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Independent Review

Innovative Statewide Summative Assessments in English Language Arts (ELA), Math, and Science Project (Project)
For the
State of Vermont
Agency of Education

Submitted to the
State of Vermont, Agency of Digital Services
August 10, 2022

FINAL

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1.0 Executive Summary

For all Information Technology (IT) activities over $1 million, State of Vermont (State) statute (or at the discretion of the Chief Information Officer [CIO]) requires an Independent Review by the Office of the CIO before the project can begin. The State Agency of Digital Services (ADS) engaged BerryDunn to perform an Independent Review of the previously bid Development of Innovative Statewide Summative Assessments in English Language Arts (ELA), Math, and Science Project (Project). This Independent Review began on April 14, 2022, and the presentation of findings is scheduled for the week of August 8, 2022.

The State of Vermont Agency of Education (VT AOE) is seeking assistance with development of content for and conducting innovative statewide summative student assessments of ELA, math, and science. Specifically, VT AOE is seeking use of innovative approaches to:

- Shorten test length/time

- Allow for use of novel item types

- Integrate new methods for receiving student responses

- Frame passages and excerpts through the lived experience of the historically marginalized.

In June 2021, VT AOE released a Request for Proposal (RFP) to establish contracts with one or more vendors that have demonstrated knowledge, applied experience, technical capacity, and resources to support secure provision of these summative student assessments to Vermont's population of students on an annual basis in a web-based format, with preference given to computer adaptive testing (CAT) systems. The RFP also focused on contracting with a vendor that has a demonstrated focus on socially just practice. VT AOE received responses to the RFP that did not satisfy their requirements for a demonstrated focus on socially just practice, so in September 2021, VT AOE released a second RFP that more clearly described the socially just practice requirements. VT AOE received bids from four vendors, and the State evaluation team selected Cognia for both developing and conducting statewide summative student assessments of ELA, math, and science.

While conducting the Independent Review, BerryDunn identified two risks, with one being of high impact and high likelihood of occurrence. These risks are listed in summary form in Section 1.3, and in detail in Attachment 2 – Risk Register.

1.1 Cost Summary

Table 1.1 includes a summary of the costs. More detail can be found in Section 5: Acquisition Cost Assessment and Section 10: Impact Analysis on Net Operating Costs.

Table 0.1: Cost Summary

IT Activity Life Cycle	Cost and Funding Source
Total Life Cycle Costs (Five Years)	$15,846,919
Total Implementation Costs	$46,236
New Annual Operating Costs (Five Years)	$15,822,419
Current Annual Operating Costs (Five Years)	$13,502,635
Difference Between Current and New Operating Costs	$2,319,784
Funding Source(s) and Percentage Breakdown of Multiple Sources	15% State 85% Federal

1.2 Disposition of Independent Review Deliverables

Table 1.2 includes a summary of the Independent Review findings as elaborated later in the report.

Table 0.2: Independent Review Deliverables

Deliverable	Highlights From the Independent Review Include Explanations of Any Significant Concerns
Acquisition Cost Assessment	The proposed solution does not include a one-time acquisition cost, so the only acquisition costs are for ADS services (e.g., Enterprise Project Management Office [EPMO, Enterprise Architect [EA], and security) and BerryDunn's independent review services totaling $46,236. The majority of the costs for this project (e.g., licenses, development/implementation, and maintenance) are recurring.
Technology Architecture and Standards Review	In Cognia's original proposal, Vermont was presumed to continue its membership in the Smarter Balanced Consortium (SBC), which has provided Vermont with ELA and math summative student assessments aligned to Common Core State Standards (CCSS). However, during this Independent Review and through further discussions with the SBC, the State terminated the Memorandum of Understanding (MOU) with the SBC on June 30, 2022. It is BerryDunn's understanding that the SBC also disallowed VT's use of their content for a bridge study (comparing SBC to Cognia test scores). The State then negotiated with Cognia to conduct an equipercentile study that

Deliverable	Highlights From the Independent Review Include Explanations of Any Significant Concerns
	will mathematically equate past SBC to Cognia test scores during the 2022 – 2023 school year.
Implementation Plan Assessment	A contract transition from the current vendor to the new vendor could lead to a gap in development and implementation of an assessment system. A contract transition that begins with the new vendor (Cognia) in July 2022 and ends with the current vendor on June 30, 2022 could lead to a gap in development and implementation of an assessment system. Starting the Project this close to the current contract's expiration might not allow the Project team and selected vendor enough time to develop, test, and implement the new system prior to the expiration of the current system. The State has indicated that summative student assessments developed by Cognia must be deployed in March 2023 and that there are other deliverables leading up to that spring assessment, such as user training for the education assessment community. The impact of this risk to the Project schedule is twofold: 1) training may be insufficient—if required to precede the spring deployment of summative student assessments—due to lack of training materials that would otherwise be fully developed from demonstrated, tested, and released working statewide assessment software and 2) the State could lose federal funds if there is a lapse in the provision of summative student assessments if new summative student assessments are not fully developed and administered by Cognia in the 2023 school year as required by the Every Student Succeeds Act (ESSA). Based on our interactions with the State Project Manager during this Independent Review, BerryDunn has confidence that the individual has the skills and experience necessary for the role.
Cost-Benefit Analysis	The negligible quantifiable benefits projected as a result of this effort do not outweigh the increase in annual operational costs. However, AOE has defined several intangible benefits that align with the those outlined in the approved IT Activity Business Case and Cost Analysis Form (IT ABC Form). Based on data available to BerryDunn, the firm is not able to determine if the additional operational costs are appropriate for the projected intangible benefits expected from this initiative.
Analysis of Alternatives	A team of business representatives from the State evaluated and scored various aspects of the four vendors' proposals they received. Based on the scores for program cost, the State's evaluation team deemed both Pearson and ETS financially unfeasible. While Cognia's overall score was significantly lower than CAI's overall score, the State's evaluation team identified

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Deliverable	Highlights From the Independent Review Include Explanations of Any Significant Concerns
	Cognia as the preferred vendor due to its superior approach to integrating principals of diversity, equity, and inclusion, greater return on investment, and intuitive interface. BerryDunn believes the competitive bid process was a sound approach to understanding the State's options for procuring the required statewide assessment services.
Impact Analysis on Net Operating Costs	The draft contract describes a cost model that increases the current annual operational costs by approximately $2.3 million over five years, with no breakeven point.
Security Assessment	BerryDunn did not meet with the ADS Security Office because a security analyst had not been engaged in the project at the time of this Independent Review. Based on our assessment of Cognia's proposal and information collected during an interview with the Cognia team, BerryDunn does not have any concerns with Cognia's ability to comply with State and federal security requirements.

1.3 Risks Identified as High Impact and/or Having High Likelihood of Occurrence

Table 1.3 provides a summary of each risk, including risk probability, impact, and overall rating. A complete Risk Register is included in Attachment 2.

Table 0.3: Project Risk Summaries and Ratings

Risk ID	Risk Description	Risk Likelihood/ Probability	Risk Impact	Overall Risk Rating
1	A contract transition from the current vendor to the new vendor could lead to a gap in development and implementation of an assessment system.	High	High	High
2	SBC is disallowing the State from using SBC scores to conduct a bridge study, to equate SBC to Cognia test scores, which could result in historical test scores being misaligned with Cognia test scores.	High	Medium	Medium

1.4 Other Key Issues

No other key issues were identified by BerryDunn.

1.5 Recommendation

Based on the assessment as provided in this report, and assuming that AOE and ADS execute the mitigation strategies as defined in Attachment 2, BerryDunn recommends the State proceed with this project and vendor.

Independent Reviewer Certification

I certify that this Independent Review Report is an independent and unbiased assessment of the proposed solution's acquisition costs, technical architecture, implementation plan, cost-benefit analysis, and impact on net operating costs, based on the information made available to BerryDunn by the State.

Charlie Leadbetter   8/31/2022

Independent Reviewer Signature   **Date**

1.6 Report Acceptance

The electronic signature below represents the acceptance of this document as the final completed Independent Review Report.

John Quinn   8/31/2022

State of Vermont Chief Information Officer   **Date**

Alex Ibey   8/31/2022

2.0 Scope of This Independent Review

2.1 In Scope

The scope of this document is fulfilling the requirements of Vermont Statute, Title 3, Chapter 56, §3303(d).

The Independent Review Report includes:

- An acquisition cost assessment

- A technology architecture review and standards review

- An implementation plan assessment

- A cost analysis and model for benefit analysis

- An analysis of alternatives

- An impact analysis on net operating costs for the agency carrying out the activity

- A security assessment.

This Independent Review used the following schedule:

- Week of April 11, 2022: Conduct project initiation; develop participation memos; schedule interviews; review documentation

- Week of April 18, 2022: Review documentation; conduct interviews with the State

- Week of April 25, 2022: Conduct vendor interview; conduct additional research; document findings

- Week of July 18, 2022: Provide the preliminary Independent Review Report to the State; collect feedback; update the Independent Review Report; submit the proposed final draft Independent Review Report to the State

- Week of August 8, 2022: Present the Independent Review Report to the CIO; complete any follow-up work and updates to the Independent Review Report; obtain CIO sign-off via the Oversight Project Manager on the Independent Review Report; facilitate the closeout meeting.

2.2 Out of Scope

No items from Vermont Statute, Title 3, Chapter 56, §3303(d) are out of scope for this Independent Review.

3.0 Sources of Information

3.1 Independent Review Participants

Table 3.1 includes a list of stakeholders who participated in fact-finding meetings and/or communications.

