmed and authorized its decision to make the change. Whether the change is approved or rejected, the project manager will update the change control log to reflect the updated status.

Implementation

The change implementation team includes project managers, team leads, and other affected parties. The change implementation team is responsible for identifying the project documentation that must be changed or updated to reflect the approved change and ensuring that such changes are made and communicated to stakeholders in a timely manner.

Issues Management

When a project risk becomes an issue, it needs to be carefully managed and tracked to resolution, and then comprehensively reviewed to inform future risk planning. As noted earlier, an issues log is a standard tracking document for CAI project managers. Updated routinely and reviewed at weekly meetings, we use this log to track issues and near-term deliverables and note progress, problems, assignment, resolution, and agreed-on changes to scope or progress, as applicable.

Similar to project risks, project issues are reviewed and qualified as they are logged. An issue owner is assigned, and details of the item are documented to include the following:

- Comprehensive issue description
- Issue categorization (low/medium/high impact)
- Identification and expected resolution dates
- Internal/external impact analysis
- Root cause/remediation plan and implementation date

High-impact issues are immediately escalated to the Production Control Board for further review and determination of whether supplemental remedies may be needed to control and correct the item(s) in question. Once the issue has been successfully and satisfactorily resolved, risk and issue management give way to QA protocols designed to inform and prevent a recurrence of the noted issue. CAI's quality processes are rooted in the continuous improvement model, wherein we strive to continually evaluate and implement improvements to all facets of our work—with a particular emphasis on ensuring that realized program risks are expansively addressed in a timely and practical manner.

Risk Management

Reducing risk and ensuring the delivery of high-quality products and services are at the core of CAI's identity as an organization. We have meticulously developed our systems and processes to deliver the most consistent and accurate products possible, and we have paired this work with a rigorous risk management and evaluation regimen which serves to instill confidence in our work, thereby reducing the need for unnecessary rework and avoiding additional project costs.

Cross-functional risk management is embedded in our everyday project management activities, and CAI uses industry-leading collaboration tools and platforms to document, categorize, and track these risks through each functional area and project phase. The result is transparent communication and supporting reports that convey clear and actionable information about the status of program dates and deliverables. CAI's systems and processes are designed to be nimble and responsive to changing program circumstances, and our intentional focus on cross-functional risk management enables us to respond quickly and reliably to identified risks before they are realized.

Cross-functional risk management refers to the identification, monitoring, and development of mitigation strategies with whole-project awareness at the center of the activity. Project managers work collaboratively with functional team leaders to identify potential points of vulnerability and document risks that may occur in all critical program areas, including the following:

1. Item and test development
2. Page production and test booklet printing
3. Shipment packaging, distribution, and retrieval
4. Ancillary material development (test administration manuals, non-embedded supports)
5. Online test configuration development and user acceptance testing (UAT)
6. Online test administration and capacity planning
7. Test scoring specifications and processing rules
8. Data processing, retention, and protection
9. Report card/student report production and delivery
10. State data file and summary report production and delivery
11. Psychometrics and technical program report production
12. Training and professional development support services
13. Project management deliverables and reports (e.g., schedule, communications plan)
14. Program financial management

In addition to assessing project-specific risks, CAI also provides a forum for project managers to engage in enterprise-level risk management. In this forum, managers can present risks that require mitigating resources or strategies that are external to the project or to their project

authority. This forum similarly engages project managers in risk identification and mitigation activities for risks that may originate from an external or enterprise-level source.

Risk Management Plan

The activities and methodologies described in CAI's Risk Management Plan are intended to safeguard on-time program delivery without causing degraded service or quality. The plan reflects our ongoing commitment to a culture of quality and further supports CAI's QA procedures and protocols.

Program risks are initially assessed as part of program planning meetings, and risk management thereafter becomes a standing facet of how we quantify the overall health and success of the program. Risks must be actively managed and represented as real program elements that require regular input and monitoring from project management and functional team members.

Our Risk Management Plan incorporates the following elements:

1. **Risk Identification:** CAI will work with NJDOE to collaboratively identify areas of concern and record them in a risk log. We use project lessons learned to populate the risk log and guide brainstorming. These risks are then incorporated into weekly program meetings for review and updating for as long as the risks remain active. Our risk log includes:
    a. Risk description
    b. Level of risk
    c. Impact
    d. Mitigation plan
    e. Projected resolution date
    f. Person responsible
2. **Qualitative and Quantitative Risk Analysis:** CAI determines which risks pose the greatest threat to program integrity and delivery and assesses how likely they are to occur. CAI defines its qualitative risk categories as follows:
    a. *Low-Impact Risks:* May have a minor effect on or consequence to project objectives. Typically, controls are already in place to prevent or significantly mitigate the occurrence; while no special project emphasis is required, these risks are closely monitored to detect any potential increase in risk level.
    b. *Medium-Impact Risks:* May have a mildly adverse effect on the project's objectives, cost, schedules, or State satisfaction, but controls are in place that are likely to successfully prevent occurrence. Close control of all risk sources is needed, and mitigation plans may need to be implemented.
    c. *High-Impact Risks:* Likely to have a significant impact (including the possibility of failure) on the project's performance, cost, schedules, or State satisfaction. The probability of occurrence is so high, and the consequence so severe, that rigorous control of all risk sources is needed. Risk mitigation plans are actively being pursued.
3. **Risk Management Planning:** CAI prepares the program documents that will be employed to guide conversations about risk management.
4. **Risk Response Planning:** CAI prepares proactive risk response scenarios for the most commonly anticipated risks across each of its primary systems. Additional response scenarios are prepared for program-specific risks and are updated in advance of each test administration to ensure that the prescribed mitigations and corrective actions are still valid and appropriately effective.
5. **Risk Monitoring and Control:** CAI identifies the tools that will be used to monitor the identified risks (e.g., using a program dashboard to monitor available TDS capacity and

testing concurrency). CAI ensures that appropriate points of communication have been established for key risk areas and that proper steps are being taken to control or contain risks that have identifiable triggers.

6. **Communication:** CAI ensures that a communication strategy exists if a risk is realized and information needs to be conveyed quickly and effectively to internal or external project stakeholders (e.g., communication tree, email notification templates, website banner messages). Waiting until a risk has been realized to determine a communication strategy means it is too late to effectively manage how information about issue resolution will be distributed or conveyed. Our plan will identify in advance how risks will be communicated to all stakeholders.

Training Plan

CAI brings extensive experience in providing training to support standardized test administration and facilitate the transition to a new testing vendor. Our experience supporting thousands of schools and districts as they transition from one vendor to another has taught us that clear, detailed training materials are critical for any standardized assessment program to succeed. We understand that user familiarity with the new online testing system is essential for a smooth test administration.

Our comprehensive training plan covers various areas, including general training requirements, schedules, a platform for registering and delivering training, training materials, CAI trainer requirements, deliverables following each training session, and online support modules.

Our approach to training supports a standardized, efficient test administration and

- teaches stakeholders how to use each component of the online testing system to ensure a smooth test administration;
- builds understanding of critical test administration procedures for online administrations, as well as tests that some accommodated test administrations may require;
- builds deeper understanding of the assessment system, how the tests are aligned to state standards, and the purposes of different types of assessments (e.g., summative and end-of-course assessments); and
- guides stakeholders on how to use the data from each type of assessment to help refine instruction and make programmatic improvements.

Maintenance and Operations

The Project Management Team carefully monitors the status of the project against the established baseline throughout the project life cycle, meeting routinely with stakeholders to review assumptions and progress. CAI uses Smartsheet as the primary repository for shared management documentation, program schedules, and program meeting minutes so that they can be referenced by each project stakeholder. The platform also facilitates the creation of dashboards and data visualizations, which provide for easy and effective tracking of project deliverables and overall program health.

Our standard processes include collecting documents that track progress on various aspects of the program. In addition, the weekly project meeting agendas outline current activities and provide updates. Weekly meetings provide a forum for addressing complicated issues and monitoring the progress of each program activity, ensuring that all stakeholders stay up to date and on track to meet goals. It is a time to regroup with stakeholders and address items that need to be discussed to keep the project moving forward successfully. During such meetings, we routinely review the following:

- Status updates
- Blockers or scope creep that need to be addressed and potential solutions
- Upcoming deadlines
- Issues logs, risk registers, and change logs, as needed

Meetings are followed up with meeting minutes that document outcomes, decisions, and action items and are available to all stakeholders as a reference for production plans and tasks.

Administrative Completion Reporting

CAI understands the requirements outlined in the Project Management Appendix and will submit Administrative Completion Reports and supporting documentation to confirm the approval and closure of all deliverables, per phase. Details for such activities will be included in the Project Management Plan.

4.2.4. Customer Service Support

We understand that the role of the Help Desk is to ensure that the educators in New Jersey districts and schools receive the technical help they need and are left feeling supported and that their time is valued. The agents we employ represent the program to stakeholders, and it is therefore essential that their training and tools, as well as their expertise, program knowledge, and professionalism, are of the highest quality.

CAI's Help Desk ensures that schools, districts, and the SCM and NJDOE staff receive prompt and accurate assistance with all questions and requests related to test administration, test scoring, and CAI testing and reporting systems. We have a proven track record of supporting many complex and nuanced assessment programs across our existing state clients. Our Help Desk provides technical and logistical support to anyone who needs assistance with program operations or systems. Our agents assist users in navigating through the full testing experience with the express purpose of minimizing burden, disruption, and inconvenience.

We commit to providing support across all technology environments in New Jersey schools and districts to ensure the successful deployment of the New Jersey Assessment Program. CAI makes it a standard practice that, during program planning and initiation, we will provide a New Jersey Help Desk Service and Staffing Plan to document the formal service-level agreements (SLAs) regarding staffing plans, training, staff certification, service hours, and performance measures, including our commitment for response time, resolution time, escalation actions, and notifications. This document serves to codify all service support requirements, ensuring that they are fully understood and concrete methods for implementation are in place.

> Across our state clients, most user contacts are resolved at our Tier 1 Help Desk with a first-call resolution rate of approximately 85% and an average call duration of under eight minutes. We resolve 90% of all cases in fewer than 24 hours.

The following sections describe the systems and processes that guide our customer support Help Desk and technical support services, and how these align to NJDOE's essential requirements. We have carefully read NJDOE's requirements for the platform, capacity, training, support service, communication, reporting, and SLAs and affirm our compliance with the requirements detailed in the RFQ.

4.2.4.1. Customer Services Platform

CAI uses the 8×8 Virtual Contact Center as our integrated contact center to handle calls, emails, and online chats. The 8×8 Virtual Contact Center is a secure cloud-contact center that can support heavy call volumes while keeping telephone lines running smoothly and facilitating agent engagement and cross-team collaboration to ensure that all client contacts are efficiently and successfully addressed. The system supports role-specific interfaces (e.g., agent, team lead, administrative), designed to consolidate the tools and data into a rich, unified interface that facilitates the work they do. For instance, the 8×8 Virtual Contact Center application is embedded in the Agent Interface, allowing agents to access critical information that improves each interaction through more personalized and efficient support. Our system supports the collection of analytic information necessary to provide agents and supervisors with timely feedback and to ensure continuous monitoring and effective management of contacts across inquiry channels (i.e., telephone, online chat, email).

CAI's 8×8 Virtual Contact Center supports automatic and efficient call routing; supports efficient workflow by routing calls to the most qualified and available agent; facilitates self-service options if elected by the client; and handles call escalation if the call is not able to be resolved in the initial contact.

All case information and follow-up communication outside normal business hours are systematically recorded in the 8×8 Virtual Contact Center; data are captured in real time and are available for reporting to the SCM. CAI will work with NJDOE to establish clear reporting protocols, with pre-established reports generated and delivered on a nightly or weekly basis, depending on the needs of NJDOE staff.

4.2.4.2. Customer Support Services Accessibility and Capacity

CAI will provide Help Desk support services via a dedicated, existing toll-free telephone line, as well as a webpage with email access and an online chat feature. We will staff necessary peak call volumes during key program periods, including test administration and registration cycles, as well as other scheduled program events. The New Jersey Help Desk will operate year-round, providing full service from 6:30 a.m. to 7:30 p.m. ET, Monday through Friday. We arrange our staffing and coverage plans to align with the program schedules of each state client and its district/school calendars. CAI's holiday schedule will be provided to the SCM for each school year; however, the Help Desk closure will correspond to NJDOE's program closure dates (e.g., state holidays).

CAI will staff the New Jersey Help Desk with high-quality, trained representatives capable of handling the expected call volume and responding in a timely manner. Ms. Victoria Anderson will lead our Service Center staff of agents who are trained and dedicated to providing excellent service to all New Jersey districts and schools that participate in the New Jersey Assessment Program. Ms. Anderson has 16 years of client service experience. She manages CAI's Help Desk across all assessment programs, with a focus on support for online testing. She also manages CAI's Service Center knowledge bases, inquiry tracking systems, and telephone and electronic communications systems. She oversees full-day support across five time zones for 10,000+ monthly inquiries. As the CAI Help Desk manager, she establishes and enforces processes and best practices; adheres to proper training methodologies and provides staff training; produces management reports; communicates program statuses and issues with the Project Management Team; oversees our clients' SLAs; and uses standard metrics to track and manage the Help Desk workflow.

Staffing levels are continuously monitored to ensure that agent resources are appropriately aligned to call volume and caseload so that all cases can be assigned and addressed as they are received, even during testing surges. Consequently, our staffing constantly scales up and

down, depending on the seasonal work volume. During peak testing periods, CAI has more than 250 staff members working in our support centers and providing services from 5 a.m. to 10 p.m. ET, Monday through Friday, with occasional Saturday support periods.

Our staffing practices—recruiting, hiring, onboarding, and training—have proven to be very successful, providing us with high-quality client services staff in both our full-time employee and contractor staffing pools. Our support calendars for clients include both spring and fall testing, and we have been able to keep or rehire many of our best temporary staff across seasons, allowing them to work part-time or with voluntary time off during the summer and holidays so that they are available for peak testing season.

CAI has successfully met the SLAs established for our clients and expects to do no less for New Jersey. We will hire, train, monitor, and support the agents necessary to meet the New Jersey Assessment Program SLAs and service center protocols, as required.

Finally, our Help Desk is committed to providing access and support for all contacts, including educators who are non-English speakers or require special telecommunication services (i.e., TTY and TDD services) for hearing-impaired callers. These are standard services for our state clients, and we will work with the SCM to determine if there are additional specialized services required for NJDOE's stakeholder populations. Additionally, CAI will work with NJDOE to understand the inquiries or support types that should be transferred to NJDOE and the protocols to conduct these transfers (i.e., warm transfers, ending recorded calls) to ensure that the caller receives the most effective, positive caller experience.

4.2.4.3. Training of Customer Service Representatives

Our Help Desk and technical services staff is initially trained on all CAI client-facing systems, receiving training and certification on the systems and interfaces in use by NJDOE's local agencies. This baseline expertise provides a critical foundation and allows us to then train the agents on the information that is specific to the New Jersey Assessment Program's user systems.

The CAI New Jersey project team will work closely with the SCM to develop and/or obtain approval on all resource materials, including manuals, scripts, and program support materials, that will be used to train Help Desk staff and made available as resource materials for agents to access throughout the project. Upon approval, the CAI New Jersey project team will set up training for Help Desk staff on program specifics and post all resource materials to Superhelp, our online knowledge-based tool. Prior to each test administration, the New Jersey project team will provide program-specific training, focusing on the support services and resources that align to each phase of program implementation, beginning with test registration and continuing through post-administration reporting and appeals. In some cases, and often during the first test administration of a new program or contract, the project team will conduct just-in-time "refresher" sessions to prepare the agents for any novel requirements or specific types of inquiries that may arise during this phase of the program. All agents that support New Jersey district and school personnel are required to complete program-specific training and certification on program materials and protocols prior to their work on NJDOE's program. Training records, materials, and syllabi are maintained for future use and for review by NJDOE if requested.

CAI uses standard templates and formats for training materials across programs, including scripts, FAQs, and other resource materials, in order to assist in easy orientation and quick reference by the agents; program-specific manuals and guides are reviewed and made familiar to the agents, allowing for easy reference. The project team provides training on critical aspects of the program, emphasizing program policy information and any unique aspects of the program.

Superhelp

All CAI Help Desk personnel have access to Superhelp, an online, CAI-developed repository with FAQ documents, guides, and manuals for agents. Superhelp uses a Google search appliance to allow Help Desk agents to quickly locate applicable, approved responses and materials. Information in Superhelp is developed with and approved by the SCM.

CAI developed this knowledge-based tool to ensure that all agent responses to the same issues are consistent. The content in Superhelp provides a common baseline for all agents. It also provides a mechanism for updating the technical information and other documentation available to Help Desk agents as a result of real-time issue identification and feedback from users. This tool is a cornerstone in ensuring that agents provide up-to-date, accurate information to every user during every phase of NJDOE's program.

Quality Assurance Monitoring

CAI also staffs an internal Quality Monitoring team that is responsible for monitoring agent performance against elements such as key performance indicators and case progress. The Quality Monitoring team uses call-recording software and automated call routing to ensure that our agents are providing the highest quality service possible and adhering to scripted responses; they also ensure that clients are receiving accurate and professional service. We are also able to use insights identified in this process to conduct retraining or targeted, issue-specific training.

4.2.4.4. Levels of Customer Support

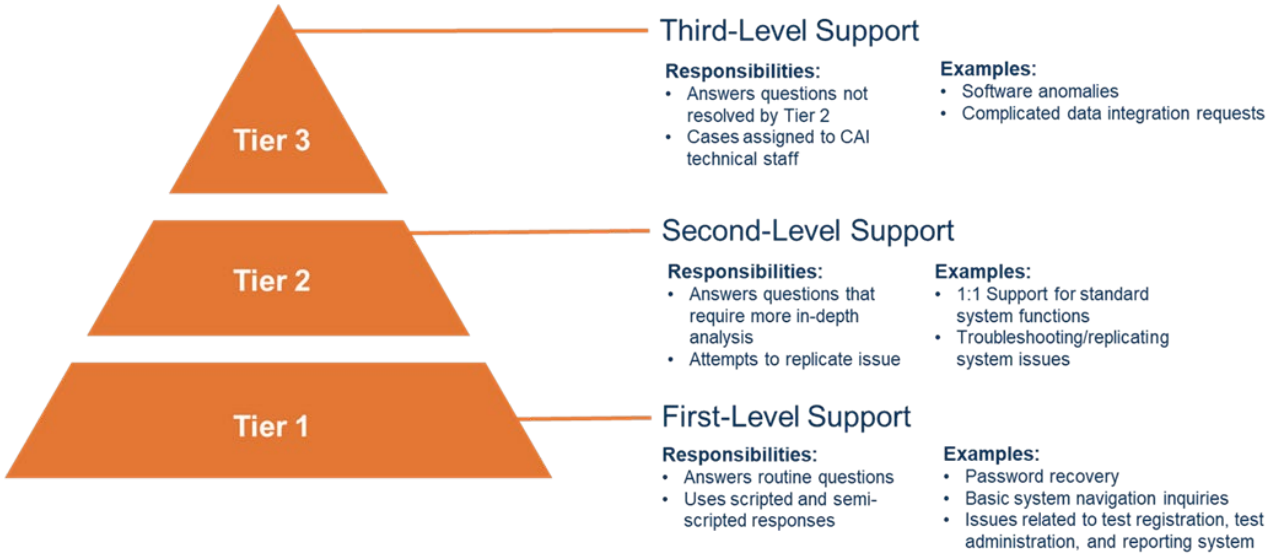
CAI uses a tiered structure to facilitate the rapid resolution of every client contact. We rely on an integrated tiered structure, where support is organized into three levels in order to manage increasing levels of complexity in the most efficient manner possible. Agents at all levels will receive training specific to the New Jersey Assessment Program and will use the tiered structure to effectively support the diverse types of client and user issues across these three levels of service. As described previously, CAI uses the 8×8 Virtual Contact Center at all tiers to facilitate the management of user calls by logging, tracking, and escalating all telephone contacts, emails, and chat interactions between CAI Help Desk agents and users. All Help Desk communications, including recorded telephone calls; emails sent and received; and conducted chat sessions are stored in their original form in the 8×8 Virtual Contact Center and may be retrieved for an extended period. We will note that all levels of service (across Tiers 1 and 3) are fully available throughout the year and staffed based on estimated and historical call volumes. New Jersey districts and schools will always have access to advanced technical support for issues that cannot be resolved at Help Desk Tier 1.

CAI will work with the SCM to establish clear issue-escalation protocols, including any issues that should be routed to NJDOE for handling. While most user contacts are resolved at Tier 1, we understand that some issues require greater levels of technical expertise or troubleshooting, and our escalation protocols allow agents to manage such issues with ease.

Using our integrated customer support services platform, we actively monitor all contact channels in real time to ensure that any call about an urgent or potentially urgent issue is promptly identified and escalated. Agents across our levels of service will be trained on New Jersey call-handling protocols, including immediate notification of the SCM about any calls of an urgent or sensitive nature.

Exhibit 4.2.4.4-1 illustrates CAI's multi-tiered customer support.

Exhibit 4.2.4.4-1: CAI's Multi-Tiered Customer Support



Tier 1. As described previously, our client support service provides an efficient, tiered structure that facilitates rapid resolution of customer queries, even when a query needs to be escalated; Tier 1 agents also have a history of quickly resolving most inquiries they receive.

Our Tier 1 agents are trained to answer routine questions and to provide explanations and clarifications using scripted and semi-scripted responses, including such things as password recovery; basic system navigation inquiries; material orders and returns; and issues related to test registration, test administration, and the reporting system. With both full-time employees and seasonal hires, our Help Desk is well staffed at Tier 1 to address peak call volumes. When a case cannot be resolved at Tier 1, the agent understands the importance of quickly determining that the case should be escalated in order to provide the most efficient service. In such a case, the agent would inform the user that their inquiry will be escalated to Tier 2.

Tier 2. When a caller presents a question or request that requires more in-depth analysis to resolve, the case details are promptly escalated from Tier 1 to Tier 2. A Tier 2 agent is then assigned as owner to the case in the 8×8 Virtual Contact Center. The Tier 2 agent reviews details in the 8×8 Virtual Contact Center and initiates contact with the user to gather additional information and update the user as the case progresses. The agent attempts to replicate the issue by using the screen-share feature in Zoom or a secure remote desktop, or by following established troubleshooting protocols.

Tier 2 agents will work within the New Jersey final SLA; however, for any escalated case, our standard protocols call for an initial response by a Tier 2 agent within two hours of escalation. If a case cannot be resolved within 24 hours of the initial response, the assigned Tier 2 agent must provide a plan to resolve it and must remain in daily communication with the contact/school until the issue is resolved. A detailed SLA will be approved by SCM and included for each test administration.

For any issue that results in a student being unable to test, a Tier 2 agent will manage the case until the issue is resolved and confirmation is received that the student has access to their test. All such cases will be reported daily to the SCM in accordance with the SLA. Additionally, any technical issue that is unable to be resolved within 24 hours will be reported to the SCM in accordance with the SLA.

Tier 3. In the rare event that an issue cannot be resolved at Tier 2, the case is escalated to Tier 3. Ownership of the case remains with the Tier 2 agent, who will follow the case's progression, provide updates to the user, and obtain additional information from the user if needed. At Tier 3, dedicated resources on the CAI New Jersey project team will also work to resolve each case with the appropriate CAI technical staff (e.g., network engineer, software engineer) to ensure that they can keep the SCM informed and can provide any program-specific information that may be helpful in the resolution of the case.

We have used the tiered support structure for all of our current state clients with great success. CAI supports all Help Desk inquiries originating from all program stakeholder groups. Our comprehensive call logging and tracking provide us with valuable insights that are used each year to improve the tools and communication that are developing for the following test administration. We can schedule post-project reviews at the end of the test administration or at critical points along the testing season timeline, extracting information from the questions asked and issues that are encountered during these reviews to continuously improve our service and support.

4.2.4.5. Customer Service Communications and Supports

While CAI expects to tailor the reports to NJDOE's requirements, we will rely on three standardized reports that efficiently monitor Help Desk activity. We will work with the SCM to identify any additional reports that may be required. We have read the report types listed in the RFQ and are readily able to provide all requested report types using the information and analytics maintained in our call management system. The following is a sampling of the report types that NJDOE requires:

- A weekly case analysis summary or aging report
- A daily report of all open Help Desk tickets
- A weekly report of all Help Desk activity

The weekly case analysis summary lists all the calls, emails, and online chats for the week by system, category, and status. The system filter allows clients to quickly identify which schools or districts currently have the most questions, and the category filter identifies the nature of callers' queries. For example, users may be calling to troubleshoot installation, navigation, or printing. These filters help pinpoint the system and the types of questions that callers ask most frequently.

In addition to the case analysis summary, we can provide a weekly report of all CAI Help Desk activity. This report lists all resolved and open tickets, the system and category information, and a summary of each inquiry, allowing the SCM to understand the details of the initial question and the response provided.

CAI's New Jersey project team can also send the SCM a weekly aggregated transaction report that includes the following metrics:

- Total number of incoming calls
- Average speed to initially answer the call
- Average talk time
- Number of calls placed on hold and the length of time on hold
- Average queue time
- Maximum wait in queue
- Number of calls abandoned, if any

- Abandonment rate
- Calls handled within service-level parameters
- Service level (percentage of calls handled within service-level parameter)

Any specialized reports (detailed or summary) requested by the SCM will be configured based on the available information and established SLA. CAI will provide designated NJDOE staff members with training and access to the New Jersey client instance of the 8×8 Virtual Contact Center so that they can monitor and generate reports using the contact information/parameters that provide meaningful information to them, including all parameters listed in the RFQ.

Refer to Exhibit 4.2.4.5-1 for sample summary reports and Exhibit 4.2.4.5-2 for a sample file evaluating a Help Desk queue.

Exhibit 4.2.4.5-1: Sample Summary Reports

Case Analysis Summary Report

version 1.2

Cases by Project

Program	Project	All Cases	Pcnt of Total	Resolved	Pcnt Referred to Tier-2	Longest Age (Work Days)	Shortest Age (Work Days)	Avg Age (Work Days)	Avg Age (HH:MM:SS)	Median Age (Work Days)
STATE A	PROJECT 1	484	33	484	0	21.4	0	0.5	4:45:17	0
STATE A	PROJECT 2	392	26	392	2	9.6	0	0.2	2:13:4	0
STATE A	PROJECT 3	604	41	604	1	19.8	0	0.2	1:39:8	0
	Program Totals	1480		1480						

Cases by CAI System

Program	System	All Cases	Pcnt of Total	Resolved	Pcnt Referred to Tier-2	Longest Age (Work Days)	Shortest Age (Work Days)	Avg Age (Work Days)	Avg Age (HH:MM:SS)	Median Age (Work Days)
STATE A	Paper-Pencil Assessment	43	3	43	0	3.2	0	0.4	3:40:8	0
STATE A	Portal-Document	30	2	30	0	3	0	0.2	2:11:49	0
STATE A	Student User Management	10	1	10	0	0.2	0	0.1	0:58:30	0.1
STATE A	TDS-Data Entry Interface	35	2	35	0	1.3	0	0.1	0:54:41	0
STATE A	TDS-Score Entry Interface	15	1	15	0	0.4	0	0.2	1:29:35	0.1
STATE A	TDS-Secure Browser	42	3	42	11	5.1	0	0.3	3:12:31	0
STATE A	TDS-Student Interface	88	6	88	7	2.6	0	0.1	1:23:9	0
STATE A	TDS-TA Interface	60	4	60	0	0.4	0	0	0:13:51	0
STATE A	TDS-Training Student Interface	7	1	7	0	19.8	0	3	30:4:17	0.4
STATE A	TDS-Training TA Interface	12	1	12	0	0.3	0	0.1	0:57:18	0
STATE A	Teacher Hand Scoring System	32	2	32	0	0.2	0	0	0:12:32	0
STATE A	TIDE	981	66	981	0	21.4	0	0.3	2:32:19	0
	Program Totals	1480		1480						

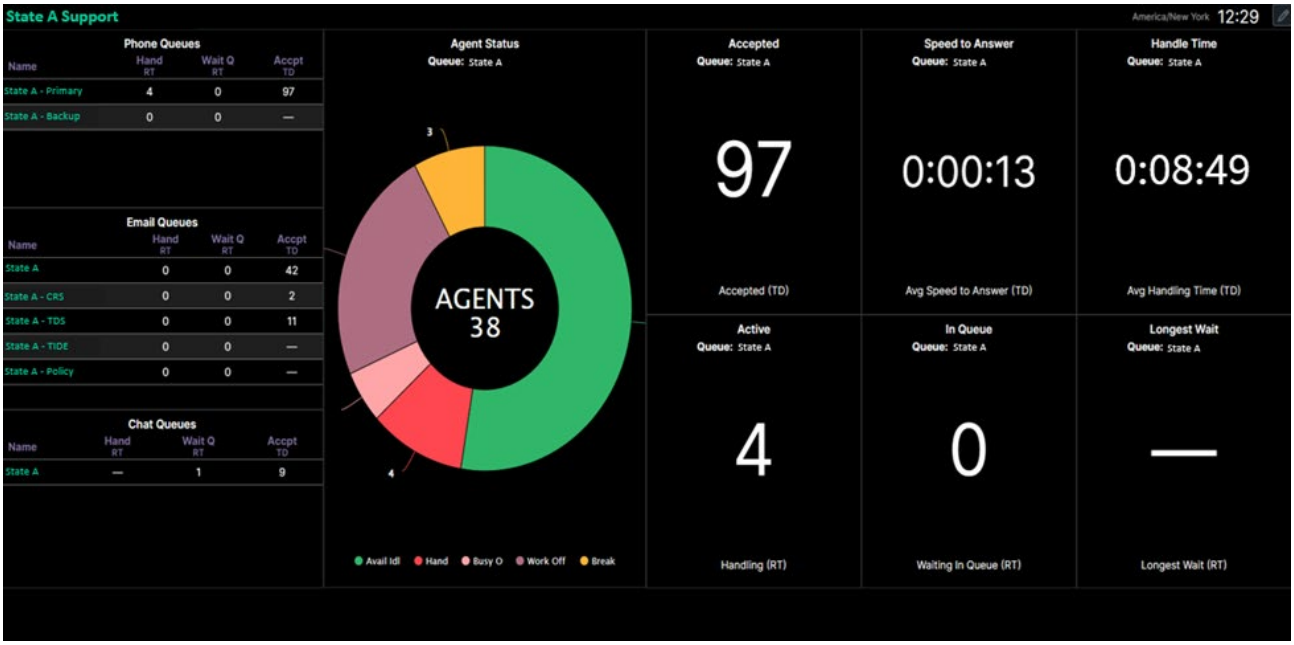
Exhibit 4.2.4.5-2: Sample File Evaluating Help Desk Queue

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Queues: Transactions**												
2	Period: 06/15/2019 - 06/30/2019												
3	Granularity: date range												
4	Report Generated on: 07/10/2019 09:56:56 (GMT-5)												
5	**Time Zone:** (GMT-5) Eastern Time												
6													
7	Media	Queue	# entered	# accepted	Answered in SLA		Average waiting time for accepted transactions	Longest waiting time before accepted	Total time processing transaction	Total time on post processing	Total time processing + post processing transaction	Average time processing transaction	Average time on post processing
8					#	%							
9	Chat	STATE A	16	15	15	100.00%	0:00:08	0:00:38	2:51:47	0:19:58	3:11:45	0:11:27	0:01:19
10	Phone	STATE A	317	315	314	99.68%	0:00:09	0:00:46	33:18:44	10:33:04	43:51:48	0:06:12	0:01:57
11	Email	STATE A	170	169	164	97.04%	0:47:15	45:09:39	5:22:14	0:00:00	5:22:14	0:01:54	0:00:00
12	**Grand Totals**		**503**	**499**	**493**	**98.80%**	**0:16:06**	**45:09:39**	**41:32:45**	**10:53:02**	**52:25:47**	**0:04:55**	**0:01:17**

Enhanced Visibility for NJDOE During Test Administration

CAI has also worked with a variety of state clients to create a Testing Support Dashboard that provides real-time access to the states' project platform. The at-a-glance Dashboard can provide access to NJDOE staff on key performance indicators, such as telephone, email, and chat queue status; agent status; speed-to-answer metrics; handling time metrics; longest wait-time metrics; and a variety of other elements in real time. In most cases, CAI maintains a regular reporting schedule of these same metrics to clients, but several state clients appreciate the real-time access and transparency that the Testing Support Dashboard can provide. Exhibit 4.2.4.5-3 presents an illustration of what might be included on a New Jersey Assessment Program dashboard.

Exhibit 4.2.4.5-3: Testing Support Dashboard



In addition to the system reporting, the CAI New Jersey project team will provide regular communication that encapsulates the Help Desk landscape and provides information about trends, recurring questions, and other issues of note. Our goal is always to use this information to improve the current and/or future program communication and ensure that NJDOE is left feeling well-informed and supported.

We pride ourselves on our system uptime, engineering support, and continuous monitoring that have resulted in our excellent track record. However, it is always our intention to be ready for any event. To this end, CAI will work with the SCM to develop a short series of pre-recorded messages that can be implemented in the case of a system outage or other emergency issues. These messages will be archived in the 8×8 Virtual Contact Center, allowing for very quick implementation should such an event be encountered and the protocol for deployment need to be initiated.

In all cases, the decision to deploy emergency messaging would be made in full view and with approval from the SCM or designated NJDOE staff. Additionally, CAI will provide NJDOE's team with emergency points of contact for any egregious or emergency-level issues, ensuring that NJDOE has access to key staff who are responsible for urgent issues outside of business hours.

4.2.4.6. Customer-Support-Level Service Agreement

CAI will comply with the requirement to draft and submit an SLA by March 1 of each contract year, detailing all obligations and targets for the customer service Help Desk support. The final SLA will meet the requirements as outlined in NJDOE's RFQ and be prepared for review and approval by NJDOE.

CAI will use a standard SLA template as a baseline, provided NJDOE does not have a preferred existing format. We expect the final document will include the key metrics and established targets for each of the metrics that will be used to evaluate the performance of the services we provide. We will track and report on all of the following key performance metrics included in the agreement:

- A response time of no more than two hours to respond to all emails received within business hours, and after-hours emails must be responded to within two hours on the next business day
- A response time within two hours of the next business day for any voicemails received outside of business hours

We are proud of the quality and responsiveness of our Help Desk staff and expect to service NJDOE and New Jersey districts and schools with high-quality professional service and become a critical component in the success of NJDOE's program.

4.2.5. Website Hosting and Data Storage

CAI will establish, host, store, and maintain a secure interactive system for storing and downloading large quantities of data. This system for storing and downloading reporting data is part of our Centralized Reporting System (CRS), a dynamic, longitudinal system that stores statewide assessment results for all students across multiple years.

Protecting Personally Identifiable Information in CRS and Across All CAI Systems

CAI recognizes the crucial importance of protecting user and student data at every stage, whether these data are being transmitted, stored, or converted. All our systems protect individual privacy and confidentiality in a manner consistent not only with New Jersey's data privacy laws, but also with the Family Educational Rights and Privacy Act (FERPA) and other federal laws. All secure data transmitted across the public internet are encrypted using secure shell (SSH), Advanced Encryption Standard (AES), or an internet protocol security (IPsec) virtual private network (VPN). All personally identifiable information (PII) and FERPA-protected information is encrypted at rest using Federal Information Processing Standard (FIPS)-140-compliant encryption technologies. File server information is encrypted with 256-bit AES, and database PII is encrypted with SQL Server AES256. All data in motion are encrypted using hypertext transfer protocol secure (HTTPS) Transport Layer Security (TLS) 1.2. Data are stored on database servers behind multiple firewalls and are secured through an encrypted connection.

Role-Based Login System. Our systems implement sophisticated, configurable privacy rules that strictly limit data access to appropriately authorized personnel. CAI uses role-based permissions to manage all critical systems and data. Access is controlled through well-established policies and processes for access management; user registration and deregistration; and access-privilege reviews. The Test Information Distribution Engine (TIDE) is the primary system used to manage client user accounts. CAI works with clients to identify the user-role hierarchy that is appropriate to its online suite of systems and that matches the roles

existing in the field. A typical hierarchy specification includes definitions of roles, such as state-level user, district coordinator, teacher, and proctor. It also includes definitions of the levels of access for each user role across each system. Access to any secure system is password-protected, and users' level of access corresponds to their role and their association with a specific school or district.

Exhibit 4.2.5-1 provides a sample role matrix for CRS. This matrix shows an important dual approach for secure authentication that includes an intersection of jurisdiction and role. The column headings in the top row (e.g., state, region, district, school, internal—CAI) juxtapose jurisdiction with the user roles in the "System" row (e.g., coordinator, viewer). The subsequent rows show the type of access for that role and jurisdiction.

Exhibit 4.2.5-1: Centralized Reporting System Role Matrix

USER ROLES AND		STATE	REGION	REGION	DISTRICT	DISTRICT	DISTRICT	DISTRICT	DISTRICT	DISTRICT	SCHOOL	SCHOOL	SCHOOL	SCHOOL	SCHOOL	SCHOOL	SCHOOL	SCHOOL	INTERNAL	INTERNAL	INTERNAL	INTERNAL	INTERNAL
SYSTEM ACCESS		STATE	ERS	RCU	DS	DTC	DTA	DRV	DCU	LMS_ONLY	CTC	CRV	OTA	PR	SDA	TE	CTS	TSA	ADMIN	PROGRAM	CAR	HELPDESK	VIEWONLY
System	TASK LABEL	State Administrator (STATE)	ESC Region Staff (ERS)	Regional Content User (RCU)	District Superintendent (DS)	District Testing Coordinator (DTC)	District Testing Assistant (DTA)	District Report Viewer (DRV)	District Content User (DCU)	LMS Only (LMS_ONLY)	Campus Testing Coordinator (CTC)	Campus Report Viewer (CRV)	Online Test Administrator (OTA)	Principal (PR)	Student Data Assistant (SDA)	Teacher (TE)	Campus Technology Staff (CTS)	Test Setup Assistant (TSA)	Admin	Program	CAI Reporting User (CAR)	Help Desk (HELPDESK)	View Only (VIEWONLY)
Reporting																							
	What level should this user have?	State	None	None	District	District	District	District	None	None	School	School	None	School	None	Teacher	None	None	State	State	District	Multi-District	Multi-District
	Does this user have access to Test Reason Manager?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Does this user have scoring access?	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	Yes	No

Industry Security Practices. CAI uses industry-standard security practices to protect information from outside intrusion. CIS-framework audit and penetration tests are performed periodically.

Access to Student Information. Individuals not employed by CAI, including staff at hosting facilities, do not have access to student information. All access to client data is authorized on a need-to-know basis.

Transmission of Data. All transmission of secure data takes place using Secure File Transfer Protocol (SFTP) or TLS 1.2. When the transferred data include student PII, the transfer software encrypts the files upon upload to the site. The files remain encrypted while they are at rest, and Secure Sockets Layer (SSL) is used to encrypt the data in transit. We recommend that our clients use similar SFTP software when the data arrive at their site to re-encrypt data at rest on their servers.

Confidential Information. We have policies and protocols in place to prevent unauthorized copying of confidential information onto portable storage devices. These protocols, which are documented in our policies for Information Classification and Handling and Acceptable Use, have been rigorously tested and are audited annually for compliance with ISO 27001 standards.

Ongoing Maintenance

CAI has several maintenance policies to ensure that data and systems are always reliable and highly available. CAI uses the following capabilities to manage and support the infrastructure:

- Active Directory (AD) is used for authentication and system management across hosting environments. We employ a separate AD domain for development to provide separation from UAT and production environments.
- CAI servers and data are backed up using Commvault Cloud software. Back-up data is stored in the local region in S3 and in a second region in S3 to protect against data loss. Critical data is also backed up to Azure.
- CAI Servers are patched monthly.
- Applications and system configuration changes are controlled and deployed using Chef.
- CAI applications are deployed using Octopus.
- System health is monitored using PRTG and Foglight.

Specifically, maintenance policies include the following:

- Maintenance procedures are part of our business continuity plan; they include daily backups and full replications to an offsite data center. Refer to Section 3.11 for more detail on these measures.
- As part of CAI's technical support services, we continuously monitor our systems to ensure that they remain highly reliable and available. We have quick escalation processes to ensure quick turnarounds after troubleshooting and investigating an issue. CAI adheres to the following monitoring and service-outage notification protocols:
  - Scheduled automated functional tests (AFTs), dashboard monitoring, and Network Operations Center (NOC) activities provide real-time data on system health. If there is an outage or some condition that creates risk of a possible outage, CAI knows about it before users in the field can be impacted. CAI's monitoring dashboards include checks for errors (prioritized according to level), data integrity, and other considerations.
  - CAI uses an alert notification system to coordinate prompt responses to outages or potential outages. Upon detection of a system outage or any other problem potentially

impacting student testing, CAI's incident response team joins a telephone call within one minute and rapidly works to understand the issue and apply a short-term fix.

- As soon as an alert notification system is triggered, the CAI Project Management Team will contact NJDOE to provide information about the issue and a timeline for resolution.
- As part of the discussion, if the incident response team determines that the issue resolution will take time, that interval is communicated to the State. With the State's permission, the field is notified through one or more of the following channels: (1) portal announcement, (2) system notification banners relaying timely messages to the field, (3) targeted messaging sent to field users via email, (4) notification of Help Desk personnel, and (5) a temporary message posted on the exact screen where the issue is occurring.
- Once an issue is resolved, an event report is created to communicate the root cause, the short-term fix, and the long-term remedy.

- CAI software maintenance windows are clearly defined and scheduled. The maintenance window schedules and associated downtimes are established and communicated prior to the start of the school year. Detailed release notes accompany all software maintenance releases, from major releases to smaller patching deployments. CAI will work with NJDOE to ensure that software maintenance windows do not conflict with any testing windows.
  - CAI has two major software release windows per year, one in the fall and a second in winter. This schedule ensures that all major releases are completed well before the peak testing season begins in spring. The fall major software release window usually includes more substantive functionality changes, new features, and user interface (UI) improvements; the winter release window focuses on performance improvements and other background changes that are largely transparent to end users.
  - In addition to major software releases, CAI conducts monthly software patching. High-priority bugs, if any, are immediately fixed. Smaller repairs and improvements are bundled together in a monthly patch. The software patching schedule for the entire year is established and communicated in advance. Software patching is typically conducted on the third Saturday of every month—except during peak testing periods when patching may be suspended—after reviewing the issues list with NJDOE staff.
  - Operating system (OS) updates and server patching are performed to keep servers up to date with the latest security and performance supports. OS updates are first performed in less-critical environments before being applied to production servers. Production OS updates are typically conducted on the third Saturday of every month. The schedule for such updates and patching is established and communicated one year in advance.
  - All code deployment activities, from major releases to software and OS/server patching, are followed by automated testing, shake-out testing, and testing of specific use cases that are relevant to the deployment and state-specific configurations.

Hosting Infrastructure Across CAI Systems

CAI's technology infrastructure is hosted in the Amazon Web Services (AWS) cloud in the US-East-1 and US-West-2 regions. Our AWS environment includes multiple AWS accounts with separate account sets for our development, UAT, and production environments. Each system group has a separate account in each environment. We use standard virtual private cloud (VPC) access controls in AWS. Systems in AWS are configured across multiple availability zones to maximize reliability and minimize the risk of downtime.

CAI uses the following capabilities to manage and support the infrastructure:

- Active Directory (AD) is used for authentication and system management across our hosting environment. We employ a separate AD domain for development to provide separation from UAT and production.
- Servers and data are backed up using Commvault Cloud software. Back up data is stored in the local region in S3 and in a second region in S3 to protect against data loss. Critical data is also backed up to Azure.
- Servers are patched monthly.
- Applications and system configuration changes are controlled and deployed using Chef.
- CAI applications are deployed using Octopus.
- System health is monitored using PRTG and Foglight.

Deployment Infrastructure. CAI has a standard infrastructure that has been optimized for our systems, and our systems have been optimized for the infrastructure. When gauging the impacts of new clients, CAI reviews the client's assessment program—including total number of students, number of tests, and expected concurrency—and expands the infrastructure to provide additional capacity with sufficient buffer to ensure program success. On the basis of our study thus far of the NJDOE program, we recommend the infrastructure described in Exhibit 4.2.5-2.

Exhibit 4.2.5-2: CAI Systems Deployment Infrastructure

System	Hosting Environment	Infrastructure Summary	Expansion Plan for NJDOE Support
Public Portal	AWS	Site content is served via CloudFront.	Create a new CloudFront distribution for New Jersey and a new site in the hosting environment.
Item Tracking System (ITS)	AWS	ITS is hosted on a load-balanced pool of web servers.	Add web server and database capacity based on anticipated NJDOE demand.
TIDE	AWS	TIDE is deployed as four clouds with a load-balanced pool of web and database servers.	Add web server and database capacity (processor and storage) based on anticipated NJDOE demand.
Test Delivery System (TDS)	AWS	The TDS is deployed as multiple clouds, each including fixed and dynamic resources. Login web servers for each cloud are load balanced. Login and satellite servers are commissioned and decommissioned on the basis of testing volume.	Add server capacity to the TDS clouds sufficient for anticipated NJDOE testing volumes. Given NJDOE's testing windows and student population, CAI estimates supporting a max concurrency of 120,000 (including a 25% buffer).[1]

[1] After looking at NJDOE's test administration schedule from last year and the state's number of eligible students, we ran this data against CAI's capacity planning model to produce the 120K concurrency estimate shown in Exhibit 4.2.5-2.

System	Hosting Environment	Infrastructure Summary	Expansion Plan for NJDOE Support
CRS	AWS	The CRS is deployed as multiple clouds, each including a load-balanced pool of web and database servers.	Add web server and database capacity to the primary cloud sufficient to meet anticipated NJDOE demand.
Database of Record (DOR)	AWS	DOR is deployed across multiple databases.	Add web and database capacity.

Parent and Educator Access to Reports and Other Information

CAI's reporting systems have been designed as longitudinal systems and can store large amounts of data across several years. The CRS is for educators, while the Family Portal is for families or parents.

On these systems, CAI will host the following:

- Individual student reports (ISRs) from 2016 through the current year
- Parent, student, and teacher guides (or equivalent) for the current year
- Listing of both the accountable school and the testing site, including testing sites of charter and Renaissance schools where there is more than one school teaching any grade
- Other information deemed important by NJDOE, evaluated and provided at the project launch meeting (PLM) and at the first month of each subsequent contract year

Section 4.13.8 contains sample screen captures from CRS and the Family Portal that provide historical data.

Loading Historical Data

In our past work for other state clients, CAI has acquired extensive experience loading historical data. This previous experience includes the following:

- Assessment data for the general education administrations of ELA, mathematics, science, and social studies tests in grades 3–8; administration of alternate assessments for students in grades 3–8 in the same subjects; and the high school end-of-course (EOC) assessments for five subjects, including Algebra 1, English 1, English 2, Biology, and U.S. History, as well as English language proficiency (ELP) assessments for general education and special education students.
- Processing of historical records for 10 prior years of Texas assessments was undertaken so that past and current test results could be incorporated for analysis. CAI imported data from MySQL to SQL Server and successfully processed more than 107 million records. CAI continues to upload Texas assessments administered by CAI into the database.
- During the 2023–2024 assessment administrations, for Texas alone, CAI processed over 23 million student test opportunities. CAI delivered both preliminary and final student-level files, rosters, summary reports, and item analyses reports during the fall and spring administrations. For more information, refer to Exhibit 4.2.5-3.

Exhibit 4.2.5-3: Student Test Opportunities Processed for Texas

Assessment	Test Opportunities
Fall EOC (A1, BI, E1, E2, US)	414,000
TELPAS ALT	11,000
TELPAS (KG, G2, G3, G4, G6, G8, G10)	4,229,000
TELPAS Native Speaking Test	4,000
EOC ALT (A1, BI, E1, E2, US)	26,000
3–8 ALT (G3, G4, G5, G6, G7, G8)	90,000
Spring EOC (A1, BI, E1, E2, US)	2,301,000
STAAR 3–8 (G3, G4, G5, G6, G7, G8)	5,864,000
Summer EOC (A1, BI, E1, E2, US)	155,000
SAFT	959,000
TFAR	621,000
TTAP	152,000
Interim Assessments	5,847,000
Teacher Authored Tests	2,819,000

CAI has extensive experience assimilating and processing very large databases and student records for the purpose of providing continuous access to historical student records. For the state of Texas, student data was available through subject and grade-level files for a 10-year period. CAI worked with the client to ingest the data and verify that the historical record was both complete and 100% accurate. CAI ran intake processes on all data files and produced summary reports for each administration. CAI then compared the results produced after intake to the publicly available reports for the same data; full and complete comparisons were made to ensure that the data serving as the source for the new public research portal matched the data that had been previously available to the public. Steps taken during this process included the following:

> For the Texas assessment program, we loaded 10 years of data from Texas' previous vendor.

- Draft a list of all files that should serve as the source of data for the new portal; for this particular effort, more than 400 files were finally identified as source files. Since historically there may have been multiple versions of the same file, it was critical to detail the filenames, date/time stamps, and numbers of records in every file.
- File layouts changed substantially over the course of 10 years, and it was incumbent upon CAI to match the correct layout with its associated student data files.
- Once the exchange of files and layouts between the client and CAI was completed, intake of all data commenced, followed by replication of the publicly available reports that had been previously generated using the corresponding data files.
- When the data analysis team was satisfied that data files had been properly processed and reports were correctly replicated, the data were loaded into the database and processing for the web site reports began. At this juncture the client and CAI worked hand-in-hand to confirm, again, that results were accurate and reflected proper intake of all data.

Testing

When loading historical data, CAI executes comprehensive test cases. CAI will work with NJDOE to prepare a testing plan similar to the one found in Appendix H of our proposal. This plan highlights and documents all steps taken to identify, ingest, and process data in ways that will produce the desired results. CAI will coordinate with NJDOE to assure that the historic data from tests administered in 2016 and thereafter have been fully and correctly processed, and we will also work with NJDOE to ensure that new assessments are added to the database as required. General steps that we will follow as we work with NJDOE's historical data include, but are not limited to, the following:

- Establish required uses for historic data
- Confirm all file layouts and relationship of layouts to data files
- Process all files and confirm correct intake
- Establish business rules to be applied to historic data
- Internal user acceptance testing (UAT) quality assurance of processed data by internal CAI teams
- NJDOE UAT quality assurance of processed data
- Process feedback from NJDOE and revise data if and when necessary
- CAI has developed an issues log format to track reporting of issues by either CAI personnel or NJDOE administrators and staff. In this manner, both teams are able to view and address issues in a timely manner, modify data, code, or both as required, and report back via the log on the status and resolution of the issues.
- CAI uses a phased approach to UAT testing. Priorities are established with the client with regard to the most high-profile or important administrations, and intake and testing for those data is fast-tracked. Generally, a two-week testing phase is established, during which all critical issues are identified, addressed, and resolved. As each phase is completed, the next phase begins; however, any lingering issues with previous phase data/reports are continuously addressed and resolved.
- Both content management (Confluence) and project tracking (JIRA) software are used to maintain visibility into the work accomplished and outstanding issues, and to confirm that the project is on target to meet the completion date.

User Acceptance Testing

CAI will provide the test plan and all results of the test plan after it has been executed for NJDOE's review and approval. This is part of CAI's UAT process.

CAI maintains UAT environments for all systems in the suite. The fully configured UAT environment is made available approximately one month before a scheduled go-live. All UAT periods are captured in the project schedule, and dates will be decided on only after discussion with NJDOE.

One of CAI's primary goals for internal UAT is to identify and resolve most, if not all, issues prior to the commencement of UAT activities. In addition, CAI will work closely with the ITFD vendor to ensure that all online accommodations (e.g., test-to-speech [TTS], refreshable braille, content and language supports) are completed prior to the TDS UAT periods for any given NJDOE test administration.

Our internal UAT process comprises experienced project team members collaborating to complete a host of test cases that are documented in Test Rail (a third-party quality-assurance software). Test Rail cases are created, updated, and maintained for each individual test

administration. To ensure cross-program consistency (e.g., summative and end-of-course), the NJDOE and CAI project teams work together to ensure that test cases are up to date with the latest TDS features. The project teams focus on end-to-end system quality control to ensure accurate student and user test eligibility rules, test tool configurations, test and tool functionality, and proper access for students who are eligible for accommodations. In addition, testing is done to ensure that tests are flowing from TDS to our downstream systems, including participation reports in TIDE and student results in CRS.

Specified staff members at NJDOE are granted access to view all of the test cases, along with completion progress and pass/fail rates. While NJDOE can monitor these activities in real time, NJDOE may also conduct their own UAT activities. CAI will provide NJDOE with a UAT overview document that includes information about the specific UAT activity, demo student/user accounts, suggested test cases, and a central UAT issues log. Any known issues that are present on the first day of UAT will be listed in the UAT issues log so that NJDOE is able to track any issues that arise during their UAT process; they will also be able to track the resolution progress of existing issues. Daily feedback will be collected in the UAT issues log, and tickets will be assigned to developers as needed for resolution. Test development teams will make continuous changes to the configurations to address these issues, and the project team will verify fixes and mark issues as ‘resolved’ in the UAT issues log. The UAT process is considered complete once CAI and NJDOE agree upon satisfactory resolution of all entries in the UAT issues log.

UAT Data Processing

A general overview of the approach that CAI took with regard to data processing for the research portal can be seen in Appendix I of our proposal. This document provides a high-level overview of CAI’s approach to managing a large volume of student assessment data. We recognize the need for access to this data, as well as the requirement that data be 100% complete and 100% accurate.

In addition, CAI will work with the client to develop a list of all possible scenarios or data anomalies that might result in data processing errors either in a database or a web-based portal. We will work with the client to develop a series of test cases to confirm that code and processing are properly handled in all scenarios. Briefly stated, areas for close review when processing historical data files can include the following:

- Identifying correct data file layouts
- Identifying the correct version of the student assessment data file
- Associating the correct data file layout and data file
- Uploading the layout and files for a given assessment to the correct location

While the aforementioned steps seem simple and straightforward, when dealing with more than 400 data files and at least 40 different layouts over 10 years, small steps that can be taken to ensure that all opportunities for small errors have been reviewed will, in the long run, serve both CAI and NJDOE well. Please refer to Appendix J of our proposal for more details on this process.

As previously mentioned, CAI has worked closely and extensively with our past clients to confirm that all of their expectations have been met. The brief list in Exhibit 4.2.5-4 provides the issue assignment and tracking process used for our Texas client to give some insight into our initial processes.

Exhibit 4.2.5-4: QC Checklist

- Identify the correct layout
  - Confirm Administration and Year
- Identify the correct data file
  - Confirm path and file name
- Identify the Business Rule to apply to the processed file
- Identify the corresponding Statewide Summary Report from the TEA website
- Intake the data file, apply the business rules, and compare the results to following fields from the Statewide Summary Report at the State Level:
  - Number of Students Tested
  - Average Scale Score
  - Number and percent of students at each performance level
  - Average number of items and % correct in each reporting category
- For one of the demographic fields below, produce and compare the results for each of the above values for the numerous categories in the field.
  - Race/Ethnicity
  - LEP – Limited English Proficiency

Once UAT testing is underway, issues are assigned and tracked through a Jira ticketing process. From the details in the ticket, we are able to see the issue number, the developer to whom the issue is assigned, and a general indication of the progress being made to resolve the issue.

4.2.5.1. Secure Data and Material Storage, Access, and Transmission

NJDOE requires an online assessment platform that is suitable for securely storing, accessing, and transmitting data materials in support of all New Jersey assessment program online testing delivery program requirements. CAI's suite of online testing systems, including our Test Information Distribution Engine (TIDE) and Centralized Reporting System (CRS), fully meet all requirements as stated in the RFQ. Refer to Exhibit 4.2.5.1-1 for more details about how CAI's suite of online systems meets or exceeds each requirement.

Exhibit 4.2.5.1-1: CAI Suite of Online Systems and RFQ Requirements

Requirement	Explanation	Requirement Met?
A. Confidential student demographic data	CAI's TIDE is the system that stores all confidential student demographic data. TIDE is robust, secure, and user-friendly. Data fields that could uniquely identify a student, such as student name, date of birth, and state-assigned identification number, are encrypted at rest in the database. All data being sent to or retrieved from TIDE are encrypted in transit. Student demographic data stored in TIDE are made available in near-real time to the other CAI online assessment systems, such as the Test Delivery System (TDS) and CRS. This means that corrections and changes made to student data in TIDE that will drive test delivery behavior in the TDS, such as test eligibility or embedded accommodation assignments, are immediately available to the TDS. Likewise, changes in student names and demographic data are immediately available to the CRS so that individual student reports (ISRs) and aggregated reports reflect the up-to-date data.	Yes
B. Rescore requests	TIDE supports enabling authorized users to request test rescores. Through TIDE, users can request either a rescore of an entire test (test-level rescore) or of only specific rescoreable items (item-level rescore). TIDE offers extensive configurability to deliver a rescore request process that aligns with SCM's policies and requirements. This configurability includes defining which user roles are authorized to submit rescore requests, as well as the period of time during which rescores may be requested, relative to the various test administration windows. Additionally, TIDE can be configured to either send rescore requests for state review and approval prior to processing or process automatically. In addition to an intuitive web form to place rescore requests, TIDE offers a bulk upload option that makes it possible for authorized users to initiate the rescore request process for multiple students/test opportunities through a file.	Yes

Requirement	Explanation	Requirement Met?
C. Material requests	TIDE is the system that is used to manage all aspects of online and paper test registration. This means that the same system and underlying database are used to assign online test eligibility and to handle paper test material assignments, requests, and quantity calculations. For a detailed discussion of paper test material calculation and ordering options available to be customized according to SCM's preference, refer to Section 4.7.3.7.	Yes
D. All scoring and reporting information including score reports developed by the Contractor	The CRS is the system that manages the distribution of all scoring and reporting information, including score reports developed by CAI, to schools, districts, and NJDOE-authorized personnel. For a detailed discussion of the CRS, refer to Section 4.13.	Yes
E. Secure training manuals or information guides	CAI offers multiple options for storing and distributing secure training materials or information guides that are not suited for offering on the public information portal. These are stored primarily within TIDE. One option is to make secure materials downloadable through the TIDE "General Resources" page. Users must log in to CAI's Single Sign-On (SSO) system before they can access and download any resources stored in TIDE. These resources include training manuals or guides that can be made available within TIDE. Refer to Exhibits 4.2.5.1-2 and 4.2.5.1-3 for samples of the "General Resources" page in TIDE. For resources that should be distributed only to specific users on a by-request basis, CAI's Secure File Center can be used. The Secure File Center is CAI's secure, integrated file-sharing and storage platform. Refer to Exhibit 4.2.5.1-4 for a sample screen capture of the Secure File Center.	Yes
F. All files or logs of student demographic records or other sensitive data	As discussed in Section (A), TIDE is the secure system that stores demographic data. This includes all student data files used to import student demographic data into TIDE. TIDE also stores a complete history of all updates made to the student data and detailed logs of what user made the updates and when. This history of student data updates and user-level student data access is retained for the duration of the contract.	Yes

Exhibit 4.2.5.1-2: Navigating to General Resources in TIDE

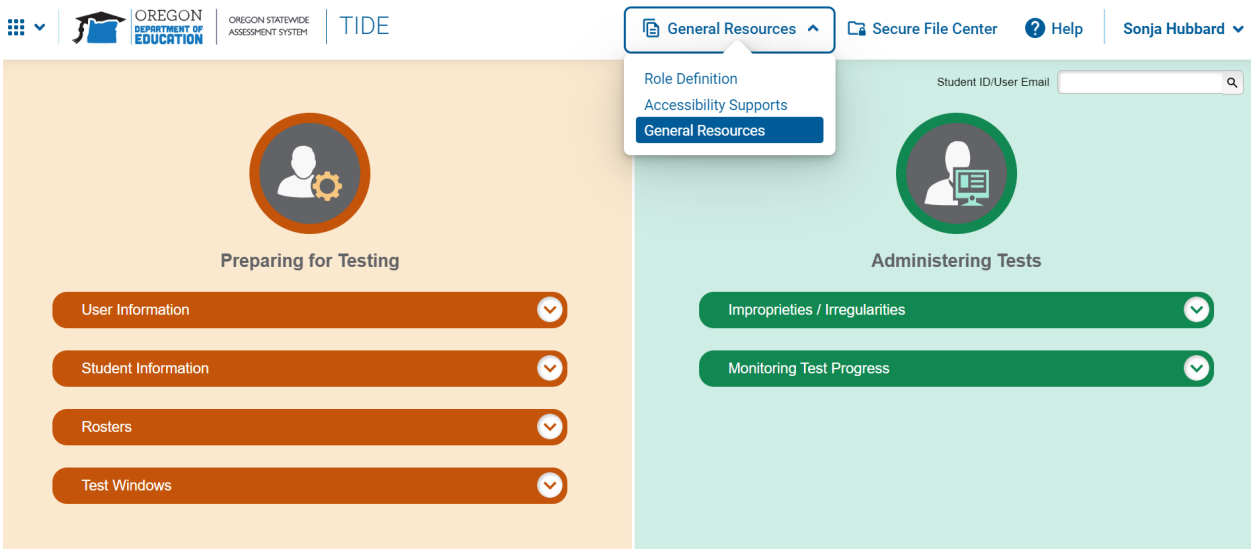


Exhibit 4.2.5.1-3: A Sample General Resources Page in TIDE

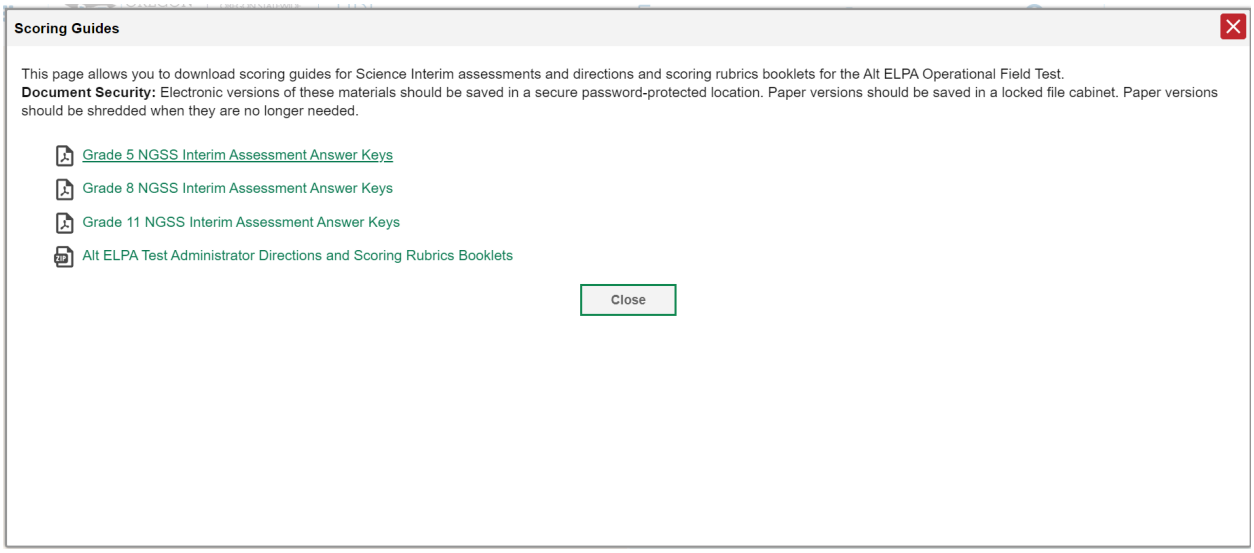
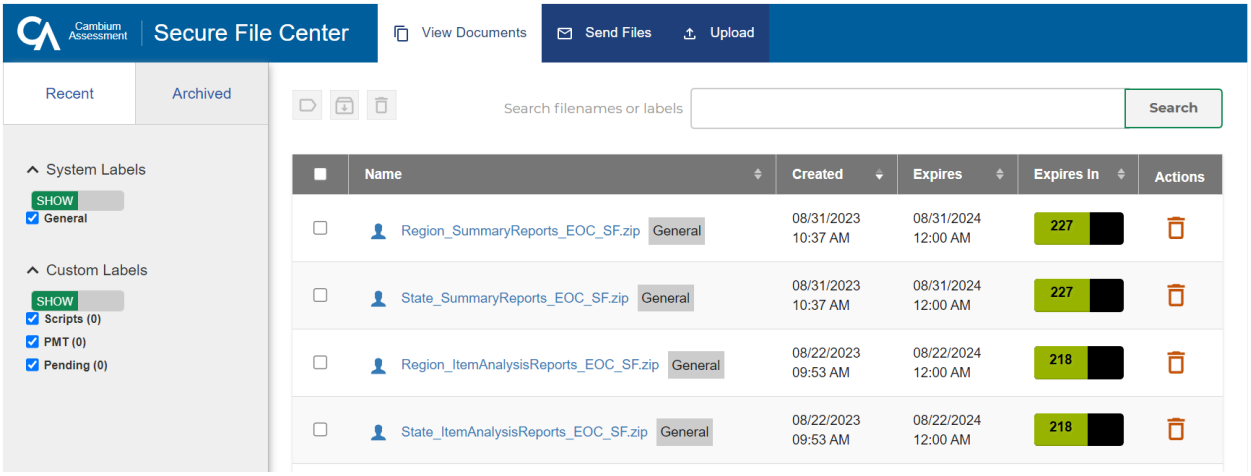


Exhibit 4.2.5.1-4: Secure File Center



4.2.5.2. Non-Secure Materials

A Customized Information Portal for Assessment Program Stakeholders

For a large-scale assessment program to be successful, an enormous amount of information must be shared with stakeholders. This includes public (non-secure) documents and private (secure) documents. In addition, stakeholders must be able to easily access multiple online systems, including test administration modules and new or existing systems hosted by NJDOE, CAI, or third parties. It is essential to have an intuitive, user-friendly, online portal where all stakeholders can easily locate and access the documents, resources, and systems that will enable them to effectively participate in the test administration process.

CAI will provide a customized information portal for the NJDOE suite of assessments in order to support dissemination of information to NJDOE personnel, local test administrators, classroom teachers, and technology coordinators, as well as students, families, and private citizens. All user documentation, technical and administration manuals, and training materials will be available on the New Jersey Assessment Portal; access to all components of the online platform will be via the New Jersey Assessment Portal.

The New Jersey Assessment Portal will have a modern look and feel and will reflect NJDOE branding and color schemes. Each page will have a consistent top navigation bar and a footer. The Portal will have the following key components:

Homepage. The Portal homepage will showcase program-wide information, with recent announcements prominently highlighted. The page will include links to landing pages and direct links to frequently used pages.

Landing Pages. Secondary landing pages will be organized around topics or stakeholders such as students and families, test administrators, or technology coordinators. Each landing page will include relevant announcements, links, and resources.

System Cards. Presented on the homepage and landing pages, System Cards will link directly to assessment program modules, NJDOE sites, and third-party sites. System Cards will include an icon that identifies secure links (those requiring a username/password to access) and indicates system status.

Resources. The resources page presents a searchable, curated collection of documents or links that stakeholders can reference and download at any time during the test administration process.

Announcements. A searchable set of announcements related to the program will be posted on the Portal. The text of all announcements will be reviewed and approved by NJDOE prior to release.

Events. This tab will display a calendar of assessment program events, including milestones throughout the test preparation process, the dates of testing windows, and the dates when student results will become available online.

CAI will maintain content pages that document system requirements and a technology guide for user and student workstation setup, secure browser installation, network configuration, and assistive technology configuration.

The New Jersey Assessment Portal will serve as a repository for all of the non-secure materials required by NJDOE stakeholders, including those listed in the Request for Proposal. Refer to Exhibit 4.2.5.2-1.

Exhibit 4.2.5.2-1: Resources and Portal Placements

Resource	Potential Portal Placement
A. Teacher training materials	Landing Page; Resources
B. Sample student instructional materials	Landing Page; Resources
C. Current memos and notifications	Announcements; Resources
D. Registration training information	Announcements; Events; Resources
E. Technical report	Resources
F. Score interpretation manual	Resources
G. Other non-secure information	Announcements; Events; Landing Pages; Resources

CAI will work with NJDOE to define and document requirements for the New Jersey Assessment Portal, including the optimal placement of materials to facilitate access by program stakeholders. This work will include alignment of the Portal with NJDOE branding and color schemes.

Exhibit 4.2.5.2-2 provides a list of URLs for the five public portals CAI has built and customized for our clients.

Exhibit 4.2.5.2-2: Public Portal URLs

State	URL	Number of Visits in SY2023–2024
Texas	texasassessment.gov	12,270,000
Florida	flfast.org/index.html	9,640,000
Ohio	oh.portal.cambiumast.com	5,620,000
Indiana	indiana.portal.cambiumast.com	1,590,000
Washington	wa.portal.cambiumast.com	1,520,000

Searching for Non-Secure Materials

Given the large volume of helpful information available to users, searching for relevant, meaningful information becomes critically important. CAI's Portal has a comprehensive search panel that allows NJDOE to fully customize the organization of the content through a search

panel. The Portal also has a Search field that shows results based on frequently run indexing jobs to optimize content searches. Refer to Exhibit 4.2.5.2-6 for a sample search panel and the search field.

In addition to the search panel and the search field, CAI is also integrating an AI engine that will search all available resources on the Portal, synthesize the response based on the user's prompt, and then provide all the sources from relevant materials. Exhibits 4.2.5.2-3 through 4.2.5.2-7 display examples of existing portal pages developed by CAI.

Exhibit 4.2.5.2-3: Florida FAST Portal Homepage (Full Page)

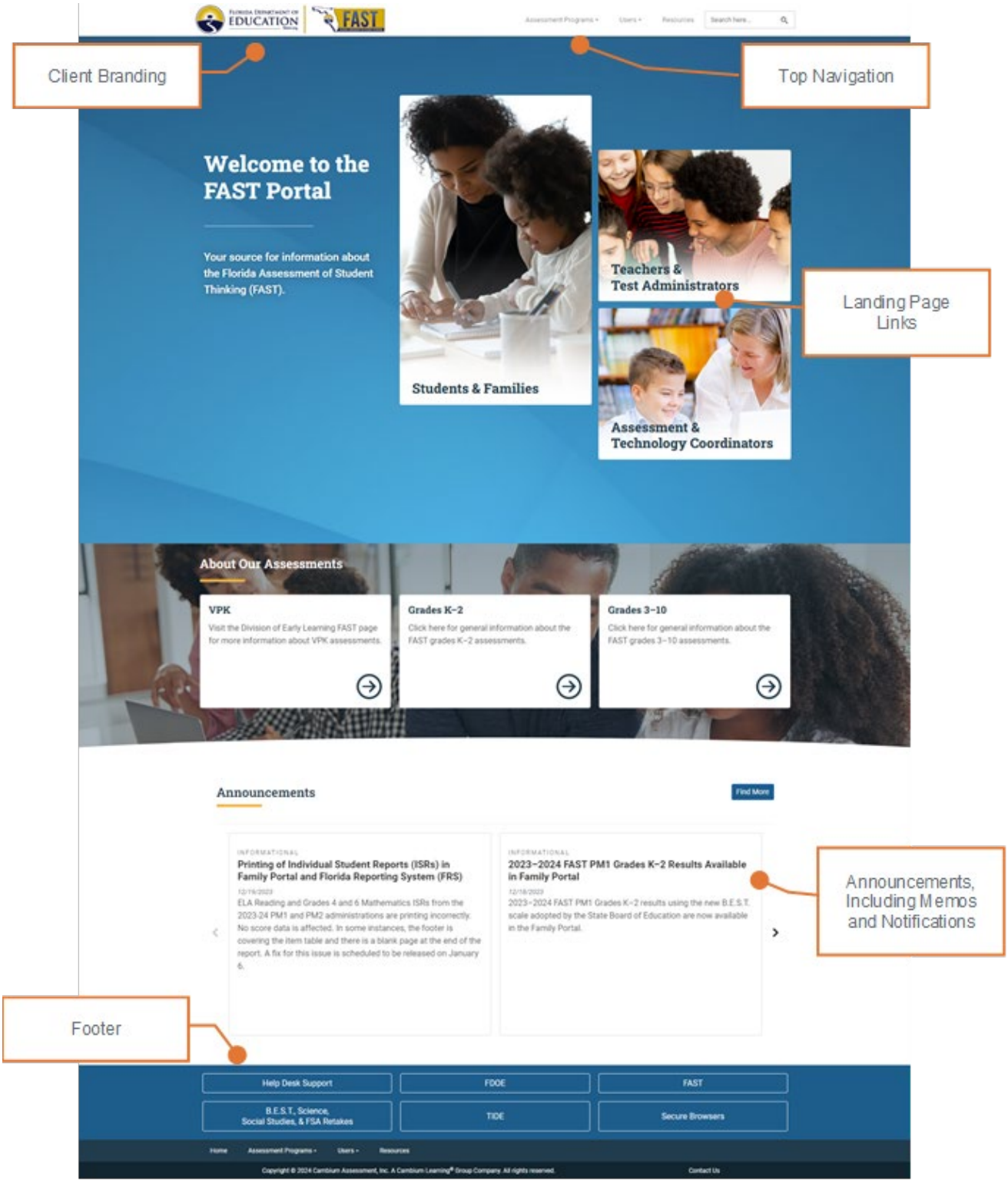
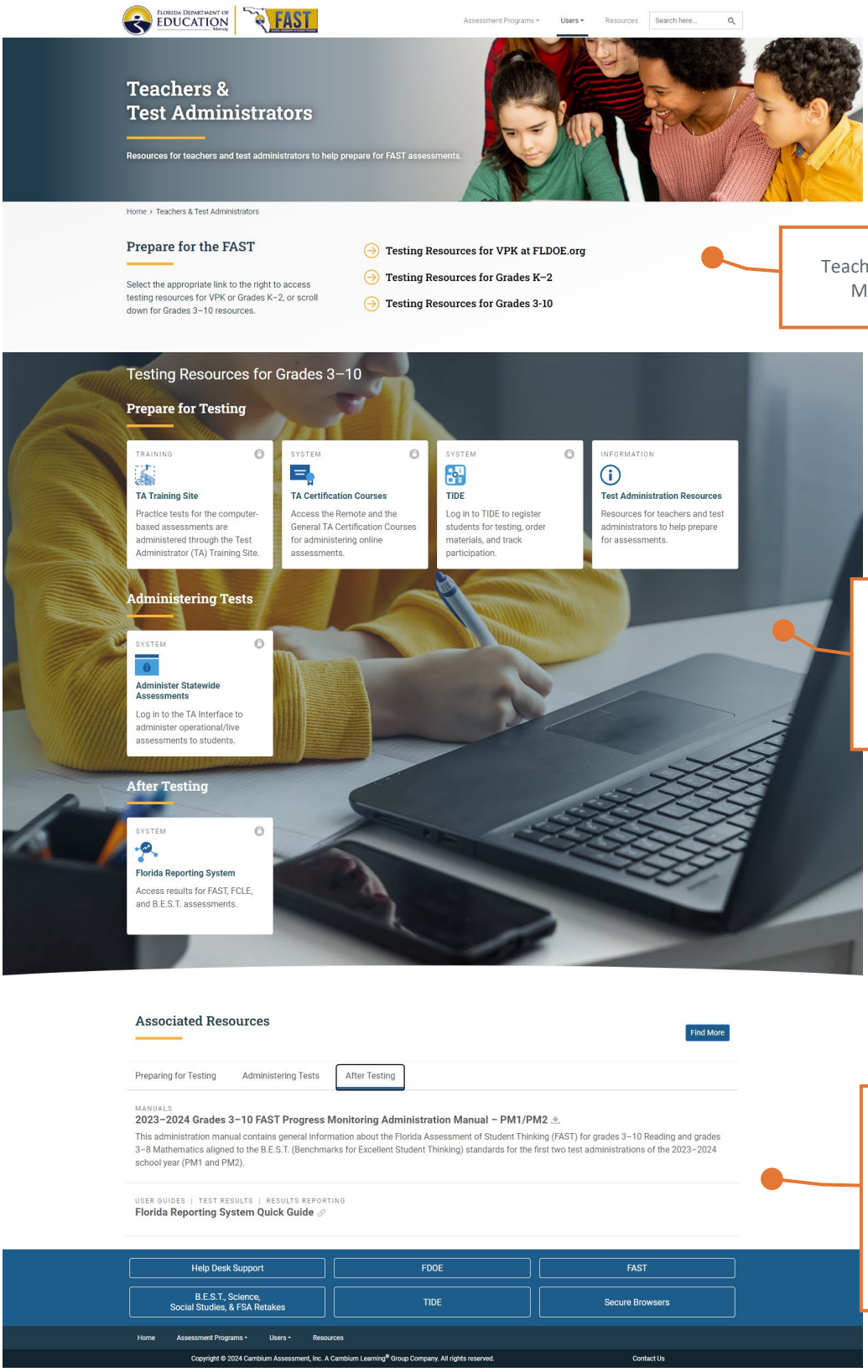


Exhibit 4.2.5.2-4: Florida Teachers & Test Administrators Landing Page



Teacher Training Materials

Test Administration Systems and Support Services

Teacher Resources and Training Materials Organized by Administration Phase

Exhibit 4.2.5.2-5: Florida Students & Families Landing Page

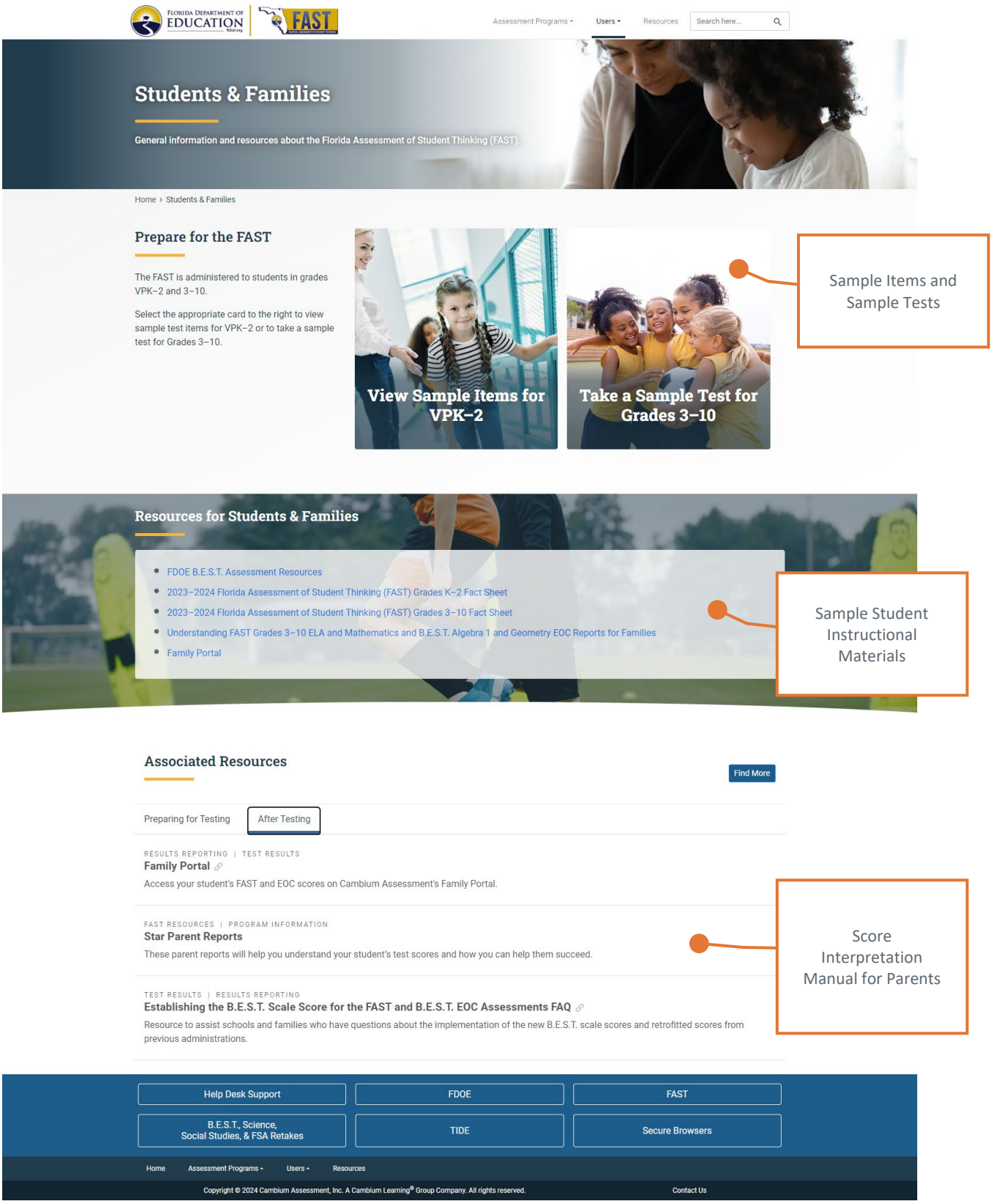


Exhibit 4.2.5.2-6: Florida Resources Search Page

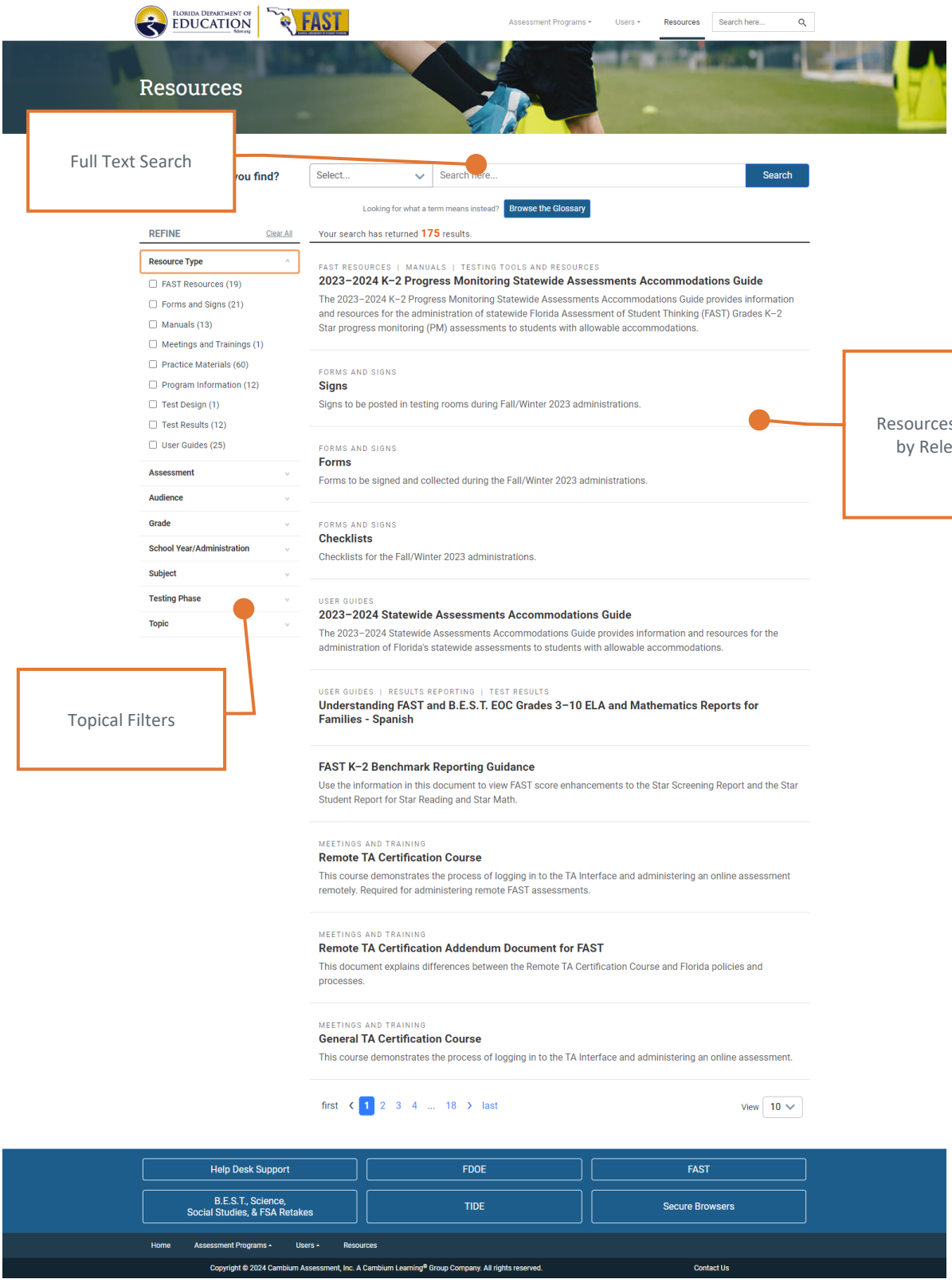
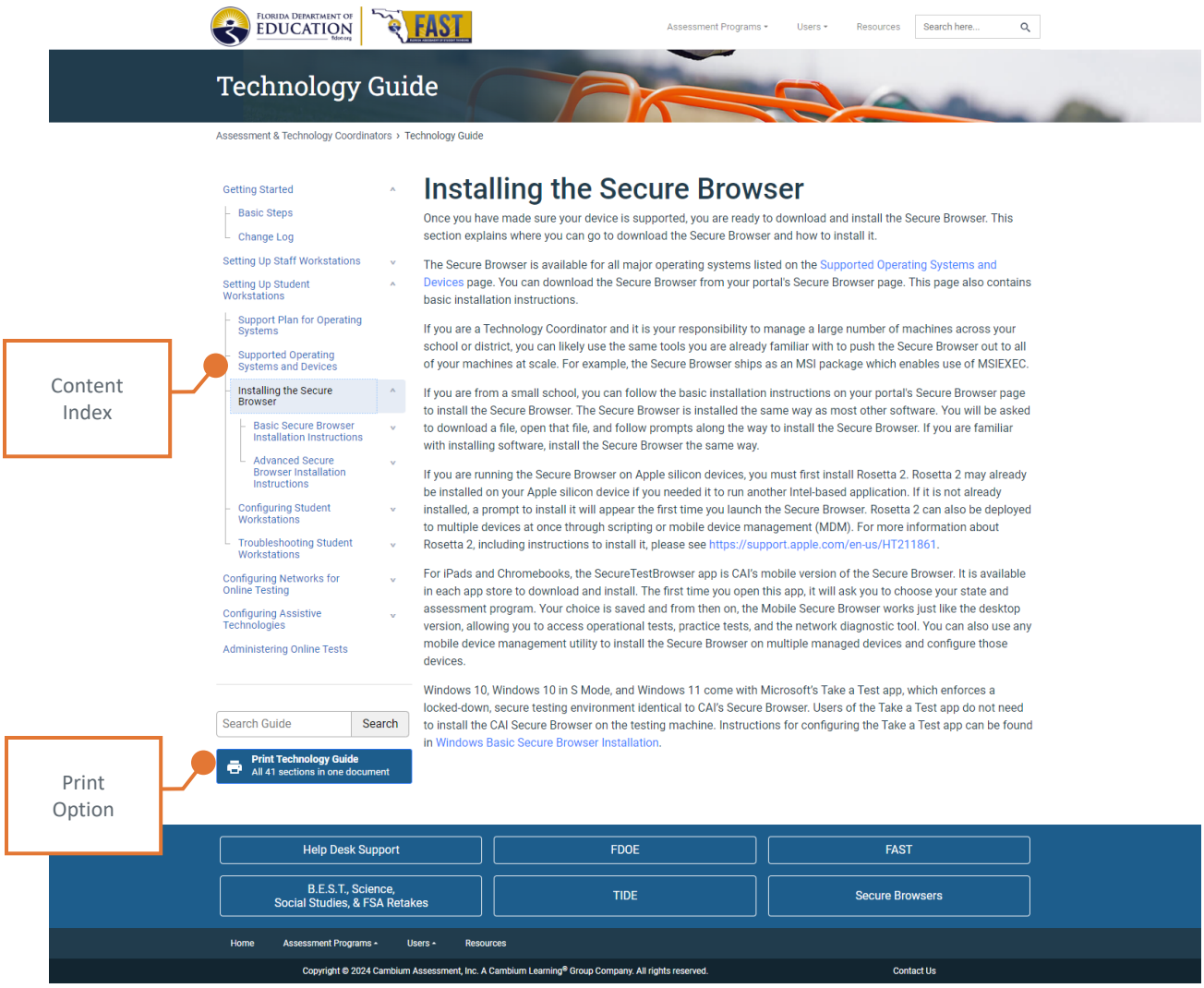


Exhibit 4.2.5.2-7: Florida Online Technology Guide



Accessing the New Jersey Assessment Portal will not require user authentication, which simplifies site access and administration. Most program information can be shared via the Portal. The Portal resources page is an ideal centralized location for sharing non-secure documents with all stakeholders.

The Portal can host links to non-secure and secure sites. System Cards provide an icon that indicates whether the target system is secure in order to improve the user experience.

4.2.5.3. Technical Support Requirements for Web-Based Components

CAI is the technology leader in web-based online testing. We have been providing web-based testing services since 2006. We currently deliver online testing in 27 states including California, Florida, Ohio, and Texas. CAI delivered more than 100 million online assessments in the 2021–2022 school year, more than 115 million online assessments in the 2022–2023 school year, and more than 124 million online assessments in the 2023–2024 school year. Our success is due to a solid technology infrastructure and is supported by processes designed to ensure the best experience and high reliability.

CAI Systems Are Scalable to Support High Usage Without Interruptions

CAI's Test Delivery System (TDS) is proven to perform under heavy traffic loads with no impact on performance at the student level.

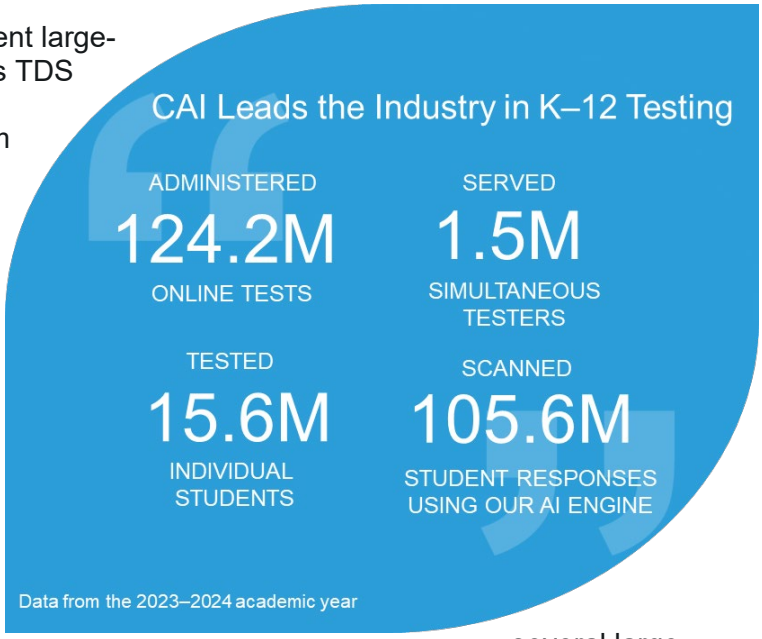
CAI's evidence includes the following:

- *Concurrency* – Concurrency refers to handling simultaneous testing across schools, districts, and states **in the same time period, at the same time**. Simply adding concurrencies across programs or states is not total concurrency if those peak concurrencies occur on different dates or times of day.
- *Number of students tested* – Students tested reflects the overall level of testing activity while eliminating differences in test structure and organization, which can impact comparisons across programs.
- *Number of total online tests* – Total online tests quantify the volume of activity across the test administration and delivery process by looking at the basic unit of work across the system.
- *Response times*, including page loads, during heavy concurrency – Response times indicate how quickly the system responds to student and proctor activities while the system is at its busiest and the quality of the user experience for system users.
- *Ramp-up time* of students logging in to reach peak concurrency – Ramp-up time demonstrates the ability of the system to handle the large numbers of students who typically begin testing within very short periods at the start of the testing day.

Concurrency, Number of Students Tested, and Number of Total Online Tests

CAI is the largest capacity provider in the assessment industry. In spring 2024, CAI reached a peak load of 1.5 million students testing concurrently across all our clients. These concurrent tests were delivered with average database latencies of less than one second, resulting in no noticeable latency between items in the student experience.

Exhibit 4.2.5.3-2 provides a list of our current large-scale assessment programs that use CAI's TDS and presents the number of students simultaneously testing on the TDS platform in school year 2023–2024.



Scalability from the Beginning

CAI designs the architecture of all our systems to be scalable such that we only need to provision more hardware, given the expected usage and concurrency rates of a client or state. In other words, no architectural changes are needed to handle New Jersey's load; CAI simply scales our hardware based on New Jersey's needs.

CAI's platform is currently used in delivering statewide assessments in several large states. In Texas, we test more than 99.99% of their 5.2 million eligible students online. In California, we test more than 99.99% of their 6.2 million eligible students online with adaptive

tests. Florida and Ohio test most of their students online using our platform, as do Connecticut, Oregon, Washington, and many other states. CAI delivers online testing in 27 states and jurisdictions, including adaptive tests for 23 of those clients.

The maximum simultaneous load experienced in the field in 2024 was more than 1.5 million students testing on our platform at the same time. However, we maintain substantially more capacity than we expect to use in any given year, given our current client load. We currently have the capacity to support a combined simultaneous load approaching two million students and evaluate this annually to ensure that we meet all clients' needs.

From a scalability standpoint, there are five critical systems that will be discussed. For each system, we will also discuss the hardware resources that we propose for New Jersey.

1. **Test Delivery System (TDS)** – This consists of the proctor application to administer the test and to take the test. It is critical that both expected proctor counts and concurrency rates, as well as student concurrency rates, can support New Jersey's expected load.
2. **Single Sign-On (SSO)** – All non-student users—such as teachers and personnel employed at the state, district, and school—log in to our systems through SSO. It is critical that the expected user counts and concurrency rates can support New Jersey's expected load.
3. **Test Information Distribution Engine (TIDE)** – This is the student and user registration system, as well as the system that provides student test participation rates. Typically, district and school coordinators and administrators are the users of this system. It is critical that the expected user counts, data upload throughput, and concurrency rates can support New Jersey's expected load.
4. **Centralized Reporting System (CRS)** – This is the reporting system that provides online reports to district and school personnel. It is critical that the expected user counts can support New Jersey's expected load.
5. **Family Portal** – This is the reporting system that provides online reports to families. It is critical that the expected user counts can support New Jersey's expected load.

TDS Scalability

Online student testing presents a relatively unique combination of problems to a scalable system architecture. It is simultaneously data intensive, transaction intensive, computer intensive, and network bandwidth intensive. In addition, because tests are proctored, it requires that partitioned cohorts of users communicate with one another in near-real time. Users (proctors and students) must travel in cohorts that can change over time, from one login to the next. Response time is critical for students because delays and disruptions can affect their testing experience and performance on their assessment. CAI's TDS has been designed to scale in a manner that maximizes system performance on this difficult combination of criteria.

Proven Scalability

On April 16, 2024, CAI supported more than 1.5 million concurrent students. These concurrent tests were delivered well within average database latencies of 100 milliseconds and included transactions for computer-adaptive tests. Our system scales linearly, and we can scale up by adding devices. Our capacity is tested in automated load tests.

Exhibit 4.2.5.3-1 summarizes the concurrent testing statistics across all clients for the past five years of test administration and presents the numbers of actual simultaneous users in operational testing.

Exhibit 4.2.5.3-1: Peak Number of Simultaneous Users in Actual Operational Testing, by Year

Metric	SY 2016–2017	SY 2017–2018	SY 2018–2019	SY 2021–2022	SY 2022–2023	SY 2023–2024
Concurrency Count	661,288	750,758	859,668	1,351,453	1,503,369	1,502,352
Concurrency % Increase	25%	13.5%	14.4%	57.2%	11.24%	-
Day	Tuesday	Tuesday	Tuesday	Tuesday	Tuesday	Tuesday
Date	May 9, 2017	May 8, 2018	May 7, 2019	May 10, 2022	May 2, 2023	April 16, 2024
Time	12:18 p.m. (ET)	12:19 p.m. (ET)	12:19 p.m. (ET)	10:35 a.m. (ET)	10:19 a.m. (ET)	10:23 a.m. (ET)

Exhibit 4.2.5.3-2 presents the maximum concurrency, by client, across time.

Exhibit 4.2.5.3-2: Maximum Concurrency, by Client

State/Client	Programs	SY 2021–2022	SY 2022–2023	SY 2023–2024
Texas	Summative, Interim, TELPAS, ALT, EOC	1,140,800	1,129,400	1,187,800
California	Summative, Interim, ALT	494,900	487,900	511,000
Florida	Summative, EOC	226,300	399,400	383,500
Ohio	Summative, ELPA21, ALT	158,900	176,100	211,300
Indiana	Summative, ALT	123,100	127,100	133,500
Washington	Summative	88,100	89,400	71,800
Arkansas	Summative, ELPA21, Interim	2,800	3,000	70,700
Utah	Summative, Interim, Benchmark	46,100	49,600	51,700
Connecticut	Summative, ALT, Interim	40,600	41,900	45,000
West Virginia	Summative, ELPA21	27,700	30,800	29,800
Idaho	Summative, ALT, Interim	22,400	30,400	23,300
Hawaii	Summative, ALT, EOC	20,700	20,400	19,400

State/Client	Programs	SY 2021–2022	SY 2022–2023	SY 2023–2024
Oregon	Summative, ELPA21, Interim	18,200	19,500	18,900
South Dakota	Summative, ALT, Interim	10,000	14,000	15,600
Wyoming	Summative, ALT, Interim	13,300	14,300	11,300
New Hampshire	Summative	10,000	11,500	10,000
Delaware	Summative, ALT, Interim	11,600	9,700	9,200
North Dakota	Summative	6,200	7,800	6,700
Rhode Island	Summative, Interim	2,900	3,300	3,800
Montana	Summative, ALT, Interim	7,100	6,800	3,500
U.S. Virgin Islands	Summative, Interim	1,300	2,000	1,700
Louisiana	ELPA21	1,900	1,800	1,700
Iowa	ELPA21	1,000	1,000	1,200
Nebraska	ELPA21	1,000	1,000	1,000
South Carolina	ALT	100	100	92
Arizona	ELPA21	41	100	41
College Board	SATs	50,800	83,500	N/A
Vermont	Summative, ALT	5,100	23	N/A

Exhibit 4.2.5.3-3 presents the total number of tests completed, by client, across time. Total tests completed during the school year include summative, interim, benchmark, and practice tests taken by actual students. The online test delivery platform has been architected to use the same computer hardware to serve all these test types.

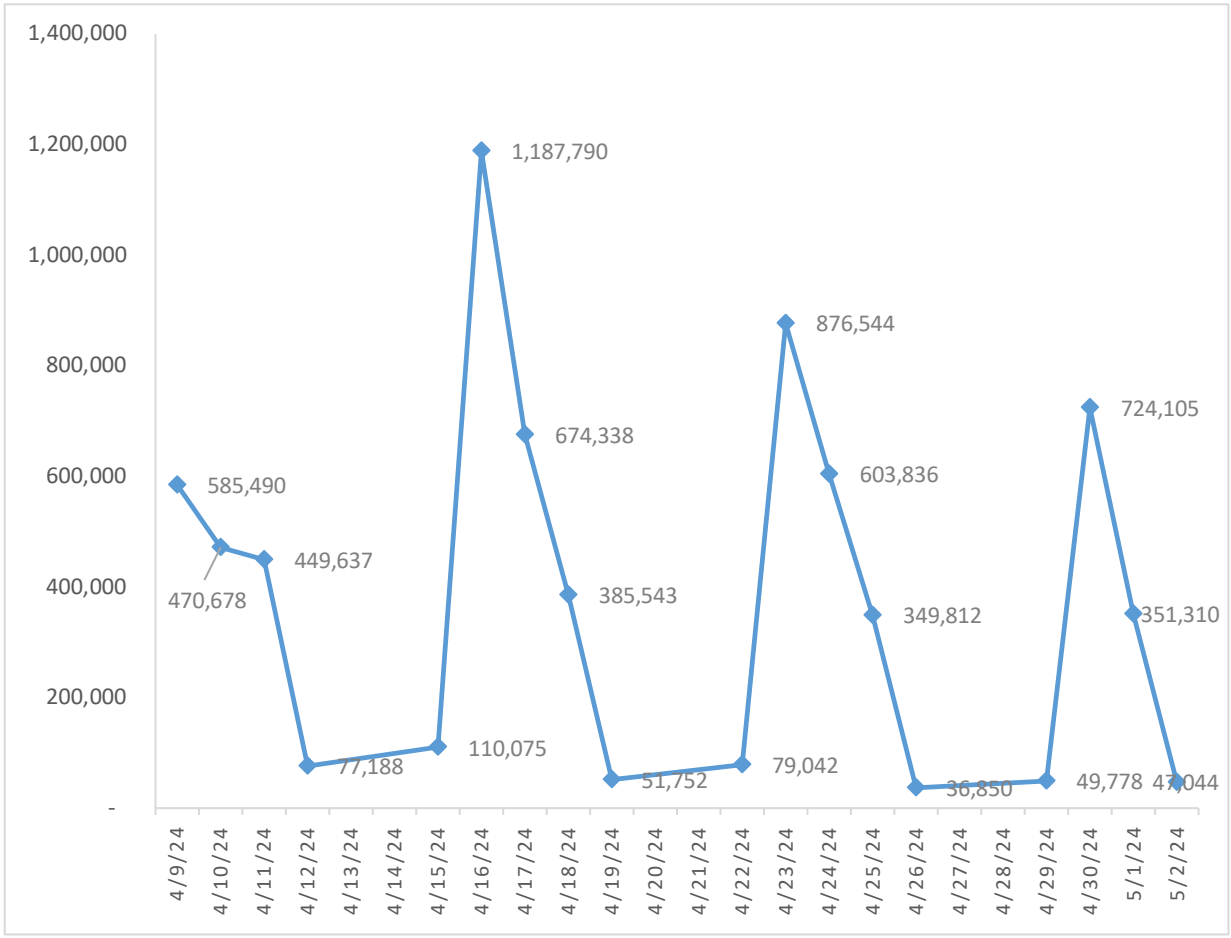
Exhibit 4.2.5.3-3: Number of Tests Completed, by Client

State/Client	SY 2016–2017	SY 2017–2018	SY 2018–2019	SY 2021–2022	SY 2022–2023	SY 2023–2024
California	22,356,914	24,439,667	26,298,263	33,876,600	32,776,700	34,338,400
Texas	Added in 2021	Added in 2021	Added in 2021	21,044,000	31,311,100	32,199,500
Florida	4,938,729	4,369,605	2,953,274	6,515,500	16,653,900	15,562,700
Ohio	6,912,011	6,758,254	6,794,096	10,090,600	10,417,900	12,129,400
Indiana	Added in 2018	Added in 2018	4,940,040	5,123,300	4,387,600	4,634,900
Washington	4,906,215	5,158,737	5,318,704	5,706,900	4,107,000	4,330,700
Utah	3,040,724	3,113,612	N/A	3,143,000	3,419,000	4,128,800
Arkansas	158,536	164,878	168,943	274,600	279,300	3,779,200
Connecticut	1,326,910	1,610,733	1,883,838	2,296,400	2,425,800	2,555,800
Oregon	1,393,469	1,415,776	1,416,410	2,058,500	1,878,000	2,226,100
West Virginia	1,649,050	1,072,856	1,606,139	1,525,200	1,656,900	1,460,200
Idaho	1,044,522	1,276,794	1,349,107	1,437,000	1,322,300	1,436,600
Hawaii	659,228	518,080	574,345	700,500	685,600	772,400
Wyoming	1,836	599,690	761,325	701,200	641,400	651,200
South Dakota	453,021	482,540	443,944	576,900	556,000	648,600
Delaware	373,192	426,339	443,597	482,700	437,600	489,000
New Hampshire	351,346	335,151	407,167	484,400	481,900	479,600
North Dakota	223,904	116,943	174,799	250,500	241,000	269,400
Iowa	130,877	163,485	177,429	229,500	236,100	265,300
Louisiana	Added in 2017	104,907	119,068	224,800	239,600	263,500
Montana	314,264	340,211	355,902	405,100	387,300	222,500
Nebraska	82,975	89,900	96,004	171,500	190,400	207,300
Rhode Island	Added in 2017	34,358	62,270	121,400	127,000	178,300

State/Client	SY 2016–2017	SY 2017–2018	SY 2018–2019	SY 2021–2022	SY 2022–2023	SY 2023–2024
U.S. Virgin Islands	41,349	Paper-pencil testing due to hurricanes	10,044	53,300	63,400	51,700
South Carolina	41,704	12,003	16,031	14,800	15,400	16,500
Arizona	3,323,240	3,612,909	3,434,296	N/A	5,700	7,600
College Board	Added in 2017	23,906	282,715	2,207,100	2,826,000	N/A
Vermont	236,602	280,537	276,143	291,900	500	24
Bureau of Indian Education	647	706	1,713	N/A	N/A	N/A

Exhibit 4.2.5.3-4 illustrates a histogram across the largest high-stakes window in Texas in 2023–2024. It shows the daily maximum concurrency across the testing window and CAI's platform meeting its demands the entire time.

Exhibit 4.2.5.3-4: Maximum Concurrency Across Spring 2024 Testing Window



Proposed Deployment of Test Delivery System for New Jersey

Given New Jersey's student population, testing schedules, and other capacity-driven factors, we expect a peak concurrency of 250,000 students. New Jersey will be deployed on a shared cloud, which will be expanded with additional capacity to support expected New Jersey testing volume. Exhibit 4.2.5.3-5 presents our proposed plan for deployment.

Exhibit 4.2.5.3-5: TDS System Configuration for New Jersey

TDS's Rated Capacities per Component **Login:** 1.5 million student concurrency per cluster (This rated capacity can increase to more than 1.5 million for one cluster just by adding more web servers.) **Shards:** 150,000 student concurrency for one shard **Satellites:** 25,000 student concurrency for one satellite	
TDS Component	Additional capacity required to support New Jersey
Login	Three additional application servers One database server (with failover over server)
Shards	With a rated capacity of 150,000 per shard, we will have two shards allocated for New Jersey.
Satellites	A maximum of approximately 1.25 million student concurrency. These satellites will spin up and down based on a capacity estimation model. Predictor – CAI provisions capacity in advance of testing windows and bases this on a capacity model that has historically proven to be accurate and reliable. It is unlikely that CAI does not accurately anticipate demand. In the unlikely event that the demand is unanticipated, CAI has a proprietary predictor tool that predicts highest concurrency based on current concurrency and student ramp-up rate per minute. If the tool predicts that it needs more capacity, the system immediately provisions and deploys servers to the environment before the prediction occurs. The immediate ramp-up includes a mandatory automated functional test to ensure that the additional resources are reliable and functional.

SSO Scalability

We use Red Hat Single Sign-On (RH-SSO) for SSO authentication. RH-SSO is a third-party identity provider built by Red Hat, one of the largest worldwide providers of Java applications, using the Linux platform. It is subdivided into two components: the application web servers and the database servers. Red Hat architected RH-SSO with the ability to handle multiple, highly available clusters distributed in different geographic regions, while at the same time maintaining sub-second authentication response time.

RH-SSO requires application web servers that can scale linearly, as well as a large database cluster for storing realm and user data. The database cluster comprises two large databases with real-time data replication; if there is an event that causes the primary server to go offline, the other passive server automatically becomes the primary one.

The users for SSO include all users who need access to our systems, except for students. When we perform capacity planning for SSO, we use a ratio of one user to 20 students based on historical usage rates we have observed across 10–12 years.

Given New Jersey's expected student concurrency of 250,000 and using the 1:20 user-to-student ratio, we expect New Jersey's SSO to reach 12,000 user concurrency. Our SSO system has a capacity of 150,000 user concurrency for one SSO cluster. Thus, we propose to provide New Jersey with a separate SSO cluster. Exhibit 4.2.5.3-6 summarizes this configuration.

Exhibit 4.2.5.3-6: SSO Configuration with New Jersey

RH-SSO's Rated Capacity: 150,000 concurrent users per cluster. Clusters can be added as needed.	
SSO Component	**Number for New Jersey**
Application Web Servers	2
Database Cluster	1

TIDE Scalability

Because TIDE is mainly responsible for user and student registration, scalability for TIDE means handling multiple student data uploads into the system while ensuring that data integrity and accuracy are not compromised in any way. TIDE is also responsible for providing student test participation data.

TIDE is divided into four primary components: (1) application web servers, (2) Roster Tracking System (RTS) database, (3) TIDE database, and (4) participation reports database.

The application web servers handle the load coming from the user interface as well as the load coming from automated data uploads. TIDE is designed to scale linearly based on the expected data uploads for a state. Because TIDE is the central repository of all registration data, the RTS database is designed to handle heavy volumes of longitudinal student and user information. TIDE is the only system that writes into RTS; all other systems read from replicated copies of it.

The participation reports database, however, receives all its information from the TDS as students progress through their tests. It can scale horizontally as expected usage rates increase.

Given New Jersey's expected user concurrency of 12,000, we propose to deploy the New Jersey TIDE application on an existing TIDE cluster. Exhibit 4.2.5.3-7 shows the number for each TIDE component.

Exhibit 4.2.5.3-7: TIDE Configuration

TIDE Component	**Number for New Jersey**
Application Web Servers	2
RTS Active-Passive Cluster	1
TIDE Active-Passive Cluster	1

Centralized Reporting Scalability

The CRS is designed to support many concurrent users interacting with the system in viewing a variety of different reports that aggregate data at different levels and over time (longitudinally). Student test information (containing item and test scores) flows from the Analysis system into the reporting system in real time and is immediately available for reporting. For tests that are fully machine-scored, this occurs in less than a second from the completion of the test to the data being available in reporting. For tests that require handscoring, the results are available in the reporting system as soon as all the scores for that test have been received from the handscorers. The system architecture is specifically designed to scale to handle the read-heavy nature of user actions (generating reports from data in the database) with the write-heavy nature of receiving and storing the score information to the database.

With an expected 12,000 user concurrency, we propose to support New Jersey on and establish an instance of the CRS. Exhibit 4.2.5.3-8 summarizes the proposed configuration.

Exhibit 4.2.5.3-8: CRS Configuration

CRS Component	Maximum Number for New Jersey at Peak Times
Application Web Servers	2
Shards	2
Cache Servers	2

Family Portal Scalability

Family Portal architecture leverages Amazon Web Services (AWS) cloud services and is dynamically scalable to the limits of AWS capacity. Exhibit 4.2.5.3-9 summarizes the current proposed configuration, which can be adjusted to AWS maximums as needed to support actual usage.

Exhibit 4.2.5.3-9: Family Portal Configuration

Family Portal Component	Maximum Number for New Jersey at Peak Times	AWS/Account Maximum
RDS Aurora Cluster	4 Capacity Units	32 Capacity Units
Fargate Cluster (Data Ingestion)	10 Tasks	1,500 Tasks/Service
Fargate Cluster (PDF Ingestion)	12 Tasks	1,500 Tasks/Service
AWS Lambda	25 Concurrent Invocations	2,500 Concurrent Invocations
API Gateway	1,500 Requests Per Second (average)	2,500 Per Second
CloudFront/S3	AWS Capacity	AWS Capacity

CAI Conducts Load Tests to Ensure System Performance Under Expected Loads

Prior to each major assessment cycle, we conduct large-scale system load tests. These load tests simulate the effects of real students from all clients at the peak of the testing season. We closely study all latency and error logs, bandwidth utilization, and data throughput, and then we make system modifications, corrections, and augmentation where needed.

Estimation of Expected Student Concurrent Load

We estimate concurrent load based on several factors:

- *Testing window length* – The shorter the testing window, the higher the concurrency.
- *Number of devices* – The larger the number of devices (and the more robust the test lab infrastructure is at the schools and districts), the higher the concurrency.
- *Time zone* – We look at time zones for each client and study their peak testing periods relative to one another.
- *Historical concurrency trends* – We look at percentage of increase over time.
- *Eligible student population* – We look at student population for the state as well as the number of tests the students are eligible to take.

Exhibit 4.2.5.3-10 shows the driving factors of expected concurrency using New Jersey figures.

Exhibit 4.2.5.3-10: Driving Factors of Expected Concurrency

Factor	New Jersey
Testing Window Length	Main testing windows: 3–4 weeks in spring
Eligible Student Population	100,000 per grade
Time Zone	Eastern
Estimated Load + 25% Buffer	250,000

CAI Monitors Systems Continually for Performance

CAI is proactive in monitoring systems for performance and issues that can impact system performance. Our Network Operations Center (NOC) team is constantly watching the monitor and dashboard application for unusual events. Unusual situations are handled immediately before they create issues in the field. Each morning before the start of the testing day, we run a series of automated functional tests (AFTs) to ensure that our systems are fully functional and ready to start on the testing day. If issues are discovered during the AFT process, the NOC immediately initiates an Everbridge call to begin resolution.

CAI Proactively Supports New Web Browsers, Operating System Versions, and Devices

CAI test delivery systems are fully accessible using standard web browsers, including Google Chrome, MS Edge, Safari, and Mozilla, running on common operating systems and hardware platforms including Windows PCs, Apple macOS desktops, Linux desktops, Chromebooks, and iPads. New browser versions are supported proactively. Support for older versions is maintained in order to accommodate school infrastructure limitations. The supported browsers list is updated annually. Secure test delivery requires the installation of the CAI Secure Browser, which is updated annually. Full system requirements are described in Section 4.7.1.2.

New Versions of Supported Browsers

CAI's platforms are designed to work with the widest range of hardware, operating systems, and browsers in the industry, and CAI continually works to stay current with browser releases. CAI currently supports the following browsers for use with our suite of applications:

- Chrome 108 or higher
- Firefox 111 or higher
- Edge 108 or higher
- Safari 11 or higher

CAI provides presumptive support for platforms that release a new browser approximately every six weeks (e.g., Mozilla, Google). We do not block new versions of these browsers from accessing the site.

Platforms that release their browsers annually (e.g., Apple, Microsoft) typically make significant changes, and for this reason, may require up to 90 days to support, although this is often facilitated in much less time. We block new versions of these browsers from accessing the site until they are tested, and all issues are resolved. The CAI Project Management Team will provide visibility to NJDOE on the timing of support for such new versions and coordinate support availability.

CAI will maintain a list of supported browser versions on the New Jersey Assessment Portal. This will include the status of support for new browsers that are not yet fully supported.

Support for Historical Browser Versions

Browsers are constantly updated by their developers to address evolving security threats. Older versions can present significant security risks, including the potential to leak student personal data. At the end of each school year, CAI updates the list of supported browser versions and removes older versions to ensure system security. The baseline for the next school year is typically the released version at the start of the summer; CAI guarantees to support that version throughout the year along with newer versions as described previously. CAI will continue to support the latest available browser version for all supported operating systems and platforms, even when that is not the current browser version.

The list of supported browsers will be coordinated with NJDOE and posted on the New Jersey Assessment Portal when finalized.

CAI Provides Organization and Role-Based Access Controls Configurable to Meeting the State Contract Manager's Requirements

Our systems use role-based security models to ensure that users access only the data to which they are permitted and that limit their ability to change that data. User groups include administrators at the state, region, county, district, and school levels; students; and parents. CAI can also configure sublevels within each of these user groups.

User rights have two dimensions: (1) the user's role and (2) the user's data access rights (organization level). The user's role determines what actions a user can take, which types of reports the user can view, and similar functional limitations. Data access rights tell, for example, which principal can view which teacher and student data. Data access rights are governed by relationships among entities in our RTS, along with a configurable set of business rules that describe which access rights correspond to which relationships and enforce client-specific policies. Roles and organizations are hierarchical. Users at higher roles and in higher organizational levels can be configured with access to impersonate subsidiary roles and to access data in subsidiary jurisdictions.

CAI systems are highly configurable and can support any number of roles. CAI will work with NJDOE to ensure that an appropriate set of differentiated roles across state, region, district, and school levels is available in the system and supports all necessary test administration activities. The required configuration will be documented in a user management specification, which will be provided for approval as part of the initial contract setup process and will be reviewed annually to capture updates. For each user role, CAI will work with NJDOE to specify which features are available to each user role. CAI will continue to work with NJDOE to review and refine these specifications and make adjustments as needed during the annual specification review process.

Family access to student data is handled separately for administrative users. Families have specific access to their own student's data in our Family Portal application.

User Passwords and Assigned Roles Ensure That Student Data Are Protected

As discussed in the previous section, CAI's access control system is role based rather than user based. However, roles and the access rights that each role confers are highly configurable; we can support a variety of roles which could be assigned in combination with each other to provide very specific access to system functions. CAI will work with NJDOE to define the appropriate

roles to manage user access while simplifying the user manager process. Access controls are also defined at the organizational level (jurisdiction level) and users can be different roles in different organizations to ensure only the required access for each user.

Access to all CAI test administration modules requires a user ID and password as well as a second identity factor, which is a code emailed to the user's known email address. As described in the following section, passwords must be secure and must be changed at least annually to prevent unauthorized access to system data.

CAI Implements Self-Service Password Management to Simplify Administration

CAI has implemented a secure password management process for our suite of systems as part of our SSO capability described in the following section. The process is designed to be secure while minimizing administrative engagement by client or CAI staff.

- Passwords are fully encrypted using one-way hash techniques and are not viewable or recoverable.
- Password management is fully self-service.
  - Users can change passwords without administrator support.
  - Users can reset lost passwords via emailed password reset links.
- User accounts are locked after five failed attempts within a five-minute window.
  - Accounts are automatically unlocked after 10 minutes to minimize administrative support requirements.

CAI will work with NJDOE to implement manual account locks if required. This capability is supported by the current SSO system, but not implemented due to the effectiveness of the existing process.

CAI Supports Single Sign-On Across All Test Administration Modules

CAI has integrated RH-SSO to provide SSO support across our suite of test administration modules. Users are created in the SSO system via TIDE. Once created, users are notified of access via email. Users can follow the link provided to create their password and then begin to access the modules in the CAI suite of applications. Once signed on, users can move between modules without the need to re-authenticate until logged out.

CAI Systems Are Supported 24/7/365 by Experienced Engineers

The CAI test administration system is engineered to be available 24 hours a day, seven days a week, 365 days a year and is supported around the clock by a team of experienced engineers. Our support team includes AWS engineers, who support our hosting environments. These engineers monitor (supported by automated monitoring processes), detect, and address hardware and infrastructure issues and ensure uninterrupted Internet access. Our NOC monitors for alerts from our hosting vendors and watches our system monitors and application dashboards as described in Section 4.7.1.6. The NOC engages our systems engineers and developers to quickly respond to issues. We use a third-party service called Everbridge to quickly assemble required staff day or night to assess and mitigate issues that could impact client assessment programs and testing operations.

CAI Minimizes Maintenance Impacts on System Availability

Routine system maintenance is performed outside regular business hours to minimize the risk of impacting system availability. CAI will only conduct maintenance requiring service interruptions after 11 p.m. on weeknights, on weekends, or on state holidays.

System patching, which may require downtime for some applications, is scheduled at least a year in advance. System and application maintenance that includes service interruptions will be scheduled at least 10 days in advance as part of our Production Control Board (PCB) process. CAI's New Jersey project manager will provide notification of planned outages and obtain NJDOE approval in advance.

System outages will be reflected in the New Jersey Assessment Portal on the system card for the application and the application URL will show an offline message during outages.

CAI Will Provide Technical Documentation to the SCM

As required, CAI will provide documentation to the SCM that describes our overall system architecture and technologies. The documentation will include information concerning software maintenance processes and schedules (e.g., downtime). CAI will review and update the documentation annually in accordance with the Annual Yearly Schedule.

CAI Will Provide Reports to the SCM as Requested

CAI will deliver reports on the following information on a quarterly basis or when requested by the SCM:

- Website availability
- Network usage and line utilization data, including how much capacity is allocated to New Jersey
- System volume and performance data, such as number of transactions, transaction processing rates, response times, etc.
- Explanations of service interruptions and remedial actions taken
- Other relevant information

Specific reports and formats will be defined during contract initiation. CAI will provide reports based on data collected by our systems.

Client Dashboard

In addition to the reports, CAI will provide a secure web-based client dashboard that provides information on how many students are currently testing in New Jersey and presents a snapshot of overall system health. Information is provided in real time. In Section 4.7.1.6 (Exhibit 4.7.1.6-8), we present a sample screen capture of this dashboard.

CAI Systems Do Not Require Special Plugins or Rights On User Computers

All CAI modules work with standard browsers. No special plugins or third-party software is required; no special user rights are required to use our systems.

CAI Systems Work With Standard Computers and Browsers

All CAI modules work with standard browsers. No special installation or integration is required.

The CAI Secure Browser, which is a standard Firefox browser with customizations to ensure a secure testing environment, can be installed without special permissions or technical knowledge.

CAI Systems Do Not Require Special Computer or Browser Configurations

All CAI modules are designed to work with standard systems and configurations. No special browser settings are required. CAI systems are designed to accommodate typical user customizations such as zooming in or out.

The CAI Secure Browser does not require configuration after installation.

4.2.5.3.1. State Technology Requirements and Standards

CAI is well positioned to meeting state technology requirements and standards.

CAI Will Support State Security and Infrastructure Review Processes

CAI has established internal policy and procedures and documented our architecture as part of our ISO 27001 and ISO 27018 certification processes. These documents have been audited for compliance with ISO standards by external auditors. CAI will make the appropriate documentation available to the New Jersey Office of Internet Technology (NJOIT) for review and will participate in the System Architecture Review (SAR) process. CAI will provide due consideration to all NJOIT recommendations and will work with NJOIT to address concerns raised during the SAR.

CAI Will Cooperate with the SCM and NJDOE to Ensure That Our Business Continuity Plan Is Revised to Address State Inputs

In Section 3.11, CAI proposes our existing business continuity plan (BCP), which is maintained as part of our ISO 27001 compliance program, as our preliminary contingency plan. CAI will review and incorporate recommendations made during the project launch meeting (PLM) into our BCP, as appropriate. CAI will submit a revised BCP to the SCM and NJDOE within 10 business days of the conclusion of the PLM. If the SCM suggests changes, CAI will incorporate suggestions for changes as appropriate into the BCM and will resubmit to the SCM within three business days of the receipt of request.

CAI Will Ensure That Our Business Continuity Plan Meets State Requirements

CAI is committed to maintaining a BCP that fully documents and defines our approach to ensuring system availability in the event of critical, unexpected events. CAI will incorporate New Jersey inputs to refine our existing documentation toward this objective. CAI will also ensure that our BCP

- fully documents our security and disaster recovery plans;
- includes or references physical diagrams;
- identifies key personnel, organization units, and alternate sites with telecommunications and computers;
- is tested at least annually or within 10 business days of notice from the SCM; and
- is reviewed and updated annually.

CAI Will Collaborate with New Jersey's Enterprise Data Services

CAI agrees to coordinate and collaborate with New Jersey's Enterprise Data Services to complete the SAR process and maintain our BCP to fulfill New Jersey's interest in ensuring the reliability and availability of the systems provided by CAI under this contract.

CAI Will Comply With the Guidance of the New Jersey Statewide Information Security Manual

CAI has implemented a security program and associated security processes that align with the guidance of the New Jersey Statewide Information Security Manual. CAI embraces our responsibility as stewards of student information and secure test items. We take clearly defined precautions to ensure the protection and privacy of these data. With our top-tier security standards, we can ensure the security of test items and secure testing materials throughout the testing cycle.

CAI is ISO 27001- and ISO 27018-certified to protect students' personally identifiable information (PII) and test data according to industry-standard security controls. We are annually audited to demonstrate compliance with these controls. We are also certified for successful implementation for Center for Internet Security (CIS) Top 20 controls. Our extensive security measures cover item development; item transfer to and from other vendors or subcontractors; data collection; test production; shipping and receiving of materials; delivery of computer-based content to schools; scanning, scoring, analysis, and reporting; storage of printed booklets; and document destruction.

CAI Will Comply With the New Jersey Web Presence Guidelines

CAI's suite of applications for assessment delivery can be customized to support New Jersey branding guidelines as described in the New Jersey Web Presence Guidelines. Customization includes State and NJDOE logos and the utilization of state colors.

CAI systems meet the requirements of Section 508, Americans with Disabilities Act (ADA), and Web Content Accessibility Guidelines (WCAG). CAI applications have received Web Content Accessibility Guidelines (WCAG) 2.1 AA compliance, a very high level of compliance for accessible web applications. CAI uses a third-party vendor to audit our WCAG compliance. We also provide Voluntary Product Accessibility Template (VPAT) documents, describing how our systems comply with Section 508 standards. CAI will be pursuing WCAG 2.2 compliance once the standard has been approved.

CAI Will Support the State's Shared Identity and Access Management (IAM) Strategy

CAI will work with NJDOE to comply with the states state's shared Identity and Access Management (IAM) strategy. CAI's Single Sign-On (SSO) module is based on Red Hat Single Sign-On (RH-SSO), RH-SSO is a third-party identity provider built by Red Hat, one of the largest worldwide providers of Java applications, using the Linux platform. RH-SSO supports various protocols, such as OpenID, OAuth version 2.0, and Security Assertion Markup Language (SAML), and provides features such as user management, password policies, and two-factor authentication.

CAI has experience developing custom authentication solutions to accommodate state-specific requirements and improve the user experience in the field. For example, in Delaware, CAI worked on custom integration solutions for CAI's single SSO to interface with Delaware's SSO. The custom solution allowed users logged in to Delaware's SSO to choose CAI systems. The solution also allowed users to not only be authenticated to CAI systems, but to be auto-provisioned by CAI if they were not already in the system. This completely removed the need to manually provision users in CAI systems.

4.2.5.3.2. Hosting and Backup Services

All CAI systems are hosted at Amazon Web Services (AWS) data centers that are ISO 22301 and SOC 1/2/3 certified and observe stringent standards for physical and electronic security, communications reliability, and resilience. Systems hosted in AWS rely on AWS isolation client capabilities, which are audited by third parties as part of the ISO and SOC certification processes.

Data in CAI's AWS infrastructure is backed up using Commvault Cloud Software. CAI backup data is stored in dedicated S3 buckets in CAI accounts. All backup data are replicated to a second region and critical data are copied to Azure.

CAI is ISO 27001 certified to protect student personally identifiable information (PII) and test data according to industry-standard security controls. We are also ISO 27018 certified for cloud-based solutions. This is significant for the following reasons:

- ISO 27001 is among the most widely recognized internationally accepted standards on information security. It uses a top-down evaluation of management processes and policies to demonstrate that an organization has adopted a set of best practices for information security.
- ISO 27018 covers the processing of PII and the safeguarding of security and privacy in public clouds.

New Jersey applications will be hosted on one of two configurations: (1) dedicated or (2) shared.

In the dedicated configuration, New Jersey will be supported by a dedicated application accessing a dedicated database. The New Jersey application will have a separate URL and only users in the New Jersey authentication domain will have access to the application. The dedicated application and database may be hosted on a shared server that supports other clients, but the clients are separate and distinct. CAI's Test Information Distribution Engine (TIDE) and Analysis systems will be deployed in the dedicated configuration for New Jersey.

In the shared configuration, New Jersey will be supported by a common application supporting multiple state clients. All database records include a client identifier, and all database access is restricted by client identifier. Shared configuration systems are thoroughly tested to ensure isolation of client data. The Test Delivery System (TDS) and Centralized Reporting System (CRS) will be deployed in the shared configuration.

4.2.5.3.3. Extranet Plan

CAI will work with NJDOE to establish Multiprotocol Label Switching (MPLS) cloud connectivity from state data centers to CAI data centers based on State requirements. This process will include the following tasks:

- CAI anticipates that NJDOE will contract with a vendor of your choosing to provide connectivity from two of the data centers:
  - The primary connection will be from the primary data center at OIT HUB, 1 Schwarzkopf Drive, West Trenton, NJ 08628.
  - The secondary connection will be from New Jersey's OARS (HAM)Data Center—State Police Technology Complex, 1200 Negron Rd. Hamilton, NJ 08691.
- CAI will establish corresponding AWS Direct Connect Endpoints in two AWS Direct Connect Locations (https://aws.amazon.com/directconnect/locations) proximate to the New Jersey data centers.

- The connection speed will be determined by NJDOE but must be within the published capabilities of AWS Direct Connect, which is currently limited to 100 Gbps.
- CAI will work with NJDOE and NJOIT to establish an Extranet Partner relationship per New Jersey's extranet policy 09-11-NJOIT.
- CAI will work with the NJOIT network group to establish the appropriate routing protocols based on the system requirements and the NJOIT security group to establish appropriate firewall rule sets to accomplish necessary business data flow.
- CAI agrees to follow New Jersey's Extranet Policy and Procedure and complete the related application form, the Memorandum of Understanding (MOU), operational form, and security controls assessment checklist.

4.2.5.3.4. Transmission of Files

NJDOE requires that the Contractor work with the State to implement a secure file transfer process that meets the State and federal security guidelines and standards. CAI has worked with all our state clients to ensure that data transfers meet both state and federal data security standards and guidelines and will do the same with NJDOE. Currently, CAI uses Citrix ShareFile to securely exchange data. The data are encrypted using hypertext transfer protocol secure (HTTPS) (Transport Layer Security [TLS] 1.2) protocols. Sensitive data are only kept for a limited time. The access is monitored, and only manager-approved personnel are granted access to this system. This access is also limited so other users cannot add or elevate other accounts. CAI performs regular audits. The accounts that do not show a login in the last 90 days are deleted. System-to-system data transfers may be performed using Secure File Transfer Protocol (SFTP), which encrypts data during transmission using secure shell (SSH).

Per NJDOE's requirements, CAI will work with the State to test the file transfer system. Additionally, as specified in NJDOE's requirements, if the State revises or changes the file transfer method and/or format to accommodate real-time processing and use case-specific information, CAI is prepared to conform to such changes. CAI has adapted to many states changing their data transfer protocol over time, including several states that have recently begun using real-time application programming interface (API) transfer of data.

4.3. General Requirements

4.3.1. Operational Work Plan and Operational Yearly Schedule

CAI's Preliminary Work Plan (PWP), submitted with our Quote according to Section 3.6.1, represents an initial draft and approach for the Operational Work Plan (OWP). Upon award of this contract, we will update the PWP to incorporate decisions and recommendations coming out of the project launch meeting (PLM). The OWP will operate as the formal road map for the program, describing the approach and plan for accomplishing the work and clearly documenting approved scope changes and their impacts.

The CAI Project Management Team will seek the SCM's written approval of the OWP before proceeding with the Operational Yearly Schedule (OYS) and will make revisions and updates to the OWP throughout the course of the contract to ensure that it accurately captures all the project deliverables and milestones, including a breakdown of who will do what and by when. The OWP will clearly define the actions that CAI will take to support NJDOE's strategic objectives and plans for this program.

4.3.1.1. Operational Yearly Schedule

CAI has submitted a Preliminary Yearly Schedule per Section 3.6.2, which represents our initial draft and approach for the OYS. If awarded this contract, we will revise the draft schedule with any needed changes that result from decisions made during the PLM.

We will be pleased to incorporate the following six requirements with respect to the OYS:

1. Elements including, but not limited to, milestones; milestone completion dates; precursor activities; activity beginning and end dates; status indictors; and responsible parties
2. Revisions submitted to the SCM within three business days of the request
3. Scheduling software that allows NJDOE's preferred organization of major task groupings
4. Print copies upon request
5. Inclusion of quality-control steps with references to updated documentation about those processes
6. Delivery of the following year's draft OYS on the first business day of March each year, with finalization by the first business day in July of each year

4.3.2. Documents and Printed Materials Requirements

CAI has a long and successful history of delivering on our commitments, including the on-time delivery and deployment of all testing and support materials. We will deliver all printed and electronic materials according to the final program schedule and after all requisite reviews and approvals by the SCM and authorized representatives of NJDOE. CAI will support the delivery of error-free, high-quality materials, understanding that NJDOE's reviews will be iterative and may result in changes that must be accommodated right up until documents go to press. CAI's collaborations and integration with industry partners create comprehensive program solutions that are unmatched in service and quality among our competitors.

Paper-based test materials are an integral part of New Jersey's Next Generation Assessment Program for those students who are unable to test online. We will include the full assessment production and delivery timelines as part of the Operational Yearly Schedule, including the editorial review-and-approval phases, in order to ensure the highest-quality production and the most timely distribution of all materials.

CAI and Measurement Incorporated (MI) have developed a strong and successful partnership, working together to capitalize on each organization's strengths and core areas of expertise. Our teams have formed an integrated support services team, with a proven track record of successfully developing, printing, and delivering paper-based test materials. Our assessment support services team will work with NJDOE to document the requirements for handling the paper documents described in this proposal. Our editorial and print production processes will ensure that every student participating in the NJSLA-ELA/M and NJGPA who receives a paper test has a successful testing experience.

MI will maintain primary responsibility for the print production scope of work. MI currently produces more than 100,000 test booklets annually. It accomplishes this volume by using both its own in-house digital printing equipment and local printers with whom MI has a long and successful relationship. MI is acutely aware of the need to enact stringent protocols that assure the security and quality of student test booklets, so it works with its printing partners to ensure that they meet MI's strict requirements. MI's assessment support services team routinely visits its local printers to verify that they are meeting MI's quality standards and those of MI's clients.

MI's assessment support services team includes full-time staff to support distribution, collection, and warehousing activities. These individuals have many years of experience implementing the stringent security measures required for large-scale, high-stakes assessments like the NJSLA-ELA/M and NJGPA. During peak periods, assessment support services managers train and supervise additional seasonal staff to uphold the same security standards. This means that NJDOE and New Jersey students can be assured that every student's test materials will remain confidential.

MI has developed an internal tracking system to locate individual documents at any time while they are in MI's possession. Paper test materials are stored in locked warehouses, and access to them is limited to a select group of employees identified by the appropriate project manager. A member of MI's information technology team must initiate any retrieval request, which only assessment support services staff can complete.

MI's headquarters and main processing center in Durham, NC, has 36,600 square feet of space devoted to staging and storage. The company maintains an additional 50,000 square feet of shipping and storage space in a nearby warehouse. MI can provide short-term or long-term storage and retrieval of documents for its clients as well as secure shredding and recycling of materials once they meet retention policy requirements. Exhibit 4.3.2-1 summarizes MI's capacity to process paper test materials.

Exhibit 4.3.2-1: MI's 2023–2024 Paper Processing Metrics

Category	Metrics
Yearly number of sheets scanned	8,900,000
Daily scanning capacity (three shifts)	1,200,000
Yearly number of documents processed[a]	750,000
Daily document processing capacity (three shifts)[a]	100,000

[a] Document processing is based on an average of a 24-page booklet.

NJDOE will receive high-quality processing of paper test materials for the NJSLA-ELA/M and NJGPA because MI has maintained the facilities and services required for large-scale assessment programs.

Printing Customized Paper Test Materials

Throughout MI's history, it has integrated test security procedures into every aspect of its testing processes, including the printing of customized test materials like those required for the NJSLA-ELA/M and NJGPA. MI bases its processes for printing paper test materials upon experience working with clients to administer large-scale assessments; best operational practices (*Operational Best Practices for Statewide Large-Scale Assessment Programs*, 2013[2]); and evolving technological and physical security developments.

MI's assessment support services staff is familiar with the printing and post-printing requirements of high-stakes assessments, including requirements to seal, barcode, and shrink-wrap test booklets. MI staff will shrink-wrap individual test materials and bag and seal testing kits to discourage district personnel from opening them prior to test day.

Producing and Printing Braille Test Booklets

MI's team will work with NJDOE to reformat items for the braille version of a test form when needed. MI works with several braille service providers, such as the American Printing House for the Blind and the National Braille Press, whose transcribers are certified in Literary Braille Code by the National Library of Congress and are Nemeth-certified. These vendors can create accurate transcriptions in a professional and timely manner.

A certified and NJDOE-approved proofreader will review each NJSLA-ELA/M and NJGPA braille test form. We maintain close relationships with several external reviewers, such as those associated with the North Carolina School for the Blind. These third-party proofreaders will verify that each test form was transcribed correctly and that the braille form is appropriate for use by students. NJDOE will have final decision-making authority for all transcription reconciliation, if required, between the braille service provider and the third-party proofreader.

The CAI/MI team will coordinate with NJDOE to facilitate all necessary processes and steps, including review and approval by the SCM, to ensure accurate braille test forms for all programs. This may include sending each test form and any related materials to NJDOE for braille review and final approval before production. The braille version may comprise multiple volumes depending on the length of the test. If needed, we will clearly title each volume, and each volume will be trackable by distinct barcodes. We will ensure that test coordinator training and documentation for braille administration include detailed instructions about test administration procedures.

Producing Large Print Test Booklets

MI will produce large print versions of the required NJSLA-ELA/M and NJGPA documents. Rather than simply photo-enlarge the regular booklets, MI will reformat the original tests to fit the larger paper size and font (at least 18-point sans serif Arial or Tahoma for text, and 18–24 point for graphics). MI will pay particular attention to the enlargement of graphics so that they accurately represent the items.

MI will produce and submit electronic PDFs of the large print versions of the NJSLA-ELA/M and NJGPA to the SCM for approval in accordance with the approved schedule.

[2] Council of Chief State School Officers and Association of Test Publishers (2013). Operational best practices for statewide large-scale assessment programs.

Packaging of Braille and Large Print Paper Test Materials

The assessment support services team packs braille and large print tests in kits. These kits include the accommodated braille or large print form, a regular print version of the form, and a cover sheet that shows the contents of the kit. These kits facilitate administration of the tests to students using these versions. They provide the tools necessary for a test proctor to record the student's answers during the test and enter the responses into the Data Entry Interface (DEI).

Once the assessment support services team creates the kits, they are handled with the same care as other secure materials during packing and shipping. A specially developed program tracks which boxes the kits are placed in, and test coordinators can use the packing slips to easily find them.

Editorial Support for Print Production

Editorial Support for Regular Print Materials

CAI will produce all paper test forms, answer folders, mathematics reference sheets, and manuals in Adobe InDesign. We will use a Secure File Transfer Protocol site or like method to provide those materials to MI. This handoff will include the following:

- Native InDesign files packaged
- Associated graphics
- Press-ready PDFs

Once MI receives the files, its editorial staff will conduct the following reviews:

1. Verify that all pages are present and in numerical order.
2. Verify that all test items are in the correct order and numbered sequentially.
3. Verify the accuracy of the read-aloud directions at the beginning of each test section.
4. Verify that the number of items in each test section/part is correct (e.g., This section contains 35 items.).
5. Verify that the appropriate number of items associated with a passage or stimulus is correct (e.g., Use the following table and diagram to answer items 1–5.).
6. Verify that answer choices are labeled sequentially and accurately (e.g., A, B, C, D).
7. Verify that headers are accurate for each test section.
8. Verify that footers contain the appropriate directions for students (e.g., Go on to the next page; Stop).
9. Verify that all graphics are legible, clear, and accurate.
10. Verify that each answer folder matches the associated test booklet.

In the unlikely event that MI finds an issue, it will work with CAI to identify the appropriate resolution. Then, it will make the updates in the InDesign files and create a new press-ready PDF.

MI understands that grade 3 test booklets will be consumable (students write their answers directly in test booklets, which are scannable). For the 2024–2025 testing year, all other grades will have a test form and a separate scannable answer folder. Starting with the 2025–2026 testing year, students will write their answers in the test booklets, and these student answers will be transcribed into the DEI by New Jersey district personnel.

Editorial Support for Braille Test Materials

MI will work with braille service providers, such as the American Printing House for the Blind and the National Braille Press, to conduct the editorial tasks necessary to produce braille test materials for the NJSLA-ELA/M and NJGPA. Braille service providers have transcribers and editors who are certified in Literary Braille Code by the National Library of Congress and are Nemeth-certified. These vendors can create accurate transcriptions in a professional and timely manner.

Editorial Support for Large Print Test Materials

MI will review large print versions of the required NJSLA-ELA/M and NJGPA documents using the same process it will use for regular print materials. Rather than simply photo-enlarge the regular booklets, it will reformat the original tests to fit the larger paper size and font. During this process, it will attend to the enlargement of graphics so that they accurately represent the items.

Editorial Support for Other Print Materials

MI will follow the same review protocols it uses for regular print materials to review other print materials that may be required for the NJSLA-ELA/M and NJGPA. These materials may include the following:

- Test Administrator Manuals (TAMs)
- District Test Coordinator (DTC) Manuals
- Mathematics Reference Sheets
- Parent/Student/Teacher Guides
- Other materials required by the SCM (Header Sheets)

4.3.3. New Jersey Educator Participation

New Jersey educators are pivotal to the quality of all items and passages developed under this contract. CAI is committed to engaging educators in the review meetings described in Sections 4.9.3–4.9.18, as well as rangefinding and training material development, when relevant. In these sections, we describe our proposed approaches for training educators according to the purposes of each of these meetings. We also propose using our content rater system, where appropriate, to facilitate these meetings. Doing so affords educators the opportunity to engage with the wide variety of item types that will be found in the New Jersey assessments in a manner similar to how students engage with the items.

Finally, success at educator review meetings also requires a rigorous process for preparing items for review by New Jersey educators. CAI proposes an item development plan (IDP) involving multiple internal content reviews and editorial reviews for content accuracy, alignment to standards, grade appropriateness, Depth of Knowledge (DOK), accessibility, and consistency with the approved item development plan. Grammar, spelling, punctuation, and style will also be an important focus. CAI's IDP places the responsibility of developing high-quality, error-free test items with experienced content specialists who are supported by experienced item and test editors. CAI views the IDP as a collaborative endeavor with our state agency partners, and we look forward to working with NJDOE in an iterative manner to assure that expectations are met at every stage.

4.3.4. New Jersey Standards Measurement and Resource for Teaching (NJ SMART) Interface

New Jersey requires that the collection, reporting, and provision of student assessment data in support of the New Jersey state assessments be undertaken in a manner compatible with NJ SMART or any program that replaces NJ SMART. Refer to Exhibit 4.3.4-1 for a more detailed explanation of CAI's proposal to ensure compatibility with NJ SMART.

Exhibit 4.3.4-1: CAI Compatibility with New Jersey Requirements

Requirement	Response
A. Include the NJ SMART Student Identification Number (SID) provided by the SCM with all student-level reports and rosters.	CAI will import student records uniquely identified by their SIDs in the Test Information Distribution Engine (TIDE), our test registration and enrollment system, thereby making these data available in near-real time to the Test Delivery System (TDS) and Centralized Reporting System (CRS). All student-level reports and rosters can be configured to include the NJ SMART SID as per NJDOE's requirement. This is the most common practice across the assessment programs we support.
B. Support the acceptance, validation, and verification of all student data against a known database of issued SIDs from the NJ SMART system.	If NJ SMART can provide an application programming interface (API) for SID and County-District-School (CDS) code validation, CAI could explore building a validation capability into TIDE to validate student data against SIDs in NJ SMART.
C. Develop interfaces to be approved by the SCM to utilize the SID as follows, but not to be limited to: 1. Accept SIDs in all phases of testing. 2. Create an electronic validation capability that verifies SIDs and CDS codes against the NJ SMART system as data is received. 3. Establish a protocol and methodology for resolving missing SIDs in test submission. 4. Interface with NJ SMART electronically to obtain SIDs for tests submitted without a SID.	State-assigned SIDs are currently used as the unique identifier for students across all of CAI's assessment systems. SIDs uniquely identify students in TIDE and in the CRS. SIDs are used by students to log in to the TDS and by proctors to admit students into their test sessions. New Jersey defines a requirement for an electronic validation capability to verify SIDs and CDS codes against NJ SMART as data are received. If NJ SMART can provide an API for SID and CDS code validation, CAI could explore building a validation capability into TIDE. Because students must provide a SID in order to log in to the TDS to take an online test, it is not possible for students to submit an online test with a missing SID. In theory, it is possible for a scanned paper test to be received with a missing or illegible SID. CAI's TIDE system offers a Discrepancy Resolution System feature to resolve cases of test materials received without a positively identified SID. Authorized users can view the front page of such materials and then choose to either link/associate the test document with an existing student in TIDE or create a new one if the student has not been imported into TIDE. As stated previously, CAI can explore building real-time validation capabilities into TIDE to validate SIDs against NJ SMART.

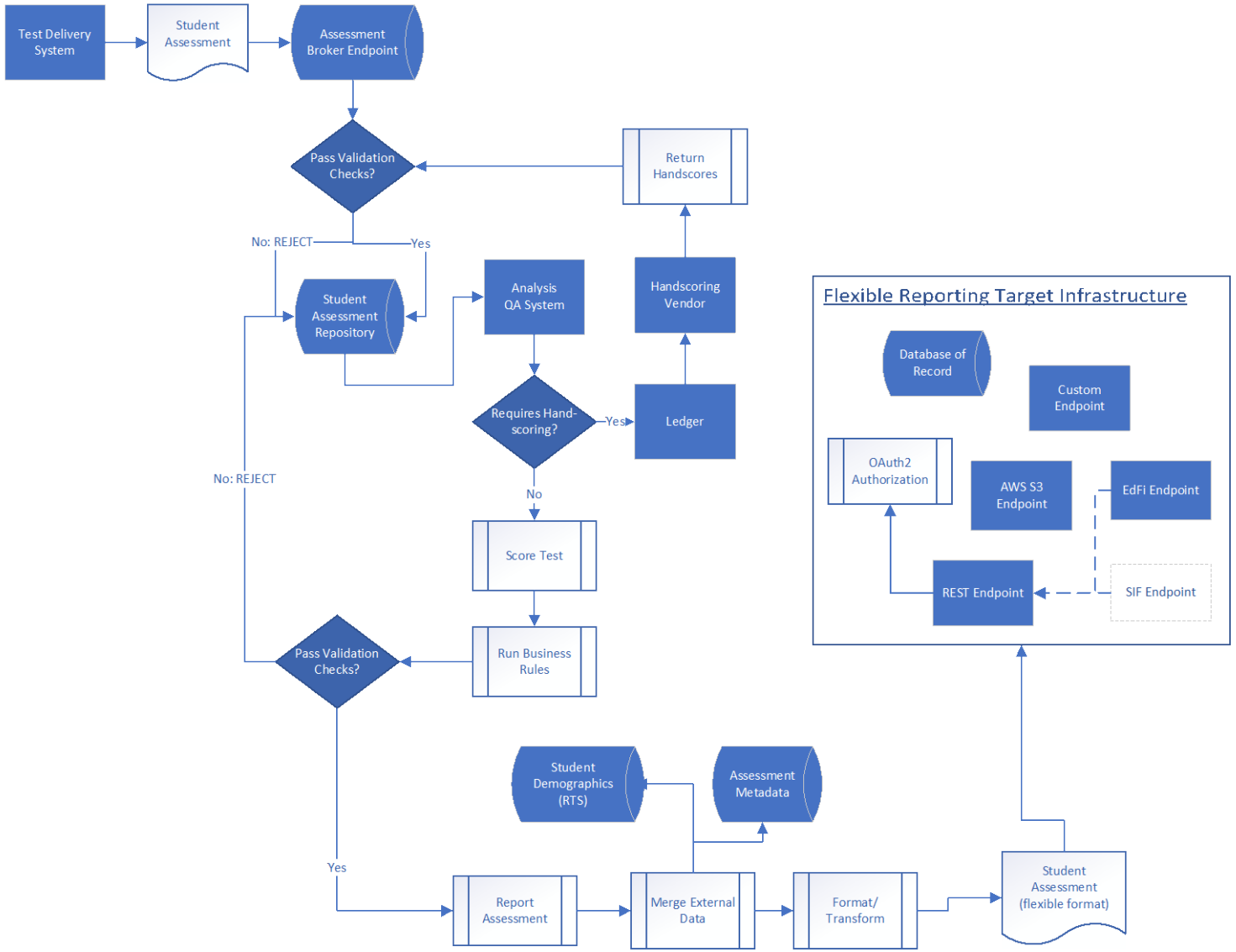
Reporting Assessment Results Through SIF

CAI has significant experience integrating with client and partner systems to deliver student assessment data via representational state transfer (REST) APIs. Presently, we deliver data in a variety of formats, including Ed-Fi JSON (by calling Ed-Fi REST endpoint hosted by the State), Smarter Balanced result XML format, and custom data formats, using various configurable services and protocols. CAI will commit to integrating with NJ SMART using SIF 2.x ISWG assessment objects to deliver student assessment results.

Exhibit 4.3.4-2 shows the data flow through our back-end systems when a student completes his or her assessment. Once the test is validated, scored, and ready for reporting, it is available through our API endpoints to be shared with NJ SMART. Our architecture is modular so depending on the receiving application, we can transform the assessment results to the standard and transmission protocols required. For supporting NJDOE's contract, CAI commits to implementing a SIF 2.x transmission adapter that will allow us to transmit assessment results in the SIF 2.x data model to call the NJ SMART-hosted receiving application.

CAI fully supports NJDOE's desire to modernize data delivery between NJDOE and the State's assessment vendor. We have enabled many of our existing clients to realize this vision and stand prepared and committed to support NJDOE in this mission.

Exhibit 4.3.4-2: Data Flow Through Back-End Systems



4.3.5. Technical Quality and Psychometric Standard Analysis

Quality assurance procedures are enforced throughout all stages of CAI's test development, administration, and scoring and reporting processes. Here, we provide an overview of quality assurance procedures associated with the following operations:

- Test configuration
- Test production
- Data preparation
- Equating and scaling
- Scoring and reporting

Quality Assurance in Test Configuration

In Section 4.12.2, we describe how the adaptive algorithm is configured for each test administration. Each test administration is generated by the adaptive algorithm to exactly match the detailed test blueprint while targeting test information to student ability. The blueprint describes the content to be covered, the Depth of Knowledge (DOK) with which it will be covered, the types of items that will measure the constructs, and every other content-relevant aspect of the test.

The adaptive test configuration process is managed through CAI's Test Simulator. Immediately upon completion of a test simulation, the Test Simulator generates a blueprint-match report that shows whether all elements of the test blueprint have been satisfied. In addition, the Test Simulator produces a statistical summary of form characteristics to indicate consistency of test characteristics across simulated test forms.

Prior to implementation in the operational test administration, the CAI scoring engine and the accuracy of data files are checked using a simulated student response data file. The simulated data are used to check whether student responses entered in the Test Delivery System (TDS) are accurately captured and scoring specifications are accurately applied. Two programmers independently score the simulated data file in accordance with scoring rules.

In addition to checking the scoring accuracy, the test configuration file is rigorously vetted. For every operational administration, the test configuration file contains all specifications for the item selection algorithm and, eventually, for the scoring algorithm, such as the test blueprint specifications, slopes and intercepts for theta-to-scale score transformations, cut scores, and item information (e.g., cut scores, answer keys, item attributes, item parameters, passage information). The accuracy of the information in the configuration file is independently confirmed numerous times by multiple staff members before the testing window opens.

Quality Assurance in the Production of Computer-Delivered Tests

Production of Content

While the workflow for producing online tests requires some additional steps, it eliminates a substantial amount of work from the time-critical path, reducing the likelihood of errors. Like a test book, an online system delivers a sequence of items; however, the online system uses an algorithm to determine the layout of that sequence. The appearance of the item on the screen can be established before the final test is configured.

The production of computer-based tests (CBTs) includes the following four key steps:

1. Final content is previewed and finalized in a process called “web approval,” in which items are packaged exactly as they will be displayed to the student.
2. The test configuration gathers the content, form information, display information, and relevant scoring and psychometric information from the item bank and packages it for deployment, after which the complete configuration is approved.
3. Tests are initially deployed to a testing site where they undergo a platform review, which is a process during which CAI staff ensure that each item displays properly on a wide variety of platforms and devices representative of those used in the field.
4. The test packages are then deployed to a staging environment accessible to NJDOE for user acceptance testing (UAT) and final review.

Web Approval of Content During Test Development

The Item Tracking System (ITS) integrates directly with the TDS to display each item exactly as it will appear to test takers. The web preview process is tied to specific levels of item review. Upon approval at each level, the system locks content as it will be rendered on the screen and presented to students. No change to the display content can occur without a subsequent round of web preview. This process freezes the display code that will present each item.

The web approval process functions as an item-by-item blueline review. Once the process is complete, layout changes can be made in only one of the following two ways:

1. Content can be revised and resubmitted for web approval.
2. Online style sheets can be changed to revise the layout of all items on the test.

Both processes are subject to strict change-control protocols that ensure that accidental edits are not introduced. In the following section, we discuss automated quality-control features that raise warnings during content publication if item content differs from the most recent web-approved version of that content. The web approval process offers the benefit of enabling final layout review much earlier in the content production process, reducing the work that must be performed during the very busy period just before tests go live.

Platform Review

Platform review is a process in which each item is checked to ensure that it displays appropriately on each tested platform. A *platform* is a combination of a hardware device and an operating system. In recent years, the number of platforms has proliferated, and platform review now takes place on approximately 15 significantly different platforms.

Platform review is conducted by a team. The team leader projects the item in its web-approved ITS format, and team members, each using a different platform, simultaneously review that item to gauge whether it renders as expected.

User Acceptance Testing and Final Review

Each release of every CAI software package undergoes a complete testing cycle, including regression testing. With each release, and every time we publish a test, the delivery system for that test undergoes UAT. During UAT, clients receive login credentials for an identical (though smaller-scale) testing environment to which the system has been deployed. We also provide clients with recommended test scenarios and constant support during the UAT period.

Deployments to the production environment must adhere to specific, approved deployment plans. Each step in the deployment plan is executed by one team member and verified by a

second. Each deployment undergoes shakeout testing after the deployment. This careful adherence to deployment procedures ensures that the operational system will exactly mirror the system evaluated on the testing and staging servers. Upon completion of each deployment project, management signs off on the deployment log.

Over the course of a year, changes may be required to the production system. Outside of routine maintenance, no change is made to the production system without approval from the Production Control Board (PCB), which includes the director of CAI's assessment program or the chief operating officer, the director of our Computer and Statistical Sciences Center (CSSC), and the project director. Any request for a change to the production system requires the signature of the system's lead engineer. The PCB reviews risks, test plans, and test results. In addition, if any proposed change will affect client functionality or pose a risk to operation of a client system, the PCB ensures that the client is informed and in agreement with the decision.

The PCB approves a maintenance plan that includes every scheduled change to the system.

Any deviation from the maintenance plan must be authorized by the PCB, including server or driver patches that differ from those approved in the maintenance plan.

Every bug fix, enhancement, data correction, or new feature must be presented with the results of a quality assurance plan and approved by the PCB.

An emergency procedure is in place that allows rapid response in the event of a time-critical change needed to avert compromise of the system. Under such circumstances, any member of the PCB can authorize the senior engineer to make a change, with the PCB retroactively reviewing the change.

Typically, deployments happen during a maintenance window and are scheduled to accommodate full regression testing on the production machines. Any changes to the database or procedures that might in any way affect performance are typically subjected to a load test.

Functionality and Configuration

The items, both individually and as configured onto the tests, form one type of online product. The delivery of that test can be thought of as an independent service. Here, we document quality-assurance procedures for delivering the online assessments.

One area of quality unique to online delivery is that of the delivery system. The following three activities support the predictable, reliable, high-quality performance of our system:

1. Testing on the system itself to confirm function, performance, and capacity
2. Capacity planning
3. Continuous monitoring

To model the likely peak loads, CAI statisticians analyze the delivery demands, including the number of tests to be delivered; the length of the testing window; and historical state-specific behaviors. Along with data from the load tests, these calculations indicate the number of each type of server necessary to provide continuous, responsive service, and CAI typically contracts for service in excess of this predicted amount. Once deployed, our servers monitor the hardware, operating system, and software platform with software that alerts our engineers at the first sign that trouble may be ahead. Applications log not only errors and exceptions, but also latency (timing) information for critical database calls. This information enables us to instantly know whether the system is performing as designed or starting to slow down or experience a problem.

In addition, latency data (data about the time required to load, view, or respond to an item) are captured for each assessed student. All this information is also logged, enabling us to

automatically identify schools or districts experiencing unusual slowdowns, often before test takers or proctors even notice.

Quality Assurance in Data Preparation

When a student responds to test questions online, his or her response to each item is immediately captured and stored in CAI's Database of Record (DOR), a repository for all data relevant to a student's testing experience. Our quality-assurance procedures are built on two key principles: automation and replication. Certain procedures can be automated, which removes the potential for human error. Procedures that cannot be reasonably automated are replicated by two CAI analysts working independently.

When data are prepared for psychometric analyses, they undergo two phases: a data preparation phase and a psychometric phase. In the former phase, data are extracted from the DOR and provided to two separate SAS programmers. These two programmers use the client-assigned business rules to independently prepare data files suitable for subsequent psychometric analysis. The data files prepared by the two programmers are formally compared for congruency. Any discrepancies identified are resolved through code review meetings with the lead programmer and the lead psychometrician.

When the two data files match exactly, they are then relayed to two psychometricians, who each perform separate classical and item response theory (IRT) analyses. Any discrepancies are identified and resolved.

When all results of the analyses match, they are uploaded to CAI's ITS.

CAI's TDS has a built-in, real-time quality-monitoring component. As students test, data flow through our Quality Monitor (QM) System. The QM System conducts a series of data integrity checks, ensuring, for example, that the record contains information for each item that was supposed to be on each test, and that test records contain no data from items that have been invalidated. In addition, the QM System scores every test, recalculates performance-level designations, calculates subscores, compares item parameters to the reference item parameters in the bank, and conducts a host of other checks.

The QM System also aggregates data to detect problems that become apparent only in the aggregate. For example, the QM System monitors item statistics and flags items that perform operationally differently than their item parameters would predict. This function constitutes a sort of automated key or rubric check, flagging items where data suggest a potential problem. This automated process is similar to the type of check performed for data review, but these checks are conducted on operational data and in real time so that problems can be caught and corrected before they have an opportunity to do any harm.

Data pass directly from the QM System to the DOR, which serves as the repository for all test information, and from which all test information for reporting is drawn. The Data Extract Generator (DEG) is the tool used to pull data from the DOR for delivery to NJDOE and the quality-assurance contractor. CAI psychometricians ensure that data in the extract files match the DOR before they are delivered to NJDOE.

Quality Assurance in Item Analyses and Equating

Prior to operational work, CAI produces simulated datasets for use in testing software and analytic procedures. The quality-assurance procedures are built on two key principles: automation and replication. Certain procedures can be automated, which removes the potential for human error. Procedures that cannot be reasonably automated are independently replicated by two CAI psychometricians, who complete a dry-run calibration and linking activities and then compare results. The practice runs serve the following two functions:

1. To verify accuracy of program code and procedures
2. To evaluate the communication and workflow among participants. If necessary, the team will reconcile differences and correct production or verification programs.

Following the completion of these activities and the resolution of questions that arise, analysis specifications are finalized.

Quality Assurance in Scoring and Reporting

CAI implements a series of quality-control steps to ensure error-free production of score reports in an online format. The quality of the information produced by the TDS is thoroughly tested before, during, and after the testing window.

Quality Assurance in Test Scoring

CAI verifies the accuracy of the scoring engine by means of simulated test administrations. The simulator generates a sample of students with an ability distribution that matches that of the state. The ability of each simulated student is used to generate a sequence of item responses consistent with the corresponding ability. Although the simulations were designed to provide a rigorous test of the algorithm for adaptively administered tests, they also provide a check of the full range of item responses and test scores in fixed-form tests. Simulations are always generated using the production item selection and scoring engine to ensure that verification of the scoring engine is based on a very wide range of student response patterns.

To verify the accuracy of the Centralized Reporting System (CRS), we merge item response data with the demographic information taken from previous-year assessment data; but if current-year enrollment data are available by the time simulated data files are created, we can verify online reporting using current-year testing information. By populating the simulated data files with actual school information, it is possible to verify that special school types and special districts are being handled properly in the CRS.

Specifications for generating simulated data files are included in the analysis specifications document submitted to NJDOE each year. Review of all simulated data is scheduled to be completed before the opening of the test administration window, so that the integrity of item administration, data capture, and item and test scoring and reporting can be verified before the system goes live.

To monitor the performance of the assessment system during the test administration window, a series of quality-assurance reports can be generated at any time during the online assessment window. For example, item analysis reports allow psychometricians to ensure that items are performing as intended; these reports can also serve as an empirical key check throughout the operational testing window. In the context of adaptive test administrations, reports such as blueprint match and item exposure reports allow psychometricians to verify that test administrations conform to specifications.

An additional set of cheating analysis reports flag unlikely patterns of behavior in testing administrations. The quality-assurance reports are generated on a regular schedule. Item analysis and blueprint match reports are frequently evaluated at the opening of the testing window to ensure that test administrations conform to the blueprint and items are performing as anticipated.

Each time the reports are generated, the lead psychometrician reviews the results. If any unexpected results are identified, the lead psychometrician immediately alerts the project manager to resolve any issues. Exhibit 4.3.5-1 presents an overview of the available quality-assurance reports.

Exhibit 4.3.5-1: Overview of Quality-Assurance Reports

QA Reports	Purpose	Rationale
Item Statistics	To confirm whether items work as expected	Early detection of errors (key errors for selected-response items and scoring errors for constructed-response, performance, or technology-enhanced items)
Item Exposure Rates	To monitor unusually high exposure rates of items or passages or unusually low item pool usage (high numbers of unused items/passages)	Early detection of any oversight in the blueprint specification
Blueprint Match	To monitor match-to-test blueprint	Early detection of blueprint violation
Cheating Analysis	To monitor testing irregularities	Detection of testing irregularities

Quality Assurance in Reporting

Scores for the online assessments are assigned by automated systems in real time. For machine-scored portions of assessments, the machine rubrics are created and reviewed along with the items, then validated and finalized during rubric validation after field-testing. The review process “locks down” the item and rubric when the item is approved for web display. During operational testing, actual item responses are compared to expected item responses (given the IRT parameters), which can detect miskeyed items, item drift, or other scoring problems. Potential issues are automatically flagged in reports that are available to psychometricians.

The handscoring processes for writing tasks include rigorous training, validity and reliability monitoring, and back-reading to ensure accurate scoring. Handscored items are married up with the machine-scored items by our Test Integration System (TIS). The integration is based on identifiers that are never separated from their data and are further checked by the QM System to which the integrated record is passed for scoring. Once the integrated scores are sent to the QM System, the records are rescored in the test-scoring system that applies the scoring rules and assigns scores from the calibrated items, including calculating performance-level indicators, subscale scores, and other features, which then automatically pass to the CRS and DOR. The scoring system is extensively tested prior to deployment, including human reviews of scored tests and large-scale simulations to ensure that point estimates and standard errors are correct.

After passing through the series of validation checks in the QM System, data are passed to the DOR, which serves as the centralized location for all student scores and responses, ensuring that there is only one place where the “official” record is stored. Only after scores have passed the QM System’s checks and are uploaded to the DOR are they passed to the CRS, which is responsible for presenting individual-level results and calculating and presenting aggregate results. Absolutely no score is reported in the CRS until it passes all QM System validation checks.

4.3.5.1. Technical Quality

CAI will comply with all requirements specified in the RFQ. CAI has a well-honed process of successfully developing and maintaining specifications documents that ensure that the final scores, reports, and data files are produced accurately and on time.

CAI will produce a set of specifications, as described in this section, detailing the procedures used to calibrate, equate, and score the assessments. We collect information in the following four critical specifications documents that are relevant to operational scoring and reporting:

1. Analysis specifications
2. Scoring specifications
3. Reporting specifications
4. Essay scoring specifications

Our analysis and scoring specifications ensure the reliability and validity of scores for all assessments. These documents lay out, in reproducible detail, all calculations, algorithms, and business rules for processing the data from calibration forward. The analysis specifications specify the parameters for item analysis, calibration, and equating. The scoring specifications detail every rule for processing tests. These rules include scales to be calculated, subscales and reporting categories, transformations of these scales and subscales, attemptedness rules, and participation rules. The reporting specifications specify aggregation rules, exclusion rules, and any calculations performed on the data. The essay scoring specifications define every rule for scoring the essay responses.

All psychometric analyses are performed by a team of psychometricians, each with a doctoral degree in measurement or a related field. CAI psychometricians employ a range of statistical software to calibrate items across state assessment programs; currently, these teams use flexMIRT, IRTPRO, Multilog, Parscale, and other software to calibrate item parameters. In addition to these software packages, we prefer to use our own software—the IRT Plugin to our *AM* statistical software (*iAM*)—which we distribute without charge (Cohen & AIR, 2002). The *iAM* software offers some capabilities that are not available from other packages, as we discuss later in this section. Psychometricians also use *R* statistical software as the primary package to support a wide range of analyses, including scoring quality control, classical item analyses, technical report analyses, and research studies.

Ensuring the collection and delivery of timely and accurate data to our clients is at the core of CAI's mission. CAI's analytic tools and project management approach are nimble enough to evolve and adapt as circumstances change, while also providing an unmatched level of reliability. To mitigate risks, our quality-assurance protocols include the following six integrated components:

1. Structured review sequences and auditable histories in item development
2. Carefully defined specifications for all transformations and analysis, sufficient for replication
3. Internal software testing, platform review, and UAT prior to a test going live
4. Independent replication of statistical analyses
5. Quality assurance of data files
6. A PCB that implements strict standards for any changes or modifications to our production servers and enforces those standards with a tiered review of every proposed change

CAI routinely works with third-party vendors who provide independent verification of calibration and equating results, as well as test scoring. CAI will subcontract for services to replicate calibration and equating results and test scoring in order to provide a report documenting results of the replication activities. CAI psychometricians work directly with the third-party vendor to provide specifications documents and data files and to resolve any discrepancies.

4.3.5.2. Psychometric Standard Analysis

In coordination with NJDOE, CAI will develop draft analysis, scoring, and reporting specifications for delivery to NJDOE as early as 45 days and no later than 90 days after award of the contract. NJDOE may wish to have your Technical Advisory Committee (TAC) review and suggest revisions to the specifications documents. The analysis and scoring specifications documents will be sufficiently detailed to support independent replication by NJDOE and/or a third-party vendor. CAI understands that revised specifications documents will be delivered to NJDOE within 10 business days of receiving requested revisions.

4.3.6. Additional Data Analysis

CAI is committed to supporting all of our state clients to successfully navigate the Peer Review process. In most states where CAI has implemented an online or adaptive testing system—including the adaptive system we designed and built for a large national multi-state assessment program—our technical support has resulted in a *Substantially Meets Requirements* rating from the U.S. Department of Education.

States delivering adaptive assessments from CAI's ClearSight item pools, as we propose for New Jersey, include New Hampshire, North Dakota, West Virginia, and Wyoming. Arkansas delivered assessments based on the ClearSight item pools in spring 2024. Other states have used the ClearSight item pools to seed their state-developed item banks, including Arizona, Florida, and Ohio, and augment their state-developed item banks, as has been the case with Utah. The ClearSight item banks have been independently verified to align with challenging college- and career-readiness standards similar to the New Jersey Student Learning Standards (NJSLS). All states in which the ClearSight item banks have been used to deliver state summative assessments have been found to substantially meet the USDE Peer Review guidelines.

To support NJDOE in gathering Peer Review evidence, CAI will provide crosswalks between the Peer Review guidelines and the technical report that CAI will deliver to NJDOE each test administration year. CAI will also provide any additional analyses requested by Peer Review committees to provide further evidence of test fairness, reliability, and validity.

All of CAI's work related to the New Jersey Next Generation Assessment will fully comply with the requirements of the Every Student Succeeds Act (ESSA) and will adhere to industry best practice standards as documented in the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014).

A technical report will be delivered to NJDOE each year following the administration of the New Jersey Next Generation Assessment. Central to the structure of our proposed technical report is reporting validity evidence to support interpretation of NJSLA and NJGPA test scores and performance-level classifications. We propose to provide validity evidence based on test content, interpretation of performance standards, internal structure, relationships with conceptually related constructs, cognitive processes, measurement invariance across subgroups, and evidence related to fairness and accessibility. CAI will work with NJDOE and in consultation with the New Jersey Technical Advisory Committee (TAC) to implement revisions to the technical documentation that best serve NJDOE's needs.

As part of the Peer Review process, NJDOE will need to submit validity evidence based on convergent and discriminant patterns of relationships with test scores measuring similar constructs. We expect that test scores for assessments measuring a common construct will be substantially correlated. Moreover, while test scores for assessments measuring different constructs may be highly correlated, the magnitude of correlations should be lower than observed for tests measuring the same construct. CAI will work with NJDOE to obtain district-

administered assessments that can be used to examine patterns of convergent and discriminant validity between test scores across assessment systems. CAI will further work with NJDOE to obtain ACT and/or SAT records to investigate the predictive relationship between student test scores on the NJSLA and NJGPA assessments and subsequent performance on college entry exams.

CAI will document all evidence for the validity, fairness, and reliability of the new New Jersey Next Generation Assessment in the technical report submitted to NJDOE annually. Evidence for the reliability of NJSLA and NJGPA test scores and performance-level classifications is administration-dependent and will be updated annually to present results for test administrations each year. Evidence for the validity of test score and performance-level interpretations accrues over time as new evidence becomes available. Our technical report outline provides the core evidence that NJDOE will need to submit for USDE's Peer Review, but we expect to work with NJDOE and their TAC to identify additional studies to investigate the validity of test score interpretations. For example, CAI has worked with states to conduct studies demonstrating that our procedures for producing and implementing glossaries serve only to increase performance of limited English proficiency (LEP) students and do not impact the performance of students in the general population, providing evidence that our glossaries remove construct-irrelevant barriers to accessing test content for LEP students.

4.3.7. Program Documents

CAI proposes that all official program documents and artifacts for each contract deliverable be stored in Seismic or transferred via a Secure File Transfer Protocol (SFTP) site. This includes publications, communications, documentation of processes and procedures, score reporting information, and information necessary to replicate analyses. CAI will work with NJDOE to provide access to our Metrics system, where all data analysis occurs. We will work closely with all parties to ensure replication of results, and we routinely consult with third-party vendors who provide independent replication of analysis results.

Documents will be available to NJDOE throughout the project lifecycle, and within 10 business days of the SCM requesting them. As required and overseen by the SCM, we will archive all documents on an agreed-upon schedule, which we understand is typically every two years.

