VERMONT

**Independent Review of Proposed
Vermont Elections Administration Platform for
Department of Information and Innovation (DII) and Secretary of
State (SoS)**

Submitted by:

Strategic Technology Services, Inc.

December 20, 2013

December 20, 2013

State of Vermont
Office of the Chief Information Officer (CIO)
Department of Information and Innovation (DII)
Attn: Mr. Richard Boes, Commissioner and CIO
133 State Street, 5th Floor
Montpelier, VT 05633-6601

Dear Mr. Boes:

I am pleased to submit this analysis containing an Independent Review of the State of Vermont
Elections Administration Platform for Department of Information and Innovation (DII) and
Vermont Secretary of State Office (SoS).

It is my hope that you find this analysis clear and succinct, and it provides State of Vermont the
information necessary to decide whether and how to proceed with the proposed project.

Should you have any questions or require clarification on any items in this report, please do not
hesitate to contact me directly.

Sincerely,

David Gadway, **MBA, PMP, MCSA**
    PMP: Project Management Professional
    MCSA: Microsoft Certified Systems Administrator
President
Strategic Technology Services, Inc.
802.363.7414
dgadway@techstrategy.biz

Attachments:
1. PCC Technology Group_GovCloud_2013.pdf
2. FINAL-REVIEW-SOW-DII-SoS-Vermont_Elections_Administration_Platform-IR-STS_Project-Cost-Detail.xlsx

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The purpose of this Independent Review is to provide an assessment of the proposed State of Vermont (SOV) <u>Secretary of State (SoS)</u> and <u>Department of Information and Innovation (DII)</u> *Elections Administration Platform* project, relative to costs, benefits, funding source, project team, risks and risk mitigation, adherence to technical standards of State of Vermont, soundness of project plan, and proposed implementation partner.

In **August, 2013**, SOV Office of Purchasing and Contracting issued an RFP seeking to procure an Elections Administration Platform to address several areas that needed improvement within the State of Vermont Secretary of State Office (SoS), including:

1. Voter Registration Checklist;
2. Absentee Ballot;
3. Elections Management;
4. Campaign Finance;
5. Lobbyist Disclosure.

In November, 2013, PCC Technology Group, located in Bloomfield, CT was selected as the software and implementation partner.

At the time of the writing of this report, there is one contract with several Attachments under review by SoS staff and State of Vermont Attorney General's office.

All items related to this project, including **some** items related to the contracts, have been assessed and are considered in this report.

RECOMMENDATIONS

Based on the analysis conducted for this Independent Review, State of Vermont should proceed with the proposed project if SOV can:

1. Adequately mitigate to their satisfaction, the risks identified in the Project Risk Register found in ***Appendix 1***;

2. Achieve favorable contracts terms.

PROJECT PROFILE: SOLUTION, SCHEDULE, COST, FUNDING, and SCOPE SUMMARY

SOLUTION SUMMARY
1. Software **($141.5K)**:
    a. Electio*Net,* including Voter Registration, Absentee Ballot, and Elections Management
    b. Campaign Finance Information System (CFIS – part of Electio*Net* Suite): Campaign Finance
    c. Lobbyist Module as part of CFIS: Lobbyist Tracking
2. Implementation Services: **$1.88M**
3. Software Maintenance and Support:**$465**
4. Hosting via Amazon Web Services GovCloud: **$224K**
5. SoS Incremental Project Costs: **$526K**
    a. Temp Staffing (1 FTE)
    b. Solution Security Assessment
    c. Computers
    d. Contingency
6. DII 3% Fee: **$97K**

SCHEDULE
It is <u>anticipated</u> that this project will require **17 months** to implement: 2/2014 – 6/2015:

1. Segment 1: Campaign Finance: 2/1/2014 – 8/1/2014
2. Segment 2: Voter Registration: 3/1/2014 – 5/1/2015
3. Segment 3: Elections Management: 8/1/2014 – 5/1/2015
4. Segment 4: Lobbyist Disclosure: 9/1/2014 – 6/30/2015

Please see **Appendix 4** which describe the Project Phases, Milestones and Schedule.

COSTS
Total project costs over a 10 year period are **$3.33M**.

FUNDING SOURCES
Project will be funded through a combination of Help America Vote Act (HAVA) funds and the Secretary of State Special Fund.

Please see **Appendix 3** which details the Project Funding Sources and Uses, Cash Flow, and Net Change in Operating Cost.

The project costs are expected to be <u>fixed</u>, based on PCC committing to stated pricing.

SCOPE

Every project operates under a triple constraint, also known as an "Iron Triangle". That is, for a given Project Schedule, Project Cost, and Project Scope, if any one of those 3 items changes, the other 2 must change. For example, if the Scope expanded, the Cost and Timeline will also typically change.

Scope   Time

Cost
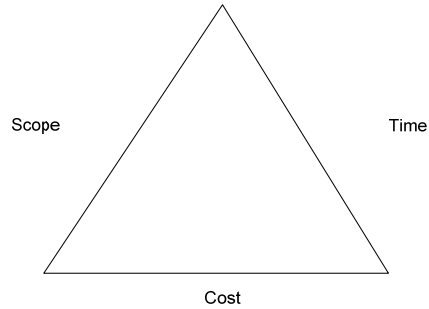
While the project scope is not *completely* defined, the requirements articulated in the RFP and the vendor responses to those requirements define the "boundaries" for this project, which leaves little concern for scope creep.

The chart below provides more detail of the areas evaluated in this analysis.

AREA EVALUATED	RELEVANT FINDINGS
Risk Mitigation Plan	See *Appendix 1*.
Acquisition cost assessment and funding considerations	Major project costs have been documented and are competitive when compared to similar projects and other bids for projects of this scope. 10 Year Total Project Costs are **$3.33M.** The source of funds is expected to meet the use of funds.
Technology Architecture	The proposed technology is based on current technology used by State of Vermont: Microsoft .NET 4.5, and SQL Server or MySQL server in an Amazon Web Services hosting environment accessed via client browser. Additionally, the proposed workstation requirements have been met. The WAN impact is not expected to be significant, as most users initiate contact from their own town.
Assessment of Implementation Plan	The Implementation Plan seems reasonable: 17 months, with a structured design, development, testing, training, implementation approach for 4 segments, each segment representing a core business function.
Assessment of Implementation Contractor	PCC has a solid track record delivering solutions on time and on budget, and has experience delivering Business Registration solution with Vermont Secretary of State.
Cost/benefit analysis	SoS completed a Cost/Benefit analysis as part of the Business Case for this project, but there is no direct dollar benefit that demonstrates a clear justification to pursue this project. This analysis can be found in *Appendix 7*.

OVERVIEW OF THIS DOCUMENT AND BACKGROUND

SCOPE OF THIS REVIEW

This overview describes what is included in the scope of this Independent Review effort. It is also important to state explicitly those areas that are outside the scope of this review:

<u>Included</u> in this Independent Review:

1. Acquisition cost assessment.
2. Technology architecture review.
3. Implementation plan assessment.
4. Cost and benefit analysis.
5. An impact analysis on net operating costs for the agency carrying out the activity.
6. Project Risk assessment.
7. Procurement Advisory services (*additional analysis may need to occur in the future, as the contract is in the process of being developed at the time of this report submission*). See *Appendix 8* for details.

<u>Excluded</u> from this Independent Review:

1. Review of vendors who comprised the pre-qualified vendor list.
2. Review of how vendor was selected for this project.
3. Anticipated Post Implementation Activities.

The following actions were taken to gather the data used to analyze the proposed project and provide this Independent Review report:

1. <u>Interviews with</u>:
   a. Interview key SoS staff:
      i. Jim Condos
      ii. Will Senning
      iii. Lori Bjornlund
      iv. Steve Mattera
      v. Marlene Betit

   b. Interview key State of Vermont staff:
      i. Martha Haley (DII)
      ii. Michael Morey (DII)
      iii. Harry Bell (DII)
      iv. Nick Waringa (DII)
      v. Jaye Johnson (Attorney General's Office)
      vi. Nancy Driscoll (Commerce and Community Development Office)

   c. Interview key PCC staff:
      i. Joe Singh
      ii. Tricia Andulot

2. <u>Analysis of</u>:
   a. SOV RFP
   b. PCC Pricing Proposal
   c. PCC Technical Proposal
   d. PCC Software License Agreement
   e. PCC Support & Maintenance Agreement
   f. PCC contract with Amazon Web Services, including both standard contract and addendum to standard contract

3. <u>Development of</u>:
   a. Project budget, including Use of Funds (Expenses), Source of Funds (Revenue), Cash Flow, and Net Change In Operating Cost
   b. Risk Register, including Risk Assessment and recommended Risk Mitigation strategies
   c. This Independent Review document

STATUTE DEFINES AN INDEPENDENT REVIEW

It is important to establish the scope of this review. 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 activity initiated after July 1, 1996, as information technology activity is defined by subdivision (a)(10) of this section, when its total cost is $1,000,000 or greater. Documentation of such independent review shall be included when plans are submitted for review pursuant to subdivisions (a)(9) and (10) of this section. The independent review shall include:
>
> (1) An acquisition cost assessment
> (2) A technology architecture review
> (3) An implementation plan assessment
> (4) A cost analysis and model for benefit analysis
> (5) A procurement negotiation advisory services contract
> (6) An impact analysis on net operating costs for the agency carrying out the activity

HISTORICAL BACKGROUND

The Vermont Office of the Secretary of State (SoS) Elections and Campaign Finance Division administers Vermont's elections, oversees campaign finance reporting and lobbyist disclosure laws, and encourages civic participation for the State of Vermont.

SoS recently completed an objective assessment of its existing Voter Registration application. The conclusion from that assessment was to dead-end the application, and search for a replacement. As part of that replacement step, SoS is taking an enterprise view and rationalizing all of the legacy and disparate technologies in use by its Elections Division business functions. That rationalization work is focused on harmonizing the Division's key business applications onto a single, integrated, technology infrastructure.

The key business application areas within the Elections Division are Voter Registration, Absentee Ballot, Election Management, Campaign Finance and Lobbyist Disclosure. It is essential these applications be qualified and operational well before the next national election.

This project is intended to address both the applications themselves as well as the platform upon which the applications run.

The Vermont Secretary of State has solicited competitive sealed proposals for development, implementation and support of certain Elections IT applications.

Through an evaluation process, Vermont selected PCC Technology Group as Software and Implementation Partner in November, 2013.

PROJECT COST SUMMARY

The 10 year cost of this project is anticipated to be **$3.33M.**

The project costs are expected to be <u>fixed</u>, based on PCC committing to stated pricing.

LIMITATIONS OF THIS REVIEW

The contract is still yet to be finalized, so additional procurement-related analysis may need to occur.

PROJECT OBJECTIVES

The objectives of this project are:

1. Design and Configure the proposed COTS solution to support the following business function software modules/applications:
    a. Campaign Finance
    b. Voter Registration, including Absentee Ballot
    c. Election Management
    d. Lobbyist Disclosure
2. Convert data from existing applications into proposed applications
3. Conduct User Acceptance Training
4. Train User Community, including Town Clerks
5. Implement Solution in a phased approach

PROJECT SCOPE

The following summarizes the project scope per the RFP.