Table 0.1: Independent Review Participants

Name	Organization and Role	Participation Topic(s)
Trisha Watson	IT Project Manager and AOE Program Manager, State ADS Enterprise Project Management Office (EPMO)	• General Project Information • Implementation Plan Review • Acquisition Cost • Risk Assessment
Amanda Meredith	IT Project Manager, State ADS	• General Project Information • Implementation Plan Review • Acquisition Cost • Risk Assessment
Wendy Geller	Director of Data Management and Analysis, VT AOE	• General Project Information • Implementation Plan Review • Cost-Benefit Analysis • Risk Assessment
Amanda Gorham	Assessment Director, VT AOE	• General Project Information • Implementation Plan Review • Cost-Benefit Analysis • Risk Assessment
Thomas Gillin	Vice President, State Partnerships, Cognia	• Project Information • Implementation Plan Review • Risk Assessment
Patti Ayer	Deputy Chief Operating Officer, Cognia	• Project Information • Implementation Plan Review • Risk Assessment
Stephen Murphy	Chief Learning Officer, Cognia	• Project Information

Name	Organization and Role	Participation Topic(s)
		• Implementation Plan Review • Risk Assessment
Julie DiBona	Program/Project Manager, Cognia	• Project Information • Implementation Plan Review • Risk Assessment

3.2 Independent Review Documentation

Table 3.2 below includes a list of the documentation utilized to compile this Independent Review.

Table 0.2: Independent Review Documentation

Document Name	Description	Source
12.13.21 – AOESWA – Updated ITABC (fully executed).pdf	IT ABC Form	AOE Statewide Assessments SharePoint site: here.
AOE SWA Project RFP 2.docx	Second RFP for Development and Implementation of Innovative Statewide Summative Assessments in ELA, Math, and Science issued September 16, 2021.	AOE Statewide Assessments SharePoint site: here.
AOE SWA Bidder Response Form 2.docx	State of Vermont Bidder Response Form attachment to RFP containing functional and non-functional requirements.	AOE Statewide Assessments SharePoint site: here.
Cognia Bid Response_VT_AOE_SWA_10-29-21.pdf	Cognia proposal/response to the RFP for the State's Development and Implementation of Innovative Statewide Summative Assessments in ELA, Math, and Science.	AOE Statewide Assessments SharePoint site: here.
12.17.21 – AOE SWA Vendor Demo – Cognia.mp4	A video recording of the vendor demonstration (Cognia).	AOE Statewide Assessments SharePoint site: here.
CAI Proposal_Vermont Statewide Assessments.pdf	Cambium Assessment Inc. (CAI) proposal/response to the RFP for the State's Development and Implementation of Innovative	AOE Statewide Assessments SharePoint site: here.

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Document Name	Description	Source
	Statewide Summative Assessments in ELA, Math, and Science.	
State of Vermont_AOE SWA_ETS Response.pdf	Ed Tech Soft (ETS) proposal/response to the RFP for the State's Development and Implementation of Innovative Statewide Summative Assessments in ELA, Math, and Science.	AOE Statewide Assessments SharePoint site: here.
VAE Request for Proposal – Pearson Response.pdf	Pearson proposal/response to the RFP for the State's Development and Implementation of Innovative Statewide Summative Assessments in ELA, Math, and Science.	AOE Statewide Assessments SharePoint site: here.
Bid Scoring & Review Sheet2.xlsx	Committee evaluation data of vendor bids.	AOE Statewide Assessments SharePoint site: here.
Cognia Response to Vermont BAFO Request_1.17.22.pdf	Cognia's response to Vermont's request for a Best and Final Offer (BAFO) in response to the Development of Innovative Statewide Summative Assessments in ELA, Math, and Science RFP.	AOE Statewide Assessments SharePoint site: here.
Justificationmemo.docx	Memorandum to Secretary Daniel M. French, Secretary of Education regarding contracting with Cognia for statewide assessment solution	AOE Statewide Assessments SharePoint site: here.
Cognia, Inc. 03.29.2022.pdf	Letter of intent to award a contract to Cognia, Inc. to implement the Statewide Summative Assessments in ELA, Math, and Science.	AOE Statewide Assessments SharePoint site: here.
08.22.22 - updated AOE SWA Project Contract	A draft contract between the State of Vermont Agency of Education and Cognia, Inc. to implement the Statewide Summative Assessments in ELA, Math, and Science.	AOE Statewide Assessments SharePoint site: here.
SLA Draft_VT Cognia.docx	Draft Service-Level Agreement (SLA) between Cognia and State	AOE Statewide Assessments SharePoint site: here.

Document Name	Description	Source
	of Vermont AOE for the provisioning of IT services required support.	
GovWin Opportunity #65254	Publicly available documentation of Colorado Department of Education's acquisition of student assessment system.	GovWin.com
GovWin Opportunity #144004	Publicly available documentation of Minnesota Department of Education's acquisition of student assessment system.	GovWin.com
GovWin Opportunity #10392	Publicly available documentation of Wisconsin Department of Public Instruction's acquisition of student assessment system.	GovWin.com
GovWin Opportunity #123460	Publicly available documentation of Nevada Department of Administration's acquisition of student assessment system.	GovWin.com
GovWin Opportunity #173018	Publicly available documentation of Florida Department of Administration's acquisition of student assessment system.	GovWin.com
GovWin bid Notification #4373968	Publicly available documentation of Oklahoma Department of Administration's acquisition of student assessment system.	GovWin.com

4.0 Project Information

4.1 Historical Background

VT AOE requires the development and implementation of statewide summative student assessments that are aligned to the CCSS in the subject areas of ELA and math, and Next Generation Science Standards (NGSS) in science. Development and implementation contracts for current ELA, math, and science summative student assessments will expire on October 31, 2022, and the maximum contract terms have been executed.

The ESSA mandates that AOE administer a peer-reviewed assessment to all students in the areas of math and ELA and identify indicators of student success in other areas. Vermont's State Consolidated Plan identifies assessment of science as one of those indicators. To meet these federal requirements, AOE must administer these summative student assessments annually and has planned to do so in the spring for the 2023 school year. Compliance with ESSA and the related state plan helps to ensure the inflow of federal funds.

After a first RFP issued on June 17, 2021, yielded insufficient responses, AOE reposted a clarified RFP on September 16, 2021, to establish a contract for the Development and Implementation of Innovative Statewide Summative Assessments in ELA, Math, and Science— with particular emphasis on finding summative student assessments that strive to be culturally responsive, socially just, accessible, and innovative. AOE received four responses to the proposal and had an evaluation team of AOE Assessment Coordinators and other knowledgeable individuals score the proposals based on the following criteria:

- Demonstrated performance

- Responsiveness to specification

- Program cost

- Previous experience

- Implementation of practice that includes a commitment to: social justice, cultural relevance, inclusion, and identifying and addressing bias (race, gender, geography, economic status, etc.).

The evaluation team identified two finalists, and these vendors gave demonstrations of their proposed solutions on December 14, 2021, and December 17, 2021. Following those demonstrations, AOE sought a BAFO from each of the finalists and the State's evaluation team selected Cognia, Inc. to provide the development and implementation services for the statewide summative assessments needed. Cognia will partner with Pearson to provide the assessment platform known as ADAM (Assessment Delivery and Management). On March 16, 2022, the State Board of Education approved the team's recommendation to contract with Cognia.

4.2 Project Goals

Through the development and implementation of statewide summative student assessments, schools, districts, and the State will be enabled to make data-driven decisions about programming and services that are inclusive and equitable. Assessment results will give evidence to support professional learning, resource allocation, programming, and services directed at closing achievement gaps brought to light to better meet the needs of students in the state. The State is particularly interested in innovative approaches to:

- Shortened test length/time

- Use of novel item types

- Integration of new methods for receiving student responses

- Framing passages and excerpts through the lived experience of the historically marginalized.

VT AOE's desired outcome is to have the summative student assessments deployed starting March 2023 to grades 3 – 9 in ELA and math, and grades 5, 8, and 11 in science.

4.3 Project Scope

The State's Project scope seeks the development and implementation, including data reporting, of secure, web-based, computer-adaptive, statewide summative student assessments in ELA, math, and science that are aligned to the CCSS in ELA and math and NGSS in science, that meet federal requirements under ESSA and the United States Department of Education (USED) peer review, and that strive to be culturally responsive, socially just, accessible, and innovative. The State's Project scope is comprised of the following non-functional requirements:

- Hosting

- Application solution

- Security

- Data compliance (the solutions must adhere to applicable State and federal standards, policies, and laws).

The State's Project scope is comprised of the following functional requirements:

- Assessment development

- Assessment delivery

- Project management

- Reporting.

4.4 Major Deliverables

Table 4.1 provides a summary of the deliverables, descriptions, and frequency, as articulated in the draft contract with Cognia.

