pGc Paul Garstki Consulting

INDEPENDENT REVIEW

OF A PROPOSED

VHCURES 3.0 PROJECT

ALL PAYER CLAIMS DATABASE

For the
State of Vermont
Agency of Digital Services (ADS)
And
The Green Mountain Care Board (GMCB)

Submitted to the
State of Vermont, Office of the CIO
by:

Paul E. Garstki, JD, Consultant
d/b/a/ Paul Garstki Consulting
344 Laird Pond Rd.
Plainfield, VT 05667
paulg.consulting@gmail.com

April 5, 2019

version 3.1b

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

The Vermont Health Care Uniform Reporting and Evaluation System (VHCURES) is the State's All Payer Claims Database (APCD). An APCD collects health insurance enrollment and claims information from a variety of payers, to be stored in a large-scale database for the purposes of (mainly) cost containment and quality improvement efforts.

VHCURES includes eligibility information and medical and pharmacy claims submitted by commercial health insurers as well as Medicaid and Medicare and Medicare Advantage. The Vermont legislature established VHCURES in 2009 via 18 V.S.A. 9410, and it is maintained and governed by the Green Mountain Care Board (GMCB) since 2013 under Regulation H-2008-01, for a variety of statutory purposes, including

- determining the capacity and distribution of existing state resources
- identifying health care need and informing health care policy
- evaluating the effectiveness of intervention programs for improving patient outcomes
- comparing costs between various treatment settings and approaches
- providing information to consumers and purchasers of health care
- improving the quality and affordability of patient health care and health care coverage

This project is to upgrade the VHCURES data collection, consolidation, storage, and processing functions to support additional analytic capabilities and new requirements including the All-Payer ACO Model. The project seeks to upgrade VHCURES to current standards, anticipated state data needs, and to resolve analytical challenges present in the current VHCURES.

Following a rigorous and well-defined procurement process, the State has selected a vendor, Onpoint Health Data (Onpoint), which has been engaged by the State since 2009 to implement and develop the existing VHCURES system. Our report describes a system which we judge to be well chosen, appropriately designed with architecture compliant with State preferences and requirements, and likely to be implemented on time and on budget. The proposed project offers a significantly lowered annual cost for improved and enhanced services, without the delay and need for increased State resources that an entirely new implementation would entail. These savings represent the greatest tangible benefit of the project, and the intangible benefits including enhancements that improve and facilitate analytical access by approved data users will support the mission and mandate of the GMCB.

1.1 COST SUMMARY

IT Activity Lifecycle (years):	**5**
Total Lifecycle Costs:	**$ 4,346,666.55**
Total Implementation Costs:	**$ 361,866.55**
New Average Annual Operating Costs:	**$ 796,960.00**
Current Annual Operating Costs	**$ 1,063,200.00**
Difference Between Current and New Operating Costs:	**$ (266,240.00)**

1.2 DISPOSITION OF INDEPENDENT REVIEW DELIVERABLES

Deliverable	Highlights from the Review *Include explanations of any significant concerns*
Acquisition Cost Assessment	The project represents significant cost savings for the State of nearly $1 million during the projected 5-year lifecycle, from lower annual costs compared to the existing system. The acquisition (implementation) costs *per-se* are quite low, most of the system being continued from the existing VHCURES. The operational and maintenance costs are reasonable. In comparison to other states with comparable APCD systems that we surveyed, the proposed project's average annual cost of $ 796,960 is quite low, at less than half the average cost of $ 1,295,165. Measured by cost per covered life, Vermont's costs are moderately high at $ 1.39 per covered life compared to an average of $ 0.76. **When measured by cost per submitter – perhaps the best metric – Vermont's proposed costs are second lowest among these states $ 6,991, well below the average of $31,312 per submitter.**
Technology Architecture Review	The vendor proposes continuing the existing VHCURES database and architecture, with enhancements in 4 areas: • redesigned data integration system • new analytical tools • expanded analytic enclave platform

	• new business intelligence reporting system The system as it exists and as proposed is secure and robust, and aligns well with the State's preferences for enterprise architecture. Some relatively minor variations from the State's standards are identified as risk areas and marked for resolution by the State in the course of contract negotiations. The proposed enhancements to the system directly address the business needs of the project as defined in the RFP and project charter. The use of data visualization BI tool (Tableau) should support the State's intention to continually make the data more usable for a wider user audience.
Implementation Plan Assessment	The implementation plan samples reflect well on the vendor's broad experience in APCD deployments. The vendor's proposal prefers narrative exposition to deliverables lists, but the substance of the proposal is more than adequate to support a successful implementation and operation. We reached out to APCD administrators in other states to inquire about their experiences with this vendor and received very favorable reviews. We had minor concerns about the vendor's inclusion of many cost-additional items in the initial proposal, but the State has addressed this concern by determining exactly which options it will elect. The internal capabilities of APCD project management in the GMCB have grown, and at this point the staff, while not large, seems well capable of handling the needs of the present project along with their continuing tasks. Some of the savings potentially realized in the proposed project are due precisely to an increased ability to do analytics in-house. The procurement process included broad and at times deep participation from stakeholders including submitters and data users. The in-house IT and data team have reached out broadly, both to national interest groupings such as the APCD Council[1] and to Vermont APCD data experts, including retired but knowledgeable former staff.
Cost Analysis and Model for Benefit Analysis	The project represents significant cost savings for the State of nearly $1 million during the projected 5-year lifecycle, with lower annual costs compared to the existing system. Engaging the incumbent vendor results in probable cost avoidance for parallel operations and additional implementation costs which would have been necessary had a new database been implemented. Improvements for internal and external data users and submitters will enhance the APCD mission and broaden access for potential data users.

[1] www.apcdcouncil.org

Impact Analysis on Net Operating Costs	With implementation costs included, total costs in FY1 exceed estimated annual costs for the existing solution by $88,226.55. In the second year of operation, breakeven is passed, with a total savings of $969,333.45.over the project lifecycle.

IDENTIFIED HIGH IMPACT &/OR HIGH LIKELIHOOD OF OCCURRENCE RISKS

NOTE: Throughout the narrative text of this document, **Risks and Issues are identified by bold red text**, and an accompanying tag (**_RISK_ID# _0_**) provides the Risk or Issue ID to reference the risk, response, and reference in the Risk Register.

The following table lists the risks identified as having high impact and/or high likelihood (probability) of occurrence.

Please see the **Risk & Issues Register, in Section 10**, for details.

Identified High Impact &/or High Likelihood of Occurrence Risks in this project:

NONE

1.3 OTHER KEY ISSUES

NONE

1.4 RECOMMENDATION

We recommend that this project go forward with the risk mitigations and other recommendations contained in this report.

1.5 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 me by the State.

E-SIGNED by Paul Garstki
on 2019-04-05 19:56:13 UTC

_____ _____

Signature **Date**

1.6 REPORT ACCEPTANCE

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

E-SIGNED by John Quinn
on 2019-04-10 15:18:22 UTC

_____ _____

State of Vermont Chief Information Officer **Date**

S.K.

2. SCOPE OF THIS INDEPENDENT REVIEW

2.1 IN-SCOPE

The scope of this document is fulfilling the requirements of Vermont Statute, Title 3, Chapter 45, §2222(g):

The Secretary of Administration shall obtain independent expert review of any recommendation for any information technology initiated after July 1, 1996, as information technology activity is defined by subdivision (a)(10), when its total cost is $1,000,000 or greater or when required by the State Chief Information Officer.

The independent review report includes:

- An acquisition cost assessment
- A technology architecture review
- An implementation plan assessment (which includes a Risk Analysis)
- A cost analysis and model for benefit analysis; and
- An impact analysis on net operating costs for the Agency carrying out the activity

2.2 OUT-OF-SCOPE

- A separate deliverable contracted as part of this Independent Review may be procurement negotiation advisory services, but documentation related to those services are not part of this report.
- Proposals and vendors other than the bidder selected as first choice through the proposed project's procurement process were not evaluated in this **Review.**

3. SOURCES OF INFORMATION

3.1 INDEPENDENT REVIEW PARTICIPANTS

Name	Date	Employer and Title	Participation Topic(s)
Tanya Perry	January 9, 2019	ADS – Project Manager	Project Mgt., SPOC
Sarah Lindberg	January 2, 2019	GMCB – Health Services Researcher	Project History, Overview
Kathryn O'Neill	January 2, 2019	GMCB – Director of Data Management Analysis and Data Integrity	Procurement, Data Issues
Jean Stetter	January 2, 2019	GMCB – Administrative Services Director	Cost, Funding
Harriet Johnson	January 2, 2019	GMCB – Financial Administrator	Cost, Funding
Richard Terricciano	January 10, 2019	ADS – Enterprise Architect	Enterprise Architecture
Scott Carbee	January 24, 2019	ADS – CISO – Deputy Information Security Officer	Security/Privacy
James Lucht, MCP	February 7, 2019	Rhode Island Executive Office of Health & Human Services, Deputy Directory of Analytics	Rhode Island APCD and experience with vendor
Thea Mounts, OFM	February 7, 2019	State of Washington – WA-APCD Program Director	State of Washington APCD and experience with vendor

3.2 INDEPENDENT REVIEW DOCUMENTATION

The following documents were used in the process and preparation of this Independent Review

Document	Source
IT Activity Business Case & Cost Analysis (IT ABC Form) VHCURES 3.0	State
GMCB VHCURES3.0 Project Charter	State
SEALED BID INFORMATION TECHNOLOGY REQUEST FOR PROPOSAL FOR Vermont Health Care Uniform Reporting and Evaluation System (VHCURES) 3.0	State
Proposal to Provide Services in Support of the Vermont Health Care Uniform Reporting and Evaluation System (VHCURES) 3.0	Onpoint
(Other documents associated with above, including follow-up questions and Best and Final Offer (BAFO)	Onpoint & State
Architecture Assessment Workbook for VHCURES 3.0 15 Jan 2019	State (ADS EA)
VHCURES Architecture Vision	State (ADS EA)
Requirements Comparison 3 Dec 2019	State
GMCB Data Governance Charter	State
WA-APCD Technology Budget	State of Washington
APCD State Efforts (by State, various pages) https://www.apcdcouncil.org/state/map	APCD Council
VHCURES Overview: A Guide for Data Users	GMCB
VHCURES Strategic Plan: Options and Recommendations, July 26, 2018	GMCB
Health System Oversight by States: An Environmental Scan / RESEARCH BRIEF NO. 20 | NOVEMBER 2017	Hub-Altarum

4. PROJECT INFORMATION

4.1 HISTORICAL BACKGROUND

The Vermont Health Care Uniform Reporting and Evaluation System (VHCURES) is the State's All Payer Claims Database (APCD). An APCD collects health insurance enrollment and claims information from a variety of payers, to be stored in a large-scale database for the purposes of (mainly) cost containment and quality improvement efforts. As of 2018, approximately 20 states have APCD efforts, of which 17 were operational.[2] In general, an APCD collects service-level information based on valid claims processed by the payers. States vary in laws and regulations that determine which payers and what information goes into the system, whether information submission is mandatory or voluntary (on the payer's part), the threshold of membership that requires claims submission, and other such aspects. Information in an APCD is "de-identified," that is to say, Personally Identifiable Information (PII) such as names, addresses, social security numbers, etc., is removed by processes of encryption or, more recently, hashing (non-reversible). In this way, the aggregate data may be used to derive cost, use, and quality information about health care in the area covered by the APCD.

VHCURES includes eligibility information and medical and pharmacy claims submitted by commercial health insurers as well as Medicaid and Medicare and Medicare Advantage. The Vermont legislature established VHCURES in 2009 via 18 V.S.A. 9410, and it is maintained and governed by the Green Mountain Care Board since 2013 under Regulation H-2008-01, for a variety of statutory purposes, including

- determining the capacity and distribution of existing state resources
- identifying health care need and informing health care policy
- evaluating the effectiveness of intervention programs for improving patient outcomes
- comparing costs between various treatment settings and approaches
- providing information to consumers and purchasers of health care
- improving the quality and affordability of patient health care and health care coverage

1.1.1.1 SUBMITTERS

The State requires that all health insurers, third-party administrators and pharmacy benefits managers that cover Vermont residents register with the State. VHCURES includes data from commercial insurers, Vermont Medicaid, and Medicare from calendar year 2007 to the present. The frequency of data submission for commercial insurers varies depending on the number of Vermont lives they cover, ranging from monthly (2,000 or more lives) to annually. Currently, there are approximately 70 commercial insurers submitting data for comprehensive major medical plans, as well as Medicare Parts

[2] APCD Council, *Interactive State Report Map (copyright 2009-2019),* https://www.apcdcouncil.org/state/map, accessed February 21, 2019.