Seismic is an online document management system on a secure cloud computing platform. Managing documents through Seismic from the point of project kickoff will increase productivity; promote efficiency; reduce error and miscommunication; provide a single reference point for all documents that house key project decisions; and increase collaboration across internal teams and our organizations. Seismic has the following three distinguishing features:

1. **Ease of Use.** With this feature, Seismic is an effective document management system because it can be sustainably used by users of varying technical ability. Seismic is user-friendly and requires little-to-no training, even for non-technical users. For example, creating files by authorized users is as intuitive as doing these same tasks in Windows Explorer.
2. **Workflow Management.** This is a key feature of Seismic because the process of fully vetting specification and schedule changes is both complicated and critical. Seismic's process allows participants to identify a stake in a document, thereby becoming stakeholders. Proposed changes are automatically circulated among stakeholders for review and approval. This provides an opportunity for those who must accomplish the work to identify dependencies or implications that may have been initially overlooked.
3. **Built-In Version-Control System.** With this feature, documents can be checked in and checked out for editing. Review workflows can also be built into each document type.

An SFTP site is most conducive for the transfer of large, secure databases. SFTP offers an efficient mechanism for transferring large-scale data. Such transfers do not require the workflow or overhead associated with the Seismic site. We propose to use an SFTP site for this specific purpose, thus maintaining the same users across systems. We will work with NJDOE to configure the systems with user roles and respective file permissions prior to deploying them.

4.3.7.1. Publication/Program Documents CD

CAI is pleased to provide the SCM with program documents in an appropriate and approved long-term storage format, such as compact discs, digital video discs, or USB flash drives. Such documents will include all publications, correspondence, and other related documents as outlined in the RFQ. We will also share non-proprietary program and source codes and make access available to proprietary systems for the SCM to conduct necessary reviews. CAI understands that the SCM will provide written notification if a different format is required.

4.3.8. Communication with Districts and Constituencies

Clear communication about the new assessment program to each stakeholder is essential for building stakeholder support and to ensuring a smooth assessment administration. While district stakeholders require communication that highlights information about the details of the assessment program, key dates, and upcoming trainings, boards of education and legislatures typically require communications that highlight big-picture trends, benefits for students and schools, and improvement in student outcomes. CAI is well-versed in providing communication strategies and material for all constituents regarding a new and/or ongoing assessment program. We draw on both the expertise of our senior staff, as well as the expertise of our media/PR partner agency, Lambert. As we describe in more detail in Section 4.3.11, members of our Senior Leadership Team bring decades of experience in supporting departments of education and national education agencies in effective stakeholder communication. Effective communication is at the heart of what we do as an organization.

4.3.8.1. Communication with Districts

CAI understands the importance of providing clear, timely, and accurate updates to New Jersey districts and schools. The information provided by CAI will allow local district coordinators to clearly understand their roles and responsibilities in the new assessment program without creating additional work. Using support phone messages, real-time communication banners, and a custom email address, CAI can quickly and effectively disseminate information to all required parties. These communications can be tailored to address a range of topics, including upcoming training sessions, recruitment for content review meetings, and key dates such as student registration, materials ordering, and availability of score reports. All communications will adhere to contract timelines, be vetted with NJDOE before dissemination, and be readily accessible in an archive on the assessment program web portal.

CAI will use the Test Information Distribution Engine (TIDE) to collect updates to shipping, mailing, and contact information for all registered users within the state. Due to the variety of information being collected and disseminated to multiple stakeholders and the levels of security required for different content, CAI will provide multiple communications approaches tailored to different stakeholder groups.

For public, nonsecure information (e.g., closure dates and testing window announcements), CAI will collaborate with NJDOE to disseminate information via announcements on the assessment program web portal and/or through the program's custom email address. Publicly available information will then be archived on the assessment program web portal for future reference.

4.3.8.2. Communications with Statewide Constituencies

CAI has a long history of supporting state departments of education in preparing materials to inform state boards of education, legislature, media, professional organizations, and other constituents. Our work across 27 state departments of education often calls on us to develop presentation materials for diverse audiences, including boards of education and members of legislative assemblies. CAI's central communication team is experienced in producing briefing materials, talking points, and presentations for these audiences. For example, we worked closely with the Chair of the Utah Board of Education to produce marketing material for Utah teachers, parents, and administrators. Similarly, we worked with the Hawaii Department of Education to conduct media briefings and appear on a live broadcast to answer questions about the Hawaii State Assessment Program. We also continue to collaborate closely with the Texas Education Agency to develop and support presentations for their Texas Education Telecommunications Network (TETN) and develop talking points for legislative briefings. CAI can also produce additional materials, such as talking points with visuals highlighting the benefits of the new assessment system, legislative briefs about an aspect of the assessment program, and infographics.

Upon award of the contract, CAI will meet with NJDOE to fully understand objectives around stakeholder requirements, including standard operating procedures, style guides, protocols for responding to inquiries by each stakeholder group, and timelines. We will also ensure that all developed materials will meet accessibility requirements. All materials will adhere to accessibility standards, undergoing rigorous reviews conducted by CAI staff or external entities trained in Section 508 accessibility compliance standards.

The CAI Help Desk serves as the primary point of contact for all questions related to the assessment program. These staff members will be trained on all aspects of New Jersey's assessment program and can respond to and triage all incoming inquiries to our Help Desk. Questions from other stakeholder groups (e.g., the media, boards of education, state legislatures) that pertain solely to state policy will be routed back to the appropriate entities within NJDOE and addressed according to standard operating procedures and required escalation and routing protocols. CAI will ensure that any questions or comments related to statewide assessment policy are re-routed to the SCM within 48 hours of receipt. All materials will be developed in close collaboration with NJDOE, and all edits will be submitted to NJDOE for final approval before public release. This approach ensures that all inquiries are addressed by the most qualified individuals, promoting efficiency and accuracy in our responses.

4.3.9. Customer Satisfaction Assessment and Reporting

CAI is committed to customer satisfaction as a core operating principle, and we have extensive experience conducting client focus groups, deploying customer satisfaction surveys, and developing action plans based on the proceeds of these feedback vehicles. CAI endeavors to meet the expectations of the NJDOE and New Jersey districts, schools, administrators, and educators. Accordingly, CAI is pleased to develop, administer, and report the results of a Customer Satisfaction Survey developed in collaboration with NJDOE, with a satisfaction index developed by CAI.

4.3.9.1. Customer Satisfaction Survey

Following the successful completion of the test administration window, CAI is prepared to implement a comprehensive online survey and distribute it within the required timelines to obtain stakeholder feedback regarding the program. This survey may encompass a broad range of topics, and CAI commits to addressing topics including, but not limited to, the following ten topics:

1. CAI's customer support center and related customer support performance
2. The CAI-developed NJDOE assessment portal
3. The quality and effectiveness of communication with the NJDOE
4. Test administration manual (TAM) and training session quality and applicability
5. User experience in the Test Information Distribution Engine (TIDE; test registration system)
6. User experience in the Test Delivery System (TDS)
7. User experience in the Centralized Reporting System (CRS)
8. The testing window and testing time
9. Shipment and receipt of paper-based materials
10. Quality of score reports and score-interpretive guides

CAI will include questions related to other topics as identified by the NJDOE or agreed upon as a result of recommendations from CAI.

The online survey will be designed for efficiency and user-friendliness, allowing response submission via desktop computers or mobile web browsers, with instructions for completion provided to district test coordinators. The format will be flexible, allowing for the inclusion of multiple-choice/fixed questions, as well as the collection of open-ended responses from survey participants regarding their experiences and impressions.

The survey will include the ability to weigh responses based on a customer satisfaction index (CSI), thus allowing us to prioritize feedback based on its impact on the overall success of the assessment program. CAI further notes that NJDOE wishes for a subset of the questions to remain the same year over year, permitting the refinement of a CSI metric.

As with all consequential program deliverables, the survey will be revisited each program year and updated in collaboration with NJDOE, with suggested revisions supplied by the end of January and requested edits addressed with the prescribed five-day response timeframe.

CAI acknowledges the prescribed timing and duration of the survey and commits to providing the NJDOE with the synthesized results in a report to be distributed to the NJDOE for review and acceptance.

4.3.9.2. Customer Satisfaction Index

As noted in Section 4.3.9.1, CAI is committed to the development of a CSI that provides CAI and NJDOE with actionable and properly prioritized information benefiting the overall improvement of the assessment program, year after year.

In addition to responses that will be collected from the customer satisfaction survey, CAI's teams continually monitor and collect internal performance metrics as part of continuous improvement and adhere to service-level agreements (SLAs) across several program areas, including the following three areas:

1. **Customer Support Services:** CAI adheres to strict metrics related to average hold times and call times, and response rates are collected to ensure the maintenance of a high-quality service.
2. **Test Registration:** System performance indicators, such as student registration counts, server latency, and error rates, are monitored.
3. **Test Delivery:** Technical metrics, including server latency, error rates, ramp-up rates, and peak concurrency, are tracked to ensure a seamless test-taking experience. CAI adheres to conservative and rigorous criteria in making determinations about acceptable performance thresholds.

CAI will further provide information about these internal metrics as part of a comprehensive customer satisfaction report, providing valuable insights into program performance and potential areas for improvement. This approach ensures a high standard of service across all program operations.

4.3.10. Editorial Review Plan and Style Guide

Within 20 business days of the project launch meeting (PLM), CAI will submit to the SCM our editorial review plan that meets the criteria set forth in the RFQ. If the SCM requests edits, we will revise and resubmit the plan within five business days of that request.

CAI has a wealth of experience producing and working with editorial style guides to create test forms and ancillary materials. We will develop a New Jersey Editorial Style Guide in consultation with, and ultimately approval by, the SCM, that documents important rules and guiding principles to ensure that all our communications and documents for this project are consistent, on-brand, and grammatically correct.

CAI will review this information annually with NJDOE, in conjunction with the proposed process for test item review rounds, during the first week of October.

In this section, we highlight our key editorial review processes and approach to implementing the principles of universal design throughout our item and test development processes, which is described in more detail in Section 4.5.1.

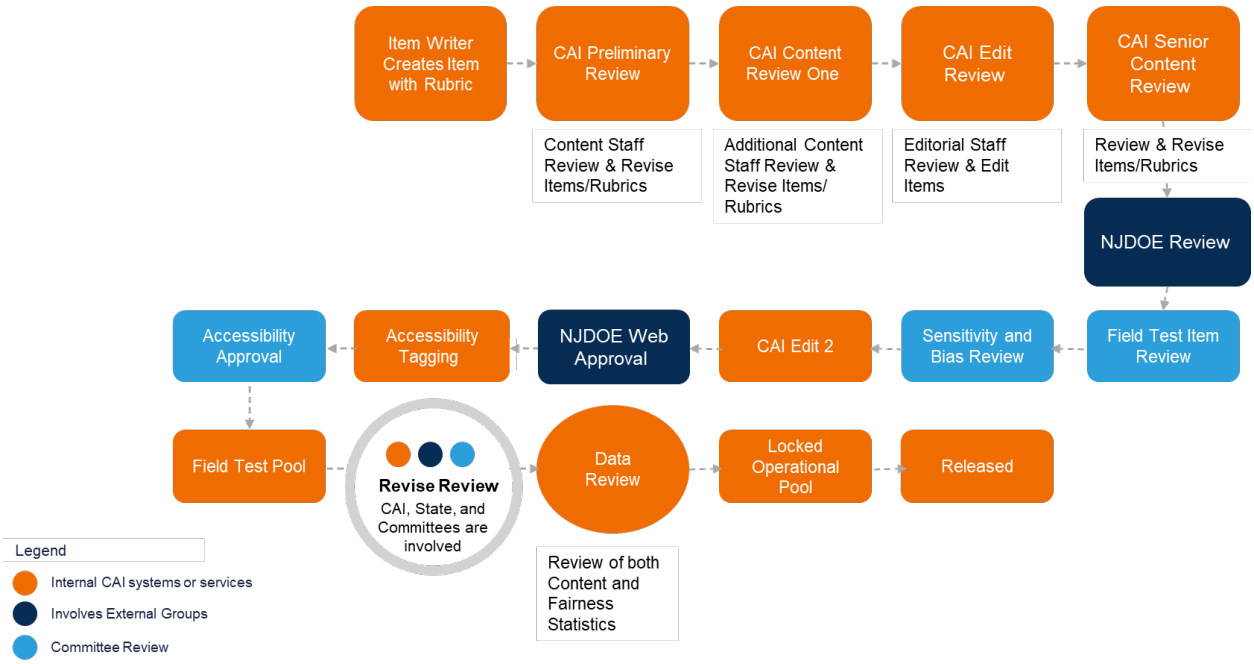
Item Writing and Review Process

CAI's Item Tracking System (ITS) relies on a series of distinct and specific review levels throughout the content development process. The system shepherds the content entities that CAI develops through every workflow step, from inception to final publication. We do so by requiring these entities to pass through targeted review, editing, and management status levels, in which specific actions are taken or reviews are conducted. ITS enforces process standardization within content areas on all entities developed within those areas; in doing so, it facilitates version control, management oversight, and preservation of the entity's development history.

Items are drafted in ITS with our industry-leading Item Authoring Tool (IAT). IAT offers the industry's broadest set of interactions and enables item authors to integrate multiple interaction types to probe more deeply into a complex problem or phenomenon. Scoring of a student's response on one part of an item may depend on his or her earlier responses. This capability allows for multiple solution paths and can challenge students to apply knowledge in meaningful settings to craft multistep solutions. At the same time, while IAT facilitates more meaningful, challenging items, it also integrates accessibility into each item, automatically inserting Accessible Rich Internet Application (ARIA) tags and other accessibility markup needed to ensure that items comply with Web Content Accessibility Guidelines (WCAG) 2.0 standards and promote compatibility with assistive technologies. These IAT integration and compatibility features allow our online tests to be accessible to virtually all students.

IAT enables test developers to create machine-scored items that challenge students to construct a response and demonstrate their understanding. ITS then manages a structured review process that includes both internal CAI reviews and external reviews, which include reviews and approvals by NJDOE and reviews by New Jersey committees. ITS is configurable for virtually any review sequence. Exhibit 4.3.10-1 illustrates our proposed review sequence for NJSLA.

Exhibit 4.3.10-1: Proposed Review Sequence for NJSLA



In the following sections, we propose our review process, but CAI can modify this sequence as needed to accommodate NJDOE's needs and practices.

Internal (CAI) Reviews

CAI implements a rigorous item review process that moves items through multiple levels of internal review before they are sent to the client. Although the exact sequence of reviews varies across programs, all items are subjected to content, language accessibility, bias and sensitivity, editorial, and lead developer reviews. Initial ideas for constructed-response items are accepted or rejected in group sessions. Draft items are subjected to initial group peer review sessions in which appropriateness and content are reviewed and discussed and graphic concepts are honed. Items are further subjected to two detailed content reviews: an editorial review and an overall review.

Items that pass these reviews are then sent to state content staff for their review. Further edits are implemented in resolution meetings, and then the items are ready for content committee review and fairness committee review. Once the necessary edits are implemented, the items can be readied for field-testing. Post-field-testing activities include validation of item rubrics (by committees of CAI and NJDOE content staff and educators) and examination of items possessing statistical anomalies (by CAI and NJDOE content and technical staff). The following sections describe the review process we propose for all New Jersey assessment items.

Preliminary Review

During the preliminary review process, CAI's test developers review items either individually or as a group. CAI finds the group process beneficial because the exchange of ideas and open discussion generally yield items that are clearer, more precise, and better aligned to academic standards than items reviewed individually.

At every stage of the item review process, beginning with the preliminary review, test developers analyze items to ensure that

- each item aligns well with the New Jersey Student Learning Standards (NJSLS);
- each item matches the item specification for the target being assessed;
- each item is based on a quality idea (i.e., it assesses something worthwhile in a reasonable way);
- each item is properly aligned to a science Depth of Knowledge (DOK) level or a cognitive demand level;
- the vocabulary used in each item is appropriate for the grade/age, subject matter, and considerations of language accessibility, bias, and sensitivity;
- the content is accurate and straightforward;
- the graphic and stimulus materials are necessary to answer the question;
- the stem is clear, concise, and succinct, meaning that it
  - has enough information to clarify what is being asked;
  - is stated positively (and does not rely on negatives—such as no, not, none, never—unless necessary); and
  - ends with a question;
- for selected-response items, the response options are as succinct and short as possible (without repeating text), meaning they are:
  - parallel in structure, grammar, length, and content;
  - sufficiently distinct from one another;
  - all plausible (but not arguable as correct if intended as a distractor); and
  - ordered in a logical way (length, number size, etc.);
- there is no obvious or subtle cueing;
- the score points for constructed-response items are clearly defined; and
- for machine-scorable constructed-response (MSCR) items, items score as intended at each score point in the rubric.

Test developers use the Web Preview feature in ITS to review items, which allows them to see an item as it will render for students in the online testing environment. Test developers interact with each item to verify that it directs the student to a clear understanding of the task, allows the student to provide a coherent response, and contains scoring guidelines that adequately account for all logical responses. Based on this meticulous review of each item, the preliminary reviewers accept the item and classification as written; revise the item, attributes, or classification; or all three.

Another alternative is to reject the item because it is too problematic in content, does not align to any standard, or both. Whatever the recommendation, the review comments are noted in ITS and, if an item is revised, its previous version is archived automatically.

Content Review 1

Content Review 1 is generally conducted by an individual test development specialist rather than as a group review. The Content Review 1 specialist carefully examines each item based on all criteria previously listed. In most cases, this reviewer is an experienced member of the content team and brings years of experience to the review. This allows the specialist to approach the item both from the perspective of NJDOE's guidelines and from his or her own experience in test development.

Content Review 1 is where items are reviewed to ensure that the revisions implemented at the preliminary review level did not introduce errors or content inaccuracies. The Content Review 1 reviewer looks at all aspects of the item and reviews the comments saved in ITS from the preliminary review to verify that any issues noted have been adequately addressed.

Edit Review

CAI editors review every item for clarity, correctness, and appropriateness of language for the grade level assessed and conformity with acceptable item-writing practices. Editors ensure clearly worded, understandable, and fair presentation of items, instructions, and administrative documents. The editorial process is related to, but separate from, the item development process so that editors can objectively review the items.

Editors have numerous tasks. First, editors perform basic line editing for correct spelling, punctuation, grammar, and mathematical and scientific notation, ensuring style consistency across the items. CAI editors have adopted standard reference resources, including the *Chicago Manual of Style*; *Webster's Collegiate Dictionary and Unabridged Dictionary*; the *EDL Core Vocabularies in Reading, Mathematics, Science, and Social Studies*; the *Children's Writer's Word Book*; the National Archives; and *Yale Law School's Avalon Project: Documents in Law, History, and Diplomacy*.

CAI content editors will thoroughly know NJDOE's style guide and ensure that frequently used and assessment-relevant information that addresses such test-specific issues align with this style guide.

Editors ensure that all items are accurate in content and query the item developer when questions arise. They compare reading passages against the original publications and ensure that all information is internally consistent across stimulus materials and items, including names, facts, or cited lines of text that appear in each item. The editors ensure that the keys are correct and that all item information is acceptable and correct. For example, editors verify common facts (e.g., the diameter of Earth, the scientific name of the fruit fly, the correct spelling of *Far from the Madding Crowd*, the formula for calculating the volume of a cube, the proper use of the semicolon, the dates of the Civil War). Science assessments present a specific challenge because of the potential for transposing numerals and the difficulty of identifying computation errors by sight. Therefore, our editors perform all calculations to ensure accuracy.

CAI's editors review all material for fairness and language accessibility issues. Although external committees and the lead item developers review all materials, editors raise questions before the materials reach the committees and then recheck all materials that undergo any changes.

Finally, our editors confirm that items reflect the accepted guidelines for good item construction. In all items, they look for language that is simple, direct, and free of ambiguity with minimal verbal difficulty. Editors confirm that a problem or task and its stem are clearly defined and concisely worded with no unnecessary information. For multiple-choice items, editors check that options are parallel in structure and fit logically and grammatically with the stem and that the key accurately and correctly answers the question posed, is not inappropriately obvious, and is the only correct answer to an item. Additionally, editors ensure that option rationales are clear and describe how or why a student might arrive at a particular response. For constructed-response items, editors review the rubrics for appropriate style and grammar.

Content Review 2

We seek to deliver innovative, complete, and high-quality items to NJDOE. A subject-area senior staff member must sign off on an item's overall quality, including content, fairness, language accessibility, and style, before it is deemed ready for State review. Senior reviewers are generally the most experienced CAI staff who are keenly aware of the specific expectations for item content and quality for each state project.

By the time an item arrives at the senior review level in ITS, it has been thoroughly vetted by both content reviewers and editors. The senior reviewer looks back at the item's entire review history, ensuring that all the issues identified in that item have been adequately addressed. For machine-scored constructed-response (MSCR) items, the senior reviewer carefully checks the rubric and scoring logic by responding to the task in the Web Preview feature in ITS, just as the student would in the testing environment. This reviewer checks full-credit, partial-credit, and no-credit responses to verify that the scoring is functioning as intended. The senior reviewer verifies the overall content of each item, confirming its accuracy, alignment to the standard, and consistency with NJDOE's expectations for highest quality.

Batch Review

After senior review, a final check of the item is performed by the project content lead for that subject or by other staff members who have been specially trained by the content lead. This reviewer ensures that all NJDOE-required attributes are confirmed to be complete and up to date and that the content is ready for NJDOE review.

External (NJDOE and Committee) Reviews

NJDOE Review and Resolution

NJDOE review is a critical step in the overall quality and adequacy of the assessment. CAI will deliver newly developed items in batches so that our test development specialists can calibrate them to meet the expectations of NJDOE reviewers. CAI acknowledges that NJDOE review does not relieve CAI of its responsibility for errors.

Final Client Sign-off

ITS includes a review step called *web approval*. Following the required item/passage review meetings and language accessibility and bias and sensitivity (LABS) review meetings, and once CAI has completed all item reviews, NJDOE formally approves the final version of the online item by web-approving it to sign off on the item. Items are presented exactly as they will appear to the student. When an item is web approved, it is packaged into the final document that will be published unchanged. This system allows NJDOE to have final approval of items well before forms are created. By moving this activity off the critical path and allowing it to occur on a flow basis, we provide more time for review with reduced stress and anxiety. Better working conditions lead to better work and a better final product.

Annotation of Items for Accessibility

One of the elements critical to our success has been the ITS workflow, which supports the embedding of accessibility markup into each item as it is being developed, rather than as a post-hoc process applied to completed test forms. The development of transcription notes (a process we call tagging for web-delivered items) proves most tractable when it is performed upon approval of the base item. This process allows tagging to be accomplished on a flow basis, eliminating the need for thousands of items to be simultaneously reviewed. Currently, our tagging capabilities include translation to Spanish and other languages, text-to-speech (TTS), braille, American Sign Language (ASL), and word lists or glossaries (which may be multilingual).

We offer the industry's largest selection of operationally deployed accommodations and embedded accessibility supports. CAI has tools that enable us to efficiently add markups to support TTS, screen readers, alternative languages, other language supports such as glossaries with audio, and many other accommodations and supports. Items authored in ITS include review levels for specialized teams to add accommodations such as TTS and Spanish. The accommodations become part of the item and travel with it throughout the rest of the review process.

Test Form Production and Review

CAI test developers construct forms that meet all form-building specifications using CAI's Form and Test Engineering Suite (FTES). Once items have been selected to meet form-building specifications, each form undergoes an extensive review process that is customizable to NJDOE's preferences. Each step in the process, as well as any possible revisions, are documented in FTES. Most forms undergo a psychometric review, a senior-level content review, as well as a review conducted by NJDOE.

Once the initial form has been created to match the blueprint and comply with any required statistical criteria, it undergoes a senior-level content review. During this review, a senior test developer interacts with the form as a student does and carefully analyzes each item and the form in general to ensure that it meets all specified criteria and is error-free. If any changes are deemed necessary, the form is sent back to the original test developer for changes to be implemented, and the review process is repeated.

After review at the senior level, the form undergoes a psychometric review. During this review, psychometricians examine each item's statistical data, as well as the overall form's statistical data, to confirm that the form fulfills all necessary criteria. Once the form has passed through the senior-level content review and the technical review, it goes to NJDOE.

As detailed earlier, during the item-writing process, all items undergo several rounds of internal review. During these reviews, all internal staff not only review the item for accuracy and adherence to standards, but also to ensure that the item is accessible to all students.

NJDOE Review of Fixed-Form Tests

After CAI's content and psychometric teams generate candidate forms that meet all requirements of the test blueprint and NJDOE form specifications, the forms will be submitted to NJDOE for review. Department staff will be able to review the draft forms using CAI's Web Preview functionality, which enables reviewers to view and interact with the online test as displayed in the same format and platform used to administer tests to students. NJDOE staff can then request modifications, as necessary. Form revisions will also be conducted in the FTES system, allowing for on-demand information, accurate version control and tracking, and immediate output of all blueprint and psychometric information for evaluation. Any requested changes or comments will be documented in the FTES to ensure an accurate review history.

Content Creation for Paper-Based Forms

Once NJDOE has reviewed and signed off on the online operational forms in FTES, development of the paper-based versions will begin. CAI will generate paper content within the Item Tracking System (ITS) for all items. This paper-based version is saved in ITS with the online version of the item. While conversion of multiple-choice items to paper format is very straightforward, there are a few well-vetted options for conversions of technology-enhanced items (TEIs). NJDOE will be involved in reviewing and signing off on the conversion of each TEI.

Test content for paper-based forms will be created using any project-specific style or instructions. These may include test booklet types (integrated or associated), grid format for equation items (number of columns, symbols available, when to use gridded responses versus open boxes), layout options, and any paper-specific wording changes for each item type (including directions).

Paper content will first be generated within ITS and edited per style as necessary. Once the paper content has been generated for all items and any associated stimuli, items and stimuli will undergo an additional editorial review to ensure that any project-specific paper-form wording is correctly included, and then advance to paper content sign-off. During the sign-off review, items

and stimuli are checked to ensure that paper content matches online content, that it meets all project style criteria, and that it is appropriate for paper-based forms. At this point, NJDOE can review a draft version of the items and presentation of the paper form. Once this preliminary view is approved by the Department, CAI's production team will receive the approved paper content for final production according to printing specifications.

Paper Forms Production

After the paper content is generated in ITS and approved by NJDOE, CAI's production team will work to create the paper-pencil test booklets and answer documents. Over the years, CAI has developed a structured and effective process for producing error-free documents of varying types.

With the test map and approved paper content in hand, CAI content, operations, and production staff will create the paper test booklets in the following two stages:

1. The blackline 1 and final blackline proofs are created.
2. The documents are taken to blueline.

Blackline 1 (step 1) is a semi-automated process. With the appropriate paper template and paper content defined, ITS generates an Adobe InDesign-readable document in the specified format. Our production staff may adjust page layout, including instructions, borders, and other elements, to meet NJDOE's guidelines. At this stage, reviewers will check the document layout and formatting. Should any egregious errors be found in the item's content, changes must be entered into ITS, and the item must be re-exported to ensure consistent item use across all test forms. Changes to blackline 1 require a second blackline proof (blackline 2) to be created.

Following blackline 1 (or blackline 2, where required), the form will be slightly updated (specifically, the ITS codes are hidden) and then internally reviewed again by operations and content staff. Any changes to the form at this stage will be incorporated, and the proof will then be sent to the client for its final blackline review. Changes to subsequent blackline proofs will require sign-off by CAI content staff assigned to the project.

The final quality-assurance step (step 2) prior to printing is the blueline, or camera-ready copy, review stage. During this step, CAI and NJDOE staff will review proofs from the print vendor, verifying that the file to be printed matches the previously approved final blackline proof.

Production and Review of Ancillary and Training Materials

CAI's process for developing high-quality test administration manuals, user guides, and systems documentation is a multi-step process that provides clear tasks and individual roles along the way. The process begins with program-specific meetings to review each document within each program (e.g., Test Administration Manuals, Test Administration Instructions/Scripts). Changes and edits are identified, and the documents are updated by subject-matter experts (SMEs) from CAI and are then provided to Department team members for their initial review.

The following review and editing process begins in earnest after the program-specific meeting:

- Round A: CAI applies NJDOE and SME edits. CAI will also review documents to ensure that NJDOE style is applied and documents are free of grammatical errors.
- Round B: Any final (or initially unidentified) edits are applied by CAI.
- Round C: Once the document is approved, CAI ensures the document is fully accessible (Section 508 compliant) before publishing or posting the document on the assessment program web portal.

CAI employs an experienced team of technical writers and editors that works together to create high-quality program publications and district-facing communications. CAI has a structured and effective process for producing error-free publications, minimizing review times, and improving the overall quality of the document production and review process. Additionally, our teams will develop ancillary materials that are

- fully customizable to include policies and procedures unique to New Jersey;
- compliant with NJDOE's review processes as defined in this solicitation;
- scheduled to ensure on-time printing and delivery to districts ahead of test administration windows;
- designed in consultation with layout and graphic design experts to create a look and feel that is aesthetically pleasing and reflective of the New Jersey assessment programs; and
- reviewed by accessibility experts to ensure that they are fully Section 508 compliant.

CAI's quality-assurance process for producing all print and electronic ancillary materials is iterative and includes NJDOE's review. It is divided into the following two general phases:

1. A drafting phase, during which we obtain agreement on the content and design of the document
2. A production phase, during which we produce the document to the required specifications, accommodate final edits and adjustments, and ensure that camera-ready proofs are error-free

Our production processes include multiple editorial reviews, and each document must receive senior staff sign-off before the document is delivered for NJDOE review. Scheduling the tasks and timelines for producing and delivering publications is part of CAI's annual planning. Tasks and deliverables will be submitted for NJDOE review and approval for inclusion in the master project schedule.

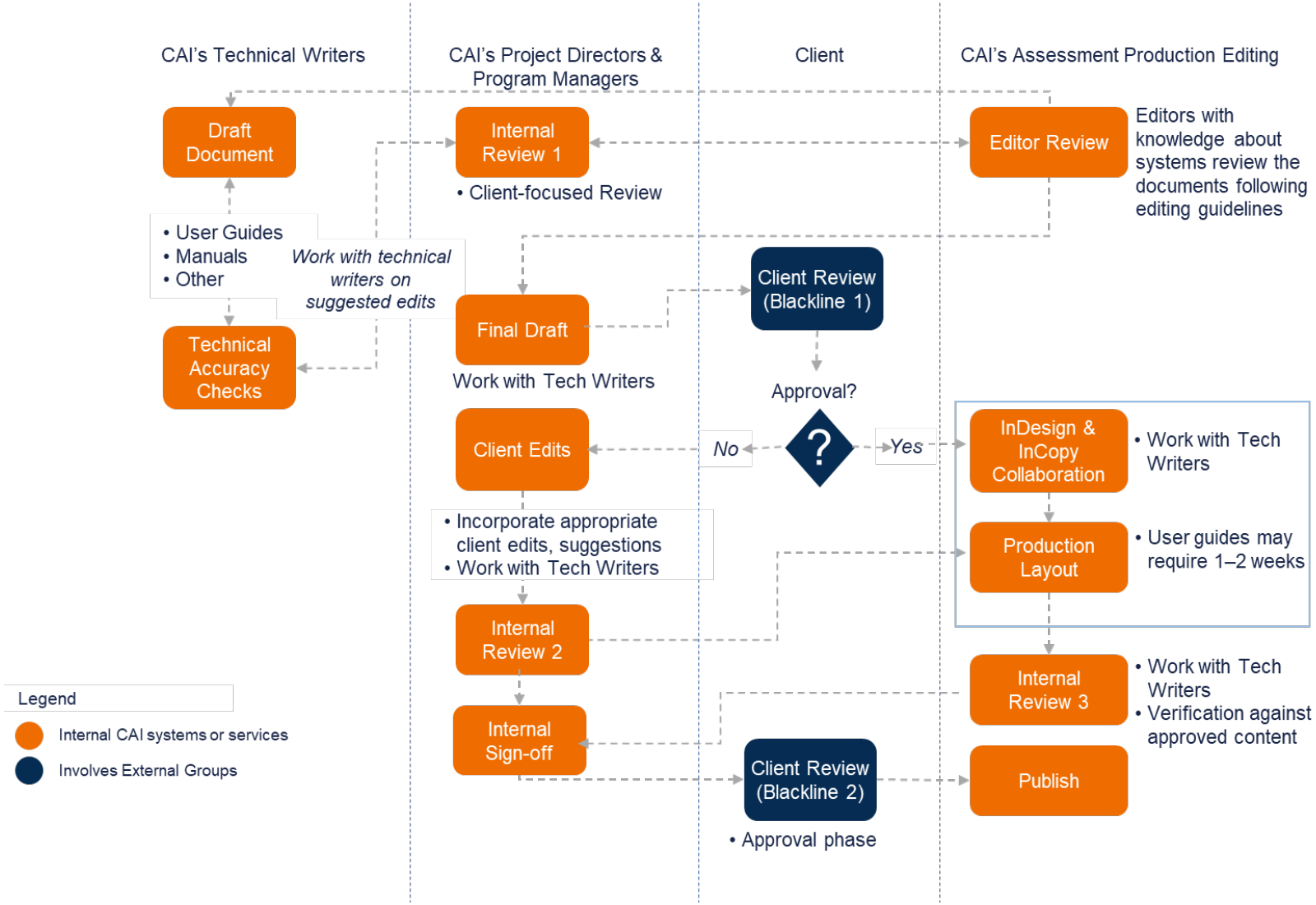
CAI's process for developing training materials is similarly divided into the following two phases:

1. A drafting phase, during which we obtain agreement on the content and design of the training materials
2. A production phase, during which we produce the training materials to the specifications developed in the first phase, make final adjustments, and ensure that the camera-ready proofs are error free

The drafting process begins with conversations with NJDOE, during which we discuss both design and content and produce an outline for the deliverable. Once the outline is approved by NJDOE, the training team will produce a draft for review. Upon receipt of NJDOE's approval, the production process begins.

Our production processes include multiple editorial reviews, and each document must receive senior staff sign-off. Exhibit 4.3.10-2 provides an overview of our editorial review process. Each document's content is fully drafted before it enters the production system. Camera-ready drafts are called blackline proofs, and we typically produce up to three of these, with final edits made on blackline 1, any missed changes corrected on blackline 2, and a clean version delivered at blackline 3. The final blackline proof must have no changes and serves as the master document against which the blueline proof is evaluated.

Exhibit 4.3.10-2: Overview of Our Editorial Review and Revision Process



Section 508 Compliance

CAI has been developing Section 508-compliant materials for federal and state agencies since accessibility requirements were enacted in 1998 as an amendment to the Rehabilitation Act of 1973. We are experienced in delivering high-quality, complete, and accurate Section 508-compliant products to clients. Our team of expert writers has developed and refined processes for creating Section 508-compliant websites; applications; emails; videos; multimedia; PDF files; and Microsoft Word, Excel, and PowerPoint files; testing and validating our work; and performing detailed quality-control (QC) checks. In many instances, we have remediated the accessibility work of other contractors and trained federal and state clients in how to create Section 508-accessible products.

Universal Design for Learning

CAI adheres to the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014) for the development and implementation of all state assessments. These standards include both: (1) developing items and tests that measure the intended construct while minimizing construct-irrelevant barriers that may impact test performance, and (2) developing and providing appropriate accommodations to remove construct-irrelevant barriers where they exist. The principles of universal design (UD) provide guidelines for test design to minimize the impact of construct-irrelevant factors in assessing student achievement. UD removes barriers to reach the widest possible range of students.

Universally designed tests include, but are not limited to, clear visuals, clear formatting, concise and readable text, and respect for a diverse population. CAI will collaborate with content developers to confirm the structure of HTML item elements used in conjunction with assistive technologies (e.g., screen readers).

CAI employs a series of automated validation checks and human platform reviews as part of the item development process to guarantee high-quality content delivery. CAI also has a variety of embedded online testing tools to support student accessibility needs. These custom settings allow the assessments to be adapted to each student's individualized needs. The following are examples of the custom accessibility settings available within our Test Delivery System (TDS):

- *Auditory Assistance Tools*: These tools allow audio transcriptions and closed captioning.
- *Cognitive Assistance Tool*: This tool allows voice guidance during assessments, as permitted by state testing regulations and policy.
- *Concentration Assistance Tools*: These tools allow students to expand passages and items, use full-screen view, and employ a line reader for on-screen reading; includes other tools that help students stay focused.
- *General Testing Tools*: These tools are equipped for all items; tools include an item tutorial, video playback controls, and font sizes/font types that can be adjusted.
- *Presentation Tools*: These tools permit language settings to be adjusted in items and passages to meet the needs of English learners (Els).
- *Reading Tools*: These tools allow TTS to be enabled; a thesaurus and a series of English and foreign language glossaries are included among these tools.
- *Visual Tools*: Text color and contrast may be adjusted using these tools; the mouse pointer color and shape may be altered.

4.3.11. Stakeholder Engagement

4.3.11.1. Stakeholder Communication Representative

CAI will provide an experienced spokesperson for all stakeholder communications. We propose Dr. Mary Cochron, former director of assessment at the Oregon Department of Education, to fill the role of stakeholder communication representative. Dr. Cochron brings a wealth of experience presenting information on the state's large-scale assessment program to school boards, education stakeholders, the Oregon State Legislature, and the media. Dr. Cochron's career in education began as a secondary school teacher in 2005. She is an expert in education research, evaluation, and assessment. With over 25 years of experience in statewide assessment programs, Dr. Cochron understands the political intricacies involved in addressing complex queries about a state assessment program. She is an exceptional leader in delivering key messages regarding state assessments and student outcomes that cut through the noise often present in media and other political forums.

Media Training

Our spokesperson will be available for public comment at the request of the SCM. The established spokesperson will undergo formal media training before assuming this role. We propose to work with our partner media relations agency, Lambert, to provide media training. This training will include a general overview of personal appearance and non-verbal communication, as well as targeted training on verbal tone and inflection; rehearsing interview questions and strategies; pivoting; and block-and-tackle techniques.

In-House Support by CAI's Senior Leadership Team

In addition to Dr. Cochron, CAI will support the spokesperson role with the expertise of Dr. Gary Phillips and Bani Dheer, J.D., both members of CAI's senior leadership team. Dr. Phillips is CAI's vice president of psychometrics and brings more than 40 years of experience leading large-scale assessment initiatives state-wide, nationally, and internationally. Dr. Phillips has conducted more than 30 national press conferences on behalf of national assessment organizations including the National Assessment of Educational Progress (NAEP), Trends in International Mathematics and Science Study (TIMSS), the Progress in International Reading Literacy Study (PIRLS), and Programme for International Student Assessment (PISA). He regularly participates in congressional briefings to the Senate Health, Education, Labor, and Pensions (HELP) Committee and the House Education and Workforce Committee. He has met with governors in a number of states and made presentations to state boards of education and state legislative committees, particularly in Delaware, Indiana, Oregon, and West Virginia.

Ms. Dheer is CAI's vice president of reporting and data use. She has more than 25 years of experience in K–12 education and reporting results from large-scale assessments. In the 2022–2023 school year, she was responsible for reporting 110 million tests across the nation. Should we be awarded this contract, Ms. Dheer will oversee the portfolio of reporting products provided for New Jersey stakeholders, including the Family Portal; the Centralized Reporting System (CRS), the online reporting system for administrators and educators; and paper reports for families.

We propose that Ms. Cochron serve as spokesperson to ensure efficient stakeholder communication, and that Dr. Phillips and Ms. Dheer provide the following services to support the Department:

- Work closely with NJDOE to develop messaging targeting each stakeholder group that the media spokesperson will use in all media engagements

- Draft talking points for NJDOE to review before the public release of all New Jersey assessment results
- Draft PowerPoint presentations identifying performance trends across subjects and grades

We understand that all contractor-developed stakeholder communications or requests for comment from education organizations or media outlets will be subject to review and approval by the SCM and developed in accordance with standard operating procedures established by the SCM. If edits are requested, CAI will resubmit the revised materials for approval by the SCM before public release.

4.3.11.2. Marketing Campaign

CAI commits to submitting a comprehensive marketing plan within 30 calendar days of the conclusion of the project launch meeting (PLM). The objective of the marketing campaign will be to establish statewide awareness of the new assessment program. The plan will include, but not be limited to, the following:

- Major social media networks
- Articles and/or announcements via major educational organizations
- Articles and/or announcements via education-focused or New Jersey-focused press outlets
- An established website presence containing information specific to New Jersey's new statewide assessment system

We propose a marketing plan that includes the following components:

- A targeted media strategy, including social media strategy and articles via major educational organizations
- Placement of education-focused articles in New Jersey-targeted press outlets
- An early communication strategy that comprises
  - stakeholder communication brochures; and
  - an established website (Information Portal) containing information about NJDOE's new assessment program.

The plan will be based on criteria established during the PLM and submitted for the SCM approval and edits. Edits requested by the SCM will be returned by CAI within five business days. CAI will begin executing the marketing campaign within 45 days of award.

Media Strategy

CAI proposes to work with Lambert, a New York-based leading media and marketing firm. Lambert brings deep experience developing and executing marketing campaigns for national and state government agencies, including the Michigan Department of Education, the U.S. Center for Disease Control, and the Michigan Economic Development Corporation. Upon award of this contract, we will work closely with Lambert and NJDOE to develop an effective media strategy for NJDOE. The media strategy will address all requirements in the RFQ, including the following:

- Drafting press releases for NJDOE review and approval, as required
- Developing a social media strategy—identifying social media platforms to use to promote awareness of the new assessment program among stakeholder groups

- Developing an editorial calendar for education-focused articles highlighting the benefits of the new assessment program and identifying New Jersey-focused press outlets to target with this content

CAI will draw on the education expertise of Mr. Joe DiBenedetto, managing director of Lambert's education practice. Mr. DiBenedetto has spent more than 25 years providing public relations support to K–12 schools across the country. We will also work with Megan Wolowiec, senior associate, public relations in Lambert's education practice to develop proposed education-focused articles for placement in New Jersey-specific media outlets.

Joe DiBenedetto and Megan Wolowiec offer a deep roster of media contacts among New Jersey-specific and national education press reporters to support this project.

Early Communication Strategy

In partnering with 27 state assessment programs, we have learned that a key component to an effective marketing plan is an early communication strategy. Transitioning a large-scale assessment program to a system of new online adaptive assessments typically produces an enormous amount of information. The objective of an early communication strategy is to provide stakeholders with a clear structure for organizing and absorbing the information they will receive. We propose to collaborate with NJDOE to customize the following two key communication tools for New Jersey families, educators, and administrators:

1. First, we propose to work with NJDOE to develop a customized information portal for all educators, administrators, families, and students that functions as a central repository for all communication and training materials.
2. Second, we propose to collaborate with the Department to develop a series of informational brochures for each user role that answer common questions about the new online testing system.

A Customized Information Portal for All New Jersey Stakeholders

The structure of the portal can be set up to present information by stakeholder (test coordinator, teacher, technology coordinator, student/parent) or by separate, subject-specific tabs such as Secure Browsers, Training, General Resources/Manuals, FAQs, and Contact Us. The portal tabs function like a table of contents, helping users organize and locate information as needed. The portal homepage also offers an easy-to-access location for important announcements and updates. Aside from functioning as a central information repository, the portal also provides each user role with password-protected access to only those components of the online testing system that are relevant to that specific role. CAI staff will work with NJDOE to configure the portal in the most optimal way for New Jersey educators and administrators.

A Series of Informational Brochures for All Stakeholders

CAI proposes to collaborate with NJDOE to develop a series of customized one-to-two-page, color informational brochures for parents, educators, administrators, and technology coordinators. The brochures will contain general information about the new online system, such as the following:

- How is the new online testing system different from the old testing system?
- Will students be required to take tests multiple times?
- What guidelines can schools use to schedule tests using the new online adaptive testing system?
- How do the new tests benefit students?

We have included sample brochures from Delaware and Utah in Appendix N of our proposal. In Exhibit 4.3.11.2-1 we propose a list of brochures for New Jersey stakeholders.

Exhibit 4.3.11.2-1: List of Proposed Brochures for New Jersey

Primary Audience for Brochure	Informational Brochure Description
Educators/Test Administrators/Local Education Agency (LEA) Assessment Staff	Overview of the new online testing system and the new assessments, and what they mean for educators and test administrators
Parents/Students	Overview of the new online testing system and tests, and what they mean for students and families
District/School Administrators/ LEA Assessment Staff	Preparing and training staff for online adaptive testing
Principals, Teachers, Test Administrators, Data Administrators	Quick guide to user roles

Branding

CAI will work closely with NJDOE to create branding specific to NJDOE's new assessment program. This will include developing a look and feel for the website, drafting social media messages, and developing graphics that can be used on the website and in presentations. CAI's communication and training team have worked with over half of the states in the nation to develop branding for their new assessment programs. We have a streamlined process for working with NJDOE to develop branding collateral; this process includes the following steps:

- A new name for the new assessments
- New logos for the assessment program
- Colors and a look and feel for the program (including images, font, and taglines)
- Logos and styles for PowerPoint presentations and presentation material
- Infographics and FAQs about the new assessment program

All marketing materials will be developed in close collaboration with NJDOE and will be reviewed and approved by the SCM. Marketing materials will also be developed in accordance with standard operating procedures established by the SCM. CAI will make all requested edits and shall resubmit all edited materials for approval by the SCM before public release.

Communication Targeting District Boards, the Legislature, and the Public-at-Large

In addition, CAI will collaborate with NJDOE to create two five-minute videos highlighting information about the new assessment program. These videos are aimed at the public and can be posted on the portal or used in presentations to district boards or legislative presentations. Our work across 27 state departments of education often calls on us to develop presentation materials for diverse audiences, including boards of education and members of legislative assemblies. CAI's central communication team is experienced in producing briefing material, talking points, and presentations for these audiences. For example, we worked closely with the Chair of the Utah Board of Education to produce marketing material for Utah teachers, parents, and administrators. Similarly, we worked with the Hawaii Department of Education to conduct media briefings and appear on a live broadcast to answer questions about the Hawaii State Assessment Program. We collaborate closely with the Texas Education Agency (TEA) to develop presentations for their Television Education Network (TETN) as required. In addition to all required training materials, CAI can produce talking points with visual aids highlighting the

benefits of the new assessment system, legislative briefs about an aspect of the assessment program, and infographics for media consumption.

4.3.11.3. Implementation Outreach

It is important for transitions to begin smoothly, and with an understanding that, while CAI is familiar with our systems and implementation approaches, educators and administrators are faced with the task of learning and adopting a new system—something that can feel overwhelming in the abstract. As noted in other sections of this response, CAI has developed a suite of systems that is deliberately straightforward and intuitive, with the end-user experience and operational simplicity at the center of the design. This makes it easy for CAI to talk about our systems and create robust learning opportunities for users while reducing the complexity of the work we expect of users to understand how to manage student information, test sessions, and testing results in our assessment platform.

Meeting Planning and Registration

As part of our initial implementation outreach, CAI will conduct 10 in-person regional meetings (three regions) in New Jersey to begin within 30-to-60 days of formal contact award. This will allow sufficient time for CAI to develop New Jersey-specific training collaterals and handouts and share those materials with the SCM for feedback before the implementation seminars begin. CAI will produce modules that focus on core assessment systems, such as the Test Information Distribution Engine (TIDE), the Test Delivery System (TDS), and the Centralized Reporting System (CRS) and summarize key program information and dates. The CAI project manager is responsible for coordinating appropriate review and approval of training materials and applying any requested edits within the specified timeframes.

CAI acknowledges the expected attendance requirements for the meetings and will work with NJDOE to ensure that the selected meeting locations are appropriately located and can accommodate the expected number of participants. Meetings are expected to be scheduled on separate days, facilitating proper attendance and travel opportunities for facilitators and attendees alike, and a registration platform will be provided so that these metrics can be tracked and plans adjusted accordingly.

CAI's assigned project manager will develop and submit the expected outreach plan within 30 days of the planning meeting, incorporating these details for final review by the NJDOE SCM.

Staffing and On-Site Meeting Logistics

CAI's assigned project manager will attend, and CAI will provision, at least two additional staff members as on-site resources during the outreach opportunity to support presentations and questions from the field during the early phases of project implementation.

At the conclusion of the outreach seminar, attendees will have an opportunity to provide CAI with feedback about the effectiveness of the presented information. Likewise, participants will have the option to sign up for information from NJDOE about similar training opportunities offered by CAI.

Attendees will be provided with snacks and light refreshments as part of their attendance. Those attendees unable to participate in person will be provided with additional virtual training opportunities (no fewer than four and as many as eight) beginning 10 days after the first outreach meeting is convened.

4.3.11.4. Feedback Sessions

Educator Involvement in Online System and Program Development

CAI has developed a flexible and highly configurable online suite of systems, and we pride ourselves on the ability to develop configurable options that meet educators and administrators where they are. We aim to provide the broadest possible set of tools and test delivery designs to accommodate all possible testing scenarios, ensuring that the platform is the most accessible and dynamic in the industry.

CAI collects feedback and makes decisions about future feature development in the following ways:

- CAI maintains a strategic roadmap for systems that considers the latest security and data protection standards, industry trends, and organizational needs.
- The states we serve may request specific features or system configurability options.
- Support Center trends are studied each year for emerging patterns and needs from the field.
- Educator focus groups, roundtables, and pilot programs provide specific and targeted feedback.

Educator feedback is particularly important in ensuring that the tools provided in our systems are relevant and carefully tailored to the identified needs of users in the field.

Facilitation of Feedback Sessions

CAI has hosted and facilitated feedback and working group meetings with educators and stakeholders across all our clients to collect feedback about the successes and challenges they have experienced, as well as to provide recommendations for program improvements. These interactions are extremely beneficial and informative and are a crucial point of information for project managers and system developers alike. In some of the states that we serve, CAI maintains a collaborative relationship with unaffiliated networks of statewide assessment professionals as a means of regularly collecting feedback on program performance. CAI has conducted both in-person and virtual (optional) training sessions in collaboration with these support networks and gathers additional feedback throughout the assessment lifecycle.

In collaboration with NJDOE, CAI will conduct six in-person regional feedback sessions (for three regions) and four virtual sessions across the state. This underscores our commitment to obtaining actionable feedback from stakeholders and continually identifying areas for improvement in the assessment program.

A smooth registration process for all participants is ensured through a comprehensive preregistration system. As with the meeting logistics discussed in Section 4.3.11.3, CAI assumes responsibility for managing all logistical aspects of these sessions, including site selection; meeting registration management; development of training sessions and meeting collaterals; provision of snacks and refreshments; and conduct of exit surveys. The sessions will be facilitated by a combination of NJDOE staff and CAI subject-matter experts (SMEs), providing an informative and quality experience for the participants.

Communication with stakeholders both before and after the feedback sessions may occur through a custom email address, which may be used to distribute updates and can archive information as needed, or via support center contact media staffed by individuals trained on all aspects of the program. The proceeds of the exit survey, along with other points of feedback collected during the meeting, will be included in a comprehensive report of feedback results.

4.3.11.5. Assessment Literacy Field Supports

CAI will provide an assessment literacy communications package available by the time the first in-person engagement sessions are launched. Webinars will include 30 minutes of subject specific content along with 15 minutes of Q&A by participants. CAI will work closely with NJDOE to develop outlines for each assessment literacy webinar. NJDOE and the SCM will review and approve all webinars before they are conducted and published on the Information Portal. In the paragraphs that follow, we describe some proposed topics to support the assessment literacy goals for the new assessment program. We propose the following assessment literacy topics in the form of online training modules and live webinars.

Topic 1: Overview of the New Jersey Assessment Program

This 45-minute webinar provides a general overview of

- the purpose of statewide assessments;
- the components and content of statewide assessments;
- best practices in using statewide assessment data;
- how statewide assessments differ from other types of assessments; and
- the statewide assessment development process.

Topic 2: In-Depth Explanation of the New Jersey Summative Assessment Program

This 45-minute webinar explains the purpose and use of the New Jersey summative assessments, how different types of assessments are designed for distinct purposes, and how the results from different assessments are used for student graduation requirements and school accountability. Participants will learn about the alignment of the assessments with the state mandated standards (New Jersey Student Learning Standards [NJSLS]). Embedded assessment literacy topics include explanations of item development, blueprints, scoring, and all reporting features and what they mean for the specific test(s).

Topic 3: School and District Administrators: How to Use Summative Results to Identify Important Trends

In this 45-minute webinar, district and school leaders will learn how to identify important performance trends using their summative data. Topics covered may include how to conduct a comparison of year 1 and year 2 summative results across grades and subjects to identify high- and low-performing schools; how to identify specific reporting-category performance gaps across a school or district, and how to conduct sub-group analysis to identify populations with performance gaps.

Topic 4: Best Practices in Using Data from Summative Assessments

In this 45-minute webinar, teachers will learn best practices on how to use the data from the summative assessments to reflect on their teaching practice from the prior year. Topics may include steps to conduct the following: an analysis on roster performance from the past-year summative results, an analysis of reporting-category performance, and a sub-group analysis that can help identify performance gaps. Teachers will also learn inferences that can and cannot be drawn from summative results.

In addition to these webinar topics, CAI will collaborate with NJDOE to produce the following one-page document and two-page graphic:

- A one-page overview describing the updated New Jersey Assessment System
- A two-page infographic on assessment literacy explaining appropriate uses of data from each assessment

4.3.11.6. Additional Stakeholder Engagement

CAI commits to meeting the requirements in this section. Four additional in-person engagement sessions will be limited to 50 attendees per session, and four live virtual sessions will be conducted if the SCM assesses that there is a demand for these sessions.

4.3.11.7. Deliverables

After the first administration, CAI will provide a report summarizing the activities undertaken to engage stakeholders before and after the first administration of the assessment. Areas that will be addressed include the following:

- Summary of communications to districts regarding the new state assessment program
- Training materials and training sessions targeted to each stakeholder group
- Attendance numbers for each webinar and training session
- Number of downloads for each stakeholder communications brochure
- Information Portal and Family Portal usage statistics indicating the number of users and high-traffic pages
- Numbers in attendance at webinars and training sessions
- Number of training module and video downloads from the Information Portal
- Number and type of presentations to the school board along with general feedback on presentation
- Number and type of presentations to the state legislature along with general feedback on presentation
- Number and type of articles placed in New Jersey media outlets
- Number and type of interviews conducted by media spokespersons
- Number and type of social media platforms used to reach each group
- Number of constituents following the messages and social media feeds
- Number of press releases and specific media outlets running press-release content
- Survey results from all feedback surveys

We note that all materials developed by CAI will be subject to review and approval by the SCM and developed in accordance with standard operations procedures established by the SCM. If CAI implements the SCM edits, we will submit the edited materials for approval by the SCM before public release.

4.3.11.8. Stand-Alone Field Test Prior to the First Operational Administration

As we describe throughout, we propose to deliver the New Jersey assessments using our well-established ClearSight item pools. The ClearSight item pools are extensive and support the assessment of each standard across the full range of academic achievement. Although NJDOE is open to deploying a licensed item pool for test administration, the RFQ is clear that all item statistics must be based on item responses from New Jersey students.

While item statistics based on stand-alone field-test administrations are sufficient for evaluating the general performance of test items—including item discrimination, general item difficulty, and differential item functioning (DIF)—stand-alone field-test administrations do not capture all of the factors that influence student achievement in the context of operational test administrations. For school year 2025–2026, therefore, we propose a fall 2025 stand-alone field-test administration to support a New Jersey-specific item data review of all ClearSight bank items, as well as any New Jersey-specific item development necessary to meet blueprint elements that are not assessed in the ClearSight pools. In this section, we propose a sampling design to ensure a representative sample of New Jersey students responding to each item.

To ensure accurate and precise item parameter estimates for scoring and reporting student assessment results, we propose a non-adaptive item selection from the item pools for the first summative test administration that will (1) ensure that all students are administered assessments that meet all New Jersey test blueprint specifications, and (2) yield samples of student responses to each item that are independent of student achievement, allowing for calibration and equating of item parameters to a unique New Jersey scale for scoring and reporting.

Stand-Alone Field-Test Administration

The stand-alone field test can be configured to either randomly sample items for administration to each student, or to administer items that meet a target blueprint (possibly shorter than the summative test blueprint to allow class period testing), but with item selection proceeding independently of student ability.

We propose that schools be the primary sampling unit for the stand-alone field test, and we propose to draw a stratified random sample of schools for participation in the stand-alone field test. Although student achievement is clustered within schools (thus reducing the efficiency of school-based samples relative to simple random samples of students statewide), employing schools as the primary sampling unit provides efficiencies for school recruitment and participation in the stand-alone field-test administration. Moreover, we note that sampling design effects of the school-based samples are minimized in our approach by randomly selecting items for administration to each student from the entire subject area pool. Importantly, we are not seeking to establish operational item parameters based on the stand-alone field test, so design effects are not relevant to the precision of item parameter estimates. It is, however, critical that sample sizes be sufficiently large to allow for reliable evaluation of DIF between focal and reference groups. We will provide NJDOE with a sampling plan that ensures stand-alone field-test samples that are sufficiently large to support the intended interpretations of item statistics, but are least burdensome on New Jersey schools.

Calibration and Equating for First Operational Test Administration

To obtain accurate and highly precise IRT item parameter estimates that capture all the factors operating on student summative test performance, we propose to non-adaptively administer the first operational test of the New Jersey assessments. We propose to administer first-year

summative assessments using the same adaptive test engine used to deliver all summative test administrations. The first-year summative test administrations will be configured to meet all NJDOE test blueprint specifications, but item selection will proceed independently of student ability. This approach will result in a sample of responses to each item that represent the distribution of ability in the New Jersey student population. Moreover, since each student is administered a different sample of items, this approach results in a linking design in which all items are linked to all other items, providing a highly robust linking design to support calibration and equating of IRT item parameter estimates.

Should NJDOE wish to report assessment results on a vertical scale that can be used to monitor student achievement across grade levels, CAI will implement a vertical linking design to place item calibrations for each of the grade-level item pools on a common scale. We note that in the development of our ClearSight item pool, a vertical linking study was conducted to establish a vertical scale for reporting student assessment results in ELA and mathematics, which allowed educators and parents to monitor achievement gains across grades.

To emphasize the acquisition of new knowledge and skills in the development of the vertical scale, operational items from each grade level assessment (g) were embedded in field-test slots of the assessment in the grade below (g − 1). While this approach requires administering students some items measuring content that students may not yet have had the opportunity to learn, the resulting linkage represents student achievement of grade-level content for which they will receive instruction and thus can be interpreted as a pre-test score for measuring student acquisition of subsequent grade level content.

In order to adequately represent the content domain measured by each of the grade-level and subject-area assessments in the vertical linking design, approximately three forms (test administrations) worth of items will be identified for the vertical linking set at each grade. The vertical linking items will be selected so that they meet blueprint for test administrations on the grade level assessments from which they were selected.

We propose a chain linking approach to link the grade-level assessments within each subject area. An important advantage of the chain linking approach is that, because item response theory (IRT) calibrations proceed by establishing the within-grade scale, the achievement construct intended by the blueprint and enacted in the operational test form is preserved. The chain linking approach is also more practical given the very large number of items included in the ClearSight adaptive item pools and the three-parameter logistic (3PL)/generalized partial credit model (GPCM) parameter estimation (should NJDOE wish to employ the more general IRT model).

Following close of the summative test administration window, IRT item parameters will be calibrated and vertical linking constants computed prior to construction of ordered item booklets to support standard-setting workshops in the summer.

4.4. Assessment Program Quality Control and Documentation

CAI shares NJDOE's commitment to 100% accuracy in all products that are delivered to New Jersey students, educators, and NJDOE staff members. For all quality control (QC) procedures associated with NJDOE assessments, we will do the following:

- Draft a QC plan within 25 business days of contract award for SCM approval.
- Include in the QC plan detailed descriptions of our processes, incorporating those listed in the RFQ alongside existing CAI organizational QC processes.
- If the SCM requests edits to the plan, we will revise and resubmit the QC plan within five business days.

Quality assurance (QA) and QC are integral to every aspect of CAI's work. We conduct QC reviews at key checkpoints throughout the project life cycle. Our commitment to quality is upheld through standardized, clearly documented processes and procedures for all critical business functions.

CAI has an established Business Process Management (BPM) system using IBM Blueworks Live as our central repository and BPM modeling and management tool. All processes, from contract initiation to the final delivery of score reports, are documented and organized to support the sequence of tasks, work activities, and critical hand-offs. This includes verification steps for all deliverables produced by subcontractors or received on behalf of NJDOE by other vendors.

Our BPM system provides a clear framework to support CAI staff in completing critical business functions accurately and consistently and provides the ability to monitor processes to detect and correct issues that fall outside these standards or requirements. We have embedded recommendations from the *Operational Best Practices for Statewide Large-Scale Assessment Programs* (Council of Chief State School Officers and Association of Test Publishers, 2013 edition) into our operational processes. The *Operational Best Practices* have become recognized as an influential resource guiding operational decisions about statewide assessment programs.

Robust QA protocols exist in every process in each phase of our work, from the item and test development process to the delivery of final reporting results and data files. Many of our QA processes are covered in detail through this proposal. Examples include the following:

- Structured review sequences and auditable histories in item development
- Detailed and standardized specifications for all data transformations and analyses
- Internal software testing plans with rigid and conservative success criteria
- Controlled platform review process to validate device compatibility with content presentation
- Uniform user acceptance testing (UAT) review prior to test release
- Independent replication of statistical analyses
- QA review of data files for completeness and accuracy
- Dedicated Production Control Board (PCB), responsible for implementing and enforcing strict change management standards and protocols for modifications to production servers, inclusive of tiered reviews of each proposed change

Some of our key processes for ensuring quality around item function and test integrity, data processing and psychometrics, data file generation, and score reporting are summarized in the following sections.

Test Development

As noted in Section 4.11.2, the Item Tracking System (ITS) relies upon a series of distinct and specific review levels throughout the content development process. The system shepherds the content entities that CAI develops through every workflow step, from inception to final publication. It does so by forcing these entities to pass through targeted review, editing, and management status levels, in which specific actions are taken or reviews are conducted. ITS enforces process standardization within content areas on all entities developed within those areas; in doing so, it additionally facilitates version control, management oversight, and preservation of the entity's development history. It also supports both NJDOE's participation in the review cycle and CAI's internal content development process.

The sequence of review levels can be customized to support New Jersey's unique content development and review requirements. At each internal stage of the review process, CAI test developers check items to ensure that they are aligned to New Jersey state standards, are worded clearly and succinctly, are grade-appropriate, contain appropriate graphics, have accurate and fact-checked content, are free of bias and sensitivity issues, follow the style guide, follow universal design principles, and can be adapted for use on a paper-pencil form. Each step in the review process corresponds to a level in ITS.

Test Security

CAI provides a forensic analysis QA report that evaluates individual test records and all aggregate levels for possible testing irregularities. The forensic analysis report identifies unusually large changes in student achievement across test administrations; unusually large number of response changes that increase item scores; analysis of item response latencies that may indicate unusually large test administration times (e.g., sessions kept open to manipulate responses or coaching of students); and person misfit, indicating an unusually large number of correct responses inconsistent with the student's overall ability. NJDOE can configure the flagging rules to best meet New Jersey forensic analysis goals.

In addition, CAI's solution includes the services of Caveon as an independent provider for ongoing web-monitoring services, added as an additional layer of protection. Caveon Web Patrol addresses the risk to tests and items posed by illicit discussion, distribution, and sale of test content on the Internet and supports NJDOE's requirements for secure web monitoring through the full test administration timeline. CAI's proposed test security and web-monitoring services are described in more detail in Section 4.12.11.3.

Test Administration Materials and Monitoring

CAI's process for developing high-quality test administration manuals, user guides, and systems documentation is divided into two phases:

1. A drafting phase, during which we obtain agreement on the content and design of the document
2. A production phase, during which we produce the document to the specifications developed in the first phase, accommodate any final adjustments, and ensure that the camera-ready proofs are error-free

The drafting process begins with discussions with NJDOE, during which we review issues of both design and content. Once drafts are approved, we proceed to production. The first blackline version of the document, which results from the first iteration through our production

process, is designed to reflect the final layout and formatting. Typically, only format and layout changes are made at blackline. A second blackline is produced after incorporating these changes to confirm that they were made correctly.

Our production processes include multiple editorial reviews, and each document must receive senior staff sign-off. We refer readers to Section 4.3.10 for an overview of our editorial review process. Each document's content is fully drafted before the document enters the production system. Camera-ready drafts are called *blackline proofs*, and we typically produce up to three versions. Final edits are made on blackline 1, any missed changes are corrected on blackline 2, and a clean version is delivered at blackline 3. The final blackline proof must have no changes and serves as the master document against which the blueline proof is evaluated.

Item Scoring Activities

Scoring Key and Machine Rubric Development

Scoring keys and machine-scoring rubrics are developed simultaneously with assessment items. This ensures the key or machine-scoring rubric undergoes the same set of reviews as the item itself. When items are developed for online systems, CAI's online development tools enable reviewers to interact with them and test the scoring.

All items go through a post-field-test key or rubric review. For machine-scored constructed-response items, items go through rubric validation, which is discussed in this section.

Paper-pencil and online tests are scored using slightly different processes at CAI, and these procedures differ substantially from traditional test scoring protocols. Even on paper, more complex item types appear and often allow for many variations of a correct answer.

Rubrics are hand-tested by our test developers during development. They are refined and further checked with real student responses during the rubric validation process. Finally, classical item analysis provides an extra check that may reveal potential issues. If any problems are found at any point along the way, they are corrected in ITS and a sample of responses in Rubric Evaluation and Verification for Items Scored Electronically (REVISE), our rubric validation software, is rescored to ensure that all and only targeted responses have changed scores.

To ensure accurate scoring of paper-pencil test responses, our Key Verification System (KVS) generates all possible response combinations for items with fewer than 50,000 combinations. For items with more possible combinations, our test developers define patterns of correct and incorrect responses to be generated. These pass through standard transformation rules and are sent through the same scoring engine with the same rubric. Test developers review the responses to ensure that all and only correct responses are given credit. Correct responses can be shared with NJDOE.

The KVS creates a key table that is used to score operational data. It is a direct mapping between the scanned response and its score. If the verification process identifies scores that need to be corrected, they are adjusted in this table and used for scoring. During operational scoring, any responses that were not verified before (for those items with more than 50,000 possible responses) are held for verification by our content experts.

Maintenance and Deployment of Keys and Machine-Scoring Rubrics

Item keys and rubrics are developed, stored, and reviewed in unison with item content. Reviewers can experiment with interactive items to test the rubrics.

As with item content, item keys and rubrics are locked down (physically written to disk) when the item receives web approval. Similarly to the item content process, keys and rubrics are checked to ensure that no changes have occurred since the most recent web approval, and a change protocol is enforced if there have been changes. This ensures that published rubrics will always match those that are approved.

After items are field-tested, machine-scored constructed-response items go through a rubric validation process. This process, similar to rangefinding, identifies anomalous responses and corrects the rubrics to accommodate them. Rubric changes can take place only in our ITS, and are then exported to REVISE, our rubric validation software. This ensures that ITS can manage changed versions of the rubric and that the operational deployment of the rubric will include the correct rubric version.

During rubric validation, changes to the item rubric are followed by rescoring. The system tracks all changed scores so that our content experts can review changes to confirm that the rubric change had only the intended effect.

Handscored items go through more familiar rangefinding processes. With selected-response items, it is easier to detect bad or malfunctioning keys. Item analysis and data review procedures are used to identify problems before the items go live.

Quality Assurance Process for Handscoring of Constructed-Response Items

To ensure industry-leading scoring of constructed-response items (CRIs) like those found in the NJSLA-ELA/M and the NJGPA, working with our scoring partner, Measurement Incorporated (MI), CAI has developed automated, objective monitoring tools and has integrated these tools into MI's Virtual Scoring Center (VSC), allowing our teams to efficiently monitor scorer performance. Access to VSC reports is available to NJDOE through the use of a dedicated login.

Score Reports

Data File Generation

All data exchanges are governed by data layouts that describe data format and syntactic constraints. These machine-readable layouts include validation criteria.

Outgoing data are generated automatically using these layouts and validation rules. We typically work with clients to validate the data files as part of our testing with artificial data. Once approved, the system consistently and reliably produces accurate data. This highly automated process enables us to deliver accurate nightly files to our clients (as requested), in addition to a cumulative, end-of-window file.

Quality Assurance Process for Score Reporting

Whether tests are administered on paper or online, scores will be reported online, as well as on printed individual student reports (ISRs). Online reports will be delivered in real time, relying on operational item keys, machine rubrics, and item parameters. As test results come back from the Test Delivery System (TDS) or the scanning-scoring process, they are routed to our test integration system and Quality Monitor (QM) System, and ultimately, to our reporting systems.

Student Response and Score Data Are Correct

Data entering the reporting process, either from paper-pencil or online assessments, flow through our QM System. The QM System conducts a series of data integrity checks, ensuring, for example, that the record for each test contains information for each item that was supposed to be on the test and that the test record contains no data from items that have been invalidated. The QM System scores the test, recalculates performance-level designations, calculates subscores, compares item parameters to the reference item parameters in the item bank, and conducts a host of other checks.

The QM System also aggregates data to detect problems that become apparent only in the aggregate. For example, the QM System evaluates item fit and flags items that perform differently operationally than their item parameters predict. This functions as an automated key or rubric check, flagging items where data suggest a potential problem. This automated process is similar to the sorts of checks that are conducted for data review, but (1) they are performed on operational data and (2) they are conducted in real time so that our psychometricians can catch and correct any problems before they have an opportunity to do any harm.

Reporting System Software Accurately Reports and Aggregates Student Scores

Online reports appear in real time. Therefore, QA cannot rely on post hoc report reviews. Instead, the accuracy of the reporting system rests on the system's quality of programming, the implementation of the State's business rules, and the quality of the algorithms used for aggregating scores.

In building our systems, we undergo an extensive software testing process, and when we configure the systems for individual clients, we test them by running simulated or real data through the full system, allowing it to generate reports. Our statistical programming team simultaneously implements the same rules and processes the same data. Statistics from the system are then compared to statistics produced by our statistical team. Discrepancies are tracked down and resolved.

This entire process is guided by a set of complete reporting and analysis specifications. Both the software team and the independent statistical programming team work from the same specifications, but they function independently. This process provides an independent check on the immediate reporting system before it is deployed.

Quality Assurance of Data Files

The final step involves conducting QA reviews before scores are released. Scores for online assessments can be assigned by automated systems in real time. For machine-scored portions of assessments, the machine rubrics are created and reviewed along with the items and then validated and finalized during rubric validation following field testing. The review process locks down the item and rubric when the item is approved for web display (web approval). During operational testing, actual item responses are compared to expected item responses, given item response theory (IRT) parameters, which can detect miskeyed items, item drift, or other scoring problems. Potential issues are automatically flagged in reports available to our psychometricians.

Only after scores have passed the QA checks in the QA system and are uploaded to the Database of Record (DOR) are they passed to the Centralized Reporting System (CRS), which presents individual-level results and calculates and presents aggregate results. No score is reported in the CRS until it passes all the QA system's validation checks. These processes take

milliseconds to complete; within less than a second of handscores being received by CAI and passing QA validation checks, the composite score will be available in the CRS.

Psychometric Activities and Monitoring

Quality Assurance Process for Data Processing and Psychometrics

All analyses are guided by specifications documents drafted in sufficient detail to reproduce them. Analysis programs are implemented separately by independent teams, and these results are compared to ensure fidelity to the documented specifications.

Operational systems are tested with artificial data. CAI's computer scientists generate simulated data files that are designed to model known and anticipated characteristics of the assessment data, as well as cases designed to evaluate the performance of the analysis, scoring, and reporting software under extreme or unusual conditions. These simulated data files are used to test all software supporting operational test analysis, scoring, and reporting, including performance of the data layout generator, data analysis software for computing classical item statistics, and calibrating and equating test items, as well as all scoring and reporting software.

The software is tested and refined until it is error-free. This process happens well in advance of any operational data becoming available. Our test data generator creates *challenge cases*, including inconsistent data, missing data, out-of-range data, and other anomalies that mimic real-world complications. This testing and refinement phase ensures that we have anticipated any problems while we have plenty of time to address them (i.e., before the operational data arrive).

When the operational data arrive, we have all analyses replicated by two analysts to ensure that the programs are applied correctly. Any discrepancy in their results is thoroughly investigated and resolved. Resulting estimates, such as item parameters and conversion tables, are compared with historical expectations under the belief that substantive changes may signal a problem.

CAI has an excellent record of delivering error-free data. We continually work to improve our processes in this regard, and we commit to NJDOE that we will continue to innovate to make our processes more efficient and as impervious to errors as possible.

Operational Item Analyses

CAI psychometricians actively monitor test administration performance throughout the testing window using a set of QA reports generated from the QM System. Throughout the testing window, QA reports will be routinely generated and evaluated to ensure the quality of the New Jersey statewide assessments. The QA reports provide information on item behavior, blueprint match rates, and item exposure rates. Additional reports, described in Section 4.12, include a forensic analysis report that flags unlikely patterns of behavior in testing administrations aggregated at the test administration, test administrator, and school levels. QA reports can be generated on any desired schedule. Item analysis and blueprint match reports are evaluated frequently at the opening of the testing window to ensure that test administrations conform to blueprint and items perform as anticipated.

Each time reports are generated, the lead psychometrician reviews the results. If any unexpected results are identified, the lead psychometrician alerts the project manager immediately to resolve any issues.

Section 4.3.5 (Exhibit 4.3.5-1) presents an overview of the QA reports.

4.5. Assessment Program Structure and Implementation Schedule

4.5.1. General Implementation Requirements

Overview of Proposed Solution to Meet General Implementation Requirements

New Jersey is committed to four major priorities for the next generation of state assessments. These priorities include the provision of timely, actionable data; short test length; accessibility; and college and career readiness. We propose to meet and exceed New Jersey's expectations via item-adaptive test administration of New Jersey academic content standards using our ClearSight item banks and augmented with New Jersey-specific item development to meet any blueprint requirements not currently assessed in our ClearSight item banks. The high-quality items that comprise the ClearSight banks can provide the core item pools for assessing college- and career-readiness (CCR) academic content standards. We propose to utilize the ClearSight item pools as we develop New Jersey-specific item pools. We propose to administer item-adaptive assessments that meet all specifications in custom New Jersey blueprints. CAI's ClearSight item banks are currently being used to measure CCR standards in numerous statewide assessments, including item-adaptive summative assessments in Arkansas, New Hampshire, North Dakota, West Virginia, and Wyoming. ClearSight forms the core of the Arkansas ATLAS assessment system, with Arkansas-specific item development to supplement the ClearSight pools. The ClearSight item banks have seeded the development of custom state item banks, including in Arizona, Florida, and Ohio. ClearSight item banks also supplement the Utah item banks. Our item banks are robust and aligned to the CCR standards for English language arts [ELA] and mathematics.

Our ClearSight items were developed in conjunction with state departments of education, following a rigorous system of internal and external review procedures implemented by each of the participating states. Each of our partner states has adopted content standards consistent with rigorous CCR standards that are common to many states. Thus, all items have been reviewed by content review committees comprising educators in one or more states, as well as by bias and fairness review committees in those states. All items have been field-tested in embedded slots within operational test administrations so that item parameter estimates, based on large numbers of students participating in state summative assessments, are highly precise and stable. Following field-test administration, item statistics for all items are evaluated for discrimination, difficulty, and differential item functioning (DIF), and any items flagged for out-of-range statistics are forwarded for further review by content, psychometric, educator, and/or state assessment staff, with items that perform poorly being rejected from the item pool.

As noted, the ClearSight item banks have been constructed to enact blueprints aligned to the rigorous CCR standards that have been adopted by many states. Blueprints are generally consistent across participating states, but the item banks are sufficiently robust to allow flexibility for each state to craft and implement a custom blueprint that meets its unique requirements. In addition, we propose to provide custom item development for NJDOE to assess New Jersey-specific content standards not assessed or well-represented in the ClearSight item pools, as well as item types required by NJDOE that are not currently part of the ClearSight item pools. For example, because New Jersey's ELA task models form the heart of the NJSLA-ELA assessment, we will focus initial development on writing task passage sets in ELA. We will work with NJDOE to finalize a blueprint that aligns to the New Jersey Student Learning Standards

(NJSLS); yields test scores that are valid and reliable, both overall and for all domain reporting categories; and ensures that test administration times remain within the desired limits.

CAI proposes a new test design for the NJGPA, which is shorter in length and time but similar to the proposed blueprints for the NJSLA. CAI will work with NJDOE to develop this test so that it fits the needs of the State and the field.

In addition, CAI is committed to providing New Jersey with high-quality item banks and adaptive assessments to meet the stringent requirements of federal peer review. In this section, we focus on the following four broad topics that are common to both the ELA and mathematics requirements, as noted in the RFQ:

1. Peer Review
2. Test Design
3. Item Specifications
4. Item Development

These four broad topics are directly tied back to CAI's commitment, as described in Section 4.2.2, to providing NJDOE with the highest quality assessments for the NJSLA and NJGPA, as required in the RFQ.

Thus, in this section, we provide a high-level overview of our proposed solution. Then, in the ELA and mathematics sections, we provide subject-specific examples to demonstrate our ability to meet the needs of the RFQ in those subject areas.

Experience with Federal Peer Review

CAI has extensive experience assisting our clients in not only preparing documentation for federal peer review but also responding to peer review concerns and requests. As a result, we are very familiar with all peer review guidelines. For example, we note that two of our partner states who have used the ClearSight summative item pools, North Dakota and West Virginia, both substantially met the federal requirements for peer review. Additionally, New Hampshire and Wyoming have recently submitted their documentation for federal peer review. As of the time of this submission, they are still awaiting their results. The results of peer review demonstrate CAI's proven experience in test design and development, offering valid and reliable assessments with full reporting designed to offer educators the necessary data for improving instruction. Another partner state, Wyoming, partially met the federal requirements for peer review. Finally, in order to complete the peer review process, New Hampshire is currently submitting additional information regarding its blueprints only. We note that Utah, which uses both Utah-owned and ClearSight items, substantially met peer review requirements for grades 3–8 ELA and mathematics in 2018.

Further, the results of the alignment studies across all of these states suggest that the ClearSight item pools are a good fit for states that adopted the CCR standards and are seeking to meet the requirements of peer review. CAI will work with New Jersey to provide all necessary documentation for its peer review submissions.

Test Design

One key consideration in test specifications development is striking a balance between overall test length (and testing time) with a state's reporting needs. An important focus of any statewide assessment program is on reporting, and adaptive test administration provides important advantages for interpreting test scores for all test users. For example, with fixed-form tests, each test form comprises a single draw on the content domain so that each standard, if measured at all, is assessed by the same item for all students. Thus, fixed-form tests do not typically assess the full range of content standards specified in the blueprint, and even for the

standards that are assessed, they measure only a very narrow slice of the content represented by the standard. By contrast, adaptive test administrations proceed from the full pool of available items, providing a far better representation of the intended content domain to be assessed. As with a fixed-form test, any one student may not be assessed with respect to all standards in the blueprint. In the aggregate, however, because students are administered different samples of items aligned to the blueprint, the full breadth of the academic content standards is assessed at each aggregate level. Moreover, because each student is administered different items measuring each standard, each standard is assessed across a much broader sample of items representing the content domain, allowing for a much more robust measure of classroom and school performance at a finer-grained level of analysis. Thus, we can provide educators with standard-level analyses of class and school performance that are highly reliable and lead to more valid interpretations of student performance since those indicators are based on a more representative range of the knowledge and skills included within those standards.

The primary limitation to reducing test length is subscale score reporting. Highly reliable subscale scores and performance-level classifications can be achieved via subject-area assessments from 25 items (e.g., mathematics) to 30 items (e.g., ELA). As noted, with item-adaptive test administration, even with reduced test length, the full breadth and depth of the content domains are assessed at each aggregate level. However, most states require reporting of subscale performance so that minimum test length is further driven by the need to produce reliable (actionable) feedback about subscale performance. CAI content and psychometric staff will work with NJDOE to develop test blueprints that are as short as possible while fully supporting New Jersey's reporting requirements.

Blueprints define the test architecture that will support its intended uses. In this very important sense, the test blueprint is a policy document; it states how a test will meet its policy objectives. Blueprints are also technical documents because they reflect the technical analysis that identifies the trade-offs among policy objectives that may compete. For example, a longer test can provide more detailed information, trading testing time for instructional utility. A statewide summative assessment may have objectives similar to the ones described in Exhibit 4.5.1-1.

Exhibit 4.5.1-1: Summary of Approach to Meeting Assessment Objectives

Objective	Proposal to Meet Objective
Maximize information for students at the ends of the performance continuum	We propose an adaptive assessment built on one of two robust item banks, providing for optimal measurement at the ends of the continuum.
Consistent experience for each student—every student measured on the breadth and depth of the standards	The proposed blueprints ensure that each student will be presented with items measuring at least 50% of the standards at each subdomain. This ensures that each student experiences the breadth of the standards. They include rigorous specifications for the distribution of Depth of Knowledge (DOK) that every student must be presented.
Emphasis on higher levels of cognitive engagement, including complex skills, processes, and practices	New Jersey educators value high levels of cognitive engagement, and we propose blueprints that will emphasize higher-level tasks.

All test blueprint development begins by defining the assessment claims, namely statements of what students can do as evidenced by their performance on the assessment. One such claim is that New Jersey schools and districts are being held accountable for ensuring that students achieve the New Jersey Academic Standards. Fixed-form tests allow NJDOE to measure only a limited subset of the standards each year. Our adaptive test blueprint allows much broader

coverage of the content domain at the aggregate level since each student is assessed with respect to a somewhat different sample of the full array of the New Jersey Academic Standards. Specifically, at the individual level, the blueprint is designed to ensure that claims about student achievement of the New Jersey Academic Standards are valid and reliable, that the proportion of standards assessed allows for valid generalizations to the standards overall, and that test scores and performance-level classifications are precise, including those for lower- and higher-ability students.

Often, these assessment claims form the basis for reporting categories. For example, in ELA, the reporting categories might include the following:

- Reading: Literary Text
- Reading: Informational Text
- Reading: Vocabulary
- Writing: Written Expression
- Writing: Knowledge of Language and Conventions

Once assessment claims and reporting categories are established, blueprints can then be developed to ensure coverage of the depth and breadth of the New Jersey Academic Standards.

We note, however, that while principal assessment claims are written with respect to achievement of subject-area standards, educators value more fine-grained feedback about student achievement. To provide differentiated feedback about individual student performance, individual standards can be grouped into instructionally meaningful subgroups or reporting categories. Decisions about whether and how to report subscales place additional constraints on the blueprint to ensure that feedback about student achievement in each subscale is sufficiently reliable.

Furthermore, within each reporting category for mathematics and ELA, the adaptive blueprint defines content clusters that contain varying numbers of related content standards. For example, in grade 3 mathematics, within the Measurement and Data strand, there are four cluster statements, each with groups of related standards. Both the content clusters and underlying content standards are assigned item ranges. The item ranges for the content clusters ensure that material is represented on a test form with the proper emphasis relative to other clusters in that reporting category. The item ranges for individual standards are constructed so that at least half of the standards in any particular content cluster must be represented on a test form. The item range approach ensures that all test forms expose students to a wide range of content in the correct proportion while providing some flexibility during form construction.

Once decisions have been made regarding the test design and other considerations, CAI has traditionally engaged in a detailed process for developing new summative ClearSight blueprints in conjunction with state educators. This section describes the process that we have used in some of our partner ClearSight states.

As part of the initial process, CAI content specialists will review the existing blueprints and then draft revised blueprints to be reviewed by senior psychometricians. The state then reviews preliminary blueprints and holds calls with CAI to review, discuss, and modify the draft blueprints. CAI staff members then implement any requested state edits prior to the blueprint meeting with educators.

When educator meetings are convened, CAI typically works with the state to recruit committee members with a high level of content expertise in the relevant grade bands in each subject area. For example, reading specialists are often experienced with multiple grade levels, ensuring vertical articulation of the blueprints and that the major areas of focus at each grade level are represented within the blueprints. Furthermore, it is important to recruit committee members from all areas of the state (i.e., urban and rural communities) and all backgrounds. Recruiting

committee members with high levels of content expertise from various areas ensures that the committees are well-balanced and representative of schools throughout the state. We also propose the inclusion of educators/specialists for each of the grade bands in order to ensure

- vertical articulation across the grades; and
- major areas of focus on each grade.

At the beginning of the meeting, CAI specialists typically present preliminary blueprints to each committee and work with them to provide sufficient coverage at all levels, including details about the following aspects of the blueprints:

- The standards to be assessed
- The assessment structure (e.g., the grouping of domains, clusters, and standards within the claims as well as the percentage weight of the total test that each claim represents)
- The minimum number of items for each reporting category and claim
- The relationship between the Achievement-Level Descriptors (ALDs) and the test blueprint
- The intended DOK addressed in each claim

After the blueprint meeting, CAI and NJDOE staff members collaborate on finalizing the blueprints based on the outcome of the meeting.

CAI is open to other structures for developing the New Jersey blueprints and will work closely with NJDOE to ensure that final blueprints cover the depth and breadth of the New Jersey Academic Standards across all subject areas.

Timing Considerations

CAI has collected historical timing data across grades and subject areas for a variety of item types used in our ClearSight states. In general, across all grades, students spent more time on machine-scored constructed-response items than on selected-response items. Exhibit 4.5.1-2 denotes the average testing time per item type for mathematics and ELA.

Exhibit 4.5.1-2: Average Testing Time per Item Type

	Item Type	Mathematics Average Testing Time per Item Type	ELA Average Testing Time per Item Type
Selected-Response	Multiple-Choice (MC)	1.3 minutes	1.9 minutes
	Multiple-Select (MS)	1.5 minutes	1.9 minutes
	Evidence-Based Selected-Response (EBSR)	N/A	1.9 minutes
	Table Match (MI)	1.7 minutes	2.8 minutes
	Editing Task (ETC)	N/A	1.1 minutes
	Hot-Text (HT)	1.5 minutes	1.9 minutes
Machine-Scored Constructed-Response	Equation Response (EQ)	2 minutes	N/A
	Graphic Response (GI)	2.2 minutes	N/A
	Table Input (TI)	2.8 minutes	N/A

Across our partner ClearSight states, we offer untimed options for our tests. We do find that most of our partner states provide untimed options, but we offer guidance around average testing times per assessment to allow for scheduling purposes and/or provide a limit on how much time a student may take during each assessment.

Item Specifications

All CAI item writing begins with detailed specifications developed using the principles of evidence-centered design. The item specification document details the item types appropriate for the assessment of each standard at each level of cognitive complexity. This document specifies the content boundaries for the standard and provides sample task demands (or models) for item writers to ensure that the item measures the intended standard appropriately. Additionally, the item specifications document will include assisting NJDOE with identifying appropriate item types to measure the cognitive processes and complexity of the standards during the blueprint development process. CAI will document the development process to ensure that the item specifications meet peer review requirements.

CAI has also worked with many of our partner states, including Florida, Indiana, Ohio, and Utah, to implement item specifications consistent with ClearSight to guide development within their states. We showcase a sample ClearSight item specification for each content area in the ELA and mathematics sections that follow.

Universal Design

Universal Design in Item and Prompt Development

As a leader in online and paper-pencil assessments, CAI understands that, for equitable and fair testing, tests must be accessible to all student populations. This has always been a guiding principle at CAI, and it is reflected in the way we develop items and assessments—from the initial writing of an item to the way we have developed our Test Delivery System (TDS) to ensure equitable access for all.

To further confirm our commitment to the intent of this principle, CAI adheres to the Universal Design for Learning (UDL). UDL is a framework that seeks to accommodate the needs and abilities of all students. This framework has the following seven major elements that CAI adheres to in all item writing:

1. Inclusive Assessment Population
2. Precisely Defined Constructs
3. Accessible, Non-Biased Items
4. Amenable to Accommodations
5. Simple, Clear, and Intuitive Instructions and Procedures
6. Maximum Readability and Comprehensibility
7. Maximum Legibility

To reach this goal, CAI has developed an end-to-end system to present all assessments in a flexible manner that can be adapted to any student population and to provide any necessary accommodations. In the following sections, we describe our approach to implementing UDL throughout our item and test development processes.

CAI has been at the forefront of both online accessibility and the implementation of new item interaction types. These parallel initiatives have enabled us to identify and optimize the accessibility profiles of each item type. CAI's item writers receive extensive training on how to identify the most appropriate item types to ensure accessibility for all. We regularly coordinate

with our internal accessibility team, particularly as new item types are developed. If, during form building, an item cannot meet our stringent accessibility requirements, CAI can substitute that item with another item with similar psychometric characteristics that meet the same standard.

Item Writing and Item Review

During the item-writing process, all items undergo several rounds of internal review. During these rounds of review, all internal staff members review the item for accuracy, adherence to standards, and accessibility to all students. This includes ensuring that a graphic is accessible for students with low vision (e.g., by adjusting color contrast, borders, or shading) and adding text-to-speech (TTS) for visually impaired students.

Attention to universal accessibility is integral to our processes. All CAI item writers and reviewers strictly follow the principles of UDL, as noted in Exhibit 4.5.1-3, which also lists the seven principles of UDL and their relationship with the seven elements referenced previously.

Exhibit 4.5.1-3: Principles of Universal Design for Learning Applicable to Item Writing and Reviewing

Universal Design Principle	Elements of Universally Designed Assessments
Equitable Use—design is useful and marketable to people with diverse abilities	Reflected in all elements
Flexibility in Use—design accommodates a wide range of individual preferences and abilities	Especially reflected in element 1 (inclusive assessment population), element 3 (accessible, non-biased items), element 4 (amenable to accommodations), and element 6 (maximum readability and comprehensibility)
Simple and Intuitive Use—design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level	Especially reflected in element 5 (simple, clear, intuitive instructions and procedures), element 6 (maximum readability and comprehensibility), and element 7 (maximum legibility)
Perceptible Information—design effectively communicates necessary information to the user, regardless of ambient conditions or the user's sensory abilities	Especially reflected in element 4 (amenable to accommodations), element 5 (simple, clear, intuitive instructions and procedures), and element 7 (maximum legibility)
Tolerance for Error—design can be used efficiently and comfortably and with a minimum of fatigue	Reflected in element 2 (precisely defined constructs) and element 5 (simple, clear, intuitive instructions and procedures)
Low Physical Effort—design can be used efficiently and comfortably and with a minimum of fatigue	Primarily reflected in element 7 (maximum legibility)
Size and Space for Approach and Use—appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility	Primarily reflected in element 4 (amenable to accommodations) and element 7 (maximum legibility)

Implementing Universal Design for Learning Principles with a Focus on Language Accessibility

To provide a more equitable test, CAI recognizes the inherent bias in some language that is colloquially used. Our test developers recognize this and are taught to use neutral and accessible language. CAI's test developers are trained to write items that are accessible to all students based on the principles of UDL. In addition, all of CAI's test developers are required to pass an examination that certifies their ability to implement CAI's Language Accessibility Guidelines in the items they develop. Each item is reviewed by at least three content experts at CAI and an editor. At each review level, every item is checked for language accessibility and for adherence to UDL principles.

In accordance with UDL, when creating items, test developers use several guidelines to create clear and concise items. To further this goal, item writers follow strict rules, including avoiding the following:

- Passive constructions
- Idioms
- Multiple subordinate clauses
- Pronouns with unclear antecedents
- Multiple-meaning words
- Non-standard grammar
- Dialect
- Jargon

Avoiding these helps students to focus less on the language and more on the material being tested.

In addition to internal reviews, CAI also implements a standard language accessibility and bias and sensitivity (LABS) client review meeting. In this meeting, clients can review items to ensure that items meet any inclusivity guidelines. In addition to checking for inclusivity during these meetings, CAI and the client also confirm that there is no regional bias, such as using an idiom or using language that may not be well known in the state. During the meetings, the client can comment on items and make recommendations for edits that CAI will then implement.

Exhibit 4.5.1-4 outlines the Language Accessibility Guidelines used by CAI when writing and reviewing items.

Exhibit 4.5.1-4: Language Accessibility Guidelines

Guideline	Details
Flexible Use	Provide equal availability for access to the item. Design the items to be appealing and accessible to all.
Simple and Intuitive	Eliminate unnecessary complexity, particularly in language and visuals.
Perceptible Information	Provide adequate contrast between essential information and the surrounding information. Eliminate any extraneous information.
Tolerance for Error	Maintain the cognitive complexity being measured by eliminating unnecessary clutter that may artificially increase the complexity of the item.
Low Physical Effort	Eliminate the need for excessive writing and unnecessary calculations.

Implementing Universal Design for Learning Principles with a Focus on Representation, Expression, and Engagement

As described in previous sections, accessibility to all populations is of paramount importance to CAI and is present in all aspects of test development. When creating items and designing tests, CAI ensures that there are variations in which the test is presented (e.g., students have a variety of ways to express understanding of the material, allowing them the opportunity to establish interest in tasks).

There are various ways CAI can present an assessment to students to ensure equitable access for all. Working with our accessibility team, a test can be presented in braille, translated text, TTS, and on paper. Additionally, we support American Sign Language (ASL), closed captioning, glossaries, and human voice recordings. Throughout our work with multiple states, CAI has accommodated a multitude of student populations and has adapted to presenting tests in various ways to be accessible to all. CAI understands that testing is not “one accommodation fits all,” and we have developed multiple test delivery accommodations to further that understanding.

Along with presenting tests in multiple variations, items can also be varied to accommodate students. CAI has pioneered the use of technology-enhanced items (TEIs), which keep tests engaging for the students and offer them multiple opportunities to respond to items. Item formats range from standard multiple-choice items to simulation items, where the student virtually runs an experiment and answers the item based on the parameters they choose. Another way of assessing student knowledge is using dependent scoring. In these item types, even if a student incorrectly responds to one part of the item, the student is still able to receive partial credit if the other parts of the item are correct. This shows the student does have some proficiency in the subject matter and therefore is not penalized fully for getting one part of an item incorrect.

Another benefit of using different item types is increased student engagement. As previously discussed, creating simulations allows the student to understand how experiments work out in real time, thereby generating student engagement. Other item formats encourage student engagement and interaction to keep the student motivated and interested in the items presented. Students can be asked to create graphs, highlight parts of passages to answer an item, and create equations—all in a manner that authentically measures the construct. By differing item formats, we can assess the standard and extract various pieces of information about what the student knows.

4.5.2. Structure of the NJSLA-ELA and Mathematics Assessment and NJGPA Assessments

Overview

CAI is committed to developing high-quality, accurate, and properly vetted content that measures the New Jersey Student Learning Standards (NJSLS) for English language arts (ELA) and mathematics. CAI proposes to leverage our existing ClearSight item bank and augment it with custom New Jersey-specific development. An immediate focus of custom New Jersey-specific development will be New Jersey-specific writing tasks, which are at the heart of the NJSLA-ELA. CAI has successfully developed and will continue to develop and administer assessments that meet all blueprint specifications across multiple states using this combined approach. In this proposal, we will demonstrate that we are well-positioned to meet the New Jersey RFQ requirements.

Augmenting our extensive ClearSight item pools with New Jersey pool development provides evidence of CAI's ability to provide content that is fully aligned to NJSLS and of high technical quality; all NJSLA items will be fully aligned to the NJSLS. CAI's item development team supports both custom item development to create state- and consortia-specific item banks (e.g., Ohio, Florida, Texas, Smarter Balanced) and internal development in support of a licensable bank of items. CAI has developed the ClearSight assessment system inclusive of summative, interim, and formative content that we license for state use. Our ClearSight item banks are robust, are aligned to the college- and career-readiness (CCR) standards for ELA and mathematics, and provide the core bank for several states that have fully adopted the CCR-derived standards. The evidence we submit will come from the state of West Virginia, which utilizes the ClearSight bank and received "Substantially Meets Requirements" status for the Elementary and Secondary Education Act (ESEA), as amended by the No Child Left Behind (NCLB) Act and Every Student Succeeds Act (ESSA) in 2021.

Our ClearSight summative ELA and mathematics item pools have been explicitly constructed to support statewide assessment programs in grades 3–8 and high school. As noted, some state clients deliver adaptive assessments solely from the ClearSight item pools (e.g., New Hampshire, North Dakota, West Virginia, Wyoming). Other states, especially where there are state specific standards not assessed in the ClearSight item pool, augment the ClearSight pools with state-developed items (e.g., Arkansas, Utah). Yet other states have used the ClearSight item pools to seed their state-developed item banks (e.g., Arizona, Florida, Ohio). This range of implementations reflects our willingness and ability to implement high-quality, custom New Jersey assessments.

Our items were developed in conjunction with state departments of education following a rigorous system of internal and external review procedures implemented by each of the participating states. Our New Jersey-specific development will follow the same rigorous process. Each of our partner states has adopted content standards consistent with the CCR standards. Thus, all items have been reviewed by content review committees comprising educators in one or more states and by bias and sensitivity committees in those states. All items have been field-tested in embedded slots in operational test administrations so that item parameter estimates, based on large numbers of students participating in state summative assessments, are highly precise and stable. Following field-test administration, item statistics for all items are evaluated for discrimination, difficulty, and differential item functioning (DIF), and any items flagged for out-of-range statistics are forwarded for further review by content, psychometric, educator, and/or state assessment staff. Items that perform poorly are rejected from the item pool.

Several ClearSight states have undergone independent alignment studies with results verifying that the ClearSight pools are strongly aligned to the CCR standards. For example, WebbAlign's 2019 *Alignment Analysis of West Virginia General Summative Assessment for ELA Grades 3–8 and Mathematics Grades 3–8 with Corresponding Grade Level West Virginia College- and Career-Readiness Standards* found strong alignment of the WVGSA test forms in both ELA and mathematics. WebbAlign found all test forms in both ELA and mathematics to be fully or acceptably aligned, with most being fully aligned.

In Sections 4.5.2.1 and 4.5.2.2, we provide evidence demonstrating how the combined ClearSight and New Jesery item pools meet the criteria for high-quality assessment and the specific criteria outlined in the RFQ for ELA and mathematics.

4.5.2.1. NJSLA-ELA–Standards and Grades Assessed

CAI will provide ELA assessments for grades 3–9 and for the high school ELA component of the NJGPA, as outlined in the sections that follow. We recognize that the high school ELA assessment is based on the grade 10 NJSLS-ELA and is administered in grade 11. The

following sections describe how the tests will assess student proficiency on the breadth and depth of the NJSLS for ELA, allowing educators to monitor student growth to ensure that students are meeting expectations to be college and career ready. We will describe how our approach of seeding the NJSLA-ELA with CAI's ClearSight reading passages along with immediate development of New Jersey-specific writing tasks meets the RFQ requirements for the NJSLA for ELA by measuring students' content knowledge of the grade-level standards and focusing on reading comprehension within and across multiple texts, cross-disciplinary literacy, vocabulary, and written expression, including language use and writing conventions.

4.5.2.1.1. NJSLA-ELA–Background Documents

CAI will work with NJDOE to provide all necessary documentation for its peer review submissions. CAI has extensive experience working with partner states in meeting the federal requirements for peer review; two of our partner states, West Virginia and North Dakota, both substantially met the federal requirements for peer review. The results of peer review demonstrate CAI's proven experience in test design and development, offering valid and reliable assessments with full reporting designed to offer educators the necessary data for improving instruction. Another partner state, Wyoming, partially met the federal requirements for peer review. Finally, in order to complete the peer review process, New Hampshire is currently submitting additional information regarding their blueprints only. Further, we note that Utah, which utilizes both Utah-owned and ClearSight items, substantially met peer review requirements for ELA and mathematics grades 3–8 in 2018. Section 4.12 further details CAI's process and experience assisting state clients in meeting peer review requirements.

4.5.2.1.2. NJSLA-ELA–Computer-Adaptive Administration

CAI leads the field in standards-based adaptive assessments. We have successfully delivered computer-adaptive assessments, including summative and interim, in many states since 2006. Our adaptive algorithm enables us to deliver tests meeting complex blueprints (including passage-based tests) while optimizing measurement for each student. CAI's adaptive algorithm takes three sources of information as input: (1) an item pool, (2) a test blueprint, and (3) the student's performance on items up to the current point. The adaptive algorithm is then configured to execute maximally adaptive test administrations under the constraint of blueprint match. Configuration of the adaptive algorithm is critical because the composition of the item pool, which changes from test administration to test administration, interacts with the blueprint to influence the performance of the adaptive algorithm.

The adaptive algorithm supports (and we advise all our clients to use) blueprints that meet the following conditions, which have been advocated by the Consortium for Citizens with Disabilities, an umbrella group encompassing most national advocacy groups for students with disabilities and other exceptional students:

1. Every student is tested on the full range of grade-level content with no discernible differences in the content assessed.
2. Every student is tested on items measuring the same mix of cognitively complex skills with no discernible difference, regardless of student proficiency.
3. Every student is tested on items reflecting the full range of other aspects of the grade-level curriculum as may be appropriate for the grade and subject.
4. Students are tested on items that provide the best measurement possible within these constraints.

These four principles ensure that every student can accurately demonstrate his or her academic skills and knowledge across the entire grade-level curriculum. CAI's adaptive algorithm supports blueprints that meet these goals, and we propose to work with NJDOE to ensure that blueprint

implementation adheres to these goals for the state of New Jersey. Section 4.12.2 provides detailed information about CAI's adaptive algorithm and processes and procedures around adaptive test construction.

CAI has the most mature, well-tested, and scalable online test delivery platform in the industry. We delivered the first statewide, online, adaptive test in the country to receive a "Substantially Meets" status under the 2005 U.S. Department of Education peer review. Currently, CAI delivers online testing in 27 states and jurisdictions. For 23 of these clients, we deliver customized adaptive tests, including tests in ELA and mathematics. We currently deliver statewide assessments in several large states, including California, where we test more than 99.99% of that state's 3.2 million grade-eligible students with online adaptive tests.

Historically, CAI is the only organization to have successfully delivered statewide adaptive assessments at scale for more than 10 years in ELA, mathematics, and science. CAI has supported more than a half-dozen states as they transitioned almost instantly from a paper-pencil testing system to a virtually all-online assessment, including rural states (e.g., New Hampshire, Vermont), isolated states (e.g., Hawaii), and large states (e.g., California, Florida).

Finally, CAI has the most accessible system available. We provide online testing for virtually all students in California, Connecticut, Delaware, Florida, Hawaii, Idaho, Indiana, Montana, New Hampshire, North Dakota, Ohio, Oregon, South Dakota, Utah, Vermont, Washington, and West Virginia. This includes not only ELA and mathematics, but often science and social studies assessments as well.

4.5.2.1.3. NJSLA-ELA–Test Design

In the following sections, CAI will share sample specifications and propose test blueprints, including reporting categories for the NJSLA-ELA. CAI is accustomed to collaborating with partner states to develop item specifications and customized blueprints for states that combine custom development with the ClearSight item pool. Upon award of contract, CAI is prepared to share all existing ClearSight specifications with the State, including test blueprints, item specifications, and other test design documents. CAI will collaborate with the State on customizing and finalizing approval for all test design documents to ensure they meet the unique needs of the NJSLA-ELA.

Alignment

CAI has reviewed the NJSLS for ELA and have found that our ClearSight item banks for ELA, which are aligned to the CCR standards, show a high level of alignment to the NJSLS ELA standards, particularly for the reading passages. Upon award of the contract, we will immediately focus our development on New Jersey-owned writing tasks, followed by New Jersey-owned reading passages in subsequent years. Further, several independent alignment studies have demonstrated the alignment with the ClearSight item banks to the CCR standards.

Item Specifications

The ClearSight item banks for ELA and mathematics were developed according to item specifications that strategically guided item development. In our experience, some item types are better than others for measuring some content, but any appropriate item type can usually span the Achievement-Level Descriptors (ALDs) and Depth of Knowledge (DOK) levels for the content standards. In the sections that follow, we describe our approach to developing item specifications and ensuring they are aligned to the NJSLS.

Upon award of the new contract, CAI will provide NJDOE with all existing item specifications for each ClearSight pool. For custom New Jersey development, CAI will work with NJDOE to draft new specifications following the approach outlined in the following paragraphs. We will ensure

that the schedule allows NJDOE to review and approve all specifications prior to new item development.

Finally, CAI considers assessment specifications to include a broad grouping of documentation related to the assessment program. For example, the blueprints, which are described in Section 4.5.2.1.3.3, are an important component of the assessment specifications. Further, a style guide is critical for the item development process. CAI will work with NJDOE to draft and publish assessment specifications that include these documents and any others required by NJDOE.

Item Specification Development and Examples

All CAI item writing begins with detailed specifications developed using the principles of evidence-centered design. The item specification document details the item types appropriate for assessment of each standard at each level of cognitive complexity. This document specifies the content boundaries for the standard and provides sample task demands (or models) for item writers to ensure that the item appropriately measures the intended standard. Additionally, the item specifications document will include assisting NJDOE with identifying appropriate item types to measure the cognitive processes and complexity of the standards during the blueprint development process. CAI will document the development process to ensure that the item specifications meet peer review requirements.

CAI has also worked with many of our partner states, including Florida, Indiana, Ohio, and Utah, to implement item specifications consistent with ClearSight and guide development in these states. We are prepared to develop custom New Jersey item specifications, which will also become the property of NJDOE.

As described in the *West Virginia General Summative Assessment 2020–2021 Technical Report*, item specifications drive the ClearSight development process. The ELA specifications, targeted toward CCR-derived standards, include the following information:

- **Content Standard.** This identifies the standard being assessed.
- **Content Limits.** This section delineates the specific content that the standard measures and the parameters in which items must be developed to accurately assess the standard, including the lower and upper complexity limits of items.
- **Acceptable Response Mechanisms.** This section identifies the various ways in which students may respond to an item or prompt. Here, it is noted whether evidence-based selected-response (i.e., two-part), extended-response, hot-text, multiple-choice, multi-select, and/or short-answer items may be used, and if so, how.
- **DOK Demands.** This section is broken into three subsections: (1) DOK, (2) task demand, and (3) response mechanism. The task demands explain the skills the students may be required to demonstrate and connect these skills to each applicable DOK. The task demands break down the cognitive complexity to show how each DOK level requires differences in higher-order thinking. Finally, the DOK and task demand are connected to appropriate response mechanisms used to assess these skills.
- **Sample Items.** In this section, sample items present a range of response mechanisms and their corresponding expected difficulties (easy, medium, and hard). Notes delineating the cognitive demands of the item and an explanation of its difficulty level are detailed for each sample item.

Exhibit 4.5.2.1-1 is a sample item specification for a grade 6 literature standard. It outlines the limits of the item content to fully address the standard. This includes specifying the type and amount of evidence required. Furthermore, as the standard requires citing “several pieces of textual evidence,” the acceptable response mechanisms are limited to hot-text, wherein the

student selects the evidence in the text itself; multi-select, which allows students to choose two or more disparate pieces of evidence; and external copy interaction, which allows students to select evidence from any place in the reading passage. The DOK sections explain the demands for each DOK level and provide the acceptable response mechanisms. The cognitive demands increase from supporting an explicit inference with explicit evidence (DOK 1) to providing implicit evidence for an inference that the student makes (DOK 3). This level of detail guides the item writer in developing items, ensuring that the items address the standard and are correctly aligned at the DOK and difficulty levels.

Exhibit 4.5.2.1-1: Sample ClearSight ELA Item Specification

Content Standard	**Literacy RL.7.1: Cite several pieces of evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.**			
Content Limits	Items may ask for text-based evidence to support what is directly stated in the text. Items may ask the student to find text-based evidence to support an inference made by the item writer or by the student.			
Acceptable Response Mechanism	Hot Text • Requires the student to select words or phrases from the text to answer items using explicit information in the text as support. • Requires the student to select an inference from four choices and then to select words or phrases from the text to support the inference (two-part hot-text items). Multi-Select • Requires the student to select multiple responses from a number of choices to answer items using explicit or implicit information from the text as support. External Copy Interaction • Requires students to support an answer by clicking selectable pieces of evidence from the reading passage.			
DOK	1, 2			
DOK Demands				
DOK	Task demand		Response mechanism	
DOK 1	Identify support for a statement in the text where both the statement and support are explicit.		1. Hot-Text Response 2. Multiple-Choice Response	
DOK 2	Provide text-based support for an inference drawn from the text. The item writer may or may not provide the inference for the student.		1. Hot-Text Response 2. Multiple-Choice Response 3. External Copy Interaction	
DOK 3	N/A			
Item Models	Sample Item	Difficulty	Notes, Comments	Passage

DOK 1	Select the sentence from the paragraph that shows why Papa had to leave the farm to go work on the railroad. [Hot-Text]	Easy	The student must understand that the price of cotton dropped, meaning the family did not have enough money. The text explicitly states the answer to the item and the student does not need to wade through extraneous details. The item difficulty is easy because the support directly precedes the idea in the text. Easy Difficulty: The answer is explicitly stated in the text.	*Roll of Thunder, Hear My Cry*
DOK 2	Select a sentence from the text that shows that the family's financial situation has still not improved. [Evidence-based selected response]	Medium	The student must support an inference provided by the item. The inference that the family's financial situation has not improved is provided. The student must infer that because Papa is returning to work on the railroad again, the family still needs to raise money beyond what they earn from the farm. The student must select an example embedded within the text, increasing the number of options and, thus, the difficulty of the item. Medium Difficulty: The student must choose which sentence (among all the sentences in the text) supports the inference provided in the item.	*Roll of Thunder, Hear My Cry*

DOK 2	Reread paragraph 6. Part A: Why does Papa believe the land is so important? Part B: Select the sentence from the text that shows why Papa thinks the land is so important. [EBSR]	Hard	The item requires the student to interpret details from the text to recognize Papa's reason for believing the land is so important. The student must differentiate between the description of the land, Cassie's thoughts and feelings, and quotes from Papa. In Part B, the student must integrate details from across the text to draw an inference about the importance of the land. The student must recognize that owning the land means that the family does not have to answer to anyone else. This item is difficult because the student must draw inferences and interpret multiple details from the text. Hard Difficulty: The student must infer the answer to the item based on a character's dialogue and then select a sentence from the text that supports this inference.	*Roll of Thunder, Hear My Cry*

Each ClearSight item specification is targeted toward the particular standard it addresses, but tailors the task demands to that standard, including the level of inference, the types of textual evidence required by an item, and the mode of student response (response mechanism) most suited to capturing the required evidence. CAI creates detailed item specifications for all standards assessed on the blueprint.

4.5.2.1.3.1. NJSLA-ELA–Reporting Categories

CAI's ClearSight item pool includes items assessing many of the reporting categories listed in this section of the RFQ. As previously stated, in school year 2025–2026, we will focus our efforts on developing New Jersey-owned writing tasks to meet the needs of the RFQ. Section 4.5.2.1.3.3 describes example ELA blueprints that include the following categories:

1. *Reading: Literary Text*. This category assesses standards aligned to the New Jersey Progress Indicators for Reading Literature.
2. *Reading: Informational Text.* This category assesses standards aligned to the New Jersey Progress Indicators for Informational Text.
3. *Reading: Vocabulary.* This category assesses the standards listed under Vocabulary Acquisition and Use in the New Jersey Progress Indicators for Language.
4. *Writing: Written Expression.* This category assesses standards aligned to the New Jersey Progress Indicators for Writing by asking students to respond to on-demand writing prompts. Writing prompts are focused on three writing purposes: (1) opinion/argument, (2) informative/explanatory, and (3) narrative.
5. *Writing: Knowledge of Language and Conventions.* This category assesses the Conventions of Standard English standards listed under the New Jersey Progress Indicators for Language by providing a Conventions score for on-demand writing tasks.

Section 4.5.2.1.5.2 details the extent to which the bank supports all listed reporting categories.

4.5.2.1.3.2. ELA Assessment Content–Text and Item Specifications

CAI acknowledges that ELA assessments must include a total of four to six authentic texts, distributed between literary and informational based on grade level, and two extended writing tasks. In the following paragraphs, we explain how our ClearSight item bank and custom development plan supports this assessment content.

Blueprint Passage Sets

The ClearSight item bank has been constructed to enact blueprints aligned to the CCR standards adopted by many states, and it supports the criteria outlined in this section of the RFQ. Blueprints are generally consistent across participating states, but the item banks are sufficiently robust to allow flexibility for each state to craft and implement a custom blueprint that meets its unique requirements. A typical ClearSight blueprint contains four to five passage sets, consistent with the expectations listed in the RFQ. As described in Section 4.5.2.1.3.4, nearly all passages are authentic and previously published. Associated items are designed to reliably and validly assess comprehension and vocabulary. Section 4.5.2.1.4.2 describes how CAI's ClearSight item specifications ensure reliable and valid assessment of the ELA standards for comprehension and vocabulary.

CAI's ClearSight item bank has a balance of literary and informational text types and can easily accommodate the State requirement that the assessment be weighted toward assessing more informational than literary content as the assessments move up in the grade bands. Evidence of CAI's experience utilizing the ClearSight item bank in this manner can be provided by the West Virginia General Summative Assessment (WVGSA) blueprint for ELA. The blueprint

requirements for assessing literary and informational text types are split by the following grade bands:

- Grades 3–5 require 15–17 items assessing literary text and 12–14 items assessing informational text.
- Grades 6–8 require 12–14 items assessing literary text and 15–17 items assessing informational text.

During the blueprint review process, CAI will collaborate with the state to finalize a blueprint that meets these requirements and accounts for development of New Jersey owned reading passages in future years of the contract. The proposed New Jersey custom blueprints in Section 4.5.2.1.3.3 further describe our blueprint creation process.

Extended Writing Tasks

The ClearSight bank includes opinion/argumentative, informative/explanatory, and narrative writing tasks designed to assess students' written expression, language use, and grasp of writing conventions. All writing tasks are passage-based, requiring students to draw on one or more texts in their writing. Writing tasks are scored using a three-dimensional, 10-point rubric, with students scored on Purpose, Focus, and Organization (4 points); Evidence and Elaboration (4 points); and Conventions (2 points).

ClearSight writing passage sets are designed to reduce reading demand in the context of writing assessment, so writing passage sets are written to the lower bound of grade-level quantitative and qualitative text complexity targets. Since NJDOE assesses writing in the context of a grade-level reading assessment, CAI will prioritize the custom development of three types of New Jersey-owned writing tasks: Literary Analysis Tasks (LAT), Narrative Writing Tasks (NT), and Research Simulation Tasks (RST). These writing tasks will include passages and item sets matching the task models for the current New Jersey tasks:

- LATs will include two passages, six evidence-based selected response (EBSR) or technology-enhanced constructed-response (TECR) items worth 12 total points, and one prose constructed-response item scored on multiple dimensions using the current New Jersey RST and LAT writing rubrics.
- NTs will include one passage, four EBSR or TECR items worth eight total points, and one Prose Constructed Response (PCR) item scored on multiple dimensions using the current New Jersey NT rubrics.
- RSTs will include three passages, eight EBSR or TECR items worth 16 total points, and one PCR item scored on multiple dimensions using the current New Jersey RST and LAT writing rubrics.

Upon award of contract, CAI will collaborate with NJDOE on a schedule for revising or creating new task models and item specifications for these custom writing tasks.

4.5.2.1.3.2.1. NJSLA-ELA–Permission for Use of Published Texts

All CAI content staff are trained in passage finding, how to use the Copyright Clearance Center (CCC) as a tool for passage finding, and procedures required for obtaining copyrights. The combination of public domain and CCC stimuli covers the vast majority of passages used in item development. However, CAI also uses targeted non-CCC-permissioned work, when necessary.

Permissioned Passages

Especially in items developed for the lower grades, stimuli drawn from contemporary works of literature are sometimes procured from copywritten sources. CAI's Copyright Acquisition Team will ensure that we obtain and pay for permission to post all copyrighted items and their associated graphics (and any other multimedia resources, as required). Our team is experienced in copyright acquisition for assessment projects, including both paid and open-source materials in all content areas. For copyrighted passages, permission request forms are sent to CAI's copyright team prior to state review. The copyright team then confirms copyright ownership, initiates contract requests and negotiations with rights holders, and determines licensing requirements, including the anticipated number of students to be assessed at each grade level and any anticipated public release of passages. Passages with copyrights that cannot be secured prior to item development will be identified by the copyright team in a timely manner so that the content team will have adequate time to find replacements. Copyright license rights will be granted for use exclusively in New Jersey's assessments for the life of the contract, which is at least three contract years, plus two additional one-year options. All information about sources, including copyright information and attached permission documents, is stored with the passage in CAI's item bank.

4.5.2.1.3.3. NJSLA-ELA–Test Blueprints

Introduction

Upon contract award, CAI will collaborate with the State to develop the NJSLA-ELA test blueprints. These blueprints will align to the NJSLS for ELA and will cover the depth and breadth of the standards and ensure documentation of all important test design considerations. CAI has more than 15 years of experience working with partner states to develop blueprints that meet a variety of needs and test designs. In the following sections, we provide an overview of test blueprint development based on CAI's best practices, provide proposed NJSLA-ELA blueprints based on required reporting categories listed in the RFQ, and describe the process we have used to create and review blueprints with state clients and educator committees.

Overview of Blueprint Development for Adaptive Tests

Blueprints define the test architecture that will support the test's intended uses. In this very important sense, the test blueprint is a policy document; it states how a test will meet its policy objectives. Blueprints are also technical documents because they reflect the technical analysis that identifies the trade-offs among policy objectives that may compete.

All test blueprint development begins with defining the assessment claims, namely statements of what students can do as evidenced by their performance on the assessment. One such claim is that New Jersey schools and districts are being held accountable for ensuring that students achieve the NJSLS. Fixed-form tests allow the State to measure only a limited subset of the standards each year; however, an adaptive test blueprint allows much broader coverage of the content domain at the aggregate level, since each student is assessed with respect to a somewhat different sample of the full array of the NJSLS. Specifically, at the individual level, the blueprint is designed to ensure that claims about student achievement of the NJSLS are valid and reliable, that the proportion of standards assessed allows for valid generalizations to the standards overall, and that test scores and performance-level classifications are precise, including for lower- and higher-ability students.

Often, these assessment claims form the basis for reporting categories. The proposed NJSLA ELA blueprint includes the following reporting categories required by the RFQ:

- Reading: Literary Text

- Reading: Informational Text
- Reading: Vocabulary
- Writing: Written Expression
- Writing: Knowledge of Language and Conventions

Once assessment claims and reporting categories are established, blueprints can then be developed to ensure coverage of the depth and breadth of the NJSLS.

Blueprint Content Coverage

Within each reporting category, the adaptive blueprint defines item ranges that ensure that material is represented on a test form with the proper emphasis.

The following two factors impose a lower bound on the number of items that can be used to measure a construct:

1. The number of items needed to credibly cover the content domain
2. The precision required by the scores to support the intended uses of those scores

While there is no fixed rule for content coverage, the peer review process has revealed a consensus of professional judgment. Under the NCLB and subsequent peer review, the standard is that each student should be tested on a minimum of half of the content standards (i.e., 50%), with a requirement that all standards be covered over time or across students. The item-range approach ensures that all test forms expose students to a wide range of content in the correct proportion while providing some flexibility during form construction.

Subscale Reporting

Some of our partner states allow for a shorter-length summative blueprint to reduce overall testing time, but our experience is that educators greatly value subscale performance reporting. We propose using test blueprints that balance test length with the ability to facilitate reporting on subscale score performance. Moreover, we recommend 8–10 items minimum for each reporting category when reporting subscale score performance.

Aggregate-Level Reporting

CAI supports detailed aggregate-level reporting because we use the full pool of available items. Although any one student will access a few items sampled from a given standard, students in the aggregate will be presented with different samples of items measuring the full breadth of the academic content standards. At the aggregate levels of classrooms and schools, each standard is assessed across a much broader sample of items representing the content domain, allowing for a much more robust measurement of classroom and school performance at a finer-grained level of analysis. Thus, we can provide educators with highly reliable standard-level analyses of class and school performance that produce more valid interpretations of student performance since those indicators are based on a more representative range of the knowledge and skills subsumed within those standards.

Proposed NJSLA-ELA Test Blueprints

Grades 4–8 Proposed ELA Blueprint

Exhibit 4.5.2.1-2 summarizes a sample adaptive blueprint for NJSLA-ELA grades 4–8. We created the proposed blueprint to meet the requirements of the RFQ and modeled the blueprint on the criteria for the current NJSLA-ELA grades 4–8 assessments. Because our adaptive algorithm is item- rather than passage-based, we organized the blueprint by reporting category rather than by passage set. This allows us to display the passage, item, and point ranges for

each reporting category. For example, the Reading: Literary Text reporting category requires a range of one to three passage sets, 10–12 items, and 15–24 points. The Reading: Informational Text reporting category requires the same range of passage sets and items. Other reporting categories have no targeted passage set ranges but do have item and point ranges. For example, Writing: Written Expression items are included in applicable literary and informational passage sets but have current item and point requirements reflected in the blueprint.

Tasks

The Number of Tasks column shows the task types to be administered and reflects the current NJSLA-ELA 4–8 requirement that students receive two writing tasks. Our adaptive algorithm allows us to set affinity groups to limit student exposure to items meeting different criteria. In our sample blueprint, the Number of Tasks column ensures that students receive two writing tasks. The value of one for the RST reflects the current requirement that the RST be administered to all grades 4–8 students. Because the NJSLA-ELA currently administers either the LAT or the NT to 4–8 students, we set a maximum value of one for both tasks. This creates an affinity group ensuring that students receive only one of those two task types.

Passage Sets

Within each reporting category, we list the relevant types of passage sets. For example, Reading: Literary Text items may be part of LATs, NTs, literary short passage sets, or literary long or paired passage sets. Writing: Written Expression may only appear as part of an LAT, NT, or RST. Reading: Vocabulary items could be part of any type of passage set.

Item Ranges

Each passage set type includes minimum and maximum item ranges. We use item ranges rather than set item values to increase the adaptability of the test while ensuring a range of content coverage within and across reporting categories. For the sample blueprint, we used the following criteria to determine item ranges:

- A minimum of 8–10 items per reporting category to facilitate subscale reporting
- Current NJSLA-ELA item requirements for passage sets, including LAT, RST, and NT sets
- Balancing reporting category maximum values with overall test length

Points

The blueprint lists a range of points for each type of passage set. The point ranges for the writing task passage sets reflect the current NJSLA-ELA requirements, including the point values for Written Expression and Conventions. Because we propose to start the contract by using ClearSight items for non-writing task passage sets, the points ranges reflect the item types in the ClearSight bank. As we develop custom passage sets for New Jersey, we will collaborate with NJDOE to revise the blueprint on a yearly basis.

Exhibit 4.5.2.1-2: Sample NJSLA-ELA Grades 4–8 Blueprint

NJSLA-ELA 4–8	Number of Tasks	Passage Set Min.	Passage Set Max.	Item Min.	Item Max.	Points Min.	Points Max.
Total Test	**2**	**4**	**6**	**35**	**35**	**100**	**124**
Reading: Literary Text	**1**	**1**	**3**	**10**	**12**	**15**	**24**
Literary Analysis Task	1	0	1	3	5	6	10
Narrative Writing Task		0	1	3	5	6	10
Literary Short Passage Set	—	0	1	3	5	3	10
Literary Long or Paired Passage	—	0	1	4	6	4	12
Reading: Informational Text	**1**	**1**	**3**	**10**	**12**	**15**	**24**
Research Simulation Task	1	1	1	4	6	8	12
Informational Short Passage Set (not on current BP)	—	0	1	3	5	3	10
Informational Long or Paired Passage (not on current BP)	—	0	1	4	6	4	12
Reading: Vocabulary	—	—	—	**8**	**11**	**10**	**22**
Literary Analysis Task	—	—	—	1	2	2	4
Narrative Writing Task	—	—	—	0	1	0	2
Literary Short Passage Set	—	—	—	1	2	1	4
Literary Long or Paired Passage	—	—	—	2	3	2	6
Research Simulation Task	—	—	—	2	3	4	6
Informational Short Passage Set (not on current NJ BP)	—	—	—	1	2	2	4
Informational Long or Paired Passage (not on current NJ BP)	—	—	—	2	3	2	6
Writing: Written Expression	**2**	—	—	**2**	**2**	**48**	**48**
Literary Analysis Task	1	—	—	0	1	0	24
Narrative Writing Task		—	—	0	1	0	24
Research Simulation Task	1	—	—	1	1	24	24
Writing: Knowledge of Language and Conventions	**2**	—	—	—	—	**6**	**6**
Literary Analysis Task	1	—	—	0	1	0	6
Narrative Writing Task		—	—	0	1	0	6
Research Simulation Task	1	—	—	1	1	6	6

Other Blueprint Elements

The ELA blueprint can also be set up to emphasize higher levels of cognitive engagement. Exhibit 4.5.2.1-3 proposes DOK constraints that ensure that students are tested on higher levels of cognitive engagement.

Exhibit 4.5.2.1-3: Proposed DOK Blueprint Constraints

DOK Ranges	Min.	Max.
DOK 1	6	10
DOK 2	10	13
DOK 3 and DOK 4	14	17
(Written responses are often categorized as DOK 4.)		

Other elements can be included in the blueprint constraints, such as the total number of score points, ranges of item types, and other constraints that are not related to the standards. CAI refers to these blueprint constraints as *affinity groups* and cautions against adding too many constraints (e.g., item types) to the blueprint. Doing so reduces the adaptive nature of the assessment.

Timing Considerations

CAI will ensure that the final ELA blueprint aligns with the RFQ requirement that the total testing time for the ELA operational assessment shall not exceed four hours, inclusive of all field-test content. CAI is well prepared to collaborate with NJDOE to adjust testing time requirements for each ELA test. Although we do not recommend adding item type as a blueprint constraint, as stated previously, we recognize that item types factor into testing time. In our work with our ClearSight partner states, CAI utilizes the historical timing data collected across grades and subject areas and for a variety of item types used in our ClearSight item bank and across our other partner states. In general, across all grades, students spent more time on machine-scored constructed-response items than on selected-response items. Exhibit 4.5.2.1-4 denotes the average testing time per item type for mathematics and ELA. In recommending test lengths for ELA tests, we take into account the different item types typically used in ELA and utilize item pool and simulation information to determine which item types students are likely to access on a given test.

Exhibit 4.5.2.1-4: Average Testing Time per Item Type

	Item Type	Mathematics Average Testing Time per Item Type	ELA Average Testing Time per Item Type
Selected-Response	Multiple-Choice (MC)	1.3 minutes	1.9 minutes
	Multiple-Select (MS)	1.5 minutes	1.9 minutes
	Evidence-Based Selected-Response (EBSR)	N/A	1.9 minutes
	Table-Match (MI)	1.7 minutes	2.8 minutes
	Editing Task (ETC)	N/A	1.1 minutes
	Hot-Text (HT)	1.5 minutes	1.9 minutes
Machine-Scored Constructed-Response	Equation-Response (EQ)	2 minutes	N/A
	Graphic-Response (GI)	2.2 minutes	N/A
	Table Input (TI)	2.8 minutes	N/A

We find that most of our partner states provide untimed options, but we offer guidance around average testing times per assessment to allow for scheduling purposes and/or provide a limit on how much time a student may take during each assessment. In all states, testing time is well under four hours.

4.5.2.1.3.4. NJSLA-ELA–Other Test Design Requirements

ClearSight Passage Development

The stimulus pool in the ClearSight item bank is balanced across literary and informational text types and across all genres necessary to assess CCR-derived standards. Because the ClearSight stimuli and items are used across several states with differing blueprints, CAI has developed the item bank to have a robust number of stimuli at each grade with a roughly equal balance of literary and informational text. Section 4.5.2.1.5.2 shows the number of stimuli at each grade of our ClearSight item bank. Upon award of contract, CAI will work with NJDOE to develop additional reading passage sets, including those with writing tasks, for New Jersey. Our passage development process is described in the following sections.

Passage Selection Criteria and Process

Full-time CAI staff complete most of the work involved in procuring stimuli. Even the most junior member of our staff must have a four-year college degree in their content area or a closely related field.

When stimuli work exceeds our in-house capacity, CAI will occasionally hire outside vendors. CAI hires only organizations that specialize in content-specific stimulus searching and writing. We require a Proof of Concept (POC) batch of stimuli in order to gauge vendors' quality and ability to follow passage specifications. For each new project, vendors receive project-specific training in the specifications and guidelines and are held to the same high standards that we apply to stimulus writing done in house.

Passage Selection Training

CAI's training materials for stimulus writers are comprehensive, covering the academic standards that each stimulus should support, general fairness and sensitivity guidelines, guidance regarding the use and capabilities of the online content authoring tools, and any additional subject- or project-specific considerations.

Bias/sensitivity and language accessibility are fundamental aspects of stimuli and item writing. CAI provides detailed guidelines that give concrete explanations and annotated examples of accessible, bias-free item writing, including the following recommendations:

- Avoid stereotyping
- Avoid sensitive or controversial topics
- Avoid giving advice
- Reflect population diversity while avoiding ethnocentrism
- Avoid contexts that are differentially familiar
- Ensure that all stimuli are written with language accessibility in mind

Exhibit 4.5.2.1-5 lists the topics addressed in the language accessibility, bias, and sensitivity guidelines that are used by CAI writers and can be tailored to New Jersey stimulus- and item-writing workshops.

Exhibit 4.5.2.1-5: CAI's Language Accessibility, Bias, and Sensitivity Guidelines

1. Stereotyping
2. Sensitive or Controversial Material
3. Advice
4. Dangerous Activities
5. Population Diversity
6. Differential Familiarity/Elitism
7. Language Use
8. Linguistic Features/Language Accessibility
9. Illustrations and Graphics

In addition, CAI content staff work closely with CAI's Diversity, Equity, and Inclusion (DEI) council on bias and sensitivity guidelines and on improving our process for finding passages that are representative of diverse cultures.

Passage Selection Criteria

To ensure that all passages align to the correct grade level and provide sufficient complexity for close analytical reading, CAI has developed detailed passage specifications. Stimulus writers use passage specifications, passage maps, and passage complexity worksheets to ensure that the following two goals are met:

1. Stimuli have the appropriate Lexiles, word length, and linguistic complexity.
2. The proposed stimulus has been thoroughly reviewed to ensure that it can be used to assess a variety of related standards; in other words, if a stimulus can assess only one or two unrelated standards, it will take up valuable real estate on the test while yielding very little information about what a student knows.

Passage Word Count

All ELA test developers utilize target word counts as a preliminary determination of passage viability. Exhibit 4.5.2.1-6 shows the maximum word count per grade for the ClearSight pool. While the chart lists the maximum number of words for each grade, test developers are encouraged to find texts at a variety of lengths and not simply target the maximum word count. We will collaborate with NJDOE on preferred word count ranges for custom-developed New Jersey passage sets and incorporate these ranges into the custom New Jersey passage specifications.

Exhibit 4.5.2.1-6: ClearSight Word Count Guidelines

ClearSight Passage Word Count Guidelines	
Grade	**Max. Word Count**
3	650
4–5	750
6–8	950
9–11	1,100

Passage Complexity Criteria

Content experts use passage complexity worksheets based on the passage specifications to perform an in-depth analysis of each passage. The passage specifications call for a close examination of both quantitative measures, such as word counts and Flesch-Kincaide and

Lexile readabilities. We understand that NJDOE requires a third quantitative complexity measure and are prepared to add NJDOE's preferred quantitative complexity measure to all ClearSight passages. Complexity worksheets also include qualitative measures, such as levels of purpose, text structure, and language complexity.

Exhibit 4.5.2.1-7 shows a sample section of a passage complexity worksheet. The grade-level details in this worksheet provide a description of the passage characteristics in informational texts that are designed for grade 7. Research supports this complexity rating system, indicating that variations in both general and specific text characteristics impact a reader's ease of comprehension. By incorporating these research findings into the development of the passage specifications, we have developed a more precise and thorough measure of text complexity into the passage development process.

Exhibit 4.5.2.1-7: Passage Complexity Worksheet

Passage Name			
Author			
Copyright Required	Yes/No		
Target Grade Level	Grade 7		
Difficulty Factor	**Passage Metric Description**	**Grade Level Detail**	**Assigned Value**
Lexile Score	1. 955-1045 2. 1055-1155 3. 1160-1200		
Levels of Meaning	1. Concrete purpose with few inferences necessary 2. Purpose(s) and some main ideas or central concepts may not be explicitly stated. 3. Abstract or obscure levels of purpose; key ideas or central concepts implied	1. The passage has a single, concrete purpose. The purpose is communicated explicitly and few inferences are required. Main ideas, arguments, and claims are stated explicitly and clearly supported by sufficient and relevant evidence. Links between individuals, events, and ideas in the text are well defined and easily perceived.	

Passage Maps

Additionally, CAI test developers use passage maps and worksheets to help them maintain focus on standards to be assessed, determine how well the selected passage will align to the standards and blueprint (and therefore meet the needs of the assessment), identify parts of the passage that will support specific development, and avoid passages with a lot of text to read but little substance.

These specifications and worksheets also provide guidelines for suggested, appropriate genres or other ideas for stimuli. Exhibit 4.5.2.1-8 shows part of a passage map used by ELA passage writers, finders, and reviewers.

Exhibit 4.5.2.1-8: Example ELA Passage Map

Non-Paired Reading Stims	Min Items	Max Items	Does this passage/pair. . .:	Confirmation/Specifics	How many items to this standard will this passage support?	Which part of text will be targeted?	Specific aspects/item ideas
Literary	**12**	**12**					
Key Ideas and Details	**6**	**6**					
RL.7.1	1	1	Support inferences? Allow for an analysis with textual support?				
RL.7.2	2	3	Have a clear theme developed over the course of the text?				
RL.7.3	2	3	Allow for an analysis of how specific elements of the text interact; does the setting help develop the characters or plot, for example?				
Craft and Structure	**6**	**6**					

CAI's typical process includes a thorough passage review by the state and external committees before any item development begins.

Item Types

CAI's ClearSight item bank comprises various item types, and CAI will work with NJDOE to maximize usage of our industry-leading suite of interaction types. Item types included in the ClearSight ELA bank are described in Exhibit 4.5.2.1-9. CAI's test developers will continue using our Item Authoring Tool (IAT) to create a wide variety of item types, including machine-scored items that challenge students to construct something tangible to demonstrate understanding. We will work with NJDOE to ensure the items developed as part of this contract take full advantage of the item types we have available.

Exhibit 4.5.2.1-9: ELA Interaction Types

Interaction Types	Description
Choice Interaction: Multiple-Choice	The student selects from traditional multiple-choice options using radio buttons (machine-scored).
Choice Interaction: Multi-Select	This is a traditional multi-select option (checkboxes) with flexibility on the minimum and maximum number of selections (machine-scored).
Custom Interaction: Edit Task	The student clicks a word and replaces it with another word that he or she types to revise a sentence (machine-scored).
Custom Interaction: Graphic Response	This is a flexible platform used to create a wide variety of items, from drag-and-drop to drawing on a coordinate plane to hot-spots. (machine-scored).
Text Entry Interaction	This is a short-answer text response that is configurable using a rich text editor (handscored or possibly machine-scored using AI).

Interaction Types	Description
Gap Match Interaction	The student drags prepared text responses into target boxes to respond (machine-scored).
Graphic Gap Match Interaction	The student drags prepared graphic responses into target boxes to respond (machine-scored).
Hot-Spot Interaction	The student selects clickable options on a graphic to respond (machine-scored).
Hot-Text Interaction	The student clicks a word or sentence to respond (machine-scored).
HTML: Slideshow	This is an audio presentation with static images used as slides (not scored).
HTML: Tutorial	This is an animation that describes how to use that type of interaction (not scored).
In-Line Choice Interaction	The student selects responses from drop-down menus throughout the text (machine-scored).
In-Line Text Entry Interaction	The student types in responses embedded within the text (fill in the blank; machine-scored).
Match Interaction	The student creates a one-to-one relationship between two elements. This item type can be represented graphically or as a table (machine-scored).
Order Interaction	The student reorders a list of elements to create the correct sequence (machine-scored).
Custom In-Line: Edit Interaction	The student enters an editorial correction to replace a word or phrase. This correction can be placed in-line with text or other HTML.
Interaction Group	This feature supports a set of in-line interactions, including in-line and custom in-line interactions.
Custom Interaction: External Copy Interaction	The student selects text or regions from the stimulus and copies them to a response area. This feature replaces hot-text interactions and allows multiple opportunities to ask the student to interact with and select from the same stimulus.

The task demand section in item specifications guides test developers toward matching the most appropriate item type, or mode of student response, with the evidence required to assess the standard. The task models describe the evidence required for items at various DOK levels to assess students' achievement of each standard. For ELA, lower-complexity items may require students to focus on a specific paragraph or a limited number of sentences, while higher-complexity items may require students to draw evidence from a broader range of text or the entire passage. CAI's item writers are trained to use the item type that will best elicit the type of evidence the standard requires from the student. Before beginning any New Jersey-owned passages or writing tasks, CAI will work with NJDOE to create and finalize item specifications that take full advantage of the wide range of interaction types supported by CAI.

Writing Tasks

ClearSight passages sets targeted for writing tasks use similar specifications, documenting word count, quantitative readability ranges, and a qualitative readability analysis. In addition, test developers must document the reasons why the passage set works as a writing prompt stimulus. For example, we want to ensure that a passage set for argumentative writing provides credible evidence for both sides of an issue rather than having a lack of balance that makes it easier for students to argue one position over another. For custom New Jersey development,

including writing task sets, CAI will collaborate with NJDOE to include New Jersey task models into the passage development process.

Rubric

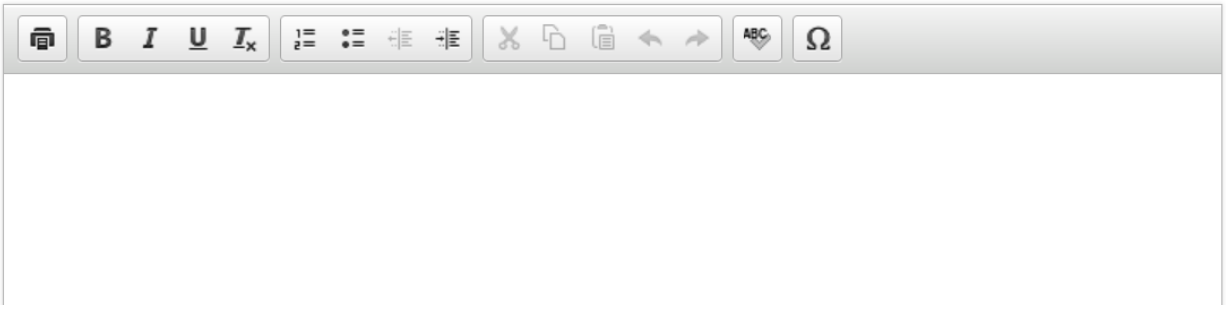
CAI and our partner Measurement Incorporated (MI) have reviewed the current rubrics used for NJSLA and NJGPA and feel confident we can meet the criteria outlined within when developing and scoring new passage sets with writing tasks. Upon award of contract, we will collaborate with NJDOE on potential revisions to the rubrics and scoring criteria.

Writing Word-Processing Tool

CAI's writing tasks typically include the types of word-processing commands found in Microsoft Word, such as the ability to bold, italicize, or underline; make bulleted or numbered lists; and other common commands. Exhibit 4.5.2.1-10 shows a typical answer space for writing task items. The available word-processing commands and available space are customizable, and CAI will work with NJDOE on customized specifications for these items.

Exhibit 4.5.2.1-10: Example Writing Task Answer Space

Your response should be in the form of a multiparagraph essay. Write your response in the space provided.



Writing Scoring in an Adaptive Environment

The first time writing tasks are administered in New Jersey, they will be handscored. These handscored responses will be used to train the AI scoring engine. In future adaptive administrations, the writing will be AI-scored using the processes and procedures outlined in Section 4.8.2.

Depth of Knowledge

As evidenced by the item specifications described in Section 4.5.2.1.3, CAI test developers receive detailed guidance on how to target a range of DOK during item writing. Test developers receive yearly training on DOK, typically as part of annual item development kickoff meetings. CAI's ClearSight bank uses the following DOK definitions:

- DOK 1: Recall knowledge, locate facts
- DOK 2: Comprehension, description, simple inference
- DOK 3: Complex analysis, synthesis, evaluation
- DOK 4: Complex reasoning, planning, developing, and thinking over an extended period of time (the writing task is the only DOK 4 item in the ClearSight pool)

Exhibit 4.5.2.1-11 shows the DOK spread of items in the ClearSight item pool. As evidenced by the report, the item pool has a robust spread of DOK at each grade.

Exhibit 4.5.2.1-11: DOK Spread of Items in ClearSight Pool

Count of ID	Column Labels				
Row Labels	DOK 1	DOK 2	DOK 3	DOK 4	Grand Total
3	109	502	180	26	817
4	114	576	180	26	896
5	105	572	200	26	903
6	97	573	210	27	907
7	79	586	222	25	912
8	83	605	225	24	937
9	61	286	84	14	445
10	75	344	109	12	540
11	43	186	75		304
Grand Total	**766**	**4,230**	**1,485**	**180**	**6,661**

Section 4.5.2.1.5.2 provides detailed information about the ClearSight item pool.

4.5.2.1.3.5. NJSLA-ELA–Approval of Specifications

CAI will provide all specifications listed in this RFQ section for NJDOE SCM review and approval no later than 30 calendar days after contract award. All ClearSight specifications are available for immediate review by NJDOE.

4.5.2.1.4. NJSLA-ELA–Test Development

As described throughout the proposal, CAI has developed the ClearSight item bank using principles and procedures that promote a high-quality product, engaging educators and subject-matter experts (SMEs) from a variety of client states. CAI further details its ClearSight development principles and procedures in the following sections.

4.5.2.1.4.1. NJSLA-ELA–Style Guide

Upon award of contract, CAI will provide NJDOE with the ClearSight style guide used to ensure all content consistently conforms to editorial and formatting requirements. The ClearSight style guide has been reviewed and approved by all client states and used to develop our extensive ClearSight item bank. Because we are planning on significant New Jersey-owned custom development over the life of the contract, it will be important to develop a New Jersey ELA style guide for use during the development of New Jersey-owned content. CAI will collaborate with NJDOE to review and receive SCM approval.

4.5.2.1.4.2. NJSLA-ELA–Test Development Principles and Processes

CAI will ensure item alignment to the assessment specifications and item specifications. Item alignment is determined through expert judgment by CAI test developers, NJDOE content specialists, and New Jersey content committee members. We propose a process that reflects best practices for ensuring alignment.

ClearSight Test Development Principles and Processes

Professional Test Developers

CAI completes most item writing work using full-time CAI staff. Even the most junior staff members must have a four-year college degree in their content area or in a closely related field. Staff at various levels conduct the interview process using a series of set questions that are designed to gauge critical thinking ability, content-area knowledge, experience and qualifications, etc. Newly hired writers and reviewers receive onboarding and training in evidence-centered design, bias and sensitivity guidelines, and universal design. CAI test developers also receive training in CAI's IAT, allowing them to utilize our suite of item types.

External Vendors

CAI may recruit external item-writing vendors to aid in the item development process when demand exceeds in-house capacity. CAI works with several organizations that have a strong history of providing high-quality items. When CAI considers hiring a new vendor, we require a POC batch of items in order to gauge item quality and the contractors' ability to follow item specifications. For each new project, vendor organizations receive project-specific training in the test specifications and writing guidelines, and their work is held to the same high standards that we apply to in-house item writing.

Item Writer Training

Item writers receive in-depth training as part of their onboarding, plus initial vendor trainings and refresher courses. In these courses, writers and reviewers are trained on such essential elements as the proper use, inputting, and scoring of CAI's interaction types; strategies for assessing the breadth of the content standards; how to clearly avoid "tricky" items; how to write assessment items with varying levels of complexity; and how to most accurately measure the construct (as noted in the item specifications) by purposeful selection of item types. The goal is to ensure that

- items are correct, realistic, and appropriate for the grade level being assessed;
- language is clear and direct and uses active voice; and
- items correctly align to state content standards.

Annual project kickoff meetings will also be held to review project-specific guidelines, including passage and item specifications, fairness and bias guidelines, and client criteria.

Universal Design

CAI adheres to the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014) in two significant ways: (1) to develop items and tests that measure the intended construct while minimizing construct-irrelevant barriers that may impact test performance, and (2) to develop and provide appropriate accommodations to remove construct-irrelevant barriers where they exist. The principles of universal design provide guidelines for test design to minimize the impact of construct-irrelevant factors in assessing student achievement. Universal design removes barriers to access for the widest range of students possible. According to Johnstone, Altman, and Thurlow (2006), "By making general education assessments accessible, we are more able to determine what students know and are able to do. Considerations for universally designed tests include

- intended constructs measured;
- respect for the diversity of the assessment population;
- concise and readable text;
- clear format for test;

- clear visuals; and
- changes allowed to format without changing meaning or difficulty."

CAI's test development specialists receive extensive training on the principles of universal design and apply these principles in the development of all test materials, including items and accompanying stimuli. In the review process, adherence to the principles of universal design is verified. Each item begins with considerations about accessibility, and our item writers receive training in language accessibility, bias, and sensitivity, as well as accessible item design. CAI provides item writers with a robust list of interactions from which to choose, each of which has its own accessibility considerations. Our item developers use the most accessible technology and response mechanisms for the specific skills or knowledge being measured. Our field-testing process ensures that the items that make it into the operational test provide valid, reliable, and fair measurement.

We pride ourselves on the accessibility of our systems. We offer the industry's largest operational selection of accommodations and embedded accessibility supports. For online accessibility, our tools help our item writers to ensure that each item will be accessible and optimally compatible with assistive technologies. Items authored in our IAT are accessible from the start with integrated Accessible Rich Internet Application (ARIA) tags. They conform to the recommendations in the Web Content Accessibility Guidelines (WCAG) for how to structure hypertext markup language (HTML) elements for use with assistive technologies (e.g., screen readers). Our IAT also includes an easy-to-use graphical user interface (UI) to author complex rubrics for items with minimal effort. This UI provides built-in tools to unit test the rubric by subjecting it to a variety of inputs. Validation checks are integrated into each step to guide the item authoring process.

In summary, CAI addresses accessibility from the very beginning of item development, rather than as something to be considered at the very end.

Language Accessibility and Bias

Training will vary for writers of ELA/social studies items and writers of mathematics/science items. In all subject areas, however, Language Accessibility, Bias, and Sensitivity (LABS) training is a fundamental aspect of stimulus and item writing. Detailed guidelines give concrete explanations and annotated examples of accessible, bias-free items, and they include the following recommendations:

- Avoid stereotyping.
- Avoid sensitive or controversial material.
- Avoid giving advice.
- Avoid mention of dangerous activities.
- Make sure that items reflect the diversity of the testing population.
- Avoid topics that are differentially familiar or display elitism.
- Ensure that language use is inclusive.
- Follow guidelines for Linguistic Features/Language Accessibility for remedial readers and English learner (EL) students.
- Use only illustrations and graphics that meet the following criteria:
  - Eliminate visual bias by avoiding unnecessarily complicated graphics.
  - Focus on graphics that can be easily explained using text-to-speech (TTS) without violating the construct.
  - Images should conform to project-specific training objectives.

Item Review Process

Throughout the item development process, CAI item writers and item reviewers ensure that the item specifications are followed. At each stage of the review process, CAI test developers check items to ensure that they are aligned to the standards, are clearly and succinctly worded, are grade-appropriate, contain appropriate graphics, have accurate and fact-checked content, are free of bias and sensitivity issues, follow the style guide, and follow the principles of universal design.

Further, CAI is committed to ensuring this thorough process by which all items will be reviewed for alignment by external reviewers, including NJDOE and New Jersey educators, as well as educators and state-level content specialists across the ClearSight states. These reviewers will also use the available item specifications as the basis for reviewing items in conjunction with an item review checklist that strongly focuses on alignment to the current standards.

Items pass through a series of rigorous reviews in which they are evaluated using specific assessment criteria. Junior staff, senior reviewers, and state office assessment and content personnel are involved at various levels throughout the process. The following are the four possible outcomes for each of these reviews:

1. Accept as Appears
2. Accept as Revised
3. Revise and Resubmit (on the basis of feedback)
4. Reject

While specific checks are applied to each review, basic item criteria are evaluated at each level. Exhibit 4.5.2.1-12 provides an example of one of these review checklists.

Exhibit 4.5.2.1-12: Example Review Checklist

Stim ID:		Item IDs:
Pass 1--Content		
Does the item fully align? (No drive by alignment!)		
Does the item reflect accurate content? (Is it really mood? Or is it tone? Is that a theme? Etc.)		
Is there a clear correct response?		
Are any distractors defensible?		
Are distractors plausible, attractive, but clearly incorrect?		
Is assigned DOK correct?		
Does the item require background knowledge?		
Is item free from bias or sensitivity concerns?		
If item requires use of context to determine meaning of word, is there sufficient context?		
Is this an item worth asking/begging to be asked?		
Pass 2--Technical Quality		
Is the item grade appropriate in language and context?		
Is the linguistic complexity appropriate?		
Is the reading load appropriate?		
Are there any outliers?		
Is there clueing/clanging within item (between stem and answer choices)?		
Is there clueing/clanging within set?		
Are rubrics accurate and complete?		
TE Items: appropriate use of technology?		
Pass 3--Style/Editorial/ITS		
Does style meet project specifications?		
Emphasis words emphasized correctly?		
Straight quotes used correctly?		
All parts of item free from grammatical/mechanical errors?		
Item checked for spelling?		
Has HT scoring been added?		
Is scoring functional?		
Does the item need a "max select"?		
Are attributes complete and accurate?		
Correct standards selected?		
Is correct tutorial selected?		
Are rationales aligned to correct option? Are they complete, sensical, and accurate?		
Pass 4--Passage Set Considerations		
Does the set meet the IDP?		
Does the set meet the DOK distribution requirement?		
Does the set meet the paired passage shared item threshold?		
Does the set meet the item type distribution requirement?		

Alignment with New Jersey Student Learning Standards

CAI has reviewed the NJSLS and found that our ClearSight item banks for mathematics and ELA, which are aligned to CCR standards, show a high level of alignment to these standards. All ClearSight item development processes closely followed our own internal item specifications (as previously described) to ensure a high degree of alignment to these standards. Further, as evidenced in Section 4.2, several independent alignment studies have demonstrated the alignment of the ClearSight item banks to these common standards.

CAI will provide evidence of alignment between the assessments and NJSLS, including balance of content and cognitive complexity, in three primary ways.

First, CAI will provide an item bank analysis for NJDOE review, as part of the Test Content Development Plan described in Section 4.5.2.1.5.2. Second, as described in Section 4.2, independent alignment studies of the ClearSight item banks note a high degree of match to the ICCR standards. Third, CAI will plan and facilitate an alignment confirmation committee meeting of experts as part of the initial Field-Test Item Review meetings described in Section 4.9.3. These experts will include CAI staff, NJDOE staff, and New Jersey educators. At the conclusion of this meeting, CAI will provide a final document of item alignment by standard, including committee notes. NJDOE will review and approve the final report from this meeting. CAI confirms we will plan this meeting according to the meeting criteria listed in Section 4.9 of the RFQ. CAI will document all of the procedures followed during the alignment process in a manner suitable for peer review.

CAI's experience in the alignment of item banks across mathematics, ELA, and science includes Florida's transition to the Benchmark for Excellent Student Thinking (B.E.S.T.) assessment system, and similar efforts in Indiana, Utah, West Virginia, and Wyoming.

Client Feedback

CAI recognizes the importance of having NJDOE staff propose edits to and provide final approval for all items used on New Jersey assessments. Immediately upon award of the contract, CAI will collaborate with NJDOE on crafting a plan to review items currently included in the internal ClearSight item banks in order to accept each item for inclusion in the NJSLA-ELA or reject it. For all new item development, NJDOE staff members will have the following three main opportunities to be involved in the item review process:

- Before the annual Field-Test Item Review meeting described in Section 4.9, NJDOE will review shared items from CAI's internal ICCR item banks to vet them for the upcoming meeting. Custom-developed items will be sent to NJDOE in batches through a schedule agreed upon by NJDOE and CAI. NJDOE staff will provide feedback and revised items will be sent back to NJDOE per the item review schedule.
- CAI and NJDOE staff will resolve New Jersey committee feedback following the annual item review meeting. Section 4.9 fully describes the steps involved in this process.
- After the item review meetings for all ClearSight member states are completed and CAI has edited the items based on the collective feedback, NJDOE staff may review the items for acceptance into the New Jersey item bank.

Should NJDOE staff members feel that additional levels of review are needed for New Jersey-owned assessment items, CAI can work with NJDOE to incorporate them as a cost option.

4.5.2.1.4.3. NJSLA-ELA–Educator and Subject Matter Expert Review

CAI recognizes the importance of state educator feedback for all items and passages used on New Jersey assessments. All ClearSight items have been reviewed by multiple state SMEs for content, bias, and sensitivity; scoring (rubric validation); and data flags. Custom New Jersey

development will follow a similar process. As described in Section 4.9, we will make the ClearSight item bank available for review by New Jersey educators. If edits are requested to the test content, CAI will resubmit the edited items for approval by the SCM before the item is eligible for operational use or field testing.

4.5.2.1.5. NJSLA-ELA–Source and Quantity of Test Content

CAI is committed to developing enough custom New Jersey items over the life of the contract for a New Jersey adaptive item pool. All items developed for New Jersey will be owned by the State. As we move toward a New Jersey-specific item bank, CAI is also committed to annual field-testing of the ClearSight item bank. Each year, CAI conducts an item bank analysis and creates a field-test plan based on both that analysis and available field-test slots in participating ClearSight states. For example, Section 4.5.2.1.5.2 shows the number of ClearSight items field-tested in spring 2024. CAI will collaborate with NJDOE and other client states on a bank analysis and create an annual item development plan (IDP) based on the bank analysis.

4.5.2.1.5.1. NJSLA-ELA–Source of Test Content

New Jersey will own all content custom-developed for the contract, including passage sets chosen for item release. As described throughout the RFQ, CAI develops all ClearSight content. Basic licensing for the use of the ClearSight item bank is part of the contract. CAI works with client states on the coordinated release of items; no state may release operational items unless that release is approved by all states. CAI then coordinates with all states to ensure that any released items are removed from the operational item bank. CAI's item development plan described in this section ensures that the State will own enough items for a linking set of content that meets blueprint requirements.

4.5.2.1.5.2. NJSLA-ELA–Quantity of Test Content

Quantity of the ELA ClearSight Bank

CAI's ClearSight item bank will provide New Jersey with a rich selection of high-quality test items that rigorously assess student achievement of the NJSLS-ELA. The ClearSight item bank is extensive and designed to support adaptive test administrations in ELA and mathematics that provide measurement precision across the full range of student ability. The large size of the ClearSight item bank allows participating ClearSight states to implement educator and community review procedures to ensure that all items deployed for statewide assessments are aligned to state academic standards and meet community standards for appropriate content. The ClearSight item pools have been explicitly constructed to support statewide assessment programs. The ClearSight item bank supports adaptive test administrations for multiple states, including New Hampshire, North Dakota, West Virginia, and Wyoming. The ClearSight item bank has also been used to seed item banks for state assessments in Arizona, Florida, and Ohio, and it is further used to augment the Indiana and Utah item banks.

Exhibit 4.5.2.1-13 shows the current summative operational item pool counts by grade for ELA. The table shows the total number of operational ClearSight items for each of the main ClearSight reporting categories. Please note that the low writing totals reflect the fact that we moved some older writing prompts to our ClearSight interim item bank and field-tested a large number of writing items in spring 2024, as shown in Exhibit 4.5.2.1-13, showing the spring 2024 field-test item counts. The spring 2024 writing items will be available for operational use in spring 2025.

Exhibit 4.5.2.1-13: ClearSight Operational Item Pool Counts for ELA by Reporting Category

Grade	Reading Informational Text	Reading Literature	Language	Writing*	Locked Operational Pool Total
3	244	250	97	3	598
4	279	249	129	3	665
5	271	252	129	3	663
6	297	258	114	4	684
7	299	244	127	3	683
8	284	289	126	3	707
9	165	135	80	5	392
10	163	154	106	3	429
11	127	62	71	3	264
	2,129	**1,893**	**979**	**27**	**5,085**

***CAI moved older writing prompts to the ClearSight interim item bank and field-tested a large number of writing prompts in spring 2024. They will be available for operational use in spring 2025.**

Annual Field Testing

Annual field testing will prioritize passages and items custom-developed for New Jersey. Each year, CAI will develop a field-test plan for each grade that outlines the quantity of custom and ClearSight content to be field-tested at each grade.

Custom New Jersey Development

New Jersey's path to a state-owned custom bank of ELA items will begin upon award of contract, as CAI proposes immediate development of passage sets to support each of the writing tasks. Exhibit 4.5.2.1-14 shows CAI's proposed task development plan. Our proposed development results in enough of each task type to support an adaptive blueprint. We used the following assumptions in proposing this task development:

- The RFQ requirements describe the existing writing task types—LAT, NT, RST—and requires that each task be part of a passage set.
- Current NJSLA-ELA and NJGPA-ELA blueprints suggest that each operational test includes two tasks:
  - All students receive the research simulation task.
  - Students in grades 3–8 receive either the literary analysis or the narrative as the second task.
  - All students in grade 9 receive the narrative as the second task.
  - All students in NJGPA grade 10 receive the literary analysis as the second task.
- Current NJSLA-ELA and NJGPA-ELA blueprint requirements include the number of EBSR and TECR items per task and per grade.
- For tasks undertaken by all students, we propose field-testing eight times the number of required tasks per grade. (For example, grade 4 would field-test eight research simulation tasks.)
- For tasks taken by half of the students, we propose developing four times the number of required tasks per grade. (For example, grade 4 would field-test four literary analysis and four narrative tasks.) Added together, this development would result in a task pool with eight times the number of required tasks.

- Proposed development totals include roughly 30% overage for EBSR and TECR items.
- To meet item release requirements, we propose developing one additional passage set per grade. This additional passage set would not contain a writing task and would require no handscoring.
- Most proposed development (that includes all handscored tasks) will be included in the fall 2025 stand-alone field test. The other portion of proposed development will be embedded in the spring 2026 operational field test.

Exhibit 4.5.2.1-14: Proposed Task Development Plan

NJSLA/ NJGPA Dev		Total Passages	Total EBSR	Total TECR	Total PCR (handscored)
Literary Analysis 3–8	FT x4	48	144	72	24
Narrative 3–8	FT x4	24	96	72	24
Research Simulation 3–9 and Narrative Grade 9	FT x 8	168	416	240	64
Literary Analysis Grade 10	FT x8	16	48	24	8
Research Simulation Grade 10	FT x8	24	56	32	8
One Passage per Grade for Release		8	48	24	0
	Total FT	**288**	**808**	**464**	**128**

Field-testing all writing tasks at the beginning of the contract allows for automated scoring models to be created at the beginning of the contract to reduce handscoring costs in subsequent years. Starting in school year 2026–2027, CAI proposes developing five passage sets per year for a total of 50 items per grade per year. As we develop these passage sets, we will begin to minimize the use of ClearSight passage sets as New Jersey shifts toward a completely custom assessment. CAI will work with NJDOE to finalize item development targets upon award of contract.

ClearSight Development

CAI is committed to sustaining a robust item pool and plans to continue to develop and field-test items each year. As part of simulation work performed each year to configure the adaptive algorithm, psychometricians can evaluate the performance of the item pool with respect to the target test blueprint. For example, item overexposure may indicate standards for which the pool is sparse and should be the target for item development. Conversely, items that are rarely selected indicate standards where item development is not a priority. Evaluation of measurement precision across the ability distribution, as well as distribution of item difficulty, indicates target difficulty levels for new item development. Each year, CAI's psychometricians and test developers will review the item pool, including shared items and field-test items, to determine where development is most advantageous.

Exhibit 4.5.2.1-15 shows the number of items developed for the fall 2025 stand-alone field test (and/or the spring 2026 embedded field test). The field-test items were the result of the content and psychometric analysis described previously. Numbers may slightly change based on simulations. Please note that the high number of writing prompts being field-tested is not an annual occurrence. The item pool is always growing, and CAI intends to periodically remove items from the operational summative pool. These items are then released or used in interim assessments.

Exhibit 4.5.2.1-15: ClearSight Field-Test Counts by Reporting Category for Fall 2025

Row Labels	Reading Informational Text	Reading Literature	Language	Writing	Total Locked Operational Pool
3	83	88	25	23	219
4	83	100	25	23	231
5	93	95	29	23	240
6	85	89	26	23	223
7	94	88	25	22	229
8	82	99	27	22	230
9	19		25	9	53
10	51	32	19	9	111
11	23	11	6	9	40
Grand Total	**613**	**602**	**207**	**154**	**1,576**

Within 30 calendar days after the award of the contract, CAI will deliver an item bank analysis and Test Content Development Plan that describes the development process.

4.5.2.2. Structure of NJSLA Mathematics

4.5.2.2.1. NJSLA-M Assessment Standards and Grades/Courses Assessed

CAI will provide mathematics assessments for each of the grades 3–8 NJSLA-M assessments and for the end-of-course (EOC) assessments in Algebra I, Geometry, and Algebra II, as outlined in the following sections. The following sections describe how the tests will assess student proficiency across the breadth and depth of the NJSLS-M, allowing educators to monitor student growth to ensure that students are meeting expectations to be college and career ready. We describe how our seeding approach for the NJSLA-M with CAI's ClearSight mathematics selected-response and technology-enhanced items (TEI), along with immediate development of New Jersey-specific multi-part items and multi-point constructed-response items, meet the RFQ requirements for the NJSLA-M by measuring students' content knowledge of the grade-level standards by assessing both the Mathematics Standards of Content and Mathematics Standards of Practice contained in the NJSLS-M.

4.5.2.2.1.1. Background Documents

As described in Section 4.5.2.1.1 for ELA, CAI will work with NJDOE to provide all necessary documentation for its peer-review submissions. CAI has extensive experience working with partner states in meeting the federal requirements for peer review. Two of our ClearSight partner states, North Dakota and West Virginia, substantially met the federal requirements for peer review. The results of peer review demonstrate CAI's proven experience in test design and development, offering valid and reliable assessments with full reporting designed to offer educators the necessary data for improving instruction. Another partner state, New Hampshire, is currently submitting additional information regarding their blueprints to complete the peer review process. Further, we note that Utah, which uses both Utah-owned and ClearSight items, substantially met peer-review requirements for the grades 3–8 ELA and mathematics in 2018. Section 4.12 further details CAI's process and experience assisting state clients in meeting peer-review requirements.

4.5.2.2.2. NJSLA-M—Computer-Adaptive Assessments

As described in Section 4.5.2.1.2, CAI pioneered and continues to lead the field in standards-based item-adaptive assessments. Our item-adaptive algorithm enables us to deliver tests meeting complex blueprints (including passage-based tests), while optimizing measurement for each student. CAI has successfully delivered computer-adaptive tests (CATs), including summative and interim, in many states since 2006.

CAI currently delivers online testing in 27 states and jurisdictions. For 23 of these clients, we deliver customized adaptive tests, including tests in ELA and mathematics. We currently deliver statewide assessments in several large states, including California, where we test more than 99.99% of California's 3.2 million grade-eligible students online with adaptive tests.

CAI is the only organization to have successfully delivered statewide adaptive assessments at scale for more than 10 years in ELA, mathematics, and science. CAI has supported more than a half-dozen states as they transitioned almost instantly from a paper-pencil testing system to a virtually all-online assessment, including rural states (e.g., New Hampshire, Vermont), isolated states (e.g., Hawaii), and large states (e.g., California, Florida).

CAI has the most mature, well-tested, and scalable online test delivery platform in the industry. We delivered the first statewide, online adaptive test in the country to receive a Substantially Meets status under the 2005 United States Department of Education (USDE) Peer Review.

CAI has the most accessible system available. We provide online testing for virtually all students in California, Connecticut, Delaware, Florida, Hawaii, Idaho, Indiana, Montana, New Hampshire, North Dakota, Ohio, Oregon, South Dakota, Utah, Vermont, Washington, and West Virginia. This includes not only ELA and mathematics, but often science and social studies assessments as well.

CAI's item-adaptive algorithm takes three sources of information as input: (1) an item pool, (2) a test blueprint, and (3) the student's performance on items up to the current point. The adaptive algorithm is then configured to execute maximally adaptive test administrations under the constraint of blueprint match. Configuration of the adaptive algorithm is critical because the composition of the item pool—which changes from test administration to test administration—interacts with the blueprint to influence the performance of the adaptive algorithm.

Our adaptive engine supports (and we advise all our clients to use) blueprints that meet the following four conditions, which have been advocated by the Consortium for Citizens with Disabilities, an umbrella group encompassing most national advocacy groups for students with disabilities and other exceptional students:

1. Every student is tested on the full range of grade-level content with no discernible differences in the content assessed.
2. Every student is tested on items measuring the same mix of cognitively complex skills with no discernible difference, regardless of student proficiency.
3. Every student is tested on items reflecting the full range of other aspects of the grade-level curriculum as may be appropriate for the grade and subject.
4. Students are tested on items that provide the best measurement possible within these constraints.

These four principles serve the objective of ensuring that every student can accurately demonstrate his or her academic skills and knowledge across the entire grade-level curriculum. CAI's adaptive algorithm supports blueprints that meet these goals, and we propose to work with NJDOE to ensure that blueprint implementation adheres to these goals for New Jersey. Section 4.12.2 provides detailed information about CAI's adaptive algorithm and processes and procedures around adaptive test construction.

4.5.2.2.3. NJSLA-M—Test Design

CAI will propose reporting categories, assessment content, test blueprints, and other specifications for the NJSLA-M. As described in the NJSLA-ELA section of this proposal, CAI has collaborated with partner states to develop item specifications and customized blueprints using our ClearSight item pool. Upon award of contract, CAI is prepared to share all ClearSight specifications with NJDOE, including test blueprints, item specifications, and other test design documents. CAI will collaborate with NJDOE on finalizing approval for all test design documents.

Alignment

CAI has reviewed the NJSLS-M. Our ClearSight item banks for mathematics, which are aligned to the rigorous college- and career-readiness (CCR) standards that are common to many states, show a high level of alignment to the NJSLS-M standards. Further, as described in Section 4.5.2, several independent alignment studies have demonstrated the alignment of the ClearSight item banks to these common standards. Further, upon award of the contract, we will also begin New Jersey-specific development to meet the needs of the NJSLA-M.

Item Specifications

The ClearSight item banks for ELA and mathematics were developed according to item specifications that strategically guided item development. In our experience, some item types are better than others for measuring some content, but any appropriate item type can usually span the Achievement-Level Descriptors (ALDs) and Depth of Knowledge (DOK) levels for the content standards. In the following sections, we describe our approach to item specification development and how we will ensure that the specifications are aligned to the New Jersey Student Learning Standards (NJSLS).

Upon award of the new contract, CAI will provide NJDOE with all existing item specifications for each of the ClearSight item pools. For custom development, CAI will work with NJDOE to draft these specifications. We will ensure that the schedule allows NJDOE to review and approve all specifications prior to new item development.

Finally, CAI considers assessment specifications to include a broad grouping of documentation related to the assessment program. For example, the mathematics blueprints, which are described in Section 4.5.2.1.3.3, are an important component of the assessment specifications. Further, a style guide is critical for the item development process. CAI will work with NJDOE to draft and publish assessment specifications that include these documents and any others required by NJDOE.

Item Specification Development and Examples

All CAI item writing begins with detailed specifications developed using the principles of evidence-centered design. The item specification document details the item types appropriate for assessment of each standard at each level of cognitive complexity. This document specifies the content boundaries for the standard and provides sample task demands (or models) for item writers to ensure that the item appropriately measures the intended standard. Additionally, the item specifications document will include assisting NJDOE with identifying appropriate item types to measure the cognitive processes and complexity of the standards during the blueprint development process. CAI will document the development process to ensure that the item specifications meet peer review requirements.

CAI also works with many of our partner states, including Florida, Indiana, Ohio, and Utah, to implement item specifications consistent with ClearSight to guide development within their states.

Mathematics Item Specifications

Item specifications for mathematics typically include the following:

- **Content Limits.** This section delineates the specific content measured by the standard and the extent to which the content is different across grade levels. For example, in grade 3, fraction denominators are limited to 2, 3, 4, 6, and 8.
- **Acceptable Response Mechanisms.** This section identifies the various ways in which students may respond to a prompt, such as multiple choice, graphic response, proposition response, equation response, or multi-select.
- **DOK.** The task demands of each standard can be classified as DOK 1, DOK 2, or DOK 3.
- **Task Demands.** In this section, the standards are broken down into specific task demands aligned to each standard. In addition, each task demand is assigned an appropriate response mechanism, DOK, and practice item clusters that are specifically relevant to that particular task demand.
- **Relationship to Range ALDs.** In this section, each task demand is further discussed in light of the Range ALDs. Each task demand corresponds to part of a particular standard, and the discussion of the Range ALDs demonstrates how that task demand relates to a student's level of proficiency with respect to the particular standard. For example, students who can only compare fractions with the use of models demonstrate a "Below" or "Approaching Proficient" achievement level. Conversely, students who can successfully perform higher-level task demands tend to operate at a higher level (e.g., "Proficient," "Highly Proficient").
- **Examples and Sample Items.** In this section, sample items are delineated along with their corresponding expected level of difficulty (easy, medium, or hard.) Notes for modifying the difficulty of each task demand are detailed with suggestions for the item writer. The suggestions for adapting the difficulty based on the task demands are research-based and have been reviewed by both content experts and a cognitive psychologist.

The sample mathematics item specifications in Exhibit 4.5.2.2-1, designed by CAI content experts, strategically guide the item development process and indicate the evidence that a student would provide to fulfill each ALD.

Each ClearSight item specification is targeted toward the particular standard it addresses by tailoring the task demands to that standard, including the level of inference, the types of textual evidence required by an item, and the mode of student response (response mechanism) most suited to capturing the required evidence. CAI creates detailed item specifications for all standards assessed on the blueprint.

Exhibit 4.5.2.2-1: Sample Mathematics Specifications for Grade 4

Content Standard	**Grade 4—Number Sense and Operations—Fractions** **M.4.NF.A.2: Compare fractions with different numerators and different denominators while recognizing that comparisons are valid only when the fractions refer to the same whole. Justify the conclusions by using visual fraction models (e.g., tape diagrams, number lines) and by reasoning about the size of the fractions, using benchmark fractions (including whole numbers) or creating common denominators or numerators. Describe the result of the comparison using words and symbols (>, =, and <).**
Content Limits	• Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100. • Benchmarks are limited to 0, ¼, ½, ¾, 1. • Fractions *a*/*b* can be improper fractions and students should not be guided to put fractions in lowest terms or to simplify. • Two fractions being compared can have both a different numerator and a different denominator (both are not required).
Calculator	None
Acceptable Response Mechanisms (Item Types)	• Equation Response • Graphic Response—Drag-and-drop (DND), hot-spot (HS), drawing • Multiple-Choice Response • Multi-Select Response • Matching Response • Editing Task Inline Response • Hot-Text Draggable Response
Universal Design, Graphics, and Special Populations	• Care should be taken when selecting number lines and denominators. For example, the more hash marks included on a number line, the more difficult it can be for a student with visual impairments to distinguish between points on the number line. • Graphic response items can be included in online braille tests (via the embosser), but they do require proctor intervention. Care should be taken when developing graphic response items to ensure that there is a balance of item types in the pool.
Depth of Knowledge (DOK)	2, 3
Model Task	
Context	Allowable. Most items at this standard should not have real-world contexts. Any situation that compares two fractions with different numerators and denominators by creating common denominators or numerators or by comparing to benchmark fractions.