Table 4.1: Project Deliverables and Frequency Proposed by the Vendor

Deliverable	Description	Frequency
Requirements Discovery Sessions (grooming)	Requirements in the form of user stories are at a high level. Requirements will need to be refined and defined to the appropriate level of detail. Acceptance criteria shall be defined for all user stories. User stories and acceptance criteria must be captured and managed.	Initially to ensure scope of project is well understood; ongoing at the beginning of each release and/or sprint as needed
Prioritized Product Backlog	Backlog of all user stories that are prioritized according to their business value. This is an ongoing exercise through the project life cycle that is typically done before each sprint.	Ongoing; typically done before each sprint
Release and Sprint Schedule	Based on the prioritized backlog, a release and sprint schedule should be created that is incorporated into the Implementation Master Schedule (IMS).	Initially after discovery and prioritized backlog are created, updated as needed throughout
Deliverable Expectation Document (DED)	Criteria that establish the acceptance and rejection criteria of each project deliverable and who is response for approval of the deliverable.	Once per deliverable
Deliverable Acceptance Form (DAF)	Obtain sign-off at the completion of each project deliverable as defined by the DED.	Once per deliverable
Change Requests	Formal document that outlines any changes to the Contract scope, schedule, budget, and resources.	As needed; completed by PM of the requesting party
Risk and Issue Log	A log of all risks and issues (opened and closed) that could (risk) or are (issue) impacting the project. Risks should be outlined by their impact and their potential to occur. All risks and issues should have an owner and a clearly defined response strategy.	Weekly (minimum); log is kept updated by State PM, but Contractor PM is expected to participate and provide risk and issue information from Contractor perspective
Action Items	A log of open and resolved/completed action items. Each action item should identify an owner and date needed for completion.	As needed; completed by PM of responsible party

Deliverable	Description	Frequency
		for the completion of the Action Item
Decision Log	A log of all decisions made over the course of the project. Decisions should have a date and name of decider.	Weekly; decisions logged by the PM of party making decision
Test Plans	A description of the testing approach, participants, sequence of testing, and testing preparations	Once
Test Cases and Results	The specific test cases and/or scripts to be tested and the testing results. Test cases must tie back to the project requirements (to ensure each one has been met).	Create once then update with results
IMS	The IMS outlines how the project will go live and will include a detailed plan for the exact events that need to occur, assigned to the resources that need to do them, and the timeframe for when they need to get done.	Within 30 days of contract execution, updated weekly
Project Status Reports	Provides an update on the project health, accomplishments, upcoming tasks, risks and significant issues. The Status Report and the project health color shall be developed in consultation with the State business lead and State PM.	Weekly
Meeting Agenda/ Minutes	All meetings will have an agenda and minutes. The minutes shall contain items discussed and the risks, issues, action items, and decisions made during the meeting. Minute criteria shall be transcribed over to the main logs.	Per occurrence; 24 hours prior to meeting for agendas and 24 hours after meeting for minutes

4.5 Project Phases and Schedule

Table 4.2 is a summary of Project phases/milestones, dates, and tasks planned, as articulated in the draft contract with Cognia.

Table 4.2: Project Phases/Milestones, Dates, and Tasks

Project Phase/Milestone	Date(s)	Phase Description
Initiation	8/5/22 – 8/25/22	Cognia conducts kickoff meeting, and planning and preparation of project management planning documentation.

Project Phase/Milestone	Date(s)	Phase Description
Requirements Gathering	8/30/22 – 11/4/22	Cognia performs necessary requirements gathering to finalize functional and technical requirements and identify gaps between State requirements and solution capabilities.
Implementation	9/28/22 – 1/19/23	Cognia installs and configures the solution in a test environment.
Testing	1/11/23 – 1/27/23	Cognia develops test plans, and the State subject matter experts (SMEs) perform solution testing in a test (not live) environment in accordance with the Cognia-developed plans.
Training	2/6/23 – 2/15/23	Cognia conducts training of State personnel (train-the-trainer or train the user).
Legacy Data Migration	9/28/22 – 12/9/22	Cognia performs all necessary legacy data migrations using State-approved migration plan and data-mapping templates.
Deployment	1/28/23 – 3/14/23	Cognia implements the tested and State-approved solution in the production environment for additional State testing and go-live.
Post-Implementation Support/Warranty	3/14/23 – 7/4/2026	Cognia corrects all defects found.

5.0 Acquisition Cost Assessment

Table 5.1 includes a summary of acquisition costs reported to BerryDunn during this Independent Review.

Table 0.1: Acquisition Cost Assessment

Acquisition Costs	Cost	Comments
Implementation Services	$0	Professional services fees are recurring and are not a one-time implementation cost. This information was obtained from the draft contract.
Software	$0	License fees are recurring annually. This information was obtained from the draft contract.
ADS EPMO Project Oversight	$2,816	Four hours per month for eight months at $88 per hour.
ADS EPMO Project Manager	$14,080	Five hours per week for 32 weeks at $88 per hour.
ADS EPMO Business Analyst (BA)	$0	N/A
ADS Enterprise Architect (EA)	$3,080	20 hours at $88 per hour.
ADS Security Staff	$1,760	35 hours at $88 per hour.
ADS IT Labor	$0	N/A
Other State Labor	$0	N/A
Independent Review	$24,500	This cost was obtained from the BerryDunn Independent Review contract.
Total One-Time Acquisition Costs	**$46,236**	

1. **Cost Validation:** Describe how you validated the acquisition costs.

   BerryDunn validated acquisition costs during documentation review, an interview with ADS' project manager, and follow-up communications with ADS via email.

2. **Cost Comparison:** How do the acquisition costs of the proposed solution compare to what others have paid for similar solutions? Will the State be paying more, less, or about the same?

   BerryDunn researched GovWin—a government contracting intelligence platform from Deltek—to research what other state government agencies have paid for similar solutions and services. In Table 5.2 below, BerryDunn compared the anticipated cost for statewide assessments to peer states agencies.

Table 5.2: Cost Assessment for Peer State Agencies

State Agency	Cost	Vendor
Colorado Department of Education	$10,156,000	NCS Pearson Inc.
Florida Department of Education	$26,633,000	NCS Pearson Inc.
Minnesota Department of Education	$28,592,000	NCS Pearson Inc.
Wisconsin Department of Public Instruction	$22,000,000	CTB/McGraw Hill
Nevada Department of Administration	$51,457,000	CTB/McGraw Hill
Oklahoma Department of Education	$4,698,000	Cognia

Given potential differences in solutions and services procured by other states, this analysis is intended to be directional in nature and should not serve as a basis for what Vermont should be paying.

3. **Cost Assessment:** Are the acquisition costs valid and appropriate in your professional opinion? List any concerns or issues with the costs.

In addition to our market research, we based our cost assessment on the work we have performed in other states during the planning and implementation of similar solutions.

Based on BerryDunn's analysis experience, we believe the State is paying comparable costs to similar solutions and services in the market.

6.0 Technology Architecture and Standards Review

1. **State's IT Strategic Plan:** Describe how the proposed solution aligns with each of the State's IT Strategic Principles:

   a. Assess how well the technology solution aligns with the business direction

Key Desired Outcome	Description
Hosting, developing, and implementing a secure and data-compliant statewide application solution	Cognia proposed a software as a service (SaaS) assessment platform solution built on the ADAM system provided by its partner, Pearson. The solution is hosted in a secure virtual private cloud, and the solution provider is SOC 2 Type II certified, ensuring data and security compliance (details of which are provided in answers to later questions in this section of the report).
Data reporting of summative student assessments	The ADAM assessment platform reporting component allows for the following: • Customized ad hoc reporting • Assessment status reporting • Assessment results reporting.
Summative student assessments in ELA and math that are aligned to the CCSS Summative student assessments in science that are aligned to NGSS	In Cognia's original proposal, Vermont was presumed to continue its membership in the Smarter Balanced Consortium (SBC), which has provided Vermont with ELA and math summative student assessments aligned to CCSS. However, during this Independent Review and through further discussions with the SBC, the State terminated the MOU with the SBC on June 30, 2022. It is BerryDunn's understanding that the SBC disallowed VT's use of their content for a bridge study (comparing Cognia scores to SBC scores). The State then negotiated with Cognia to conduct an equipercentile study that will mathematically equate past SBC to Cognia test scores during the 2022 – 2023 school year.
Summative student assessments that meet federal requirements under ESSA and USED for peer review	The Cognia proposal states that for science, a program using the Cognia Science test solution will be submitted for peer review in fall 2022 under the Elementary and Secondary Education Act of 1965 (ESEA) and more recent authorization under ESSA. The State should follow up to ensure this takes place to confirm compliance with this requirement. The Cognia proposal offers information about the SBC ELA and math content's peer review compliance; however, BerryDunn could not find information about Cognia's licensed ELA and math content's peer review.

Key Desired Outcome	Description
Secure provision of summative student assessments to Vermont's students	Cognia's proposed solution platform, ADAM utilizes a TestNav component for test delivery, which allows test administrators to control authorization of individual students who log in with unique credentials. The TestNav component runs a secure kiosk that locks down the testing device and disallows printing, cutting, and pasting. Students cannot visit websites or access other applications on the device during the test.
Web-based assessment development, delivery, scoring, and computer adaptive testing	Cognia's proposed solution platform, ADAM, utilizes TestNav, a web-based component for test delivery that contains a computer adaptive test engine aligned to industry standards. The TestNav component of the proposed solution also provides automated machine scoring, while another component of the platform, OSCAR (Online Scoring and Reporting), allows for manual, human scoring.
Summative student assessments that strive to be culturally responsive and socially just	Cognia's response points out that its Director of Diversity, Equity, and Inclusion and its Measurement Services Senior Advisor for Content are collaborating with measurement and education leaders at Historically Black Colleges and Universities to recruit interns for the content development program, which offers opportunities to complete research into related diversity, equity, accessibility, and inclusion. Cognia's response highlights ways in which its content specialists evaluate items for bias and sensitivity, and it notes its commitment to social justice, inclusivity, and accessibility by striving to understand the culture, context, socioeconomics, values, and experiences of students and communities that the program will serve. Cognia offers its commitment to collaborate with AOE to engage with stakeholders through focus working groups, and/or surveys to generate qualitative data and meaningful reflections and experiences that its content development team can leverage for the State's assessment content.
Summative student assessments that are accessible	Cognia's response points to its team of accessibility specialists with a background in special populations. These experts review for clarity and simplicity of graphics and text, appropriateness of vocabulary and sentence complexity for the grade level, and content that might unfairly advantage or disadvantage any student group. Cognia's graphic artists and content editors use checklists and other specifications derived from principles of Universal Design for Assessment (UDA), which focuses on developing content and assessments that reach the widest population of students possible. Stimuli and items on the test are designed to simply and clearly present tasks to provide maximum readability, comprehensibility, and legibility. Cognia's proposal contains an appendix item containing its Accessibility