C and D. Vermont Medicaid submits data monthly and Medicare data are integrated on a quarterly basis.[3]

1.1.1.2 DATA USES AND DUAS

Users of the data in VHCURES includes the GMCB itself, other State agencies and contractors, and other approved users such as researchers and policy makers. These users analyze health care access, spending, utilization, public health, and quality. Approved users execute Data Use Agreements (DUAs) with the GMCB. The existing vendor collects data from payers; the aggregated data in released for use in quarterly database extracts.

1.1.2 PROCUREMENT

1.1.2.1 CURRENT VENDOR

The vendor for the existing system, Onpoint Health Data (Onpoint), was engaged by the State in 2009 to build the VHCURES system. The vendor has been engaged continually by the State since that time, and through a series of contract extensions has developed and evolved the system to its current state.

1.1.2.2 REASONS FOR RFP

The State has expressed satisfaction with the current vendor. In 2018, however, the GMCB decided that it would be appropriate to re-develop or at least re-state the business needs of VHCURES in order to release a Request for Proposals (RFP) to elicit fixed price proposals for solutions to enhance the existing system. A third-party business process analyst was engaged to help refine and document the business needs and process.

1.1.2.3 PROCUREMENT PROCESS

The GMCB staff, with ADS assistance, assembled a "core" procurement and proposal evaluation team of Sarah Lindberg (GMCB Health Services Researcher), Michael Barber (GMCB Chief of Health Care Policy), Andrew Laing (ADS Chief Data Officer), Richard Terricciano (ADS Enterprise Architect), and Timothy Trembley (Blueprint Data Analytics, and Information Administrator). This core team gather requirements utilizing a fairly intensive stakeholder interview process, including:

- data users
- data submitters
    - largest submitter

[3] State of Vermont, *Request for Proposal VHCURES 3.0 (RFP)*, pg. 3

    - all other submitters
- assorted internal interviews to get whole landscape

Additionally, a consultant business analyst was engaged to develop details of business process/flow, to ensure sufficiently detailed functional requirements in the resultant RFP.

The RFP was issued on September 7, 2018, with responses due on October 24, 2018. Following the bidders conference and questions period, a sufficient number of proposals were received, including one from the incumbent vendor.

The core team evaluated the received proposals and scored them strictly along the scoring metrics promulgated in the RFP. The finalists were evaluated by the team Enterprise Architect for alignment with functional requirements, non-functional requirements, and State EA preferences. At this point, the team was expanded to include GMCB Executive Director Susan Barrett and GMCB Administrative Services Director Jean Stetter. After a series of follow up questions to finalist vendors and demo sessions, Best and Final Offers (BAFO) were requested. The project team selected Onpoint Health Data.

In reaching that decision -- which was ultimately unanimous -- the team debated the strengths and possibilities inherent in some other vendors' proposals. While we strongly support the team's final decision, we note that the team members we interviewed had significant interest in some of the alternative proposals, suggesting the proposals had features or approaches which were very interesting and even exciting, but that the proposals or the vendors proposing them were not yet sufficiently mature and/or robust. The sense was that these alternatives represented a direction or approach "we might want to use eventually, a few years down the line."[4]

In the project team's view, the incumbent vendor's proposal represented a tried-and-tested approach, with minimal disruption of VHCURES operations, and fully within the existing capabilities of GMCB staff, while allowing enhanced features and capabilities that align with the GMCB's current VHCURES focus (for example, on increased in-house analytics capabilities and more useable data analysis and presentation features for less sophisticated users). **We agree with this assessment.**

However, in light of the possibilities (though they may be on the horizon) that emerged through the procurement process, we note a general agreement on the project team that it would be best to keep the initial contract period relatively short (e.g., 3 years), so that the State can keep its options open. Given that the RFP indicated "Contracts arising from this RFP will be for a period of implementation (completed by November 1, 2019) plus an additional 5 years,"[5] and that the vendor's cost proposal assumes "five (5) years of Maintenance and Operations,"[6] we identify the implicit 5 year contract period as a risk **_RISK_ID# _R3_** and recommend that the State consider and negotiate a shorter initial period,

[4] Lindberg, Interview, January 2, 2019.

[5] RFP, pg. 13

[6] Proposal, Section 3.4.4, pg. 63

with the option to continue as desired. Regardless of the vendor's stated assumption, the State now informs us that GMCB's intent is to negotiate a 3-year contract with the option of two 1-year renewals. We support this decision.

1.1.2.4 PROPOSED VENDOR

Onpoint is an independent nonprofit health data organization based in Portland, Maine, delivering data management and analytic services in 10 states and for the federal government. They claim prominence as a market leader in the APCD space, having implemented more than 50 percent of the state-sponsored APCD systems in the country.

In the proposal evaluation process, the scoring team followed up on references provided by the finalist vendors, except that they did not contact references provided by the incumbent vendor, given the State's long experience with this vendor. The team did, however, contact a Minnesota APCD employee regarding Onpoint's work in that State. [7] (We are informed the choice to call references listed is consistent with State procurement policy guidelines: the decision to call references rests with the project team.) However, in the course of the present review, we have contacted 2 of the selected vendor's references (for states Rhode Island and Washington). Specifics of these conversations are in **7. Assessment of Implementation Plan, *below***. In brief, these references confirmed a high satisfaction with the performance of the selected vendor.

[7] O'Neill, Email, January 4, 2019.

4.2 PROJECT GOAL

This project is to upgrade the VHCURES data collection, consolidation, storage, and processing functions to support additional analytic capabilities and new requirements including the All-Payer ACO Model. The project seeks to upgrade VHCURES to current standards, anticipated state data needs, and to resolve analytical challenges present in the current VHCURES.[8]

The project will procure a vendor(s) to supply four (4) core services:

- Collection, processing, and management of health care claims data.
- Master Person Management, creating an identification number for each person so that their claims and enrollment can be linked over time, and can also be linked to other data sets.
- Creation of an analytic environment in which the data can be securely stored and made available to users for analysis.
- Make extracts of the VHCURES data available to qualified entities outside of the analytic environment as directed by the GMCB.[9]

The State seeks to achieve the following business value goals:

- Customer Service Improvement
- Risk Reduction
- State and Federal Compliance
- User Friendly for Data Submitters and State/Public Users

4.3 PROJECT SCOPE

1.1.3 IN-SCOPE

The RFP lists the following definition of project scope:[10]

- **A Technology Solution** that addresses the business need(s);
- **A Comprehensive Data Management Plan** to include a detailed review of techniques to address data quality and assurance;
- **Professional Services for Project Management** to manage the implementation of the technology solution;
- **Professional Services to Perform Technical Work** in support of the implementation;

[8] *VHCURES 3.0 Charter*, pg. 3

[9] *Ibid.*

[10] *VHCURES 3.0 Request for Proposal*, pg.3

- **Professional Services for Maintenance and Support** of the implemented technology.

A more general overview of project scope is listed in the project charter:[11]

- Implementation of Master Person Index, including a unique identification number.
- Collection, processing, and management of health care claims data.
- Transfer of data to hosted warehouse solution.
- Creation of analytic environment.
- Creation and availability of data extracts.
- Producing simple recurring reports.

Taken together, these lists do define the scope of the project as it is delineated in the selected proposal.

1.1.4 OUT-OF-SCOPE

The project charter lists the following features and services as out-of-scope:

- Direct integration of claims data with other data sources (e.g., hospital discharge dataset).
- Analytic services.
- Lock box solution that includes an outside vendor for identity management.

4.3.1 MAJOR DELIVERABLES

Milestone/Deliverable	Target Delivery Date or Range
A Technology Solution **that addresses the business need(s);**	Project Lifecycle
A Comprehensive Data Management Plan **to include a detailed review of techniques to address data quality and assurance;**	Contract Execution to 10/18/19
Professional Services for Project Management **to manage the implementation of the technology solution;**	Project Lifecycle
Professional Services to Perform Technical Work **in support of the implementation;**	Contract Execution to 10/18/19
Professional Services for Maintenance and Support **of the implemented technology.**	Project Lifecycle

[11] GMCB VHCURES 3.0 Charter pg. 3

4.4 PROJECT PHASES, MILESTONES, AND SCHEDULE

Project Milestone	Date
Project Start Date (IT ABC Approved)	**11/16/17**
Requirements Gathered	09/21/18
RFP Posted	09/07/18
RFP Responses	10/25/18
Vendor Selected	12/18/18
Independent Review Completed	02/11/19
Vendor Contract Signed	03/15/19
Final Project Deliverable Acceptance	10/16/19
Go Live	10/18/19
Final System Acceptance (go/no-go)	04/20/20
Project End Date (Project Closeout)	04/24/20

5. ACQUISITION COST ASSESSMENT

Acquisition Costs	Cost	Comments
Hardware Costs	**$ 0.00**	no add'l cost during implementation
Software Costs	**$ 0.00**	no add'l cost during implementation
Implementation Services	**$ 265,200.00**	All vendor services
State Personnel	**$ 79,786.00**	ADS Services
Professional Services (e.g. Project Management, Technical, Training, etc.)	**$ 16,880.55**	Independent Review
Total Acquisition Costs	**$ 361,866.55**	

5.1 COST VALIDATION:

Describe how you validated the Acquisition Costs.

Basic vendor implementation services were listed as quoted by the vendor in its proposal (and as referenced in the Best and Final Offer (BAFO)). Additional options chosen by the State (Transition from Hashed to Live Identifiers; Rule Change and Redesign of Data Layout) are included with costs provided by the State and based on estimates supplied by the vendor in answer to State questions during the procurement process.

State personnel costs are based on State actuals (for ADS services) from VISION and on estimated FTE needs derived from the vendor's answers to State questions during the procurement process, and State

estimates of internal training needs for Tableau software training. Professional services are third-party, such as Independent Review.

All costs are listed in **Attachment 3, Cost Spreadsheet, *below.***

5.2 COST COMPARISON:

How do the above Acquisition Costs compare with others who have purchased similar solutions (i.e., is the State paying more, less or about the same)?

BACKGROUND

We attempted to capture comparable figures in the analysis below; however, state APCDs vary in numerous ways. States employ various governance models. The APCD may governed by an internal but statutorily independent entity, such as Vermont's GMCB; or in some states such as Washington by a university-based lead organization; or by other models.

Funding streams vary as well. Some states, like Vermont at this point in time, fund the APCD through general funds; others define by statute a "fee for service" model, making data consumers help fund the APCD; other states require that "fees for service" fund the entire cost of the APCD.

Technological preferences vary significantly: some states, like Vermont, prefer cloud-based SaaS systems; some states prefer to host the APCD in state datacenters; and these choices may shift costs within or without state personnel and other expenses for support and maintenance.

VENDORS

Onpoint serves as vendor for approximately half of the state-sponsored APCDs. Another not-for-profit vendor, HSRI, and a for-profit platform, Milliman Medinsight, serve most of the rest.[12]

For purposes of comparing cost of the present project with other states, acquisition (implementation) costs are not so useful, as the proposed project primarily continues to operate the existing VHCURES system. *Implementation* costs in this proposal refer only to implementation of the *enhancement*s, and not the system as a whole. This is not so unusual: APCDs in several states have evolved over time, both in their statutory remit and in the way they are governed. In general, we see a trend away from voluntary systems and toward mandatory ones. Most existing APCDs have evolved over time, often integrating historical data into new systems with changing mandates.

[12] https://www.apcdcouncil.org/state/map

O&M COST COMPARISONS

Most useful to compare are the annual Operations & Maintenance (O&M) costs of other states, whether using the same vendor or others. For a sense of Onpoint costs, we spoke directly with APCD administrators of 2 other states who employ Onpoint for APCD operations. Some of their comments are in **Additional Comments**, *below*. The State of Washington's O&M costs in FY18 were $2,948,317[13]. (Washington's APCD governance model is different and uses a university intermediary, called a "lead organization.") Rhode Island expends $1,244,705 to Onpoint for their APCD services[14].