DOK Demands			
DOK	**Task Demand**	**Response Mechanism**	**Relationship to Range ALDs**
DOK 2	1. Compare fractions relating them to benchmark fractions using visual models (e.g., number lines) and/or numeric reasoning.	• Equation Response • Graphic Response • Multiple-Choice Response • Multi-Select Response	Students who can only compare fractions by using benchmark fractions are Below or Approaching Proficient. Similarly, if a student can only compare fractions using visual models, he or she is Below or Approaching Proficient.
	2. Interpret information about fractions with different denominators and different numerators to compare fractions using visual models or numeric reasoning.	• Multiple-Choice Response • Multi-Select Response	Students who can interpret information about fractions (e.g., their relative sizes) are at or above the Proficient level, meaning they have met the standard.
	3. Compare fractions using symbols <, >, and =, with no situational context or visual model.	• Multi-Select Response • Matching Response • Editing Task Inline Response	Students who can fluently compare a variety of fractions using symbols are at the Proficient level, meaning they have met the standard.
	4. Order three or more fractions from least to greatest or greatest to least.	• Hot-Text Draggable Response	Students who can extend their fraction comparison thinking by ordering fractions demonstrate an Above Proficient level of understanding.
DOK 3	5. Develop logical arguments, draw conclusions, and relate use of models to numeric strategies to compare fractional quantities.	• Equation Response • Graphic Response • Multiple-Choice Response • Multi-Select Response	Depending on the arguments used, a student who performs this task demand could be at varying levels of proficiency. For example, if the logical arguments rely solely on benchmark fractions, then a student is operating at a Below or Approaching Proficient achievement level. Conversely, if a student is fluently comparing fractions and flexibly working with various types of models and fractions (e.g., improper fractions), then the student is operating at a Proficient or Highly Proficient level.

Example				
Context	• Compare fractions or fractions represented by models with or without a situational context, such as pizza. • A fraction's denominator does not have to be a multiple of the other (e.g., 2/5 and 2/3). • Fractions are less than 1. • Both fractions can be non-unit fractions.			
Context Easier	• Fractions are less than 1. • One of the fractions involved is a unit fraction. • One fraction's denominator is a multiple of the other.			
Context More Difficult	One or both are improper fractions.			
Item Models	**Sample Item**	**Difficulty**	**Response Mechanism**	**Notes, Comments**
DOK 2	Select >, <, or = to complete a true statement about each pair of fractions. 1/2 ☐ 3/8 [include at least two more pairs of fractions]	Easy	• Matching Response	This is a DOK 2 because students are comparing fractions using <, >, or =. It is easy because both fractions are less than 1, and one fraction is a unit fraction.
	Select >, <, or = to complete a true statement about each pair of fractions. 3/5 ☐ 5/12 [include at least two more pairs of fractions]	Medium	• Matching Response	This is a DOK 2 because students are comparing fractions using <, >, or =. It is medium because both fractions are less than 1.
	Select >, <, or = to complete a true statement about each pair of fractions. 4/3 ☐ 6/5 [include at least two more pairs of fractions]	Hard	• Matching Response	This is a DOK 2 because students are comparing fractions using <, >, or =. It is hard because both fractions are "improper" fractions.

4.5.2.2.3.1. NJSLA-M—Reporting Categories

The NJDOE has expressed a desire for reporting categories for domains that contain the major cluster for each grade and course. The ClearSight item bank supports these content reporting categories and will work to develop appropriate items for the practice categories. We will also work with NJDOE to ensure appropriate representation on the blueprint at each reporting category to meet reporting goals. Refer to Section 4.5.2.2.2 for a detailed description of CAI's approach to blueprint development. Further, New Jersey-specific development will be targeted to meet the proportion of each of the reporting categories on the NJSLA-M.

4.5.2.2.3.2. NJSLA-M—Test Blueprints

Section 4.5.2.1.3.3 describes CAI's approach to blueprint development and provides an example ELA blueprint. The process for developing mathematics blueprints follows the same guidelines as ELA. Similar to ELA, we propose item ranges for the domains with major clusters, which are reporting categories and the practices. Upon contract award, we will work with NJDOE to determine the appropriate ranges for the adaptive algorithm to follow at the standard level and to appropriately allow for reporting.

NJDOE wishes to assess and report on two mathematical practice categories: (1) Modeling with Mathematics and Construct Arguments and (2) Critique the Reasoning of Others. Upon contract award, we will begin New Jersey-specific item development for the practices. We recommend a combination of multi-point constructed-response items, as well as multi-part task-based items.

Our understanding is that NJDOE would like to report at the domains containing major clusters for each grade. Our process for building the blueprints is to ensure enough coverage of these areas for reporting. The content from domains that contain only supporting and additional clusters will be assessed in a category together and/or will be incorporated into the content being assessed by the practices.

Exhibits 4.5.2.2-2–4.5.2.2-4 summarize sample NJSLA-M blueprints at major cluster and practice reporting levels for grades 4, 6, and high school Algebra I.

The sample grade 4 blueprint shown in Exhibit 4.5.2.2-2 has three domains containing major cluster content. These represent the reporting categories. In addition, there are two mathematical practice reporting categories. We have grouped the domains with supporting and additional clusters into a category that may or may not be reported on individual student reports (ISRs).

Exhibit 4.5.2.2-2: Sample Item Cluster-Level Blueprint for Grade 4 Mathematics

Grade 4 Math		Total Stand-Alone Items		Total Multi-Part Items		Total Items		Total Points	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	Totals	**30**		**4**		**34**		**32**	**40**
Major	Operations and Algebraic Thinking	7	8	1	1	8	9	8	10
Major	Number and Operations in Base Ten	7	8	1	1	8	9	8	10
Major	Number and Operations - Fractions	7	8	1	1	8	9	8	10
S/A	Measurement + Data Literacy + Geometry	7	8	1	1	8	9	8	10
	Totals	**4**		**4**		**8**		**24**	**32**
Practice	Modeling with Mathematics*	2	2	2	2	4	4	12	16
Practice	Construct Arguments & Critique Reasoning of Others*	2	2	2	2	4	4	12	16

***Each mathematics practice will have two items with handscored components, with a total of four handscored items that will eventually use AI (ML model) scoring. All of the other items will have implicit machine scoring.**

The sample grade 6 blueprint (Exhibit 4.5.2.2-3) has the same overall test length as grade 4 and three content reporting categories.

Exhibit 4.5.2.2-3: Sample Item Cluster-Level Blueprint for Grade 6 Mathematics

Grade 6 Math		Total Stand-Alone Items		Total Multi-Part Items		Total Items		Total Points	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	Totals	**30**		**4**		**34**		**32**	**40**
Major	Ratios and Proportional Relationships	7	8	1	1	8	9	8	10
Major	The Number System	7	8	1	1	8	9	8	10
Major	Equations and Expressions	7	8	1	1	8	9	8	10
S/A	Geometry + Statistics and Probability	7	8	1	1	8	9	8	10
	Totals	**4**		**4**		**8**		**24**	**32**
Practice	Modeling with Mathematics*	2	2	2	2	4	4	12	16
Practice	Construct Arguments & Critique Reasoning of Others*	2	2	2	2	4	4	12	16

***Each mathematics practice will have two items with handscored components, with a total of four handscored items that will eventually use AI (ML model) scoring. All of the other items will have implicit machine scoring.**

The sample high school Algebra I blueprint (Exhibit 4.5.2.2-4) is slightly longer than lower grades to account for more standards being assessed, and thus can support four reporting categories of domains with major clusters. The content found in the supporting and additional clusters will be incorporated into the mathematical practice items.

Exhibit 4.5.2.2-4: Sample Item Cluster-Level Blueprint for High School Geometry

Algebra I		Total Stand-Alone Items		Total Multi-Part Items		Total Items		Total Points	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	Totals	**38**		**5**		**43**		**40**	**50**
Major	Seeing Structure in Expressions	7	8	1	1	8	9	8	10
Major	Creating Equations	7	8	1	1	8	9	8	10
Major	Reasoning with Equations and Inequlaities	7	8	1	1	8	9	8	10
Major	Interpreting Functions	7	8	1	1	8	9	8	10
Major	Interpreting Categorical and Quantitative Data	7	8	1	1	8	9	8	10
	Totals	**4**		**4**		**8**		**24**	**32**
Practice	Modeling with Mathematics*	2	2	2	2	4	4	12	16
Practice	Construct Arguments & Critique Reasoning of Others*	2	2	2	2	4	4	12	16

***Each mathematics practice will have two items with handscored components, with a total of four handscored items that will eventually use AI (ML model) scoring. All of the other items will have implicit machine scoring.**

Clusters and standards reside in each domain. In general, we set the minimum number of items from each cluster to something that best represents the weight or emphasis of that cluster. Then, for standards, we set the minimum number of items to zero and establish a maximum that, when taken together with the minimum for the item cluster, will force at least one half of the standards to be administered to each student. This approach allows for greater adaptability at the student level and ensures more comprehensive coverage of the standards at the aggregate levels. Exhibit 4.5.2.2-5 provides an example for one item cluster. Notice that, to meet the minimum number of item clusters (three), items from at least two of the three standards must be administered.

Exhibit 4.5.2.2-5: Sample Standard-Level Blueprint

Subdomain		Practices	Total
NBTF	**Numbers and Operations in Base Ten and Fractions**	15	18
A	Generalize place value understanding for multi-digit whole numbers.	3	5
4.NBT.1		0	3
4.NBT.2		0	3
4.NBT.3		0	3

Finally, the blueprint contains a section imposing additional constraints that will guide the item choices. In this case, we add a constraint for DOK to ensure that each student will see enough items measuring a range of DOK, including higher levels of DOK. Refer to Exhibit 4.5.2.2-6.

Exhibit 4.5.2.2-6: Proposed, Draft DOK Constraints, Mathematics/ICCR

Additional Constraints	Items	
DOK RANGES	**Min.**	**Max.**
DOK 1	5	9
DOK 2	17	22
DOK 3	5	9

4.5.2.2.3.3. NJSLA-M Item Specifications

Our responses for RFQ requirement 4.5.2.2.3.3 are provided in the sections that follow.

4.5.2.2.3.3.1. Item Specifications

As described in Section 4.5.2.2.2, CAI's ClearSight item bank maximizes our ability to use machine-scored constructed-response items to target hard-to-measure constructs such as modeling, mathematical practice, and items that allow students to construct and graph equations, solve graphing problems, draw charts, keyboard text, and use multiple interactions. Our custom New Jersey development will leverage the same functionality as our existing item bank.

4.5.2.2.3.3.2. Description of Proposed Item Types

CAI's ClearSight item bank comprises various item types, and CAI will work with NJDOE to maximize usage of our industry-leading suite of interaction types. Item types included in the ClearSight mathematics item bank are described in Exhibit 4.5.2.2-7. We propose using these interactions for NJSLA-M, as well. CAI's test developers will continue using our Item Authoring Tool (IAT) to create a wide variety of item types, including machine-scored items that challenge students to construct something tangible to demonstrate understanding.

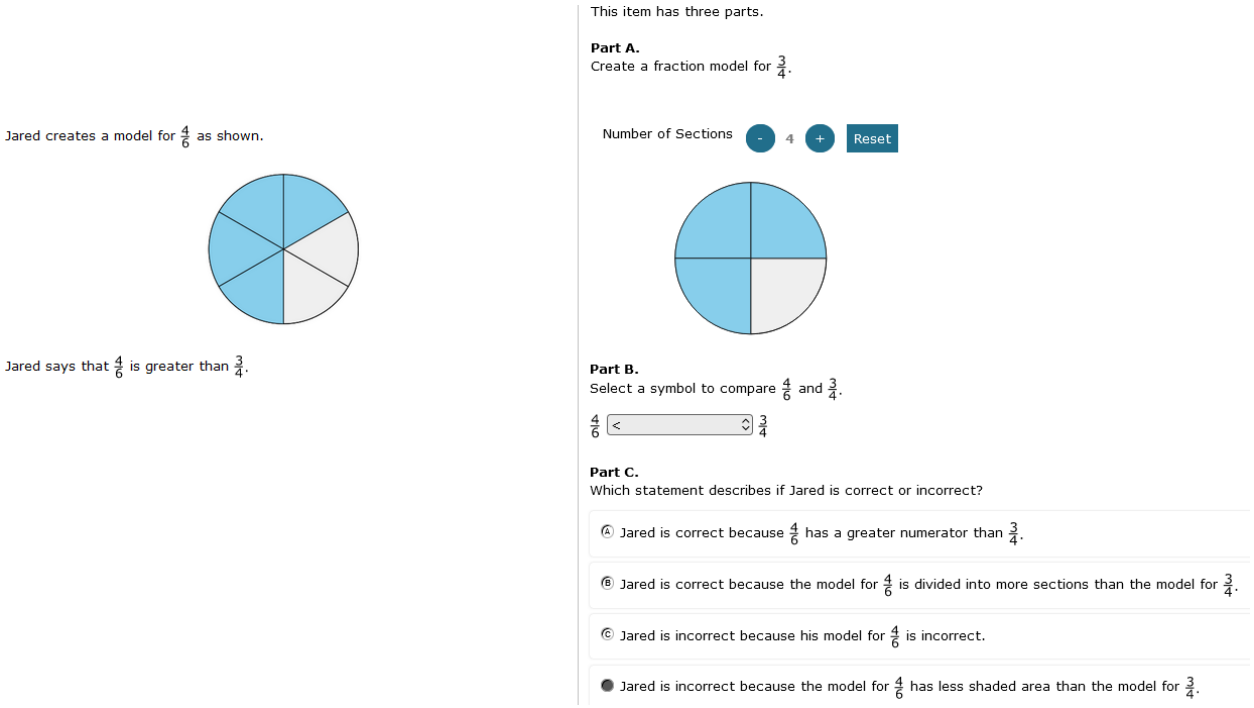
The ClearSight mathematics item bank takes advantage of a wide variety of interaction types, from traditional selected-response items to cutting-edge TEI. Moreover, the IAT allows test developers to combine these interaction types into one item, with no restriction on the number or type that can be combined. Test developers can create multi-point, multi-step items that are ideal for measuring deeper and harder-to-measure concepts; test developers can do the aforementioned in a way that is tailored to that item's specific context and content. To illustrate this, we show the sample item in Exhibit 4.5.2.2-8. In this grade 4 item, the student can create a model and then use that model to make a comparison. The student then uses their results to evaluate a claim. In general, these multi-part items created in CAI's extremely flexible system do a much better job in allowing students to show knowledge of the broader modeling cycle and demonstrate multi-step reasoning processes.

Exhibit 4.5.2.2-7: ClearSight and Proposed NJSLA Mathematics Interaction Types

Interaction Types	Description
Choice Interaction: Multiple-Choice	The student selects from traditional multiple-choice options using radio buttons. Machine-scored.
Choice Interaction: Multi-Select	This is a traditional multi-select option (checkboxes) with flexibility on the minimum and maximum number of selections. Machine-scored.
Custom Interaction: Bar Chart	The student uses simple, single-click actions to draw bar charts. Machine-scored.
Custom Interaction: Edit Task	The student clicks a word and replaces it with another word that he or she types to revise a sentence. Machine-scored.
Custom Interaction: Equation Editor	The student uses flexible entry of one or more mathematical expressions. Machine-scored.
Custom Interaction: Graphing	The student can graph points, polygons, lines, circles, absolute values, exponentials, parabolas, and trigonometry functions and identify regions as solutions with this point-and-click interaction. Machine-scored.
Custom Interaction: Graphic Response	This is a flexible platform used to create a wide variety of items, from drag-and-drop to drawing on a coordinate plane to hot-spots. Machine-scored.
Custom Interaction: Simulation	This is a flexible tool that takes student inputs and produces an output. It is primarily used to conduct experiments by manipulating inputs until the desired output is reached. Machine-scored.
Gap Match Interaction	The student drags prepared text responses into target boxes to respond. Machine-scored.
Graphic Gap Match Interaction	The student drags prepared graphic responses into target boxes to respond. Machine-scored.
Hot-Spot Interaction	The student selects clickable options on a graphic to respond. Machine-scored.
Hot-Text Interaction	The student clicks a word or sentence to respond. Machine-scored.
In-Line Choice Interaction	The student selects responses from drop-down menus throughout the text. Machine-scored.
Match Interaction	The student creates a one-to-one relationship between two elements. This item type can be represented graphically or as a table. Machine-scored.
Order Interaction	The student re-orders a list of elements to create the correct sequence. Machine-scored.

Interaction Types	Description
Custom In-Line: Equation Editor	The student enters a mathematical expression using an Equation Editor. This expression can be placed in-line with text, in a table, or in other HTML.
Interaction Group	This feature supports a set of in-line interactions, including in-line and custom in-line interactions.
Custom Interaction: External Copy Interaction	The student selects text or regions from the stimulus and copies them to a response area. This feature replaces hot-text interactions and allows multiple opportunities to ask the student to interact with and select from the same stimulus.

Exhibit 4.5.2.2-8: Multi-Part Item Assessing Higher Cognitive Skills



The task demands in the ClearSight item specifications guide test developers toward matching the most appropriate item type or mode of student response with the evidence required to assess the standard. The task models describe the evidence required for items at various DOK levels to assess students' achievement of each standard. CAI's item writers are trained to use the item type that will best elicit the type of evidence the standard requires from the student.

4.5.2.2.3.3.3. Number of Each Item Type

Section 4.5.2.2.2 proposes test blueprints for example elementary, middle, and EOC mathematics. The section also describes CAI's rationale for creating adaptive blueprints that balance blueprint coverage with maximizing adaptability based on student ability. While we can account for the number of different types of items that are administered to each student, we typically do not do so. In our simulations and research, we have found that adding further constraints, such as item type, reduces the adaptability of the test. As we explain, we take item type into account for timing purposes, but do not add that constraint into our ClearSight blueprints. In addition, as we describe in Section 4.5.2.2.2, we train test developers to use the item type that best elicits the type of evidence required by the standard. We feel that putting

limits on specific item types limits the ability of the algorithm to pick the item that best measures a given standard.

However, we can add some constraints to ensure similar testing time and environments. We can ensure that a student does not receive all 4-point items for example when being administered a multi-part item. We look forward to working with NJDOE upon award to ensure that these constraints are necessary while also being mindful of the need for adaptability in an item-adaptive assessment. Exhibit 4.5.2.2-9 shows a range of items available for each of the content and modeling standards. We will work with NJDOE to determine item specifications for the New Jersey-specific development to better determine point values for each standard.

Exhibit 4.5.2.2-9: Items Available for Each Content and Modeling Standard

	Number of Items Aligned to Standards of Content	Number of Items for Modeling with Mathematics	Number of Items for Constructing Arguments/ Critiquing the Reasoning of Others	Number of Score Points # Items X Score Point Value of Items	Percentage of Total Number of Score Points
1-Point Selected Response	0-30	N/A	N/A	0-30	TBD
1-Point TEIs	0-30	N/A	N/A	0-30	TBD
2-Point, shall include TEIs	0-4	N/A	N/A	0-8	TBD
3-Point, shall include TEIs	0-4	0-4	0-4	0-36	TBD
4-Point, shall include TEIs	0-4	0-4	0-4	0-48	TBD
Total	**34**	**4**	**4**	**TBD**	**100%**

4.5.2.2.3.3.4. NJSLA-M—Tools

CAI's Test Delivery System (TDS) supports a wide variety of interactive tools available to the student. These include all the tools previously listed and others, such as graph paper. All these tools can be configured by test session for all students or can be configured as an accommodation.

4.5.2.2.3.4. Approval of Mathematics Test Blueprint and Item Specifications

CAI will provide all specifications listed in this RFQ section for NJDOE SCM review and approval no later than 30 calendar days after contract award. All ClearSight specifications are available for immediate review by NJDOE.

4.5.2.2.4. NJSLA-M—Test Development

As described throughout the proposal, CAI has developed the ClearSight item bank using principles and procedures that promote high-quality products while also engaging educators and subject-matter experts (SMEs) from a variety of client states. We will follow the same rigorous process for developing New Jersey-specific mathematics items. We describe these procedures in more detail in the ELA section of the proposal and in the following sections.

4.5.2.2.4.1. NJSLA-M—Style Guide

Upon award of contract, CAI will provide NJDOE with the ClearSight style guide that is used to ensure that all content consistently conforms to editorial and formatting requirements. The ClearSight style guide has been reviewed and approved by all client states and is used to develop our extensive ClearSight item bank. Because we are planning on significant New Jersey-owned, custom item development over the life of the contract, it will be important to develop a New Jersey mathematics style guide for use during the development of New Jersey-owned content. CAI will collaborate with NJDOE to review and receive SCM approval.

4.5.2.2.4.2. NJSLA-M—Test Development Principles and Processes

Test Development Processes

Section 4.5.2.1.4.2 describes CAI's test development principles and processes with respect to the details previously listed. Mathematics item development uses the same principles and processes as ELA item development.

Professional Test Developers

CAI completes most item-writing work using full-time CAI staff. Even the most junior staff member must have a four-year college degree in their content area or in a closely related field. Staff at various levels conduct the interview process using a series of set questions that are designed to gauge critical-thinking ability, content-area knowledge, experience and qualifications, etc. Newly hired writers and reviewers receive onboarding and training in evidence-centered design; bias and sensitivity guidelines; and universal design. CAI test developers also receive training in CAI's IAT, allowing them to use our suite of item types.

External Vendors

CAI may recruit external item-writing vendors to aid in the item development process when demand exceeds in-house capacity. CAI works with several organizations that have a strong history of providing high-quality items. When CAI considers hiring a new vendor, we require a

Proof of Concept (POC) batch of items in order to gauge item quality and the contractor's ability to follow item specifications. For each new project, vendor organizations receive project-specific training in the test specifications and writing guidelines, and their work is held to the same high standards that we apply to the item writing performed in-house.

Item Writer Training

Item writers receive in-depth training as part of their onboarding, plus initial vendor trainings and refresher courses. In these courses, writers and reviewers are trained on such essential elements as the proper use, inputting, and scoring of CAI's interaction types; strategies for assessing the breadth of the content standards; how to clearly avoid "tricky" items; how to write assessment items to varying levels of complexity; and how to most accurately measure the construct (as noted in the item specifications) by purposeful selection of item types. The goal is to ensure that

- items are correct, realistic, and appropriate for the grade level being assessed;
- language is clear and direct and uses active voice; and
- items correctly align to state content standards.

Annual project kickoffs will also be held to review project-specific guidelines, including passage and item specifications, fairness and bias guidelines, and client criteria. Even for shared item banks, feedback from the previous year's state-specific reviews can usefully inform the development process.

Universal Design

CAI adheres to the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], and the National Council on Measurement in Education [NCME], 2014) in two significant ways: (1) to develop items and tests that measure the intended construct while minimizing construct-irrelevant barriers that may impact test performance, and (2) to develop and provide appropriate accommodations to remove construct-irrelevant barriers where they exist. The principles of universal design provide guidelines for test design to minimize the impact of construct-irrelevant factors in assessing student achievement. Universal design removes barriers to access for the widest range of students possible. According to Johnstone, Altman, and Thurlow (2006), "By making general education assessments accessible, we are more able to determine what students know and are able to do. Considerations for universally designed tests include

- intended constructs are measured;
- respect for the diversity of the assessment population;
- concise and readable text;
- clear format for test;
- clear visuals; and
- changes allowed to format without changing meaning or difficulty."

CAI's test development specialists receive extensive training on the principles of universal design and apply these principles in the development of all test materials, including items and accompanying stimuli. In the review process, adherence to the principles of universal design is verified. Each item begins with considerations about accessibility, and our item writers receive training in language accessibility; bias and sensitivity; and accessible item design. CAI provides item writers with a robust list of interactions from which to choose, each of which has its own accessibility considerations. Our item developers use the most accessible technology and response mechanisms for the specific skills or knowledge being measured. Our field-testing

process ensures that the items that make it into the operational test provide valid, reliable, and fair measurement.

We pride ourselves on the accessibility of our systems. We offer the industry's largest operational selection of accommodations and embedded accessibility supports. For online accessibility, our tools help our item writers to ensure that each item will be accessible and optimally compatible with assistive technologies. Items authored in our IAT are accessible from the start with integrated Accessible Rich Internet Application (ARIA) tags. They conform to the recommendations in the WCAG for how to structure HTML elements for use with assistive technologies (e.g., screen readers). Our IAT also includes an easy-to-use graphical user interface (UI) that can be used to author complex rubrics for items with minimal effort. This interface provides built-in tools to unit-test the rubric by subjecting it to a variety of inputs. Validation checks are integrated into each step to guide the item authoring process.

In summary, CAI addresses accessibility from the very beginning of item development, rather than as something to be considered at the very end.

Language Accessibility and Bias

Training will vary for writers of ELA and mathematics items. In all subject areas, however, language accessibility and bias and sensitivity (LABS) training is a fundamental aspect of stimulus and item writing. Detailed guidelines provide concrete explanations and annotated examples of accessible, bias-free items; the guidelines include the following recommendations:

- Avoid stereotyping.
- Avoid sensitive or controversial material.
- Avoid giving advice.
- Avoid mention of dangerous activities.
- Ensure that items reflect the diversity of the testing population.
- Avoid topics that are differentially familiar or display elitism.
- Ensure that language use is inclusive.
- Follow guidelines for Linguistic Features/Language Accessibility for remedial readers and English learner (EL) students.
- Use only illustrations and graphics that meet the following criteria:
  - Eliminate visual bias by avoiding unnecessarily complicated graphics.
  - Focus on graphics that can be easily explained using text-to-speech (TTS) without violating the construct.
  - Images should conform to project-specific training objectives.

Item Review Process

CAI will ensure item alignment to the assessment and item specifications. Item alignment is determined through expert judgment by CAI test developers, NJDOE content specialists, and New Jersey content committee members. We propose a process that reflects best practices for ensuring alignment.

Throughout the item development process, CAI item writers and item reviewers ensure that the item specifications are followed. At each stage of the review process, CAI test developers check items to ensure that they are aligned to the standards; are clearly and succinctly worded; are grade-appropriate; contain appropriate graphics; have accurate and fact-checked content; are free of bias and sensitivity issues; follow the style guide; and follow the principles of universal design.

Further, CAI is committed to ensuring this thorough process by which all items will be reviewed for alignment by external reviewers, including NJDOE and New Jersey educators, as well as educators and state-level content specialists across the ClearSight states. These reviewers will also use the available item specifications as the basis for reviewing items in conjunction with an item review checklist that is strongly focused on alignment to the current standards.

Items pass through a series of rigorous reviews in which they are evaluated using specific assessment criteria. Junior staff, senior reviewers, and state office assessment and content personnel are involved at various levels throughout the process. The following are four possible outcomes for each of these reviews:

1. Accept as Appears
2. Accept as Revised
3. Revise and Resubmit (on the basis of feedback)
4. Reject

While specific checks are applied to each review, basic item criteria are evaluated at each level. Exhibit 4.5.2.2-10 provides an example of one of these review checklists.

Exhibit 4.5.2.2-10: Example of a Review Checklist

- ☐ Does the item align with the standard?
- ☐ Is the item mathematically correct?
- ☐ Is the item aligned to the project's item specifications and does it follow the content limits?
- ☐ Is the language in the item simple, clear, and concise?
  - Are all words appropriate for the grade level?
  - Is all wording mathematically precise?
- ☐ Is the context plausible?
- ☐ Is the context appropriate for the grade level?
- ☐ Is the depth of knowledge level appropriate?
- ☐ Is the key(s) the only correct answer?
- ☐ Is the item scoring properly?
- ☐ Does the item comply with any client-specific requests for this round of development?

<u>Scoring Assertion (SA) and Human Readable Rubric (HRR)</u>

- ☐ Do the scoring assertions each represent a correct student response with the specific aspect of the standard being measured?
- ☐ Is there one scoring assertion per score point?
- ☐ Do the bullets at the top of the HRR match the scoring assertion wording verbatim?
- ☐ Is the Exemplar response the correct, ideal answer?
- ☐ Is there additional wording explaining other correct responses when applicable?

<u>Exemplars</u>

- ☐ Does the item have at least one exemplar for each score point?
- ☐ Are they named in a way that describes the response (not 'Correct' or 'Incorrect')?
- ☐ If there is an interesting response/other popular response that is not in the exemplars, add it.

Selected Response Options

- ☐ Are the distractors plausible?
- ☐ Are the distractors parallel (no one distractor stands out)?
- ☐ Do the distractors address common student misconceptions?
- ☐ Do the rationales explain, to the project's satisfaction, why a student would select each option?

Item Formatting and Layout

- ☐ Is the layout in Web Preview grade-appropriate?
- ☐ Is scrolling minimized?
- ☐ Would a stimulus-based item be more appropriate?
- ☐ Is the format of the interactions appropriate for the grade level?
- ☐ Does the format of the interactions represent a natural response mechanism for students to interact with the item?
- ☐ Is the item format the most appropriate/accessible?

Style

- ☐ Does the format of the item match the style guide, including EQ keypads and option stacking?
- ☐ Do the graphics match the style guide?
- ☐ Is the item description general and does it match the item?

Alignment with New Jersey Student Learning Standards

CAI has reviewed the NJSLS. Our ClearSight item banks for mathematics and ELA, which are aligned to CCR standards, show a high level of alignment to these standards. For all ClearSight item development, as well as all New Jersey-specific item development, processes closely follow our own internal item specifications (as previously described) to ensure a high degree of alignment to these standards. Further, as evidenced in Section 4.2, several independent alignment studies have demonstrated the alignment of the ClearSight item banks to these common standards.

CAI will provide evidence of alignment between the assessments and the NJSLS, including balance of content and cognitive complexity, in three primary ways.

First, CAI will provide an item bank analysis for NJDOE review as part of the Test Content Development Plan described in Section 4.5.2.1.5.2. Second, as described in Section 4.2, independent alignment studies of the ClearSight item banks note a high degree of match to the CCR standards.

Further, CAI will plan and facilitate an alignment confirmation committee meeting of experts as part of the initial Field-Test Item Review meetings described in Section 4.9.3. These experts will include CAI staff, NJDOE staff, and New Jersey educators. At the conclusion of this meeting, CAI will provide a final document of item alignment by standard, including committee notes. NJDOE will review and approve the final report from this meeting. CAI confirms that we will plan this meeting according to the meeting criteria listed in Section 4.9 of the RFQ. CAI will document all the procedures followed during the alignment process in a manner suitable for peer review.

CAI's experience in the alignment of item banks across mathematics, ELA, and science includes Florida's transition to the B.E.S.T. assessment system, as well as similar efforts in Indiana, Utah, West Virginia, and Wyoming.

Client Feedback

CAI recognizes the importance of having NJDOE staff propose edits to and provide final approval for all items used on New Jersey assessments. Immediately upon award of the contract, CAI will collaborate with NJDOE on crafting a plan to review the items currently included in the internal ClearSight item banks in order to accept or reject each item for inclusion on the NJSLA-M. For all new item development, there will be the following three main instances when NJDOE staff can be involved in the item review process:

1. Prior to the annual Field-Test Item Review meeting described in Section 4.9, NJDOE will review shared items from CAI's internal ClearSight item banks to vet them for the upcoming meeting. Custom-developed items will be sent to NJDOE in batches through a schedule agreed upon by NJDOE and CAI. NJDOE staff will provide feedback and revised items will be sent back to NJDOE per the item review schedule.
2. CAI and NJDOE staff will resolve New Jersey committee feedback following the annual Item Review meeting. Section 4.9 provides a full description of the steps involved in this process.
3. After Item Review meetings for all ClearSight member states are completed and CAI has edited the items based on the collective feedback, NJDOE staff may review the items for acceptance into the New Jersey item bank.

Should NJDOE staff feel that additional levels of review are needed for New Jersey-owned assessment items, CAI can work with NJDOE to incorporate them as a cost option.

4.5.2.2.4.3. NJSLA-M—Educator and Subject-Matter Expert Review

As stated in Section 4.5.2.1.4.3, CAI recognizes the importance of state educator feedback for all items used in the NJSLA-M. All ClearSight items have been reviewed by multiple state SMEs for content; bias and sensitivity; scoring (rubric validation); and flagged data. Custom New Jersey development will follow a similar process. As described previously and in Section 4.9, we will make the ClearSight item bank available for review by New Jersey educators. If edits are requested to the test content, CAI will resubmit the edited items for approval by the SCM before the item is eligible for operational use or field testing, but no later than 30 calendar days after receipt of the request for edits.

4.5.2.2.4.4–4.5.2.2.4.4.1. NJSLA-M—Source and Quantity of Test Content

As described throughout the RFQ, CAI develops all ClearSight content. Basic licensing for the use of the ClearSight item bank is part of the contract. We acknowledge New Jersey-specific item development will belong to NJDOE. CAI works with client states on coordinated release of items; no state may release operational items unless that release is approved by all states. CAI then coordinates with all states to ensure that any released items are removed from the operational item bank. Our item development counts for New Jersey custom development accounts for the required release plan noted in the RFQ, as well as enough items for a linking set of content that meets blueprint requirements.

4.5.2.2.4.4.2. NJSLA-M—Quantity of Test Content

CAI's ClearSight item bank will provide New Jersey with a rich selection of high-quality test items that rigorously assess student achievement of the NJSLS-M. The ClearSight item bank is extensive and designed to support adaptive test administrations in ELA and mathematics that provide measurement precision across the full range of student ability. The large size of the ClearSight item bank allows participating ClearSight states to implement educator and community review procedures to ensure that all items deployed for statewide assessments are

aligned to state academic standards and meet community standards for appropriate content. The ClearSight item pools have been explicitly constructed to support statewide assessment programs. The ClearSight item bank supports adaptive test administrations for multiple states, including New Hampshire, North Dakota, West Virginia, and Wyoming. The ClearSight item bank also has been used to seed item banks for state assessments in Arizona, Florida, and Ohio, and it is further used to augment the Indiana and Utah item banks.

Exhibit 4.5.2.2-11 shows the current summative operational item pool counts by grade for mathematics. The exhibit shows the total number of operational ClearSight items for each of the content domains.

Exhibit 4.5.2.2-11: ClearSight Operational Item Pool Counts for Mathematics by Content Domain

Grade	Geometry	Measurement and Data	Numbers and Operations in Base Ten	Numbers and Operations—Fractions	Operations and Algebraic Thinking	Locked Operational Pool Total
3	87	180	113	152	190	722
4	108	116	202	179	130	735
5	121	116	179	196	89	701
	Geometry	**Expressions and Equations**	**The Number System**	**Ratios and Proportional Relationships**	**Statistics and Probability**	
6	100	222	200	130	86	738
7	140	107	97	129	132	605
	Geometry	**Expressions and Equations**	**The Number System**	**Functions**	**Statistics and Probability**	
8	174	238	57	163	92	724
	Geometry	**Algebra**	**Number and Quantity**	**Functions**	**Statistics and Probability**	
HS	470	339	79	375	174	1,437
Total						**5,662**

Annual Field Testing

Annual field testing will prioritize New Jersey's custom-developed items. Each year, CAI will develop a field-test plan for each grade that outlines the quantity of custom and ClearSight content to be field-tested at each grade. CAI is committed to sustaining a robust item pool and plans to continue to develop and field-test items each year. As part of simulation work performed each year to configure the adaptive algorithm, psychometricians can evaluate the performance of the item pool with respect to the target test blueprint. For example, item overexposure may indicate standards for which the item pool is sparse and should be the target for item development. Conversely, items that are rarely selected indicate standards where item development is not a priority. Evaluation of measurement precision across the ability distribution, as well as distribution of item difficulty, indicate target difficulty levels for new item development. Each year, CAI's psychometricians and test developers will review the item pool, including shared items and field-test items, to determine where development is most advantageous.

Exhibit 4.5.2.2-12 shows the number of items that we anticipate developing each year following the stand-alone field test. This was the result of the previously described content and psychometric analysis of the existing ClearSight pools and our intended New Jersey development for the stand-alone field test; numbers may change slightly based on simulations.

Exhibit 4.5.2.2-12: New Jersey Field-Test Counts by Year for Each Year Following the Stand-Alone Field Test and Operational Field Test

Test/Grade	# of 1-Point Selected Response Items (Content Standards Only)	# of 1-Point TEI (Content Standards Only)	# of 2-Point TEI (Content Standards Only)	# of 3-Point TEI (Content Standards Only)	# of 4-Point TEI (Content Standards Only)	# of 3-Point TEI (Modeling/ Practice Standards Only)	# of 4-Point TEI (Modeling/ Practice Standards Only)	# of Handscored Items (to Eventually Use AI) for Modeling Practice Standards Only	Total # Per Year
NJSLA 3	10	10	5	2	2	3	3	6	41
NJSLA 4	10	10	5	2	2	3	3	6	41
NJSLA 5	10	10	5	2	2	3	3	6	41
NJSLA 6	10	10	5	2	2	3	3	6	41
NJSLA 7	10	10	5	2	2	3	3	6	41
NJSLA 8	10	10	5	2	2	3	3	6	41
NJSLA Algebra 1	10	10	5	2	2	3	3	6	41
NJSLA Geometry	10	10	5	2	2	3	3	6	41
NJSLA Algebra II	10	10	5	2	2	3	3	6	41
NJGPA	10	10	5	2	2	3	3	6	41

Within 30 calendar days after contract award, CAI will deliver an item bank analysis and Test Content Development Plan that describes the ClearSight development process.

4.5.2.3. New Jersey Graduation Proficiency Assessment Program (NJGPA)

4.5.2.3.1. Purpose of NJGPA

CAI understands that the purpose of the NJGPA is to ensure that students have demonstrated proficiency in English language arts (ELA) and mathematics as a criterion for graduating from high school. This test is administered in the spring for students in grade 11, and retakes are available during the following summer, fall, and spring of senior year.

NJDOE seeks a solution that ensures compatibility in student results from year to year. In addition, New Jersey is interested in creating efficiencies to reduce costs and testing times for the NJGPA while maintaining a fixed-form assessment with up to three unique retake opportunities.

CAI has prepared a solution that we believe fits this requirement. We will work with NJDOE to develop a shorter assessment design for NJGPA that better aligns to the Next Generation Assessment that CAI is suggesting in this proposal. We will commit to supporting this assessment using ClearSight items to the extent possible, as well as developing only custom items where required and agreed upon by NJDOE.

4.5.2.3.2. NJGPA Administration Schedule

CAI understands that the NJGPA requires up to four testing opportunities. The first will occur in the spring of a student's junior year, the second as a retake option in the summer before senior year, the third as another retake option in the fall, and a final retake option in the spring of the student's senior year. We recommend offering this current fixed-form test online with a Data Entry Interface (DEI) paper version provided only to those students who require this as an accommodation. CAI is prepared to begin offering the NJGPA in spring 2026 as part of this new contract.

4.5.2.3.3. NJGPA: Design and Reporting Requirements

CAI proposes to develop a new design for the NJGPA, which will require an operational field test in spring 2026. NJDOE aims to ensure comparability in student results, and CAI is prepared to do this by working with NJDOE to acquire content from the current provider. As part of the spring 2026 test administration, CAI will embed the test items from the current provider to establish linkages between the proposed ClearSight item pools and the current NJGPA item pools. Once this linkage is established, NJDOE can continue to report NJGPA assessment results on the same scale and performance-level classifications. Finally, CAI will work with NJDOE to import the current provider's items into our Item Tracking System in order to build all of the necessary forms, and we understand that NJDOE will assist us in obtaining the necessary items.

4.5.2.3.4. Future NJGPA Design

CAI will work with NJDOE on a new design for the NJGPA that reduces both cost and testing time. We recommend an adaptive assessment that is completely machine scored. The blueprint can be similar to the proposed NJSLA blueprints. If NJDOE intends to only report subject-area scores for the NJGPA, we could significantly shorten the test length to approximately 25 items for mathematics and 30 for ELA while maintaining the high levels of subject test score reliability and performance-level classification consistency and accuracy necessary to meet peer review guidelines. We recommend an adaptive test administration so that NJDOE will not need to develop fixed forms each year (which reduces cost). Tests can be shorter with more precision in

ability level, especially at the higher and lower ends. We propose completely machine-scored items so that results can be reported immediately and no handscoring will be necessary, which will also reduce costs. A phased approach will be needed to eventually have a grade 11 item bank robust enough for an adaptive assessment with four testing opportunities.

We outline our plan for meeting NJDOE needs, including linking to previous scale and across grade levels. During spring 2026, CAI proposes an operational field test that will include many new ClearSight items that will be created for the NJGPA only. CAI will continue to develop and field-test ClearSight items so that grade 11 students in spring 2027 will be able to take the test adaptively.

We propose to embed a sample of existing NJGPA items into the spring 2026 operational field test. We will use approximately two-to-three forms' worth of items for establishing links and calibrating the new ClearSight items to the NJGPA scale. At this point, we will be able to deliver an adaptive test for future administrations. In addition, we will link all item parameters to the underlying ClearSight scale and use these parameters for scoring and reporting. We will also monitor items for item response theory (IRT) model misfit and can re-field-test operational items if we suspect item parameter drift.

4.6. Additional Assessment Item Development

NJDOE is looking for an assessment system that provides timely, actionable data; is short in length; is accessible to all students; and adequately assesses college and career readiness. With CAI's solution of custom New Jersey development, augmented by the ClearSight assessment suite, NJDOE will be able to ensure that each of these priorities is met immediately. Upon contract award, CAI will collaborate with NJDOE on finalizing the item development plans described in Section 4.5.2 and begin developing items for the 2025 stand-alone field test.

As CAI collaborates with NJDOE to develop custom New Jersey item pools, CAI is prepared to follow all criteria laid out in this RFQ including the following:

- Deliver an item development plan that describes a high-quality item development process, sufficient to develop the requisite number of test forms necessary to administer an operational assessment as defined in this RFQ within 20 business days after the contract is awarded.
- Ensure that all items adhere to the test blueprint developed by the contractor and approved by the SCM (refer to RFQ Section 4.5.2.1.3.3 NJSLA-ELA Test Blueprints and Section 4.5.2.2.3.2 NJSLA-Mathematics Test Blueprints).
- Ensure that all items are reviewed by the identified committees, in conjunction with the NJDOE Office of Assessment, as outlined in RFQ Section 4.9.3 Field-Test Item Review Meetings through Section 4.9.18 Unplanned Meeting(s).

In addition, CAI is prepared to continually develop and increase the size of the ClearSight item banks according to New Jersey educator input. We also commit to allowing NJDOE access to linking items for the duration of the contract plus any extensions and an additional three years thereafter.

4.6.1. Item Bank Access

Throughout the life of the contract (including any extensions), CAI will ensure that NJDOE has full access to all items in the New Jersey item bank, including both New Jersey-owned and CAI-owned items. More details about our proposed item bank system can be found in Section 4.11.2. CAI will continue to support an instance of the New Jersey item bank for NJDOE to access. We note, however, that this instance of the item bank will contain only items specifically owned by New Jersey.

4.6.2. Performance-Level Descriptors

CAI will work with NJDOE to review and revise the New Jersey Performance-Level Descriptors (PLDs) to ensure that they reflect any changes in the current assessment designs.

Throughout all steps of the PLD review and revision process, CAI will document all procedures and submit proposed revisions to NJDOE. CAI will resubmit the document with completed edits within 10 business days of receipt. CAI will also assist NJDOE in developing PLDs for the new high school graduation assessments, possibly including a reduction in the number of performance levels from five to four.

CAI Experience Developing Performance-Level Descriptors

With the development of PLDs, a state department of education establishes the rigor of its achievement standards and defines what alignment evidence along the test scale looks like. When validating PLD reviews, the state investigates if the score interpretations are reasonably true and useful to teachers as an informative framework to better understand stages of student learning (Schneider et al., 2022) depicted by the score interpretations.

CAI has successfully facilitated several broad types of Range PLD meetings with educators, including the following:

- In Indiana, we worked with panels of stakeholders to gather feedback and high-level information about the expectations to be included in the PLDs.
- For our ClearSight partner states, we drafted the initial Range PLDs, and educators reviewed and suggested changes to them.
- In Indiana and Utah, CAI facilitated educator meetings where the PLDs were developed organically by educators following a standardized process, including a template and rounds of review within and across grades.

CAI will convene and facilitate a stakeholder PLD meeting, as described in Section 4.6.2.1.

4.6.2.1. Performance-Level Descriptor Engagement

Performance-Level Descriptor Meetings

CAI will work with NJDOE and New Jersey stakeholders to review and refine policy PLDs, as needed, for the NJSLA-ELA/M. This review will reflect changes resulting from updates to test designs proposed by CAI and agreed to by NJDOE. In addition, CAI will develop Range PLDs that are consistent with the revised expectations for the high school graduation assessments. To this end, CAI will organize a two-day workshop prior to any item development (if required). In developing Range PLDs and Threshold PLDs, we follow the steps as outlined in the research of Egan, Schneider, and Ferrara (2012) and Schneider and Egan (2014). We explicitly state the intended outcomes of the assessment program relative to the following:

- The intended claims about what students know and can do
- The intended use of scores
- The evidence required to support the intended claims and test scores

Pre-Meeting Activities

Prior to the PLD workshop with State educators, NJDOE will collaborate with CAI staff to articulate New Jersey's vision, and CAI will develop a first draft of revised Range PLDs that describe the knowledge, skills, and processes that students should exhibit as they progress through achievement levels. These first drafts will serve as a framework for educators participating in the Range PLD workshop. Providing draft PLDs to panelists will also support the standardization of language across groups of panelists working on different sets of standards.

Range Performance-Level Descriptor Quality Characteristics

When creating PLDs, developers must describe explicitly how the evidence of intended abilities collected should increase in sophistication. The evidence should describe simultaneously the attributes to be observed in the student response and which attributes prompts across tasks should elicit. Therefore, the use of frequency-based terms, such as "partially demonstrates,"

"adequately demonstrates," and "consistently demonstrates" or similar types of phrasing as a defining phrase to separate achievement levels, is insufficient as an evidence statement. The evidence should describe the characteristics of the response in terms of what the student at that achievement level demonstrates successfully.

Contextual or scaffolding characteristics of prompts and assessment tasks can elicit relevant student responses to the elements of the dimensional standards. This information is often central to understanding why a student can or cannot respond to a prompt; thus, discussing the contextual or scaffolding characteristics that need to be present for the student to demonstrate a skill is an important characteristic of Range PLDs. It is essential that scaffolding or guidance offered to the student be specifically described so that it is replicable across tasks. Students may be able to respond to a model, for example, when that model has obvious organizational structures (e.g., use of bold on key concepts) or graphics that help the student locate information.

Level 2 students may be able to respond to a model when that model has fewer organizational structures, less granular information, or makes visible and explicit processes that must be inferred to occur from evidence. Without such scaffolds, the students may not be able to independently locate or infer the necessary details to use the model.

Level 3 students may be able to respond to a model when that model has more complex organizational structures or granular information but does not make explicit processes that must be inferred to occur from evidence. Without mapping out systematically how models should be adapted along the reporting scale to target a student's intended scientific reasoning, the State may unintentionally make models systematically too easy or too difficult. Under such a condition, the ability to measure what high-ability students or low-ability students can do is lost.

When standards use implicit verbs, item writers and teachers infer their meaning. Implicit verbs, such as "recognize" and "understand," need to be made explicit in the PLDs. When explicit verbs are used, teachers, parents, and stakeholders have a better sense of what the student can do (at least within reasonable probability). Item writers know what evidence to elicit. Therefore, we recommend that developers and panelists define the intended meaning of each verb. For example, writing "The Level 3 student recognizes" does not lead to a clear conceptualization of what the student should do to demonstrate recognition. Rather, writing "The Level 4 student is able to tell, show, or identify" describes the observable behaviors needed to measure the intended claim.

Workshop Materials

CAI will collaborate with NJDOE to finalize the PLD approaches and draft meeting materials for State approval based on that approach. These may include the following:

- Microsoft PowerPoint slides for large groups, describing meeting purpose and logistics
- Breakout room slides guiding educators through the process
- New Jersey Student Learning Standards (NJSLS)
- Templates for reviewing PLDs, which allow for consistency across content areas and grades

CAI will send all workshop materials to NJDOE at least five days before the meeting.

Workshop Requirements

CAI will meet the logistical meeting requirements outlined in the RFQ, including the meeting requirements described in Section 4.9.20.1 and Section 4.9.20.3.

4.6.3. Accessibility and Accommodation Features

CAI works diligently to ensure that our items, assessments, and test delivery systems support all students, allowing them to access their assessment content in a way that allows for a positive testing experience and the generation of results that are a fair and accurate estimation of their achievement. To this end, we take considerable pride in ensuring that the assessments we deliver and the materials we produce are accessible to all audiences. Further, our online suite of systems offers the most complete set of digital tools, supports, and accommodations available; these tools focus on improving the assessment experience of all students while preserving the validity of the assessment.

In this section, we address our process and system compliance with the New Jersey design principles and affirm that we currently fully support all tools and accommodations outlined in the NJSLA *Accessibility Features and Accommodations Manual*. We included a selection of the accessibility features and special accommodations in Appendix C of our proposal, including a description and screen capture illustrating the tool in use.

Beyond CAI's mission-driven commitment to ensuring digital access as broadly as possible, we understand that the systems that support your statewide assessments must comply with Section 508 of the U.S. Rehabilitation Act. Section 508 requires electronic and information technology to be accessible to people with disabilities in accordance with the Web Content Accessibility Guidelines (WCAG) 2.0, a globally recognized and technologically neutral set of accessibility guidelines for web content. To this end, CAI maintains WCAG 2.1 AA compliance as well as Voluntary Product Accessibility Template (VPAT) documents describing how our systems comply with Section 508 standards. We have made a significant commitment to embedding accessibility tools into our Student Interface, believing that students benefit when the tools they need remain consistent between assessments and devices. We pride ourselves on having the most complete set of digital assessment features available that meet the documented needs of students and keeping pace with the available research.

Access to Assessment Features

CAI's test delivery suite supports the configuration of tools' distinct categories of assessment features, allowing for your state policies to determine the assessment features available for all students by self-selection (universal tools), available when indicated by an appropriate adult or team (designated support), or available to students when documented in an Individualized Education Plan (IEP) or Section 504 Plan (accommodation). Each year, we will work with the SCM to configure the system to implement your state-specific accessibility policies, understanding that policies may change across administrations.

Each year, CAI will work with NJDOE to ensure that the NJSLA *Accessibility Features and Accommodations Manual*, training materials, and test administration resources provide information regarding the selection and use of accessibility tools and features. Any annual changes will be documented in the introductory section and Change Log for easy identification by your users within your districts and schools. Additionally, for new or changed features (e.g., tools, supports, accommodations), we will work with NJDOE on the system-level coding to ensure that we are able to track and report on usage that is consistent with your guidelines. All tool usage data will be reported to NJDOE along with assessment results.

CAI systems allow for supports and accommodations to be set by designated personnel within the school or district for individual and/or groups of students. Our systems allow this to be done in our Test Information Distribution Engine (TIDE) or in the Test Administrator (TA) Interface prior to testing.

Student Accessibility Information

CAI's TIDE supports all manner of student registration functions, including the management of student demographic data and testing accommodations, via integration with state and/or district Student Information System (SIS) or through TIDE's user interface (UI). TIDE will support the retention of students' accessibility information across administration years, while allowing for reviews and updates each year if required.

Student accessibility information is currently exportable from TIDE at any point during the year such that state, district, and school staff can conduct different analyses for their purposes. In spring 2024 (TIDE 16.1, February 2024), TIDE will be releasing a new feature that allows users to export these accessibility settings in the exact file format required to re-upload them back into TIDE. This feature will make it easy for state, district, and/or school assessment personnel to export the student settings at the end of the year and then inspect, modify as needed, and re-upload them at the start of the following year.

Additionally, TIDE supports allowing selected accessibility settings to be persisted from one year to the next without having to be re-uploaded. Although supported by the systems, changes from one year to the next in state policy and test design, as well as advances in the Test Delivery System (TDS), often make this practice not operationally feasible. The new feature to allow export and quick re-upload will make this process easier for district and school users.

Compatible Assistive Technology

As described previously, our commitment to ensuring access for all is a principal tenet for CAI, and we place significant time and attention to ensuring that we support assistive technologies that support students in their access to the assessment. Before our compatibility testing and effort, CAI begins with our commitment to accessible content. We render items and test content for optimal accessibility for all students, following universal design principles and WCAG 2.1, for which we received AA compliance. We offer Permissive Mode as an accommodation, which turns off select security features that may interfere with some assistive technology. We also offer Streamlined Mode, which eliminates many visual elements from the screen, delivering the test in a more linear format to reduce distraction and simplify navigation for students who benefit from this support.

The TDS complies with the following standards:

- **WCAG:** The CAI TDS is WCAG 2.1 AA compliant.
- **User Agent Accessibility Guidelines (UAAG):** This is a part of the WCAG and Authoring Tool Accessibility Guidelines (ATAG).
- **World Wide Web Consortium (WC3):** The Web Accessibility Initiative–Accessible Rich Internet Application (WAI-ARIA) forms a portion of the WC3 industry standards. The CAI TDS is fully ARIA compliant and is entirely readable by screen readers.

CAI supports an extensive list of embedded and non-embedded assistive technologies and will align the provision to NJDOE specifications. We put our system through an annual rigorous testing cycle to determine whether it can support an assistive technology device. The most significant risk associated with a third-party technology device is incompatibility with critical, high-stakes requirements that the TDS must always support, including security, Secure Browser functionality, and performance. We test assistive technologies against CAI's Secure Browser and TDS to ensure that the required functionality is there and that there are no security threats introduced when using assistive technologies in a secure testing environment. CAI provides an *Assistive Technology Manual* each year that includes the list of supported devices and applications, as well as setup instructions for assistive technologies that require some configuration.

4.6.3.1. Developing Items Meeting Bias and Sensitivity Guidelines

Upon contract award, CAI will conduct a thorough review of the New Jersey Bias and Sensitivity Guidelines and compare them with the ClearSight Bias and Sensitivity Guidelines. Because the ClearSight guidelines were developed in conjunction with several states with diverse geography and populations, we feel they include all information from the referenced New Jersey document. If we find New Jersey-specific criteria missing in the ClearSight document, we will conduct a review of the ClearSight item bank to ensure conformity with the New Jersey guidelines.

As described in Section 4.5.1.4.2 for English language arts (ELA) and Section 4.5.2.2.4.2 for mathematics, item writers receive annual and project-specific training on bias and sensitivity guidelines from item creation to all reviews throughout the life cycle of the item. Training will vary for writers of ELA items and writers of mathematics items. In all subject areas, however, language accessibility and bias and sensitivity (LABS) training is a fundamental aspect of stimulus and item writing. Detailed guidelines give concrete explanations and annotated examples of accessible, bias-free items, and they include the following recommendations:

- Avoid stereotyping.
- Avoid sensitive or controversial material.
- Avoid giving advice.
- Avoid mention of dangerous activities.
- Ensure that items reflect the diversity of the testing population.
- Avoid topics that are differentially familiar or display elitism.
- Ensure that language use is inclusive.
- Follow guidelines for linguistic features/language accessibility for remedial readers and English learner (EL) students.
- Use only illustrations and graphics that meet the following criteria:
  - Eliminate visual bias by avoiding unnecessarily complicated graphics.
  - Focus on graphics that can be easily explained using text-to-speech (TTS) without violating the construct.
  - Images should conform to project-specific training objectives.

Section 4.9.7 describes the Sensitivity Review Committee process and CAI's process for making changes to assessment material reviewed by that committee.

4.6.3.2. Developing Items That Meet Accessibility Guidelines

CAI will apply and comply with NJDOE accessibility guidelines upon contract award. CAI has extensive experience with these guidelines. As described in Sections 4.5.2.1 and 4.5.2.2, CAI's test developers are trained to develop items that allow for accessibility supports while preserving construct-relevant item elements.

One of the elements critical to our success has been Item Tracking System (ITS) workflow, which supports the embedding of accessibility markup into each item as it is being developed, rather than as a post hoc process applied to completed test forms. The development of transcription notes (a process that we call *tagging* for web-delivered items) proves most tractable when it is performed upon approval of the base item. Tagging is accomplished (and reviewed by NJDOE) on a flow basis so that the review of thousands of items at the same time is not required. Currently, our tagging capabilities include translation, TTS, braille, American Sign Language (ASL), and word lists or glossaries (may be multilingual).

CAI's ITS captures braille, text descriptions, and closed captioning/ASL videos, which are uploaded directly to the application. We offer the industry's largest selection of operationally deployed accommodations and embedded accessibility supports. CAI has tools that enable us to efficiently add markups to support TTS, screen readers, alternative languages, other language supports such as glossaries with audio, and many other accommodations and supports.

CAI has provided braille, ASL, TTS, Spanish translations, and assistive technology to clients for many years. Accommodated versions of an item are maintained in ITS, and changes are incorporated without risking unintentional changes to other item content. When an item includes additional content, such as braille files, TTS content, sign language content, and secondary language content, ITS maintains this content in separate review lanes.

Once an item's English content is web-approved, accommodation teams can work in their distinct review lanes on these additional content requirements, which are not dependent on each other, concurrently. This feature of allowing users to create and review discrete item content in tandem ensures an efficient and quick item creation process. Each accommodation review lane follows its own structured review process, and once approved and completed, the accommodations lanes are merged into the main item content package. If changes are required to a specific accommodation, only the review lane for that accommodation is unlocked.

The review process is followed again for the required edits, and when the edits are approved, the review lane is locked again, and the accommodation lane is merged into the main content package. ITS provides CAI the ability to incorporate changes to accommodations without accessing the main content of the item, ensuring item content integrity.

4.6.3.2.1. Braille and Large Print Test Materials

As described in Section 4.3.2, we will produce, print, and deliver braille and large print documents for assessment and resource documents/test materials for all components of each assessment and for each test administration under the contract. We will obtain the student enrollment estimates through our standard test registration process, described in Section 4.7.1.3, to ensure that we produce enough materials for visually impaired student populations. All braille and large print materials will be developed according to the final program schedule; materials will be developed a minimum of 90 days prior to the test administration to allow SCM sufficient time to review them. Students and test administrators will be supported by resource materials that accompany a braille or large print test, including a materials kit that contains items such as test administration instructions, resource materials (e.g., formula sheets), and instructions for transcribing and returning test materials.

Each year, the test specifications will confirm the braille version(s) for that contract year, ensuring that we produce braille materials that are the currently accepted version of braille, and will be approved by the SCM prior to the braille process.

4.6.3.2.2. Non-English Version(s)

Our solution includes the Spanish-language translation, or transadapted version, of each assessment at each grade. We will ensure that the content of each assessment moves through the translation process, translation reviews, and approval process. CAI contracts with multiple translation vendors who are selected for their expertise/certification in K–12 education assessments. For this contract, we included TriLin Integrated Services, Inc. as our subcontractor because it is specialized in English–Spanish translations and transadaptations and it understands the formal and dialectical differences in language and culture.

CAI continues to enrich language supports for students and will work with NJDOE to ensure that our systems remain well-aligned with NJDOE's translation needs. CAI's Test Delivery System

(TDS) currently offers language translation supports in the following formats: stacked (English over Spanish), English-only/Spanish-only with a student toggle feature, and Spanish TTS.

CAI's ClearSight item bank includes a sizable portion of the summative and interim item banks that contain translated items, allowing for online computer-adaptive tests (CATs) for those students who are eligible to receive a Spanish-language assessment. All test administration directions, resources, and system messaging are also translated to fully support the student and to ensure that the assessment is a fair and valid representation of what they know and can do. These translated items do not alter the construct being measured by the assessment or give unfair advantage to students who receive a language accommodation over other non- or differently accommodated students.

CAI will support the provision of Spanish-language assessments and/or transadapted versions at least 90 days prior to the test administration.

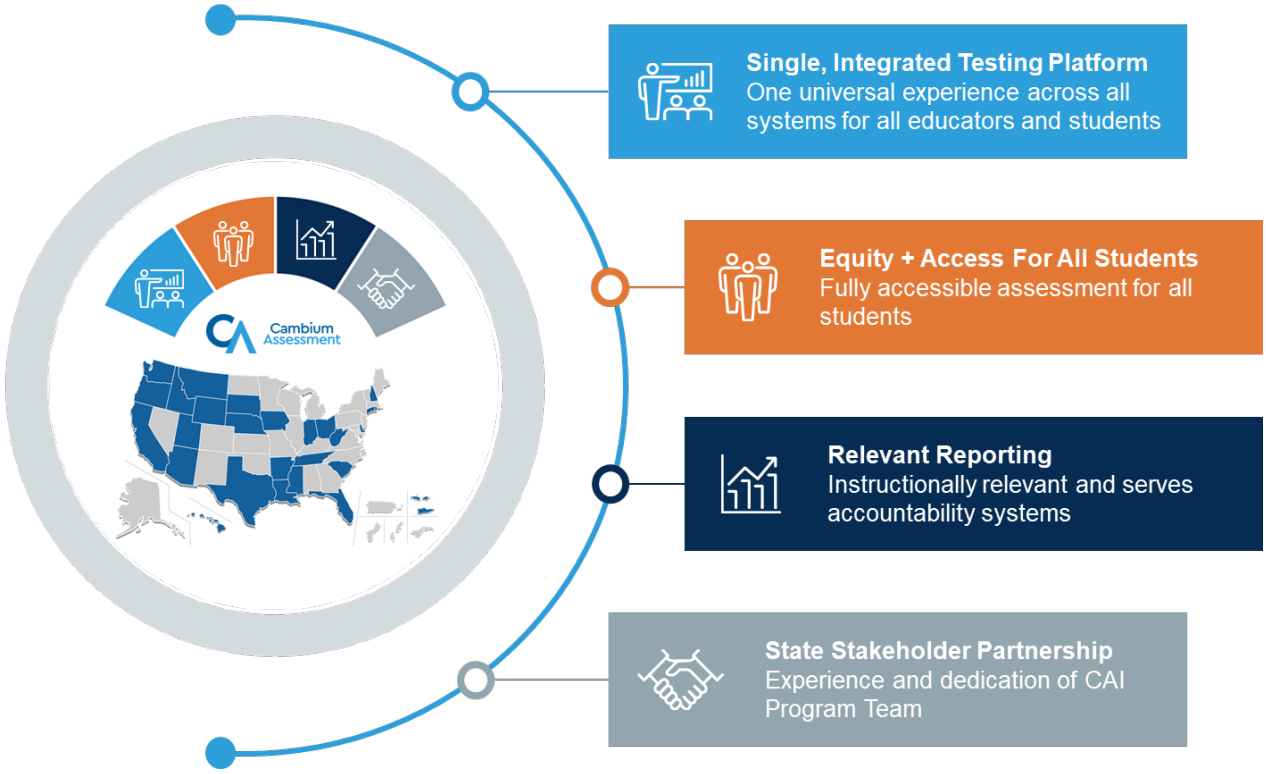
4.7. Comprehensive Testing Program

Introduction

CAI currently delivers customized fixed-form or computer-adaptive assessments in 27 states and jurisdictions. Our various online management, assessment delivery, and reporting applications are seamlessly integrated to provide a powerful solution to meet the requirements of a statewide testing program. CAI delivered more than 100 million online assessments in the 2021–2022 school year, more than 115 million online assessments in the 2022–2023 school year, and more than 124 million online assessments in the 2023–2024 school year. On April 16, 2024, CAI reached a peak load of more than 1.5 million students testing concurrently across all of our clients. These concurrent tests were delivered well within average database latencies of 100 milliseconds and included transactions for computer-adaptive tests. Our technology platform is highly scaled and has been load-tested to show that it can support more than three million concurrent test takers.

CAI envisions a relationship with assessment partners who can work together to support the diverse and complex technical needs of a large-scale program while supporting NJDOE in making decisions on how to best achieve its objectives. Exhibit 4.7-1 illustrates multiple components of CAI's comprehensive assessment system, including our dedicated Project Management Team's collaboration with state stakeholders.

Exhibit 4.7-1: CAI's Comprehensive Assessment System



CAI is committed to partnering with our clients to ensure the following:

- A single, integrated testing platform that emphasizes ease of use and keeps the focus of the assessment program where it should be—on New Jersey students
- Assessments that measure the achievement level and learning gains of all students, as well as their educational strengths and needs

- Equal opportunity for all students by providing the accessibility tools needed to access and use CAI's tests effectively and without distraction
- Timely reporting and immediately actionable data for making decisions at the classroom and school levels
- Quality service that is deeply rooted in a spirit of partnership and shared ownership

Our understanding of and response to the administration, scoring, and reporting requirements are comprehensive. We understand the importance of competency in several different program areas and in ensuring on-time and error-free delivery. In particular, we emphasize the following CAI services to be included as part of this proposal:

- Deployment of a large-scale, dedicated, and experienced Project Management Team with a clear understanding of NJDOE's required schedule and program goals, as well as expert knowledge of CAI system integration points with internal systems and external collaborators, including the management and maintenance of a master schedule across contracts by a dedicated program scheduler
- Implementation of a robust, architecturally sound, and highly fault-tolerant online administration platform that emphasizes the seamlessness of the student experience, accessibility, and system security, alongside accurate and efficient machine and automated scoring services
- Implementation of a dynamic, Single Sign-On User Management System that permits users to manage and fully administer the different facets of the assessment program for their students, inclusive of materials and contact management, online test session creation and management, reporting and data corrections, and access to historical data and informational family and research portals
- Industry-leading psychometric and analytical services from CAI to ensure that requirements are being met in all aspects of test development, validation, administration, scaling and equating, scoring, reporting, and score interpretation
- A flexible and visually dynamic reporting application that provides users with access to student data in various on-screen configurations and downloadable reports
- Unique and industry-differentiating expertise in accountability reporting, referencing our successful past production of error-free Consolidated Accountability Files as an indicator of our ability to systematically understand and implement complex accountability business rule calculations
- Approachable and knowledgeable District Outreach support staff and Help Desk agents, who are recognized for their responsiveness and close collaboration with district partners
- Experienced technical writers, publication editors, training personnel, and professional development personnel
- Integrated and thorough quality assurance (QA) testing within each application team

As described in the following sections, we present a plan that draws upon each organization's strengths and capacity in order to offer a solution that supports NJDOE's vision to produce the nation's leading assessment program for New Jersey students.

4.7.1. Online Testing Delivery Program

CAI's Test Delivery System (TDS) is a very mature, established web application that will be used to deliver all assessments in the New Jersey Next Generation Assessment Program. It has successfully and routinely delivered over 124 million online tests in the previous school year and is approaching the release of its 18th version. Students and test administrators only need a

supported, internet-connected device and the CAI Secure Browser to take a secure assessment.

CAI's TDS meets and exceeds all the criteria that NJDOE has identified in the RFQ, as explained in this section.

CAI's Comprehensive Demonstration of the Online Test Delivery System

CAI will provide a comprehensive demonstration of our online TDS using one or more existing client practice tests that include technology-enhanced items, as well as constructed-response items like those that are used in New Jersey assessments. The demonstration will present the complete testing process, including session creation, student approval, progress monitoring, and session close-out by a test proctor and session login, test selection, options selection, test initiation, test and item interaction, review, and test submission by a student. CAI delivers practice tests using the same platform used for summative and interim assessments; practice tests are modelled on operational items or include released items from prior tests; the demonstration will provide a complete representation of CAI test delivery capabilities. The demonstration will be conducted by senior members of the TDS team who will be able to answer questions on the system functionality and configuration options.

Practice Tests and Ancillary Materials for Public Access

CAI will provide an online practice test site that uses the same applications as the operational test site, such as the Test Administrator (TA) Interface, the Student Interface, and the test management reports. This design ensures that students, educators, and teachers become familiar with the online testing system before operational testing begins.

The practice test site and operational site will share the same code (i.e., the application version), configuration, and hardware. On the practice test site, CAI will work with NJDOE to build a blueprint that is aligned to or a subset of the blueprint for the operational tests, thus providing users with exposure to all item types.

We propose to provide online practice tests at least three months before the specific testing window begins. CAI will deliver grade-level practice tests that

- are delivered using the same system as the operational test, so that the student experience is the same in every way;
- include the same embedded accessibility features that are in the operational tests;
- include every item type that students will encounter on an operational test;
- can be accessed using an ordinary browser (rather than our CAI Secure Browser, though specific functionality may require the Secure Browser); and
- can be anonymously accessed for independent practice, or in proctored sessions, which enables test administrators to practice their duties.

CAI will work with NJDOE to define the appropriate practice tests. Practice tests will include items and tasks from prior operational administrations. We can work with NJDOE on item-scoring models so that all online practice tests will be automatically scored, and students will be provided with scores in real time.

Every item type that students will see on the operational test will be available on the online practice site. As new constructed-response item types become available, tutorials and practice materials will likewise be deployed to the practice and training sites.

The practice does not simply mimic the functionality of the operational test site, but uses the same TDS used to administer operational test administrations. Of course, the practice test can be accessed using non-secure browsers as well as secure ones. Configurable features include the following:

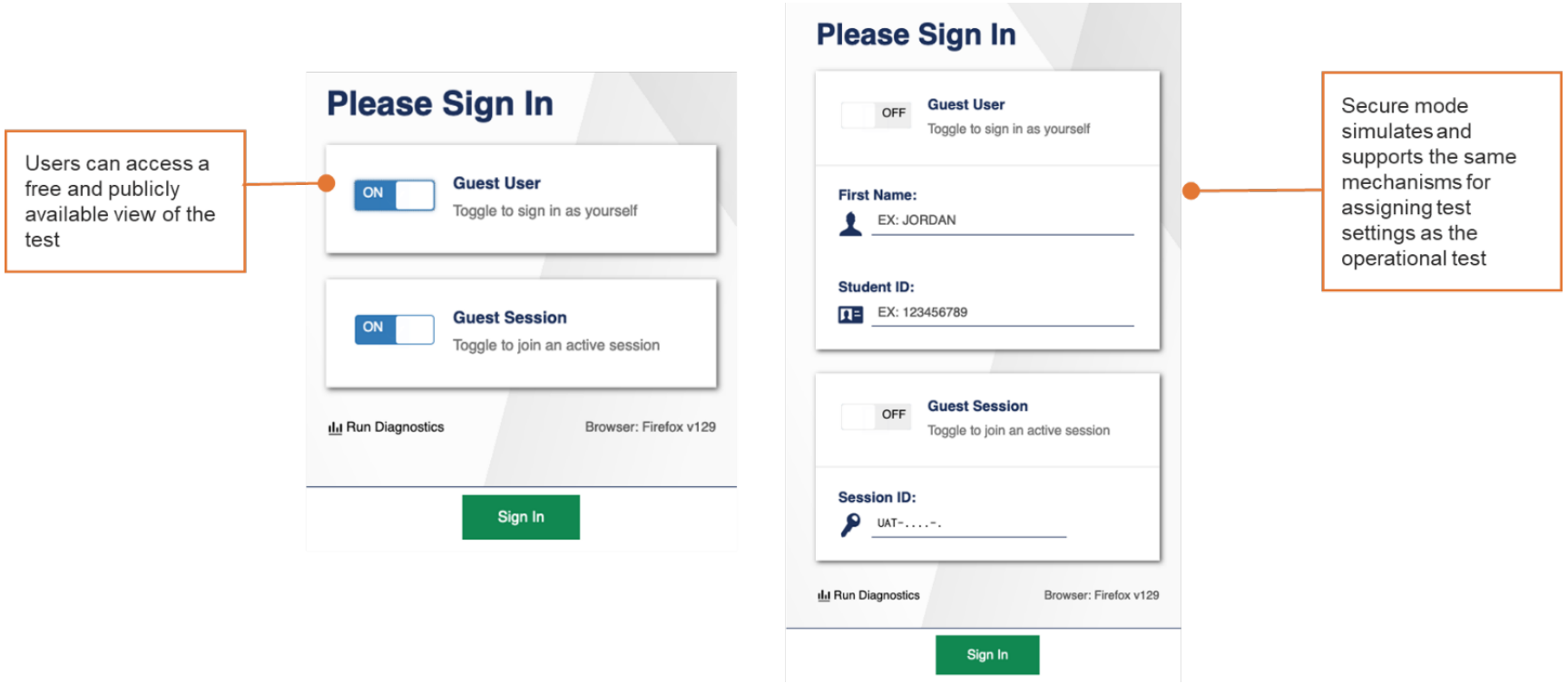
- **Test Blueprint.** NJDOE can choose which content areas and items to include in this site. Practice tests can have blueprints that differ from their operational counterparts.
- **Anonymous Students.** NJDOE can choose whether students who use this site have to be pre-registered in the system.
- **Anonymous Test Administrators.** NJDOE can choose whether test administrators who use this site must be preregistered in the system. For example, parents helping their children prepare for the test may want to play the role of test administrator and create sessions for the tests that their children are practicing.
- **Instant Score.** NJDOE can choose what scores or other information to display to the student at the end of the test.
- **Accommodations and Modifications.** Any accommodations or modifications can be turned off or on by test.

CAI's TDS can deliver practice tests in two modes: (1) Guest Mode and (2) Secure Mode (refer to Exhibit 4.7.1-1). In each mode, the practice test always uses the same applications as the operational test environment, such as the TA Interface, Student Interface, and test management reports.

In Guest Mode, anyone can anonymously log on to the system and take any test offered. Users can experience all item types as presented in the Student Interface, including performance tasks. Because the tests are anonymously administered, there is no way to resume a paused test. At each sitting, users start a new test. Anonymity also implies that users may take as many tests as they like, because the system cannot track how many tests have been taken. Many states enjoy the benefits of a freely and publicly available view of the assessment, which provides transparency to parents and other stakeholders. The practice environment allows students to configure their own settings. In Guest Mode, the user can select from among the available accommodations and supports at the beginning of the test.

The design of the Secure Mode ensures that students, educators, and teachers are familiar with the online testing system and procedures before operational testing begins. The system delivering the practice test will be the same system delivering the summative assessment, so the same set of accessibility tools, accommodations, and embedded supports are available. When the test is delivered in Secure Mode, the system will support the same mechanisms for assigning test settings that are supported in the summative assessment.

Exhibit 4.7.1-1: Delivering Practice Tests in Two Modes



CAI will develop ancillary materials for practice tests, including guides for parents. These will be available on the New Jersey Assessment Portal (as described in Section 4.2.5.2).

Fully Supported Test Administration with Training, Troubleshooting, and Problem Resolution

Comprehensive Training

CAI will provide a comprehensive suite of virtual training sessions and online training modules to assist New Jersey educators and administrators in preparing for and administering assessments and interpreting results. We commit to meeting all requirements in the RFQ and to providing additional training modules that exceed those required. NJDOE will approve all language, content, and format of the trainings.

Our comprehensive training for all stakeholders covers all requirements outlined in the RFQ, including the following:

- Training sessions for district and school staff to train each stakeholder group on each component of the testing system (i.e., Test Information Distribution Engine [TIDE], TDS, Centralized Reporting System [CRS], Authoring)
  - Included in these sessions are training sessions on processes for paper-based and computer-based testing.
- Practice tests that can be used by school and test coordinators as a full dress rehearsal for the operational test
- A series of online training modules that cover all aspects of test administration, the online system, security protocols, and different modes of testing
- A mandatory online TA Certification Course that requires test administrators to pass a quiz on the logistics of starting, pausing, monitoring, and ending a test session before they can access the TDS to administer a test
- A district readiness tool, CAI Secure Browser installation instructions, a quick guide to technology setup, and a technology coordinator webinar to support technology coordinators in the logistics of technology setup in schools and districts

CAI will collaborate with NJDOE to develop, design, and produce all training materials and we will provide a training project plan at the beginning of each fiscal year. NJDOE will have successive rounds of review on each training deliverable, as well as the proposed training plan.

Please note that training sessions will closely mirror the content to be included in the training modules. We organize these materials, whether virtual training or online modules, into the following three categories:

1. Training to prepare for online testing
2. Training to administer online tests
3. Training on tasks that take place after testing is complete

All training will include the following:

- Accommodations, such as closed captioning (an American Sign Language [ASL] interpreter will be provided)
- Pre-registration and a confirmation notice, which includes training logistics
- A guest feedback survey capturing participant evaluation of the training content and delivery format

- Facilitation by the NJDOE Service Center to accept registration requests up to one hour before the training session

Troubleshooting and Problem Resolution through the New Jersey Service Center

As described in Section 4.2.4.2, CAI's industry-leading Service Center will ensure that New Jersey schools, districts, staff, and educators receive prompt and accurate responses to their questions and requests related to test administration, test scoring, and CAI testing and reporting systems. We have a proven track record of supporting many complex and nuanced assessment programs across our 25 current state clients. Our Service Center provides technical and logistical support to anyone needing assistance with program operations or navigating our systems. Customer service agents assist users in moving through the full testing experience with the express purpose of minimizing burden, disruption, and inconvenience.

Tiered Customer Support

CAI uses a tiered structure to facilitate rapid resolution of every query. We rely on an integrated tiered structure, where support is organized into three levels in order to manage increasing levels of complexity in the most efficient manner possible. Agents at all levels will receive training specific to the New Jersey program and will utilize the tiered structure to effectively support the different types of client and user issues across these three levels of service. As described in more detail in the following section, CAI uses 8×8 Virtual Contact Center at all tiers to facilitate management of user calls by logging, tracking, and escalating all telephone contacts, emails, and chat interactions between CAI Service Center agents and users.

CAI will provide NJDOE with the issues escalation protocols currently in use for our state clients as a starting point for review; alternatively, we can begin with NJDOE's existing protocols, if preferred. While most user contacts are resolved at Tier 1, we understand that some issues require greater levels of technical expertise or troubleshooting, and our escalation protocols allow agents to manage such issues with ease.

Using our integrated customer-support services platform, 8×8 Virtual Contact Center, we can actively monitor all contact channels in real time to ensure that any call about an urgent or potentially urgent issue is promptly identified and escalated. Agents across our levels of service will be trained on New Jersey-specific call-handling protocols, including immediate notification of NJDOE about any calls of an urgent or sensitive nature.

Tier 1. As described, our client support service provides an efficient, tiered structure that facilitates rapid resolution of customer queries even when a query needs to be escalated; Tier 1 agents also have a history of quickly resolving the majority of inquiries they receive.

Our Tier 1 agents are trained to answer routine questions and to provide explanations and clarifications using scripted and semi-scripted responses, including such things as password recovery, basic system navigation inquiries, material orders and returns, and issues related to test registration, test administration, and the reporting system. With both full-time employees and seasonal hires, our Service Center is well staffed at Tier 1 to address peak call volumes. When a case cannot be resolved at Tier 1, the agent understands the importance of quickly determining that the case should be escalated in order to provide the most efficient service. In such a case, the agent will inform the user that their inquiry will be escalated to Tier 2.

Tier 2. When a caller presents a question or request that entails more in-depth analysis to resolve, the case details are promptly escalated from Tier 1 to Tier 2. A Tier 2 agent is then assigned as owner to the case in 8×8 Virtual Contact Center. The Tier 2 agent reviews details and then initiates contact with the user to gather additional information and update the user as

the case progresses. The agent attempts to replicate the issue by using the screen-share feature in Zoom or another online meeting software, or by following established troubleshooting protocols.

Tier 2 agents will work within the NJDOE-required final service-level agreement (SLA), but for any escalated case our standard protocols call for an initial response by a Tier 2 agent within two hours of escalation. If a case cannot be resolved within 24 hours of the initial response, the assigned Tier 2 agent must provide a plan to resolve it and must remain in daily contact with the contact/school until the issue is resolved. A detailed SLA will be approved by NJDOE and included in the service plan for each administration.

For any issue that results in a student being unable to test, a Tier 2 agent will manage the case until the issue is resolved and confirmation is received that the student has access to their test. All such cases will be reported daily to NJDOE in accordance with the SLA.

Tier 3. In the rare event that an issue cannot be resolved at Tier 2, the case is escalated to Tier 3. Ownership of the case remains with the Tier 2 agent, who will follow the case's progression, provide updates to the user, and obtain additional information from the user if needed. At Tier 3, dedicated resources on the CAI New Jersey project team will work to resolve each case with the appropriate CAI technical staff (e.g., network engineers, software engineers).

Escalation of Calls

CAI and NJDOE will work together to establish escalation protocols that include escalation triggers and response times. The agreed-upon triggers and times will be implemented in 8×8 Virtual Contact Center. Inquiries tagged as priority will be escalated more quickly in the system and will trigger notification of NJDOE.

We understand that call handling—specifically, calls being escalated between tiers of service—needs to be carefully managed and professionally handled, and that clients should feel supported even when their calls need to be transferred to a higher tier for resolution. We understand the real pressures on school and district personnel during test administration, and our agents are dedicated to supporting your district and school personnel while ensuring that every inquiry receives the correct level of technical support to resolve.

To promote efficient resolution and ensure that escalated cases with priority designations are expedited, team leads and the CAI New Jersey project team monitor all open cases across service levels until the cases are resolved. All escalation protocols, SLA, and detailed staffing plans will all be documented in the New Jersey Service Center Service and Staffing Plan that will be provided to NJDOE during the test administration planning period and well in advance of the first test administration and each subsequent administration.

Sufficient Testing Capacity

CAI has multiple processes in place to ensure that sufficient testing capacity is available at all times. The two key elements are: (1) thorough capacity planning conducted in collaboration with each client prior to the start of the testing year, and (2) highly scalable systems that can be scaled up to meet changing demand. Capacity planning and system scaling are discussed later in this section.

As discussed in Section 4.2.5.3, overall TDS capacity is driven by the capacity of several TDS components, including the Login Database Server, Login Web Servers, Shard Database Servers, and Testing Satellites.

New Jersey will share a login database server and login web servers with other clients. CAI determines the capacity for those servers based on the overall capacity requirements of all

clients with sufficient excess capacity to handle unexpected loads. The anticipated capacity for these components for the environment that will support New Jersey testing will be in excess of one million concurrent students. While CAI will provision excess capacity for these servers, the servers can be quickly expanded as needed should demand far exceed projections. This is a benefit of hosting TDS in Amazon Web Services (AWS), which provides a flexibility not available in a traditional hosting environment.

CAI will configure two TDS Shard Database servers for New Jersey. *Shards* are the demographic history servers that are the primary repository for student test response data and are very active during the student's testing session. As each Shard Database server is rated to support in excess of 150,000 simultaneous students, this will provide a capacity for over 300,000 students simultaneously testing. The login servers can also be scaled up if demand far exceeds expected usage.

While CAI can maintain TDS Satellite capacity at 250,000 concurrent students year-round, we would not recommend this since it would be an unnecessary expense for New Jersey and decrease the return on investment for the assessment program. CAI architecture allows for immediate scaling up and down, as needed. As described in the following section, CAI proposes to leverage the scalability of TDS to ensure sufficient capacity on a day-to-day basis while minimizing operating costs. Each TDS satellite can support 20,000 students and CAI will have at least two satellites deployed each day to ensure redundancy and system reliability. CAI can place additional satellites in service in less than 30 minutes if needed to support testing demand.

Scaling Test Delivery to Meet Unplanned Requirements

CAI's TDS uses a hybrid architecture of dynamic and fixed resources. This design provides an unparalleled combination of elastic scalability with reliability. The TDS is hosted on AWS infrastructure using an Infrastructure as a Service (IAAS) model; stated simply, CAI uses the computing, storage, and network resources provided by AWS and develops all the application and database code in-house, along with all processes for setting up and managing a large-scale cloud deployment. Dedicated connections within AWS provide a secure, express channel between our systems and the Quality Monitor (QM) System in AWS, where completed tests are routed.

TDS architecture includes the core components described in the following sections.

TDS Login Component

TDS login components are dedicated servers that are responsible for user login and test session load balancing. Proctors using the proctor application are authenticated through our common Single Sign-On (SSO) platform. The login component automatically directs the proctor-activated session to one of the various test delivery servers where active test taking occurs. Similarly, when students launch the Secure Browser, they are connected to the login component where they enter the student credentials (typically, their first name and state ID) along with the session ID provided by the proctor. The login component will authenticate the student and redirect the Secure Browser to the specific test delivery servers where that particular test session is assigned.

The login component employs a farm of web servers behind a network load balancer and database servers. The web server farm provides redundancy and additional capacity to handle any burst loads that are typical on a heavy testing day. The architecture allows us to linearly scale by simply adding more servers to meet the desired capacity. Note that CAI believes in pre-scaling our infrastructure so that all required resources are available, tested, and ready for test takers. We do not rely on AWS for any load-triggered auto-scaling. Auto-scaling is not

instantaneous and can result in test takers being negatively impacted. Our approach to scaling the infrastructure before the load arrives ensures that there are no impacts to test takers, even on the heaviest testing days. All database servers are backed up and redundant.

Demographic History Servers

Demographic history servers are high-powered, massively scaled, dedicated database servers where testing history and all student tests taken during the current academic year reside. Once students log in, the system will use the testing history for the student to determine if they have any tests that they have previously started but have not completed. These servers work in concert with the constellation of test delivery servers (described in the following section). Students entering a test session to complete a previously started test (or to start a new test) will "check out" the test from the history servers. The tests are then delivered to the test delivery server where the active test taking will occur. Once the test is complete (or if the student pauses the test), those tests will be "checked in" to the history servers. These servers also handle the data transfers to the downstream QM System for all completed (or expired) tests. These servers are backed up and run as clustered servers in an active/passive setup to ensure maximum reliability and data redundancy.

Test Delivery Servers

Once proctors and students have successfully been logged in, they are transferred to a test delivery server where all computation and transactional activities around test session monitoring and test taking occurs. These test delivery servers represent the dynamic component of our architecture. Each test server is capable of testing more than 25,000 concurrent users. Simply by activating new servers, we can linearly grow our capacity. CAI has a sophisticated capacity planning model that we use to estimate the number of servers that we need to meet the expected testing volumes. We will meet with NJDOE and, using the testing windows and student population as references, provide a capacity plan that will show exactly how many of these servers we will have to support NJDOE's program. We are conservative in our estimations and always provision extra servers to ensure that we can handle the volumes with sufficient margin.

Each server is an independent, high-performance machine specifically designed to handle the transactional volumes associated with test taking. During a high-volume testing day, these servers need to handle millions of transactions and we achieve this with latencies that are measured in milliseconds. The databases that we use on these servers ensure that all data are securely stored and backed up. Furthermore, by having many independent servers, we increase our system's overall fault tolerance. Even in the highly unlikely event of one of these enterprise-grade servers going offline, the impact is limited to only those test sessions that happen to be running on that server. We can quickly and easily switch to another server and resume testing with no data loss.

CAI has developed a predictor process that runs each morning, approximately 45 minutes before expected peak testing volume is reached. This predictor assesses student testing concurrency against expectations and system capacity and automatically spins up additional test delivery servers as needed to ensure sufficient capacity at peak demand.

Load Tests to Verify System Capacity

Prior to each major assessment cycle, CAI conducts large-scale system load tests. These load tests simulate the effects of real students from all clients at the peak of the testing season. These load tests take place in the evening hours on the real, operational system with real test items and content. CAI's custom-built load tester uses millions of proctor and student accounts to simulate the login and testing experience from end to end in the platform. Representatives

from all teams participate in the stress test and monitor things like database latencies, utilization, and client-side perceived latencies. We closely study all latency and error logs, bandwidth utilization, and data throughput, and then we make system modifications, corrections, and augmentation where needed. These tests are conducted a minimum of five times a year and prior to any major software change.

Estimation of Expected Student Concurrent Load

We estimate concurrent load based on the following factors:

- *Testing window length.* The shorter the testing window, the higher the concurrency.
- *Number of devices*. The larger the number of devices (and the more robust the test lab infrastructure is at the schools and districts), the higher the concurrency.
- *Time zone.* We look at time zones for each client and study their peak testing periods relative to one another.
- *Historical concurrency trends.* We look at percentage of increase over time.
- *Eligible student population.* We look at student population for the state, as well as the number of tests the students are eligible to take.

Exhibit 4.7.1-2 shows the driving factors of expected concurrency using New Jersey figures.

Exhibit 4.7.1-2: Driving Factors of Expected Concurrency

Factor	New Jersey
Testing Window Length	Main testing windows: Approximately three weeks
Eligible Student Population	100,000 per grade
Time Zone	Eastern
Historical Concurrency Trends in New Jersey	TBD
Estimated Load	250,000

Verifying Test Readiness

CAI's TDS includes an online diagnostic readiness tool (described later in this section) that allows schools and districts to test and verify technology, hardware, and software. CAI will also work with NJDOE on developing sample/practice tests using released/sample items. The practice tests will be deployed on the same platform that we propose to use for NJDOE. Proctors and students will have the same experience taking practice tests as they will the operational NJDOE assessments. CAI can commit to having the Secure Browser, diagnostic readiness tool, and practice tests ready at least four months ahead of the start of test administration. CAI recommends that schools follow the following three-step process for evaluating district readiness and verifying the capacity of the technical infrastructure:

1. District and school staff confirm system configurations and install the CAI Secure Browser on testing devices.
2. District and school staff run our diagnostic readiness tool to ensure that the network can support the planned number of testers.
3. Districts conduct a district-wide practice test day to check both technology and staff readiness.

The first step will confirm that all planned testing devices can run the Secure Browser, which is the key component for test administration. The second step will help schools and districts to measure and verify their maximum testing capacity. The third step will provide a realistic cross-school check of the district's network readiness. The practice test day will also evaluate the TA processes, provide training, and allow schools to resolve challenges in their planning in an environment that is lower in stress than the testing day.

CAI's Diagnostic Readiness Tool Supports Recommended Three-Step Process for Verifying Technology Readiness

Diagnostic Readiness Tool. CAI's web-based diagnostic readiness tool assesses the preparedness of specific computers for testing. One of the tool's features is a download and upload speed check that estimates the number of test takers who can simultaneously test at the same location. Exhibit 4.7.1-3 provides a sample screen capture from this easy-to-use tool.

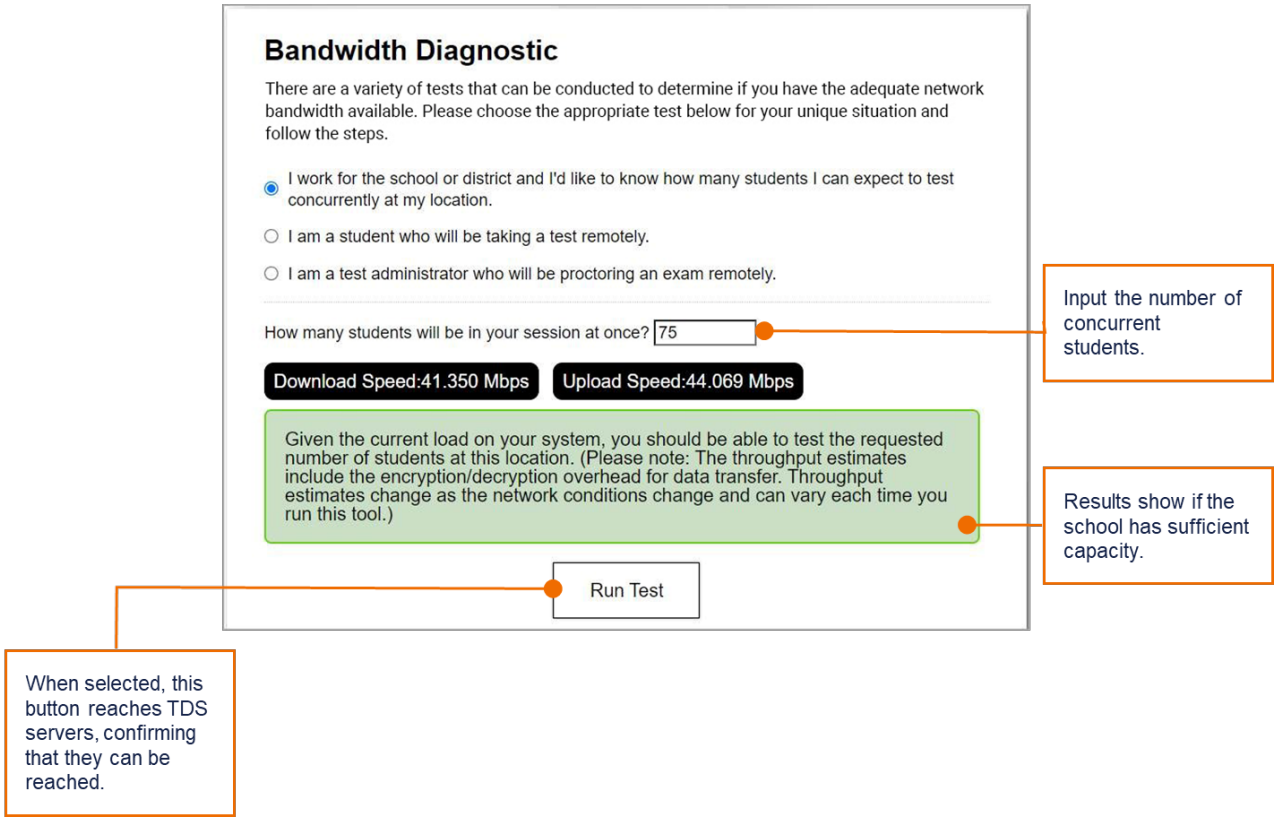
The diagnostic readiness tool can be run on all platforms supported by CAI's TDS. Typically, no network reconfiguration is required at the school. Sometimes, school or district networks are configured to restrict access to only certain allow-listed IP addresses. In these cases, the schools must add CAI's URLs or IP addresses to their allow-list. Unusual configurations, such as certain proxy server arrangements, may need adjustment to allow traffic to appropriately pass to our servers or prevent proxy servers from caching content, which may be updated. CAI has experience with many of the security products commonly used by schools, and we provide simple instructions to address these rare cases.

The diagnostic readiness tool uses a sophisticated statistical model of the testing process that models variation in instantaneous demand (e.g., the number of students who simultaneously press the Next button) and evaluates the likelihood that peaks will exceed network-free capacity (not used by other processes) with a frequency likely to cause noticeable delays in testing.

Practice Test Day. CAI will work with NJDOE on scheduling a practice test day. This day can be made available during an agreed-upon timeframe and can provide the benefits of a dry run, allowing teachers, administrators, and students to rehearse logistics and use the software as part of their planning.

As part of the practice test day, districts will complete a pre-testing preparedness checklist and administer a practice test. This is an opportunity for districts and schools to prepare for operational computer-based testing administration by simulating test-day network utilization, resolving any school or district issues, and confirming that all devices that will be used for testing can run the appropriate software. The trial should take approximately 15 minutes.

Exhibit 4.7.1-3: Diagnostic Readiness Tool



Additional Diagnostic Checks

In addition to testing bandwidth, schools and districts can use the same diagnostic readiness tool to run audio, video, and text-to-speech (TTS) checks if tests use multimedia. Refer to Exhibits 4.7.1-4 –4.7.1-8 for example screen captures.

Exhibit 4.7.1-4: Audio/Video Checks

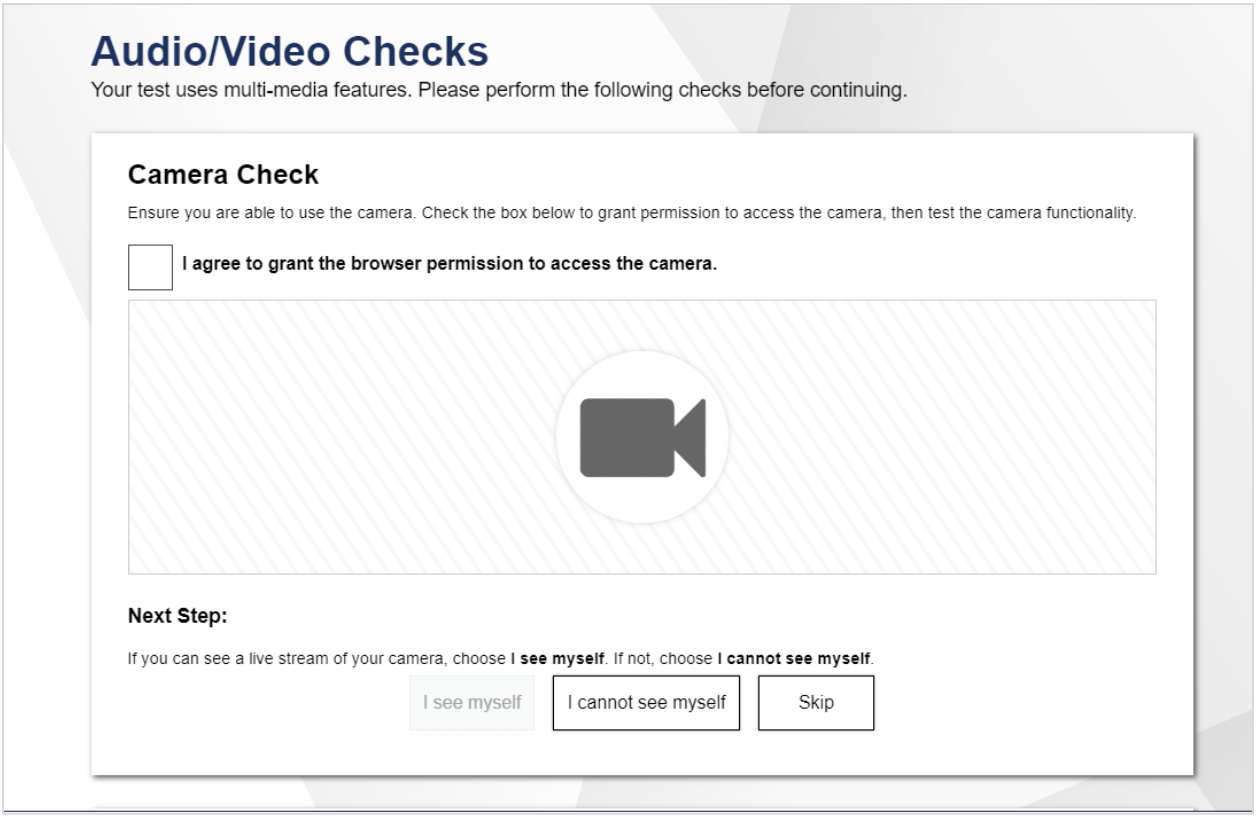


Exhibit 4.7.1-5: Microphone Check

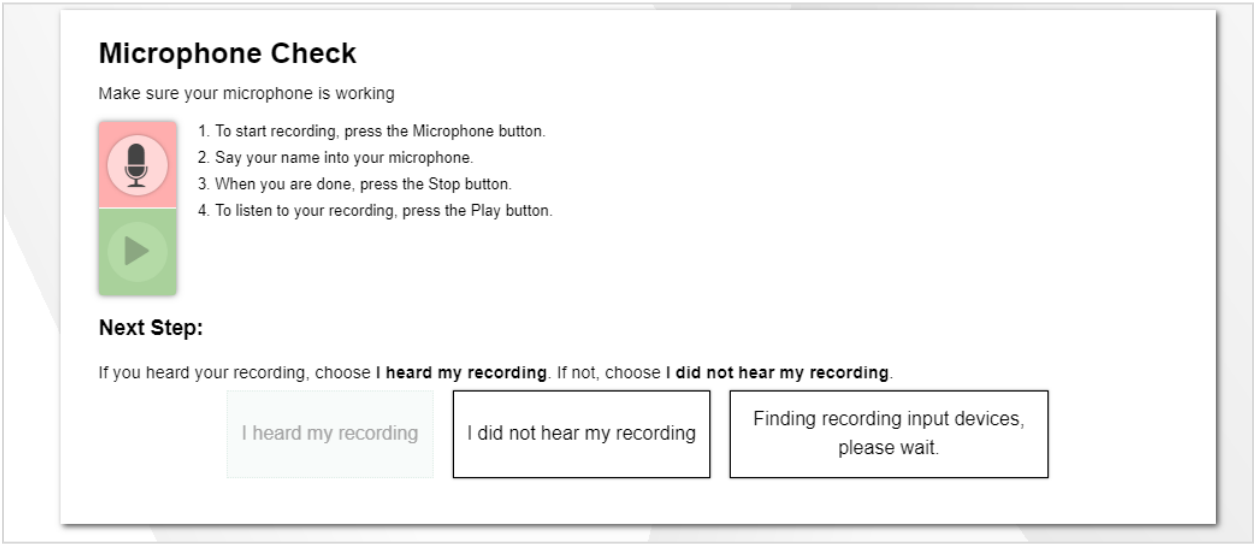


Exhibit 4.7.1-6: Audio Playback Check

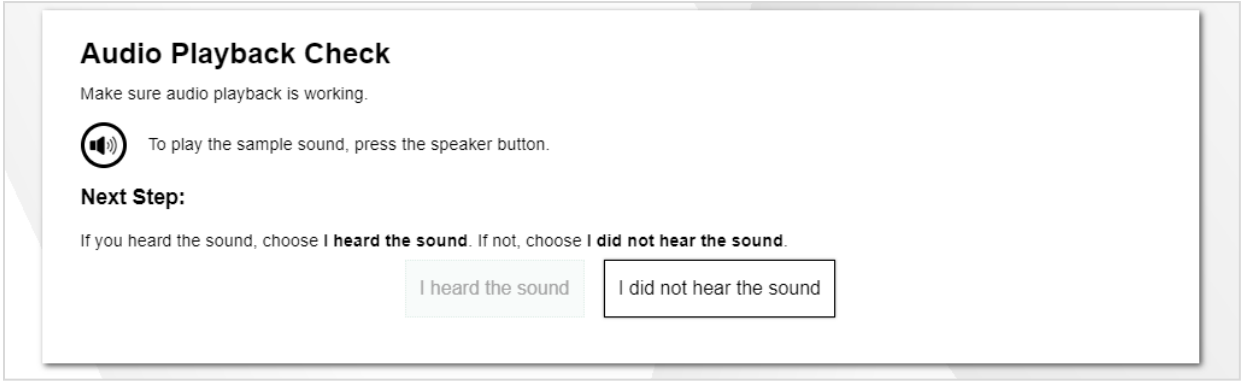


Exhibit 4.7.1-7: Video Playback Check

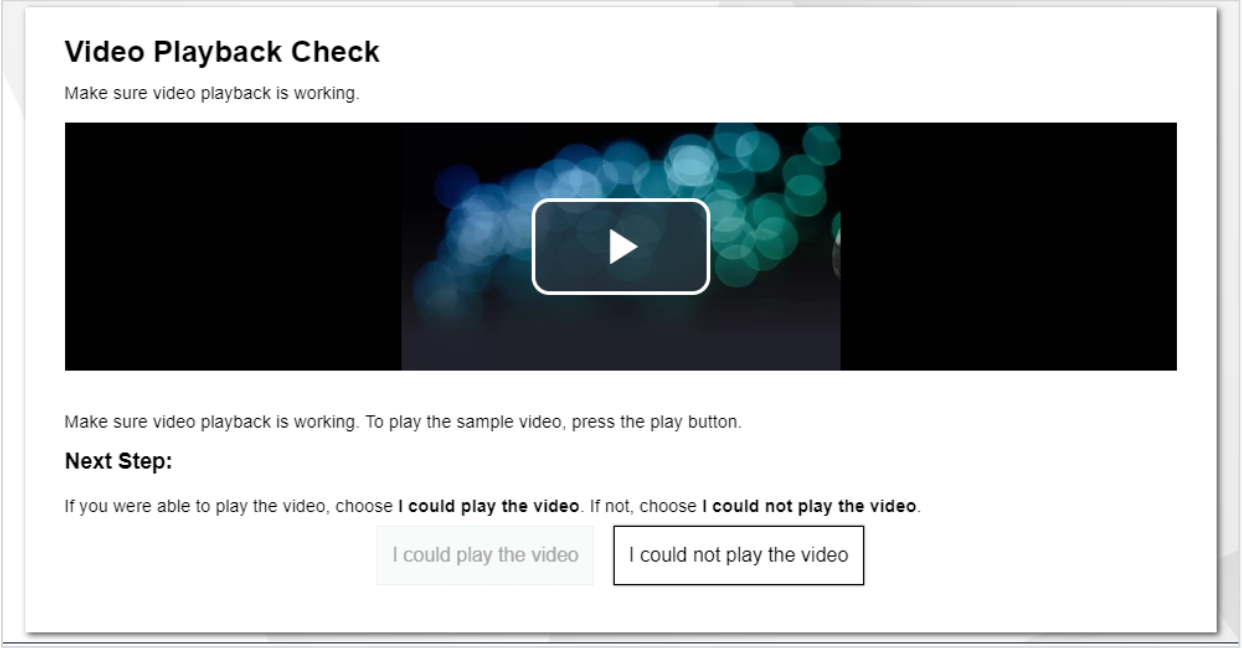
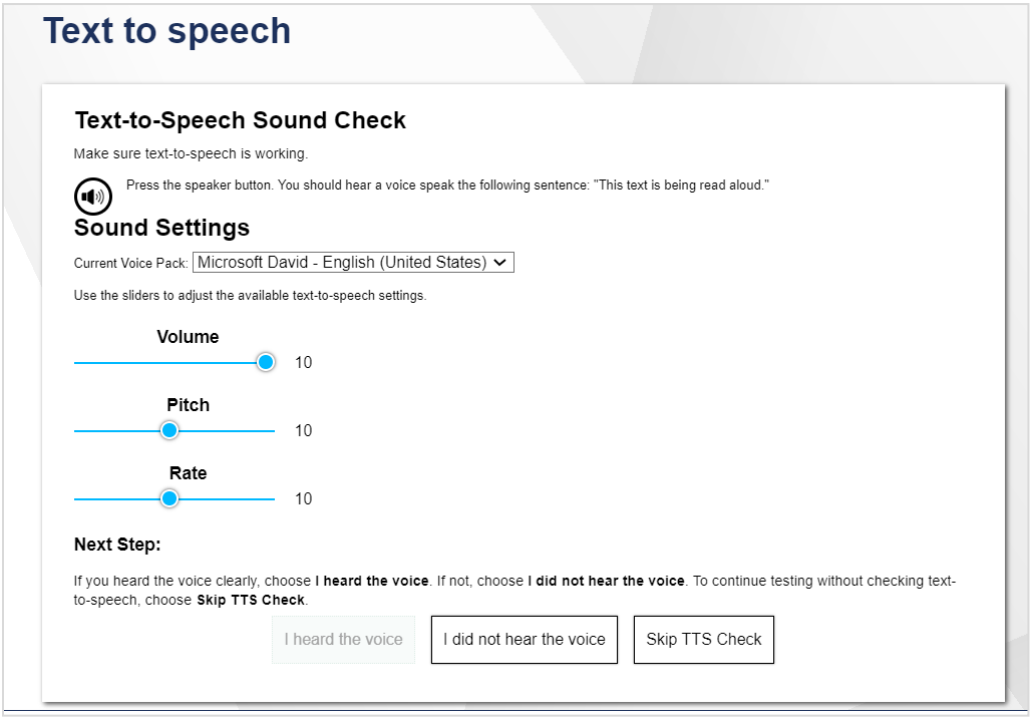


Exhibit 4.7.1-8: Text-to-Speech Check



NJDOE User Acceptance Testing Each Administration Year

Before deployment, the testing system, all supporting systems, and content are deployed to a staging server, where they are subjected to user acceptance testing (UAT). The UAT environment reflects the production environment and serves as a software and content evaluation site, giving NJDOE an opportunity to interact with and approve all CAI systems before they are deployed to production and are made available to users.

The UAT process is conducted by the CAI Project Management Team and NJDOE. It is a highly collaborative process whereby CAI and NJDOE work together to ensure that the tests and test environment match the specified configurations, and that the student testing experience is error-free. The process will integrate all the systems with the application versions and tests that will be deployed to production once NJDOE signs off on the UAT process.

UAT is an iterative process that results in the TDS delivering error-free tests that match specified functional requirements. The constant communication exchange with CAI and NJDOE using the UAT Issues Log continues until all issues are satisfactorily resolved. In addition to system functionality, at NJDOE's request, other materials (e.g., resources for school/district readiness, monitoring procedures) can also be evaluated. Once NJDOE is satisfied that all issues have been resolved, NJDOE provides formal approval by notifying CAI that the system and tests in the UAT environment are ready to be deployed to the production environment. This final approval must be obtained before the testing window opens.

While UAT is a critical activity leading up to test delivery, it is not a substitute for comprehensive system testing. The TDS quality assurance team designs and carries out a full suite of test cases across supported device platforms and operating systems. These test cases cover regression tests, security tests, stress tests and validation tests. At NJDOE's request, CAI can show evidence of successful execution of all these tests.

User Acceptance Testing Prior to Each Testing Window

Each test will be deployed to the TDS UAT environment at least 30 days prior to deployment to production and the start of the testing window. The TDS UAT environment will have the latest version of the TDS software and the test will be fully configured with all test forms and content available for verification. NJDOE will be able to utilize demo students to take assessments to validate test configurations and test content.

CAI will resolve any test configuration or content issues identified during the UAT period or requested by NJDOE prior to deploying the test to the production environment.

After the production deployment has been completed, the tests will be available for final validation through CAI's Secret Test Mode, which allows demo proctors and students to initiate tests in the production environment before the start of their testing window. Secret Test Mode enables the post-deployment validation of new assessments during business hours without opening them to field users. NJDOE will be able to use this facility to verify the production deployment process and ensure that the test is configured as expected and that test content is complete and correct.

4.7.1.1. Security Requirements

CAI will meet and exceed the security requirements of the Statewide Information Security Manual and those outlined by NJDOE in the RFQ. In addition, we acknowledge and will comply with the provisions set forth in Section 6. Data Security Requirements.

Each requirement in Section 4.7.1.1 of the RFQ has been identified and addressed in Exhibit 4.7.1.1-1, providing a simple, concise response.

Exhibit 4.7.1.1-1: How CAI Meets the RFQ Security Requirements

Requirement	CAI Response
A. Test access control, such as limiting test access to specified testing windows and times of day within the testing window.	The Test Information Distribution Engine (TIDE) and the Test Delivery System (TDS) each support a variety of different access controls, such as test eligibility criteria and statewide and locally controlled testing windows. Each of these access controls are independently configurable as low as the test level.
B. Student authentication (e.g., login ID, password) to access an online test. The Contractor shall ensure that the required authentication information for gaining access to an online test be generated only within a secure administrative system. A student test record shall exist in the administrative system before the corresponding authentication information may be generated.	Students must first be registered in TIDE before they can gain sufficient credentials to log in to the TDS. Student login in TDS is configurable by client, but the most common student login credentials consist of a student's (1) first name and (2) state-assigned student identification number. In addition to the usual credentials, a session ID, created at the time of testing by the proctor, is also required before the student can progress beyond the software's login screen.
C. Administrative authentication (e.g., login ID, password) to gain access to administer online tests, view/maintain student data, and access student performance reports.	All educators at any level in the State hierarchy will be required to be registered and validated through TIDE before they are able to log in to the system.
D. Administrative user accounts capable of being assigned varying levels of role-based access and functionality, and capable of being activated or inactivated as needed.	Each system in the suite of CAI systems has a configurable set of role-based permissions which will further limit a user's access to only those data that they should be permitted to access. For example, a role can be created that permits only the ability to deliver an online test in the TDS, but that same user can be denied access to performance reports.
E. Security of test content and student data while at rest or in transit.	All transmission of secure data takes place using Secure File Transfer Protocol (SFTP) or TLS 1.2. When the transferred data include student personally identifiable information (PII), the transfer software encrypts the files upon upload to the site. Files remain encrypted while they are at rest, and Secure Sockets Layer (SSL) encrypts the data in transit. We recommend that our clients use similar SFTP software when the data arrive at their site to re-encrypt data when they are at rest on their servers.

Requirement	CAI Response
F. All test content encrypted at the host server and remain encrypted during all network transmissions.	Content resides only on our testing servers, and all data transfers are over HTTPS. Test content is protected at rest because our testing servers do not have any remote access enabled. Only specific CAI staff who follow strict procedures and undergo training have access to these servers. Finally, the dedicated server role eliminates most common threat vectors (e.g., there are no emails and no mapped drives and there is extremely limited access).
G. Only valid authentication information may enable test content to be decrypted to a viewable format. For protection purposes, the Contractor shall ensure that decryption to memory only (versus being written to disk) is provided for its test content. No decrypted or unencrypted test content shall exist on equipment outside the hosting facility or the NJDOE's physical location.	Content is encrypted using a proprietary encryption mechanism to ensure that wherever it travels, it is protected. However, when content is decrypted for delivery to the student, the decrypted version is stored only in memory and expires when the browser is closed, leaving no trace on the user's machine. Content is served to testers strictly through the application layer, which performs multilayer authentication, authorization, and context-sensitive checks. Our end-point security model locks down the student machine, preventing access to other applications and operating system capabilities that pose threats to item security. Regardless of specific devices, no content is stored on the testing end points. During testing, the system monitors continuously for execution of deny-list applications or unknown applications taking focus from the CAI Secure Browser. If a threat is detected, the student is stopped from testing. Only authorized personnel are provided with server access. This access is limited to specific CAI and, Amazon Web Services (AWS) systems engineers, who follow strict procedures and undergo specialized training. No access is granted without approval and a ticket (Jira).
H. Test content accessed via valid authentication information must be displayed only while the student is taking the test. Upon completing the test, any residual, decrypted test content must automatically be removed from any systems outside of the host systems.	Test content delivered to the student's machine is viewable only during that test session. All residual content is cleaned when the web browser closes, and no action is required by the test administrator. It is an automatic process.

Requirement	CAI Response
I. If caching technology is utilized, details must be provided (and approved by the State Contract Manager prior to implementation) on how the cached content is secured, managed, and purged.	CAI's optional TDS Edge system for local caching will keep all content encrypted within the supplied server that the school or district rents. Even if the device is compromised, all content residing on disk is encrypted using CAI's proprietary encryption algorithm and will be useless to an attacker. The Edge system is self-managing and maintained server-side by CAI, not by the local school or district entity. If any content is to be added to or removed from the system, that action will be remotely triggered.
J. Ensure all transmissions of student data shall occur over secure network connections that utilize authentication and encryption technologies.	All data exchanges between the student testing device and our central servers run over encrypted HTTPS sessions with Transport Layer Security (TLS) 1.2 or higher. Furthermore, all secure data are encrypted at rest and in transit.
K. Automate assessment security configuration on client devices used by students during testing.	The CAI Secure Browser is the only software that needs to be installed locally on the student's device. After that, all assessment security features and protocols are controlled automatically server-side by CAI per the security policies of NJDOE.
L. Ensure that while students are testing, decrypted test content is protected through control of the client device. Access to other applications or web sites must be disabled or disallowed while a test is being accessed. Please note that the Contractor shall provide a plan to integrate third-party assistive technology devices or software with the software that will deliver assessment content to students. Strict controls must be maintained over operating system functionality, printing, copying and pasting, screen captures, keyboard shortcuts, right-mouse clicks, or other functionality that could compromise test content.	The CAI Secure Browser locks down the students' testing machine by presenting the testing interface in full-screen/kiosk mode, blocking operating system shortcut keys and preventing any access to other websites or applications, copying and pasting, printing, and screen capturing. The Secure Browser is constantly tested to ensure that it provides a locked-down, secure testing environment. All these automated features are part of the system. Configuring and enabling them requires no local intervention. The Secure Browser can interoperate with third-party assistive technology in a special mode called "permissive mode." This mode can be triggered only by the student obtaining a special accommodation through TIDE before starting the test. When the mode is enabled, it temporarily stops the blocking of necessary keyboard shortcuts and other functionality of the operating system so that the student can use both applications simultaneously. More generally speaking, the application is designed to be simply a website running in a web browser. As long as the third-party assistive technology is compliant with Web Content Accessibility Guidelines, it should interoperate with no trouble at all.

Requirement	CAI Response
M. Ensure, at all times, that security on all supported client devices exists across all client-supported devices, as specified under the hardware requirements.	All devices that CAI supports for testing have the full gamut of security functionality described in earlier sections. No security feature is ever designed to work only on a single operating system.
N. Currently, most schools utilize wireless networking. The proposed solution must provide details for only testing security in a wireless environment.	All data exchanges between the student testing device and our central servers run over encrypted HTTPS sessions with TLS 1.2 or higher. This includes traffic over both wired and wireless networks. The Secure Browser checks fingerprints for all SSL certificates to ensure that they are properly signed by authorized root-level certificate authorities. The secure connection is created with the server before anything is sent, which makes it immune to attacks such as man-in-the-middle attacks.
O. Provide auditing and transaction logging. Details of any auditing and transaction logging capabilities shall be provided.	We keep extensive logging records on three critical levels, enabling us to gather a comprehensive, holistic picture of the entire chronology of user history and activity and drill down to the minutest detail of that user's activity. These three levels are the operating system, database, and application levels. This holistic approach also enables us to track all possible entries and exits that a user may have taken. For example, a user may have accessed a database directly without using the application to do so. The three levels are as follows: 1. *Logging at the Operating System Level***.** At this level, we track who logged in and out and their respective time stamps. 2. *Logging at the Database Level***.** At the database level, we track who logged in to specific databases and their respective time stamps. Especially because we encrypt our PII and test content, this includes tracking critical databases that hold keys to PII and test content. 3. *Logging at the Application Level***.** At the application level, we log and keep audit trails in TIDE, the TDS, the Item Tracking System (ITS), and the Centralized Reporting System (CRS). This includes the chronological list of user activities since the user logged in to the system. It includes the time logging in and logging out of the system, which page was accessed, what the user selected, and the actions performed on that page.

Requirement	CAI Response
P. Single Sign-On (SSO): The solution must use Security Assertion Markup Language (SAML) 2 SSO with the State's Identity Provider (IdP).	CAI's SSO system (RedHat SSO) uses SAML. CAI has many years of experience integrating with state identity providers to provide users with direct and seamless authentication from state-managed portals into CAI online assessment systems. Two of CAI's current state contracts utilize such an integration, through which users log in via their state's portal and are redirected securely into CAI systems and authenticated without having to log in again.
Q. User registration: The solution must be able to incorporate a simple self-registration application into a workflow to allow new users to be vetted and granted initial access to the application.	Although CAI does not currently provide a self-registration page for new user account requests, we will commit to developing such a feature in TIDE if NJDOE requires it. Most state clients that use CAI's TIDE as the sole identity provider for CAI's SSO use TIDE for user management, where higher-level user roles create lower-level users. States that use their own identity management systems as the IdP and have TIDE integrate through SAML already have their own internal user request and vetting process. Again, CAI will commit to building a self-registration request form if required.

Liquidated Damages

CAI acknowledges that liquidated damages, as specified in this contract, may apply if CAI

A. fails to ensure test security, such as unauthorized access and/or unauthorized exposure of assessment content;
B. fails to ensure data privacy and/or security such as unauthorized access and/or unauthorized exposure of PII of student, teacher, NJDOE staff, or other registered user associated with this Contract in the Contractor's system; or
C. experiences unrecoverable data loss and/or corruption such as orphaned data, missing data, and/or mis-linked data and the data is unrecoverable.

CAI has development its technology architecture, applications, and operating processes to secure and protect client data. CAI has achieved certification under ISO-27001 and ISO 27018 to demonstrate the suitability and robustness of our processes to protect client and student data.

4.7.1.2. Hardware and Software Requirements

CAI's Test Delivery System (TDS) meets and exceeds all the requirements outlined by NJDOE in the RFQ for an online testing system capable of delivering both adaptive and fixed-form assessments. Regarding the user interface, Exhibit 4.7.1.2-1 provides a CAI response for each requirement. CAI's TDS has the most extensive list of accommodations and supports in the industry; Section 4.7.1.7.3 provides more detail on the 230 different features the system currently handles. Appendix C of our proposal provides the complete list of accessibility and accommodation tools.

Exhibit 4.7.1.2-1: CAI's TDS Meets and Exceeds the Requirements in the NJDOE RFQ

RFQ Requirement	CAI Response
A. Provide on-line access that requires minimal installation of applications on all supported client devices – note the support requirements for Windows, Apple Mac OS, Apple iOS, Google ChromeOS, and Android operating systems. The application that is installed shall be able to be remotely managed and updated, to avoid excessive software installations and maintenance on individual computers.	The CAI Secure Browser, responsible for locking down the student's device while testing, is the only software required to be installed in the field before testing. This is supported on Windows, ChromeOS, macOS, and iOS. The Secure Browser is updated once annually to avoid any interruptions or unnecessary work for educators or IT personnel during the school year. This update can be performed individually or in bulk across all devices in a district at once. All security features are remotely controlled and managed by CAI in accordance with NJDOE's security policies.
B. Provision of the flexibility needed to provide consistent, reliable online assessment services within such varied technical environments. (There are various technical architectures utilized for wide area network (WAN), local area network (LAN), server, and desktop hardware throughout the State. Schools in a LEA contract with various Internet Service Providers (ISPs) for varying levels and types of Internet connectivity).	CAI's TDS is designed from the ground up to be a simple, web-based application as familiar for students to use as it is for IT administrators to access. The system only needs access to an Internet connection, just like any other website. For this reason, it operates transparently with no information about the local network or ISP configuration. Students may use laptops or desktops, wireless or wired connections, and fiber optic or satellite Internet. All methods to access the Internet are acceptable. In other words, local administrators only need to treat the TDS like any other website that they are going to allow traffic to and from at their school. All the same proxy and HTTP traffic rules apply.

RFQ Requirement	CAI Response
C. Provide a plan for evaluating and communicating to the SCM how the operating system and various third-party software updates may impact use of the online testing system. LEAs vary in how rapidly they deploy software updates and patches to their workstations and servers. The plan shall be submitted to the SCM for approval within 30 Calendar Days of Contract award. If the SCM requests changes, the Contractor shall submit the edited document to the SCM within five (5) Business Days of receipt of the request for edits.	CAI shall submit a plan to the SCM thoroughly outlining the procedure through which new operating systems and browsers will be supported by the TDS. This plan consists of the following: • *Windows, macOS, iPadOS, and Linux***.** All new minor versions are automatically supported. Students will not be blocked from using them as schools adopt these new versions. Major versions will be supported in 90 days or less after manufacturers release them to the public. • *ChromeOS***.** All new versions of ChromeOS are tested on beta channels before release and so are supported on day one of release to the public by Google. However, if NJDOE would like to prevent students from using new versions of ChromeOS in the middle of the school year, this is also configurable. CAI will only add support for new operating systems. Support is never removed for any operating system mid-year.
D. Provide information on the proposed solution's usage of and compatibility with open source software. Describe any standard Application Programming Interfaces (APIs) that may be in place for interfacing with open source or standards-based solutions such as One Roster, EdFi, or an equivalent approved by the SCM. Describe any ability for the test delivery system to implement open source solutions for accessibility.	CAI's Item Tracking System (ITS); our user registration system, the Test Information Distribution Engine (TIDE); and a reporting system, the Centralized Reporting System (CRS), have integration points with OneRoster and Ed-Fi. TIDE has all the necessary APIs available for receiving student and roster data from the State in a standards-compliant format and ensuring that ITS can receive item packages in a standards-compliant format. Finally, the CRS can post the results of the assessments in an Ed-Fi format to the State using an API. The TDS is standards compliant with Question and Test Interoperability (QTI) 3.0 and Web Content Accessibility Guidelines (WCAG) 2.1. All item content authored in QTI 2.2 through 3.0 will work in the TDS with no modifications. The well-established accessibility of the application and adherence to the WCAG 2.1 standard permit the TDS's interoperability with accessibility vendors and assistive technology manufacturers, which can be closed or open source. So long as the vendor also adheres to the WCAG standard, the TDS should interoperate with it without any additional development.

RFQ Requirement	CAI Response
E.1. Standardized display of text and graphics for all students regardless of monitor type and resolution setting. If a specific resolution setting is required, the Contractor shall indicate such.	The TDS is responsive to the screen real estate available to the student. The content will take advantage of any screen space available to reduce vertical and horizontal scrolling. This is a core feature and works across any device that a student might use from an iPad to a TV.
E.2. Ability for students to navigate the complete test (forward, backward, and skipping items) unless restrictions are put in place due to test specifications e.g., sectioning of the test or adaptive test design requirements.	Students may use various methods to navigate through the test. Back and forward buttons are available on the screen at all times, and all students may also use the keyboard shortcuts to navigate. Review menus and screens throughout the test also enable a student to move around between the items. However, all these features are strictly governed by the configuration of the test and the visibility rules of the content based on the specifications from NJDOE. For example, if a student pauses for *X* minutes (where *X* is a configurable number), then he or she will no longer be able to see his or her previous items.
E.3. Ability for students to mark or change an answer to a question using a pointing device or keyboard.	Students can use various methods to interact with items, including pointing devices or the keyboard. They may also use switch controls and tab-enabled devices, including eye gaze, to interact with the software.
E.4. Ability for students to stop taking a test and, with proper authority, be re-located to another computer to login and resume taking the test. Answers shall be available to be viewed and changed upon re-entering the secure test with appropriate permission as well as imposing all restrictions for reviewing and changing answers given the test specification and/or design.	The ability to pause and resume a test is a core feature built into the system, and various configurations are available for restricting or enhancing the visibility of the test content in this event. Any system built around an expectation of flawless performance by computers or networks in schools and districts is bound to fail. CAI knows that school or district computers and networks will occasionally experience technological problems. Our system is intended to ensure the validity of the testing experience and results despite such inevitable glitches. Thus, the TDS is designed to protect data integrity and prevent student data loss at every point in the process. In the event of local machine failure, our system is designed to allow the student to rejoin the session from another machine and pick up exactly where he or she left off. Similarly, when Internet service is lost, the student can continue as soon as service is restored. Our system can prevent students from changing the answers to previously answered questions after an interruption of a certain length.

RFQ Requirement	CAI Response
	As students work through the test, some responses, such as multiple-choice responses, are saved to our servers as soon as the responses are selected. Other responses, such as equations and essays, are saved at configurable intervals (usually set to two minutes) and each time the response box loses focus (if the student clicks outside of the response box). With each save, the system asynchronously waits for a confirmation that the save was successful. If confirmation is not received in the designated time span (which is usually set to 30–90 seconds), the system will prevent the student from working until connectivity is restored. The student is offered the option of asking the system to try again or pausing the test and returning later. If connectivity is lost and restored within the designated time span, the student may be unaware of the momentary interruption. If connectivity cannot be silently restored, the student is prevented from testing and given the option to log out or retry the save. If the system fails completely, upon logging back in to the system, the student returns to the item at which the failure occurred. The system is designed to make multiple attempts to reach the server. Therefore, even if connectivity is temporarily lost, no work on the assessment is lost. Often, the connection is reestablished without the student ever being aware that it was temporarily lost. This same process protects data in case of a power outage. Student responses are submitted immediately or automatically and frequently during longer responses. If the power goes out, the student responses before the outage have already been saved on CAI servers. Our system protects against any interruptions, regardless of source or scope, by protecting student responses, allowing students to seamlessly rejoin their test in the same or any other session and protecting the integrity of the test in the process. Our widespread success across the country testifies to the effectiveness of this approach.
E.5. Ability for students to return to the test after a break, to the exact location in the test form prior to the break.	As described in this section, a student may pause and resume a test as many times as needed. The software will handle this transparently and return the student to the point where he or she left off, as rules permit.

RFQ Requirement	CAI Response
E.6. Ability for students to view the text or graphic simultaneously with the test item stem and distractors when an item or set of items is text or graphic intensive.	CAI's TDS permits the delivery of test content in nearly 40 different layouts. This offers significant flexibility for the items and stimuli to be authored so that students can see all test content simultaneously. In addition to that, all tools and features a student would interact with in the test are movable and resizable so that the student can manage his or her screen space effectively.
E.7. Online availability of NJDOE approved ancillary test materials for use by students (e.g., various calculators, various rulers, straight-edge, formula sheets, compass, etc.) as stated in test specification documents.	CAI's TDS has a fully configurable set of tools and features that will allow NJDOE to offer ancillary test materials to students in the assessment. For features that are built into the system, such as the calculator, NJDOE will prescribe what version of the feature should be available on each test delivered in the system and whether the calculator will be a universal feature or will first need to be turned on. For features based on materials produced by the State, for example, formula sheets and reference sheets, CAI will convert these NJDOE-provided resources into an online delivery-compatible format. The same specifications process will then be used to determine which tests should have these features enabled and when. All these features will open in a movable, resizable window for the student to view while taking the test securely. Students can zoom in and out on the content and see it in their choice of different color backgrounds to accommodate their needs.
E.8. Paper copies of ancillary materials that can be printed must be available to schools upon request.	CAI can provide printed paper copies upon request.
E.9. Indication (on the workstation display) of the name of the student login used to access the test.	The TDS can display the student's first, last, or full name and statewide student identifier at the top of the screen next to the items on the assessment. We can configure which features to show when. This will be set up according to NJDOE's specifications.
E.10. Indication via a warning screen that the student has chosen to end his/her test. The warning screen shall allow the student to return to continue taking the test.	At the end of the assessment, the student will be shown a final review screen. This will include all items to which he or she has access, along with any indicators such as items skipped or marked for review. After the student is finished reviewing all responses and is confident the test is complete, he or she clicks a button to submit the test. The system will issue a

RFQ Requirement	CAI Response
	warning screen to remind the student that this cannot be undone and encourage the student to review all his or her answers before submitting the test. The student can click a cancel button to return to the test or confirm and submit it.
E.11. Functionality that allows for eliminating one (1) or more distractors.	CAI's TDS has strikethrough, a built-in feature. (Often, this feature is called an "answer eliminator.") This will enable a student to eliminate one or more response options on a choice-interaction item type. The option is visually indicated as struck, but the design permits the student to read the text behind the strikethrough. Repeating the action will allow a student to easily undo the strikethrough and make the option fully visible again. Refer to Exhibit 4.7.1.2-2 for a sample screen capture. CAI also has masking, an additional feature. This support enables students who are easily distracted to mask portions of the test content on the screen so that they can focus on their work. Refer to Exhibit 4.7.1.2-3 for a sample screen capture.
E.12. Functionality that allows for highlighting and/or underlining key words or graphics.	The built-in highlighting feature of CAI's TDS will allow the student to select any text with his or her mouse or finger and highlight it in any of four WCAG-compliant colors. These colors were carefully selected to ensure that the contrast of the highlighting remains visible regardless of what color background a student uses. The variety of colors allows a student to adopt his or her own convention. For example, the topic sentence can be in blue, and the evidence can be in green. Any amount of text can be highlighted from a single character to entire paragraphs in either the stimuli or the items. Refer to Exhibit 4.7.1.2-4 for a sample screen capture.
E.13. Functionality that allows for flagging items as incomplete or in need of review prior to completing the test.	The TDS's mark for review feature allows students to flag items as incomplete or in need of review so that they can return to them later. This indicator is shown in four places to remind the student that he or she has flagged an item: 1. On the item itself 2. In the item navigation menu at the upper-left corner of the screen 3. On each segment review screen 4. On the final test submission screen The flag is not removed unless a student actively removes it from the item. Refer

RFQ Requirement	CAI Response
	to Exhibit 4.7.1.2-5 for a sample screen capture.
E.14. Review capability that provides indicators of which items have been answered/unanswered or marked for review.	Each functionality described here enables the student to see what items have been flagged for review or skipped. This provides ample opportunities to remind the student that he or she should return to an item before submitting the test. Refer to Exhibit 4.7.1.2-6 for a sample screen capture.
E.15. Functionality that allows for online "scratch paper" or notes with text and drawing capability.	CAI's TDS has numerous features to allow a student to take notes in a test. First, note-taking features can be configured to be available at the item level or the test level. In the former case, student notes are associated with a specific item on the test. When the student is no longer looking at the item, he or she will no longer have access to his or her notes. This is helpful when the notes that a student is taking are specific to the item the student is working on and would only distract him or her later if he or she were to see them again. This type of granularity is helpful for mathematics assessments, where repurposing the same notepad could potentially be distracting. When the note-taking features are configured at the test level, they are accessible from the toolbar at the top of the screen and available throughout the entire test. This allows the student to take some notes that may not be specific to a single item on the test. These notes might be relevant to an entire item group or performance task on which the student is working. These notes can also be configured to be available across segment boundaries in the system. CAI has a robust set of note-taking features that can all be independently configured. In general, CAI works to make any feature available to a student in a constructed response also available as a note-taking feature. Not only can students type into a text box or create a free-form drawing, but they can also use rich-text formatting, create tables, and use text-to-speech and speech-to-text to take notes. Refer to Exhibit 4.7.1.2-7 for a sample screen capture.

Exhibit 4.7.1.2-2: Tool for Eliminating Distractors via Strikethrough

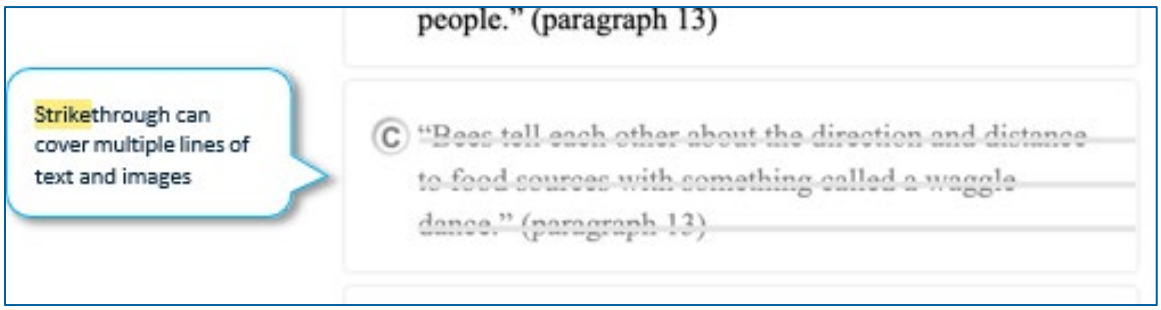


Exhibit 4.7.1.2-3: Tool for Eliminating Distractors via Masking

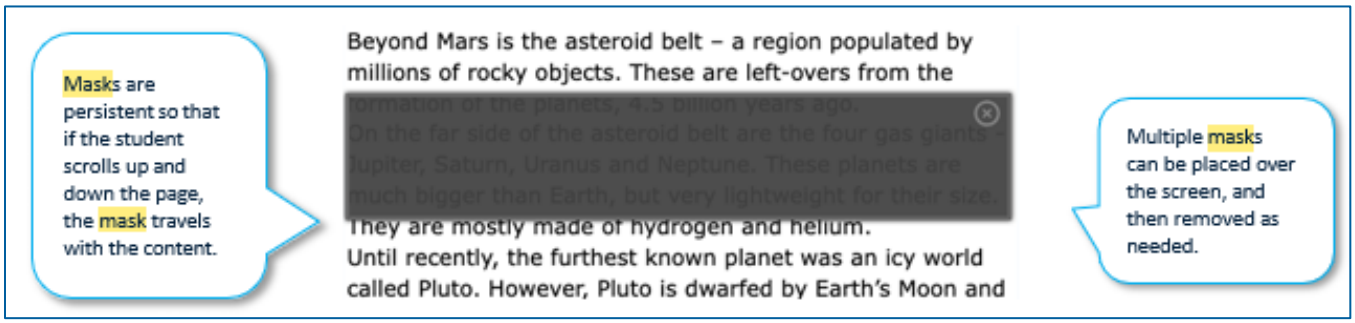


Exhibit 4.7.1.2-4: Highlighting

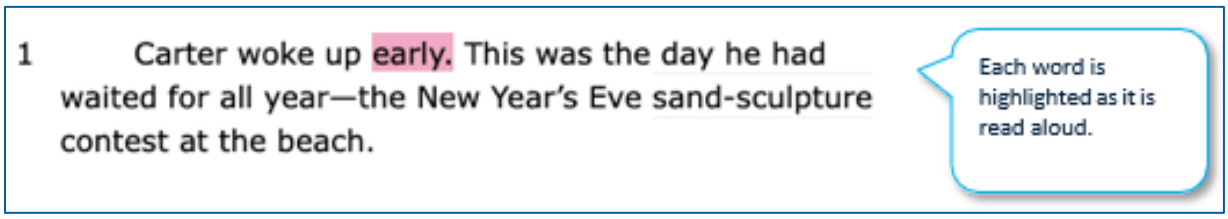


Exhibit 4.7.1.2-5: Mark for Review

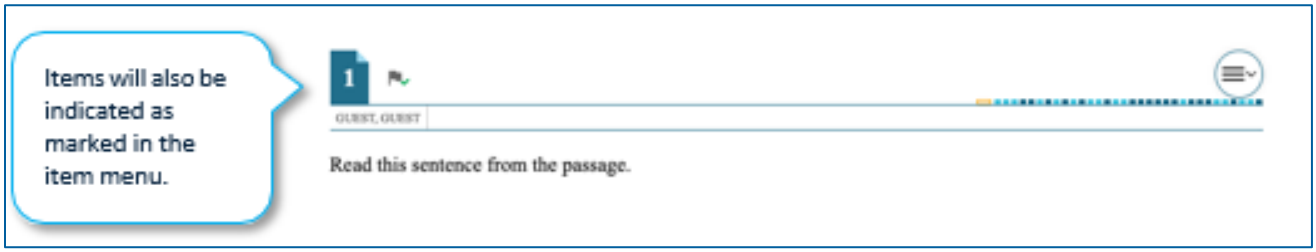


Exhibit 4.7.1.2-6: Items Unanswered or Marked for Review

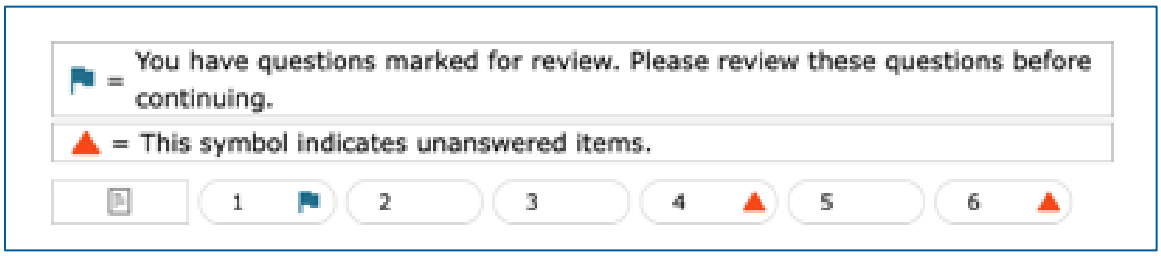
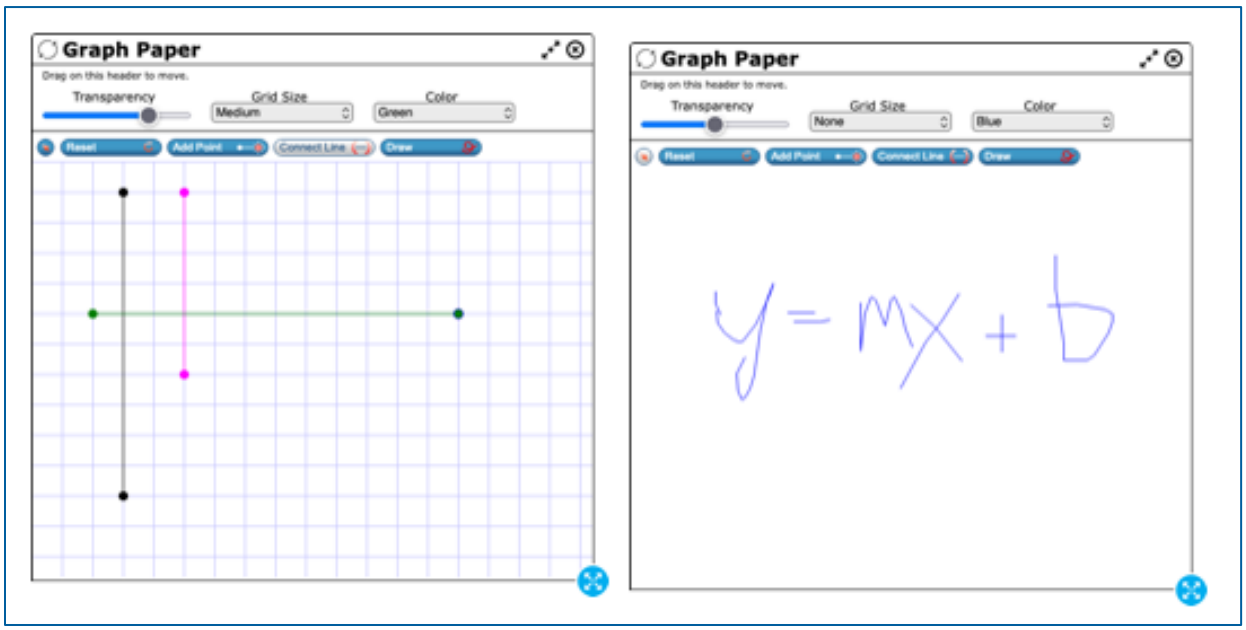


Exhibit 4.7.1.2-7: Graph Paper and Scratch Pad



4.7.1.3. Administrative System for Managing Online Tests

NJDOE requires an administration management system which supports file uploads, student registration, and student monitoring, and uses a role-based authorization design. CAI proposes our Test Information Distribution Engine (TIDE) as the proven solution to meet this requirement.

TIDE is a mature system that has been in use for more than 15 years. It currently supports 27 states and jurisdictions and manages student data for over one-third of the nation's grades 3–8 students. Like all CAI systems, in addition to being reliable and secure, TIDE is feature-rich and highly customizable. Exhibit 4.7.1.3-1 shows the volume of student and state user populations across our clients that use TIDE to manage their assessment programs.

Exhibit 4.7.1.3-1: State and User Populations Using TIDE for Assessment Programs

Client	Number of Grades	Students Registered	Average Students per Grade	Users Registered
Total CAI	**-**	**20,865,100**	**-**	**1,556,100**
California	13	5,733,300	441,100	300,300
Texas	16	5,071,400	317,000	294,000
Florida	15	3,212,800	214,200	227,700
Ohio	15	1,299,000	86,600	170,900
Washington	12	909,500	75,800	85,200
Indiana	11	875,900	79,700	70,000
College Board	7	773,600	110,600	64,600
Oregon	14	638,900	45,700	76,500
Connecticut	13	495,000	38,100	51,200
Utah	7	307,300	43,900	21,900
West Virginia	13	233,600	18,000	21,000
Idaho	13	225,200	17,400	23,500

Client	Number of Grades	Students Registered	Average Students per Grade	Users Registered
Hawaii	18	178,500	10,000	30,400
New Hampshire	13	167,700	12,900	18,000
Montana	13	145,800	11,300	7,000
South Dakota	10	105,500	10,600	10,500
Wyoming	13	89,900	7,000	9,900
North Dakota	7	65,900	9,500	8,700
ClearSight	13	65,500	5,100	8,400
Delaware	6	64,100	10,700	14,000
Arkansas	14	42,700	3,100	4,500
Iowa	14	40,700	3,000	2,700
Louisiana	15	38,000	2,600	5,200
Rhode Island	3	30,800	10,300	8,100
Nebraska	14	30,400	2,200	4,200
Vermont	8	11,800	1,500	12,600
Virgin Islands	8	6,400	800	1,400
South Carolina	11	4,700	500	2,600
Arizona	13	1,200	100	1,100

TIDE supports state, district, and school personnel in accomplishing all required test administration activities, including the following:

- Managing system users through web-based user interface (UI) updates and/or via integration with state and district student information systems (SISs) through file- or application programming interface (API)-based exchanges
- Managing students, including student demographic data and testing accommodations, via integration with state and district SISs or through TIDE's UI
- Ordering paper testing materials and tracking order shipments
- Managing test administrations and tracking student participation and ongoing administration status
- Executing administrative functions, such as reopening tests and identifying and resolving testing discrepancies

TIDE is centered around administrative tasks performed by users throughout the school year and permits users to enter information through near-real-time integration, manually through the UI, or by file upload. TIDE supports extensive search features, allowing users to easily look up information, make updates, and create reports. TIDE also supports direct integration with the SIS through nightly file transfers and using web service APIs.

TIDE dramatically reduces workload and stress in schools and districts by incorporating a file upload feature into all its UIs. Information added or uploaded into TIDE becomes available in near-real time in all CAI systems, including the Test Delivery System (TDS) and the Centralized Reporting System (CRS). There is no need to roster students into testing sessions; once enrolled, students are eligible for tests through configurable business rules, and test takers are then able to sign in to a testing session without the need for creating testing rosters.

Student data can be verified and adjusted at any time, starting from the day TIDE opens to users. This reduces the rushed and compressed work at the end of the testing window that

often produces errors. Tools for editing student information are not limited to online testing but extend to paper-pencil testing, as well.

TIDE is highly customizable. NJDOE will be able to tailor the interface to meet the needs of all types of New Jersey users. Many features allow the configuration of sophisticated business rules, from determining students' test eligibility, to managing users' permissions to administer a test, to performing calculations for quantities of paper materials, to validating student data.

Implementing digital business rules frees end users from manual work and improves reliability. The sections that follow provide specifics on how each NJDOE requirement of an administrative management system is fulfilled by TIDE.

Data Management

Upload Data Files

NJDOE requirements for student data file upload in an administrative data management system specify that:

1. Administrative users must have the ability to upload data files containing student demographic data and/or accessibility profile information.
2. All incoming data must be validated to meet all data requirements specified by the State,
3. The administrative system must provide information to the user on any data that violates these requirements in user-friendly language.
4. The system must allow the user to make corrections and resubmit files.

TIDE meets these requirement through our extremely robust and capable UI file upload task. The task facilitates the file upload of student enrollment data in the UI, and access to the upload task can be configured by user role (according to State preference). This interface is easy to use and provides users with detailed feedback, including error logs, user-friendly validation messages and summaries, and upload confirmation. TIDE can process more than 100,000 records and provide validation information to users. Once data are uploaded into TIDE, they become available in near-real time in other CAI systems, such as TDS and CRS.

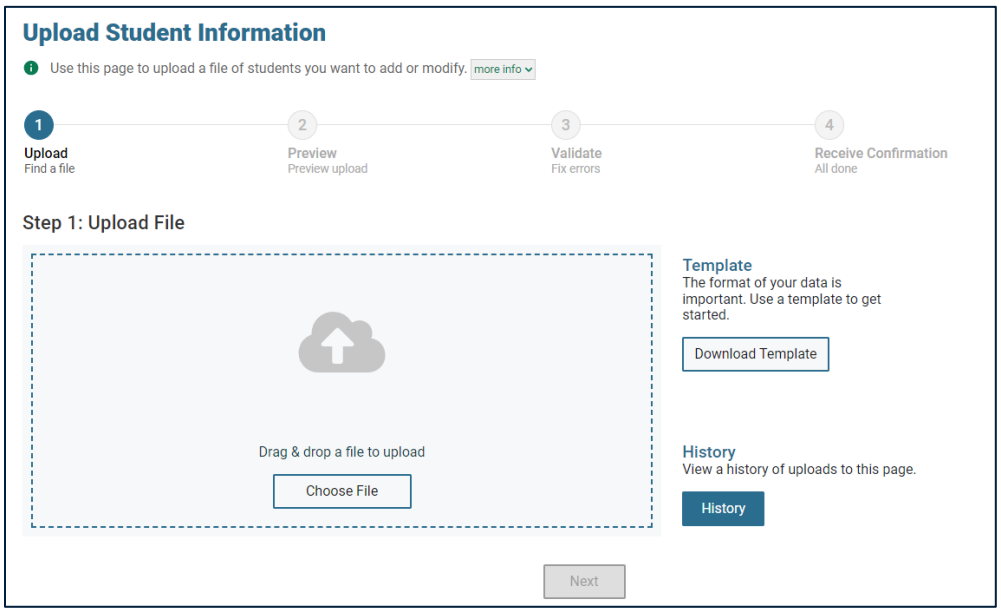
TIDE meets each of the NJDOE requirements, as noted here and shown in the exhibits that follow:

1. Easy UI upload of student and accessibility data
2. Built-in data validation processing configured to match all NJDOE-specific requirements
3. User-friendly data validation messages that indicate the types and location of validation errors that may be contained in a user's file
4. Easy file re-upload by the user, once any data errors in an uploaded file are corrected by the user

Uploading a file with the TIDE UI is a quick, four-step process:

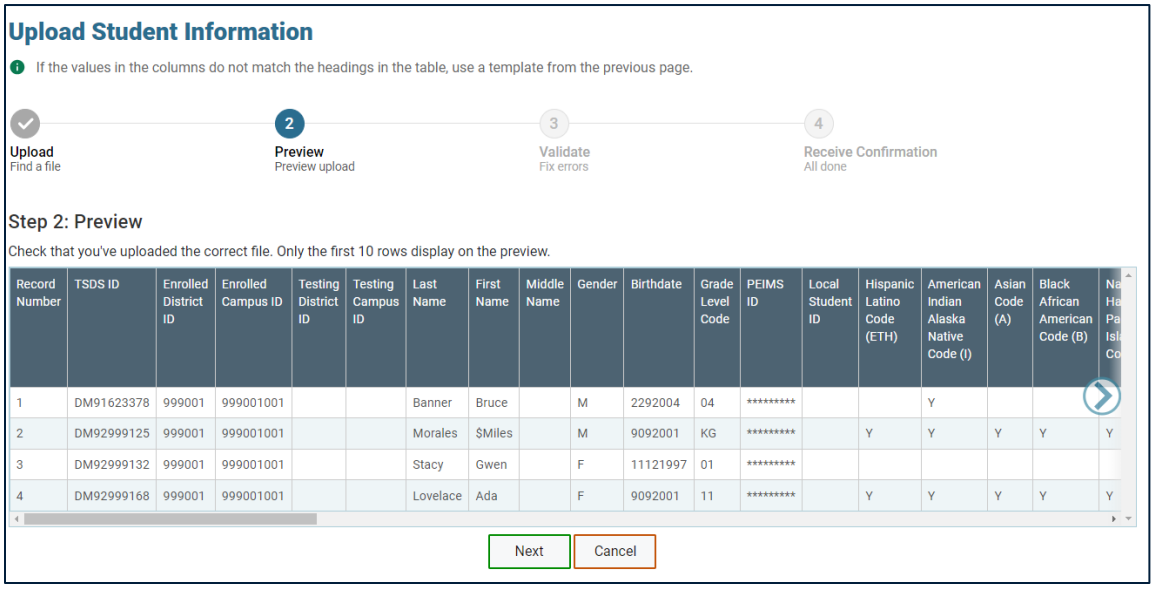
1. Download the template available in TIDE, fill in student information, and upload (refer to Exhibit 4.7.1.3-2).

Exhibit 4.7.1.3-2: Sample Upload File Page



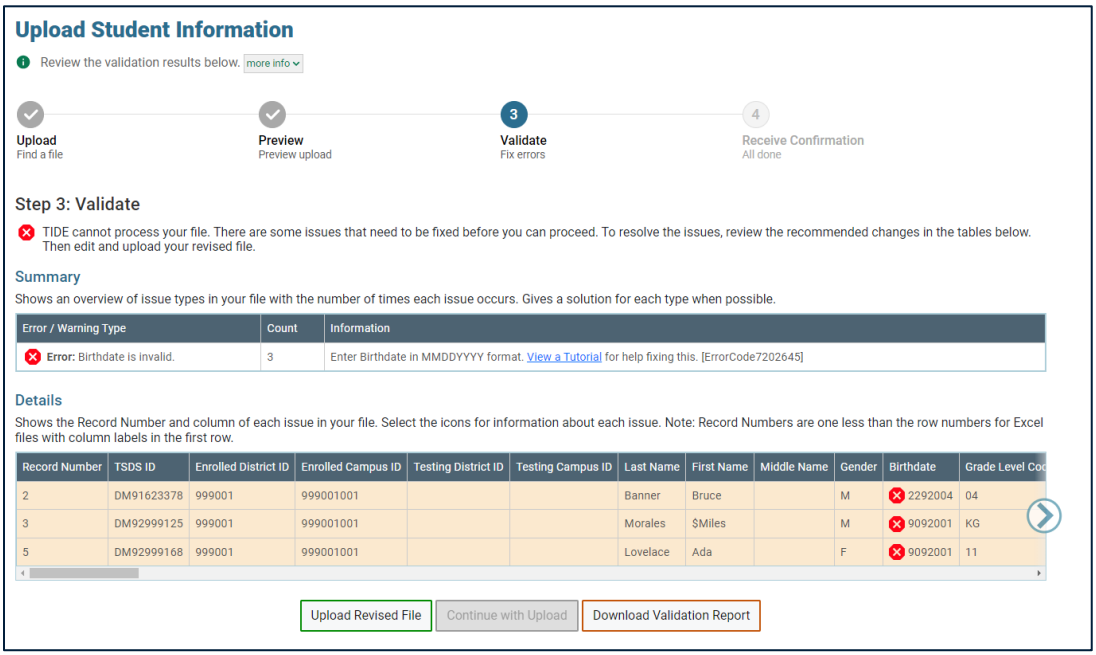
2. TIDE provides a preview of the records so the user can confirm whether the appropriate file has been uploaded (refer to Exhibit 4.7.1.3-3).

Exhibit 4.7.1.3-3: Sample File Upload Preview (Partial View)



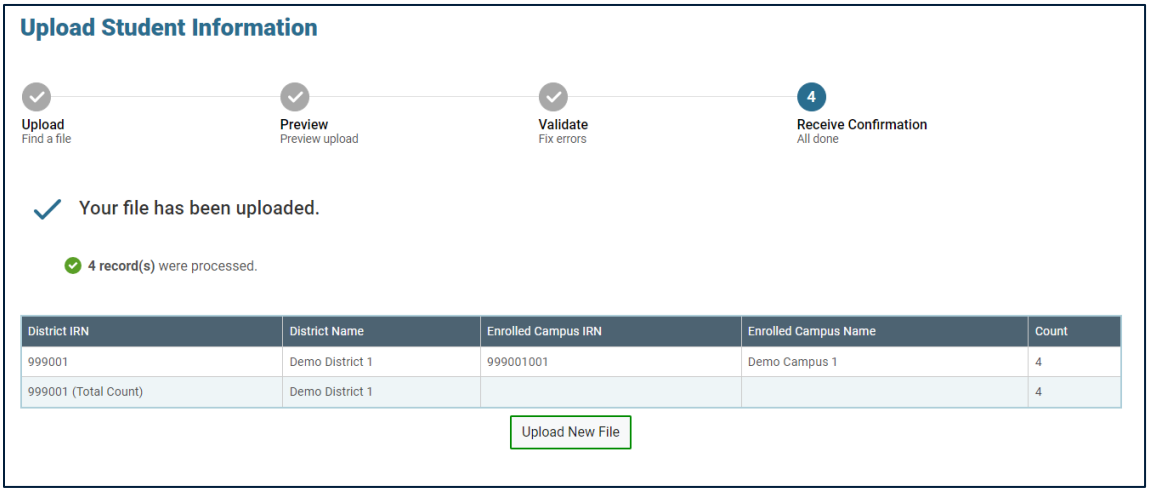
3. TIDE generates a detailed validation report with feedback in each cell that gives users clear instructions on how to fix a validation error. In order to support personnel with varying levels of technical expertise, the file validation process also includes brief video tutorials showing how to correct common errors (refer to Exhibit 4.7.1.3-4).

Exhibit 4.7.1.3-4: Sample Validation Page



4. TIDE provides confirmation that records have been incorporated into the database along with a report on the number of records successfully uploaded, the number that were rejected due to errors, and a distribution of the number of records uploaded by district/school/grade/etc. (refer to Exhibit 4.7.1.3-5).

Exhibit 4.7.1.3-5: Sample Confirmation Page



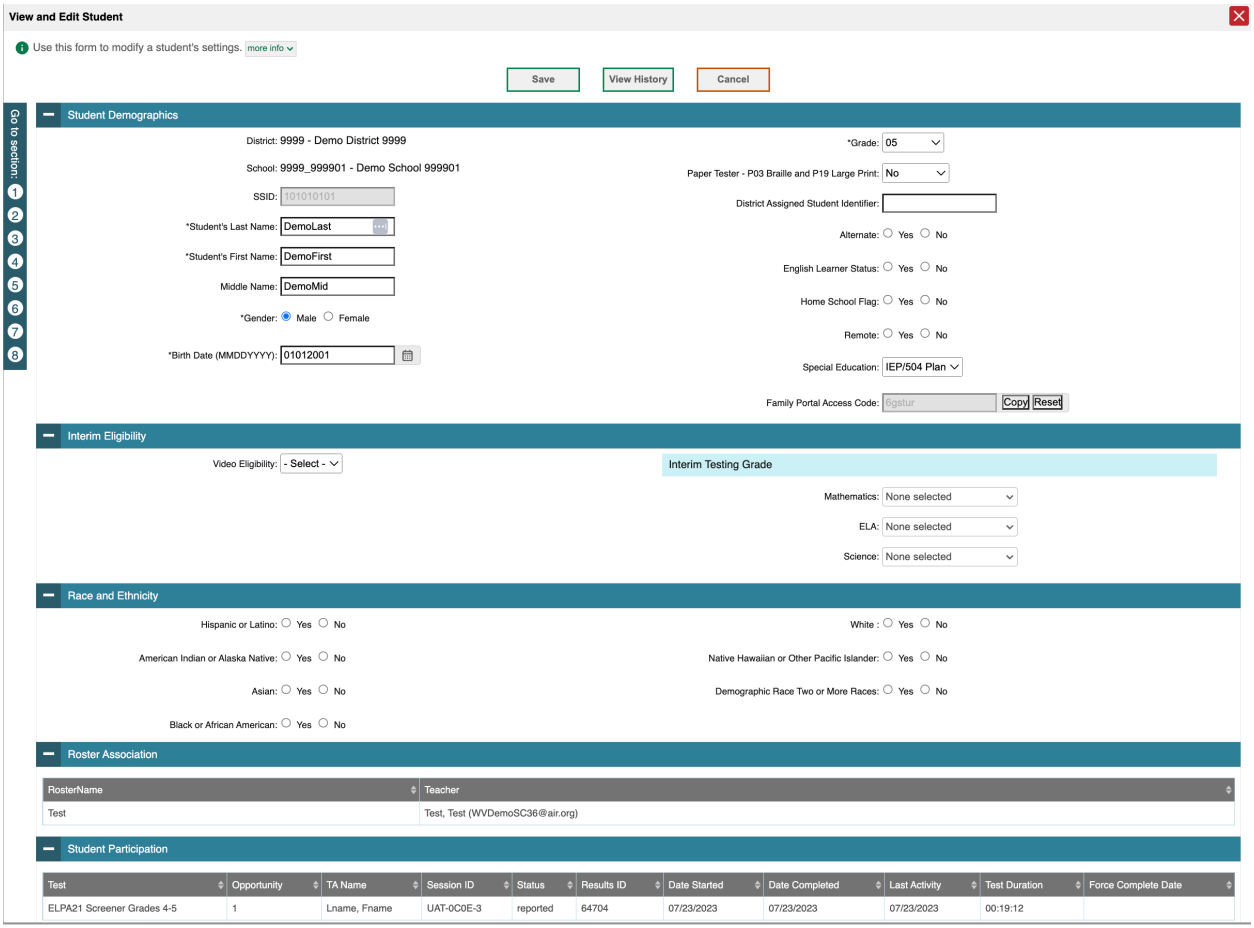
View and Edit Student Information

NJDOE requires that administrative users be able to view and edit student demographic information. Refer to Exhibit 4.7.1.3-6. The TIDE View/Edit Students task fulfills this requirement by providing functionality for users to search for students, view their information (including test accessibility settings), export a list of students, or edit a student's information. The State may

choose to give certain user roles editing capabilities and to limit other roles to view-only access. In addition, as with all fields in the TIDE UI, all demographic and accessibility screens can be configured with different categories to closely depict how users identify them in the field (e.g., visual tools, braille, audio accommodations).

Accessibility tools set in TIDE will apply to students in TDS immediately.

Exhibit 4.7.1.3-6: View and Edit Student Details Page



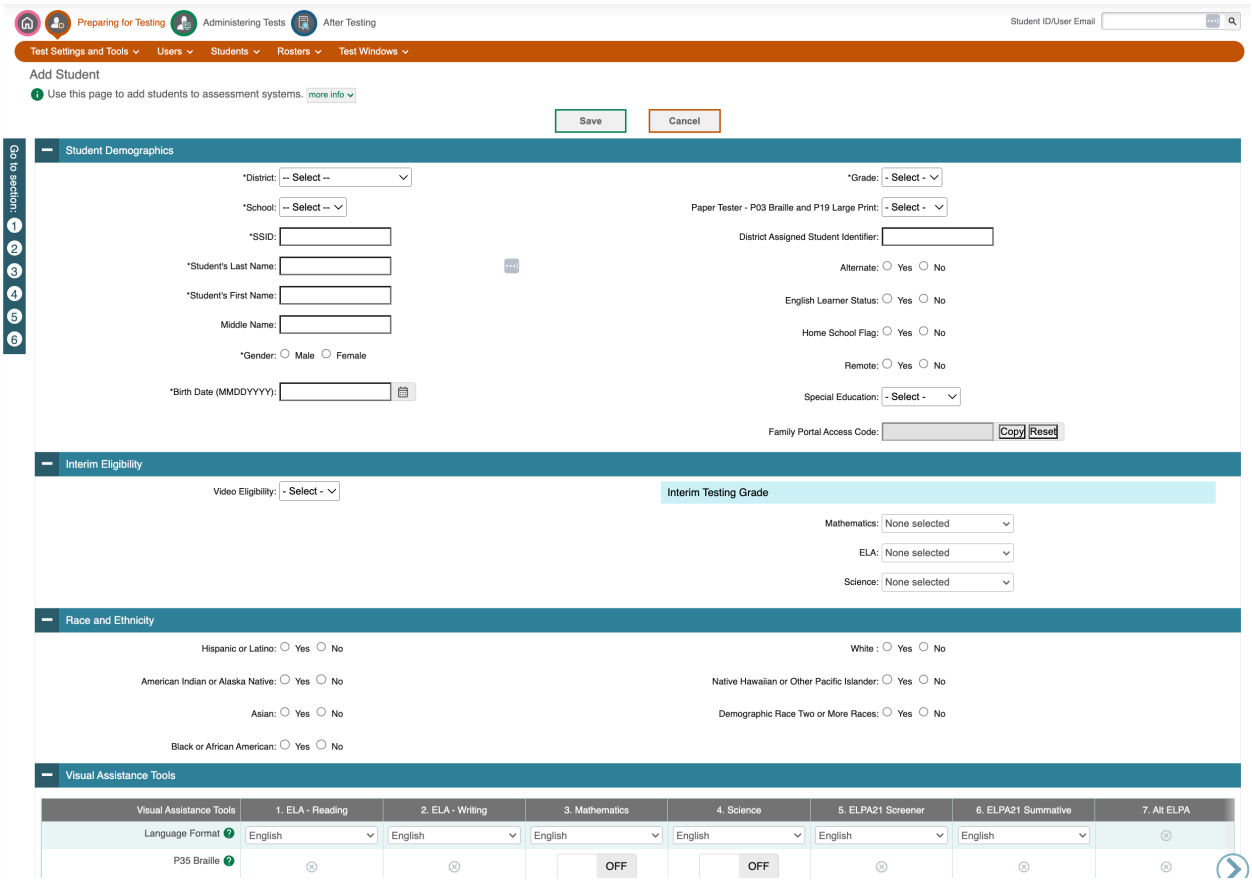
Manually Enter Student Records

NJDOE requires the ability for administrative users to manually enter student records at any time. TIDE fulfills this requirement by providing (as an alternative to uploading a student data file) users the ability to add students manually in the TIDE UI (Exhibit 4.7.1.3-7). This UI has the same validation rules as those used during file uploads. Manual entry in TIDE is useful when registering a single student in TIDE, just prior to testing. As with the upload functionality, access to this task in the UI can be configured by user role.

TIDE allows continuous enrollment throughout the school year whereby users can add or edit student information, even on testing day. Integration between TIDE and TDS is designed so that any student information added or edited in TIDE makes it to TDS in near-real time. This system works well for walk-in students and on-the-fly corrections on testing day. Any missing students can be added on the day of testing, and students can expect to test right away. Data correction is not limited to just student demographics; it is extended to all student accommodations, even when day-of-testing updates affect eligibility for a specific test. For example, if a grade 3 student is moved to grade 4, not only will TDS immediately detect this update, but the student will also

be made eligible automatically for the grade 4 test and will be able to take the assessment immediately.

Exhibit 4.7.1.3-7: Add Student Page in TIDE



Maintain Unique Student Records

NJDOE has specified that the administrative system must be capable of maintaining unique student test records with both optional and required data fields.

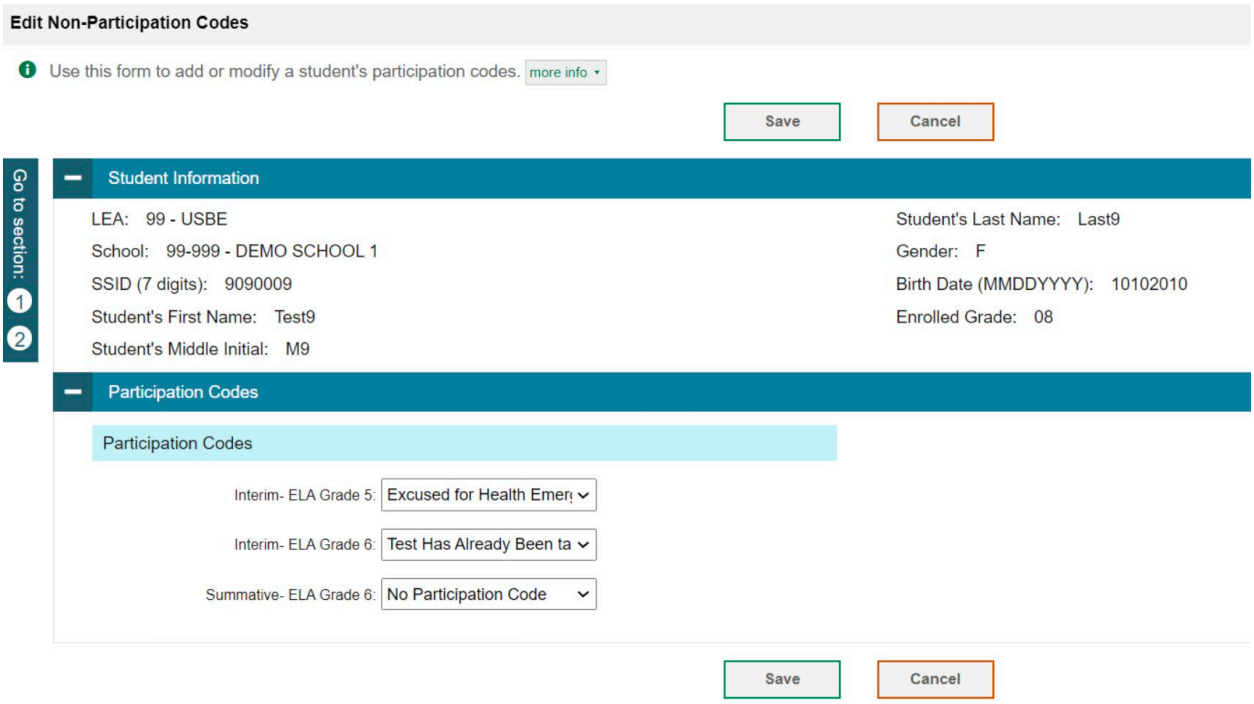
As described, TIDE provides a way to manage data for individual students. Furthermore, TIDE provides the State with the configurability of enforcing required and optional student data fields.

Refer to Exhibit 4.7.1.3-6, which shows a sample student details page in TIDE. Note that certain fields, such as test format, are editable by the user, but other fields, such as SSID (Statewide Student Identifier), are read-only (greyed out).

Collect Student Demographic Information

As part of the requirements for the New Jersey Assessment Program, NJDOE requires an administrative system that can collect student demographic information for students who were expected to take the test but who were not tested for various reasons (e.g., absent, medical emergency, individualized education program [IEP], limited English proficiency [LEP]). TIDE meets this requirement by providing the functionality to assign students with reasons for not testing. The TIDE feature allows a user to either individually or through a file upload assign these reasons for not testing a student and each available test for that student. As with all TIDE configurations, the task to assign students with reasons for not testing is highly configurable and based on the State's specific requirements. Refer to Exhibit 4.7.1.3-8.

Exhibit 4.7.1.3-8: Non-Participation Codes Task



Data Edit Alerts

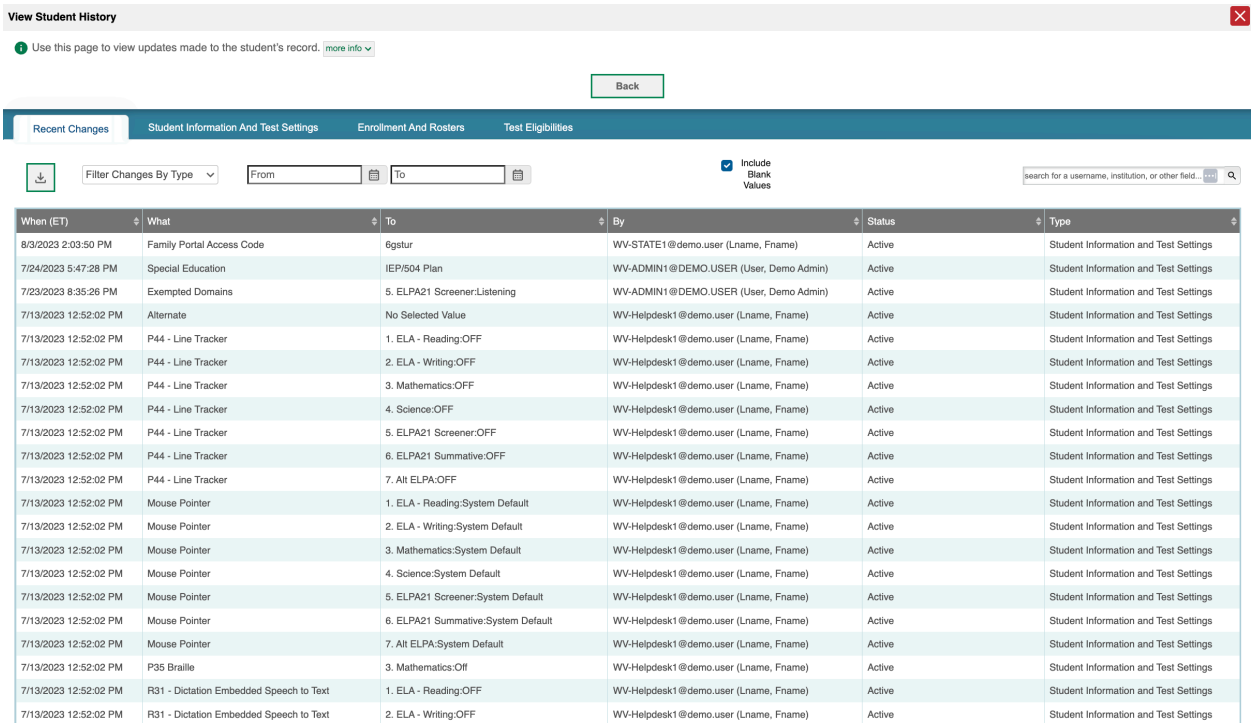
NJDOE requires that the administrative system provide data edit alerts to an administrative user and a process for correcting errors. TIDE meets this requirement by providing data validation error messages for UI and file upload scenarios. The data validation error messages are highly customizable, user-friendly, and specify acceptable data types for each field. Additionally, for common data validation errors in file-based uploads, the Validation Summary page provides video tutorials for fixing these errors (refer to Exhibit 4.7.1.3-4).