Key Desired Outcome	Description
	Guide, which identifies all the accessibility and accommodations available in its systems, including their proposed platform's TestNav delivery component.
Summative student assessments that are innovative in the following ways: • Shortened test length/time • Use of novel item types • Integration of new methods for receiving student responses. Framing passages and excerpts through the lived experience of the historically marginalized	Cognia's response recommends the State establish a task force to discuss future innovations. It identifies the Innovative Assessment Demonstration Authority (IADA), which is an innovative assessment pilot program offered by ESSA. Cognia points to some limitations with that program and suggests the State would be better served by its own task force to study challenges faced by other innovative pilots.

b. **Assess how well the technology solution maximizes benefits for the State**

Primary benefits to the State provided by the solution will be those articulated in the IT ABC Form and the RFP:

- **Customer Service Improvement:** Standardized, statewide assessment, as a practice, provides several types of efficiencies for districts and schools. Assessment results inform practice and resourcing at the school, district, and state levels. The new solution will continue to provide, if not improve, these efficiencies.

- **Risk Reduction:** The new solution will reduce risk to the State by maintaining compliance with federal requirements under ESSA.

- **Compliance:** Compliance with ESSA and the related state plan ensures the inflow of federal funds.

c. **Assess how well the information architecture of the technology solution adheres to the principle of Information is an Asset**

The solution platform provider adheres to the data privacy laws of the jurisdiction in which they do business. Its use of Amazon Web Services (AWS) provides the flexibility to limit data where it is stored and the destinations to which it is transmitted. Further, Cognia concurs on the Bidder Response Form that State data, including user information and results that Vermont may enter, migrate, or transmit using ADAM or OSCAR, will be owned by the State and available for export at the State's discretion without additional charge. Lastly, the solution platform provider is SOC 2 Type II certified, which ensures data compliance in all required areas.

    d. Assess if the technology solution will optimize process

The solution offered by Cognia has the advantages of being a fully developed stable platform deployed in other states that is configurable and customizable to the State's needs.

    e. Assess how well the technology solution supports resilience-driven security

The proposed platform is a SaaS solution hosted in an Amazon virtual private cloud (VPC). The State's Summative Assessment program will be deployed through AWS and stored in Amazon's network of regional data centers with Amazon's Simple Storage Service (S3). The proposed solution services will run in multiple availability zones, and business-critical systems will be fully duplicated across zones. In the event of a disaster, recovery time will be eliminated, and network traffic will be routed to healthy availability zones. Enterprise monitoring tools are utilized to monitor network operations and provide real-time information on system operation, failures, and outages.

2. **Sustainability:** Comment on the sustainability of the solution's technical architecture (i.e., is it sustainable?).

The solution provider platform, known as ADAM, is a secure cloud-hosted SaaS platform that is scalable and stable, hosted in a VPC over distributed availability zones and designed with well-documented Application Programming Interfaces (APIs) in order to be easily integrated with other educational infrastructure components. The underlying framework provides for the flexibility to customize and accommodate new assessment requirements and features that may be needed by the State's assessment programs over time.

3. **How does the solution comply with the ADS Strategic Goals enumerated in the ADS Strategic Plan of January 2020?**

The Cognia solution complies with the following ADS strategic goals, enumerated in the ADS Strategic Plan of January 2020:

- Vermonter experience: Well-designed online transaction will reduce complexities, frustrations, and time expended by Vermonters obtaining the services they are entitled to.

  - This will be achieved through a more modern solution, with more customer self-service functionality than the past solution and: shortened test length/time, use of novel item types; integration of new methods for receiving student responses, and framing passages and excerpts through the lived experience of the historically marginalized.

4. **Compliance with the Section 508 Amendment to the Rehabilitation Act of 1973, as amended in 1998:** Comment on the solution's compliance with accessibility standards as outlined in this amendment. Reference: http://www.section508.gov/content/learn.

It is BerryDunn's understanding that compliance with the Section 508 is not pertinent to this contract, as the State did not include it in the requirements.

However, the proposed vendor solution uses a test delivery system that adheres to general accessibility standards for online technology, including Question and Test Interoperability (QTI), Accessible Portable Item Protocol (APIP) and Web Content Accessibility Guidelines (WCAG).

5. **Disaster Recovery:** What is your assessment of the proposed solution's disaster recovery plan? Do you think it is adequate? How might it be improved? Are there specific actions that you would recommend to improve the plan?

The proposed platform is a SaaS solution hosted in an Amazon VPC. The State's Summative Assessment program will be deployed through AWS and stored in Amazon's network of regional data centers with Amazon's S3. The proposed solution services will run in multiple availability zones, and business-critical systems will be fully duplicated across zones. In the event of a disaster, recovery time will be eliminated and network traffic will be routed to healthy availability zones. Enterprise monitoring tools are utilized to monitor network operations and provide real-time information on system operation, failures, and outages.

Additionally, snapshots will be taken automatically every hour for archiving purposes and the proposed solution vendor will utilize continuous cloud backups that log full operations for the last hour permitting a restore to any point in time within that window.

ADAM's standard minimum Recovery Point Objective (RPO) is 48 hours (i.e., maximum data loss cannot exceed 48 hours), and standard Recovery Time Objective (RTO) is 48 hours (i.e., maximum time to recover the system cannot exceed 48 hours).

The solution platform provider follows ITIL best practices for incident management. Their Disaster Recovery Team will communicate with VT AOE in accordance with established plans in the event of a disaster. The Disaster Recovery Team also addresses any gaps that are discovered during annual disaster simulations when it comes to RPO and recovery time objective (RTO).

It is BerryDunn's belief that the proposed solution platform provider's disaster recovery plan meets industry best practices and technical standards.

6. **Data Retention:** Describe the relevant data retention needs and how they will be satisfied for or by the proposed solution.

The State's non-functional requirements state that, "Any solution vendor must provide for the…data retention…of a contracted/hosted application solution." It does not specify which data and for how long; however, Cognia's proposal states it will retain scoreable test materials for a period of one year from the last day of the test administration from which they were collected and retain non-scoreable test materials for a period of six months from the last day of the test administration from which they were collected. Cognia will retain

electronic copies of returned test materials for the full term of the contract agreement. Cognia's proposal further states that it will require the State's approval prior to destroying any materials.

It is BerryDunn's assessment that the State's data retention needs will be met for this proposed solution.

7. **SLA:** What are the post-implementation services and service levels required by the State? Is the vendor-proposed SLA adequate to meet these needs, in your judgment?

Support Service	Description	Vendor-Proposed Service Response
Monitoring	Pearson shall constantly monitor the availability and performance of ADAM and report errors or suspected errors that occur and immediately report to the designated Cognia Program Manager.	Enterprise monitoring tools are utilized to monitor network operations and provide real-time information on system operation, failures, and outages.
Backup	Pearson shall establish industry-standard operational backup processes and procedures for ADAM and provide documentation related to such backup processes and procedures upon request.	Backup solutions within each cloud environment have been implemented to ensure the backup of files and databases required to properly support the systems and applications related to the ADAM system. Production databases are backed up daily; certain systems also use technologies that provide point-in-time recovery of data. The backups are stored encrypted within highly available object-based storage stored separately from the primary location.
Hosting location	ADAM will be hosted within the United States.	The technology platform is a SaaS solution offering VPC hosting through AWS and its network of regional data centers. All data processed, stored, and managed for the Vermont Innovative Statewide Summative Assessment program will be hosted with AWS data centers in the United States.
Uptime	ADAM shall be available to its end users, excluding scheduled maintenance, during the contractually defined windows of time.	Because the ADAM Technology Platform is a cloud-hosted SaaS solution, the hours of system availability can be established to meet the State's needs, including SLAs up to 24/7/365.
Emergency Maintenance	In the event the need for emergency maintenance of ADAM arises Pearson will notify Cognia of the	As with all IT solutions, patches, updates, and fixes to unexpected events need to be deployed from time to time. Pearson

Support Service	Description	Vendor-Proposed Service Response
	specific circumstances giving rise to the emergency need immediately and shall schedule the emergency downtime as to avoid significant impact to end users as much as reasonably possible.	establishes regular maintenance windows and coordinates with customers as needed to ensure minimal interruption to assessment services. Pearson's goal is to make sure customers know in advance about any update or system downtime that may be necessary.

It is BerryDunn's belief that the vendor's proposed services will be adequate to meet the State's needs. In further support of BerryDunn's assessment, the State's draft SLA requires and is aligned to the vendor's proposed three-tiered system of support where the Service Provider's Cognia Client Care Center (CCC) resolves incidents at each level and provides one point of contact for customers. Table 6.4 identifies the State's SLA levels of service as pulled directly from the vendor's proposal.