The scope of work for the FUNCTIONAL components of this project is summarized below:
  1. **Voter Registration**
       a. VR-1 Manage Voter Functions
       b. VR-2 First Time Voter, In-person Registration
       c. VR-3 First Time Voter, Registration By Mail
       d. VR-4 Voter Registration Previously Registered Vermont Voter
       e. VR-5 Voter Registration Previously Registered Out of State
       f. VR-6 DMV Voter Registration
       g. VR-7 Military and Overseas Voter Registration, Vermont Resident
       h. VR-8 Election Day Registration
       i. VR-9 Self Registration
       j. VR-10 Voter Challenge and Purge
       k. VR-11 Duplicate Voter Detection
       l. VR-12 State-to-state Notification
       m. VR-13 In-state Notification
       n. VR-14 Query Support
       o. VR-15 District Support
       p. VR-16 Reporting
       q. VR-17 REST API Support
       r. VR-18 GIS Support
       s. VR-19 Integration

  2. **Absentee Ballot**
       a. AB-1 Absentee Ballot Functions
       b. AB-2 Absentee Ballot
       c. AB-3 Military and Overseas Absentee Ballot
       d. AB-4 Ballot Requests
       e. AB-5 Ballot Delivery
       f. AB-6 Integration with Voter Registry
       g. AB-7 DOJ and EAC Compliance
       h. AB-8 Reporting

  3. **Elections Management**
       a. EM-1 District Maintenance
       b. EM-2 Create and Maintain Elections
       c. EM-3 Create and Assign Candidates
       d. EM-4 Ballot Production
       e. EM-5 Election Night Support
       f. EM-6 Official Results Entry
       g. EM-7 Official Results Certification
       h. EM-8 Query Support
       i. EM-9 Reporting

j. EM-10 Role-based Support
k. EM-11 Data Retention
l. EM-12 REST API Support
m. EM-13 Integration

4. **Campaign Finance**
    a. CM-1 Financial Data
    b. CM-2 Mass Media Activity
    c. CM-3 Submission Portal
    d. CM-4 Data Import
    e. CM-5 Integration with Elections Management
    f. CM-6 Query Support
    g. CM-7 Data Retention
    h. CM-8 Reporting
    i. CM-9 REST API Support

5. **Lobbyist**
    a. LB-1 Registration
    b. LB-2 Financial Data
    c. LB-3 Submission Portal
    d. LB-4 Registration Payment Processing
    e. LB-5 Session Support
    f. LB-6 Data Import
    g. LB-7 Query Support
    h. LB-8 Data Retention
    i. LB-9 Reporting
    j. LB-10 REST API Support

The scope of work for the NON-FUNCTIONAL and TECHNICAL components of this project is summarized below:
1. TM-1 Minimize Vendor Dependencies
2. TM-2 Minimize Platform Lock-in
3. TM-3 Minimize Recurring License Costs
4. TM-4 Maximize Extensibility
5. TM-5 Maximize Integration
6. TM-6 Maximize Reliability and Scalability
7. TM-7 Minimize DevOps Support
8. TM-8 Maximize Data Privacy and Protection
9. TO-1 Overview
10. TO-2 Business Layer
11. TO-3 Application Layer
12. TO-4 Software Services Layer
13. TW-1 Web Application Requirements
14. TW-1.1 Browser Support
15. TW-1.2 HTML5 and CSS3
16. TW-1.3 Responsive and Semantic Design

Additional Scope of Work items includes:
1. Management
2. PM-1 Practices
3. PM-2 Activities and Deliverables
4. PM-3 Change Management and Change Orders
5. PM-4 Staffing
6. PM-5 Issue Tracking
7. PM-6 Policies and Guidelines
8. DM-1 Software Quality
9. DM-1.2 Software and Artifact Management
10. DM-1.3 Development Documentation
11. DM-2 Software Verification
12. DM-2.1 Unit and Integration Testing
13. DM-2.2 Acceptance Testing
14. DM-3.1 Maintenance and Support

The scope of work and deliverables for the PROFESSIONAL SERVICES portion of this project is summarized below:

PHASE 1: Project Planning and Business Analysis
1. Project Management Plan
2. Project Organization & Governance
3. Project team member Roles and Responsibilities
4. Resource Plan
5. Communications Plan
6. Quality Management Plan
7. Risk Management Plan
8. Change Management Plan
9. Deliverable Acceptance Plan
10. Preliminary Project Schedule
11. Project Scope Management Plan
12. Project Charter
13. Project Work Plan (initial)
14. Microsoft Project (MPP file) schedule file
15. System Design Document
16. Business Requirements Document
17. Fit/Gap Analysis Document
18. Change orders or Proposals for enhancements or modifications to accommodate any gaps
19. Detailed Project Work Plan
20. Detailed System Design Document

PHASE 2: Installation and Configuration
1. Deployment of the Contractor application in the test/development environment
1. Basic configuration of the system is complete
2. Contractor builds Interface Plan
3. All required interfaces are designed, developed and implemented by Contractor
4. Contractor builds Conversion Plan. Plan includes details of conversion of non digital data sources like microfiche and paper records
5. Data mapping signoff by State
6. Contractor develops data conversion scripts for agreed data sources
7. Contractor builds Report Plan
8. Contractor works with the State to configure security per business requirements
9. Custom Document templates are completed
10. Basic data conversion is complete
11. State signoff on basic conversion
12. User Acceptance Test plan

PHASE 3: User Acceptance Testing
1. Contractor provides end-user documentation and training materials along with delivering training sessions as required to facilitate effective UAT
2. Contractor incorporates completed user tests (actions and results) into a comprehensive UAT results document
3. Division approves results of UAT

PHASE 4: Deployment
1. Contractor develops go-live plan, including spot check tests for production and fallback decision points and criteria
2. State stakeholder sign off on go-live plan
3. Training
4. Training documents
5. Final UAT Report
6. State UAT acceptance
7. Final data conversion
8. Conversion validation
9. Signed UAT acceptance document by State
10. Production deployment, according to Go-live plan
11. Signed UAT acceptance document by State
12. Production deployment

MAJOR TASKS AND DELIVERABLES

Appendix 4 highlights the timeline of the major tasks and deliverables for this project <u>as of the date of this report</u>.

SUMMARY

The project, as described and defined, addresses all of the Project Objectives.

ACQUISITION COST ASSESSMENT

This section provides both a summary of the hardware, software, staffing, services, and other costs associated with the project.

PROJECT COST SUMMARY

Project costs related to the entire project can be found in *Appendix 3*, and are **$3.33M** over a 10 year period.

HARDWARE COSTS

There is expected to be hardware costs of **$25K** for laptops.

There are hosting costs through Amazon Web Services (AWS) GovCloud hosting solution at **$224K**.

SOFTWARE COSTS

The costs associated with Software are **$141.5K**.

SERVICE COSTS

The costs associated with Professional Services are **$1.88M**.

STAFFING COSTS

The costs associated with temporary staffing are **$62.4K**.

SYSTEM INTEGRATION COSTS

All System Integration costs are included in the "Service Costs" analysis above.

ADDITIONAL COSTS

There are additional costs of **$439K** for:
1. Security Assessment
2. Independent Review Report
3. Project Management Services
4. Contingency

There are also limited <u>funds</u> for changes of scope or cost overruns in this project, unless additional funds can be secured.

SUMMARY

The <u>TOTAL</u> 10 year Project Costs are **$3.33M**.

The professional service fees are highlighted above, are understood, and appear competitive and thorough.

There are only provisions for change of scope or additional costs in the project budget should additional budget funds can be secured.

TECHNOLOGY ARCHITECTURE REVIEW

SUPPORT FOR THE STATE'S STRATEGIC ENTERPRISE SYSTEMS DIRECTION

The primary hardware and software components of this initiative are closely aligned with the State's supported technology at this time which is .NET, and SQL Server 2008 or MySQL 5.x.

There was consideration given to a hosted vs. on-premise solution, and SOV decided on Amazon Web Services (AWS) GovCloud hosting services. The specific AWS service to be used is EC2 (Elastic Compute Cloud) with the Elastic Block Store for storage.

Security Analysis

The proposed solution uses encrypted user authentication. Data encryption at the proposed AES 128-bit is achieved through the web browser.

> The proposed solution is 100 percent Web-based application developed using HTML5 and CSS3 to support responsive Web design. The proposed solution supports the following browser versions:
> 1. IE 7+
> 2. Chrome 26+
> 3. Firefox 19+
> 4. Safari 6+
>
> Additionally, the proposed solution's Web interface is optimized for mobile browsers and is fully supported on the following browsers used by mobile devices:
> 1. Internet Explorer 6.0 or higher
> 2. Firefox 4.0 or higher
> 3. Safari 4.0 or higher
> 4. Opera 9.0 or higher

Additionally, the proposed solution maintains granular user permission capabilities that can be associated to an individual or group.

The proposed solution software is compliant with the secure coding principles and required automated scans to meet PCI Level 3 or 4 compliance, depending on the number of transactions expected (over one million required for Level 4).

PCC has implemented the integration with multiple standard payment gateways such as (VeriSign/PayPal, Authorize .NET, etc) in the past, including successfully interfacing specifically with the current VTSOS gateway for the implementation of the Vermont Business Portal.

Additionally, SoS expects to have a Security Assessment conducted on the solution prior placing the solution into production.

Finally, we discussed Security with Mr. Waringa as part of the Independent Review. Mr. Waringa is in the process of developing Security Standards and Mr. Gadway reviewed a draft as part of the IR process. It is expected that the then current version of those security standards be reviewed as part of the Security Assessment.

Disaster Recovery Plan

The proposed solution is expected to utilize the BC/DR plan available with the AWS offering, and is augmented by PCC's contract and contract addendum with AWS as well as PCC's task of performing data backups.

The proposed solution creates Amazon EC2 application server and database server instances using Amazon machine image (AMI) and stores it in the Amazon EBS volumes. Amazon EBS snapshots are used for incremental database backups for the changes in the volume daily, weekly or monthly.

The proposed application uses Amazon RDS to automatically patch the database software and backs up the proposed application's database, storing the backups for a user-defined retention period and enabling point-in-time recovery when needed.

The proposed solution will utilize AWS Management console and AWS CloudWatch for resource and application monitoring to proactively prevent any downtime and send an alert or alarm based on the configured thresholds. The AWS CloudWatch will be configured with performance counters to monitor the system state or an activity and alert / alarm the administrator. The AWS Management console application services, such as simple email service (SES) or simple notification service (SNS), will be used to alert the user by email or optional SMS text-based messaging service.

State-wide WAN/LAN Impact

PCC has not provided data to allow for a determination of required bandwidth.

The proposed application utilizes Amazon CloudFront to deliver the static and dynamic content using global network of edge locations. The requests for the content are automatically routed to the nearest edge location EC2 instance for the content to be delivered with best performance. The proposed solution uses Amazon CloudFront to work with Simple Storage Service (Amazon S3) for optimized performance of documents or images from the storage location.

SYSTEM INTEGRATION REQUIREMENTS

The data interfaces and integration to external systems and repositories are supported using the Electio*Net* External Interface Server that supports various industry standard data formats, including XML, CSV, delimited, ODBC, and tabbed files. The security model of the Electio*Net* External Interface Server supports integration with LDAP and other standard security protocols to comply with any State of Vermont specific security standards.