To make more sense of these and other bottom-line costs, it will be helpful to include a few other metrics, primarily:

- The population of the states
- The annual cost of the APCD
- The number of "covered lives.")This is the approximate number of distinct individuals covered by the payers in the database.)
- The number of "submitters," or insurance carriers and Medicaid and Medicare who submit data to the APCD. (This may vary according to the statutory requirements of each state and the number of payers, as well as the number of insurers who report voluntarily even if not statutorily required per *Gobeille vs. Liberty Mutual*.)

COMPARABLE STATES

For purposes of comparison, we chose 8 states for which we could elicit fairly recent and, we judge, comparable data. The most populous state in our selection is less than 10 times the size of Vermont by population. Our list included:

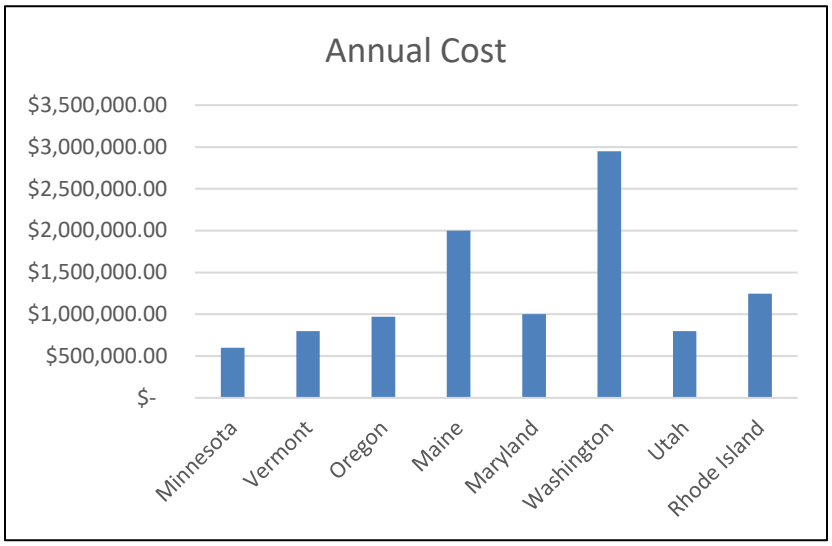
- Maine
- Maryland
- Minnesota
- Oregon
- Rhode Island
- Utah
- Vermont
- Washington

[13] State of Washington, *WA-APCD Technology Budget*, October 21, 2017.

[14] James Lucht, *email, breakdown of costs from Onpoint contract*, February 28,2019.

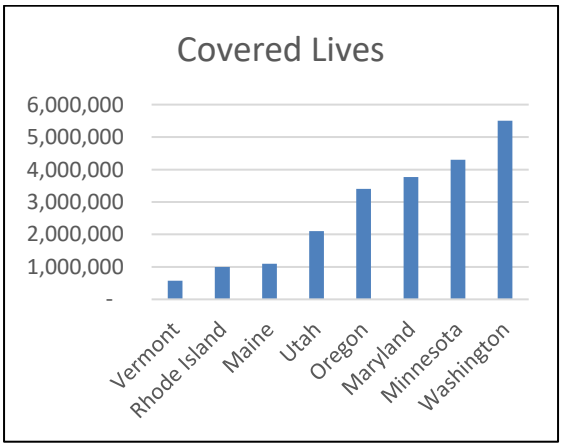
ANNUAL COST

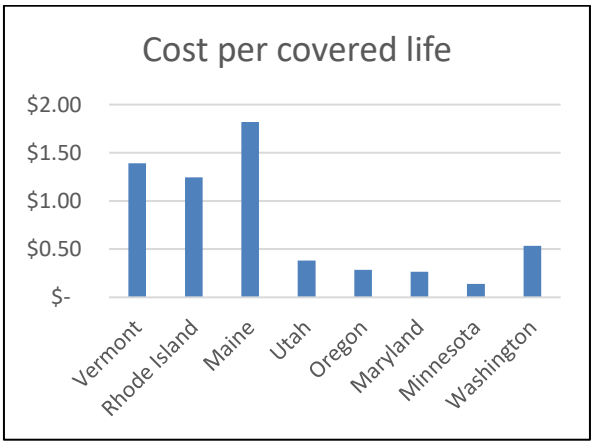
Our first comparison is total annual cost, with Washington the highest at $2.9 million (although notably a very recent implementation) and Minnesota the least, at $600,000. Vermont is near the low end at an average annual cost of $796,960.



COVERED LIVES

Given the differences in population, annual cost is probably not the most telling comparison. More interesting is a comparison of cost per covered life. Here, Vermont (reflecting the size of its population) has the smallest number of covered lives, but a moderately expensive cost per covered life, at $1.3 per covered life compared to an average among these 8 states of $.0.76 per covered life. Here again, we may be seeing a reflection of population size. (A comparison of per capita costs results in a similar ranking, because in these states the number of covered lives is consistently a high percentage of total population.)



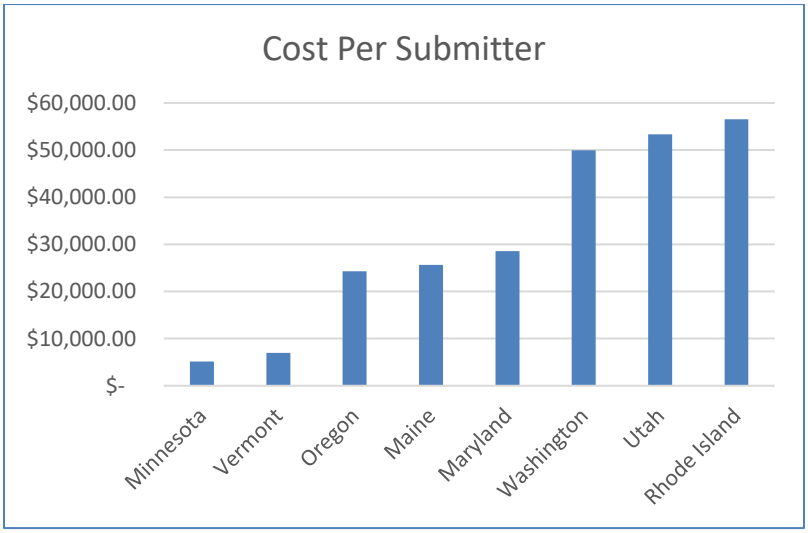


COST PER SUBMITTER

Since the function of an APCD is to capture as completely as feasible the claims across a market, an APCD in a given state aims to source data from the largest number of submitters it can.

State	Number of Submitters
Minnesota	117
Vermont	114
Oregon	40
Maine	78
Maryland	35
Washington	59
Utah	15
Rhode Island	22

When we compare these states by cost per submitter, Vermont's costs are among the lowest. Vermont's cost of $6,991 per submitter is well below the average of $31,312 per submitter:



CONCLUSION

Of the 8 states here compared, the proposed project's average annual cost of $ 796,960 is quite low, at less than half the average cost of $ 1,295,165. Measured by cost per covered life, Vermont's costs are

moderately high at $ 1.39 per covered life compared to an average of $ 0.76. **When measured by cost per submitter – perhaps the best metric – Vermont's proposed costs are second lowest among these states $ 6,991, well below the average of $ 31,312 per submitter.**

5.3 COST ASSESSMENT:

Are the Acquisition Costs valid and appropriate in your professional opinion? List any concerns or issues with the costs.

Yes, we think the Acquisition (and operational) costs are valid and appropriate. (Please see also additional comments below)

Additional Comments on Acquisition Costs:

The State has a significant and satisfactory history of engagement with this vendor. We noted in our review of the vendor's proposals and in our discussions with GMCB staff that the proposed total cost seemed quite low, given especially that the vendor is continuing (and enhancing) existing VHCURES operations with a higher annual cost. The State tells us that the primary reason for this lower cost is the GMCB's increased internal capacity for analytics, diminishing the need to require these services from the vendor. [15] This seems reasonable to us. At the same time, discussion with staff concerning the history of costs from this vendor revealed a widely shared perception that the vendor often priced services performed as optional or additional, requiring a careful reading and understanding of invoices. The proposal for the present project includes several instances of services, reports, or features that would require extra cost should the State elect to expand the offering (for example, the number of reports) beyond the level suggested in the proposal. Interestingly, our discussions with the administrator of a different state's APCD using the same vendor revealed a perception in *that* state that the vendor tended to "high ball" their quotes, with the final cost actually coming in somewhat *lower.*[16] A generous but not unreasonable explanation (and one suggested by the vendor in its BAFO) is that the vendor uses its knowledge of Vermont's needs to develop a proposal of lowest cost and highest value for the State.

We emphasize that the State is highly satisfied with the work of this vendor and the associated costs, and we see no reason to dispute this. What we do point out and have identified as a risk **_RISK_ID# _R1_**, is the possible cost uncertainty that could impact cost planning. The State has mitigated this risk by identifying the options and "add-ons" it wishes to elect, before undertaking contract negotiations. We support this approach, and generally find that the State is getting good value for money in this proposal. All the same, we would point out that the State prefers "firm fixed price" proposals, and this proposal was less firm than it might be.

[15] Stetter, Email, February 14, 2019.

[16] Interview, Lucht, February 7, 2019.

6. TECHNOLOGY ARCHITECTURE REVIEW

6.1 APCD ARCHITECTURE

The selected vendor proposes to maintain and enhance the existing VHCURES architecture.

Viewed from a very high level, VHCURES (as it exists and as proposed) consists of these main components:

- A system by which claims are submitted by payers through a secure cloud-hosted process, verified for data consistency, and integrated into the database. The exact workflow processes by which Commercial, Medicare, and Medicaid raw data are submitted vary depending on statutory and regulatory requirements.
- An Online Transactional Processing (OLTP) database (Amazon Aurora) hosted via Amazon Web Services (AWS)
- An "analytic enclave" available to approved users. A data enclave is commonly described as a secure network through which confidential data can be stored and disseminated. In a virtual data enclave, a researcher can access the data from their own computer but cannot download or remove it from the remote server.[17] The purpose is to allow authorized users to analyze and draw conclusions from data while not exposing that data in a generally public manner. A columnar Online Analytical Processing (OLAP) database (Redshift) hosted via AWS, forms the Enclave data core.
- Database extracts which are utilized by state agencies, state contractors and other approved users. (All approved users are required to execute data use agreements (DUAs) with the GMCB.) Approved users may also contract with vendors to provide additional analytical services.
- Full "instances" of the VHCURES dataset are hosted at the Agency of Human Services (AHS) and the University of Vermont (UVM) for State purposes.

The selected vendor proposes to continue operation of the existing system, with the enhancements/changes described in the following section.

6.2 ENHANCEMENTS IN THE PROPOSED PROJECT

The proposed project would implement 4 main enhancements to the existing system:

1. REDISIGNED DATA INTEGRATION SYSTEM

The vendor proposes a redesigned user interface with improved data collection, data validation and ease of variance management through the vendor's Web-based Claims Data Manager (CDM) portal. This

[17] National Network of Libraries of Medicine, *Data Enclave*, https://nnlm.gov/data/thesaurus/data-enclave, accessed February 13, 2019.

portal would also provide significantly improved reporting capabilities for the State and for data submitters.

Data submitters use the CDM portal and/or SFTP to transfer claims and eligibility data to VHCURES, so it is in a sense the "front-end" of the system. Improvements to this portal would serve to improve both the usability and utility of the system as a whole.

2. NEW ANALYTICAL TOOLS

The vendor proposes the following additions/enhancements to analytic tools. These are described in more detail in **6.8 System Integration**, *below*. The GMCB has recently been growing its internal staff analytics capabilities. These new tools assist both that internal staff and other approved data users.