Table 6.4: SLA Levels of Service

Support Tier	Description
Tier I	The Cognia CCC service representative will be responsible for owning the support ticket from beginning to end while keeping Program Management updated every step of the way. He/she will respond to basic policy, materials, and procedure questions including password resets, administration procedure questions, ordering of additional materials (labels, test materials), workshop signup, UPS pickup assistance, and discrepancies.
Tier II	The CCC representative will engage the caller on common mid-level technical questions such as local system set-up or data formatting, as well as solutions to other identified issues that may be more technical, but for which systems engineers have provided resolution methods. If necessary, the appropriate program management representative(s) will be contacted to assist with resolution and/or engage VT AOE as needed.
Tier III	These events often require Subject Matter Experts (SMEs) in a particular area such as development, systems engineers, and/or third-party support such as Pearson. The CCC representative or the Program Manager will identify the necessary resource, make contact, and provide resolution to the caller as quickly as possible. We work seamlessly with Pearson to address any issues that need to be escalated to them for support for the online administration, assessment, and reporting modules that teachers and students will use.

8. **System Integration:** Is the data export reporting capability of the proposed solution consumable by the State? What data is exchanged and what systems (State and non-State) will the solution integrate/interface with?

During our stakeholder interviews, the AOE's Chief Data Officer indicated that the enterprise data environment is being built currently, using the Common Education Data Standards Data Model, which is a fully extensible data model. It is capable of living locally or within an elastic cloud environment and uses Master Data Management principles, aligned to the Common Education Data Standards (CEDS). Cognia's proposed solution for the summative assessment platform identifies data exchange and service integrations for student roster data, district, and school organization data, and assessment results. Figure 6.1 below illustrates integration junctures and data flow from the state rostering data store into the ADAM test Administration Platform and complete Assessment Results out to the Vermont data store.

Cognia's proposed solution supports and prefers CEDS data format (among others) and data transport via secure API or Secure File Transfer Protocol (SFTP) Item Format Standard: QTI 2.1 and 3.0 and Learning Tools Interoperability Framework (LTI).

Figure 6.1 Proposed Solution Platform Architecture Diagram
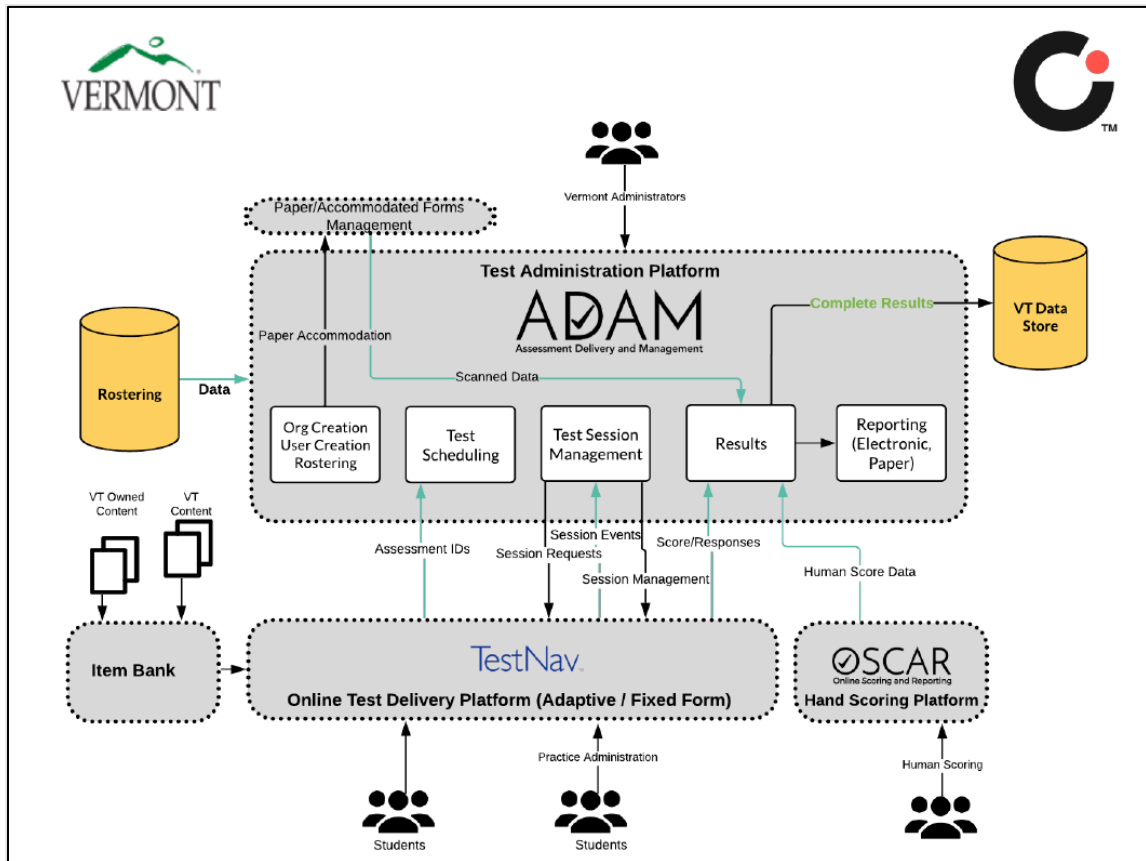
7.0 Assessment of Implementation Plan

1. **The reality of the implementation timetable.**

   The implementation timeline is grouped into the following phases:

Phase	Estimated Dates	Phase Description
Initiation	8/5/22 – 8/25/22	Cognia conducts kickoff meeting, and planning and preparation of project management planning documentation.
Requirements Gathering	8/30/22 – 11/4/22	Cognia performs necessary requirements gathering to finalize functional and technical requirements and identify gaps between State requirements and solution capabilities.
Implementation	9/28/22 – 1/19/23	Cognia installs and configures the solution in a test environment.
Testing	1/11/23 – 1/27/23	Cognia develops test plans, and the State subject matter experts (SMEs) perform solution testing in a test (not live) environment in accordance with the Cognia-developed plans.
Training	2/6/23 – 2/15/23	Cognia conducts training of State personnel (train-the-trainer or train the user).
Legacy Data Migration	9/28/22 – 12/9/22	Cognia performs all necessary legacy data migrations using State-approved migration plan and data-mapping templates.
Deployment	1/28/23 – 3/14/23	Cognia implements the tested and State-approved solution in the production environment for additional State testing and go-live.
Post-Implementation Support/Warranty	3/14/23-7/4/2026	Cognia corrects all defects found.

   A contract transition from the current vendor to the new vendor could lead to a gap in development and implementation of an assessment system. A contract transition that begins with the new vendor (Cognia) in July 2022 and ends with the current vendor on June 30, 2022 could lead to a gap in development and implementation of an assessment system. Starting the Project this close to the current contract's expiration might not allow the Project team and selected vendor enough time to develop, test, and implement the new system

prior to the expiration of the current system. The State has indicated that summative student assessments developed by Cognia must be deployed in March 2023 and that there will be other deliverables leading up to that spring assessment, such as user training for the education assessment community. The impact of this risk to the Project schedule is twofold: 1) training may be insufficient—if required to precede the spring deployment of summative student assessments—due to lack of training materials that would otherwise be fully developed from demonstrated, tested, and released working statewide assessment software and 2) the State could lose federal funds if there is a lapse in the provision of summative student assessments if new summative student assessments are not fully developed and administered by Cognia in the 2023 school year as required by the ESSA.

2. **Readiness of impacted divisions/departments to participate in this solution/project (consider current culture, staff buy-in, organizational changes needed, and leadership readiness).**

    Based on interviews, it appears that State staff are ready to embrace the new platform, as it will provide new and improved functionality (e.g., translations, parent portal, and data management/reporting). Cognia plans to provide just-in-time end-user training (both in-person and via webinar for testers) and to record and share them with end users, and its proposal provides a sufficient plan/approach for such.

3. **Do the milestones and deliverables proposed by the vendor provide enough detail to hold the vendor accountable for meeting the business needs in these areas?**

    a. **Project Management**

        In its proposal, Cognia describes developing/following/maintaining/monitoring a project management plan, communication management plan, business partner roles and responsibilities document, quality assurance plan, client deliverable acceptance form, change request log, risk log, and process for creating meeting agendas and logging meeting notes and action items. Cognia also describes enough of the methods/strategies/formats that will be used for these items to provide enough detail to hold them accountable for meeting the business needs in the area of project management.

    b. **Training**

        In its proposal, Cognia describes its test administration training efforts via in-person regional workshops—and recorded training sessions available online through the Pearson platform—that will cover the User Guide and an Accommodation and Accessibility Guide and topics such as scheduling sessions, registering students in the ADAM system, conducting the online testing sessions, understanding the features and capabilities of the student interface (including accommodation options), interpretation of test results and scoring, etc., which is enough detail to hold Cognia accountable for meeting the business needs in the area of training

    c. **Testing**

In its proposal, Cognia describes its approach to verifying technology readiness, which includes a technology and infrastructure evaluation, infrastructure trial(s), on-demand customized technical consultations, TestNav App checks, network checks, and online assessment data analytics. Cognia also describe its process for developing unit test cases, conducting security testing, conducting code reviews, performing load testing, and performing UAT— which is enough detail to hold Cognia accountable for meeting the business needs in the area of testing.

d. Design

In its proposal, Cognia describes its approach to development of the Science Secure Item Bank (SSIB) assessment items and tests. Cognia describes the Principled Approach to assessment Design, Development, and Implementation (PADDI), based on the work of Cognia's Dr. Steve Ferrara, in Ferrara, Lai, Reilly, and Nichols (2016). Using the PADDI, Cognia describes in detail how it plans to guide the assessment program design, development, and reporting decisions to align to industry best practices (as outlined in the Standards for Educational and Psychological Testing and integrating the Council of Chief State School Officers (CCSSO) Criteria for Procuring and Evaluating High-Quality Assessments) and meet federal peer review requirements—which is enough detail to hold Cognia accountable for meeting the business needs in the area of design. This is largely an out-of-the-box solution.