Retain Record of Changes

NJDOE requires that the Contractor retain a record of all changes made to the system by an administrative user, along with user identity and date and time of change, as well as any other information requested to be retained by the SCM specified at the Project Launch Meeting (PLM) or updated at any of the planning meetings thereafter. TIDE meets this requirement by serving as the Database of Record (DOR) for all changes made to all entities (Users, Students, Rosters, Districts, Schools). Every change to an entity is recorded with the user identity, date and time of the change, and type of change. TIDE can provide NJDOE with data extracts for any information requested pertaining to entity changes. The system maintains a history of all edits made to student records, from retained through the life of the contract.

Additionally, TIDE has a UI feature that allows specific user roles (to be determined by the State) to access a history of changes to a student's data. The Student History feature, accessed directly through the View and Edit Student Details page (see Exhibit 4.7.1.3-6) in TIDE, enables authorized users to view the modifications made over time to a given student's assessment data. Student History displays a transparent record of all updates to student demographic, enrollment, and eligibility data, including, but not limited to, name, grade, test eligibility assignments, and test settings. Exhibit 4.7.1.3-9 shows the updates made to a demo student history during a two-week span in July and August of 2023.

Exhibit 4.7.1.3-9: An Individual Student History Over Two Weeks



When (ET)	What	To	By	Status	Type
8/3/2023 2:03:50 PM	Family Portal Access Code	6gstur	WV-STATE1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/24/2023 5:47:28 PM	Special Education	IEP/504 Plan	WV-ADMIN1@DEMO.USER (User, Demo Admin)	Active	Student Information and Test Settings
7/23/2023 8:35:26 PM	Exempted Domains	5. ELPA21 Screener:Listening	WV-ADMIN1@DEMO.USER (User, Demo Admin)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Alternate	No Selected Value	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	1. ELA - Reading:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	2. ELA - Writing:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	3. Mathematics:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	4. Science:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	5. ELPA21 Screener:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	6. ELPA21 Summative:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P44 - Line Tracker	7. Alt ELPA:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	1. ELA - Reading:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	2. ELA - Writing:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	3. Mathematics:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	4. Science:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	5. ELPA21 Screener:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	6. ELPA21 Summative:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	Mouse Pointer	7. Alt ELPA:System Default	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	P35 Braille	3. Mathematics:Off	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	R31 - Dictation Embedded Speech to Text	1. ELA - Reading:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings
7/13/2023 12:52:02 PM	R31 - Dictation Embedded Speech to Text	2. ELA - Writing:OFF	WV-Helpdesk1@demo.user (Lname, Fname)	Active	Student Information and Test Settings

Test Management

Form Distribution

CAI's TDS is fully capable of delivering fixed forms according to a set plan (e.g., by school) or randomly throughout the State to ensure equal distribution.

Assign Accommodated Forms

Ensuring accommodated students are delivered the appropriate test content is of paramount concern. To that end, not only has the TDS been designed to assign forms to different students based on configurable accommodation or Personal Needs Profile data, but it is also capable of doing this adaptively. For example, if a student is deaf and has a hard-of-hearing accommodation, the system can dynamically filter out any items that assess listening comprehension just for that student. These two features can also be combined on a single test to handle unique scenarios where a portion of the test must be fixed, and another portion should be more randomized or adaptive. This flexibility is configurable in a variety of ways and will be part of the test design and specifications process to which NJDOE will contribute at the beginning of the project.

Randomly Assign Different Versions of Test Forms

Field-testing items on fixed-form, adaptive assessments or mixed-mode tests is something with which CAI is very familiar. Test design has several granular components that can be individually controlled to achieve the optimum outcome. Tests can be segmented into multiple parts, and each of these segments can have its own form or item selection algorithm associated to it. However, the default behavior of the platform is to deliver field-test items randomly to achieve the greatest distribution, not just in the classroom, but in the state, as well. Reports on field-test item selection performance will be available to NJDOE throughout the test administration to provide transparency on how the algorithm(s) are able to achieve the desired equal distribution.

These decisions about how to design field-test item selection will be part of the test design and construction process in which NJDOE will be involved.

Schedule Students for Online Tests

CAI's TDS has a variety of ways to meet the requirements put forth in the RFQ regarding scheduling students. This can be handled as automated or as manually as NJDOE would like and can be configured by assessment. Educators can log into the Test Administrator (TA) Interface to pre-schedule a test session on a given day and generate a token that can be used by students on that one day to log in. However, if a more automated approach is desired, which is the most common technique used by our partners, educators can open that session on test day and admit students into the session on the fly without any pre-configuration or pre-rostering whatsoever. This flexibility allows for real-world scenarios, such as students being absent and taking a make-up assessment or having a secondary proctor or substitute involved, because the system is designed not to require any up-front administrative burden to admit students into a test session.

Manage Test Assignments

Test form and item administration in CAI's system is designed from the ground up to avoid delivering the same test content to the student more than once during a school year, or even across school years, if a student happens to repeat a grade. In the case of fixed forms, several forms are assigned to the test as a part of the test construction process. The system will randomly deliver one of these forms to each student on the first testing event. On subsequent testing events, the system will automatically move the form the student already saw to the bottom of the list and choose from one of the unused forms first. The same process occurs with item administration on adaptive tests. Items that have already been used are deprioritized in favor of items that are unused.

Assign Specific Test Forms to Students

All abilities described about the automatic administration of forms and masking out content that has already been delivered works by default and is a core feature of the TDS without any additional configuration. However, if NJDOE would like a more manual approach to controlling precise forms that a student may receive, there are methods to configure the system's functionality, as well. In TIDE, authorized personnel can be permitted to change the form assigned to a student to a more specific form. This is helpful in situations when a paper form is administered as an accommodation, and it is necessary to make sure that the Data Entry Interface (used to collect paper tests digitally) administers the same form to the data entry clerk that the student received on paper.

View Individual Student Test Information

NJDOE requires that select authorized users have the ability to view a variety of different information about a student's testing event, including but not limited to the actual answers the student gave to the items, any response codes issues by handscorers, dates and times, durations, and forms assigned. All this information and much more is available in a variety of applications that CAI will make available. The depth of information accessible will change based on the audience for that information and their role. For example, nearly all the information requested will be available in the CRS after the student is finished testing. During testing, TIDE and TDS will enable authorized users to see this information and more.

View Aggregate Test Information by Subject

Within TIDE, there are many reports that NJDOE can run before, during, and after testing. These reports will enable users to view upcoming scheduled test sessions, tests that are being delivered live in real time, and test completion reports at the student level and aggregated to the

school, district, and state levels. There are a variety of other reports available in this system to help educators meet their participation goals, file non-participation codes when students do not test, and track the current status of any given testing event.

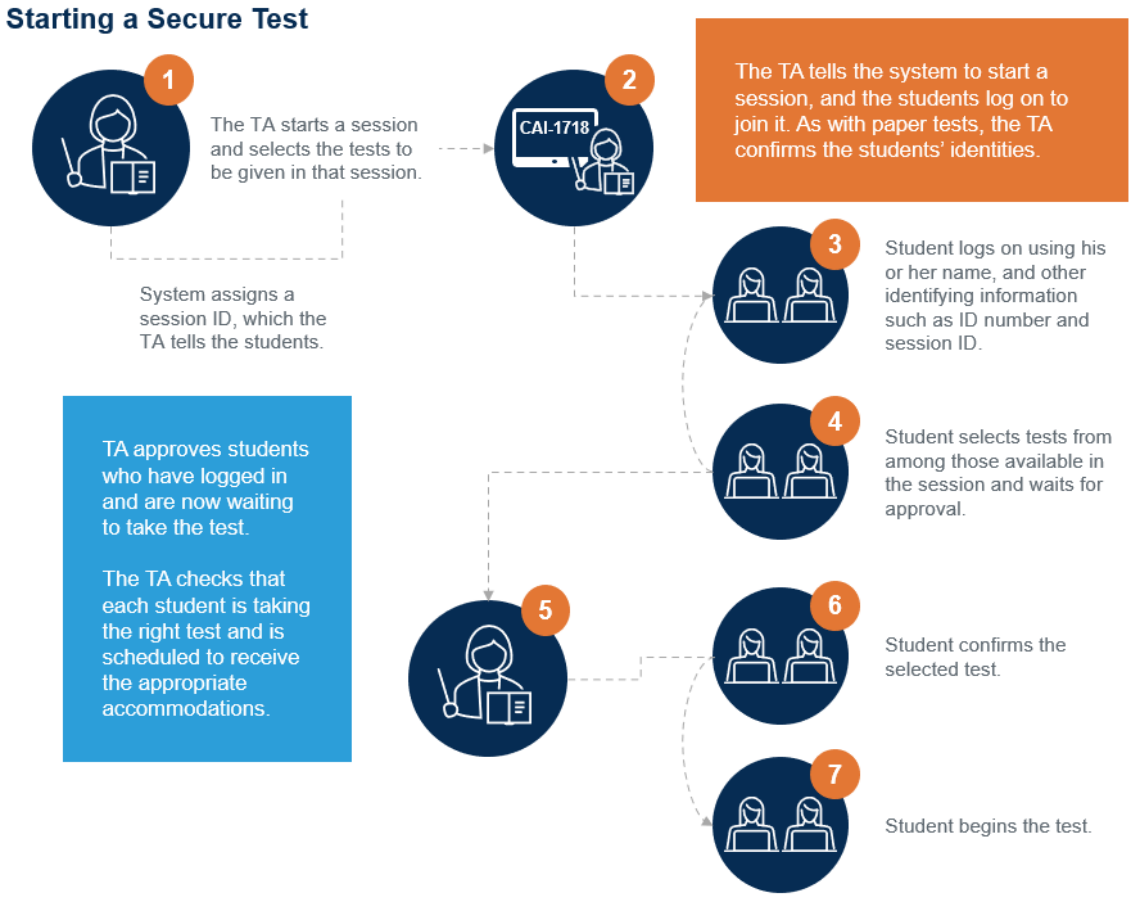
In addition to the reports, CAI will provide a secure, web-based client dashboard that displays information on how many students are currently testing in New Jersey and presents a snapshot of overall system health. Refer to Section 4.2.5.3 for more detail.

Proctoring

The student login process is secure, easy to use, and configurable to meet NJDOE requirements. Student authentication is managed through interaction between the TA and the students, as summarized in Exhibit 4.7.1.3-10. The TA Interface allows the TA to create a test session, admit students to the test session, and adjust the test settings for individual students. Students log in using the session ID, their student ID, and first name. The TDS validates the student's login credentials and prompts the student to confirm his or her identity. After the student confirms this information, the TDS determines the student's tests from those available in the session.

These steps provide more security than a simple password system and simplify the administrative tasks associated with test administration. We note that student passwords are a security vulnerability. Given the broad age range of the K–12 student population, participants may likely write down a password or share it with others. Once approved, the student can begin testing and proceed until finished.

Exhibit 4.7.1.3-10: Starting a Secure Test



Student Access to Online Tests

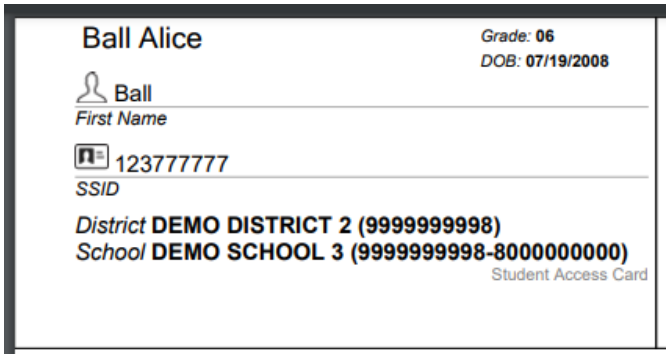
Due to the secure nature of assessment, CAI has a comprehensive set of controls in place to safeguard against unauthorized access to sensitive information during test administration. Authenticated administrative access is necessary to administer tests, and all student authentication is performed through a secure administrative system. At login, a user's access privileges are evaluated through a system that includes automatic disable/enable functions based on the user's profile. All test content and student data are protected using techniques such as device-specific and device-appropriate security. Valid authentication information is necessary for test content to be viewed, and test content is displayed only while the student is taking the test.

All student data transmissions are secure, and any cached content is secured, managed, and purged. At the desktop level, decrypted test content is protected through control of the desktop computer while students are testing. The CAI Secure Browser restricts and disables access to other applications while a test is being accessed. An authentication sign-on process between the authorized TA and the student is built into the application, resulting in a test-taking environment that is secured through embedded security features of the teacher and student testing interfaces and prevention of forbidden applications.

Obtain Student Login Credentials

Typically, clients use the student ID, student first name, and session ID to log in to TDS. CAI will work with NJDOE on reviewing these credentials. This process does not require pre-rostering or reliance on secure test tickets or other secure artifacts that must be managed in the schools. This vastly reduces test administration work within the schools and districts. TIDE, however, has the configurable option of printing student testing tickets (refer to Exhibit 4.7.1.3-11) if NJDOE would prefer. Tickets usually include the student's name and state student identifier but may include any other student attributes or static text, as needed. TIDE lets proctors print test tickets in advance or on demand if that is helpful to assist students with logging in.

Exhibit 4.7.1.3-11: Sample Testing Ticket



Fields in the upper-right corner are configurable and can show different attributes or be removed, according to NJDOE's requirement.

Local testing proctors have at least two different ways they can assist students logging in on test day. First, the TA Interface, which is part of the TDS, has both a quick and advanced search function that will permit educators to quickly find the student's login credentials. Second, TIDE has access to the same information with broader search capabilities. If the educator is more familiar with TIDE and prefers to use it to find their student information, they can use that system on test day, as well. Either system will permit the user to find student login credentials.

Test Authorization

In addition to the student's credentials, there are several other security controls in place to ensure that the student does not have access to test content when they should not, including testing windows, test eligibility configuration, and other controls. The most important of these barriers is a session ID that is created either in advance or on testing day. The session ID is a random ID number generated by the proctor and must be provided by the student on the login screen to log in to the system. This session ID is very important because it ties the student and the proctor together as a part of the testing session and makes that proctor responsible for that student moving forward in the testing process. After logging in, the proctor will see their student appear on their application as waiting for approval to test and will need to approve them (either individually or as a group) to navigate any further in the system. Only after a student meets all these criteria and the system verifies that a proctor is actively monitoring them will they be able to access any of the test content.

Mark a Testing Window Complete

NJDOE requires the ability to mark a testing event as complete and to identify the reason why it is complete, such as the student being sick. In CAI's systems, a *session* is defined as one or more students testing with a proctor, usually in the same place at the same time. On the next day, those same students can test with the same proctor, but the session will have a different identity. There will be many places in this proposal where the term *session* is used. What NJDOE refers to as a session is what CAI calls a testing event or test opportunity. This is a unique testing record for an individual student for a single assessment.

All testing events have a series of statuses that they transition through on the road to becoming completed. In TIDE, all testing opportunities are easily searchable using a variety of parameters, including testing status, and this enables those with the appropriate role to identify non-participation codes for students who did not test due to a sick day or any other configurable list of reasons. This information is then reported in both TIDE and the CRS, and any scoring rules required to be implemented on incomplete or even partially complete test opportunities are conducted.

Add Testing Anomaly Status

The SCM requires that proctors be able to add testing anomaly status, such as fire drills, to an individual student's record or to an entire session of students. TIDE already fully supports this requirement. Administrative procedures such as test resets, reopening a test (when a test is paused for more than the allowed time), invalidations, and other actions are requested through TIDE. TIDE can be configured so that users must include a "reason" with these administrative procedure requests. CAI will work with the SCM to define the acceptable set of testing anomalies that can be reported through TIDE, and which specific administrative procedures allow a given reason. Reasons are available in a dropdown list, with a text box for additional comments.

According to the SCM's preference, reasons can be made mandatory or optional. If the SCM requires the ability for proctors to submit testing anomaly reports for testing incidents which for some reason did not warrant a test reopen, invalidation, or reset affecting the student's test-day experience, TIDE supports this requirement through the TIDE Forms feature. CAI can set up a form in TIDE for proctors to provide additional details about any testing anomaly, including the affected student(s) and/or test session ID(s).

Security Protocols to Re-Enter Tests

When a student exits the testing system, all the same security protocols remain in place upon their return. The student cannot re-enter their test on their own. They must go through the exact

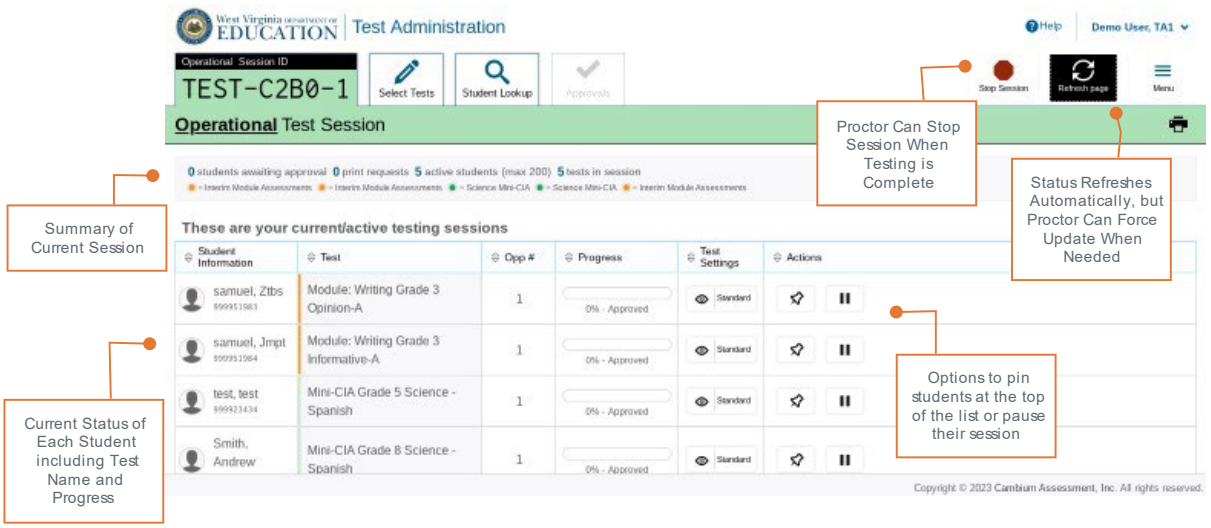
same login and approval process by a proctor to re-gain access to the test content, as illustrated in Exhibit 4.7.1.3-10. All these events are logged in the background for test irregularity investigation later, if that becomes necessary.

When the student re-enters the test, there are a set of configurable rules that will trigger to honor NJDOE's policy on resuming test opportunities and the visibility of previous test content. Most partners typically allow students to exit the system for up to 20 minutes (this is configurable) to accommodate a quick break, fire drill, or some other interruption. After 20 minutes, any item(s) the student already viewed will no longer be visible or editable. This can be overridden administratively on a case-by-case basis, if necessary, but generally speaking, students will be prevented from accessing previous items unless NJDOE would like to disable this rule.

Monitor Test Progress of All Students

Proctors can monitor student progress while they are testing through the TA Interface. The system automatically notifies proctors of events that require action. For example, students with the appropriate accommodation may want to print a passage. The TA Interface displays an icon to alert the proctor that his or her approval is required. Student sessions requiring additional monitoring can be pinned to remain at the top of the status list. Exhibit 4.7.1.3-12 shows a sample TA Interface during an active test session with four approved students.

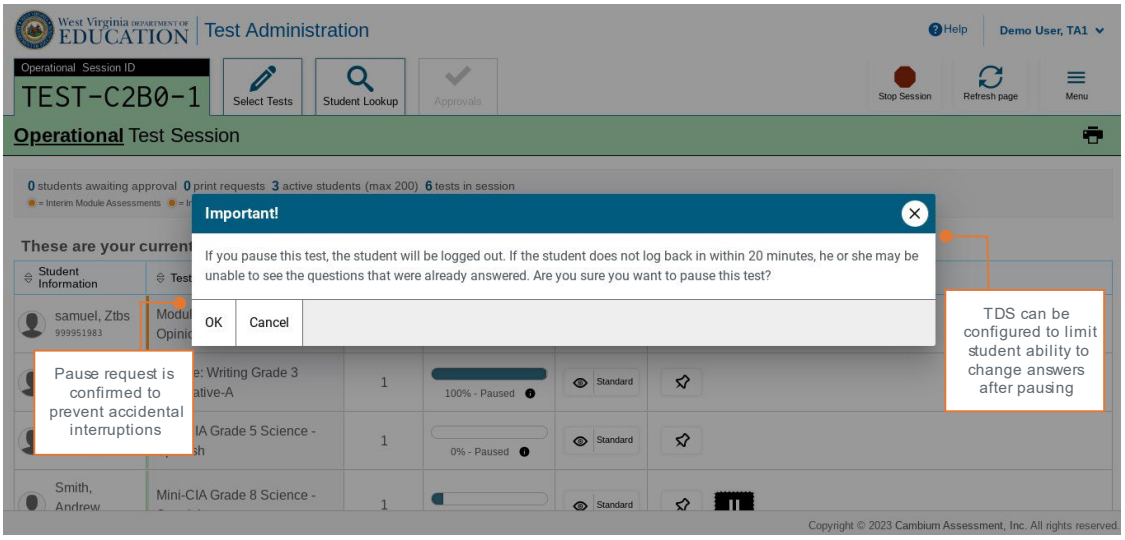
Exhibit 4.7.1.3-12: Test Administrator Interface During an Active Session



From time to time while students are testing, the proctor may need to take action to support and manage the testing process. The TA Interface enables the proctor to address most issues with a single click.

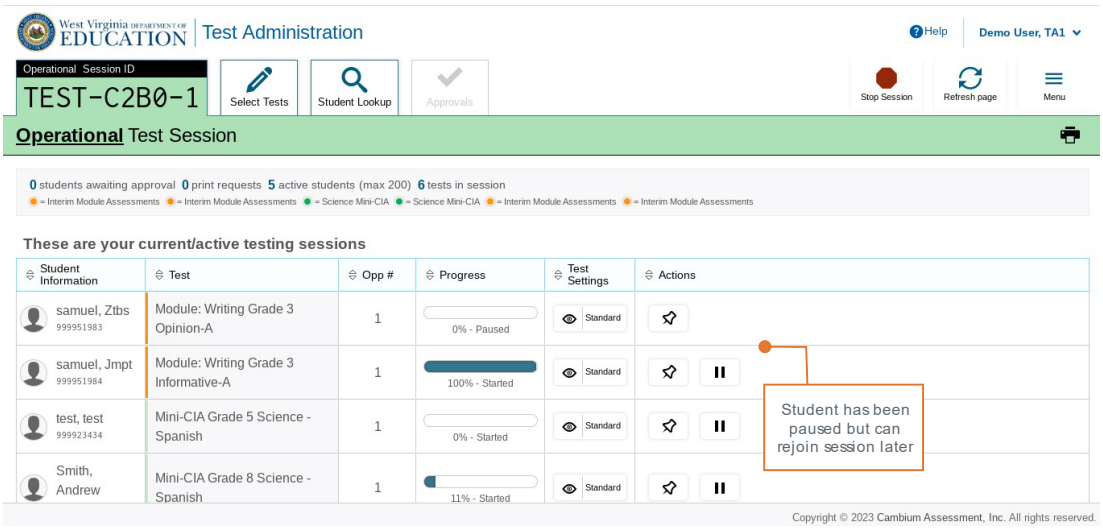
One common situation is the need for the student to pause testing. While the student can pause their own session, the proctor may need to do it as well using the TA Interface. As shown in Exhibit 4.7.1.3-13, there is a pause icon for each student. To pause the student's test, the proctor needs only to click the icon and confirm the request.

Exhibit 4.7.1.3-13: Confirming a Pause Request



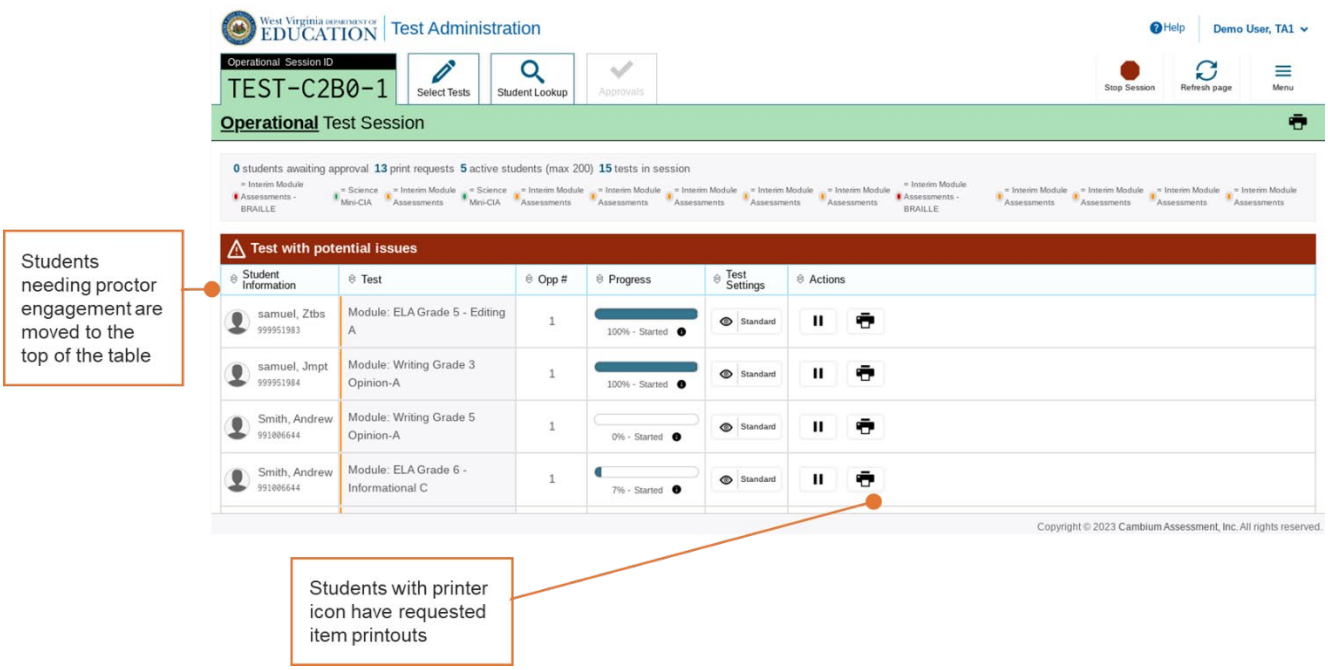
Once paused, the student cannot continue testing. As shown in Exhibit 4.7.1.3-14, the student's test remains in the session status table. The student's status will be updated if they rejoin the session.

Exhibit 4.7.1.3-14: Test Session with a Single Paused Student



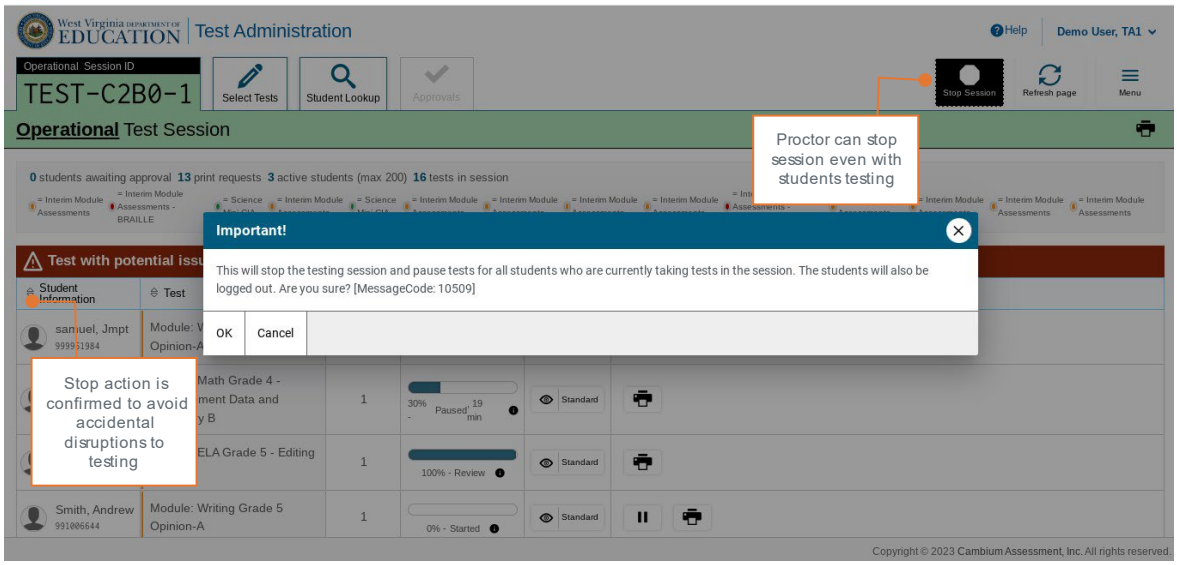
A less common situation, which is also supported with one click, is the need to print test passages for students. Students with approved accommodations can request printed copies of passage from the Student Interface. These requests appear on the TA Interface as a printer icon for the requesting student, as shown in Exhibit 4.7.1.3-15. The proctor need only click the icon to print the requested item. The process ensures test content security with minimal burden on the proctor.

Exhibit 4.7.1.3-15: TA Interface Showing Students with Item Print Requests



At the end of testing or if testing needs to be quickly paused for all students in the session, the proctor can stop the session with a single click by selecting the Stop Session icon in the TA Interface. The proctor is asked to confirm this request, as shown in Exhibit 4.7.1.3-16, to prevent accidental interruptions. Once the session is stopped, all student testing is halted.

Exhibit 4.7.1.3-16: Confirming a Stop Session Request



Security Management

Password-Protected User Accounts

NJDOE requires that the administration management system be able to control system access based on specific password-protected user accounts. TIDE meets this requirement by serving

as the role-based identity management system for all CAI systems. All CAI systems use a role-based access control design. TIDE provides an integrated system for adding, editing, and deleting users and assigning them different authorizations based on roles. TIDE is the authoritative source for all role-based access controls across CAI's systems, including the TA Interface, the Student Interface, and the CRS. Configuring and controlling which role has access to which systems is granular; control can be configured at the task or functionality level and, at times, even at the test level. Once these roles are configured in TIDE, the data are sent downstream so that other systems can apply these roles, effective immediately.

Creating and maintaining user accounts in TIDE is easy. It offers an intuitive, web-based interface to add, edit, and upload user accounts. CAI will work with NJDOE to develop a set of differentiated user roles sufficient to support all necessary workflows. User roles may be customized according to client-specific requirements during annual specifications review and finalization. NJDOE can decide which roles have access to which tasks and data elements in CAI's online systems. CAI technical staff will then configure the roles in TIDE according to NJDOE's specifications.

Our systems use role-based security models to ensure that users access only the data to which they are entitled and limit their ability to change that data. User rights have two dimensions: (1) the user's role and (2) the user's data access rights (his or her jurisdiction). A user's role determines which actions that user can take, which types of reports he or she can view, and similar functional limitations. Data access rights clarify, for example, which principal can view which teacher and student data. Data access rights are governed by relationships among entities in our TIDE Database of Record (DOR), along with a configurable set of business rules that describe which access rights correspond to which relationships and enforce client-specific policies. See Exhibit 4.7.1.3-17 for an example of state-determined configurability of data element access and tasks by user role.

Exhibit 4.7.1.3-17: User Roles and System Access Specifications

USER ROLES AND SYSTEM ACCESS		STATE	DISTRICT	DISTRICT	DISTRICT	DISTRICT	DISTRICT	SCHOOL	SCHOOL	SCHOOL	SCHOOL
		STATE	DTC	DA	EC	ITC	DRU	BTC	BRU	TE	TA
System	TASK LABEL	State Personnel	District Test Coordinator (DTC)	District Administrator (DA)	EMIS Coordinator (EC)	Information Technology Center (ITC	District Reporting User (DRU)	Building Test Coordinator (BTC)	Building Reporting User (BRU)	Teacher (TE)	Test Administrator (TA)
TIDE	View/Edit Rosters	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
TIDE	Upload Rosters	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
TIDE	Plan and Manage Testing	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
TIDE	Participation Search By SSID	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
TIDE	Test Session Status Report	No	Yes	Yes	No	No	No	Yes	No	No	No
TIDE	State Participation Counts	Yes	No	No	No	No	No	No	No	No	No
TIDE	Test Status Code Report	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
TIDE	Test Completion Rates	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
TIDE	State Dashboard	Yes	No	No	No	No	No	No	No	No	No
TIDE	Discrepancy Resolution	No	Yes	Yes	No	No	No	No	No	No	No
TIDE	Student Enrollment History	No	Yes	Yes	No	No	No	No	No	No	No
TIDE	Print from Student List	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
TIDE	Print from Roster List	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
TIDE	Score Reports Shipping Information	No	Yes	Yes	No	No	No	No	No	No	No
TIDE	Score Reporting Label Requests	No	Yes	Yes	No	No	No	No	No	No	No
TDS	**Which system(s) can users access?**										
	TA Certification Site	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
	Test Administrator Sites	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
	Data Entry Interface	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
Rosters	**Which students can users see?**										
	Which students can users see?										
	Read-only access? (Can only view rosters, cannot create or edit	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Student Passwords	**Who can edit/reset students' passwords?**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Able to edit or reset student passwords	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reporting											
	What level should this user have?	State	District	District	District	None	District	School	School	Teacher	None
	Is this user a Test Resource Admin?	No	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
	Does this user have access to Test Reason Manager?	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
	Does this user have scoring access?	No	Yes	Yes	No	No	No	Yes	No	Yes	No
	Does this user have scoring administrator access?	No	Yes	Yes	No	No	No	Yes	No	Yes	No
TASC											
	What level should this user have?	State	District	District	District	None	District	School	School	Teacher	None
	Is this user a Test Resource Admin?	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
	Does this user have access to Test Reason Manager?	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
	Does this user have scoring access?	No	Yes	Yes	No	No	No	Yes	No	Yes	No
	Does this user have scoring administrator access?	No	Yes	Yes	No	No	No	Yes	No	Yes	No
Authoring											
	Should this user have access?	None	District Admin	District Admin	None	None	None	School Admin	None	Teacher	None

Secure Encrypted Transmission of All Student Information

NJDOE requires that the Contractor provide a secure encrypted transmission of all student information. All CAI's systems meet this requirement by ensuring that all transmission of secure data takes place using Secure File Transfer Protocol (SFTP) or TLS 1.2. When the transferred data include student personally identifiable information (PII), the transfer software encrypts the files upon upload to the site. The files remain encrypted while they are at rest, and Secure Sockets Layer (SSL) encrypts the data in transit. We recommend that our clients use similar SFTP software when the data arrive at their site to re-encrypt data when it is at rest on state servers.

Student Data Encrypted at Rest

NJDOE requires that all student data be encrypted while at rest in addition to while in transit. As mentioned earlier, CAI systems meet this requirement by ensuring that all student data remain encrypted while at rest on our servers.

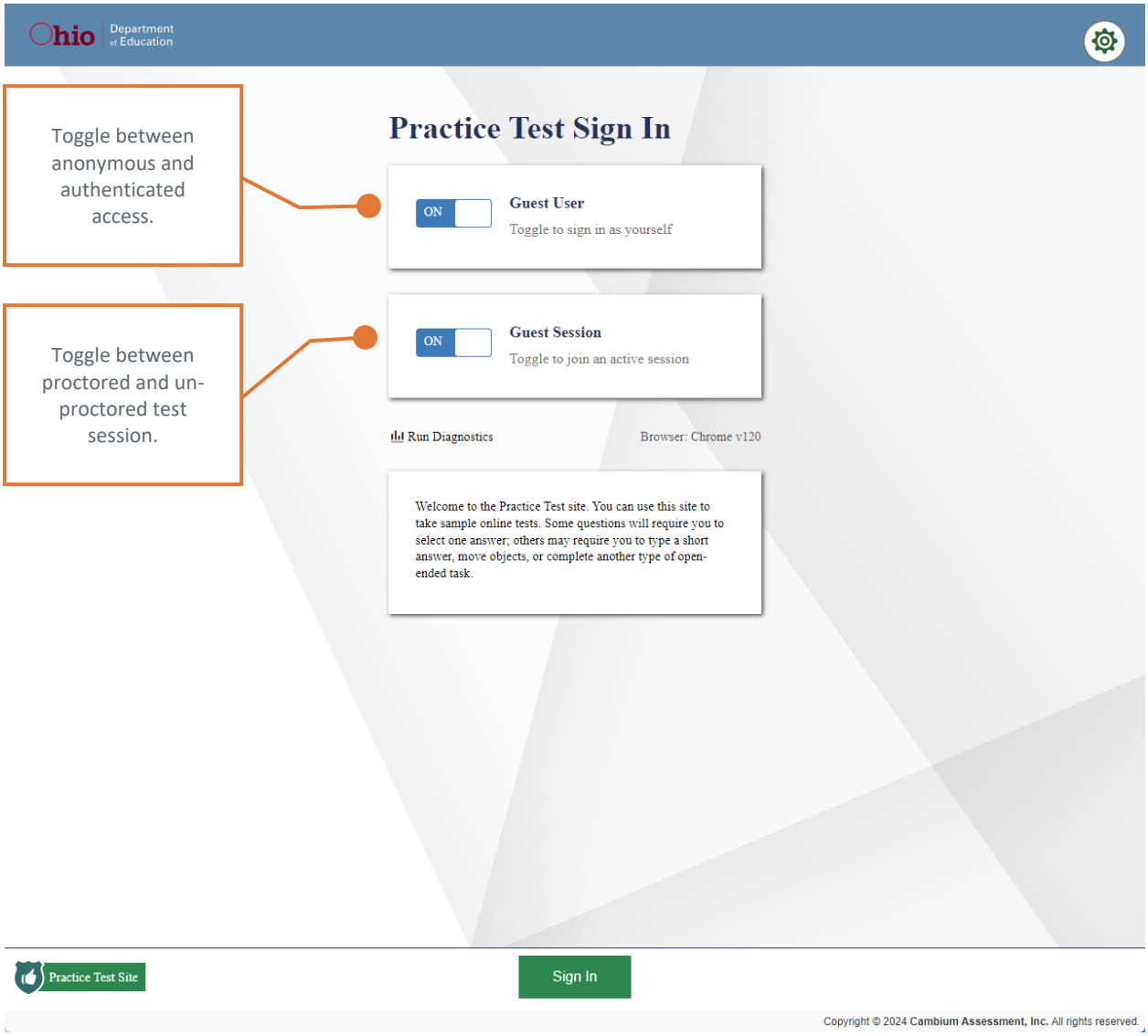
Practice Test Environment

Practice Test Environment That Replicates Actual Test Environment

CAI will deliver practice tests using the same TDS platform used to deliver summative assessments. Our test engine is fully configurable to support administration of formative, interim, summative, training, and practice tests to provide a consistent experience to educators and students, which minimizes training requirements and simplifies the testing process.

Practice tests will be delivered via a separate practice test site parallel to the operational site used to deliver summative and benchmark assessments. The practice test site will be configured identically to the operational site, with the exception that it will support both authenticated and anonymous testing and support testing in proctored or un-proctored sessions. This provides maximum flexibility for students to take practice tests during class time to rehearse the test administration process or on their own time to practice test material and test-taking skills. The login interface for a typical practice test site is shown in Exhibit 4.7.1.3-18.

Exhibit 4.7.1.3-18: Student Sign-On Form for Practice Test Sites



The practice test site will have access to the same tools, item formats, and response formats as available on the operational site. Because our system can tailor the testing environment to the specific requirements of each test type, we can customize the practice tests as needed. For example, we can easily configure practice tests for unlimited opportunities or allow access using standard browsers.

Practice tests can be enabled year-round, independent of the summative assessment testing window.

CAI provides a navigation link between the student login pages for the operational and practice test site to allow students to quickly switch between the two as needed. The link to the practice test site is generally found on the Family Portal, which targets families and students to allow quick access for at-home practice.

Submit Responses

Practice tests have the same response capabilities as summative tests. Students enter responses to practice items exactly as they would for summative test items. There is no distinction between practice tests and summative tests with regard to testing capabilities.

Score Report at the End of Assessment

TDS can be configured to provide a score report at the end of practice tests. Scores for all machine-scorable responses from simple multiple-choice to advanced technology-enhanced items (TEIs) like simulation, graphing, and equation items, can be reported at the end of the test session. A sample score report is shown in Section 4.13.2.1. The scoring rationale is developed as part of item development and can be fully customized as needed.

Alternatively, TDS can be configured to provide feedback after each item is completed. The scoring response displays as a pop-up when the item is completed, as shown in Exhibit 4.7.1.3-19.

Exhibit 4.7.1.3-19: Individual Item Scoring Response

Your response earned **1** point of a possible **1**

Score Rationale	
The student chose the correct answer.	✔

4.7.1.4. Online Testing System Requirements

CAI Systems Are Designed for Continuous Availability

The CAI test administration system is engineered to be available 24 hours a day, seven days a week, 365 days a year. User-facing systems, including the Test Information Distribution Engine (TIDE), Test Delivery System (TDS), Centralized Reporting System (CRS), and Family Portal leverage techniques, such as pooled web servers and database clusters, to ensure that they are available without interruption. Systems are monitored to detect outages; action is immediately taken to resolve issues that impact availability. Internal systems are engineered to maximize availability and minimize impact of testing operations. The full system architecture is described in Section 4.2.5.3.

CAI Minimizes Maintenance Impacts on System Availability

Routine system maintenance is performed outside regular business hours to minimize the risk of impacting system availability. CAI will only conduct maintenance requiring service interruptions between 11:00 p.m. and 5:00 a.m. on weeknights, weekends, or state holidays.

Monthly System Patching, which may require downtime for some applications, is scheduled at least a year in advance. System and application maintenance that includes service interruptions will be scheduled at least 10 days in advance as part of our Production Control Board (PCB) process. CAI's project manager will provide notification of planned outages and obtain New Jersey approval in advance.

System outages will be reflected in the New Jersey Assessment Portal on the system card for the application; the application URL will show an offline message during outages.

CAI Will Support State Security and Infrastructure Review Processes

CAI has established internal policy and procedures and documented our architecture as part of our ISO 27001 and ISO 27018 certification processes. These documents have been audited for compliance with ISO standards by external auditors. CAI will make the appropriate documentation available to NJOIT for review and will participate in the System Architecture

Review (SAR) process. CAI will give due consideration to all NJOIT recommendations and work with NJOIT to address concerns raised during the SAR.

CAI's Test Administration Platform Will Be Available During Designated Testing Windows

CAI systems are engineered to be highly available. We recognize the importance of state testing programs and the limited testing windows in which they occur. Therefore, we take every possible measure to ensure that nothing disrupts the testing process. Our TDS and all supporting administrative systems will be available from 6:00 a.m. EST to 10:00 p.m. EST, Monday–Friday.

Routine system maintenance is performed outside regular business hours to minimize the risk of impacting system availability. CAI will only conduct maintenance requiring service interruptions after 11:00 p.m. on weeknights, weekends, or state holidays.

CAI has established clearly documented protocols on how to respond when an incident impacts online testing, as discussed in Section 4.7.1.6. These protocols are reinforced through periodic training and meetings involving all incident response team staff, with additional follow-ups and emphasis prior to peak testing season.

The CAI New Jersey Project Management Team, the senior leadership team, and/or CAI technology directors will initiate an Everbridge alert to notify NJDOE of the major system disruption and collaborate on a course of action and communications plan.

CAI Will Manage System Updates to Ensure Online Testing Process Success

In the system development cycle, new features for the upcoming school year will be communicated to NJDOE in the spring leadership meetings. Typically, this includes screen captures or mock-ups of the new features to help clarify what they will accomplish. The discussion includes the benefits of the feature; how it was initiated or who requested it; and any configuration options. NJDOE can review this information and makes any decisions, such as whether to use a feature or how to configure its options. At this time, NJDOE may also request new features, consider adopting currently unused features, or change configuration options on currently used features.

CAI has two major software release windows per year—the first in fall and the second in winter. This schedule ensures that all major releases are completed well before the peak spring testing season begins. The major software release window in the fall includes more substantial functionality changes, new features, and user interface (UI) improvements, while the winter release window focuses on performance improvements and other background changes that are largely transparent to end users.

CAI will provide an environment for external user acceptance testing (UAT) so that NJDOE staff will be able to conduct a hands-on review of the system at least 15 days prior to the deployment of new functionality and the start of testing windows. UAT documents are created for each assessment to identify new and existing features along with test cases to ensure that the system meets the client-configured specifications, complex business rules, and is functioning as expected. The SCM's role is to provide valuable feedback for CAI to make adjustments during the UAT review. CAI will partner with the SCM to identify and prioritize issues that are considered severe or that concern the students' testing experience. Typically, UAT will be scheduled for three rounds, which allows for the SCM and CAI to alternate the schedule and cycle between testing, fixing, and verification. The last round is a final verification and approval

step. At the successful completion of UAT, the SCM will approve system deployment to production.

CAI acknowledges that NJDOE reserves the right not to have system changes deployed prior to or during a statewide test administration period. CAI's New Jersey Project Management Team will work with NJDOE to coordinate approval of deployments as part of our PCB process.

Within 30 calendar days of contract award, CAI will provide the SCM with a detailed description of how system updates, system patches, and/or system enhancements are planned, managed, and fully tested prior to deployment into production. If the SCM requests changes, CAI will submit the edited document within five business days of receipt of the request for edits.

CAI's New Jersey Project Management Team will work with NJDOE to develop a plan for accepting, evaluating, and responding to requests by the NJDOE for system enhancements. The plan will be submitted to the SCM within 30 calendar days of contract award. If the SCM requests changes, CAI will submit the edited document within five business days of receipt of the request for edits. The plan will align with existing CAI processes for collecting and evaluating requests for system enhancements.

Strict Change Control Processes

CAI's approach is to always deploy changes with minimal impact on school and district personnel. We do this in the following ways:

- Strict change control with strict deployment schedules
- Rigorous testing
- Deployment changes that are aligned with the State's test administration schedules as much as possible
- A detailed document listing the changes and the impact of those changes; the release notes are sent to NJDOE (detailed release notes accompany all software maintenance releases, from major releases to smaller patching deployments)

In the system development cycle, new features for the upcoming school year are communicated to NJDOE in the spring leadership meetings. Typically, this includes screen captures or mock-ups of the new features to help clarify what the new features accomplish. The discussion includes the benefits of the feature; how it was initiated or who requested the feature; and any configuration options for the feature. NJDOE reviews this information and makes any decisions, such as whether to use a feature or how to configure its options. At this time, NJDOE may also request new features, consider adopting currently unused features, or change configuration options on currently used features.

Outside of routine maintenance, no change is made to the production system without the approval of the PCB. The PCB includes a senior-level technical staff member, the director of our Computer and Statistical Sciences Center (CSSC), and the program director. Any request for a change to the production system requires the signature of the system's lead engineer. The PCB reviews risks, test plans, and test results. If any proposed change affects client functionality or poses a risk to the operation of a client system, the PCB ensures that the client is informed and in agreement with the decision.

The PCB will approve a maintenance plan that includes every scheduled change to the system. Deviations from the maintenance plan must be approved by the PCB, including server or driver patches that differ from those approved in the maintenance plan. Every bug fix, enhancement, data correction, or new feature must be presented with the results of a quality-assurance plan and approved by the PCB.

CAI's program director is responsible for representing NJDOE on the PCB and ensuring that NJDOE is informed of any changes to the production system. We have an emergency procedure that allows rapid response in the event of a time-critical change needed to avert compromise of the system. Under these circumstances, any member of the PCB can authorize the senior engineer to make a change, with the PCB retroactively reviewing the change.

Constant Communication Regarding System Features and Updates

Once we have all this information in hand, CAI will start preparing the systems for the new school year, beginning with updating the relevant system specifications. As the various systems are configured, NJDOE will have the opportunity to review those updates when performing UAT.

CAI will work with NJDOE to ensure that software maintenance windows do not conflict with any testing windows in New Jersey. All routine system maintenance is performed during off-hours only, with no impact on testing.

CAI has a well-planned, predefined schedule for all maintenance windows and will communicate this plan at least three years in advance. CAI understands that detailed planning and follow-up communication with stakeholders are critical to mitigating risks to these maintenance windows. CAI has a detailed policy around patching, including timing patching with Windows and Linux updates; using a comprehensive set of test cases; and retaining full rollback procedures in case they are required. These updates and server patching keep servers up to date with the latest security and performance supports. OS updates occur in lower environments first before being applied to production servers. Production updates are typically performed on the second Saturday of every month; this schedule will be established and communicated one year in advance.

4.7.1.5. Online Testing Platform User's Guide

Preparing district and school test coordinators and district technology coordinators for online testing is critical to ensuring a smooth, standardized administration. Our documentation and training materials to support New Jersey stakeholders meet and exceed the requirements outlined in the RFQ. We will provide the following documentation for technology coordinators:

- Instructions for installing secure browsers
- Device configuration, minimum hardware and software requirements
- Network configuration instructions
- System update notifications
- System user guides for each component of the platform
- Quick guide for setting up technology for online testing
- Systems training workbook
- Troubleshooting document for each operating system

In the following paragraphs we describe

- each technology document or training resource listed here;
- the process for producing the technology documentation;
- the proposed timeline for state review and approval; and
- the proposed schedule for making these documents available to the field.

For the past 19 years, CAI has provided documentation and training for technology coordinators for 29 states. CAI project teams and technical writers have successfully collaborated with our clients to meet their state assessment and technology needs. We intend to leverage our

experience providing clear, useful technical documentation to ensure that districts are prepared with technology for a smooth online administration.

> *In 2021, CAI's one-hour webinar for Technology Coordinators was used to successfully train over 300 Texas district technology coordinators during the first year of testing for all of the Texas state assessment program on the CAI platform. Because our systems are purely Internet-based and the CAI Secure Browser is the only software necessary in schools or districts that can be installed easily, we can deliver short, efficient training to technology coordinators in a webinar that provides them with all of the necessary information to ensure successful online administration.*

In the following sections we detail each technology document and training listed here.

Proposed Training Topics and Materials

We will provide the following technology training materials and resources for New Jersey district and school test coordinators and district technology coordinators:

- District Technology Coordinator Training Video
- Quick Guide for Setting up Online Testing
- Network Configuration Document
- New Jersey Assessment Portal Instructions for Installing Secure Browser and Troubleshooting Student Workstations
- New Jersey Assessment Portal Instructions for Setting up and Troubleshooting Staff Workstations
- Systems Training Workbook
- Minimum Hardware Requirements
- System Updates Notifications
- User Guides and Manuals for CAI Systems (to support New Jersey educators and technology personnel and ensure smooth test administration)

These resources provide step-by-step instructions and best practices for setting up and configuring devices that will be used for online testing. Along with a troubleshooting document, these resources can help ensure that technology coordinators have the information needed to effectively set up and manage online testing systems for their districts and schools.

In the following paragraphs we summarize the contents of each technology training support resource. These documents will include graphics, photos, diagrams, text, and screen captures as needed for clarity. Technology coordinators use them to prepare for smooth test administration.

District Technology Coordinator Training Video

This online training module reviews information for school and district technology coordinators and network administrators to provide guidelines for varied technical setups and technical support available in the schools. Technical setups include multiple CAI Secure Browser installation methods, such as manual installation on individual machines, installation on machines through a network, access from a shared network drive, and thin-client setup. Minimum hardware requirements will also be reviewed in detail.

Quick Guide for Setting up Online Testing

This document provides an overview of CAI's online testing system and its structure and how to navigate the online system. The quick guide describes easy-to-follow guidelines for setting up

workstations for both the test administrator (TA) and the student, along with various methods of installing the Secure Browser. Users can also review technical specifications including information about supported desktops, laptops, and other approved testing devices and their related hardware requirements. We offer recommendations for network configuration, including steps for checking network bandwidth using the diagnostic readiness stool and configuring wireless networks, proxy servers, and Help Desk information for technology coordinators to receive more personalized assistance.

Network Configuration Document

This document outlines information on configuring networks for online testing and lists resources to the allow-list for online testing; the ports and protocols used for online testing; and steps to configure filtering system, domain name resolution, network settings, and proxy servers. Users can learn how to access the network diagnostic tool from this document to ensure that networks are configured correctly.

Portal Instructions on Installing Secure Browsers and Troubleshooting Student Workstations

We offer a dedicated page on the New Jersey Assessment Portal that describes critical information for setting up student workstations. The Secure Browser is CAI's customized web browser. It is designed to keep tests secure by locking down the student desktop and preventing the student from accessing anything except his or her test. This page provides the support plan, basic Secure Browser installation instructions for each operating system (Windows, macOS, Linux, iPadOS, and ChromeOS), and advanced Secure Browser installation instructions on a shared network drive (Windows, macOS, and ChromeOS).

Troubleshooting information for student desktops and laptops running Windows, macOS, and Linux workstations can also be easily accessed on the New Jersey Assessment Portal. Some examples include the following:

- To disable some features that are not allowable on the state assessment such as the Automatic Volume Reduction feature in Windows
- To configure the touch bar on a MacBook to prevent students from getting kicked out of a test

Portal Instructions for Setting up and Troubleshooting Staff Workstations

Because nearly any modern device, including mobile devices such as tablets and phones with any modern browser, can be used to access the TA Interface and administer a testing session, it is unlikely that any setup will be required for TA workstations. Nevertheless, we provide information on how TA or proctor workstations can be set up for each operating system (Windows, macOS, Linux, iPadOS, and ChromeOS). A list of supported web browsers as well as information about the best method of accessing certain CAI systems can be found on the New Jersey Assessment Portal.

System Training Workbook

This workbook includes a comprehensive list of system tasks to complete before, during, and after test administration. It also provides step-by-step instructions on how to prepare for online test administrations by simulating test-day network utilization and ensuring that all devices can run the appropriate software.

This workbook includes step-by-step instructions for districts and schools to prepare for operational computer-based test administrations by simulating test-day network utilization and ensuring that all computers and devices that will be used for testing can run the appropriate software. Some of the important tasks it covers include how to use the web-based diagnostic

readiness tool, download and install the Secure Browser, create a test session, start a test session, log in to a test session, and stop a test session.

Minimum Hardware and Software Requirements

To ensure and maximize the best online testing experience, we list supported operating systems, including versions, OS release dates, and support timelines. We also list supported devices and related hardware requirements and describe how CAI plans to support both staff and student workstations.

System Update Notifications

CAI utilizes the technology resource page on the New Jersey Assessment Portal to effectively notify technology users of any deployed changes that can affect network configuration or staff or student workstations. On the New Jersey Assessment Portal, we provide the most recent and up-to-date information on any system updates, including a summary of newly deployed changes for advanced users, a list of change logs with brief descriptions of the changes, and direct links to the technology documents where these updates and or changes took place.

System User Guides, Quick Guides, and Manuals

CAI will also provide system user guides (Exhibit 4.7.1.5-1) for each component of the online testing platform. The guides most relevant to technology coordinators are described in detail in the following paragraphs. CAI commits to providing NJDOE with at least five business days to review all draft documents and updates. CAI will commit to delivering these materials to the SCM at least 10 business days before the start of September, and local education agencies (LEAs) on a schedule determined and approved by NJDOE. All training and ancillary materials will be available electronically via the assessment portal after NJDOE has reviewed and approved them. CAI will ensure that all guides, as well as any supporting documents, are accurate, error-free, and compliant with Section 508 of the Rehabilitation Act of 1973.

Exhibit 4.7.1.5-1: System User Guides and Quick Guides

User Guide Title	Description
Test Information Distribution Engine (TIDE) User Guide	TIDE is used to manage user and student information, order testing materials, track orders, monitor test progress, and execute administrative functions, such as test resets or reopens. This guide covers a wide array of tasks in TIDE, including how to log in and navigate TIDE, manage user accounts, manage student information and accommodation settings, order paper materials, and monitor test progress.
Test Administrator User Guide	This user guide supports TAs who manage testing for students participating in online practice tests and operational tests. The guide includes the overall layout of the TA site, a description of how to create test sessions and approve students for testing, and an explanation of how students navigate the test and use test tools.
Assessment Viewing Application (AVA) User Guide	The AVA allows authorized users to review assessments for administrative or instructional purposes. This guide explains how to access AVA, how to select tests to review, and how to navigate and view assessments.

User Guide Title	Description
Data Entry Interface (DEI) User Guide	This user guide provides instructions on how to enter student responses and submit students' tests in the DEI.
Assistive Technology Manual	This document provides information about how to configure accommodations and assistive devices and includes an overview of braille hardware and software requirements as well as basic test administration processes.
Authoring User Guide	This user guide provides instructions for using the test authoring system to create custom items and tests.
Quick Guides: • TIDE Quick Start Guide • Authoring Quick Guide • Test Administrator Quick Guide • Remote Proctoring Quick Guide for Teachers • Remote Testing Quick Guide for Students and Families • Remote Proctoring Quick Guide for Technology Coordinators	These quick guides provide a brief overview of key tasks performed in each system.

CAI's Experience in Developing Technology and Systems Resources

Our team has extensive experience in developing technology and systems resources to meet the needs of our clients. The examples of documents we have developed for our clients demonstrate our commitment to providing comprehensive and effective resources for district and school technology personnel.

- Portal Technology Resource Page for Florida Technology Coordinators
- Technology Training Module for Ohio Technology Coordinators

Exhibit 4.7.1.5-2 presents an example of how a technology resource page in the Florida client portal offers easy-to-navigate, task-specific information for technology coordinators. Users can also download a PDF document that includes the full resources of this technology guide.

Exhibit 4.7.1.5-2: Technology Resource Page

Florida
Statewide Assessments

Home › Assessment & Technology Coordinators › Technology Guide

- Getting Started
  - Basic Steps
  - Change Log
- Setting Up Staff Workstations
  - Setting Up TA or Proctor Workstations
  - Setting Up Workstations to Access Other CAI Systems
- Setting Up Student Workstations
  - Support Plan for Operating Systems
  - Supported Devices
  - Installing the Secure Browser
  - Configuring Student Workstations
  - Troubleshooting Student Workstations

Setting Up Student Workstations

In order for students to access online tests, each student workstation needs CAI's Secure Browser installed on it. The Secure Browser is CAI's customized web browser designed to keep tests secure by locking down the student desktop and preventing the student from accessing anything except their test. Unlike conventional web browsers, the Secure Browser displays the student application in full-screen mode with no user interface to the browser itself. It has no back button, next button, refresh button, or URL bar. Students open the Secure Browser and are taken exactly where they need to go.

To get started setting up your student workstations, you should first make sure your device is supported. Please note the Secure Browser is not supported for use within a virtual machine.

For a list of supported devices and operating systems, please visit Supported Devices.

Cambium Assessment

Technology Guide

Florida Statewide Assessments

Setting Up Workstations to Access Other CAI Systems

Access to other CAI systems requires the use of one of the following supported web browsers:

- Chrome 101 or higher
- Firefox 101 or higher
- Edge 101 or higher
- Safari 15 or higher

For the best experience, TIDE and Reporting should be accessed on desktops or laptops running Windows, macOS, or Linux.

Setting Up Student Workstations

In order for students to access online tests, each student workstation needs CAI's Secure Browser installed on it. The Secure Browser is CAI's customized web browser designed to keep tests secure by locking down the student desktop and preventing the student from accessing anything except their test. Unlike conventional web browsers, the Secure Browser displays the student application in full-screen mode with no user interface to the browser itself. It has no back button, next button, refresh button, or URL bar. Students open the Secure Browser and are taken exactly where they need to go.

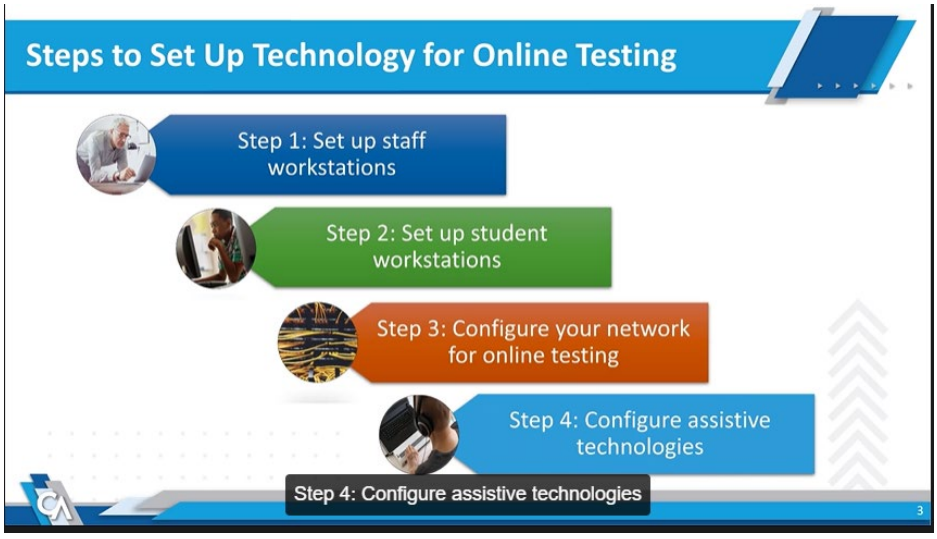
To get started setting up your student workstations, you should first make sure your device is supported. Please note the Secure Browser is not supported for use within a virtual machine.

For a list of supported devices and operating systems, please visit Supported Devices.

We also offer online training modules that are posted in the client portal technology resource page to promote asynchronous learning opportunities (Exhibits 4.7.1.5-3 and 4.7.1.5-4). Our team is dedicated to providing comprehensive and effective technology resources that are tailored to the unique needs of each client.

Exhibit 4.7.1.5-3: Ohio Technical Resource Page

Exhibit 4.7.1.5-4: Client Online Training Example



4.7.1.5.1. System Update Notifications

CAI will detail the specifics of newly deployed system changes via release notes on our website on a quarterly basis. For every set of changes that are released into production systems, CAI prepares release notes for each system that details the ticket ID and a user-friendly description of the change. Refer to Exhibit 4.7.1.5-5 for a sample.

Exhibit 4.7.1.5-5: Release Notes

A	B	C	D
What's New—Test Delivery System: 16.0 (6/23/22)			
FEATURE/BUG	JIRA TICKETS	APPLICATION	DESCRIPTION OF CHANGE
New Feature	TDS-12419	TA Site	Redesigned the TA Site to use a tab-based interface, rather than one consisting of modal windows. Some features were moved into a menu, and other site elements were rearranged.
New Feature	TDS-12553	Student Site	Updated masking tool behavior for WA to prevent users from responding to short answer items while masking tool is enabled.
New Feature	TDS-12650	Student Site	Dictation features were added to the global and context menu note tools.
New Feature	TDS-12867	Student Site	Allow clicking/tapping to targets instead of dragging
New Feature	TDS-12873	TA Site	Added the configurable setting to hide the Approve/Deny buttons in the student approvals tab.
New Feature	TDS-12917	Student Site	Updated configurable application settings to allow UI messages to appear in English even when test is set to another language.
New Feature	TDS-12930	Student Site	Added a new configurable setting to disable the predict ahead feature for cowriter.
New Feature	TDS-13081	DEI/AVA	Hiding the View Settings feature from tests in which no settings are applied.
New Feature	TDS-13102	Student Site	Changed the message that displays to students when trying to access an inactive session.
New Feature	TDS-13129	Student Site	Created a new early childhood layout of the student testing site, which uses larger icons and simplified navigation.
New Feature	TDS-13227	Student Site	Updated the end test behavior to automatically bring students to the review page when they click Next on the last item page.
New Feature	TDS-13291	TA Site	Added a new configurable setting requiring TAs to enter a statement of intent before proctoring a summative test.
New Feature	TDS-13470	Student Site	Added a new protractor tool to the global menu.

4.7.1.6. Online Monitoring

CAI has implemented a comprehensive solution for monitoring our systems. This solution is designed to meet the needs of NJDOE and CAI as we execute a successful test administration program. CAI's solution provides information for NJDOE and its users to track the test administration process. CAI's solution also provides the information that CAI needs to manage the test administration and test delivery platforms. The summary of our solution as it meets and exceeds NJDOE's requirements is shown in Exhibit 4.7.1.6-1.

Exhibit 4.7.1.6-1: CAI Monitoring Solution Summary

Requirement	CAI's Solution
A. Ensure that all system monitoring shall be conducted by the Contractor with results available to the NJDOE regularly, on the first Business Day of the month, and upon request.	CAI has a comprehensive monitoring solution and will deliver results to NJDOE on the first business day of the month and upon request.
B. Immediately notify the SCM and designees by phone and email regarding any interruptions, degradations of performance, or potential security breaches and/or concerns.	CAI has a proactive monitoring, notification, and issue resolution process. CAI's project manager for NJDOE will immediately notify the SCM and designees of interruptions, degradations of performance, or potential security breaches and/or concerns.

Requirement	CAI's Solution
C. Provide a means for automatically monitoring system availability to end-users in LEAs and schools. The Contractor must provide automatic notification of system warnings and/or system failures to appropriate Contractor staff for corrective action.	CAI has implemented proactive exception alerting; real-time monitoring; and diagnostics systems, processes, and procedures to ensure the reliability, availability, and performance of our suite of online systems. CAI's Network Operations Center (NOC) personnel review and analyze warnings and alerts, collect supporting information, and route events to systems engineering and development teams for investigation and resolution.
D. Provide real-time and archived users' statistic.	CAI provides a client dashboard to enable NJDOE to monitor real-time testing statistics. CAI also provides participation reports to monitor progress of the test administration.
E. Provide regular reports of online system usages.	CAI captures and stores system usage, telemetry and student response data for all item types while students are testing. The Test Delivery System (TDS) telemetry data can be provided to NJDOE as part of the state data files or generated supplemental reports.

CAI Will Deliver Monitoring Results on the First Business Day of the Month and Upon Request

CAI has a comprehensive monitoring solution and will deliver results to NJDOE on the first business day of the month and upon request. Metrics to be reported and reporting format will be documented during the contract initiation process. The information available is summarized in the following sections.

CAI Has a Proactive Monitoring, Notification, and Issue Resolution Process

We take many precautions to mitigate the risks of interruptions. Some of these precautions were previously discussed under monitoring and alerting. Of course, load testing, performance testing, system testing, integration testing, and user acceptance testing (UAT) all contribute to risk mitigation.

In addition, we run daily automated functional tests against key systems before testing begins. Test results and key performance statistics are transmitted to our engineers for review at approximately 6:15 a.m. (ET) every day. This provides an opportunity to review maintenance logs, analyze performance, and address any issues that may emerge before students begin testing.

During testing, our NOC observes our system monitors and application dashboards. Should an alert arise, or if an application dashboard detects anomalous performance, we have an emergency response protocol in place. Interruptions are rare, but we have a well-defined protocol to escalate issues in near-real time. Should an issue arise, including one that could potentially cause problems in the field, our NOC or other monitoring staff will use the automated alert system to send automated alerts to staff's mobile phones (the list of recipients is dependent on the system). Predefined recipient groups include several senior executives, representatives of the software development team responsible for the system, network engineers, Amazon Web Services (AWS) representatives, and representatives of our Help Desk and lead members of the project team.

Within minutes of the alert going out, we convene the necessary staff to form a response plan and response team. Heather Hayes, our vice president of Assessment Programs and Client Services, or a representative is on the telephone. The role of the project management representative is to ensure that program managers from affected programs and any affected clients are notified. In general, it can take up to 10 minutes to determine whether a problem actually exists; if a potentially field-affecting problem appears, the client can expect to be notified in approximately that time frame by telephone.

Should an issue arise that can affect the field, our process calls for the deployment of pre-approved automated messages on our helpline and the posting of notifications on client portals. In addition, we can push messages to the Test Administrator (TA) Interface so that any TAs will be informed of the process in real time or as they log on.

We have an annual process that reviews these procedures with staff, and we practice the procedures in frequent “fire drills” throughout the year. We hope we never have to use them, but should a problem arise, these procedures will mitigate the impact on the field.

Constant Communication with NJDOE

In the unlikely event of systemwide issues, the CAI New Jersey project team will immediately communicate to NJDOE when issues are identified in parallel with CAI internal analysis and mitigation efforts. Systemwide issues can be reported using one of several options, including the banner notification system via the Test Information Distribution Engine (TIDE) or announcements via the client portal. We will work with NJDOE on preferred communication methods, such as alert notification or written or verbal communication.

Event Reports Support Root Cause Analysis and Client Visibility

After the initial mitigation of a systemwide issue, CAI will prepare an Event Report that identifies the root cause of the issue and prevention steps to avoid the issue moving forward. The initial Event Report will be provided to NJDOE within 24 hours of the discovery of the issue. CAI will provide daily updates until the issue has been resolved and no longer impacts production operations.

CAI Will Closely Monitor All Test Delivery Systems to Ensure High Availability and Performance

CAI has implemented rigorous, proactive exception alerting; real-time monitoring; and diagnostics systems, processes, and procedures to ensure the reliability, availability, and performance of our suite of online systems. CAI systems are monitored by automated systems, which are also monitored by staff, allowing prompt action to be taken to resolve issues before they impact testing operations in the field. We have a variety of tools and protocols in place for monitoring our systems (both hardware and software) and in responding to any issues that occur. We rely on automation for all our monitoring. Mitigation is automatic in some cases, but in others, we prefer a human review of the issue to trigger the mitigation.

CAI’s NOC is responsible for monitoring our system monitors and application dashboards. NOC personnel review and analyze warnings and alerts, collect supporting information, and route events to systems engineering and development teams for investigation and resolution. Routine issues that could impact testing operations are quickly resolved within CAI’s change control policies.

CAI’s TDS is monitored using a combination of commercial monitoring tools and CAI-customized automated functional tests and dashboards specific to CAI systems.

System Monitors and Application Dashboards

CAI conducts extensive monitoring to track and manage our infrastructure and to detect technology failures using off-the-shelf monitoring tools. PRTG, IDERA, and CloudWatch are three of the core monitoring platforms we use. All our tools are described in Exhibit 4.7.1.6-2.

Individual systems within the CAI application suite log their own status and performance data, including data on exceptions and latencies of specific procedures. The application dashboards also incorporate data from PRTG, IDERA, and CloudWatch sensors to provide a unified view of system status and health. Internal dashboards and a customized automated functional test allow CAI to monitor and optimize application performance based on these data. Deviations from expectations are flagged on the dashboard for analysis and mitigation.

Our systems also log user access and maintain an audit trail of changes to managed entities and attributes. Each application maintains one or more internal error logs that are used by our development teams to investigate errors and anomalies. Our systems run nightly validation routines to confirm key data entities and relationships in our databases to ensure complete data integrity.

CAI will work with NJDOE to understand NJDOE's requirements for monthly and ad hoc reporting of system monitoring information.

Exhibit 4.7.1.6-2: CAI Monitoring Tools

Monitoring Tool	Description	Automated	Drivers That Trigger Notification to Support Personnel	Sample Screen Captures[3]
Tools for Monitoring Production Environment, Network, and Hardware Devices				
PRTG	This tool monitors the health of all our client-facing systems. Any URL that does not respond immediately triggers an alert to our NOC. We also use PRTG to monitor CPU/memory/disk usage on servers to alert us to any thresholds that are being exceeded.	Yes	• ICMP ping failure • CPU utilization above threshold • Memory utilization above threshold • Disk-free space below threshold • Key process offline • Replication errors • Service broker errors • Down HTTP sites	Exhibit 4.7.1.6-3
FogLight	SQL Server Monitor watches server and database health.	Yes	• Deadlocks • SQL job failures • Internal SQL errors	-
CloudWatch	This is the AWS monitoring tool for tracking servers and services.	Yes	• EC2 instance status • ALB load balancer latency • Application programming interface (API) gateway endpoint status • RDS database status	Exhibit 4.7.1.6-4
Load Balancers	All our client-facing websites use load balancers with multiple web servers behind them. The load balancer periodically checks the health of each web server and can automatically take a server off rotation if it does not respond within a prescribed interval.	Yes	Our systems engineers will receive an alert and can investigate the server in the background while the site is still operational using the other servers that are in the pool.	-

[3] Note that some screen captures have redacted information for security purposes.

Monitoring Tool	Description	Automated	Drivers That Trigger Notification to Support Personnel	Sample Screen Captures[3]
Tools for Monitoring Security				
Shield Advanced	This tool monitors for distributed denial-of-service (DDoS) attacks in AWS.	Yes	Incidents are reported to the AWS Security Monitoring Center, which then engages CAI.	-
LogRhythm	This tool involves log scanning to raise alerts for any malicious activity.	Yes	Monitored by the Information Security Team, who alert systems engineering and development teams to address incidents.	-
Tools for Monitoring Applications				
Automated Functional Test (AFT)	Automated tests run early every morning to test the readiness of our systems. For the TDS AFT, this emulates demo proctors running test sessions and demo students taking tests to identify any issues well before testing begins. For Single Sign-On (SSO), the AFT tests login and password reset operations, while for TIDE, the AFT emulates common functions that users would perform once logged in.	No	The NOC team raises alerts if high latencies are observed.	-
TIDE	This tool reports the status of TIDE web servers and support processes.	No	• System outages • System errors • High system latencies • Integrates server status from PRTG	Exhibit 4.7.1.6-5

Monitoring Tool	Description	Automated	Drivers That Trigger Notification to Support Personnel	Sample Screen Captures[3]
TDS	This tool reports the status of TDS databases and test delivery satellites.	No	• Tests load-approaching system capacity • Server performance issues • High system latencies • Integrates server status from PRTG	Exhibit 4.7.1.6-6
Analysis	This tool reports the status of student responses after completion of testing to ensure prompt availability of student results.	No	• Backlogs in analysis processes • Errors in analysis processes	Exhibit 4.7.1.6-7
Tools for Monitoring Assessment Administration				
TDS Proctor Application	This tool provides the real-time status of students testing within a test session. Issues requiring proctor engagement are highlighted.	No	• Student requests to join the test session • Student progress through the assessment • System issues impacting student progress • Issues impacting administration security	-
TIDE Participation Report	This tool provides visibility into test participation, including active test sessions within the organization.	No	• Progress of test administration within school or district	-
Client Dashboard	This tool provides a client-wide view of current testing volumes and test participation.	No	• Progress across state of test administration	-

Sample Screen Captures

Exhibit 4.7.1.6-3: PRTG Monitor Main Dashboard

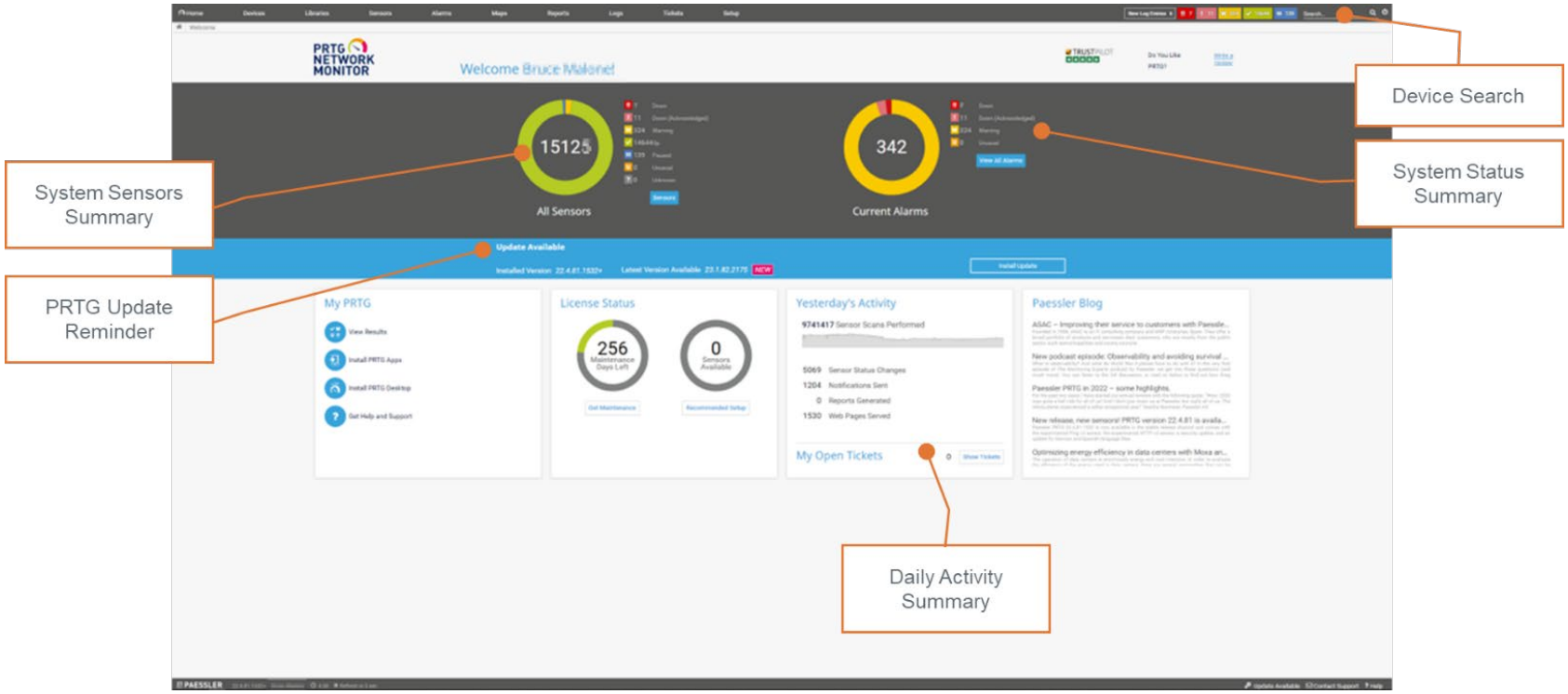


Exhibit 4.7.1.6-4: CloudWatch Alarm Notification

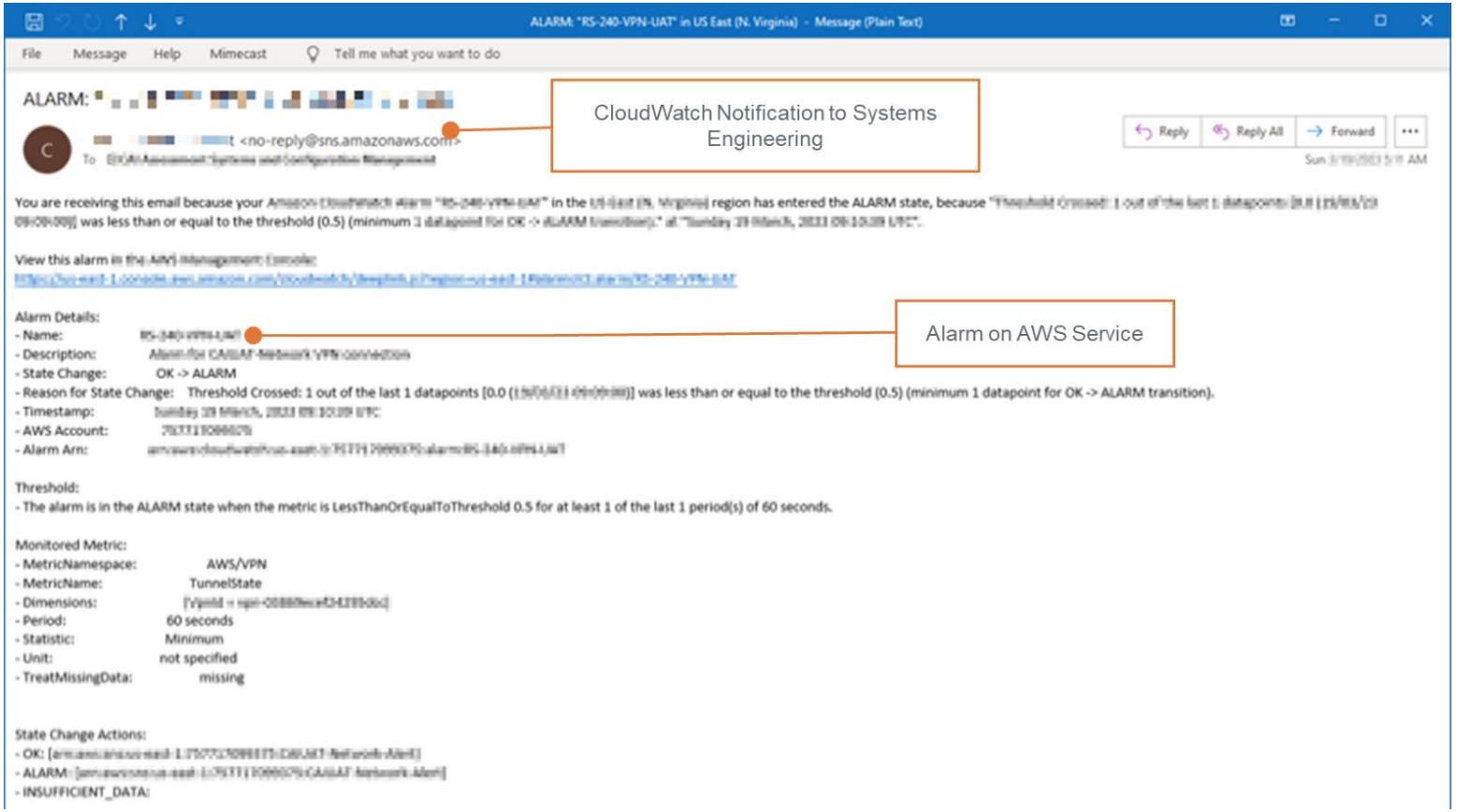


Exhibit 4.7.1.6-5: TIDE Dashboard

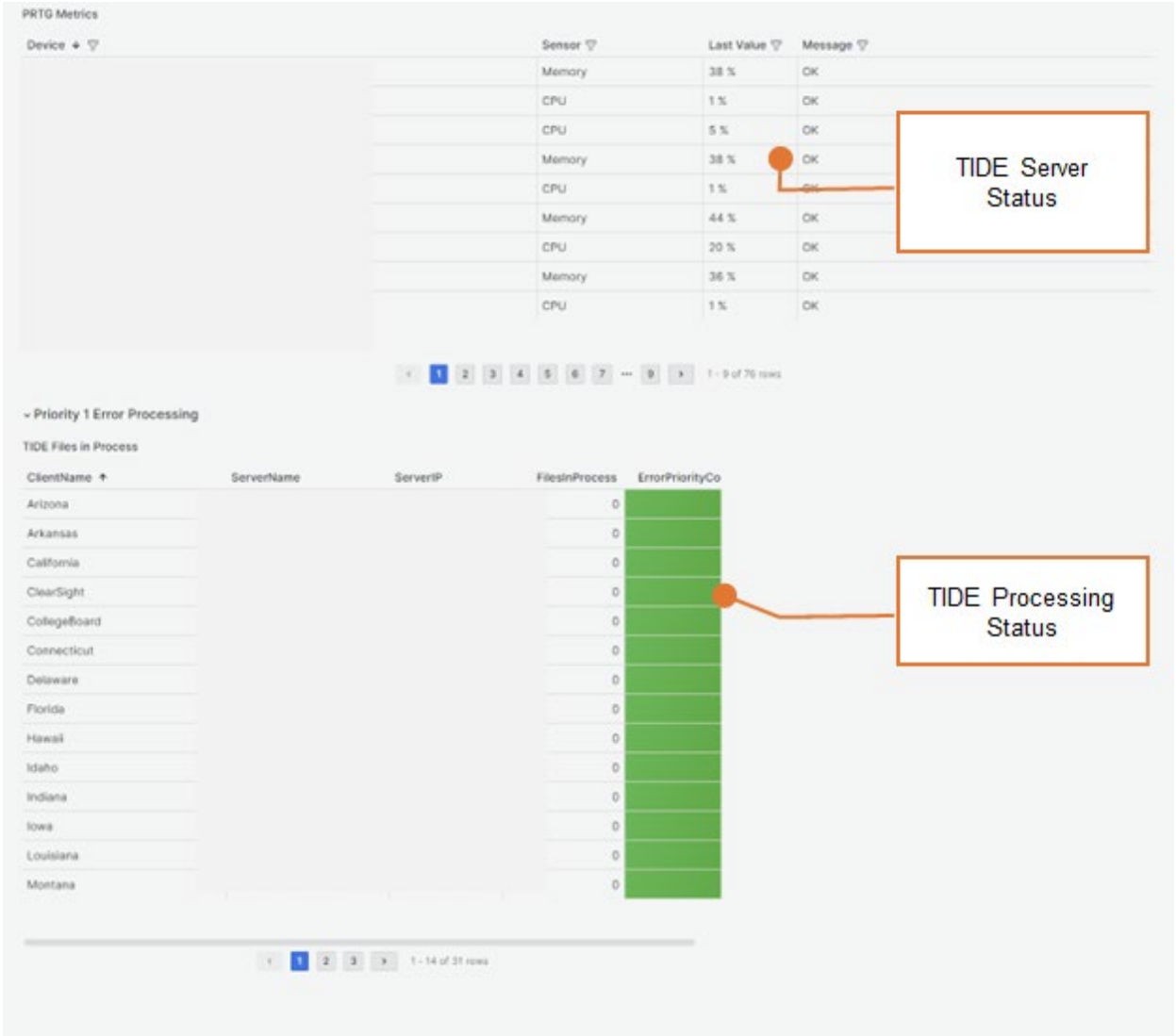


Exhibit 4.7.1.6-6: TDS Dashboard

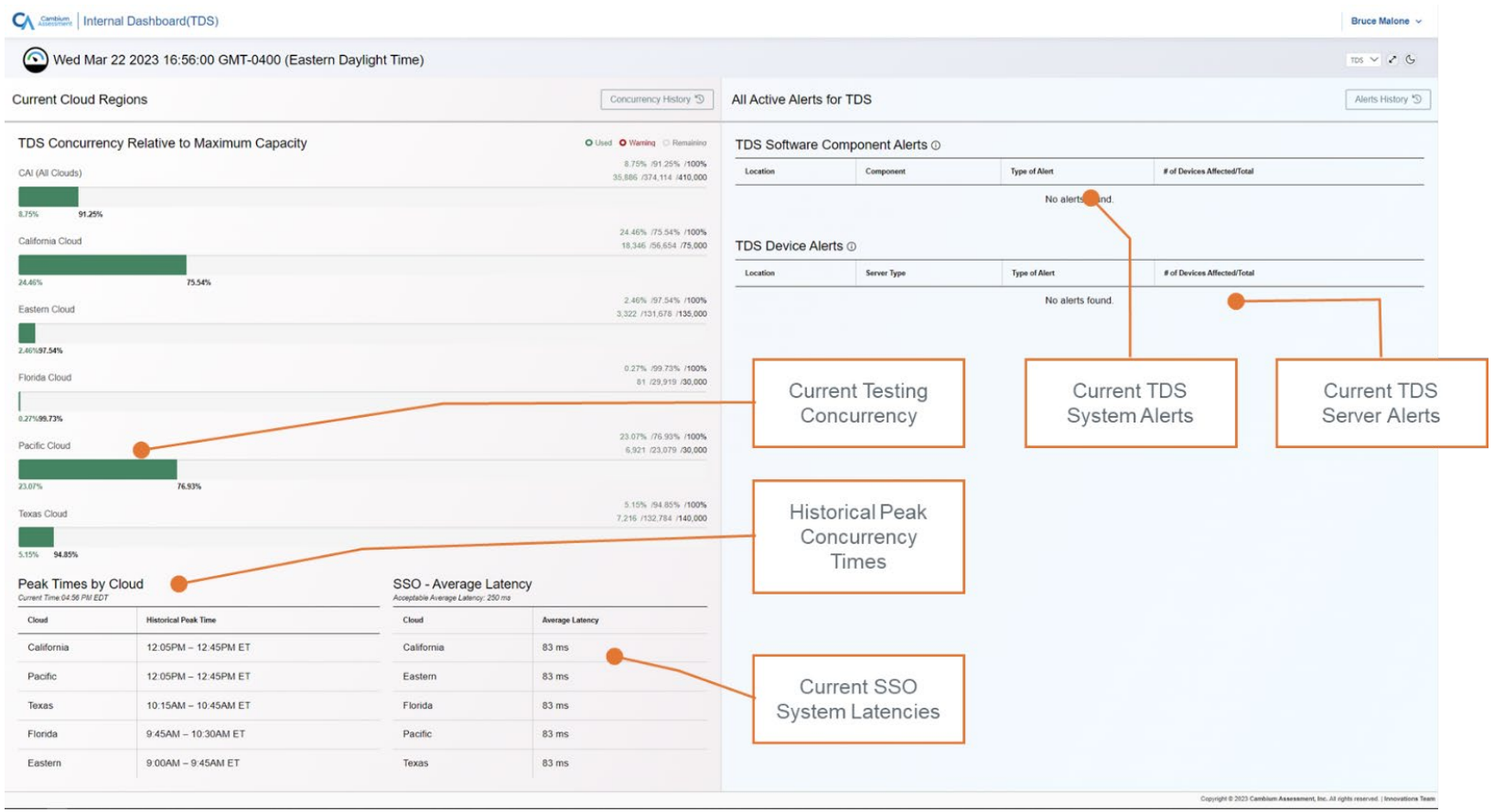
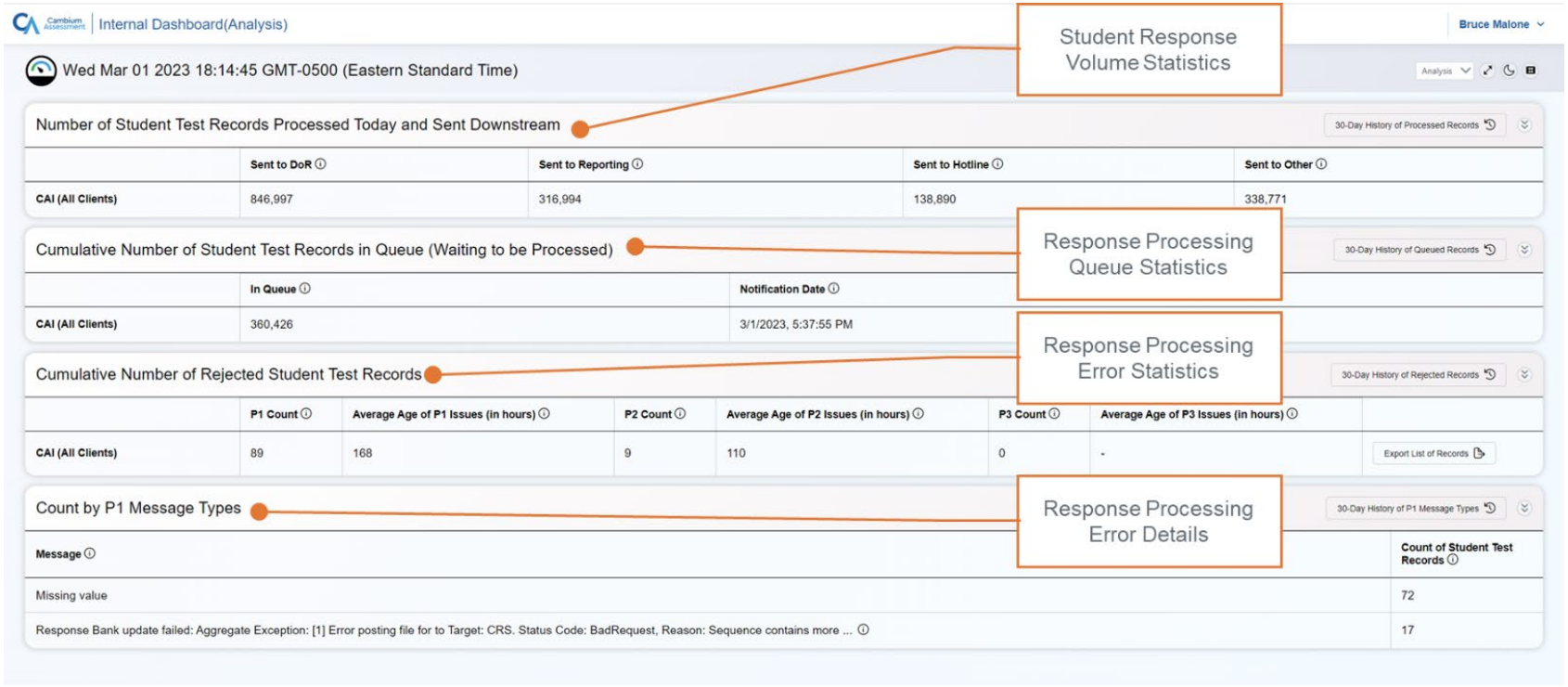


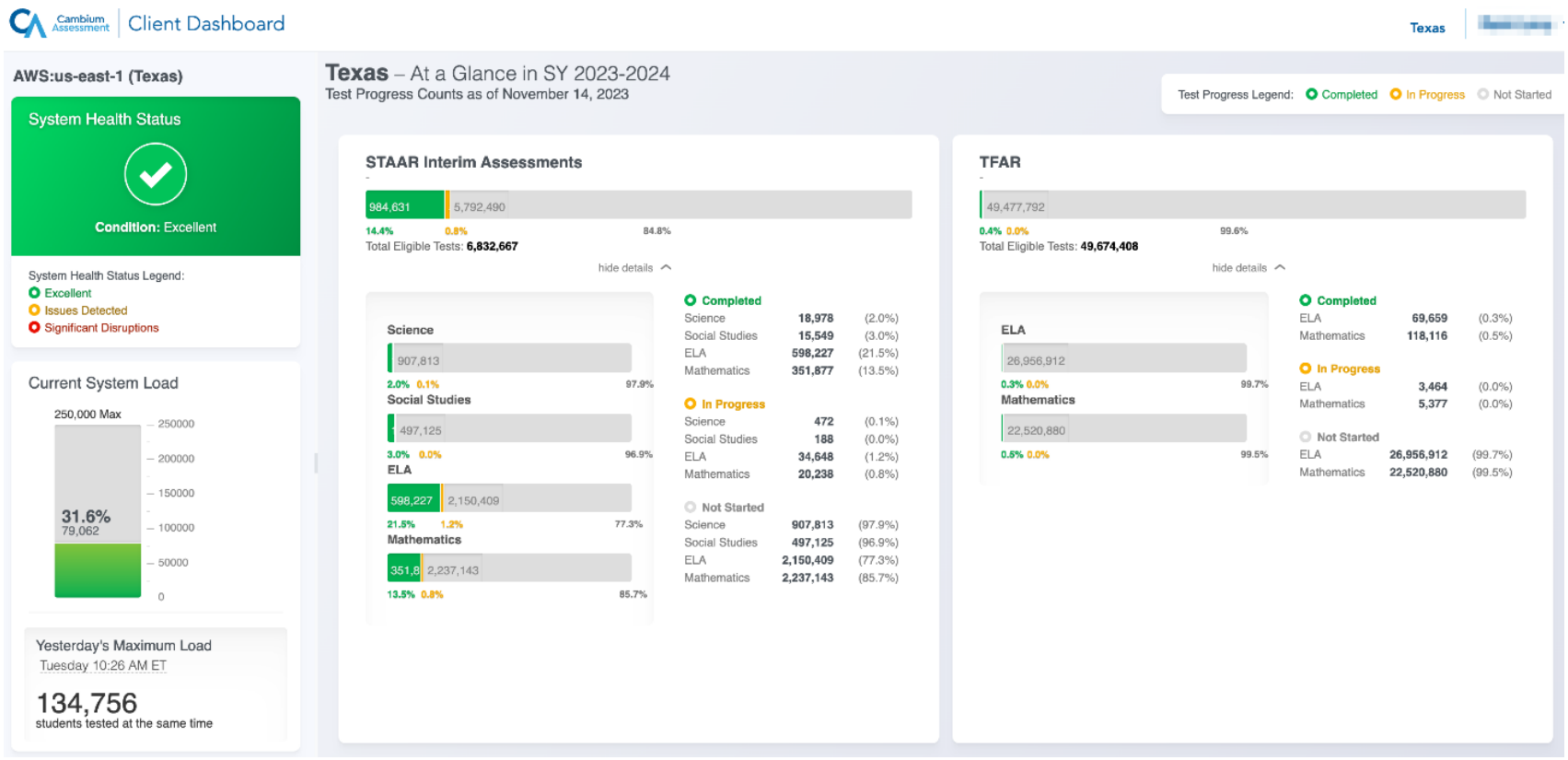
Exhibit 4.7.1.6-7: Analysis Dashboard



CAI's Client Dashboard Provides NJDOE Staff with Real-Time Testing Statistics

To monitor the progress of test administrations, CAI provides a client dashboard. Available to state-level users, the client dashboard shows the percentages of tests completed, tests in progress, and tests not yet started based on the number of eligible students per test as of the end of the previous day. The dashboard also displays a system status indication and system health in real time, as well as the number of concurrent users and the percentage of total system load that number represents, also in real time. Exhibit 4.7.1.6-8 provides a sample screen capture of this dashboard.

Exhibit 4.7.1.6-8: Client Dashboard



During testing, our proctor application provides test proctors with the real-time status of students testing in their session. The proctor is alerted if the student's test progress is interrupted or if contact is lost with the student's testing application. This enables immediate response to student- and technology-focused issues.

CAI Provides Additional Visibility of Testing Progress via the Participation Reports Module

TIDE users in authorized roles have access to our Participation Reports module, which provides school-level status of testing activities. This module is updated in near-real time and provides visibility into which students are testing and their current test status. This module can be used to monitor and manage test day activities.

The Participation Reports module summarizes the number of tests completed versus the number of eligible students for each assessment aggregated at the state, district, or school level as of the start of the day. TIDE also provides visibility into student test duration.

CAI Will Track and Report System Usage and Telemetry Information

CAI's TDS collects system usage data on proctors and students and CAI's TIDE and Reporting systems collect system usage data about their respective users. These data can be provided to NJDOE on a regular basis as requested. Data collected include tests taken by time with environmental data, including browser type and version, operating system type and version, and local IP address.

CAI captures and stores telemetry and student response data for all item types while students are testing. All response changes are stored, and responses are saved every two minutes, even while students are interacting with an item. Timing data are stored for any item presented on a screen, and timing data are stored each time a student views an item. CAI uses unique identifiers for each student test opportunity to map the opportunity to the telemetry and response data.

Every time a student submits a response, the response is immediately sent to our servers and is not stored on the local machine. Other responses, such as constructed-response items, are saved at configurable intervals before students submit the response.

The TDS captures telemetry data that can be provided to NJDOE as part of the state data files or generated supplemental reports. These data include the following:

- The configuration of the student's testing device, including operating system and browser
- The time at which a student started an assessment
- The number of times a student paused a test or paused and resumed within the configured grace period
- The amount of time a student spent viewing each page
- The latency between when an item was administered and when the student provided a final response
- The latency between the final response to an item and the presentation of the next item
- The time at which a student completed an assessment
- Tool/accommodation usage by item or stimulus
- Data on the test sessions a student accessed throughout a test
- The last answer changed with a code of right to wrong, wrong to wrong, or wrong to right

The TDS captures the telemetry data, and we can extract this information from the Database of Record (DOR), which maintains records of tests administered and completed.

4.7.1.7. Item Portability Standards

CAI's Item Tracking System (ITS) and Test Delivery System (TDS) fully comply with 1EdTech (formerly IMS Global) Question and Test Interoperability/Accessible Portable Item Protocol (QTI/APIP) standards. ITS is QTI 3.0 certified for item and test authoring, as well as item imports and exports; the TDS is QTI 3.0 certified for item and test delivery. CAI is an active member of standards organizations such as 1EdTech and will continue to ensure that our systems are fully interoperable. CAI can also import and export items and tests in the older QTI 2.x formats, which our systems are fully compatible with. CAI will commit to working with the SCM to ensure that all items and functionality are developed to align to the version of QTI that SCM specifies at the project launch meeting.

4.7.1.7.1. Compliant Content Format

CAI's Item Tracking System (ITS) captures braille, text descriptions, and closed captioning/American Sign Language (ASL) videos, which are uploaded directly into ITS. We offer the industry's largest selection of operationally deployed accommodations and embedded accessibility supports. CAI has tools that enable us to efficiently add markups to support text-to-speech (TTS), screen readers, alternative languages, other language supports such as glossaries with audio, and many other accommodations and supports. Further, ITS includes review levels for specialized teams to add accommodations. The accommodations become part of the item and travel with the item throughout the rest of the review process.

CAI supports all the accessibility features NJDOE requires (refer to Exhibit 4.7.1.7-1), and we will work with NJDOE for the duration of the contract to make additional supports available as necessary.

Exhibit 4.7.1.7-1: Embedded Tools CAI's TDS Can Support for New Jersey Assessments

Accessibility Feature	Description
Text-to-Speech (TTS)	This accommodation enables TTS to automatically start reading the test content when students navigate to a new page, rather than requiring them to invoke TTS playback manually. Auto TTS recreates an experience similar to a group oral administration.
Screen Reader Version (e.g., Job Access With Speech [JAWS]/NVDA) for students who are blind or have vision impairments	Refreshable braille is supported by a combination of a screen reader, such as JAWS, with a Refreshable Braille Display (RBD). Test content can be marked up to avoid construct violations and adhere to the client style guide. Similarly, all graphical content is tagged with alternate tagging to ensure that students who are using a screen reader have equitable access to all graphical content.
Human Voice Recording (HVR)	This accommodation is similar to TTS, but all test items are read to students using human-recorded text rather than a computer voice pack.
American Sign Language (ASL)	Students with this accommodation can view ASL videos inside the assessment that are specific to the test content. Similarly, we also support signed English and closed captioning.

Accessibility Feature	Description
Online Refreshable Braille	The Test Delivery System (TDS) supports the following types of braille files for use with the online RBD: • Unified English Braille (UEB) and English Braille American Edition (EBAE) • PRN and BRF files • Contracted and uncontracted braille • Nemeth braille

4.7.1.7.2. Information Profiles

NJDOE requires that the Contractor provide an assessment management system that can accept student information files containing the necessary accessibility components to support test administration, scoring, and reporting, as described in the RFQ. CAI proposes our Test Information Distribution Engine (TIDE) as the proven solution to meet this requirement. TIDE is a mature system that has been in use for more than 15 years, currently supports 27 states and jurisdictions, and manages student data for over one-third of the nation's grades 3–8 students. Like all CAI systems, in addition to being reliable and secure, TIDE is feature rich and highly customizable. Refer to Section 4.7.1.3 for a detailed discussion of TIDE and samples of the TIDE user interface (UI), including student demographic and registration file uploads.

TIDE is capable of collecting all state data elements defined in the *New Jersey Department of Education State Assessment Registration Student Data Handbook*. TIDE is highly configurable and can accept any type of student data element (e.g., accessibility information) in any layout using many different file formats, such as Microsoft Excel, CSV, delimited text, and XML.

Personal Needs Profile (PNP) information can be collected through TIDE through UI-based file uploads or automated Secure File Transfer Protocol (SFTP)-based file transfers. PNP upload uses the same data file upload process as student demographic and registration information. Because CAI's online Test Delivery System (TDS) offers a very rich and extensive set of test tools, our recommendation is to collect test settings (i.e., PNP) through a dedicated file upload which can validate against the test tools that are selectable per content area for the various New Jersey state assessments. A sample of the file upload is shown in Exhibit 4.7.1.7-2.

Exhibit 4.7.1.7-2: Sample File Upload

SID	Subject	Tool Name	Value
0982176	Mathematics	Content and Language Supports	On
0982176	Mathematics	Presentation	Spanish
0982176	Mathematics	Text-to-Speech	On
0982176	Mathematics	Basic TI Calculator	On
0982176	Mathematics	ASL Videos	On
0982176	RLA	Spell Check	On
0982176	RLA	Word Prediction (Co:Writer)	On
0982176	RLA	ASL Videos	On
0982176	RLA	Auto Text-to-Speech	n

Auto Text-to-Speech
Content and Language Supports
Permissive Mode
Presentation
Proctored Administration
Speech-to-Text
Spell Check
Text-to-Speech

Interoperability and Data Standards

TIDE currently supports application programming interface (API)-based exchanges using OneRoster and Ed-Fi, as well as OneRoster CSV file imports, and has had several such integrations operational for multiple years for other state assessment contracts.

CAI will provide instructions and additional resources to local districts and schools that need to generate the necessary profile data or files as part of the assessment registration or supplemental process. These resources can take the form of short training videos, one-pager documents, or other appropriate materials.

4.7.1.7.3. Digital Test Delivery System

CAI is the technology leader in online testing. We have been providing web-based testing services since 2006. We currently deliver online testing in 27 states including California, Florida, Ohio, and Texas. Our success is due to a solid technology infrastructure and supported by processes designed to ensure the best experience and high reliability.

The CAI system has proved reliable, secure, and scalable across all the states and jurisdictions that CAI currently serves. Thus, CAI believes that our Test Delivery System (TDS) exceeds NJDOE's required features and functionality and provides the best solution to meet NJDOE's needs and the needs of its educators and students.

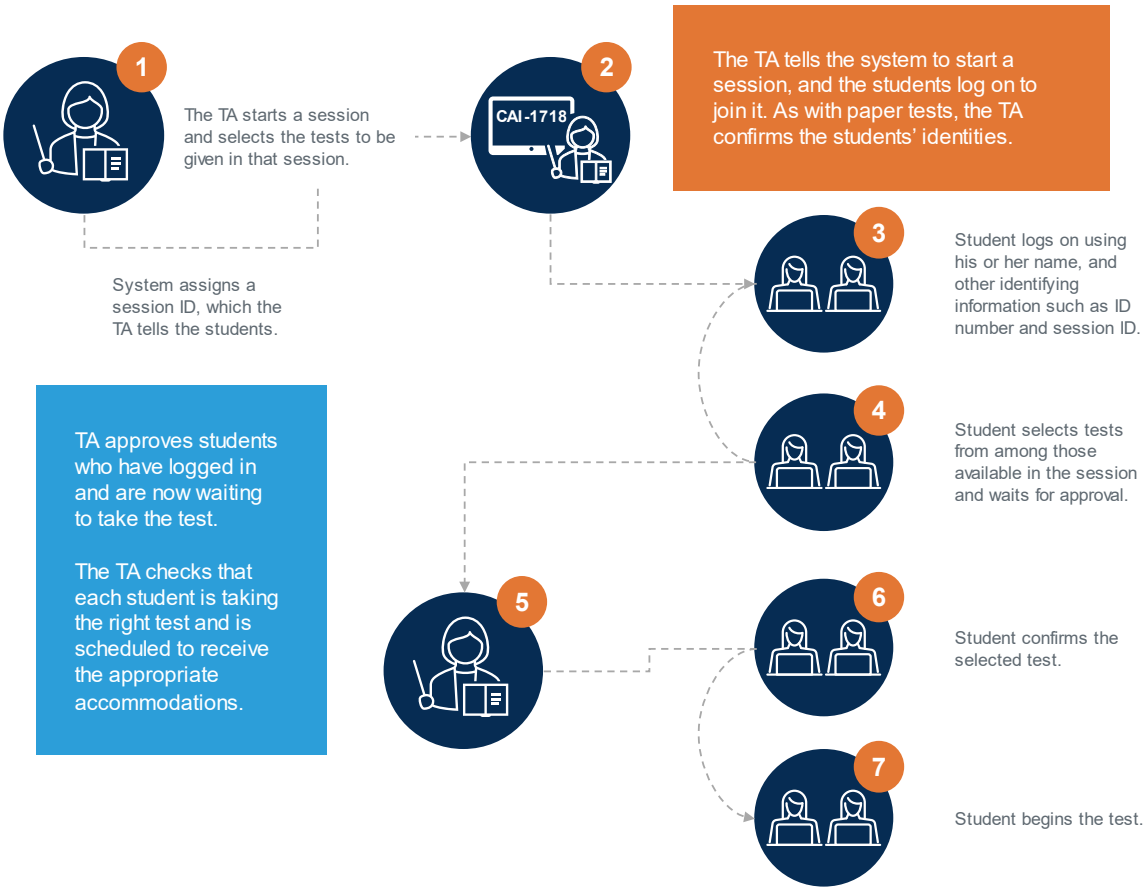
The TDS has a Test Administrator (TA) Interface and a Student Interface. Proctors use the TA Interface to manage testing sessions, and students use the Student Interface to join sessions and take tests.

Authentication and Login Process

Student authentication is managed through a simple interaction between the TA and the students, as summarized in Exhibit 4.7.1.7-3. Students can test when the TA is logged on and

has an active session. After a student pauses a test, the TA must readmit that student to the session.

Exhibit 4.7.1.7-3: Starting a Secure Test



TAs can create a test session by simply selecting the tests that will be available in the session. The system assigns a session ID, and the student login process involves a request to enter a session. When students join the session, they can select from among the tests for which they are eligible and that are offered in the session. A TA can administer multiple tests in a single session; however, students may access only those tests for which they are eligible.

Students use the session ID to log in to a test session. Session IDs are unique to each test session. When a student enters the session ID, the system alerts the TA, who then approves or denies the student's access request. Once admitted, students are given a final chance to confirm that they have requested the correct test. Upon confirmation, the test begins.

Student Interface

Students take secure tests through the Student Interface, which is a secure website accessed through CAI's Secure Browser. This Secure Browser is the only software needed to take a secure test and is a secure build of the Mozilla Firefox browser, or a secure testing app for tablets and other platforms.

CAI's Secure Browser operates in full-screen mode, disables access to other applications, and prohibits navigation away from the test. The Secure Browser is designed to intercept all operating system hot-key combinations and print capabilities; it enables keyboard combinations specifically designed for test navigation. The system verifies that the test is being launched in CAI's Secure Browser and prevents the test taker from continuing if the test is launched in another browser.

Students are always presented with the same authentication sequence and interactions with the TA, regardless of the test being administered. To access a test, a student logs in using his or her name, unique Statewide Student Identifier (SSID) number, and test session ID.

TDS Intuitive Design Supports Accessibility

CAI's TDS is accessible, user-friendly, and easy to use, as demonstrated across more than 27 states and jurisdictions. We have a dedicated team of web designers responsible for the user experience aspects of our assessment systems. This includes the appearance, layout, navigation, and accessibility of all our user interfaces (UIs). The team maintains industry-standard interfaces, where applicable, as well as principles on usability and accessibility.

The TDS Student Interface begins with a clean, uncluttered look and feel that is customizable for New Jersey assessments. CAI's platform offers a great deal of flexibility in the presentation of passages and items.

Evidence includes the following:

- **WCAG Compliance.** CAI's testing system is Web Content Accessibility Guidelines (WCAG) 2.1 AA compliant. This level of compliance is quite high, indicating that the system is accessible and compatible with standards-compliant assistive technology.
- **Qualitative Evidence.** CAI clients will attest to the usability of the CAI platform, which leads to successful testing programs.
- **Quantitative Evidence.** In Section 4.2.5.3, we illustrate the breadth and depth of the use of our TDS platform.
- **99.99% Student Population Tested Online.** For the past two years, almost 100% of our tests have been administered online across all our clients. Our extensive accommodation supports can handle entire statewide populations to test online. In CAI's second year working with Texas to transition to our platform from a previous online testing vendor, Texas administered 99.99% of its tests online on CAI's TDS.

TDS Provides Extensive Support for Accessibility and Testing Accommodation

CAI's online test delivery platform has the most extensive list of accommodations and supports in the industry. More than 230 different features (settings, tools, and accommodations) in the system are designed to help students access test content appropriately.

The TDS supports the 52 accessibility features and accommodations described in the *New Jersey Student Learning Assessment (NJSLA) Accessibility Features and Accommodations Manual (Ninth Edition)*. Exhibit 4.7.1.7-4 lists the features and accommodations described in the document and the TDS equivalent accommodation or describes the TDS system support. In some cases, the support is a non-embedded accommodation provided outside the TDS environment, for example, physical scratch paper made available during testing. The TDS supports additional and innovative tools beyond those required by New Jersey, which can enable the State to maximize student participation in the assessment program. This will enrich the accessibility experience for all students statewide. Sample mathematics and English language arts items with examples of available tools and accommodations are shown in Exhibits 4.7.1.7-5 and 4.7.1.7-6. The tools

and accommodations are listed in Appendix C of our proposal along with presentation images. CAI can work closely with NJDOE to configure and set up these tools based on NJDOE policy.

The TDS provides a highly customizable testing experience. Embedded accommodations, supports, and other features, including accessibility features, are made available to all students taking a test or are selected using one or more of the following methods:

- In the Test Information Distribution Engine (TIDE) as part of the student data
- By the proctor during student test start-up
- By the student during the test sign-on process

Accommodations and supports allowed based on the student's Individualized Education Plan (IEP), Section 504 Plan status, or Personal Needs Profile (PNP) are typically selected in advance in TIDE either directly or based on student demographic data. This is most effective and eases administration on test days. However, tests can be configured to allow proctors to select or remove accommodations at the start of the test session if required. Accommodations and supports available as student preferences can be made available at the start of testing for the student selection.

Accessibility feature selections are logged as part of the student test data. Accessibility feature selections are preserved if the student pauses and restarts a test.

Generally, we recommend that most features, even those that are universally available, be set before testing rather than during test administration. This is because the sheer number of features in the Student Interface can create a distraction (e.g., students can change background colors, experiment with text-to-speech [TTS] voices, play with masks and guides). Too many student choices can impede access.

CAI's commitment to ensuring access for all students is principal for us, and we work hard to ensure that we support assistive technologies and devices that are part of students' standard instructional experience. CAI is committed to accessible content even before we begin compatibility testing. We render items and test content for optimal accessibility to all students following universal design principles and WCAG 2.1, for which we have received AA compliance. We provide all accessibility features as defined in the Question and Test Interoperability/Accessible Portable Item Protocol (QTI/APIP) standards. We offer permissive mode as an accommodation, which deactivates select security features that may interfere with some assistive technologies. We also offer streamlined mode, which eliminates many visual elements from the screen to deliver the test in a more linear format. This reduces distraction and simplifies navigation for students.

The TDS complies with the following standards:

- **WCAG.** The CAI TDS is WCAG 2.1 AA compliant.
- **User Agent Accessibility Guidelines (UAAG)** are part of the WCAG and Authoring Tool Accessibility Guidelines (ATAG).
- **World Wide Web Consortium (WC3).** The Web Accessibility Initiative – Accessible Rich Internet Applications (WAI-ARIA) forms a portion of the WC3 industry standards. The CAI TDS is fully ARIA compliant and is entirely readable by screen readers.

CAI supports an extensive list of embedded and non-embedded assistive technologies. Annually, our system undergoes a rigorous testing cycle to determine whether it can support an assistive technology device. The most significant risk associated with a third-party technology device is incompatibility with critical, high-stakes requirements that the TDS must always support, including security, Secure Browser functionality, and performance. We test assistive technologies in CAI's Secure Browser and the TDS to ensure that the required functionality is

available and that no security threats are introduced when using assistive technologies in a secure testing environment. CAI provides an assistive technology manual each year that lists the supported devices and applications and provides setup instructions for the few assistive technologies that require some configuration.

CAI's TDS is designed to work with a variety of input devices including a standard, compliant point device (mouse), keyboards (standard and alternate), touch screens, and tab-enter-enabled devices. All interface elements can be reached via tab navigation, and all interaction types can be completed using only the keyboard. Testing can be completed without using a mouse. Keyboard shortcuts are provided for common commands to increase testing efficiency.

CAI's system currently works with a wide range of refreshable braille devices, screen readers, on-screen keyboards, and other input devices. Although no organization can guarantee support for every type of hardware and software, CAI is committed to accessibility for all students and has demonstrated that commitment through our industry leadership in this area.

Our system has supported screen readers, alternative input devices, and other supporting software since 2007. We designed our system from its inception to integrate with assistive technology. We remain the only organization in the country delivering online, adaptive braille tests.

Supporting Old and New Devices

As discussed in Section 4.2.5.3, CAI's platforms are designed to work with the widest range of hardware, operating systems, and browsers in the industry. CAI continually works to remain up to date with hardware, operating system releases, and browser versions. At the same time, CAI is aware that schools operate on tight budgets and need to maximize the use of existing resources. As a result, CAI also works to support older versions of devices as long as possible. This effort to support both current and legacy devices extends to peripherals such as assistive technology devices. We undertake a rigorous testing cycle to determine if we can support an assistive technology device. The biggest risk of a third-party technology device is incompatibility with critical, high-stakes requirements that the TDS must always support, including security, Secure Browser functionality, and performance.

Exhibit 4.7.1.7-4: Accessibility Features from NJSLA Accessibility Features and Accommodations Manual (Ninth Edition) with TDS Equivalent

Accessibility Feature		TDS Equivalent Feature(s)/Notes
Table 1: Accessibility Features for All Students		
1a	Answer Masking	Masking
1b	Audio Amplification	Audio Playback Controls
1c	Bookmark	Mark for Review
1d	Color Contrast (Background/Font Color)	Color Choices, Enhanced Contrast
1e	Blank Scratch Paper	Notepad, Scratchpad, or Non-Embedded Accommodation
1f	Eliminate Answer Choices	Strikethrough (Answer Eliminator)
1g	General Administration Directions Clarified	Additional Directions
1h	General Administration Directions Read Aloud and Repeated as Needed	Additional Directions with TTS
1i	Highlight Tool	Highlight

Accessibility Feature		TDS Equivalent Feature(s)/Notes
1j	Headphones or Noise Buffers	TTS (Headphones) or Non-Embedded Accommodation (Noise Buffer)
1k	Line Reader Mask Tool	Line Reader
1l	Magnification/Enlargement Device	Print Size (Magnifier/Zoom)
1m	Notepad	Global Notes
1n	Pop-up Glossary	Keyword Glossary
1o	Redirect Student to the Test	Secure Browser or Non-Embedded Accommodation
1p	Spell Check or External Spell Check Device	Spellcheck
1q	Student Reads Assessment Aloud to Self	Non-Embedded Accommodation
1r	Text-to-Speech for Mathematics and Science Tests	TTS
1s	Human Reader or Human Signer for Mathematics and Science Tests	American Sign Language (ASL) or Non-Embedded Accommodation
1t	Writing Tools	TDS-Enhanced HTML Editor with Configurable Buttons
Table 2: Administrative Considerations for All Students		
2a	Small Group Testing	Non-Embedded Accommodation
2b	Time of Day	Non-Embedded Accommodation
2c	Separate/Alternate Location	Non-Embedded Accommodation
2d	Specified Area or Setting	Non-Embedded Accommodation
2e	Adaptive and Specialized Equipment or Furniture	Non-Embedded Accommodation
2f	Frequent Breaks	Non-Embedded Accommodation
Table 3: Presentation Accommodations for Students with Disabilities		
3a	Assistive Technology	Various Assistive Presentation Technology Devices Supported in the TDS
3b	Screen Reader Version	Permissive Mode (to relax test security and allow third-party application[s] to run)
3c	Refreshable Braille Display	Refreshable Braille (various refreshable braille displays supported by the TDS)
3d	Braille with Tactile Graphics	Emboss on Demand or Non-Embedded Accommodation
3e	Tactile Graphics	Emboss on Demand or Non-Embedded Accommodation
3f	Large Print	Print Size (Magnifier/Zoom) or Non-Embedded Accommodation
3g	Alternate Representation—Paper Test	Non-Embedded Accommodation
3h	Closed Captioning of Multimedia on the ELA Assessments	Closed Captioning
3i	ELA Assessments, Including Items,	TTS

Accessibility Feature		TDS Equivalent Feature(s)/Notes
	Response Options, and Passages—Text-to-Speech	
3j	ELA Assessments, Including Items, Response Options, and Passages—ASL Video	ASL
3k	Human Reader/Human Signer	Non-Embedded Accommodation
3l	ASL Video for the Mathematics/Science Assessments	ASL
3m	Human Signer for Test Directions	Non-Embedded Accommodation
Table 4: Response Accommodations for Students with Disabilities		
4a	Assistive Technology	Various TDS-Supported Assistive Response Technologies
4b	Electronic Braille Response	Various TDS-Supported Assistive Braille Writer Devices
4c	Electronic Braille Response	Various TDS-Supported Assistive Braille Writer Devices
4d	Calculation Device (on Calculator Sections)	Desmos Calculator or Non-Embedded Accommodation
4e	Calculation Device and Mathematics Tools (on Non-Calculator Sections)	Desmos Calculator or Non-Embedded Accommodation
4f	ELA Selected-Response or Technology-Enhanced Items—Speech-to-Text	Dictation (Speech-To-Text [STT])
4g	ELA Selected-Response or Technology-Enhanced Items—Human Scribe	Non-Embedded Accommodation or Data Entry Interface (DEI)
4h	ELA Selected-Response or Technology-Enhanced Items—Human Signer	Non-Embedded Accommodation
4i	ELA Selected-Response or Technology-Enhanced Items—Assistive Technology Device	Various TDS-Supported Assistive Technology Devices
4j	Mathematics/Science Accommodated Response—Speech-to-Text	Dictation (STT)
4k	Mathematics/Science Accommodated Response—Human Scribe	Non-Embedded Accommodation or DEI
4l	Mathematics/Science Accommodated Response—Human Signer	Non-Embedded Accommodation
4m	Mathematics/Science Accommodated Response—Assistive Technology Device	Various TDS-Supported Assistive Technology Devices
4n	ELA Constructed Response—Speech-to-Text	Dictation (STT)
4o	ELA Constructed Response—Human Scribe	Non-Embedded Accommodation or DEI
4p	ELA Constructed Response—Human Signer	Non-Embedded Accommodation
4q	ELA Constructed Response—Assistive	Various TDS-Supported Assistive

Accessibility Feature		TDS Equivalent Feature(s)/Notes
	Technology Device	Technology Devices
4r	Monitor Test Response	Non-Embedded Accommodation (test delivery can be configured to prevent skipping items)
4s	Word Prediction	Co:Writer
Table 5: Timing and Scheduling Accommodation for Students with Disabilities		
5a	Extended Time	Pausing/Breaks
Table 6: Guidance on Selection of Accommodations for English Language Learners		
N/A	N/A	N/A
Table 7: Accommodations for English Language Learners		
7a	Extended Time	Pausing/Breaks
7b	Word-to-Word Dictionary	Spanish Dictionary
7c	English Language Learner Accommodated Response for the Mathematics/Science Assessments in Spanish—Speech-to-Text	TTS
7d	English Language Learner Accommodated Response for the Mathematics/Science Assessments in Spanish—Human Scribe/Human Signer	Non-Embedded Accommodation or DEI
7e	General Administration Directions Read Aloud in Student's Native Language	TTS
7f	General Administration Directions Clarified in Student's Native Language	TTS
7g	Spanish Transadaptation of the Mathematics/Science Assessments in Spanish	Language/Language Display/Language UI Toggle
7h	Spanish Transadaptation of the Mathematics/Science Assessments in Spanish	Language/Language Display/Language UI Toggle
7i	Large-Print Edition of the Mathematics/Science Assessment in Spanish	Print Size (Magnifier/Zoom) or Non-Embedded Accommodation
7j	Text-to-Speech for the Mathematics/Science Assessments in Spanish	TTS
7k	Human Reader for the Mathematics/Science Assessments in Spanish (or other languages)	Non-Embedded Accommodation

Exhibit 4.7.1.7-5: Sample Mathematics Item with Tools and Accommodations

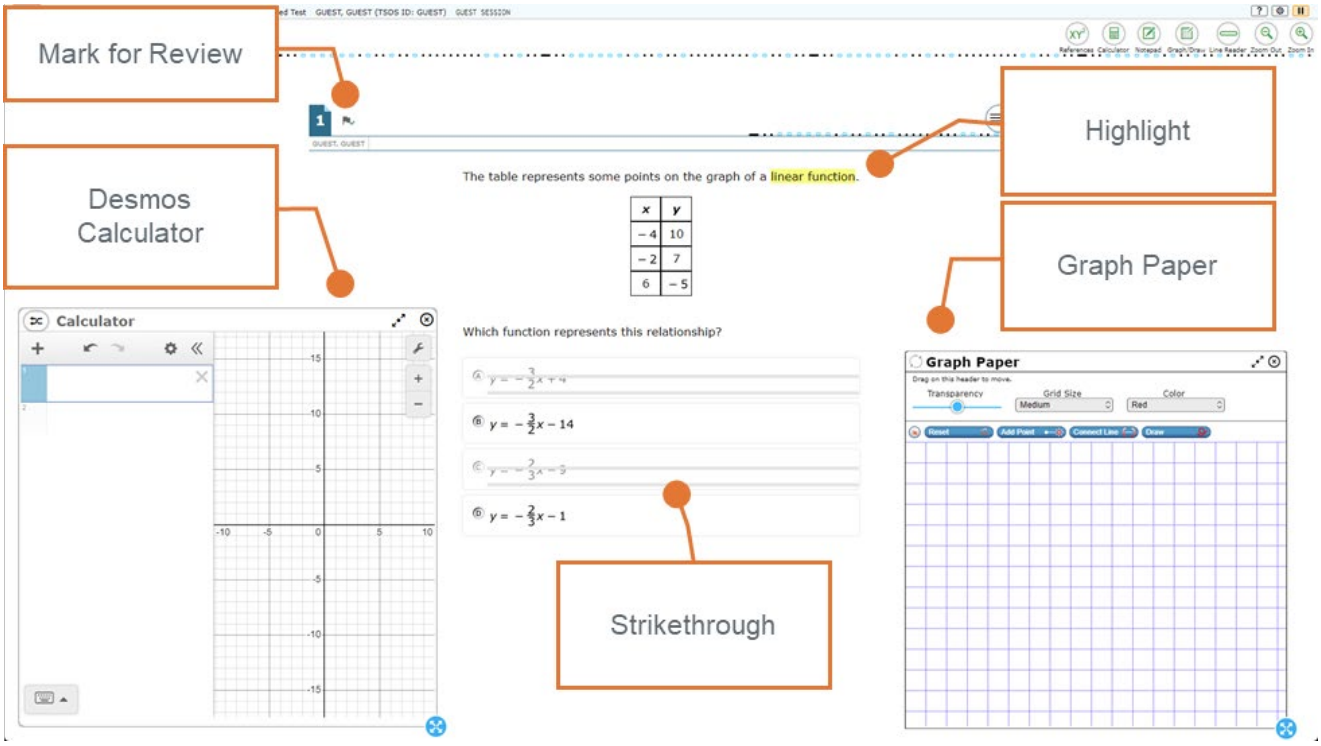
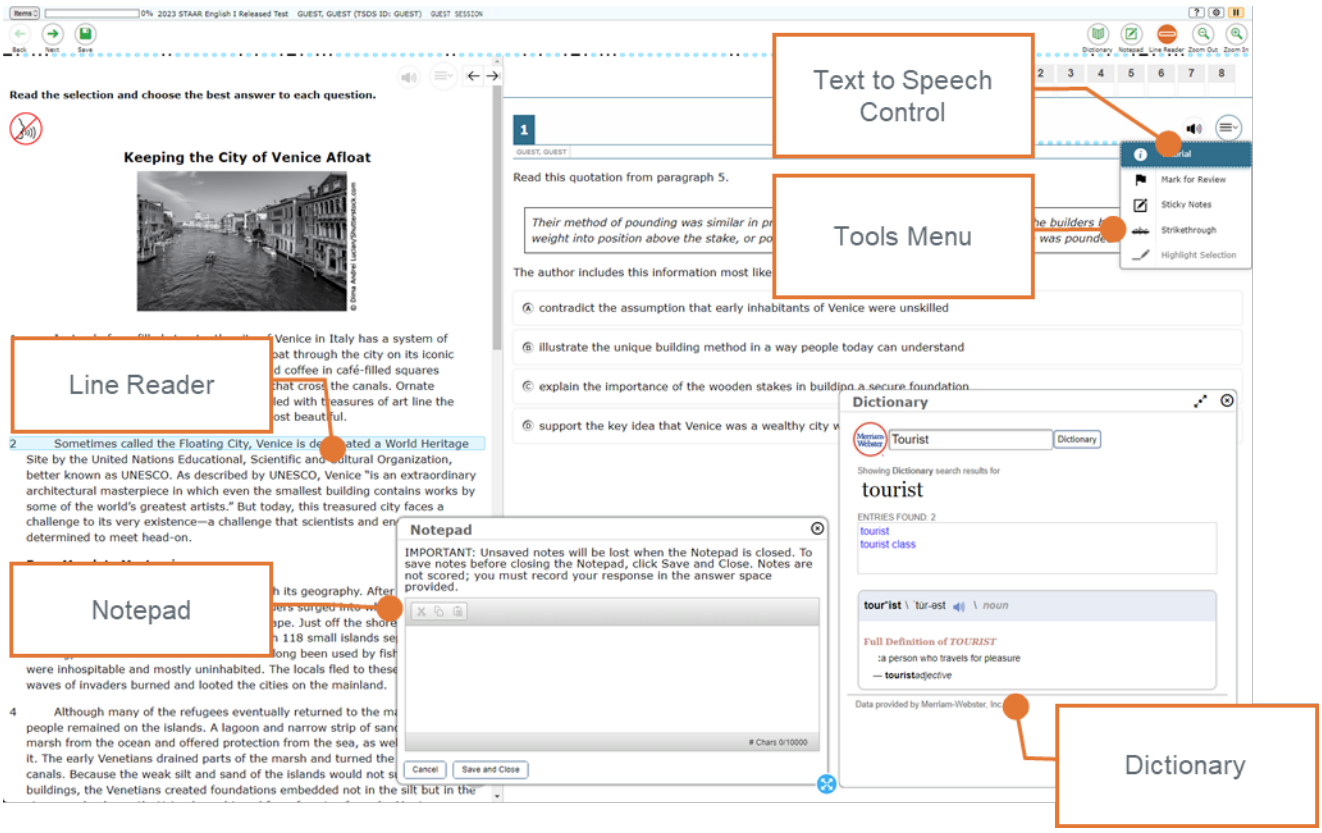


Exhibit 4.7.1.7-6: Sample English Language Arts Item with Tools and Accommodations



Transcribing Student Responses from Paper Assessments into the Online System

We acknowledge that NJDOE intends to transition from using answer folders to a method where the local education agencies (LEAs) would transcribe student responses directly from the test book into an online test. CAI proposes using our Data Entry Interface (DEI), which enables authorized users to transcribe responses from paper-pencil and braille test items into CAI's online TDS for scoring and reporting. This approach provides cost reductions to NJDOE and immediate scoring and reporting for paper-based assessments, and supports NJDOE's program goals for timely, near-real-time scoring and reporting for all students. CAI can accomplish this transition starting with school year 2025–2026.

Entering responses into the DEI submits student responses into our online processing workflow. The DEI is connected to CAI systems as part of a user's Single Sign-On (SSO) and does not require separate user credentials. Once logged in to the system, a user needs only a student's first name and New Jersey Assessment System ID in order to input responses for scoring and reporting.

Following the login sequence, district and school personnel are presented with a test page in an interface that is similar to the TDS Student Interface. Some test pages may have only one item, and others may have multiple items. Users are directed to select the appropriate response option for each item based on a student's written response to the equivalent paper test. The DEI will automatically capture and save the student response data when it is entered.

When users finish entering student responses, the DEI version of the student test is submitted in the same manner as a student test completed in the TDS. Users are permitted to review the entered responses to ensure completeness and accuracy, after which the test is submitted and placed into the workflow.

Liquidated Damages

CAI acknowledges that Liquidated Damages, as specified in this contract, may apply if

A. the digital test delivery system is interrupted or delivers slowed test administration, such as issues pertaining to outages and/or slowed responsiveness to the degree where student experience and/or ability to respond to the test items has an impact for 20 minutes or more;
B. test content during administration, such as issues with item rendering, item versioning, and/or item selection/ordering, is found to not match the test blueprint or is not performing as agreed upon by the Contractor and the SCM; or
C. test accommodations are not functioning appropriately during test administration for 20 minutes or more.

CAI has developed its test development, test delivery, and operating processes to provide a highly reliable test delivery platform. CAI proactively addresses issues that could impact test delivery, including conducting automated functional tests prior to the start of the testing day to confirm that all systems are fully operational. CAI will work with NJDOE to review and validate test configurations to ensure that they meet State requirements prior to the start of testing.

4.7.2. Paper-Pencil Delivery Program

Our partner, Measurement Incorporated (MI), will be responsible for the production and printing of test materials. The following sections describe the high-level process steps that MI takes to meet clients' requirements and ensure successful delivery of paper-pencil program materials.

After much careful deliberation, our solution includes an alternate method of student response capture for students who are administered a paper-based test. CAI proposes using our Data Entry Interface (DEI) rather than providing and collecting an answer folder. We propose this method of collection based on several key considerations and to be entirely responsive to the previous decisions implemented by NJDOE:

- Based on the instructions provided to districts and schools by NJDOE in spring 2023, we understand that NJDOE opted to discontinue the use of answer documents for paper-based testing, instead using a district personnel transcription process for student responses.
- CAI's DEI significantly improves upon the district and school personnel transcription process, providing an intuitive interface that supports an efficient, accurate transcription process.
- Our solution capitalizes on the many benefits of a transcription process, which are described in more detail in the following paragraphs.

The DEI, described in more detail in Section 4.7.1.7.3, enables authorized users to transcribe responses to paper and braille test items into CAI's online Test Delivery System (TDS) for scoring and reporting. This eliminates the delays associated with transporting, preparing, and scanning student responses and supports NJDOE's program goals for timely, near-real-time scoring and reporting for all students.

We have worked with many states to implement a DEI solution for their statewide assessment programs, reducing program costs and time associated with the development, review, production, and handling of answer documents that support the student populations of a primarily online testing program. Furthermore, students benefit from responding directly in their test booklets (designed to capture their responses) by not having to move back and forth between test booklets and answer documents.

Paper-Pencil Program Supports

As described previously, CAI and MI have integrated our teams and processes to support the development, printing, distribution, collection, and processing of paper-based test materials. As the current vendor for the NJSLA-S, MI has the experience and capability to print paper-pencil test materials for the NJSLA-ELA/M and NJGPA. We will use this experience to the benefit of the New Jersey Next Generation Assessment Program. At the beginning of the school year, CAI will collect information from the districts regarding which testing mode each school will use. This information will be used to determine the quantities of paper-pencil test materials that should be shipped to each district and the print quantities required for successful test administration.

MI acknowledges the critical nature of test material printing. Its in-house and external printers have extensive expertise in printing test materials securely and accurately. MI will work collaboratively with NJDOE during the printing process to ensure that assessment materials meet NJDOE's approval. MI's project manager and assessment support services team possess all the capabilities to consistently meet NJDOE's expectations.

MI will print all required test booklets, answer folders, manuals, and other documents required by the RFQ for successful administration of the NJSLA-ELA/M and NJGPA. MI acknowledges responsibility for the distribution, collection, and security of test materials and for the scanning, processing, and storage of test booklets and answer folders.

MI will be responsible for the costs associated with shipping materials to and from NJDOE and New Jersey school districts. MI will maintain enough inventory to provide additional test materials when needed.

MI has a well-deserved reputation for producing and delivering paper-based assessment materials that are of the highest quality and technical accuracy. MI has successfully scanned, scored, and processed student documents for multiple large-scale, high-stakes assessments around the country, including several New Jersey assessments beginning in 2002. NJDOE can have the utmost confidence that paper-pencil testing will go smoothly. Meeting the demands of timely production, ensuring the security of materials, and working collaboratively with NJDOE are capabilities MI has demonstrated in the past and continues to exhibit in the present.

In the following sections, MI details its plans for the production and printing of test materials. As CAI's printing partner for the NJSLA-ELA/M and NJGPA, MI will focus on printing high-quality test materials using rigorous security measures and tracking the location of materials throughout the project. This focus will result in successful administration of the paper-pencil versions of the NJSLA-ELA/M and NJGPA.

4.7.2.1. Test Booklets

MI understands that, although most districts will be administering the NJSLA-ELA/M and NJGPA to their students using the online platform, some students will require a paper version of the assessment. MI will ensure the security and quality of paper-pencil test booklets. Based on the RFQ, MI calculates that paper-pencil materials will be required for approximately 795 students.

Printed test materials for the NJSLA-ELA/M and NJGPA will include the following:

- Regular test booklets will be provided.
- Braille and large-print test booklets will be provided; MI will provide braille and large-print paper versions of test materials for students who require these accommodations. An external reviewer with expertise in visual impairments will review the braille test booklets.

- Spanish-language test booklets will be provided; MI will provide Spanish-language translations or transadapted versions of each assessment for students who meet the NJDOE's eligibility guidelines. A Spanish-language Test Review Committee will review Spanish test materials.
- Alternate test booklets will be provided. In case of a security breach, students can be retested using an alternate test form.

Throughout MI's history, they have integrated test security procedures into every aspect of the paper-based testing process. MI's processes for paper test materials are based on their experiences working with clients in high-stakes, large-scale assessments; on educational measurement industry best practices; and on advancements in physical and technological security.

MI's process for producing paper test booklets for the NJSLA-ELA/M and NJGPA will begin with a collaboration with the NJDOE before producing the first round of test booklets. MI will familiarize themselves with the NJDOE's current style guides and other editorial guidance. From that starting point, MI will work with the NJDOE to develop a new editorial style guide, which identifies stylistic, grammatical, formatting, and other fundamental editorial norms that will govern print materials preparation.

Throughout the process of producing paper-pencil test materials for the NJSLA-ELA/M and NJGPA, MI will conduct multiple rounds of editorial review—scrutinizing each page and making sure that everything on the page, from items to graphics to page headers and footers, is accurate. MI will conduct a final proofing review to detect typographical and other errors before publication in order to produce flawless materials. Furthermore, MI acknowledges that, should any paper document be printed with one or more errors, they will correct and reproduce the document(s) at no additional cost to NJDOE.

MI will produce and submit drafts of the test booklets to NJDOE for review and approval in accordance with the project schedule. They will provide time for NJDOE staff to complete their review of camera-ready (or equivalent) copies. They will not submit materials for printing without the review and approval of NJDOE.

4.7.2.2. Answer Folder (Base Test and Embedded Field Test)

Students who take the paper versions of the NJSLA-ELA/M and NJGPA will record their responses in machine-scannable answer folders. Grade 3 students will record their responses in a machine-scannable consumable test booklet. For each test, MI will produce four different answer folders: one answer folder for the regular test, one for the Spanish-language test, one for the alternate test, and one for the large-print and braille tests. The answer folders will be specific to the tests and will include the following:

- A cover page that identifies the test, the administration date, and the student will be included. The student information will include demographic information used in score reporting.
- Additional pages to capture student responses for each component of the assessment will be included. The student's response to every item in the test will be captured in the same answer folder, which will be divided into multiple sections.

At MI, the project manager works with the client and with staff from the information technology and editorial groups to design documents that function well for students, districts, and the scanning team. An important step in achieving a smooth paper-based test administration is to develop easy-to-use answer folders. MI has designed materials for numerous statewide assessment programs, including the NJSLA-S. MI will use this experience as a foundation for

producing the most effective answer folders for the NJSLA-ELA/M and NJGPA, and they will make specific changes requested by the NJDOE each year.

Transcribing Student Responses from Paper Assessments Into the Online System

Although we are committed to providing scannable answer documents as specified in the RFQ, we offer an alternative approach that provides cost reductions to NJDOE and immediate scoring and reporting for paper-based assessments. In most states, we capture student responses to paper test forms in our Data Entry Interface (DEI), which enables authorized users to transcribe responses to paper and braille test items into CAI's online Test Delivery System (TDS) for scoring and reporting. Cost savings are achieved by eliminating production, shipping, and processing of scannable answer documents. Once student responses are entered into the DEI, student assessment results are immediately available, just as with online test administrations. This approach supports NJDOE's program goals for timely, near-real-time scoring and reporting for all students.

The DEI is described in more detail in Section 4.7.1.7.3.

4.7.2.2.1. Answer Folder Storage/Archive

MI acknowledges that they will retain answer folders for two years. Answer folders will be archived in a secure warehouse in Durham, NC, subject to the approval of the SCM. MI currently uses a secure and traceable system for answer-folder storage, which enables staff members to immediately identify the exact location of a given document. This allows MI to easily access the document to verify student information, to rescore tests, or to complete other activities the NJDOE may require.

After two years, MI's program manager will request, in writing, authorization from the SCM to securely destroy paper copies of test materials. MI will not destroy paper materials until they receive approval from the SCM.

4.7.2.3. Student Identification Labels for Answer Folders

CAI's solution for the transmission and management of districts' Student Identification Number (SID) data includes our Test Information Distribution Engine (TIDE), a full-service administration management system that supports SID data integration to facilitate the upload of student demographics and enrollment data. We describe TIDE in greater detail in Section 4.2.5.3.

As described previously, CAI's proposed solution for paper-pencil testing includes the provision of test books and an integration with our Data Entry Interface (DEI) in lieu of answer folders. Our solution removes the need for Student Identification Labels, allowing your districts and schools to use the same student registration process for all digital and paper-pencil assessments.

4.7.2.4. Header Sheets

For the NJSLA-ELA/M and NJGPA, students participating in the paper-pencil versions of the assessments will have their responses entered into CAI's Data Entry Interface (DEI). A test administrator (TA) will input each student's response, simplifying the process of capturing the responses of paper-pencil test takers.

4.7.2.5. Packing, Distributing, Receiving, and Reporting Testing Materials

4.7.2.5.1. Packing and Distributing Testing Materials

Having successfully packaged and distributed New Jersey test materials for many years, Measurement Incorporated has systems in place that can meet all requirements associated with the NJSLA-ELA/M and NJGPA. MI will be responsible for the packaging and distribution of paper-pencil test materials that are sent to the districts and schools, such as test booklets, accommodated special forms (braille), manuals, and others, as specified in the RFQ. MI will provide secure receipt and return of all secure materials, including test booklets. MI will ship secure materials with specific instructions for return and verification.

Materials for the NJSLA-ELA/M and NJGPA Tests

Test materials shipped to districts will have been proofread by MI staff and an external reviewer. Materials will also be reviewed and approved by the SCM prior to printing. MI will shrink-wrap test booklets and reference sheets in sets of five, or in another manner deemed most appropriate by NJDOE. The plastic wrapping material used will be strong enough so that it will not break during shipment or routine handling.

Shrink-wrapped packages of secure materials will be sorted in sequence by security number in packages of five, with the first document's barcode visible on the top and the last document's barcode visible on the bottom of the pack. Each pack will contain a range sheet indicating the name of the assessment, the shrink-wrapped pack's security barcode (scannable and human-readable), and the barcode numbers for the individual test booklets in the pack. MI will work with NJDOE to determine the format and whether any other fields should be included on the range sheet.

MI will box test materials for districts and schools separately. District boxes will be easily distinguishable because they will be white cardboard boxes instead of brown. In addition, MI will provide district and school packing lists that specify the types, quantities, and security number ranges of test materials contained in district and school boxes. The order of schools within a district on all lists and for shipping purposes will be according to the County-District-School (CDS) code rather than the school name. MI will include packing lists in the first box of test materials for each district and school.

MI will place materials into boxes of appropriate size. Since some materials, such as manuals, do not need to be returned to MI, the boxes from the original shipment will be large enough to accommodate repacking the materials after testing, even with normal expansion resulting from the removal of the shrink-wrapping and use of the materials. The largest boxes will be small enough for district staff to lift easily and will weigh no more than 30 pounds.

MI will organize materials in a logical manner that makes it straightforward for district and school staff to unpack and inventory the contents of their respective boxes.

Pick and Pack Processes for the NJSLA-ELA/M and NJGPA Tests

For each shipment of NJSLA-ELA/M and NJGPA materials, MI proposes to use its internally developed Order-Pack-Ship (OPS) application to accurately prepare orders for shipment. The OPS application allows customized paperwork and labels to be generated for the NJSLA-ELA/M and NJGPA print materials. Exhibit 4.7.2.5-1 presents the features of OPS.

Exhibit 4.7.2.5-1: Overview of MI's Order-Pack-Ship (OPS) System

System	Description
Order-Pack-Ship (OPS)	Maximizes efficiency and accuracy of order processing.
Key Attributes	
• Supervisory personnel can print pull lists to ensure that orders are filled and no order is duplicated. • NJDOE can customize the organization of orders by district or school. OPS facilitates processing orders using both a ship-to-district and ship-to-school approach. • OPS subtracts products from inventory as they are scanned and packed so that a current inventory is always available and security barcodes cannot be duplicated on subsequent orders. • Personnel can print box inventory lists and security forms when the box is closed and ready for shipping. • Personnel can print a shipping label when the box is ready for shipping.	

New Jersey district and school staff will receive the materials needed to administer paper-pencil versions of the NJSLA-ELA/M and NJGPA because MI has developed systems to accurately pack and ship materials.

Exhibit 4.7.2.5-2 shows a completed order in the OPS system. Exhibits 4.7.2.5-3–4.7.2.5-6 show samples of the pull lists, box lists, packing lists, and a list of secure materials produced by OPS.

Exhibit 4.7.2.5-2: Example of a Completed Order in OPS

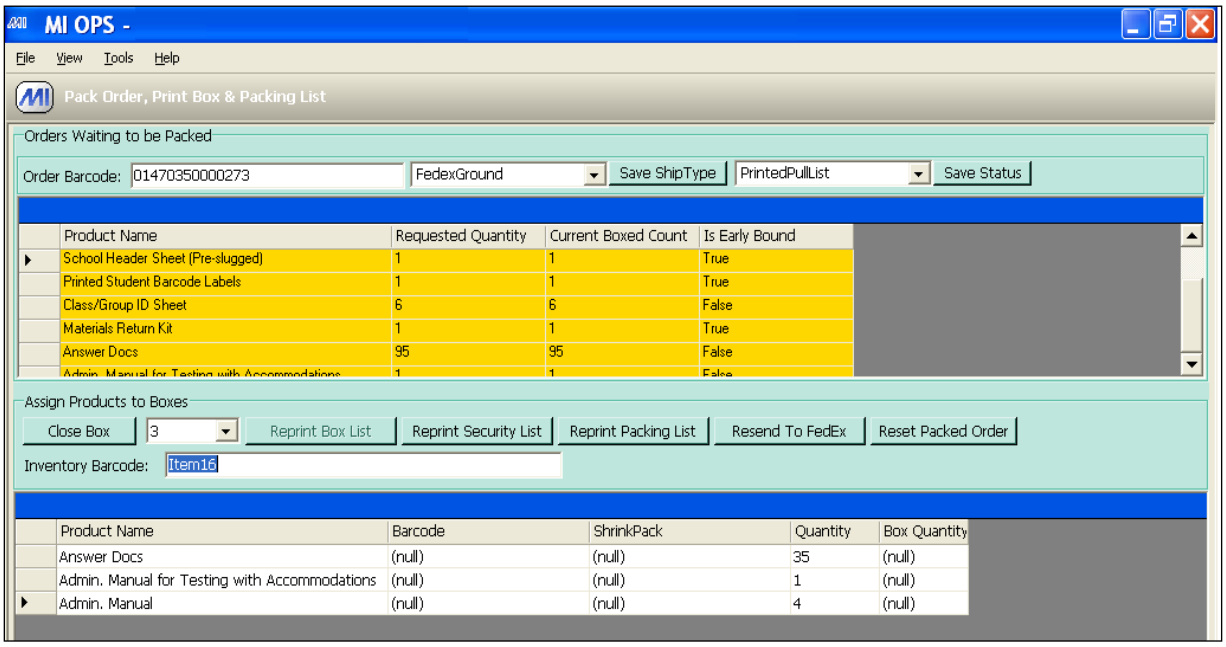


Exhibit 4.7.2.5-3: Sample NJSLA-S Pull List

PULL LIST

NEW JERSEY STUDENT LEARNING ASSESSMENT - SCIENCE

2023

Order Type = Initial
ANY DISTRICT
99-9999

District: ANY DISTRICT

Priority Code: 03 - Districts

MI Order: 08170350000196

Product	Quantity
District Coordinator Kit	1
Barcode = 1D05230000030040	

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1 page(s)

FOR INTERNAL USE ONLY. DO NOT SHIP TO CUSTOMER.

Exhibit 4.7.2.5-4: Sample NJSLA-S Box Summary

DISTRICT BOX SUMMARY

NEW JERSEY STUDENT LEARNING ASSESSMENT - SCIENCE

2023

Order Type = Initial
99-9999

SHIPPED TO: ANY DISTRICT
JANE DOE
179 ANY STREET
ANYTOWN, NJ 07052
(999) 999-9999

MI Order Number: 08170350000214

CDS Code	Order Number	School Name	# Boxes
99-9999	08170350000214	**DISTRICT OVERAGE**	1
99-9999-010	08170350000149	ANY SCHOOL	1
99-9999-020	08170350000150	ANY SCHOOL	1
Total Number of Boxes for District in this Shipment:			3

This report summarizes all the boxes shipped to your district.
Please use it to inventory the materials for each school and in the district overage.
New Jersey Customer Support Center: 1-888-705-9416 Mon - Fri, 8 am - 5 pm (ET). Select Option 1 for Science.

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Exhibit 4.7.2.5-5: Sample NJSLA-S Packing List

PACKING LIST

NEW JERSEY STUDENT LEARNING ASSESSMENT - SCIENCE

2023

Order Type = Initial
99-9999

SHIPPED TO: ANY SCHOOL DISTRICT
JOHN DOE
525 ANY AVENUE
ANYTOWN, NJ 07010
(999) 999-9999

MI Order Number: 08170350000199

Product Description	Quantity
[Total Number of Boxes in this Order = 1]	
District Chain-of-Custody Form for Initial Shipment of Materials	1
District Coordinator Kit	1

Order Received By: _____ Date: _____
Order Verified By: _____ Date: _____

Retain this form for your records.

If you have damaged items in your shipment, or if items are missing, please contact the New Jersey Customer Support Center at 1-888-705-9416 for assistance. (Monday - Friday, 6:30 am to 7:30 pm ET.)

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Exhibit 4.7.2.5-6: Sample NJSLA-S Chain-of-Custody Form

DISTRICT CHAIN-OF-CUSTODY FORM FOR INITIAL SHIPMENT
NEW JERSEY STUDENT LEARNING ASSESSMENT - SCIENCE
2023

Order Type = Additional
99-9999

SHIPPED TO: ANY DISTRICT
JOHN DOE
7317 ANY STREET
ANYTOWN, NJ 07047

MI Order Number: 08170350000217

INSTRUCTIONS:
The following list contains the ranges of all secure materials that are included in this shipment.

Do not return this form with your test materials. Retain a copy of this form for at least three years. You will need it to refer to if an investigation of missing materials takes place. Any material listed on this form must be returned to Measurement Inc. and the school and district will be held responsible for any secure materials that were received at the school but not returned.

All secure documents must be tracked using this form or an equivalent form. For further information about implementing a security plan for your school, see Section 2.1.1 of the TCM.

Record the date and time, and initial the form when materials are transferred from the DTC to the STC. The School Test Coordinator and the District Test Coordinator must be careful about checking the security numbers of the materials to make sure the sequence of materials received and returned matches what is on this form.

School Number and Name	Form	Security Number From	Security Number To	Qty Sent	Qty Rec	Date/ Time	Initial Upon Transfer DTC	Initial Upon Transfer STC
010/ANY SCHOOL	Gr11 SP LP Kit/TestBk	2120006	2120006	1				
100/ANY SCHOOL	Gr8 Reg Kit/Test Book	180412	180412	1				

I certify that the receipt of all secure test materials from Measurement Inc. has been verified by:

1) Counting the test materials.
2) Verifying the range of test material security numbers, and
3) Verifying that the test material count and the range of security numbers are consistent with the information provided on this form.

_____ _____
(Print) First Name, Last Name, and Title Telephone Number

_____ _____
DTC Signature Date

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New Jersey test coordinators will receive the resources needed to track materials throughout administration of the paper-pencil versions of the NJSLA-ELA/M and NJGPA. These resources will assist them with maintaining test security and accounting for all materials following test administration.

Labeling of Boxes Containing NJSLA-ELA/M and NJGPA Test Materials

Using the OPS application, MI will package and label materials according to NJDOE's specifications. MI staff will clearly label and address materials. The labeling methods and packaging procedures will result in shipping materials to the correct locations, and MI staff will work with NJDOE and district test coordinators to quickly resolve any unforeseen issues.

MI staff will affix two types of labels to each box. The first label, which is the smaller of the two, will show the CDS code, district name, and, if applicable, the school name. This label will be affixed to the top and all four sides of the box. A special designation will be added to this label for the first box in a shipment in order to make it easier for district or school staff to identify. This way, personnel can open that box first to retrieve the packing list for inventory purposes. MI currently prints "**Open me first.**" on the labels for this box.

The second, larger shipping label will indicate the box number, the Chief School Administrator's (CSA) name and address, and a brief description of the types of materials inside the box. For boxes belonging to the district overage, the name of the district test coordinator will also be printed on the shipping label. For boxes that contain test booklets, the shipping label will include the message "**To be opened only by authorized personnel.**" so that district and school staff can easily identify secure materials. Likewise, MI will identify on the shipping label boxes that contain Spanish-language, braille, and large print materials.

Shipping and Distribution of NJSLA-ELA/M and NJGPA Test Materials

MI understands the need to use a shipping company that can provide a two-day or overnight delivery service, and MI will be responsible for the costs associated with shipping NJSLA-ELA/M and NJGPA test materials to and from each district. MI will use FedEx to ship materials for the NJSLA-ELA/M and NJGPA programs. MI has successfully used FedEx to ship NJSLA-S test materials for many years and has successfully used FedEx's two-day and overnight shipping services. MI will use the appropriate level of shipping speed to ensure on-time delivery of materials.

MI will package materials by school in returnable boxes and ship them to the correct district. The district will then distribute materials to the schools. MI acknowledges that they are not responsible for any costs that may occur when shipping test materials between the district office and schools unless the need to ship is the result of a packaging error. If test materials are shipped to the wrong district, MI will schedule and be held responsible for the costs associated with using FedEx's overnight delivery service to forward the materials to the correct district.

NJDOE and district staff will decide how the materials overage will be distributed to schools. If there are any discrepancies between the packing list and what is contained in the packages, the district should notify the MI Help Desk immediately so that MI can investigate and resolve the discrepancy. MI will notify the SCM within 24 hours of any test booklets that are lost during shipping.

MI will ship test materials directly to the districts and NJDOE. The shipment will contain test booklets, student identification labels, and related materials and will be scheduled to arrive no later than five business days prior to the test administration. These shipping timelines give New Jersey school district staff enough time to inventory the materials and distribute them to the schools while limiting the amount of time that test booklets are exposed to potential security issues prior to testing. The delivery dates for each test administration will be determined in collaboration with the SCM during the project launch meeting (PLM).

Districts needing additional materials may order more through CAI's test registration system, the Test Information Distribution Engine (TIDE). CAI and MI have integrated our test materials ordering process, allowing MI to fill and ship additional orders within one or two business days. Our teams take great care to ensure that test materials arrive on time so that the districts can

test on the scheduled testing dates, and they will ship overnight if that service is warranted. Miscellaneous test materials will also be sent to NJDOE upon request.

Return and Storage of NJSLA-ELA/M and NJGPA Test Materials

After test administration, school and district staff will package test materials for return to MI. Once received at MI's warehouse and processing center, any unused test booklets, manuals, and other materials will be inventoried. Any materials that may be used in subsequent test administrations will be retained for that purpose. MI assessment operations staff will also inventory used secure test materials, routing documents that contain student responses to scanning and routing other used test materials to storage.

For the NJSLA-ELA/M and NJGPA, MI will store 100 copies of each regular test booklet form for the life of the project. If NJDOE requests any of these materials, MI will ship the desired quantity to the SCM. Six months following the test administration, MI will seek written approval from the SCM to destroy any unused test booklets. MI recycles nonsecure materials.

MI assessment services staff will generate a Secure Materials Received Report and send that to the SCM for review and approval. MI will store used test materials for at least two years in a secure warehouse and will then request the SCM's written approval to destroy these materials. MI will destroy used test materials only after receiving written permission from the SCM and will maintain test security throughout the destruction process.

Used test booklets from the NJSLA-ELA/M and NJGPA will be retained in a secure warehouse for a period of at least two years. After the two-year period, MI will write to the SCM and request permission to destroy these materials. At the SCM's option, MI will either destroy them or ship them to a location designated by the SCM.

4.7.2.5.2. Shipping Requirements

We will ensure that NJSLA-ELA/M and NJGPA test materials are delivered to and picked up from the CSA or their designees inside district offices. Our packaging and distribution specifications will document shipping requirements and the procedures that district and school administrators should use when handling test materials. We propose using a Test Booklet Receipt form to verify the identity of the CSA/designee. Exhibit 4.7.2.5-7 shows an example of this form.

Exhibit 4.7.2.5-7: Sample Test Booklet Receipt Form

Department of Education
Security and Confidentiality Agreement

Test Booklet Receipt

I certify that I am serving in one of the following professional positions:

- test examiner who will read items aloud to the students;
- educational interpreter for students with hearing loss who will interpret the test items and test directions.

I understand the following:

- I have been assigned a copy of the test booklet solely to facilitate the administration of the test to my students, either as an Examiner who must read the test items aloud to students, or as an Interpreter who must sign the test items **and** directions to students.
- All information revealed during the use of the test booklet, including wording of test items and response options, name and content of passages and texts, order of materials, and any other knowledge revealed to me during this process is confidential.
- Any and all materials used in this process, and any information conveyed during this process, must be held in confidence and can not be discussed with anyone.

I certify that I will use the test booklet solely for the purpose intended, and will keep confidential all test booklet information.

I agree to keep secure and confidential all information revealed during this process both now and in the future.

I understand that there may be professional consequences if the security and/or confidentiality of the materials and information are breached.

Name (print):_____

Signature:_____

Date:_____

Justification for Obtaining Test Booklet: _____

Test Booklet Security Barcode Number:_____

School Test Coordinator Issuing Receipt:_____

The Test Administration Manual (TAM) will reinforce NJDOE's requirements for test security throughout administration of the NJSLA-ELA/M and NJGPA paper-pencil tests by providing forms that, like the Test Booklet Receipt form, document the chain of custody for test materials.

MI will pack and distribute NJSLA-ELA/M and NJGPA materials to districts and will receive these materials back from districts. They understand that prompt and accurate delivery of materials is important to NJDOE and to the district and school personnel responsible for managing materials during each assessment. MI will use a barcode labeling system to completely account for test booklets and secure test materials.

MI will deliver detailed packaging and distribution specifications to the SCM four months before each test administration. Packaging specifications will include a description of how test materials will be packaged for shipment, including examples of packing and inventory lists for boxes being shipped to districts and schools, methods used for distributing and returning materials, and a description of the procedures used to inventory materials as they are returned for processing. If the SCM requests edits to the process, MI will submit the revised specifications to the SCM within five business days.

4.7.2.5.3. Receiving Testing Material

MI will provide prepaid, pre-addressed FedEx return labels to the districts in their initial shipments of test materials so that used test booklets can be returned by overnight or two-day delivery immediately after testing. MI currently provides these labels for the NJSLA-S tests. MI will also provide labels that allow district staff to return test booklets in the last return shipment following the make-up test administration. MI assessment support services personnel will scan the FedEx tracking numbers from incoming packages into their proprietary internal application, called Object Tracker. There, the system will assign the box and its contents to the NJSLA-ELA/M or NJGPA.

MI's assessment support services team, having worked with New Jersey districts on the NJSLA-S, is familiar with how test materials are supposed to be packaged and shipped from districts. These team members will log problems that interfere with processing arising from district staff failures to follow procedures. MI will email these districts, copying NJDOE, to notify them of the problem and how MI resolved the issue. If necessary, MI will request any additional information that may be required before processing of the materials can continue.

MI will develop an error log template, subject to NJDOE approval, to collect information about shipping problems, which district or school was involved, and how MI resolved the problem. MI will deliver the log to the SCM twice, once immediately after MI has received materials and then again with the final report for each test administration.

Processing Boxes Containing Test Materials

MI's assessment support services staff place batches of test booklets into a durable cardboard box with handles, referred to as a *tote*. Each tote contains several tracking and quality control features. MI's staff uses two different scannable sheets, which they generate in the warehouse and place on top of the stack of test booklets. One scannable sheet links the tote to the FedEx shipment and the school, while the other links the tote to a unique batch-tracking barcode label affixed to the outside of the tote. Assessment support services staff place test booklets on top of a scannable End-of-Batch sheet at the bottom of the tote. When this sheet has been scanned, it confirms that all of the test booklets above it have also been scanned.

Each person who handles the tote scans the batch-tracking barcodes into Object Tracker. This allows MI to track each tote as it moves through the warehouse and processing center:

- Origin at warehouse
- Arrival at IT department
- Pre-cutting waiting area
- Post-cutting waiting area
- Scanning area
- Batch edit
- Short-term storage location
- Long-term storage location

Object Tracker allows personnel to locate specific totes and determine their current status. Object Tracker verifies accounts for all batches and notifies assessment support services personnel if one is delayed at any point during processing. MI captures the weight of each tote at key points along the processing chain to maintain the integrity of the batch and ensure that all materials retain their association with their assigned batch.

Exhibit 4.7.2.5-8 describes the features of Object Tracker.

Exhibit 4.7.2.5-8: Features of MI's Object Tracker Application

Application	Description
Object Tracker	Suite of tracking applications developed to monitor the flow of materials from arrival at MI through all phases of processing.
Key Attributes	
• Assessment support services staff verify the contents of a box, place the contents into a tote, and enter the information into Object Tracker. • Once materials are placed into a tote, Object Tracker creates an association between the materials and the tote. This association allows MI to locate any document as it goes through processing. • Staff scan tote barcodes during each stage of processing. Object Tracker logs the time and the location at which staff scanned the tote. • Object Tracker can produce reports that monitor the location of totes. If a tote is overdue at the next station, Object Tracker signals staff to find the tote and move it back into the process. • Staff weigh totes at key points during processing. This quality assurance step ensures that all the materials assigned to the tote are still inside.	

NJDOE will receive an accurate accounting of materials used for administration of the paper-pencil version of the NJSLA-ELA/M and NJGPA because MI uses proprietary applications, like Object Tracker, to expedite the accurate handling of test materials.

Test booklet barcode scanners can capture 30,000 barcodes per eight-hour shift. Support services staff manually scan documents that are too thick to go through the scanners (e.g., braille documents). The application checks each barcode number against the original list of test booklets shipped to districts. MI uses this information to prepare a Missing Test Booklet Report.

MI's system for barcode verification is very reliable (less than 0.02% error rate). The scanner directly places each scanned test booklet back into the labeled box for long-term storage. After the box is full, the system checks the total weight against the number of barcodes recorded from the test booklets inside. A discrepancy triggers an automatic rescan of the entire box. MI also conducts a targeted rescan, which focuses only on boxes from schools and districts that are missing one or more test booklets. Beyond the rescan, MI staff manually check certain boxes of test booklets to ensure 100% accuracy of the secure materials check-in process.

4.7.2.5.4. Delivery Plan and Verification of Receipt of Materials

MI acknowledges the responsibility to provide a comprehensive test materials delivery plan, demonstrating how it will ensure the delivery of test materials to the CSA or their designee at school district offices. Within 60 business days of contract award, MI will provide this plan to the SCM for approval.

MI will use FedEx for delivery of materials to New Jersey school districts and collection of materials for return to the MI warehouse and processing center in Durham, NC. FedEx has successfully handled these operations for many years for the NJSLA-S program and has an excellent history of maintaining accurate records of boxes while in its possession.

4.7.2.5.5. Missing Shipments

Many state education agencies rely on MI to accurately ship their paper test materials and to resolve any shipping errors that occur in a timely manner. They also require MI to correct shipping problems at their own expense. If district personnel experience a missing shipment, damaged materials, or missing items, they can contact the Help Desk for resolution. MI ships replacement materials within one business day using overnight delivery. Its goal is to provide or replace test materials within 48 hours of notification. MI asks that district staff finish inventorying boxes before placing an order for additional materials. MI will provide the SCM with a full report on a missing shipment within 24 hours of notification. It will also provide additional information after following up with FedEx.

4.7.2.5.6. Carrier

MI will use FedEx to successfully ship paper test materials for the NJSLA-ELA/M and NJGPA (both outgoing and incoming shipments). FedEx offers a wide range of shipping options, including next-day service, to meet testing and scoring schedules. FedEx also offers advanced online tracking capabilities, the ability to provide inside delivery of each shipment, and the requirement of a receipt acknowledgment signature.

4.7.2.5.7. Copies of Materials

MI understands that NJDOE will have final approval of all memos and test materials prior to production or distribution. At the PLM, MI will establish how long the SCM will need to review each deliverable and how far in advance the review needs to occur prior to shipping. Specific dates will be built into the annual project schedule. We will provide the SCM with final copies of school district mailings and shipments for NJDOE's records. No item shall be sent to school districts without prior written approval from the SCM.

4.7.2.5.8. Test Materials Shipment

We acknowledge that test materials must arrive in New Jersey districts at least five business days prior to testing. Delivery of these shipments shall be made inside of the district office to the designated recipient of the materials. MI will pack materials by school so that district testing staff can efficiently forward test materials to each school.

4.7.2.5.9. Return of Material

Along with each initial shipment of NJSLA-ELA/M and NJGPA materials to districts, MI will provide test coordinators with Materials Return Kits containing labels and documentation about how to return materials. MI will include labels so that test coordinators can identify the materials inside each box. This will help MI to expedite processing once materials arrive at their Durham, NC, warehouse and processing center.

When MI assessment support services staff create Materials Return Kits, they capture in OPS the tracking numbers for the return packing slips. This process offers an accurate and expedient method of logging materials upon their return to MI.

If a test coordinator requires additional return labels, they will contact the Help Desk. MI will email additional FedEx labels to the test coordinator so they can quickly continue preparing their return shipment. Coordinators can print the labels on letter-sized paper and securely affix them to the package(s) with clear packing tape.

District test coordinators use the original packing list and security information to verify the full collection and return of materials. Then, they package the materials and apply the self-adhesive

return label found in the Materials Return Kit. Once the shipment is ready, coordinators call a toll-free FedEx telephone number to arrange for the pickup of their boxes.

FedEx typically picks up test materials on the next business day, depending upon the time of day in which the call is made and the distance that FedEx must travel for the pickup. MI encourages test coordinators to return materials as soon as the shipment is ready rather than waiting for a pre-determined return date. This expedites the return of test materials and allows MI to start processing test materials as shipments arrive.

MI's assessment support services team processes materials as they arrive at the warehouse and operations center in Durham, NC. As materials are received, the FedEx tracking number is scanned into Object Tracker. MI uses this data to provide materials processing reports documenting the number of boxes of materials received from each district or school. This report also lists the number of boxes received each day of the project.

4.7.2.5.9.1. Overnight Return of Answer Folders

Our solution for using a Data Entry Interface (DEI) to support paper-based scoring reduces the criticality of oversight shipping as a means of expediting scoring and reporting for the population of students who are unable to take an online test. However, we still believe that an expedited return of all secure test materials is a best practice, and as such we will arrange to have used test booklets and secure test materials from the regular and make-up test administrations returned to MI's Durham, NC, warehouse and processing center from the districts via FedEx's overnight delivery service.

To facilitate shipping and handling of test materials, MI will provide the following items in the Materials Return Kits:

- FedEx PAKs for smaller test booklet quantities (Districts can reuse the original shipping boxes for larger test booklet quantities.)
- Security forms
- Headers containing school, district, and grade information
- Special handling envelopes

Upon arrival at MI, experienced assessment support services staff check the number of boxes received against the number shipped by each district. If a discrepancy exists, they check with FedEx about the shipping status of unreceived boxes. If the box is not en route to MI's warehouse and processing center, they check with district staff to verify that the missing box is not still at the district's offices.

4.7.2.5.9.2. Return Notification

MI's assessment support services team is familiar with NJDOE's requirements for return notification because they currently administer the NJSLA-S. This same team will closely monitor the return of materials from districts following administration of the NJSLA-ELA/M and NJGPA, ensuring that each district's return shipment is complete.

If a New Jersey district's shipment is found to be incomplete, the assessment support operations team will scrutinize FedEx tracking information. If the box is not in the FedEx system, they will contact the district to determine whether the box is still at the district office.

On the first day after the close of the return window, MI staff will scrutinize the tracking data for any districts that have not returned all materials; within four business days after the completion of each test administration, MI will notify the SCM of any boxes not received.

Authorized NJDOE personnel, including the SCM, will have access to a daily report documenting the progress of returns, scanning, and processing. The Materials Processing Report is a spreadsheet that provides aggregate and district-level data for boxes shipped versus boxes received; the number of totes created and scanned; and the total number of booklets scanned, processed, and palleted, broken down by scorable and nonscorable materials. This helpful report allows MI and NJDOE personnel to monitor the progress of returns, evaluate processing performance, and flag particular items for closer examination or inquiries.

4.7.2.5.9.3. Answer Folder Acceptance

As described previously, our proposed plan does not rely on the return of answer documents, but rather the use of CAI's DEI to ensure that student responses are submitted for scoring and reporting. We will provide instructions for appropriate personnel to enter/transcribe student responses into the online system for scoring. CAI will work with NJDOE to establish a notification process to support New Jersey's paper-based testing and ensure the timely completion of the response transcription process.

All secure test materials will be accepted and processed upon receipt. If materials are returned well after the completion of processing, at the request of NJDOE, we will process, inventory, and report these to NJDOE.

4.7.2.5.9.4. Secure Return of Test Booklets

MI will provide prepaid, pre-addressed FedEx return labels to New Jersey districts in their initial shipments of test materials. Test coordinators will use these labels to return their secure materials to MI, who can follow the return of each package using the tracking numbers on the labels.