- Disease and chronic condition flagging
- Service line flagging
- HEDIS measures (delivered in an easy-to-use, person-level report)
- Risk classification – 3M Clinical Risk Groups (CRGs)
- Episodes of care (choice of 3M Patient Focused Episodes (PFEs) or service price reporting)
- Patient-to-provider attribution
- Member-year analytic file
- Analytic file (VT Custom Research Extract)

3. EXPANDED ANALYTIC ENCLAVE PLATFORM

These enhancements build on the existing Analytic Enclave:

- Tableau analytics software. (See 4. (BI) below) Each user in the Analytic Enclave is provided with a separate virtual Workspace within the Enclave. User tools, including Tableau Desktop, R, Python and SQL Workbench, are installed on each Workspace. Access to the Redshift database will be permitted to each Workspace for users to access the data using the tool of choice. A Tableau Server will be installed in the Analytic Enclave for Enclave users to publish dashboards and reports to for external users to access.

- A number of pre-defined VHCURES-specific reports. The State is offered 10 choices from an array of 15 available standard reports, to enhance the State's analysis capabilities.

4. NEW BUSINESS INTELLIGENCE (BI) REPORTING SOLUTION

The vendor is proposing Tableau Server and Tableau desktop as an integrated BI solution. Tableau is an analytics and data visualization tool, very widely used, with both Server and Desktop components. The proposed project includes 5 "Creator licenses", 15 "Explorer" licenses, and 25 "Viewer" licenses, to address the range of enclave users. At this time, the State finds Tableau software to be potentially very

useful for data visualization. Some Tableau development capability already exists within the GMCB staff, and this capability would be expanded by means of internal staff training.

The GMCB staff has found that there is a growing need for more easily accessible forms of data access, to make APCD data available to a wider audience of potential users. Since 2018, the GMCB already addresses this need to a certain extent by make available so-called "Analytic Files," using a simplified file layout and linking schema to reduce the technical knowledge needed to get meaningful information from VHCURES, while still maintaining adequate detail to perform detailed analysis. (Prior to this, approved users could only access the "full consolidated extract," which requires significant technical and analytical sophistication on the part of the user.)

One potential use of Tableau is in the development of "dashboard"-style reports. Even with the availability of Analytic files, in order to be useful for the more casual researcher or other data user, the wider availability of pre-defined reports for approved users could enhance the statutory mission of the VHCURES APCD. The technology exists within Tableau to make such reports more widely available (for example, via web hosting outside of the enclave) should the State desire to employ it.

We think this attention to data usability and availability on the part of the State, with the understanding and facilitation offered by the selected vendor, add significant value to the project as proposed.

6.3 STATE'S IT STRATEGIC PLAN

6.3.1 DESCRIBE HOW THE PROPOSED SOLUTION ALIGNS WITH EACH OF THE STATE'S IT STRATEGIC GOALS AND ACTIVITIES:

Transform our customer experience

The project as proposed significantly improves both internal (State) and external user experiences. The improved CDM portal would potentially streamline data submitter interactions with VHCURES, and the enhancements to the data enclave should support efficiency for the internal GMCB analytics staff. Tableau data visualization tools have the potential to improve access to data, especially for data users who are less technically supported.

Invest in our technology

The proposed project enhances the existing VHCURES system while significantly lowering annual cost.

Secure Vermont's data

Please see **6.5 Security**, *below.*

Leverage Cloud Services

The system as proposed is purely Software as a Service (SaaS). No part of the proposed system itself is hosted in State datacenters or on State-owned equipment. Updates and software enhancements are provided in the background and benefit all vendor's clients.

IT and Business Alignment

The project requirements as developed for the RFP reflect both State preferences and requirements (e.g., NFRs) for IT projects as well as particular business needs of the GMCB.

Federated Support Model (FSM)

The VHCURES 3.0 project has consistently engaged ADS support staff for project management, enterprise architecture, procurement services, security analysis, and proposal scoring.

6.4 SECURITY

The VHCURES system, by its nature, contains sensitive private information that must be securely protected. The data submitted by payers contains:

- Personally Identifiable Information (PII)
- Private Health Information (PHI)
- Affordable Care Act (ACA) Personally Identifiable Information (PII)
- Medicaid Information
- Prescription Information
- And potentially other Sensitive, Confidential, or Non-public Information

This information is protected by the Health Insurance Portability and Accountability Act (HIPAA) and other statutes and regulations at both State and federal levels. Since the purpose of APCD data analysis is to identify information at the aggregate level, the commonly accepted practice in APCD databases is to "de-identify" the data as or before it enters the system. De-identification removes (or very greatly decreases) the ability to associate any particular information with any particular individual.

The general means to do this is by using a "hashing"[18] algorithm and software, provided by the APCD vendor to data submitters, so that the identifiable information is removed (or strictly speaking, irreversibly obscured). The data is further encrypted in extracts provided by the vendor.

VHCURES data is available to users who meet the requirements of the GMCB's data release process. Each organization must execute a Data User Agreement (DUA) with the GMCB.

Beyond the process of de-identifying data, the data itself must be secured and protected, logically and physically. The State requires vendors handling sensitive data to comply with all applicable State and

[18] Hashing is similar to encryption, but hashing is a non-reversible, "one-way" process, and cannot be "de-hashed."

Federal Standards, Policies, and Laws (listed in detail in the RFP Part 4: Data Compliance). In general, the State requires certification under the U.S. National Institute of Standards and Technology (NIST) SP 800-53 Revision 4 "moderate" risk controls. The vendor proposes to use instead HITRUST certification. HITRUST is a healthcare specific common security framework that overlaps with many of other frameworks and security standards. Using guidance from NIST, including but not limited to security standards (800-53), risk management (800-30 and -37), and governance/policy (800-12). We identify this as a risk **_RISK_ID# _R5_**.

It is the opinion of this reviewer that HITRUST certification is appropriate and comprehensive for health care data systems and could be an alternative non-functional-requirement in standard contract IT provisions for health care data. However, such policy and non-functional requirement decisions are for the State to make, possibly in a wider scope of review. For this project, the State CISO office has determined that HITRUST certification is appropriate and will ensure that the contract reflects this decision.

The vendor has also proposed 2 other variations from State security requirements:

The State requires that Hosting Service Providers procure SSL certificates on the State's behalf using VeriSign Corporation as the Certification Authority (CA). The vendor replies that "Onpoint currently uses Starfield Technologies for all SSL certificates."[19] We identified this as a risk **_RISK_ID# _R9_** and discussed it with the State's security analyst for this project. We received the State's assessment that:

"If the CA is for the vendor, we don't particularly care as long as they are at least OV (organizational validation). If the CA is for a dedicated VHCURES site that is standalone, then we would want a reputable root certificate provider to issue the certificate. Starfield appears to be an intermediary. If the site will fall under GMCB then a request for a certificate must go through ADS to get a GlobalSign cert to fall under our OV."[20] We have passed this assessment on to the project team and recommend that, whatever the State's determination, that it be memorialized in the contract.

The vendor has also proposed some language to change parts of the State's Attachment D: Other Terms and Conditions for Information Technology Contracts[21], in the following sections:

- 6.4 Operations Security
- 6.5 Redundant Backup
- 6.6 Vulnerability Testing

We identify these as a risk **_RISK_ID# _R8_** to the extent that they change conditions the State has determined to be in its interest for security of data systems. We are not suggesting that these proposed

[19] Proposal, Attachment #4, pg. 21

[20] Carbee, Email, January 24, 2019.

[21] Proposal, Section 3.4.4, pg. 68

edits are improper or necessarily against the State's interest; but we recommend that the State CISO office review them carefully and under internal legal advice.

The vendor identifies the following "highlights" of its security stance:

- HITRUST-certification since January 2017
- HIPAA and CMS Qualified Entity Certification Program security standard-compliant
- SOC 3-certified data center
- National Institute of Standards and Technology (NIST) security guidance-compliant
- Data always encrypted in motion and at rest
- Real-time firewall and system monitoring
- Certified Information Systems Security Professional (CISSP) security advisor
- Performance of at least annual third-party penetration tests and quarterly firewall reviews
- Performance of regular risk assessments and remediation
- Weekly vulnerability scans

The vendor has been hosting its cloud-provided services (such as VHCURES) on Amazon Web Services (AWS) for over two years. In light of this, the vendor lists the following features of its infrastructure approach:

- Infrastructure design and security best practices are followed to meet HITRUST and other third-party audits
- All systems are located in a Virtual Private Cloud (VPC)
- Except for front-end applications, production systems cannot be directly logged into by users
- Networks are broken into separate subnets to reduce exposure should one be compromised: DMZ tier (reverse proxy), application tier, data tier, active directory (AD) tier, and a processing (Cloudera) tier
- All networks are fronted with a firewall appliance that provides web filtering, Intrusion Detection services (IDS), and Intrusion Protection Services (IPS) as well as general firewall functions
- All systems are built for high availability and failover across AWS availability zones with 99.9% uptime
- Client data is always virtually segmented from other client data
- Real-time system monitoring and alerting is in place 24x7
- Systems are managed and monitored by cloud-certified engineers
- All system access is logged and monitored
- All networks and systems are tested by third-party security professionals
- Real-time firewall and log analysis performed by systems and personnel at a third-party security partner
- Several risk assessments are performed annually

In general and in all particulars, we assess the vendor's security and privacy stance to be strong, reliably certified, and likely to be compliant.

6.5 COMPLIANCE WITH THE SECTION 508 AMENDMENT TO THE REHABILITATION ACT OF 1973, AS AMENDED IN 1998

N/A (no public facing components at this time)

6.6 DISASTER RECOVERY

The functional requirements of the RFP, to which the vendor states agreement and compliance, require that the vendor maintain a comprehensive back-up and recovery plan for the database. The vendor states that it maintains a Business Continuity and Disaster Recovery Plan as part of its Information Security Program and would share this plan with the State upon execution of a confidentiality agreement. We find this to be reasonable, and discussion with the State's security analyst confirms that the State would elect to view the plan.[22]

Full back-ups are performed weekly and incremental back-ups are performed daily. Backed up data is encrypted and is stored on disk in a physically separate location.

The vendor indicates that their maximum Recovery Time Objective (RTO) for client-facing systems (such as VHCURES) is 24 hours. According to the vendor, this assumes a worst-case scenario as opposed to more common occurrences when recovery would be much faster. Recovery procedures are in place to be executed depending on the severity of the failure. Should a catastrophic failure occur, systems would be available in another location containing data that are no more than 24 hours older than the time of the failure (RPO). This RTO/RPO appears reasonable to us, and the State agrees.

6.7 DATA RETENTION

The vendor is required to maintain all data for analysis back to 2007 (i.e., since first data submitted to the VT APCD). The vendor agrees. The State further requires the vendor to maintain submitted data as long as technically feasible, and extracts for "a few years."[23] The vendor replies that "all submitted data to Onpoint is retained on disk for the length of the contract and is backed up to a secondary location. All data is retained in our Operational Datastore for the length of the contract and all extracts are retained for the length of the contract."[24]

6.8 SERVICE LEVEL AGREEMENT

6.9.1.1 WHAT ARE THE POST IMPLEMENTATION SERVICES AND SERVICE LEVELS REQUIRED BY THE STATE?

[22] Interview, Carbee, January 24, 2019

[23] Proposal, Attachment #4, p. 6

[24] *Ibid.*

As part of the RFP process, rather than proposing a service level agreement to bidders, the State invited bidders to submit "A copy of your Service Level Agreement (SLA)"[25], which were then evaluated as part of the scoring process. The selected bidder proposed the following:[26]

Service Level Standard	Fees at Risk
Processing Time: Once all payer files included in an extract cycle have achieved DQ/PASS status in Onpoint's system, Onpoint shall supply to the GMCB all standard extract tables within 30 days and all non-standard analytic tables (e.g., groupers, measures, attribution) within 45 days.	1% of monthly fees at risk for every calendar day past the 30 or 45-day deadline, up to a maximum 8% of fees for only the applicable month.
E**nclave Availability**: Onpoint shall make its Analytic Enclave environment available 24 hours per day, 7 days per week, with 99.9% uptime, excluding scheduled downtime with a minimum of 5 business days' notice. **Issue Resolution, Response Time, and Escalation Procedures:** • **Priority 1:** Issue acknowledgement within 30 minutes with a support representative engaged within 1 hour. A Priority 1 Issue is defined as a major systematic issue or production-affecting issue, with multiple systems or users down or performance seriously degraded during business hours. • **Priority 2**: Issue acknowledgement within 1 hour with a support representative engaged within 2 hours. A Priority 2 issue is defined as a localized/isolated issue, with a single system or application down or seriously degraded. • **Work request:** Request acknowledged with 1 business day and a timeline for completion provided within 2 business days. A work request is defined as anything that is not a Priority 1 or Priority 2 issue and is a request not requiring immediate attention.	0.25% of monthly fees at risk for each 1-hour outage, up to a maximum 2% of fees for only the applicable month. Each SLA violation will hold a penalty of 2% of the fees for the applicable month only, up to a maximum of an 8% penalty.
Disaster Recovery Time Objective and Recovery Point Objective: This pertains to client-facing systems, including SFTP, the Onpoint CDM portal, and the Analytic Enclave and are as follows. • **Recovery Time Objective (RTO):** 24 hours • **Recovery Point Objective (RPO):** 24 hours	Each SLA violation will hold a penalty of 5% of fees for the applicable month.