e. Conversion (If Applicable)

In its proposal, Cognia describes data exchange and service integrations for student roster data, district, and school organization data, and assessment results—including integration junctures and data flow from the State rostering data store into the ADAM test administration platform and complete assessment results out to the State data store. This description also explains that a CEDS data format is preferred (among others) and that data transport will occur via secure API or SFTP Item Format Standard: QTI 2.1 and 3.0, and LTI—which is enough detail to hold Cognia accountable for meeting the business needs in the area of conversion.

f. Implementation Planning

In its proposal, Cognia provided a sample project work plan—similar to one it will develop for the State—and a proposed project schedule that has enough detail to hold Cognia accountable for meeting the business needs in the area of implementation planning.

g. Implementation

In its proposal, Cognia describes its approach to development of the SSIB assessment items and tests. Cognia describes the PADDI, based on the work of Cognia's Dr. Steve Ferrara, in Ferrara, Lai, Reilly, and Nichols (2016). Using the PADDI, Cognia describes in detail how it plans to guide the assessment program design, development, and reporting decisions to align to industry best practices (as

outlined in the Standards for Educational and Psychological Testing and integrating the CCSSO Criteria for Procuring and Evaluating High-Quality Assessments) and meet federal peer review requirements—which is enough detail to hold Cognia accountable for meeting the business needs in the area of implementation.

4. **Does the State have a resource lined up to be the project manager on the project? If so, does this person possess the skills and experience to be successful in this role, in your judgment? Please explain.**

Based on our interactions with the State Project Manager during this Independent Review, BerryDunn has confidence that the individual has the skills and experience necessary for the role.

8.0 Cost Analysis and Model for Benefit Analysis

1. **Analysis Description:** Provide a narrative summary of the cost-benefit analysis conducted. Be sure to indicate how the costs were independently validated.

    To conduct the cost-benefit analysis, BerryDunn used the draft contract and the most recent version of the IT ABC form, both of which the State provided.

    BerryDunn validated each cost through the following methods:

    - Annual costs for Cognia's services were verified in the draft contract.

    - The cost for ADS project oversight, project management, EA, and security staff were verified in the most recent version of the IT ABC form.

    A detailed breakdown of these costs can be found in Attachment 1 – Life Cycle Cost-Benefit Analysis.

2. **Assumptions:** List any assumptions made in your analysis.

    This is a five-year lifecycle project, beginning in August 2022.

3. **Funding:** Provide the funding source(s). If multiple sources, indicate the percentage of each source for both acquisition costs and ongoing operational costs over the duration of the system/service life cycle.

    The State will receive 85% federal funding, leaving 15% to be paid with State funding.

4. **Tangible Costs and Benefits:** Provide a list and description of the tangible costs and benefits of this project. It is "tangible" if it has a direct impact on implementation or operating costs (an increase = a tangible cost, and a decrease = a tangible benefit). The cost of software licenses is an example of a tangible cost. Projected annual operating cost savings is an example of a tangible benefit.

    Tangible Costs

    Licenses, Support, and Maintenance – These combined fees total $617,636 for FY 2023; $606,296 for FY 2024; $617,839 for FY 2025; $617,945 for FY 2026, and $618,054 for FY 2027 for a total of $3,077,770 over the first five years of the five-year lifecycle.

    Professional Services – Implementation services include project management, system development, implementation/deployment, quality management, and training. These combined fees total $2,713,297 for FY 2023; $2,448,251 for FY 2024; $2,489,260 for FY 2025; $2,518,618 for FY 2026, and $2,553,487 for FY 2027 for a total of $12,747,413 over the first five years of the five-year lifecycle.

    ADS Services – ADS services include project oversight, project management, enterprise architecture, and security analysis. These costs total $21,736.

Tangible Benefits

AOE reported that this investment will significantly decrease the workload for AOE and State education staff by consolidating contracts and utilizing vendor resources for development and implementation activities. Historically, AOE has had to dedicate three full-time employees (FTEs) for the development and implementation of the current solution and has also had to recruit Vermont educators to participate in this effort. AOE believes this can be reduced to approximately 1.5 AOE FTEs, as outlined below.

- Project Management and accommodations and accessibility coordinator (1 FTE)

- Accommodations and accessibility subject matter expert (SME) support (.2 FTE)

- ELA, Math, and Science SME support (cumulative .3 FTE)

Using an annual, fully loaded (e.g., salary, pension, and benefits) value of $100,000, this represents an AOE business operational savings of approximately $150,000 per year. Over a five-year period, this equates to $750,000.

5. **Intangible Costs and Benefits:** Provide a list and descriptions of the intangible costs and benefits. Its "intangible" if it has a positive or negative impact but is not cost related. Examples: Customer service is expected to improve (intangible benefit) or employee morale is expected to decline (intangible cost).

Based on documentation review and interviews with the State, BerryDunn identified the following intangible benefits:

- **Compliance** – The ESSA requires that the State measure every student achievement in the areas of Math and ELA. Additionally, the State is required to identify indicators of student success in other areas. The State identifies assessment of Science as one of those indicators. Compliance with ESSA and the related State plan helps ensure compliance with the ESSA and flow of federal funds into the State.

- **Customer Service** – Standardized, statewide assessments, as a practice, provide several types of efficiencies for districts and schools. Schools and districts receive access to information related to effectiveness of practices—which informs professional learning, resource allocation, programming, and services. Services and programming are tailored based on assessment results to better meet general student needs. Data manipulation and analysis will be automated by Cognia.

6. **Costs vs. Benefits:** Do the benefits of this project (consider both tangible and intangible) outweigh the costs in your opinion? Please elaborate on your response.

While the tangible benefits appear negligible, BerryDunn's opinion is that the intangible benefits (specifically compliance with ESSA requirements to receive federal funding) outweigh the costs.

7. **IT ABC Form Review:** Review the IT ABC form (Business Case/Cost Analysis) created by the Business for this project. Is the information consistent with your Independent Review

and analysis? If not, please describe. Is the life cycle that was used appropriate for the technology being proposed? If not, please explain.

The State used cost estimates for annual costs in the IT ABC Form approved in December 2021. Through contract negotiations with Cognia, the State identified more accurate costs, so BerryDunn recommends that AOE and ADS update the IT ABC Form and reroute for approval.

9.0 Analysis of Alternatives

1. **Provide a brief analysis of alternative solutions that were deemed financially unfeasible.**

2. **Provide a brief analysis of alternative technical solutions that were deemed unsustainable.**

3. **Provide a brief analysis of alternative technical solutions where the costs for operations and maintenance were unfeasible.**

A team of business representatives from the State evaluated and scored various aspects of the vendors' proposals, with the total score comprising Demonstrated performance: development and/or implementation (20%), Responsiveness to specifications (20%), Program cost (20%), Previous experience: development and/or implementation (20%), and Implementation of practice (20%). Table 9.1 below shows the evaluated vendors' weighted scores with totals.

Table 9.1: Summary of Proposal Scores

Proposal Section	Pearson	ETS	Cognia	CAI
Demonstrated performance: development and/or implementation	56.67	20.00	53.33	63.33
Responsiveness to specifications	46.67	20.00	23.33	53.33
Program cost	23.33	20.00	26.67	46.67
Previous experience: development and/or implementation	60.00	20.00	56.67	73.33
Implementation of practice	24.00	20.00	53.33	26.67
Total	**210.67**	**100.00**	**213.33**	**263.33**

Based on the scores for program cost, the State's evaluation team deemed both Pearson and ETS financially unfeasible. While Cognia's overall score was significantly lower than CAI's overall score, the State's evaluation team outlined the following reasons why Cognia is identified as the preferred vendor:

*   Cognia proposed a far superior approach to integrating principals of diversity, equity, and inclusion into its organization, the assessment development process, and the implementation of the solution

*   The State will have a greater return on investment due to Cognia's comprehensive suite of resources, including benchmark student assessments, annual summative

student assessments, robust item banks, advanced accessibility features and accommodations, and advanced interoperability

- Cognia's technical solution has an enhanced, intuitive user interface that helps enable engagement with educators, students, and families.

BerryDunn believes the competitive bid process (e.g., proposal evaluations, vendor demonstrations, and BAFOs) was a sound approach to understanding the State's options for procuring the required statewide assessment services.

10.0 Impact on Analysis of Net Operating Costs

1. **Insert a table to illustrate the Net Operating Cost Impact.**

   Table 10.1, on the following page, illustrates the impact on net operating costs over five years.