To simplify the return process, MI asks that New Jersey districts return test booklets in the shipment of used test booklets following the make-up test administration. Test booklets will arrive in Durham, NC, within three business days after completion of make-up testing. MI will then process the secure materials and account for all secure materials used in the administration of the NJSLA-ELA/M and NJGPA.

4.7.2.5.9.5. Notification of Missing Test Booklets

MI will notify the SCM of any missing test booklets within 24 hours of the discovery that the booklet(s) is (are) missing.

MI may notify the SCM prior to the testing dates as they monitor the receipt of shipments by New Jersey districts.

During testing, districts may contact the Help Desk when they realize they have lost track of secure materials, although NJDOE should be their first point of contact. MI will obtain the details and refer these districts promptly to the SCM.

After testing, MI will monitor shipments as they move from New Jersey districts to the MI warehouse and processing center. MI will notify the SCM if any return shipments containing secure test materials are late.

4.7.2.6. Test Materials Security

With more than 40 years administering large-scale, statewide assessments, MI has earned a reputation for ensuring the security of all materials and working collaboratively with its clients and partners to ensure that high standards are met. MI's experiences with the administration of assessments in New Jersey and other states have brought an awareness of the many

opportunities that districts and schools have for unauthorized handling of secure testing materials. MI knows the chain of custody from their shipping dock to the school and back, and they are aware of every point at which test security may become compromised.

In MI's work with NJDOE for the NJSLA-S and other assessments, MI developed and implemented procedures that provided the necessary security for test materials without placing an undue burden on local districts. These procedures kept test materials safe, as evidenced by the 99.99% recovery rate of test booklets following test administration. MI proposes to use the current NJSLA-S procedures as the basis for their plan for the NJSLA-ELA/M and NJGPA. MI will work with NJDOE on an annual basis to ensure that the plan is meeting stakeholders' needs and may incorporate additional security measures recommended by NJDOE.

In examining past security breaches, MI has found that some individuals did not realize that they had violated security protocols. With this in mind, New Jersey test coordinator training will emphasize the importance of taking test security seriously and will include an introduction to the guidelines of high-stakes testing. Materials and training will address the requirements for inventory, storage, and distribution of test materials prior to testing and for the accounting and return of all used and unused test materials after testing.

4.7.2.6.1. Test Booklet Security

Each year, before administration of the NJSLA-ELA/M and NJGPA, CAI will conduct test coordinator training. This training will emphasize what the test coordinators need to do to maintain security of NJSLA-ELA/M and NJGPA test materials. We will do whatever is possible to design the delivery, distribution, and pickup instructions, as well as the test materials themselves, to promote test security and make it easier for the test coordinators to complete paper test administration.

As part of our secure inventory reporting, we will provide copies of the NJDOE Statewide Assessments Test Security Agreement and the NJDOE Security and Confidentiality Agreement for posting to the NJSLA-ELA/M and NJGPA website and for use in test administration manuals. Test examiners will sign these agreements when they receive materials, which reinforces the need for security. Test coordinators will be expected to keep these forms in their files for three years following test administration.

Throughout the delivery period, we will track initial and additional shipments and will provide a log to the SCM every day until deliveries are complete. If a shipment of test booklets is lost, MI will report this issue to the SCM within 24 hours. Once materials are in the district, the Chief School Administrator (CSA) will become responsible for maintaining security within the district throughout test administration.

MI maintains responsibility for materials until district personnel sign for them at the district office. MI labels boxes of secure test materials with the message "**To be opened only by authorized personnel.**" When test materials arrive at the district office, the CSA acknowledges receipt of the materials by signing with FedEx.

Following receipt of test materials, the district test coordinator (DTC) inventories the test booklets. The DTC should count the test booklets, check the numbers against the packing slips, sign the form, and retain the form for their records. This procedure provides written acknowledgment from the CSA and the DTC that the district received each test booklet assigned to them and gives them an opportunity to investigate and resolve any discrepancies. Shrink-wrapped materials should not be opened until immediately before distributing the test booklets for testing.

District and school personnel should keep secure materials in a locked area prior to test administration and whenever the test booklets are not in use. Shortly before test administration,

the DTC distributes the boxes of test materials to a designated school testing coordinator (STC) at each school. On testing day, the STC distributes the test booklets to the examiners, who return the materials to the STC when they finish testing for the day. STCs use a School Security Checklist to manage the exchanges between the STC and test examiners. The School Security Checklist lists each test booklet and provides a place for the examiner and school test coordinator to sign. This provides a daily record of the whereabouts of the test booklets.

Following test administration, the STC delivers materials back to the DTC. The DTC inventories and packages materials for return to MI's warehouse and processing center. Before sealing each package, the DTC should count and check the test booklet numbers against the District Return Form. MI provides prepaid, pre-addressed FedEx return labels so that they can monitor the return shipments.

MI will notify the SCM of any secure test materials lost during return shipment within 24 hours, or of any shipments that have not been received in four business days, as requested.

4.7.2.6.2 Security Forms and Procedures

It is MI and CAI's collective goal to keep test materials secure and make sure that test coordinators promptly return all materials for secure inventory and archive. CAI and MI therefore design test booklets to include multiple security features.

Seals

MI will seal NJSLA-ELA/M and NJGPA test booklets on all open sides. MI uses adhesive seals that are a full five inches in length and are of sufficient strength to resist accidental breakage. Test booklets used for multiple days of testing will have each day's pages separately sealed.

Security Statement

The front cover of each test booklet will bear the following statement:

> "Security breaches may have financial consequences for the **district**, professional consequences for **staff**, and disciplinary consequences for **students**. This New Jersey Student Learning Assessments test booklet and its contents are secure. Under no circumstances may any of the enclosed contents be conveyed orally or copied, either manually or electronically. All test booklets must be returned to Measurement Incorporated."

Photocopy Warning

The top of each test booklet page will state:

> Do not photocopy—must return to Measurement Incorporated.

These warnings should make it clear to staff and students handling secure materials that photocopying test pages and student responses are violations of NJDOE's security policies.

Return Address

MI's return address will be printed on the back cover of each test booklet, with a statement that this test booklet must be returned to MI. This increases the chances that FedEx will be able to return any test booklets in the rare event they become separated from a shipment. MI has

received excellent service from FedEx in recovery of test booklets separated from damaged packages.

MI's methods of labeling with unique identifiers and their packaging procedures provide the necessary measures to assure the security and integrity of secure test materials. MI will work with the SCM to improve security measures each year of the contract. In the unlikely event of a loss of secure materials, the MI Project Manager will inform the SCM within 24 hours.

Security Forms

We will uniquely number each test booklet so that test coordinators can track these documents on the security forms. We understand that the CSA will receive test materials and assure the transfer of responsibility for these materials through the following sequence of individuals: district test coordinator, school test coordinators, and test examiners. After the test examiners have administered the test, the sequence of responsibility returns in reverse order to the CSA (i.e., test examiners, school test coordinators, and district test coordinator).

In all instances, once the CSA takes possession of the test materials, the CSA and the building principal are ultimately responsible for them. MI will provide the necessary security forms to districts for use in secure inventory control while tests are in the district's possession. These forms help to facilitate inventory check-in, chain of custody, and transfer within the district and return of all secure materials to MI. Exhibit 4.7.2.6-1 identifies the forms that MI will provide to support secure administration of the paper-pencil versions of the NJSLA-ELA/M and NJGPA.

Exhibit 4.7.2.6-1: District and School Security Forms

Form	Purpose
District Receipt Form	The CSA and DTC sign this form to acknowledge receipt of test booklets.
District Return Form	The CSA signs this form to acknowledge return of all test booklets.
School Security Checklist	STCs and examiners use this form to track test booklets during testing.
School Security Checklist—District Overage	DTCs and STCs use this form to track test booklets received from the district overage and issued to examiners.
School Security Checklist—Make-Up	This form is similar to a regular School Security Checklist. However, since only a certain portion of test booklets are required during make-up testing, this form does not include preprinted test booklet numbers.

Staff handling NJSLA-ELA/M and NJGPA paper-pencil tests and secure materials will use security forms to monitor the chain of custody throughout the test administration process. These forms will reinforce test security.

4.7.2.7. Data Verification Plan

Error-free results require sound processing procedures throughout all phases of data collection and scoring and careful monitoring of test materials at critical checkpoints throughout the system.

In collaboration with Measurement Incorporated, CAI will draft a detailed plan encompassing all critical data verification elements and submit the plan to the SCM for approval at least five months prior to each test administration. If the SCM requests changes, we will revise the plan and submit the edited version for approval within five business days of receipt of the request. To accommodate data verification requests from NJDOE, we will store, at a secure location, used

test booklets for a period of at least two years. This will allow us to retrieve a student's test booklets or a scanned image of the folder.

Our data verification plan will explicate the business rules, technical data, or other information to ensure continued reliability in scoring, reporting, and analysis of the NJSLA-ELA/M and NJGPA.

It should be noted that our proposed plan will use CAI's Data Entry Interface (DEI) as the primary means to return student responses for paper-pencil testing, as described in Section 4.7.2. In the following sections, we describe the processes we will complete for the processing and verification of secure testing materials, rather than a complete document scanning/scoring plan. It should be noted that CAI's and MI's teams are fully capable of meeting the requirements for scanning and scoring as outlined in the RFQ. Given NJDOE's desire to move away from the use of answer documents and the many benefits of CAI's DEI offering, we felt strongly that this was a more responsive solution than the full traditional scan/score solution for the low-volume use of paper-based testing. If NJDOE decides to move back to a full scanning/scoring solution, CAI is prepared to offer these services in conjunction with our scoring partner, MI.

The final data verification plan will address the procedures for all components of data processing and paper-based scoring to demonstrate the accuracy of the final reports we produce, including:

- DEI setup, verification, user training, and user acceptance testing (UAT) procedures
- Item and test scoring procedures and UAT/test deck processes
- Test administration quality assurance (QA) and data monitoring procedures
- Secure materials inventory and reporting procedures

4.7.2.8. Processing and Scanning Verification Steps

MI will conduct the processing and scanning for all secure test materials. MI has established procedures, security measures, and quality-assurance checks to support the secure inventory scanning process. These processes, driven by proprietary software applications, will ensure precise scanning of each returned test booklet, including security barcodes and student demographic information. These proprietary software applications will facilitate accurate and efficient tracking of student documents throughout the scanning/inventory workflow.

Verifying the Total Quantities of Test Booklets Returned

On behalf of NJDOE, and in collaboration with CAI, MI will ensure that NJSLA-ELA/M and NJGPA test materials are received, checked in, processed, and accurately reported. MI will use a custom tracking application (Object Tracker) to monitor the flow of materials from districts to MI.

MI assessment support services staff use Object Tracker to track the location of a tote and its contents (answer folders and headers) throughout processing. As they create batches, staff attach unique batch-tracking barcode labels to the tote and its corresponding batch-tracking sheet (BTS). MI places the BTS on top of the school header and its associated answer folders in the tote. They record the batch-tracking barcode in Object Tracker, allowing assessment support services staff to identify specific totes and to determine their current status. Scanning each tote in and out of each processing area makes it easy to determine which processing area is in possession of the material.

The Object Tracker application verifies that every batch is accounted for and notifies assessment support services staff if one is delayed at any processing area. Object Tracker captures the weight of each tote at key points along the processing chain to maintain the integrity of the batch and ensure that documents retain their association with a specific batch.

Since test booklets are secure, every NJSLA-ELA/M and NJGPA test booklet returned from districts will be inventoried using the security barcode Check-in Application (BCA) by scanning the secure material barcode from each test booklet. The Data Verification Plan will include verifying the number of answer folders scanned from each district against the number that the district indicated on the header. This allows MI to identify situations when districts may have failed to return all the student answer folders. MI will notify districts and the SCM of any missing test booklets.

4.7.3. Materials and Procedures Required for Both Delivery Systems

4.7.3.1. Materials and Procedures Editing and Development Schedule

In producing manuals, user guides, training materials, and ancillary materials, CAI will rely on its dedicated team of technical writers, editors, and graphic designers who continually develop, edit, and enhance documentation for CAI's testing system. CAI acknowledges and fully commits to complying with the specified timelines and procedures.

In preparation for school year 2025–2026, we will proactively develop new versions of materials outlined in Section 4.7.3.1.1 of the RFQ. These materials include the Test Administration Manual, Score Interpretation Manual, and Parent/Student/Teacher Guide and will align with assessments conducted during that period. To uphold the quality of these materials, collaboration with NJDOE is integral to our approach.

Throughout the rigorous SCM-led evaluation, our collaboration with NJDOE remains central. Actively seeking NJDOE's insights will enhance the relevance and effectiveness of the materials. We will ensure that any required revisions will be swiftly incorporated and resubmitted within 10 days for final approval. We will also ensure that these new materials will be delivered to NJDOE and will adhere to the Operational Yearly Schedule (OYS) for seamless integration and compliance.

In school year 2026–2027 and annually, thereafter, our commitment extends to a thorough evaluation of the existing materials and procedures. These materials include the Test Administration Manual, Score Interpretation Manual, and Parent/Student/Teacher Guide, as well as the reference sheet for each subject area.

The proposed revised materials and procedures will be subject to a 10-day review period by the SCM. CAI will address any required revisions and deliver the revisions to NJDOE within another 10-day timeframe for final approval. CAI will ensure that all updated materials and procedures will be accessible in line with the OYS. This commitment highlights our dedication to consistent, prompt delivery of the highest-quality materials throughout the contract.

CAI's Approach to Development, Editing, and Review

CAI's process for developing manuals, ancillary materials, training materials, and user guides is divided into two phases:

1. A drafting phase, during which we obtain agreement on the content and design of the document from NJDOE
2. A production phase, during which we produce the document to the specifications developed in the first phase, accommodate any final adjustments, and ensure that the camera-ready proofs are error-free

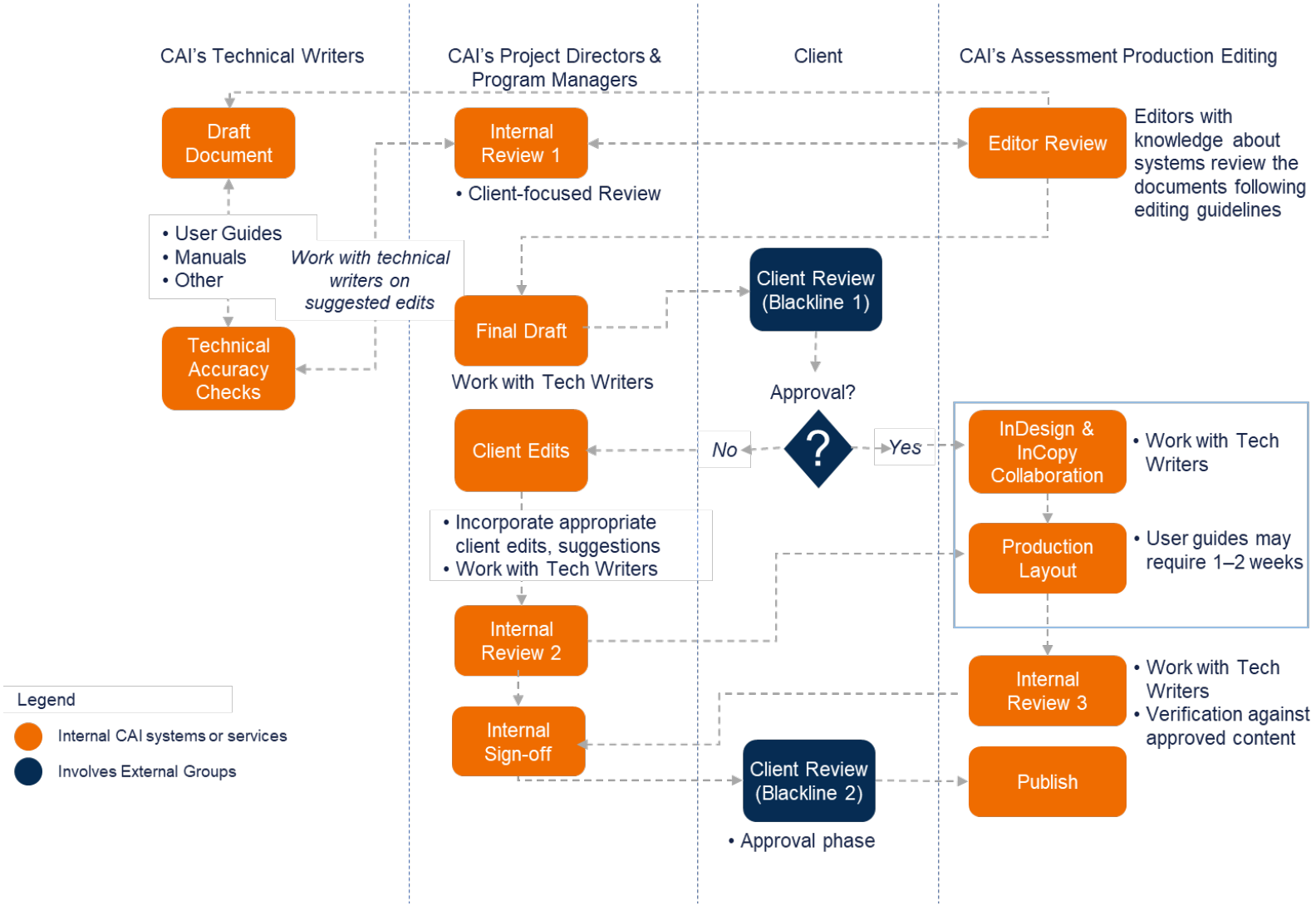
The drafting process begins with conversations with NJDOE, during which we discuss both design and content issues. Once drafts are approved, we proceed to production. The first blackline version of the document, which results from the first iteration through our production process, is designed to reflect final layout and formatting. Typically, only format and layout changes are made at the blackline stage. After these changes are incorporated, a second blackline document is produced to confirm that they were made correctly.

Our production processes include multiple editorial reviews, and each document must receive senior staff sign-off. Exhibit 4.7.3.1-1 provides an overview of our editorial review process. Each document's content is fully drafted before it enters the production system. Camera-ready drafts are called *blackline proofs*. We typically produce up to three blackline proofs. Final edits are made on blackline 1, any missed changes corrected on blackline 2, and a clean version delivered at blackline 3. The final blackline proof must have no changes and serves as the master document against which the blueline proof is evaluated.

CAI will provide NJDOE with at least seven business days to review the initial document draft. Additional review rounds are built into the review process to confirm requested updates. All training and ancillary materials will be available electronically via the assessment portal after they have been reviewed and approved by NJDOE. CAI will ensure that all training materials and any supporting documents are accurate, error-free, and prepared to be compliant with Section 508 of the Rehabilitation Act of 1973.

CAI commits to proofreading all electronic documents for 100% accuracy at each stage of the production process. At each internal review stage shown in Exhibit 4.7.3.1-1, our editorial staff review drafts and revisions to ensure that there are no errors. In addition, the project team cross-references the draft submitted to NJDOE for review alongside the marked-up version of the document to ensure that each requested edit or revision by NJDOE is made accurately. For documents describing online systems and processes, our technical writers draft and review all relevant sections, ensuring the content's technical accuracy. In the event inaccuracies are found in the final electronic documents, NJDOE may request an internal review of CAI's procedures, and we will include additional quality control steps at CAI's expense.

Exhibit 4.7.3.1-1: Overview of Our Editorial Review and Revision Process



4.7.3.1.1. Assessment Literature (Test Administration Manual, Score Interpretation Manual, Parent/Student/Teacher Guide)

We propose an all-encompassing strategy designed to effectively address each requirement, meeting diverse needs across various testing scenarios, such as regular, make-up, large print, braille, Spanish-language, and alternate situations. CAI is committed to collaborative development with NJDOE to produce all assessment literature listed in the RFQ.

Test Administration Manuals

Our team of experienced content developers will produce test administration manuals, including manuals for school and district test coordinators and test administrators (TAs) and an Accessibility Features and Accommodations (AF&A) guide. Each manual will undergo vigorous rounds of review to ensure accuracy and compliance with the specified guidelines.

CAI will partner with NJDOE to create clear and detailed test administration manuals that testing personnel can use to successfully administer the NJSLA. CAI will collaborate closely with NJDOE to create comprehensive manuals to explain all procedures before, during, and after testing for computer-based and paper-based tests. These manuals will include policies and procedures that are familiar to districts, schools, teachers, and especially, students.

Our project managers have considerable experience creating manuals, scripts, and instructions that support CAI's Test Delivery System (TDS) across various states. Our extensive experience in other states will help ensure that test administration requirements are efficiently communicated to districts and schools. CAI will ensure that manuals and test administration scripts meet the administration requirements and reflect New Jersey's established style guides. CAI commits to gaining a comprehensive understanding of New Jersey's test administration processes and policies and creating clear, well-documented manuals and scripts for test coordinators and TAs to ensure that standardized procedures for test administration are understood and followed.

Proposed topics for the Test Administration Manual will include the following:

- Overview
- Test Times
- Test Security
- Accessibility Information
- Administration Preparation Guidelines (both staff and student)
- Instructions to Be Given to Students (script to be read aloud during test administration)
- Resources and Training Materials

Screen captures will be included in each section of the Test Administration Manual to allow testing personnel to assess how each section of the online testing system should look. Where applicable, a checklist will be included as well. For example, a checklist could outline the steps for setting up a test session and approving students to test. An outline for a typical Test Administration Manual is shown in Exhibit 4.7.3.1-2.

To help ensure secure, standardized test administration, testing personnel must follow certain test protocols. The Test Administration Manual will include the protocols that district test coordinators, school test coordinators, and TAs/test proctors must follow regarding test security and test administration. All administration instructions are contained in each script. As with the development of the Test Administration Manual, CAI will collaborate with NJDOE to create these test scripts and ensure that all scripts are reviewed and approved.

Exhibit 4.7.3.1-2: Sample Outline of a TAM

I. Overview of the Composition of the Test and General Information About How to Conduct the Test
II. Key Dates
III. Test Times
IV. Test Security and Administration Policies
- Importance of Test Security

V. Accessibility Information
- Administration of the Braille Version of the Test
- Administration of the Spanish Version of the Test
- Administration of the Print-on-Demand Accommodation
- Assistive Technology Devices
- Accessibility Resources

VI. Administering Computer-Based Tests
- Accessing the TA Site
- Starting a Test Session
- Approving Students for Testing (Test Settings and Accessibility Support)
- Monitoring Students' Testing Progress
- Stopping a Test Session and Logging Out

VII. Logging In to the Student Testing Site
- Logging In
- Verifying Student Information
- Selecting a Test
- Performing Software and Hardware Checks
- Troubleshooting Audio Issues

VIII. Test Administration Instructions and TA Scripts for Online Test Administration
IX. Proceeding Through the Online Test
- Answering Test Items
- Reviewing Items
- Completing and Submitting the Test

X. Administering Paper-Based Tests
- Test Administration Instructions and TA Scripts for Paper-Based Tests

XI. User Role-Specific Checklists of Tasks to Complete Before, During, and After Testing
XII. Frequently Asked Questions and Emergency Situations
XIII. Resources and Training Materials
XIV. Help Desk and Contact Information

Parent/Student/Teacher Guide

We propose a unified guide designed for parents, students, and teachers. Our approach involves employing instructional design principles to create an informative, accessible, and user-friendly guide that caters to the needs of all three stakeholders.

Score Interpretation Manual

Our subject-matter experts will diligently develop a comprehensive Score Interpretation Manual, aligning with the requirements outlined in Section 4.13.3. This manual will provide educators and administrators with a clear understanding of test scores.

Additional Assessment Literature

Working closely with the SCM, CAI will develop necessary ancillaries for the New Jersey testing program, including information on mutually agreed-on topics. We will follow the same two-phase process previously described for developing ancillary materials. First, we draft the document with NJDOE to agree on content and design. Second, we produce the document to NJDOE's specifications, accommodating final adjustments and ensuring error-free proofs. We have multiple editorial reviews to ensure 100% accuracy of the text.

CAI commits to developing publications and ancillary materials that are

- fully customizable to include policies and procedures unique to the New Jersey Next Generation Assessment Program;
- designed in consultation with NJDOE to create a look and feel reflective of New Jersey assessments;
- consistent with NJDOE's protocols and practices;
- scheduled to ensure that there is minimal overlap with other test administration materials under development; and
- reviewed and produced by accessibility experts to ensure that they are fully compliant with the Americans with Disabilities Act.

Informational Materials

CAI will collaborate with NJDOE to develop, produce, maintain, and distribute engaging informational materials for parents, educators, administrators, and the public that answer common questions about the new online testing system. Additionally, we will establish a web presence and leverage social media platforms to reach all stakeholders.

These informational materials will contain general information about the new online system, such as the following:

- How the new online testing system is different from the old testing system
- Whether students will be required to take tests multiple times
- Guidelines schools can use to schedule tests using the new online testing system

A Customized Informational Portal for All New Jersey Stakeholders

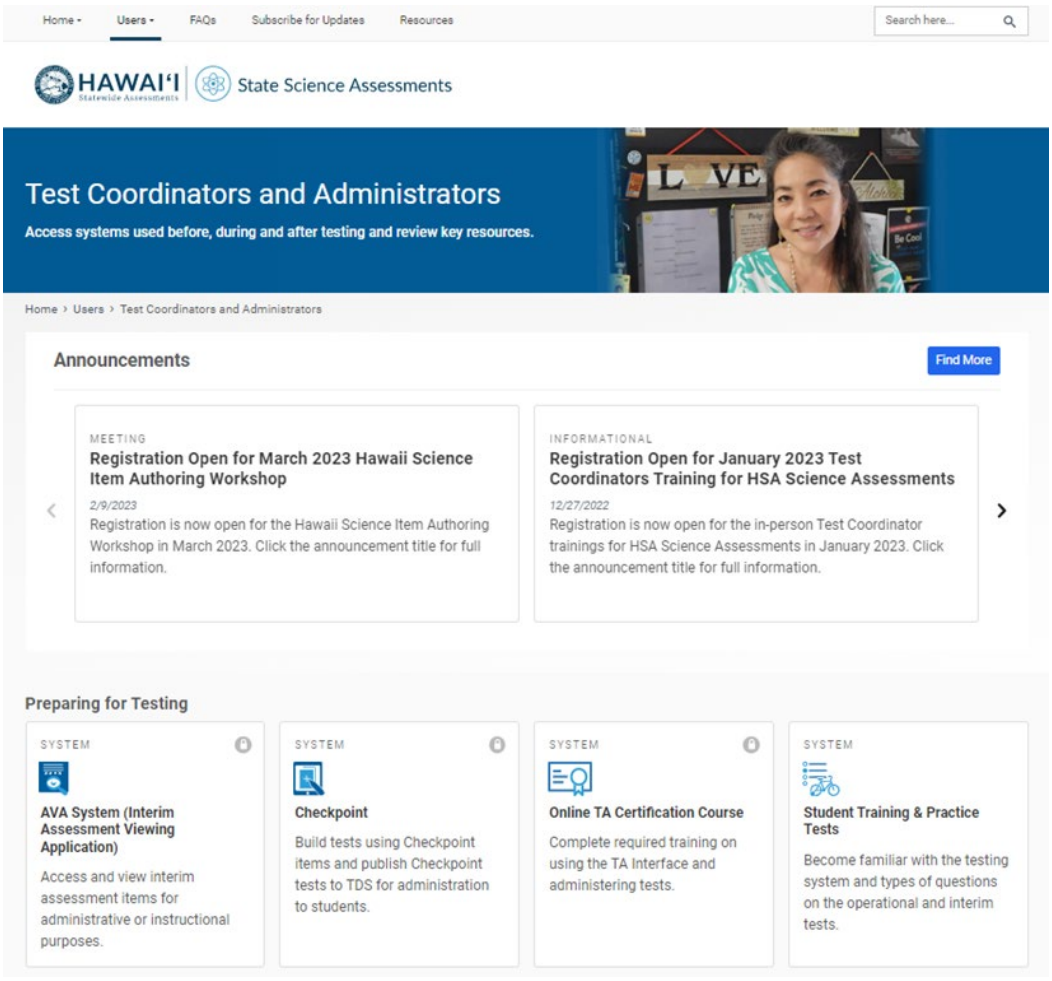
Transitioning a large-scale assessment program produces an enormous amount of information. The objective of an early communication strategy is to provide stakeholders with a clear structure for organizing and absorbing the information they will be receiving. We will accomplish this by collaborating with NJDOE to customize key communication tools for parents, educators, and administrators. We will develop a customized information portal for all educators, administrators, families, and students that functions as a central repository for all communication and training materials.

To facilitate access for each stakeholder group, all technology user documentation, technical manuals, training materials, and administration manuals will be available on the portal. All components of the online platform will be accessed via the portal.

To enable easier access for stakeholders to the large volume of materials required to successfully administer a large-scale assessment program, we recommend that the structure of the portal be set up to mirror the structure of New Jersey's user roles (test coordinator, teacher, technology coordinator, student/parent) and by separate, subject-specific tabs such as CAI Secure Browser, Training, General Resources and Manuals, FAQs, and Contact Us. The portal tabs function like a table of contents, helping each user group organize and locate information as needed.

The portal home page also offers an easy-to-access location for important announcements and updates to the field. Aside from functioning as a central information repository, the portal also provides each user role with password-protected access to only those components of the online testing system that are relevant to the specific role. CAI staff will work with NJDOE to configure the portal in the most optimal way for New Jersey educators and administrators. All text for announcements will be reviewed and approved by NJDOE before release. Exhibit 4.7.3.1-3 shows a sample portal page.

Exhibit 4.7.3.1-3: Hawaii Portal Test Coordinators and Administrators Page for State Science Assessments



4.7.3.1.1.1. Pre-Test Administration Products/Materials

In the following sections, we discuss the materials that will be produced before the administration of each component of each assessment.

4.7.3.1.1.2. Parent/Community Information Pamphlet

We understand the importance of closely aligning the parent/community information pamphlet with the goals of the New Jersey Next Generation Assessment Program. We are committed to collaborating with NJDOE to ensure that the content accurately reflects the nature of the assessments and empowers parents and communities to understand their children's assessment results.

Proposed topics for the parent/community information pamphlet are as follows:

- Introduction and a comprehensive overview of the New Jersey Next Generation Assessment Program
- Information and guidance for interpreting performance results and how assessment results can be beneficial to inform meaningful decisions

Our production process will encompass all aspects described earlier in Section 4.7.3.1, from design to multilingual content creation in at least Arabic, Chinese, Portuguese, Spanish, and one other language as deemed necessary by the SCM. Final deliverables available in a web-ready version will be accessible via the New Jersey Assessment Portal or the NJDOE website. Additionally, CAI will ensure that the brochures are Section 508 compliant to guarantee accessibility for all users.

In adherence to the protocols, written materials intended for parents will undergo a thorough review by parent focus groups. Similarly, materials directed at educators will be reviewed by educator focus groups, ensuring the highest quality and relevance for both audiences.

4.7.3.1.1.3. Student Preparation Booklet

CAI will deliver a comprehensive student information and preparation booklet for the New Jersey Assessment Program, with a primary focus on providing students with a clear understanding of each assessment. Our commitment involves developing relevant materials to support students in their preparation and ensuring their optimal performance, fostering a positive test-taking experience appropriate for their scheduled tests. The booklet will feature sample items that meet NJDOE-specified requirements.

In collaboration with NJDOE, CAI will incorporate suggested information to create a comprehensive guide for students in the initial contract year. For subsequent years, the booklet will undergo updates with changes being approved by the SCM to ensure accuracy and alignment with testing standards.

To meet timeline requirements, CAI will finalize the booklet and publicly post it to the New Jersey Assessment Portal at least three months before the test date, allowing ample time for distribution to schools. This commitment reflects our dedication to accessibility for all students in the tested grade.

Accessibility and inclusivity are at the forefront of CAI's approach. Recognizing New Jersey's diverse student population, we will provide the booklet in multiple languages to ensure it reaches as many families as possible. Translations will be made available in Arabic, Chinese, Portuguese, Spanish, and an additional language specified by the SCM, as per the guidelines established in the Operational Yearly Schedule. Each version of the booklet will meet or exceed accessibility standards, creating an inclusive experience for all families, students, and community members.

Through these efforts, CAI will deliver a high-quality, accessible Student Information and Preparation Booklet that reflects NJDOE's commitment to preparing students for success.

4.7.3.1.1.4. District/School Test Coordinator (DTC/STC) Manual

CAI recognizes the significant value of well-designed district/school test coordinator manuals in ensuring smooth and efficient test administration. We are committed to closely reviewing the current coordinator manual and collaborating with NJDOE to tailor it to NJDOE's unique requirements. Our team will work diligently to create a comprehensive coordinator manual that covers all critical information and procedures for both computer-based and paper-based tests and adheres to the specifications. Information will be incorporated for both the computer-based test and paper-pencil modes of administration. We will submit the manual to NJDOE no later than the beginning of the third full week in September each year of the contract and promptly address NJDOE's requested changes within five business days for approval. Additionally, CAI will update the manual annually for each spring test administration. This comprehensive and up-to-date resource will meet the exact needs of NJDOE, providing district and school test coordinators with the guidance necessary to administer the testing program successfully.

Before production, the Test Coordinator Manual (TCM) will be submitted to NJDOE for review and approval. To ensure that the manual meets NJDOE's exact needs, the proposed topics are outlined as follows:

- Overview of the composition and purpose of the assessments
- Test security and administration policies
  - Test coordinator and administrator responsibilities for maintaining security
  - Test irregularities and security breaches
  - Testing environment
  - Scheduling and testing time
- Checklist of tasks to complete before testing
  - Develop a test administration plan
  - Complete technology setup
  - Establish a testing schedule
  - Schedule trainings, tutorials, and practice tests
  - Organize materials for computer-based and paper-based tests
- Checklists of tasks to complete during testing
  - For computer-based tests
  - For paper-based tests
- Procedures for test irregularities
- Checklists of tasks to complete after testing
  - Collect and organize materials
  - Tasks to complete for paper-based tests
  - Tasks to complete for computer-based tests
- Accessibility and accommodations features

4.7.3.1.1.5. Examiner Manual

CAI will develop, produce, and maintain an Examiner Manual as outlined in the provided requirements. In contrast with the TCM, the Examiner Manual will be crafted to meet the test administrator's specific needs by including only information relevant in the applicable assessment cycle. Our commitment involves providing comprehensive administrative instructions and scripts for test administrators to ensure successful test administration.

Understanding the necessity for multiple versions to accommodate embedded field testing across each component's administration, CAI is dedicated to ensuring that the manual addresses both computer-based and paper-pencil formats. This approach ensures a cohesive and accurate administration process for all testing components. Furthermore, CAI acknowledges the critical importance of accessibility. We will ensure the translation of read-aloud test directions into the top 10 languages determined by the SCM. In partnership with NJDOE, our translation efforts will continue to address a diverse student population in New Jersey.

4.7.3.1.1.6. Instructional Guide for Constructed-Response Scoring

As NJDOE's current contractor for the NJSLA-Science, MI understands that the constructed-response item (CRI) instructional guides are an essential part of New Jersey assessments. MI will prepare and produce the CRI scoring instructional guides, which will include the scoring rubrics, and assist New Jersey educators in understanding how CRIs are scored.

MI will obtain at least 300 student responses for each CRI. From these responses, MI and NJDOE will select samples for MI to place in the guide. The guides will include the scoring rubrics used to score the CRIs and several sample responses at each score point for each sample item. The guides will include responses from all grades of mathematics and ELA. MI will produce the instructional guides as PDFs that NJDOE can post online.

4.7.3.1.1.7. Subject-Area Reference Sheet

For all tests identified by the SCM as requiring reference sheets, CAI will develop and/or provide the appropriate grade and subject-area reference sheet in the mode and language of the students' test administration. For students that take computer-based tests (CBTs), reference sheets are provided within the Student Interface of our Test Delivery System (TDS) that are specifically provisioned to align with the test ID (and, if required, a segment of a test). For students eligible to take a Spanish test, the reference sheets available in the Student Interface will include a Spanish language reference sheet. Similarly, all students that take a paper-based test (PBT) will receive the reference materials that are appropriate for their test as part of their secure test materials.

All reference sheets will be approved for use by the SCM and deployed or printed as a standard component of the test administration set-up procedures.

4.7.3.1.2. Retest Administration Materials

CAI supports retest windows in many states by utilizing a feature that annotates students in the Test Information Distribution Engine (TIDE) and indicates participation in a retake or retest assessment opportunity. Based on the state's passing standards, a student's profile in TIDE may be updated to reflect their need to participate in a retest assessment or as having met proficiency/passed an assessment. This feature allows for districts to easily track and review student assessment outcomes that may be part of graduation requirements.

CAI utilizes assessment data files to identify students who fail to demonstrate proficiency according to state standards. Once students are identified, a data exchange process occurs that automatically flags students in requisite databases and displays their status to the field in the TIDE user interface (UI). Based on this information, CAI systems can automatically update a student's eligibility to retake the NJGPA. This feature and associated rules are configurable to support one or multiple retest administration opportunities that are identified by NJDOE.

4.7.3.2. External Proofing

As required by NJDOE, we will have third-party external proofing conducted on all assessment materials (test booklets, documents, publications). The CAI Project Management Team, in concert with Measurement Incorporated, will work with NJDOE to establish timelines for completion of this work. We will select an authoritative source with assessment experience to conduct external proofing. The third party will conduct their review at the times identified in the project schedule.

During the project launch meeting, we will propose two candidates for this position, one as the prime and one as backup, to ensure that the review will not be jeopardized due to unforeseen conflicts for the prime external reviewer. Security of materials will be maintained by using Secure File Transfer Protocol (SFTP) file sharing.

4.7.3.3. Editorial Review

CAI and MI understand that all assessments, documents, and materials must undergo a stringent editorial review process that will ensure error-free deliverables. Shortly after the project launch meeting, and in consultation with the SCM, CAI and MI will develop an editorial style guide that will outline the editorial norms governing all documents prepared for the project. We will work with the SCM to identify components of the style guide that may need revisions and make the necessary changes. We understand that the SCM must approve the style guide and, following initial approval, any revisions to the style guide.

4.7.3.4. Overage

Our print production estimates will be able to provide sufficient overage for each district and school to cover unexpected enrollment changes, damage to materials during shipping, or production errors that make materials unusable. Specifically, we propose to deliver a 5% overage of test booklets and any ancillary materials necessary for testing to districts, as well as a 3% overage to schools.

We will calculate overage percentages using the number of students at each school participating in paper testing. CAI will collect these data from the districts at the beginning of each school year. If the overage we provide in the initial order is insufficient to meet a district's needs, the district may order additional materials at no cost to them through CAI's Test Information Distribution Engine (TIDE) system.

At the close of each test administration, we will review a summary of additional orders and may make suggestions to NJDOE about adjustments to the overage calculations. This will be a standard topic for discussion at the annual post-administration review meeting.

4.7.3.5. Scoring and Reporting Verification Steps

CAI will support the scoring and reporting verification process as described in New Jersey's RFQ, providing a Score Verification Plan to outline clear specifications, clarify roles and responsibilities, delineate key handoffs and timelines, and detail plan deliverables and approval processes. The plan will be drafted to allow time for an iterative review process by the SCM, with approval required no later than 60 days before the conclusion of the spring test administration each academic year. It will outline the processes required to ensure the accuracy of individual student scores and all aggregate scores at the school, district, and state levels. Key components detailed in the plan will include the following:

- A score replication process, including the independent validation of calibrating, scaling, and equating. Briefly, CAI proposes a partnership with the Human Resources Research Organization (HumRRO) to serve as an independent third party with the expertise to review

test specifications and blueprints and verify calibrating, equating, and scoring analyses. We describe our process in greater detail later in this section.

- Score verification for handscored/autoscored items, including verification of expert reader-assigned scores and final score calculation of all writing items, and handscoring and automated scoring quality control and quality monitoring procedures, including oversight by NJDOE.
- Score reporting quality assurance (QA) processes, with a description of current QA procedures, including the verification of student- and aggregate-level scores and approval reviews by NJDOE.
- Verification of data reporting, including independent validation by HumRRO (or an approved third party) of scored data files for state, district, and school results.

Proposed Scoring Replication Activities

HumRRO will replicate all scoring activities, relying on established procedures for all psychometric work. HumRRO routinely assigns two psychometricians to review psychometric specifications documents independently. Using only these documents, each psychometric analyst will build code to reflect all requirements documents in the specifications.

HumRRO has expertise with all industry-standard psychometric software (e.g., Winsteps, IRTPRO, flexMIRT, STUIRT) and will use the same software used by CAI to complete the calibration and equating work. All other analyses will be conducted using their own internally developed programs, which they have successfully used for other state assessments.

HumRRO psychometricians will complete all operational work independently and will compare results for exact matches with CAI operational results. They will replicate the calibration, scoring, and equating results for the NJSLA, the end-of-course assessments, and the NJGPA.

HumRRO psychometricians will receive item data and test maps from CAI for all assessments. They will use these raw student data files and test maps to create a dataset containing student item scores and item parameter estimates for each item. Before item calibrations, HumRRO will apply attemptedness rules and verify that we include the same items and students in the calibration analysis. They will then independently calibrate and equate the test items using only the information in the psychometric specifications. They will compare their item parameter estimates to those produced by CAI. If any discrepancies exist, HumRRO will identify and resolve the discrepancies with CAI before continuing any analysis.

For scoring verification, they will first verify that HumRRO-computed total raw scores match CAI's total raw scores. If differences exist, HumRRO will work with CAI to identify and resolve the source of the difference. Next, HumRRO will use the item parameters to replicate pattern scoring procedures to derive student scale scores and performance-level assignments. HumRRO will use the same process and formulas as CAI, as documented in their scoring specifications, to compute ability estimates, transform them into scale scores, assign proficiency levels, and check attemptedness. They will then compare the scores and proficiency levels assigned to those assigned by CAI and document any differences. HumRRO will compare their results to CAI's results, share these comparisons with the SCM, NJDOE, and CAI, and work collaboratively to document and resolve any discrepancies thoroughly.

We understand that final approval of our third-party vendor will lie with the SCM. We have selected HumRRO as our proposed vendor because of their industry experience, expertise, and reputation.

4.7.3.6. Generation of Data for Checking Purposes

CAI has significant experience generating and using mock data to test and verify end-to-end processing of student assessment data, and confirm and certify reporting deliverables. CAI generally follows this process with all assessment clients. For our two largest clients, we produce or work with client-generated demographics for the student sample, assessments are administered, and results flow through systems just as they do for live student assessments.

Client deliverables, including but not limited to student- and item-level data files, district aggregate data files, and student-level reports, are produced. All reporting artifacts are delivered to our client. In conjunction with NJDOE, CAI teams and client-based teams will apply rigorous quality control (QC) processes to all deliverables to confirm that all results are 100% accurate and conform to team expectations. The rigor of our QC processes assures all parties that student assessment results are delivered rapidly and accurately, in all formats expected and across all delivery modes.

Using the observable characteristics of students historically enrolled in grades 3–9 and those of students historically enrolled in high school mathematics courses such as Algebra and geometry throughout New Jersey, CAI will work with NJDOE to apply the same exceptional QC processes to New Jersey student assessment results.

Through an exchange of files and during the QC processes carried out by both CAI and NJDOE, we will be able to confirm that all processes, including but not limited to assessment processing, scanning, scoring, and reporting, are following required guidelines and producing predicted, accurate results. The timeline for executing these processes and this exchange of files, reports, or other deliverables should afford ample opportunities to confirm results, update specifications and results if required, and regenerate all data files and reports, as required. A one-week turnaround is possible during mock data testing. This work will be scheduled to ensure that all results are as expected, at least 30 days before the first production deliverables, as required by the RFQ.

Exhibit 4.7.3.6-1 captures the steps we may take during mock data and report processing, based on our estimate of the volume of New Jersey data.

Exhibit 4.7.3.6-1: Mock Data and Report Processing Steps for Spring Administration

Program	Task Name	Description	Duration (in days)
Assessment Grades 3–9, High School	User Acceptance Testing (UAT) Processing Setup	2/1/2025–2/28/2025	
	Create Mock Data and Student Data Files	Establish demographic characteristics of the mock data and produce student records reflecting these characteristics.	2
	CAI and NJDOE Staff Take Assessments	Student assessments are administered for staff to demonstrate flow of records through CAI systems and to NJDOE.	4
	CAI Generates and QCs Data Files	Data files will be presented to NJDOE for their review. Files will be the source of data for all subsequent reports.	2
	CAI Produces Reports: Individual Student Reports (ISRs); State, District, and School Aggregate Reports	Reports per NJDOE specifications are generated and provided for QC by NJDOE in parallel with CAI QC.	4
	Review of Results, Reconsideration of Specifications if Required. and Regeneration of Data and Reports if Required	Evaluate and review mock data and associated data files and reports. When required, updates to specifications and regeneration of all data files and reports may occur.	5
	Repeat of Previous Steps as Necessary Until Final NJDOE Approval of All Mock Deliverables		

The preparation of mock data and reporting deliverables well in advance of preliminary production data and reports will accelerate CAI and NJDOE's creation, QC, and sign-off of delivery of both the preliminary production deliverables and the final production deliverables. The sample project schedule shown in Exhibit 4.7.3.6-2 illustrates the processes and timelines for this work.

Exhibit 4.7.3.6-2: Sample Project Schedule for Delivery of Preliminary and Final Student-Level Data Files to NJDOE (2024–2025)

Program	Task Name	Description	Start Date	End Date
Assessment Grades 3–9, High School	**Production Processing Steps**	**Preliminary Student-Level Data Files**	**16-Apr-25**	**21-May-25**
	Preliminary Student-Level Data	Analysis pushes configurations from user acceptance testing (UAT) to production	16-Apr-25	
		Assessment window closes	16-May-25	
		Analysis generates preliminary student-level data file	19-May-25	
		Analysis shares draft student data file with Reading Sufficiency Act data	19-May-25	
		SAS team pulls Database of Record (DOR) extracts	19-May-25	
		SAS team QCs and signs off on preliminary student-level data files	20-May-25	
		Analysis delivers preliminary student-level data files to NJDOE	21-May-25	
		Correction period for district updates to student data	**22-May-25**	**5-Jun-25**
		NJDOE approves preliminary student-level data files	6-Jun-25	
		Analysis and Reporting Teams produce all data-dependent reports, ISRs, state, district, and school aggregate reports	7-Jun-25	9-Jun-25
	Production Processing Steps	**Final Student-Level Data Files**	**20-Jun-25**	**25-Jun-25**
	Final Student-Level Data	Analysis generates final student-level data file	20-Jun-25	
		SAS team pulls DOR extracts	20-Jun-25	
		SAS team QCs and signs off on final student-level data files	21-Jun-25	
		Analysis delivers final student-level data file to NJDOE	22-Jun-25	
		Analysis and Reporting Teams produce all data dependent reports, ISRs, state, district, and school aggregate reports	23-Jun-25	25-Jun-25

Once schedules have been agreed upon, CAI will prepare data and reports with sufficient time for NJDOE and the SCM to review them before data and reports are released to the field. Through secure transfer protocols, data files and reports for state personnel review can be delivered in hours, affording ample time for close evaluation and consideration of results prior to release.

4.7.3.7. Content Data Systems Master File and Material Ordering

CAI's Test Information Distribution Engine (TIDE) stores all information about institutions (such as schools and districts) and their relationships with their users and students. TIDE will provide the master file to NJDOE based on the State's requirements. TIDE processes and validates data from authorized sources efficiently and regularly, as dictated by NJDOE. As soon as TIDE validates the data successfully, it immediately stores them in the database and makes them available for extract and display. Refer to Exhibit 4.7.3.7-1 for a flowchart. Exhibit 4.7.3.7-2 provides a CAI response for each requirement.

Exhibit 4.7.3.7-1: TIDE System Flowchart

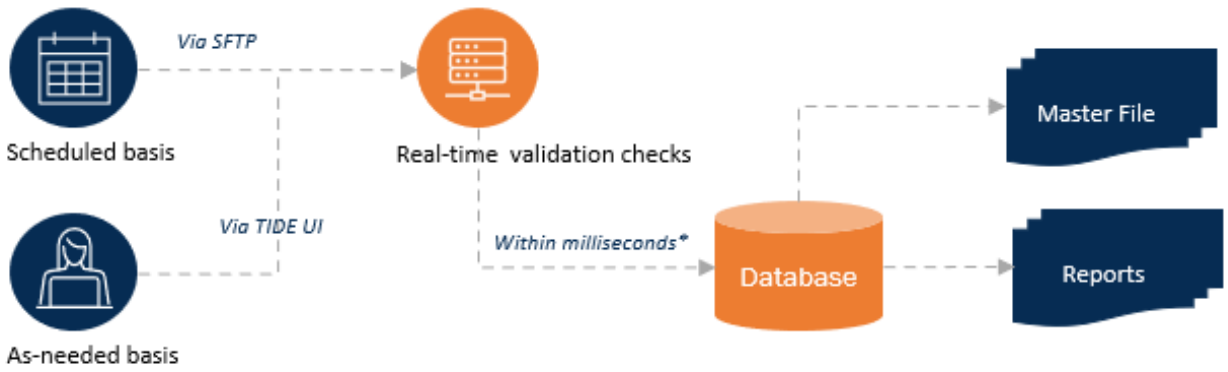


Exhibit 4.7.3.7-2: NJDOE Data System Requirements

Requirement	Response
A. Maintain the list of DTCs and the Content Data Systems Master File in the online assessment system and update them as notified by the SCM.	CAI's TIDE system is used to manage all data related to testing entities (districts, schools, users, students). The Content Data Systems Master file provided by the SCM will be imported into the TIDE system at the beginning of the year. All data related to districts, schools, names and identification numbers, and all related contact information will be immediately present in TIDE and will remain there for the entire school year. Updates to this information from the SCM can be provided to CAI at any time during the year. These updates can be provided through scheduled automated data file transfers or as needed.
The online system must allow the DTC or other authorized users to update the content data systems information at any time.	CAI's TIDE enables authorized users (to be determined by NJDOE) such as district test coordinators (DTCs) to update content data present for the entities that they manage in TIDE.
The Contractor shall continuously update the list and provide a copy of the data file to the SCM at the end of the Contract.	CAI can update the Content Data Systems Master File according to the guidance of the SCM at any time during the school year and can provide the SCM with a copy of the data file at the end of the contract. Updates can be made through scheduled data file transfers or as needed.
Note: The number of districts may change slightly during the life of the Contract. New Jersey districts vary greatly in size.	CAI's TIDE system can manage district changes throughout the year. Districts can be added at any time. CAI also has a standard process for removing districts from the administration system if and when directed by NJDOE. CAI is accustomed to handling districts varying greatly in size based on the 27 states and jurisdictions we work with, including California, Florida, Hawaii, Ohio, and Texas.
B. Provide the districts an online web form at least 45 Calendar Days prior to each test administration to collect the initial quantities of test materials required for each district for each assessment (both for the online delivery and paper-and-pencil delivery).	CAI's TIDE system provides a comprehensive set of tasks related to paper test material ordering. The paper test ordering tasks will be made available in TIDE at least 45 calendar days before teach test administration. For online test delivery, students are assigned to an online test based on test assignment rules determined by NJDOE before a test window opens. For example, NJDOE may choose to assign all grade 5 students the English language arts (ELA) and mathematics summative online assessments unless a student profile has a paper tester flag. In this case, the student should receive a paper test. Paper test materials can be calculated on the basis of paper tester flags assigned to individual students. As an alternative,

Requirement	Response
	individual districts or schools can input desired quantities directly. Either option is available, and CAI will work with NJDOE to define the online test specifications for the paper test ordering in TIDE according to NJDOE's preference. The process for ordering paper tests is further discussed in the CAI Response to NJDOE Requirement Number 9.
The Content Data Systems Master File shall be updated utilizing the counts collected for each test administration.	CAI's TIDE system provides users with an extremely robust report creation functionality at the state, district, or school level. In fulfillment of NJDOE's requirement to identify counts of student testing by material, users can use reports such as frequency distribution reports that can generate counts on any number of categories like grade, paper testing flag, or any other attributes required by NJDOE.
Based on the information and counts collected, five (5) hard copy lists of schools, DTCs, test material quantities, and other information shall be produced by the Contractor and presented to the SCM within 15 Business Days of the close of the data collection window. An electronic version of the Content Data Systems Master File shall also be made available to the SCM upon request.	TIDE contains state-level paper ordering quantity information, providing report breakdowns by test material and district, or at the state level by test material. In addition, CAI can provide NJDOE with hard-copy lists of schools, DTCs, and test material quantities.
C. Provide an online dashboard indicating the number of students anticipated to be tested in each school for each assessment and whether the mode of administration is online or paper-and-pencil (based on information obtained from the online form and/or the student pre-id information collected). The dashboard shall include a history of the previous year's enrollment in each assessment with the actual number of students tested from each school.	CAI's TIDE system offers several options for monitoring online and paper test registration counts at the school, district, and state level for the current year. The student search capabilities allow users to search all students in a school by online or paper test mode and view and export those reports. TIDE will work with NJDOE to design a report that shows previous-year enrollment and test participation. TIDE stores all historical data across time.

Requirement	Response
D. Provide detailed instructions and directions to the DTC for the completion of the online form data collections. The Contractor shall notify the DTC to adjust the counts, update contact information as appropriate, and complete the online form as directed through the Contractor's secure website.	CAI uses a state-specific portal to provide all assessment-related messaging for personnel in the state. The information provided on the portal includes details on the timing of ordering windows, testing, reporting, and the like. Furthermore, as users interact with TIDE to complete tasks such as initial or additional paper ordering, the system's intuitive user interface guides these users through each step of the process. Additionally, users have constant on-screen access to a very comprehensive online help guide specific to every task they might access in TIDE. In addition, the TIDE User Guide provides an exhaustive set of detailed instructions to complete every task a DTC or any other user might want to complete in TIDE.
E. Decide, with final approval from the SCM, on the method used to determine the final number of students per assessment in each school. The Contractor shall use the number of students reported on population updates and those actually tested in each school during previous administrations as well as information collected from the online forms to determine the final numbers. This number shall be the basis for determining the quantities of materials (including overages) to be shipped for each school and district (both for CBT and paper-and-pencil administration).	Based on specific guidance from the SCM, TIDE is designed to manage all aspects of the test mode (either online or paper) assignment process. Students are flagged as either online or paper test takers and receive appropriate assessments based on these indicators. For students taking online assessments, eligibility for a test is determined by a set of business rules that NJDOE can provide. For example, all grade 5 students without a paper tester flag receive the online interim and summative grade 5 ELA, mathematics, science, and social studies tests. For paper-pencil testers, initial order quantities can be determined through one of two means: specific order form entry via the TIDE user interface or automatic calculation by TIDE based on the number of students with a paper testing flag as flagged in TIDE before initial order-window deadlines. As students are added to TIDE and paper attributes are set, district personnel can verify anticipated quantities before the initial order shipment for accuracy. Once the initial order window for the district or school has closed, TIDE also provides the functionality for additional ordering. This allows authorized users (as determined by NJDOE) to order additional paper testing materials. TIDE handles all aspects of the paper-materials order process, including calculating or entering initial orders of paper-pencil test materials, submitting additional order requests, and tracking shipments.
The Contractor shall generate packing lists based on these numbers.	CAI's partner, MI, will generate test material order packing lists.

Requirement	Response
F. Provide, prior to shipping the test materials to the school districts, the SCM with a summary of these counts for the State and each district.	As mentioned in this section, CAI's robust reporting features enable users to access detailed reports of the quantity of printed test materials at the state, district, and school level. Authorized NJDOE users can obtain summary counts directly in TIDE, or CAI can develop a report and provide it to the SCM.
G. Provide, after the initial data collection and distributions are complete, an online form for the DTC to order additional materials.	As mentioned in this section, if a district requires additional paper-pencil test materials after the initial order shipment is received, the district can request additional paper materials through the Additional Orders task in the TIDE user interface. The TIDE Additional Orders task is highly configurable and can be configured to be open and closed for a specified period of time. Individual test materials in an overarching additional orders window can even be made available for specific time periods. According to NJDOE's preference, additional order materials can be automatically approved for processing, or quantities above a certain threshold can be routed for review and approval before processing.
H. Tally and provide to the SCM for their approval any additional orders to the districts.	The TIDE Additional Orders task is configurable so that specific paper test items can be configured to require approval from a state user for any additional paper ordering request. If configured in this way, the additional order is submitted in TIDE by the DTC or another authorized personnel. It is then queued for review by a state user. On logging in to TIDE, this user will have a notification of the outstanding additional orders, the district and personnel who submitted the order, and any additional comments that the submitter might have included in the order submission.

4.8. Scoring/Training

CAI is pleased to partner with NJDOE to provide state-of-the-art, high-quality scoring for all English language arts (ELA) and mathematics items on the NJSLA-ELA/M and the NJGPA. Serving 27 large-scale, statewide assessment programs, CAI has developed robust and rigorous scoring methods, ensuring that logistical, technological, and psychometric issues are considered and addressed throughout the design, configuration, item-scoring, and test-scoring phases in the assessment process.

CAI's scoring is driven by scoring specifications (reviewed and approved by NJDOE) that drive the configuration of our scoring systems. This ensures that our systems are configured and deployed to meet your program needs and requirements. Quality checks are embedded throughout our scoring process for all item types to ensure that New Jersey students receive the most accurate scores possible for all assessments. We prioritize the security of student data and test/item data; our procedures and systems are designed to ensure these data always remain secure.

This process also ensures that responses are separated from personally identifiable information (PII) when submitted for handscoring, and that scores can be matched back to the student. Finally, our scoring processes ensure that all items, whether online or on accommodated forms, are scored in the same manner (including any make-up administrations).

CAI commits to ensuring that all scoring will occur in a timely manner to meet the agreed-upon score reporting due dates. We believe strongly in transparent processes, especially involving scoring. Our processes include preparing reports that NJDOE can access and monitoring the completion rates and overall scoring process flows. We will provide technical reports describing our scoring processes, rater training, reliability metrics, automated scoring model performance (quadratic weighted kappa, standard mean difference, exact agreement statistics to compare against handscoring), latency reports, etc. We further commit to ensuring that item-level raw scores will be used to calculate equated test scores on NJDOE-approved scales. The specifics of this process are described in Section 4.12.

Next, we discuss item scoring. All selected-response items will be fully machine-scored using CAI's advanced item-scoring engines. Our systems support the full suite of scoring operators defined in the Question and Test Interoperability (QTI) specification, and we offer the largest suite of custom operators that enables complex machine-scoring for innovative item types that include simulations, equations, graphing, and other technology-enhanced item (TEI) types. All open-ended constructed-response items, including short and extended items, will be scored using our automated scoring/human hybrid scoring model.

Both CAI and our partner, Measurement Incorporated (MI), have over a decade of experience working together on large, statewide assessment programs. Together, we bring industry-leading expertise in both automated scoring and handscoring and have tightly integrated processes that support the ability to route and monitor scoring. Additionally, MI also has extensive experience managing paper-based scoring and any accommodated forms, including the secure storage of those materials.

4.8.1. Selected-Response Item Scoring

CAI will develop and deliver a scoring plan and quality control procedure to the SCM within 60 calendar days of the project paunch meeting (PLM). It will include the scoring plan for all selected-response items that use single-point and partial-credit scoring. We commit to ensuring that scoring keys are accurate and follow a host of procedures to ensure their accuracy, including rigorous item development (described in Section 4.5.2), a rubric-validation process, key reviews, data reviews, and educator reviews. In the context of an adaptive test environment, we rigorously enforce scoring checks prior to the opening of the testing window and continuously monitor item performance during the testing window. We describe our scoring plans and quality control processes in this section, with particular emphasis on scoring key verification for both paper and online tests.

First, our modularized item scoring engine supports scoring for all selected-response item types. This means that all items are scored by the item scoring engine, albeit routed to different scoring engines as appropriate. The item scoring engine supports the full suite of response processing operators specified in the IMS Question and Test Interoperability (QTI) standard and augments this with a powerful suite of CAI custom operators. This allows us to implement single-point scoring (e.g., for single-select multiple-choice items) and partial-credit scoring for more sophisticated selected-response items (e.g., multi-select multiple-choice, evidence-based selected-response, hotspot, drag-and-drop, and fill-in-the-blank items) including multi-part selected-response items. In Section 4.8.2, we describe our innovative item scoring framework that allows for sophisticated rubrics with partial credit. This enables us to access fine-grained details on student knowledge and locate gaps in their knowledge.

Our quality control procedures for key verification involve multiple steps. First, we describe how the reviews pass through our Item Tracking System (ITS). Any existing NJDOE items imported into ITS will undergo our quality control process, which includes checking the scoring of each imported item. All items natively created in CAI's Authoring system include a dedicated rubric review step where item scoring is fully tested. When CAI develops items, scoring keys and machine-scoring rubrics are simultaneously developed. This ensures that the key or the machine-scoring rubric undergoes the same set of reviews as the item itself. Within ITS, content reviewers can interact with the item, providing different responses and invoking the scoring logic to ensure that the right scores are being awarded. The responses and scores can be stored in ITS as exemplars. These exemplars act as automated test cases that ITS will periodically check to ensure that items score exactly as designed over time.

Second, all items go through a post-field-test key or rubric review. Machine-scored constructed-response items undergo a rubric validation, which is discussed in Section 4.8.2. Classical item analysis provides an extra check that may reveal problems; any problems are corrected in ITS. A sample of responses in Rubric Evaluation and Verification for Items Scored Electronically (REVISE)—our rubric validation software—is rescored to ensure that all and only targeted responses have changed scores.

Items delivered online or on paper-pencil tests are scored using the same rubric, albeit through slightly different data flows. This approach is unique to CAI and ensures that items are scored exactly the same way irrespective of the mode in which they are administered. Even with paper-pencil tests, more complex item types appear and often allow for many variations of a correct answer. To ensure accurate scoring of paper-pencil test responses, our Key Verification System (KVS) generates all possible response combinations for items with fewer than 50,000 combinations. For items with more possible combinations, our test developers define patterns of correct and incorrect responses to be generated. These pass through standard transformation rules and are sent through the same scoring engine with the same rubric as the online responses. Test developers review the responses to ensure that all and only correct responses are given credit. The KVS creates an answer key table that is used to score operational data. It

is a direct mapping between the scanned response and its score. If the verification process identifies scores that need to be corrected, they are adjusted in the answer key table and used for scoring. During operational scoring, any responses that were not previously verified (i.e., those items with more than 50,000 possible responses) are held for verification by our content experts. This answer key table and set of correct responses can be shared with NJDOE in the format you have requested (i.e., item identification number, item type, item position [with form identification], and the answer keys and/or rubric). We can also commit to ensuring that two content experts other than the item's author review the answer keys for each selected-response item.

Item keys and rubrics are locked down (i.e., physically written to disk) when the item receives final approval. Similar to the process for item content, the keys and rubrics are checked to ensure that no changes have occurred since the most recent web approval, and a change protocol is enforced if there have been changes. This ensures that published rubrics will always match approved rubrics.

Finally, CAI's automated scoring engine, Autoscore, has been used successfully alongside MI's handscoring in many summative and interim assessment programs for ELA essays, ELA constructed-response items, and mathematics items. Our processes are designed to support hybrid automated/handscoring designs and can be configured to a wide variety of designs, including a 10% human read-behind, handscoring of unusual responses or low-confidence responses, and handscoring of tests just below the passing threshold (refer to Section 4.12.10).

CAI has a long-standing reputation and proven ability to machine-score the assessment industry's largest variety of selected-response and constructed-response item types. Our use of an innovative item framework, hybrid machine/handscoring, and asynchronous scoring design enables us to support the development, administration, and scoring of any item type. This can then support better assessment by

- increasing the range and Depth of Knowledge that can be assessed;
- reducing the cost of administering the test by reducing handscoring costs; and
- improving instruction by getting high-quality information back into the classroom faster.

We group items into two categories: (1) items scored using explicit rubrics, and (2) items scored using implicit rubrics. At CAI, machine-scoring engines score items in the first category, and the latter are either handscored or hybrid-scored using human/automated-scoring designs.

- Explicit rubrics are used to score selected-response item types, including multiple-choice and multi-select, as well as constructed-response items with structured inputs, such as equations, graphical responses, table entry, and the like. Explicit rubrics use transparent, rule-based methods, and scores are verified using expert review of score patterns. Rubric validation is conducted through our dedicated REVISE system, ensuring that all explicit rubric constructed-response items are scored accurately and approved by content experts.
- Implicit rubrics use a statistical model to emulate handscoring. They are used for essay-type and constructed-response items in which response entry is unconstrained text. Scoring with implicit rubrics involves handscoring to obtain samples to calibrate the machine-scoring engine, validate engine scoring, and score responses in a hybrid scoring design. As noted earlier, we are transparent about implicit rubric scoring by providing reports on automated model performance, handscorer performance, and hybrid scoring performance.

Regardless of item type, we will use rubrics and scoring criteria developed for items and item clusters and will develop rubrics—submitted to NJDOE for final approval—as part of our regular item development process.

4.8.2. Constructed-Response Item Scoring

As with the selected-response scoring, CAI will provide the SCM with a scoring plan that includes quality control procedures within 60 calendar days of the PLM. This plan will describe scoring for machine-scored and hybrid automated/human-scored items. We describe our approach for the scoring of all item types in this section, including machine, automated, human, and hybrid scoring.

Recall that we group items into two categories: items scored using (1) explicit rubrics and (2) implicit rubrics. Explicit rubrics are used to score TEIs and constructed-response items (and selected-response item types) with structured inputs such as equations, graphical responses, table entry, and simulations. Explicit rubrics use transparent, rule-based methods; scores are verified using expert review of score patterns. Implicit rubrics use either human or automated scoring to predict the scores humans would assign. Implicit rubrics are used for essay-type and constructed-response items in which response entry is unconstrained text. Scoring with implicit rubrics involves human scoring in order to obtain samples to calibrate the machine-scoring engine, to validate engine scoring, and to score responses in a hybrid scoring design.

Scoring Framework

We use a modularized item scoring engine to support the scoring of all items and item types, including single-point, partial-credit, and multi-dimension items. Our engine supports the full suite of response processing operators specified in the IMS QTI standard and augments this with a powerful suite of CAI custom operators. These custom operators support the machine scoring of graphic responses, symbolic mathematics equations, simulations, and table input scoring. The custom operators extract relevant information from the student responses. This information can be bound to variables, which can then be used to evaluate the rest of the response using standard QTI or other custom operators. This capability makes it possible to author sophisticated, machine-scored items that include multiple interactions, and in which students are scored on relationships among the interactions in addition to responses to individual interactions.

In addition to a fully functional QTI scoring engine, TEI custom interactions draw on the capabilities of the following CAI custom scoring engines using explicit rubrics:

- The graphic-response scoring engine, which has an explicit test-developer-created rubric that describes the properties of correct responses
- The equation scoring engine, which evaluates the characteristics of student-entered equation responses against an explicit test-developer-created rubric
- Simulation-interaction and table scoring engine, which evaluates a sequence of trials in a simulation item against an explicit test-developer-supplied rubric and can score any information stored in table format

CAI has pioneered an innovative item scoring framework that allows for very sophisticated rubrics with partial credit that allows us to get at fine-grained details on what students know and where their gaps in knowledge are. This is supported using a three-part, patented model to support the development and scoring of innovative item types, including multi-interaction items, simulation items, or performance tasks. The three parts of the model include the following:

1. **Bindings** are variables bound to important information from the student response. In simple cases, bindings might be the value of a number entered (whether or not an equation is in a particular form) or the slope of the line that the student drew.

2. **Assertions** are “true/false” variables that combine and analyze the bindings in various ways using the QTI operators. For example, an assertion might implement “the slope of the line drawn matches the slope of the line in the equation.”
3. **Scoring rules** make it possible for the assertions to be counted or combined using test-developer-defined logic to assign numeric scores.

This approach, combined with our machine- and automated-scoring engines, means that CAI can automatically score almost any item. Importantly, CAI can leverage this framework to develop, administer, and score a vast array of performance tasks designed to assess a wide variety of content areas, including science simulations. We have even extended this technology to include scoring written constructed-response items when they are incorporated into multi-interaction items with dependent scoring.

Rubric Validation for Explicit Rubric Items, Including TEI

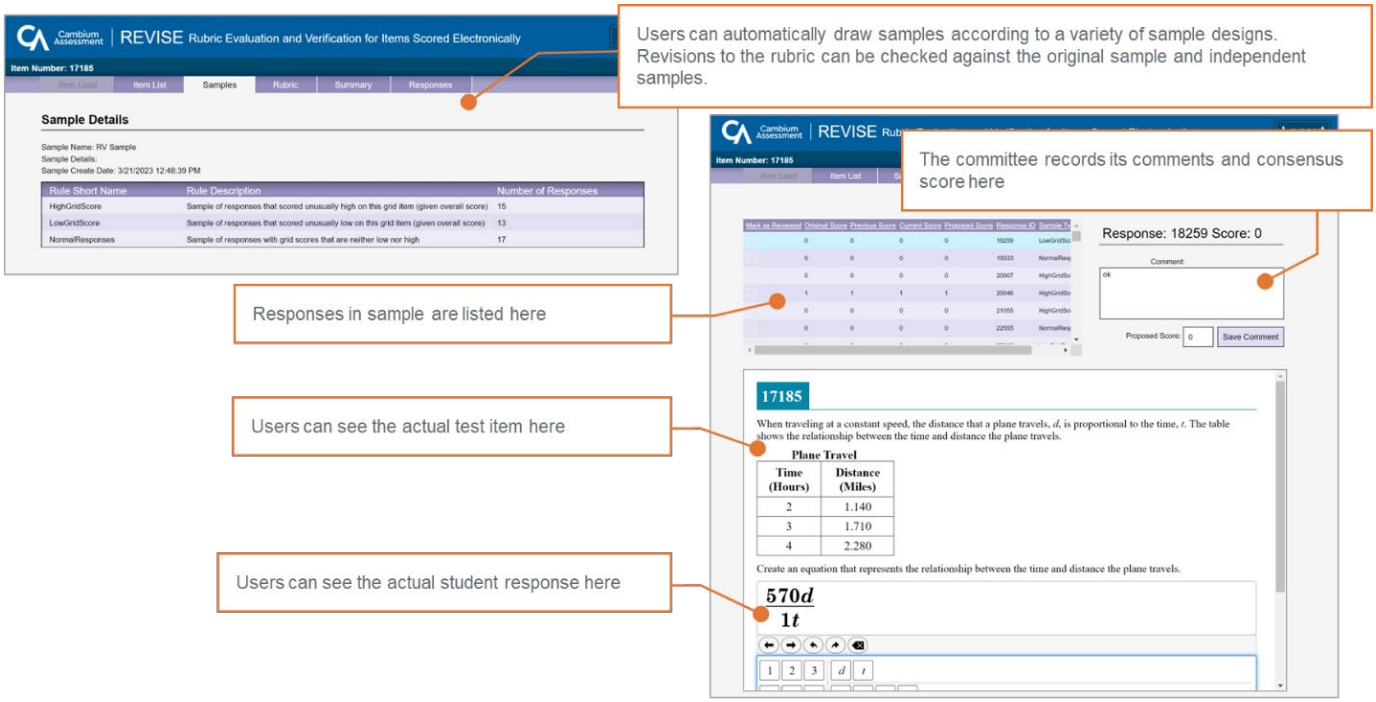
At CAI, we recognize that New Jersey teachers and students need accurate scores in order to understand what students know and can do and to make instructional decisions. To ensure that we can meet this need, CAI has processes and technology in place to validate scoring rules and scores specifically designed to address the complex scoring logic associated with explicit rubrics, including TEIs.

Our Item Tracking System (ITS) provides content writers with a simple graphical user interface (UI) to build sophisticated scoring rubrics that can use our full suite of standard QTI and CAI custom operators. For simple selected-response item types, like multiple-choice items that are scored using a key check against a reasonable number of correct answers, standard QTI response-processing templates can be used. For more sophisticated items, like multi-interaction, simulations, or technology-enabled items, item writers use our library of custom operators and employ our patented three-level rubric development framework.

The process for scoring and validation of scoring involves both CAI and NJDOE review and approval. Using field-test data, machine-scored items undergo one of two types of checks. Selected-response items with a reasonable number of possibilities go through a typical key-check process described in Section 4.8.1. Actual responses are tabulated and scored, and content experts ensure that every response pattern scores correctly. Constructed-response TEIs that use sophisticated, rule-based, explicit rubrics undergo CAI’s rubric validation process using our REVISE rubric validation system. This system draws independent stratified samples of responses (up to and including 5,000 responses) whose scores are reviewed by content experts at CAI and NJDOE. The scoring review undergoes three steps: (1) CAI content experts vet the scoring rules using student responses and adjust the rules as needed; (2) the scoring rules and responses are provided to NJDOE for review and approval; (3) the scoring rules are reviewed by a committee of experts, validated with new data, and finalized.

Exhibit 4.8.2-1 highlights key features of our REVISE system. First, we select item responses to disproportionately represent anomalous responses. Specifically, the sampling algorithm identifies examinees who scored well on the multiple-choice items but poorly on the item being studied, as well as those who did poorly on the rest of the test and well on the studied item. Within these guidelines, the selection is random, ensuring representation of all responses. The balance of the sample comprises those responses fitting neither of the other two categories. By selecting equal numbers of cases from these three strata, we over-represent anomalous responses, which rigorously tests how well the binding-assertion-rule framework is representing student responses. As depicted in the exhibit, the users can view a response, enter a score, and compare that score against what the engine produced. If these differ, then the binding-assertion-rule framework can be adjusted, and the data rescored.

Exhibit 4.8.2-1: Features of the REVISE Software



To support rubric validation, CAI conducts an initial review of each item's responses and scores and identifies interesting or borderline cases. These cases are provided to NJDOE, who can then identify the items in the set of items and cases that they want to bring to a review committee. These items and cases are presented to the committee along with any statistical information, such as score frequency tables. The committee makes recommendations, and NJDOE has the option to follow committee guidance when finalizing the scoring.

After NJDOE finalization, CAI rescores item responses, verifies that only the intended rubric changes were made, and ensures that no unintended changes were introduced. After this verification step, the item is locked. In user acceptance testing (UAT), test decks that include a range of responses are exercised to verify that items are scoring as intended when integrated with the test delivery and reporting platform.

Following rubric validation, all items are subject to psychometric and statistical checks, and flagged items are presented in data review committees. In preparation for testing, scoring specifications are created that define all scoring processes; these NJDOE-approved specifications are used to govern the configuration and testing of our software systems and ensure that our systems are producing accurate scores.

Automated/Human Scoring for Short and Extended-Text Constructed-Response Items

CAI proposes a hybrid automated/human scoring for both short- and extended-text constructed-response items. CAI and MI have established an industry-leading model that is in operational use in several statewide summative assessment programs for the responsible use of automated scoring with trained human supervision to bring highly accurate and immediate scoring for text-based constructed-response items. For any hybrid scoring, all responses will be scored by CAI's automated scoring engine, Autoscore, and then a configurable percentage, depending on grade and item type, will be routed for trained human scoring at MI. We route unusual responses and a random percentage of responses for human scoring. Typically, we target roughly 25% of the overall responses for a human read during processing of item scores. Section 4.12.1 also

requires routing responses for which the total test score is one point lower than the passing score. We expect that no more than 5% of responses will be flagged for routing due to this condition. In all, we expect a total of 30% of responses to be routed for human scoring.

In this section, we describe all aspects of Autoscore. This includes the engine, our training and validation approach, hybrid automated/human scoring, score monitoring, and quality control procedures. We end the section with a discussion of the rangefinding procedures and location, as well as the management of human scoring.

Autoscore Engine

Autoscore has the demonstrated capability to produce similar results to human scores across a variety of short/extended-text constructed-response items across grades. The use of automated scoring helps to ensure that scores are quickly returned to New Jersey educators and students at lower cost and ensures consistency in scoring within and across administrations. CAI uses Autoscore in eight state-level summative programs and 14 state-level interim programs.

Autoscore uses features associated with writing quality and uses features associated with response meaning. Writing quality features include measures of syntax, grammatical/mechanical correctness, spelling correctness, text complexity, paragraphing quality, and sentence variation and quality. Measures of response meaning include the use of latent semantic analysis (LSA) and deep learning methods, which consider not just the pattern of word frequencies but also the location of words in a response. LSA ignores word order but identifies key topics associated with the sets of words in a response. Deep learning methods use word order and sets of localized word patterns that are related to the scores that human raters have assigned, leveraging models of language patterns learned from large bodies of text. The features of deep learning models can be thought to represent a student response in a high-dimensional semantic space. Finally, in Autoscore, we build two models in parallel and combine the outputs of these models to predict the response score. This approach allows for a more stable score estimate, one similar to the use of two or more human raters.

Autoscore also produces condition codes and confidence values as part of its scoring process. Each method is useful in identifying non-attempts, unusual responses, or borderline responses that can be routed for human verification scoring. Condition codes include those indicating that a response is blank, is a refusal to respond, uses too few words, uses mostly duplicated text, is written in another language, consists primarily of stimulus material or the stem, uses vocabulary that does not overlap with the sample used to train the engine, or uses language patterns that are reflective of off-topic or off-task responses. Autoscore also has a condition code that can be used to capture unusual scoring patterns, such as very short essays receiving scores greater than 1. The confidence value reflects whether response is similar to those used to train the engine or is on the boundary between score points. A high confidence value indicates that the engine is confident in its prediction; a low confidence value indicates that the engine is less confident in its prediction.

The use of condition codes and their thresholds are configurable and are included in scoring specifications used when training and validating the engine models. The scoring specifications that outline the hybrid scoring model also list the condition codes to be used for routing, as well as the threshold used to route low-confidence responses. Our clients review and approve these choices and specifications to ensure that the planned scoring and routing decisions are clear and transparent.

Autoscore Training and Validation

CAI uses standard engine training and verification approaches. This includes creating a sample that reflects the population of interest, submitting that sample to handscoring using high-quality

procedures (two independent reads with expert adjudication of discrepant scores), creating training (approximately 85%) and validation (15%) sub-samples, building models using the training set, and evaluating engine performance on the validation sample.

The model evaluation criteria use methods and thresholds adopted in the assessment industry. These metrics examine how much Autoscore and the human scorers agree and how similar the mean scores are between Autoscore and the human scorer. CAI uses the following metrics: exact agreement, quadratic weighted kappa (QWK), and standardized mean difference (SMD).

CAI uses the following thresholds to identify poorly performing items:

- Engine-final exact agreement lower than 5% of human-human exact agreement
- Engine-final QWK/K lower than .1 of human-human QWK/K
- Engine-final SMD magnitude greater than .15

Most models meet these thresholds; when they do not, they are often very close to the thresholds. The reason for this success is the quality of the Autoscore engine, the quality of the handscoring approach applied to the training sample, and the size of the training and validation samples. CAI recommends the use of samples of 3,000 to 4,000 responses for engine training and validation. Samples of this size, especially for samples approaching 4,000 responses, tend to include sufficient numbers of responses at each score point for engine training. If CAI identifies any items with small numbers of responses at a given score point, we will notify NJDOE of the issue and discuss potential options, such as routing additional, randomly sampled student responses collected during the testing window for handscoring and generating the models once we have sufficient responses.

Autoscore Performance

In this section, we illustrate the performance of Autoscore on the held-out validation sample on a range of item types across assessment programs. As can be seen in Exhibit 4.8.2-2, on average, the exact agreement of Autoscore with the final, resolved score is often higher than the agreement of the two human raters for almost all item types. The same holds true for QWK. Additionally, on average, Autoscore and the final, resolved mean scores very similar, often within .03 standard deviations. While not displayed, Autoscore typically meets the criteria for most, if not all, items. When discrepancies occur, they tend to be near the thresholds.

Exhibit 4.8.2-2: Performance of Autoscore by Item Type

Item Type	Score Range	No. of Items	Exact Agreement		QWK		HSAS SMD
			H1H2	HSAS	H1H2	HSAS	
Mathematics	0,1,2	8	79%	81%	0.70	0.76	–0.01
ELA short constructed-response items	0,1,2	50	73%	82%	0.62	0.74	0.00
Reading short constructed-response items	0,1,2	24	76%	83%	0.62	0.73	0.02
ELA extended constructed-response item conventions	0,1,2	7	75%	79%	0.80	0.82	–0.02

Item Type	Score Range	No. of Items	Exact Agreement		QWK		HSAS SMD
			H1H2	HSAS	H1H2	HSAS	
ELA extended constructed-response item elaborations	1,2,3,4	7	80%	80%	0.90	0.88	0.03
ELA extended constructed-response item organization	1,2,3,4	7	80%	80%	0.90	0.88	0.03

Note: H1 = First human score; H2 = Second human score; HS = Final resolved human score; AS = Autoscore

CAI has undertaken studies to determine whether the engine scores differ from human scores for key subgroups, such as gender, race/ethnicity, disability status, and English learner (EL) status. In Exhibit 4.8.2-3, we show average means, standard deviations, and SMDs across 24 reading comprehension items. On average, the engine produced very similar means and standard deviations to the human scores within the subgroup categories. Examining differences at the item level, very few items (n = 5) displayed statistical and practical differences for any subgroup. This result is similar to those presented for the National Assessment of Educational Progress Automated Scoring Challenge in Reading Comprehension, in which CAI was among the award winners.[4]

Exhibit 4.8.2-3: Means, Standard Deviations, and Standardized Mean Differences Overall and by Subgroup in Reading Comprehension

Group	Average Number	Mean		SD		SMD
		HS	AS	HS	AS	HSAS
Overall	566.5	0.42	0.42	0.60	.058	–0.02
Male	280.9	0.34	0.33	0.54	0.53	–0.01
Female	285.9	0.51	0.50	0.64	0.61	–0.02
Asian	22.5	0.67	0.70	0.68	0.66	0.05
Black	28.2	0.38	0.37	0.57	0.53	–0.03
Hispanic	348.5	0.40	0.39	0.58	0.57	–0.01
White	68.2	0.53	0.50	0.64	0.61	–0.04
Non-EL	440.6	0.48	0.47	0.63	0.60	–0.02
EL	126.2	0.20	0.21	0.42	0.43	0.02
Non-SPED	535.9	0.44	0.43	0.61	0.59	–0.02
SPED	30.9	0.15	0.16	0.36	0.38	0.03

Note: H1 = First human score; H2 = Second human score; HS = Final resolved human score; AS = Autoscore

[4] https://github.com/NAEP-AS-Challenge/reading-prediction/blob/952ee82cc52163b17bccc1f12174ce246b8dff9b/results.md

Hybrid Automated/Human Scoring

CAI offers a flexible and configurable design for hybrid automated/human scoring. NJDOE can choose when, how, and what types of responses to route for human scoring. In our approach, all responses undergo automated scoring, and a portion of responses (25% for NJDOE) are identified for routing for human scoring. Section 4.12.1 also requires routing responses for which the total test score is one point lower than the passing score. We expect that no more than 5% of responses will be flagged for routing due to this condition. In all, we expect a total of 30% of responses to be routed for human scoring.

Generally, we recommend three types of routing: one for reliability review of the engine scoring, another for routing unusual responses based upon their textual characteristics, and a third for low-confidence responses. For the reliability review, NJDOE randomly routes responses throughout the testing window. This is configurable; however, our pricing estimates 10% of responses routed randomly to meet the criteria in Section 4.8.5.C of the RFQ. We use condition codes to identify unusual or non-attempt responses using their textual features. NJDOE can determine which condition codes to route for review. Often, we recommend routing condition codes that indicate that the response does not share language with the training sample, has unusual writing indicating that the response is off-topic, or has unusual score assignment given the characteristics of the sample (e.g., a short essay receiving a high score). While many of these condition code assignments are rare (often less than 5%) we believe it is important that human scorers be the final arbiter for such responses. Finally, we also recommend routing responses for which the engine has low levels of confidence. Our pricing has set the value of this routing to around 10% of low-confidence items. Each of these routing conditions is stored in our databases so that we can identify how many responses of what type are routed and examine engine-human agreement for each routing condition.

Monitoring Hybrid Scoring Performance During Testing

CAI monitors the human and engine scoring agreement during live scoring using daily monitoring and routing reports. Routing reports monitor the number and percentage of responses for each routing condition, such as reliability review, condition code, or low confidence. Agreement reports examine agreement of the engine with human scorers for the routing conditions. We review the routing reports to ensure that the percentages of responses routed for each condition matches the expected percentages. We review the agreement reports to examine the degree to which the humans and the engine are agreement.

To monitor engine performance with the reliability review, CAI uses the held-out validation agreement results between the two humans as the benchmark and compares the operational reliability score to the engine scores. We expect to meet the 70% exact agreement requirement for both the human-human and engine-human agreement, per the requirement in Section 4.8.5.D of the RFQ, with careful attention paid to ensuring that the human raters are not drifting (requirement in Section 4.8.6.D of the RFQ) both during and after the testing window. We also expect the SMD of the operational reliability score and the engine score to be near zero, indicating that the two produce similar means. Finally, we expect the QWK values of the engine-human agreement to be no lower than .1 of the human-human agreement.

Exhibit 4.8.2-4 presents a snapshot of the performance of the engine on 11 essay (extended constructed-response) items. As these results indicate, the engine and reliability score agreements are similar to the benchmark for the three rubric dimensions and for exact agreement and QWK. The SMD values are near zero, indicating the means for the engine and the reliability scores are similar. We also examine agreements at the individual item and dimension level. Note that the engine-human agreement exceeds 70% on average.

Exhibit 4.8.2-4: Autoscore-Human Agreements for the Reliability Sample

Dimension	Exact Agreement		QWK		SMD
	Benchmark	H1AS	Benchmark	H1AS	H1AS
Conventions	76%	77%	0.60	0.69	0.08
Evidence and Elaboration	73%	79%	0.73	0.77	0.04
Purpose, Focus, and Organization	73%	81%	0.73	0.80	0.01

Note: Benchmark indicates H1H2 agreements on the held-out validation sample. H1AS indicates the comparison of the engine to the operational reliability score.

Examining human and engine agreement is one way to measure score quality. However, this approach does not measure the degree of drift, if it exists, in handscoring. CAI also includes papers used to train and validate the engine as part of the validity samples used to monitor the human raters. Analysis of the mean differences between the aggregate set of raters and the final resolved scores for these papers can also help to measure whether the human raters as a group are adhering to the rubric assignments used when these papers were originally scored. Because the engine models are trained on the data used to estimate item parameters, it is critically important that the human raters are also vetted against these data.

Taken together, these approaches ensure that the hybrid scoring model provides accurate and reliable scores within and across test administrations that are also grounded in the original interpretation of the rubric. We also believe that the combination of human and automated scoring can produce scores that are accurate and reliable by using the engine to score responses that are aligned with the training papers and by using human scores to score borderline or unusual responses. It is our experience that teachers, states, and Technical Advisory Committees (TACs) support this approach, particularly when the entire scoring process is monitored and improved, as needed.

Autoscore Quality Assurance

CAI's scoring and quality assurance processes around automated scoring are well-developed and rigorous. The automated scoring team, led by an industry expert with extensive automated scoring experience, regularly works with psychometric, content, technical, and handscoring staff to ensure that its procedures meet the requirements necessary to support scoring.

Once models have been approved, the model deployment steps are also well-tested. Models are deployed to the UAT scoring environment and all data used to validate the engine are rescored, with the expectation that all scores, condition codes, and confidence values can be reproduced. Integration testing is conducted to ensure that the test delivery platform is sending scores to and from the engine, and that downstream systems can use the scoring information as outlined in the scoring specifications. Once tests pass UAT, models are deployed to the production scoring environment and re-validated.

Finally, as noted earlier, the agreement of the engine and the human rater scores is monitored throughout the testing window, as are the percentages of responses routed for handscoring. The results for engine validation and monitoring will be documented and included in the process for approval by NJDOE.

Constructed-Response Item Handscoring

MI scoring management will coordinate with CAI's Project Management Team in developing the scoring plan. The scoring plan for handscoring will include sections for rangefinding, scorer

training, and anchor set development. Scorer training and anchor set development will incorporate NJDOE guidelines and require review and approval by NJDOE before use in scorer training.

CAI has a long successful partnership with MI, working together for more than a decade. We have selected MI as our paper-test print production and handscoring vendor because of their industry-leading capabilities and expertise, as well as their experience and success working in the state of New Jersey. MI brings more than 40 years of experience scoring student responses to constructed-response items. They relentlessly pursue ways to improve methods and use technology to improve their scoring quality while reducing cost and turnaround time. Over the years, they have improved training methods; developed novel scorer monitoring, feedback, and evaluation technologies; and automated many QA procedures. As a result, their handscoring solutions are unmatched in the industry.

MI has successfully scored constructed-response items for New Jersey assessments for more than 25 years. This includes scoring New Jersey science items for more than 25 years and scoring New Jersey ELA and mathematics items from 1998–2014.

MI will conduct the scoring of the NJSLA-ELA/M and NJGPA using a remote scoring model; scorers will be residents of the United States. Detailed descriptions of MI's scoring processes, including scorer monitoring, scoring security, scorer staffing, and scoring accuracy, reliability, and timeliness are described in detail in Sections 4.8.3–4.8.8.

MI annually handscores tens of millions of student responses with the help of their Virtual Scoring Center (VSC), which facilitates the hiring, training, and qualifying of thousands of high-quality scorers each year. Scorers use VSC during training, qualifying, and operational scoring of student responses. VSC delivers images of student responses provided both on paper and online. MI has automated the quality assurance measures taken during scoring, including scorer monitoring, feedback, and evaluation. Their scoring leaders use real-time reports, found in VSC, to monitor scoring and to take action to improve scoring quality.

At the company's inception, MI developed an outstanding, industry-leading training method for the scoring of student responses to constructed-response items. Over the last 40 years, MI has improved this model as they adjusted to changes in the process of scoring student responses. The primary goal of MI's training method is to explain client-approved scoring criteria in a way that ensures that scorers can confidently and accurately score. Pre-recorded online lesson modules ensure that all scorers receive consistent training using the same scoring rationales.

Scorers use the training they receive, scoring criteria, and exemplary student responses to complete the training and qualification process. First, they apply scoring rationales to practice responses. Following a discussion of the practice responses, they demonstrate their proficiency to accurately score responses by scoring qualification sets. Once qualified, they begin scoring operational student responses.

The strength of MI's training process is in ensuring that scorers internalize the scoring criteria. Then, as they score operational student responses, MI reinforces their training by maintaining direct communication with scorers and with scoring supervisors throughout the scoring event. This allows scoring managers to keep the scoring team aligned with the scoring criteria from the first day of training through the last day of scoring. MI's scoring expertise is outlined in Exhibit 4.8.2-5.

Exhibit 4.8.2-5: MI's Scoring Expertise

Scoring Expertise	
• Reader recruitment • Reader training • Reader qualification • Reader monitoring	• Reader retention • Evaluate constructed-response items • Use online tools to facilitate remote scoring

4.8.3. Selection of Human Scorers

Developing a Scoring Team That Accurately and Efficiently Scores Student Responses

MI has a demonstrated history of recruiting, training, and retaining high-quality handscorers and is uniquely positioned to continue this process for the NJSLA and NJGPA programs. The MI Scoring Services team will train scorers to use the approved scoring rubrics, annotated anchor responses, and training materials to conduct handscoring consistently and accurately for New Jersey.

In this section, we describe

- the organization of MI's Scoring Services team;
- MI's process for consistently recruiting high-quality scorers to score the NJSLA-ELA/M and NJGPA; and
- MI's employment requirements for scorers (which align with those of NJDOE).

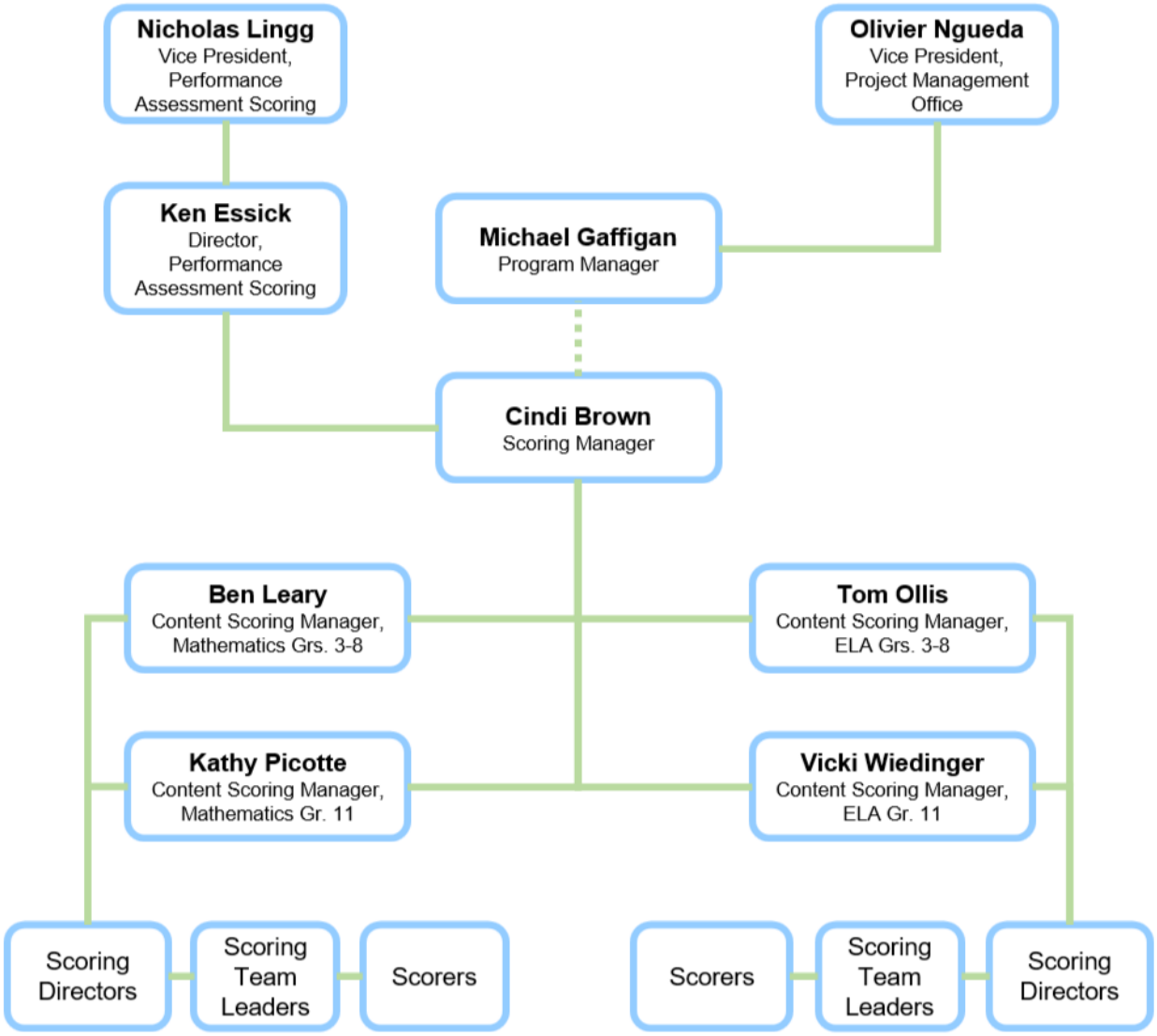
During the 2023–2024 school year, MI recruited and employed 7,000 remote scorers to conduct scoring of constructed-response items.

Organizing the Scoring Services Team for Quality and Efficiency

Students participating in the NJSLA-ELA/M and NJGPA will receive accurate scores for their responses to constructed-response items (CRIs) because MI brings an experienced handscoring management team with a deep understanding of how to integrate quality throughout the scoring process. The team assigned to NJSLA-ELA/M and NJGPA has the experience necessary to train, monitor, and evaluate the scorers selected for this important project. MI uses a collaborative approach for completing scoring projects, meaning they will work with NJDOE staff and work groups throughout this assignment.

Exhibit 4.8.3-1 shows the proposed organizational structure for the NJSLA-ELA/M and NJGPA scoring team. This structure shows clear lines of authority and communication. Within this structure, MI scoring managers will use proven project management practices and tools to accurately score student responses to NJSLA-ELA/M and NJGPA CRIs.

Exhibit 4.8.3-1: Scoring Team for the NJSLA-ELA/M and NJGPA



NJDOE will receive accurate scores on time because MI has selected experienced professionals to lead CRI scoring for the NJSLA-ELA/M and NJGPA. The leadership team begins with an experienced scoring manager, Cindi Brown, who will oversee every aspect of scoring for the NJSLA-ELA/M and NJGPA. Working with Ms. Brown will be a management team that facilitates accurate scoring and verifies scoring quality within and across test administrations. These leaders will recruit, train, and retain scorers who will consistently and precisely score student responses to CRIs.

To accurately score items for the NJSLA-ELA/M and NJGPA, Ms. Brown will lead a team that includes:

- **personnel managers** who recruit, hire, and provide support to scorers;
- **technical managers** who set up the training and scoring system and makes sure the system operates properly throughout the project;
- **scoring managers** who develop scoring materials, confirm adherence to those materials by scorers, prepare the training and scoring system, and supervise scoring directors, team leaders, and scorers;

- **scoring directors** who assist the scoring managers with oversight of a specific grade's items/responses, monitor the work of team leaders and scorers, review alert responses, and apply condition codes to nonscorable responses;
- **scoring team leaders** who monitor the work of 15 to 25 scorers by reviewing responses they have scored, providing feedback to improve scorers' performance, and answering questions; and
- **scorers** who score student responses to CRIs.

Using this multi-pronged management approach provides strong oversight so that responses are scored within the timeline required by NJDOE.

Recruiting and Retaining a High-Quality Scoring Team

To successfully score CRIs for the NJSLA-ELA/M and NJGPA, MI will bring together a scoring team that meets the RFQ's requirements and reflects the diversity of New Jersey students. To support the team, MI has built a culture that makes opportunities available equitably and that fosters mutual respect amongst everyone working on a scoring project. MI is an equal opportunity employer and treats individuals equitably regardless of race, religion, sex, color, age, sexual orientation, physical or mental disability, gender identity and expression, military service, marital status, pregnancy, medical conditions, national origin, and other characteristics.

Ms. Brown will work with personnel managers to select scorers for the NJSLA-ELA/M and NJGPA from a diverse pool of more than 7,000 experienced remote scorers. MI typically starts this process by identifying scorers who worked on the project the previous year or worked on a similar project in the past. They fill any remaining scoring spaces with other scorers in their database who have experience successfully scoring other large-scale assessments, or with qualified applicants who are new to scoring.

MI scoring managers have developed a scorer evaluation process that helps them retain only the highest quality scorers from year to year. The process consists of evaluating data collected from the current scoring season regarding:

- **accuracy** of scoring using data from their online scoring system;
- **production rate** of scoring using data from their time management system;
- **ability to communicate** clearly about scoring criteria and rationales; and
- **adherence to MI policies** governing employee conduct.

Ms. Brown and MI's personnel managers will use these data to identify which scorers should be retained for the next scoring year.

Requiring Scorers and Scoring Team Leaders to Meet Employment Requirements

Scoring student responses to CRIs in the NJSLA-ELA/M and NJGPA will be completed accurately and consistently because MI requires that scorers possess, at a minimum, a four-year college degree. Their remote hiring application includes a lengthy questionnaire that collects proof that the scorers obtained their degree before beginning employment. When possible, educators with experience teaching the content area being scored are hired for the project, but this is not a requirement for employment.

MI completes an Employment Eligibility Verification (Form I-9) for each scorer they hire, which requires that each prospective employee presents MI with acceptable documents confirming identity and employment authorization. They retain Employment Eligibility Verification forms for the length of time required by U.S. Citizenship and Immigration Services, and they can make

the forms available for inspection by authorized government officers. All scorers reside in the United States.

Prospective scorers must complete a document attesting that they meet MI's requirements, will follow scoring and security procedures, and will not disclose item, student, or score information. Acknowledging these requirements is built into the Virtual Scoring Center (VSC), MI's online scoring platform, which means that scorers will routinely attest to these requirements.

In addition to these hiring requirements, MI asks applicants what content area and what grade levels they prefer to score. These preferences generally align with each applicant's educational experience, professional experience, and scoring abilities. They also search their database of transcripts, diplomas, and résumés to find degrees and classes that match or closely match the content of the project being scored. Finally, they search their database to identify scorers and leaders who are highly experienced scoring specific content areas that match or closely match the content of the projects being scored. This multi-step process results in the assignment of scorers to the content areas, grades, and types of items they will be most successful scoring.

4.8.4. Preparation and Training Procedures for Scoring Constructed-Response Items

Training and Qualifying Scorers to Evaluate Student Responses

Producing reliable and accurate scores for constructed-response items (CRIs) like those in the NJSLA-ELA/M and NJGPA requires an extensive training process. MI scoring managers have designed a comprehensive online training process that maximizes validity and reliability, resulting in defensible score results. They use an interactive methodology, meaning that scoring directors and scoring team leaders facilitate a conversation with scorers. This conversation moves the team beyond a superficial understanding of the scoring process and toward a genuine internalization of the scoring criteria.

MI will use NJDOE-approved materials and qualification rules to conduct scorer training and qualifying. Exhibit 4.8.4-1 shows the types of materials they will use.

Exhibit 4.8.4-1: Handscoring Training and Qualifying Materials

Document Name	Description
Anchor sets	Anchor sets are annotated and clarify the differences in performance at each score point. They typically include three or four exemplar responses for each score point.
Training sets	Training sets allow scorers to assign scores to responses using the scoring criteria defined in the anchor sets. They typically include 10 responses that present all score points.
Qualifying sets	Qualifying sets determine the eligibility of scorers to score live responses. They include 10 responses per set. Scorers must achieve a minimum exact agreement score, with no non-adjacent scores, on several qualifying sets predetermined by NJDOE.

NJDOE will receive accurate scores from handscoring because MI will use approved training materials. During training, these materials will help scoring managers focus scorers on evaluating student work using scoring rubrics and sample responses.

Using Virtual Scoring Center to Train and Qualify for Scoring

Scorers working on the NJSLA-ELA/M and NJGPA project will complete remote training and scoring activities in the Virtual Scoring Center (VSC). This online system contains training modules that remote scorers will use to train and qualify to score each item. This system also houses rubrics, training materials, and anchor sets that scorers can refer to throughout the project.

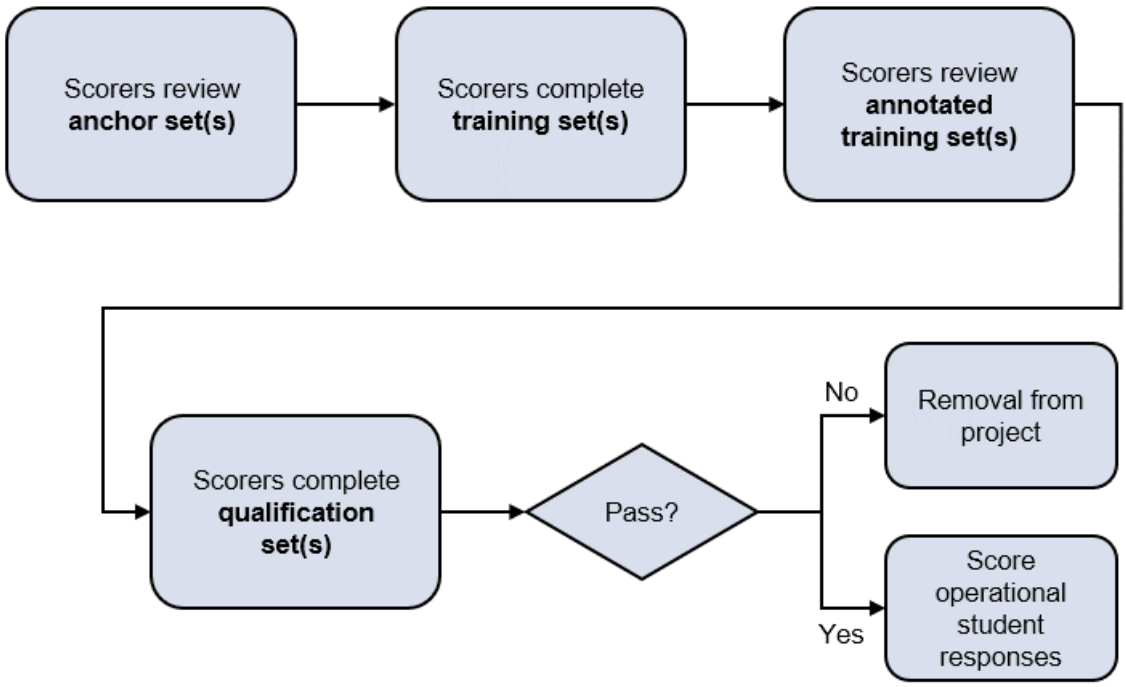
MI scoring managers will use the training materials to produce online training modules that guide the scorer through the entire training and qualifying process. These modules replicate every aspect of training previously conducted in live training environments. The modules include the following:

- Videos of anchor and training set discussions
- The ability to complete training and qualifying sets in a secure, online environment
- Access to training materials in a resource library
- Access to other documents required to systematically ensure the successful completion of online training

Scoring managers use their years of experience to anticipate common questions that scorers may have during training. They develop anchor and training set videos that address these common questions. The videos provide scorers with detailed explanations and visual cues, such as highlighting and text callouts, which identify the aspects of each response relevant to its score. These training modules ensure that scorers receive the same training every time a specific item is scored, both within and across test administrations.

Scorers train on one item at a time and are allowed to score those items for which they have qualified. Exhibit 4.8.4-2 shows an overview of the process that MI's scoring team will follow to score NJSLA-ELA/M and NJGPA CRIs.

Exhibit 4.8.4-2: Scoring Training Process



NJDOE will receive accurate scores for the NJSLA-ELA/M and NJGPA because every person, no matter their role, will go through a comprehensive training process. MI scoring staff repeat this same process for each CRI or group of related items.

Standard Training Module Process

A standard training module begins with a brief introduction to the project, scoring expectations, and how to use VSC. After the introduction, the anchor set video provides discussion of the item, rubric, and annotated anchor set responses. VSC prevents scorers from moving to the next step of the training process until they have completed the current step, ensuring that all scorers receive consistent training.

Following review of the anchor set video, scorers receive a training set, allowing them to apply the scoring rationales described in the anchor responses. Scorers then receive results of their training set performance and view the training set video to hear the rationales for the scores of the training set responses.

As scorers progress through the training process, the system adds documents to a resource library. For example, after completing the training set discussion, an annotated copy of the training set is added to the resource library. The inclusion of training materials provides scorers with access to all responses required to accurately apply the scoring criteria, and it maintains consistent scoring rationales for all training responses, both within and across test administrations. This resource library is available throughout live scoring and allows scoring management to add supplemental training materials and other important documents, as needed.

Following the training set discussion, scorers complete qualification sets. If scorers are unable to meet the qualification requirements, they are not allowed to continue the training process and are automatically moved out of the training and scoring platforms. Scorers who qualify are shown several training videos that cover a variety of important topics, such as how to identify nonscorable responses and send them to their team leader, how to identify and alert student at-risk responses, and how to chat with their team leaders if they have questions during live scoring.

By following this training and qualification process, scorers come to understand that scoring decisions are grounded in the training materials. Scorers learn how to navigate the anchor set, develop an understanding of when to escalate a response for further review, and internalize the information needed to score each response accurately. This comprehensive, consistent, and standardized process of training and qualifying scorers using video and online tools and the scoring manager's diligence during the development of scoring materials ensure that NJDOE can expect scores to be as accurate and defensible as possible.

4.8.5. Implementing and Monitoring the Scoring of New Jersey Assessment Program Constructed-Response Items

CAI and MI will develop and deliver to the SCM a plan for monitoring handscoring and automated scoring to ensure high levels of scoring accuracy are maintained for all item types. The SCM will give final approval to these procedures. We will also provide our plan for monitoring scoring across administrations and throughout the lifecycle of an item, recognizing that monitoring and mitigating drift is a key factor in ensuring that the interpretation of item and test scores is consistent across time and fair to all students, regardless of when they test. We agree to provide edits to the procedure documents within five business days of an NJDOE request.

We describe first the monitoring of handscorers, as this oversight is critical to ensuring that any scoring engine–handscorer comparisons are valid. This is because CAI's Autoscore is typically trained on handscores from a highly vetted and carefully scored sample that is also used to calibrate the item response theory (IRT) parameters that are essential to generating reported

test scores and achievement levels. In Section 4.8.2, we describe the automated scoring and hybrid automated/handscoring approach for open-ended, text-based constructed-response items (CRIs). Recall that all open-ended CRIs will be hybrid automated/handscored. If CRI items do not have data on which to train the engine, a sample of student responses (approximately 3,000) will be selected for double scoring with resolution of non-exact scores; the engine will be trained on these data as outlined in Section 4.8.2. We also highlight key elements to confirm the requirements around hybrid scoring, as relevant.

We begin with checks for scoring accuracy and consistency, and then discuss student alerts and plagiarism. We end the section with discussing how CRI scores will be combined with scores from other items.

Scoring Accuracy and Consistency

To support scoring consistency, MI will conduct daily supervisor read-behinds for each handscorer and administer and examine pre-scored validity response checks. This is described later in this section.

Regarding reliability reads, we will use hybrid automated/handscoring as outlined in Section 4.8.2. Using this method, all responses receive a score or condition code from Autoscore, and 25% are routed for handscoring using a 10% random verification read to examine reliability, certain condition codes to route any unusual responses, and responses that fall below a low-confidence percentile threshold. Routed responses will receive a single handscore, aside from any read-behind scores that MI conducts.

The 10% random verification sample will be used to evaluate the agreement between Autoscore and handscoring. As noted, we will examine exact agreement rates, Quadratic Weighted Kappas (QWKs), and standardized mean differences (SMDs) between Autoscore and handscores in each dimension and for each item. We will use the 70% exact agreement and 90% exact + adjacent thresholds for examining performance and will compare Autoscore-reader performance against the human-human performance on data used to train and validate the engine prior to deployment. Note that CAI will also submit the validation data to MI as validity papers and will examine aggregate reader performance using exact agreement, exact + adjacent agreement, QWK, and SMD.

This combined set of results (scoring supervisor read-behinds, pre-scored validity papers, 10% random verifications, engine validation papers) will provide a full picture of the performance of both the handscorers and the scoring engine. In all, we will route more than 25% of responses for the computation of reliability, with 20% routed using the methods described and 5% routed because the total test score falls within one point of the passing score. Should a handscorer be determined to meet the requirements, he or she will be retained. If the scorer continues to fail to meet requirements after training, they will be dismissed. If the scoring engine is not meeting requirements, then we will determine ways to retrain the engine that also ensure adherence to the application of the rubric and rangefinding decisions.

Student Alerts

Student alerts can be identified in two ways. The first is through CAI's industry-leading crisis response paper detection system, *Hotline*, and the second is through MI's handscoring procedures. Hotline identifies responses in which students disclose serious issues, such as anxiety, depression, suicide, self-harm, and abuse (Burkhardt et al., 2021). Since 2018, crisis responses have been identified using Hotline's hybrid engine-human alerting system.

The Hotline alert system automatically scans all submitted tests for student-produced text, including notes entered into the Test Delivery System (TDS), to identify crisis responses. If a

response is flagged as a potential crisis alert, it is routed for human review. If verified as a crisis response, the response, along with student information, is escalated to the NJDOE immediately.

The benefit to our clients is three-fold. First, we provide a very quick turnaround on crisis response detection, often within minutes or hours (during peak testing days) of the student submission. Second, our system scans all free-form text entered by a student, including notes that are not sent for handscoring and may never be viewed by adults. Third, our process ensures that every response has undergone a systematic review. Many of our clients have found Hotline to be a very valuable tool in identifying at-risk students. In the 2023–2024 academic year, CAI's Hotline scanned more than 100 million student-entered texts and escalated more than 29,000 human-verified alerts across the various states we serve. In almost every case, Hotline scanned alerts and provided potential cases for human review within one hour of submission. While the human alert review is not immediate, we expect to route alerts to our clients within 24 hours of student submission. The Hotline engine used to classify potential crisis responses uses a deep neural net to predict whether a response should be routed for human review. The current accuracy rate on a held-out validation sample is 98.4%, even when routing a very small percentage (0.15%) of responses for human review. Hotline balances the critical importance of accurately flagging true crisis responses while minimizing the number of responses we route for human review. This ensures that we return information quickly to our clients to support students in need.

Plagiarism

CAI's current test administration processes help prevent plagiarism because students test in sessions monitored by human proctors, and because students can test only within a secure browser that restricts access of any material on the Internet or on their computers. In addition, CAI's prompt copy condition code identifies responses that contain primarily the prompt or passage. Still, it is possible that proctored sessions are not carefully managed. To address this, CAI has developed metrics to examine student-to-student and student-to-proctor/teacher copying. These metrics examine the pairwise similarity of responses within a proctored session and then can be used to represent an aggregate measure of similarity within a proctored session. This index is then calculated for all proctored sessions, and statistical outliers can be identified and provided to NJDOE for review and potential investigation. CAI will work with NJDOE and their Technical Advisory Committee to identify the best approach for identifying outliers.

Merging Item Scores

CAI's Test Integration and Scoring (TIS) system and the Ledger platform work together to merge scores from both machine-scored items and handscored items on a completed test prior to generating the overall test-level scores. Ledger is an automated workflow and response-routing tool that handles routing of all handscored responses between CAI and MI's handscoring platform. Once a student completes a test in TDS, the test flows downstream to our data analysis and Quality Monitoring (QM) System. Here, any responses on the test that are marked for handscoring (including any artificial intelligence [AI]-scored items that are low-confidence) are picked up by Ledger and automatically sent to MI's handscoring platform (through secure representational state transfer [REST] application programming interfaces [APIs]). Ledger tracks all responses routed to MI and their return of scores (with detailed time stamps).

As scores arrive from MI's handscoring system, Ledger updates the corresponding tests that are held in the QM System awaiting scores. The TIS system constantly monitors these tests that are in the holding state to see if all operational items administered on that test have a final score with no low-confidence scores. For tests that meet these criteria, TIS will automatically score the test and publish the results to the Database of Record (DOR) and reporting platforms.

Scoring CRIs Accurately and Efficiently

Scoring NJSLA-ELA/M and NJGPA CRIs will require

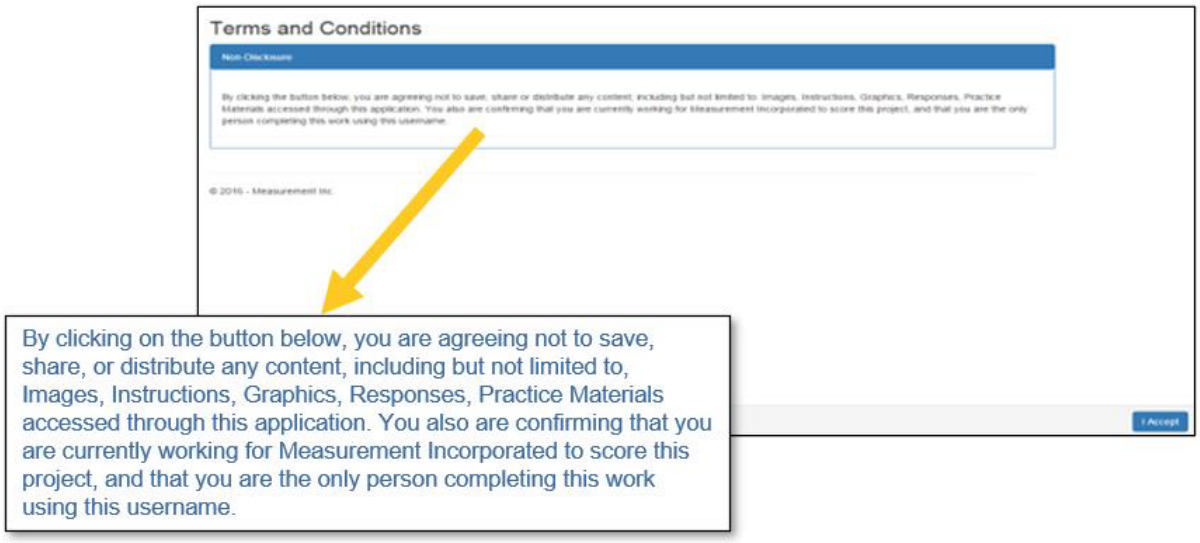
- organizing trained and qualified scorers into teams;
- using a secure, online system to route student responses to qualified scorers;
- monitoring scoring metrics and conducting quality assurance (QA) reviews; and
- communicating clearly with scorers and, when needed, retraining them to score an item.

MI's scoring managers will ensure that these important activities are completed, that the scoring process is being conducted according to established protocols and is resulting in the quality required by NJDOE, and that the project is proceeding on schedule.

To score projects the size and scope of the NJSLA-ELA/M and NJGPA, MI scoring managers assign scoring team leaders and handscorers to scoring groups using a ratio of one team leader for each 15–25 scorers. The number of scorers per team leader depends on the type of item being scored. MI uses a lower ratio for items that are difficult to score and for items with more score points.

Scorers and scoring team leaders complete their work within the Virtual Scoring Center (VSC). Every time scorers sign in to the Virtual Scoring Center (VSC), they must accept the terms of a nondisclosure agreement, which is shown in Exhibit 4.8.5-1. They are then taken to the VSC landing page. From this page, they select "Scoring" to navigate to their work queue.

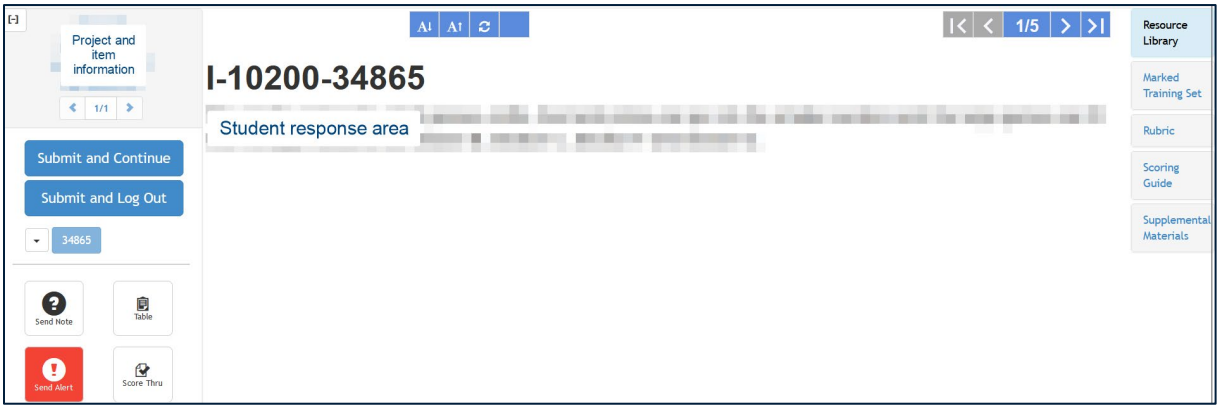
Exhibit 4.8.5-1: Nondisclosure Agreement Screen in VSC



Security of CRIs for NJSLA-ELA/M and NJGPA will be enforced, in part, by asking each scorer to acknowledge the secure nature of the items and student responses each time they log in to VSC.

VSC groups student responses into sets of 5–20 responses, called a **scoring set**. Each scoring set contains student responses for one item. This prevents scorers qualified to work on multiple items from moving between items following each response. By focusing scorer effort this way, MI increases the efficiency of scoring and simplifies the monitoring performed by team leaders and scoring managers. Once a scorer receives a scoring set to score, they are taken to the scoring screen. Exhibit 4.8.5-2 shows an example of a scoring screen.

Exhibit 4.8.5-2: Scoring Screen Within VSC



Students, families, teachers, administrators, and state education agency staff will receive accurate scores on time because VSC is easy to use. Scorers can quickly review a student's response, assign scores and special codes, and access scoring rubrics and other information.

The scorer works through the scoring set within this screen. The scorer evaluates the first response, enters the score by clicking the appropriate value on the scoring toolbar, and clicks the Submit button. For multi-page responses, VSC requires the scorer to view each page before entering a score. Once the scorer clicks the Submit button, VSC records the score and presents the next response in the scoring set. This process continues until all responses in the set have been scored.

When a scorer has a question about a response, he or she can transfer the response and a note containing his or her question from the current scoring set to a **review set** assigned to a scoring team leader. The team leader may submit the appropriate score themselves or return the response to the scorer with comments.

After scoring all the responses in a scoring set, the scorer can review any of the responses and modify the scores before committing them to the system. Once the scorer commits the scoring set back to VSC, the set is considered checked in and the responses are routed to the next step in the process. For example, VSC may route random student responses to another scorer for a second read. Student responses are not marked as complete until the requisite number of independent scorers have scored the response.

VSC has built-in tools that allow scorers, scoring team leaders, and scoring directors to communicate with one another using a secure chat system. The chat system allows the team to collaborate throughout the project, which facilitates efficient and accurate CRI scoring.

Handling Alerts and Crisis Responses Properly

MI's training modules provide scorers with rules for identifying alert responses. An alert response is a student response that includes discussions of suicide, criminal activity, alcohol or drug use, extreme depression, violence, rape, sexual or physical abuse, self-harm, intent to harm others, or neglect. MI's primary goal in identifying alert responses is to bring them to the attention of an appropriate official quickly so they can begin the work of informing local officials. If a scorer finds an alert response, they identify it in the VSC. The system then routes the response to scoring leadership for review. If scoring leadership agrees, the response is flagged for immediate escalation to CAI.

Monitoring CRI Scoring Quality

To ensure industry-leading scoring of CRIs like those found in NJSLA-ELA/M and NJGPA, MI has developed automated and objective monitoring tools and integrated those into the VSC. To improve these tools, they use a large, longitudinal data set regarding scorer performance. They use these data to compare past performance with the current performance of the scoring pool. The result of these efforts is that NJDOE will receive highly accurate scores because MI can efficiently monitor scorer performance.

VSC calculates multiple metrics, like validity and inter-rater reliability (IRR), for the pool of items being scored and for sub-pools as needed. VSC uses these data to generate scorer performance information that is incorporated into an automated system to monitor and evaluate scorer performance. If items are repeated across test administrations, data from past scoring performance are used to generate performance evaluations over time.

Scorers and scoring managers receive daily automated messages that summarize scorers' performance. This information helps them stay aware of current performance and any issues that require attention. Managers may also access specialized reports they can use to identify scorers who require retraining and/or removal because of issues with accuracy or production. These reports allow scoring managers to identify specific areas that require additional attention and training.

Scorer monitoring features in VSC afford the objective, dynamic identification of the absolute best (most accurate and productive) scorers, whom MI refers to as **advanced scorers**. A scorer's status as an advanced scorer changes daily based on current performance. MI can configure VSC so that only advanced scorers may conduct second and third readings. Having highly accurate scorers performing second and third readings improves the utility of IRR data for monitoring and evaluating scorer performance.

MI will maintain the required minimum agreement rates. MI proposes that 5% of responses be pre-approved validity (check set) responses. VSC automatically and randomly routes the requisite number of responses for second reads. Handscorers do not know if they are scoring a first read, a second read, or a validity response. VSC also prohibits scorers from being eligible to score second reads for responses they have already scored. MI will maintain the required agreement percentages for double-blind and validity reads.

Reviewing reports daily, working with scorers struggling to achieve quality metrics, and identifying advanced scorers are only a few ways MI monitors the quality of scoring CRIs. In the paragraphs that follow, we summarize other quality assurance processes that MI will use to ensure that the scores generated for NJSLA-ELA/M and NJGPA are accurate and reliable.

Automated score resets. Expectations for IRR may be used to automatically reset recently scored responses in the event scorer agreement for the item fails to meet expectations. Such an evaluation is conducted prior to submitting scores, so the scoring QA process is not disruptive to CAI.

Automated scorer reassignment. Item-specific agreement expectations, along with validity response performance, are further used to automatically unassign scorers from individual items if their performance does not meet expectations. A scorer is automatically removed entirely from scoring if they no longer meet performance expectations for any of the items for which they are qualified to score.

Systematic read-behinds. Scoring team leaders conduct systematic read-behinds, beginning on the first day of scoring. When a scoring team leader conducts a read-behind, they have access to the score generated by the scorer for each response in the read-behind set. This allows the team leader to review the responses thoroughly and target feedback to the reader on

mis-scored responses, especially if the scorer exhibits a bias or an easily correctable misconception. Once the team leader has completed their review of the read-behind set, they return selected responses to the scorer with appropriate feedback and encourage the scorer to ask questions if they encounter similar responses in the future. MI will implement specific read-behind requirements after discussions with NJDOE.

Targeted read-behinds. Scoring team leaders initiate and conduct targeted read-behinds for scorers who are having difficulty applying the scoring criteria. A scorer will be automatically targeted for read-behinds if they fall short of the agreed-on perfect- or adjacent-agreement rates. The process for conducting a targeted read-behind is the same as conducting a systematic read-behind.

Discussions of scoring issues. Scoring managers review scoring issues at least once each day during a scoring project. These discussions include opportunities to clarify any misunderstandings about how to score each item. The discussions frequently lead to refresher sessions with scoring team leaders and scorers, which will be important to accurately score NJSLA-ELA/M and NJGPA CRIs.

Minimizing Scorer Bias

To reduce common sources of scorer bias when scoring CRIs like those in NJSLA-ELA/M and NJGPA, MI scoring managers implement strategies to reduce common sources of scorer bias.

- Scorers are not given access to any student identifiers. Unless students sign their name, write about their hometown, or in some way provide other identifying information as part of their response, MI scorers have no knowledge of a student's identity or demographics.
- Scorers are trained using NJDOE-approved training materials, which represent unbiased examples of responses at the various score points. MI's training process involves constant comparisons with the rubric and anchor responses so that scorers' judgments are based solely on the scoring criteria.
- Following training, MI employs a cycle of diagnosis and feedback to identify any issues discovered during scorer monitoring. Instances of scorers making scoring decisions based on anything besides the criteria are swiftly addressed, and scorers are dismissed if they continue to exhibit bias after receiving a reasonable amount of feedback.

If a scorer is unable to achieve and maintain required standards of accuracy or productivity, he or she is dismissed from the project. MI resets scores entered by the dismissed scorer, and those student responses are routed for scoring by other qualified scorers. MI's robust QA procedures have evolved over more than 40 years as the industry leader in scoring CRIs, and these processes will result in accurate scores for the NJSLA-ELA/M and NJGPA.

List of Reports Available in VSC

To assist in providing information to scoring managers, and to help keep NJDOE informed about progress, MI has built the following list of reports into VSC (refer to Exhibit 4.8.5-3). Access to VSC reports is available to NJDOE on demand using a dedicated login.

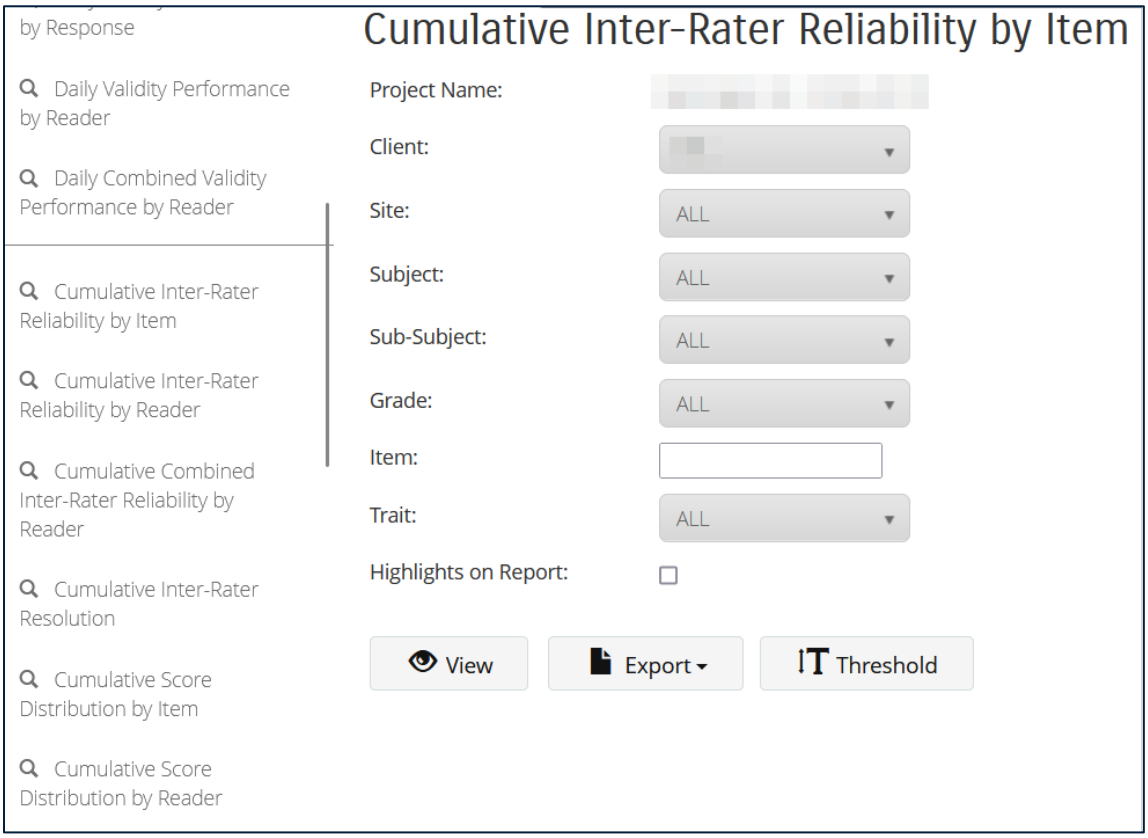
Exhibit 4.8.5-3: Reports Available in VSC

• Daily Inter-Rater Reliability by Item • Cumulative Inter-Rater Reliability by Item • Daily Inter-Rater Reliability by Scorer • Cumulative Inter-Rater Reliability by Scorer • Summary Inter-Rater Reliability • Daily Score Distribution by Item • Cumulative Score Distribution by Item • Daily Score Distribution by Scorer • Cumulative Score Distribution by Scorer • Summary Score Distribution	• Daily Validity Performance by Item • Cumulative Validity Performance by Item • Daily Validity Performance by Response • Cumulative Validity Performance by Response • Daily Validity Performance by Scorer • Cumulative Validity Performance by Scorer

Inter-rater reliability reports provide the percentage of exact, adjacent, and non-adjacent agreement for scoreable responses. **Validity performance reports** provide the percentage of exact, adjacent, and non-adjacent agreement for validity responses and are used to monitor drift. **Score point frequency distribution reports** provide the percentage per score point and include the mean and standard deviation for each item.

To access the reports, users log in to VSC and click “Reports” from the landing page. Exhibit 4.8.5-4 shows the report selection screen. Available reports are listed on the left, and search/sort/filter criteria are in the center of the page.

Exhibit 4.8.5-4: VSC Reports Selection Screen



NJDOE will receive accurate results for the NJSLA-ELA/M and NJGPA because MI scoring managers have access to information they need to monitor scoring.

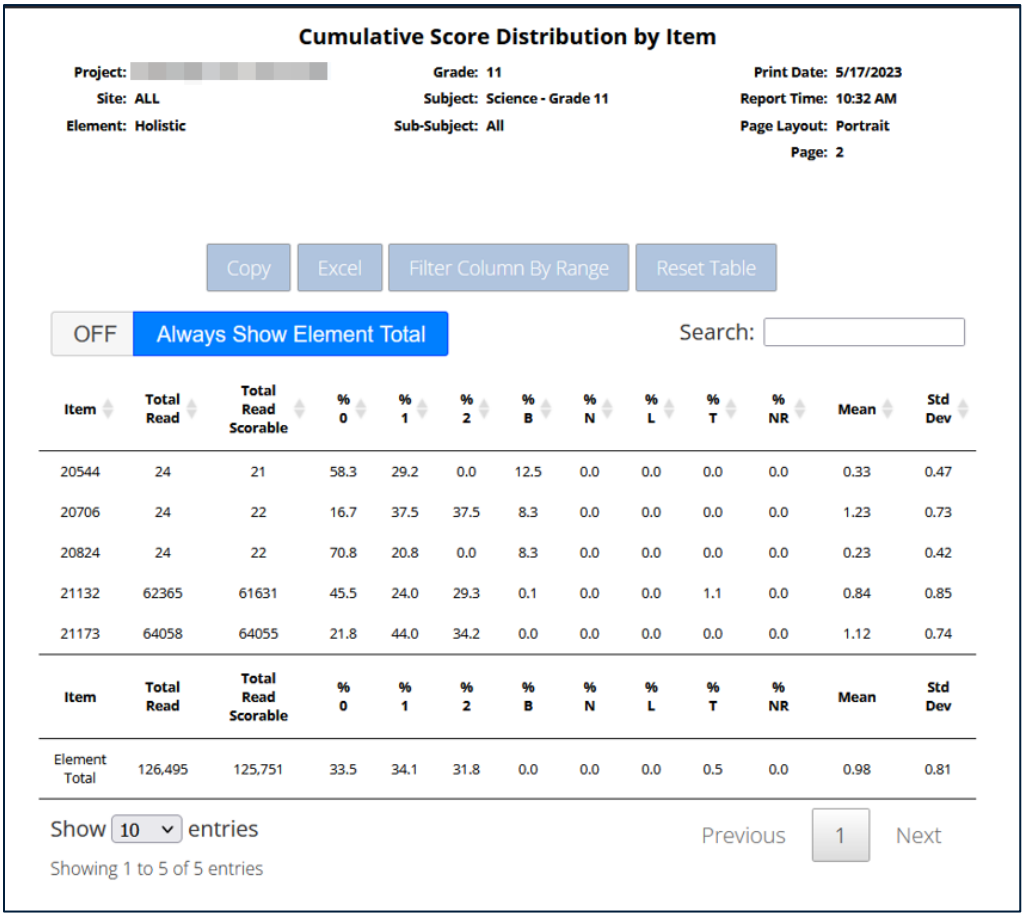
Exhibits 4.8.5-5 and 4.8.5-6 show examples of two reports available in VSC, including the following:

1. The **Cumulative Inter-Rater Reliability by Item Report** provides the percentage of exact, adjacent, and non-adjacent agreement for scoreable responses.
2. The **Cumulative Score Distribution by Item Report** provides the percentage per score point and includes the mean and standard deviation for each item.

Exhibit 4.8.5-5: Sample Cumulative Inter-Rater Reliability by Item Report

Item	Total Read	Total Read Scorable	Second Read	% Non-Adj Low	% Adj Low	% Exact	% Adj High	% Non-Adj High	% Mismatch NS	% MM NS/Score	R1 Mean	R2 Mean
20395	65840	64649	16866	0.0	4.8	90.4	4.8	0.0	0.0	0.0	0.12	0.11
20544	22	21	6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.44	0.67
20706	22	20	6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.29	2.00
20824	22	21	6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.39	0.00
21132	66404	65925	17198	0.0	7.6	84.7	7.6	0.0	0.0	0.0	1.02	1.06
21173	22	20	6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.00	1.33
21187	65177	64816	16910	0.0	9.8	80.4	9.8	0.0	0.0	0.0	0.95	0.94
Item	**Total Read**	**Total Read Scorable**	**Second Read**	**% Non-Adj Low**	**% Adj Low**	**% Exact**	**% Adj High**	**% Non-Adj High**	**% Mismatch NS**	**% MM NS/Score**	**R1 Mean**	**R2 Mean**
Element Total	197,509	195,472	50,998	0.0	7.4	85.2	7.4	0.0	0.0	0.0	0.70	0.71

Exhibit 4.8.5-6: Sample Cumulative Score Point Distribution by Item Report



Cumulative Score Distribution by Item

Project: [redacted]
Site: ALL
Element: Holistic
Grade: 11
Subject: Science - Grade 11
Sub-Subject: All
Print Date: 5/17/2023
Report Time: 10:32 AM
Page Layout: Portrait
Page: 2

Copy | Excel | Filter Column By Range | Reset Table

OFF | Always Show Element Total | Search:

Item	Total Read	Total Read Scorable	% 0	% 1	% 2	% B	% N	% L	% T	% NR	Mean	Std Dev
20544	24	21	58.3	29.2	0.0	12.5	0.0	0.0	0.0	0.0	0.33	0.47
20706	24	22	16.7	37.5	37.5	8.3	0.0	0.0	0.0	0.0	1.23	0.73
20824	24	22	70.8	20.8	0.0	8.3	0.0	0.0	0.0	0.0	0.23	0.42
21132	62365	61631	45.5	24.0	29.3	0.1	0.0	0.0	1.1	0.0	0.84	0.85
21173	64058	64055	21.8	44.0	34.2	0.0	0.0	0.0	0.0	0.0	1.12	0.74
Item	**Total Read**	**Total Read Scorable**	**% 0**	**% 1**	**% 2**	**% B**	**% N**	**% L**	**% T**	**% NR**	**Mean**	**Std Dev**
Element Total	126,495	125,751	33.5	34.1	31.8	0.0	0.0	0.0	0.5	0.0	0.98	0.81

Show 10 entries
Showing 1 to 5 of 5 entries
Previous | 1 | Next

Students participating in the NJSLA-ELA/M and NJGPA will receive accurate results because MI scoring managers can thoroughly monitor scoring activities and respond to the available data.

Automated Score Verification

When scoring writing items for programs like the NJSLA-ELA/M and NJGPA, MI conducts additional automated score verifications to confirm score accuracy. For example, they conduct a blank check which resets scores when a condition code of *blank* is assigned to a response that has one or more characters in the response string (a response including spaces or tabs). In this case, only after three independent scorers have assigned a condition code of *blank* to a response that appears blank (but includes characters in the response string) is the score recorded. MI conducts a similar verification process when a score or condition code other than *blank* is assigned to a response that includes no characters in the response string.

4.8.6. Post-Scoring Activities and Documentation

CAI and MI systems and processes handle all post-scoring activities and documentation required for constructed-response items (CRIs) in the New Jersey Assessment Program covering both online and paper-pencil administration.

Score Appeals Process

All score appeals processes are managed through CAI's Test Information Distribution Engine (TIDE). Authorized district and school users can log in to TIDE and submit appeals. Within TIDE, users can view records for students under their jurisdiction, view each test taken, and

submit a rescore appeal for specific CRIs on that assessment. This ensures that the rescore appeal clearly identifies the student, the test taken, and the specific item(s) being appealed. Each appeal goes through an approval process that requires authorized state or district administrators to review and approve it before triggering a rescore. We acknowledge that only those requests signed by a New Jersey local education agency chief school administrator, and that clearly identify the student for which rescores are requested in addition to the assessments and the items to be rescored, are to be addressed. NJDOE will be able to view all submitted appeals, their status, and their final resolution in TIDE.

See Exhibits 4.8.6-1 and 4.8.6-2 for sample interfaces to request an item-level rescore. TIDE supports both item-level rescores (of specific items within a test) as well as test-level rescores to reevaluate all eligible items on a student's test.

Exhibit 4.8.6-1: Sample TIDE Interface for Initiating Item-Level Rescore Request

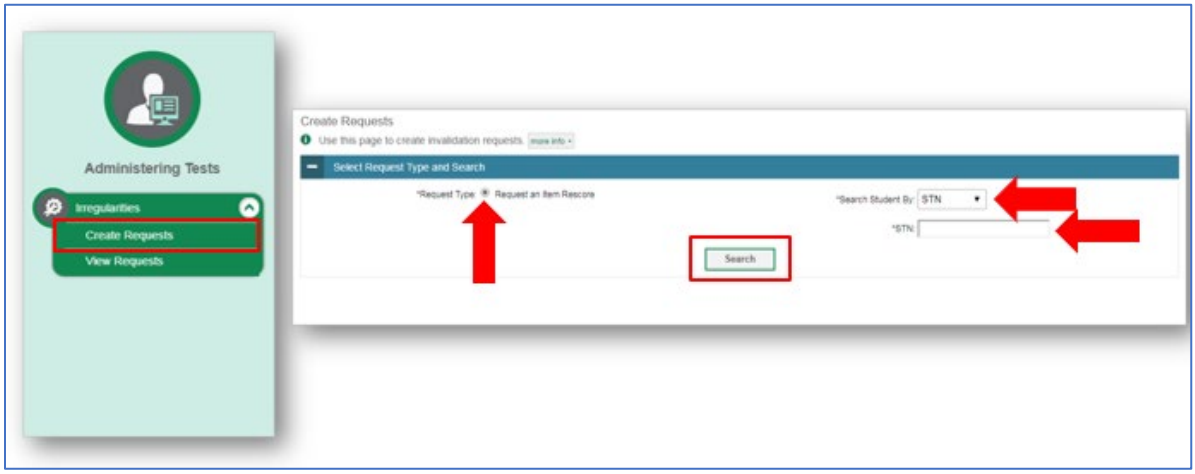
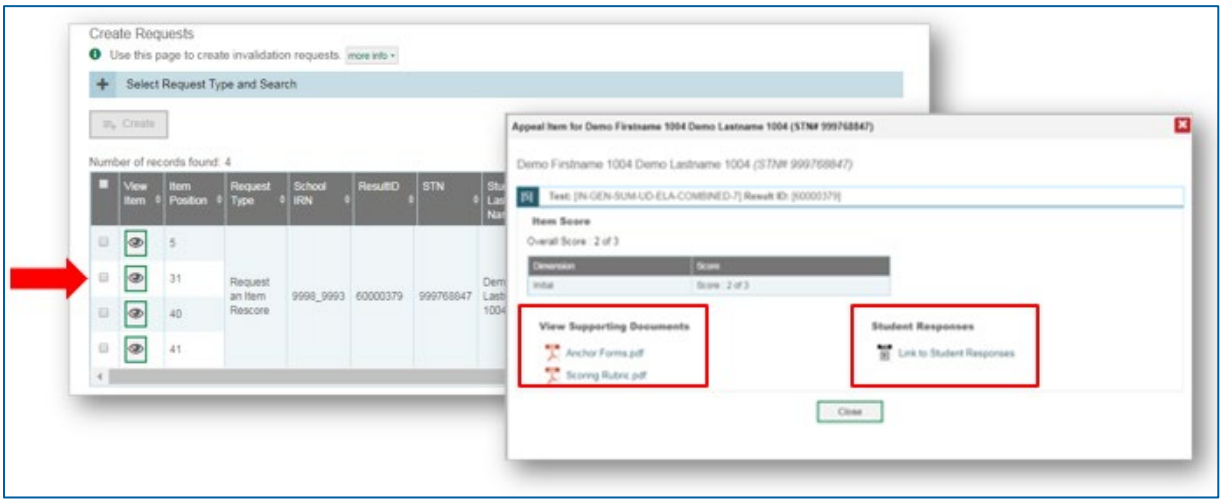


Exhibit 4.8.6-2: Selecting Individual Items on a Test to Be Rescored



Scoring Paper-Pencil and Online Test-Taker Responses

Test administrators enter responses for students taking paper-pencil versions of the NJSLA-ELA/M and NJGPA into the Data Entry Interface (DEI). For this reason, all student responses are scored as online responses.

If scorers can use the same scoring criteria across test administration modes, MI's Virtual Scoring Center (VSC) routes these responses to the same team of qualified scorers. For items

that use different rubrics based on test administration mode, MI trains scoring leaders to score these items using information about scoring differences by mode. NJDOE will approve any differences in scoring based on the student's test administration mode. Content scoring managers and scoring directors will score these types of responses, ensuring that the scores are as accurate and defensible as possible.

Scoring Reports for NJDOE State Contract Manager

Access to VSC reports is available to NJDOE on demand through a dedicated login process. These reports provide 24/7 access to inter-rater reliability (IRR), score point distribution, and validity data. In addition to these on-demand reports, MI scoring managers will provide daily updates on the completion status of all item handscoring. If needed, daily and/or weekly meetings will be held to discuss any concerns regarding handscoring completion or accuracy.

MI will provide a final summary report of IRR and score point distribution results to the SCM at the end of each scoring season. This report will include both quantitative and qualitative information, including suggestions to improve handscoring accuracy. MI scoring managers will also provide a written report to be included in the annual technical report.

Annual Handscorer Drift Studies

Annual drift studies will be conducted to ensure that handscorers are assigning scores consistently within and across test administrations. These studies will have two core elements. First, validity papers will be seeded randomly into the scoring process and examined for the aggregate and rater-level agreement and distributional characteristics using rangefinding or otherwise vetted consensus scores as truth. These papers will be verified by NJDOE to ensure that scores are correct. They will also be used to monitor raters during the handscoring process and after handscoring is complete.

Validity papers offer important information about rater adherence to the rubric's center scores; however, they do not provide information about rater scoring of the boundaries between score points. Because of this, MI will also monitor data with papers in the validation sample used to examine scoring engine performance. Like the validity papers, these data will be seeded randomly into the scoring process. We will then compute the standardized mean difference of the rater scores relative to the final, resolved score in the validation sample. We expect that when drift is not occurring, this value will be relatively small (no greater than 1). Because the engine on these data was validated, we expect this handscoring will have similar levels of agreement on the scores as the scoring engine.

4.8.7. Braille and Large Print Test Scoring

Students using the braille or large print versions of the assessments will answer the items using the technique(s) approved in their Individualized Education Plans. These methods may include braille, dictation, or the use of large-sized paper, among others. Following administration, a test administrator will enter the student's responses into the Data Entry Interface.

4.8.8. Scoring Quality-Control Procedures

Scoring Quality-Control Procedures for Machine-Scored Items

CAI will develop and deliver a detailed scoring quality-control plan that includes specifics of all quality assurance checks we have in place (both automated and manual) to ensure the highest levels of scoring accuracy for all item types. This includes all dashboards that NJDOE staff can access to monitor the status of all responses going through handscoring (for CRIs), score

frequency reports (by individual item) for all completed assessments, automated scoring checks performed as part of our user acceptance testing (UAT) processes, etc.

CAI will submit the plans to the SCM for final approval before the testing windows open. Any requested edits will be incorporated and updated plans will be submitted to the SCM within five business days.

Section 4.4 contains additional information about CAI's quality-control procedures.

Scoring Quality-Control Procedures for Constructed-Response Items

To ensure industry-leading scoring of CRIs, like those found in the NJSLA-ELA/M and NJGPA, MI has developed automated and objective monitoring tools and integrated those into the Virtual Scoring Center (VSC). To improve these tools, they use a large, longitudinal data set regarding scorer performance. They use these data to compare past performance with current performance of the scoring pool. The result of these efforts is that NJDOE will receive highly accurate scores because MI can efficiently monitor scorer performance.

MI scoring managers use reports and other features in the VSC to monitor scoring quality. Scoring managers conduct systematic and targeted read-behinds of each scorer. Following the read-behinds, scorers receive automated and/or human feedback on their progress. If a scorer fails to meet quality metrics following feedback, the VSC may conduct automated score resets and automated scorer reassignments. Throughout this process, scoring managers hold multiple discussions with scorers about issues they find across the team scoring an item (or group of items).

Refer to Section 4.8.5 for additional information about MI's quality-control procedures.

4.8.9. Portfolio Appeals (Cost Option)

In the event that a student fails to meet the standards for graduation on the mathematics or English language arts (ELA) components of the NJGPA, the state of New Jersey supports multiple alternative methods for the student to show proficiency, including submitting a portfolio of work that demonstrates understanding of the subject matter. This portfolio of work is evaluated and scored locally by the student's school. CAI has already developed a solution to a similar (but not identical) requirement from another state and will commit to developing an online solution meeting each requirement defined in the RFQ. The portfolio entry and State review and approval solution will be integrated fully into the Test Information Distribution Engine (TIDE), the same test registration and enrollment system that would be used for the other New Jersey online and paper state assessment systems. Alternative proficiency portfolio appeals would be connected internally to a student's existing record in TIDE and could be reported in the same Reporting system as other assessments. TIDE already supports file uploads of student information.

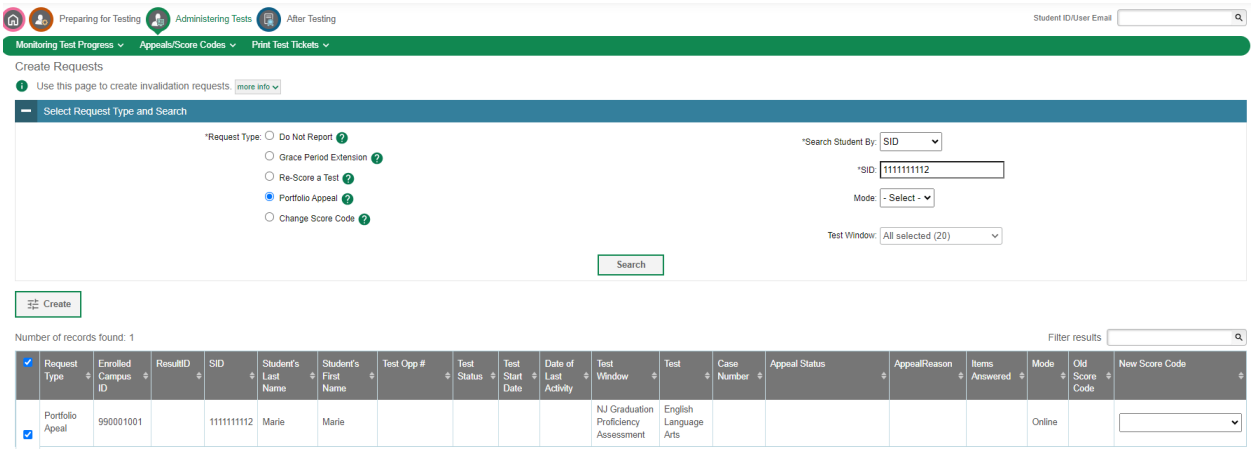
Additional details relevant to a student's portfolio appeal could be collected through the same demographic data upload process or through a separate dedicated file upload in TIDE. CAI has already built a similar appeal request type for another state; that feature, which has been in operational use for several years, supports school staff submitting score codes for participating or non-participating students, describing circumstances surrounding a student's test-taking status that flow downstream to our Analysis and Reporting systems and are used as an input in score reporting. The proposed solution here would involve extending this existing functionality to include the collection of proficiency evidence in the form of file attachments. The TIDE Appeals module already supports sending requests for State review. Authorized state-level users would review each request and either approve or reject it. CAI would customize the appeal request

type such that the approval or rejection status of each appeal request is sent downstream for scoring. CAI will work with the SCM to determine and implement business rules for scoring and reporting approved or rejected portfolio appeals.

The basic workflow would be as follows:

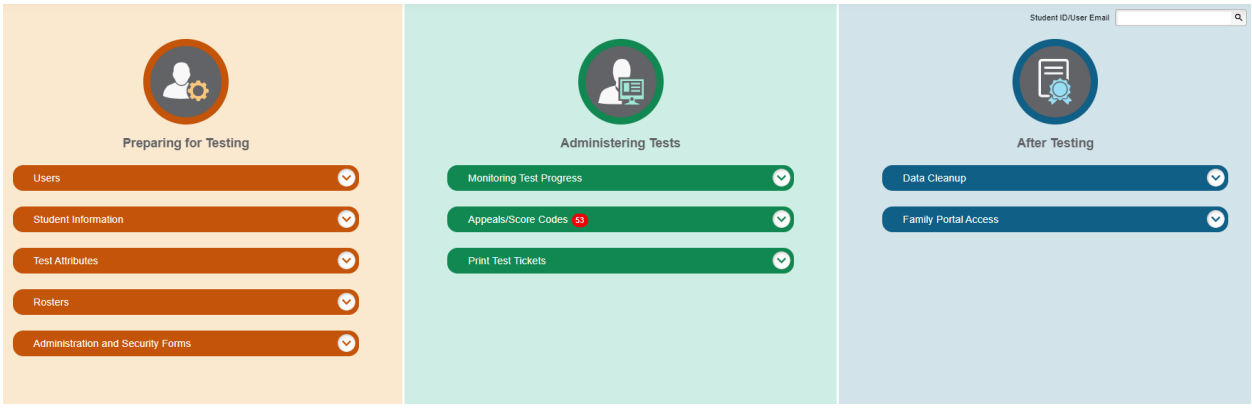
1. An authorized user (proctor/administrator) would search for a student in TIDE using the Student Identification Number (SID). Only students already registered in TIDE with a valid SID would be available to enter a portfolio appeal. Exhibit 4.8.9-1 shows a sample create appeal request form for a demo student, reflecting Portfolio Appeal as one of the available options to this particular user role.

Exhibit 4.8.9-1: Sample Create Appeal Request Form Depicting a Portfolio Appeal Option



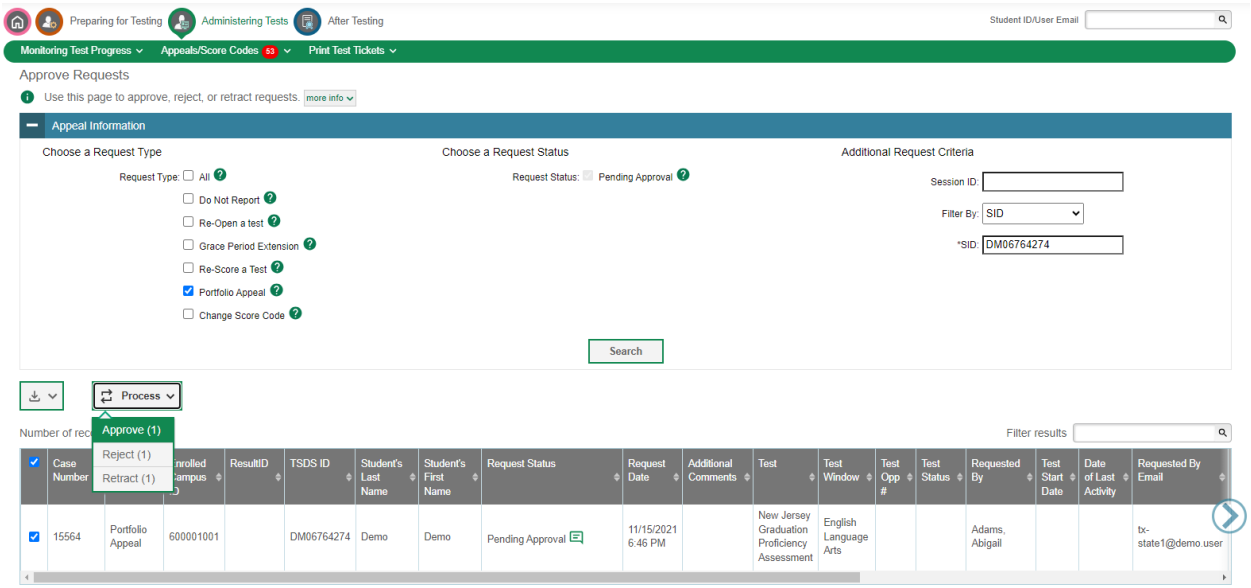
2. The user would input the relevant details and supporting evidence for the student's portfolio appeal into TIDE, using a combination of web form entry and file uploads. CAI will work with NJDOE to define the required data elements and validation rules and ensure that the solution aligns with New Jersey requirements.
3. Once submitted by school or district staff, any portfolio appeal requests pending State review will be available in TIDE to inspect and approve or reject. Exhibit 4.8.9-2 shows a sample TIDE dashboard state-level user role view, with 53 appeal requests pending review. Note the "Appeals/Score Codes" navigation item in the middle column with a red number indicating items pending State review.

Exhibit 4.8.9-2: Sample State-Level TIDE Dashboard Showing Appeal Requests Pending Review



4. The authorized state-level user would review the portfolio appeal request and all supporting materials and documentation, including all file attachments that were uploaded. The state-level user would then approve or reject the request. Exhibit 4.8.9-3 shows a sample appeal request review and approval screen. CAI proposes to enhance this existing functionality with an interface to download and view the file attachments that were uploaded by the proctor.

Exhibit 4.8.9-3: Sample Approve/Reject Appeal Request Screen Depicting a Portfolio Appeal with a Drop-Down to Accept or Reject the Request



4.8.9.1. Links to Main Assessment System

The SCM desires a portfolio appeals system that is, at minimum, linked to the main assessment system. CAI's proposed solution for portfolio appeals is fully integrated into TIDE, satisfying each of the requirements in the RFQ. As discussed previously in Section 4.8.9, portfolio appeal requests can be placed only for students who are already loaded into TIDE. Users must be logged in to the main Single Sign-On (SSO) system and be authorized to submit portfolio appeal requests according to the role-based access control rules defined by New Jersey and implemented by CAI. The same back-end data systems that support the other online and paper test administration tasks would be used to support the portfolio appeals process.

4.8.9.2. Student Identification

The SCM prefers a solution that ensures portfolio appeal requests are linked to and validated against the student data records in the main assessment system. CAI's proposed solution meets this requirement fully because it involves extending the existing Appeals module in TIDE. Appeals in TIDE are, by design, connected internally to the same student data that drives test delivery, scoring, and reporting. A student must exist in TIDE with a valid SID before a portfolio appeal can be requested for him or her. Once a portfolio appeal is requested for a student, authorized users with access to that student's record can search for and view the status of the student's portfolio appeal by student ID number.

4.8.9.3. Security/User Management

NJDOE requires that established user management and security roles and responsibilities be shared between the portfolio appeals system and the main assessment system and that the portfolio appeals system be accessed using the same SSO integration and workflow. CAI's

proposed solution for portfolio appeals is integrated entirely into TIDE, the same test administration platform used for student demographic data management and all other administrative activities required to support both online and paper testing. Students are not given access to TIDE and therefore would have no access to the portfolio appeal request process.

4.8.9.4. File Upload

The SCM requires that the file upload solution for the portfolio appeals system matches or mirrors the file upload interfaces from the main test administration platform. Because CAI's proposed solution is fully integrated into the test administration platform, we can guarantee a unified file upload interface and a familiar user experience. All file uploads in TIDE use the same intuitive four-step process discussed in greater detail in Section 4.7.1.3.

4.8.9.5. Reporting Data

NJDOE indicated a desire for appeal outcomes from portfolio appeals to be included in the main assessment system reporting data. CAI's proposed solution will support this requirement with minimal customization required. The existing appeal request type that we propose to extend to support portfolio appeals already includes support for sending certain score codes downstream for scoring and reporting. With the currently supported functionality, score codes are collected in TIDE and scored and reported based on business rules defined by the client. CAI will work with NJDOE to define the data elements that would be added to the main state reporting file and the requirements governing scoring.

4.8.9.6. State Requirements and Guidelines

As discussed previously in Section 4.8.9.5, CAI's proposed solution is to integrate portfolio appeals into the existing Appeals module in TIDE, the main test administration platform. This approach makes it feasible to send portfolio appeal requests downstream, along with approval or rejection status, for scoring and reporting. The main workflow would be for proctors/administrators to access TIDE to submit a portfolio appeal request for State approval. State-level users would then log in to TIDE, see an icon indicating that appeal requests are pending their review, review the portfolio appeal and supporting documentation, and either approve or reject. Once action is taken to approve or reject the request, the entire request would be sent downstream to scoring and reporting. CAI will work with NJDOE to define the data elements that would be added to the main assessment reporting file.

4.8.9.7. Portfolio Data File

NJDOE is developing a standard spreadsheet and associated data dictionary for data elements required to be submitted with a portfolio appeal for each student. CAI will work with NJDOE to define a standard file layout, including all necessary data validation rules, which would be uploaded to the portfolio system. Because CAI proposes to fully integrate the portfolio appeal request into TIDE, the main test administration platform, the exact same file upload interface, including workflow and data validation capabilities and user experience, would be used to support portfolio appeals.

4.8.9.8. Tasks

As described in the RFQ, each district and school offering portfolio appeals can define and develop tasks that will be used to assess a student's ability in specific areas of mathematics and ELA. While the portfolio system will provide an interface for tasks to be uploaded into the system, NJDOE desires a solution for districts and schools to choose to share these tasks with other districts and schools. CAI proposes the use of our Authoring system to support the

development of performance tasks for use in portfolio appeals and to support the sharing of such tasks. Performance tasks can be created in Authoring for printing and delivery offline. Please refer to Section 4.3.10 for a more detailed discussion of CAI's Authoring system.

4.8.9.9. Responses/Evidence

The RFQ describes a high-level portfolio appeal collection process through which each student completes a task, and then the response information for that task is collected by the schools in electronic or non-digital format. NJDOE's expectation is that the portfolio appeals system will provide an interface for the collected evidence to be uploaded into the system in the form of images, video, audio, PDFs, text-based files, or formatted data files. As discussed previously, the upload of task response information will be handled in TIDE. CAI recommends collecting all response files in a zip file, which allows maximum flexibility for different types and quantities of files from one request to another. CAI will work with the SCM to define the structure and parameters of the response/evidence file.

4.8.9.10. Workflows and Approval

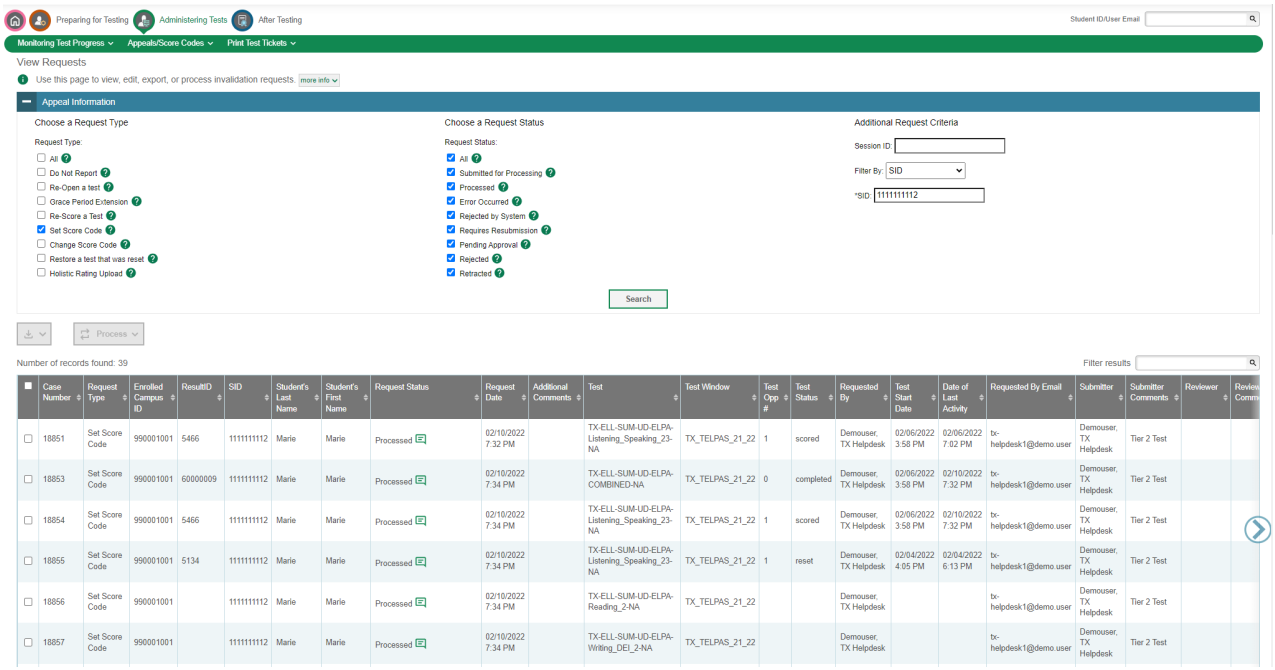
NJDOE requires that each student portfolio appeal request that is entered into the system be tracked and transitioned through a State-approved workflow of receipt, review, and ultimately approval/rejection. The TIDE Appeals feature currently supports the implementation of state-specific review and approval workflow processes through configuration. CAI will work with NJDOE to define all statuses and steps through which an appeal is processed and ensure that only appeals that are approved are to be used to indicate the student has met required proficiency levels. CAI proposes either of two options. Option one would be for all State-reviewed appeal requests to be sent downstream for scoring and reporting, whether approved or rejected. Option two would be for only State-approved appeal requests to be sent downstream for scoring and reporting. TIDE will still retain a complete searchable history of all appeal requests, both approved and rejected, for reference.

4.8.9.11. Reporting and Aggregation

NJDOE desires reports that include details of individual appeal requests as well as summary reports by district and/or school. Because CAI's proposed solution for portfolio appeals is fully integrated into TIDE, the main test administration system, several existing reporting and aggregation features can be leveraged to meet this requirement.

Exhibit 4.8.9.11-1 shows a sample appeal search results set. Various types of appeal requests can be searched and additional search criteria can be applied, such as individual student ID, submission, and submitting user. This report can be used to search and retrieve reports on a statewide basis (by authorized state-level users), district-wide (by district-level coordinators), or at the individual school level.

Exhibit 4.8.9.11-1: Appeals Search Results and Report Sample



4.8.9.12. Security

NJDOE requires a secure web-based system for portfolio appeal request management. Because CAI's proposed solution is to integrate the portfolio appeal requests into the main assessment platform (TIDE), all the same user role- and organization-based jurisdictional controls would apply to the portfolio appeal requests as to all other aspects of student assessment data management. Users would have to sign in using the SSO system before they could request or review portfolio appeal requests. Only authorized user roles would have access to submit portfolio appeal requests. Review and approval/rejection of portfolio requests can easily be limited to State personnel only. District- or school-level users having a role authorized to view portfolio requests would only be able to access requests for students falling within their jurisdiction, in other words, only in their district or their school.

Exhibit 4.8.9.12-1 shows a sample user management specification defining role-based access rules to the various appeal request types currently supported in TIDE. CAI proposes to add a Portfolio Appeal Request type to the existing types. CAI will work with New Jersey to define the user role specifications for access to the portfolio appeal request type.

Exhibit 4.8.9.12-1: Sample User Management Specification for Appeal Request Types (Partial View)

USER ROLES AND SYSTEM ACCESS				STATE	DISTRICT	DISTRICT	DISTRICT	DISTRICT	DISTRICT	SCHOOL	SCHOOL	SCHOOL	SCHOOL
				STATE	DS	DTC	DTA	DRV	DCU	CTC	CRV	OTA	PR
System	Parent Task Type	Task Type	Task Label	State Administrator (STATE)	District Superintendent (DS)	District Testing Coordinator (DTC)	District Testing Assistant (DTA)	District Report Viewer (DRV)	District Content User (DCU)	Campus Testing Coordinator (CTC)	Campus Report Viewer (CRV)	Online Test Administrator (OTA)	Principal (PR)
TIDE	Invalidations/Resets	Create Invalidations/Resets	Create Requests	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes
TIDE	Invalidations/Resets	Create Appeal Type	Do Not Report	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A	Yes	Yes
TIDE	Invalidations/Resets	Create Appeal Type	Re-Open a test	No	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Create Appeal Type	Grace Period Extension	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A	Yes	Yes
TIDE	Invalidations/Resets	Create Appeal Type	Re-Score a Test	Yes	N/A	Yes	Yes	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Create Appeal Type	Set Score Code	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A	Yes	Yes
TIDE	Invalidations/Resets	Create Appeal Type	Change Score Code	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A	Yes	Yes
TIDE	Invalidations/Resets	Create Appeal Type	Restore a test that was reset	No	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Create Appeal Type	Holistic Rating Upload	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A	No	No
TIDE	Invalidations/Resets	View Invalidations/Resets	View Requests	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes
TIDE	Invalidations/Resets	Approve Invalidations/Resets	Approve Requests	Yes	No	No	No	No	No	No	No	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Do Not Report	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Re-Open a test	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Grace Period Extension	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Segment Re-Open	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Re-Score a Test	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Set Score Code	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Change Score Code	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Restore a test that was reset	No	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Approve Appeal Type	Holistic Rating Upload	Yes	N/A	No	No	N/A	N/A	No	N/A	No	No
TIDE	Invalidations/Resets	Upload Invalidations/Resets	Upload Requests	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes
TIDE	Invalidations/Resets	Student Rating Upload	Holistic Rating Upload	Yes	No	Yes	Yes	No	No	Yes	No	No	No

4.9. Meetings

CAI understands the important role that well-organized and effectively run program meetings play in the success of a program. As part of our work, CAI will organize and convene required program meetings, including the following:

- Quarterly planning meetings
- Item writer and assessment coordinator trainings
- Content reviews
- Sensitivity and bias reviews
- Form construction and form reviews
- Statistical/data reviews
- Accommodated form reviews
- Report reviews
- Advisory meetings
- Performance standard-setting events
- Other critical program meetings as agreed by CAI and the SCM

Over the last year, CAI successfully planned and executed more than 500 meetings in more than 25 states across the country. We are well versed in the logistics and execution of virtual meetings, in-person meetings, and meetings that combine in-person and virtual elements.

Preparing for a meeting includes consideration of a variety of factors that influence the conduct of the meeting, as well as the effective dissemination and memorialization of key meeting decisions and outcomes. In preparing for each meeting, CAI will undertake the following tasks:

- **Communication and Collaboration with Stakeholders:** CAI has mature meeting management processes, access to flexible technology (Microsoft Teams, Zoom, etc.), and extensive experience communicating with meeting attendees across the educational spectrum.
- **Formal Communications and Meeting Plan:** CAI will work with NJDOE to develop a communications and meeting management plan that ensures communications with NJDOE and its stakeholders about meeting preparation, travel, conduct, and follow-up are clearly defined, accurate, and timely.
- **Materials Preparation and Planning Logistics:** The CAI Project Management Team will coordinate calendars, send and/or update meeting invitations, and prepare and distribute meeting materials for both virtual and in-person meetings.
- **Agenda Development:** A comprehensive agenda that keeps the meeting focused on relevant issues is one of the keys to a successful meeting. The CAI Project Management Team will propose CAI staffing for each meeting type and will work with the SCM to identify and confirm topics, as well as NJDOE-required and optional attendees. CAI will also designate the CAI and NJDOE representatives responsible for coordinating and leading the discussion on each topic. Meeting-specific and supplemental materials will be posted for review by NJDOE in an agreed-on format to a secure site according to mutually agreeable specifications and timelines.
- **Meeting Documentation and Action Items:** During each meeting, a record of conversations, action items, decisions, and outstanding questions will be created. The record will be reviewed and revised as needed prior to the end of each meeting. After the

meeting, any changes to meeting-specific and supplemental materials posted for review by NJDOE will be updated and/or added, as required.

As NJDOE's partner, we are committed to New Jersey's strategic goals for the assessment program and understand that these meetings represent an opportunity to socialize and refine the State's initiatives and priorities.

CAI follows a continuous improvement model approach and will incorporate lessons-learned processes throughout the year, wherein the team will conduct focused discussions and address incremental changes that will enable the program to run more smoothly. The outcome of these discussions may include updating the format and conduct of future meetings to ensure clear alignment with program goals and intended outcomes.