[25] RFP p. 6

[26] Proposal, Attachment #9

6.9.1.2 IS THE VENDOR PROPOSED SERVICE LEVEL AGREEMENT ADEQUATE TO MEET THOSE NEEDS IN YOUR JUDGMENT?

The State informs us that the Service Level Standards in the above proposal meet the needs of the State for performance of the VHCURES.[27] We agree that the proposed targets are sufficiently rigorous and comparable to standards expected for secure, non-emergency systems.

The "fees at risk" (i.e., remedies or penalties) also seem reasonable in relation to their associated standards.

However, we note and identify as a risk **_RISK_ID# _R10_** the fact that each of the first two categories carry penalties which are capped.

6.9 SYSTEM INTEGRATION

6.10.1 IS THE DATA EXPORT REPORTING CAPABILITY OF THE PROPOSED SOLUTION CONSUMABLE BY THE STATE?

Yes. The GMCB employs in-house analytics capability, as well as third-party analytics services, to derive useful information through means of the analytic enclave. (Some of these services are provided under separate contract with the proposed vendor Onpoint.) This generally takes place at the "power user" level, using the tools available. In addition to features already present the project includes several proposed data enhancements:

- Quality, utilization, and expenditure measures
    - State can choose 20 measures from among approximately 200 available in the solution's "Measures Engine."
- Person-level report
    - Allows analysts to easily summarize data for various needs.
- Service-line flagging
    - Assigns analytic flags to define the type of service (e.g., dialysis, advanced imaging, preventative visit) performed for a medical record in hierarchical or concurrent form.
- Member year
    - Determines primary medical and pharmacy payer and product for each member for each year of eligibility.
- Risk Classification
    - Assigns risk scores using broadly accepted 3M Clinical Risk Groups software.

[27] Lindberg, Conference Call, January 18, 2019.

- Disease/Condition flags
    - GMCB can choose 20 disease/condition flags (e.g., breast cancer, diabetes) from vendor's existing library.
- Episodes of Care
    - Vendor is offering choice of two episodes-of-care solutions (3M PFE, a widely used solution; and Onpoint's Facility Price Transparency Report).
- Patient to Provider Attribution
    - Uses a Centers for Medicare & Medicaid Services (CMS) approved algorithm, with configurable business rules.

These enhancements, along with data features available in the existing solution, should significantly improve usability of the data by the State (and other qualified users).

We do note, however, that some of these enhancements have seemingly arbitrary limits (i.e., 20 of 200 quality measures, 20 condition flags). The GMCB data staff inform us that they find these limits reasonable, as they represent significant enhancements. We recommend that the State, in its contract negotiations, discuss with the vendor the reason for these limitations and to establish the costs involved with any future changes, should the State decide to request them.

6.10.2 WHAT DATA IS EXCHANGED AND WHAT SYSTEMS (STATE AND NON-STATE) WILL THE SOLUTION INTEGRATE/INTERFACE WITH?

Claims and eligibility data from payers are submitted either via Secure File Transport Protocol (SFTP) or via the Onpoint CDM portal. Data extracts for qualified users are delivered via SFTP or within the analytic enclave environment.

There exists ongoing discussion within the State concerning the eventual desirability (or not) of interfacing the APCD with clinical data existing in other State sources. At this time, such integration is out-of-scope for this project.

Please create a visual depiction and include as Attachment 1 of this report.

[See attachment 1]

Will the solution be able to integrate with the State's Vision and financial systems (if applicable)?

N/A

Additional Comments on Architecture:

6.11 ALIGNMENT WITH VERMONT'S ENTERPRISE ARCHITECTURE (EA) GUIDING PRINCIPLES

In December of 2018, ADS developed an internal paper titled, "**Architecture Vision: Vermont Health Care Uniform Reporting and Evaluation System (VHCURES 3.0)**." The paper states:

> *The Architecture Vision is ideally created early in the project lifecycle and provides a high-level, aspirational view of the end architecture product. The purpose of the vision is to agree at the outset what the desired outcome should be for the architecture so that architects can then focus on the critical areas to validate feasibility. Providing an Architecture Vision also supports stakeholder communication by providing an executive summary version of the full Architecture Definition*.

We think this type of internal overview is enormously enlightening and useful. It crystallizes and memorializes the various perspectives on the project's enterprise architecture. The ADS Enterprise Architect working on this project has confirmed the following ways in which the proposed project aligns with EA Guiding Principles:[28]

Align the Business and Technology Direction:

- Virtualization and Cloud Computing
    - Is a COTS solution
    - Is cloud hosted and maintained
    - Utilizes Virtualization of hardware functionality

Maximize Benefit to the Enterprise:

- Cost Optimization
    - Bidders solution was reasonably priced. By staying with the incumbent vendor, data migration and configuration costs are saved
- Ensure Non-Functional Requirements
    - Bidders solution meets non-functional requirements, or can be configured to meet them
- Adhere to Open Standards
    - Many of the underlying software components are open source
- Configuration over Customization
    - Rest API function works like a rules engine enabling configuration and the potential to change front and backend databases while keeping business logic intact

[28] ADS, Richard Terricciano, *Architecture Vision, VHCURES 3.0,* Dec. 21, 2018, pg.8

Information is an Asset:

- Data Quality and Value
    - Strong Governance exists for data submission – ensuring clean, complete and usable data
- Information Accessibility
    - Access to the data is improved through a well architected and flexible data access and reporting Enclave solution
- Common Data Dictionary
    - The current data dictionary is Legislatively mandated. The bidder's solution does not require this. Legislative requirements for data elements make it harder to respond to changing requirements and limits the possibility of including other data types for linkage with claims.

Resilience Driven Security:

- Security
    - The Bidders solution complies with security standards
- Secure, Complete Audit Trail
    - The bidder's solution maintains a complete audit trail for all data and any transformations

6.12 REQUIREMENTS COMPARISON

In addition to the above document, we have also reviewed the internal "**Architecture Assessment Workbook for VHCURES 3.0 (19 Dec 2018 FINAL)**", an Excel workbook assessing each bidder's proposals against the following Architecture Assessment Domains:

- Business Architecture (10 Assessment "Entities," or categories)
- Application Architecture (8 Assessment Entities)
- Information Architecture (6 Assessment Entities)
- Technology Architecture (16 Assessment Entities)

For each entity, the proposals were scored as Excellent, Good, Acceptable, Marginal, or Unacceptable. In total, the selected vendor Onpoint scored as high or higher than all other bidders. With 2 exceptions, Onpoint score Excellent or Good for all entities.

(These 2 exceptions have since been addressed and resolved through further discussion. One concerned the vendor's use of Restful Application Programming Interface (API) as an alternative to a rules engine; this was subsequently deemed acceptable by ADS EA. The other concerned the fact that the RFP did not specify the State's multi-tenancy requirement for DBMS. All bidders "failed" this requirement, since it was not addressed in the RFP – however, on examination, the vendor's hosting approach (AWS) does meet this requirement.)

7. ASSESSMENT OF IMPLEMENTATION PLAN

7.1 THE REALITY OF THE IMPLEMENTATION TIMETABLE

The vendor's proposal includes a well-structured sample "Project Phases, Tasks/Major Milestones, & Implementation Time-Line," a required attachment[29] to the vendor's proposal.

This plan covers 40 monthly activities over 24 calendar months (plus 3 operational years), and is divided into 6 major activity sections:

1. Project Management
2. Data Collection and Release
3. Annual Registration
4. Claims Data Manager New Release
5. Analytic Enclave
6. Business Intelligence Solution

We find this sample plan to be reasonable and adequate as a high-level outline of the overall project phase timeline. Given that the proposed project largely maintains the existing VHCURES architecture (with the exceptions of the new "front-end" CDM portal and integration of Tableau software), the implementation time frame is reasonable and reflects the vendor's significant experience in these areas.

7.2 READINESS OF IMPACTED DIVISIONS/ DEPARTMENTS TO PARTICIPATE IN THIS SOLUTION/PROJECT (CONSIDER CURRENT CULTURE, STAFF BUY-IN, ORGANIZATIONAL CHANGES NEEDED, AND LEADERSHIP READINESS).

Over the weeks of the present review, we have observed and communicated with members of the GMCB project team, including both permanent GMCB staff and ADS assigned staff. Our clear sense of the team is that it is highly motivated, focused on the project, enthusiastic about the vendor selection and yet able to be critical and reflective of other options presented by bidders in the procurement process.

The GMCB staff has been increasing and improving its internal analytics capabilities in recent years.[30] This endeavor, which appears to be succeeding, is crucial to the success of the present project. Some of the savings potentially realized in the proposed project are due precisely to this increased ability to do analytics in-house. The internal capabilities of APCD project management in the GMCB have grown, and at this point the staff, while not large, seems well capable of handling the needs of the present project along with their continuing tasks. We note for example that the internal staff includes a staff member

[29] RFP, pp. 6, 8, 28.

[30] Interview, O'Neill, January 2, 2019.

with specific Tableau software expertise; we expect this capability to increase by means of in-house training.

The procurement process, described in **Section 1.1.2**, *above*, included broad and at times deep participation from stakeholders including submitters and data users. The in-house IT and data team have reached out broadly, both to national interest groupings such as the APCD Council[31] and to Vermont APCD data experts, including retired but knowledgeable former staff.

7.3 DO THE MILESTONES AND DELIVERABLES PROPOSED BY THE VENDOR PROVIDE ENOUGH DETAIL TO HOLD THEM ACCOUNTABLE FOR MEETING THE BUSINESS NEEDS IN THESE AREAS:

7.3.1 PROJECT MANAGEMENT

The vendor states that they apply "processes advocated by the Project Management Institute" (PMI). (The vendor states use of an Agile scrum methodology for software development.)[32] The proposal lists the following deliverables as "key activities" for project management:[33]

- A Statement of Work will be developed to outline the scope of the project, including a list of deliverables, high-level timeline, assumptions, and key roles and responsibilities.
- A detailed project plan will be built with key milestones, task duration and dependencies, and task owners.
- Onpoint will facilitate weekly status meetings to update the GMCB on accomplishments, status of in-process and upcoming tasks, and known issues or risks.
- A change management process will be outlined and discussed with the GMCB.
- All meetings will have an agenda, and key decisions and action items will be documented.
- Lessons Learned will be conducted at project close to document successes and improvement opportunities.

While this list is somewhat general, it does cover the key PM tasks. The project documentation ticket software and SharePoint site reference in 7.3.1.2, *below*, along with the State's significant experience with this vendor, lead us to conclude that this general list is adequate.

7.3.1.1 VENDOR PROJECT MANAGER

The vendor assigns the current Onpoint project manager (PM) for the existing VHCURES system as the Dedicated Project Manager for VHCURES program support, deliverables, issue resolution, and contract management overall; also provides project management for data intake and aggregation through

[31] www.apcdcouncil.org

[32] Proposal, Section 3.4.4, pg. 45

[33] *Ibid.*

extract production as well as overseeing submitter registration, development of limited extracts and ad hoc analytic reporting.

We have reviewed her resume as provided by the vendor. While we do not see specific certifications regarding project management (such as PMP certification), we note her successful work with the existing GMCB VHCURES staff as well as decades of experience and support her engagement in this role.