The External Interface Server was developed to handle various external interfaces (including interface mandated by the Health America Vote Act (HAVA) in batch or real-time mode. The external interface processes utilizes SOAP technology to support guaranteed delivery of data from and to Electio*Net*.

The External Interface Server provides specific reports, reminder screens and automated processes that provide appropriate measures to ensure data integrity and quality.

The proposed solution supports voter registration process from external interfaces, including DMV, SSA, and Vital Records. The system, through built-in verification and validation processes against external government agency data sources, such as DMV, American Association of Motor Vehicle Administrators (AAMVA), Social Security Administration (SSA), and Vital Records, will significantly augment the VTSOS's ability to detect fraudulent voter registration activity. The system complies with federal statutes of the National Voter Registration Act (NVRA), Help America Vote Act (HAVA) and Military and Overseas Voter Empowerment (MOVE) Act.

The screen shot below provides a visual for how this works:
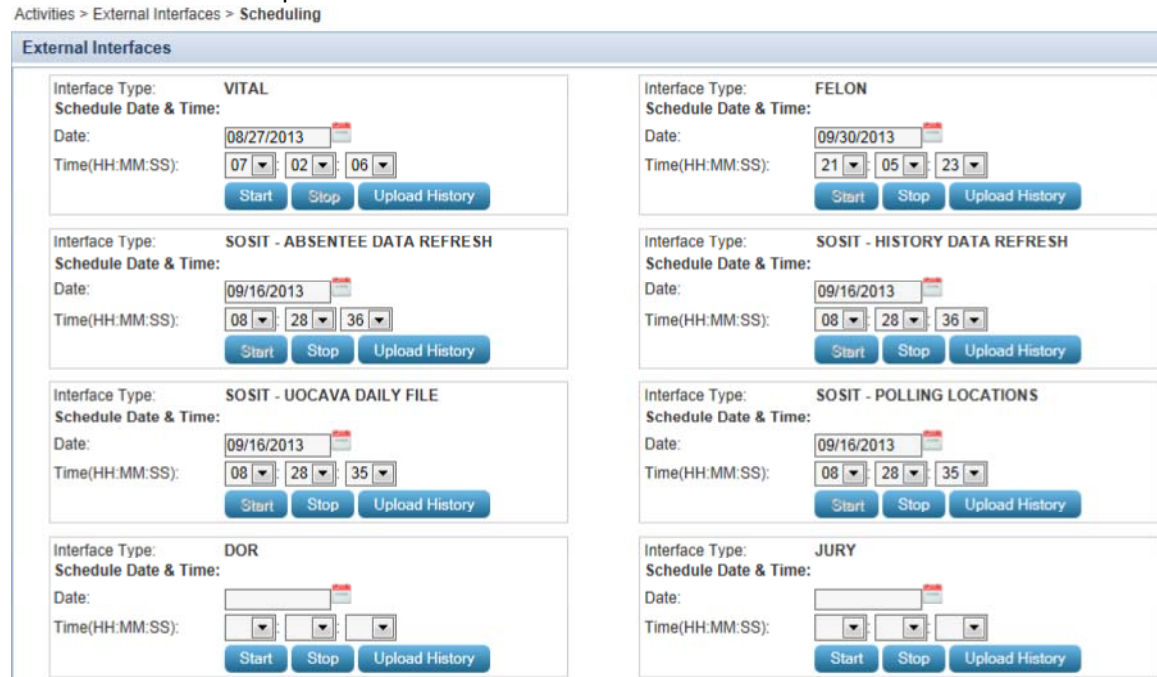
Agency of Administration Information Technology Server Optimization Plan
In reviewing how this project fits with the memorandum from DII CIO Tom Murray dated Sept. 5, 2007 and titled "*Agency of Administration Information Technology Optimization*", this application is not applicable, as it runs on the AWS GovCloud service.

ABILITY OF THE TECHNOLOGY TO SUPPORT BUSINESS NEEDS

Based on the requirements identified by Vermont in the RFP, and the vendor's RFP response, vendor has demonstrated that they will be able to configure the software to meet Vermont's needs.

ABILITY OF THE USER AND OPERATIONAL STAFF TO INTEGRATE SOLUTION INTO THEIR WORK

This is expected to be a moderate change in how SoS perform their daily operations, but the stakeholders appear committed to making this happen and have adequate time to devote to this project.

SUMMARY

The technology proposed is consistent with the Enterprise systems strategic options supported by the State of Vermont.

See **Appendix 6** which describes the solution architecture.

Finally, SOV is staffed adequately for this project.

ASSESSMENT OF IMPLEMENTATION PLAN/IMPLEMENTATION RISK ANALYSIS

THE REALITY OF THE TIMETABLE

The **17 month** schedule is feasible, based on the scope and breadth of operational changes expected.

A significant downside to extending the timeline is the *potential* for additional costs associated with associated labor.

TRAINING OF USERS IN PREPARATION FOR IMPLEMENTATION

It is expected that SOV will embrace a combination of Vendor-provided training as well as a "Train the Trainer" approach.

READINESS TO PARTICIPATE

The Implementation Team is comprised of staff from SoS, certain to-be-named Town Clerks, and PCC. The Vermont project team's time allocation to this project is NOT impacted by competing projects and/or priorities.

ADEQUACY OF DESIGN, CONVERSION, AND IMPLEMENTATION PLANS

Adequacy of Design, Conversion, and Implementation Plans appears sound.

PCC's overall approach to the project follows the following 7 phases:

1. Phase 1—Project Initiation
2. Phase 2—Business Needs Assessment and Gap Analysis
3. Phase 3—Software Configuration and Testing
4. Phase 4—Data Conversion
5. Phase 5—User Acceptance Training
6. Phase 6—Training
7. Phase 7—Production Deployment and Closeout

Within some of these phases, PCC will run "segments" in order to implement in stages.
1. Segment 1—Campaign Finance Disclosure
2. Segment 2—Voter Registration and Absentee Voter Registration
3. Segment 3—Elections Management System
4. Segment 4—Lobbyist Tracking System

The **DESIGN** components of the project are found in Phases 1, 2, and 3.

The **CONVERSION** components of the project are found in Phase 4.

The **IMPLEMENTATION** components of the project are found in phases 5, 6, and 7.

The DESIGN and IMPLEMENTATION components are not contemplated in more detail here. They have been reviewed and appear to be sound.

The CONVERSION component is reviewed in detail, as this is considered a critical success factor for the project.

The Conversion effort goes through a three-pull strategy. This involves extracting the data from the current databases in three pulls with each subsequent pull resulting in cleaner converted data.

The following diagram illustrates the process for data acquisition and data analysis:

Data Acquisition and Data Analysis

Legacy Data

Staged or Target Data

Legacy Data Elements

Mapping

Legacy associate with entity, filing #

Image formats and index records

Analyze data fields (formats, data type and data integrity)

Legacy Data Elements

Data Elements

Repository

Common Business Rules for numbering scheme and Data Rules / Specifications

Data Dictionary

The existing legacy data dictionary and other legacy system technical artifacts to create the legacy data elements

Data Mapping

Perform the data mapping links with the assistance of the data dictionary and mapping tools

The following diagram illustrates the process for data transformation and data loading:

Data Transformation and Data Loading
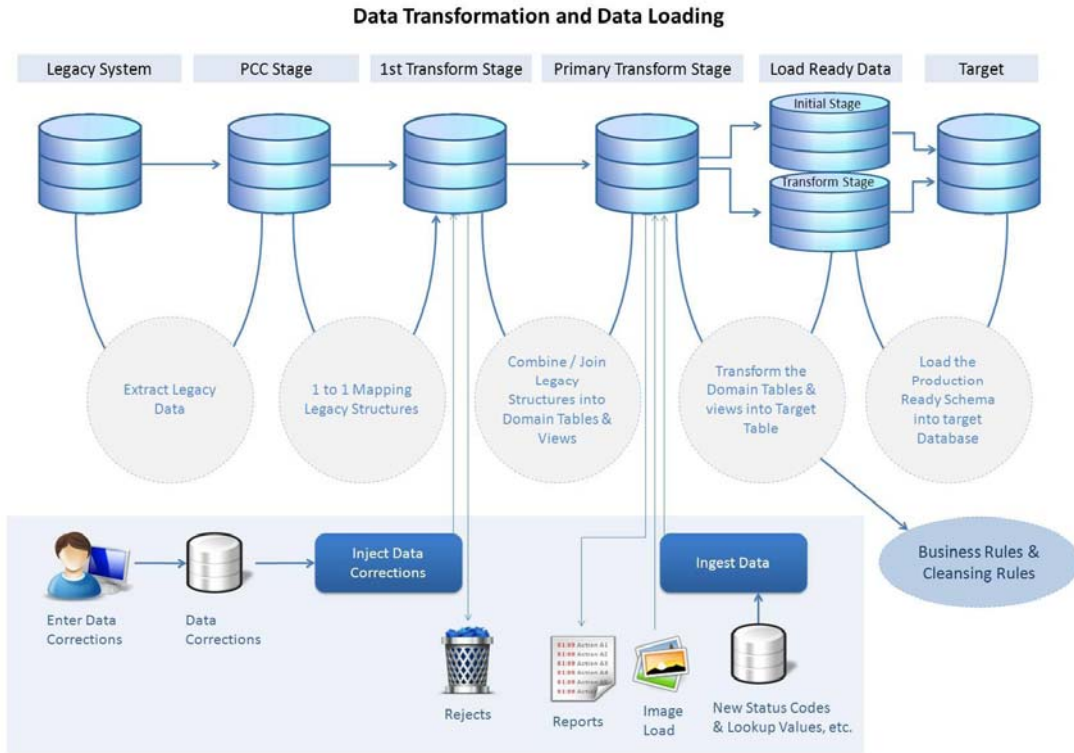
The following diagram illustrates the data conversion process for FoxPro, Microsoft Access and Microsoft SQL Server applications into the single integrated system:
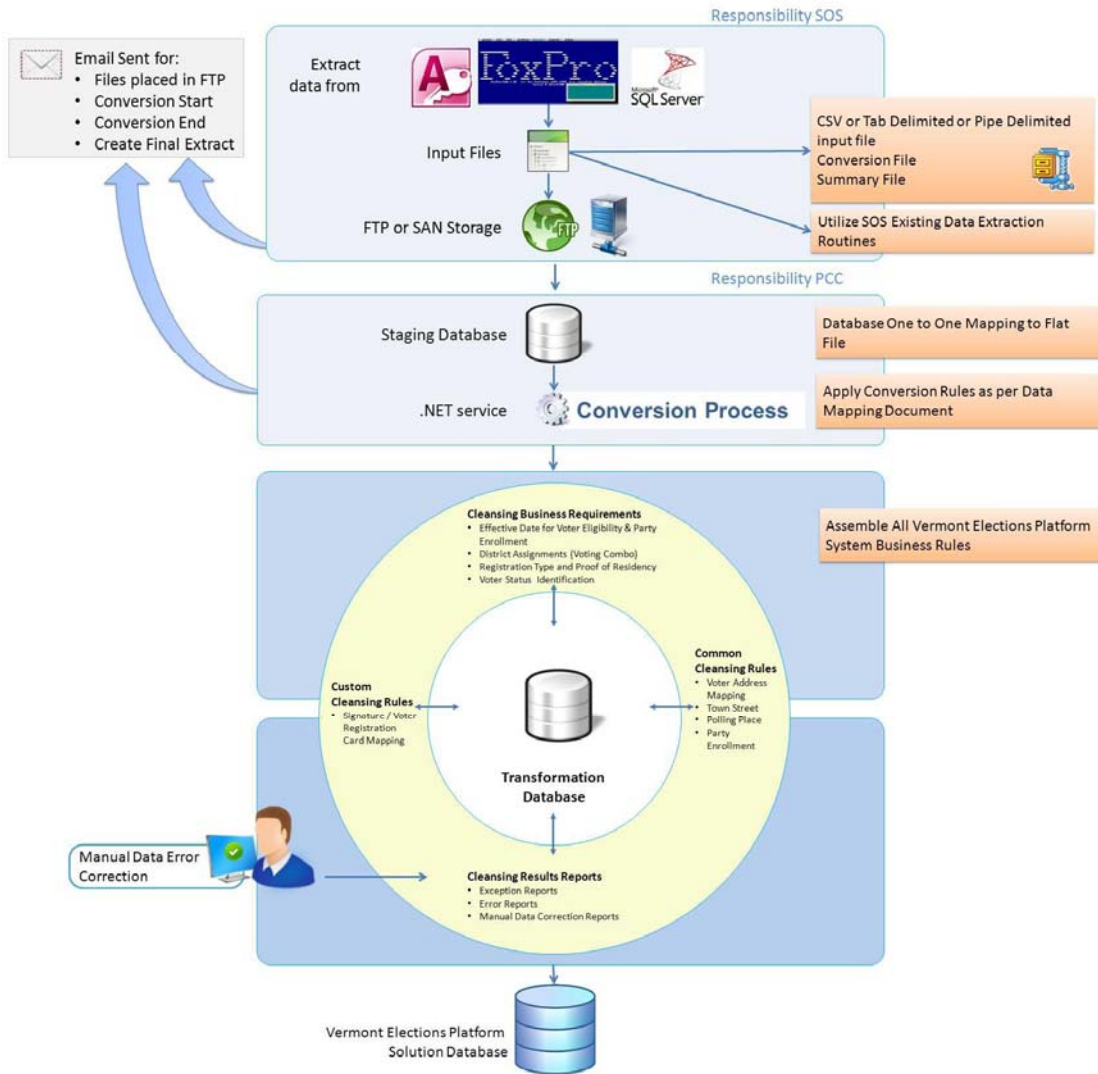
ADEQUACY OF SUPPORT FOR CONVERSION AND IMPLEMENTATION ACTIVITIES