4.9.1. Quarterly Planning Meetings

In close collaboration with the SCM of the New Jersey Next Generation Assessment, CAI will convene four two-day planning meetings each year for up to nine NJDOE staff. Two planning meetings shall be held in person at a location approved by the SCM in New Jersey adjacent to and in advance of the biannual Technical Advisory Committee (TAC) meetings. Two additional meetings will be held at a location approved by the SCM in New Jersey or in a CAI facility. One virtual meeting may be held with at least 45 days' prior approval by the SCM.

CAI will reserve the meeting venue and necessary equipment and will provide meals and refreshments when appropriate for all attendees (see RFQ Section 4.9.20.4 for more information). CAI will cover the travel expenses for all NJDOE staff attending scheduled meetings at CAI sites.

CAI will be responsible for providing attendees with all necessary meeting communications, such as invitations, agendas, minutes, and action items. Invitations to the meeting will be provided to the SCM and all NJDOE staff attendees at least 25 business days in advance, and the agenda and meeting materials/handouts will be distributed to participants at least five business days prior to the meeting.

The first meeting will be the project launch meeting (PLM). This three-day meeting will include time to review and finalize the Preliminary Work Plan, the Preliminary Yearly Schedule, and the Preliminary Contingency Plan. Meeting deliverables will include updated schedules along with detailed meeting minutes and next steps or action items (see RFQ Section 4.2.1 for more information).

Attendees of the PLM will include the SCM and NJDOE personnel (up to 15 staff members) and members of the CAI leadership team and project team, along with key project staff leads and Measurement Incorporated (MI) project teams and leads. The CAI project team will work with the SCM and NJDOE to develop and finalize an agenda for the PLM.

4.9.2. Technical Advisory Committee Meetings

CAI considers advisory committee meetings to be an important part of a continuous improvement model. Consultations between assessment and psychometric experts and district staff can valuably enhance communication, administrative processes, and the effectiveness of assessment programs.

CAI will collaborate with NJDOE to convene three two-day-long New Jersey TAC meetings each year for up to eight TAC members, up to 12 NJDOE staff for each day of the meeting, and up to four CAI staff (psychometric or other key staff members). Two meetings will be in person in New Jersey and one meeting will be virtual. CAI will reimburse participants for any applicable mileage, meals, lodging, or other travel-related expenses in accordance with the State of New

Jersey OMB Travel Regulation (currently 20-04-OMB) and State of New Jersey Appropriations Handbook, General Provisions #41, and with any adjustments as State-directed changes are made to these documents. CAI will also process meeting time honoraria at the approved daily rate (currently $1,500).

CAI will reserve the meeting venue and necessary equipment and will provide meals and refreshments when appropriate for all attendees (see RFQ Section 4.9.20 for more information).

CAI will be responsible for providing attendees with all necessary meeting communications, such as invitations, agendas, minutes, and action items. Invitations will be provided to the SCM and all NJDOE staff participants at least 25 business days in advance, and the agenda and meeting materials/handouts will be distributed at least five business days prior to the meeting.

4.9.3. Field-Test Item Review Meetings

Requirements

The Field-Test Item Review meeting is a critical component of the item development process. As mentioned previously, New Jersey educators will have opportunities to review all ClearSight items selected for the New Jersey assessments. Additionally, custom-developed items will also be submitted to a committee of NJDOE administrators for review and approval. During the Field-Test Item Review meeting, a panel of New Jersey educators, the number and composition of which is described in the RFQ, will be charged with ensuring that all items field-tested in New Jersey schools are aligned to the New Jersey Student Learning Standards (NJSLS) and appropriate for New Jersey students.

The purpose of the Field-Test Item Review meeting is to evaluate the content of test items and related test materials prior to field testing in New Jersey. A brief training at the beginning of the meeting will remind participants to be alert for any potential bias or sensitivity issues, even though these concerns are not the main focus of their review. CAI content specialists facilitate the reviews and include NJDOE content specialists in all meetings and post-meeting resolutions. Panelists will assess the following dimensions of all items and passages:

- Alignment to the NJSLS
- Grade appropriateness
- Depth of Knowledge (DOK) or cognitive complexity of the item as compared with the complexity of the standard
- Content accuracy
- Interaction type and appropriateness (e.g., how the student responds)

In the next two sections, we describe our proposed approach to meeting the requirements of the RFQ with respect to meeting preparation and meeting format.

The proposed process described in this section is for development years following the operational spring 2026 assessment. We note that for the stand-alone field test (described in Section 4.3.11.8), which comprises ClearSight items that are operational in other states and newly developed custom New Jersey items, CAI will conduct a special Field-Test Item Review meeting with New Jersey educators likely during late spring or early summer 2025. This will allow time for items to be selected for the stand-alone field test in fall 2025. All other elements of the RFQ, including meeting preparation and format, accommodations, and meeting materials will still be followed for this special pre-stand-alone Field-Test Item Review meeting.

Meeting Preparation

CAI will provide logistical and financial support for the Field-Test Item Review meeting, handling arrangements for the meeting venue and covering travel costs and other appropriate meeting expenses. CAI will work with NJDOE to plan the meeting and will draft an agenda for NJDOE's review, revision, and approval. CAI will organize and coordinate services for meeting participants; develop and distribute communications with attendees; track participant registration; and process stipends and receipts to ensure proper reimbursement. CAI's project team will work with NJDOE to schedule, coordinate, and staff the meeting with panelists who can meet the reviewing goals established by NJDOE. Decisions made during the meeting will be recorded in the appropriate specifications document and in the meeting minutes.

Meeting Format

All content reviews of field-test items are conducted directly within CAI's Item Tracking System (ITS), which is described in greater detail in Section 4.11.2. These reviews ensure item security by providing meeting participants with a login and password that enable access only during the meeting and only to items that are part of the review. Participants can interact with the items exactly as a student would in the testing environment. In addition, they can score items and see item-level alignment, DOK information, option rationales, and item rubrics within ITS's content rater system.

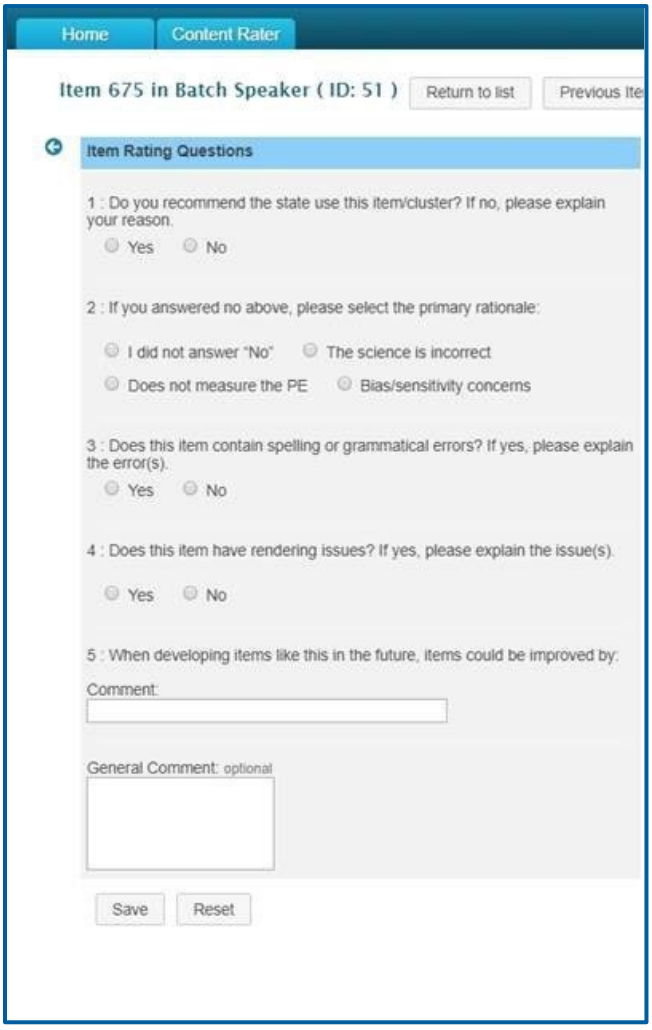
Meeting participants will use the content rater interface to view items, answer review questions, and provide other feedback on each item assigned to them. In the content rater system, as shown in Exhibit 4.9.3-1, users are assigned batches of items. Each item has an associated set of questions that are

- dependent on the purpose of the meeting; and
- customizable to NJDOE preferences (including Likert scale, "yes"/"no," and open-ended comments).

As they review the items in their assigned batches, the panelists record their comments and recommendations in ITS, where CAI facilitators can monitor participants' progress, review comments in real time, and identify items that need additional moderation or discussion. All meeting participants will then review the comments as a group, and final changes will be relayed to NJDOE for determination of item promotion or item rejection. Final decisions on all items will be documented directly in ITS. We will be happy to provide NJDOE with a final report as an export from ITS at the conclusion of each meeting.

Any custom-developed New Jersey items that are reviewed will undergo a resolution process that involves NJDOE staff in the final decisions on and outcomes of content changes.

Exhibit 4.9.3-1: An Example of Questions in the ITS Content Rater System



At the conclusion of each Field-Test Item Review meeting, CAI will take full advantage of ITS's powerful reporting capabilities for item pool management and status to provide NJDOE with a summary report. Summary reports can be generated to show the history of an item's review at each step in the ITS review process and can also cover a group of items associated with a stimulus to obtain a quick count of items by DOK, standard, interaction type, or any other customizable attribute.

CAI will collaborate with NJDOE to conduct the Field-Test Item Review meeting on an annual basis. CAI has more than 20 years of experience facilitating this type of committee review across more than 27 states, and our test development staff are well versed in ensuring that teachers' voices are heard while keeping meetings on track to complete reviews within the timeframe required by the RFQ. Furthermore, we agree to fulfill all RFQ requirements related to meeting participants, materials, and associated costs.

CAI facilitators will provide overall training on the item content review process, track the progress and feedback of the meeting participants, assist with specific content questions, and keep the panelists on track to complete their review assignments. CAI's test development manager will attend all meetings to provide additional expertise.

CAI will identify any reference materials that NJDOE wishes to provide to educators during item review. Training materials used by educators within the meeting rooms may include the following:

- NJSLS for the specific content area and grade
- Item specifications for that content area and grade
- DOK explanation document
- For mathematics items, the reference sheet provided to students in that grade
- For mathematics items, the calculator policy document for students in that grade
- For English language arts (ELA) items, information on stimulus passages, including word count

Participants will be asked to review items individually within the content rater system, and CAI will facilitate group discussion of items once reviews of individual items are complete. CAI staff will take notes directly in ITS on the group discussion of each item and will record any final consensus—such as Accept, Accept with Revisions, or Reject—reached by the panel. CAI will resolve any outstanding content-related comments and then provide the finalized item to NJDOE administrators, who will determine whether to accept or reject it.

The four typical outcomes for an item include the following:

1. **Accept as Appears**: The item/item cluster is accepted as is, with no additional edits.
2. **Accept as Revised**: The item/item cluster is accepted with minor additional edits that are clearly documented in ITS.
3. **Revise and Resubmit**: The panel requests that CAI make further edits to the item and then resubmit the revised item. All edits are documented clearly in ITS.
4. **Reject**: The panel does not approve the item/item cluster and eliminates it from the review process with New Jersey educators.

As previously noted, summary reports can be generated from ITS after the conclusion of any content review meeting and provided to NJDOE. CAI and NJDOE will then meet to review all recommended item outcomes. Once all ClearSight member states have completed their Field-Test Item Review, CAI will consider the feedback from each panel when making edits. The State can then review items again to ensure that approved edits have been correctly incorporated. NJDOE will have the final say on all item-level and stimulus-level outcomes, and CAI staff will document NJDOE's final recommendations directly in ITS. As soon as an outcome is recorded in ITS, the item or stimulus moves to an appropriate level based on the State's final decision.

Accommodations

CAI is prepared to organize Field-Test Item Review meetings in person, but optionally, we have the capability and experience in conducting these meetings virtually or in a hybrid setting of in person and virtual for any reason as dictated by the SCM. Since 2020, CAI has successfully led meetings virtually across most of our partner states.

We have used multiple platforms for conducting virtual meetings with educators, including Microsoft Teams and Zoom. Both platforms allow for large-group trainings and smaller breakout rooms for subject and grade/grade-band groupings. Additionally, NJDOE staff can move easily among the breakout rooms to observe educator discussion around the items.

For virtual meetings, participants will use the content rater system and are assigned an individual login for review that will expire at the conclusion of the meeting. CAI has experience conducting virtual item reviews in two different formats:

1. Review items/passages "in real time," similar to an in-person meeting. We can require attendees to participate with video cameras on to add an enhanced layer of security.

2. Review items/passages at their own pace and then return on certain days/times to discuss items/passages with concerns. Because there is a more “open-ended” nature to this structure, we would advise a daily security and confidentiality reminder to all participants.

CAI staff will be available to assist participants remotely with any login issues or questions about technology. CAI staff will also monitor the content rater activity to ensure that participants are working at an acceptable pace. CAI has also worked with our partners to use web monitoring services as an added security measure for virtual meetings and test administration to ensure that test content reviewed during virtual meetings does not soon thereafter appear on any online forums. All documentation required by the RFQ would still occur in ITS.

Meeting Materials

CAI will prepare in advance an agenda, items for analysis, scoring rubrics, manuals, and other meeting materials. CAI will ensure that all such materials are provided to NJDOE for review and approval at least 90 calendar days prior to the meeting, with final, approved meeting materials provided at least five days prior to the start of the meeting. Afterward, within two weeks of the meeting’s end, CAI will provide NJDOE with documentation that includes attendance logs, evaluations, and discussion and decision summaries.

4.9.4. English Language Arts Passage Review Meetings

For the newly developed ClearSight content, as well as any newly developed custom New Jersey content, passages will be reviewed during the item review meetings by New Jersey educators. This section describes how CAI plans to conduct the passage review meetings needed for newly developed New Jersey custom content.

CAI’s passage review sequence will include CAI content experts, NJDOE staff, and New Jersey educators and subject-matter experts (SMEs). All stimuli undergo a rigorous internal review before they are submitted to NJDOE. Passage finders must first submit passages for senior content preview and approval before each passage proceeds through a preliminary content review, a group review, and a second senior review. At every review level, SMEs review the passages alongside passage complexity charts and passage maps, as described in Section 4.5.2.1.

Additionally, CAI conducts accessibility reviews at all levels of internal review. As described in Section 4.5.2.1, CAI passage writers and finders follow the principles of universal design when procuring passages for NJDOE to ensure that the selection of passages are accessible and non-biased; allow for maximum readability and comprehensibility; and are amenable to accommodations, where appropriate.

Approved passages will then be submitted to NJDOE according to an agreed-upon passage-review schedule. Only passages approved by NJDOE will then be submitted to the committee of New Jersey educators and SMEs for passage review. Following passage review, CAI will develop items associated with these passages.

CAI is prepared to facilitate the ELA passage review in person. Because our Item Tracking System (ITS) is entirely web based, it is easy for CAI to make these materials available for NJDOE review prior to ELA passage review meetings. Using ITS, CAI can distribute passage lists to NJDOE prior to meetings so that NJDOE can prepare. Online materials also grant CAI and NJDOE the ability to limit access to passages, if desired; only users with access to certain review levels will be able to review and comment on passages, thereby increasing security and accountability. Further, as we describe in Section 4.9.3, we can also support virtual meetings. We refer the reader back to that section for specific details about how we will utilize a web-based video/audio conference system, as well as the use of ITS when meetings are conducted virtually.

CAI will be responsible for all logistics and stipends. The committees shall comprise eight local educators and SMEs; one NJDOE staff member; and three committees, with one committee each for grades 3–5, 6–8, and 9/GPA, who will meet concurrently for up to five days. Additionally, CAI will support a second meeting each year—up to three days per committee (as described)—should NJDOE require verification and approval of requested changes from the first meeting. Experienced CAI staff will facilitate these meetings in collaboration with NJDOE.

As mentioned in Section 4.9.3, CAI recommends the use of the content rater system. By using this system, NJDOE can provide feedback on individual passages and stimuli. This feedback can be generated as a Microsoft Excel spreadsheet that can be distributed to NJDOE. Exhibit 4.9.4-1 denotes some of the potential information (metadata) available to the passage review committee as part of their review. Prior to passage development, CAI will work with NJDOE to determine the metadata that should be documented for each passage; what is shown to the committee is configurable.

Exhibit 4.9.4-1: Examples of Metadata Provided for ELA Passage Review

Stimulus Properties	
Subject	ELA
ITS ID	113
Description	The Creator of Oz
Stimulus Attributes	
Extended Description	Short biography of L. Frank Baum.
Grade	5
Subject	Reading
Stimulus Type	Informational
Stimulus Subtype	Biography
Discipline Alignment	History/Social Studies
Text Structure	Chronology/Sequence
Paired	No
Author	Shawn Hoffelt
Word Count	733
Length	Long
Lexile	1040L
Lexile Range	Top
Passage Complexity	Medium
Main Character Gender	Male
Stimulus Permission	Permissioned
Shared With	Arizona_Practice
Braille	BRF_UEB
Stimulus Source #1	Hoffelt, S. (2000). The creator of Oz. Highlights for Children 55(10), 26. (http://www.highlightskids.com/stories/creator-oz)
Stimulus #1 Permission	Permissioned

CAI confirms that all required metadata, as noted in the RFQ, will be included in ITS for participants.

Prior to the meeting, CAI will provide NJDOE with sample questions that participants can use to guide their reviews, including ensuring accessibility of passages for all students. Exhibit 4.9.4-2 denotes sample questions that can be modified to meet the needs of NJDOE.

Exhibit 4.9.4-2: Sample Guiding Questions for ELA Passage Review

1. Is the reading load and linguistic complexity appropriate for the grade and subject?
   - Yes
   - No
2. Is the passage or prompt free of content errors?
   - Yes
   - No
3. Does the prompt align with the intended standard? [for prompts only]
   - Yes
   - No
4. Is there adequate evidence from the text for a student to respond to the prompt? [for prompts only]
   - Yes
   - No
5. Is the passage or prompt free from bias related to the following areas: Stereotyping; Sensitive or Controversial Material; Advice; Dangerous Activities; Population Diversity; Language Accessibility and Linguistic Features; Illustrations and Graphics
   - Yes
   - No
6. Is this passage or prompt free of specific experiences or required background knowledge (unrelated to the content) that students of this grade/age may lack?
   - Yes
   - No
7. Is the passage or prompt free of topics and keywords related to current events that may cause a student anxiety?
   - Yes
   - No
8. Recommendation:
   - Accept as is
   - Accept with revisions
   - Reject

4.9.5. Range Finding Meetings (Operational Items)

Rangefinding of Operational Constructed-Response Items

Rangefinding is a key step in the development of scoring materials and in ensuring a consistent interpretation of scoring rubrics and determining consensus scoring. As such, MI has refined a virtual meeting model that facilitates a highly interactive, consensus-building process. MI has developed a remote Rangefinding Score Validation (RSV) system, an online application that allows the scoring team to facilitate rangefinding virtually at times convenient for educators and without requiring them to travel. Conducting rangefinding remotely eliminates costs for travel, hotels, and meals. RSV and remote meetings allow for more flexibility in educator scheduling since rangefinding can be held on nonconsecutive days, conducted during variable hours during the day, and paused as needed.

RSV allows MI's staff to select rangefinding responses, combine them into sets, and present them to educators in a secure, password-protected, online environment. This process works exactly like in-person rangefinding. By using RSV in combination with a remote meeting application, such as Microsoft Teams, rangefinding committees can discuss responses in real time while also being able to pause as needed.

RSV stores committee scores and comments and clearly identifies the consensus score for each response. The system provides a secure resource library of constructed-response items (CRIs), rubrics, and supplemental materials, and allows for easy reference to previously scored responses that may require further discussion. After rangefinding is complete, the responses and scores can be exported to develop training materials. Exhibit 4.9.5-1 summarizes this process.

Exhibit 4.9.5-1: Overview of Operational Rangefinding Process for NJSLA-ELA/M and NJGPA

Phase of Work	Description of Activities
Prepare for Rangefinding	• Select 100 sample student responses per item for use during the rangefinding meetings • Receive feedback on sample student responses from NJDOE • Recruit meeting participants • Select facilitators for the rangefinding meetings • Create and distribute secure usernames and passwords to meeting participants
Conduct Rangefinding Meetings	• Oversee meeting logistics • Provide training on the use of RSV • Facilitate rangefinding meeting groups • Keep detailed notes on responses selected by the committee for inclusion in the scorer training materials • Ask participants to complete an end-of-meeting survey
Secure Approval of Training Materials	• Submit draft anchor sets, training sets, and qualification sets (training materials) to NJDOE • Revise training materials based on feedback • Submit final drafts of training materials for review and approval • Reimburse meeting participants for travel expenses and pay honoraria

NJDOE will receive accurate scores for student responses to CRIs because MI conducts a thorough rangefinding of operational items prior to operational testing. This activity will yield the anchor sets, practice sets, and qualification sets that MI will use to score each item.

To prepare for rangefinding for the NJSLA-ELA/M and NJGPA, MI's scoring manager, Cindi Brown will work with NJDOE to finalize the logistics for the rangefinding meetings. For virtual rangefinding, MI will provide the following:

- Secure usernames and passwords for access to RSV
- Training on how to use RSV
- A method for distributing daily honoraria and/or substitute reimbursement

Exhibit 4.9.5-2 summarizes the scope of the rangefinding meetings.

Exhibit 4.9.5-2: Scope of Work for Operational Rangefinding Meetings

Requirement	Amount and Unit	Total Amount and Unit
Committees	One per grade and content area	14 committees
Participants	Five per committee	70 total participants
Days	Five per committee	70 total days of meetings

Participants in rangefinding meetings for the NJSLA-ELA/M and NJGPA will be able to focus on their activities because MI takes care of the logistics and reimburses participants for their expenses in a timely manner.

Ms. Brown will work with NJDOE to recruit rangefinding meeting participants. MI's goal is to select participants for rangefinding committees that have both a deep understanding of the test content and represent the diversity of the student population in New Jersey. MI anticipates that NJDOE will provide lists of approved participants for the rangefinding committees.

Rangefinding meetings for the NJSLA-ELA/M and NJGPA will be held concurrently and led by MI's scoring directors. The meetings will begin with a discussion of the goals for the meetings. The scoring directors will provide each participant with a detailed meeting agenda and will use the agenda to monitor the pace of work.

An MI Technology Manager will provide training on the use of RSV. The scoring directors will then facilitate a discussion of the item content and scoring rubric for each item before rangefinding participants begin scoring responses. Participants will score a collection of student responses independently, after which the scoring directors will facilitate discussion amongst participants about their rationales for the score they selected for each response. From these discussions, the scoring director will ask the participants to arrive at a consensus score. Participants will also identify any responses they believe should be used as anchor set exemplars.

MI's scoring directors will be responsible for documenting scoring rationales, compiling scores assigned by participants, tracking which responses should be used in training, and compiling consensus scores. Ms. Brown will also participate in the rangefinding meetings and provide support.

After the rangefinding meetings, MI's scoring directors will use committee-scored responses to construct for each CRI the materials shown in Exhibit 4.9.5-3.

Exhibit 4.9.5-3: Materials Development Following Operational Rangefinding Meetings

Document Name	Description
Anchor Sets	Anchor sets for NJSLA-ELA/M and NJGPA CRIs will contain stimulus materials, the prompt, and the scoring rubric. Responses in the anchor set will be annotated and will clarify the differences in performance at each score point. The number of responses included in the anchor set will vary based on the score point range and complexity of the item. The anchor sets are developed for operational test items prior to field testing but are revised (if needed) based on the results of the operational rangefinding.
Training Sets	Training sets will allow scorers to assign scores to responses using the scoring criteria outlined in the rubric and exemplified in the anchor set responses and annotations. They will typically include 10 responses that present all score points.

Document Name	Description
Qualifying Sets	Qualifying sets will determine the eligibility of scorers to score live responses. Qualifying sets will include 10 responses per set. Scorers must achieve a minimum exact agreement rate, determined by NJDOE, on at least one of the two qualification sets, with no non-adjacent scores.

NJDOE will receive accurate scores for student responses to CRIs because MI's scoring experts will construct the materials necessary to properly train scorers.

4.9.6. Range Finding Meetings (Field-Test Items)

Rangefinding of Field-Tested Constructed-Response Items

On behalf of NJDOE, MI will conduct rangefinding of new constructed-response items (CRIs) that are field-tested on the NJSLA-ELA/M and NJGPA. During rangefinding, MI's scoring team will use the scoring rubric and any other client-provided material to identify student responses that could serve as high-quality exemplars within anchor sets and training sets. Then, MI will work with NJDOE and committees of New Jersey educators to conduct rangefinding meetings. Exhibit 4.9.6-1 summarizes the rangefinding process.

Exhibit 4.9.6-1: Overview of Field Test Rangefinding Process for NJSLA-ELA/M and NJGPA

Phase of work	Description of activities
Prepare for Rangefinding	• Select 30 sample student responses per item for use during the rangefinding meetings • Recruit meeting participants • Select facilitators for the rangefinding meetings • Create and distribute secure usernames and passwords to meeting participants
Conduct Rangefinding Meetings	• Oversee meeting logistics • Provide training on the use of the Rangefinding Score Validation (RSV) system • Facilitate rangefinding meeting groups • Keep detailed notes on responses selected by the committee for inclusion in the scorer training materials • Ask participants to complete an end-of-meeting survey
Secure Approval of Training Materials	• Submit draft anchor sets and training sets (training materials) to NJDOE • Revise training materials based on feedback • Submit final drafts of training materials for review and approval • Reimburse meeting participants for travel expenses and pay honoraria

NJDOE will receive accurate scores for student responses to CRIs because MI conducts a thorough rangefinding of new items following field testing. This activity will yield the anchor sets, practice sets, and qualification sets that they will use to score each item.

To control the costs of administering the NJSLA-ELA/M and NJGPA, MI's scoring manager, Ms. Brown and MI will conduct rangefinding meetings online. MI has developed a remote Rangefinding Score Validation (RSV) system, which allows the scoring team to conduct online rangefinding at times that are convenient for educators and that do not require them to travel. Remotely conducting meetings eliminates costs for travel, hotels, and meals. RSV and remote

meetings allow for more flexibility in educator scheduling since rangefinding can be held on non-consecutive days, conducted during variable hours during the day, and paused as needed.

RSV allows MI's rangefinding staff to select responses, combine them into sets, and present them to educators in a secure, password-protected, online environment. This process works exactly like in-person rangefinding. By using RSV and a remote meeting application, like Microsoft Teams, rangefinding committees can discuss responses in real time while also being able to pause as needed.

RSV stores all committee scores and comments, and clearly identifies the consensus score for each response. The system provides a secure resource library of CRIs, rubrics, and supplemental materials, and allows for easy reference to previously scored responses that may require further discussion. After rangefinding is complete, the responses and scores can be exported to develop training materials.

To prepare for rangefinding for the NJSLA-ELA/M and NJGPA, Ms. Brown will work with NJDOE to finalize the logistics for the rangefinding meeting. For virtual rangefinding, MI will provide

- secure usernames and passwords for access to RSV;
- training on how to use RSV; and
- a method for distributing daily honoraria and/or substitute reimbursement.

Exhibit 4.9.6-2 summarizes the scope of the rangefinding meetings.

Exhibit 4.9.6-2: Scope of Work for Field-Test Rangefinding Meetings

Requirement	Amount and unit	Total amount and unit
Committees	1 per grade and content area	14 committees
Participants	5 per committee	70 total participants
Days	3 per committee	42 total days of meetings

MI takes care of the logistics and reimburses participants for their expenses in a timely manner so that participants in rangefinding meetings for the NJSLA-ELA/M and NJGPA will be able to focus on their activities.

Ms. Brown will work with NJDOE to recruit rangefinding meeting participants. MI's goal is to select participants for rangefinding committees that have both a deep understanding of the test content and represent the diversity of the New Jersey student population. MI anticipates that NJDOE will provide lists of approved participants for the rangefinding committees.

Rangefinding meetings for the NJSLA-ELA/M and NJGPA will be held concurrently and led by MI's scoring directors. The meetings will begin with a discussion of the goals for the meetings. They will provide each participant with a detailed meeting agenda, and scoring directors will use the agenda to monitor the pace of work.

An MI Technology Manager will provide training on the use of RSV. The scoring directors will then facilitate a discussion of the item content and scoring rubric for each item before rangefinding participants begin scoring responses. Participants will independently score a collection of responses, after which the scoring directors will facilitate discussion amongst participants about their rationales for the score they selected for each response. From these discussions, the scoring director will ask the participants to arrive at a consensus score. Participants will also identify any responses they believe should be used as anchor set exemplars.

MI's scoring directors will be responsible for documenting scoring rationales, compiling scores assigned by participants, tracking which responses should be used in training, and compiling

consensus scores. Ms. Brown will also participate in the rangefinding meetings and provide support.

After the rangefinding meetings, MI's scoring directors will use committee-scored responses to construct for each CRI the materials shown in Exhibit 4.9.6-3.

Exhibit 4.9.6-3: Materials Development Following Field-Test Rangefinding Meetings

Document Name	Description
Anchor Sets	Anchor sets for NJSLA-ELA/M and NJGPA CRIs will contain stimulus materials, the prompt, and the scoring rubric. Responses in the anchor set will be annotated and will clarify the differences in performance at each score point. The number of responses included in the anchor set will vary based on the score-point range and complexity of the item. The anchor sets are developed for operational test items prior to field testing of the item, but are revised (if needed) based on the results of the operational rangefinding.
Training Sets	Training sets will allow scorers to assign scores to responses using the scoring criteria outlined in the rubric and exemplified in the anchor set responses and annotations. They will typically include ten responses that present all score points.

NJDOE will receive accurate scores to student responses to NJSLA-ELA/M/M and NJGPA CRIs because MI's scoring experts will construct the materials necessary to properly train scorers.

Scoring Field-Tested Constructed-Response Items After Rangefinding

After rangefinding, MI's scoring team will assemble field-test training materials that include an anchor set and training set for each item. Following approval of the training materials for the field-tested CRIs, their scoring team will score enough student responses from the field test to generate valid and reliable field-test item statistics. MI will use the same process to score field-test items that they do for operational items.

Over MI's more than forty years of experience scoring CRIs like those found in the NJSLA-ELA/M and NJGPA, they have been able to retain a significant percentage of their scoring leadership from year to year. They anticipate providing the same consistency for the NJSLA-ELA/M and NJGPA, which means that they will have consistent leadership between operational and field-test scoring. In addition, only scorers who have successfully trained, qualified, and accurately scored operational items will be invited to score field-test responses.

4.9.7. Sensitivity and Bias Review Meetings

The Bias and Sensitivity Committee's role is to ensure that tests are fair for all student populations so that all students have an equal opportunity to demonstrate their knowledge of the New Jersey Student Learning Standards. The purpose of the bias and sensitivity review meeting is to allow the Bias and Sensitivity Committee to review and evaluate test items and related test materials for issues of potential bias and sensitivity. These committees often meet at the same time as other groups, such as Item Review Committees and Item Data Review Committees.

There are three variations of the bias and sensitivity review meetings.

1. Review newly developed ClearSight content prior to field testing
2. Review newly developed New Jersey custom-owned content prior to field testing
3. Review previously field-tested content along with relevant data

New Jersey educators will be an integral part of the review process regardless of whether New Jersey is using ClearSight items or its own custom-developed items. Should NJDOE decide to develop custom items, we will follow the review process as outlined for custom item development in the following paragraphs and as requested in the RFQ. When New Jersey educators review ClearSight items, reviews will be conducted on the passages and the items at the same time. For all previously field-tested items, we propose that educators review the ClearSight items and any custom-developed items, along with their data, at the same time and following the same criteria and process.

Prior to the Bias and Sensitivity Committee meetings, CAI's experienced bias and sensitivity facilitators will conduct two one-day trainings to prepare individuals who will serve on the committee. Participants can opt to attend one of the two trainings. CAI facilitators will train Bias and Sensitivity Committee members to consider and identify issues that might be sensitive in passages and items based on the wide range of cultural, regional, philosophical, and religious backgrounds of the State's students. Committee members are trained with CAI's language accessibility and bias and sensitivity (LABS) review guidelines to ensure that all items are free from bias and sensitive topics are avoided wherever possible.

During the bias and sensitivity review meetings, CAI's facilitators will ask committee members to consider and identify passages and/or items that inadvertently demonstrate bias (e.g., racial, ethnic, gender, geographic) in some way. Furthermore, committee members ensure that all items are accessible to all students by examining language accessibility (e.g., grade-level-appropriate language for all students) and accessibility for students with visual and/or hearing impairments. Any passages or items that demonstrate issues of bias or sensitivity will be revised, when possible, or removed from further consideration. CAI will work closely with NJDOE to attract a diverse make-up of participants to serve on the Bias and Sensitivity Committee, one that reflects the diverse population of the State.

Evaluating for Bias and Sensitivity at Various Points of Item Development

CAI will convene committees for and conduct meetings in the content areas of English language arts (ELA) and mathematics for the following tasks: ELA passage review, ELA item review, and mathematics item review. Each committee will consist of up to 12 local educators/subject-matter experts and one NJDOE staff member. CAI will ensure that participant breakdown, committee composure, and meeting duration for both subject areas are followed, as specified in the RFQ. CAI will accommodate two additional meetings as needed and as approved throughout the item development cycle.

Bias and Sensitivity Committee reviews occur at three points of annual custom item development:

1. *First round*: Review all ELA passages (texts and multimedia) prior to the beginning of item development. Any passages that are found to have issues of bias or sensitivity will not be eligible for item development.
2. *Second round*: Review ELA and mathematics items and tasks to ensure that they are free from issues of bias and sensitivity prior to becoming eligible for field testing.
3. *Third round*: After field testing, the Bias and Sensitivity Committee will meet again to review relevant item statistics from a bias and sensitivity perspective. This meeting can be held concurrently with a content-focused data review committee.

Meeting to Evaluate for Bias and Sensitivity Informed by Field-Test Data

At the start of the data review meeting, CAI psychometric staff will lead all participants in a formal training to familiarize them with the purpose of a bias and sensitivity data review and the meanings of the various flags.

The training will include group review of item cards, which detail specific item attributes (including grade level and alignment to State standards), item content and rubric, and various item statistics. Participants will review the items and view relevant statistics associated with them. The three main statistics that are addressed are item difficulty, item quality, and differential item functioning (DIF). Item difficulty is referred to as the *p*-value of an item. Item quality is referred to as the correlation between a high-scoring student and his or her performance on that item. DIF references the different subgroups of students and flags items that show potential bias between subgroups. These subgroups include male/female, English learner (EL)/non-EL, White/Black, White/Hispanic, students with disabilities/students without disabilities, and other subgroups determined by CAI and NJDOE.

Meeting Logistics

As with other meetings, CAI will be responsible for meeting logistics, including securing suitable venues for in-person meetings and meals and refreshments for in-person meeting attendees. CAI will send invitations to the SCM and NJDOE staff at least 90 days before the meetings and can accommodate a shorter timeframe to send invitations as needed. Agendas will be distributed to the SCM and all NJDOE staff identified to be in attendance. Invitees will receive meeting agendas and the materials necessary to prepare for the meeting. Finally, as we describe in our response in Section 4.9.3, we can effectively support in-person and virtual meetings. We refer the reader back to that section for specific details about how we will use a web-based video/audio conference system as well as the use of our Item Tracking System (ITS) when meetings are conducted virtually.

CAI's Bias and Sensitivity Training Materials

CAI's training materials for item and passage writers and reviewers are substantial and include the complete set of standards that the stimuli will support, subject-specific information, and how to use our proprietary item development platform efficiently, in addition to fairness guidelines and considerations. NJDOE will review and approve all materials in advance of Bias and Sensitivity Committee meetings, and CAI will work with NJDOE to compile a list of sensitive topics specific to the State's diverse population of students.

Bias and sensitivity and language accessibility are fundamental aspects of item and passage writing and reviewing. Detailed guidelines give concrete instructions and annotated examples, including the following:

- Avoid stereotyping.
- Avoid sensitive or controversial topics.
- Avoid giving advice.
- Reflect population diversity while avoiding ethnocentrism.
- Avoid contexts that are differentially familiar.
- Ensure that all stimuli are written with language accessibility in mind.

CAI's LABS guidelines are used by CAI writers and can be tailored to New Jersey Bias and Sensitivity Committee workshops. The following topics are among those covered:

1. Stereotyping
2. Sensitive or Controversial Material
3. Advice
4. Dangerous Activities
5. Population Diversity
6. Differential Familiarity/Elitism
7. Language Use
8. Linguistic Features/Language Accessibility
9. Illustrations and Graphics

CAI's Effective Content Rater System

As with item reviews, CAI recommends that participants in Bias and Sensitivity Committees review items and passages individually in the content rater system. The functionality of the content rater system will log each committee member's review outcome of Accept as Appears, Accept as Revised, or Reject with any relevant comments, although more specific rating questions can be tailored for the Bias and Sensitivity Committee review process. CAI will then facilitate discussion as a group when individual reviews are complete and take notes about any group discussions regarding an item directly in the content rater system. CAI will also note in the content rater system the final consensus made by the committee for each passage and item after these discussions. Facilitators will meet with NJDOE to resolve any items where the committee could not come to a consensus. At the end of the meeting, and at any time during the item development process, reports can be retrieved to review the results of a committee's progress or to prepare reports about final decisions.

4.9.8. Statistical Item (Data) Review Meetings

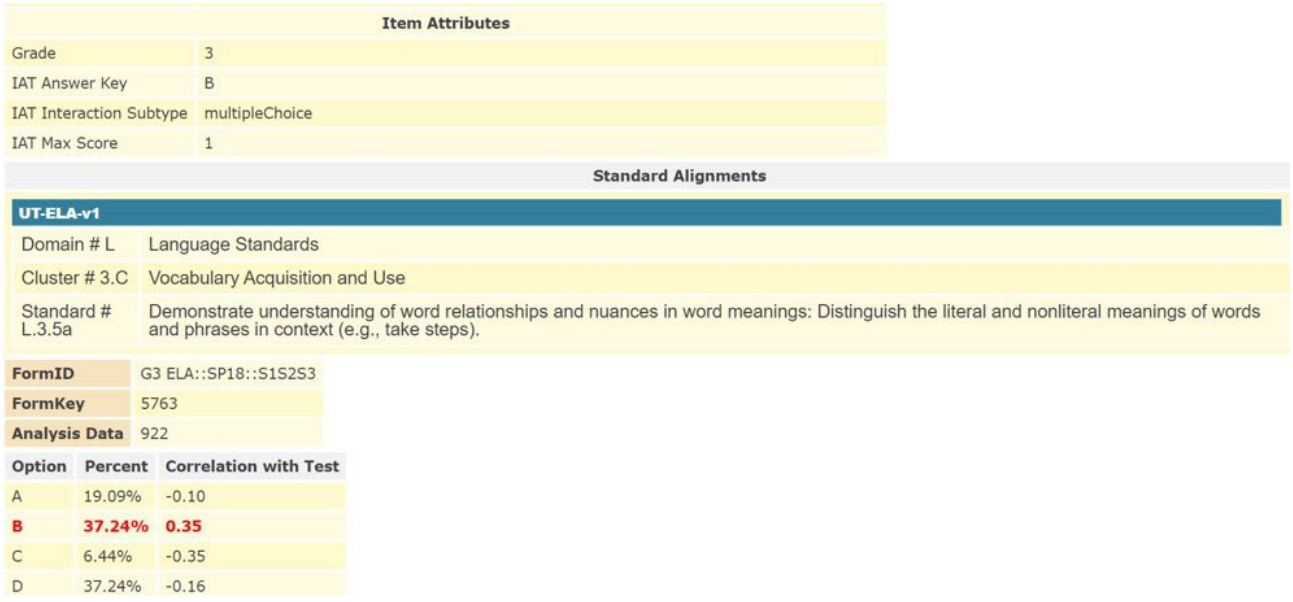
At the start of the virtual statistical item data review meeting, CAI psychometric staff will lead all participants (who are specified in the RFQ) in a formal training to familiarize them with the item development process, the purpose of data review, the meanings of the various flags, and how a data review committee operates. The training will include a group review of item cards, which detail specific item attributes (including grade level and alignment to State standards), the item's content and rubric, and the various item statistics. Participants will review items and view all statistics associated with each item. Additional information about how we will support this virtual meeting can be found in Section 4.9.3.

The three main statistics that are addressed are item difficulty, item quality, and differential item functioning (DIF). Item difficulty is referred to as the *p*-value of an item. Item quality is referred to as the correlation between a high-scoring student and the student's performance on that item. DIF references the different subgroups of students and flags items that show potential bias between subgroups. These subgroups typically include male/female, English learner (EL)/non-EL, white/black, white/Hispanic, students with disabilities/students without disabilities, and other subgroups determined by CAI and NJDOE.

As with the previously discussed item reviews, CAI recommends that Data Review Committees be conducted using CAI's content rater system in the Item Tracking System (ITS). With data review, the content rater system also enables educators to see the online "item card" stored alongside each item in ITS. Exhibit 4.9.8-1 contains a screen capture of a sample online item card. CAI can customize content rater system questions to the data review process and then use the system to capture individual educator decisions about items at data review. CAI will

then facilitate group discussion of the item data once individual reviews are complete. CAI will record notes directly into ITS on any group discussions of the item data. CAI will also note in ITS any final consensus reached by the committee and then meet with NJDOE to resolve any items on which the committee could not reach a consensus. Any items rejected by NJDOE and meeting participants at data review will be removed from the New Jersey operational item pool.

Exhibit 4.9.8-1: Sample Content Rater Screen Capture for Item Data Review Meeting



Item Attributes	
Grade	3
IAT Answer Key	B
IAT Interaction Subtype	multipleChoice
IAT Max Score	1

Standard Alignments	
UT-ELA-v1	
Domain # L	Language Standards
Cluster # 3.C	Vocabulary Acquisition and Use
Standard # L.3.5a	Demonstrate understanding of word relationships and nuances in word meanings: Distinguish the literal and nonliteral meanings of words and phrases in context (e.g., take steps).

FormID	G3 ELA::SP18::S1S2S3
FormKey	5763
Analysis Data	922

Option	Percent	Correlation with Test
A	19.09%	-0.10
B	**37.24%**	**0.35**
C	6.44%	-0.35
D	37.24%	-0.16

4.9.9. Forms Construction Meetings

CAI knows that test development is a balance between expert judgment, robust content, and statistical requirements. While the item-adaptive assessment we are proposing for NJSLA does not require forms construction, the accommodated paper-pencil form for NJSLA does. In addition, the NJGPA will require a recurring forms construction process.

Should NJDOE decide to build both the NJSLA accommodated paper-pencil form and the NJGPA fixed form, we will conduct an educator in-person meeting to ensure that all requirements laid out in the RFQ are met. The focus of the meeting will be to construct the forms required for each of these testing events.

During this stage, the CAI content team will facilitate an in-person meeting with CAI psychometricians; the NJDOE content team; NJDOE researchers and psychometricians; and New Jersey educators and subject-matter experts (SMEs). CAI will ensure that all participants have access to the items and criteria outlined in the RFQ.

During the forms construction meeting, CAI content and psychometric teams will work with committee members to create proposed forms that meet the blueprint and statistical requirements of the test specifications. CAI proposes using our Form and Test Engineering Suite (FTES) for this process. All items can be verified using our Item Tracking System (ITS) web preview functionality, where committee members will take on a “student role” and ensure that all items can be answered by the student with the given tools and functionality of the item. After this step, CAI will provide NJDOE with all guiding documents related to the proposed forms, including the specifications, actual blueprint (how they met the specifications) and statistics, and projected raw cuts.

NJDOE content and psychometric teams will review the first draft of forms and recommend changes. While this step is owned by NJDOE, CAI content and psychometric teams will be

available to answer any questions. NJDOE will have direct access to the proposed forms in ITS, which will allow for an efficient and effective form review by NJDOE. Further, meeting results and documentation will be provided after the conclusion of this meeting, including any educator judgment forms, forms construction notes, and all specifications and statistics.

4.9.10. Forms Review Meetings

Prior to the Forms Review Meetings, CAI content and psychometric staff will ensure that forms created during the Forms Construction Meeting adhere to the blueprint and statistical requirements from the test specifications. After the forms have been reviewed and signed off on by both CAI and NJDOE staff, they will be presented to educator committees at the Forms Review Meetings. The focus of these meetings will be to review the selected passages and items for their content, fairness, alignment, and position within the form.

At the start of the meeting, CAI's content test developer will train participants on the review process, which will be approved by NJDOE.

As with many of our other educator meetings, CAI recommends that the Forms Review Meetings be conducted using laptops signed in to CAI's content rater system in the Item Tracking System (ITS). Through this secure online system, educators will be able to interact with items from the students' perspective and will be able to view metadata for each item, such as standard alignment, rubrics, and option rationales. Educators will be prompted to select an outcome for each item, such as accept, accept with edits, and reject. In addition, they will have the opportunity to provide written feedback by answering questions that can be customized for the specific form. Examples of these questions include:

- Does the question have one and only one correct answer?
- Does the question clue within the same form?
- Are the passages and items fair and appropriate for students in the intended grade?
- Does the form adequately measure each concept?
- Can students respond appropriately to open-ended and technology-enhanced items?

NJDOE will have the final say on these questions.

After participants have reviewed the items individually in each form, the CAI facilitator will generate an ITS report to collate all participant feedback in one central location. During the large-group discussion, CAI staff will take detailed notes directly in ITS for each item, documenting discussion details and suggestions for edits. The entire Forms Review Meeting committee will be able to see the detailed notes as they are projected.

Following the meeting, CAI can then provide NJDOE with a report of educator comments when reviewing the forms and use this feedback to facilitate discussions with the larger group about possible edits. Finally, CAI staff will complete all edits suggested by educators and approved through reconciliation with NJDOE before moving the form to the production phase of the development cycle. CAI confirms we will provide the SCM written confirmation that all identified issues have been resolved at least 20 days prior to the opening administration date.

As with the other educator meetings, CAI confirms that we will support all meeting-related logistics and ensure the number of educators and breakdown of rooms specified by the RFQ.

4.9.11. Spanish-Language Test Form Review Meetings

CAI will convene and facilitate a virtual five-day meeting for committees to review Spanish language adaptions of the NJSLA and NJGPA mathematics fixed-form tests. Once the translated forms have been built, this meeting will commence.

At the start of the meeting, CAI's Spanish test development representative will train participants on the process, which will be approved by NJDOE. This will consist of training on a previously agreed-on Spanish translation style guide.

As with many of our other educator meetings, CAI recommends that the Spanish Language Test Form Review Meetings are conducted using participant laptops signed in to CAI's content rater system in the Item Tracking System (ITS). Through this secure online system, educators will be able to interact with items from the students' perspective and will be able to view metadata for each item, such as standard alignment, rubrics, and option rationales. They will be able to toggle between the English and Spanish versions of each item. Educators will be prompted to select an outcome for each item, such as accept, accept with edits, or reject. In addition, they will have the opportunity to provide written feedback by answering questions that can be customized for the specific form. Examples of these questions include:

1. Does the Spanish translation accurately reflect what is asked in the English version?
2. Does the Spanish version have a correct answer and is it in the same position as the English version? (e.g., both keys are "C")
3. Is the Spanish translation fair for the grade level?
4. Are any graphics also accurately translated?
5. Can students respond appropriately to open-ended and technology-enhanced items?

NJDOE will have the final say on these questions.

After participants have individually reviewed the items in each form, the CAI facilitator will generate an ITS report to collate all participant feedback in one central location. During the large-group online discussion, CAI staff will take detailed notes directly in ITS for each item, noting discussion details and suggestions for edits. The entire Spanish Language Test Form Review Meeting committee will be able to see the detailed notes as they are projected.

Following the meeting, CAI can then provide NJDOE with a report of educator comments when reviewing the forms and use this feedback to facilitate discussions with the larger group about possible edits. Finally, CAI staff will complete all edits suggested by educators and approved through reconciliation with NJDOE before moving the form to the production phase of the development cycle.

As with the other educator meetings, CAI confirms that we will support all meeting-related logistics and ensure the numbers of educators and breakdown of rooms specified by the RFQ. We refer the reader back to Section 4.9.3 for specific details about how we will utilize a web-based video/audio conference system, as well as the ITS, for this virtual meeting.

4.9.12. Performance Standard Setting Committee

CAI confirms that we will meet all requirements for the in-person standard-setting committee set forth in this RFQ. Further details about the standard-setting plan are provided in Section 4.12.5.

4.9.13. Coordinator Training

Calling on our extensive experience in the assessment industry, CAI commits to hosting annual comprehensive coordinator training for regional district test coordinators (DTCs) and school test coordinators (STCs) in New Jersey. Our demonstrated success in guiding districts and schools through vendor transitions and providing unwavering support demonstrates our ability to generate clear, effective training materials. With a track record of effective training across diverse user roles, we are well prepared to support New Jersey's assessment program.

In collaboration with NJDOE, our comprehensive plan encompasses all requirements listed in the RFQ, such as registration, CAI trainer standards, session deliverables, and any necessary support to ensure successful and meaningful meetings for all participants. CAI will coordinate six sessions across three regions, accommodating educators from each district. These meetings will be scheduled on separate days in approved facilities, providing snacks and beverages for all participants. Our plan includes a secure website for pre-registration, comprehensive training packets, prompt materials distribution, and a commitment to Section 508 compliance. We will assign staff for detailed online platform training and additional personnel for registration, logistics, and related tasks as deemed appropriate by the State Contract Manager, ensuring these meetings' success.

We propose asynchronous learning using the New Jersey assessment portal and by making all training materials available to a broader audience. CAI will collaborate with NJDOE to finalize details, ensuring the effective dissemination of essential information for successful test administration within two business days of the conclusion of training.

4.9.14. Post-Administration Review Meeting

Within 30 calendar days of the conclusion of each testing cycle, CAI will convene and facilitate a one-day, virtual post-administration review meeting. The annual meetings will adopt a continuous improvement model approach, where the team will conduct focused lessons-learned discussions and address incremental changes that will enable the program to run more smoothly. CAI will be responsible for preparing a comprehensive list of lessons learned from the test administration and making recommendations for improving future test administrations. These improvements may include updating the steps of a particular process or addressing systematic updates in the New Jersey test administration configuration.

The draft of lessons learned will be shared with the SCM in preparation for the meeting. During the meeting, CAI will use a virtual whiteboard tool (e.g., MS Whiteboard, Jamboard, Zoom Whiteboard) to capture input from all participants and to further inform and refine the draft lessons learned and recommendations.

Additionally, CAI will provide the SCM with a list of any items exposed during the conduct of the test administration, and the nature of the reported exposure no less than five (5) Business Days prior to the meeting.

Meeting participants will represent all functional phases of the program and include the CAI Project Management Team, client support leads, content development, test delivery, scoring and reporting, and Measurement Incorporated (MI) project teams and leads. CAI will make accommodations for approximately seven (7) participating NJDOE staff members.

4.9.15. Summary and Individual Student Score Report Review Meetings

CAI will meet the following four requirements for the summary and individual student score report review meetings:

1. Summary Score Reports
   a. We will assist NJDOE in reviewing the NJSLA and NJGPA summary score reports for accuracy and completeness. The review will take up to five days and commence no less than 10 business days prior to the release of the reports to schools and districts.
   b. We will plan for eight NJDOE staff to participate at each occurrence.
2. Individual student score reports:
   a. We will assist NJDOE in reviewing individual student score reports. The review will be scheduled approximately 25 business days prior to the release of the reports.
3. For both the summary score report and individual student score report reviews, we will provide an approach and materials (copies of reports) to ensure that the reviews are efficiently and effectively conducted.
4. We will cover all NJDOE staff costs associated with both meetings (e.g., travel, meals, lodging) should the SCM determine that meetings are to be hosted at the Contractor's site.

Before release of any summary or individual student score reports, CAI and NJDOE will review the reports and user acceptance testing (UAT) in the Centralized Reporting System (CRS). The UAT environment reflects the production environment and provides a software and content evaluation period, giving NJDOE an opportunity to interact with all CRS reports before they are deployed to production and made available to users.

CAI will first conduct internal UAT to detect any functionality or appearance defects in the system and will initiate the process for correcting system defects before giving NJDOE access to the UAT site for review. If defects are not corrected before NJDOE has access to the site, CAI will provide NJDOE with a list of known issues and a timeframe for their resolution to eliminate redundancy in the review process. CAI will also provide NJDOE with a system- and state-specific UAT document that includes important login information and outlines test cases and expected system functionality. CAI and NJDOE will collaborate regularly during the UAT period to ensure that any system defects are identified and communicated. The CAI Project Management Team will be responsible for working with other CAI staff and the systems team to resolve issues detected during the UAT period before each system's deployment.

4.9.16. Accessibility and Accommodations Advisory Meetings

CAI is prepared to host twice-yearly Accessibility and Accommodations Advisory Meetings. We will conduct these meetings in accordance with RFQ requirements.

CAI factors in accessibility and accommodations at the very beginning of test development all the way through the development process. Here, we explain how item development incorporates reviews for accessibility and accommodations.

CAI will begin the item development process by starting with the principles of universal design (UD). We adhere to UD in all phases of item development, embedding these principles into item specifications and style guides; item-writer training; and edits and reviews. We incorporate them into structured item reviews, including reviews by accessibility and other experts working with diverse groups of students (e.g., students with disabilities, English learners [ELs]). By beginning with the understanding that all items need to be equally valid and accessible to all students, we

greatly minimize the items that need to be modified or not used by the student population that needs accommodated forms.

During the development or review process, if items are identified by experts as being inappropriate for visually impaired students or students who require an accommodated form, these items are tagged by our content team as “not appropriate” through an item attribute metadata value (i.e., not appropriate for visually impaired test takers). Examples of this may include items that can be accessed by screen readers or via braille files, but that include a highly visual context that may not be appropriate for a visually impaired student. In many cases, these items might be rejected for bias and sensitivity concerns, but if the Department approves the item to move forward, we can utilize metadata to ensure that they are de-selected from the form-building process for base and accommodated forms.

In general, as items are finalized and prepared for field testing, CAI accessibility specialists review the items for their suitability for braille, translation, American Sign Language (ASL), and other supports.

CAI imposes the following three forms of accessibility reviews:

1. During the form-building process, finalized forms are reviewed by CAI accessibility specialists using well-defined checklists to ensure that they are suitable for inclusion on an accommodated form and appropriate for the population of students who use them.
2. Final, approved forms are sent to specialized, certified accommodation specialists (e.g., certified braille transcribers, certified translators, certified ASL signers). These specialists provide a two-level process, including the initial transcription (braille) or translation (Spanish for mathematics), followed by a second-level review and approval by a separate certified specialist or proofreader.
3. After accommodation application, once the resource has been added to the items, CAI conducts a final review of the computer-based form to ensure that the assistive technology works for all items. This includes reviews using screen readers and refreshable braille displays, ensuring translated content, text-to-speech, and other accommodations are presented and working as intended. While this process is a standard part of CAI’s Platform Review, we will work with NJDOE to determine how best to conduct this review in the test administration vendor’s system.

4.9.17. District Test Coordinator Advisory Meetings

As noted in Sections 4.3.11.3 and 4.3.11.4, CAI commits to managing the required meeting logistics for the bi-annual district test coordinator advisory meetings. CAI has extensive experience facilitating these meetings with many of our other state partners, including facilitating the annual Accessibility Working Group and District Working Group meetings in the state of Texas. During these meetings, CAI subject-matter experts (SMEs) will collaboratively present policy and system updates to stakeholder groups, with the overall goal of obtaining feedback that will help to shape development decisions and feature designs.

In advance of these meetings, CAI with work with NJDOE to provide draft agendas and training materials, as well as to coordinate on-site logistics. Feedback obtained during these meetings will be compiled into an extensive overview document utilized by both the client and CAI’s technical teams to improve the quality of solutions made available to students and educators.

CAI will work with NJDOE to develop training materials for the district test coordinator advisory meetings, addressing the diverse needs of superintendents, testing coordinators, special education coordinators, and technology coordinators alike. The CAI Project Management and Technical Support Team members will be available on site for these meetings as SMEs in the

areas of online test delivery, student and user management, student score reporting, and accountability reporting.

CAI will reserve the appropriate facility and necessary equipment; we will provide meals and refreshments when appropriate for all attendees. We will be responsible for providing attendees with all necessary meeting communications, such as invitations, agendas, minutes, and action items. Invitations will be provided to the SCM and all NJDOE staff attendees at least 25 business days prior to the meeting; the agenda and meeting materials/handouts will be provided at least five business days prior to the meeting.

4.9.18. Unplanned Meeting(s)

CAI will assume that ten (10) additional, five-day-long, unplanned, in-person meetings may take place each year. The meetings will support up to eight (8) committee members and one (1) NJDOE staff member.

CAI will reserve the appropriate facility and necessary equipment for each meeting and will provide meals and refreshments when appropriate for all attendees (refer to RFQ Section 4.9.20 for more information).

CAI will be responsible for providing attendees with all necessary meeting communications, such as invitations, agendas, minutes, and action items. Invitations will be provided to the SCM and all NJDOE staff attendees at least 30 calendar days prior to the meeting, and the agenda and meeting materials/handouts, etc., will be provided at least five business days prior to the meeting.

4.9.19. NJDOE Monitoring at Contractor Scoring Site

Although Measurement Incorporated (MI) conducts training and scoring of constructed-response items (CRIs) remotely, they maintain their headquarters in Durham, NC. NJDOE and local education agency (LEA) staff can visit MI's Durham office and spend a week with the scoring management team. During this visit, NJDOE and LEA staff can review and/or complete training lessons and monitor remote scoring. They can sit in with managers to gain an intimate understanding of how the system ensures communication with remote readers, maintains accurate and productive handscoring, and provides timely score reporting. Alternatively, NJDOE and LEA staff can review training lessons remotely or via webinar with the scoring management team.

4.9.20. Other Meeting Requirements

4.9.20.1. General Requirements Related to Meetings with Educators

CAI will work with the SCM to create a membership contact list for all meetings that include educators. We will maintain a list with contact information (e.g., mailing address, email address, telephone numbers) and will share the list with the SCM in an agreed-upon, secure location for easy access.

Prior to each meeting involving educators (e.g., passage review, item review, data review, rangefinding, forms construction), CAI will conduct an orientation meeting to review the schedule and purpose of the meeting and to outline the scope of work, daily tasks, and any security policies associated with the meeting.

The agenda, handouts, and training materials will be provided to the SCM and all NJDOE staff attendees at least 30 calendar days prior to the meeting for review. CAI will update materials as

requested and provide the final agenda and meeting materials/handouts, etc., at least five business days prior to the meeting.

Within 10 business days after each meeting with educators, a report of the proceedings will be provided to the SCM. The report will include a list of attendees, meeting outcomes, decisions, action items, and any other relevant information.

4.9.20.2. Meeting Venues

CAI will collaborate with the SCM to identify and reserve appropriate venues and necessary equipment for in-person meetings. All locations will be submitted to the SCM for approval at least four months prior to committee meetings that involve local educators and subject-matter experts (SMEs) and at least six weeks prior to meetings between CAI and NJDOE staff members.

Venues will meet all requirements for each meeting, such as separate meeting rooms for individual grade-level, grade-span, and course-specific meetings, and a large room for general meetings before and/or after individual meetings.

4.9.20.3. Location for Meetings Including Local Educators

CAI acknowledges that facilities used for meetings and trainings that include local educators will be hotels, universities, or conference centers in New Jersey, and that the facilities will be easily accessible by major New Jersey highways. All locations will be submitted to the SCM for approval at least four months prior to meetings that involve local educators and SMEs.

4.9.20.4. Location for Other Meetings

CAI acknowledges that any other in-person meetings with the SCM and NJDOE will be held at locations approved by the SCM. If CAI and the SCM choose to have meetings at CAI facilities, CAI will cover all costs for NJDOE staff members, including travel, hotel, and meal expenses. All locations will be submitted to the SCM for approval at least six weeks prior to meetings.

4.9.20.5. Meeting Materials

CAI will provide all materials necessary for successful completion of each meeting. We acknowledge that we are responsible for the security of all materials on site, and we will dispose of all secure materials not needed by NJDOE at the conclusion of the meeting.

4.9.20.6. Phone and Meeting Support Materials

CAI is highly experienced in working with a variety of facilities to provide all necessary equipment for successful meetings. As requested, CAI will provide the following six materials for in-person meetings:

1. A phone with long-distance and local access in at least one of the meeting rooms
2. A printer in at least one of the meeting rooms
3. Secure Internet access in all meeting rooms
4. Audiovisual equipment, as needed, in all meeting rooms
5. Photocopying capabilities for use by on-site NJDOE staff members
6. Stationery supplies (e.g., pens, pencils, highlighters, Post-it notes, writing pads, flip charts, White-Out) and reference materials (e.g., dictionary, thesaurus) in all meeting rooms

4.9.20.7. Virtual Meetings

CAI is well versed in the logistics and execution of virtual meetings. For this program to be successful, we will need to communicate and collaborate with many stakeholders in different locations. CAI has the processes, technology (e.g., Microsoft Teams, Zoom), experience, and relationship skills needed for this task.

In coordination with the SCM, we will choose a platform that will include video and call-in options. CAI will also provide all invitations, agendas, handouts, etc., within the timelines specified for each meeting type.

4.9.20.8. Meeting Arrangements

During in-person meetings, CAI will provide a method for all participants to register themselves at the beginning of each day. CAI will also be responsible for refreshments and meals, as needed. CAI will work with each facility to provide photocopying as requested by the SCM.

4.9.20.9. Meals and Refreshments for Committee Meetings

CAI will collaborate with the SCM to identify and reserve the appropriate facilities and necessary equipment for in-person meetings, including meals and refreshments for all committee members, NJDOE staff members, and CAI staff members.

4.9.20.10. Stipends, Honorariums, and Reimbursements

CAI will collaborate with NJDOE to identify cost-effective travel options for meeting attendees; we will reimburse attendees for any applicable mileage, meals, lodging, or other travel-related expenses in accordance with the State of New Jersey OMB Travel Regulation (currently 20-04-OMB) and State of New Jersey Appropriations Handbook, General Provisions #41, and any adjustments as State-directed changes are made to these documents.

CAI will provide the following stipends, reimbursements, and honoraria:

- Substitute teachers will receive a stipend of $200 per day to be paid directly to the district to cover meeting participation costs.
- Compensation will be provided for educator mileage and tolls incurred while participating in meetings on personal time, in accordance with the state rate schedule published at https://www.nj.gov/infobank/circular/cir23-02-OMB.pdf.
- Educators participating in meetings on personal time (e.g., summer, weekends, school vacation days) will receive a stipend of $200 per day, paid directly to the educator. Educators will also receive reimbursement for travel expenses according to the parameters outlined by NJDOE.
- Technical Advisory Committee (TAC) members will receive an honorarium of $1,500 per day for their attendance at the TAC meeting, inclusive of their participation in an additional one-day preparation meeting, and their review of meeting notes, documents, and proceeds (a total of three meeting days). TAC members will also receive reimbursement for travel expenses (e.g., travel, hotel, meals) according to the parameters outlined with NJDOE.

Additionally, CAI will honor standard New Jersey reimbursement rates for district staff for all visitation events. As NJDOE-directed changes are made to the Appropriations Handbook, CAI will adjust the rate for reimbursement to adhere to the new policy/policies.

4.10. Field Test

NJDOE desires, and we are proposing, an item-adaptive assessment system that supports immediate scoring and reporting of student assessment results. To support adaptive item selection, student ability estimates must be continually updated as students progress through the assessment. Adaptive item selection thus requires precise, pre-equated item parameter estimates that capture all influences on student achievement occurring in operational, summative test administrations. To achieve this, all ClearSight items are embedded in summative test administrations for field testing and item calibration, yielding item parameter estimates that support adaptive item selection and immediate reporting of student test results.

Our proposed field-test administration plan relies on both a stand-alone field-test in fall 2025, followed by embedded field-testing in each summative test administration for all grades/content areas. We understand that this is NJDOE's preferred method of field testing, and we wholeheartedly support this as the recommended approach. Our first field-test administration will occur as a stand-alone field test in fall 2025. We will field-test as part of the summative test administration beginning in spring 2026 and each administration thereafter.

As described in Section 4.5.2, CAI conducts annual field testing of ClearSight items in all ClearSight states. NJDOE and New Jersey educators will have multiple opportunities to review ClearSight items for approval to include on the New Jersey assessments, as outlined in the meetings described in Section 4.9. Only items approved by NJDOE and New Jersey educators will become part of the New Jersey field test and eligible for operational use in New Jersey. No more than 90 calendar days from contract award, CAI will provide NJDOE with the ClearSight field-test plan, including a New Jersey-specific plan outlining information such as the number of students needed. We will also provide a field-test data analysis plan as described in Section 4.10.1; as described in Section 4.5.2, CAI captures timing data for ClearSight tests and will share this data with NJDOE.

For the NJDOE-required custom development, CAI will partner with NJDOE to create specifications. CAI will include New Jersey-specific items in a field-test plan that prioritizes these items in the field test beginning in the fall 2025 stand-alone field test.

All field-test items will use CAI's adaptive field-test algorithm described in Section 4.11.1.1.

4.10.1. Field-Test Data Analysis

Computer-adaptive test administration requires pre-equated item parameters to support immediate updating of student ability estimates during test taking to adapt item selection to maximize test information near the students' ability level. For this reason, we field-test items by embedding them in summative test administrations so that item parameter estimates capture all factors contributing to item difficulty in the context of state summative test administrations. CAI can flexibly configure the number of field-test items eligible for administration to students each year based on the number of items to be field-tested. The number of embedded field-test slots required is determined by the number of responses per item necessary to obtain precise item response theory (IRT) item parameter estimates.

Field-Test Administration

The field-test engine that CAI employs for embedding field-test items in online test administrations randomly samples field-test items for each individual test administration, essentially creating hundreds of unique embedded field-test (EFT) forms. This sampling approach to EFT items results in some important outcomes, including:

- Reduction in the number of EFT items that each student must respond to and more efficient item spiraling, which reduces clustering of item responses, resulting in more precise item parameter estimates
- More generalizable item statistics because they are not based on items appearing in a single position or following the same item
- A truly representative sample of respondents for each item

CAI's EFT algorithm for adaptive test administrations actually consists of two different algorithms: one for identifying which field-test items will be administered to which student (the distribution algorithm), and one for selecting the position on the test for each item administered to the student (the positioning algorithm). For fixed-form tests, field-test items are administered in fixed locations.

Item groups are randomly selected for field testing until a student has received the minimum required number of items. Item groups that will exceed the maximum number of field-test items permitted are not selected for administration. We refer to item groups rather than items because field-test items, like items in the operational tests, can either be stand-alone items or appear together, such as when items are bound with a reading passage or some other common stimulus. We use the term *item groups* to refer to both cases, with stand-alone items representing item groups of one. This randomization ensures that each task/item is seen by a representative sample of students across the state, and every task/item is as likely as every other item to appear in a class or school, minimizing the clustering effects.

Field-Test Analyses

Following the close of the testing window each year, CAI will analyze field-test data in preparation for item data review meetings and the promotion of high-quality test items to the NJSLA and NJGPA item pools. The item analyses include classical item statistics and IRT item calibrations. Classical item statistics are designed to evaluate the relationship of each item to the overall scale, evaluate the quality of the distractors, and identify items that may exhibit a bias across subgroups (differential item functioning, or DIF, analyses). The IRT item analyses allow us to examine the fit of items to the measurement model and provide the statistical foundation for operational form construction and test scoring and reporting. In this section, we describe the classical item analyses that will be instrumental in the evaluation of field-test item performance by the data review committees following field-test administration.

Classical Item Analysis

Classical item analyses ensure that the items function as intended with respect to the underlying scales. CAI's analysis program computes the required item and test statistics for each multiple-choice and constructed-response item to check the integrity of the item and to verify that the difficulty of the item is appropriate for the grade level. Key statistics that we compute and examine include the following:

- *Item Discrimination.* The item discrimination index indicates the extent to which each item differentiates between those test takers who possess the skills being measured and those who do not. In general, the higher the value, the better the item can differentiate between high- and low-achieving students. The discrimination index for multiple-choice items is calculated as the correlation between the item score and the student's IRT-based ability estimate. For polytomous items, we compute the mean total number of items correct for students scoring in each of the possible score categories.
- *Distractor Analysis.* Distractor analysis for multiple-choice items is used to identify items that may have marginal distractors or ambiguous correct responses. In the distractor analysis, the correct response should be the most frequently selected option among high-scoring test

takers. The discrimination value of the correct response should be substantial and positive, and the discrimination values for distractors should be lower and, generally, negative. The biserial correlation for distractors is the correlation between the item score—treating the target distractor as the correct response—and the student's IRT ability estimate, restricting the analysis to those students selecting either the target distractor or the keyed response.

- *Item Difficulty.* Items that are either extremely difficult or extremely easy are flagged for review but are not necessarily deleted if they align with the test specifications. For multiple-choice items, we compute the proportion of test takers in the sample selecting the correct answer (*p*-values), as well as those selecting the incorrect responses. We also produce the *p*-values for students in each of a configurable number of quantiles. For constructed-response items, item difficulty is calculated both as the item's mean score and as the average proportion correct (this is analogous to *p*-value and indicates the ratio of an item's mean score divided by the number of points possible).

Analysis of Differential Item Functioning

CAI conducts differential item functioning (DIF) analysis on all field-tested items to detect potential item bias across major ethnic and gender groups. The following DIF groups are included in this analysis:

- Ethnicity
  - African American
  - Hispanic
  - Native American
  - Asian
  - White
- Gender
- Special Education Status
- Limited English Proficient Status
- Free/Reduced Price Lunch Status
- Accommodation Status

DIF refers to items that appear to function differently across identifiable subgroups, typically across different demographic groups. Identifying DIF is important because sometimes it is a clue that an item contains a cultural or other bias. Not all items that exhibit DIF are biased; characteristics of the educational system may also lead to DIF. For example, if schools in low-income areas are less likely to offer geometry classes, students at those schools might perform more poorly on geometry items than would be expected, given their proficiency on other types of items. In this example, it is not the item that exhibits bias but the curriculum. However, DIF can indicate bias, so all field-tested items are evaluated for DIF, and all items exhibiting DIF are flagged for further examination by a Fairness and Sensitivity Committee. Committee members are asked to reexamine each flagged item, using the statistics as a guide, and to make a final decision about whether the item should be excluded from the pool of potential items given its performance in field testing.

CAI typically uses a generalized Mantel-Haenszel (MH) procedure to evaluate DIF. The generalizations include (1) adaptation to polytomous items and (2) improved variance estimators to render the test statistics valid under complex sample designs. IRT ability estimates for each student on the test are used as the ability-matching variable. That score is divided into five intervals to compute the MH chi-square DIF statistics for balancing the stability and sensitivity of the DIF scoring category selection. The analysis program computes the MH chi-

square value, the log-odds ratio, the standard error of the log-odds ratio, the MH-delta for the multiple-choice items, the MH chi-square, the standardized mean difference (SMD), and the standard error of the SMD for the constructed-response items. The purification method described by Holland and Thayer (1988) is included in the DIF procedure.

Items are classified into three categories (A, B, or C), ranging from no evidence of DIF to severe DIF according to the DIF classification convention illustrated in Exhibit 4.10.1-1. Items are also categorized as positive DIF (i.e., +A, +B, or +C), signifying that the item favors the focal group (e.g., African American, Hispanic, female), or negative DIF (i.e., –A, –B, or –C), signifying that the item favors the reference group (e.g., white, male). Items are flagged if their DIF statistics fall into the "C" category for any group. A DIF classification of "C" indicates that the item shows significant DIF and should be reviewed for potential content bias, differential validity, or other issues that may reduce item fairness.

Exhibit 4.10.1-1: DIF Classification Rules for Items

Dichotomous Items	
Category	**Rule**
C	$MH\chi^2$ is significant and $\lvert\hat{\Delta}_{MH}\rvert \geq 1.5$.
B	$MH\chi^2$ is significant and $\lvert\hat{\Delta}_{MH}\rvert < 1.5$.
A	$MH\chi^2$ is not significant.
Polytomous Items	
Category	**Rule**
C	$MH\chi^2$ is significant and $\lvert SMD\rvert / \lvert SD\rvert \geq .25$
B	$MH\chi^2$ is significant and $\lvert SMD\rvert / \lvert SD\rvert < .25$
A	$MH\chi^2$ is not significant.

4.11. Test Development

4.11.1. Forms Construction

4.11.1.1. Test Form Design

NJDOE requires a rigorous and well-documented test form design process that aligns with the mission of producing adaptive and highly accessible Next Generation assessments. In this section, we discuss design considerations for paper-pencil fixed forms and computer-adaptive tests that will (1) ensure comparable testing within and across administrations, (2) maintain reporting scales, (3) accurately differentiate performance levels, and (4) include items for field testing.

Fixed-Form and Computer-Adaptive Assessments That Match Test Blueprints

In Section 4.12.3, we describe our approach to designing and configuring content-first, item-adaptive test forms as well as our Form and Test Engineering Suite (FTES), which supports test developers with full form construction capability, including automatically generated test forms that meet all content and psychometric specifications for fixed-form tests, as well as manual development, refinement, and revision of fixed-form assessments. CAI content and psychometric staff will work with NJDOE to capture all blueprint specifications, including item ranges for standards, Depth of Knowledge (DOK) levels, and any other item attributes that NJDOE wishes to track. For fixed-form tests, we will incorporate reference-form items to create the reference-form targets for fixed-form test construction that ensure equivalence in form construction across test administrations. The adaptive configurations and fixed-form specifications will be reviewed, revised, and approved by NJDOE before any adaptive simulations or fixed-form construction activities commence.

CAI is the industry leader in developing accountability and accessibility tools to ensure that all students can participate in the same computer-adaptive online assessments. In most states that we work with, virtually all students can access test content online. Nevertheless, CAI recognizes that there may be situations where a paper-pencil test form is required. To accommodate this need, CAI uses our Data Entry Interface (DEI) to capture student responses online, which reduces processing costs for paper-pencil testing and supports immediate scoring and reporting of assessment results. For these assessments, CAI generates “paper content” for items chosen to be used on paper-pencil fixed forms. These forms do not contain separate items but versions of an online item generated with the paper format and interaction taken into consideration. The paper items are created directly in CAI’s Item Tracking System (ITS) and are stored with the online versions in the item bank in perpetuity. Before the paper version is “locked,” it is reviewed by content experts, editors, and operations experts. We have found that most online interactions can be converted to paper formats with no performance issues.

Before any form construction takes place, CAI proposes to create, in conjunction with NJDOE, a fixed-form specifications document that captures all constraints on the form development for each subject and grade. This document can also include considerations for developing or selecting items for paper-pencil delivery. In addition to this specifications document, the NJSLA blueprints will be used to begin the form construction process. To ensure that paper-based forms generate results comparable to those of computer-based forms, CAI adheres to the principles of universal design (UD) in the development of test items. With the accessibility of item content maximized to the widest range of the student population, test items are rendered comparably across accommodated and non-accommodated test administrations. We note that every accommodated test administration should be based on the students’ Individualized

Education Plan (IEP) and should be consistent with how students access instruction daily. In this framework, accommodations serve only to remove construct-irrelevant barriers to accessing test items and thus support the validity of intended test-score interpretations. When assessments are administered across multiple modes to a substantial proportion of the student population, CAI psychometricians conduct mode comparability studies to identify the linking constants necessary to locate item parameters estimated from across modes on a common scale.

The adaptive algorithm also uses a set of specifications for administering assessments to individual students, including the NJSLA blueprints. For more information on the adaptive algorithm, please see Section 4.12.2, which contains a detailed description of how tests are configured.

Ensure Comparable Test Results Within and Across Administrations

Section 4.12 describes the psychometric activities designed to support the NJSLA and NJGPA assessments. ClearSight items are field-tested in embedded slots within summative assessments. Items are randomly selected for test administration, resulting in responses to each item from a random and representative sample of students; the placement of field-test items is also randomly selected from item positions across the full length of the test administration, ensuring that any position effects on item performance are averaged out. To enable immediate and continuous updating of student ability estimates in support of adaptive item selection, as well as to promote immediate scoring and reporting of assessment results to the field, CAI employs pre-equated item parameters in the operational test administrations. As described in Section 4.12, CAI psychometricians also evaluate items for item response theory (IRT) model misfit, and misfitting items are targeted for re-field testing in a subsequent summative test administration. Our equating approach ensures the comparability of test scores within a summative test administration as well as between assessment opportunities.

Maintain Reporting Scales

The procedures described in Section 4.12 and referred to in this section ensure the comparability of assessment scores across all test administrations. In the first administration of the new summative assessments, CAI will embed a sample of NJSLA legacy operational items that are proportional to the NJSLA and NJGPA blueprints. We will calibrate the legacy items and link them to the ClearSight reference scale. Each of the sampled legacy items will thus have two sets of item parameters, one on the current NJSLA/NJGPA scale and one set on the ClearSight scale, enabling CAI to identify the linking constants necessary to place the CAI ClearSight item parameters on the existing NJSLA/NJGPA scales and allowing NJDOE to maintain its current reporting scale. We will be happy to work with NJDOE's legacy content provider through the State to gain access to these legacy items.

Accurately Differentiate Performance Levels

As described in Section 4.3.5, CAI will produce scoring specifications annually for review and approval by NJDOE and its Technical Advisory Committee (TAC). Before the opening of the summative testing window each year, CAI psychometricians independently rescore all simulated test records to verify the accuracy not only of test scores and performance-level classifications for subject area and subscale scores but also of condition codes and other variables. In addition, two external consultants, working independently, also reproduce all test scores and performance levels.

Include Items for Field Testing

Each year, as part of item development, CAI will collaborate with NJDOE to develop an annual plan for all field-test items developed during the previous cycle. The field-test engine that CAI employs to embed field-test items in online tests randomly samples field-test items for each test administration, essentially creating hundreds of unique embedded field-test (EFT) forms. This sampling approach to EFT items results in several important outcomes:

- Reduction in the number of EFT items that each student must respond to and more efficient spiraling of items, which reduces clustering of item responses and thus produces more precise item parameter estimates
- Item statistics that are more generalizable because they are not based on items appearing in a single position or following the same item
- A truly representative sample of respondents for each item

CAI's EFT algorithm for adaptive test administrations consists of two different algorithms: one for identifying which field-test items will be administered to which student (the distribution algorithm) and one for selecting the position on the test for each item administered to the student (the positioning algorithm).

Item groups are randomly selected for field testing until a student has received the minimum required number of items. Item groups that would exceed the maximum number of field-test items permitted are not selected for administration. We refer to item groups rather than items because field-test items, like items in the operational tests, can be either a stand-alone item or linked with other elements, such as when items are bound with a reading passage or some other shared stimulus. We use the term *item groups* to refer to both cases, with stand-alone items representing item groups of one. This randomization ensures that each task or item is seen by a representative sample of students across the state, and every task or item is as likely as every other to appear in a class or school, minimizing the clustering effects.

4.11.1.2. Accommodated Forms

4.11.1.2.1, 4.11.1.2.1.1, 4.11.1.2.1.2, 4.11.1.2.1.3. Equating Consultants (Accommodated Forms), Braille and Large Print, Screen-Reader and Text-to-Speech, American Sign Language, and Closed-Captioned Form Review

Overview

CAI has a long-standing commitment to developing, scoring, and reporting assessments that yield fair and valid test score interpretations. This includes removing construct-irrelevant barriers to accessing test content via accommodations and accessibility tools. Our goal is that all students should be provided the tools necessary to participate on a level playing field in item-adaptive assessments of state academic content standards. We have been committed to accessibility for all students ever since we conceptualized and designed our Test Delivery System (TDS) and the items it contains. Accessibility remains a top priority as we continue to innovate around student testing and learning. CAI is committed to ensuring that all of the accommodations listed in the RFQ can be administered. Most of the accommodations required by NJDOE can be administered in an adaptive testing environment, including braille (should NJDOE choose that option).

CAI's testing system is Web Content Accessibility Guidelines (WCAG) 2.1 AA compliant, which is a high level of compliance indicating that the system is accessible and compatible with standards-compliant assistive technologies. Because our security mechanisms can interfere

with some assistive technologies, we have built a permissive mode into the TDS that relaxes these restrictions for individual students who rely on such technologies.

The system currently works with a wide range of refreshable braille devices, screen readers, on-screen keyboards, and input devices. While it is impossible for any organization to guarantee support for unknown hardware and software, CAI is committed to accessibility for all students, as our leadership in this area has long demonstrated.

Our Item Tracking System (ITS) manages the addition of all accommodations to the base language of an item. Once the base language content of an item is locked down and approved, the system opens lanes to allow for simultaneous accommodation tagging to take place. This means that tagging for braille, American Sign Language (ASL), text-to-speech (TTS), paper formatting, and translations can all happen at the same time within the system. The attributes in ITS will be configured to determine which markups are required for field-test or operational use. If a required markup is not present, then the item cannot be exported into a test package; this ensures that all accommodated forms are properly configured for test delivery.

Development of Accommodated Forms

As part of this contract, CAI will develop all required accommodated forms, including braille, large print, screen-reader, TTS, ASL, and closed captioning. We confirm our ability to support all modes required by the RFQ, as evidenced in Exhibit 4.11.1.2-1.

Exhibit 4.11.1.2-1: Accommodations Available for Online and Paper Tests

Test Mode	Accommodation	Supportable?
Online	Text-to-Speech (Mathematics)	Yes
	Spanish and other languages as required (with or without TTS)	Yes
	ASL	Yes
	Screen Reader (e.g., Job Access With Speech [JAWS])	Yes
	Closed Captioning	Yes
Paper	English (standard and large print)	Yes
	Spanish (standard and large print)	Yes
	Braille	

Since item development adheres to universal design (UD) and the belief that all items need to be equally valid and accessible to all students, we greatly minimize the items that need to be modified or that are not used by the populations of students that need an accommodated form. However, if there are items within the bank that are not suitable for a specific population (e.g., assessing understanding of an inherently visual construct), it will be noted by an attribute in ITS. When the accommodated form is built in the Form and Test Engineering Suite (FTES), the test developer can see the content of the items they are selecting, as well as any attribute noting items that are not suitable for a specific population.

Prior to form development, CAI will begin the item development process grounded in the principals of universal design (UD). We adhere to UD in all phases of item development, embedding these principals into item specifications and style guides; item-writer training; edits and reviews; and incorporating the principals into the structured reviews of items, including reviews by accessibility and other experts working with diverse groups of students (e.g., students with disabilities and English learners [ELs]). By beginning with the belief that all items need to be equally valid and accessible to all students, we greatly minimize the items that need to be modified to not used the by populations of students that need an accommodated form.

If, during the development or review process, items are identified by experts as not being appropriate for visually impaired students or students that require an accommodated form, these items are tagged by our content team as 'not appropriate' through an item attribute metadata value (i.e., not appropriate for visually impaired test takers). Examples of this may include items that can be accessed by screen readers or via braille files, but that may include visual context that may not be appropriate for a visually impaired student. In many cases, these items might be rejected for bias and sensitivity concerns, but if the department approves the item to move forward, we can utilize metadata to ensure that these items are de-selected from the form-building process for base and accommodated forms. In general, as items are finalized and prepared for field-testing, CAI Accessibility Specialists review the items for their suitability for braille, translation, ASL, and other supports.

CAI imposes the following three forms of accessibility reviews:

1. During the form building process, finalized forms are reviewed by CAI Accessibility Specialists using well-defined checklists to ensure that they are suitable for inclusion on an accommodated form and suitable for the populations of students that use them.
2. Final, approved forms are sent to specialized and certified accommodation specialists (e.g., certified braille transcribers, certified translators, certified ASL signers). These specialists provide a two-level process, including the initial transcription (e.g., braille) or translation (e.g., Spanish for mathematics), followed by a second-level review and approval by a separate certified specialist or proofreader.
3. Following the application of accommodations (i.e., after the resource has been added to the items), CAI conducts a final form review of the computer-based form to ensure that the assistive technology works for all items; this includes reviews using screen-readers and Refreshable Braille Displays (RBDs), and reviews of translated content, TTS, and other accommodations. These reviews ensure that accommodations are presented and working as intended. This process is a standard part of CAI's Platform Review.

Establishing Comparability

Paper forms will be designed each year to be as similar as possible to the online form, differing only in how student responses are captured. In rare instances, when an online item cannot be equivalently rendered for paper test administration, CAI staff will use our FTES software to identify a replacement that yields a psychometrically equivalent paper form. All common items between the online and paper forms provide the basis for an equating study to examine the performance of items between online and paper modes of test administration.

CAI psychometricians employ a matched samples design (Way, Davis & Fitzpatrick, 2006) to equate ability estimates between the online and paper test administrations. A covariate regression approach is implemented to construct equivalent groups of students taking the assessment in both modes of test administration.

Item response theory (IRT) parameter estimates are independently calibrated for the matched online and paper test administration mode samples, centering ability to zero for each of the matched samples. Because the samples are matched on ability, the resulting item parameter estimates can be used to identify differential item functioning between test administration modes. In addition, obtained parameter estimates for the common items can be used to identify the linking constant necessary to bring the matched sample-paper-items parameters onto the matched sample online scale.

Stocking-Lord or other test characteristic curve (TCC)-linking methods can be used to identify the linking constants necessary to place the paper item parameters on the online bank scale. The online scale is the reference scale for the assessments, since estimation of all IRT parameters, adoption of performance standard, and all previous reporting have been conducted with respect to the item parameters estimated from online test administrations.

We note that the matched samples can be used to estimate the comparability of item parameters between any mode of test administration, and to link parameter estimates so that test scores have the same meaning across test administration modes. We further note, however, that when the number of students administered tests in a particular mode is very small, the mode compatibility analysis will not yield reliable results. In those instances, we propose to designate the mode as an accommodation, and not attempt to empirically examine comparability of item parameter estimates between the accommodated modes. Even in these cases, content staff follow CAI procedures to ensure comparability of test items, to the extent possible, across all modes of test administration.

Subcontractors and External Consultants

CAI has a long-standing relationship with subcontractors and external consultants who are well-versed at reviewing the accommodated forms required by this RFQ. CAI confirms that we will submit all subcontractor names to the SCM for review and approval, and we will find replacement Subcontractors and external consultants if required by the SCM. These subcontractors and external consultants will have access to their forms and items to be reviewed, either by access to ITS for online assessments, or for printed forms via a Secure File Transfer Protocol (SFTP) site.

Finally, CAI confirms that in preparation for school year 2025–2026, we will submit a plan to the SCM within 30 calendar days of the project launch meeting. This plan will include details about our proposed work with any subcontractors and/or external consultants, who will be available for the all the requirements listed in the RFQ.

4.11.1.3. Forms Pulling (Content Selection)

The Form and Test Engineering Suite (FTES) system allows for both automated and manual construction of test forms. We propose a hybrid form-construction process that proceeds from a highly automated process for initial candidate form construction, with intensive review and revision by CAI and NJDOE content staff. CAI content and psychometric staff will work with NJDOE to develop a comprehensive set of test-form specifications with all requirements for form construction including blueprint criteria, metadata requirements for the eligible pool, pool attributes to use during the form-building process, statistical criteria, reference forms, linking items/blocks, field-test items/blocks, and any other desired constraints. Upon NJDOE approval of the form specifications, each content constraint and statistical target will be entered into the FTES. Once the FTES is configured, the form-construction process will begin with automated generation of candidate test forms that meet all blueprint requirements and psychometric criteria.

CAI will collaborate with NJDOE to develop a yearly field-test plan for all field-test items developed during the previous cycle. CAI recommends that NJDOE use random selection and administration for embedding field-test items in the adaptive assessment.

We start the form-building process by defining an item pool in the Item Tracking System (ITS) from which all items in the new form are to be selected. A reference form can also be defined to serve as a baseline for comparison with the new form on certain statistics. If the test has been operational for at least one year, any previously developed form can be designated as the reference form to which the new test form is equated. We propose to designate the first operational test form as the reference form to ensure that test forms each year are as nearly equivalent to the base form as possible, and that forms are as equivalent as possible from year to year.

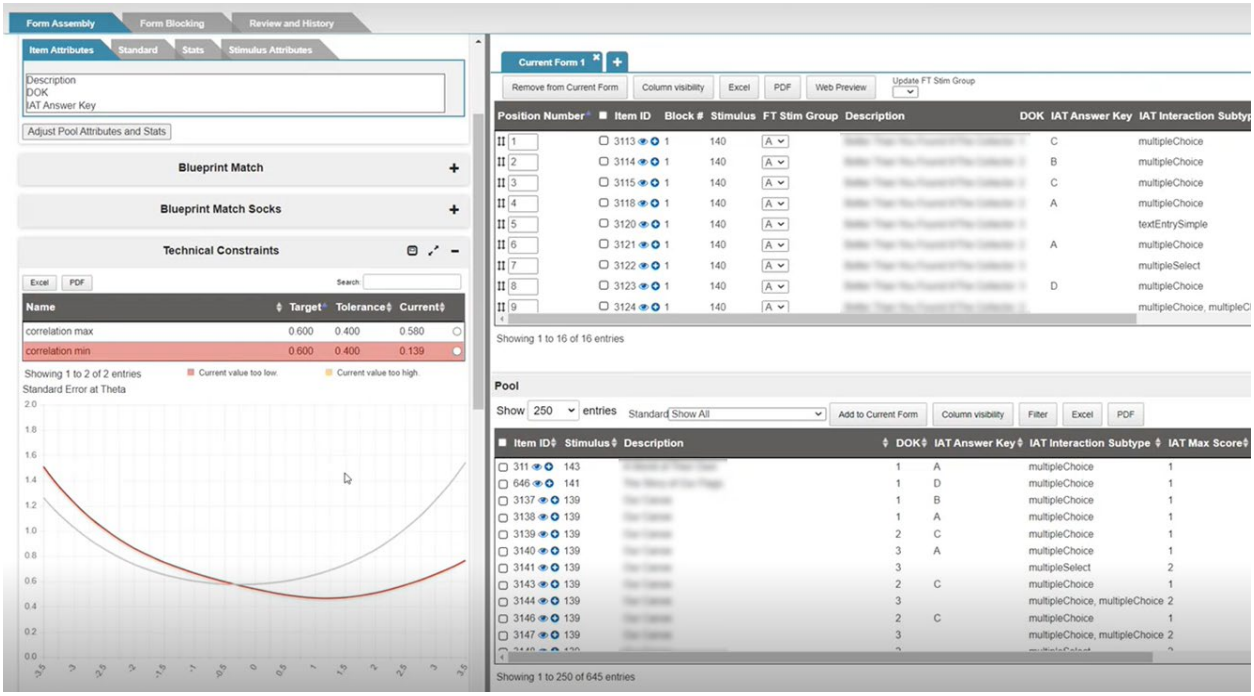
The next step in the form-building process is to set up or select the test blueprint. This blueprint specifies the minimum and maximum number of items allowed in each required content standard to be tested. After the form is built, a summary of the number of items in each content

standard in the new form is compared against the blueprint. Any violations are highlighted for easy identification.

The FTES displays the items selected for the form on the upper-right side of the screen and the items in the pool on the lower-right side of the screen. This includes items and stimuli with all selected attributes, as shown in Exhibit 4.11.1.3-1. The left side of this view presents the configured constraints tabs and the standard error curve of the form as currently constructed. In this example, the conditional standard error of measurement (CSEM) curve for the reference form is displayed in gray while the curve for the form being built is displayed in red. Test characteristic curves (TCCs) are displayed similarly.

The test developer can filter and sort the item list to show items with specific criteria. Clicking the “Add to Current Form” button adds the item to the form and removes it from the available items list. The test developer adds, removes, and replaces items on the form until the blueprint is met and the TCC difference curves are within defined limits so that test information is distributed equivalently across the range of ability and CSEM curves are as near to identical as possible.

Exhibit 4.11.1.3-1: Reference Form Graphs and Eligible Items and Stimulus



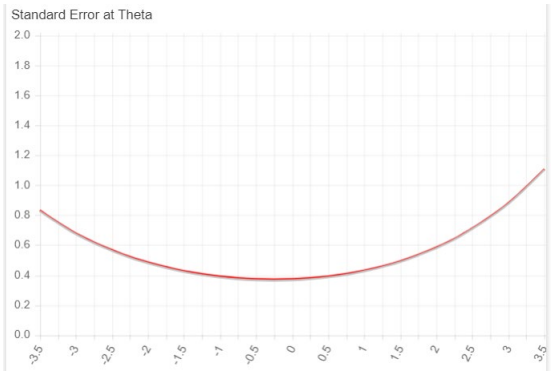
New forms can be assembled automatically. The built-in automatic test assembling algorithm will construct forms satisfying all blueprint requirements and all pre-determined technical constraints provided that the item pool is deep enough. If needed, one can assemble multiple forms through this automatic process and select the best form from among all generated forms. Alternatively, one may also assemble a form manually, selecting one item at a time.

After the form is assembled, a summary will be provided indicating whether all constraints have been met and if not, where the violation has happened. Charts comparing CSEMs and TCCs between the new form and reference form are also provided. Descriptions of these charts are presented in Exhibit 4.11.1.3-2.

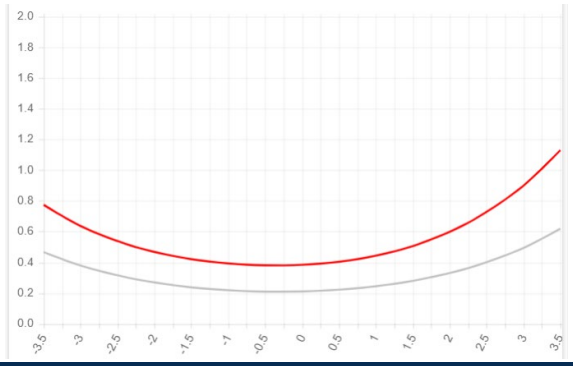
Exhibit 4.11.1.3-2: Charts Comparing CSEMs and TCCs Between New Form and Reference Form

Chart of Conditional Standard Error of Measurement

Using a prior fixed form as the reference form:

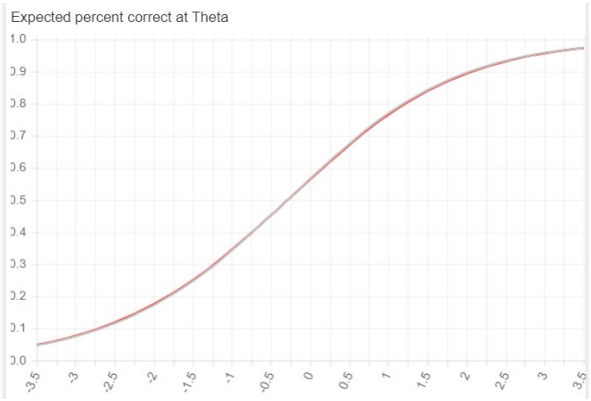
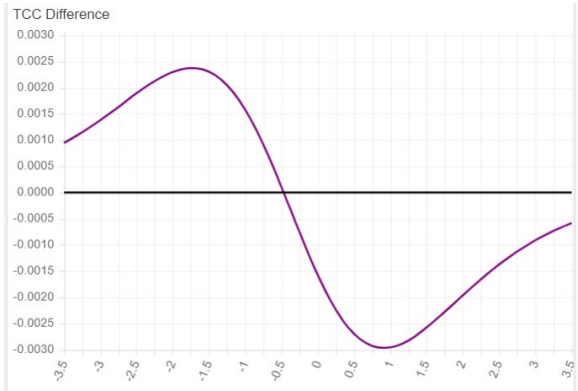


Using the item pool as the reference form:



This chart plots the CSEM (*y*-axis) against the theta score estimate (*x*-axis). Two curves are in the chart: the red curve represents the new form and the gray curve represents the reference form.

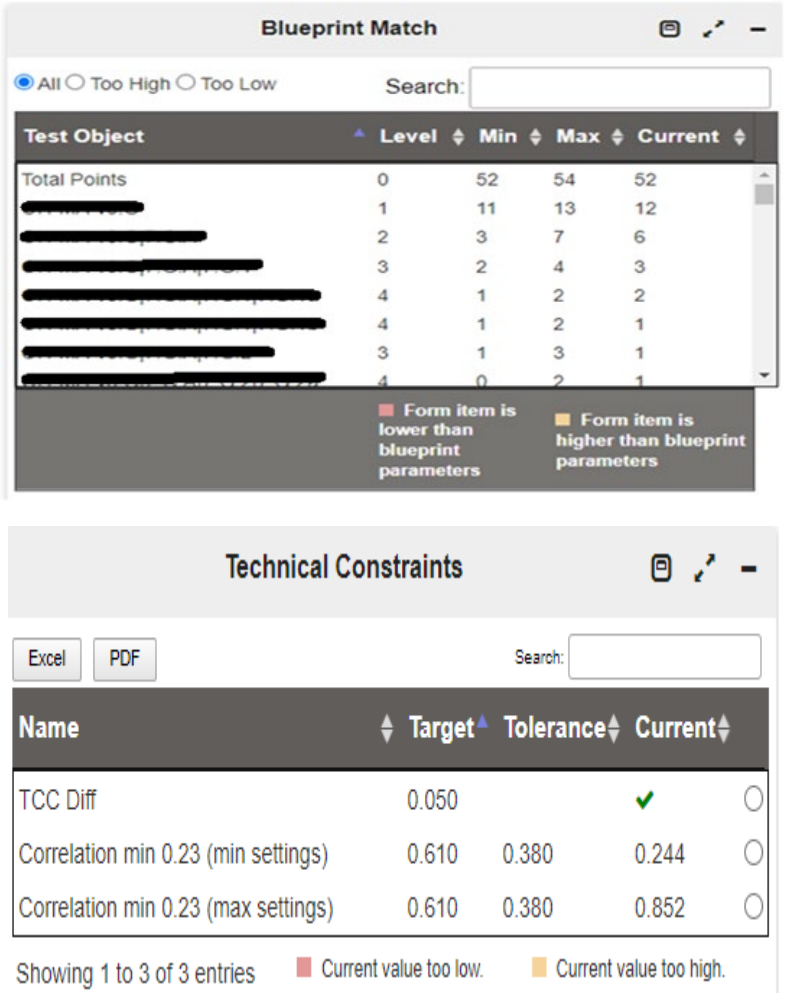
This chart compares the CSEM along the theta scale between the new form and the reference form. When the reference form is a fixed form of the same length as the new form, the two curves should stay close to each other (as shown in the upper chart), indicating that the two forms have similar CSEM along the ability scale. When the reference form is the entire pool (as shown in the lower chart), the reference form (or gray curve) will be below the new form (or red curve) because the entire item pool has more items than the fixed form. More items in a test always result in a lower CSEM.

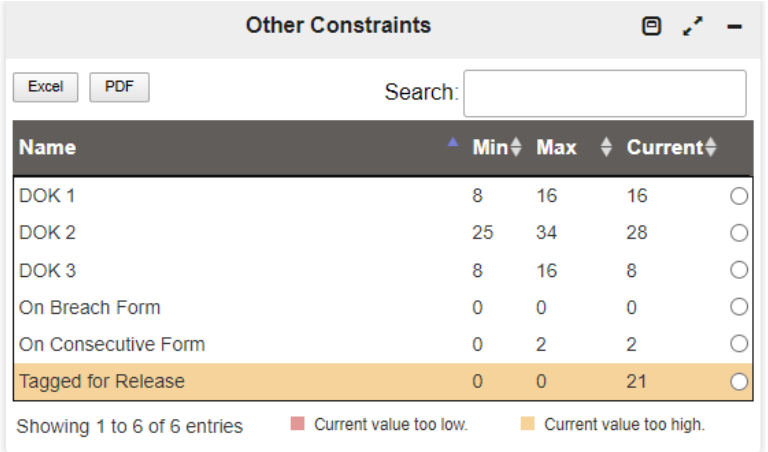
Chart of Adjusted Test Characteristic Curves 	This chart plots the expected proportion correct (*y*-axis) against the theta score estimate (*x*-axis). Two curves are in the chart: the red one represents the new form and the gray one represents the reference form. This chart compares the difficulty level of the new form (or red curve) with that of the reference form (or gray curve). The closer the two curves are to each other, the more similar the new form is to the reference form in terms of test difficulty. The technical constraint set on this aspect is that the vertical difference between the two curves shall not exceed the pre-determined technical constraint (e.g., 0.05) at any theta point in a pre-determined range (e.g., –2 to 2, this being middle range of the ability scale into which most students would fall), and shall not exceed the pre-determined constraint (e.g., 0.06) at any point beyond the theta score range mentioned in this section. The difference between the two curves is also plotted in the TCC difference chart that follows.
Chart of TCC Difference 	The TCC difference chart plots the difference between the TCCs of the new form and the reference form at each selected theta point, using the new form TCC minus the reference form TCC. When the technical constraint of “TCC Difference” is met, the vertical value of the curve should be within +/–0.05 for theta scores in the range of –2 and 2 and within +/–0.06 for theta scores beyond the range of –2 and 2.

NJDOE will have full access to all statistical data for all items used in the assessment. Following the analysis of field-test data for items, a series of classical test theory and item response theory (IRT) statistics are computed for each item to support evaluation of the item’s performance during data review along with subsequent scoring of student responses for items passing through data review to operational test status. Item statistics may be computed multiple times during the item’s life cycle, and ITS maintains all versions of the uploaded item statistics. While viewing an item in ITS, the item card with the statistical data is immediately available at the click of a button.

In the FTES, the blueprint-match, technical constraints, and other constraints sections shown in Exhibit 4.11.1.3-3 provide more detailed information about the form's properties. The blueprint-match section shows the total number of items selected to be on the form and the minimum and maximum requirements for each standard to meet the blueprint. The technical constraints section shows the required technical constraints and the level of tolerance. These constraints are developed as part of the form specifications process and are input by CAI's psychometricians to ensure equivalence across forms. The other constraints section shows any additional requirements set by NJDOE, such as Depth of Knowledge (DOK) and specific attribute counts. Those constraints created at the beginning of the form-building process will be displayed and tallied in these sections as the form is created and revised.

Exhibit 4.11.1.3-3: Statistics and Form-Building




Other Constraints

Excel PDF Search:

Name	Min	Max	Current
DOK 1	8	16	16
DOK 2	25	34	28
DOK 3	8	16	8
On Breach Form	0	0	0
On Consecutive Form	0	2	2
Tagged for Release	0	0	21

Showing 1 to 6 of 6 entries Current value too low. Current value too high.

If an item ever needs to be removed or replaced, the FTES can be used to determine what other items are available and how the substitution will affect the constraints.

4.11.1.4. Forms Composition

As stated previously, the forms composition process is completed using CAI's Form and Test Engineering Suite (FTES) system. There are review levels within that system to ensure that each review is documented with comments and outcomes.

During the item development process, our test developers use the Web Preview feature to see the item exactly as it will render to the students during online testing. This feature is used each time the item is reviewed in the Item Tracking System (ITS). During forms construction, reviewers can also invoke Web Preview. This allows them to see and interact with the items exactly as the student would. In addition, the paper preview can also be viewed during forms construction.

CAI also conducts Platform Review on tests before delivery to ensure consistent presentation of items across delivery modes. Before each test administration, CAI conducts an end-to-end check of the testing platform. CAI's Platform Review process, described in this section, tests every test item on different devices and operating systems (OSs). The goal is to ensure that the item renders and functions the same on each system. Before deployment, the testing system, all supporting systems, and content are deployed to a staging server, where they are subjected to user acceptance testing (UAT).

CAI's Platform Review process is designed to ensure that all content displays and functions identically on all our supported platforms. The Platform Review process is run completely within our ITS and all items are reviewed using the same item rendering engine that the Test Delivery System (TDS) uses. The Web Preview feature uses the same renderer code as the code displaying items on the TDS platform. An authorized user in ITS creates batches of items and assigns them for review, including providing instructions on what accommodations and platforms need to be used for the review. The dashboard also allows the administrator to see the progress of all batches under review, any items that have been flagged for attention on any platform, and batches that are complete with no issues reported to close out that batch and mark those items as having passed Platform Review.

Each team member performing the Platform Review will use two devices: a standard-issue laptop to log in to ITS, and a separate device with CAI's Secure Browser loaded (this is the platform on which the reviewer is tasked with reviewing the content). The reviewer will ensure that the content renders on his or her device exactly as it appears in ITS. Any issues noted are logged to ITS, and items can be marked for administrator review. If there are no issues, the reviewer will mark the item as having passed on the platform and proceed to his or her next item

in the batch. Once the batch has been reviewed on all platforms, a supervisor receives a report in ITS displaying the status of each item in the batch along with any associated issues. The supervisor may then approve items (with no issues) or flag items for content and project team intervention and resolution.

The initial paper generation process takes place in ITS and goes through a review process to ensure that the paper version is as similar as possible to the online version with appropriate directions and wording. This review process includes content reviewers and editors.

Once the paper version is created and the forms are approved, the items flow into our paper production process. Over the years, CAI has developed a structured and effective process for producing error-free documents of all sorts. These documents include such things as test booklets, test administration manuals, training documents, interpretive guides, and other ancillary materials. CAI will follow the same general process for the development of all materials. We divide the process into two phases:

1. A drafting phase, during which we obtain agreement on the content and design of the document (this part of the process differs somewhat for test booklets, which were discussed in the previous section)
2. A production phase, during which we produce the document to the specifications developed in the first phase, accommodate any final adjustments, and ensure that the camera-ready proofs are error-free

The drafting phase will begin with conversations with NJDOE, during which we will discuss issues of both design and content. Following these discussions, CAI will begin to develop the draft. We view the drafting process as iterative. Especially with new materials, we understand that it is not possible to make all final decisions prior to a first draft. New reviewers enter the process as documents approach completion. Interactions among design or content elements can sometimes be unexpected, and sometimes, a seemingly good idea at an early stage simply does not work. Therefore, we build in multiple drafts of each product before it enters the production process.

The quality assurance (QA) process for paper-pencil test booklets begins with the QA processes for items and bookmaps. With the bookmap in hand, test developers create the paper-pencil test booklets in four stages:

1. The 1×1s are created.
2. Blackline 1 is drafted.
3. The documents are brought to blueline.
4. The test booklets are printed and collated.

Step 1 is entirely automated within ITS. ITS houses destination templates that define the format of the 1×1s and automatically generates these documents based on the test map (CAI defines 1×1s as test items printed one per page according to the test map sequence). At this stage, items are proofread by both editorial and test development staff at CAI and NJDOE. Additionally, the items are reviewed to verify that all edits from previous rounds of review have been correctly implemented. Any changes required at this stage are entered directly into ITS to ensure consistency across all item uses.

Blackline 1 (Step 2) is a semi-automated process. With the appropriate destination template defined and 1×1 approval, ITS generates a Quark-readable document in the specified format. Our production staff may adjust the page layout, including instructions, borders, and other elements, to meet NJDOE's guidelines. At this stage, reviewers check the document layout and formatting. Should any egregious errors be found in the content of an item, changes must be entered into ITS and the item must be reexported to ensure consistent item use across all test

forms. Changes to blackline 1 require a second blackline proof. Changes to subsequent blackline proofs require sign-off by senior management.

The final QA step before printing is the blueline, or camera-ready copy, review stage. During this step, CAI and NJDOE staff review proofs from the print vendor, verifying that the file to be printed matches the previously approved blackline proof. At CAI, in addition to reviews by test development and forms production staff, two members of the technical team—who have not seen the items previously—independently take the tests. This process forces a close look at the items and provides a final opportunity to verify the keys.

4.11.2. Item Banking System

4.11.2.1. Instance of Item Bank for NJDOE

Upon award of contract, CAI will collaborate with NJDOE to create a New Jersey-specific item bank in our Item Tracking System (ITS). The New Jersey item bank will include ClearSight content as well as any content custom-developed for and owned by NJDOE. While we are proposing the ClearSight item pool, NJDOE and New Jersey educators will review the pools for alignment to NJSLS and appropriateness for the New Jersey student population. Only items passing that review will be included in the New Jersey instance of the item bank—it will not be possible to inadvertently administer items not approved by NJDOE.

CAI's content development process and item bank are managed using our ITS, which serves the following critical roles:

- A customizable content development and management tool
- An item bank
- A publication system that supports both online and paper publications

ITS relies upon a series of distinct and specific review levels throughout the content development process. The system shepherds the content entities that CAI develops through every workflow step, from inception to final publication. It does so by forcing these entities to pass through targeted review, editing, and management status levels, in which specific actions are taken or reviews are conducted. ITS enforces process standardization within content areas on all entities developed within those areas; in doing so, it additionally facilitates version control, management oversight, and preservation of the entity's development history. It also supports both NJDOE's participation in the review cycle and CAI's internal content development process.

CAI's ITS is a full-featured item development, test development, test management, and item banking system. During item development, items travel through a customizable, structured review sequence managed by ITS. ITS includes automated audit procedures and a substantial reporting capability designed to track item development progress as well as item quality.

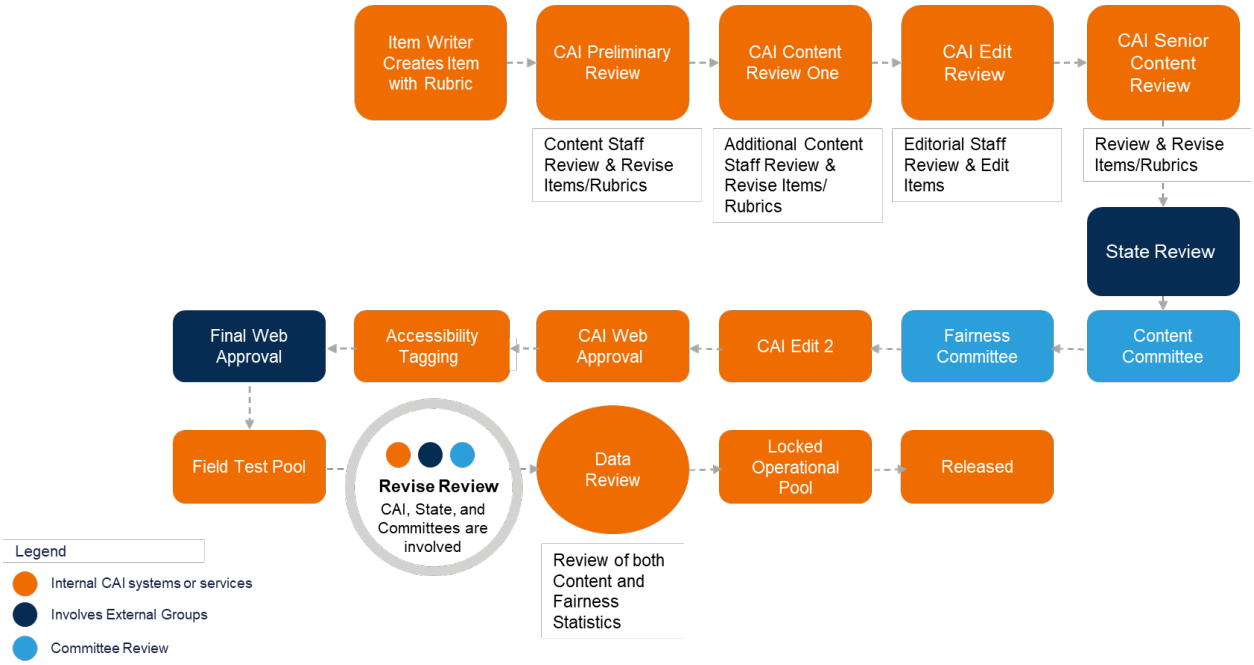
ITS supports a rigorous item review process that puts items through multiple levels of internal and external review. This sequence can be customized to support New Jersey's unique requirements. At each internal stage of the review process, CAI test developers check items to ensure that they are aligned to the standards, are worded clearly and succinctly, are grade-appropriate, contain appropriate graphics, have accurate and fact-checked content, are free of bias and sensitivity issues, follow the style guide, follow universal design principles, and can be adapted for use on a paper-pencil form. Each step in the review process corresponds to a level in ITS.

Once an item passes through our internal processes (including automated audit procedures which ensure the highest item quality), ITS makes the item available to NJDOE staff for review, evaluation, and acceptance. Subsequent review stages include review by New Jersey content,

fairness, and parent committees before field testing and data review afterward. ITS manages all of these reviews, recording comments and review outcomes such as acceptance or rejection.

Exhibit 4.11.2.1-1 shows the typical review process followed by ClearSight items. As noted in the diagram, state clients typically review items at certain points in the review process. However, these review levels, and their sequence, can be adjusted based on NJDOE's needs and requirements. If NJDOE desires to be involved in the item review process at an earlier stage, CAI can add an extra review level earlier in the item review process.

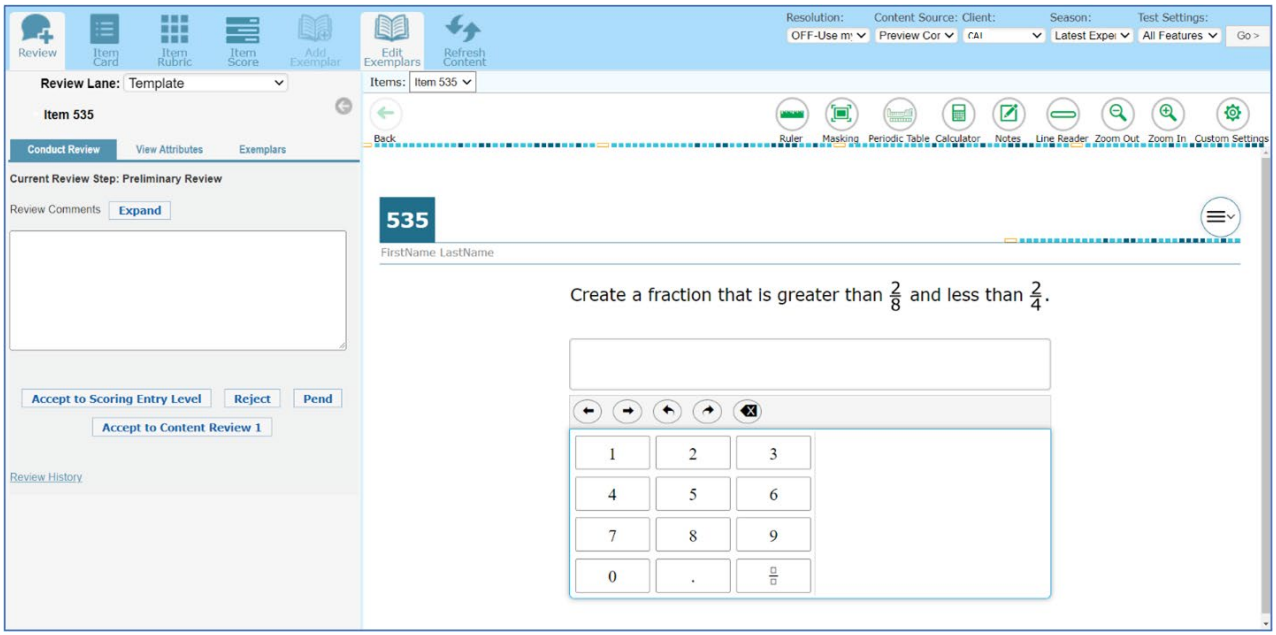
Exhibit 4.11.2.1-1: Item Review Cycle



Web Preview

After an item has been created in our Item Authoring Tool (IAT), our Web Preview feature allows the user (CAI, NJDOE, educator committees, etc.) to view and interact with each item type the same way a student will in the testing environment. Exhibit 4.11.2.1-2 shows the features available in Web Preview. The user can access support tools (e.g., ruler, calculator, line reader) and attempt the item as the student would. In terms of review, the user can view the rubric and item attributes alongside the item and enter comments that will be maintained in ITS. Items that have been field-tested also have an Item Card available in Web Preview with a summary of the item's statistics. CAI staff and clients consider the Web Preview feature essential, as we can view implemented edits and scoring changes to the item in real time.

Exhibit 4.11.2.1-2: Web Previewing an Item in ITS



Upon award of contract, CAI will begin collaborating with NJDOE on creating specifications for the New Jersey item bank, including New Jersey's desired review sequence.

4.11.2.2. Information Stored in Item Bank

Item Bank Metadata

Metadata (attributes) about each item or passage are fully configurable and can capture any information that NJDOE would like to maintain, including all metadata listed in this section of the RFQ. For passages, ITS attributes typically include general passage information, such as grade level, genre, and readability measures (e.g., Lexiles, word counts). In addition, all information about sources, including copyright information and attached permission documents, is stored with the passage in ITS.

Some examples of metadata stored for previous contracts include key blueprint-relevant metadata (such as grade level, content alignment, and Depth of Knowledge [DOK]), item-level attributes (used to track information, such as the gender of the name of the character embedded in the context of the item), item origin (for tracking any shared items), item formats, and item-scoring attributes. These attributes allow for ease in tracking and maintaining information about the item bank. At any time, if NJDOE has questions about the item pool, we can produce a summary table based on any attribute to quickly and accurately estimate the number of items in a particular category (e.g., the number of items in grade 3, Reading for Information, at DOK3). ITS also stores item administration metadata, including the date field-tested and used operationally. The field-test and operational forms, including the item, administration type and date, and other form-level information taken directly from CAI's Form and Test Engineering Suite (FTES) are described in Section 4.11.1.3.

Statistical Data

Following analysis of field-test data for items, item statistics are uploaded to ITS, which maintains all statistics associated with the item. A series of classical and item response theory (IRT) statistics are computed for each item to support evaluation of the item's performance

during data review, as well as for subsequent scoring of student responses for items passing through data review to operational test status. The statistics for each item include:

- Classical Item Analysis
  - proportion correct (*p*-value)
  - point biserial correlation
  - bias scores (differential item functioning [DIF])
- IRT
  - IRT parameters and model fit
- For multipoint items
  - percentage of students achieving each score point, including writing items

If additions or changes are needed, ITS is fully configurable and can capture any statistic necessary. Item statistics can be computed multiple times during the item's life cycle, and ITS maintains all versions of the uploaded item statistics. Item statistics can be generated from ITS at any time, just like other item metadata. While viewing an item in Web Preview, the Item Card with the statistical data is immediately available at the click of a button. A sample Item Card is shown in Exhibit 4.11.2.2-1. While the Item Card does not currently show item response times or change data, CAI can customize the Item Card to include this information.

Exhibit 4.11.2.2-1: Sample Item Card

IRT Statistics	
A	1.00
B	0.92
C	0.00
Total Students Administered	125356.00

Points	Percent in Category	Average Score of Students in Category
0	60.59%	-0.051
1	39.41%	0.801
Percent Correct	39.41%	
Correlation with Test		0.48

Fairness Statistics			
Label	**Grade**	**Focal Count**	**Reference Count**
Female / Male	-A	61414	63689
African American / White	+A	20837	84290
Hispanic / White	+A	5186	84290
Multi Racial / White	+A	11378	84290

Accommodations

ITS captures braille, text descriptions, and closed captioning/American Sign Language (ASL) videos, which are uploaded directly into ITS. We offer the industry's largest selection of operationally deployed accommodations and embedded accessibility supports. CAI has tools that enable us to efficiently add markups to support text-to-speech (TTS), screen readers, alternative languages, other language supports such as glossaries with audio, and many other accommodations and supports. ITS includes review levels for specialized teams to add accommodations such as TTS and braille. The accommodations become part of the item and travel with the item throughout the rest of the review process.

Reports

ITS has powerful reporting capabilities for item pool management and status. These reports can be generated on demand, either by NJDOE or CAI, and can include any metadata or attributes available in the item bank.

The following are examples of available reports in ITS:

- *Bookmaps* are a list of all items on a test form, formatted in a Microsoft Excel workbook with customizable column headings based on any of the attributes associated with the items in ITS.
- *Form Use History* provides information about how items have been used on previous test forms, including the name of the form, item position (for fixed-form assessments), and test administration date.
- *Summary Reports* can be created to show the history of an item's review in ITS at each step in the review process and can also cover a group of items associated with a stimulus to obtain a quick count of items by DOK, standard, interaction type, or any other customizable attribute.
- *File Size Reports* offer the capability to see at a glance the file size of any group of items, as well as information about whether the file size exceeds the established specifications.
- *Braille File Reports* show which items have which types of braille files (e.g., UCL, UCN, UCT) uploaded.

4.11.2.3. Item Bank Maintenance

CAI will provide an item bank maintenance plan to the SCM between 45 and 90 days from contract award to describe our ITS maintenance processes. Upon contract award, CAI will showcase our ITS and create specifications for the New Jersey item bank.

All updates to test content in ITS are captured in real time. Once an attribute update or content revision is saved in ITS, the update is viewable by anyone with ITS access. ITS captures all versions of an item. Exhibit 4.11.2.3-1 shows the version history for a released ClearSight item. The history documents the action taken by each user, what part of the content was affected—template (student-facing content), rubric, translation, etc.—a user comment describing the edit, and a time stamp showing when the new version was saved. In addition, users can access Web Preview to view any version of the item.

Exhibit 4.11.2.3-1: Released Item Version History

Version	Action	Date	Comment	User	Content Modified
1	Edit English Legacy	11/21/2016 4:57:31 PM	Convert OO approved content to IAT content.	Yang Sun	+ *Legacy*
2	Edit English Legacy	11/21/2016 4:57:34 PM	Convert OO latest content to IAT content.	Yang Sun	+ *Legacy*
3	Edit English Legacy	11/28/2016 10:49:51 PM	Convert OO latest content to IAT content.	Yang Sun	+ *Legacy*
4	Edit English Legacy	12/1/2016 6:22:12 PM	Update to latest metadata.	Marta Gebrehiwot	+ *Legacy*
5	Edit English Legacy	12/22/2016 10:23:37 PM	Convert OO approved content to IAT content. And approve it in IAT.	Yang Sun	+ *Legacy*
6	Edit English Legacy	12/22/2016 10:23:40 PM	Convert OO latest content to IAT content. And approve it in IAT.	Yang Sun	+ *Legacy*
7	Edit English Legacy	1/27/2017 4:41:46 PM	Update to latest metadata.	Susan Sherwood	+ *Legacy*
8	Edit English Legacy	2/5/2018 5:57:33 PM	Update to latest metadata.	Mengyao Cui	+ *Legacy*
9	Edit English Legacy	4/7/2020 12:37:41 PM	Added scoring assertion	Caitlin McGrory	+ *Legacy*
10	Edit English Legacy	4/7/2020 4:51:26 PM	Mass tutorial association at Interaction level	Animesh Mathur	+ *Legacy*
11	Edit English Legacy	4/8/2020 3:08:14 PM	ND	nina dyer	+ *Legacy*
12	Edit English Legacy	4/8/2020 3:11:01 PM	Nd reverted	nina dyer	+ *Legacy*
13	Edit Template	4/28/2020 8:14:20 PM	Up-conversion from legacy package v12	ITS Service	+ *Template , Rubric , mx AlternateTrans*

CAI does not delete any items from ITS. When an item is retired, it goes into “Archived” or “Released” status and resides at the appropriate Archived or Released review level. Items at such review levels are ineligible for operational test use and will generate an error if mistakenly placed on a test form. However, items at these levels are viewable in ITS.

At CAI, we have a dedicated staff working on ITS, constantly improving its user interface, accessibility, and functionality. Our team is very receptive to any changes NJDOE may wish to implement. While most item banks share the same basic structure, CAI realizes each state has its own needs, and that flexibility is designed into ITS. While each item bank is similar, each item bank is also distinct in its own way based on client preferences. This gives CAI flexibility to offer a standard product but still have it customizable to suit NJDOE’s preferences. Some common customizations include offering different review levels, featuring varying metadata, setting specific levels of access, and controlling imports.

ITS is engineered with security in mind. It is password-protected, and users have access to only certain review levels. For example, CAI editors have access to only editorial review levels, and educators reviewing items in ITS have access to only the appropriate educator review level. CAI will collaborate with NJDOE on a review sequence and appropriate ITS access for NJDOE staff. All ITS security measures are described in further detail in Section 4.11.2.4.

4.11.2.4. Item Bank Security

CAI will provide an item bank security plan to the SCM to ensure that the New Jersey item bank is protected from unauthorized access. The document will include the user roles and permissions for each role, the review and approval workflows, details on our audit logs, and information NJDOE would like us to report on periodically. ITS is a secure system with a host of application- and infrastructure-level security controls that safeguard against any unauthorized item access. All content files on disk are stored encrypted using National Institute of Standards and Technology (NIST) Federal Information Processing Standards (FIPS) 140-2-compliant Advanced Encryption Standard (AES)-256 and cannot be read without access to a secure key management service that manages the keys used to encrypt data. These keys are stored separately from ITS, and a secure key exchange protocol is used by the application to access

keys securely. This ensures that item security is preserved, and only authorized systems that have access to the encryption keys can decrypt the content.

In addition to encryption at rest, all data exchanges are limited to only secure transport channels to ensure that they stay encrypted during transit. All access to ITS web applications uses HTTPS with Transport Layer Security (TLS) 1.2 or higher. Additionally, ITS uses our Red Hat Single Sign-On service for authentication. Password rules enforce strong passwords, require periodic changes, and prevent password reuse for an extended period.

Finally, ITS offers fine-grained, role-based access control that allows the item bank to be configured to permit or restrict which users can perform specific actions within the item bank. Only senior project content leads have access to all item development levels in the item bank, and access for item writers, editors, and item reviewers is limited to the level at which they work. All updates to an item (e.g., modifications to item content, changes in review levels) are tracked in audit logs. A detailed version history allows users to review the item's history. Within this version history, every item modification is preserved along with information on who modified it and when it was modified, which allows for simple item audit tracking.

4.11.2.5. Test Item Selection

As mentioned previously, item statistics are readily available in ITS. These data can be seen at any time, especially during test construction and adaptive pool approval. Using the FTES within ITS is the most efficient way to select items for operational use.

Field-test items are selected by the field-test algorithm to ensure a representative distribution, as described in Section 4.10.1.

4.12. Psychometrics

As we have demonstrated consistently in our work implementing statewide assessments, all CAI's work related to NJSLA and NJGPA assessments will fully comply with the requirements of the Every Student Succeeds Act (ESSA) and will adhere to industry best practice standards as documented in the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014). During this period of rapid transformation in assessment technology, CAI is committed to both the adherence to best practices as they evolve and the active participation in the development and implementation of best practices for educational assessment.

Technical Problem Solving

CAI works closely with state departments of education and their technical advisory committees (TACs) to identify and solve a range of technical issues. In this section, we describe key issues in educational measurement in which CAI has been at the forefront in investigating and providing solutions.

Sampling. CAI is the industry leader in sampling designs for large-scale assessments. The impact of sampling design on test results can be substantial, but most testing companies overlook it. A smaller sample, randomly selected according to an appropriate sample design, provides better estimates of a population than a larger sample selected using ad hoc methods. Random sampling offers two critical advantages that have been the pillars of statistical science over the last century and a half:

- Random selection ensures that the probability of selection into the sample is independent of any factors that might affect the target statistics, eliminating potential biases.
- Random selection yields estimates with known sampling properties, enabling statisticians to estimate accurate standard errors. With ad hoc sampling methods, accurate estimators for the standard errors are unavailable, and therefore the resulting statistics' reliability is unknowable.

The National Research Council's (NRC) review of the National Assessment of Educational Progress (NAEP) underscored the importance of appropriate variance estimates in testing. It determined that the reliability of NAEP estimates was overstated because they neglected to appropriately consider the standard errors of the item parameters (National Research Council, 1999, p. 69). Shortly thereafter, the National Center for Education Statistics contracted with American Institutes for Research (AIR, now Cambium Assessment, Inc.) to develop estimators for the standard error of item response theory (IRT) item parameters under complex samples (Cohen, Jiang, Seburn, & Chan, 2008). These estimators are available through the iAM software, which CAI distributes without charge (Cohen & AIR, 2002).

Clustering. This concept refers to the idea that students in the same school or district are more alike than would be true of a simple random sample of students drawn from the population. Because schools are typically the primary sampling unit for educational research, clustering is observed in virtually all education-related samples.

Moreover, because clustering decreases the effectiveness of samples, larger samples of schools and students are necessary to achieve the same level of statistical precision obtained using a simple random sample of students.

For example, in evaluating comparability of items across test administration modes, researchers typically identify matched samples of students participating in online and paper-pencil test

administrations. In this approach, students matched on achievement and demographic characteristics are identified from both online and paper-pencil test administration modes. Responses for those groups are independently calibrated under the assumption of equivalent group ability, and parameter estimates of test items are compared across modes. However, the standard errors of resulting parameter estimates are estimated under the assumption of simple random samples, which is typically not the case. The matched paper-pencil sample typically comprises a highly clustered sample of districts not prepared to move to online test administration, with the result that apparent differences in item parameter estimates across test administration modes are often over-interpreted.

Equating. CAI has also worked with states and their TACs to investigate the volatility of test scores and associated performance classification outcomes across years, especially in the context of post-equated test results. While psychometricians routinely work to investigate and take steps to reduce measurement error in test scores, little attention has been paid to equating error that can also impact the stability of test scores between forms on equated tests. *Equating error* refers to the standard error of the linking constant identified to equate test forms. The magnitude of equating error is affected by the effective size of the equating samples, as well as by the number of linking items. CAI has worked with state TACs over many years to evaluate the impact of equating error in conjunction with industry-standard equating practices; as a result, many TACs have revised their recommendations about best practices in the identification of linking sets for equating test forms.

Bi-Factor IRT Models. CAI has been at the forefront in developing new item types that measure student knowledge and skills more deeply by providing students with real-world problems to investigate and solve. These new item types involve multiple interactions that support a range of assertions about the knowledge and skills demonstrated in a student's interactive responses. These new item types violate some underlying assumptions of general IRT models, and thus CAI has also been active in research on psychometric approaches that consider some of the complexities inherent in these new item types. Scoring assertions resulting from the multiple interactions within each item cluster are likely to be correlated.

It is sometimes suggested that several items, or in this case scoring assertions, simply be summed up and treated as a polytomous item. The idea is that each "testlet" can be scored as a polytomous item using either a partial credit model (Masters, 1982; Muraki, 1992) or a graded-response model (Samejima, 1969). Unfortunately, the models for polytomous items currently in operational use do not adequately address this issue.

Both approaches fail to accurately model the local dependence among interactions or assertions within a testlet. Partial credit models assume the same conditional independence among score points that traditional binary models assume, thereby overestimating the information available from the item cluster. Graded-response models make the opposite assumption and assume perfect conditional dependence (a single draw on an error term), thereby underestimating the information from the cluster.

We solve the problem by explicitly modeling and accounting for the correlation among assertions within compound items. Examples of IRT models that follow this approach are the bi-factor model (Gibbons & Hedeker, 1992) and the testlet model (Bradlow, Wainer, & Wang, 1999). The testlet model is a special case of the bi-factor model (Rijmen, 2010).

Benchmarking. CAI's incorporation of benchmarking into the standard-setting process is an innovation that has facilitated state adoption of rigorous performance standards that more accurately reflect the intent of adopted state standards. By providing standard-setting panelists with the location of performance standards for other important national and international assessments, they can more readily identify the neighborhood of likely proficient-level performance standards in the context of their own statewide assessments. While panelists continue to make judgments about the location of performance standards based on the

knowledge and skill requirements of test items as they relate to state academic standards, panelists can better evaluate the likelihood that *just barely meets* students can respond successfully in the context of rich benchmarking information. Importantly, the validity of test score interpretations is strengthened when the achievement levels indexed by multiple important assessment systems converge, providing consistent feedback about student achievement.

Accommodations. As we describe in Section 4.7.1.7.3, CAI has the most extensive range of accommodations and accessibility tools available and currently in use for delivering state summative assessments. The purpose of accommodations and accessibility tools is to remove construct-irrelevant barriers to accessing test content so that students can demonstrate what they know and can do. Beyond simply providing such tools, it is incumbent on test developers to investigate whether accessibility tools remove construct-irrelevant barriers as intended. CAI collaborates with states to investigate the differential impact of accessibility tools for students who are the intended beneficiaries of the accessibility tools and the general education population. For example, CAI recently completed a study in collaboration with the Arizona Department of Education to evaluate the differential impact of glossaries for limited English proficiency (LEP) students versus non-LEP students. Results of this study indicated that the performance of LEP students improved when glossaries were provided, while the performance of general education students was unaffected by the presence or absence of glossary terms. As a result of this finding, CAI is working with states to implement glossaries to reduce construct-irrelevant barriers to accessing test content for LEP students.

4.12.1. Psychometric, Research, and Technical Activities

CAI psychometricians provide support through all phases of the test development and implementation cycle. Section 4.13.9.1 provides an outline for our proposed technical report design, which provides a template for describing the extensive psychometric contributions to test development, implementation, scoring and reporting, and establishing evidence for the validity, fairness, and reliability of test scores and test score interpretations. Psychometricians work with content staff to identify gaps in the item pool each year that should be targeted for development, and work to identify the number of embedded field-test (EFT) slots necessary to field-test all new development, identifying the minimum number of EFT slots necessary to obtain highly precise and stable item parameter estimates.

Section 4.10 describes the classical item analyses and item response theory (IRT) calibrations, respectively, that psychometricians perform annually for all field-tested items. Flagging criteria are configurable and developed in collaboration with NJDOE. Items flagged based on classical item statistics are routed for review by the State's Content Review Committee, while items flagged for differential item functioning (DIF) are routed for review by the State's Fairness and Sensitivity Committee. Items passing through data review are promoted to operational pool approval and are then eligible for administration to students in summative assessments.

With the operational pool finalized, test configurations are produced that define the attributes of the item pools (e.g., standards, Depth of Knowledge [DOK], item parameters, etc.) and test specifications. These configurations are loaded into our adaptive algorithm simulator, and psychometricians work to identify the optimal weights to maximize test information at each student's ability while meeting all test blueprint specifications. Psychometricians also independently score all simulated test records to verify accurate scoring of test records, including overall test scores and performance levels, as well as subscale scores and performance classifications.

Throughout the testing window, psychometricians generate a series of quality assurance (QA) reports described in Section 4.4 to monitor the performance of the adaptive algorithm. QA reports include item analysis to evaluate the performance of test items, blueprint match to

ensure that the algorithm is performing as expected from the simulations, item exposure to evaluate uneven pool usage and target item development in the subsequent year, as well as a forensic analysis report to identify unusual, and potentially suspect, test administration conditions.

Following test administration each year, psychometricians produce the item and test analyses required to document the performance of the assessment system in the annual technical report. Section 4.12 describes the analyses used to evaluate test score precision and performance-level classification accuracy and consistency. This section also describes validity evidence that psychometricians will produce to support intended test score interpretations. CAI psychometricians will work with NJDOE to annually conduct additional validity studies to expand and strengthen validity evidence of test score interpretations.

4.12.2. Overview of Requirements for Psychometric Analysis of Operational Test Forms

Adaptive Test Construction

In a fixed-form test, the ideal test information function is decided once. Each year, a team of content experts and psychometricians makes a sequence of decisions about items to include. The test construction team may allow some deviation from the ideal information function to get a better match to the blueprint. The team may allow the reuse of some items from a prior test administration to achieve the desired balance. The number and types of compromises made often depend on the items available in the operational item bank. Participants draw on their experience and professional judgment to make these decisions but rarely articulate the guiding principles.

In an adaptive, criterion-referenced test, these decisions take on a different character. The system does not construct a test but rather implements an algorithm for constructing many tests. Calculations and algorithmic logic take the place of professional judgment. CAI's adaptive algorithm is highly configurable. This allows variable weighting of different blueprint constraints and provides several mechanisms for controlling the balance between blueprint match and measurement precision. In addition, the adaptive algorithm provides the ability to limit item exposure. In a fixed-form test, all items are "overexposed" each year.

Blueprint Construction

Sample blueprints are provided in Section 4.5.2. The distribution of item ranges is designed to accomplish several important goals. First, as criterion-referenced tests, the NJSLA and NJGPA must reflect a representative sample of the knowledge and skills that students are expected to achieve by the end of each school year or course. In addition, to support student-level reporting of domain scores, each domain must be assessed with sufficient items to support reliable subscale performance-level reporting. Whether adaptive or fixed form, the blueprints are designed to accomplish both goals, with items targeting the full breadth of the academic content standards but constrained to ensure a sufficient number of items in each domain to achieve reliable subscale reporting. Moreover, item ranges for Depth of Knowledge (DOK) levels and item types ensure that students, regardless of overall academic ability, are administered test items representing the full range of cognitive complexity and are provided the opportunity to demonstrate their knowledge and skills through the range of item types.

Configuration of Adaptive Tests

CAI's adaptive algorithm has a well-proven track record of delivering tests that ensure that each student has an opportunity to show what he or she knows and can do across the breadth of the

curriculum. We begin our presentation by clarifying several terms. The delivery of an adaptive test depends on two things: the test blueprint and the adaptive algorithm. The *test blueprint* defines the characteristics and content of the items that will be delivered. The *adaptive algorithm* refers to the sequence of procedures that selects the items according to the blueprint. It is the blueprint that specifies the range of standards to be administered to each student and the other characteristics of the items that make up each student's test, such as DOK and item type. The algorithm is the procedure that ensures that the blueprint is matched and that these items are of the appropriate difficulty.

Our algorithm seeks to optimize any or all of the following three criteria:

1. Match to a complex blueprint
2. Precision of content strand or other reporting category scores
3. Precision of overall scores

The emphasis of each of these objectives is separately configurable for each test.

The blueprint defines the characteristics of the items to appear on each test, specifying the minimum and maximum number of items to be delivered in each category. These categories generally include content (e.g., strand, cluster, standard), DOK, item type, and other salient subject-specific characteristics. Usually, minima and maxima in the lower levels of the hierarchy are established to ensure that each student sees the full breadth and has an equal chance of seeing each standard, rather than forcing an item on each standard. The de facto standard for peer review has been that at least half the standards in each reporting category be covered, although this is entirely a state-specific, blueprint issue. In cases where every student does not see every standard, we ensure that each student has an equal chance of seeing items on each standard, and we prevent systematic content differences across the range of proficiencies.

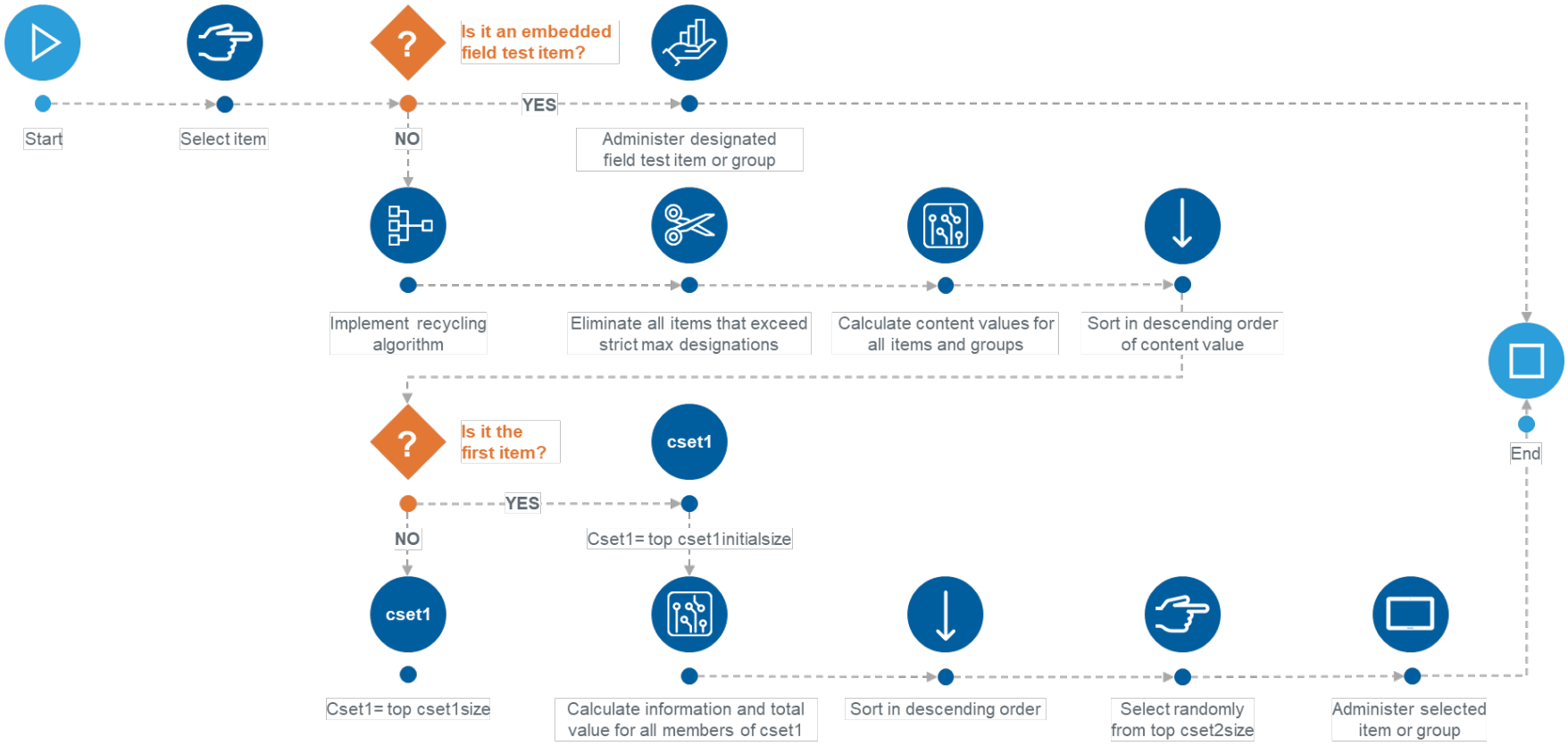
The algorithm is based on a multidimensional objective function. Each time an item is selected, every item in the pool has a value, and this value derives from the item's utility in terms of fulfilling the blueprint and its match to student proficiency. Calculating this value directly for each item is prohibitively time-consuming. Instead, the algorithm goes through a four-step process that trims the search space, limiting the number of items for which the actual value of the objective function must be calculated.

The four-step process of the algorithm is as follows:

1. Identify the *k* items or item groups (e.g., a group of items following a common passage) that provide the most value in terms of matching the blueprint.
2. Sort the *k* items in an order based on the weighted average of match-to-blueprint and contribution to performance. The weights are configurable and are generally set during the pre-deployment simulations.
3. Select randomly from the top *n* candidates (this limited application of random selection helps control item exposure).
4. If the selection is an item group and the group contains more items than it is set to administer with the stimulus, then sort the items according to a configurable mix of blueprint match and performance match and select the top *m* items, where *m* is the number of items designed to be administered with the stimulus.

The variables *k*, *n*, and *m* are all configurable, as are the weights associated with each element in the blueprint and the relative weights of the components of the objective function. A summary of the item selection process is also provided in Exhibit 4.12.2-1. This configurability provides a powerful mechanism for tuning the algorithm for the item bank for each test.

Exhibit 4.12.2-1: Summary of Item Selection Process



Constructing “forms” or configuring the adaptive algorithm for adaptive tests consists of two steps: establishing the item pool and then optimizing the item selection parameters for the selected pool. Our adaptive engine is robust to imbalances in the item pool as long as there are a sufficient number of items in the various blueprint categories. Therefore, the selection of items for inclusion in adaptive pools is less critical. When items are clustered into groups, as with reading tests, we must also pay attention to the composition of the item sets and the degrees of freedom available to the algorithm to select from among them. To configure and evaluate the performance of the adaptive algorithm, CAI psychometricians use our simulation tool.

Item Pool. As long as there are sufficient items to meet each of the blueprint specifications, the adaptive algorithm is robust with respect to item pool composition. It is therefore not necessary that the distribution of content standards within the item pool be proportional to the test blueprint. That said, the ClearSight item pools are highly robust and allow for adaptation test administration even for through-year assessment designs. Nevertheless, CAI test development and psychometric staff inventory the item pools prior to each test administration to identify any gaps that should be especially targeted for item development.

Item development in a fixed-form environment typically aims to concentrate test information near the critical proficiency cut score. When all students are administered the same form, the goal is to minimize measurement error near the location of important cut scores. In adaptive environments, of course, the goal is to minimize errors near each student’s ability level. This places a greater premium on developing items that more effectively measure students near the ends of the ability distribution, increasing the proportion of very easy and very difficult items. As part of our item pool inventory, we also evaluate the distribution of item difficulties within content domains to guide our item development strategy.

With respect to item pool adequacy, we note that in an adaptive assessment, the evaluation of items and their selection into the operational pool proceed somewhat differently than they do in a fixed-form assessment. In a fixed-form environment, the criteria for promoting items to the operational bank may be somewhat relaxed, allowing the inclusion of items that may not have optimal statistical characteristics but that are intended only to be available for placement in a test form when no other suitable items are available. Thus, item statistics are generally evaluated twice, once during data review for inclusion in the operational pool and again at form construction for placement in operational test forms. In an adaptive assessment, all items in the pool are available for test administration. For this reason, the criteria for including items in the operational bank should be more stringently applied than might be the case in a fixed-form environment. All items in the adaptive item pool must meet minimum requirements for item discrimination, be within the acceptable range of item difficulties, and demonstrate appropriate fit statistics. The adaptive algorithm does not recognize items as being for use only in emergencies.

Simulation Tool. The simulator allows psychometricians to adjust parameters within the adaptive algorithm to optimize it for use with a particular item pool. The simulator outputs a host of indicators including, but not limited to, the following:

- Estimates of bias at the overall and reporting category levels
- Standard errors and distributions of standard errors
- Match to blueprint
- Number of unique benchmarks administered to each student
- Item exposure
- Number of item groups administered
- Item reuse across opportunities

Psychometricians adjust configuration parameters to achieve the optimal mix of outcomes. Psychometricians interact with the simulator by modifying the configuration parameters in a web-based environment. When the configuration parameters are finalized, this same configuration is uploaded to the Item Tracking System (ITS) to generate a new version of the configuration file. Simulations are run on the new file as a final check that nothing has changed and that all procedures were followed. NJDOE will receive a final report on all simulations containing the detailed statistical output.

Monitoring Performance of the Adaptive Algorithm. CAI psychometricians generate quality assurance (QA) reports to provide ongoing monitoring of test administrations throughout the testing window. The QA reports provide information on item behavior, blueprint match rates, and item exposure rates that psychometricians can use to verify that the adaptive algorithm is performing consistently with the simulated test administration runs.

Fixed-Form Test Construction System

The process for constructing fixed-form operational tests begins after field testing and committee review. Once the item pool is finalized and locked down, our content specialists begin the process of constructing test forms.

Each fixed form is built to exactly match the detailed test blueprint and match the target distribution of item difficulty and test information. Together, these constitute the definition of the instrument. The blueprint describes the content to be covered, the DOK with which it will be covered, the type of items that will measure the constructs, and every other content-relevant aspect of the test. The statistical targets ensure that students will receive scores of similar precision, regardless of which test form they receive.

All fixed test forms will be constructed so that they are strongly parallel. This means that the test scales and performance levels will be equivalent from form to form and that the raw score to scale score comparisons for each form will be as similar as possible, given the characteristics of the item bank.

CAI's experienced team will use our full-featured Form and Test Engineering Suite (FTES) to support the form-building process from beginning to end. The FTES stores all constraints relevant to form-building activities and is designed to support each critical stage in the form-building process itself. For example:

1. **Blueprints**: Blueprints are entered and stored in CAI's publication maintenance system. The blueprints show form constraints by content standards and by crosscutting elements, or affinity groups, such as DOK.
2. **Item-level attributes**: Item attributes are stored in ITS and are available for reference within the FTES. These attributes include, but are not limited to, item alignments, item DOK, item biserials, item *p*-value, item difficulty (Rasch), item braille status, item type, and item-passage association.
3. **Form-level attributes**: The FTES displays the form test characteristic curve (TCC), standard error of measurement (SEM) curve, TCC curve match against a reference form, and form statistical averages.

Each of the content constraints and statistical targets previously mentioned can be entered into the FTES and customized to the needs of each individual form. As items are added and removed during the form-building process, the FTES will track progress against these constraints in real time and flag any violations, empowering form builders and senior review staff to efficiently build error-free forms that take full advantage of the available item pool.

CAI will also develop a form specification document for NJDOE review and approval that captures all constraints in form development for each subject and grade. These specifications

will be the basis for all form-building activities, including form-building meetings. Prior to the meeting, CAI content and psychometric teams will generate candidate forms that meet all requirements of the form specification document. During the meeting, CAI and NJDOE staff will review the forms and modify them as necessary. Form revisions can be made within the FTES, allowing for on-demand information, accurate version control and tracking, and immediate output of all blueprint and psychometric information for evaluation. Once the form is approved, items can be sequenced into both the “base” and “scrambled” versions of the forms. The FTES empowers users to “duplicate” and then re-sequence previously approved forms, enabling an efficient and error-free basis for the form “scrambling” activities.

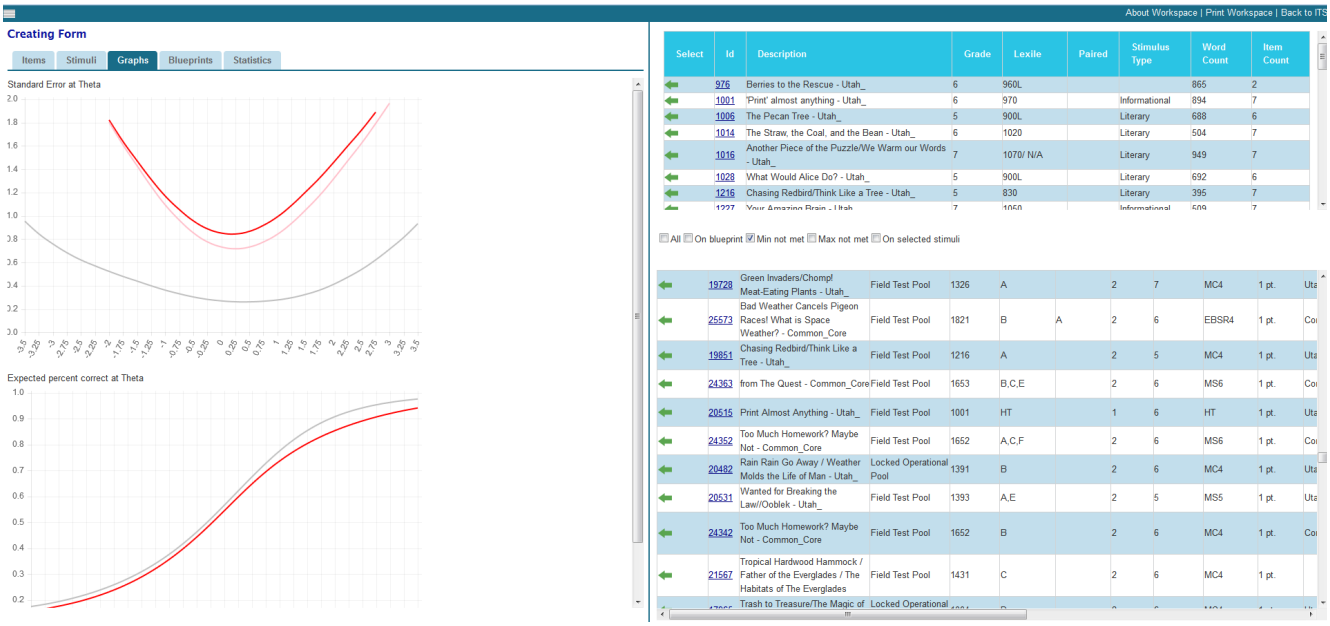
If the forms are for a first-year assessment, a reference form may not exist, but form developers can use the item bank as a reference form in the base year. However, once the test has been operational for at least one year, the original year’s reference form can be designated as the reference form. This is useful since the forms must be as equivalent as possible from year to year. The standard error of the theta curve of the reference form is provided, and this helps guide the test developer in the form-building process.

The tool displays the item pool on the right side of the screen and includes items and stimuli with all selected attributes. This is depicted in Exhibit 4.12.2-2**.** The left side of this view presents the standard error curve of the form as currently constructed, and in gray, the standard error curve for the reference form. On the lower portion of the left side, the system presents the TCC for the current form and, if available, the reference form.

The test developer can filter the item list to show only the items whose alignments are still needed to meet the blueprint. Clicking the green arrow puts the item on the form and removes it from the available items list. The list of items will also be adjusted based on the need for items at this same alignment on the blueprint. If the test developer hovers over the green arrow, a light red curve will appear showing how the curve will change if the test developer adds this item to the form. The test developer adds, removes, and replaces items on the form until the blueprint is met and the red curve overlaps as much as possible with the gray curve.

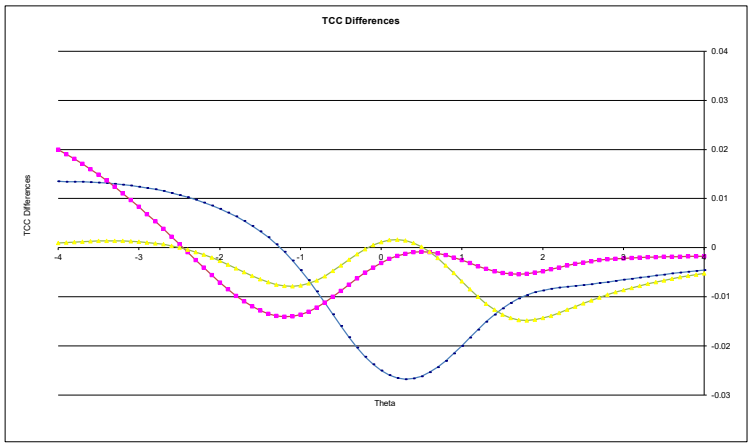
The FTES allows the test developer to enter a stimulus-level blueprint as well as an item-level blueprint. The stimulus-level blueprint in English language arts (ELA), for example, allows the test developer to determine how many of what types of passages should be on the test. For science, the stimulus-level blueprint ensures that test forms have the prescribed number of clusters. Once this is determined, the FTES will generate all possible combinations of clusters that fit the stimulus-level blueprint and will fulfill the item-level blueprint. Then, the test developer can move through each of the combinations to determine which set of clusters would best fit the curve and any other criteria.

Exhibit 4.12.2-2: Reference Form Graphs and Eligible Items and Stimulus



At this point, the test developer can see the exact difficulty relationship between the target and reference forms. Exhibit 4.12.2-3 shows a graph of the TCC differences. There are several important aspects to note when examining TCC differences. First, differences in TCC can occur at specific locations if the TCCs are across a range of abilities. These differences reflect different emphases in test information across forms at these ability levels. If the difficulty and error structure for the target forms is virtually identical to the reference form, as in the sample TCC and SEM curves, then the item selection process concludes with multiple, parallel test forms. Once the goal of parallel forms is achieved, the information is entered into ITS, which tracks item usage and generates bookmaps (test maps) for use in form development and other processes.

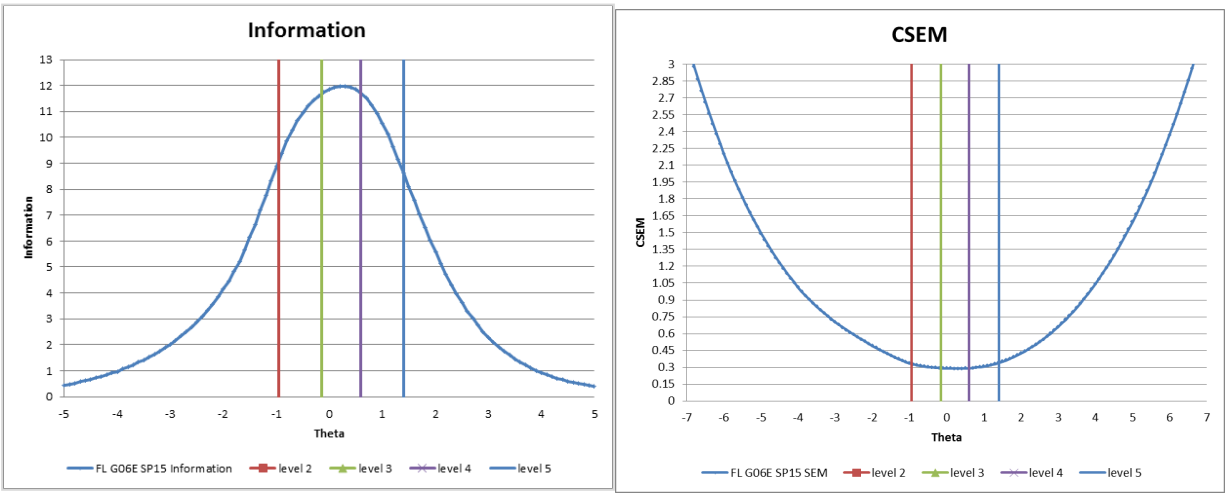
Exhibit 4.12.2-3: Test Characteristic Curve Differences



For the base year, test construction targets can be based either on the psychometric characteristics of the item bank or on the locations of anticipated (or historical) performance standards identified for the NJGPA assessments. For fixed-form assessments, it is preferable to target test information near critical cut scores, especially the proficient cut score, and to ensure reasonable precision of measurement across the range of performance standards. As illustrated in Exhibit 4.12.2-4, by evaluating test characteristics in reference to the likely location of recommended performance standards, test developers can ensure that fixed-form tests

measure with precision in the locations where students are being classified into performance levels.

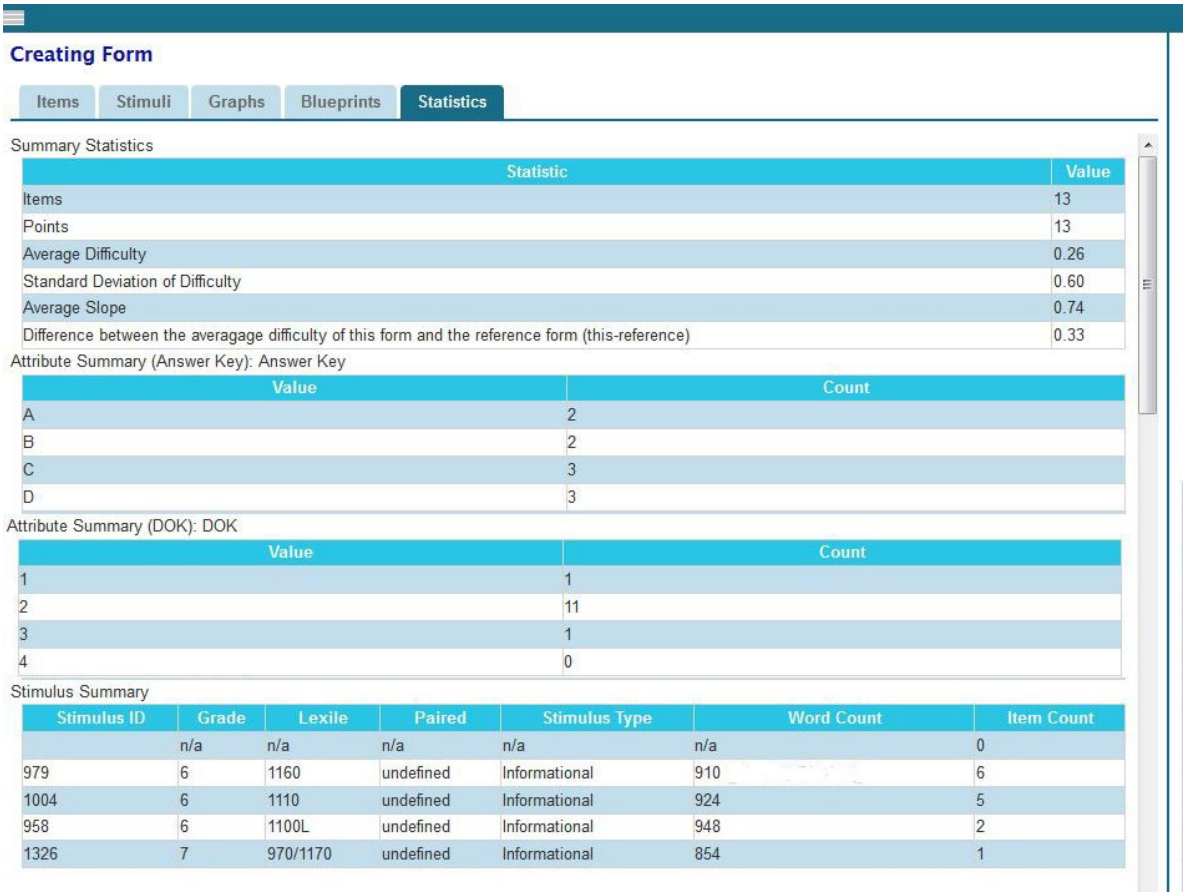
Exhibit 4.12.2-4: Test Information and Standard Errors Relative to Performance Standard Locations



For subsequent test administrations, all test forms for each content area will be constructed so that they are strongly parallel. This means that the test scales and performance levels will be equivalent from form to form and that the raw score to scale score comparisons for each form will be as similar as possible, given the characteristics of the item bank.

The item statistics tab shown in Exhibit 4.12.2-5 provides more detailed information about the properties of the form. This tab shows the total number of items selected to be on the form, as well as the average difficulty and slope. Counts are provided for each of the important attributes. For example, Exhibit 4.12.2-5 shows that there are currently 13 items selected to be on the form, and the average difficulty of these 13 items is 0.26. The multiple-choice items currently selected for the form have a nice distribution across the answer keys 2, 2, 3, and 3 for A, B, C, and D, respectively. The distribution of the DOK levels is also shown. Whichever attributes were selected at the beginning will be shown and tallied in this tab as the form is being created.

Exhibit 4.12.2-5: Summary of Current Form Statistics and Item Attributes



Creating Form

Items | Stimuli | Graphs | Blueprints | Statistics

Summary Statistics

Statistic	Value
Items	13
Points	13
Average Difficulty	0.26
Standard Deviation of Difficulty	0.60
Average Slope	0.74
Difference between the averagage difficulty of this form and the reference form (this-reference)	0.33

Attribute Summary (Answer Key): Answer Key

Value	Count
A	2
B	2
C	3
D	3

Attribute Summary (DOK): DOK

Value	Count
1	1
2	11
3	1
4	0

Stimulus Summary

Stimulus ID	Grade	Lexile	Paired	Stimulus Type	Word Count	Item Count
	n/a	n/a	n/a	n/a	n/a	0
979	6	1160	undefined	Informational	910	6
1004	6	1110	undefined	Informational	924	5
958	6	1100L	undefined	Informational	948	2
1326	7	970/1170	undefined	Informational	854	1

While there are many criteria that need to be met in form building, it is also necessary to ensure that the items being selected are appropriate and are not clueing or cueing other items. Clicking the item ID in the FTES will open the item in a separate window so the test developer can see the item along with additional attributes and statistics.

Once the form has been created to meet the blueprint and any required statistical criteria, the items can be rearranged to reflect the order in which they would be presented on the test following the procedures documented in the Test Form Assembly specifications document.

If at any point an item needs to be swapped out, the FTES can be used to see what other items are available and how it will affect the curve.

This tool has made form building a much smoother process, and in the end, the forms more precisely meet both content and statistical criteria.

4.12.3. Differential Item Functioning

As described in Section 4.10, following field-test administration each year, CAI will conduct item response theory (IRT) and classical item analyses to calibrate and equate items to NJSLA and NJGPA scales, and to evaluate the fitness of items for promotion to the operational item pool. These analyses include evaluation of differential item functioning (DIF) between designated focal and reference groups. Results of these item analyses will be provided annually to NJDOE as a report, but data are always available to NJDOE in CAI's Item Tracking System (ITS).

As described in Section 4.4, a series of quality-assurance reports are also generated throughout the test administration window to evaluate the performance of test items. These reports include

item analysis, blueprint match, and item exposure reports that CAI psychometricians can make available to NJDOE at any frequency that the Department requires (typically, reports are generated frequently at the beginning of the testing window to quickly identify any item performance issues).

4.12.4. Detailed Item Analysis

As we have described throughout this response, CAI proposes to use pre-equated item parameters to support NJDOE's transition to an adaptive test administration, as well as to provide New Jersey educators and families with more timely reporting of assessment results. Even when using pre-equated item parameters for immediate scoring and item/stage selection, it is important to monitor item parameters for possible drift over time. In the context of fixed forms and Stage 1 forms in stage-adaptive models—where test items are administered to all students—we propose to recalibrate operational items each year and link them back to the reference scale so that bank item parameters are refreshed following each operational test administration. We will also compute classical item analyses on fixed-form operational items, consistent with the field-test analyses.

For items administered adaptively, whether in an item- or stage-adaptive framework, because item administration is targeted to a subset of the student population based on student ability, there is no expectation that item performance will be consistent between field-test and operational-test administration. For example, items that are relatively easy in the field-test administration will be selectively administered to only the lowest-ability students. As a consequence, items will appear to become more difficult, but only as an artifact of having been selectively administered to only low-ability students.

In the context of adaptive test administrations where items are selected for administration in part to maximize measurement precision at the students' ability levels, it is not possible to directly examine item parameter drift as in the case of fixed-form test administrations where all students are administered the same sample of test items. Nevertheless, should item parameter drift occur, bank item parameters will no longer exhibit good fit with the pattern of students' responses. Thus, during the course of each test administration, CAI psychometricians monitor test items for fit to the relevant item response theory (IRT) model. For each student and each item, a residual between observed and expected score given the student's ability is computed. The residuals for each are averaged across all students, and the average residual is used to flag an item.

We also note that CAI psychometricians actively monitor the performance of test administrations throughout the testing window using a set of quality-assurance reports generated from the Quality Monitor (QM) System. Throughout the testing window, quality-assurance reports will be routinely generated and evaluated to ensure the quality of the NJSLA and NJGPA. The quality-assurance reports provide information on item behavior, blueprint match rates, and item exposure rates. Additional reports include a forensic analysis report that flags unlikely patterns of behavior in testing administrations aggregated at the test administration, test administrator (TA), and school levels. The quality-assurance reports can be generated on any desired schedule. Item analysis and blueprint match (for item-adaptive test administrations) reports are frequently evaluated at the opening of the testing window to ensure that test administrations conform to blueprint and items perform as anticipated.

Each time the reports are generated, the lead psychometrician reviews the results. If any unexpected results are identified, the lead psychometrician immediately alerts the project manager to resolve any issues. Exhibit 4.12.4-1 presents an overview of the quality-assurance reports.

Exhibit 4.12.4-1: Overview of Quality-Assurance Reports

QA Reports	Purpose	Rationale
Item Analysis	To confirm whether items work as expected	Early detection of errors (key errors for selected-response items and scoring errors for constructed-response, performance, or technology-enhanced items)
Blueprint Match Rates	To monitor unexpected low blueprint match rates	Early detection of unexpected blueprint match issues
Item Exposure Rates	To monitor unlikely high exposure rates of items or passages, or unusually low item pool usage (high unused items or passages)	Early detection of any oversight in the blueprint specification
Cheating Analysis	To monitor testing irregularities	Early detection of testing irregularities

Summary

Item analysis results are always available to NJDOE. Once item statistics have been uploaded to the Item Tracking System (ITS), NJDOE and all test development staff can view item statistics along with any other attribute of test items. Item statistics can be viewed as a "card" for each individual item, or summary reports can be generated to view item statistics for entire pools or any subset of test items. In addition, results of item analyses will be summarized and reported annually as part of CAI's technical reporting, as described in Section 4.13.9.1.

4.12.4.1. Preliminary Item Analysis

As noted previously, CAI will generate item analysis reports throughout the operational testing window for examination of item performance. Items showing evidence of IRT model misfit or low biserial/polyserial correlations will be flagged for review by CAI content staff to ensure the fidelity of the test items. CAI psychometricians will work with NJDOE to conduct studies investigating the stability of ClearSight item parameters over time, as well as the appropriateness of the ClearSight item parameters for New Jersey. CAI employs a multiple-group IRT model to calibrate ClearSight items, and we will provide NJDOE with analyses comparing the IRT parameters estimated in the multiple-group approach and those estimated using only New Jersey students. In addition to our evaluation of IRT model misfit, we can also identify a sample of operational items for administration in embedded-field-test (EFT) slots each year to directly evaluate item parameter drift. The sample of items identified for investigation each year may be, for example, those items showing evidence of model misfit in the previous test administration.

4.12.4.2. Final Item Analysis

Following the close of the testing window, CAI psychometricians will additionally produce quintile analyses for selected-response items, the proportion of students in each score category for polytomous items, as well as biserial and polyserial correlations between items and overall and subscale test scores. CAI will submit the final item analysis report to NJDOE within 30 calendar days following the close of the summative testing window. Item analyses will also always be available to NJDOE in ITS.

4.12.5. Standard Setting

CAI brings to New Jersey a highly experienced standard-setting team that has successfully conducted dozens of standard-setting workshops in support of 17 state accountability assessment systems and six state alternate accountability assessment systems. CAI psychometric and test development staff have extensive experience leading standard-setting workshops that apply a range of standard-setting procedures, including the widely used Bookmark procedure as well as modified Angoff, Item-Descriptor Matching, and Body of Work procedures. We also use our innovative Assertion Mapping procedure to support assertion-based scoring models employed by a consortium of states assessing the Next Generation Science Standards (NGSS).

CAI works closely with state departments of education to systematically validate performance standard locations, especially in the context of revisions to the state standards and test blueprints that, while significant, may not warrant re-establishing performance standards. While revisions to standards or blueprints may alter the measurement construct, maintaining the continuity of scale-score and performance-level classifications is an important goal of established assessment systems. Although major revisions to the standards framework and test blueprint likely require establishing new scales and performance standards, more minor revisions may simply require additional evidence that performance standards continue to support valid inferences about student achievement. We note that standards validation can also provide additional evidence for the validity of test score interpretations even in the absence of revisions to the standards or test blueprint.

As indicated in the RFQ, we anticipate that new standards will be adopted for all New Jersey assessments in summer 2026 following the first operational test administration of the new assessments. Our standard-setting workshops are greatly facilitated by the use of our online standard-setting tool. All panelists in all workshops and rooms are guided through the standard-setting procedures using highly scripted workshop modules that ensure standardization of workshop procedures for all panelists. Importantly, because ordered-item booklets (OIBs) are presented online, panelists can interact with test items the same way students do, allowing participants to better understand the knowledge and skills required to successfully respond to each item. Presenting panelists with paper representations of interactive item types does not allow panelists to fully evaluate the demands of many of the newer and more innovative item types available online.

CAI has successfully delivered standard-setting workshops (as well as standards validation workshops) remotely since the COVID-19 pandemic. Although we propose to conduct standard-setting/validation workshops in person, we note that our success with remote standard-setting workshops has been such that several states continue to proceed with remote standard-setting workshops, even though travel and meeting restrictions have been lifted.