Table 10.1: Life Cycle Costs by Year

Impact on Operating Costs	FY2023	FY2024	FY2025	FY2026	FY2027	Five-Year Totals
Professional Services (Non-Software Costs)						
Current Costs	$2,700,527	$2,700,527	$2,700,527	$2,700,527	$2,700,527	**$13,502,635**
Projected Costs	$2,737,797	$2,448,251	$2,489,260	$2,518,618	$2,553,487	**$12,747,413**
Maintenance, Support, and Licenses Costs						
Current Costs	$0	$0	$0	$0	$0	**$0**
Projected Costs	$617,636	$606,296	$617,839	$617,945	$618,054	**$3,077,770**
Other Costs (State Labor)						
Current Costs	$0	$0	$0	$0	$0	**$0**
Projected Costs	$21,736	$0	$0	$0	$0	**$21,736**
Baseline Annual Current Costs	$2,700,527	$2,700,527	$2,700,527	$2,700,527	$2,700,527	**$13,502,635**
Baseline Annual Projected Costs	$3,377,169	$3,054,547	$3,107,099	$3,136,563	$3,171,541	**$15,846,919**
Cumulative Current Costs	$2,700,527	$5,401,054	$8,101,581	$10,802,108	$13,502,635	**$13,502,635**
Cumulative Projected Costs	$3,377,169	$6,431,716	$9,538,815	$12,675,378	$15,846,919	**$15,846,919**
Net Impact on Professional Services	($37,270)	$252,276	$211,267	$181,909	$147,040	$755,222
Net Impact on Maintenance, Support, and Licenses Costs	($639,372)	($606,296)	($617,839)	($617,945)	($618,054)	**($3,099,506)**
Net Impact on Operating Costs	($676,642)	($354,020)	($406,572)	($436,036)	($471,014)	**($2,344,284)**

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2. **Provide a narrative summary of the analysis conducted and include a list of any assumptions.**

BerryDunn conducted an impact analysis on net operating costs using the costs validated and verified in acquisition cost assessment and cost benefit analysis.

The following calculations were used in performing the analysis:

- The projected costs for FY 2023 Professional Services (Non-software Costs) includes:
  - Cognia's services, including:
    - Project management: $431,715
    - Content Development: $693,143
    - Online content development: $272,347
    - Paper-based material: $174,954
    - Scoring and reporting: $685,223
    - Psychometrics: $41,260
    - Quality management: $363,625
    - Training: $51,030
  - Independent Review Services: $24,500
- The projected costs for FY 2023 Maintenance, Support, and Licenses Costs includes:
  - Enterprise application license fees: $499,554
  - Operating system software license fees: $54,000
  - Support and maintenance: $64,082
- The projected FY 2023 cost for Other Costs (State Labor) includes:
  - ADS EPMO Project Oversight: $2,816
  - ADS EPMO Project Management: $14,080
  - ADS EA: $3,080
  - ADS Security Staff: $1,760
- The projected costs for FY 2024 Professional Services (Non-software Costs) includes:
  - Cognia's services, including:
    - Project management: $363,518
    - Content Development: $835,770
    - Online content development: $22,870
    - Paper-based material: $140,129
    - Scoring and reporting: $701,816

- Psychometrics: $42,428
- Quality management: $307,535
- Training: $34,185

- The projected costs for FY 2024 Maintenance, Support, and Licenses Costs includes:
  - Enterprise application license fees: $490,303
  - Operating system software license fees: $53,000
  - Support and maintenance: $62,993

- The projected costs for FY 2025 Professional Services (Non-software Costs) includes:
  - Cognia's services, including:
    - Project management: $379,059
    - Content Development: $857,308
    - Online content development: $23,459
    - Paper-based material: $143,741
    - Scoring and reporting: $719,146
    - Psychometrics: $44,277
    - Quality management: $287,440
    - Training: $34,830

- The projected costs for FY 2025 Maintenance, Support, and Licenses Costs includes:
  - Enterprise application license fees: $499,554
  - Operating system software license fees: $54,000
  - Support and maintenance: $64,285

- The projected costs for FY 2026 Professional Services (Non-software Costs) includes:
  - Cognia's services, including:
    - Project management: $383,289
    - Content Development: $867,970
    - Online content development: $23,751
    - Paper-based material: $145,528
    - Scoring and reporting: $727,318
    - Psychometrics: $45,599
    - Quality management: $290,333
    - Training: $34,830

- The projected costs for FY 2026 Maintenance, Support, and Licenses Costs includes:
    - Enterprise application license fees: $499,554
    - Operating system software license fees: $54,000
    - Support and maintenance: $64,391
- The projected costs for FY 2027 Professional Services (Non-software Costs) includes:
    - Cognia's services, including:
        - Project management: $392,357
        - Content Development: $878,916
        - Online content development: $24,051
        - Paper-based material: $147,363
        - Scoring and reporting: $735,704
        - Psychometrics: $46,962
        - Quality management: $293,304
        - Training: $34,830
- The projected costs for FY 2027 Maintenance, Support, and Licenses Costs includes:
    - Enterprise application license fees: $499,554
    - Operating system software license fees: $54,000
   - Support and maintenance: $64,500

3. **Explain any net operating increases that will be covered by federal funding. Will this funding cover the entire life cycle? If not, please provide the breakouts by year.**

85% of all net operating increases will be covered by federal funding.

4. **What is the break-even point for this IT activity (considering implementation and ongoing operating costs)?**

Based on the costs in the draft contract, there is a net annual increase in operational costs, with no break-even point.

Figure 9.1: Cumulative Current and Cumulative Projected Costs

Cumulative Current and Cumulative Projected Costs
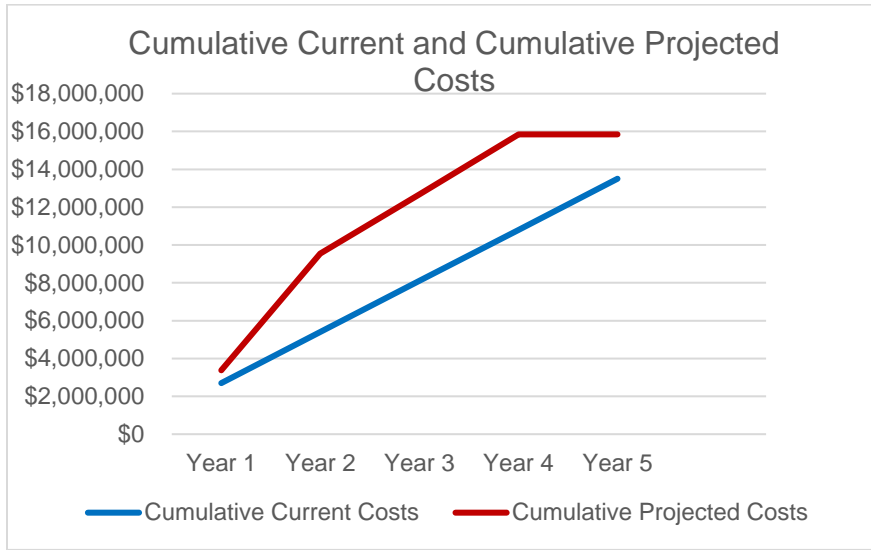
11.0 Security Assessment

1. **Will the new system have its own information security controls, rely on the State's controls, or incorporate both?**

   The solution platform provider has its own information security controls, to include the following:

   - Code review standards and vulnerability scans

   - A third-party assurance program that annually evaluates the adequacy of the solution provider security controls

   - Data validation and sanitation to prevent SQL injection attacks

   - 256-bit SSL, HTTPS, and SCP encryptions

   - SOC 2 Type II Certification controls and policies for user authentication, password management, cryptography, error handling and logging, data protection, risk assessments, and incident response team

   - Session management using JWT tokens

   - Enterprise monitoring tools of network operations in real-time

   - Information Security Policy that governs with the following basic principles:

     o Network access should be controlled

     o Networks should be segregated based on criticality

   - System configuration via unique environment variables

   - Vulnerability assessment and penetration testing.

2. **What method does the system use for data classification?**

   The solution platform provider Pearson provides information about its Global Information Security Policies and Standards that define a three-tier data classification level (DCL) scheme. DCL3, the highest classification tier, denotes customer and Pearson intellectual property, data subject to U.S. and international data security and privacy regulations, and data requiring comparable protections as defined in contracts. DCL3 classified data requires the most stringent information security controls.

3. **What is the vendor's breach notification and incident response process?**

   The solution platform provider Pearson identifies its Cybersecurity Response Program that encompasses the Incident Response Policy, the Cybersecurity Incident Response Plan (CIRP), and other documents, forms, checklists, and tools used to implement the requirements of the Incident Response Policy.

Pearson's Cybersecurity Response Plan and Procedure includes guidelines for Incident Classifications, Communications, Roles and Responsibilities, Process Flow, and detailed Procedural Phases and Notifications.

Cognia and Pearson will work with the State to confirm each of these processes during the process validation phase of Project implementation. The partner vendors identify the following priorities for defining their response:

- Protect customer information and assure organizational data integrity

- Maintain the organization's reputation and control external communication

- Prevent damage to systems

- Minimize disruption of computing resources.

Should any security breach occur, Cognia will notify all customers impacted as soon as feasible, and within a period of not more than 24 hours upon Pearson's acknowledgment of the breach. Cognia and Pearson will provide a standard Root Cause Analysis (RCA) within seven business days of the event. The RCA will detail the cause and result of the breach and activities that have been implemented and will be implemented to reconcile any effects of the breach. The RCA will also provide details regarding all measures that are taken to avoid any similar breach in the future.

4. **Does the vendor have a risk management program that specifically addresses information security risks?**

Cognia's SOC 2 Type II Certification program management performs a review of risks and undertakes risk assessment activities on a regular basis and when significant changes occur at strategic, operational, or project levels. To identify and mitigate risks within the environment, program management performs an annual risk assessment. The risk assessment takes into account a defined risk methodology that sets the precedent on how identified risks should be mitigated, accepted, avoided, or transferred. The risk assessment includes identifying, assessing, and mitigating the risk associated with identified threats and fraudulent activities that may impair system security, availability, and confidentiality.

The solution provider platform (known as ADAM) team has developed and communicated to its users procedures to support security, availability, and confidentiality in the following specific areas:

- Account management, including authorization, privileged access, and periodic reviews

- Change management

- Data storage, including encryption and retention

- Endpoint security (anti-malware and file integrity monitoring)

- Firewall management

- Incident management

- Log reviews

- Monitoring of system availability

- Patching

- Penetration testing and segmentation testing.