Adequacy of Support for Conversion and Implementation Plans appears sound.

ADEQUACY OF PLANNED TESTING PROCEDURES

Adequacy of Planned Testing Procedures appears sound.

The Testing phase should result in the following:
1. Tools and clear processes to document, report and managed defects and issues related to the solution
2. A set of test cases that can be used for future releases
3. Confidence in the hardware and software supporting the solution and the defined code migration process
4. An acceptable level of risk, minimizing the likelihood of defects in production that significantly impact the business
5. Evidence to support acceptance of the application and a decision to move the solution into a production environment
6. Confirmation that the solution design will enable acceptable productivity of job tasks in production, including appropriate coverage of functionality, and availability, performance and responsiveness of the solution.

The Testing Procedures are a component of PCC's Quality Assurance Plan (**QAP**), which documents the necessary information required to effectively manage project quality from project planning to delivery. It defines a project's quality policies; procedures; criteria for and areas of application; and roles, responsibilities; and authorities. A robust QAP will provide confidence that the products and services are developed and delivered according to the established processes and are of the highest quality. PCC's approach uses common global systems and tools that help achieve consistency, quality, and improvements on projects, enabling PCC to deliver quality service to the VTSOS Election Platform project.

The basic approach to quality management described in this deliverable is intended to be compatible with that of the International Organization for Standardization (ISO) and IEEE 730-2002, Standard for Software Quality Assurance Plans.

PCC distinguishes between QA and QC per the table below. The remainder of this section focuses on the topic of this section, namely Testing Procedures.

Quality Assurance	Quality Control
Process	Product
Proactive	Reactive
Prevent Defects	Find Defects
Quality Audit	Walkthroughs
Defining Process	Testing
Training	Checkpoint Review

The Quality Assurance team will be a separate entity and maintain independence from the individual project functions. The QA team will report directly to the PCC Project Manager and the QA Lead will be responsible for the development of the final QAP that will be used to identify its roles and responsibilities.

In evaluating system acceptance criteria, PCC will look at both system quality and data quality. For system quality, PCC will review the defect severity classification for all outstanding defects. All open defects should have an assigned target fix date, a defined manual workaround (if appropriate), and a priority assigned based on business impact and frequency. System acceptance is based on "critical" (system inoperable), "high" (module/feature is inoperable) defects, and a planned target date or workaround for any "Moderate" (module/feature not working as documented) or "Low" (operational question or cosmetic concern) open issues. All system test cases must be complete, has all been executed by an appropriate stakeholder/SME, and have a pass rate at 95 percent or better. All interface specifications, system design, and business process documentation should be complete prior to the execution of the tests.

PCC has performed test-driven development practices in the entire project referenced within this response. This begins with a thorough Test Plan to outline the testing approach and strategy for the VTSOS Elections Platform through the development of each software release. It details the deliverables, test strategy and approach, resources, assumptions, and risks. Its primary intended audience is the project sponsor, project manager, VTSOS subject matter experts (SMEs), PCC testing lead, PCC testing team, and PCC development team. This document will be finalized during the Initiation Phase and continuously updated to reflect current project testing needs.

Testing of the Elections Platform is intended to verify that the solution performs as expected before it is placed in production. The key to effective testing is a well-defined test plan that clearly defines the expected performance, a method to effectively measure the solution against those expectations, and a strategy to fully remediate any discrepancy between the two.

A **test plan** is essential in that it defines what will occur in testing, the strategy that has been adopted, and the approach. The Test Plan details the management and technical approach, the schedule, and the overview of the various phases of testing. It addresses the hardware, system software, application software, communications and networking facilities, individually or in combination.

The testing includes:
1. Unit – Developer test of code to ensure it meets design and behaves as expected
2. Functional Testing – Demonstrates each of the discrete functional capabilities of the system
3. Conversion – Validates that the conversion process works and that legacy data is valid and stored/presented properly after it is converted to the new system
4. Operational – Demonstrates the full operability of all integrated components in an operational environment and validates the associated user and maintenance documentation.
5. Regression – Performed on previously tested system functionally to ensure that changes or enhancements did not adversely affect unchanged functions
6. Final Acceptance Testing – Demonstrates that system components are completely ready for production implementation
7. Vulnerability – Simulates an outside attack on the system to ensure the system is not vulnerable
8. Benchmark Testing – Demonstrates that the system meets or exceeds performance requirements, including throughput and response times.

The intent of the Test Plan is to provide the high-level scope, schedule, resources, and approach for the Business Filing System testing. The objectives of this Test Plan document include:

1. Identify the strategy for completing testing tasks on schedule
2. Define the testing organization, tools, and environment
3. Identify roles and responsibilities to support testing
4. Provide a common understanding of the testing approach

PCC will use a proven approach for software development during this project, where the activities are in logical steps, and one step does not begin until the prior is complete. The most common steps are depicted in the diagram below:
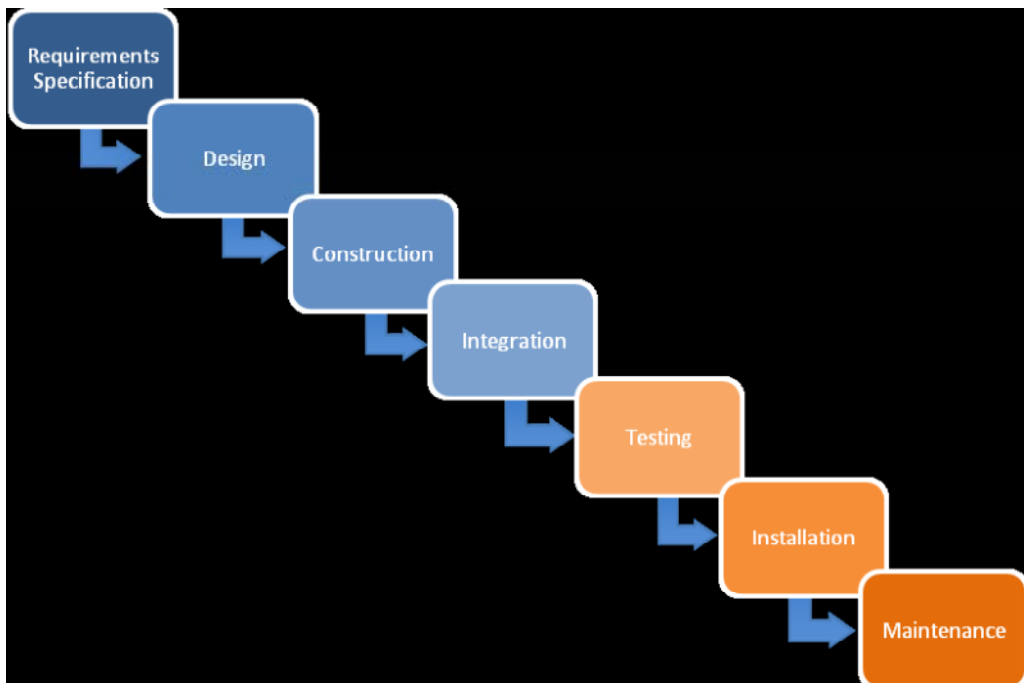
Using this approach, the PCC team has a tried and refined process for sequencing activities and ensuring thorough testing. This approach has been successfully executed to test and implement similar projects in the states of Connecticut, Vermont, Maine, West Virginia, and Wisconsin, as well as the various other large-scale system implementations.