The validity of test score interpretations is bolstered when performance standards converge across important assessment systems. CAI has been on the vanguard of providing standard-setting panelists with benchmarking data to provide context about likely performance standard locations and to promote convergence among performance standards between important assessment systems. The standard-setting tool can be flexibly configured to provide panelists with benchmark and impact data differentially across rounds. For example, some states wish to provide benchmarking information upon initial review of OIBs, while others wish to provide benchmarks only after initial performance standard recommendations have been made. Our tool supports a variety of possible configurations.

Performance standard recommendations are captured online, ensuring accurate data capture of panelist recommendations and facilitating faster feedback to panelists. Moreover, the online system automatically evaluates the vertical articulation of recommended performance

standards, providing panelists with immediate feedback about how performance standards emerging from each of the grade-level panels cohere as a cross-grade system of performance standards. Thus, the online tool also supports moderation of performance standards following vertical moderation sessions, ensuring that all steps in the standard-setting process are fully captured and documented.

Standard-Setting Plan

Upon award of this contract, CAI will prepare a standard-setting plan for review by NJDOE and its Technical Advisory Committee (TAC). Following New Jersey's review of the standard-setting plan, CAI will make recommended revisions to the plan and resubmit it to NJDOE for final approval.

Interpretation of test scores rests fundamentally on how they relate to performance standards that define the extent to which students have achieved the expectations defined in the academic standards. With the development of new statewide assessments in English language arts (ELA) and mathematics, NJDOE will need to adopt a new system of performance standards to determine whether students have met the learning goals defined by the new assessments. The cut score establishing the proficient level of performance is the most critical because it indicates that students (1) are meeting grade-level expectations for achievement of the New Jersey Student Learning Standards (NJSLS), (2) are prepared to benefit from instruction at the next grade level, and (3) are on track to pursue post-secondary education or enter the workforce. Thus, the procedures used to adopt performance standards for the new assessments are central to the validity of test score interpretations.

CAI will work with NJDOE to identify the number of performance levels to be reported for New Jersey's redesigned assessments and their associated labels. We recommend that NJDOE identifies no more than three performance standards, demarcating the four levels required to meet federal assessment reporting requirements. To meaningfully support reporting of more proficiency levels requires an assessment length that is greater than what NJDOE envisions with respect to test administration time.

Performance-Level Descriptors (PLDs) define the content-area knowledge, skills, and processes that students at a specific performance level are expected to possess. Standard-setting panelists will base their judgments about the location of the achievement levels by using the PLDs as well as the subject-area content standards. CAI will provide NJDOE with draft PLDs for review. NJDOE may wish to consider posting the PLDs for review by educators in order to incorporate important feedback from the field in the final set of PLDs. This procedure also ensures that panelists are currently familiar with the PLDs before the standard-setting workshop, which greatly facilitates their performance.

New Jersey educators, serving as standard-setting panelists, will follow a standardized and rigorous procedure to recommend performance-level cut scores. We propose that the workshops employ the Bookmark procedure (Mitzel, Lewis, Patz, & Green, 2001), a widely used method in which standard-setting panelists apply their expert knowledge of NJSLS and student achievement to map the PLDs adopted by New Jersey onto an OIB constructed from items administered in the first operational test administration. The OIBs are devised to be proportional to the blueprint and to minimize information gaps between consecutive items.

We propose to provide panelists with contextual information that informs their primarily content-driven performance standard recommendations. For ELA and mathematics, linkages to the National Assessment of Educational Progress (NAEP) performance standards can be used to provide panelists with context information about the likely location of new performance standards. These linkages allow NJDOE to provide panelists with benchmark information about the location of important performance standards when considering the location of performance standards for the new NJSLA and NJGPA. Locations where performance standards from

multiple important assessment systems converge represent neighborhoods in which performance standards likely reside. When panelists can use benchmark information to locate performance standards that converge across assessment systems, the validity of test score interpretations is bolstered.

For ELA and mathematics standard-setting workshops, we propose to convene grade-band standard-setting panels for ELA (e.g., grades 3–4, 5–6, 7–8, 9/high school graduation assessment) and mathematics (e.g., grades 3–4, 5–6, 7–8, end-of-course [EOC] assessments). Panels begin by recommending performance standards in anchor grades (e.g., grades 4, 6, 8) using the standard Bookmark procedure. We note that high school ELA has only a single grade, while there are three EOC assessments in mathematics. The high school EOC mathematics panel will likely need an additional day to complete its work. Alternatively, NJDOE may convene separate panels for each of the mathematics EOC assessments. For the high school ELA panel, we will ask table leaders to reconvene for final moderation.

Online Bookmark Procedure. To ensure vertically articulated performance standards across grade-level assessments, CAI proposes to employ an augmented Bookmark procedure to establish grade-level cut scores for New Jersey's new statewide assessments. Following the recommendation of anchor grade standards, the full panel convenes to vertically articulate the anchor grade performance standard recommendations. With vertically articulated performance standards for the anchor grades, initial performance standard recommendations for the remaining grades are identified by interpolating the anchor grade performance standards. Panelists employ a modified judgment task to recommend performance standards for the interpolated grades. If panelists determine that two-thirds of students just barely qualified for entry into the performance standard can respond successfully to the item on the interpolated OIB page, they are asked to adopt the interpolated location as the standard. If panelists cannot adopt the interpolated page as the performance standard, they are asked to identify an OIB page as near to the interpolated page, where two-thirds of students just barely qualified for entry into the performance level can respond successfully. This approach allows panelists to consider explicitly the importance of vertically coherent performance standards when recommending performance standards.

We recommend that the Bookmark procedure be implemented in two rounds, providing panelists with contextual (benchmark and impact) data before Round 1 and panel feedback before Round 2. We also propose to employ our web-based approach to the Bookmark procedure, in which panelists access OIBs, review benchmark and impact data, and set standards online. CAI's standard-setting tool allows panelists to view and interact with items in the way they are presented to students, which is crucial to the evaluation of the knowledge and skills required for students to respond correctly to the item types developed for online assessments. The standard-setting tool also enables immediate calculation and results reporting, reducing the overall workshop time and burden on panelists.

Online Ordered-Item Booklets. CAI proposes using an online OIB based on an operational test administration of items meeting all blueprint specifications and augmented as necessary to minimize gaps in assessment information. Items used to augment the OIB will be selected so that they are proportional to the test blueprint and minimize information gaps between adjacent items. The OIB may include approximately 50% more items than an operational test administration. Increasing the number of items in the OIB modulates the impact of bookmark placements, especially in higher- and lower-ability regions, freeing panelists to focus on content considerations when placing bookmarks. Although items will have been previously field-tested, classical item analysis and differential item functioning (DIF) statistics will be evaluated for all items to ensure that the selected OIB test items are not flagged for item characteristics that could result in their rejection from the operational item pool. The online OIB will be presented to panelists using CAI's online standard-setting tool and will enable the display of complex item types as well as benchmark and impact data and item attributes, such as content alignment.

Workshop Panelists and Stakeholder Review Committees. CAI proposes to work with NJDOE to recruit classroom teachers and curriculum specialists with expertise in the grade-level content standards and instructions for the standard-setting workshops. To ensure that the widest range of stakeholders has meaningful input into the standard-setting process, we propose to conduct a stakeholder review with a more general group after the workshop. This group will consist of table leaders from the standard-setting workshops and representatives from other important stakeholder groups.

Performance-Level Descriptors. PLDs define the content-area knowledge, skills, and processes that students at a specific performance level are expected to possess. The standard-setting panelists will base their judgments about the location of the achievement levels by using the PLDs as well as the subject-area content standards. CAI will provide NJDOE with draft PLDs for review. NJDOE may wish to consider posting the PLDs for review by educators in order to incorporate important feedback from the field in the final set of PLDs. This procedure also ensures that panelists are currently familiar with the PLDs before the standard-setting workshop, which greatly facilitates their performance.

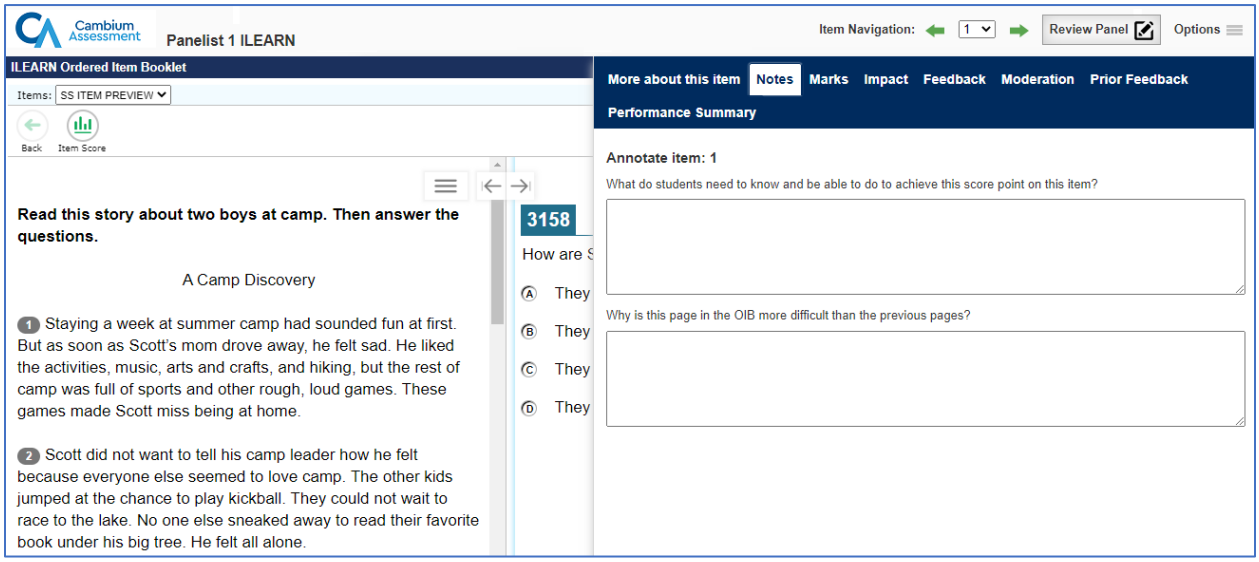
Panelist Recruitment. To recruit panelists, CAI will assist NJDOE in actively seeking individuals from the diverse backgrounds found in New Jersey. For the ELA assessments, CAI will convene four grade-band panels (grades 3–4, 5–6, 7–8, and 9/EOC). Each grade-band panel will include approximately 12 panelists, divided among grades and grouped into tables. One panelist at each table will be assigned as a table leader. Table leaders will have the additional responsibility of ensuring that table activities remain focused, verifying that panelists understand their assignment, and alerting workshop leaders about any issues encountered.

Training. Training at the meetings will involve helping panelists familiarize themselves with the assessment system and the standard-setting process. Training will include a review and discussion of the assessments, the content standards, and the PLDs for each performance standard. Central to panelist training will be their use of the PLDs to develop a representation of students who just barely qualify for entry into each identified performance level. During this training task, panelists learn that, although PLDs are written to characterize typical members of each achievement level, their bookmark placements will be directed toward characterizing and identifying the most minimally qualified members of each performance level. All panelists will receive training before the start of the meeting on how to access and use the standard-setting tool.

Further, panelists will receive training in bookmark placement in the online OIBs. As part of this training, panelists will learn to use CAI's online standard-setting tool to place a bookmark that best delineates two achievement levels.

OIB Review. Following training on how to use the standard-setting tool, panelists will begin reviewing the online OIB for the grade-level assessment. For each item, panelists will be instructed to consider (1) what a student must know and be able to do to successfully answer each question, and (2) what makes each item more difficult than the previous items. As shown in Exhibit 4.12.5-1, the standard-setting tool provides a review tab where panelists can briefly respond to these questions and refer to their notes throughout the workshop. After reviewing the items individually, panelists engage in discussion with table members about the knowledge and skills required to respond successfully to items in the OIB. This process ensures that panelists have a solid understanding of the progression of item difficulty in the OIB and how the knowledge and skill requirements for successful responses relate to the PLDs. The process also ensures that panel members share a common understanding.

Exhibit 4.12.5-1: Panelist View of Ordered-Item Booklet and Answering the Two Questions

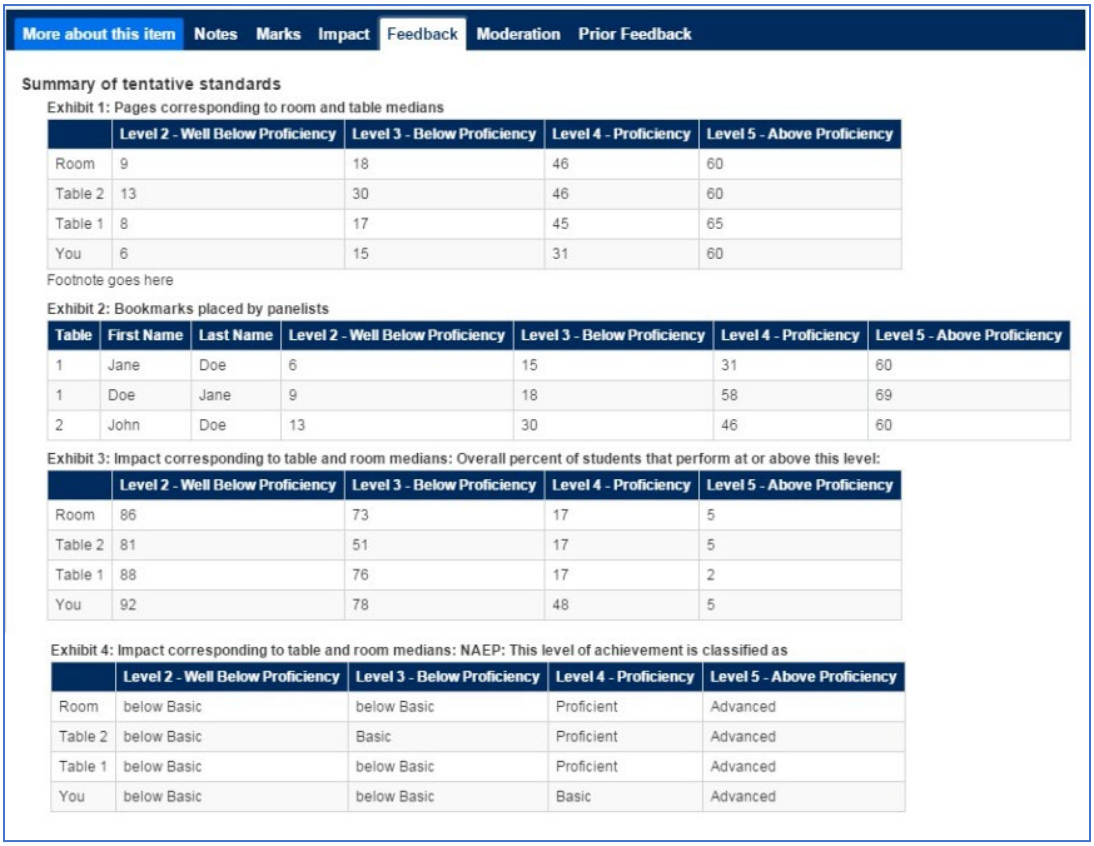


Bookmark Placement. Following a review of the OIB, panelists are provided with additional training in the Bookmark procedure. This is intended to ensure that panelists understand the procedure used to place bookmarks and how to use the online tool to record their responses. To ensure that panelists understand the Bookmark procedure, panelists engage in a practice bookmark-placement session using the standard-setting tool, and they complete a readiness assessment before recommending performance standards.

Panelists are instructed to review each page in the OIB and consider whether two-thirds of students who just barely qualify for entry into the performance level can respond successfully. They are further instructed to place their bookmark on the last page in the OIB, where two-thirds of students who just barely qualified can respond successfully. While most standard-setting workshop activities allow for and encourage group discussion, bookmark placement is an individual judgment task, and panelists are instructed not to consult with table members about their bookmark placements. Panelists begin their bookmark placements with the proficient-level performance standard. Once they feel comfortable about their placement of the proficient-level bookmark, they will move on to place bookmarks for other performance standards.

Feedback and Impact Data. Immediately following Round 1 bookmark placement, CAI's online standard-setting tool will instantly evaluate and display the results from Round 1 and create feedback reports for both the workshop table and the room as a whole. These reports include summary statistics showing the median, lowest, and highest bookmark placements for each performance standard. In addition, the tool contains impact data tables that contain scale scores and percentages of students at or above the level for each possible performance standard in the OIB for reference and discussion. Exhibit 4.12.5-2 illustrates the types of tables available to the panelists at feedback review.

Exhibit 4.12.5-2: Feedback from Standard-Setting Tool



More about this item | Notes | Marks | Impact | Feedback | Moderation | Prior Feedback

Summary of tentative standards

Exhibit 1: Pages corresponding to room and table medians

	Level 2 - Well Below Proficiency	Level 3 - Below Proficiency	Level 4 - Proficiency	Level 5 - Above Proficiency
Room	9	18	46	60
Table 2	13	30	46	60
Table 1	8	17	45	65
You	6	15	31	60

Footnote goes here

Exhibit 2: Bookmarks placed by panelists

Table	First Name	Last Name	Level 2 - Well Below Proficiency	Level 3 - Below Proficiency	Level 4 - Proficiency	Level 5 - Above Proficiency
1	Jane	Doe	6	15	31	60
1	Doe	Jane	9	18	58	69
2	John	Doe	13	30	46	60

Exhibit 3: Impact corresponding to table and room medians: Overall percent of students that perform at or above this level:

	Level 2 - Well Below Proficiency	Level 3 - Below Proficiency	Level 4 - Proficiency	Level 5 - Above Proficiency
Room	86	73	17	5
Table 2	81	51	17	5
Table 1	88	76	17	2
You	92	78	48	5

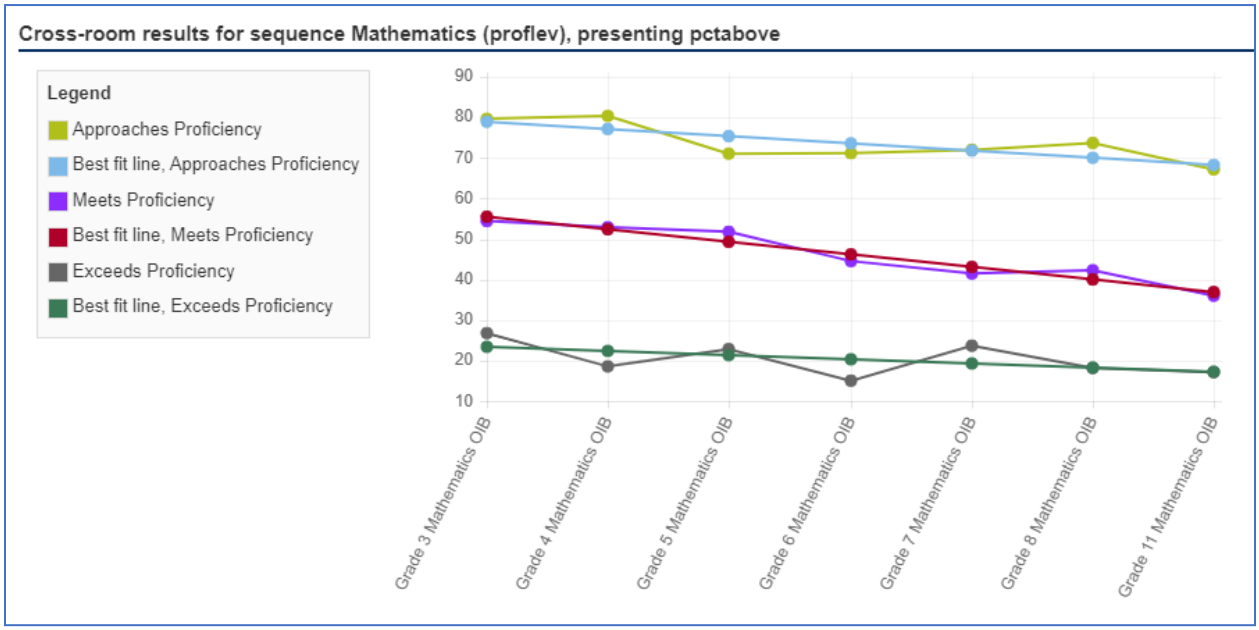
Exhibit 4: Impact corresponding to table and room medians: NAEP: This level of achievement is classified as

	Level 2 - Well Below Proficiency	Level 3 - Below Proficiency	Level 4 - Proficiency	Level 5 - Above Proficiency
Room	below Basic	below Basic	Proficient	Advanced
Table 2	below Basic	Basic	Proficient	Advanced
Table 1	below Basic	below Basic	Proficient	Advanced
You	below Basic	below Basic	Basic	Advanced

Round 2 begins with each table reviewing and discussing cut-score placements, focusing on the lowest and highest recommended cut scores and the table's median score. Discussion then expands to the room, with each table reviewing for the group at large the basis for its recommendations. After completing these discussions, panelists again work through the OIB, placing their cut scores for all four performance levels.

Vertical Articulation and Moderation. Following Round 2 recommendation of performance standards, CAI proposes to conduct a moderation session consisting of all table leaders from each panel. The table leaders will be tasked with evaluating whether the recommended performance standards are reasonable across all grade levels based on moderation tables generated in CAI's online standard-setting tool (refer to Exhibit 4.12.5-3) and modifying the locations of the standards if necessary. If modifications to the performance standards are recommended at moderation, CAI's online standard-setting tool allows only a table leader to make the recommended performance standard change and captures the written reason for the recommendation to amend the performance standard.

Exhibit 4.12.5-3: Moderation in CAI's Standard-Setting Tool



Workshop Staffing. Each workshop panel will be staffed by a CAI senior workshop leader, a content specialist, and a research assistant. In addition, CAI psychometricians will be available to observe real-time data using CAI's online standard-setting tool. This allows the psychometricians to respond rapidly to recommendations made in each workshop room.

Standard-Setting Meetings and Logistics

CAI will conduct the standard-setting workshop in an NJDOE-approved location. CAI will be responsible for all facets of meeting planning and execution, including meeting logistics and costs; participant notifications and registration; materials production, distribution, and security; as well as stipends and/or reimbursement costs for standard-setting panelists.

Standard-Setting Technical Report

Following the completion of standard-setting workshops, CAI will provide a comprehensive standard-setting technical report that will be available for review by NJDOE and its TAC. The technical report will detail the procedures, participants, and other relevant elements. It will contain the following five sections:

1. Executive summary written for policymakers that can be used by NJDOE for workshops
2. Background and history of the New Jersey assessments
3. Preparation for the standard-setting workshop, which covers development of the PLDs, psychometric details of the field test, item calibrations, estimation of impact data, explanation of the articulation process and benchmarking procedures, and the composition and demographics of the standard-setting panels
4. Conduct of the standard-setting workshop, which includes agendas, training procedures, details of the Round 1 and Round 2 estimates of cut scores and moderation sessions, security procedures, and panelist and stakeholder evaluation summaries
5. Results of the standard-setting workshop, which includes summaries of each round, reliability of the achievement-level standards, changes in cut scores resulting from the stakeholder review and moderation sessions, final cut scores, and the percentages at and above each achievement level

In addition, CAI will assist NJDOE with any materials or other assistance needed for New Jersey's approval of the standards, including presentation of the recommended performance standards to the State.

4.12.5.1. Requirements for Setting State's Performance Standards and Cut Scores

As described in Section 4.3.11.8, CAI will implement a stand-alone field test of all ClearSight items and any New Jersey-specific item development required to meet summative test blueprints in school year 2025–2026. This will facilitate item data review of all items based on responses from New Jersey students. In addition, we propose a non-adaptive administration of the new assessments in the first summative test administration to implement a calibration and equating design that establishes a new item response theory (IRT) scale based exclusively on item responses from New Jersey students. This includes a vertical linking design to support monitoring student growth across school years. Following the first administration of the new summative assessment, CAI will conduct standard-setting workshops, following the procedures described in Section 4.12.5, as modified following feedback from NJDOE and its Technical Advisory Committee (TAC).

With the newly established IRT scale and performance standards, CAI will work with NJDOE to develop new linear transformations for reporting assessment results. CAI will propose multiple linear transformations to NJDOE and its TAC to facilitate discussions of scaling properties that most effectively meet the reporting goals for NJDOE.

4.12.6. Scaling and Equating

4.12.6.1. Technical Specifications for Scaling and Equating – Overview

Calibration is the process by which we estimate the statistical relationship between item responses and the underlying trait being measured. CAI psychometricians employ a wide range of item response theory (IRT) models in the execution of state assessment programs, extending from the simple one-parameter (or Rasch) model (Rasch, 1980; Cohen & Kolstad, 2000) to multi-parameter models (Johnson, 1992; Beaton, Johnson, & Ferris, 1987) and even to cutting-edge multi-component models (Cohen & Kolstad, 2000). The ClearSight item pools in English language arts (ELA) and mathematics are calibrated using the unidimensional three-parameter logistic (3PL)/generalized partial credit (GPC) IRT models, while the cluster-based science assessments are calibrated using the bifactor or testlet model to account for cluster-specific variance in students' responses.

Unidimensional IRT Models

Traditional IRT models assume a single underlying trait, and they assume that items are independent given that underlying trait. In other words, the models assume that given the value of the underlying trait, knowing the response to one item provides no information about responses to other items. This basic simplifying assumption allows the likelihood function for these models to take the relatively simple form of a product over items for a single student:

$$L(Z) = \prod_{j=1}^{n} P(z|\theta),$$

where Z represents the pattern of item responses and θ represents a student's true proficiency.

For multiple-choice models, the 3PL model takes the form

$$P(x_j = 1|\theta_k, a_j, b_j, c_j) = c_j + \frac{1-c_j}{1+e^{-1.7a_j(\theta_k - b_j)}} = P_{j1}(\theta_k).$$

The *b* parameter is called the *location* or *difficulty* parameter. The *a* parameter is referred to as the *slope* or *discrimination* parameter. The slope parameter is essentially the inverse of the standard deviation of the measurement error associated with the item. The third parameter, *c*, defines a lower asymptote. In the absence of the *c* parameter, the probability of a correct response approaches zero as proficiency decreases toward negative infinity. The *c* parameter allows the probability to approach some other lower bound. Given multiple-choice items, a student with very little ability on the target trait could guess a correct answer. The *c* parameter captures the effect of such guessing.

For items that have multiple, ordered response categories (i.e., partial-credit items), we again have the choice of a simple Rasch family model (Masters' 1982 partial credit model) or a more general variant such as Muraki's (1992) generalization of Samejima's (1972) graded response model. For tests with a smaller sample size, such as state-specific alternate assessments, we recommend the Rasch family of variants because they can be reliably estimated with fewer cases. Under Masters' model, the probability of a response in category *i* for an item with m_j categories can be written as

$$P\left(x_j = i|\theta_k, b_{j0} \ldots b_{jm_j-1}\right) = \frac{e^{\sum_{v=0}^{i} 1.7(\theta_k - b_{jv})}}{\sum_{g=0}^{m_{j-1}} e^{\sum_{v=0}^{g} 1.7(\theta_k - b_{jv})}}.$$

Muraki's generalization adds an item-dependent discrimination parameter as follows (again, Masters' formulation does not usually include the arbitrary constant 1.7):

$$P\left(x_j = i|\theta_k, b_{j0} \ldots b_{jm_j-1}\right) = \frac{e^{\sum_{v=0}^{i} 1.7a_j(\theta_k - b_{jv})}}{\sum_{g=0}^{m_{j-1}} e^{\sum_{v=0}^{g} 1.7a_j(\theta_k - b_{jv})}}.$$

Returning to the likelihood equation, the contribution of each item to the overall likelihood function remains independent of all other items, given θ. This is convenient for two reasons: mixing models within an analysis (e.g., one-parameter and partial-credit items on the same scale) becomes no more complicated, and the likelihood of the response pattern may be calculated as the product of the likelihood of responses to individual items.

The number of items that a student answers correctly and the difficulty of the items presented are used to assign maximum likelihood estimates to student ability. In this approach, we maximize the log-likelihood function, given as:

$$\ln(L(\theta_i)) = \sum_{j=1}^{k_i} \ln\left(p_j(z_{ji}|\theta_i; \beta_i)\right)$$

where θ_i is an estimate of the student score, z_{ji} is student *i*'s response to item *j*, and β_i represents the item parameters, treated as fixed and known, associated with the items seen by student *i*. The function $p_j(.)$ represents the particular IRT model employed for item *j*. The summation is over the k_i operational items administered to student *i*. This likelihood function is maximized using Newton–Raphson or Steepest Ascent iterations, each potentially with adaptive step sizes. Non-concave likelihoods are maximized starting from multiple starting points.

The student's performance in each content-area test is reported in an overall test score referred to as a *scaled score*. The scaled scores represent a linear transformation of the ability estimates (theta scores). CAI proposes to use maximum likelihood estimation scoring based on pre-equated item parameters to score all of New Jersey's tests, whether administered as adaptive or fixed-form assessments.

Bifactor IRT Models for Integrated Cluster Items

An important assumption, known as local independence, is required when using unidimensional IRT models. In some instances, this assumption may not hold true, and other IRT models may be needed when there is in fact *dependence* between item responses. This often occurs when items appear nested within groups or share common stimuli. Generally, these items are clustered within the grouping structure.

The effects of item clusters can be accounted for by including additional dimensions in the IRT model. These dimensions are considered to be nuisance dimensions. Examples of IRT models that follow this approach are the bifactor model (Gibbons & Hedeker, 1992) and the testlet model (Bradlow, Wainer, & Wang, 1999). The testlet model is a special case of the bifactor model (Rijmen, 2010). The testlet model with 3PL version takes the form

$$P\left(x_{jc}=1\middle|\theta,u_c;a_j,b_j,c_j\right)=c_j+\frac{1-c_j}{1+e^{-a_j(\theta+u_c-b_j)}}=P_{j1}(\theta,u_c),$$

where u_c indicates the nuisance dimension for item cluster *c*. The item response function $P_{j1}(\theta,u_c)$ now becomes a response surface that is a function of two latent variables: the latent trait θ representing a student's proficiency (the underlying trait of interest), and the nuisance dimension u_c accounting for the conditional dependencies between items of the same item cluster. A Rasch version of the testlet model is obtained by setting the guessing parameters to zero and the discrimination parameters to 1, and it was proposed by Wang and Wilson (2005).

Whereas traditional unidimensional IRT models assume that all items are independent, given a single underlying trait θ, the testlet and bifactor models assume conditional independence of items, given the underlying latent trait θ and all nuisance dimensions:

$$P(\boldsymbol{x}|\theta,\mathbf{u})=\prod_{c=1}^{C}\prod\nolimits_{j\in c}P(x|\theta,u_c),$$

where **u** is the vector of all *C* nuisance dimensions.

The application of the Rasch testlet model for calibrating item cluster scoring assertions has been reviewed and endorsed by technical advisory committees (TACs) in multiple states, including Connecticut, Hawaii, New Hampshire, Rhode Island, Utah, Vermont, and West Virginia; it also supported summative test scoring for three-dimensional science tests in New Hampshire, Utah, and West Virginia in spring 2018. A similar model is employed for calibrating English Language Proficiency Assessment for the 21st Century (ELPA21) test items, which are administered in 10 states. Utah is working to include item clusters in its ELA and mathematics assessments as well.

CAI has fully developed systems to estimate and score these models reliably. For unidimensional models, a marginal likelihood function is maximized as follows:

$$L(\theta)_{marginal}=\int_{\mathbf{u}}P(x|\theta,\mathbf{u})p(\mathbf{u})d\mathbf{u},$$

where $P(x|\theta,\mathbf{u})$ is defined above and $p(\mathbf{u})$ is the prior (i.e., normal) distribution for **u** in the population.

Ability Estimation

We propose to use the maximum likelihood method to compute scores based on the pattern of correct and incorrect student responses to operational items. For the unidimensional IRT models, the likelihood equals the conditional probability for the observed response pattern but is considered as a function of theta:

$$L(\theta) = P(\mathbf{x}|\theta) = \prod_{j=1}^{n} P\left(x_j|\theta\right).$$

The likelihood function (or technically, its logarithm) is maximized with respect to θ using the Newton–Raphson method.

For the bifactor and (Rasch) testlet models, the conditional probability $P(\mathbf{x}|\theta, \mathbf{u})$ for an observed response pattern **x** contains the vector **u** of nuisance dimensions associated with item clusters, in addition to θ, the general proficiency. We propose to marginalize out the nuisance dimensions and maximize the marginalized likelihood function for θ,

$$L(\theta)_{marginal} = \int_{\mathbf{u}} P(\mathbf{x}|\theta, \mathbf{u}) p(\mathbf{u}) d\mathbf{u},$$

where $P(\mathbf{x}|\theta, \mathbf{u})$ is defined above and $p(\mathbf{u})$ is the prior (i.e., normal) distribution for **u** in the population. The marginal likelihood is maximized with respect to θ using the Newton–Raphson method.

Reporting scales will be constructed as a linear transformation of the underlying trait θ that is common to all items.

Estimation of IRT Models

CAI psychometricians employ a range of statistical software to calibrate items across state assessment programs and currently use flexMIRT, IRTPRO, Multilog, Parscale, and other software to calibrate item parameters in state assessment programs. In addition to these software packages, we prefer to use our own software, the IRT Plugin to our *AM* statistical software (*iAM*), which we distribute without charge (Cohen & AIR, 2002). *iAM* offers some capabilities that are not available from other packages, as we discuss in the following paragraphs.

iAM offers a key advantage over other available software because it provides design-consistent standard errors and yields accurate estimates of linking errors under complex designs. Like Parscale, *iAM* includes a variety of constructed-response models (including the generalized partial credit model [GPCM]) that can be simultaneously estimated with two-parameter logistic (2PL) and 3PL models on the same test. Like BILOG-MG, *iAM* can simultaneously estimate the proficiency distributions in multiple groups. Building on its design-consistent estimators, *iAM* provides fit statistics that reflect the complex sample design.

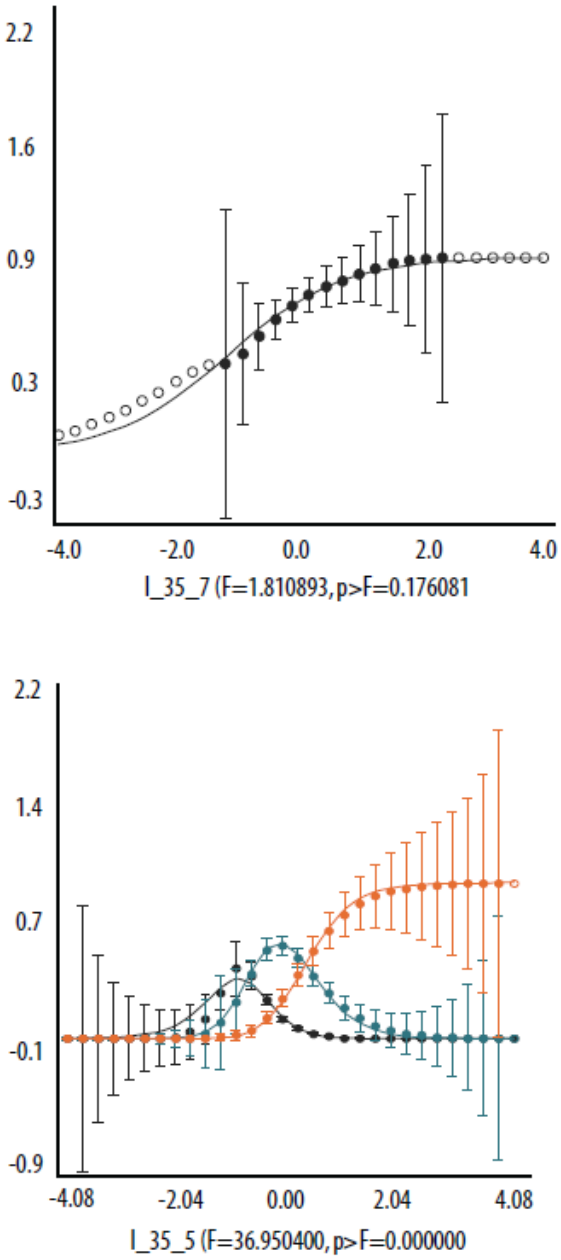
Like Parscale and BILOG-MG, *iAM* estimates item parameters by using marginal maximum likelihood (MML), which provides consistent estimates under the assumed proficiency distribution. MML estimation numerically integrates over the population proficiency distribution. In the absence of analytic solutions to the problem, finding the parameter values that maximize the likelihood of the data requires numerical optimization. The preferred method for finding the maximum likelihood estimate of such models is the use of the expectation maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977). Bock and Aitkin (1981) propose an EM algorithm for this class of models, and this is the approach taken in popular IRT software.

Evaluation of Model Fit

Psychometricians use a variety of measures to evaluate the fit between models based on IRT and observed item data (Yen, 1981; McKinley & Mills, 1985; Fitzpatrick et al., 1996). These statistics operate by evaluating the variance between observed and predicted item responses, a task made difficult by the fact that both the observed and the predicted item responses are contingent on the value of a latent trait (θ). Typically, some estimate of θ is used, and the discrepancy between the true and estimated values of θ is ignored. Fit statistics typically ignore a second source of error as well: the estimates of θ and the predictions both depend on a common set of item parameters that are themselves estimates. Hence, IRT fit statistics are notoriously conservative. This problem is compounded by the fact that item data almost always come from a complex, clustered sample. The end result is that typical IRT packages report significant χ^2 statistics for most items, regardless of actual fit.

CAI uses a fit statistic that overcomes these problems, incorporating uncertainty in the item parameter estimates and uncertainty in the estimates of the latent trait and taking into account uncertainty in the item statistics. When these sources of uncertainty are correctly addressed, the χ^2 becomes an *F* statistic. *iAM* reports fit statistics along with innovative graphics that characterize the item fit, as shown in Exhibit 4.12.6.1-1.

Exhibit 4.12.6.1-1: Item-Fit Graphics



The top panel in Exhibit 4.12.6.1-1 shows a sample fit graph for a well-fitting multiple-choice item, and the bottom panel shows a sample fit graph for a poor-fitting partial-credit item. In both graphs, the x-axis represents the range of student ability values, the y-axis represents probability, the solid line represents the item characteristic curve (ICC), the dots represent the empirical estimates, and the bars indicate the standard error of the distance of the empirical estimates from the ICC. Note that the standard error bars are smaller near the center of the distribution and grow larger toward the tails. When the standard errors grow to be virtually infinite, the empirical estimates are represented as an empty circle.

The item in the first panel of Exhibit 4.12.6.1-1 shows a well-fitting item; misfit appears only at the tails of the distribution, where data are sparse and often not enough to draw valid conclusions. The second graph, however, shows misfit along the one-point line (represented as a black ICC). The empirical data points fall substantially off of the ICC line. Although no single

point is outside of its confidence limit, the cumulative misfit across points is statistically significant, as depicted by the *F* printed at the bottom of the graph. These fit graphics were designed to provide clearer insights than the fit graphics typically produced by off-the-shelf programs. For example, some graphics use larger symbols to denote scores with more cases, a practice that is visually misleading. Estimates from large samples are precise and should appear at a precise point on the page, while estimates from small samples should appear more diffuse. Our graphics achieve this by graphing standard error bars. Near the center of the proficiency distributions, the estimates are precise, as shown by narrow error bars; they grow diffuse in the tails where little data appear, as shown by wide error bars.

Vertical Scale in ELA and Mathematics

During the formation of the ClearSight item bank, vertical scales were established for ELA and mathematics. The linkage was accomplished by embedding a representative set of upper-grade items in the lower, adjacent grade, and using the Stocking–Lord method to link these items to their home grade. This linking approach is designed so that the within-grade score also provides an unbiased estimate of a student's performance on the adjacent, upper-grade test. As such, end-of-year summative test scores thus represent pretest scores for student achievement in the subsequent grade. CAI proposes to establish a new IRT scale based solely on item responses from New Jersey students. We propose to administer the first-year summative assessment non-adaptively to obtain item response samples that are suitable for IRT calibration and equating because they are independent of student ability. All summative test administrations would, however, be configured to meet all elements of the New Jersey test blueprint. Should NJDOE wish to report assessment results on a vertical scale, CAI will implement a vertical linking design as part of the first summative test administration, consistent with the approach initially employed to establish the ClearSight vertical scale.

Equating

Equating is a statistical process used to adjust scores on test forms so that scores on different forms can be used interchangeably. Both pre-equating and post-equating methods are used in statewide assessment programs. The principal advantage of pre-equating methods is that they can be applied before the assessment takes place, allowing for immediate scoring and reporting of test results. In addition, they allow the possibility of computer-adaptive item selection. However, pre-equating methods rely on the assumption that the item parameters are invariant across measurement occasions. This assumption may be violated when items were calibrated several years prior to their current use (item drift over time) or when the items were calibrated for a different population (differential item functioning).

Post-equating methods are applied after the operational test administration. They rely on a set of anchor items, a representative set of items that are in common between the current test and a previous test (or item bank). After the operational test administration, all items are (re)calibrated, and the anchor items are used to linearly transform the new item parameters so that they are expressed on the existing scale. Whereas pre-equating methods rely on the assumption that the psychometric properties of items did not change from one measurement occasion to another, it is sufficient for post-equating methods that the assumption of item parameter invariance holds for the common items. The item parameters of all other items are always based on the most current test administration.

In practice, a mixed approach is often used. For example, the pre-equated item parameters are used by default for all items, but the items that show item drift are recalibrated and post-equated to the base scale using the remaining items as common items.

Adaptive test administrations require the use of pre-equated item parameters to enable adaptive item selection. More generally, one of the most consequential features of online test

administration, coupled with automated scoring of test items, is the ability to score and report assessment results immediately. In fact, students and educators participating in online assessments expect to view assessment results immediately or with very little delay. For these reasons, the slight advantages accrued by post-equating may be outweighed by delays in score reporting. Thus, we propose a pre-equating design for scoring and reporting assessment results.

Although all operational scoring of test items is based on pre-equated item parameters, it is nevertheless important to evaluate item parameters for drift over time. When item parameter drift is detected under typical testing conditions, items can be re-field-tested to update the item parameters or the items can be targeted for transition to an interim assessment or practice test item pool.

Evaluation of Item Parameter Drift in Fixed Forms

To evaluate item parameter drift in fixed forms, item parameters for each test administration can be independently calibrated and then a set of linking constants identified to place the new item parameters on the bank scale. This procedure results in two sets of item parameters, the bank item parameters on the reference scale, and the newly calibrated and equated item parameters from the current test administration. Once these parameters are estimated, a set of analyses can be conducted to identify whether there are substantial differences between the two sets of item parameter estimates.

To investigate possible item parameter drift, ICCs are plotted and compared between test administrations. The weighted area between the ICCs is calculated using the mean squared difference (MSD), and items with standardized MSDs greater than 2.5 are flagged as showing drift using the following procedure:

1. Compute the weighted area between the ICCs using the MSD method.
2. Compute the mean and standard deviation of the MSD, and standardize the MSD to obtain the SMSD (standardized MSD).
3. Order all items by |SMSD|.
4. Identify “extreme” items as any item with |SMSD| > 2.5 and flag them for drift.

The MSD is computed by integrating out θ as follows:

$$D^2 = \int \left(E(z_{i,J}|\theta) - E(z_{i,I}|\theta)\right)^2 f(\theta;\mu,\sigma^2)d\theta.$$

The D^2 integral does not have a closed form solution, and so its approximation is based on the weighted summation over q={1, 2, …, 30} quadrature points, all taken from equally spaced points interior to the normal density, w, between –4 and 4 of the marginal distribution

$$\mathrm{D}^2 = \sum_{q=1}^{30} w_q \left(E\left((z_{i,J}|\theta_q\right) - E\left(z_{i,I}|\theta_q\right)\right)^2.$$

Evaluation of Item Fit in Adaptive Test Administrations

In the context of adaptive test administrations where items are selected for administration in part to maximize measurement precision at the students’ ability levels, it is not possible to directly examine item parameter drift as in the case of fixed-form test administrations where all students are administered the same sample of test items. Nevertheless, should item parameter drift occur, bank item parameters will no longer exhibit good fit with the pattern of students’ responses. Thus, during each test administration, CAI psychometricians monitor test items for fit to the relevant IRT model. For each student, a residual between observed and expected score

given the student's ability is computed for each item. The residuals for each are averaged across all students, and the average residual is used to flag an item.

We begin by defining $p_{ij} = pr(z_{ij} = 1)$, representing the probability that student *i* responds correctly to item *j* (z_{ij} represents the student's score on the item). For selected-response items, we use the 3PL IRT model to calculate the expected score on item *j* for student *i* with estimated ability $\hat{\theta}$ as

$$E(z_{ij}) = c_j + (1 - c_j)\frac{\exp\left(Da_j(\hat{\theta}_i - b_j)\right)}{1 + \exp\left(Da_j(\hat{\theta}_i - b_j)\right)}$$

For constructed-response, performance, or technology-enhanced items, using the GPCM, the expected score for student *i* with estimated ability $\hat{\theta}$ on an item *j* with a maximum possible score of K_j is calculated as

$$E(z_{ij}) = \sum_{l=1}^{K_j} \frac{l\exp\left(Da_j \sum_{k=1}^{l}(\hat{\theta}_i - b_{j,k})\right)}{1+\sum_{m=1}^{K_j}\exp\left(Da_j \sum_{k=1}^{m}(\hat{\theta}_i - b_{j,k})\right)}.$$

For each item *j*, the residual between observed and expected score for each student is defined as

$$\delta_{ij} = z_{ij} - E(z_{ij}).$$

The statistic δ is aggregated across students of different abilities for each item,

$$\bar{\delta}_j = \frac{1}{n}\sum_{i=1}^{n}(\delta_{ij}).$$

The report can be configured to report all items or to flag and report only those items where the fit index is above a given threshold. For example, items could be flagged when

$$\frac{\bar{\delta}_j}{se(\bar{\delta}_j)} > 1.96$$

where $\bar{\delta}_j = \frac{SD(\delta_{ij})}{\sqrt{n}}$.

Monitoring Scale Drift

NJDOE intends to develop item statistics for the New Jersey assessments based solely on item responses from New Jersey students. CAI proposes to administer the first summative test administration non-adaptively to execute a calibration and equating design that will result in a New Jersey-specific IRT scale for scoring and reporting. Our calibration and equating design incorporates methods that are designed to mitigate the effects of scale drift over time (Harris & Kolen, 1994), including the construction of linking sets and linking methods that are known to minimize the effects of scale drift.

4.12.6.2. Scaling Requirements

As described in Section 4.3.5, CAI will deliver to NJDOE draft analysis and scoring specification documents no later than 90 days following award of this contract. CAI psychometricians will collaborate with NJDOE and its Technical Advisory Committee (TAC) to revise the specifications to best meet New Jersey's needs. ClearSight items were originally calibrated using the three-parameter logistic (3PL)/generalized partial credit (GPC) item response theory

(IRT) models. NJDOE intends to base all item statistics on responses from New Jersey students, and CAI has proposed a design for the first summative test administration that ensures (1) all students are administered summative assessments that meet all of NJDOE's test blueprint specifications, and (2) item selection is independent of student ability, yielding item response samples that are representative of the New Jersey student population and suitable for calibration and equating of items on a common New Jersey scale. Calibration and equating of items will follow the first summative test administration in spring 2026, and those calibrations will be used to support standard-setting workshops in summer 2026, scoring of spring 2026 test administrations following standard setting, as well as item selection and scoring for all subsequent adaptive test administrations. Because test administrations will be adaptive for the NJSLA, we propose to estimate student ability using maximum likelihood estimation (MLE) since each student is administered a different sample of items from the ClearSight scale.

4.12.6.3. Equating Requirements

As described in Section 4.10, pre-equated item parameters are necessary to support immediate updating of student ability estimates to guide adaptive item selection. For this reason, as well as to support immediate scoring and reporting of assessment results, we propose to use pre-equated item parameters to score student assessments. That said, it is important to monitor the performance of test items and to be able to identify items that no longer fit the item response theory (IRT) model. CAI psychometricians monitor items for model misfit throughout the assessment window to identify items that may not be performing as intended and to forward those items for further review by content specialists. Adaptively administered items are selectively administered to students in a restricted range of the ability distribution; therefore, it is not possible to directly evaluate item parameter drift in test items. However, we can identify a sample of operational items each year for administration in the embedded field-test slots where they will be administered to a random sample of New Jersey students, and for which item parameters can be estimated and evaluated for drift from the bank IRT parameters. Items showing evidence of poor model fit are good candidates for an investigation.

As described in Section 4.8.2, we propose a hybrid system for scoring student essay responses, with all open-ended items initially scored in our automated scoring system. In addition to assigning a score to each response, the Autoscore system assigns a confidence index to each score. The confidence index is derived from the distance from the boundary between rubric scores (i.e., predicted scores on the boundary between two rubric scores are assigned as "lower confidence"), as well as the similarity of the response to responses in the training set, with scores to responses that deviate from those in the training set assigned as lower confidence. In addition to forwarding low-confidence scores for additional human scoring, we also propose to select a random sample of responses each year for human scoring to monitor human-machine agreement rates.

4.12.6.4. Equating Consultants (Equating Results)

As described in Section 4.3.5, CAI routinely works with third-party vendors to provide independent replication of calibration and equating analyses, as well as test scoring. We propose to contract with HumRRO to provide independent replication of calibration and equating results, as well as test scoring. The analysis and scoring specifications documents provide sufficient detail for the completely independent verification of assessment results. That said, CAI psychometricians work closely with third-party vendors to ensure that all parties have a common understanding of the specifications and to resolve any differences in analysis results.

4.12.7. Analysis of Test Results

As described in Section 4.10.1, following the close of the operational testing window each year, CAI will produce classical item analysis statistics and item response theory (IRT) item parameter calibrations for all field-tested items in preparation for item data review by the Content Review Committee and the fairness and sensitivity committee. In Section 4.4, we describe our quality-assurance reports, which allow CAI psychometricians and NJDOE to monitor assessment performance throughout the testing window. Included among the quality-assurance reports is an item analysis report that allows psychometricians to monitor test item behavior. As described in Section 4.12.4, CAI will provide NJDOE with a final item analysis report following the close of the operational test administration. The results of all item- and test-level analyses will be documented annually in the technical report, as described in Section 4.13.9.1; CAI will deliver the technical report each year to NJDOE.

4.12.8. Establishing Technical Adequacy – Reliability, Validity, and Comparability

CAI is widely recognized as the industry leader in assessment psychometrics; in nearly every state where CAI has implemented a computer-adaptive testing system—including the adaptive system we designed and built for Smarter Balanced—our superior technical support has resulted in “meets requirements” from the U.S. Department of Education (USDE) for all member states of the Smarter Balanced Assessment Consortium.

Each year, CAI will produce a comprehensive technical report for the NJSLA and NJGPA assessments, summarizing all technical information for New Jersey’s assessment systems in English language arts (ELA) and mathematics. The report will include all aspects of the technical qualities of the NJSLA and NJGPA assessments described in the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014) and the requirements outlined in the USDE’s peer review *State Assessment Systems Non-Regulatory Guidance for States*, demonstrating information that supports the validity of test score interpretation, which is the central focus of the *Standards* (AERA, APA, & NCME, 2014).

4.12.8.1. Reliability

Reliability refers to the consistency or precision of test scores and performance-level classifications, and essentially addresses the question of how likely a student would be to achieve the same score, or be classified in the same performance level, across multiple administrations of equivalently constructed and administered test forms. As part of each test administration, the reliability of test scores and performance classifications will be evaluated from a variety of perspectives, using both classical and item response theory (IRT) indices of internal consistency, the precision of reported test scores, and decision accuracy and consistency of performance-level classifications. Reliability analyses will be reported for subject-area test scores and performance levels, as well as subscale scores. Any responses requiring handscoring will also be evaluated for inter-rater consistency in the application of scoring rubrics. For responses scored using our automated scoring engine, a random sample of responses will be routed for handscoring in each summative test administration to monitor agreement rates between the autoscoring engine and human readers.

In Classical Test Theory, reliability is defined as the ratio of the true score variance to the observed score variance, assuming the error variance is the same for all scores. Within the IRT framework, measurement error varies across the range of ability. The amount of precision is indicated by the test information at any given point of a distribution. The inverse of the test

information function represents the standard error of measurement (SEM). The SEM is equal to the inverse square root of information. The larger the measurement error, the less test information is being provided. The amount of test information provided is at its maximum for students toward the center of the distribution, as opposed to students with more extreme scores. Conversely, measurement error is minimal for the part of the underlying scale that is at the middle of the test distribution and greater on scaled values farther away from the middle.

We note that adaptive test administrations significantly improve measurement precision for low- and high-performing students, since test information is targeted near student ability rather than, for example, the proficient cut score or population mean. This means that standard errors for low- and high-performing students will be much smaller than can be obtained with fixed-form assessments, resulting in more stable ability estimates that yield better indicators of student growth over time.

As part of the technical report delivered annually to NJDOE, CAI will report internal consistency reliability estimates for test scores, SEM curves, as well as SEMs at each performance standard. Test reliability will be reported for overall subject-area scores as well as for reporting category ability estimates.

When student performance is reported in terms of performance categories, a reliability index is computed in terms of the probabilities of consistent classification of students as specified in Standard 2.16 in the *Standards* (AERA, APA, & NCME, 2014). This index considers the consistency of classifications for the percentage of test takers who would, hypothetically, be classified in the same category on a second administration of a similarly constructed test form, using either the same form or an alternate, equivalent form.

Students can be misclassified in one of two ways. Students who are truly below a proficiency cut point but are classified based on the assessment as being above the cut point are considered to be false positives. Similarly, students who are truly above a proficiency cut point but are classified as being below the cut point are considered to be false negatives.

The classification index can be examined for decision accuracy and decision consistency. Decision accuracy refers to the agreement between the classifications based on the form actually taken and the classifications that would be made on the basis of the test takers' true scores, if their true scores could somehow be known. Decision consistency refers to the agreement between the classifications based on the form (adaptively administered items) actually taken and the classifications that would be made on the basis of an alternate, equivalently constructed test form or test administration (e.g., another set of adaptively administered items given the same ability)—that is, the percentages of students who are consistently classified in the same performance levels on two equivalent test administrations.

The technical report will document classification accuracy and classification consistency for each of the subject-area performance-level classifications.

4.12.8.2. Validity

Validity refers to the degree to which test score interpretations are supported by evidence and speaks directly to the legitimate uses of test scores. Establishing the validity of test score interpretations is thus the most fundamental component of test design and evaluation. The *Standards* (AERA, APA, & NCME, 2014) provide a framework for evaluating whether claims based on test score interpretations are supported by evidence. Within this framework, the standards describe the range of evidence that supports the validity of test score interpretations.

The types of evidence required to support the validity of test score interpretations depend centrally on the claims made for how test scores may be interpreted. Moreover, the standards conceptualize validity as an attribute of test score interpretations rather than as an attribute of

tests overall. Some test score interpretations may be supported by validity evidence while others are not. The validity of the test itself is not considered; rather, the validity of the intended interpretation and use of test scores is evaluated.

The NJSLA and NJGPA are designed to measure the degree to which students have achieved the academic learning standards defined by the New Jersey Student Learning Standards (NJSLS). There are several intended uses for NJSLA and NJGPA test scores, including school accountability, feedback about student and class performance, measurement of student growth over time, evaluation of performance gaps between groups, evaluation of teacher performance, and examination of individual student strengths and weaknesses. Each intended use requires claims about the interpretation of test scores, and the strength of those claims rests on the validity evidence supporting those claims. Some validity evidence will be central to all claims, especially evidence for the alignment of test items and test administrations to the NJSLS. Other evidence may target more specific claims, such as evidence for measurement of student growth or evaluation of teacher performance. Evaluation of validity evidence should therefore be made with respect to the claim that it is purported to support.

CAI is committed to developing evidence for the validity of NJSLA and NJGPA test scores and performance-level interpretations. The proposed outline for the validity chapter of the annual technical report (refer to Section 4.13.9.1) includes a sample of the validity evidence that NJDOE will need to submit for peer review and that CAI will work with NJDOE to develop. Evidence based on test content includes evidence that the test blueprints measure the intended breadth and depth of the NJSLS and that test items are aligned to the intended content standard. Evidence for these alignments comes from the item and test development process, including external reviews of item alignment by educator committees, but also evidence from independent alignment studies examining the degree to which items are judged to measure their intended content standards and at the intended Depth of Knowledge (DOK), as well as the alignment of test forms to the intended breadth and depth of student assessments as defined in the test blueprints.

Cognitive laboratories are designed to provide evidence that test items elicit the intended cognitive processes and help ensure that the test items are measuring the intended DOK specified in the test blueprint. CAI will work with NJDOE to design cognitive laboratories to investigate the cognitive processes elicited by the current NJSLA and NJGPA test items, as well as any new item types adopted by NJDOE for the NJSLA and NJGPA over time.

Evidence for the interpretation of performance standards is based primarily on the convergence between the performance standards recommended to and adopted by NJDOE with the location of performance standards for other important assessment systems, including, for example, the National Assessment of Educational Progress (NAEP), other state (consortium) assessments, as well as college entrance exams. Providing standard-setting panelists with benchmarking information about the location of other important performance standards facilitates convergence of performance standards across important assessment systems.

The NJSLS and NJSLA and NJGPA test blueprints represent a conceptual model of the structure of academic achievement. In the test design, content standards are grouped into subscales or reporting categories so that each item is an indicator of a subject-area reporting category, and the reporting categories are, in turn, indicators of subject-area achievement. Confirmatory factor analyses can, for example, provide evidence that the test items are indicators of a single common subject-area achievement factor, while a second-order confirmatory factor analysis can evaluate whether the reporting category variables provide greater model fit over the first-order model, providing evidence based on internal structure. Evaluation of measurement invariance across subgroups evaluates the degree to which this structural model is equivalent across subgroups. The greater the measurement invariance, the more confident we are that test score interpretations are equivalent across subgroups.

We expect that tests purporting to measure similar constructs should be highly correlated. Moreover, while correlations between subject-area tests are substantial, we expect to observe that correlations between tests measuring similar constructs (e.g., two tests of mathematics achievement) should be higher than between tests measuring different achievement constructs (e.g., tests of ELA achievement and mathematics achievement). CAI will work with NJDOE to obtain student test results for district-administered assessments to provide evidence of convergent and discriminant validity between assessment systems. In addition, CAI will document correlations between interim and summative assessments to provide further evidence of convergent and discriminant validity across assessment systems.

Fairness and accessibility of test content are central to the valid interpretation of test scores. All test items are developed and evaluated with respect to fairness and sensitivity guidelines. Items passing through content and fairness review are field-tested, with any items flagged for differential item functioning passing through a second review by the fairness and sensitivity committee to ensure adherence to all fairness and sensitivity guidelines. CAI provides the widest array of online accessibility tools and accommodations to remove construct-irrelevant barriers to accessing test content. Moreover, CAI works with states to investigate the impact of accessibility features on student performance, working to ensure that accessibility features selectively improve the performance of target student populations by removing construct-irrelevant barriers to test content and not simply making the test content easier for all students.

4.12.8.3. Establishing Comparability

Paper-pencil test forms will be designed each year to be as similar as possible to the online form, differing only in how student responses are captured. In rare instances when an online item cannot be equivalently rendered for paper test administration, CAI content staff will use our Form and Test Engineering Suite (FTES) form-building software to identify a replacement item that yields a psychometrically equivalent paper-pencil test form. All common items between the online and paper-pencil test forms provide the basis for an equating study to examine the performance of items between the online and paper modes of test administration.

CAI psychometricians employ a matched samples design (Way, Davis, & Fitzpatrick, 2006) to equate ability estimates between the online and paper test administrations. A covariate regression approach is implemented to construct equivalent groups of students taking the assessment in both modes of test administration.

IRT parameter estimates are calibrated independently for the matched online and paper test administration mode samples, centering ability to zero for each of the matched samples. Because the samples are matched on ability, the resulting item parameter estimates can be used to identify differential item difficulty between test administration modes. In addition, obtained parameter estimates for the common items can be used to identify the linking constant necessary to bring the matched sample paper item parameters onto the matched sample online scale.

Stocking–Lord or other test characteristic curve linking methods can be used to identify the linking constants necessary to place the paper item parameters on the online bank scale. The online scale is the reference scale for the assessments since estimation of all IRT parameters, adoption of performance standards, and all previous reporting have been conducted with respect to the item parameters estimated from online test administrations.

We note that the matched samples approach can be used to estimate the comparability of item parameters between any mode of test administration and to link parameter estimates so that test scores have the same meaning across test administration modes. We further note, however, that when the number of students administered tests in a particular mode is very small, the mode comparability analysis will not yield reliable results. In those instances, we propose to designate the mode as an accommodation, and not attempt to empirically examine

comparability of item parameter estimates between the accommodated modes. Even in these cases, however, content staff follows CAI procedures to ensure comparability of test items, to the extent possible, across all modes of test administration.

4.12.9. Quality Control Sample (Each Assessment)

In the context of adaptive test administration, the accuracy of item and test scoring must be verified prior to the opening of the testing window. Every time students respond to an item, the item must be scored and the student's ability estimate must be updated within milliseconds to support adaptive item selection. CAI psychometricians use our simulation tool to generate thousands of simulated test records that represent the full range of possible test conditions, including not only items and item responses, but all conditions represented in the scoring specifications, including attemptedness rules, handling of incomplete records, and so on. Because all scoring checks, including by third-party vendors, are completed prior to the opening of the testing window, test results are available for reporting immediately upon student completion of a test administration.

In addition to verifying the accuracy of scoring, it is important to identify whether assessment results are consistent with previous-year results or whether there have been impacts to instruction, such as with the COVID-19 pandemic, which may cause a large shift in student performance. NJDOE will always have access to state assessment results after test administrations are completed and scored. CAI will also draw a stratified random sample of New Jersey schools, meeting all the requirements of the RFQ, for additional evaluation of scoring accuracy and to monitor for any shifts in test performance over time.

4.12.10. Verification of Scores

CAI will work with NJDOE to develop routing rules for essay responses for students who score Just Below the 'proficient' or 'passing' threshold. In Section 4.8.2, we describe our hybrid automated scoring system in which low-confidence scores are automatically routed for handscoring, as well as a random sample of responses for evaluating machine-human agreement rates. CAI will similarly implement a rule to automatically route responses when the overall assessment score is Just Below the critical cut score. Test records where essay responses have been routed for handscoring will not be reported until the handscoring is completed and "stitched" back to the student test record.

4.12.11. Additional Test Security Services – Data Forensics and Web Monitoring

4.12.11.1. Data Forensics: Testing Irregularity Detection Report Plan

The validity of test score interpretation depends critically on the integrity of the test administrations on which those scores are based. Any irregularities in the administration of assessments can therefore cast doubt on the validity of the inferences based on those test scores. Multiple steps are taken to ensure that tests are administered properly, including providing clear test administration policies, effective test administrator (TA) training, and tools to identify possible irregularities in test administrations.

For all online test administrations, quality assurance (QA) reports are generated during and after the testing windows. Many of these reports are geared toward ensuring the quality of test administrations, including item analysis reports, which are used to ensure that items are performing as intended; blueprint match reports, which ensure that the adaptive algorithm is

performing as configured through simulations; and item exposure reports, which likewise indicate whether pool usage is consistent with the configuration of the adaptive algorithm during simulations and identify content gaps in the item pools. In addition, a series of forensic analyses provided in the QA reports assist in the detection of irregularities in test administrations that may indicate possible instances of cheating. These forensic analysis reports contain both individual-level and aggregate-level results. By aggregating unusual responses, we flag possible group-level testing anomalies. The aggregate levels include Session, Test Administrator, School, and District.

Because testing information is accumulated automatically as testing proceeds, data analysis can occur regularly throughout test administration. However, because flagging criteria for forensic analyses are based on deviations from the testing population, the flagging values will continually shift throughout the test administration window. Thus, while the forensic analysis QA reports can be generated at intervals throughout the testing window, we recommend generating these reports immediately after the testing window has closed. Evidence evaluated includes the following:

- Item score changes
- Item response times
- Changes in test scores across administrations (after the first operational administration)
- Item response patterns using the person-fit index

The flagging criteria used for these analyses are configurable and can be changed by the user. Analyses are performed at the student level and summarized for each aggregate unit, including testing session, TA, and school. The RFQ indicates that New Jersey flags testing units that are |4| or more standard deviations (SD) from the state mean, and we can implement that flagging rule. In the following sections, we describe the forensic analysis reports generated in the QA system.

Item Score Change

Students are allowed to revisit items as many times as they wish within a session and may even mark items to be revisited before completing the session. Nevertheless, excessively high rates of item score change, especially high rates of item score increases, may indicate irregularities in test administration. TAs could, for example, review students' responses and either coach them to modify their responses or keep the session active and change responses themselves.

To identify irregular patterns of item score change, we examine the item score for the final response to each item and the penultimate response if one exists, and then count the number of instances in which the item score increases. Students with item score changes greater than or equal to |4| standard deviations above the state mean will be flagged, although the flagging value is configurable.

At the aggregate level, group means are evaluated with respect to their deviation from the state mean. As with the other analyses, the state mean and standard deviations is computed based on the aggregate level of analysis, such that the state mean and standard deviation for evaluating student records is the simple average of all student records, while the state mean and standard deviation for sessions is the mean of all session means, the mean and standard deviation for TAs is based on the mean of all TA means, and so on. The number of standard deviations from the state mean used for flagging is configurable and will be set to greater than or equal to |4| standard deviations beyond the state mean for NJDOE.

Item Response Latency

The online environment also allows item response latency to be captured as the item page time (the length of time that each item page is presented) in milliseconds. Discrete items appear on the screen one item at a time. However, for stimulus-based items selected as part of an item group, all items associated with the stimulus are selected and loaded as a group. For each student, the total time taken to complete the test is computed by adding up the page time for all items and item groups.

An example of unusual item response time would be a test session with students scoring very well on the test, but with test administration times on average far less than that required of students statewide. Such a pattern of short response times and high scores might be expected if, for example, students already know or have been provided the answers to the questions. Conversely, if a TA helps students by coaching them to change their responses while taking the test or leaves a test session open to manipulate student responses, the testing time could be much longer than expected.

The average and the standard deviation of test-taking time are computed across all students for each test administration. The flagging rate is configurable, but following NJDOE's current practice, student records will be flagged if their test-taking time is greater than or equal to |4| standard deviations from the state average. For aggregate level reporting, group means are evaluated with respect to their deviation from the state mean testing time. This is consistent with the preference of many clients for evaluating deviations from the state mean. As with the other analyses, the state mean and standard deviation is computed based on the aggregate level of analysis, such that the state mean and standard deviation for evaluating student records is the simple average of all student records, while the state mean and standard deviation for sessions is the mean of all session means, the mean and standard deviation for TAs is based on the mean of all TA means, and so on. The number of standard deviations from the state mean used for flagging is configurable, and following NJDOE's current practice, testing units will be flagged for mean test administration times greater than or equal to |4| standard deviations from the state mean.

Changes in Student Performance

While students grow and gain academically each year, the rank order of students' achievement is quite consistent over time. When multiple testing occasions are available, the forensic analysis report predicts the expected level of achievement on the current test based on students' performance on the previous test administration. Fluctuation in individual student records does occur. For example, a student may have been ill during the previous test administration, causing the student to underperform and his or her current normal performance to appear as an unusually large gain. However, such fluctuations are relatively rare.

For between-year comparisons, the scores between the current year and the previous year are evaluated. The most recent opportunity score in the current year (e.g., grade 4) will be regressed on the most recent score in the previous year performance (e.g., grade 3). Note that between-year comparisons are not available for the lowest grade tested (typically grade 3).

A large score gain or loss between grades is detected by examining the residuals for outliers. The residuals are computed as the observed score minus the predicted score in the regression model. To detect unusual residuals, we compute the studentized t residuals. An unusual increase or decrease in student scores between opportunities is flagged when studentized t residuals are greater than 3 or less than –3, although this value is configurable.

For each aggregate unit, aggregate unit means can be evaluated with respect to their deviation from the state mean. The state mean and standard deviation of residuals can be computed based on either the weighted average and standard deviation or the unweighted average and

standard deviation. The user can select which mean and standard deviation to use, either weighted or unweighted, in the setting.

The weighted state average and standard deviation of residuals are computed based on all student records. The unweighted state average and standard deviation of residuals are computed based on the aggregate unit means such that the state mean and standard deviation for sessions is the mean of all session means, the state mean and standard deviation for TAs is based on the mean of all TA means, and so on. Small units are excluded in computing the unweighted state mean and standard deviation of the aggregate means.

For NJDOE, an aggregate unit will be flagged if the aggregate unit means of residuals is greater than or equal to |4| standard deviations of the state mean. The number of standard deviations from the state mean used for flagging is configurable.

Inconsistent Item Response Pattern (Person Fit)

In item response theory (IRT) models, person-fit indices are used to identify students whose patterns of responses to items are improbable given an IRT model. If a test has psychometric integrity, little irregularity will be seen in the item responses of the individual who responds to the items fairly and honestly.

In the IRT models used to score students' tests, the expectation that a student will respond correctly to an item depends both on the student's ability level and the difficulty of the item. Thus, high-ability students will have a higher probability of responding correctly to all items, but especially so as item difficulty increases. Sometimes, however, low-ability students answer difficult items correctly, perhaps through guessing. Sometimes high-ability students respond incorrectly to easy items, perhaps through lack of attention. Generally, however, students' responses to test items are consistent with the scoring model.

For example, if a student is coached during a test administration or copies responses of other students, the student may provide correct responses to items at a higher probability than would be expected by his or her ability as estimated across all items. In this case, the person-fit index will be large for the student.

The person-fit index is based on all item responses. An unlikely response to a few test items may not result in a flagged person-fit index. Of course, not all unlikely patterns indicate cheating, as in the case of a student who is able to guess a significant number of correct answers. Therefore, the evidence of person-fit index should be evaluated along with other indicators of testing irregularities to determine whether cheating may be suspected.

Following Drasgow, Levine, and Williams (1985), the person-fit index l_z, is computed as

$$l_z(\theta) = \frac{l(\theta) - E\big(l(\theta)\big)}{Var\big(l(\theta)\big)},$$

where $l(\theta)$ is the log-likelihood of a vector of observed item scores for a given ability $l(\theta)$ with expected value $E\big(l(\theta)\big)$ and variance $Var\big(l(\theta)\big)$. The asymptotic distribution of l_z is a standard normal distribution (i.e., with an increasing number of administered items, i).

The asymptotic standard normal distribution of l_z only holds when the true person ability is known. In practice, the person ability is estimated from the same data that are used to compute l_z. The variance of l_z can be considerably smaller than 1 when the true ability θ is replaced by its estimate $\hat{\theta}$ (Snijders, 2001). To remedy this, Snijders derived a family of asymptotically normal person-fit statistics when $\hat{\theta}$ is used. When $\hat{\theta}$ is the maximum likelihood estimator, the fit statistic l_z^* is computed as l_z but with a corrected variance in the denominator. CAI applies a generalized derivation for l_z^* given by Lin, Jiang, and Rijmen (2021), because the generalized

l_{zg}^* index applies also to IRT models that are not unidimensional (e.g., the Rasch testlet model of Wang and Wilson, 2005).

The null hypothesis is one-sided, such that a student's responses to test items are consistent with the scoring model. Model misfit is indicated by low values of l_{zg}^*. Students with l_{zg}^* values smaller than –4 are flagged, although this value is configurable.

Group means of l_{zg}^* values can be evaluated with respect to their deviation from the state mean of l_{zg}^* values. As with the other analyses, the state mean and standard deviation is computed in either the weighted average and standard deviation or the unweighted average and standard deviation. The user can select which mean and standard deviation to use, either weighted or unweighted, in the setting. The number of standard deviations from the state mean used for flagging is configurable and will be set to flag the number of standard deviations from the state mean determined by NJDOE.

Response Similarity Reports

Although these reports have not yet been implemented in the QA system, CAI does provide response similarity reports for fixed-form assessment systems, and if awarded the New Jersey Next Generation Assessment Program contract, we will incorporate a response similarity report into the QA system. In fixed-form assessment environments, students can more readily copy from one another than would be possible in a computer-adaptive testing environment where students are seeing different sets of items in different sequences. To detect possible copying, it can be useful to examine student response records for patterns of excessive response similarity. While similarity in student responses to test items may be an indicator of irregularities in test administration, response similarity does not always indicate a testing irregularity. For example, in schools with high levels of academic achievement, one would expect large numbers of students to respond correctly, and therefore similarly, to most items on the assessment. Nevertheless, patterns of similar responding can indicate testing irregularities, especially when students respond correctly and incorrectly to the same items. CAI employs an algorithm, similar to the model developed by Wesolowsky (2000), for detecting overly similar student responses to items to evaluate patterns of student responses in schools where test irregularities are suspected.

Exhibit 4.12.11.1-1 reproduces the forensic analysis requirements presented in the RFQ and references the QA report that supports those analyses. Exhibit 4.12.11.1-2 shows the configurable settings available for NJDOE to customize forensic analysis reports, which include different analytic approaches and flagging rules. Exhibit 4.12.11.1-3 provides the data layout for an aggregate-level forensic analysis report.

Exhibit 4.12.11.1-1: Detection Statistics

Possible Test Security Irregularity or Breach	Detection Statistics	Forensic Analysis QA Report
Test takers who share answers, teachers or proctors who disclose the actual test questions, or proxy test taking	Pairs or groups of tests that are extremely similar (i.e., large numbers of identical answers).	Person Fit Performance Change Response Similarity
Illicit use of stolen test questions also known as "brain dump" materials	Clusters of similar test instances and association counts for detecting membership in gangs of cheaters.	Person Fit Performance Change Response Similarity

Possible Test Security Irregularity or Breach	Detection Statistics	Forensic Analysis QA Report
Test content that may have been exposed prior to administering the test	Counts of identical tests or perfect tests. Also, unusual score differences between previously published items and new field-test items that have not been published before.	Person Fit Performance Change Response Similarity
Test takers who may have been coached or received unauthorized assistance	Inconsistent response patterns as measured by response aberrance (e.g., answering difficult questions correctly and missing easy questions). Analysis of gain scores may also identify test takers who received unauthorized assistance.	Person Misfit Performance Change
Test takers who may have worked together and/or communicated with one another during the test	Analysis of response time stamps when the tests are given by computer can determine whether a pair of test takers has worked in a synchronous manner.	Response Latency
Coaching of actual test content	Test takers with unusual gain scores (for detecting possible gains that are artificial). Requires prior year test scores or scores from other tests that correlate highly with the test results being analyzed.	Performance Change
Disclosure of actual test content by a teacher, by an instructor, or on the Internet	Inconsistent use of time in responding to items or answering questions in unusually short time intervals. Response times are collected to facilitate this review.	Response Latency
Inappropriate tampering of test materials or inappropriate direction during testing	High numbers of wrong-to-right erasures on paper-and-pencil tests and/or analysis of answer changes from wrong to right.	Score Change

Exhibit 4.12.11.1-2: Configurable Elements for Forensic Analysis Reports

Forensic Analysis Report Setting	Example 1 Setting	Example 2 Setting
Changes in Student Performance Analysis (both within and between years)		
Students—Flag Cutoff in Studentized *t* Residual (two-way flagging)	3	3
Aggregates—Flag Method (1 = *t* value at aggregate unit, 2 = state mean/SD)	1	2
Aggregates—Flag Cutoff (two-way flagging)	3	3
Last Year's Database		
Last Year's Admin IDs		
Create Last Year Data? True/False		

Forensic Analysis Report Setting	Example 1 Setting	Example 2 Setting
Merge by Test Family, not Subject? True/False		
Test-Taking Time Analysis		
Students—Flag Cutoff (two-way flagging)	3	3
Aggregate—Flag Cutoff (two-way flagging)	3	3
Students—Invalid Test Time Cutoff (invalid if at least one page time is greater) (than milliseconds)		
Person-Fit Analysis		
Students—Flag Cutoff (one-way flagging, <)	–3	
Aggregates—Flag Method (1 = *t* value at aggregate unit, 2 = state mean/SD)	1	2
Aggregates—Flag Cutoff (one-way flagging, <)	–3	–3
Wrong-to-Right Response Changes Analysis		
Students—Flag Cutoff (one-way flagging, >)	3	3
Aggregates—Flag Cutoff (one-way flagging, >)	3	3
State Mean/SD Computation		
Aggregates—State Mean and SD (1 = weighted mean/SD of all aggregate unit means, 2 = unweighted mean/SD of the aggregate unit means, excluding small group units)	1	2
Small Group Flagging		
Aggregates—Small Group Size (number of students in group, = <)	5	5
Aggregates—Small Group Flag Cutoff (% flagged students in group, >)	50	50
Other		
Enter Current Year Begin Date		
Enter Current Year End Date		
Print-Only Flagged Students (True/False)	FALSE	FALSE
Include Demo Students? (0 = False, 1 = True)	0	0
Include SSID? True/False	FALSE	FALSE

Exhibit 4.12.11.1-3: Data Layout for Aggregate Forensic Analysis Report

Variable Name_Smarter 2020–2021	Variable Name_Updated	Description_Updated
Test ID	Test ID	Test ID
Aggregate ID	Aggregate ID	Aggregate ID
Aggregate Type	Aggregate Type	Aggregate level being summarized (e.g., Session, Test Administrator, or School)
Aggregate Name	Aggregate Name	Aggregate name
School ID	School ID	School ID
School Name	School Name	School name
District ID	District ID	District ID
District Name	District Name	District name
Total # Tests	Total Number of Tests	Total number of tests in the aggregate unit
Total # Tests Flagged	Total Number of Tests Flagged	Total number of tests flagged by at least one of the analyses in the aggregate unit
Within Year # Tests Total	Within Year Score Change Number of Tests	Number of tests being analyzed in the within year score change study in the aggregate unit
	Within Year Score Change Small Group Indicator	Small group indicator for within year score change study: 1 for small group, otherwise 0. Default of small group size is ≤ 5 (configurable by a user).
Within Year Most Recent Score	Within Year Most Recent Current Year Scale Score	Aggregate unit mean of most recent scale score from current year
Within Year Second Most Recent Score	Within Year Second Most Recent Current Year Scale Score	Aggregate unit mean of second most recent scale score from current year
Within Year Score *t* Value	Within Year Score Change *t* Value	*t* value at the aggregate level
Within Year Score Flag	Within Year Score Change Flag	True/False; flagged if absolute *t* value (|t|) is greater than a cutoff. Default cutoff is 3 (configurable by a user).
Within Year Score # Tests Flagged	Within Year Score Change Number of Tests Flagged	Number of tests being flagged by within year score change study in the aggregate unit
Between Year # Tests Total	Between Year Score Change Number of Tests	Number of tests being analyzed in the between year score change study in the aggregate unit
	Between Year Score Change Small Group Indicator	Small group indicator for between year score change study: 1 for small group, otherwise 0. Default of small group size is ≤ 5 (configurable by a user).

Variable Name_Smarter 2020–2021	Variable Name_Updated	Description_Updated
Between Year Most Recent Score From Current Year	Between Year Most Recent Current Year Scale Score	Aggregate unit mean of most recent current year scale score
Between Year Most Recent Score From Previous Year	Between Year Most Recent Previous Year Scale Score	Aggregate unit mean of most recent previous year scale score
Between Year Score *t* Value	Between Year Score Change *t* Value	*t* value at the aggregate level
Between Year Score Flag	Between Year Score Change Flag	True/False; flagged if absolute *t* value (|t|) is greater than a cutoff. Default cutoff is 3 (configurable by a user).
Between Year Score # Tests Flagged	Between Year Number of Tests Flagged	Number of tests being flagged by between year regression study in the aggregate unit
	Test Time Number of Tests	Number of tests being analyzed in the test time study in the aggregate unit
	Test Time Small Group Indicator	Small group indicator for test time study: 1 for small group, otherwise 0. Default of small group size is ≤ 5 (configurable by a user).
Total Test Time State Average Time (Opportunity 0)	Test Time State Mean	State mean of test time (either weighted or unweighted)
Total Test Time State Standard Deviation (Opportunity 0)	Test Time State SD	State standard deviation of test time (either weighted or unweighted)
Total Test Time Value (Opportunity 0)	Test Time Value	Aggregate unit mean of test time
Total Test Time Flag (Opportunity 0)	Test Time Flag	True/False; flagged if aggregate mean of test time is greater or smaller than a cutoff. Default cutoff is ± 3 SD from state mean (configurable by a user).
Total Test Time #Tests Flagged (Opportunity 0)	Test Time Number of Tests Flagged	Number of tests being flagged by test time study in the aggregate unit
Total Test Time Number of Standard Deviations (Opportunity 0)	Z-score for Test Time	(Aggregate unit mean of test time– state mean)/state standard deviation
	Person-Fit Number of Tests	Number of tests being analyzed in the person-fit study in the aggregate unit
	Person-Fit Small Group Indicator	Small group indicator for person-fit study: 1 for small group, otherwise 0. Default of small group size is ≤ 5 (configurable by a user).
Person-Fit Value (Opportunity 0)	Person-Fit *t* Value	*t* value for the aggregate unit

Variable Name_Smarter 2020–2021	Variable Name_Updated	Description_Updated
Person-Fit Flag (Opportunity 0)	Person-Fit Flag	True/False; flagged if *t* value for the aggregate unit is less than a cutoff. Default cutoff is –3 (configurable by a user).
Person-Fit # Tests Flagged (Opportunity 0)	Person-Fit Number of Tests Flagged	Number of tests being flagged by person-fit study in the aggregate unit
Person-Fit Number of Standard Deviations (Opportunity 0)		
	Wrong-to-Right Response Change Number of Tests	Number of tests being analyzed in the response change study in the aggregate unit
	Wrong-to-Right Response Change Small Group Indicator	Small group indicator for wrong-to-right response change study: 1 for small group, otherwise 0. Default of small group is ≤ 5 (configurable by a user).
State Average Number of Positive Score Changes (Opportunity 0)	Wrong-to-Right Response Change State Mean	State mean of wrong-to-right response change (either weighted or unweighted)
Total Positive Score Changes State Standard Deviation (Opportunity 0)	Wrong-to-Right Response Change State SD	State standard deviation of wrong-to-right response change (either weighted or unweighted)
Average Number of Positive Score Changes (Opportunity 0)	Wrong-to-Right Response Change	Aggregate unit mean of wrong-to-right response change
Average Number of Positive Score Changes Flag (Opportunity 0)	Wrong-to-Right Response Change Flag	True/False; flagged if aggregate mean of wrong-to-right response change is greater than a cutoff. Default cutoff is 3 SD of state mean (configurable by a user).
Total Positive Score Changes Flagged (Opportunity 0)	Wrong-to-Right Response Change Number of Tests Flagged	Number of tests being flagged by wrong-to-right response change analysis in the aggregate unit
	Response Change Total Number of Items	Aggregate unit mean of response change total number items
Average Number of Positive Score Changes Number of Standard Deviations (Opportunity 0)	Z-score for Wrong-to-Right Response Change	(Aggregate unit mean of wrong-to-right response change—state mean)/state standard deviation

4.12.11.2. Final Data Forensics: Testing Irregularity Detection Report

As described previously, CAI's forensic analysis report is configurable, and CAI will work with NJDOE to specify the configurable elements to meet NJDOE's requirements. The report provides forensic flagging for individual student records and all levels of aggregation, including test session, test administrator, school, and district.

4.12.11.3. Ongoing Web Monitoring—Before, During, and After Test Administrations

CAI's solution includes the services of Caveon as an independent provider for ongoing web monitoring services, added as an additional layer of protection. Caveon Web Patrol addresses the risk to tests and items posed by illicit discussion, distribution, and sale of test content on the Internet and supports NJDOE's requirements for secure web monitoring through the full test administration timeline. Caveon Web Patrol provides technology tools and human expertise to identify, prioritize, and monitor websites, discussion forums, peer-to-peer servers, etc., where sensitive test information may be disclosed or be put at risk of disclosure.

Patrolling efforts routinely find and evaluate "brain-dumps" (websites where test items have been posted, supposedly by individuals who memorized them and/or where disclosed test content may be inexpensively resold); test preparation training and education sites that may use actual (operational) test items in trainings; online auctions and classifieds such as eBay and Craigslist; and other social media channels and forums in which actual test items may be revealed or where proxy test takers offer their services.

CAI has integrated with Caveon's reporting systems, allowing us to provide periodic (weekly) updates as well as immediate reporting of high-risk findings. The periodic updates categorize identified threats by their level of actual or potential risk to a testing program based on either the representations made on the websites or actual analysis of the proffered content. Websites and Internet extracts are ranked from CLEARED (lowest risk but should be monitored) to SEVERE (highest risk). The reports contain specific URLs and other content extractions that represent and depict the categorized threat. Additionally, the reports include overall and specific threat analyses, with actionable recommendations for an organization to minimize and eliminate the risks.

We will also provide end-of-administration reports that summarize the complete log of reported Internet risk incidents, provide overall recommendations, and characterize the findings for each administration. This information will be provided to NJDOE and included in the post-administration review meetings to formalize program improvements or follow-up actions that may result from the findings.

4.12.11.3.1. Duration of Web Monitoring

We will support web-monitoring activities for the full span of the administration timeline, beginning a minimum of one week prior to each administration, encompassing the full active test administration window, and concluding a minimum of one week after the end of test administration for each contract year. Should there be any reason to extend these services, based on our findings and discussions, we are prepared to do so.

4.13. Reporting

Introduction

The success of an assessment program depends on the ability to provide meaningful data and reports to teachers, schools, districts, and families quickly and in ways that each user group can access and understand easily. To facilitate this vision, we commit to providing the SCM and NJDOE with the following:

- An online reporting portal called the Centralized Reporting System (CRS) for New Jersey teachers, schools, and districts. The CRS provides each user group access to dynamic, near-real-time data and reports, including individual student reports (ISRs), aggregate reports, and data files for each user based on permissions and authorized access configured by the SCM and NJDOE.
- Personalized video reports (cost option) for families/guardians that explain a student's results in plain language, in multiple languages, and in an accessible, engaging format.
- State data files that include results for all students tested.
- Individual student reports for New Jersey families that can be duplicated or triplicated to address the RFQ requirements (in English and another designated language; one for the district, charter school, or Renaissance school and one for any receiving school into which a Special Education student was placed).
- A Family Portal (cost option) through which families can access student results directly. Electronic delivery of the parent/student report through the Family Portal will offer cost savings and a better experience for families because the results will be available more quickly. Interactive, customized video reports will also be available through the Family Portal.

Our plan for reporting the NJSLA-ELA/M and the NJGPA offers several benefits to New Jersey educators, schools, families, and NJDOE personnel, including the following:

- A single, integrated reporting system, the CRS, for the NJSLA-ELA/M and the NJGPA
- CRS data displays that are intuitive and easy to understand for each audience
- Access to scores in near-real time as students submit their tests, enabling teachers and administrators to monitor student performance and take action in real time throughout the year, reducing the need for Cycle I and Cycle II reporting
- Immediate reporting, including most tests that contain essays or extended-response components (We commit to immediate scoring of online, machine-scored tests, and to results reporting of tests that require handscoring within 10 business days after the student completes the test.)
- A reporting system that is fully integrated with the student enrollment system (Roster Tracking System [RTS] and Test Information Distribution Engine [TIDE]), enabling each student's scores to follow that student as he or she moves among districts, schools, or classes
- A collection of meaningful reports, including longitudinal reports and standards-level reports for the class, school, and district, to help pinpoint programmatic strengths and weaknesses.
- Reports for non-secure assessments that allow users to view actual test items and actual student responses, enabling teachers to identify gaps in students' conceptual understanding
- Time-saving features for school and district administrators, including batch-printing of PDF files of family reports for delivery to families

- An online Family Portal (optional) and customized, interactive video reports providing families with direct access to their child's test results without having to wait for districts or schools to distribute these results

CAI's CRS meets all the requirements listed in the RFQ. It contains score reports for individual students, classrooms, schools, and districts, as well as for the State overall. CAI's CRS also enables districts to download student data in Microsoft Excel or CSV formats or to download individual student PDF reports with a manifest, all of which districts can then upload into their own systems for electronic delivery to families. This capability is significant, because the world is becoming increasingly web based. Electronic delivery of the family/student report through the Family Portal (optional) will offer cost savings and a better experience for families because the results will be available more quickly. Alternatively, CAI can design and print hard copies of the family reports to send directly to school districts for distribution to students and their families. Video reports (cost option) can also be available in the Family Portal for parents to access.

Liquidated Damages

CAI understands that the liquidated damages may apply if

A. the score reports are delivered later than the established date in the operational yearly schedule should the cause of the delay be determined that is was the fault of the Contractor; or
B. the reports contain errors in score validity such as inaccurate item scores, inaccurate scale scores, or inaccurate performance levels.

4.13.1. Report Specifications

CAI commits to adhere to all requirements listed in Section 4.13.1 of the RFQ. CAI will work closely with the SCM and NJDOE to ensure that report specifications are detailed and clear and that final delivery of the reports meets the listed requirements.

Process for Configuring and Developing Reports

To ensure that our reports facilitate analysis and action by NJDOE, administrators, teachers, and families, we have conducted extensive focus groups and usability tests. The reporting tool's design, layout, graphical displays, and use of color have been implemented based on rigorous focus groups conducted with educators, administrators, and families. Colors associated with performance are used consistently throughout the report, and graphical displays are chosen carefully to maximize the amount of information conveyed. For example, bar charts illustrate the percentage of a specific teacher's students at each performance level, but the relative positioning of each teacher's bar chart can also efficiently communicate which teachers have a higher-performing group of students, even if there are differences by performance level.

While designing the reports, we will work with the SCM and NJDOE for the initial "skinning" of the Centralized Reporting System (CRS) to finalize the look and feel of all online reports. CAI will work with the SCM and NJDOE to select a "skin" for the CRS, composed of colors, logos, headers, and footers that will give each report and data display a unified style. The SCM and NJDOE can also use the current skin throughout the systems. They will approve all final reports to ensure the State's branding requirements.

Next, we will work with the SCM and NJDOE to gather requirements and configure the system. To ensure that the online reports meet stakeholder needs, CAI will also work closely with the State to document requirements and configure the online reports. We will use feedback gathered by focus groups on report shells and content during this process. We will begin by drafting a reporting elements document that describes stakeholders' reporting needs and the

available measures that can be used to meet them. When the reporting elements document is approved, we will work with the SCM and NJDOE to complete the online reporting specifications, which define everything in the system, including table layouts, user-role access, definitions, reporting rules, and content hierarchies. To facilitate this process, we propose conducting a working session with the SCM and NJDOE to capture requirements for each part of the CRS and to complete all specifications.

Each school year, CAI will provide mock-ups of online report pages to be configured for State review. The SCM and NJDOE will review and approve all report designs and input documents, including mock-ups and specifications. CAI programmers will use these documents to configure the CRS and conduct quality assurance (QA) checks to ensure that the system is functioning as required. CAI will provide a user acceptance testing (UAT) environment that contains examples of the reports using mock data. Client sign-off is a prerequisite for deployment to production.

Reporting System Documentation

The cornerstone of the entire reporting process is the scoring and reporting specifications process—a fully vetted document that governs all scoring and reporting activities and is configured uniquely for each client.

We have a long history of successfully developing and maintaining scoring and reporting specifications to ensure that final reports and data files are produced accurately and on time. We rely on our specifications documents to capture detailed business and processing rules that enable CAI staff to conduct critical QA processes far in advance of receiving final data. In addition, these specifications include rules that govern how the CRS will be configured and how data will be displayed in that system. Specifically, this document defines the rules for table layouts, data filters, user-role access, definitions, and content hierarchies. Mock-ups of various report pages will also be included in the specifications to help NJDOE understand how the CRS will appear.

The CRS is preconfigured to receive scores from the Database of Record (DOR) according to rules dictated by the reporting specifications. CAI's Data File Generator (DFG) extracts scores from the DOR and populates the CRS with data files that are immediately accessible for publication online.

The reporting documentation that we use to produce the online reports and online individual student reports (ISRs) includes:

1. Reporting specifications
2. Next-steps text documentation
3. Mock-ups

Once the SCM and NJDOE review and approve the mock-ups and specifications, CAI programmers use these documents to configure the CRS and conduct numerous QA checks to ensure that the system is functioning as required. CAI will provide the UAT environment that contains examples of the reports using mock data. Client sign-off is a requirement for deployment to production.

Reporting System Quality Assurance

CAI's automated data intake, processing, and extract systems are designed for high-volume efficiency and accuracy. Each time a student completes an online test, the Test Delivery System (TDS) transmits data from that test event to our Quality Monitor (QM) System. Upon receipt of the student record, the QM System

- verifies scoring of student responses;

- validates scores presented to the student;
- calculates any other scores that will be used in the reporting systems, along with standard errors of measurement;
- calculates derivative measures from those scores (e.g., proficiency designations); and
- performs customized validations of incoming data.

In virtually all cases, these checks are all passed. When they are not, an automated system alerts project team members who investigate and resolve the issue.

The QM System's quality checks are typically completed within a second of data receipt. Once complete, the data are transmitted to the DOR and CRS.

In addition, CAI performs rigorous QA checks to ensure the data accuracy of data files and online reports far in advance of any reports being released to the public.

Reporting System Security Features and Access Control

Our CRS is designed to meet the highest security standards. It belongs to CAI's suite of programs and can be accessed through the common login system (CLS). The CRS allows educators and administrators to move seamlessly between authorized programs without re-entering their login information. For example, if a teacher is moving between the Test Information Distribution Engine (TIDE) and the CRS, he or she will not need to sign in to two different applications. When a user signs in, he or she will see only the reports and student data to which he or she has access. Besides ensuring that users do not have access to unauthorized reports, this also helps to improve the user experience by displaying only data and reports that are relevant to the user. Any reports generated by our system are always encrypted at rest.

Access is controlled by a role- and a jurisdiction-based permissions system. A user who is authorized to view reports will have access to data only for students over whom the user has jurisdiction. For example, a district user (with an appropriate role) can see all students in the district, but not students in other districts. A school user can see students in the school, and a teacher can see students in his or her class(es). User access to system functionality depends on the user's role, and roles (along with the permissions they require) are entirely configurable and customizable. All personally identifiable information (PII) is encrypted in the database.

Further access to data is controlled by configuring the CRS to allow users to see scores for students as appropriate and is granted according to NJDOE policy. Exhibit 4.13.1-1 presents one sample configuration of user roles and access to data. Roles and access are completely configurable, and one of our early tasks will be to work with NJDOE staff to decide which roles should exist and what each role should be able to do. In this example, school test coordinators are permitted to see all the scores for students in the school, but teachers are permitted to view the scores only for their students. We will work with NJDOE to configure the user roles and access to student score data for the assessments to reflect New Jersey's policy in this area.

Exhibit 4.13.1-1: Sample List of Possible User Roles and Access to Data

	DISTRICT	DISTRICT	SCHOOL	SCHOOL	SCHOOL
	DA	AC	SC	TE	PR
TASK LABEL	District Administrator	Assessment Coordinator	School Coordinator	School Teacher	Proctor
What level should this user have?	all students within the district	all students within the district	all students within the school	all students within the roster	No Relationship
Does this user have access to Test Reason Manager?	Yes	Yes	Yes	No	No
Does this user have scoring access?	N/A	N/A	Yes	Yes	No

4.13.1.1. Data Files

An extensive series of steps are followed during the preparation and quality control (QC) of student assessment results to ensure that CAI will meet the schedule for delivery of NJDOE student data files and associated aggregate files and reports. Steps taken to ensure the accuracy of student results and adherence to specifications include but are not limited to data file layout preparation and review, production and QC of sample data files by two independent teams to confirm that all business rules have been properly implemented, and sharing of mock and UAT sample data. This enables both NJDOE and SCM to review data files, provide feedback, and request modifications as CAI further refines the final deliverable format and process.

QC/QA procedures are in place early and at every stage of data file preparation. By developing and implementing steps during the preparation and delivery of mock or UAT data, CAI takes precautions early in the file preparation process and affords a generous review timeframe. In this way CAI anticipates, prepares for, and remediates for potential trouble spots in advance of the production data file preparation and report generation. Steps taken during the mock data/UAT window and applied during the production file delivery window include student data file preparation.

Student data file preparation and QC include the following:

- Detailed review with NJDOE and SCM, and then among CAI internal teams, to fully understand the intentions of the data file specifications and the appropriate interpretation of the business rules to be applied to data as they are populated into the data files and used in the generation of aggregate reports at the state, district, and school levels.
- Preparation by two independent teams of two separate implementations of the student-level data files. The data stored in CAI's databases are accessible to both teams, but the route of access is different. After both teams have prepared a version of the data file, the two versions are meticulously compared, examining every aspect of each file.
- Specifications for all fields in the student data files are detailed. For example, each layout that guides the production of student-level data files includes the following specifications:
  - The field name is generally specified according to client requirements.
  - The start and end positions of the field ensure that the field is of the proper width. Hard errors are established if any field value violates the width of the field.
  - Whether the field is required to be populated in the data file is specified. If a field is required, field values should not be blank or null.

- When acceptable values for the field are specified, checks are performed by both systems to confirm that no values violate the rule. Records that violate the rules will not be included in the data file until all violations are resolved or, alternatively, after the layout has been updated to reflect the new values.
- Definitions of field values are also presented in the layout. This further allows for a thorough review of values and the manner in which the data files have been populated.
- Value ranges for score measures are documented in the layout. When violations occur, they are brought to the attention of the teams preparing the data files as well as the Psychometrics and Statistics Team, who is responsible for QCing scoring before the production of data files. Both teams review anomalous values and confirm or correct them as required before production and delivery of final files.
- When student scores are aggregated, especially during the production of aggregate files at the state, district, or campus level, frequency distributions of aggregate measures are produced and reviewed by several CAI teams, including the Analysis/Data team, the Score Reporting team, and the Project Management Team. These independent reviews afford multiple opportunities for inspection and approval of data files before delivery to NJDOE and other stakeholders.
- Braille test processing is like that of other tests, and these tests are subjected to the same level of QC as all test administrations for a client. The use of a Data Entry Interface (DEI) allows student responses to test questions to be entered into the standard database along with all other assessments, and these tests are subject to the same high level of review and QC.
- The file is named in accordance with the data file specifications.
- All fields specified in the layout are accounted for.
- All data are correctly represented; there is no violation of acceptable values as detailed in the layout; all required fields are present and have non-null or non-blank values where mandated.
- If required, a header record is present in the file and correctly reflects what is documented in the layout.
- All student assessments, as specified by the technical project manager and noted in the layout, are included in the data file.
- All requested demographic fields are populated in accordance with the business rules.
- All measures calculated for the student's assessment are populated, and scoring is complete and accurate.
- Both files contain the same number of records.

Exhibit 4.13.1.1-1 presents an example of QC results that would require regeneration of the data files and re-QCing of these files. In these two files being compared, there are 156 records, and each record contains 223 fields. There is a difference in one field in one record. After meeting to discuss the difference, one team or both teams would regenerate their data files, and the process would repeat iteratively until a completely clean comparison report was produced.

Exhibit 4.13.1.1-1: Example QC Results That Require Regeneration and Re-QC of Data Files

```
--------------------

DataFrame Summary
-----------------

  DataFrame  Columns  Rows
0  from_SDF      223   156
1  from_DoR      223   156

Column Summary
--------------

Number of columns in common: 223
Number of columns in from_SDF but not in from_DoR: 0
Number of columns in from_DoR but not in from_SDF: 0

Row Summary
-----------

Matched on: Vndr_test_event_ID
Any duplicates on match values: No
Absolute Tolerance: 0
Relative Tolerance: 0
Number of rows in common: 156
Number of rows in from_SDF but not in from_DoR: 0
Number of rows in from_DoR but not in from_SDF: 0

Number of rows with some compared columns unequal: 1
Number of rows with all compared columns equal: 155

Column Comparison
-----------------

Number of columns compared with some values unequal: 1
Number of columns compared with all values equal: 222
Total number of values which compare unequal: 1

Columns with Unequal Values or Types
------------------------------------

  Column from_SDF dtype from_DoR dtype  # Unequal  Max Diff  # Null Diff
0    ELL         object         object          1         0            0

Sample Rows with Unequal Values
-------------------------------

   Vndr_test_event_ID ELL (from_SDF) ELL (from_DoR)
74               4578              Y             01
```

An example of a comparison report where no issues were found is shown in Exhibit 4.13.1.1-2. All 201,472 records from each file compared were exactly equal on all 86 fields included in this data file layout.

Exhibit 4.13.1.1-2: A Comparison Report with No Issues

```
DataFrame Summary
-----------------

  DataFrame  Columns    Rows
0  from_SDF       86  201472
1  from_DoR       86  201472

Column Summary
--------------

Number of columns in common: 86
Number of columns in from_SDF but not in from_DoR: 0
Number of columns in from_DoR but not in from_SDF: 0

Row Summary
-----------

Matched on: UIN, EntityKey
Any duplicates on match values: No
Absolute Tolerance: 0
Relative Tolerance: 0
Number of rows in common: 201,472
Number of rows in from_SDF but not in from_DoR: 0
Number of rows in from_DoR but not in from_SDF: 0

Number of rows with some compared columns unequal: 0
Number of rows with all compared columns equal: 201,472

Column Comparison
-----------------

Number of columns compared with some values unequal: 0
Number of columns compared with all values equal: 86
Total number of values which compare unequal: 0
```

The iterative nature of this QC process during the UAT phase of testing assures both teams that code is in place, and that business rules have been correctly interpreted and properly implemented. Once the project enters the production phase, because such care has been taken during UAT, CAI teams can produce data files and perform the QC process very quickly, thus allowing CAI to deliver student data on aggressive timelines.

Aggregate Data File Preparation and QC

CAI follows a similar process during the preparation of aggregate reports. Initial steps in this preparation process include the development of a layout that consists of all required reporting specifications and business rules to be applied in the preparation of the aggregate results. CAI works with two of our clients to prepare aggregate results at the state, district, and school levels. The report format differs between the clients, and as such CAI has experience in the delivery of aggregate data files and the preparation and delivery of PDF summary reports at the state, district, and school levels.

Included in Appendix D of our proposal is an example of a layout prepared to deliver district-level aggregate results to our client and a representation of the actual aggregate file, as found in Section 4.13.5.3.1, Exhibit 4.13.5.3.1-1. In this example of a layout and data file, we note that the aggregate files are uploaded to the state department of education, and they are disseminated by the state to the appropriate local education agency (LEA) personnel.

Alternatively, working with another large CAI client, a slightly different approach was implemented at this client's request. The specifications document in Appendix E of our proposal provides layout details, business rules, file-naming conventions, and additional information regarding cadence for report delivery. Output format for these reports at the state level is presented in Appendix F of our proposal. Reports are prepared at the school, district, region, and state levels and zipped into region- or district-level archives for delivery to the appropriate entity. A secure file transfer portal has been established for very rapid delivery to LEA entities, pending the approval of state-level personnel. Millions of PDF reports are uploaded and delivered in one hour or less. Permissions to view files are established in cooperation with the client, and only personnel with the required level of privilege receive the reports.

In a manner like that described to prepare student data files, a comparable QC process is followed during the preparation of aggregate data files and other aggregate reporting deliverables sourced from state-level data. Two programmers, working independently to review specification documents and business rules, develop code and produce the target reports. All aspects of the reports from the two programmers are compared. Where issues are identified, specification and business rules are reviewed to highlight the cause of the differences. Once the cause of differences is identified, one programmer or both programmers review and update code accordingly and produce another round of reports. Again, the comparison is made, and this process is repeated until the results produced by both programmers are identical when compared. All reports are run and compared until all reports are deemed correct and no differences between the programmers' results are seen. The process is thorough and exhaustive, leading to very high-quality results.

Among the QC checks carried out on the aggregate data files and reports, we include the following:

- Complete and accurate file names have been applied.
- All requested data elements are present, all values are in compliance with acceptable values, and all required fields contain non-null values.
- If required, a header file is present and accurately reflects field names.
- All student assessment opportunities have been included in the file.
- Both production and replication versions of the file contain the same number of records.
- All student demographic attributes are captured in accordance with the business rules.
- All fields in both the production and replication versions of the files are exactly equal in terms of value and format when compared.

A sample comparison report for student rosters can be seen in Exhibit 4.13.1.1-3. Both the production version of the file and the file's replication version contain the same number of fields (Columns = 35) and the same number of records (Rows = 710). If differences between the two files had been seen during this round of QC, both programmers would have reviewed the business rules and their implementation of the business rules and continued to work through the differences until a clean report was available. If more detail was required, the CAI and NJDOE technical leads for the report would be consulted.

Exhibit 4.13.1.1-3: A Comparison Report with No Issues

```
DataComPy Comparison
--------------------

DataFrame Summary
-----------------

          DataFrame  Columns  Rows
0   from_Production       35   710
1  from_Replication       35   710

Column Summary
--------------

Number of columns in common: 35
Number of columns in from_Production but not in from_Replication: 0
Number of columns in from_Replication but not in from_Production: 0

Row Summary
-----------

Matched on: StudentID
Any duplicates on match values: No
Absolute Tolerance: 0
Relative Tolerance: 0
Number of rows in common: 710
Number of rows in from_Production but not in from_Replication: 0
Number of rows in from_Replication but not in from_Production: 0

Number of rows with some compared columns unequal: 0
Number of rows with all compared columns equal: 710

Column Comparison
-----------------

Number of columns compared with some values unequal: 0
Number of columns compared with all values equal: 35
Total number of values which compare unequal: 0
```

In conjunction with NJDOE, CAI will establish a schedule to drive the delivery of files and reports to NJDOE as soon as possible after the close of the testing windows. The schedule must afford ample opportunity to complete scoring or handscoring, allow for review and QC of scores by the psychometric teams, and produce, replicate, and QC the student-level data files. Additional time will be required to produce and QC aggregate reports and ISRs based on NJDOE-approved data files. Examples of the processing time required for CAI's larger clients for the production and QC of data files are presented in Exhibit 4.13.1.1-4.

Exhibit 4.13.1.1-4: Processing Times Required for CAI's Larger State Clients

Client	Grade	Subject	No. of Student Records	No. of Student/ Item Records	Estimated Time to Produce and QC File (concurrent processing of grades/subjects)	Client	Grade	Subject	No. of Student Records	Estimated Time to Produce and QC File (concurrent processing of grades/subjects)
FL	3	Math	221,165	9,936,008	Six hours	TX	3	ELA/Math	389,197	Seven hours
FL	4	Math	197,903	8,892,166	Six hours	TX	4	ELA/Math	389,302	Seven hours
FL	5	Math	206,377	9,272,797	Six hours	TX	5	ELA/Math/ Science	392,502	Seven hours
FL	6	Math	211,194	9,701,116	Six hours	TX	6	ELA/Math	397,231	Seven hours
FL	7	Math	151,537	6,956,101	Six hours	TX	7	ELA/Math	409,867	Seven hours
FL	8	Math	170,998	7,852,217	Six hours	TX	8	ELA/Math/ Science/ Social Studies	493,016	Seven hours
FL	3	ELA	221,685	10,541,370	Six hours	TX		Algebra	491,128	10 hours
FL	4	ELA	201,178	9,642,035	Six hours	TX		Biology	473,935	10 hours
FL	5	ELA	207,524	9,911,997	Six hours	TX		English I	531,006	10 hours
FL	6	ELA	216,439	10,328,834	Six hours	TX		English II	482,994	10 hours
FL	7	ELA	209,636	9,871,276	Six hours	TX		USH	389,205	10 hours
FL	8	ELA	215,786	10,246,534	Six hours	TX		TOTAL Spring STAAR Records	4,839,383	
FL	9	ELA	223,161	10,636,743	Six hours					
FL	10	ELA	262,476	12,499,338	Six hours					
FL	TOTAL FAST Session		2,917,059	136,288,532						

Client	Grade	Subject	No. of Student Records	No. of Student/ Item Records	Estimated Time to Produce and QC File (concurrent processing of grades/subjects)	Client	Grade	Subject	No. of Student Records	Estimated Time to Produce and QC File (concurrent processing of grades/subjects)
FL	TOTAL Annual No. of Records		8,751,177	408,865,596						
FL		Algebra	254,329	13,945,621	Six hours					
FL		Geometry	222,868	12,234,523	Six hours					
FL	TOTAL EOC Session		477,197	26,180,144						
FL	TOTAL Annual EOC		1,431,591	78,540,432						

CAI's capacity to produce and QC a large volume of reports in one to three days is documented in the following schedule. Given the relative number of student records, CAI can produce, QC, and deliver files in five days or less once approval of data files is received. Refer to Exhibit 4.13.1.1-5.

Exhibit 4.13.1.1-5: Capacity to Produce and QC Large Volume of Reports

Assessment Type	Description of Deliverable	Production Student Count Counts are # of student records per test administration	District Data Files Count is # of data files per delivery	Region Data Files Count is # of data files per delivery	Rosters # of PDFs created at campus level	Summary Reports # of PDFs created at campus level	Item Analysis Reports # of PDFs created at campus level	Student Item Analysis Reports # of PDFs created by campus and grade levels	Constructed Response- Essay Reports # of PDFs created by campus and grade levels
Fall EOC (A1, BI, E1, E2, US)	Subject-level data files	505,000	1,093 (two deliveries)	20 (two deliveries)	13,333	33,281			
TELPAS ALT	Combined grades file	12,000	595 (two deliveries)	20 (two deliveries)	7,626	13,275			
TELPAS (K, G2, G3, G4, G6, G8, G10)	Grade or grade-band files	1,200,000	1,144 (two deliveries)	20 (two deliveries)	33,740	28,874	28,293	61,230	
EOC ALT (A1, BI, E1, E2, US)	Subject-level data files	31,000	847 (two deliveries)	20 (two deliveries)	2,698	4,426	4,408	2,698	
3–8 ALT (G3, G4, G5, G6, G7, G8)	Grade-level data files	42,000	1,004 (two deliveries)	20 (two deliveries)	10,456	17,019	12,432	25,398	
Spring EOC (A1, BI, E1, E2, US)	Subject-level data files	2,400,000	1,155 (two deliveries)	20 (two deliveries)	11,379	19,843	19,707	11,337	4,523
STAAR 3–8 (G3, G4, G5, G6, G7, G8)	Grade-level data files	2,500,000	1,210 (two deliveries)	20 (two deliveries)	21,005	33,039	16,272	21,683	21,683
Summer EOC (A1, BI, E1, E2, US)	Subject-level data files	160,000	1,038 (two deliveries)	20 (two deliveries)	4,514	6,610			
CAF	Statewide accountability file	4,076,027	1,216	20					

4.13.2. Cycle I and Cycle II Reporting

The RFQ requires that the Contractor shall report the results of the assessment in two phases: (1) Cycle I (Each Assessment—Individual Reporting) and (2) Cycle II—Aggregate Reporting. Instead of using two separate phases of reporting, CAI proposes to use the Centralized Reporting System (CRS) to report results in near-real time.

CAI will provide online student-, class-, teacher-, school-, district-, and state-level reports in the CRS that include information to help administrators evaluate the efficacy of school-level academic programs or curricular decision. Depending on the test design, reporting results can be moved as close to the time of actual testing. With our proposed autoscoring online tests, the CRS provides real-time scores as students submit their tests. Results can be available on the Test Delivery System and also on the CRS. Only a small percentage of the students taking writing assessments will have their scores handscored. The CRS can generate reports in real time when scoring has been completed and educators do not have to wait until the end of the testing window to see their results. This will provide a reporting system where relevant, actionable data arrive quickly at the school to support instruction and success. The Student Results Generator tool in the CRS allows users to export a raw data file for the district, school, teacher, or roster as the data become available.

By using the CRS, teachers, schools, districts, and state personnel can easily generate the following reports in near-real time:

1. Individual student reports (ISRs) (including student growth)
2. Student rosters
3. School and district roster summary reports
4. Aggregate score reports, including federally required subgroups
5. Summary reports by reporting category
6. Item analysis report (for fixed-form tests)
7. State Summary Report
8. Score interpretation manual

Overview of the Centralized Reporting System

We propose to use CAI's CRS designed to provide immediate, relevant reports to teachers and administrators so they can make valid, instructional, and programmatic decisions based on the data. The CRS provides a secure, full-service online reporting platform through which all reports and data files for the NJSLA-ELA/M and the NJGPA can be accessed.

Twenty-five states use the CRS to report their statewide assessments in near-real time. Exhibit 4.13.2-1 indicates the number of tests reported in the CRS for the past three school years.

Exhibit 4.13.2-1: Number of Tests Reported in the CRS in 2021–2022, 2022–2023, and 2023–2024

State Using Centralized Reporting System	Number of Tests Reported in the CRS in SY 2021–2022	Number of Tests Reported in the CRS in SY 2022–2023	Number of Tests Reported in the CRS in SY 2023–2024
1. Arizona	N/A	N/A	1,299
2. Arkansas	49,829	46,421	2,339,054
3. Connecticut	1.6 million	1,884,190	1,974,997
4. Delaware	207,446	227,872	286,266
5. Florida	549,372	9,283,208	16,363,922
6. Hawaii	429,647	392,720	492,209
7. Idaho	950,165	716,209	932,520
8. Indiana	1.4 million	1,438,012	1,495,069
9. Iowa	42,469	44,693	50,029
10. Louisiana	41,704	42,606	47,570
11. Montana	262,557	251,700	145,585
12. Nebraska	30,871	33,564	38,504
13. New Hampshire	318,841	329,199	322,040
14. North Dakota	137,828	134,512	141,600
15. Ohio	4.4 million	5,086,037	6,015,790
16. Oregon	735,820	749,245	790,874
17. Rhode Island	64,548	68,766	114,304
18. South Carolina	9,322	9,557	9,956
19. South Dakota	338,607	327,385	414,885
20. Texas	N/A	9,902,626	19,561,182
21. U.S. Virgin Islands	31,279	34,062	42,158
22. Utah	2.7 million	2,763,593	3,693,360
23. Washington	N/A	N/A	2,340,914
24. West Virginia	1.2 million	1,176,095	1,133,293
25. Wyoming	602,211	491,767	550,036

The design of the CRS is grounded in cognitive and focus group research with end users to help ensure that educators and families who receive our reports understand the information as intended.

Colors associated with performance are used consistently throughout the system, and graphical displays are chosen carefully to maximize the amount of information conveyed. For example, bar charts illustrate the percentage of a teacher's students at each performance level, but the relative positioning of each teacher's bar chart also efficiently communicates which teachers have a higher-performing group of students, even if there are differences by performance level.

Navigation in the system emphasizes the context of a student's performance by relating it to aggregate performance and trends over time to help users quickly locate the level of data they are searching for.

The design of the CRS also provides the specific data that each user group most requires. For example, for nonsecure tests, research with teachers has indicated the importance of receiving item-level data and information about the student response. As a result, for nonsecure assessments, the CRS is designed to display item-level data along with

- the actual item;
- detailed information about the item (standards alignment, rubric information); and
- the actual student responses to items on the nonsecure assessments.

All of this information is displayed in easy-to-understand reports to help teachers quickly pinpoint gaps in conceptual understanding.

Overview of the Reports and Features Provided in the CRS

The CRS is integrated with CAI's suite of online systems such that updates performed in one system will be reflected in near-real time in the CRS, based on the rules established in collaboration with NJDOE. The CRS dashboard presents users with summary data about the students for whom they are responsible (e.g., a principal would see the students in the school, a teacher would see students in his or her class). The user can then search through various levels of aggregation, all the way to individual reports. The system allows users to target and access content more precisely, moving from subject area through reporting categories, and even to standards-level reports for aggregates. Finally, the system offers a longitudinal view of individual students or aggregates. Aggregate reports are available at every level, and authorized users can print or download them (or the data on which they are based). The CRS also provides a state view of student results at aggregate and individual levels. ISRs can be produced individually or batched as PDFs.

In addition, the CRS integrates with CAI's Roster Tracking System (RTS), which serves as the student enrollment system of our Test Information Distribution Engine (TIDE). Consequently, each student's scores can follow the student as he or she moves among classes, schools, and districts. The RTS maintains information about the relationships among schools, districts, teachers, and students. As students graduate and move to a new school, their score history is automatically available to authorized users in their new school. A teacher with a new class can already know a good deal about the educational preparation of the students that he or she is about to teach. This is an especially important feature for schools and districts serving families and students who experience high mobility.

Our CRS currently supports translated reports for the following 15 languages: Arabic, Burmese, Cambodian, Chinese, Korean, Mandarin, Marshallese, Punjabi, Russian, S'gaw Karen, Somali, Spanish, Tagalog, Ukrainian, and Vietnamese. The system was designed to support translations in any language, and we have a process to verify support for each language and potentially make adjustments, if needed, for each new language. The process involves translating a sample ISR, rendering it using the same code the CRS uses to render the ISR, and then having a translation vendor verify that the translated text is being rendered correctly.

Summary of Centralized Reporting System Capabilities

The CRS provides dynamic information for educators. Student demographics and school/district associations can be updated at any time, and these changes are immediately reflected in the reporting system. The CRS generates reports from individual student results in real time as the results are requested. Data for aggregations are always pulled from the RTS, which reflects the

latest information about who is in what school. Note that the system also enables users to obtain information for students who were in their school on a given date. The CRS makes the data available to authorized users for download at any time, supporting district and school needs. Note that the system allows users to download PDF reports and data files as of the date they are viewing the results.

The educational world is dynamic, and the functionality of our integrated CRS reflects this growing, changing, and evolving world. In the following paragraphs, we describe our reporting system's functionality to ensure that stakeholders can access relevant data quickly and easily.

- **Batch Printing.** Users can generate a PDF of any table on any report in the CRS. Printed tables carry with them a footnote indicating the date on which the report was generated. ISRs can be produced individually or batched as PDFs. At NJDOE's discretion, the system can deliver a zip file containing ISRs as PDFs and a machine-readable manifest suitable for uploading into the district Student Information System (SIS). Most districts have these systems and maintain a secure family portal, providing an efficient means of delivering the ISRs to families.
- **Delivery of District Data Files.** Our CRS includes a Student Results Generator tool that allows users to export a raw data file by district, school, teacher, or roster as the data become available. The files can be exported into Microsoft Excel or any other delimited file format so that they can be loaded easily into other software platforms. Users can export any table on any report in the CRS.
- **Customizability.** All text and measures in the reporting tool are configurable, and CAI reporting staff will work closely with NJDOE to define all text and measures as part of the reporting specifications development.
- **Sorting and Filtering.** Users can choose to show or hide individual columns in a table or sort columns in ascending or descending order. A filter option is available on the left side of all report pages, allowing users to filter by specific criteria.
- **Mobile Compatible Reports.** All features and reports of the CRS are tablet accessible. All tables and data displays adjust to the tablet screen, simplifying the process of viewing rosters, requesting downloadable data files, and viewing custom-created reports.
- **Aggregation and Disaggregation.** Aggregate reports are available at every level, and authorized users can print these or download them (or the data on which they are based). In addition to the expected aggregate reports for a district, school, teacher, and class, the reporting tool allows users to create custom rosters of students so that groups of students within a class can be tracked and reported on separately. All aggregate reports are calculated from the student level up, so as new students test, reports for the roster, teacher, school, and district are updated instantaneously. All aggregate reports in the CRS can also be disaggregated by subgroups, as defined by NJDOE. For example, reports can be disaggregated by demographic characteristics such as gender, ethnicity, or English learner (EL) status. The CRS can also be configured to disaggregate by multiple characteristics at once (e.g., gender by ethnicity).
- **Interpretive Guidance and Assistance.** The CRS comes with an intuitive user guide that provides step-by-step instructions for every report, information about each measure included in the CRS, and screen captures to illustrate processes and outputs. The user guide is accessible from any page in the CRS. Once the user clicks the Help icon, the user will be taken to the relevant section of the user guide specific to the page that the user is on. The CRS also has an Information icon that provides a quick reference for users who want more information about how to interpret a specific reporting element.
- **Student Search.** Sometimes a user wants only an individual student's report and wants it quickly. The student search feature allows users to search by student ID. Users can see only students to whom they have access, though users can also search for students from

previous years. This capability allows a user to see an individual student's results with a minimal number of clicks.

- **Roles.** Access to any report in the CRS can be configured according to user role. We will work with NJDOE to define the program's user roles and their access to the various reports. The CRS also has jurisdiction features that limit users to viewing only the student scores within their own school or district. NJDOE can choose to be more restrictive and limit users' access to data on a specific group of students, identified on the basis of classroom information that can be fed into TIDE. Alternatively, NJDOE can have school or district coordinators define these groups by uploading them to TIDE.
- **Privacy.** Access is controlled by a role- *and* jurisdiction-based permissions system. A user who is authorized to view reports will have access only to data for students over whom the user has jurisdiction. For example, a district user (with an appropriate role) can see all the students in the district but not students in other districts. A school user can see students in the school, and a teacher can see students in his or her class(es). User access to system functionality depends on roles, and roles (along with the permissions they require) are entirely configurable and customizable. All personally identifiable information (PII) is encrypted in the database.
- **Reporting System Security Features and Control of Access**. Our CRS is designed to meet the highest security standards. It belongs to CAI's suite of programs and can be accessed through the common login system (CLS). It allows educators and administrators to move seamlessly between authorized programs without needing to reenter their login information. For example, if a teacher is moving between TIDE and the CRS, he or she will not need to sign in to two different applications. When a user signs in, he or she will see only the reports and student data to which he or she has access. Besides ensuring that users do not have access to unauthorized reports, this also helps to improve the user experience by displaying only data and reports that are relevant to the user. Any reports generated by our system are always encrypted at rest.

Virtually Real-Time Reports

Access to timely data is essential for any good assessment system. CAI will ensure that the scoring of tests is completed on a rolling basis during the testing window. One of the most powerful benefits of an online assessment system with automated essay scoring is that **we can easily support immediate reporting of assessment results for most students**.

- Scores for all tests that successfully pass the scoring checks will be populated in the CRS, in near-real time, as students submit them. This allows educators and administrators to view results on a real-time basis throughout the year and use these results as factors in important programmatic and instructional decisions.
- For tests that pass the scoring checks, the ISR will flow to the CRS immediately as students complete their tests and the ISRs will be available to the authorized users in near-real time.
- Similarly, the aggregate data (group-level data) will be updated in near-real time as the student record is processed.
- Machine-scored tests will be reported in the CRS virtually immediately after the student completes and submits the test.

The advantage of near-real-time reporting for all opportunities of the summative assessments is significant, especially for educators who can use scores to make data-driven instructional decisions all year long. Most of our clients use the system in this real-time mode and, having experienced it, would not go back to static, delayed reporting.

In the following sections, we summarize several current assessment reports and include screen captures to demonstrate the kinds of data that families and educators can use and how these

displays can be customized. It is important to note that these reports are just samples and can change based on NJDOE's policy decisions regarding test design.

4.13.2.1. Cycle I Reporting (All School and District/Charter/Renaissance School Assessments)

4.13.2.1.1. Individual Student Reports

CAI commits to providing student reports in English to the district. Electronic student reports will be available through the Centralized Reporting System (CRS) and Family Portal (optional); customized video reports (optional) can also be available through the Family Portal for parents. Electronic delivery of the parent/student reports provides test results faster than paper reports and would offer a cost savings to the Department.

The RFQ requires that the contractor shall prepare individual student reports (ISRs) to be duplicated or triplicated as follows:

- One ISR for the student (as appropriate in English or one of the other four designated languages)
- One ISR for the school district, charter school, or Renaissance school (English version)
- One ISR for any receiving school (English version) into which a special education student was placed to receive instructional services

CAI will provide a student report for all New Jersey families. Student reports for districts and schools will be accessible through the CRS. CRS accounts for dual reporting, linking the student with their school district, charter school, or Renaissance school, as well as the receiving school into which a special education student was placed to receive instructional services. Our CRS links directly to the database built by our Test Information Distribution Engine's (TIDE) student enrollment system, the Roster Tracking System (RTS). The RTS maintains information about the relationships among districts, schools, teachers, and students. If a student is enrolled in two different schools or districts in TIDE, CRS will report the student results in all schools and districts that the student is associated with in TIDE.

We have been working with our state clients for almost twenty years to develop easy-to-understand, color-coded score reports for families. Our reporting capability offers virtually infinite flexibility in designing new reports that meet the needs of New Jersey students, teachers, and administrators. We can place any text, graphic, color, or data element on any part of the page.

Exhibit 4.13.2.1-1 lists the states with whom we currently work to produce and deliver paper family reports. CAI has successfully delivered approximately 21 million pages of customized, full-color score reports to families in 10 states during peak years. CAI has also electronically delivered 37 million pages of reports. Currently, a number of states have been moving away from providing paper reports to districts and instead provide electronic PDFs that the district or school can print at their discretion or provide to families through the Family Portal. In Texas and Washington, CAI produces electronic PDFs of the paper reports that are loaded into the secure inboxes in the CRS for districts to access; in Delaware, we mail the paper family reports directly to the family addresses provided by the Delaware Department of Education (DDOE).

Exhibit 4.13.2.1-1: Paper Family Reports

States with Paper Reports for Families	Paper Report Pages Printed Annually	Years CAI has Produced Paper Reports
Connecticut	1,470,000	9+ years
Delaware	300,000	9+ years
Ohio	6,750,000	9+ years
Rhode Island	66,000	5 years
South Carolina	30,000	9+ years
Texas	5,126,100	3 years
Virgin Islands	70,000	8 years
Washington	3,400,000	9+ years
West Virginia	580,000	6 years
Wyoming	127,000	6 years

CAI proposes to work with NJDOE and the SCM to design and deliver student reports and student labels following the close of the testing window. CAI's reporting capabilities allow the Department virtually infinite flexibility in designing new reports that meet the needs of students, teachers, and administrators. Our plan for assisting the Department in developing student reports offers the following experience and benefits:

- CAI successfully distributes approximately 58 million student reports annually to families across the nation.
- Our student reports offer unparalleled customizability, allowing any text, shape, or data to be displayed on any part of the page. This flexibility enables our designers and psychometricians to experiment with different ways to visualize the data and to propose designs that can be accurately understood by parents.
- Our reports are grounded in cognitive and focus group research with end users to help ensure that parents who receive our reports understand the information as intended.
- Most importantly, an effective reporting system helps improve education by changing the behavior of stakeholders. CAI's student reports are designed to encourage meaningful change by helping parents draw accurate inferences about what their child knows and can do and by providing rich text recommendations, giving parents specific guidance on how to help their child improve their performance.

If awarded this contract, CAI will work with NJDOE and SCM to design and develop customized, full-color reports and revise them to eliminate sources of misunderstanding. We refer readers to Appendix M of our proposal for sample student reports.

Reporting Measures for ISRs

CAI will work with the SCM and NJDOE to design data displays for the student reports. We will work closely with the SCM and NJDOE to capture the relevant measures to provide to families.

ISRs will include, but not be limited to, the following seven measures:

1. Scale score and probable range of scores
2. Performance level
3. School, district, and state comparisons

4. Reporting category performance
5. Actionable instructional next steps based on student performance
6. Item-level data that provide teachers with detailed information about which items a student answered correctly or incorrectly
7. Actual student responses to items on the benchmark assessment

We will work with the SCM and NJDOE to define and report additional measures that may be useful.

Substantive Text Recommendations for Parents

We also propose to include plain-language text for students and parents that explains the content standards assessed on each test and what students in each of the reporting levels typically know and can do. We further suggest including advice about some next steps the parents and students might take at home to practice skills needed to master the standards. Students performing in different score ranges receive advice appropriate to those score ranges. Content specialists or statisticians draft interpretations, recommendations, and other texts. Written in parent-friendly language, this data-driven text provides a substantive explanation of what parents should understand from the data and what they can do as a result of the data. Data-driven text appearing on the reports will be developed within the Item Tracking System (ITS), reviewed by content experts and editors, and submitted to the SCM and NJDOE for review and approval.

Individual Student Reports in CRS

CAI proposes to provide New Jersey districts, parents, and guardians with an ISR that is intuitive and user-friendly and provides immediate access to assessment data. Online ISRs will be available in CRS and can be individually produced or batched as PDF files. At the SCM's and NJDOE's discretion, the system can deliver a zip file containing ISRs as PDF files and a machine-readable manifest suitable for uploading into the district Student Information System (SIS). Most districts have these systems and maintain a secure Family Portal, providing an efficient means of delivering the ISRs to parents.

Although reports for each grade and subject may have differing templates, formats, and content, we understand that the data for student-level reports will include, but not be limited to, the following measures:

- Overall Scale score
- Probable range of scores
- Overall proficiency level
- Performance-Level Descriptor (PLD) based on student performance
- Performance on each reporting category
- Actionable instructional next steps based on student performance on individual domain

An example of an ISR is shown in Exhibit 4.13.2.1-2.

Exhibit 4.13.2.1-2: Individual Student Report

State of New Jersey
Department of Education | Reporting

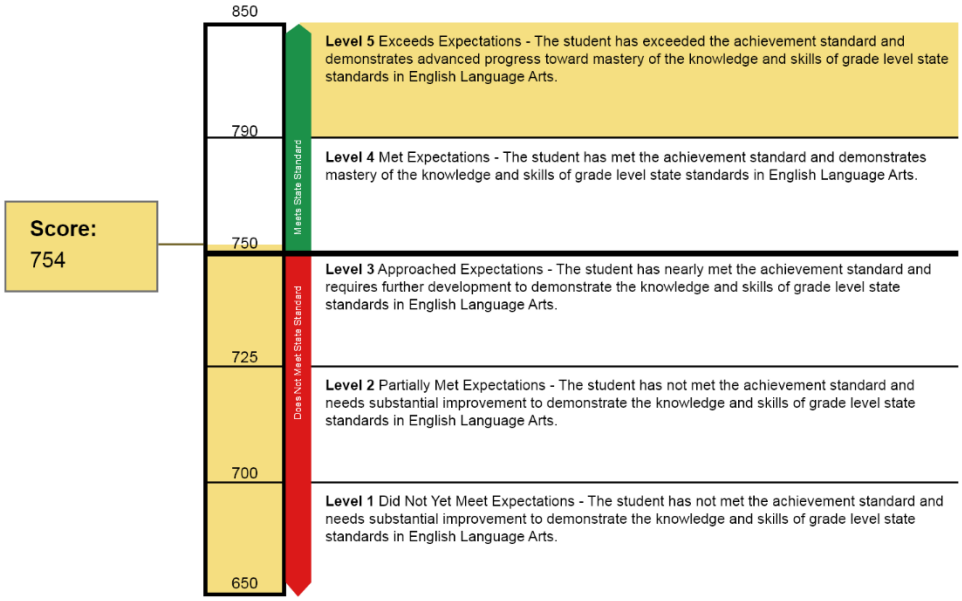
Individual Student Report

Demo, Student A.
Student ID: 9999900001 | Student DOB: 05/13/2013 | Enrolled Grade: 5
Date Taken: 5/24/2024

Grade 5 ELA - Summative 2023-2024
Demo District 9999
Demo School 99991

Scale Score: 754 **Opportunity Performance Level:** Level 4 **Predicted Performance Level:** Predicted to Earn Level 4
Gain or Loss Between Opportunities 2 and 3: Gain **Difference between Opportunities 1 and 2:** 53

How Did Your Student Do on the Test?



How Does Your Child's Score Compare?

Name	Average Scale Score
New Jersey	721
Demo District 9999	719
Demo School 99991	733

State of New Jersey
Department of Education | Reporting

Individual Student Report

Demo, Student A.
Student ID: 9999900001 | Student DOB: 05/13/2013 | Enrolled Grade: 5
Date Taken: 5/24/2024

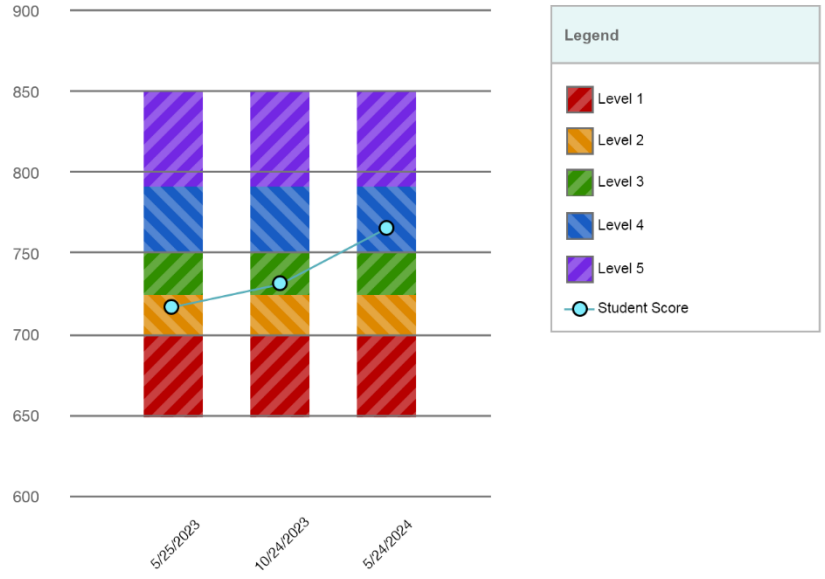
Grade 5 ELA - Summative 2023-2024
Demo District 9999
Demo School 99991

Scale Score: 754 **Opportunity Performance Level:** Level 4 **Predicted Performance Level:** Predicted to Earn Level 4
Gain or Loss Between Opportunities 2 and 3: Gain **Difference between Opportunities 1 and 2:** 53

Your Child's Progress

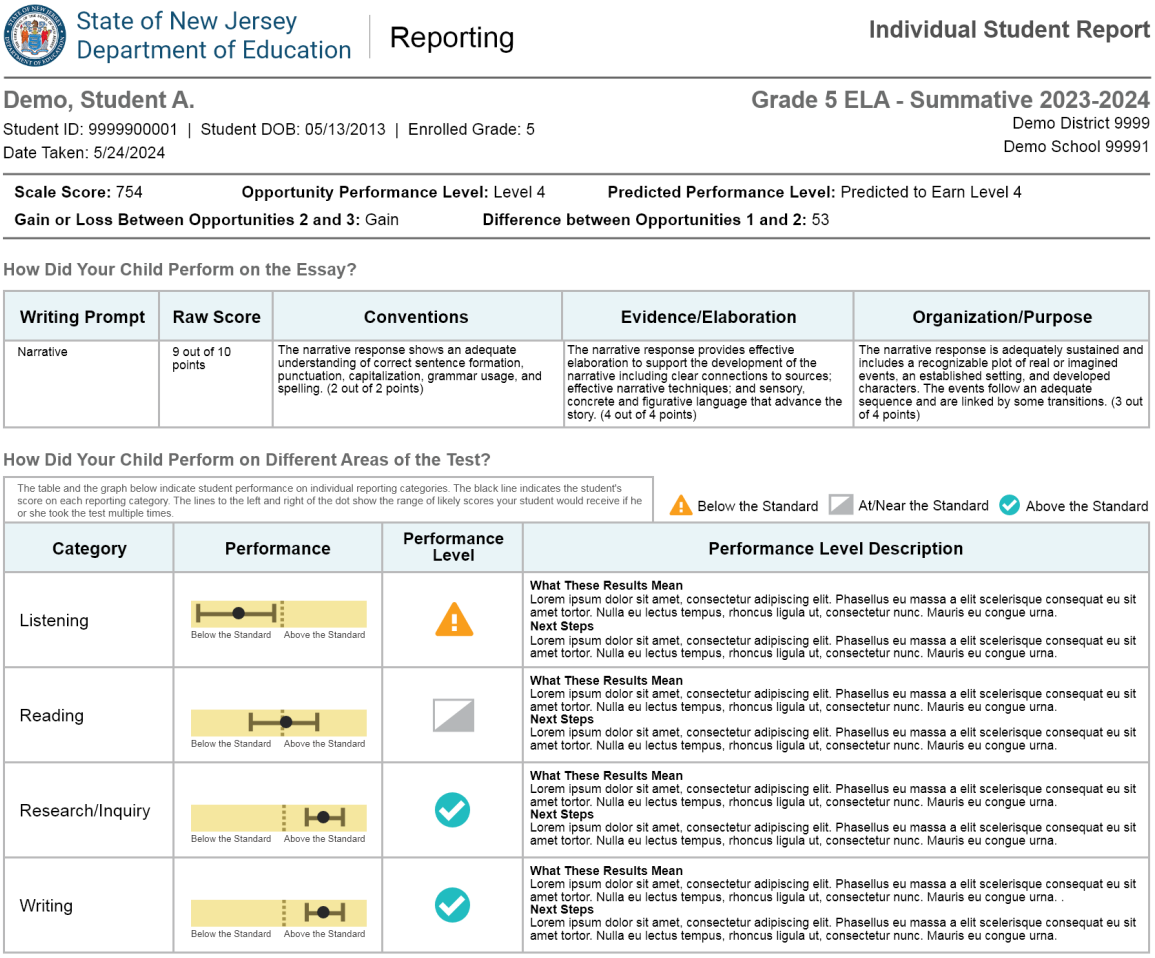
Longitudinal Trend Chart Information

The chart below reports your child's performance over time. The shaded areas in multiple colors indicate the scale score range in each achievement level. Each mark on the graph represents your child's score and indicates whether he or she met the standards that year.



Your Child's Progress

Date	Test Reason	Test Label	Scale Score	Performance Level
5/25/2023	Spring 2023 (Summative)	Grade 4 ELA - Summative	723	Level 2
10/24/2023	Fall 2023 (Interim)	Grade 5 ELA - Interim	726	Level 3
5/24/2024	Spring 2024 (Summative)	Grade 5 ELA - Summative	754	Level 4



State of New Jersey
Department of Education | Reporting

Individual Student Report

Demo, Student A.
Student ID: 9999900001 | Student DOB: 05/13/2013 | Enrolled Grade: 5
Date Taken: 5/24/2024

Grade 5 ELA - Summative 2023-2024
Demo District 9999
Demo School 99991

Scale Score: 754 **Opportunity Performance Level:** Level 4 **Predicted Performance Level:** Predicted to Earn Level 4
Gain or Loss Between Opportunities 2 and 3: Gain **Difference between Opportunities 1 and 2:** 53

How Did Your Child Perform on the Essay?

Writing Prompt	Raw Score	Conventions	Evidence/Elaboration	Organization/Purpose
Narrative	9 out of 10 points	The narrative response shows an adequate understanding of correct sentence formation, punctuation, capitalization, grammar usage, and spelling. (2 out of 2 points)	The narrative response provides effective elaboration to support the development of the narrative including clear connections to sources; effective narrative techniques; and sensory, concrete and figurative language that advance the story. (4 out of 4 points)	The narrative response is adequately sustained and includes a recognizable plot of real or imagined events, an established setting, and developed characters. The events follow an adequate sequence and are linked by some transitions. (3 out of 4 points)

How Did Your Child Perform on Different Areas of the Test?

The table and the graph below indicate student performance on individual reporting categories. The black line indicates the student's score on each reporting category. The lines to the left and right of the dot show the range of likely scores your student would receive if he or she took the test multiple times.

Below the Standard | At/Near the Standard | Above the Standard

Category	Performance	Performance Level	Performance Level Description
Listening	Below the Standard – Above the Standard		**What These Results Mean** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna. **Next Steps** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna.
Reading	Below the Standard – Above the Standard		**What These Results Mean** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna. **Next Steps** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna.
Research/Inquiry	Below the Standard – Above the Standard		**What These Results Mean** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna. **Next Steps** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna.
Writing	Below the Standard – Above the Standard		**What These Results Mean** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna. . **Next Steps** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus eu massa a elit scelerisque consequat eu sit amet tortor. Nulla eu lectus tempus, rhoncus ligula ut, consectetur nunc. Mauris eu congue urna.

Value to End Users/Support in Making Decisions Around Instruction and Curriculum. ISRs can be produced individually or batched as PDF files through CRS. The ISRs include plain-language text for students and parents that explains the content standards assessed on each test and what students in each of the reporting levels typically know and can do. In addition, we typically include advice about some next steps that parents and students might take at home to practice skills needed to master the standards. Students performing in different score ranges also receive advice appropriate to those score ranges. Written in parent-friendly language, this data-driven text provides a substantive explanation of what parents should understand from the data and what they can do as a result of the data. Content specialists or statisticians draft interpretations, recommendations, and other texts. Focus group feedback confirms that parents find the “next step” text the most useful part of the student report. Many parents use this text as a starting point for conversations with their child’s teacher about the instructional support their child requires.

The layout and measures of the ISR have been updated over time, and the student’s longitudinal graph and visual representation of student performance on each reporting category are included.

Translated ISR

CAI commits to providing translated ISRs for families in the four languages identified in the RFQ. We will work with a team of experienced translation vendors to translate the reports and

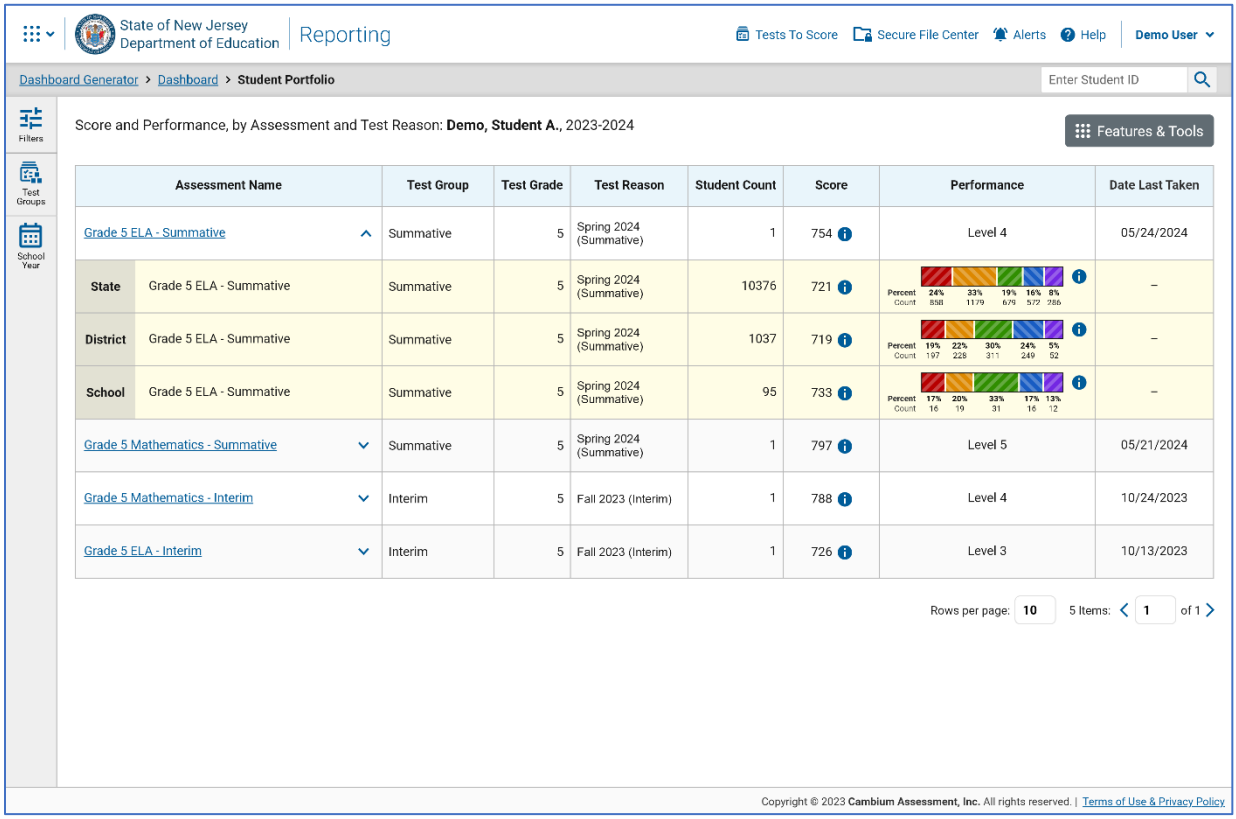
conduct rigorous quality-assurance checks on the initial translation. CAI will also work closely with Chief School Administrators (CSAs) and NJDOE to ensure that the translations meet CSA and NJDOE's requirements. CSA and NJDOE's approval of the translation will be required prior to loading the translation in various reports and systems.

To inform non-English-speaking families of their child's performance, CAI proposes to provide translated ISRs through CRS and the Family Portal. Translated ISRs allow parents to understand their child's results in their own language. Educators can download translated ISRs through the Student Results Generator in CRS and batch print these reports. Currently, CRS provides translated ISRs in multiple languages, including Arabic, Burmese, Cambodian, Chinese, Korean, Marshallese, Punjabi, Russian, S'Gaw Karen, Somali, Spanish, Tagalog, Ukrainian, and Vietnamese. CRS has the ability to support additional languages as needed that are Latin-based or Roman-based, and we have a process to verify support for each language and potentially make adjustments, if needed, for each new language. The process involves translating a sample ISR, rendering it using the same code that the CRS uses to render the English ISR, and then having a translation vendor verify that the translated text is being rendered correctly.

Student Portfolio Reports

Our CRS provides useful summary views of all assessment scores for a student. For example, the student portfolio report shown in Exhibit 4.13.2.1-3 allows a teacher to see every assessment taken by a specific student and to quickly pinpoint that student's strengths or weaknesses.

Exhibit 4.13.2.1-3: Student Portfolio Report



Value to End Users/Support in Making Decision Around Instruction and Curriculum. Educators can use the student portfolio report to view all tests that a particular student has

taken. This can be particularly useful as teachers prepare for parent-teacher conferences where teachers need to quickly access how a particular student performed across tests.

Family Portal (Optional)

CAI built the Family Portal to directly engage parents in their child's performance. Through these portals, families can access score and assessment information at their convenience throughout the year. They can also access customized video reports (optional) through the Family Portal.

Exhibit 4.13.2.1-4 includes volumes of tests reported by some of our clients via the Family Portal.

Exhibit 4.13.2.1-4: Volumes of Tests Reported by State via Family Portal

Client	Total Tests Reported in Family Portal by State for 2022–2023	Total Tests Reported in Family Portal by State for 2023–2024
Delaware	124,060	123,393
Florida	14,752,817	16,324,587
Hawaii	231,313	238, 818
New Hampshire	205,912	173,746
Texas	10,673,911	10,618,346
U.S. Virgin Islands	14,340	14,228
West Virginia	247,190	239,511

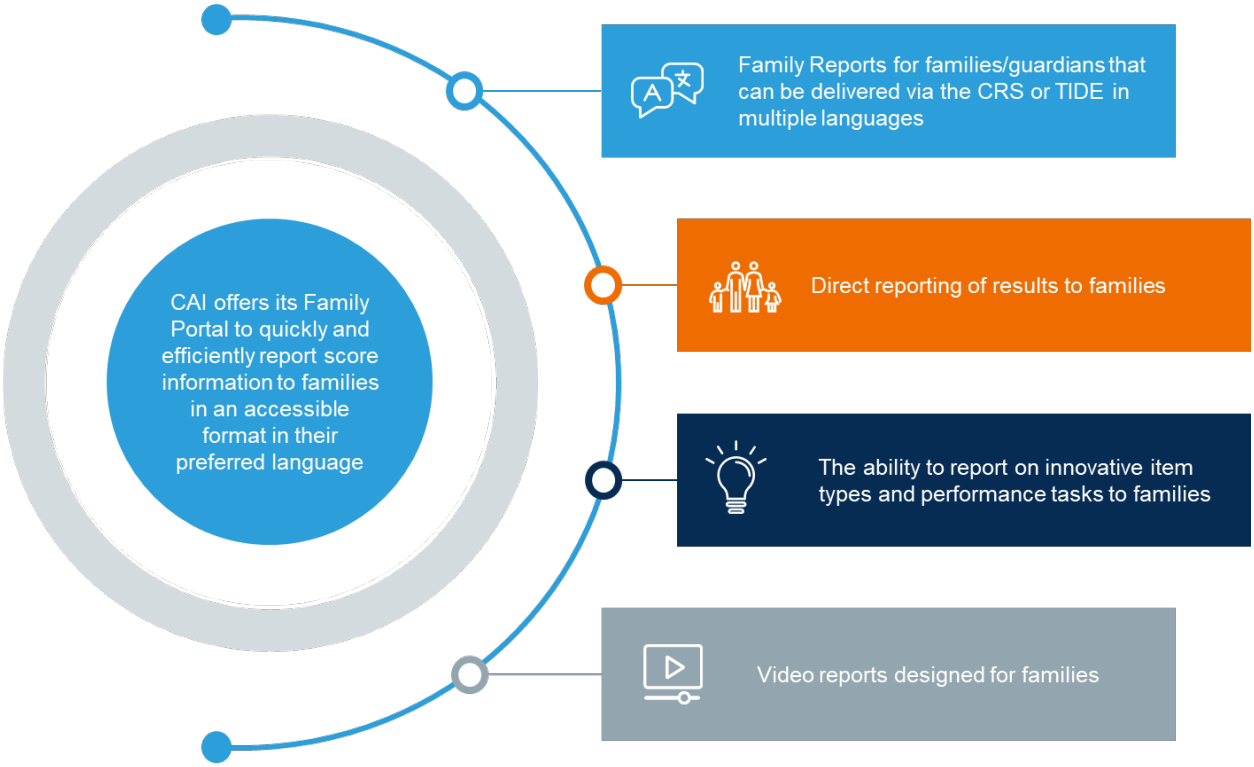
CAI provides the Family Portal as a way to quickly and efficiently report score information to families in their preferred language and in an accessible format. The Family Portal is designed to

- provide rapid, flexible reports to parents in a highly secure environment;
- reduce the burden on districts and schools to distribute printed ISRs to families;
- provide full translation of the Family Portal, which allows non-English-speaking parents to be more engaged in their child's education;
- give the State the ability to report both summative and end-of-course scores to families throughout the year as soon as this data is available;
- give the State the ability to distribute student results to families at the same time that the data are available in CRS;
- enable educators or administrators to generate access codes through TIDE for Family Portal credentials on behalf of parents and guardians, who can then use those credentials to sign into the portal and view their student's performance reports; and
- provide a platform to share a range of interpretive information with families to help them understand the purpose of the assessments, assessment terminology, and the elements and measures reported in the ISR.

The Family Portal is integrated with CAI's suite of online systems such that updates performed in one system will be reflected in near-real time in the Family Portal, based on the rules established in collaboration with the State.

The Family Portal is designed to meet the highest security standards. All personally identifiable information (PII) is encrypted in the database, and any system-generated reports are always encrypted at rest.

The Family Portal is also integrated with local education agencies (LEAs) that have existing SIS Family Portals. CAI has worked closely with SIS vendors to establish a secure, trusted channel that allows parents to seamlessly navigate from existing family portals to view the student reports directly in the CAI Family Portal. Parents may login to the Family Portal and access the data from the LEA information system without the need for re-authentication.



Additional benefits of the Family Portal include the following:

- **Ability to download Student Report Cards (SRCs).** With this benefit, SRCs are available in the Family Portal for parents to view and download. This reduces the burden on districts and schools to distribute printed ISRs to families.
- **Ability to access performance across years.** With this benefit, the Family Portal has up to 10 years of student's test results available in the system. Parents can easily access how the student has performed over the years.
- **Internationalization.** With this benefit, the Family Portal is fully translated into Spanish. With a large population of Spanish speakers in New Jersey, the Family Portal becomes more accessible to non-English speaking parents.
- **Item Responses.** With this benefit for released tests, the Family Portal displays real questions from the test along with student responses. By seeing actual student responses, especially for items that demand higher cognitive complexity, parents can more precisely identify potential gaps in understanding.
- **Progress/Trend.** With this benefit, the Family Portal includes progress information that allows parents to analyze student growth when comparing performance results across assessments. The progress and trend information are shown at the overall subject level, as well as at the Lexile/Quantile levels. Parents can use this report to track changes in achievement gaps and show progress over time.
- **Resources.** With this benefit, the Family Portal contains resources tailored to the student, including activities that parents can do at home to help their child academically improve in the coming years. Resources include advice about some next steps that the parents and

students might take at home to practice skills needed to master the standards. Students performing in different score ranges receive advice appropriate to those score ranges.

- **Interpretive Resources.** With this benefit, the Family Portal provides a platform to share a range of interpretive information with families to help them understand the purpose of the assessments, assessment terminology, and the elements and measures reported in the report.

Accessing the Family Portal

CAI has developed a feature that allows a student's family members to log into the CAI Family Portal directly from a district's SIS. Once district and SIS providers integrate this feature with their SIS, parents and guardians can access their student's reports with the click of a button, bypassing the Family Portal login screen where they would typically enter the student's access code, date of birth, and first name.

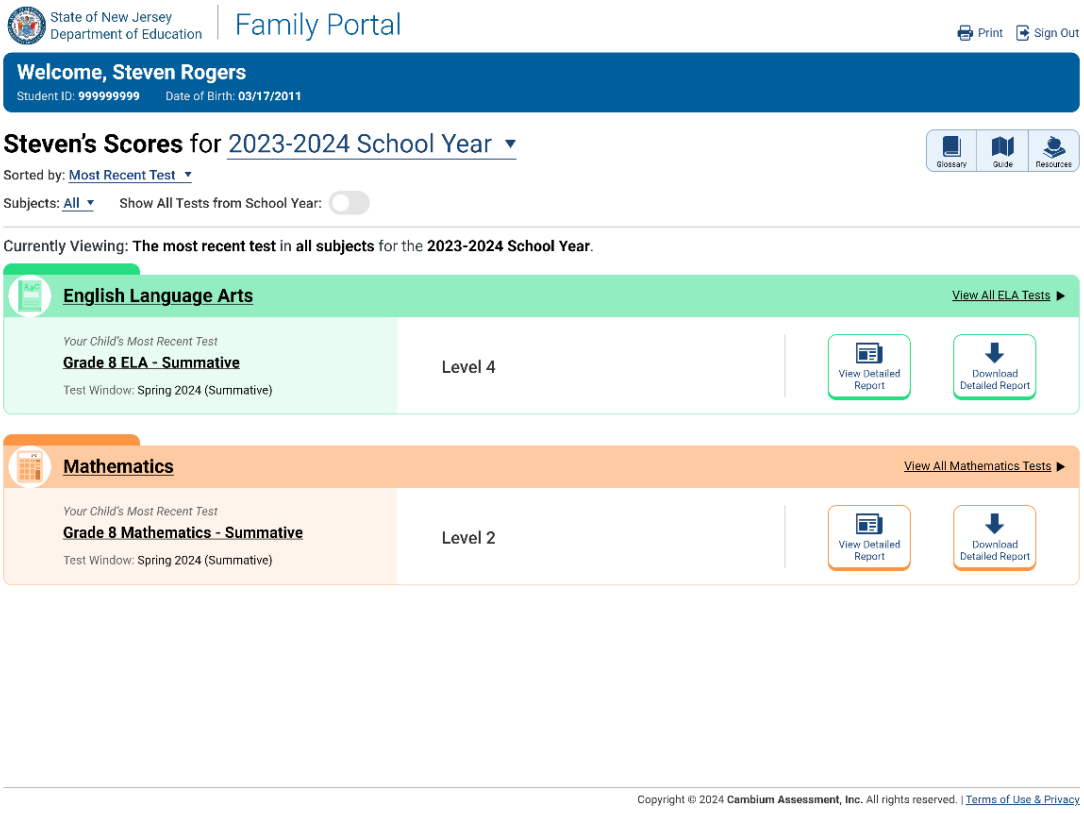
Parents can also use CAI's Internet-based portal to access a student's assessment data. Parents will use the access codes and do not need to create their own accounts. TIDE can download printouts of students' Family Portal credentials and email them to parents and educators. Once the access code information has been shared with the parents and guardians, family users can sign into the Family Portal with their student's credentials and view that student's performance reports. This will involve using a combination of the student's PII, such as name, student ID, or date of birth. The challenge here is to ensure that the process is secure and the data required are not readily available to others. Once such a mechanism is established, users can visit the Family Portal, enter the necessary credentials, and access the appropriate student's data.

Sample Family Portal Pages

We propose to enhance the current Family Portal to include additional details and information on students' assessment results. In this section, we summarize some of the proposed reporting pages for the Family Portal for New Jersey, accompanied by screen captures, to demonstrate the kinds of data and information that parents will be able to access through the Family Portal and how these displays can be customized. This is only a sample of the reports and data that we can include in the Family Portal; we can provide any measure or information that NJDOE would like to display in your reports.

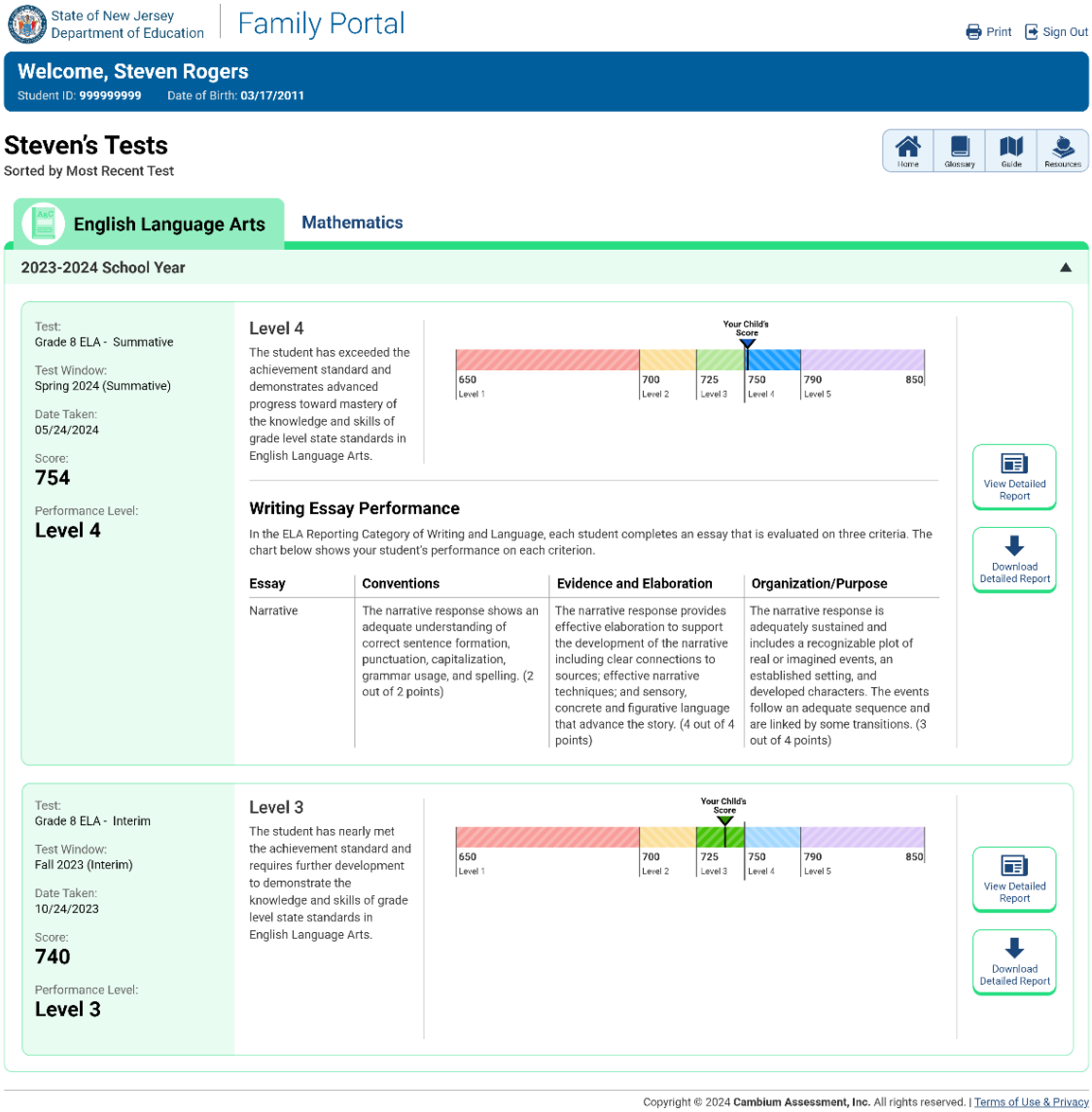
Landing Page. Upon logging in to the Family Portal, parents are presented with overall results for tests that their child has taken during the current year. Parents can change the school year by using the drop-down menu at the top of the report page. Each subject card shows the date on which the test was taken, the testing window, the subject-area test score, and a description of the student's performance. Parents can click "View All Tests" to access individual test results for the selected subject. Parents can also click "View Detailed Report" to download an ISR of the student's test. Refer to Exhibit 4.13.2.1-5 for a sample landing page.

Exhibit 4.13.2.1-5: Sample Landing Page in the Family Portal



Subject Summary Results. The Subject Summary Results page displays subject-level information to offer families more comprehensive views on how their children have progressed over the year in that subject. Exhibit 4.13.2.1-6 displays a student results sample from spring 2024. As additional tests are taken within the school year or across school years, families can expand the school year views to access even more progress data over the years.

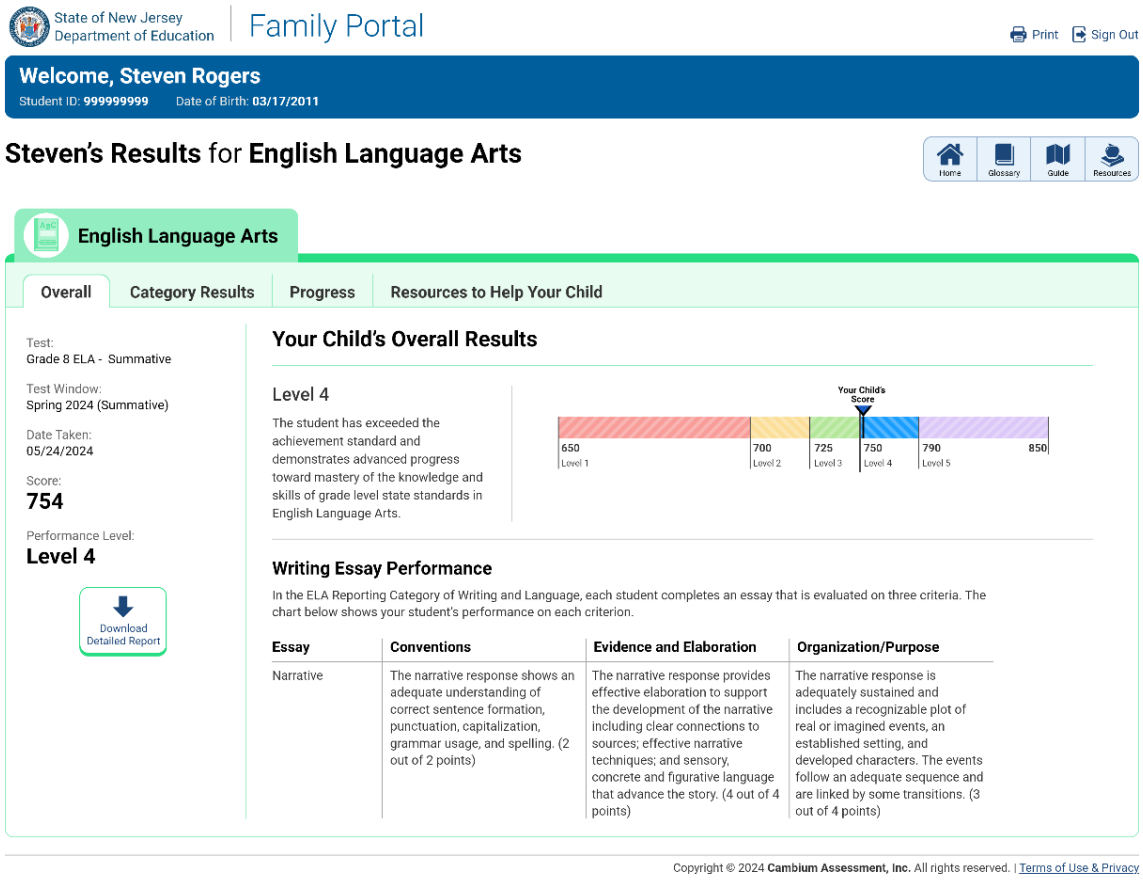
Exhibit 4.13.2.1-6: Subject Summary Results



Test Detailed Results. The Test Detailed Results page displays tabs at the top of the page that provide additional information, including: Overall test results for each subject, reporting-category-level results, a list of test questions indicating which items the student correctly or incorrectly answered, points earned for each student, actual student responses for each released item, progress over time (typically a trend chart plotting results by administration or year), and additional interpretive resources to help parents understand reports, measures, tests, and the overall assessment program.

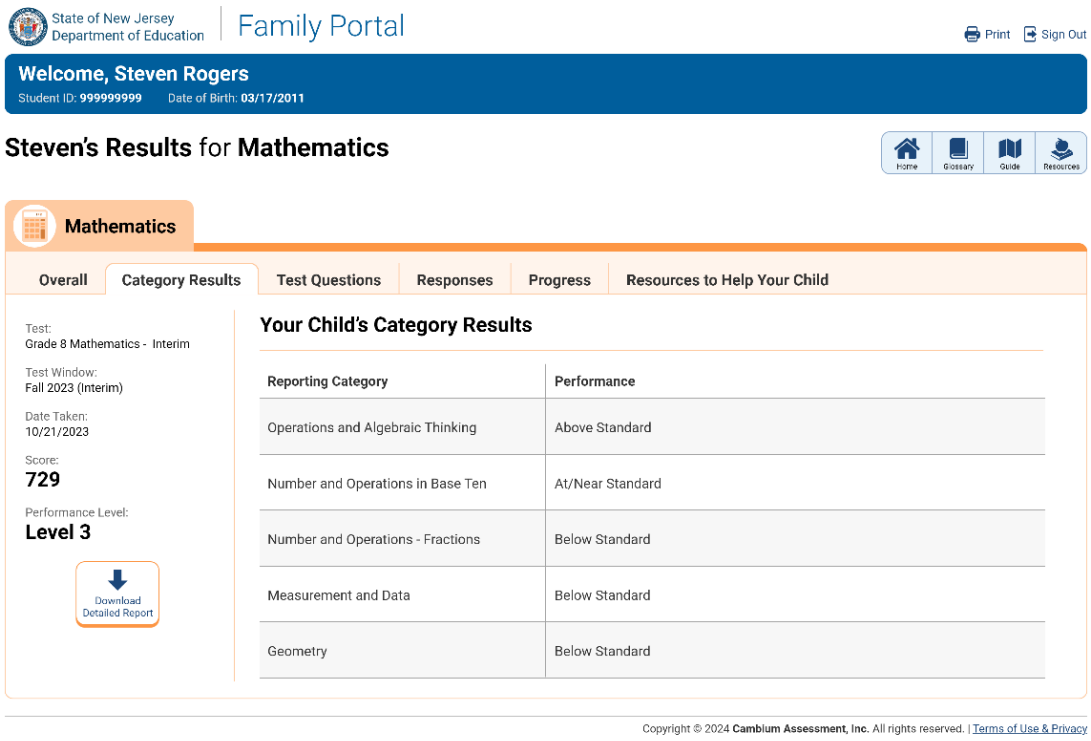
Test Detailed Results—Overall Tab. The Overall tab displays the overall student performance on the select test. It contains the same information as the subject summary results page, but for a selected test only. Exhibit 4.13.2.1-7 shows a sample Test Detailed Results—Overall Tab report for a student.

Exhibit 4.13.2.1-7: Test Detailed Results—Overall Tab



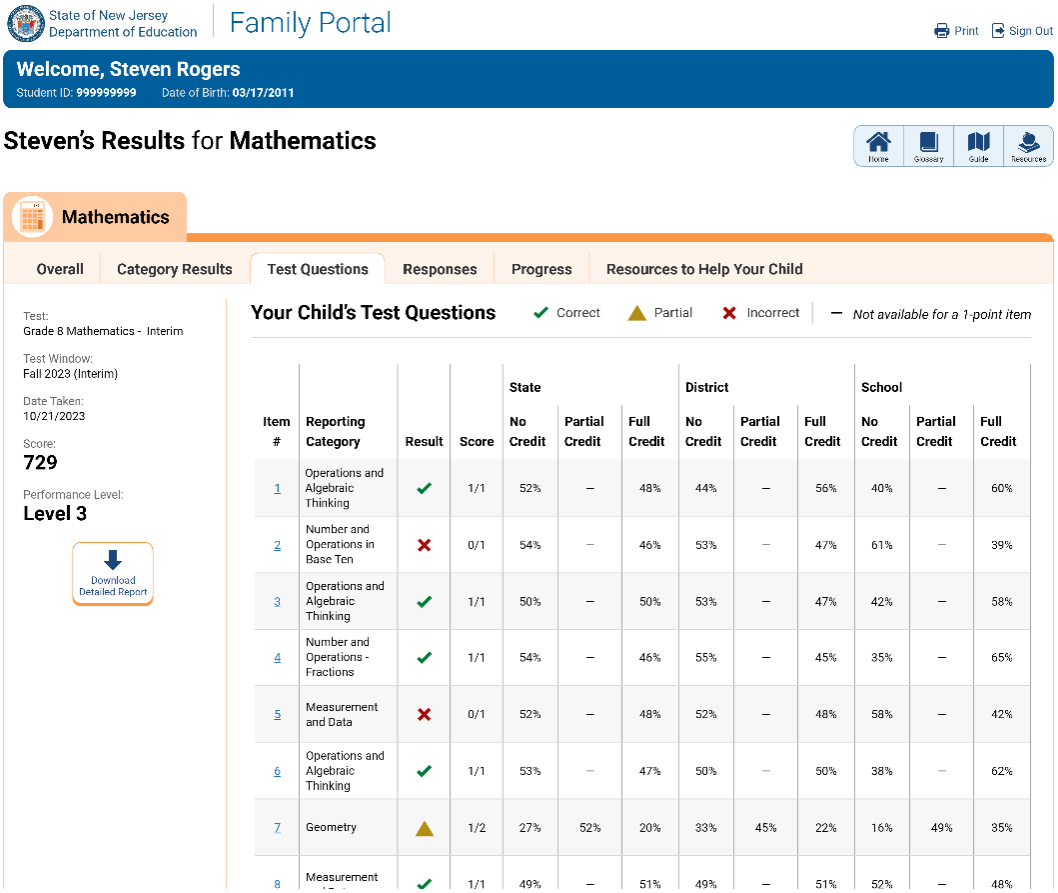
Test Detailed Results—Category Tab. The Category tab allows parents to understand how their child has performed on each category reported on the test. This allows parents to know if their child is excelling or struggling on any reporting category within the overall subject. Exhibit 4.13.2.1-8 shows a sample Test Detailed Results—Category Tab report for a student.