In addition to the Dedicated Project Manager, the vendor has assigned and identified a Lead Client Support person and an Operations Management and Quality Assurance Lead. Here too, **the assigned staff appear to be well-qualified and experienced.**

7.3.1.2 PROJECT DOCUMENTATION

The vendor uses Atlassian Jira, a widely-accepted development and ticketing tool, to track implementation from development through deployment. Tickets are assigned to team members for execution, and their status can be monitored throughout their progression in the development cycle from system design to system requirements development, production, quality assurance and deployment.

The vendor proposes using the VHCURES Collaboration Zone, a vendor-hosted SharePoint site, for sharing project management and requirements documentation, status updates, and timelines. Approved GMCB users will be granted access to a VHCURES 3.0 project folder. In addition, the Collaboration Zone can be used to provide data users with announcements and information related to new feature implementation.

Both of these choices are appropriate and continue already accepted practices within the VHCURES project.

7.3.2 TRAINING

The selected vendor suggests they have "supplemented [their] training and support strategy."[34] They further reference "providing training and support to VHCURES users [to] promote use of the data and ensure that users have the tools they need to conduct efficient and effective analyses"[35] as well as the use of "group meetings."[36] In a list of deliverables for technical services, the vendor states that "To help data submitters learn about new CDM functionality, Onpoint will host webinar trainings and provide detailed documentation regarding system enhancements."

[34] Proposal, Section 3.4.2, pg. 3

[35] Proposal, Section 3.4.4, pg. 46

[36] *Ibid.*

The proposed training focus areas include:

- Data submitter training
- Data user training
- Client (i.e., GMCB users) training

While the State's history with the vendor shows the vendor to be accomplished and effective at training and support, at the same time **we do not see sufficient training deliverables in the proposed project to delineate exactly which topics, formats, and timeframes are included in the fixed price proposal and which may be optional.** Some examples of the language used by the vendor to in response to an RFP instruction to "Describe the training that is included in your proposal" are:[37]

> *"Our approach to training has always been to tailor the training to the needs of the State and the State's end users. Our support will be customer focused and flexible, using a variety of approaches including webinars, conference calls, and dedicated support email boxes."*
>
> *"When a situation arises that requires communication with and action by the data submitters, Onpoint will work with the State to determine the best means to document and train the users: webinars, conference calls, targeted newsletter or email blast, or another approach."*
>
> *Our skilled team of professionals is available to present topics of interest in VHCURES user group meetings or through separate training venues organized by Onpoint. Whether on site in Vermont or remote from our offices in Portland, Maine, Onpoint will prepare a presentation and work with the State to tailor the content to the audience."*
>
> *"Onpoint is available to travel to Vermont, conduct webinars, or schedule one-on-one telephone training with GMCB team members."*

The vendor includes a line item for training in the cost proposal, totaling $4,200 (implementation period only.)[38]

Aside from that line item, the language in the proposal, as represented by extracts above, tends to conflate support with training. Some of the text above (e.g., "available to travel to Vermont, conduct webinars, or schedule one-on-one telephone training") is ambiguous in the context of the RFP instruction to describe included training. If requiring some training, would the State incur extra costs, and what would those costs be? We think this particular response skirts the State's solicitation of a fixed price proposal. **We suggest that the State clarify training deliverables in the final contract.**

[37] Proposal, Section 3.4.4, pg. 54

[38] *Ibid*., Section 3.4.4, pg. 62

In contrast, we find the deliverables and services listed in the proposal **Part 7: Maintenance and Support Services**, to be well-detailed and appropriate.

7.3.3 TESTING

Onpoint has a four-tier System Development Lifecycle (SDLC) process that leverages DEV, TEST, STAGE/UAT (user acceptance testing), and PRODUCTION environments. All software is developed in the development (DEV) environment and must pass unit tests and regression tests prior to being promoted to the TEST environment. When a release is promoted to TEST, further testing occurs in the TEST environment prior to being promoted to the STAGE environment where user acceptance testing occurs. Once all tests are passed, the release is taken through a standard deployment checklist and process before being released into Production (PROD).[39] Onpoint does not put any PII or PHI in non-production environments. DEV and TEST environments use mocked-up, fake data.

The State is familiar with Onpoint's testing procedures and environment and has found them appropriate in past development cycles. The environment described above is used for upgrade development, although not for maintenance updates.[40] This is appropriate. The employment of a user acceptance testing (UAT) / staging environment before releasing upgrades into the production environment is good and standard practice.

7.3.4 DESIGN

The proposed project continues and maintains the VHCURES architectural design as implemented by the vendor. The vendor internally employs an Agile methodology for software development and releases software updates every two to four weeks. The proposal includes a required development road-map as Attachment #2. This outline shows expected development work covering CY 2019-2021 covering 4 main areas:

- Onpoint CDM
- Analytic Enclave
- Business Intelligence Solution
- Performance Reporting Portal

The detail in this table is sufficient to support the vendor's claim of continuous and relevant solution development. (The table shows only major development expectations; minor work continues on the 2-4 week schedule.)

The vendor proposes their CDM portal "front-end" application as a crucial enhancement in this project. This product is slated for release in second quarter (Q2) 2019, and therefore we identify as a risk **_RISK_ID# _R6_** the fact that it is not yet an existing product. We have enquired as to the status of the

[39] Proposal, Section 3.4.4, pg. 58

[40] *Ibid.*

CDM portal and the project staff has communicated with the vendor, who reports the product as being on-time for Q2.

7.3.5 CONVERSION (IF APPLICABLE)

The vendor states, "As the current VHCURES data vendor, our proposed solution builds off of and enhances the existing systems and so there would be no conversion or transition that might interrupt scheduled deliverables."[41]

This is accurate; however, we suggest that this would be an appropriate time to consider data cleaning (just as it would be if a vendor other than the incumbent were standing up a new system). Data cleaning, also called scrubbing, involves detecting and removing errors and inconsistencies from data in order to improve the quality of data.

7.3.6 IMPLEMENTATION PLANNING

The RFP required bidders to submit a "typical implementation plan."[42] The vendor responded to this requirement by submitting a sample implementation plan for ***a rule change***, including finalizing requirements, system build, submitter communication and training, release of the data, and parallel processing of old and new layouts to minimize impact on processing and extract schedules.[43]

Because the vendor is proposing to continue and enhance the existing system rather than to stand up a new database, and because the "Project Phases, Tasks/Major Milestones, & Implementation Time-Line" of proposal Attachment #5 already provides an overview of implementation planning for the project lifecycle, we think this substitution is reasonable and useful as a glimpse into the vendor's approach to implementation planning.

The typical rule change implementation plan is sufficiently detailed and realistic as a high-level overview of a 12-month implementation period with 4 major phases:

- Specification Finalization
- System Build
- Release for Production
- Data Release

In fact, the State is electing that the vendor implement a rule change, (perhaps as incumbent the vendor anticipated this because of their familiarity with Vermont GMCB trends and processes) a quote for which was requested by the State as part of the final questions and BAFO process.

---

[41] *Ibid.*, pg. 49

[42] RFP p. 6

[43] Proposal, Attachment #7

7.3.7 IMPLEMENTATION

Section **6.2 Enhancements to the Proposed Project**, *above*, lists the additions the vendor is proposing for the existing VHCURES system. Taken together with continued operation and incremental development of the existing system, these comprise the deliverables proposed for the project. Taken together with the milestones and timetable listed in 7.1 The Reality of the Implementation Timetable, *above*, **the implementation deliverables are sufficiently delineated, and adequate detail is provided throughout Part 2: Vendor Proposal/Solution, of the vendor's proposal.**

We contacted 2 senior APCD administrators in other states, James Lucht of Rhode Island and Thea Mounts of Washington State, both listed as references by the vendor, and both having had significant experience with the vendor. In both cases, we heard a generally **very high level of satisfaction with the vendor**, including a good record of bringing projects in on time. We have already referred to some minor questions of cost accuracy related by one of these individuals in **5. Acquisition Cost Assessment**, *above*, with no suggestion of impropriety. There was also some reference to some earlier "QA issues" that had since been satisfactorily resolved.

We think the vendor is well capable of performing the contracted implementation.

7.4 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 JUDGEMENT? PLEASE EXPLAIN.

Yes. The project has engaged ADS resources including an ADS-assigned PM throughout the project procurement phase and into the present. We have reviewed the project SharePoint site and project documentation for detail and diligence, and **we conclude that the project has a well-qualified and experienced PM. The documentation for the project is complete and sufficiently extensive.**

Additional Comments on Implementation Plan

NONE

8. COST BENEFIT ANALYSIS

8.1 ANALYSIS DESCRIPTION:

The tangible cost benefit analysis (resulting in cost savings) is show in **9. Net Cost Impact Analysis**, *below*. Total costs expected for the project in each fiscal year and over the 5-year project lifecycle are compared with the State's best estimate of average annual ongoing costs, were the existing system to be extended in its current form.

8.2 ASSUMPTIONS:

List any assumptions made in your analysis.

- Existing average annual cost estimates are accurate.
- Existing costs would stay flat over lifecycle
- State has identified all options it wishes to select in the vendor's proposal
- Implementation costs are incurred in FY1

8.3 FUNDING:

Funding for this project is 100% State.

8.4 TANGIBLE COSTS & BENEFITS:

Provide a list and description of the tangible benefits of this project. Tangible benefits include specific dollar value that can be measured (examples include a reduction in expenses or reducing inventory, with supporting details).

- **Compared to the cost of maintaining the existing VHCURES system under current contract(s) at the existing level, the State could expect cost savings of $848,933.45 over the 5-year project lifecycle.** (Analysis in 9. Impact Analysis on Net Operating Costs, *below*)

8.5 INTANGIBLE COSTS & BENEFITS:

Provide a list and description of the intangible benefits of this project. Intangible benefits include cost avoidance, the value of benefits provided to other programs, the value of improved decision making, public benefit, and other factors that become known during the process of analysis. Intangible benefits must include a statement of the methodology or justification used to determine the value of the intangible benefit.

- **By engaging the incumbent vendor, by not having to implement a new APCD system, but instead continue the existing system in the main, the State could realize cost avoidance of about $354,400 by not having to maintain parallel systems for the approximately 4 months of a typical cutover period.** (Existing annual cost = $1,063,200 / 12 months X 4)
- Similarly, the State is avoiding possible implementation costs associated with implementing a new system via a different vendor.
- Data will be made more useable by a wider range of data consumers. The implementation of new data visualization tools provides the prospect of making data analysis more widely available for less technically-oriented users.
- Data Enclave enhancements would work synergistically with the GMCB's increased internal analytics capacity to further the data component of the GMCB mission.
- The new CDM portal increases usability for data submitters.

8.6 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.

Yes. The tangible cost savings reflect a lower annual cost for the existing system with enhancements. State staff interpret the lower cost as reflecting the increased internal capability for data analysis within the GMCB staff. **The intangible benefits, including likely cost avoidance and system usability enhancements support the mission and mandate of the GMCB.**

Statutorily, the GMCB is required to maintain the VHCURES database for a variety of purposes, including: (1) determining the capacity and distribution of existing state resources; (2) identifying health care needs and informing health care policy; (3) evaluating the effectiveness of intervention programs for improving patient outcomes; (4) comparing costs between various treatment settings and approaches; (5) providing information to consumers and purchasers of health care; and (6) improving the quality and affordability of patient health care and health care coverage.[44]

[44] GMCB, *VHCURES Overview: A Guide for Data Users,* p. 4

This broad mandate requires a system that is reliable and secure, but also flexible in the sense of providing data which may be analyzed and understood by a variety of data consumers across the full range of analytical sophistication, from researchers and policy makers to the general public. In 2018 the GMCB developed a VHCURES Strategic Plan[45] to further define ways in which VHCURES can support the Board's regulatory and oversight responsibilities.

Our sense of the GMCB staff involved in this present project is that they have made their procurement decisions in the context of this future-facing environment, choosing a system that maintains the high performance of VHCURES while increasing its capacity to fulfil data analysis needs in a more capable environment (and at the same time improving usability for data source stakeholders, i.e., the submitters). So, while it is obvious that the lifecycle cost savings **of $848,933.45** and lower annual cost (after a moderately brief implementation period) represent a significant tangible benefit, we think the intangible benefits are particularly interesting in that future-facing context.