PCC's testing methodology serves to identify and resolve issues as early on in the process as possible. Early identification of issues reduces rework, cycle time and project risk. The testing methodologies to be used for this project are provided below:
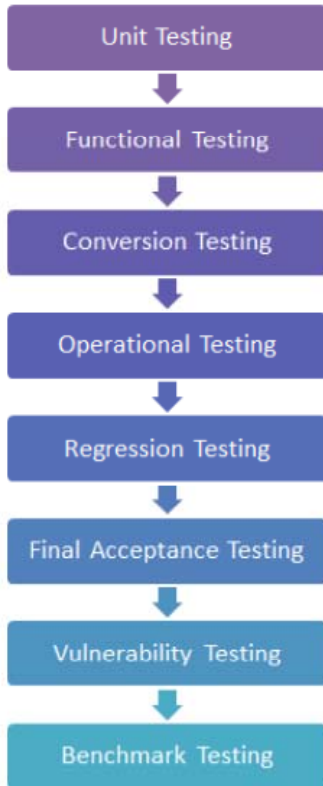
The testing process begins with development of a specific test plan for each type of testing. After the test plans are approved, the test cases developed. Test Cases are the actual steps to be executed to perform the test (automated test cases may also be referred to as test scripts). Test Cases are executed and subsequent action is based on whether the expected results are achieved. The diagram below depicts the Testing Life Cycle from test plan development to final test reporting and sign off.
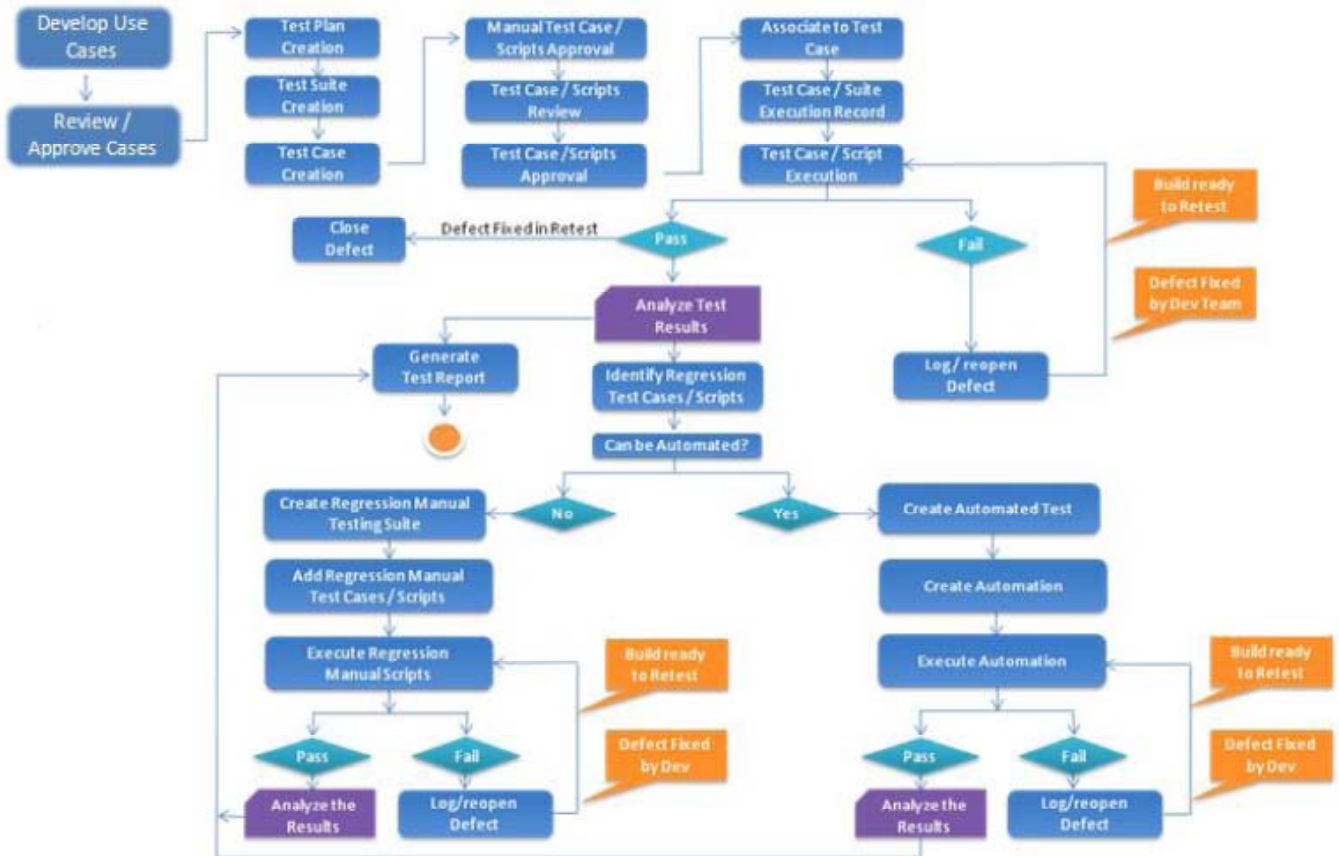
ADEQUACY OF DEPARTMENT AND PARTNER STAFF TO PROVIDE PROJECT MANAGEMENT

See *Appendix 5* for details on Project Team.

The PCC Project Manager is Sreeji Vijayan. The Functional Requirements Leader is Tricia Andulot. The Technical Leader is Bhanu Nagella. The Data Conversion Leader is Tom Bryers.

The SoS Project Leader is Lori Bjornlund and the Technical Leader is Steve Mattera.

The DII Project Management Oversight is provided by Martha Haley.

This will be the largest Project Management effort in Ms. Bjornlund's career. See *Appendix 1* which discusses the risk associated with this.

IMPLEMENTATION RISK ANALYSIS

See *Appendix 1* which details the Risk Register and *Appendix 2* which details the Risk Analysis Score.

SUMMARY

Regarding the feasibility of the Implementation Plan and Project Timeline, both appear to be feasible, based on Vendor experience with projects of similar scope.

Regarding an overall Risk Analysis score, per *Appendix 2*, this project receives a risk position of <mark>**MEDIUM LOW RISK**</mark>.

COST/BENEFIT RECOMMENDATION

METHOD

See ***Appendix 7*** which contains details regarding the assumptions, methods used, and underlying data used for this analysis.

COSTS

There are two types of COSTS for this project: TOTAL PROJECT COST and SoS PROJECT COSTS, which are the TOTAL PROJECT COSTS less those costs NOT covered by HAVA funding.

The 10 year TOTAL COST of this project is **$3.33M** as detailed in ***Appendix 3 and Appendix 7***.

The 10 year TOTAL INCREMENTAL COST of this project is **$1.71M**, which is derived by taking the current 10 year costs and subtracting those from the 10 year cost of the proposed solution ($3.33M less $1.62M).

The 10 year SoS COST of this project is **$1.21M** as detailed in ***Appendix 7***.

The 10 year SoS INCREMENTAL COST of this project is **$677K**, which is derived by taking the current 10 year SoS costs and subtracting those from the 10 year SoS cost of the proposed solution ($1.21 less $542K).

Further, as outlined in Appendix 3, there is **$736K** in net operating cost changes (increase) over a 10 period, which is an **$73.6K** annual average.

BENEFITS

The monetary quantifiable benefits are: **$288,000**.
The monetary non-quantifiable benefits are: **$130,000**.
The total monetary benefits are: **$418,000**.

There are other non-monetary benefits outlined in the Cost/Benefit analysis in ***Appendix 7***.

SUMMARY

There is a **Total Project negative benefits realization** of **$1.3M** ($418K benefit less $1.71M TOTAL incremental cost over a 10 year period).   See the full Cost/Benefit chart found in ***Appendix 7***.

There is also a **SoS Project negative benefits realization** of **$259K** ($418K benefit less $676K SoS incremental cost over a 10 year period).   See the full Cost/Benefit chart found in ***Appendix 7***.

RECOMMENDATION

Even though the monetary benefits realization does not justify proceeding, considering the non-monetary benefits, the relatively low out of pocket costs for SoS, and the relatively low increase in annual operating costs, it is recommended that SoS proceed with this project.

APPENDIX 1 – PROJECT RISK REGISTER

Risk Assessment Methodology:

1. Project Risks are summarized into PMI Knowledge Areas:
   a. Integration Management
   b. Scope Management
   c. Time Management
   d. Cost Management
   e. Quality Management
   f. HR Management
   g. Communications Management
   h. Risk Management
   i. Procurement Management

2. The following categories are also assessed for risk:
   a. Technology/Tools used
   b. Infrastructure (Also see Procurement Management)
   c. Vendor

3. Specific analysis was conducted to assess risk in each of the Project Activities listed in **Chart A** below. Using DII's suggested Risk Rating template, risk is measured for **Impact** (High, Medium, Low) and **Probability** (High, Medium, Low). Colors are used to show where risk exists if either measure (Impact or Probability). For a measure of "HIGH", RED is used, otherwise, YELLOW is used.

4. Finally, using DII's Risk Rating Chart, we provide details for each identified Risk. See **Chart B**.

Chart A: Project Risk By Process Group and Knowledge Area

Process Group: 42 TOTAL Knowledge Area:	Initiating (2)	Planning (20)	Executing (8)	Monitoring and Controlling (10)	Closing (2)
Integration Management	• Develop Project Charter	• Develop Project Plan	• Direct and Manage Project Execution	• M&C Project • Perform Integ Change Mgt	• Close Project
Scope Management	•	• Define Requirements • Define Scope • Create WBS	•	• Verify Scope • Control Scope	•
Time Management	•	• Define Activities • Sequence Activities • Estimate Act Resources • Est Activity Durations • Develop Schedule	•	• Control Schedule	•
Cost Management	•	• Estimate Costs • Determine Budget	•	• Control Costs	•
Quality Management	•	• Plan Quality	• Perform QA	• Perform Quality Control	•
HR Management	•	• Develop HR Plan	• Acquire Team • Develop Team • Manage Team	•	•
Communications Management	• Identify Stakeholders	• Plan Communications	• Distribute Information • Manage Stakeholders Expectations	• Report Performance	•
Risk Management		• Plan Risk Mgt • Identify Risks • Perform Qual Risk Analysis • Perform Quan Risk Analysis • Plan Risk Responses	•	• Control Risk	•
Procurement Management	•	• Plan Procurements	• Conduct Procurements	• Administer Procurements	• Close Procurements

Chart B: Risk Rating

The Risk Rating charts on the ensuing pages use the following Data Elements to describe Risk and Risk Mitigation.

Data Element	Description
Risk #	This is a sequential number assigned to each risk to be used when referring to the risk.
Finding Reference	This is a cross-reference to the Finding from which the Risk was determined.
Risk Impact / Probability	This is a two-value indicator of the potential impact of the Risk if it were to occur, along with an indicator of the probability of the risk occurring. Values: Impact (High, Medium, Low); Probability (High, Medium, Low).
Recommended Risk Response Timing	This is value used to indicate whether the Risk is likely to occur Prior to contract execution or Subsequent to contract execution (e.g. the DDI phase). Values: Prior / Subsequent
Risk Description	This is a brief narrative description of the identified Risk.
Risk Impact Description	This is a narrative description of the potential impact of the risk.
Risk Response Recommendation	This field includes Vendor's recommendation on how the State should address the risk.
Risk Mitigation Plan	This field includes the results of discussions between State staff and Vendor regarding how the State plans to address the risk. This includes the State staff person responsible for managing the risk, the action plan to mitigate the risk and the timing of the action plan.

INTEGRATION MANAGEMENT:

Risk #: IM-1	Finding Reference: N/A	Risk Impact/Probability: MEDIUM/MEDIUM	Recommended Risk Response Timing: Prior to Contract Execution

Risk Description: DIRECT AND MANAGE PROJECT EXECUTION. Staff expected to perform Project Management activities have limited Project Management experience. Additionally, the project organization chart and day-to-day organization chart has "reporting to/subordinate" roles reversed for key team members.

Risk Impact Description: Utilizing a Project Manager that lacks the opportunity of having experienced many projects of this size creates the risk of not anticipating items that could adversely impact the project, be those scope, budget, schedule, or other. Further, while on a daily basis, Lori Bjornlund (proposed project manager) reports to Will Senning, however, on this project, Mr. Senning would report to Ms. Bjornlund, creating the chance of team dynamics issues.