Exhibit 4.13.2.1-8: Test Detailed Results – Category Tab



Test Detailed Results—Test Questions Tab. Using this report, as shown in Exhibit 4.13.2.1-9, parents can know the total number of test questions on the test, the reporting category for each question, and the number of points their child scored for each question. This page also shows the percentage of students who answered the question correctly in the state, district, and campus.

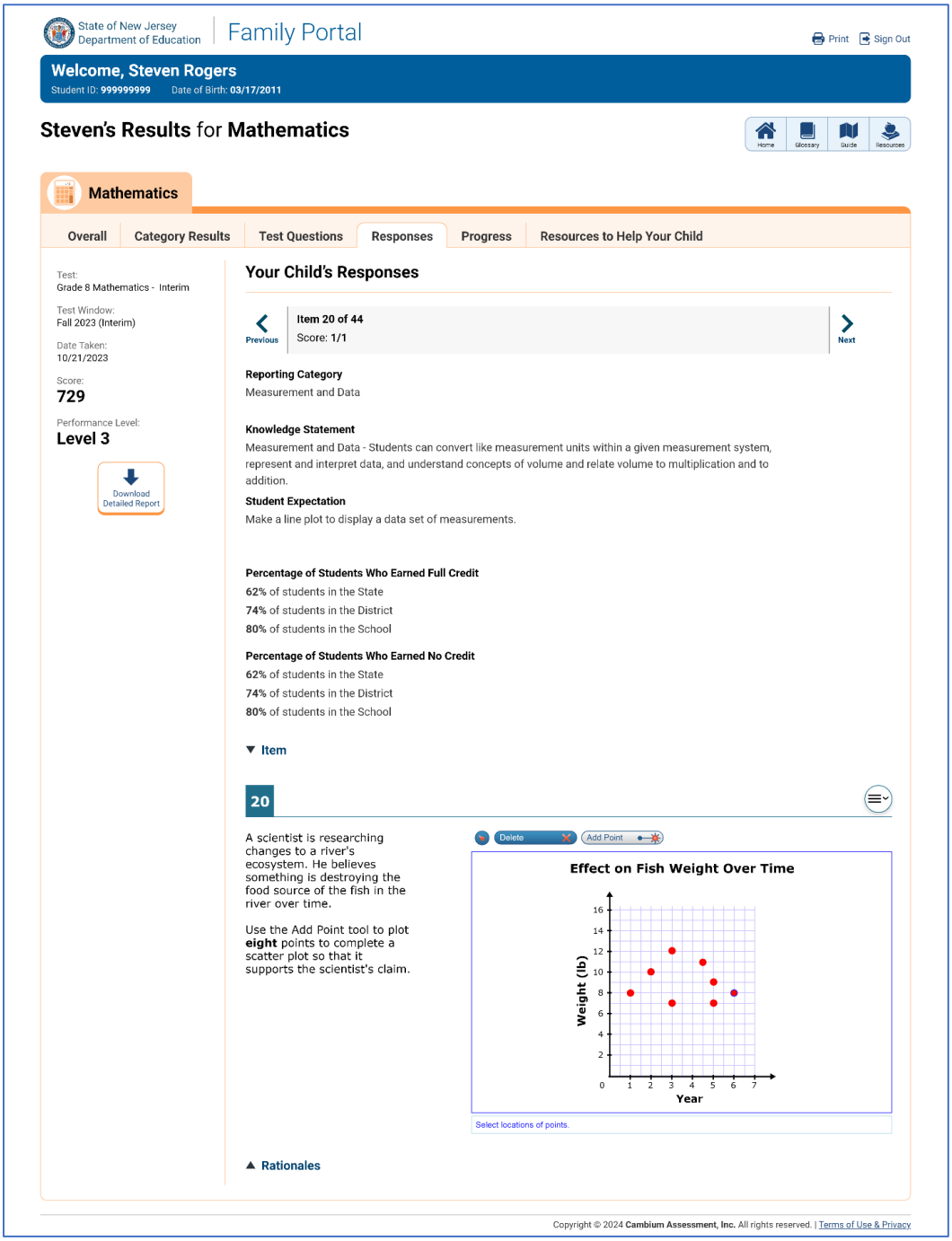
Exhibit 4.13.2.1-9: Test Detailed Results—Test Questions Tab



Item #	Reporting Category	Result	Score	State			District			School		
				No Credit	Partial Credit	Full Credit	No Credit	Partial Credit	Full Credit	No Credit	Partial Credit	Full Credit
1	Operations and Algebraic Thinking	✓	1/1	52%	–	48%	44%	–	56%	40%	–	60%
2	Number and Operations in Base Ten	✗	0/1	54%	–	46%	53%	–	47%	61%	–	39%
3	Operations and Algebraic Thinking	✓	1/1	50%	–	50%	53%	–	47%	42%	–	58%
4	Number and Operations - Fractions	✓	1/1	54%	–	46%	55%	–	45%	35%	–	65%
5	Measurement and Data	✗	0/1	52%	–	48%	52%	–	48%	58%	–	42%
6	Operations and Algebraic Thinking	✓	1/1	53%	–	47%	50%	–	50%	38%	–	62%
7	Geometry	▲	1/2	27%	52%	20%	33%	45%	22%	16%	49%	35%
8	Measurement	✓	1/1	49%	–	51%	49%	–	51%	52%	–	48%

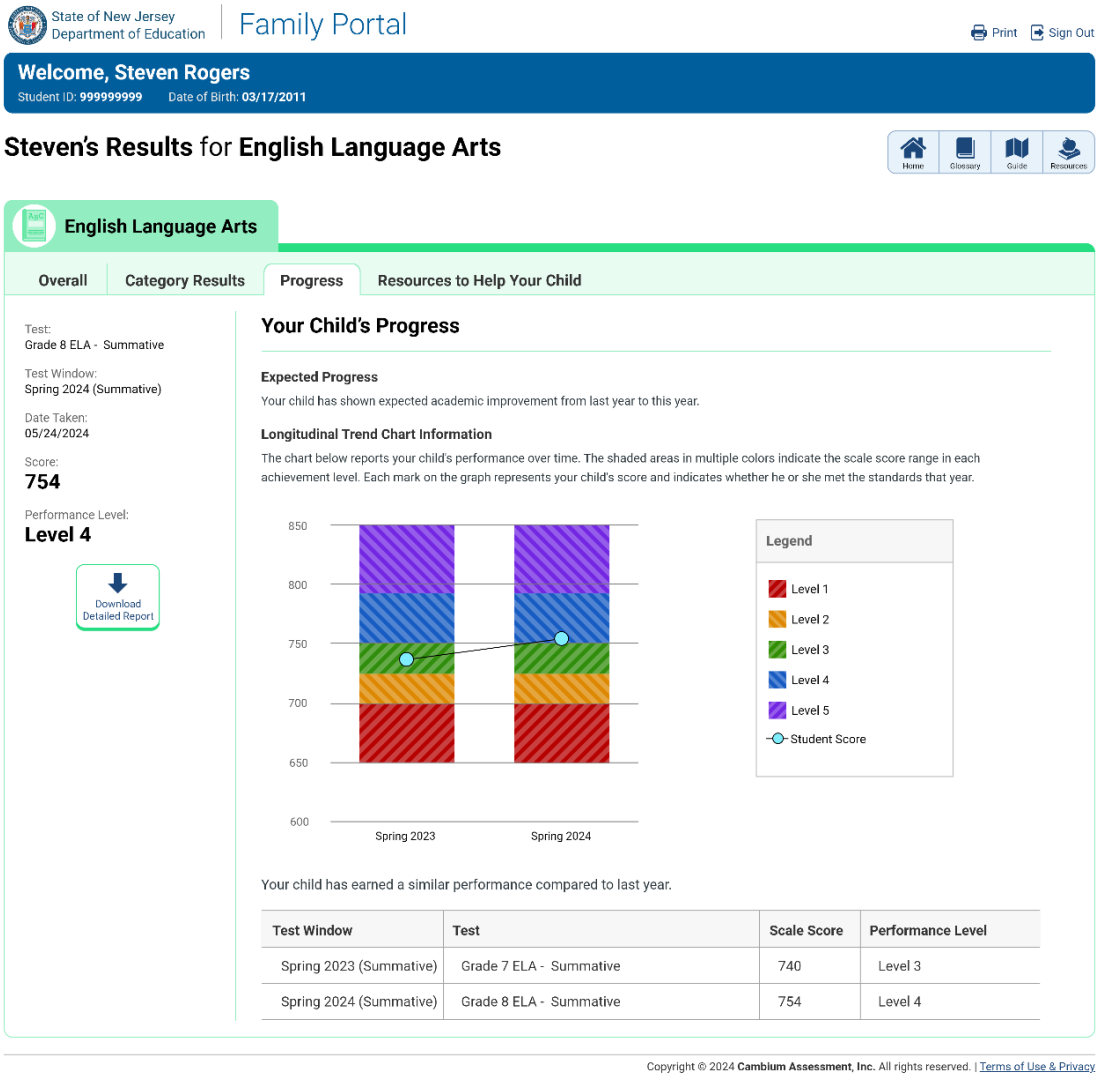
Test Detailed Results—Responses Tab. For released tests, the Family Portal displays real questions from the test along with student's responses. By accessing actual student responses, especially for items that demand higher cognitive complexity, parents can more precisely identify potential gaps in understanding. On the responses tab, as shown in Exhibit 4.13.2.1-10, parents can access the real question from the test, their child's answer to the question, the correct answer, and whether their child's answer was correct or incorrect. This page also provides an explanation for the correct answer and information about what the question measures.

Exhibit 4.13.2.1-10: Test Detailed Results—Responses Tab



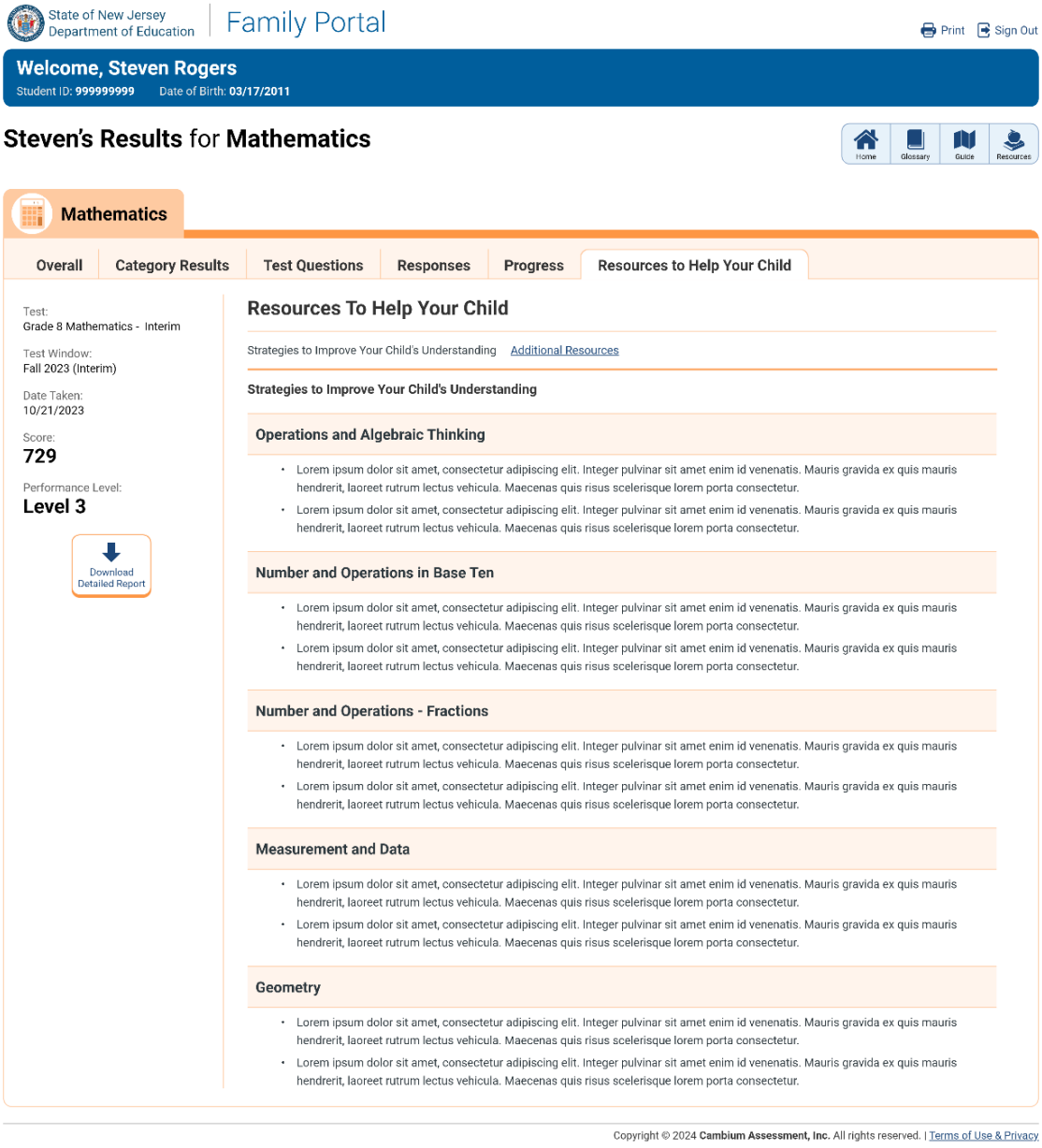
Test Detailed Results—Progress Tab. The Family Portal includes progress information that allows parents to analyze student growth when comparing performance results across assessments. The progress and trend information are shown at the overall subject level. Parents can use this report to track changes in achievement gaps and show progress over time. Parents can access a graph that shows how their child has performed over time, as well as their child's progress measure score and category. Refer to Exhibit 4.13.2.1-11.

Exhibit 4.13.2.1-11: Test Detailed Results—Progress Tab



Test Detailed Results—Resources Tab. The Family Portal contains resources tailored to the student, including activities parents can do at home to help their child improve in the coming years. It includes advice about some next steps the parents and students might take at home to practice skills needed to master the standards. Students performing in different score ranges receive advice appropriate to those score ranges. The Resources to Help Your Child tab displays helpful information based on the child's test results. These resources provide suggested strategies and activities that parents can use at home to improve their child's understanding of the subject area tested. There may also be links to additional resources to help the student, depending on the test. Exhibit 4.13.2.1-12 shows strategies to improve the student's understanding of each reporting category based on student's performance on the test.

Exhibit 4.13.2.1-12: Test Detailed Results—Resources Tab



Individual Student Report. When parents click “View Detailed Report,” they have the option to download the student report. Exhibit 4.13.2.1-2 shows a sample student report.

Development of the Family Portal

Our Family Portal was designed using extensive user feedback from usability testing with parents. We conducted extensive usability testing with users while designing the interface for the reporting systems. To ensure that we were designing an interface that made intuitive sense to the intended users, we conducted focus group studies with parents from several states. The results of that testing identified several “so-what” messages and developed reports that address the needs of key audiences to ensure that data are communicated clearly and to minimize misinterpretation.

The reporting tool’s design, layout, graphical displays, and use of color have all been implemented based on rigorous focus groups conducted with parents. Colors associated with performance are consistently used throughout the report, and graphical displays are carefully chosen to maximize the amount of information conveyed.

Summary of Family Portal Support

The Family Portal comes with many features that can support parents. The following are the specific features and supports of the Family Portal:

- **Login Support.** This feature assists parents who need support when logging into the Family Portal. Parents can refer to the sign-in questions page for more information. Some of the common needs that users have when logging into the system include acquiring the access code, failing to log in, and needing additional help. We will work with NJDOE to draft Q&A documents that will help parents log in.
- **Internationalization.** This feature represents how the Family Portal is fully translated in Spanish. With a large population of Spanish speakers in New Jersey, the Family Portal becomes more accessible to non-English-speaking parents.
- **Glossary.** This feature provides a glossary with information about the terminology and each measure included in the Family Portal and ISR. Parents can click the book in the top right corner of the page to view a glossary that explains the terms that a user may come across in a student's reports.
- **Guide.** This feature comprises two types of guides that are available in the Family Portal. One is the interactive guide, which provides information about each feature and measure included in the Family Portal, along with screen captures to illustrate the placement on the report page. This interactive guide is accessible from any page in the Family Portal. The second type of guide available in the Family Portal is the interpretive guide for the ISR. A parent who clicks “View Detailed Report” has the option to print an ISR for that test and to download the interpretive guide. For help in interpreting student's scores, parents can print an interpretive guide along with the ISR. The proposed content for the family interpretive guide includes a screen capture of the ISR with a legend to explain each component of the report and what it means to families. Using a legend, the guide will visually show families where they can find information on the report and what it means.
- **Resources.** With this feature, parents can click the apple in the top right corner of the page to view helpful resources, such as FAQs and information about performance levels.
- **Print.** With this feature, parents can print screen captures of their child’s scores by clicking the print button in the upper right corner of the page.

CAI has developed the following resources to assist parents and teachers in accessing the Family Portal:

- The **Parent Brochure** provides directions to parents on how to access the score reports for the different administrations, such as summative and end-of-course assessments, and how to understand and interpret the scores.
- The **Teacher Brochure** provides directions to teachers on how to retrieve and send the access code to parents to log into the Family Portal and access their child's results.

Appendix N of our proposal shows sample parent and teacher brochures. CAI commits to producing customized brochures and user guides for the Family Portal. CAI will use plain-language explanations in the resources for each section to help parents understand their children's results on the assessment. We will work with NJDOE to develop these resources to support parents' understanding of test results.

Video Report

We will be happy to work with NJDOE and the SCM to produce video reports for parents. CAI proposes to work with the SCM and NJDOE to develop a short 6-minute static video with voice-over that walks parents through the elements of the ISR. The video will explain, for example, what the overall scale score means, the student's PLD, and the reporting-category-level measures. We will produce the video reports in four different languages that will be posted on the Family Portal, and one video template per grade and subject will be available.

CAI can also work with the SCM and NJDOE to develop customized, student-specific video reports (cost option) explaining the student's performance to parents, providing a number of benefits, including the following:

- Easy for parents to understand
- Can be produced in English and Spanish and other languages, if needed
- Can potentially be delivered faster to parents given the elimination of printing and shipping time
- Are easier to access than paper reports shipped to districts, which may or may not reach parents before the end of the school year

We suggest developing the video reports and piloting them in a few districts to understand parents' usage and consumption patterns. Once we understand this, we will work with the SCM and NJDOE to roll out the video reports statewide.

In developing video reports for families, CAI will work closely with the SCM and NJDOE to do the following:

- Establish an outline of the scripts to be used for various templates to explain a child's scores.
- Develop a storyboard and script for each video template so that each video report is no more than three minutes in length.
- Review the storyboard and script according to the blackline process we discuss in Section 4.7.3.
- Determine the credentials that parents will require in order to access the video reports in a secure manner.
- Determine the length of time the link to the video report will be available.

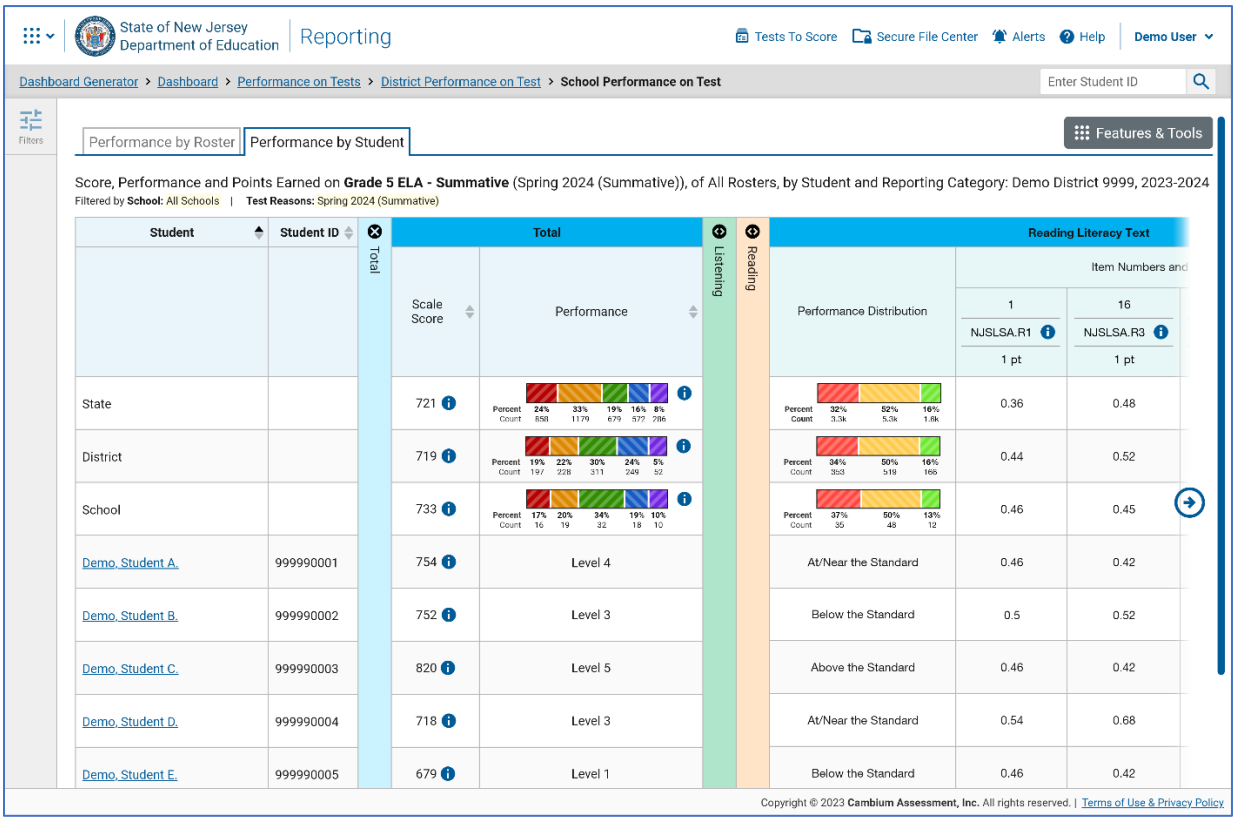
- Determine a secure, encrypted delivery mechanism for video reports (video reports can be accessed via parent cell phones, on a secure portal, or other means).
- Ensure that the treatment and destruction of all PII in the reports adheres to NJDOE data security policies.

4.13.2.1.2. Student Rosters

CRS will provide an electronic roster report of each assessment for all students based on jurisdictions.

Class/Teacher/School Performance Rosters. Class-, teacher-, and school-performance rosters provide users with performance data for a group of students belonging to a system-defined or user-defined class. The report typically includes each student's unique state ID, overall subject score, and reporting category scores. Exhibit 4.13.2.1-13 shows a sample roster performance report that indicates which reporting category students are performing well on and which they may need more help understanding.

Exhibit 4.13.2.1-13: Sample Roster Performance Report



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The performance roster report allows teachers to compare students' performance among different students. Teachers can also evaluate how their students performed compared with other students in the school, district, and state.

4.13.2.1.3. School and District Roster Summary Reports

Through CRS, the aggregate reports can also be provided in near-real time for authorized users to access, including SCM. CRS online reports will include, at a minimum, proficiency, and sub-score information, as well as aggregate reports for the following:

- State summary
- District summary
- School summary
- Class summary
- Individual student results, including actionable instructional next steps and reporting category information with references to Depth of Knowledge (DOK) to demonstrate alignment

Aggregate reports (described and illustrated later in this section) are available at every level, and authorized users can print these or download them (or the data on which they are based).

ISRs (described and illustrated earlier in this section) can be produced individually or batched as PDF reports. At State discretion, the system can deliver a zip file containing individual student PDF files and a machine-readable manifest suitable for uploading into the district SIS. Most districts have these systems and maintain a secure Family Portal, providing an efficient means of delivering the ISRs to parents.

We will work with the SCM and NJDOE to identify measures for the assessments that are the most useful for each level of user.

CRS Dashboard. The CRS dashboard page shows overall test results for all tests that the students have taken. For each test, the assessments table shows the test reason (a category assigned to an assessment; e.g., fall or spring), number of students who took the test, average score, performance distribution, and date the test was last taken. Exhibits 4.13.2.1-14 and 4.13.2.1-15 show sample dashboard pages for a state and a district. Exhibit 4.13.2.1-16 shows a detailed dashboard page for a school with ELA results.

Exhibit 4.13.2.1-14: Dashboard for a State

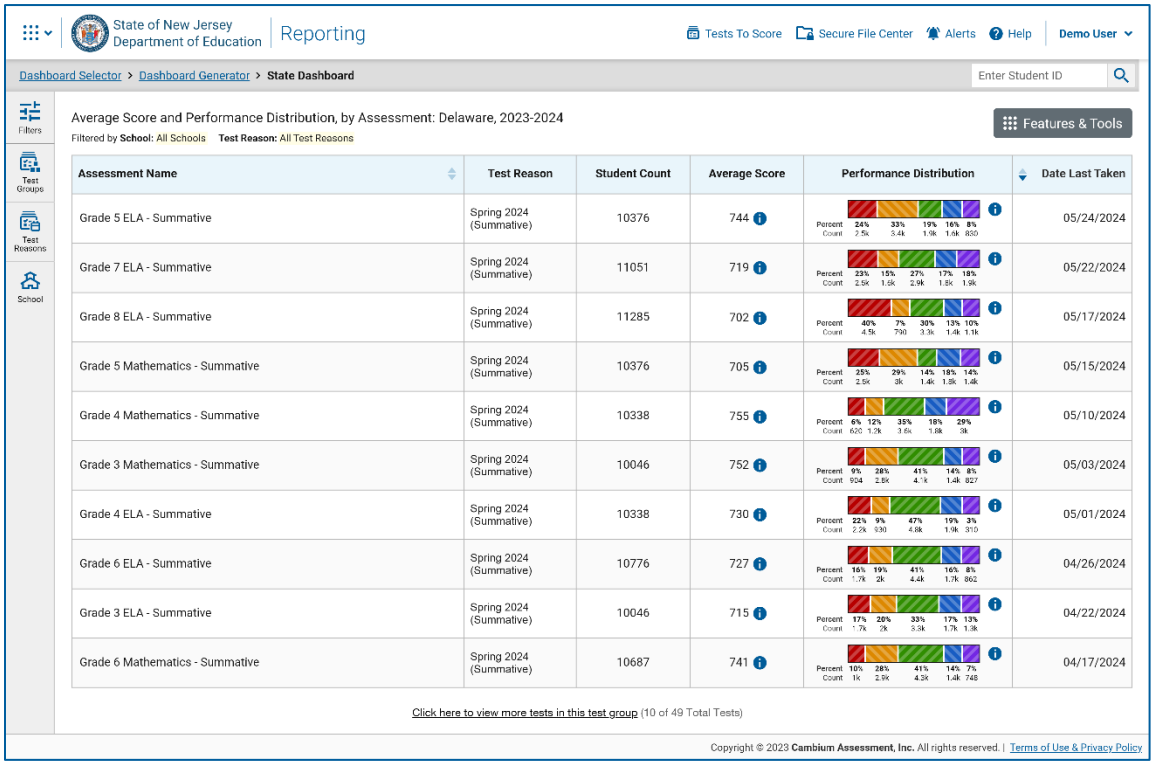


Exhibit 4.13.2.1-15: Dashboard for a District

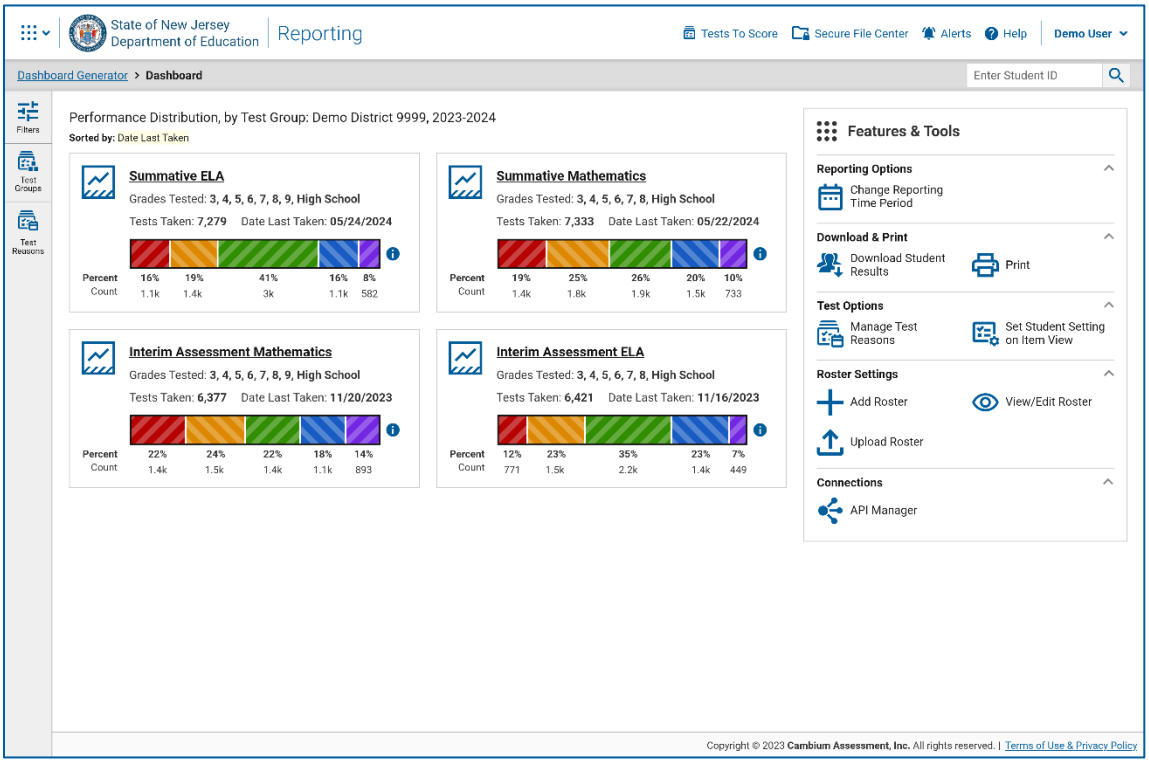
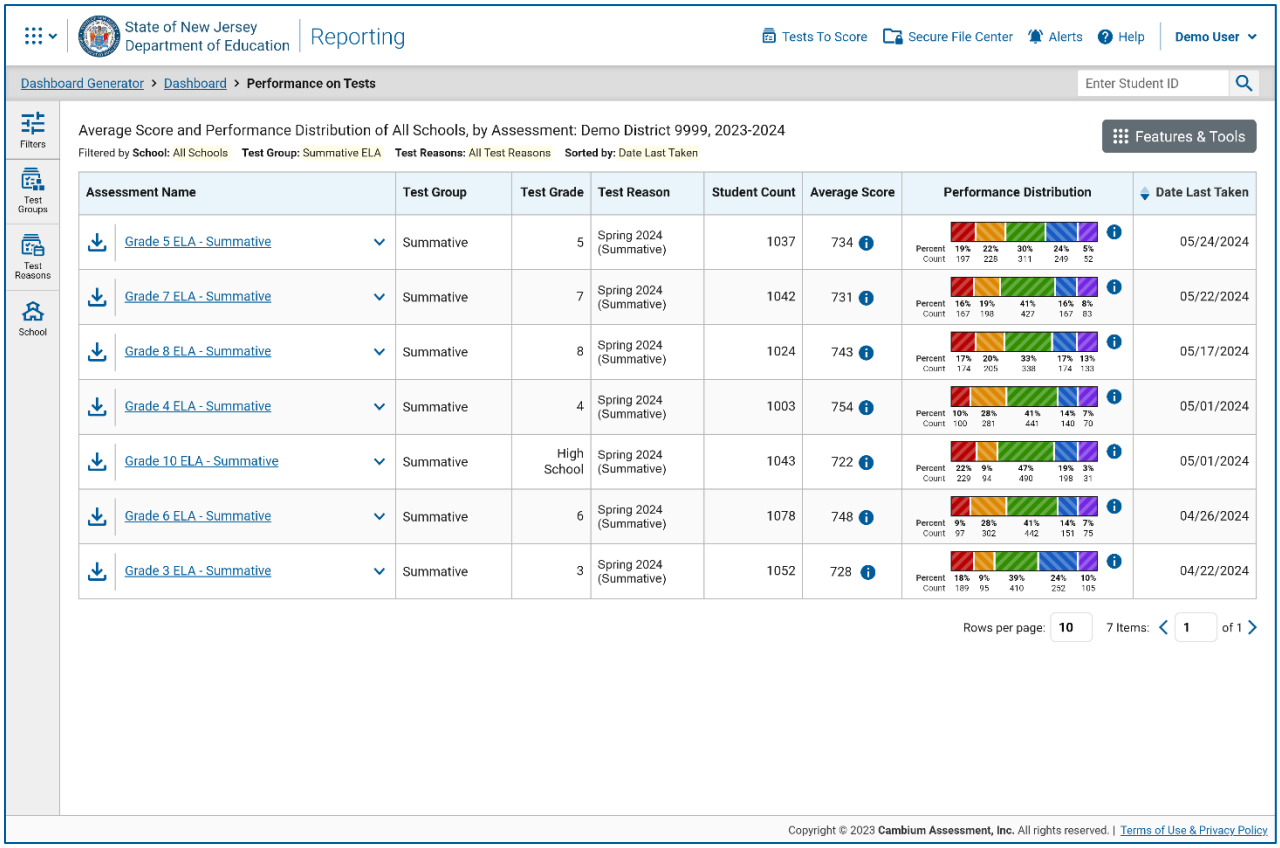


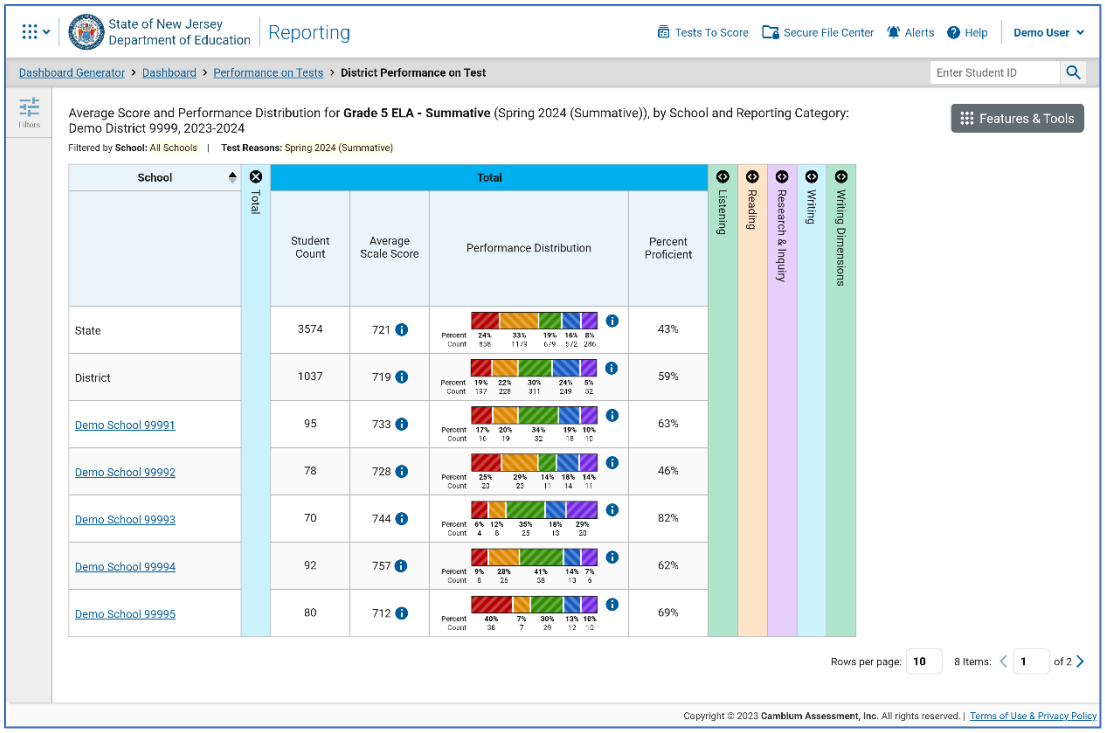
Exhibit 4.13.2.1-16: Detailed Dashboard for a District with ELA Results



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The data on the Dashboard page, gives NJDOE, administrators, principals, and teachers a way to quickly compare how their students have performed across different linked tests and test instruments. The dashboard allows teachers to view data across statistically linked tests to view progressions across tests. This is the first step in understanding which subject areas may need support both instructionally and from a curriculum perspective.

Subject Summary Results. Aggregated subject summary reports show average performance for the state, districts, schools, teachers, and classes. Bar chart displays show the distribution of students' performance levels. Columns can be sorted on any table in the system to allow for easy comparison, and groups can be disaggregated to report by demographic subgroup (e.g., gender). Exhibit 4.13.2.1-17 shows a sample subject summary report for a district.

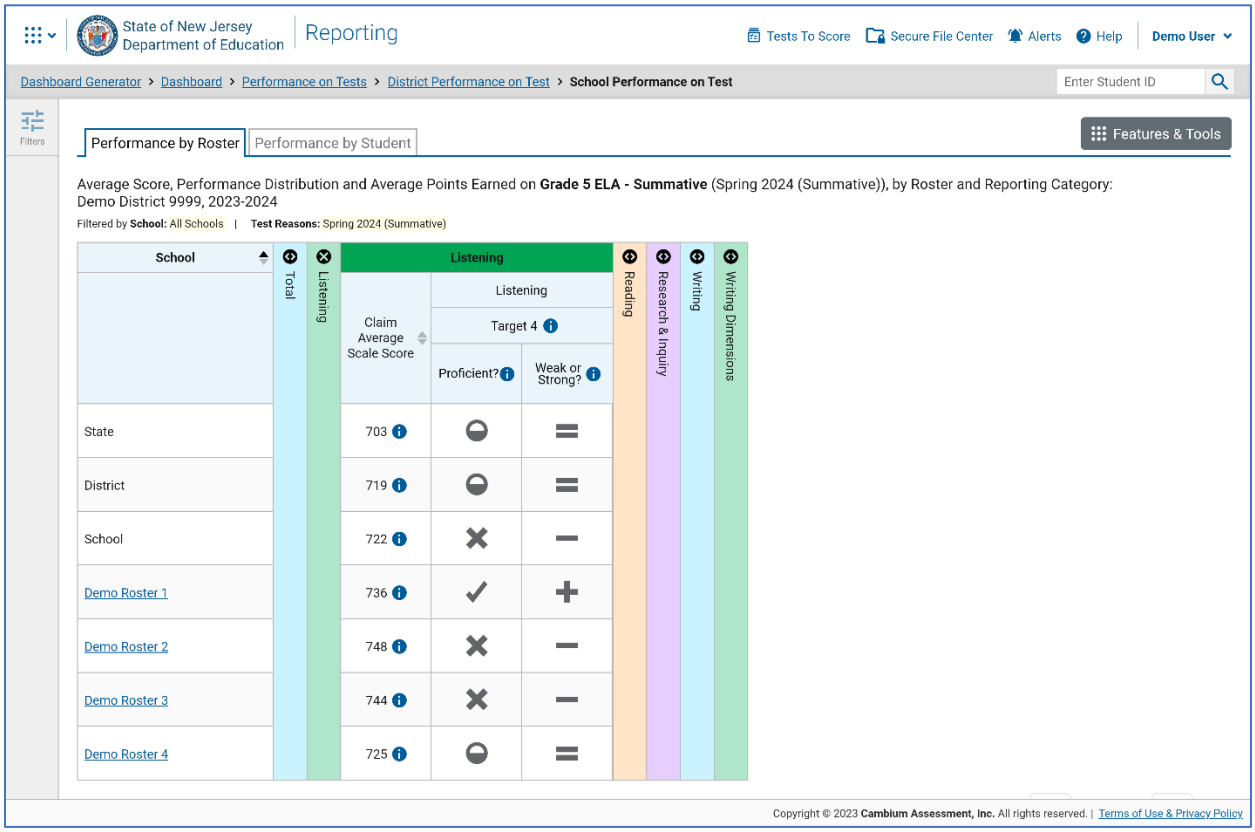
Exhibit 4.13.2.1-17: District Subject Summary for Grade 5 ELA Test Result



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The subject summary report gives users detailed information on how students have performed on the selected tests. The report also provides a list of schools/rosters for educators to identify which group of students are struggling and which group of students are excelling on the test. Educators can also determine if there were any differences in the student's performance based on the demographic subgroups. For example, teachers can access student assessment results by gender and observe that students in the certain gender category are struggling.

Reporting-Category-Level Results. Aggregated domain results are also available on the same report, displaying performance data for the state, districts, schools, teachers, and classes. Exhibit 4.13.2.1-18 shows sample district summary reporting category reports for a grade 5 ELA test. We detail the percentage at each achievement category for each reporting category.

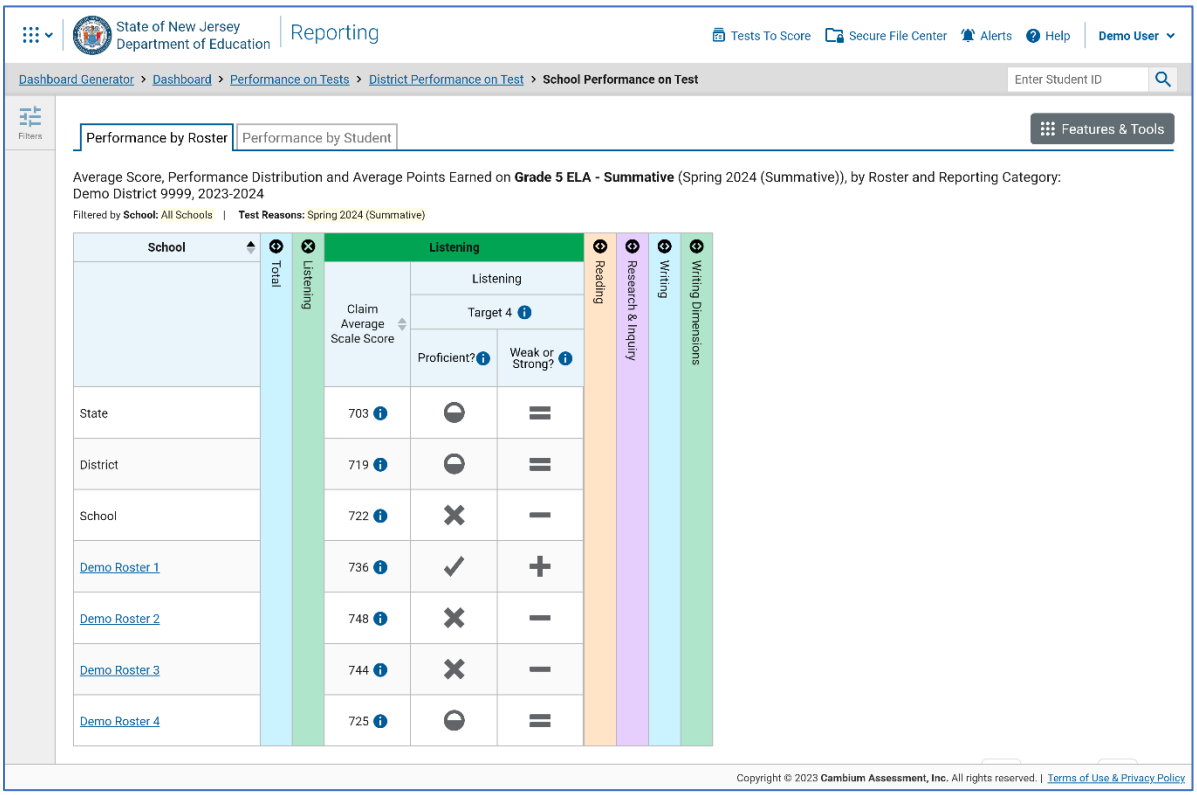
Exhibit 4.13.2.1-18: District Reporting Category Summary for Grade 5 ELA



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The domain summary report provides educators with detailed information on how students have performed on the different areas of the selected tests. For example, teachers might notice that their students are performing well overall on the mathematics test, but are struggling in Algebra because a majority of the students are performing below proficient in that area. This will help educators identify the areas where students are struggling and provide instructional support in the future.

Standard-Level Results. We have developed a standard-level report that can provide useful and reliable information at the group level (usually becoming useful for groups of 10 or more students). These reports leverage the adaptive environment to provide highly reliable, standard-level reports of strengths and weaknesses at the class, school, or district levels. Educators want precise information about the knowledge or skills that students have or have not mastered; in the standard-level report, strengths and weaknesses are reported for groups of students based on whether there is a statistically significant difference between that group's performance on each standard and the group's performance on the rest of the test. A standard-level report also includes group performance relative to the expected performance of a student at the Proficient cut score. Please note that this report is only available for adaptive tests. Refer to Exhibit 4.13.2.1-19 for a sample standard-level report.

Exhibit 4.13.2.1-19: Standard-Level School Results



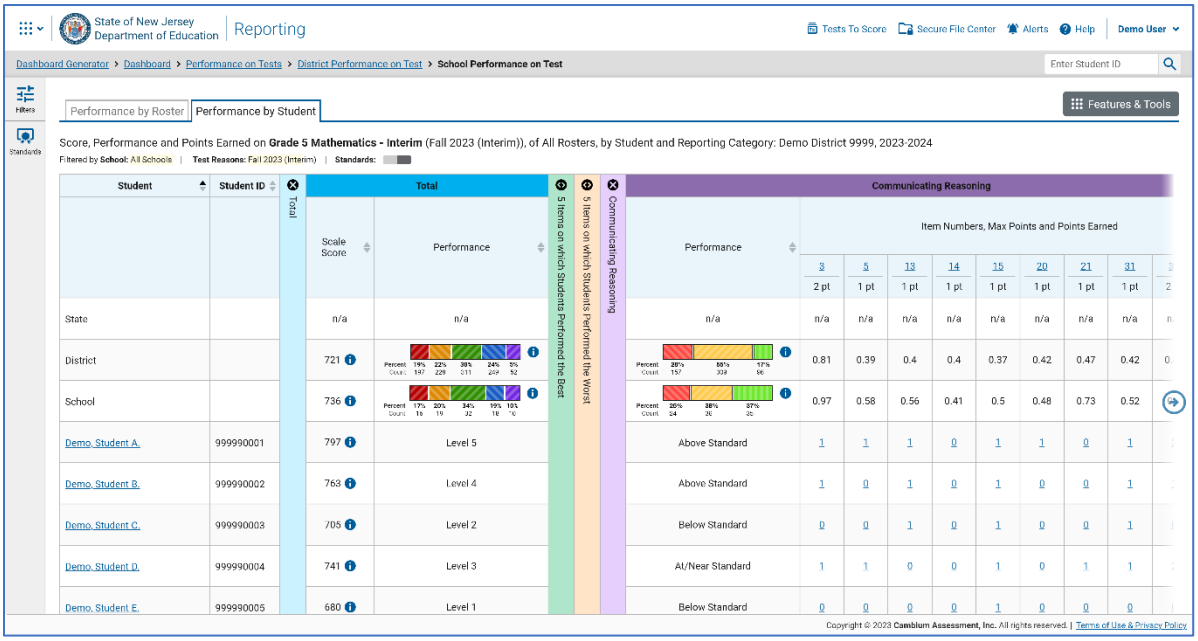
Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The fine-grained information in the standard-level report is actionable; it lets educators know where students are succeeding. Exhibit 4.13.2.1-19 shows a sample standard-level report for a school where relative strengths and weaknesses are shown for each standard. By narrowing down the performance result by standard, teachers and schools can determine what strategies may need to be implemented to improve teaching and student learning. We note that shorter tests will lead to more standards indicating "insufficient information" for very small group sizes, but will not impact standards reporting for most class sizes.

Item-Level Results. The CRS also provides additional reporting capabilities for formative and classroom-based assessments. The following measures can be reported for formative assessments:

- Item-level data to provide teachers with detailed information about which items a student answered correctly or incorrectly
- Actual student responses to items on the formative and classroom-based assessments to help teachers pinpoint gaps in conceptual understanding
- Standards or assessment targets to which the item is aligned
- Scoring rubric for each item so that teachers can better understand how items are scored
- Strengths and weaknesses at the class, school, and district levels by identifying the five items with the highest and lowest scores

The item-level results reports (refer to Exhibit 4.13.2.1-20) provide teachers with their formative and classroom-based assessment scores, performance-level classifications, and/or points earned for the selected assessment of all students. The data in the formative reports helps teachers pinpoint gaps in conceptual understanding and areas for further instruction based on the assessments

Exhibit 4.13.2.1-20: Item-Level Results Report



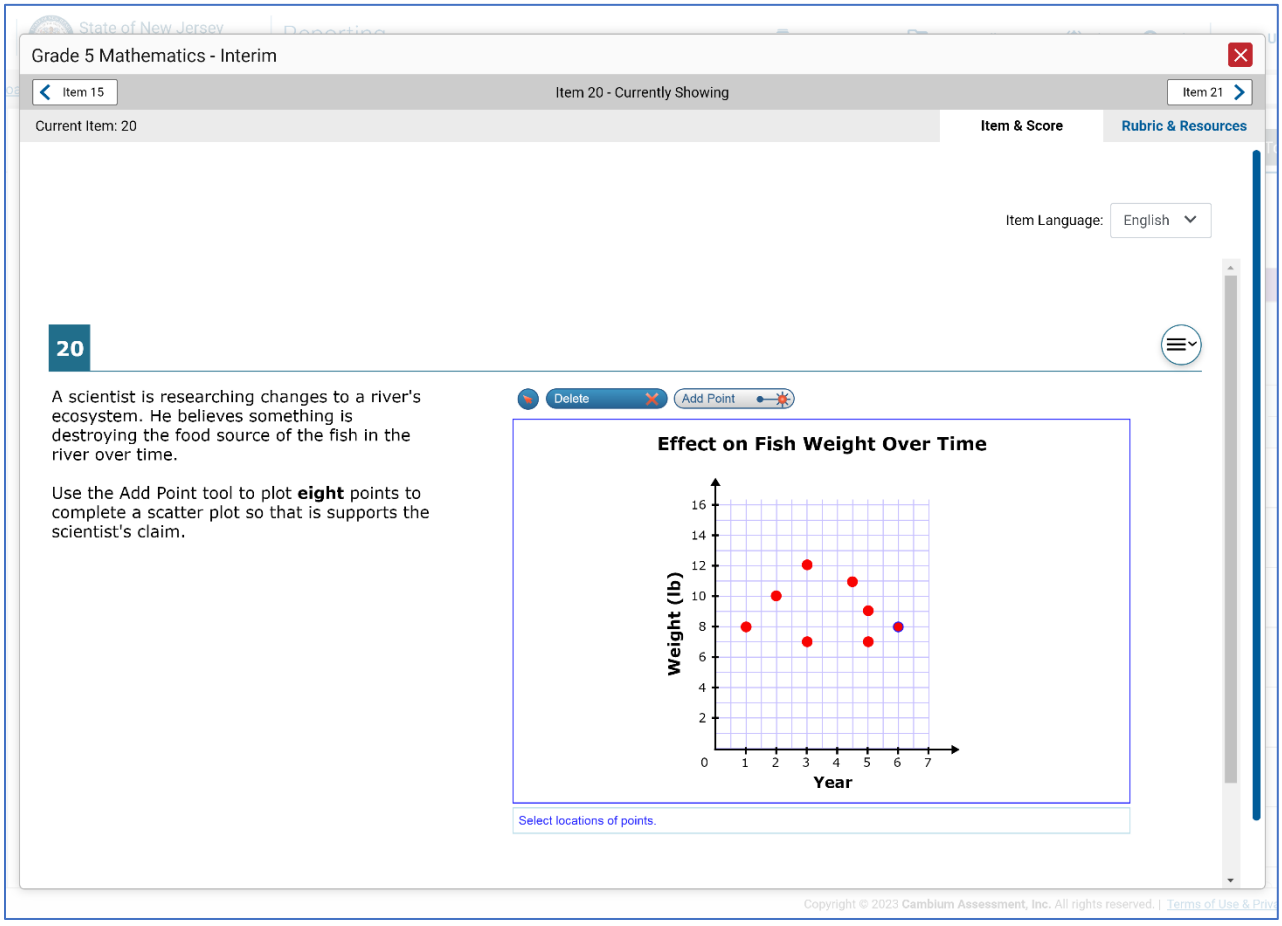
Value to End Users/Support in Making Decisions Around Instruction and Curriculum. This report can be used to determine how a group of students or individual students have performed compared to the rest of the students. It also displays the five assessment items with the highest or lowest average score for students, which helps teachers analyze students' strengths and weaknesses. In addition, the system provides the following item-level information to teachers:

- The standard to which each item is aligned to help teachers understand the specific skills each student needs to learn
- The scoring rubric for each item

This helps teachers understand which standards students need support with and how items are scored.

For released tests, CRS also allows teachers to see exactly how a student responded to an item along with the actual test item (refer to Exhibit 4.13.2.1-21).

Exhibit 4.13.2.1-21: Student Item Response Report



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. By seeing actual student responses, especially for items that demand higher cognitive complexity, teachers can more precisely identify potential gaps in understanding and use that information to provide targeted instruction.

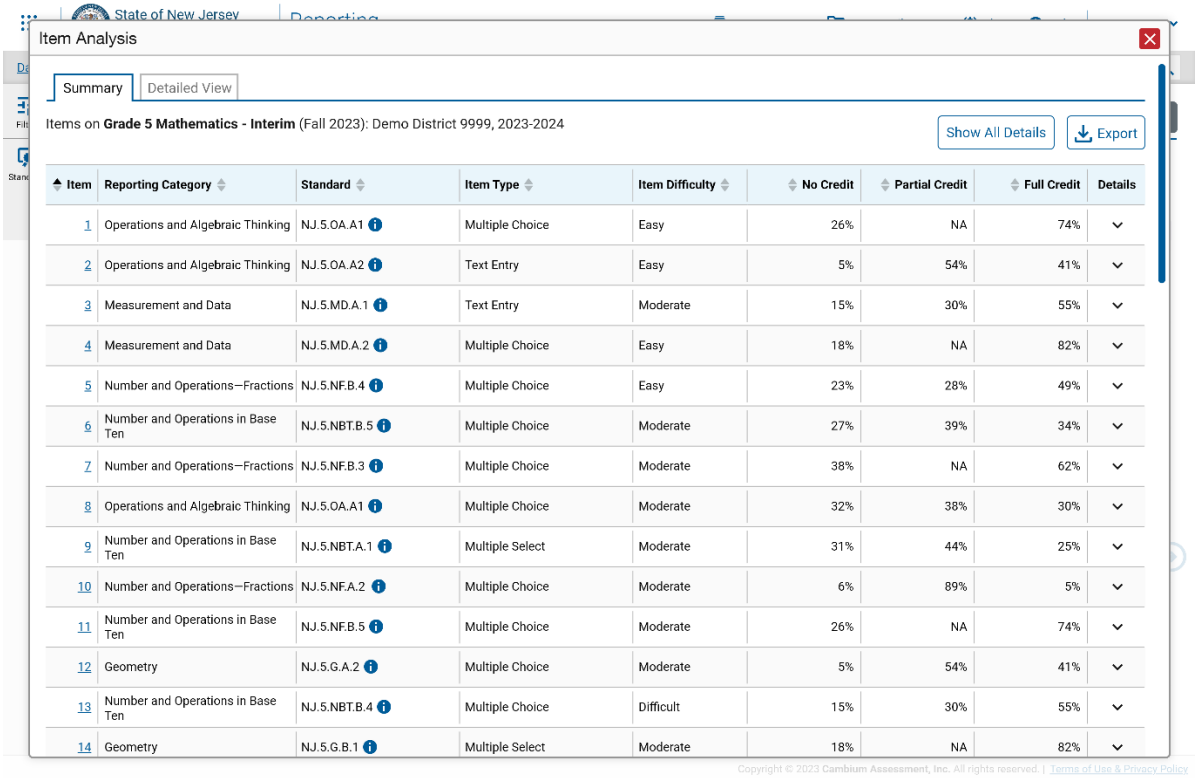
In addition, we recognize that, for formative tests, there is great value in allowing teachers of different subjects to review student scores in other subjects. For example, provided Student A is rostered to the mathematics teacher and the ELA teacher, both teachers can access Student A's responses for all of the assessments completed by that student. This provides the mathematics teacher in our example with the ability to look at Student A's responses to the writing, reading, and mathematics formative and classroom-based assessments. In this way, our CRS allows co-teachers to more easily pinpoint a student's conceptual misunderstandings, even if that misunderstanding is rooted in another subject. Based on this information, co-teachers for Student A can work together to provide meaningful, differentiated instruction to their students across subjects.

In the same way, our formative reports can help districts and schools establish systematic processes to allow teachers to work together to analyze and improve their classroom practice. For example, a school's grade 6 teachers can use our reports to analyze how all grade 6 students performed on a common formative assessment. Specifically, team members can use the teacher report to analyze the five assessment items with the highest or lowest average score for students, helping teachers analyze students' strengths and weaknesses and discuss

how they can build on the strengths and address the weaknesses. Test results are broken down to show every teacher how his or her students performed on every test item.

Item Analysis Reports. CAI is planning to launch an item analysis report that can be available for the fixed-form test that CRS currently reports items on. For multiple-choice items, the report will include a frequency distribution of each (multiple-choice) response. Exhibit 4.13.2.1-22 shows a frequency distribution breakdown. Reporting category and standard alignment will be reported alongside each item to provide valuable context when considering the performance of each item.

Exhibit 4.13.2.1-22: Item Analysis Report



Item	Reporting Category	Standard	Item Type	Item Difficulty	No Credit	Partial Credit	Full Credit	Details
1	Operations and Algebraic Thinking	NJ.5.OA.A1	Multiple Choice	Easy	26%	NA	74%	
2	Operations and Algebraic Thinking	NJ.5.OA.A2	Text Entry	Easy	5%	54%	41%	
3	Measurement and Data	NJ.5.MD.A.1	Text Entry	Moderate	15%	30%	55%	
4	Measurement and Data	NJ.5.MD.A.2	Multiple Choice	Easy	18%	NA	82%	
5	Number and Operations—Fractions	NJ.5.NF.B.4	Multiple Choice	Easy	23%	28%	49%	
6	Number and Operations in Base Ten	NJ.5.NBT.B.5	Multiple Choice	Moderate	27%	39%	34%	
7	Number and Operations—Fractions	NJ.5.NF.B.3	Multiple Choice	Moderate	38%	NA	62%	
8	Operations and Algebraic Thinking	NJ.5.OA.A1	Multiple Choice	Moderate	32%	38%	30%	
9	Number and Operations in Base Ten	NJ.5.NBT.A.1	Multiple Select	Moderate	31%	44%	25%	
10	Number and Operations—Fractions	NJ.5.NF.A.2	Multiple Choice	Moderate	6%	89%	5%	
11	Number and Operations in Base Ten	NJ.5.NF.B.5	Multiple Choice	Moderate	26%	NA	74%	
12	Geometry	NJ.5.G.A.2	Multiple Choice	Moderate	5%	54%	41%	
13	Number and Operations in Base Ten	NJ.5.NBT.B.4	Multiple Choice	Difficult	15%	30%	55%	
14	Geometry	NJ.5.G.B.1	Multiple Select	Moderate	18%	NA	82%	

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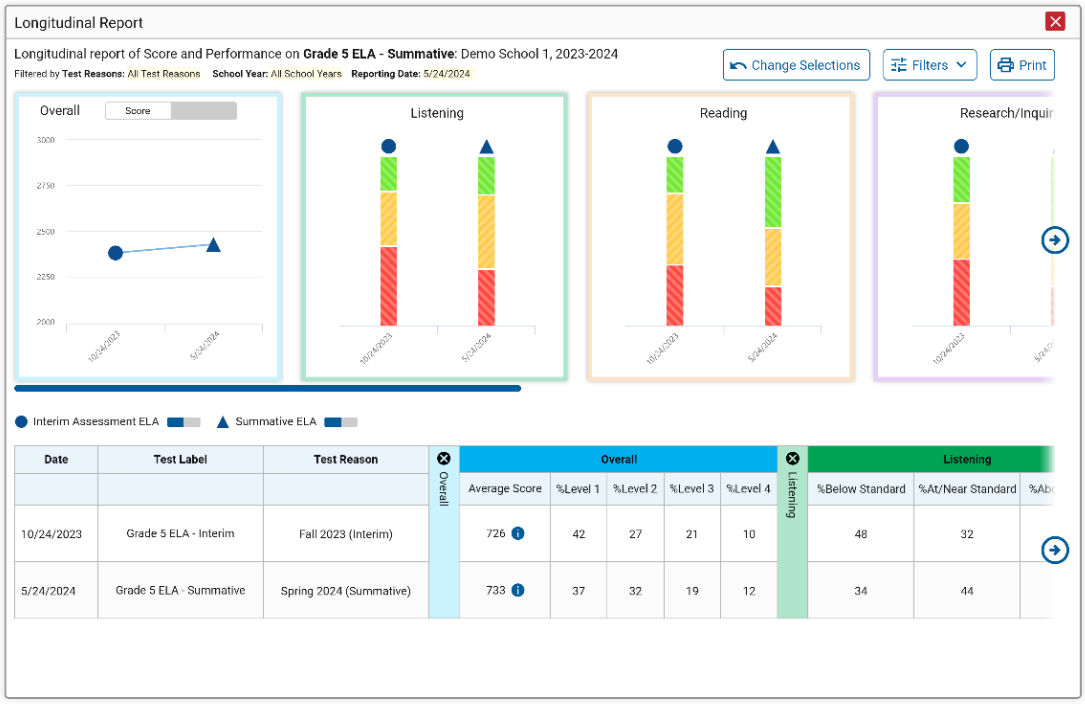
Value to End Users/Support in Making Decisions Around Instruction and Curriculum. By viewing the percentage of students who have given correct answers by item and standard, educators can identify if there are certain standards that students are struggling with. By viewing which answer choice students selected the most for the items where students incorrectly responded, educators can draw insights on which part of the question the students are struggling with (where applicable).

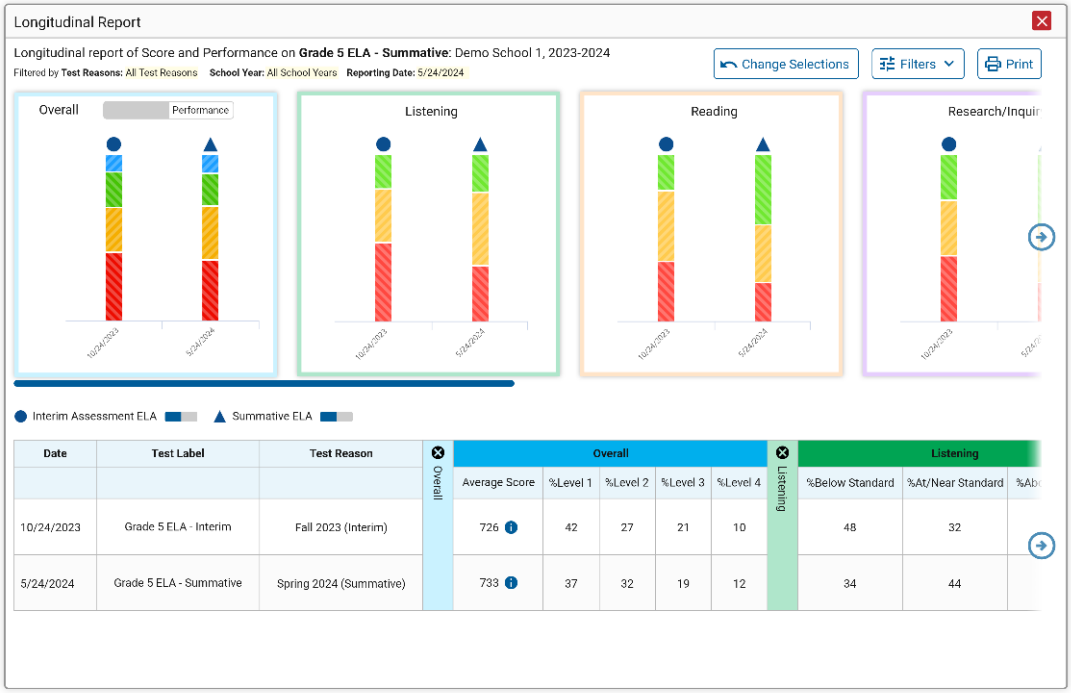
Longitudinal Reports. The state, districts, schools, teachers, classes, and students can be plotted on a trend report to illustrate how performance has changed over time. Scores can be provided across years (e.g., from spring administration to spring administration). Multiple trend lines can be plotted at once to understand how student growth compares among students or groups of students. Reporting category trends can also be added to understand whether there are differences in performance within a subject. Exhibits 4.13.2.1-23 and 4.13.2.1-24 show sample longitudinal reports of score and performance for a school across administrations in ELA assessments.

Exhibit 4.13.2.1-23: Longitudinal Report of Score for a School



Date	Test Label	Test Reason	Overall					Listening			
			Overall	Average Score	%Level 1	%Level 2	%Level 3	%Level 4	Listening	%Below Standard	%At/Near Standard	%Ab
10/24/2023	Grade 5 ELA - Interim	Fall 2023 (Interim)		726	42	27	21	10		48	32	
5/24/2024	Grade 5 ELA - Summative	Spring 2024 (Summative)		733	37	32	19	12		34	44	

Exhibit 4.13.2.1-24: Longitudinal Report of Performance for a School

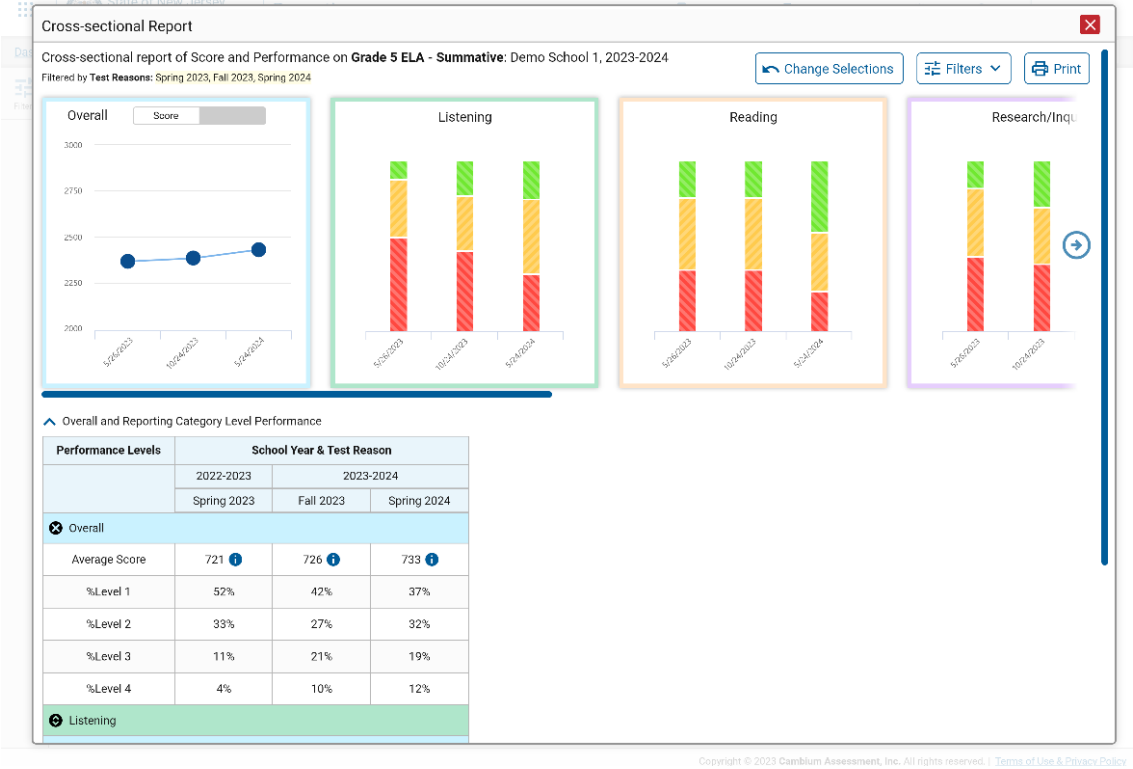


Date	Test Label	Test Reason	Overall					Listening			
			Average Score	%Level 1	%Level 2	%Level 3	%Level 4		%Below Standard	%At/Near Standard	%Ab
10/24/2023	Grade 5 ELA - Interim	Fall 2023 (Interim)	726	42	27	21	10		48	32	
5/24/2024	Grade 5 ELA - Summative	Spring 2024 (Summative)	733	37	32	19	12		34	44	

Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The longitudinal reports allow educators and administrators to analyze student growth when comparing performance results across assessments. Educators and administrators can also use this report to track changes in achievement gaps and show progress over time within and across statistically linked tests (e.g., progressions across interim and summative assessments). This report helps educators and administrators refine the instructional and programmatic decisions they have made so that they can understand the effect of intervention over time.

Cross-Sectional Reports. With the longitudinal report, educators are given the opportunity to "follow" the progress of a cohort of students as they progress through testing each year. Users will also have the ability to evaluate changes and trends in performance on a specific test (or portion of a test) by comparing the results of the current year's test to the results of the same test taken in previous years. The key difference between the cross-sectional report and the longitudinal report is that, while the longitudinal report tracks the performance of a group of students as they take different tests, the cross-sectional report will instead track the performance of a specific test as different cohorts of students take that same test each year. Exhibits 4.13.2.1-25 and 4.13.2.1-26 show sample cross-sectional reports of score and performance for a school across administrations in ELA assessments.

Exhibit 4.13.2.1-25: Cross-Sectional Report of Score for a School



Performance Levels	School Year & Test Reason		
	2022-2023	2023-2024	
	Spring 2023	Fall 2023	Spring 2024
Overall			
Average Score	721	726	733
%Level 1	52%	42%	37%
%Level 2	33%	27%	32%
%Level 3	11%	21%	19%
%Level 4	4%	10%	12%
Listening			

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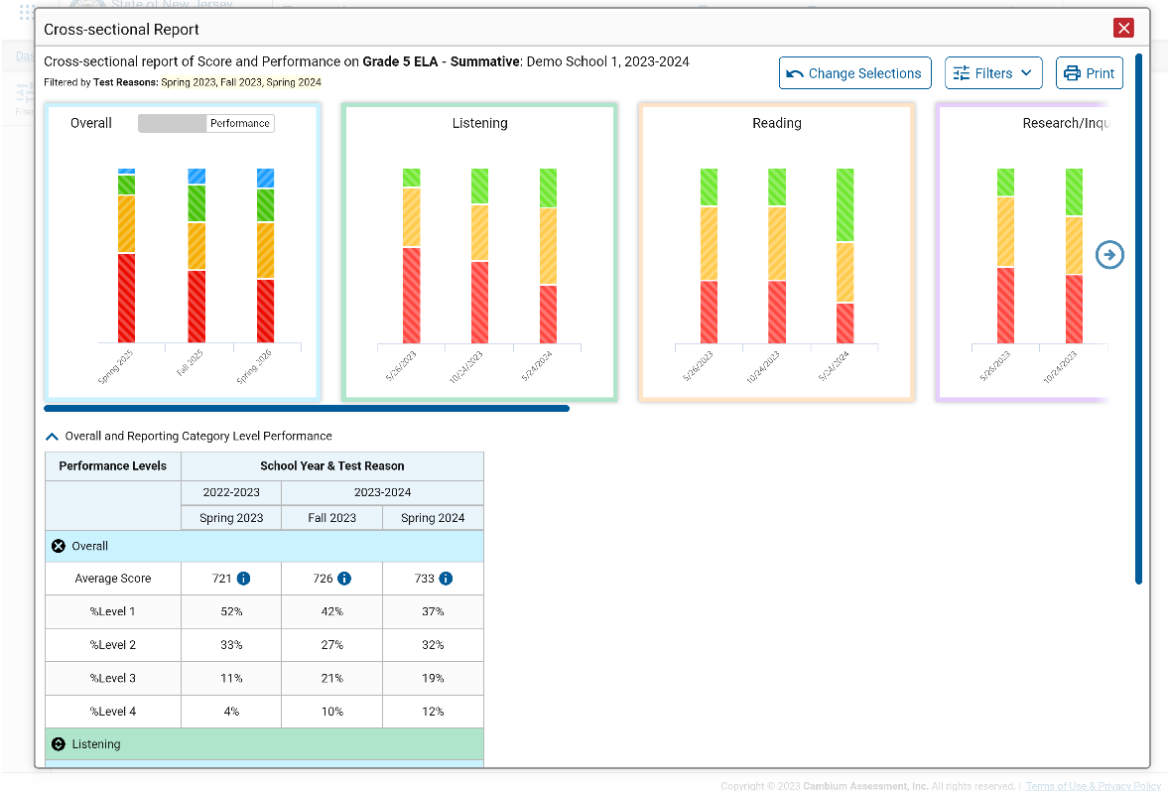
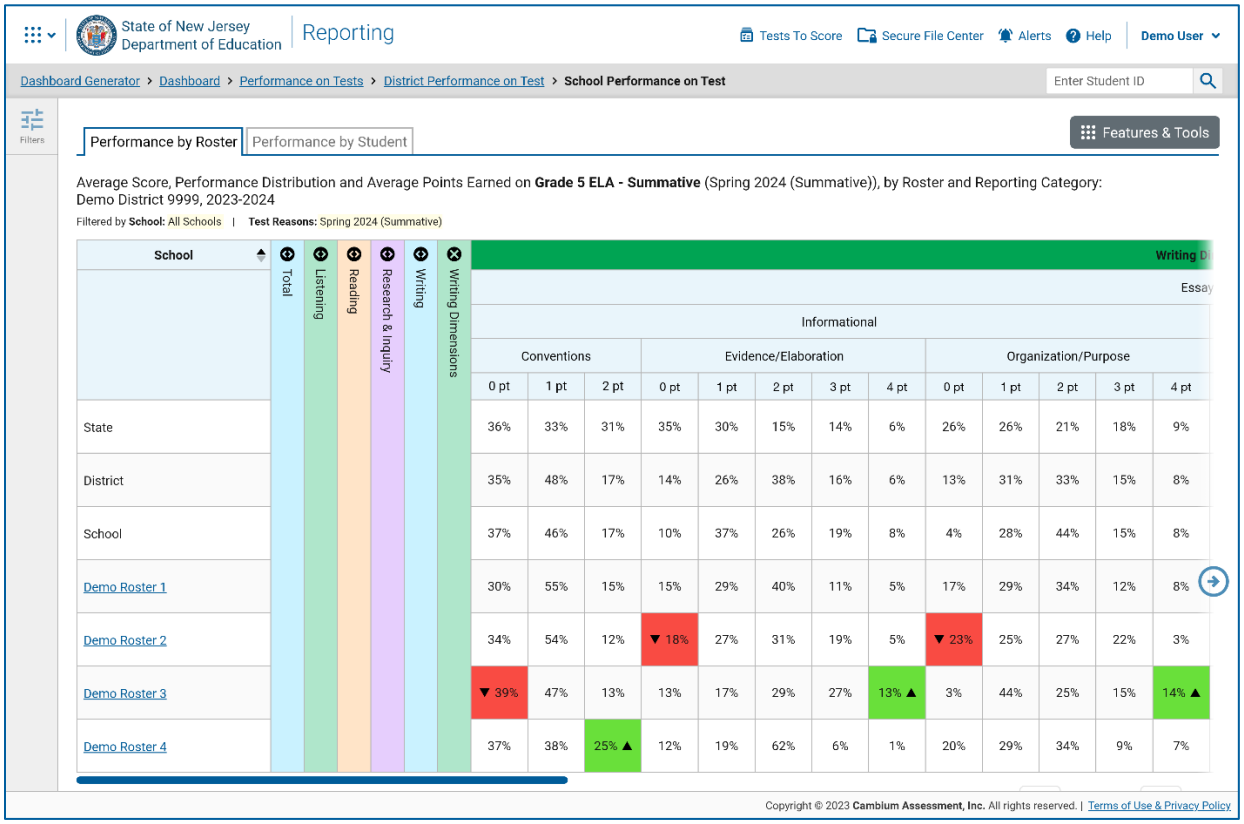
Exhibit 4.13.2.1-26: Cross-Sectional Report of Performance for a School



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The cross-sectional reports allow educators and administrators to analyze how students are performing when comparing performance results within the assessments. Educators and administrators can use the cross-sectional reports to know if students are struggling within a certain grade and subject/reporting-category area.

The Writing Dimensions Report. Exhibit 4.13.2.1-27 includes a writing dimensions report with shading to help teachers more quickly identify groups of students or rosters that have the highest percentage of students obtaining the highest point value for a particular writing dimension compared to other groups.

Exhibit 4.13.2.1-27: Writing Dimensions Report



Value to End Users/Support in Making Decisions Around Instruction and Curriculum. The writing dimension report allows teachers to quickly view how the students are performing on different writing dimensions. Teachers can evaluate how their students in the roster or school perform on the writing dimension compared with other students in the roster or school. Teachers can quickly identify which group of students have earned the highest scores on the highest and lowest point value for each of the writing dimension. Teachers can share their reports from all assessments and quickly learn when another teacher has been particularly effective in teaching a certain skill.

Using all immediate, relevant, and various reports provided through CRS, educators, administrators, and the State can utilize the assessment data to make valid, instructional, and programmatic decisions.

4.13.2.1.4. Report Review by NJDOE Personnel

CAI's autoscoring system and CRS report results in near-real time; therefore, reviewing reports after the close of the testing window might not be necessary, as the review process occurs prior to the testing window for states that report results near-real time. However, if NJDOE wishes to release the scores after the testing window, CAI will work closely with NJDOE to determine the timeline and the review schedule.

CAI understands and will adhere to the following report review criteria:

- We will ensure that a meeting to complete preliminary work checking draft score reports shall be scheduled approximately 25 business days prior to the release of individual reports. This preliminary meeting shall require five business days. The contractor shall cover all costs, including, at a minimum, meals, travel expenses, and lodging, as needed, of the preliminary meeting.
- No more than ten business days prior to the release of the ISRs, we will ensure that as many as four NJDOE personnel will check all report components in their final draft to ensure the correctness of data and the reporting program, done at the contractor's location, where necessary. The process will be no more than five business days. The contractor shall cover all costs including, at a minimum, meals, travel expenses, and lodging, as needed.

Test Deck to Assure Data Validity

The mock-data process is a complete end-to-end testing solution that ensures that all systems have been properly configured, while the QM System monitors test data in real time.

CAI will generate a comprehensive test deck of mock student data, including all scoring data. The test deck will exercise all scoring outcomes that could be experienced in operation. This test deck will be used to verify that the scoring and reporting system is working properly prior to live student data being received. This will demonstrate that the scoring and reporting system is error-free and that individual student data and rollup data at all levels are accurate. CAI will provide copies of the test deck files and the reporting outcomes generated by the test deck prior to operational testing.

User Acceptance Testing

Before deployment, the testing system, all supporting systems, and content are deployed to a staging server and subjected to user acceptance testing (UAT). The UAT environment reflects the production environment and serves as a software and content evaluation site, allowing the State to interact with all CAI systems before they are actually deployed to production and made available to users.

Preparation for UAT

Preparing for UAT includes the data and content that the State will be using to conduct UAT. All user and student data subject to UAT are demo data; for security purposes, none are real. All tests and items are the same tests and items that will be live in production.

The State can review the exact version of the tests and items that will be live for students. In addition, the UAT environment will use the same application version that CAI will deploy to the production environment once the State has signed off.

The quality-control procedures to verify this workflow include five steps: (1) completion of a mock-data process (UAT) prior to each test administration, (2) automated quality checks performed by the QM System during the course of a test administration, (3) automated monitoring of the handscoring workflow in our Ledger system, (4) completion of a reconciliation process following the close of each testing window, and (5) quality checks embedded in the automated generation program for files to be delivered to NJDOE.

CAI understands how critical it is to verify that student responses are accurately saved and associated with the correct student demographic information. Several systems support this verification from the point at which the students' responses are captured to the time when final student data files are generated for an assessment. Across that workflow, our systems use automated quality-control mechanisms and other controls built into our systems for conducting a

test administration. In this section, we describe the various quality-control procedures that CAI uses to verify that the data we collect, store, and report are accurate and complete.

CAI's automated data intake, processing, and extract systems are designed for high-volume efficiency and accuracy. Each time a student completes an online test, the Test Delivery System (TDS) transmits data from that test event to our QM System. Upon receipt of the student record, the QM System

- verifies scoring of student responses;
- validates scores presented to the student;
- calculates any other scores that will be used in the reporting systems, along with standard errors of measurement (SEMs);
- calculates derivative measures from those scores (e.g., proficiency designations); and
- performs customized validations of incoming data.

In virtually all cases, these checks are all passed. When they are not, an automated system alerts project team members who investigate and resolve the issue. The QM System's quality checks are typically completed within one second of data receipt. Once complete, the data are transmitted to the Database of Record (DOR) and the CRS. In addition, CAI performs rigorous QA checks to ensure the accuracy of data files and online reports far in advance of any reports being released to the public.

4.13.2.1.5 Distribution of Cycle I Reports

CAI commits to providing paper copies of parent and student reports that will be delivered to the districts; all other reports will be available through CRS. Electronic delivery of the parent and student reports through the Family Portal offers more cost savings and a better user experience for the parents, as the results can be available quicker.

4.13.2.2. Cycle II Reporting – Aggregate Reports

4.13.2.2.1. Aggregate Score Reports

As discussed in Section 4.13.2.1.3, reports in the Centralized Reporting System (CRS) include aggregate score reports for each assessment, including school, district, and State information. Aggregate reports are available at every level, and authorized users can print or download them (or the data on which they are based).

In addition to the expected aggregate reports for a district, school, teacher, and class, the reporting tool allows users to create custom student rosters so that groups of students within a class can be tracked and reported on separately. All aggregate reports are calculated from the student level up, so as new students test, reports for the roster, teacher, school, and district are updated instantly. All aggregate CRS reports can also be disaggregated by subgroup, as defined by NJDOE. For example, reports can be disaggregated by demographic characteristics such as gender, ethnicity, or English learner (EL) status. The CRS can also be configured to disaggregate by multiple characteristics at once (e.g., gender by ethnicity).

4.13.2.2.2. Distribution of Cycle II Reports

Access to any report in the CRS can be configured according to user role. We will work with NJDOE to define the program's user roles and their access to the various reports. The CRS also has jurisdiction features that limit users to viewing only the student scores within their own school or district. NJDOE can choose to be more restrictive and limit users' access to data on a specific group of students, identified based on classroom information that can be fed into the

Test Information Distribution Engine (TIDE). Alternatively, NJDOE can have school or district coordinators define these groups by uploading them to TIDE.

4.13.2.2.3. State Summary Data File

CAI commits to work closely with NJDOE to meet all requirements for the State summary data file, as described in the RFQ.

4.13.3. Score Interpretation Manual

CAI has worked extensively to ensure that navigation in the Centralized Reporting System (CRS) emphasizes the context of a student's performance by relating it to aggregate performance and trends over time. Colors associated with performance are used consistently throughout the report, and graphical displays are chosen carefully to maximize the amount of information conveyed. For example, bar charts illustrate the percentage of a teacher's students at each performance level, but the relative positioning of each teacher's bar chart also efficiently communicates which teachers have a higher-performing group of students, even if there are differences by performance level.

In addition, the CRS comes with an intuitive user guide that provides step-by-step instructions for every report, information about each measure included in the CRS, and screen captures to illustrate processes and outputs. The user guide is accessible from any page in the CRS. Once the user clicks the Help icon, he or she will be taken to the relevant section of the user guide specific to the page that the user is on. The CRS also has an Information icon that provides a quick reference for users who want more information about how to interpret a specific reporting element. CAI will work closely with the SCM and NJDOE to ensure that the tutorials/user guides are updated. The tutorials can also be housed on the state portal that can be linked to the NJDOE assessment page.

CAI has a proven record of developing a structured and effective process for producing error-free documents, including Interpretive Guides for educators and families. We will work with NJDOE to develop guides that support not only stakeholders' understanding of how the CRS works, but also how to use summative test results for instruction in the classroom. The guides can be accessed easily using a quick link on CAI's CRS. CAI's development and production of all Interpretive Guides are based on best practices in communicating the use of these reports to families and educators.

Content of Interpretive Guides

CAI will use plain-language explanations in each section of the guide to help educators and parents understand their students' results on the summative assessment. CAI has found that reviewing Help Desk queries from educators is the best method to identify areas of the reports that require additional interpretive information, and we will work with NJDOE to capture the most useful content in the Interpretive Guides.

The proposed content for the Interpretive Guides includes information to help educators interpret and use the results of the summative assessment as displayed in the online reports. The goal of the guide is to motivate teachers to make the best use of the system and its data using the following outline:

- Introduction and overview of the assessment and scores
- Description of various data elements that are displayed on the individual student report (ISR) and how this information can be used by educators
- Overview of the CRS, including the following:

- Description of the measures on each report and how educators should interpret these data
- Description of how to access results for different groups at different levels (e.g., summary of overall student performance and performance on different reporting categories or content areas within the assessment at the individual, group, class, school, district, and state levels)
- Description of how to assign user roles, log in to the CRS, navigate the CRS, create rosters, print reports, and download student data files

CAI values these score reports and the measures that are reported as key information that educators must understand to help their students succeed. Therefore, we designed the Interpretive Guides to help teachers understand how to use the system and what they can infer from the data. We propose including frequently asked questions by educators, such as the ones listed here, along with how the data provided in our reporting system can help answer these questions.

- How can I tell if there are differences in the results for my students among subgroups?
- How do my students' results compare to the school, district, and state overall?
- How can I determine what my students' strengths and weaknesses are?
- What areas of the test do my students understand well and in which areas might they need additional instructional support?

In addition to the Interpretive Guide that can be accessed via a quick link in the CRS, CAI can create a Family Interpretive Guide, which can be posted on the NJDOE online portal or printed with the ISR. These guides help families understand the purpose of the assessment and their child's results. The proposed content for the Family Interpretive Guide includes a screen capture of the ISR with a legend to explain each component of the report and what it means to families. The guide will visually show families, using a legend, where they can find this information on the report and what it means. We propose the following content for the Family Interpretive Guide:

- Explanation of the graphical representation that shows the range of scores and performance levels possible for the assessment (e.g., barrel chart)
- Description of performance levels and what they mean
- Description of reporting categories or content areas within the assessment (i.e., English language arts [ELA]/literacy and mathematics) and the ability level for each (i.e., below mastery, at/near mastery, and above mastery)
- Description of what the results mean and next steps for each content area of the test
- Description of which skills were assessed overall and on each content area of the test

Development Process

CAI's approach to developing the Interpretive Guides is divided into two phases:

1. A drafting phase, during which we obtain agreement on the content and design of the document
2. A production phase, during which we produce the document to the specifications developed in the first phase, accommodate any final adjustments, and ensure that the camera-ready proofs are error-free

The drafting process begins with discussions with NJDOE, during which we discuss issues of both design and content. Once drafts are approved, we proceed to production. The first blackline version of the document, which results from the first iteration through our production

process, is designed to reflect the final layout and formatting. Typically, only format and layout changes are made at blackline. A second blackline is produced after incorporating these changes to confirm that they were made correctly.

Our production process includes multiple editorial reviews, and each document must receive senior staff sign-off. In Section 4.7.3.1 (Exhibit 4.7.3.1-1), we provide an overview of our editorial review process and a more detailed discussion of our development and production process.

We have successfully trained educators to access, understand, and use their score reports for summative assessments in many states. During this time, we have learned that teaching data literacy requires clear and concise support materials for teachers to absorb the information. To help teachers access the most relevant data, we provide teachers with a framework to organize their questions and prioritize which set of data they can use to answer those questions. CAI will collaborate with NJDOE to create these materials and use them to support trainings for all educators.

4.13.4. Constructed-Response Item Scoring Procedures Electronic Manual

CAI is prepared to meet the requirements for the manual describing the procedures used to score students' responses to constructed-response items. Both CAI and our partner, Measurement Incorporated (MI), have extensive experience creating scoring guides that include annotated samples of student work, both for ClearSight states and many other client states. CAI will collaborate with NJDOE on the *Constructed-Response Item Scoring (CRIS) Manual* by

- selecting student responses in consultation with SCM;
- developing annotations to accompany each student response;
- preparing the manual for all of the entities listed in the RFQ; and
- making the manual available via download from the New Jersey Assessment Portal.

4.13.5. Dissemination of Reports

CAI is adaptable in our ability to produce and deliver student assessment results using any number of media formats. While the most streamlined and secure delivery method is over Secure File Transfer Protocol with tightly managed user roles and dual authentication in place, CAI is also familiar with processing and storing data on password-protected media, such as CD/DVD/USB, and has delivered data files and reports in this manner to other clients.

CAI has established a secure file transfer site with many of our assessment clients. This site allows fast, secure delivery of files and reports, and allows our clients to manage access roles seamlessly to ensure that data and reports are delivered to intended personnel only.

Non-printed reports may be transmitted via a secure file transport portal. Reports will be sent only to individuals whose roles have designated them as recipients. Changes may be made throughout the contract as individuals leave or assume new responsibilities.

CAI's processes of replication of all client deliverables by two independent programmers will ensure that data and reports are completely accurate and fully align with the specifications and expectations of NJDOE. Requests for changes to report or file formats will be reviewed and CAI will work closely with NJDOE to be certain our work products completely satisfy the requirements and expectations of NJDOE.

4.13.5.1. Data Files and Test Results Delivered on CDs

CAI works closely with assessment clients to provide data files, summary reports, and rosters that align with NJDOE's requirements. At the beginning of our work together, CAI will review the existing layouts that have been used by NJDOE. We will work closely with NJDOE to understand requirements for the compatibility of files and reports across years; layouts drafted for data files will reflect both fields required for compatibility with historic data files as well as new fields requested for current and future test administrations. A sample data file layout, SampleDataFileLayout.pdf, is included to provide NJDOE with the opportunity to review CAI's approach to data file layout development. This sample file documents CAI's approach to preparing and delivering data that are complete and completely accurate.

The process of drafting and testing client layouts begins very early in the contract calendar. CAI will draft the layout, present it to NJDOE, and schedule a series of meetings to review it and confirm that all information requested by NJDOE has been included in the proposed data files. Revisions as needed are incorporated into the layout, and sample data files are prepared for NJDOE review. If changes to the layout are required, CAI will incorporate the requested changes, documenting these in a version history tab, and deliver new data files until NJDOE is completely satisfied with the final layout and the data files prepared in accordance with the layout.

CAI can produce files in any number of formats, including but not limited to fixed format, pipe-delimited text files, CSV files, and tab-delimited files. The quality control (QC) of these files in these formats is rigorous, thorough, and comprehensive. Any issues around data accuracy and data integrity are dealt with quickly and in time for delivery. Lastly, CAI will work closely with NJDOE to confirm complete compatibility with NJDOE's systems.

CAI will provide two copies of the final data files on password-protected CDs, delivered as required by NJDOE. CAI also can deliver on other secure media or via a dedicated, secure file transfer portal.

We understand that the CDs may be replaced by a USB flash drive with approval or request by the SCM.

4.13.5.2. Pupil Score CD

CAI will securely deliver to NJDOE (via preferred carrier) test results for all students who participated in the test administration. Aggregate reports will also be delivered on password-protected CDs, and two copies of all files will be provided. CAI understands that NJDOE wants to suppress information in reports when the number of participants in a test administration is small. CAI currently suppresses counts in several reports for other clients, due to the requirement to protect student results.

CAI will work with NJDOE as we prepare data files and reports for release to the field. CAI understands that NJDOE will want the opportunity to independently evaluate and quality check final results. CAI will provide final results well in advance of release to the field so that the internal QC process can take place. If issues are found, CAI will revise and release updated results with sufficient lead time for NJDOE to complete their QC and approve results.

Ten copies of student results (suppressed and non-suppressed) will be provided to NJDOE on password-protected CDs. If preferred, a secure file transfer portal can be used to deliver these results as well.

4.13.5.3. School/District Summary CD

In a manner similar to that described for drafting the student data file layout and preparation of student data files, CAI will work with NJDOE to prepare the layout and business rules for preparation of the summary data reports. CAI has developed a layout with another client (see Appendix D of our proposal). This layout is used to prepare aggregate reports at both the state and district levels; aggregates are prepared for districts and include averages and percentages for scale score and number of students achieving performance levels 1–5, for example. As you can see from the screen capture in Exhibit 4.13.5.3-1, state, district, and school averages are presented in a single file, which is delivered to the district. While this file presents a relatively small number of fields and does not aggregate for any student demographic groups, the addition of this information could readily be included in the file.

Exhibit 4.13.5.3-1: State, District, and School Averages Are Presented in a Single File

FAST_23SPR_07_DAR_ELA.txt

	Mode	SchoolYear	DisName	SchName	Dis	Sch	Grd	SchType	TestName	Students	MSS	StvSS	PctPass	PctAL1	PctAL2	PctAL3	PctAL4	PctAL5	PctAL345	NumAL1	NumAL2	NumAL3	NumAL4	NumAL5	NumAL345	Suppl0	SuppAL	FileDate	Version	EndRec			
2	1	2223	STATE TOTALS				GRADE 03						0	0	3		FAST Grade 3 ELA Reading PM3			221504	297	24	27	23	25	18	7	50	60545	49868	55159	40205	15727	111091	N	N	7262023	B	$
3	1	2223	STATE TOTALS				GRADE 04						0	0	4		FAST Grade 4 ELA Reading PM3			201024	312	25	23	19	24	21	12	58	47194	38177	48428	42683	24542	115653	N	N	7262023	B	$
4	1	2223	STATE TOTALS				GRADE 05						0	0	5		FAST Grade 5 ELA Reading PM3			207370	320	27	24	22	24	20	11	54	50157	45169	49669	40515	21860	112044	N	N	7262023	B	$
5	1	2223	STATE TOTALS				GRADE 06						0	0	6		FAST Grade 6 ELA Reading PM3			216020	321	28	31	22	19	18	10	47	67106	47589	40379	39523	21423	101325	N	N	7262023	B	$
6	1	2223	STATE TOTALS				GRADE 07						0	0	7		FAST Grade 7 ELA Reading PM3			209005	328	27	32	21	20	16	11	47	66614	44255	41585	34286	22265	98136	N	N	7262023	B	$
7	1	2223	STATE TOTALS				GRADE 08						0	0	8		FAST Grade 8 ELA Reading PM3			214929	332	28	34	20	21	15	11	47	72311	42267	44544	32148	23659	100351	N	N	7262023	B	$
8	1	2223	STATE TOTALS				GRADE 09						0	0	9		FAST Grade 9 ELA Reading PM3			222104	339	27	31	21	18	18	11	48	69555	45695	40725	40950	25179	106854	N	N	7262023	B	$
9	1	2223	STATE TOTALS				GRADE 10						0	0	10		FAST Grade 10 ELA Reading PM3			213324	346	28	50	30	20	18	19	12	50	63811	43077	38971	41445	26020	106436	N	N	7262023	B	$
10	1	2223	STATE TOTALS				GRADE 10 RETAKER						0	0	RE		FAST Grade 10 ELA Reading PM3			47430	323	23	12	63	25	9	3	0	12	30106	11684	4265	1209	166	5640	N	N	7262023	B	$
11	2	2223	CALHOUN				DISTRICT TOTALS GRADE 03						7	0	3		FAST Grade 3 ELA Reading PM3			130	301	19	21	28	27	17	8	52	27	36	35	22	10	67	N	N	7262023	B	$
12	2	2223	CALHOUN				DISTRICT TOTALS GRADE 04						7	0	4		FAST Grade 4 ELA Reading PM3			146	311	21	24	18	29	21	7	58	35	27	43	31	10	84	N	N	7262023	B	$
13	2	2223	CALHOUN				DISTRICT TOTALS GRADE 05						7	0	5		FAST Grade 5 ELA Reading PM3			146	323	22	18	23	32	23	5	59	27	33	46	33	7	86	N	N	7262023	B	$
14	2	2223	CALHOUN				DISTRICT TOTALS GRADE 06						7	0	6		FAST Grade 6 ELA Reading PM3			143	327	23	20	24	27	20	10	56	29	34	38	28	14	80	N	N	7262023	B	$
15	2	2223	CALHOUN				DISTRICT TOTALS GRADE 07						7	0	7		FAST Grade 7 ELA Reading PM3			166	330	22	23	30	23	15	8	47	38	50	39	25	14	78	N	N	7262023	B	$
16	2	2223	CALHOUN				DISTRICT TOTALS GRADE 08						7	0	8		FAST Grade 8 ELA Reading PM3			157	330	25	36	19	24	15	6	45	56	30	37	24	10	71	N	N	7262023	B	$
17	2	2223	CALHOUN				DISTRICT TOTALS GRADE 09						7	0	9		FAST Grade 9 ELA Reading PM3			175	342	23	24	22	26	18	10	54	42	38	45	32	18	95	N	N	7262023	B	$
18	2	2223	CALHOUN				DISTRICT TOTALS GRADE 10						7	0	10		FAST Grade 10 ELA Reading PM3			160	351	26	55	23	23	20	19	16	55	36	36	32	31	25	88	N	N	7262023	B	$
19	2	2223	CALHOUN				DISTRICT TOTALS GRADE 10 RETAKER						7	0	RE		FAST Grade 10 ELA Reading PM3			16	326	18	13	69	19	13	0	0	13	11	3	2	0	0	2	N	N	7262023	B	$
20	3	2223	CALHOUN				BLOUNTSTOWN HIGH SCHOOL						7	21	6		FAST Grade 6 ELA Reading PM3			68	328	25	18	18	28	25	12	65	12	12	19	17	8	44	N	N	7262023	B	$
21	3	2223	CALHOUN				BLOUNTSTOWN HIGH SCHOOL						7	21	7		FAST Grade 7 ELA Reading PM3			85	331	22	24	24	26	16	11	53	20	20	22	14	9	45	N	N	7262023	B	$
22	3	2223	CALHOUN				BLOUNTSTOWN HIGH SCHOOL						7	21	8		FAST Grade 8 ELA Reading PM3			82	332	24	32	20	26	18	5	49	26	16	21	15	4	40	N	N	7262023	B	$
23	3	2223	CALHOUN				BLOUNTSTOWN HIGH SCHOOL						7	21	9		FAST Grade 9 ELA Reading PM3			123	340	22	25	24	26	20	5	51	31	29	32	25	6	63	N	N	7262023	B	$
24	3	2223	CALHOUN				BLOUNTSTOWN HIGH SCHOOL						7	21	10		FAST Grade 10 ELA Reading PM3			107	354	25	59	19	22	22	16	21	59	20	24	24	17	22	63	N	N	7262023	B	$
25	3	2223	CALHOUN				BLOUNTSTOWN HIGH SCHOOL						7	21	RE		FAST Grade 10 ELA Reading PM3			13	329	18	15	62	23	15	0	0	15	8	3	2	0	0	2	N	N	7262023	B	$
26	3	2223	CALHOUN				CARR ELEMENTARY & MIDDLE SCHOOL						7	91	3		FAST Grade 3 ELA Reading PM3			26	303	21	15	31	27	19	8	54	4	8	7	5	2	14	N	N	7262023	B	$
27	3	2223	CALHOUN				CARR ELEMENTARY & MIDDLE SCHOOL						7	91	4		FAST Grade 4 ELA Reading PM3			23	312	21	17	9	52	13	9	74	4	2	12	3	2	17	N	N	7262023	B	$
28	3	2223	CALHOUN				CARR ELEMENTARY & MIDDLE SCHOOL						7	91	5		FAST Grade 5 ELA Reading PM3			23	321	18	13	39	26	17	4	48	3	9	6	4	1	11	N	N	7262023	B	$
29	3	2223	CALHOUN				CARR ELEMENTARY & MIDDLE SCHOOL						7	91	6		FAST Grade 6 ELA Reading PM3			24	322	24	33	21	25	13	8	46	8	5	6	3	2	11	N	N	7262023	B	$
30	3	2223	CALHOUN				CARR ELEMENTARY & MIDDLE SCHOOL						7	91	7		FAST Grade 7 ELA Reading PM3			23	326	21	30	30	26	4	9	39	7	7	6	1	2	9	N	N	7262023	B	$
31	3	2223	CALHOUN				CARR ELEMENTARY & MIDDLE SCHOOL						7	91	8		FAST Grade 8 ELA Reading PM3			24	337	24	29	17	21	21	13	54	7	4	5	5	3	13	N	N	7262023	B	$
32	3	2223	CALHOUN				ALTHA PUBLIC SCHOOL						7	101	3		FAST Grade 3 ELA Reading PM3			45	307	19	11	24	29	20	16	64	5	11	13	9	7	29	N	N	7262023	B	$
33	3	2223	CALHOUN				ALTHA PUBLIC SCHOOL						7	101	4		FAST Grade 4 ELA Reading PM3			49	312	18	18	27	27	24	4	55	9	13	13	12	2	27	N	N	7262023	B	$
34	3	2223	CALHOUN				ALTHA PUBLIC SCHOOL						7	101	5		FAST Grade 5 ELA Reading PM3			44	323	26	20	14	32	30	5	66	9	6	14	13	2	29	N	N	7262023	B	$
35	3	2223	CALHOUN				ALTHA PUBLIC SCHOOL						7	101	6		FAST Grade 6 ELA Reading PM3			47	326	19	19	34	26	15	6	47	9	16	12	7	3	22	N	N	7262023	B	$

The delivery of district and school summaries via a secure file transfer portal is an option that CAI offers to other clients. As mentioned previously, by designation of roles, clients can control who receives these reports, adding another layer of security to the exchange of student data and reports.

4.13.6. Record Changes

CAI's Test Information Distribution Engine (TIDE) maintains the student demographic information provided by districts and schools who are in the process of registering students' testing eligibility. At the discretion of NJDOE, updates to this demographic information can be made during designated discrepancy resolution windows. This opportunity for data corrections and updates provides a mechanism for ensuring that the most up-to-date and correct student information is included in preliminary and final student data files and is reflected in all aggregate and summary reports. Because CAI's systems are fully integrated across all systems, CAI is able to incorporate the most up-to-date demographics in the file. The Discrepancy Resolution System (DRS) within TIDE allows authorized users to make necessary corrections to student enrollment information and demographic data, and to resolve various types of discrepancies that may arise. This is a critical aspect in ensuring the accuracy of student records before the release of Cycle I Score Reports. The process of updating records is secure and robust, as it involves several steps to ensure data integrity and security.

Discrepancy Management and Correction Requests

NJDOE requires a process for allowing schools and districts to review and request corrections to their assessment results and to resolve discrepancies that can arise if a student takes a test in different formats, among other scenarios. CAI online systems fully support this requirement.

Discrepancy Resolution System

While the online testing system actively prevents a student from taking the same test online multiple times, the same is not true for paper tests. Paper tests can cause several different scenarios that may result in duplicate records. CAI has proven processes for detecting situations where a student mistakenly takes both a paper test and online test (or even the same paper test twice). CAI's DRS, accessed through TIDE, provides an interface to report and resolve discrepancies.

The DRS is fully integrated with our Database of Record (DOR) that receives and stores all paper records, and with TIDE so the record can be reconciled with what we have on file about the student. This full integration allows us to present and provide accurate, timely, and complete information to authorized users.

Regarding identifying and correcting discrepancies around duplicates, the DRS can be configured to check for the following:

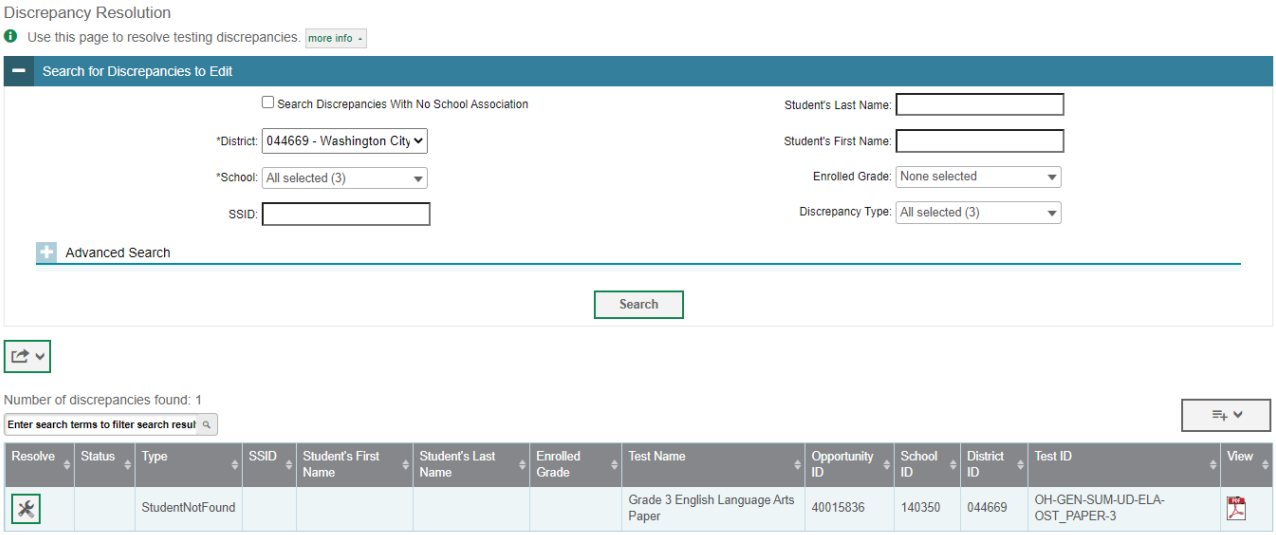
- Student has taken a paper-pencil test as well as an online version of the same test
- Student has taken multiple attempts of paper-pencil tests
- Student has taken the same subject tests in more than one grade (possible with paper tests)
- Student paper test record does not have a PreID label and, once the test is assigned to a student, we identify that the student now has duplicate test records

These discrepancies are automatically displayed when an authorized school or district user logs in to the DRS. The user can easily resolve these discrepancies by choosing to invalidate a duplicate test, add a missing student, and associate a test booklet to an existing student in

TIDE. The user is able to view a PDF of the answer document's demographic page to make better decisions on resolving any discrepancies.

Exhibit 4.13.6-1 shows a sample discrepancy viewed through DRS in which a scanned paper test could not be associated with a student. The user can view the PDF of the test booklet and resolve the discrepancy by either linking the booklet to an existing student already in TIDE, or creating a new student in TIDE.

Exhibit 4.13.6-1: Sample Discrepancy Resolution



4.13.7. Computer Format

CAI will coordinate and test in conjunction with NJDOE to confirm that all exchanges of data and reports, regardless of format or media, are fully compatible with NJDOE systems.

4.13.8. Report Storage

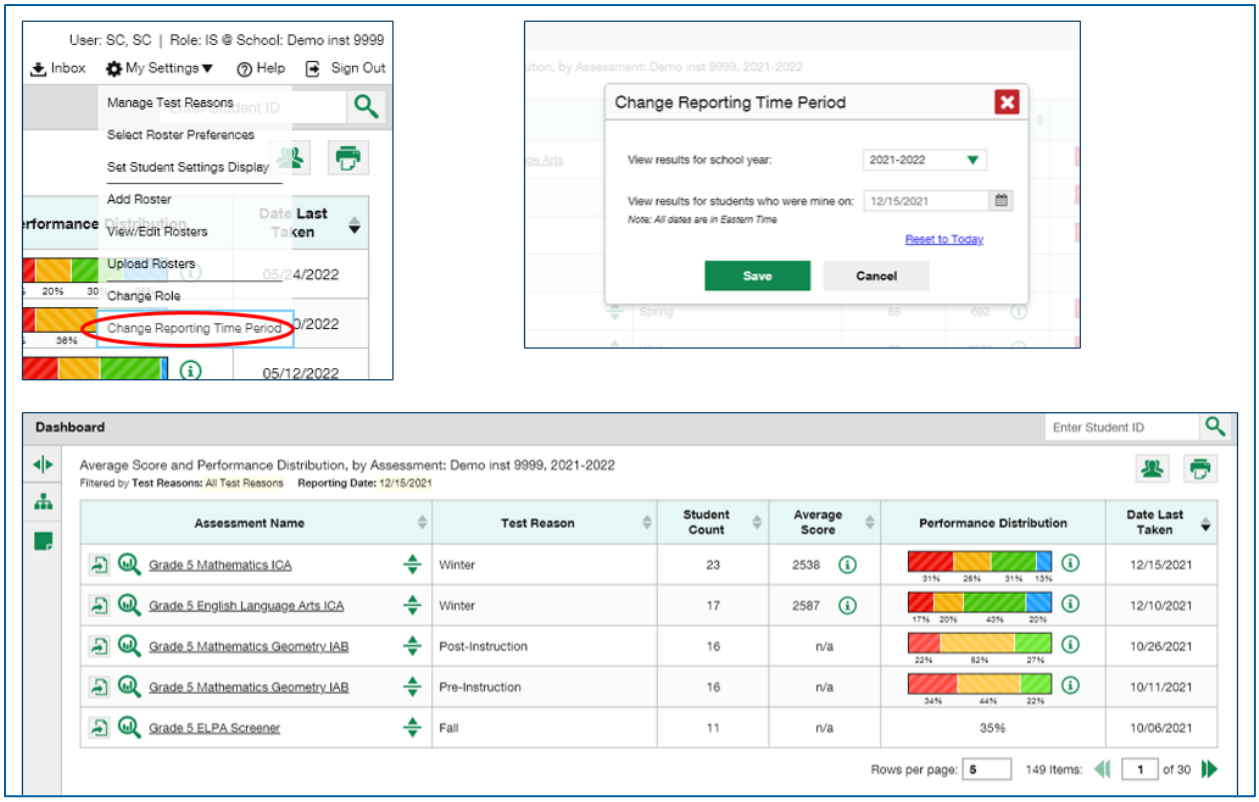
CAI will store reports for all test administrations for at least five years after the end of the test administration window. These reports will be accessible on CAI's Centralized Reporting System (CRS) and the Family Portal. CAI will also host historical individual student reports (ISRs) from 2016 through the current year.

Both the CRS and the Family Portal are designed to be longitudinal systems. Thus, these systems can store data and provide electronic longitudinal and cross-sectional reports for any number of years. The systems can also link the student scores and aggregate scores across time. The following exhibits show a sample of the reports on both the CRS and the Family Portal.

Change Reporting Time Period

The Change Reporting Time Period function allows a user to view data only for the year or date range selected. This functionality allows a teacher entering a new class in the fall to know a good deal about the educational preparation of the students that he or she is about to teach. At the beginning of the school year, a teacher can access his or her students' scores for the prior year by selecting the previous school year from the "Change Reporting Time Period" option available in the My Settings menu (refer to Exhibit 4.13.8-1).

Exhibit 4.13.8-1: Data That Follow the Student: Change Reporting Time Period



Longitudinal

In addition to the Change Reporting Time Period feature, the CRS provides longitudinal reports at the individual and aggregate levels (refer to Exhibits 4.13.8-2–4.13.8-4). A user can compare overall scores or performance levels across time, as well as reporting-category-level performance. Progression can be shown across interim and summative assessments, as well. These data are available both in graph and table format.

Exhibit 4.13.8-2: Individual Student Longitudinal Report

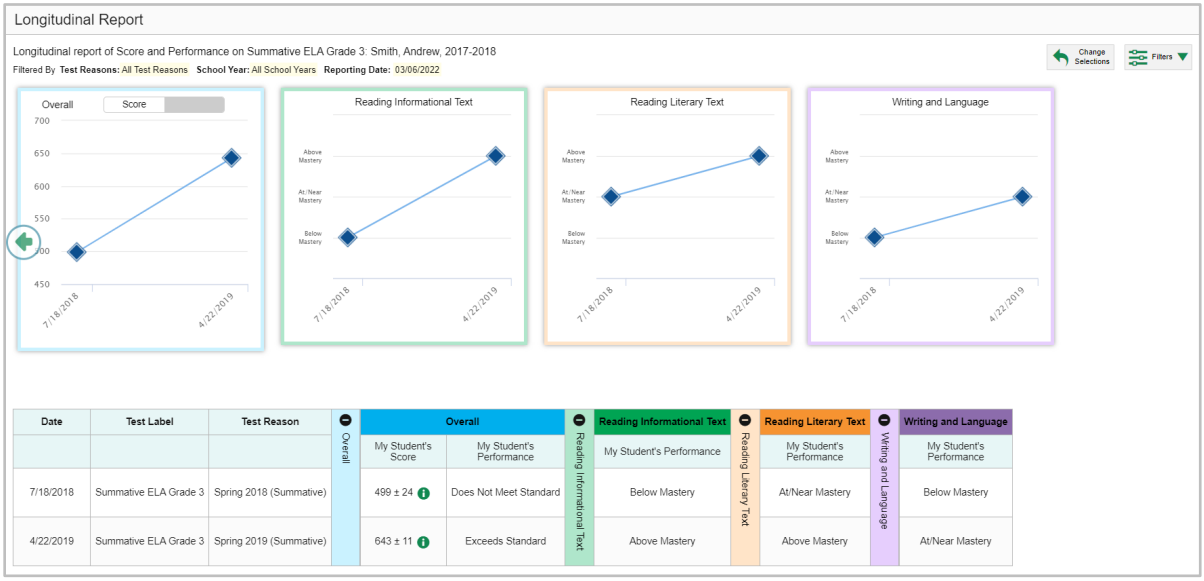
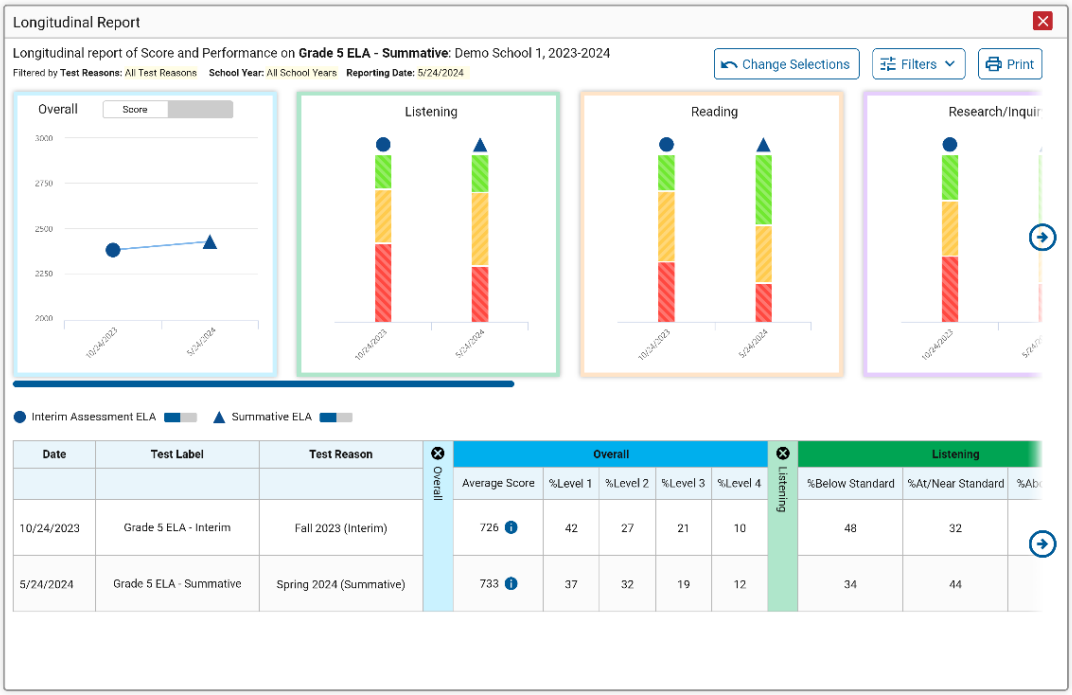
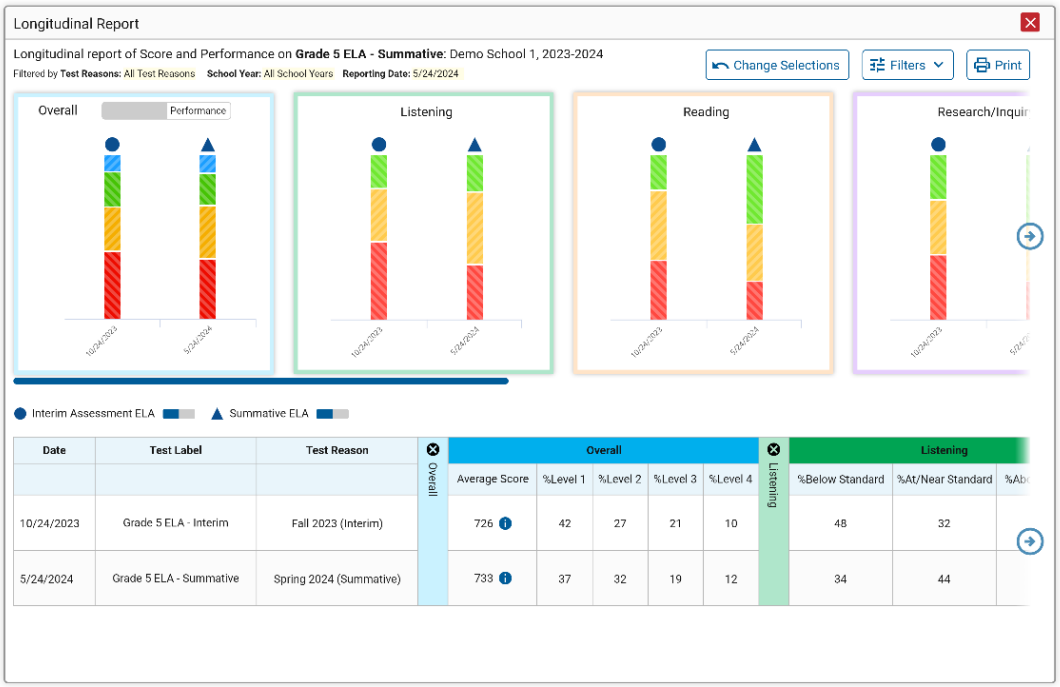


Exhibit 4.13.8-3: Longitudinal Report of Score for a School



Date	Test Label	Test Reason	Overall					Listening			
			Average Score	%Level 1	%Level 2	%Level 3	%Level 4	%Below Standard	%At/Near Standard	%Ab
10/24/2023	Grade 5 ELA - Interim	Fall 2023 (Interim)	726	42	27	21	10	48	32	
5/24/2024	Grade 5 ELA - Summative	Spring 2024 (Summative)	733	37	32	19	12	34	44	

Exhibit 4.13.8-4: Longitudinal Report of Performance for a School



Date	Test Label	Test Reason	Overall					Listening			
			Average Score	%Level 1	%Level 2	%Level 3	%Level 4	%Below Standard	%At/Near Standard	%Ab
10/24/2023	Grade 5 ELA - Interim	Fall 2023 (Interim)	726	42	27	21	10	48	32	
5/24/2024	Grade 5 ELA - Summative	Spring 2024 (Summative)	733	37	32	19	12	34	44	

Cross-Sectional

The key difference between the cross-sectional report and the longitudinal report will be that, while the longitudinal report tracks the performance of a group of students as they take different tests, the cross-sectional report will instead track the performance of a specific test as different cohorts of students take that same test each year. Exhibits 4.13.8-5 and 4.13.8-6 show sample

cross-sectional reports of score and performance for a school across test administrations in English language arts (ELA) assessments.

Exhibit 4.13.8-5: Cross-Sectional Report of Score for a School

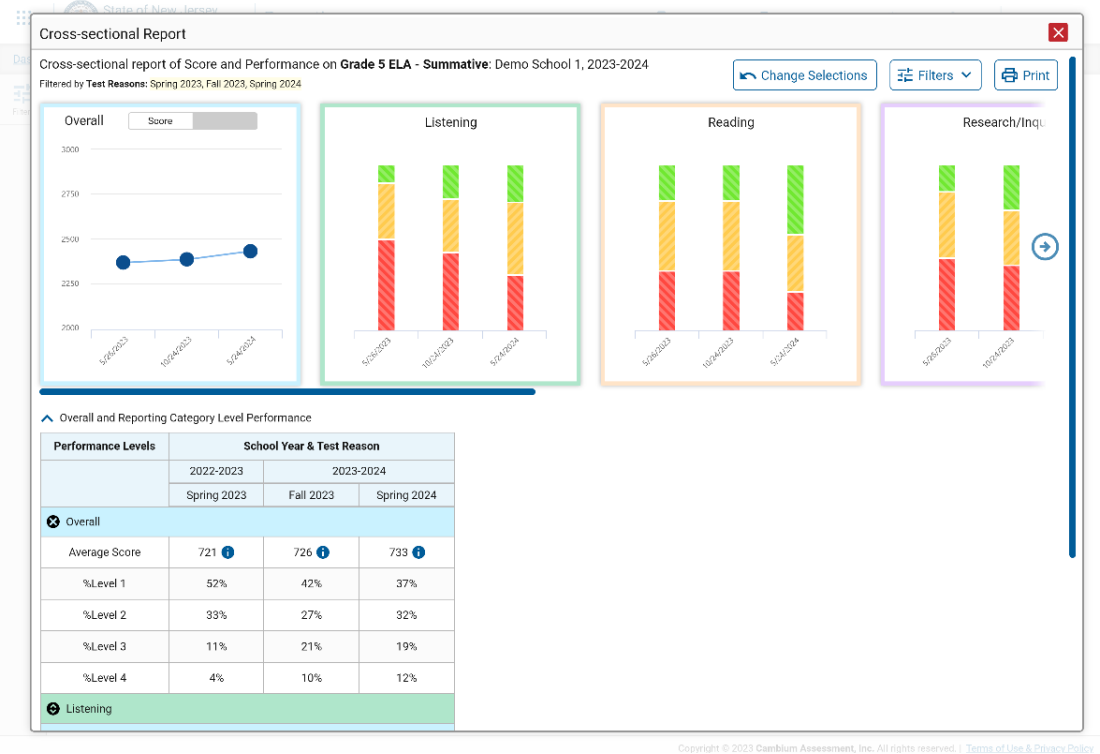
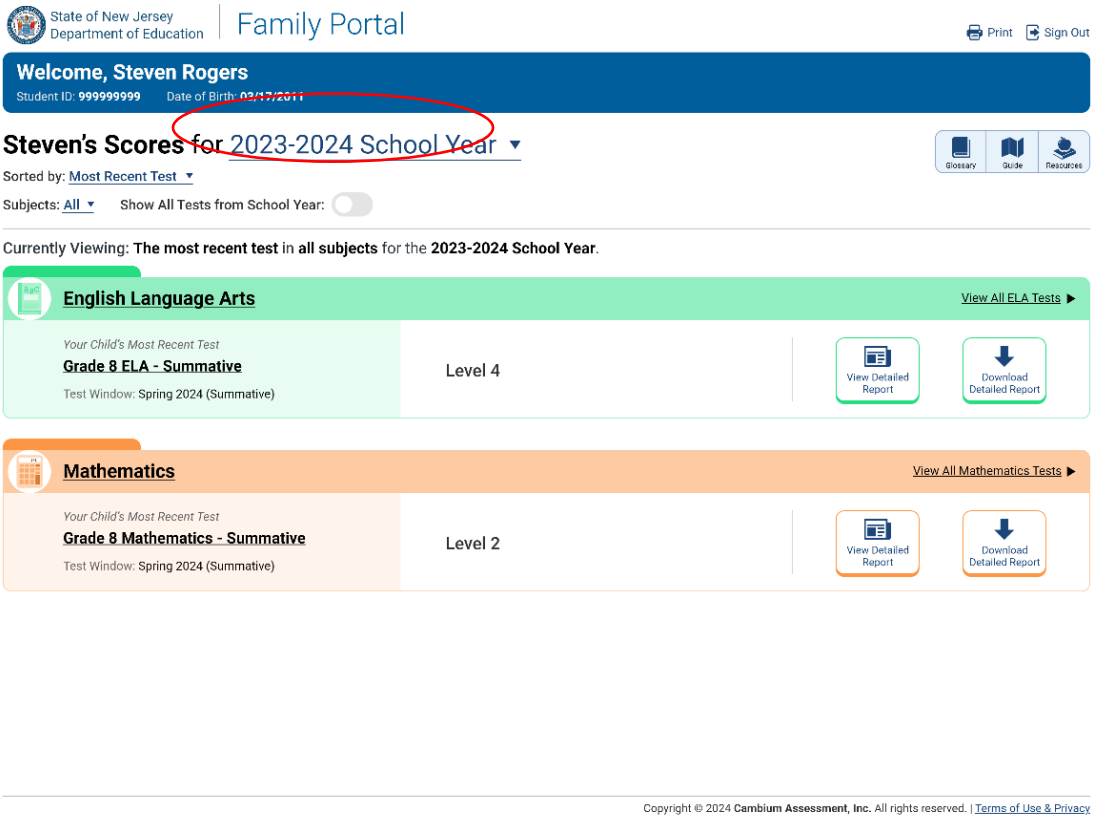


Exhibit 4.13.8-6: Cross-Sectional Report of Performance for a School

Family Portal

The Family Portal Landing Page (Exhibit 4.13.8-7) presents overall results to parents for tests that their child has taken during the current year. Parents can change the school year by using the drop-down menu at the top of the report page.

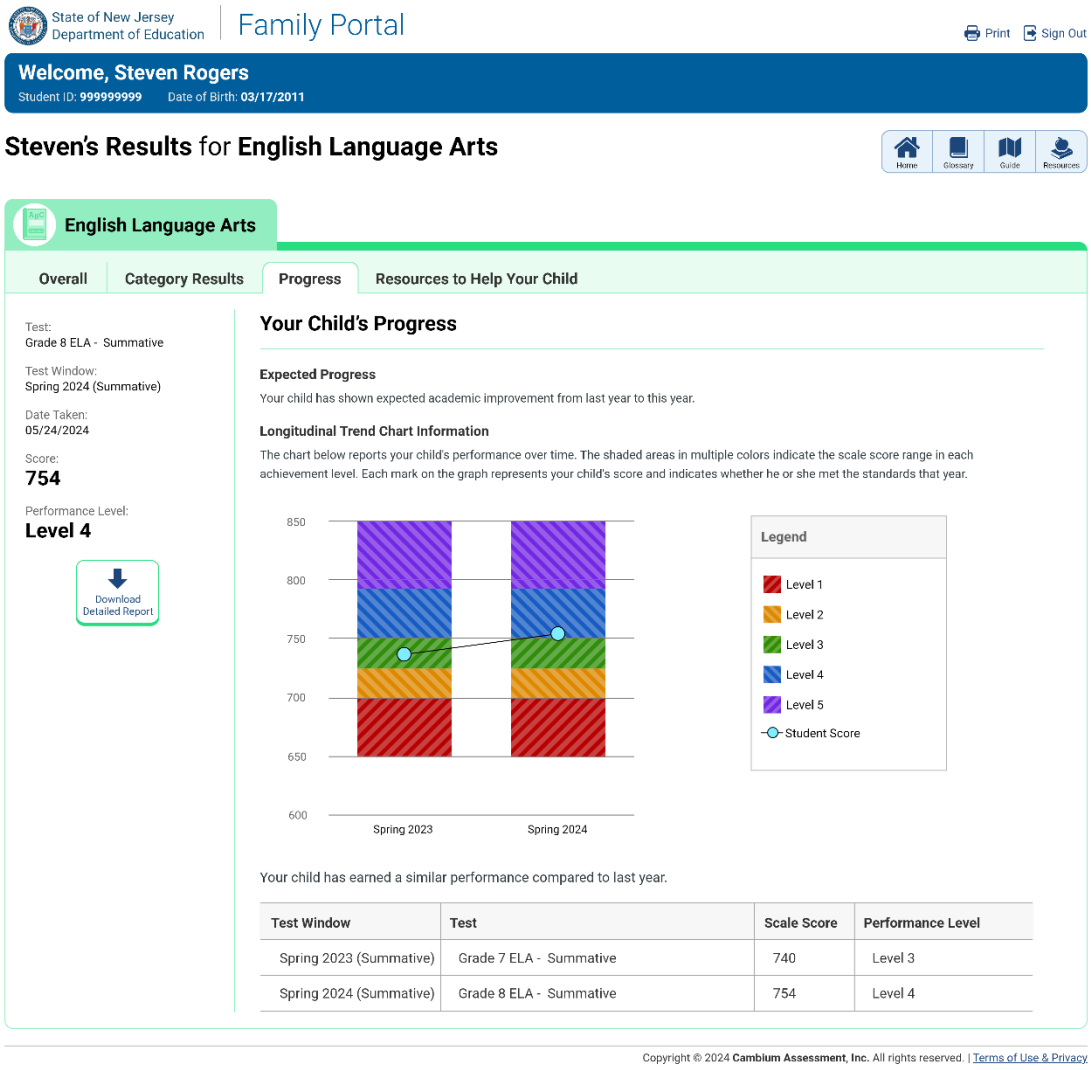
Exhibit 4.13.8-7: Sample Landing Page in the Family Portal



Family Portal (Progress Tab)

The Family Portal includes progress information (Exhibit 4.13.8-8) that allows parents to analyze student growth when comparing performance results across assessments. The progress and trend information are shown at the overall subject level. Parents can use this report to track changes in achievement gaps and show progress over time. Parents can see a graph that shows how their child has performed over time, as well as his or her progress measure score and category.

Exhibit 4.13.8-8: Test Detailed Results—Progress Tab



4.13.9. Other Reports

4.13.9.1. Technical Report

4.13.9.1.1–4.13.9.1.2. Technical Report Overview and Requirements

A technical report will be delivered to NJDOE each year following the test administration of the New Jersey Next Generation Assessment. The technical report will be delivered to NJDOE no later than January 15 each year for the preceding year's summative test administration. CAI will work with NJDOE to establish a schedule for completion of technical reporting in the first year that meets the intended timeline and includes documentation of the standard-setting procedures and results, with the understanding that some activities unique to the production of the school year 2025–2026 technical report may require an extension of this timeframe. This annual technical report will be reviewed by NJDOE and its Technical Advisory Committee (TAC), and the report will be periodically revised to support NJDOE's technical reporting goals. CAI will also provide NJDOE with a detailed crosswalk that identifies locations in the report of evidence related to critical elements required for peer review. The technical report will be formatted to meet Section 508 accessibility guidelines. A sample of a CAI technical report following the structure shown in

Exhibit 4.13.9.1-1 can be found here: https://schools.utah.gov/assessment/_assessment_/_resources_/_technical_reports_/22_RISE_TechnicalReport.PDF.

Exhibit 4.13.9.1-1 provides our proposed outline for the annual technical report on the New Jersey Next Generation Assessment. CAI will work with NJDOE and in consultation with its TAC to design and implement technical documentation that best supports NJDOE's program goals.

Exhibit 4.13.9.1-1: Proposed Outline of New Jersey Next Generation Assessment Technical Report

Chapter 1	**Introduction: The Validity of New Jersey Next Generation Assessment Test Score Interpretations**
1.1	Overview/Technical Quality
1.2	Validity Evidence
1.3	Evidence Based on Test Content
1.3.1	Review Process for Items Appearing in New Jersey Next Generation Assessment Operational Test Administration
1.3.2	Independent Alignment Study
1.4	Evidence for Interpretation of Performance Standards
1.5	Evidence Based on Internal Structure
1.5.1	ELA Content Model
1.5.2	ELA Depth of Knowledge Model
1.5.3	Mathematics Content Model
1.5.4	Mathematics Depth of Knowledge Model
1.5.5	Science Content Model
1.5.6	Science Depth of Knowledge Model
1.6	Evidence for Relationships with Conceptually Related Constructs
1.7	Evidence Related to Cognitive Processes
1.8	Measurement Invariance Across Subgroups
1.9	Evidence for Gain Score Difference Across Subgroups
1.10	Fairness and Accessibility
1.10.1	Fairness in Content
1.10.2	Statistical Fairness in Item Statistics
1.10.3	Fairness in Test Score Interpretation
1.10.4	Effects of Dictionary Availability on Student Performance
1.11	Summary of Validity of Test Score Interpretations
Chapter 2	**Background of New Jersey Next Generation Assessment**
2.1	Background and Historical Context of Test
2.1.1	Development of New Jersey Academic Standards
2.1.2	Online Item-Pool Construction
2.2	Recent Changes to the Test
Chapter 3	**Summary of the (School Year) Operational Test Administration**
3.1	Student Population and Participation
3.2	Summary of Overall Student Performance
3.3	Student Performance by Subgroup
3.4	Reliability
3.4.1	Marginal Reliability
3.4.2	Standard Error of Measurement
3.4.3	Student Classification Reliability
3.4.4	Classification Accuracy
3.4.5	Classification Consistency
3.4.6	Classification Accuracy and Consistency Estimates

3.4.7 Reliability for Subgroups in the Student Population
3.4.8 Subscale Reliability
3.5 Subscale Intercorrelations

Chapter 4 Item Development and Test Construction
4.1 Test Design and Test Specifications
4.1.1 Target Blueprints
4.1.2 Item Selection Algorithm
4.1.3 Blueprint Match
4.2 Item Development Process
4.2.1 Item-Writer Workshop
4.2.2 Summary of Item Sources
4.2.3 Alignment of New Jersey Next Generation Assessment Items to the New Jersey Student Learning Standards
4.2.4 Development of New Items
4.2.5 Developing Machine-Scored Constructed-Response Items
4.2.6 Item Types
4.3 Item Review
4.3.1 Item Review Processes
4.3.2 Security in Item Review Process
4.3.3 Department Item Review and Approval
4.3.4 Committee Review of Item Pool
4.3.5 Rubric Validation
4.4 Field-Testing
4.5 Item Statistics
4.5.1 Classical Statistics
4.5.2 Item Response Theory Statistics
4.5.3 Analysis of Differential Item Functioning
4.6 Item Banks
4.6.1 Establishing the Item Banks
4.6.2 Item Bank Maintenance
4.6.3 Summative vs. Interim Item Pools
4.6.4 Modular Benchmarks

Chapter 5 Test Administration
5.1 Testing Options
5.2 Test Administration
5.2.1 Administrative Roles
5.2.2 Online Test Administration
5.2.3 Braille and American Sign Language Test Administration
5.2.4 Allowable Resources for Online Testing
5.3 Training and Information for Test Coordinators and Administrators
5.3.1 Online Training
5.3.2 Manuals and User Guides
5.4 Test Security
5.5 Data Forensics Program
5.5.1 Changes in Student Performance
5.5.2 Item Response Latency
5.5.3 Inconsistent Item Response Patter (Person Fit)
5.5.4 Response Change and Response Similarity

Chapter 6 Reporting and Interpreting New Jersey Next Generation Assessment Scores
6.1 Appropriate Uses for Scores
6.2 Reports Provided
6.2.1 Family Reports
6.2.2 Online Reporting System for Educators
6.3 Interpretation of Scores

Chapter 7 Performance Standards
7.1 Standard-Setting Procedures
7.2 Recommended Proficiency Standards

Chapter 8 Scaling and Equating
8.1 Item Response Theory Procedures
8.1.1 Calibration of New Jersey Next Generation Assessment Item Banks
8.1.2 Estimating Student Ability Using Maximum Likelihood Estimation
8.1.3 Bringing Field-Test Items on the New Jersey Next Generation Assessment Scale
8.2 Establishing a Vertical Scale for ELA and Mathematics Items
8.2.1 Selecting Linking Items
8.2.2 Linking Analysis
8.2.3 Final Linking Set
8.2.4 Chain-Linking
8.3 New Jersey Next Generation Assessment Reporting Scale (Scale Scores)

Chapter 9 Constructed-Response Scoring
9.1 Machine-Scoring
9.1.1 Explicit Rubrics
9.1.2 Essay Autoscoring
9.1.3 Machine-Identified Condition Codes
9.2 Machine-Scoring Verification

Chapter 10 Quality Assurance Procedures
10.1 Quality Assurance in Item Development and Test Construction
10.2 Quality Assurance in Production of Computer-Delivered Tests
10.2.1 Production of Content
10.2.2 Web Approval of Content During Development
10.2.3 Platform Review
10.2.4 User Acceptance Testing and Final Review
10.2.5 Functionality and Configuration
10.3 Quality Assurance in Data Preparation
10.4 Quality Assurance in Test Form Equating
10.5 Quality Assurance in Scoring and Reporting
10.5.1 Quality Assurance in Handscoring
10.5.2 Test Scoring
10.5.3 Reporting

Chapter 11 References

CAI structures the technical report so that some of the chapters require only minimal changes once an assessment program has been established. For example, chapters such as Performance Standards (which documents the standard-setting process) and Reporting and Interpreting New Jersey Next Generation Assessment Scores (which documents test score reporting and interpretation) are expected to remain essentially the same across the duration of

the contract. Chapter 3, Summary of the (School Year) Operational Test Administration, on the other hand, will be updated every year, as it contains the results of the statistical and psychometric analyses of that year's assessment. Hence, the report's structure allows for an optimal use of CAI's and NJDOE's resources in reviewing and copyediting the extensive technical documentation. Also, importantly, it allows readers to focus attention each year on variable elements of the report.

As we have demonstrated in our work on many state assessment programs, CAI is committed to working with clients to provide all of the technical documentation necessary to successfully complete the peer-review process. To support NJDOE and its TAC in the development and review of evidence, CAI will supply NJDOE with a crosswalk between the peer-review guidelines and key sections in the technical report that discuss the required evidence.

All of CAI's work related to the New Jersey Next Generation Assessment will fully comply with the requirements of the 2015 Every Student Succeeds Act (ESSA) and will adhere to industry best-practice standards as documented in the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014). Especially during the current period of rapid transformation in assessment technology, we commit not only to adherence to best practices as they evolve but to active participation in the development and implementation of best practices for educational assessment.

4.13.9.2. Customer Satisfaction Report

CAI will provide the customer satisfaction report at the end of the testing window (i.e., approximately 10 weeks after test materials have been returned) and will include this task in the master program schedule. CAI will develop the report in accordance with the specifications outlined in Section 4.3.9.1 and deliver it to the SCM for review and identification of any additional additions or edits.

CAI customarily produces an end of administration report (sometimes called a "look back" report) recapping the immediate past test administration. In addition to the prescribed customer satisfaction information, CAI may also include, at NJDOE's direction, information about items such as the following:

- The number of tests administered during the testing window
- Call volumes and primary call drivers
- System performance metrics
- Log of reported system or administration issues

These metrics, in combination with the collected customer feedback, form the foundation for recommendations for continuous improvement in forthcoming testing windows.

4.13.9.3. Missing Shipments Report

The CAI and Measurement Incorporated (MI) teams will track both outbound and inbound shipments of secure materials so that we can identify secure materials that have gone missing as soon as possible. For outbound materials, we will reconcile deliveries each business day. For inbound shipments, we will retrieve tracking information from FedEx each business day.

MI will provide a complete report on any missing shipments to the SCM within 24 hours of the discovery that a shipment is lost. The report will include the origin and destination addresses, tracking numbers, and information about the last confirmed shipping status. MI has worked with the FedEx Overgoods Office in the past to identify the contents of damaged packages that belong to New Jersey testing programs.

4.13.9.4. Missing Test Booklet Report

The CAI and MI teams will track and account for all test booklets returned by districts. From experience, we know that there will be at least a few test booklets not returned immediately after testing. To facilitate the search for missing test booklets, MI will provide a Missing Test Booklet Report to the districts and the SCM within 30 business days following completion of test booklet check-in.

A Missing Material Report lists the assessment, test form, and barcode number of secure, barcoded materials that have not been returned to MI. The report includes regular test booklets, as well as alternate, braille, large-print, or Spanish-language test booklets. Special forms such as these are more likely to be missed when districts are returning materials because they were administered in a special setting. Exhibit 4.13.9.4-1 shows an example of a Missing Material Report, which is sent by email to the Chief School Administrator (CSA).

Exhibit 4.13.9.4-1: Sample Missing Material Report

MEASUREMENT INCORPORATED

Measurement Incorporated has completed security check-in of the secure test materials for the **NJSLA and/or GPA**

Our records indicate the following secure test materials have not been received from your district/school –

SecureNumber	OrderKey	OrderType	Grade	InKit	Description	OrderCancelled	ManuallyResolved	Comments	CDS	CDSType	Dis_Name	School_Name	District Test Coordinator	Multiple District Test Coordinators	DTC_Email	DTCStatus
180557	4777	Additional	8	Grade 8 Human Reader Test Kit	Grade 8 Test Booklet	No	No		99-9999	D	ANY DISTRICT	DISTRICT OVERAGE		Jane Doe, John Doe	janedoe@dtc.org, johndoe@dtc.org	No Lead DTC
180558	4777	Additional	8	Grade 8 Human Reader Test Kit	Grade 8 Test Booklet	No	No		99-9999	D	ANY DISTRICT	DISTRICT OVERAGE		Jane Doe, John Doe	janedoe@dtc.org, johndoe@dtc.org	No Lead DTC

Please do the following:

1. Check all secure areas where the test materials were stored to see if any may have been overlooked.
2. If the test materials were returned - please reply to this e-mail with the FedEx tracking number used to return the materials and the date they were picked up by FedEx.
3. If the above NJSLA/GPA secure materials are discovered please call this number: (xxx-xxx-xxxx) and ask for instructions to return them. These materials must now be returned via FedEx at the district's expense. This provides a secure traceable shipping method.

We appreciate your immediate attention and cooperation in this matter. Please respond by (give them 5 business days from date of the e-mail)

CSAs will receive a report if they failed to return all secure materials following an administration of the NJSLA-ELA/M or the NJGPA. These reports help administrators identify what materials are missing so that they can conduct an internal investigation.

Prior to contacting districts regarding the need to find missing test booklets, MI will confirm that the materials are not at their warehouse and processing center. They will re-scan boxes from schools and districts that are missing at least one test booklet. If materials are still missing, they may hand-check the boxes and look over all processing areas to ensure that the materials have not been misplaced.

MI works to quickly resolve any missing material discrepancies to minimize any potential compromises to the secure test items, particularly equating or field-test items that may appear on a future test. MI completes check-in and verification of test booklets prior to providing results to CAI. They will submit a preliminary Missing Test Booklet Report to the districts and the SCM within 30 business days after completing the check-in of test booklets. The report for the CSA will include a district-level summary with the total number of missing test booklets arranged by school. The report for the SCM will be a state-level summary report.

MI will ask the CSA to search for the missing test booklets. MI's Help Desk is available to assist district staff as they search. If a district is unable to locate the missing test booklets, the school

district must submit a written security affidavit to MI indicating that the materials could not be located. MI will send a single, final summary report of any remaining missing materials from the assessment to the SCM 20 business days after the Missing Test Booklet Reports have been sent out.

4.13.9.5. Secured Materials Received Report

The Secured Materials Received Report will include the total number of test booklets shipped, the number returned, and a description of the check-in process. The report will also describe the processes that MI used to scan the test booklets, including documentation of any rescans and hand-validations used to find materials.

4.13.9.6. Status Report for Scoring Constructed-Response Items

During operational program scoring, the NJDOE SCM will receive daily reports regarding the status of constructed-response item scoring. These reports allow us to monitor inter-rater reliability (IRR) and determine whether the performance of any one group of scorers is irregular, determine scoring progress against the planned schedule, and collect additionally nuanced data about the ratings provided to date. These reports are of importance to both internal (project team, psychometrics) and external stakeholders.

MI will generate daily status reports during constructed-response item scoring. These reports will include IRR, the number of scores at each rubric's score point, and any other measures required by NJDOE. MI will provide these reports to the SCM within five business days after the conclusion of the scoring session. If the SCM requests edits, MI will submit the edited documents to the SCM within five business days of receipt of the request for edits.

4.13.9.7. Online Usage Report

CAI's systems collect important metadata about the types of devices being used in the administration of student assessments. This information is critically important to technical project managers who are tasked with reviewing and prioritizing future development because, particularly with the proliferation of mobile devices in the classroom, platform usage trends have significantly changed over the years. CAI produces an annual operating system usage report that includes the following:

- Internal CAI system identifiers, including individual test result identifiers
- Information about the specific operating system and browser used to take the test
- Usage information, such as test start and end dates and the session in which the test was taken
- Other internal CAI identifiers that allow CAI to uniquely identify a student or student test result in our systems

The information is provided in a flexible format that can be used to create quick and informative pivot tables about device usage information across the program. CAI will provide similar online usage reports (by district, state, and CAI) on the last business day of every month. This includes all required fields mentioned in the RFQ. If the SCM requests changes after reviewing the report, CAI will work closely with them and have an updated version within three business days of the request.

CAI has effectively used these data in the past to drive program changes and system enhancements.

4.13.10. Project Reports and Meeting Minutes

4.13.10.1. Monthly Progress Reports

Within 10 business days of the end of each month, CAI will provide a monthly progress report to the SCM that reflects the status of significant tasks/milestones and ongoing work; a decision log that indicates task status; and both an activity/issues log and schedule of upcoming deliverables for the interactive website. We will work with the SCM early in the project lifecycle to agree on the format and design of this report.

4.13.10.2. Meeting Minutes

Taking effective meeting minutes is an essential part of project management. Meeting minutes are key for accountability and productivity and are the best way to document next steps while keeping stakeholders aligned.

Using the agenda to track key points, a designated note-taker will document the outcomes, decisions, and action items in the meeting minutes. These meeting minutes will be delivered within five business days after any meeting, and in the appropriate specifications documents. Changed specifications will be circulated among internal and NJDOE stakeholders.

Minutes need to be stored or filed in a way that is easy to access, since they serve as the reference for all production plans and tasks. CAI utilizes Smartsheet as the primary repository for shared management documentation, program schedules, and program meeting minutes so that each project stakeholder can reference them. The platform also provides opportunities for the creation of dashboards and data visualizations, which provide for easy and effective tracking of project deliverables and overall program health.

4.13.10.3. Item Analysis Report

As we describe in Section 4.12.5, CAI will provide NJDOE with detailed item analysis reports throughout the test development process. Item analyses following field-test analysis will be provided to NJDOE prior to item data review meetings each year. In an adaptive test design, items approved for operational testing will be included in the configuration of the adaptive algorithm and be administered to students as part of the summative test.

Throughout the testing window, psychometricians monitor the performance of test items via a suite of quality assurance reports. Reports include an item analysis report, which can be provided to NJDOE at any frequency, but is typically provided weekly early in the testing window and less frequently later.

CAI will provide a final item analysis report to NJDOE following close of the testing window. We note that NJDOE will always have access to item statistics via the Item Tracking System (ITS), as well, allowing NJDOE to examine any item (including all metadata associated with it) at any time.

4.13.10.4. Machine-Scorable Items

CAI agrees to provide NJDOE with the item analyses for machine-scorable items that include the analyses specified in the RFQ.

4.13.10.5. Constructed-Response Items

CAI agrees to provide NJDOE with the item analyses for constructed-response items that include the analyses specified in the RFQ.

4.13.11. Content Data Systems Master File and Material Survey Report

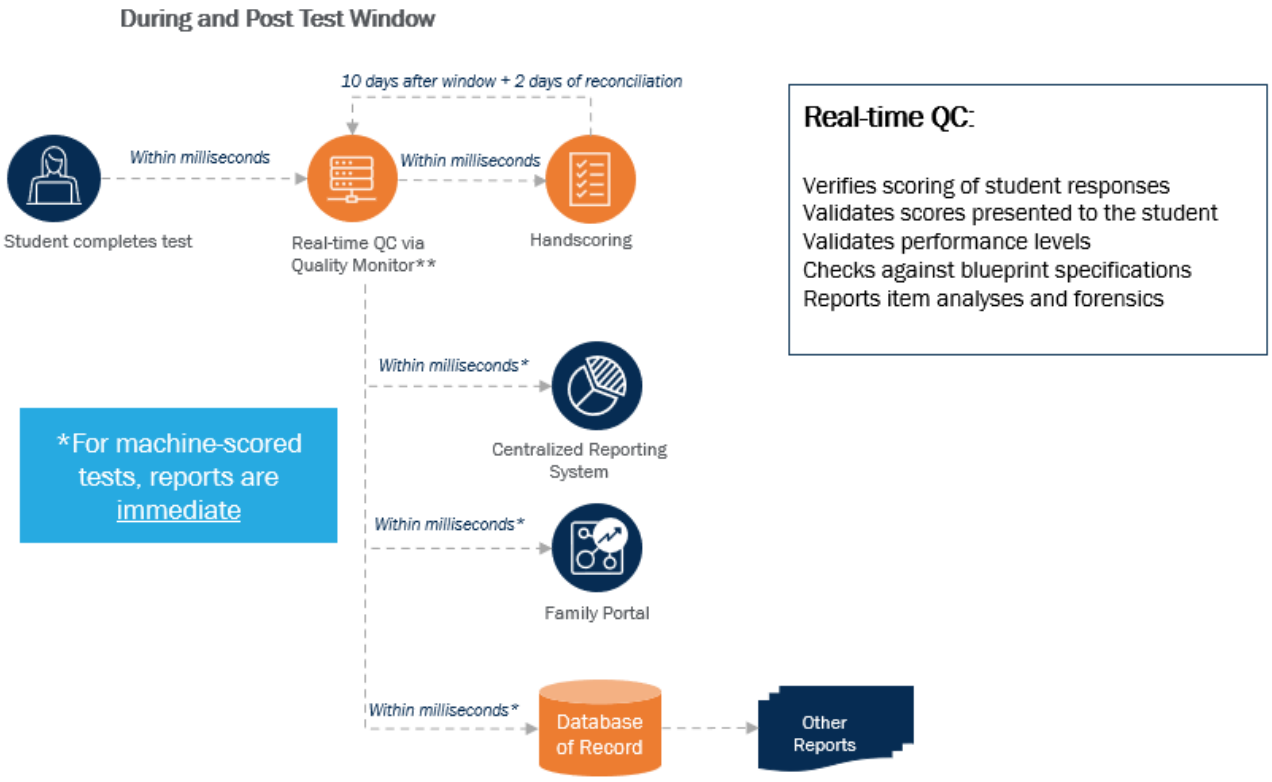
NJDOE requires that the Contractor provide a Microsoft Excel file including all contact information gathered through the Material Survey process, according to the criteria in the RFQ, and a schedule defined by the SCM. As discussed previously, the Test Information Distribution Engine (TIDE) is the system that manages contact information for paper test material shipments. Shipping address extracts can be generated easily from TIDE on demand at any time. A shipping address extract is currently supported in TIDE that includes the data elements listed in the RFQ, such as name, first-class mailing address, shipping mailing address, telephone number, and email address. If the SCM requests edits to the report, those edits will be made to the shipping addresses directly in TIDE and a new report will be generated. CAI can commit to timely delivery of this, as both the capability to edit the shipping addresses and to repull the address report are currently available via the TIDE interface.

4.13.12. Dynamic Reporting

CAI systems are data-driven and designed to provide dynamic reports whenever updates are made on the upstream systems. This includes updates made to the Test Information Distribution Engine (TIDE) or Test Delivery System (TDS). These updates are immediately sent downstream to the Database of Record (DOR), which is the source of truth for all student results—both online and on paper.

Exhibit 4.13.12-1 illustrates the workflow of dynamic and near-real-time data transfer protocols from the time the student completes the test in the TDS to the time the assessment is reported downstream in the Centralized Reporting System (CRS) and Family Portal. Prior to reporting on any completed online or paper-pencil test, CAI's platform ensures that the record is accurate. This occurs regardless of whether the test is immediately reported or released on a pre-determined schedule.

Exhibit 4.13.12-1: Workflow of Data Transfer Protocols



CAI's automated data intake, processing, and extract systems are designed for high-volume efficiency and accuracy. Each time a student completes an online assessment, the TDS transmits data from that test event to our Quality Monitor (QM) System. Upon receipt of the student record, the QM System

- verifies scoring of student responses;
- validates scores presented to the student;
- calculates any other scores that will be used in the reporting systems, along with standard errors of measurement (SEMs);
- calculates derivative measures from those scores (e.g., proficiency designations); and
- performs customized validations of incoming data.

In most cases, these checks are all passed, and the final test record is sent downstream to CAI's reporting systems. When the checks are not all passed, the test record is sent to the automated system alerts project team members and technical staff who immediately investigate and resolve the issue.

The QM System's quality checks are typically completed within one second of data receipt. Once complete, the data are transmitted to the DOR and CRS.

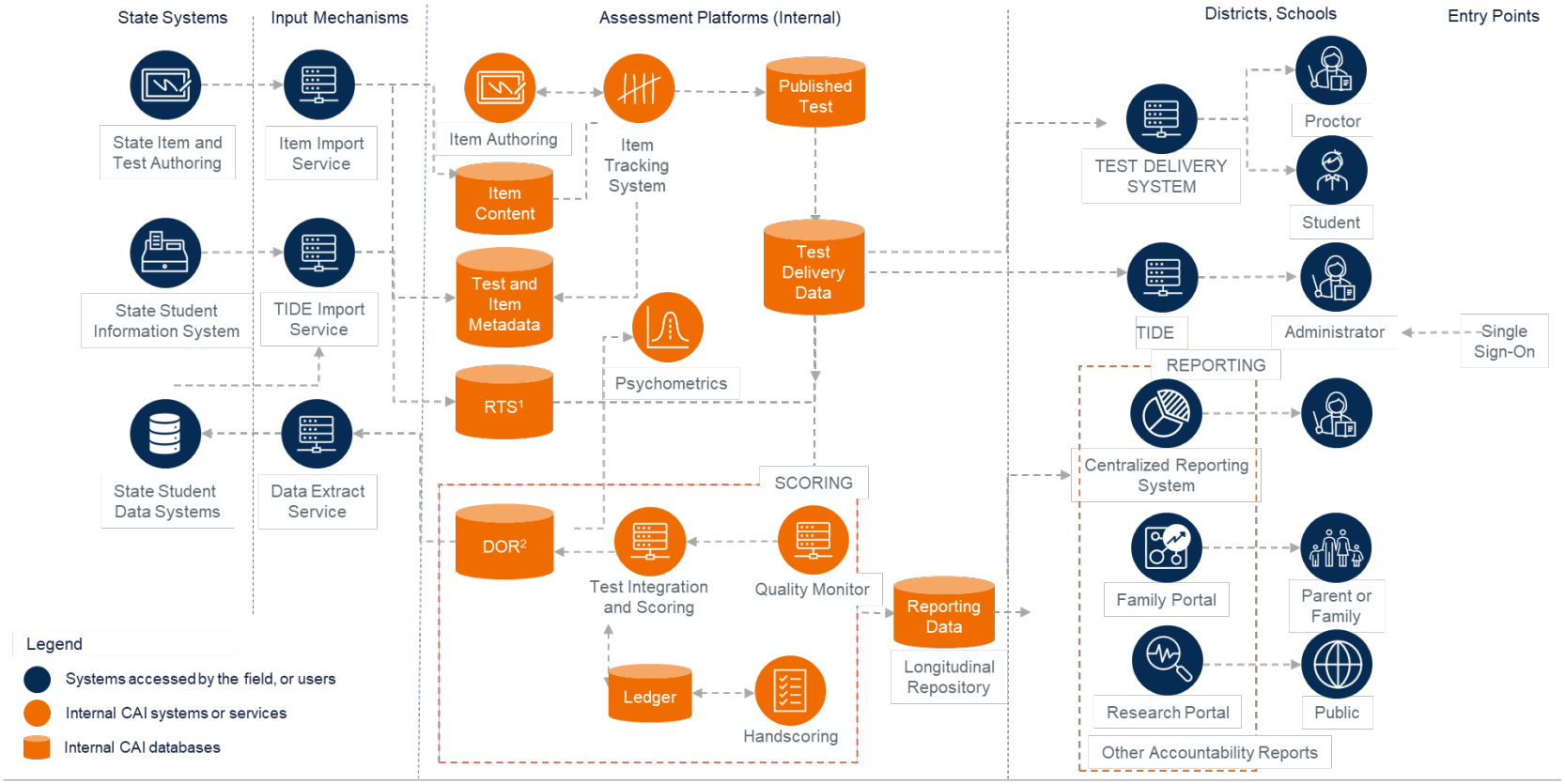
Complete Functionality for Post-Assessment Management and Storage of All Assessment Results

CAI's systems provide complete functionality for all assessment results. Exhibit 4.13.12-2 provides a schematic overview of CAI's assessment system and describes the dynamic movement of data elements from one system to another. The right side of the figure depicts the main field-facing systems, including:

- Public Portal
- Test Information Distribution Engine (TIDE)
- Test Delivery System (TDS)
- Centralized Reporting System (CRS)
- Family Portal
- Research Portal

It is important to note that for all systems used by educators and administrators, CAI employs a Single Sign-On (SSO) system as a single point of entry, allowing users to navigate seamlessly across CAI systems without logging in multiple times.

Exhibit 4.13.12-2: Overview of CAI's Online Systems



[1] RTS (Roster Tracking System): State, District, School, Center, Student Data Repository
[2] DOR (Database of Record)

TIDE is responsible for administrative tasks, including managing enrollments, capturing changes to demographic information, setting online accommodations, ordering materials, tracking testing progress, and other activities that are usually the responsibility of school and district test coordinators.

The **TDS** has two interfaces: a Test Administrator (TA) Interface and a Student Interface.

The TA Interface is the starting point for TAs when setting up a test session. Test sessions can occur in both proctored and unproctored configurations, with most test sessions created in as little as two mouse clicks. Unlike most testing systems, the TDS can either schedule sessions in advance or create sessions on the fly *without the administrative burden of pre-creating rosters*. TAs can adjust student test settings (accommodations) if they have not been preset in TIDE, start a test session, add tests to a session, admit students to an existing session, monitor the progress of each student through the test, and pause or restart test sessions.

The simple-to-use Student Interface offers a feature-rich interface delivering fully accessible tests, supported by the industry's most robust suite of interaction types and accessibility tools. The student login, which requires students to know only their first name and student identification number, is a request to enter the session. When TAs start a session, they receive a session ID, which they share with the students. The TA authenticates and approves the student into the session. This process eliminates pre-rostering, printing of test tickets, and other administrative burdens.

The **CRS** provides individual and aggregate results and offers differentiated access for various user roles. Access is controlled by both role and jurisdiction, so each user has access to data for students in his or her jurisdiction and allowed by his or her role. The system supports real-time reporting and integrates enrollment information in real time, allowing data and access to these data to follow students as they move across jurisdictional boundaries. The system supports longitudinal reporting; delivers data to teachers, schools, and districts; and provides access to highly configurable individual student reports (ISRs) that are suitable for printing and delivery to families.

At the far left of Exhibit 4.13.12-2, client systems deliver enrollment and demographic data through the TIDE import capability. This service supports continuous imports from a state data system. When an appropriate state data system is not in place, the TIDE user interface can be configured to allow uploads of appropriately formatted files.

Student data flow in our Roster Tracking System (RTS), which is accessed by all our systems. The RTS stores the hierarchy of local education agencies (LEAs), schools, teachers, classes, and custom rosters, along with student demographics and other information. Personally identifiable information (PII) is encrypted, and most systems operate only with a CAI-assigned identifier, rather than with stored PII.

The RTS supports real-time updates, which eliminate many of the administrative issues that arise from some other systems. For example, when a student moves from one school to the next in the middle of a test, the student can simply log in to the test from the new school and continue testing without any administrative intervention. When a student leaves School A and enters School B, the system prevents School A from accessing any test scores collected after the student left the school, while preserving access to data collected prior to the transfer. At the same time, School B automatically gains access to the student's test history, which enables the new school to tailor instruction from Day 1.

The center of the diagram depicts the QM System, a real-time system that monitors tests as they are completed. This system conducts a variety of tests at the end of an assessment, ensures that all machine-scored items have received scores, and stores information and

produces reports that can reveal items that have been exposed, items that are drifting from their expected performance, and anomalous changes in performance that may signal irregularities.

The bottom middle of Exhibit 4.13.12-2 depicts our analysis systems. These systems are responsible for the centralized DOR, test integration and scoring, quality monitoring, and Ledger. Ledger will monitor and track all records sent to the handscoring system. Our systems have been refined over the course of more than a decade to support error-free, immediate scoring and reporting.

An arrow indicates the flow of completed test records between our QM System and the analysis systems. We recommend that the test record includes only our internal identifier if passed among organizations, but we can create encrypted identifiers using shared private keys across the systems.

The **Family Portal** provides student-level results for families. The system supports both pre-scheduled reporting and real-time reporting and integrates with the CRS and enrollment information in TIDE, which allows access to student data to transfer to a new school along with the student. The system supports longitudinal reporting and provides direct access to families.

Static and Dynamic Generation of Reports and Robust User Interface for Multiple Reports

CAI's CRS provides static and dynamic report generation in multiple formats and at all levels. The educational world is dynamic, and the functionality of our integrated CRS reflects this growing, changing, and evolving world.

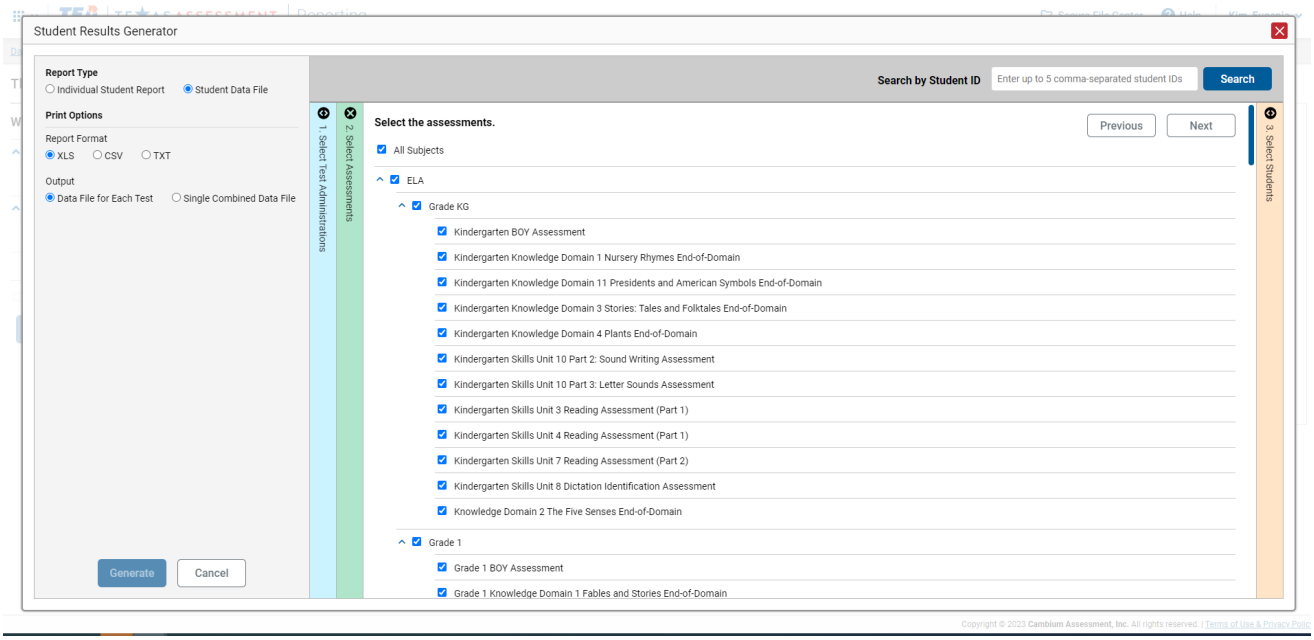
Student demographics and school/district associations can be updated at any time, and these changes are reflected immediately in the reporting system. The CRS generates reports from individual student results in real time as the results are requested. Data for aggregations are always retrieved from the RTS, which reflects the latest information about who is in what school. Note that the system also enables users to obtain information for students who were in their school on a given date. The CRS makes the data available to authorized users for download at any time, supporting district and campus needs. The system allows users to download PDF reports and data files as of the date they are viewing the results.

Static reports include offline reports generated outside of the system and then uploaded to the Secure File Center.

Dynamic reports, on the other hand, can be provided immediately at the authorized user's request through the CRS. In the following paragraphs, we describe the CRS's functionality to ensure that stakeholders can access relevant data quickly and easily.

- **Batch Printing.** Users can generate a PDF of any table on any report in the CRS. Printed tables carry with them a footnote indicating the date on which the report was generated. ISRs can be produced individually or batched as PDFs. An example of our Student Results Generator is shown in Exhibit 4.13.12-3. The system also delivers a compressed file containing ISRs as PDFs and a machine-readable manifest suitable for uploading into the district Student Information System (SIS). Most districts have these systems and maintain a secure Family Portal, providing an efficient means of delivering the ISRs to families.
- **Delivery of District Data Files.** Our CRS includes a Student Results Generator that allows users to export a raw data file by district, school, teacher, or roster as the data become available. The files can be exported into Microsoft Excel or any other delimited file format so that they can be loaded easily into other software platforms. Users can export any table on any report in the CRS.

Exhibit 4.13.12-3: Student Results Generator



- **Customizability.** All text and measures in the reporting tool are configurable, and CAI reporting staff will work closely with NJDOE to define all text and measures as part of reporting specifications development.
- **Sorting and Filtering.** Users can choose to show or hide individual columns in a table or sort columns in ascending or descending order. The filters panel is available on the left side of all report pages, allowing users to filter by specific criteria.
- **Accessibility.** The CRS is designed to be accessible not only on different devices but also by different user types, including people with disabilities. The system is Web Content Accessibility Guidelines (WCAG) 2.0 AA-certified, which means it meets federal accessibility standards.
- **Mobile Compatible Reports.** All CRS features and reports are tablet accessible. All tables and data displays adjust to the tablet screen, simplifying the process of viewing rosters, requesting downloadable data files, and accessing custom-created reports.
- **Aggregation and Disaggregation.** Aggregate reports are available at every level, and authorized users can print these reports or download them (or the data on which they are based). In addition to the expected aggregate reports for a district, school, teacher, and class, the reporting tool allows users to create custom student rosters so that groups of students in a class can be tracked and reported on separately. All aggregate reports are calculated from the student level up, so as new students test, reports for the roster, teacher, school, and district are updated instantly. All CRS aggregate reports can also be disaggregated by subgroups, as defined by NJDOE. For example, reports can be disaggregated by demographic characteristics such as gender, ethnicity, or English learner (EL) status. The CRS can also be configured to disaggregate by multiple characteristics at once (e.g., gender by ethnicity).
- **Online Help (Interpretive Guidance and Assistance).** The CRS comes with an intuitive user guide that provides step-by-step instructions for every report, information about each measure included in the CRS, and screen captures to illustrate processes and outputs. The user guide is accessible from any page in the CRS. Once the user clicks the help icon, he or she will be taken to the relevant section of the user guide specific to the page that the user is on. The CRS also has an information icon that provides a quick reference for users who want more information about how to interpret a specific reporting element.

- **Student Search.** Sometimes a user wants only an individual student's report and wants it quickly. The student search feature allows users to search by student ID. Users can see only students to whom they have access, though users can also search for students from previous years. This capability allows a user to see an individual student's results with a minimal number of clicks.
- **Compatibility.** All electronic files and web-based programming are compatible with Windows, Chrome, and Macintosh applications. CAI will provide NJDOE with the technical specifications required for any online applications.

Privacy and Security in Reporting

CAI embraces our responsibility as stewards of student information, secure test items, and all reports that include student and test data. We take clearly defined precautions to ensure data protection and privacy. With our top-tier security standards, we can ensure the security of test items and testing materials throughout the testing cycle. CAI is ISO 27001- and ISO 27018-certified to protect students' PII and test scores, and our systems are audited annually to demonstrate compliance with these industry-standard security controls. We are also certified to implement the Center for Internet Security (CIS) Top 20 controls. Our extensive security measures cover reporting; item development; item transfer to and from other vendors or subcontractors; data collection; test production; shipping and receiving of testing materials; delivery of computer-based content to schools; scanning, scoring, and analysis; storage of printed booklets; and document destruction.

In addition to being ISO 27001-certified, CAI's privacy policy is publicly available and audited to conform with the Family Educational Rights and Privacy Act (FERPA), the Children's Online Privacy Protection Act (COPPA), and California Student Privacy Certification (CSPC) guidelines.

All data exchanges between CAI's DOR and reporting systems run over encrypted HTTPS sessions with Transport Layer Security (TLS) 1.2 or higher. Furthermore, all secure data are encrypted at rest and in transit.

Single Sign-On and Identity Management

All users accessing CAI applications are authenticated using our SSO system. Password policies (e.g., password strength, expiration timelines) are fully customizable, and we can work with NJDOE to ensure that its selections comply with State policies. Role-based authorization ensures that authenticated users can perform only actions that are permissible for that role and can view data about students within their jurisdiction only. The roles and functions users can perform are fully configurable and can be set up according to NJDOE's specifications. Departing personnel accounts are immediately deactivated. CAI routinely implements multi-factor authentication for all logins.

Role-Based Login System

Our systems implement sophisticated, configurable privacy rules that strictly limit data access to appropriately authorized personnel. CAI uses role-based permissions to manage all critical systems and data. Access is controlled through well-established policies and processes for access management, user registration and deregistration, and access-privilege reviews. TIDE is the primary system used to manage client user accounts. CAI works with clients to identify the user-role hierarchy appropriate to its online suite of systems that matches the roles existing in the field. A typical hierarchy specification will include defining roles such as state-level user, district coordinator, teacher, or proctor. It will also include defining the levels of access for each user role across each system. Access to any secure system is password-protected, and users' levels of access correspond to their role and association with a specific school or district.

Refer to Section 4.7.1.3 for more details regarding identity- or role-based management.

4.14. Additional Notes and Comments

4.14.1. Mechanicals and Camera-Ready Copies

At the end of the contract, CAI will deliver mechanicals and camera-ready versions of graphics as required by this RFQ. Additionally, graphics associated with New Jersey items will be exported as part of the items.

4.14.2. Sign-Offs

CAI will provide a comprehensive yearly project schedule that provides a clear roadmap for successful program delivery. CAI will obtain SCM approval on all timelines and deliverables and will create schedules that allow for such review at appropriate stages in the project life cycle.

4.14.3. On-Site Visits

According to the requirements of this RFQ, CAI will handle meeting logistics and costs for travel, lodging, and meals for two NJDOE staff members to attend one five-day on-site visit each for mathematics and English language arts (ELA) content activities. The visits will occur annually at CAI facilities. Should more than one visit be necessary and mutually agreed upon, CAI commits to the same requirements.

4.14.4. Attendance at Conferences

CAI will cover the registration, travel, lodging, and incidental costs for the attendance of up to two NJDOE staff members at the spring meetings of the National Council on Measurement in Education (NCME) and the American Educational Research Association (AERA), as well as the annual conference of the Council of Chief State School Officers.

We understand and agree to the requirement to provide the same support for one NJDOE staff member to attend additional conferences in a year, should any of these organizations choose to hold multiple conferences.