First, there is the cost avoidance implicit in continuing to operate the core of an already-proven APCD. The easy to identify benefits here are the elimination of a need to operate the "old" and "new" systems in parallel for a time, as would be required during a period of implementation and acceptance testing, and the avoidance of costs involved in standing up a whole new database. Accompanying these would be the likely need to engage significant GMCB staff time in facilitating and participating in a new vendor's data migration, acceptance testing, requirements determination, etc. There may, of course, be advantages in replacing the whole system at some point in the future (and hence our attention to the contract length), but it seems to us that *at this time* the project team is correct in focusing on analytical and environmental enhancements.

Second, those enhancements will tend to make the access to data more productive across a wider range of users. An example is the implementation of more capable data visualization tools, enabling skilled users and the GMCB staff to present complex analyses in forms which are more intuitively understood. Another example is the expansion in the number of so-called "canned" reports, pre-defined to meet a variety of ongoing needs. Improving the efficiency of the system for data submitters speaks to the quality and efficiency of the system at the intake. These sorts of benefits are not easily defined in strictly monetary terms, but they go directly to the regulatory and oversight needs of the GMCB. They also reflect quite exactly the business benefits identified by the project team from the outset, through the IT ABC form (see immediately below), the project Charter, and the RFP.

8.7 IT ABC FORM REVIEW:

[45] GMCB, *VHCURES Strategic Plan: Options and Recommendations,* July 26, 2018, https://gmcboard.vermont.gov/content/vhcures-strategic-plan-0, Accessed March 1, 2019.

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.

The project has evolved considerably since the IT ABC form was approved, but in most cases to the State's benefit.

From a cost perspective, the IT ABC form projected a lifecycle cost of $7,076,660.00. The lifecycle cost as now proposed is $4,467,278.05, a difference of $2,609,593.45, or 37% lower. The difference reflects both a lowered annual O&M cost and a much lower implementation cost.

One of the data risks identified in the IT ABC form was avoided, that of transitioning to a new data system (including the parallel operations mitigating strategy referred to above.)

Most of the Business Value descriptions in the IT ABC form are achieved in the proposed project. However, there is a reference to eliminating the burden of administering the an internal State instance of the VHCURES database, performed by the IT staff of the Agency of Human Services (AHS).[46] (This objective may also be found in the project Charter[47] and the ADS EA "VHCURES Architecture Vision" document.[48]) **The current project does not include eliminating that instance, although it may be laying groundwork to make that change possible eventually.**

Additional Comments on the Cost Benefit Analysis:

NONE

[46]State of Vermont, *GMCB VHCURES 3.0 IT ABC form*, pg. 2

[47] Charter, pg. 3

[48] ADS, *VHCURES 3.0 Architecture Vision*, pg. 4

9. IMPACT ANALYSIS ON NET OPERATING COSTS

9.1 INSERT A TABLE TO ILLUSTRATE THE NET OPERATING COST IMPACT.

	Implementation	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance	Total
		FY1	FY2	FY3	FY4	FY5	
O&M Costs		$ 789,560.00	$ 793,260.00	$ 796,960.00	$ 800,660.00	$ 804,360.00	$ 4,346,666.55
Implementation Costs	$ 361,866.55	$ 361,866.55	$ -	$ -	$ -	$ -	$ -
Annual Total		$ 1,151,426.55	$ 793,260.00	$ 796,960.00	$ 800,660.00	$ 804,360.00	$ 4,346,666.55
Existing Solution Average Annual Cost		$ 1,063,200.00	$ 1,063,200.00	$ 1,063,200.00	$ 1,063,200.00	$ 1,063,200.00	$ 5,316,000.00
Cost (Savings) over current		**$ 88,226.55**	**$ (269,940.00)**	**$ (266,240.00)**	**$ (262,540.00)**	**$ (258,840.00)**	**$ (969,333.45)**

9.2 PROVIDE A NARRATIVE SUMMARY OF THE ANALYSIS CONDUCTED AND INCLUDE A LIST OF ANY ASSUMPTIONS.

The O&M costs and Implementation Costs in the table above are derived from **Attachment 3, Cost Spreadsheet**. These costs include vendor proposed prices (including cost proposal prices and options selected by the State), third-party costs, and internal State costs, including ADS support and any staff support specifically dedicated to this project. (See notes on the Cost Spreadsheet).

The Existing Solution annual costs are as quoted by State sources and are assumed to stay flat over the lifecycle.

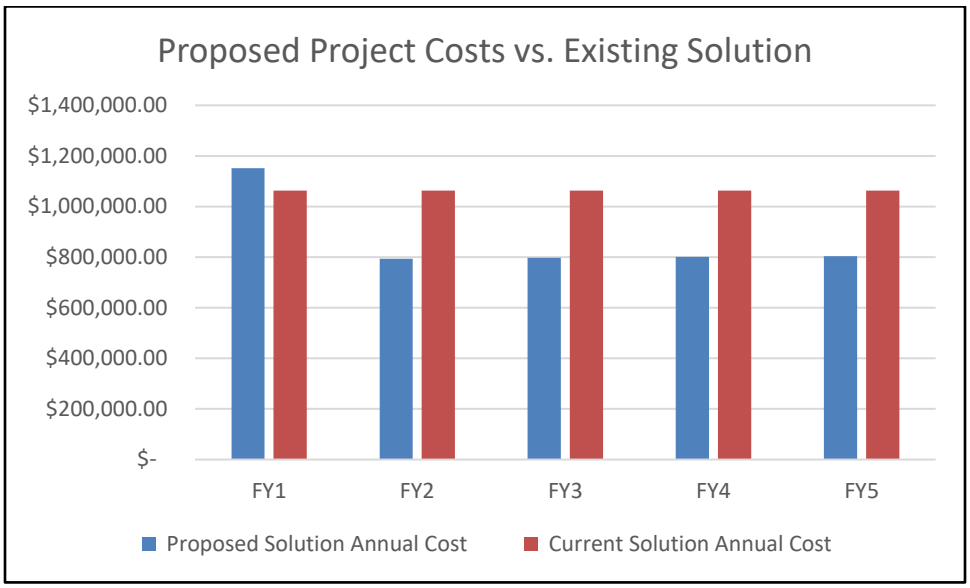
Assumptions include:

- Existing solution average annual cost estimates are accurate.
- Existing costs would stay flat over lifecycle
- State has identified all options it wishes to select in the vendor's proposal
- Implementation costs are incurred in FY1

9.3 EXPLAIN ANY NET OPERATING INCREASES THAT WILL BE COVERED BY FEDERAL FUNDING. WILL THIS FUNDING COVER THE ENTIRE LIFECYCLE? IF NOT, PLEASE PROVIDE THE BREAKOUTS BY YEAR.

No federal funding is anticipated for this project.

9.4 WHAT IS THE BREAK-EVEN POINT FOR THIS IT ACTIVITY (CONSIDERING IMPLEMENTATION AND ON-GOING OPERATING COSTS)?



With implementation costs included, total costs in FY1 exceed estimated annual costs for the existing solution by $88,226.55. In the second year of operation, breakeven is passed, with a total savings of $969,333.45 over the project lifecycle.

10. RISK ASSESSMENT & RISK REGISTER

The risks identified throughout this review are collected below, along with an assessment of their significance, a description of the State response and timing, and our evaluation of the State response.

10.1.1 RISK REGISTER

The following table explains the Risk Register components:

Risk ID:	Identification number assigned to risk or issue.	
Risk Rating:	An assessment of risk significance, based on multiplication of **(probability X impact ratings)** (*see below*).	
	1-6 = low	See table below
	7-44 = moderate	
	45-90 high	
Probability:	Assessment of likelihood of risk occurring, scale of **1,3,5,7, or 9**, from least to most likely	
Impact:	Assessment of severity of negative effect, scale of **1,3,5,7, or 10**, from least to most severe	
Finding:	Review finding which led to identifying a risk	
Risk Of:	Nature of the risk	
Risk To:	What may be impacted, should the risk occur	
Reviewer's recommendation	Decision to *avoid*, *mitigate*, or *accept* risk Detailed description of response to risk, in order to accomplish decision	
State's response	State's planned action in light of recommendation	
Reviewer's Assessment:	Reviewers evaluation of the State's planned response	

Risk Rating Matrix			IMPACT				
			Trivial	Minor	Moderate	Major	Extreme
			1	3	5	7	10
LIKELIHOOD	Rare	1	1	3	5	7	10
	Unlikely	3	3	9	15	21	30
	Moderate	5	5	15	25	35	50
	Likely	7	7	21	35	49	70
	Very Likely	9	9	27	45	63	90

Risk ID: R1	Rating:	**5**
	Probability:	**3**
	Impact:	**15**
Finding:	Various options the State may choose may possibly increase total cost.	
Risk Of:	inaccurate cost planning over time	
Risk To:	cost planning	
Reviewer's recommendation	MITIGATE: cost out all State option preferences	
State's response	agree	

Risk ID: R3	Rating:	**7**
	Probability:	**5**
	Impact:	**35**
Finding:	Vendor's pricing assumes 5 years of O&M starting 3/18/2019 (+ some earlier implementation costs). State may prefer a shorter term (e.g., 3 + optional 2).	
Risk Of:	increased cost	
Risk To:	project cost, impact analysis	
Reviewer's recommendation	MITIGATE: determine state contract preference; negotiate and memorialize in contract	
State's response	GMCB's intent is to negotiate a three year contact with the option of two, one year renewals.	

	Rating:	**5**
Risk ID: R5	Probability:	**1**
	Impact:	**5**
Finding:	Vendor employs HITRUST for security certification, rather than NIST 800-53 as specified in requirements and Attachment D: Other Terms and Conditions for Information Technology Contracts	
Risk Of:	non-alignment with State security preferences	
Risk To:	security, privacy	
Reviewer's recommendation	MITIGATE: confirm and memorialize VT CISO office consent to HITRUST certification adapt contract language	
State's response	agree	

Risk ID: R6	Rating: Probability: Impact:	**7** **5** **35**
Finding:	Vendor proposes software not yet released. Projected for Q2 2019. (“Onpoint CDM’s redesigned online administrative and submission reporting portal”; p.32 of proposal)	
Risk Of:	Implementation delay	
Risk To:	project success, project cost	
Reviewer’s recommendation	MITIGATE: address this in contract: e.g., deliverables-based payment, retainage, etc. Remedies if delayed?	
State’s response	GMCB received an update from the vendor, which stated they were on track for a release at the end of Q2.	

Risk ID: R8	Rating: Probability: Impact:	**5** **5** **25**
Finding:	Vendor proposes various modifications to State's Attachment D: Other Terms and Conditions for Information Technology Contracts	
Risk Of:	non-alignment with State security preferences; insufficient protection of data privacy;	
Risk To:	security, privacy	
Reviewer's recommendation	MITIGATE: negotiate and resolve differences early in contract negotiations	
State's response	agree: include all Attachment D part 6 requirements	

	Rating:	**1**
Risk ID: R9	Probability:	**5**
	Impact:	**5**
Finding:	Vendor uses Starfield Technologies as Certification Authority (CA) (State requirement is Verisign Corporation)	
Risk Of:	non-alignment with State security preferences	
Risk To:	security, privacy	
Reviewer's recommendation	MITIGATE: confirm and memorialize VT CISO office consent to alternative CA adapt contract language	
State's response	agree / ongoing internal discussion on final status re: CISO	

Risk ID: R10	Rating: Probability: Impact:	**7** **5** **35**
Finding:	Vendor's proposed SLA limits fees at risk for several SLA violations. (e.g., "up to a maximum 8% of fees", "up to a maximum 2% of fees") (The question here is about the source of these limits: if the vendor feels no pain it is not a sufficient incentive for SL target performance)	
Risk Of:	insufficient compensation to State; insufficient performance incentive	
Risk To:	project success, project performance	
Reviewer's recommendation	MITIGATE: understand the reason(s) for these limitations and negotiate changes if appropriate. (Note: the RTO and RPO target fees at risk are not so limited)	
State's response	agree	