Risk Response Recommendation: It is anticipated that PCC will manage to completion the project tasks, the project timeline, and as this is fixed price project, the project budget. This leaves the bulk of the SoS PM's job to protect the interests of the State of Vermont and ensuring the deliverables meet the requirements. Ms. Bjornlund knows the stakeholders and has credibility with the stakeholders. She also knows the subject matter well, and has authority over other SoS staff assigned to this project. Given these factors, it is expected the Requirements Definition will be managed well by Ms. Bjornlund. Mr. Condos, as head of SoS, or his designee, will need to manage any issues related to project roles vs. normal organization roles. Further, this project affords the SoS office, and the State of VT, the opportunity to develop the project management skills of an engaged, capable, and loyal State of Vermont employee in Ms. Bjornlund. Additional Project Management mentorship may be gained through DII Oversight Project Manager OR by a Contracted Vendor.

Risk Mitigation Plan: SoS will contract for Project Management guidance for Ms. Bjornlund as required throughout the project. Additionally, SoS is confident in the PM skills of PCC, given the experience SoS had with PCC during the Business Registration Project.

SCOPE MANAGEMENT:

Risk #: SM-1	Finding Reference: N/A	Risk Impact/Probability: MEDIUM/MEDIUM	Recommended Risk Response Timing: Subsequent to Contract Execution

Risk Description: DEFINE REQUIREMENTS. The broad functional requirements and typical business use cases have been defined as part of the RFP. However, the detailed requirements have yet to be defined, as it is the first work task scheduled in the project plan, and there is expected to be broad participation in this activity, including involvement from to-be-named Town Clerks.

Risk Impact Description: The potential impact is scope creep if the requirements gathering process is not managed well and if expectations are not clearly defined from the outset.

Risk Response Recommendation: Ensure Ms. Bjornlund, with guidance from Mr. Senning, have final say on functional requirements and overall project scope, and ensure the Town Clerks understand their role as subject matter experts but not decision-makers.

Risk Mitigation Plan: Implement Risk Response Recommendation.

BUDGET (COST) MANAGEMENT:

Risk #: BM-1	Finding Reference: N/A	Risk Impact/Probability: HIGH/MEDIUM	Recommended Risk Response Timing: Prior to Contract Execution

Risk Description: DETERMINE BUDGET. This project is expected to have two funding sources: Help America Vote Act (HAVA) and Secretary of State Services fund. The Services fund has at $100K balance through 6/30/13, but is expected to have an additional liability of $190K. Further, it is not clear whether adequate Services funds required for this project are available over the 10 year project life-cycle contemplated in this analysis, as those funds are earmarked only annually.

Risk Impact Description: Simply, a lack of funding could terminate this project.

Risk Response Recommendation: SoS should convene a meeting with decision-makers who can determine if funds can be earmarked for this project. It is not clear who all the decision-makers are, but it is understood that it is at least the Secretary of State and Agency of Administration leadership, and perhaps certain Legislators.

Risk Mitigation Plan: SoS will accept the risk and expects the Services funding source will be available.

From SoS Office's Marlene Betit: "Certainly with any project there is always budget risk. We do have a guarantee of 70% of the funds in an account available at this time. That leaves the 30% SoS funds which are also guaranteed as part of our fee revenue – corp. fees are reviewed and increased (or decreased) as needed to sustain our services and we have excess SOS funds each year. Except for FY14 – we have not committed to providing a sweep to the general fund – unless we have excess above our budget available. For FY14 we have the necessary SOS funds to meet the payment demands and have planned for them in FY15. Additionally, I believe the budget risk is actually less for this project because we are paying for the implementation after and over a 10 year period. We are also not dependent on State general fund which has a $70 Million dollar gap in funding."

HR MANAGEMENT:

Risk #: HR-1	Finding Reference: N/A	Risk Impact/Probability: MEDIUM/MEDIUM	Recommended Risk Response Timing: Subsequent to Contract Execution

Risk Description: DEVELOP TEAM. The project team is expected to be comprised of members of the SoS office, primarily Ms. Bjornlund, Mr. Senning, and some Elections staff, who will work under the direction of Ms. Bjornlund. Additionally, it is expected that SoS will ask several Town Clerks to participate in Requirements Definition and System Testing. All Town Clerks will be asked to participate in User Training. There is risk in how well this yet-to-be defined team functions. Also, it is unknown which Town Clerks will be on the Requirements Definition team.

Risk Impact Description: The impact this risk creates is the potential for scope expansion and schedule slippage, should the Town Clerks define requirements outside the current broad scope definition. There is low risk that the scope will not be defined thoroughly enough. Another potential impact is that user testing is not thorough.

Risk Response Recommendation: It is suggested that a careful and thoughtful process is undertaken to identify and secure for this project, the Town Clerk team members who possess subject matter expertise, willingness to work on such a project, and who are detail-oriented in order to serve the user testing function.

Risk Mitigation Plan: SoS will identify a representative cross-section of Town Clerks and time their involvement to maximize the benefit without that involvement impacting scope creep or schedule. Regarding testing quality, SoS to work with PCC to develop testing scripts that address specific requirements SoS and Town Clerks define.

Risk #: HR-2	Finding Reference: N/A	Risk Impact/Probability: MEDIUM/MEDIUM	Recommended Risk Response Timing: Subsequent to Contract Execution

Risk Description: MANAGE TEAM. The project team has four critical weak links:

1. Secretary of State: This is an elected position. If the person in that position changes, the project may lose momentum and/or change scope under new leadership.
2. Project Manager: If Ms. Bjornlund leaves, the project could lose momentum. This is somewhat mitigated by Mr. Senning being able to step in if needed.
3. Subject Matter Expertise: If Ms. Bjornlund leaves, the project could fail with the loss of her subject matter expertise.
4. IT Manager. Mr. Mattera has unique skills found in terms of technical skill/background, ability to manage teams, and ability to get results. If Mr. Mattera leaves, the project could lose momentum.

Risk Impact Description: The impact of this risk ranges from moderate to significant project delay while replacement staff is identified and trained/brought up to speed on this specific project.

Risk Response Recommendation: Keep close tabs on key project members' plans and consider cross-training or identifying people who could step in.

Risk Mitigation Plan: Practically speaking, the Risk Response Recommendation is the best SoS can do.

COMMUNICATIONS MANAGEMENT:

Risk #: CM-1	Finding Reference: N/A	Risk Impact/Probability: MEDIUM/MEDIUM	Recommended Risk Response Timing: Subsequent to Contract Execution
Risk Description: MANAGE STAKEHOLDERS EXPECTATIONS. This risk is related to HR-1, which is the need to manage Town Clerk expectations. That is, while Town Clerks have a role defining the functional requirements, they do not have the final decision regarding those functional requirements. **Risk Impact Description:** The risk impact is that the stakeholders lose interest and/or buy-in. **Risk Response Recommendation:** See HR-1. **Risk Mitigation Plan:** See HR-1. Additionally, SoS is expecting to work with PCC to develop a stakeholder engagement strategy to garner buy-in among Town Clerks.			

PROCUREMENT MANAGEMENT:

Risk #: PM-1	Finding Reference: N/A	Risk Impact/Probability: MEDIUM/LOW	Recommended Risk Response Timing: Prior to Contract Execution

Risk Description: ADMINISTER PROCUREMENTS. SoS will not directly administer procurement of hosting providers, as PCC will be contracting with Amazon Web Services (AWS) to host the application. Mr. Morey in DII is in the process of developing minimum performance standards to be placed on cloud hosting infrastructure, but these are not yet fully defined. Mr. Waringa of DII is in the process of developing minimum security standards to be placed on applications, but these are not yet fully defined. As the contract is with PCC and not with AWS, PCC owns the responsibility of meeting those standards when defined.

See http://aws.amazon.com/agreement/ for an understanding of the standard agreement AWS has with its customers, such as PCC. AWS and PCC also have an addendum which has been reviewed as part of the IR (see PCC Technology Group_GovCloud_2013.pdf).

Of negative note, AWS offers no data backup service and can terminate without cause with 30 days notice. The backup process is to be carried out by PCC as part of the contract. The termination clause is cause for concern, but it is unlikely this will happen without cause.

Of positive note, the AWS/PCC Addendum expands the security warranty; meeting NIST 800-53 Rev 3 controls for a Federal Information Security Management Act ("FISMA"), including the proposed EC2 service, and for AWS US Region, maintain physical and logical access controls to limit access to the AWS network by AWS personnel, including employees and contractors, to U.S. persons.   Further, continued evaluation of this security position and security breach notification are provided.

 In summary, the risks include AWS terminating service without cause and the chance that the hosting and security standards to be defined are not met.

Risk Impact Description: The risk impact is negligible when considering the likelihood of occurrence.

Risk Response Recommendation: Perform an annual or semi-annual assessment of actual performance vs. standards, and determine if better solutions exist in the marketplace.

Risk Mitigation Plan: SoS will accept this risk.

TECHNOLOGY:

Risk #: TT-1	Finding Reference: N/A	Risk Impact/Probability: LOW/LOW	Recommended Risk Response Timing: N/A

Risk Description: TECHNOLOGY. This is a standard Risk assessment item for every project. In this case, the risk of the proposed underlying technology failing to perform or deliver the expected solution is very low, due to the fact that the proposed solution operates in several client sites. The specific underlying technology is based on the model-view-controller (MVC) pattern as the main architecture, and uses the current Microsoft .NET application development toolset, and is expected to deploy MySQL database technology in the AWS GovCloud. The specific AWS service is the Elastic Block Store for all EC2 instances (EC2 = Elastic Compute Cloud) such as Web /application server and database server. (Amazon EBS provides highly available, highly reliable, predictable storage volumes that can be attached to any running Amazon EC2 instance.)

How the underlying technology performs relative to security and protection of personally identifiable information is subject to a Security Assessment, which will be conducted during implementation, by an independent 3rd party provider to be determined. Further, it is expected this Security Assessment not only assess the underlying technology, but also business processes, PCC development and QA processes, and user experience/user processes.

In summary, the risks include the use of obsolete technology and/or technology or implementation that is not secure.

Risk Impact Description: The risk impact is that the solution does not perform as expected and/or uses obsolete and/or unsecure technology. In this case, there is little risk.

Risk Response Recommendation: No response needed.

Risk Mitigation Plan: N/A.

VENDOR:

Risk #: VN-1	Finding Reference: N/A	Risk Impact/Probability: LOW/LOW	Recommended Risk Response Timing: N/A

Risk Description: VENDOR. This is a standard Risk assessment item for every project. In this case, SoS has an existing relationship with PCC for the Business Registration (Corporations) application, and PCC has proven to be a good partner for SoS. Additionally, PCC has delivered the proposed solution successfully for other clients.

Risk Impact Description: Not applicable.

Risk Response Recommendation: No response needed.

Risk Mitigation Plan: N/A.

APPENDIX 2 – RISK ANALYSIS SCORE

The worksheet on the following pages provides a "RISK SCORE" to Business and Project-related aspects of this project.

Interpret the results using the following guide: The higher the score, the more risky the project.

An answer of "YES" means (Low risk); Score:	1
An answer of "LARGELY" means (Medium Low Risk); Score:	2
An answer of "TO SOME EXTENT" means (Medium Risk); Score:	3
An answer of "PARTIALLY" means (Medium High Risk); Score:	4
An answer of "NO" means (High risk); Score:	5

The risks are divided into:

Inherent risks, i.e. Risks that relate to the organization itself.

Acquired risks, i.e. Risks that arise as a consequence of doing the project.