5. **What encryption controls/technologies does the system use to protect data at rest and in transit?**

The solution platform will use 256-bit SSL encryption from browser to server, and server to database for all data in transit, and AES256-CBC 256-bit encryption for all data at rest. Access to data stored within HTTPS-based services will be transmitted between systems using encrypted channels (SCP, HTTPs, etc.).

6. **What format does the vendor use for continuous vulnerability management, what process is used for remediation, and how do they report vulnerabilities to customers?**

The solution platform vendor maintains a SOC 2 Type II certification through an independent auditing body, which attests to the rigor of the infrastructure, engineering practices, and operational protocols specifically as they apply to security, privacy, and confidentiality (as well as system availability and processing integrity).

A third-party assurance program is maintained that evaluates, tracks, and monitors the compliance and security controls of the vendor's partner providing the solution platform. Service auditor reports and/or compliance certifications are reviewed annually for the subservice organizations to monitor and evaluate the adequacy and effectiveness of controls in place at the sub-service organizations.

12.0 Risk Assessment and Risk Register

This section describes the process for development of a Risk Register, including the following activities:

A. Ask the Independent Review participants to provide a list of the risks that they have identified and their strategies for addressing those risks.

B. Independently validate the risk information provided by the State and/or vendor and assess their risk strategies.

C. Identify any additional risks.

D. Ask the Business to respond to your identified risks, as well as provide strategies to address them.

E. Assess the risks strategies provided by the Business for the additional risks you identified.

F. Document all this information in a Risk Register and label it Attachment 2. The Risk Register should include the following:

- **Source of Risk:** Project, Proposed Solution, Vendor, or Other

- **Risk Description:** Provide a description of what the risk entails

- **Risk Ratings to Indicate:** Likelihood and probability of risk occurrence; impact should risk occur; and overall risk rating (high, medium, or low priority)

- **State's Planned Risk Strategy:** Avoid, Mitigate, Transfer, or Accept

- **State's Planned Risk Response:** Describe what the State plans to do (if anything) to address the risk

- **Timing of Risk Response:** Describe the planned timing for carrying out the risk response (e.g., prior to the start of the project, during the Planning Phase, prior to implementation, etc.)

- **Reviewer's Assessment of State's Planned Response:** Indicate if the planned response is adequate/appropriate in your judgment, and if not, what you would recommend

Additional Comments on Risks:

The risks identified during this Independent Review can be found in Attachment 2 – Risk Register.

Attachment 1 – Life Cycle Cost-Benefit Analysis

Table A.1, on the following page, reflects a five-year life cycle cost analysis.

Table A.1: Life Cycle Analysis

FY	2023	2024	2025	2026	2027	Total
Enterprise Application - License Fees	$499,554	$490,303	$499,554	$499,554	$499,554	**$2,488,519**
Operating System - License Fees	$54,000	$53,000	$54,000	$54,000	$54,000	**$269,000**
Support and Maintenance	$64,082	$62,993	$64,285	$64,391	$64,500	**$320,251**
Other Professional Services						
Project Management	$431,715	$363,518	$379,059	$383,289	$392,357	**$1,949,938**
Development	$1,866,927	$1,743,013	$1,787,931	$1,810,166	$1,832,996	**$9,041,033**
Quality Management	$363,625	$307,535	$287,440	$290,333	$293,304	**$1,542,237**
Training	$51,030	$34,185	$34,830	$34,830	$34,830	**$189,705**
State Labor Costs						
ADS EPMO Project Oversight	$2,816	$0	$0	$0	$0	**$2,816**
ADS EPMO Project Manager	$14,080	$0	$0	$0	$0	**$14,080**
ADS EA	$3,080	$0	$0	$0	$0	**$3,080**
ADS Security Staff	$1,760	$0	$0	$0	$0	**$1,760**
Totals						
Licenses/Professional Services Costs + State Labor Costs	$3,352,669	$3,054,547	$3,107,099	$3,136,563	$3,171,541	**$15,822,419**
BerryDunn IR	$24,500					**$24,500**

BerryDunn

FY	2023	2024	2025	2026	2027	Total
Total Costs	$3,377,169	$3,054,547	$3,107,099	$3,136,563	$3,171,541	**$15,846,919**
Total Lifecycle Costs to be paid with State funds	$506,575.35	$458,182.05	$466,064.85	$470,484.45	$475,731.15	**$2,377,037.85**
Total Lifecycle Costs to be paid with Federal funds	$2,870,593.65	$2,596,364.95	$2,641,034.15	$2,666,078.55	$2,695,809.85	**$13,469,881.15**

Attachment 2 – Risk Register

Data Element	Description
Risk #	Sequential number assigned to a risk to be used when referring to the risk.
Risk Likelihood/Probability, Impact, Overall Rating	Two-value indicator of the potential impact of the risk if it were to occur, along with an indicator of the probability of the risk occurring. Assigned values are High, Medium, or Low.
Source of Risk	Source of the risk, which might be interviews with the State, project documentation review, or vendor interview.
Risk Description	Brief narrative description of the identified risk.
State's Planned Risk Strategy	Strategy the State plans to take to address the risk. Assigned values are Avoid, Mitigate, Transfer, or Accept.
State's Planned Risk Response	Risk response the State plans to adopt based on discussions between State staff and BerryDunn reviewers.
Timing of Risk Response	Planned timing for carrying out the risk response, which might be prior to contract execution or subsequent to contract execution.
Reviewer's Assessment of State's Planned Response	Indication of whether BerryDunn reviewers feel the planned response is adequate and appropriate, and recommendations if not.

Risk Rating Criteria			
Scale	Low	Medium	High
Impact	Condition does not impact quality and is unlikely to impact achievement of project objectives. -OR- Condition might be mitigated through adjustment in effort to avoid impacts to project objectives.	Condition might be mitigated through reduction or deferral of baseline scope in order to avoid impact to quality and/or moving date of key milestone. -OR- Condition might be mitigated by focused corrective actions in order to help ensure achievement of project objectives.	Condition might require acceptance of agreed-upon modifications in order to avoid impact(s) to key project objectives. -OR- Conditions might introduce risk to project scope, quality of work products, system solution and/or user experience.
Likelihood	1 – 39%	40 – 89%	90 – 100%

Risk #:	Risk Likelihood/Probability:	Risk Impact:	Overall Risk Rating:
1	High	High	High

Source of Risk: Stakeholder interviews

Risk Description: A contract transition from the current vendor to the new vendor could lead to a gap in development and implementation of an assessment system.

A contract transition that begins with the new vendor (Cognia) in July 2022 and ends with the current vendor on June 30, 2022 could lead to a gap in development and implementation of an assessment system. Starting the Project this close to the current contract's expiration might not allow the Project team and selected vendor enough time to develop, test, and implement the new system prior to the expiration of the current system. The State has indicated that summative student assessments developed by Cognia must be deployed in March 2023 and that there will be other deliverables leading up to that spring assessment, such as user training for the education assessment community. However, after interviewing Cognia, it appears there is not yet consensus/alignment between Cognia and the State regarding the definitive list of Project deliverables and related due dates. The impact of this risk to the Project schedule is twofold: 1) training may be insufficient—if required to precede the spring deployment of summative student assessments—due to lack of training materials that would otherwise be fully developed from demonstrated, tested, and released working statewide assessment software and 2) the State could lose federal funds if there is a lapse in the provision of summative student assessments if new summative student assessments are not fully developed and administered by Cognia in the 2023 school year as required by the ESSA.

State's Planned Risk Strategy: Mitigate

State's Planned Risk Response: The State will work with the vendor to ensure deliverable deadlines will be in alignment with the business requirements for the timing of assessment administration.

Timing of Risk Response: Prior to contract execution

Reviewer's Assessment of State's Planned Response: The State's response is acceptable.

Risk #:	Risk Likelihood/Probability:	Risk Impact:	Overall Risk Rating:
2	High	Medium	Medium

Source of Risk: Stakeholder interviews

Risk Description: SBC is disallowing the State from using SBC scores to conduct a bridge study, to equate SBC test scores to Cognia test score, which could result in historical test scores being misaligned with Cognia test scores.

We understand through reviewing the State's draft contract with Cognia that they are proposing to use an equipercentile method to compare historical SBC with Cognia test scores/scales/methods to equate them. We also understand that this method is used by ACT/SAT to provide concordance or lookup information between the two scores. However, it is not clear if Cognia has used this method before, for this purpose, and how successful the method will be.

State's Planned Risk Strategy: Accept

Risk #: 2	Risk Likelihood/Probability: High	Risk Impact: Medium	Overall Risk Rating: Medium

State's Planned Risk Response: Equipercentile methodology is entirely appropriate in this case. This is an acceptable and statistically sound means of moving forward with this new assessment. The state will move forward, as agreed with Cognia, with Cognia conducting an equipercentile analysis.

Timing of Risk Response: This will take place as outlined in the drafted contract. There will not be a readjustment of the timeline, only an adjustment of the methodology.

Reviewer's Assessment of State's Planned Response: The State's response is acceptable, however; BerryDunn might suggest that the State request Cognia to demonstrate the method—actually comparing SBC to Cognia test scores—early on in the contract, to help ensure the method can be applied for this purpose and that Cognia is capable of performing such comparisons. Alternatively, the State might ask Cognia to provide examples of instances where they have previously applied this method, request contact information for any Cognia clients who were involved with such analysis, and reach out to the Cognia clients to confirm the method's efficacy/appropriateness as applied for this use.