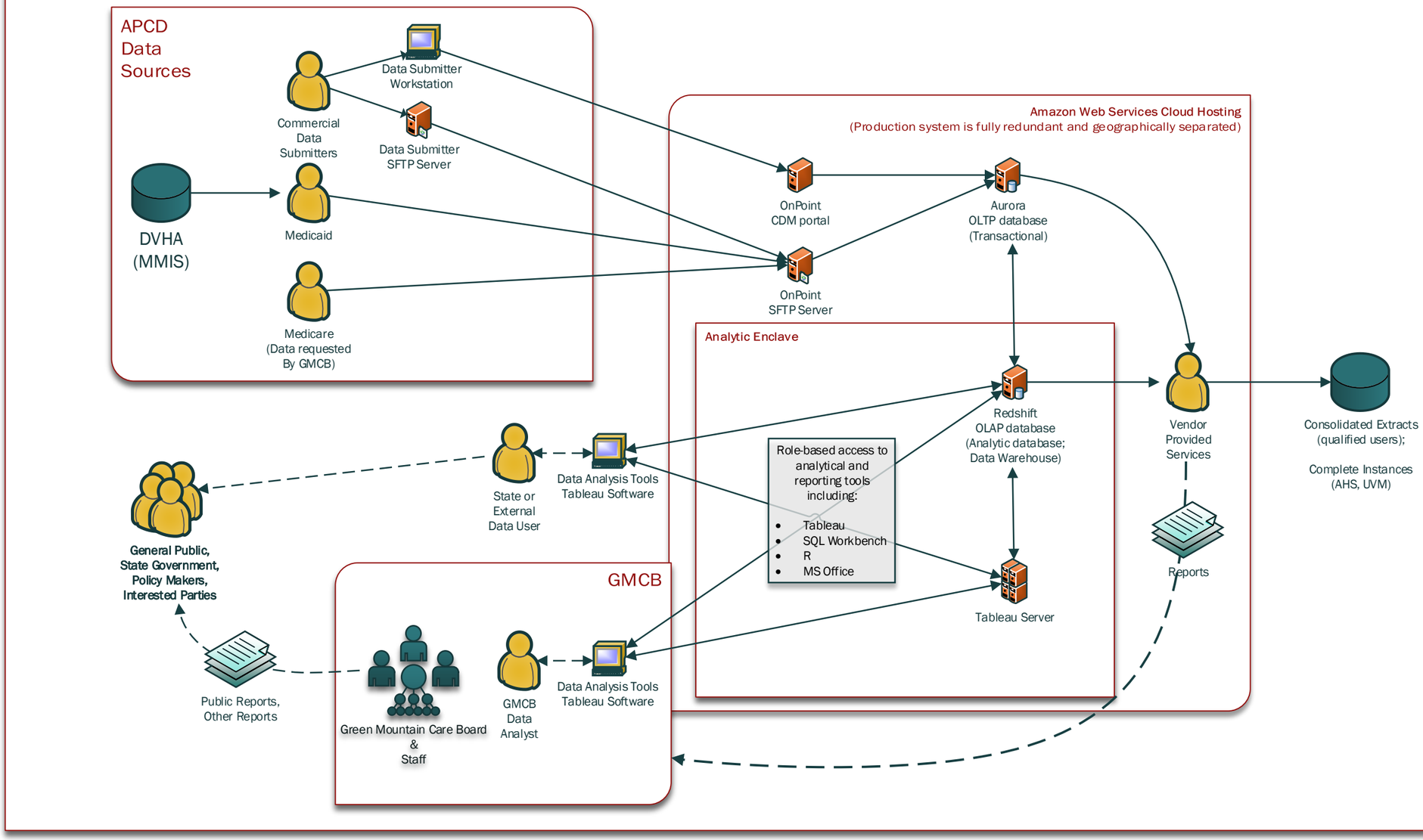
11. ATTACHMENTS

Attachment 1 – Illustration of System Integration

Attachment 2 – Risk & Issues Register Summary

Attachment 3 – Cost Spreadsheet

Attachment #1 - VHCURES 3.0 Illustration of System Integration / ver. 2.0



ATTACHMENT 2 - VHCURES 3.0 INDEPENDENT REVIEW -- Risk and Issues Register -- version 3.1.a -- 2019 - March - 5 -- Paul E. Garstki, JD -- Paul Garstki Consulting								
								1-6 = low
RISKS	**What is the finding that leads to identifying a risk? (This is a highly condensed version that is explained more fully in the report narrative)**	**What exactly are the risks implied by the finding?**	**What aspects of the project are at risk if the risk(s) are realized?**	**What is the Independent Reviewer recommending?**	**What is the State's response to the recommendation(s) (e.g., agree, or alternative risk response.)**	**1,3,5,7, or 9**	**1,3,5,7, or10**	**7-44 = moderate**
Note: Risk ID # list may have gaps, in order to maintain consistency with earlier drafts								**45-90 high**

Risk #	Finding	risk of	risk to	Reviewer Recommendation	SOV response	likelihood 1-9	impact 1-10	total rating
R1	Various options the State may choose may possibly increase total cost.	inaccurate cost planning over time	cost planning	MITIGATE: cost out all State option preferences	agree	**3**	**5**	**15**
R3	Vendor's pricing assumes 5 years of O&M starting 3/18/2019 (+ some earlier implementation costs). State may prefer a shorter term (e.g., 3 + optional 2).	increased cost	project cost, impact analysis	MITIGATE: determine state contract preference; negotiate and memorialize in contract	GMCB's intent is to negotiate a three year contact with the option of two, one year renewals.	**5**	**7**	**35**
R5	Vendor employs HITRUST for security certification, rather than NIST 800-53 as specified in requirements and **Attachment D: Other Terms and Conditions for Information Technology Contracts**	non-alignment with State security preferences	security, privacy	MITIGATE: confirm and memorialize VT CISO office consent to HITRUST certification adapt contract language	agree	**1**	**5**	**5**
R6	Vendor proposes software not yet released. Projected for Q2 2019. ("Onpoint CDM's redesigned online administrative and submission reporting portal"; p.32 of proposal)	Implementation delay	project success, project cost	MITIGATE: address this in contract: e.g., deliverables-based payment, retainage, etc. Remedies if delayed?	GMCB received an update from the vendor, which stated they were on track for a release at the end of Q2.	**5**	**7**	**35**
R8	Vendor proposes various modifications to State's **Attachment D: Other Terms and Conditions for Information Technology Contracts**	non-alignment with State security preferences; insufficient protection of data privacy;	security, privacy	MITIGATE: negotiate and resolve differences early in contract negotiations	agree: include all Attachment D part 6 requirements	**5**	**5**	**25**
R9	Vendor uses Starfield Technologies as Certification Authority (CA) (State requirement is Verisign Corporation)	non-alignment with State security preferences	security, privacy	MITIGATE: confirm and memorialize VT CISO office consent to alternative CA adapt contract language	agree / ongoing internal discussion on final status re: CISO	**1**	**5**	**5**
R10	Vendor's proposed SLA limits fees at risk for several SLA violations. (e.g., "up to a maximum 8% of fees", "up to a maximum 2% of fees") (The question here is about the source of these limits: if the vendor feels no pain it is not a sufficient incentive for SL target performance)	insufficient compensation to State; insufficient performance incentive	project success, project performance	MITIGATE: understand the reason(s) for these limitations, and negotiate changes if appropriate. (Note: the RTO and RPO target fees at risk are not so limited)	agree	**5**	**7**	**35**

ISSUES	none at this time

Attachment 3: VHCURES 3.0 Cost Spreadsheet -- ver. 3.0							
Description	**Initial Implementation**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Total**
Fiscal Year		**FY1**	**FY2**	**FY3**	**FY4**	**FY5**	
Software							
Enterprise Application: License Fees	$ -	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 200,000.00	$ 1,000,000.00
Maintenance &/or License Fee Add-Ons	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subscription cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Storage Limitations and/or Additional Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Database Software: License Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Middleware Tools: License Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating System Software: License Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Data Visualization Tool: License Fees	$ -	$ 14,100.00	$ 14,100.00	$ 14,100.00	$ 14,100.00	$ 14,100.00	$ 70,500.00
Upgrade Costs for Later Years	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Support and Maintenance Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Software Total	$ -	$ 214,100.00	$ 214,100.00	$ 214,100.00	$ 214,100.00	$ 214,100.00	**$ 1,070,500.00**
Hardware							
Computing Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Storage and Backup Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Network Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Facilities/Data Center	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Hardware Total	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Consulting							
Independent Review	$ 16,880.55	$ -	$ -	$ -	$ -	$ -	$ 16,880.55
Consulting Total	$ 16,880.55	$ -	$ -	$ -			**$ 16,880.55**
Maintenance and Operations Services							
Data Aggregation Services	$ -	$ 366,600.00	$ 370,300.00	$ 374,000.00	$ 377,700.00	$ 381,400.00	$ 1,870,000.00
Data Analytics Services	$ -	$ 53,110.00	$ 53,110.00	$ 53,110.00	$ 53,110.00	$ 53,110.00	$ 265,550.00
Ad Hoc Services2	$ -	$ 71,250.00	$ 71,250.00	$ 71,250.00	$ 71,250.00	$ 71,250.00	$ 356,250.00
Delta Dental		$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 100,000.00
Maintenance and Operations Services Total	$ -	$ 510,960.00	$ 514,660.00	$ 518,360.00	$ 522,060.00	$ 525,760.00	**$ 2,591,800.00**
Implementation Services							
Project Management	$ 5,600.00	$ -	$ -	$ -	$ -	$ -	$ 5,600.00
Requirements	$ 4,200.00	$ -	$ -	$ -	$ -	$ -	$ 4,200.00
Design (Architect Solution)	$ 7,000.00	$ -	$ -	$ -	$ -	$ -	$ 7,000.00
Development (Build, Configure or Aggregate)/Testing	$ 20,450.00	$ -	$ -	$ -	$ -	$ -	$ 20,450.00
System Testing	$ 5,250.00	$ -	$ -	$ -	$ -	$ -	$ 5,250.00
Defect Removal	$ 2,100.00	$ -	$ -	$ -	$ -	$ -	$ 2,100.00
Implement/Deploy or Integrate	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Quality Management	$ 1,400.00	$ -	$ -	$ -	$ -	$ -	$ 1,400.00
Training	$ 4,200.00	$ -	$ -	$ -	$ -	$ -	$ 4,200.00
Transition from Hashed to Live Identifiers	$ 65,000.00	$ -	$ -	$ -	$ -	$ -	$ 65,000.00
Rule Change and Redesign of Data Layout	$ 100,000.00	$ -	$ -	$ -	$ -	$ -	$ 100,000.00
Delta Dental	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ 50,000.00
Implementation Services Total	$ 265,200.00	$ -	$ -	$ -	$ -	$ -	**$ 265,200.00**
Personnel Additional							
State Labor (ADS Services)[1]	$ 79,786.00	$ -	$ -	$ -	$ -	$ -	$ 79,786.00
Personnel Additional Total	$ 79,786.00	$ -	$ -	$ -	$ -	$ -	**$ 79,786.00**
Hosting							
Hosting Fees	$ -	$ 64,500.00	$ 64,500.00	$ 64,500.00	$ 64,500.00	$ 64,500.00	$ 322,500.00
Hosting Total	$ -	$ 64,500.00	$ 64,500.00	$ 64,500.00	$ 64,500.00	$ 64,500.00	$ 322,500.00
Column Totals:	**$ 361,866.55**	**$ 789,560.00**	**$ 793,260.00**	**$ 796,960.00**	**$ 800,660.00**	**$ 804,360.00**	**$ 4,346,666.55**
Proposed Solution Average Annual Cost	$ 796,960.00					checksum	**$ 4,346,666.55**
IT ABC Current Solution Average Annual Cost	$ 1,063,200.00					vendor only	$ 4,250,000.00
Difference	$ (266,240.00)					difference	$ 96,666.55
IT ABC Estimate Lifecycle Cost	$ 7,076,660.00						
Proposed Solution Lifecycle Cost	$ 4,346,666.55	61%					
Difference	$ 2,729,993.45	39%					
Annual Cost Vendor Only		$ 789,560.00	$ 793,260.00	$ 796,960.00	$ 800,660.00	$ 804,360.00	$ 3,984,800.00
Implementation Vendor Only	$ 265,200.00					checksum	$ 4,250,000.00
Average Annual M&O Cost Vendor Only (not including implementation)	$ 796,960.00						

Notes:
1. As reported by State. Most of these costs will have been incurred in the FY prior to the 1st FY of the project lifecycle.
2. State's estimate for optional services which may or may not be needed