Inherent risks are further divided into:
1. Business vision
2. Business process
3. Business environment and constraints

Acquired risks are divided into:
1. Scope of project or procurement
2. Project organization and control
3. Team capability, experience and support

Risk Summary Graph:

The higher the score, the higher the risk
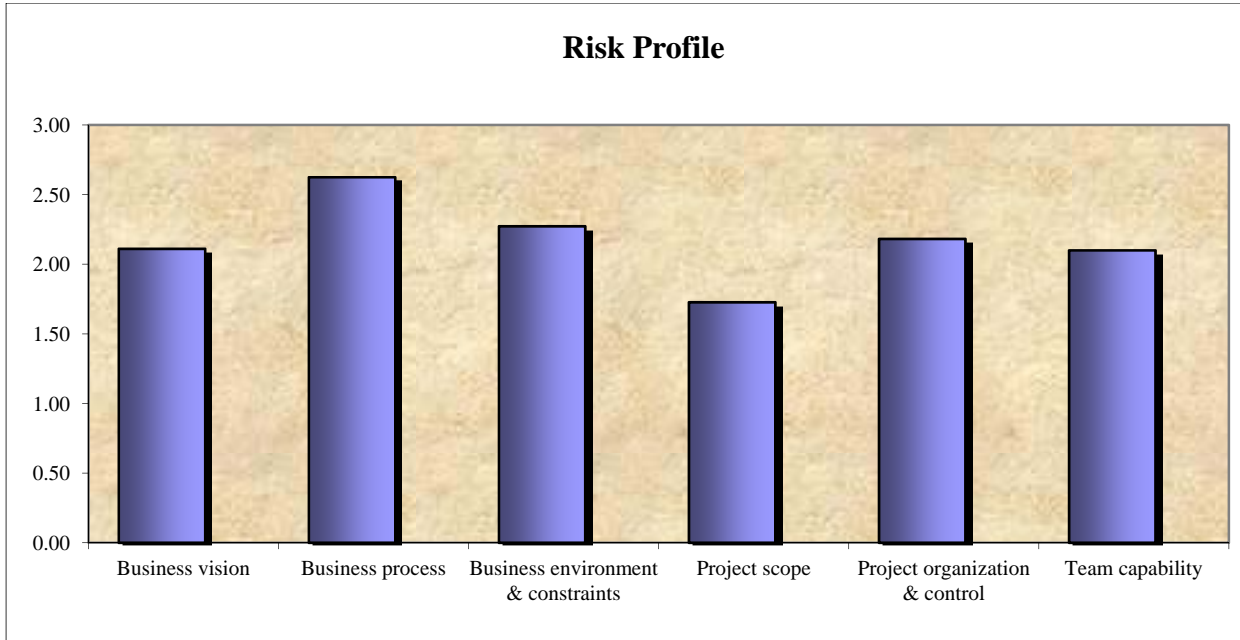
As detailed in the chart on the following pages:

The **Inherent Risk** is: **2.34**, which is considered to be MEDIUM LOW RISK.

The **Acquired Risk** is: **2.00**, which is considered to be MEDIUM LOW RISK.

The **Overall Project Risk** is: **2.10**, which is considered to be MEDIUM LOW RISK.

Risk Analysis Score Worksheet:

Key to scoring system

An answer of "YES" means (Low risk); Score: **1**
An answer of "LARGELY" means (Medium Low Risk); Score: **2**
An answer of "TO SOME EXTENT" means (Medium Risk); Score: **3**
An answer of "PARTIALLY" means (Medium High Risk); Score: **4**
An answer of "NO" means (High risk); Score: **5**

Inherent Risk: Corporate risks (external to the project)	Risk assessment
A **Business vision**	
A.1	Are the business needs, assumptions and outcomes clearly understood?	2
A.2	Is the impact of business change small?	4
A.3	Has the organization delivered comparable change before?	3
A.4	Is it clearly stated how the changes will affect the business?	2
A.5	Is the requirement clearly defined and related to business objectives?	2
A.6	Do those affected by the change know how they will be affected and why?	2
A.7	Is the delivery team able to translate the business requirement into a detailed specification?	2
A.8	Is it clear how the new program or project fits with existing business and any conflicting priorities resolved?	1
A.9	Is it clear why the change needs to be made?	1

		2.11	Medium Low Risk

B **Business process**	
B.1	Is it clear how existing business processes will be affected by the change?	2
B.2	Will critical business processes be unaffected?	2
B.3	Will existing ways of working remain unchanged?	3
B.4	Is the likely impact of other change on this minimal?	3
B.5	Are the people who will work in new ways all in one place?	5
B.6	Is the business process that underpins the change already in place?	2
B.7	Are existing communication lines between programs/projects and stakeholders adequate?	2
B.8	Does the organization learn from relevant experience?	2

		2.63	Medium Risk

C **Business environment & constraints**	
C.1	Does the organization understand the current state of its infrastructure?	2
C.2	Are the proposed changes to the technical environment straightforward?	4

C.3	Is the impact on the existing technical environment (including facilities and services) well understood?	2
C.4	Is the business familiar with any proposed technology and does it have available the core skills and competencies to exploit it?	2
C.5	Are the technical components of the change basic 'off-the-shelf' items and / or compliant with relevant industry standards?	2
C.6	Has the entire life-cycle of the project been adequately considered in terms of cost/budget and flexibility?	2
C.7	Has the need for modular/incremental delivery been addressed, where appropriate?	2
C.8	Are customers likely to be confident about the reliability of the existing technical infrastructure and quality of existing services?	2
C.9	Will the implementation of the change be straightforward?	4
C.10	Does the organization have (or can readily obtain) the necessary capability and capacity to own and manage the business change?	2
C.11	Do the senior managers responsible for delivery of this program acknowledge and accept their responsibilities?	1

Risk assessment answer: 2.27 Medium Low Risk

An answer of "YES" means (Low risk); Score: **1**
An answer of "LARGELY" means (Medium Low Risk); Score: **2**
An answer of "TO SOME EXTENT" means (Medium Risk); Score: **3**
An answer of "PARTIALLY" means (Medium High Risk); Score: **4**
An answer of "NO" means (High risk); Score: **5**

TOTAL Inherent Risk: Corporate risks (external to the project) **2.34** Medium Low Risk

Acquired Risk: Project-specific risks

		Risk assessment
D	**Scope of project or procurement**	
D.1	Is the 'project' scope well defined and agreed in terms of what the project should deliver?	2
D.2	Is the 'project' well defined and understood by the project team and all stakeholders?	2
D.3	Does the scope of the 'project' include all of the business areas affected?	1
D.4	Does the scope of the 'project' address modular and/or incremental delivery, each with clear business scope and business case, where appropriate?	1
D.5	If the project fails to deliver the expected outcome, will the business be able to continue?	1
D.6	Does the 'project' have some flexibility on delivery dates?	3
D.7	Are the business processes being supported or enabled by the technical infrastructure (solution) well understood, well defined and formally documented by the project team?	1
D.8	Do all the people who have a stake in the project agree on what the project should deliver and how it will benefit the business?	2
D.9	Is there a business case that clearly states why the changes are needed, what the changes are, how the business will benefit and how benefits will be measured?	1
D.10	Has the necessary funding been approved and allocated, with budget holders identified?	3
D.11	Have you considered how changes will be dealt with in the future?	2
		1.73 Medium Low Risk
E	**'Project' organization and control**	
E.1	Are the stakeholders committed in their support of the 'project' and its objectives?	1
E.2	Are customers and/or users able to commit sufficient time to the 'project'?	2
E.3	Is the 'project' plan complete and considered to be achievable?	2
E.4	Are good relationships established between the project team, customers and suppliers?	2
E.5	Are the project management approach and milestones approach understood by all parties?	2
E.6	Is there adequate budget provision (risk allowance) for contingency actions?	3
E.7	Are the project interfaces defined and being managed effectively?	3
E.8	Is the project fully under control, in terms of progress against milestones, budget and deliverables?	2
E.9	Are there appropriate processes for managing change to requirements?	2
E.10	Are there established and effective communications between the project and all stakeholders?	3
E.11	Are the project dependencies clearly identified and being managed effectively?	2
		2.18 Medium Low Risk
F	**Team capability, experience and support**	
F.1	Are the necessary project skills available within the project team?	2
F.2	Are team members able to commit sufficient time to the project?	2
F.3	Is there sufficient fall back for critical resources?	4
F.4	Has the team access to the specialist expertise needed, when required?	2
F.5	Is the team adequately supported in terms of accommodation, administrative support and tools?	1

F.6	Is there enough time and resource within the schedule for necessary information gathering?	2
F.7	Has the team access to people who understand the business domain and the business needs?	2
F.8	Is there a good mix of leadership and other key attributes within the project team?	2
F.9	Are roles and responsibilities clearly defined both within the team and third party interfaces?	2
F.10	Are the customer and/or user roles clearly defined and understood?	2

Risk assessment answer: 2.10 Medium Low Risk

An answer of "YES" means (Low risk); Score: **1**
An answer of "LARGELY" means (Medium Low Risk); Score: **2**
An answer of "TO SOME EXTENT" means (Medium Risk); Score: **3**
An answer of "PARTIALLY" means (Medium High Risk); Score: **4**
An answer of "NO" means (High risk); Score: **5**

TOTAL Acquired Risk: Project-specific risks   *2.00*   Medium Low Risk

OVERALL RISK   *2.17*   Medium Low Risk

APPENDIX 3 – PROJECT FUNDING SOURCES AND USES, CASH FLOW, AND NET CHANGE IN OPERATING COSTS

The 10 year cost of this project is **$3.33M**.

SUMMARY:

USE: Total Project Cost Over 10 Years:	**$3,334,409**
SOURCE:	
Total HAVA Funding:	$2,115,686
Total SoS Funding:	$1,218,723

USE BY COST TYPE:

Software:	$141,500
Services:	$1,880,000
Maintenance and Support:	$465,000
Application Hosting:	$224,000
SUB-TOTAL (PCC Fees):	**$2,710,500**
PLUS SOS Incremental Costs: Security Assessment, Laptops, 1 FTE Temp Staff, User Interface, Marketing, Contingency	$526,790
PLUS DII Project Management Oversight and Enterprise Architecture Fee (3%)	$97,119
TOTAL USE:	**$3,334,409**

DETAILED FUNDING SOURCES/USES, CASH FLOW, NET CHANGE IN OPERATING COSTS:
See attached:

1. FINAL-REVIEW-SOW-SOW-DII-SoS-Vermont_Elections_Administration_Platform-IR-STS_Project-Cost-Detail.xlsx.

APPENDIX 4 – PROJECT PHASES, MILESTONES and SCHEDULE

The following chart summarizes the key Milestones of this project.

Task	Billing Milestone	Fee	Target Start Date	Target Completion Date
Enterprise License	Contract Signing	$141,500	2/1/2014	2/1/2014
Project Initiation	Contract Signing	$30,000	2/1/2014	2/1/2014
Analysis and Design	System Design Sign Off	$180,000	2/1/2014	11/1/2014
Segment 1 (Campaign Finance) Customization & Configuration	Start of UAT Segment 1	$120,000	2/1/2014	5/1/2014
Segment 1 UAT	Completion of Segment 1 UAT	$24,000	6/1/2014	7/1/2014
Segment 1 Documentation & Training	Completion of Segment 1 Training	$12,000	6/1/2014	8/1/2014
Segment 1 Roll-out	Segment 1 Go-live	$12,000	7/1/2014	8/1/2014
Segment 2 (Voter Registration & Absentee Ballot) Customization & Configuration	Start of UAT Segment 2	$780,000	3/1/2014	2/1/2015
Segment 2 Data Conversion	Completion of Segment 2 Production Pull	$60,000	3/1/2014	7/1/2015
Segment 2 UAT	Completion of Segment 2 UAT	$66,000	1/1/2015	4/1/2015
Segment 2 Documentation & Training	Completion of Segment 2 Training	$80,000	1/1/2015	5/1/2015
Segment 2 Roll-out	Segment 2 Go-live	$40,000	4/1/2015	5/1/2015
Segment 3 (Elections Management) Customization & Configuration	Start of UAT Segment 3	$80,000	8/1/2014	4/1/2015
Segment 3 UAT	Completion of Segment 3 UAT	$12,000	4/1/2015	5/1/2015
Segment 3 Documentation & Training	Completion of Segment 3 Training	$6,000	3/15/2015	5/15/2015
Segment 3 Roll-out	Segment 3 Go-live	$6,000	4/1/2015	5/1/2015
Segment 4 (Lobbyist Tracking) Customization & Configuration	Start of UAT Segment 4	$120,000	9/1/2014	6/1/2015
Segment 4 UAT	Completion of Segment 4 UAT	$12,000	5/1/2015	6/1/2015
Segment 4 Documentation & Training	Completion of Segment 4 Training	$6,000	5/1/2015	7/1/2015
Segment 4 Roll-out	Segment 4 Go-live	$6,000	6/1/2015	6/30/2015

APPENDIX 5 – PROJECT ORGANIZATION CHART

The following highlights the roles of the people assigned to the project:

State of VT Team:
1. SoS Executive Sponsor: <u>Jim Condos</u>
2. SoS PM: <u>Lori Bjornlund</u>
    a. SoS Subject Matter Experts: <u>Lori Bjornlund , Will Senning, Lelonie Adams</u>
    b. Town Clerk Subject Matter Experts: To be determined
3. SoS Technical Lead: <u>Steve Mattera</u>
4. SoS Contracts and Finance: <u>Marlene Betit</u>

PCC Team:
1. CTO/Co-Founder: <u>Joe Singh</u>
2. VP of Delivery and Project Executive: <u>Anand Balasubramanian</u>
3. Project Executive: <u>Greg Amato</u>
4. Project Manager: <u>Sreeji Vijayan</u>
5. Functional Lead: <u>Tricia Andrulot</u>
6. Technical Lead: <u>Bhanu Nagella</u>
7. Data Conversion Lead: <u>Tom Bryers</u>

APPENDIX 6 – SYSTEM INFRASTRUCTURE

The proposed solution is designed in the MVC pattern as its main architecture. In this architecture, WCF is used to invoke the model objects in order to communicate through Web/mobile apps. The MVC pattern helps create an application that separates concerns (input logic, business logic, and UI logic), while providing a loose coupling between these elements.

The following describes the solution architecture of the proposed application:
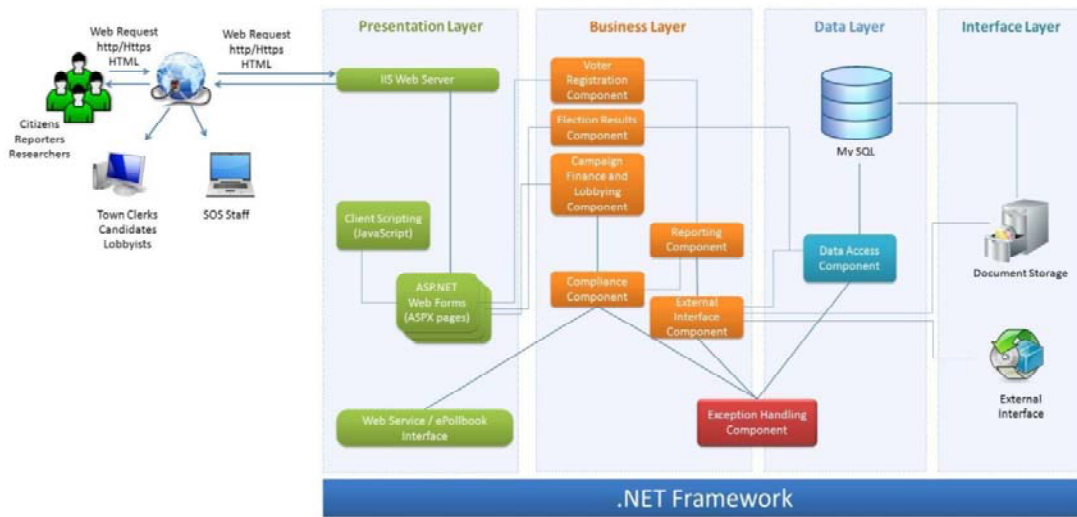
The proposed solution is built using object oriented design patters for flexible architecture. The diagram below list the architecture patterns of the proposed solution.
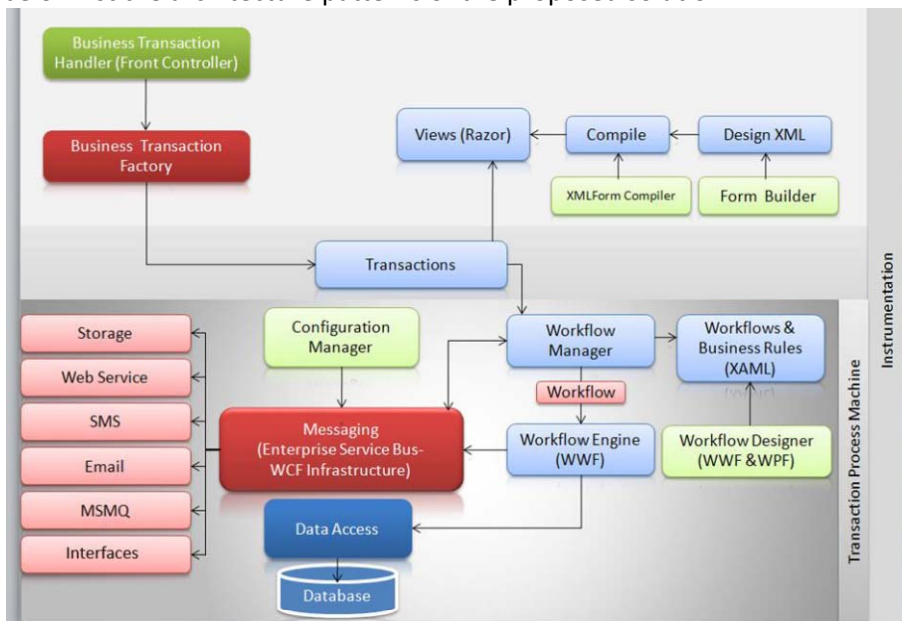
APPENDIX 7 – COST/BENEFIT ANALYSIS

The following outlines the cost/benefit analysis developed as part of this Independent Review.

METHOD

The method used for this cost/benefit analysis is:

1. Develop underlying assumptions
2. Calculate monetary <u>quantifiable</u> benefits of using the proposed solution
3. Calculate monetary <u>non-quantifiable</u> benefits of using the proposed solution
4. Identify non-monetary benefits of using the proposed solution
5. Calculate the ***TOTAL*** 10 year cost of the <u>proposed solution</u>
6. Calculate ***SoS' Costs*** of the 10 year cost of the <u>proposed solution</u>, as part of the TOTAL project cost is covered through HAVA funding
7. Calculate the ***TOTAL*** 10 year cost of maintaining the <u>existing applications</u>
8. Calculate ***SoS' Costs*** of the 10 year cost of the <u>existing applications</u>, as part of the current costs are covered through HAVA funding
9. Subtract the existing application cost from the proposed solution cost to arrive at ***TOTAL INCREMENTAL*** costs for the <u>entire project</u>
10. Subtract the existing application cost from the proposed solution cost to arrive at ***SoS INCREMENTAL*** costs for the <u>SOS cost portion of the project</u>
11. Subtract benefit dollars from the ***TOTAL INCREMENTAL*** cost dollars to arrive at *TOTAL NET* project (Cost)/Benefit
12. Subtract benefit dollars from the ***SoS INCREMENTAL*** cost dollars to arrive at a *SoS NET* project (Cost)/Benefit

Assumptions:
1. Labor costs remain the same to administer old and new systems (Voter Registration, Absentee Ballot, Campaign Finance, Lobbyist Disclosure)
2. Hourly labor rate fully burdened: $40

BENEFITS

MONETARY QUANTIFIABLE BENEFITS OF USING NEW SYSTEM		
Hours Saved due to improved data quality-Campaign Finance	3,600	$144,000
Hours Saved due to improved data quality-Lobbyist Disclosure	3,600	$144,000
TOTAL QUANTIFIABLE BENEFITS		**$288,000**
MONETARY NON-QUANTIFIABLE BENEFITS OF USING NEW SYSTEM		
Risk Reduction by removing FoxPro technology		$10,000
Risk Reduction by not using single person entity in TakeNote		$10,000
Risk Reduction by not using single person entity in BPro		$10,000
Improved data quality		$50,000
Improved data access/transparency by public		$50,000
TOTAL NON-QUANTIFIABLE BENEFITS		**$130,000**
TOTAL BENEFITS		**$418,000**

Non-Monetary Benefits include:

1. Increased voter participation due to easier access to registration and related information on-line.
2. Creation of self-service portal for voters, lobbyists, and candidates to conduct their business, improving customer service as well as the image of the State of Vermont as an on-line capable place to conduct business and civic activities. Specific examples include:
   a. Currently, Candidates fill out paper Campaign Finance reports. They would now enter this data on-line.
   b. Currently, Elections staff organizes report filings, then scans filings to PDF documents, upload to the web, and field questions from Candidates, PACs, Political Parties. Depending the on data set, stakeholders would get their questions answered from the portal, or call SoS office, who would have the data available and not have to shuffle through PDFs to find the answer.
   c. Currently, there is no ability to sort or search data. Sorting, searching, and extracting will be available in the new system.
   d. Currently, voters call SoS office to get polling locations and hours. This will be available in the new system.
3. Reduction in manual data entry, improving data quality and reducing time spent on non-value add activities.
4. Better access to data through the portal, as people can get their own data now vs. asking SoS office to send data.
5. Better data analytics, as the data is now in a database vs. spreadsheets and PDF files
6. Direct link to Social Security Administration to verify SSNs vs. needing to interface with Vermont DMV.

COSTS

TOTAL PROJECT COSTS

TOTAL COSTS		
Costs to implement new system:		
Software	$141,500	
Implementation	$1,880,000	
Software Maintenance and Support	$465,000	
Software Hosting	$224,000	
SoS Implementation Tasks	$526,790	
DII Fee	$97,119	
TOTAL 10 YEAR COSTS TO IMPLEMENT NEW SOLUTION:		**$3,334,409**
Less:		
Current Costs to maintain systems:	**Annual**	**10 Year Cost**
Voter Registration	$75,000	
Absentee Ballot	$72,000	
Voter Reg and Absentee Ballot IT Infrastructure	$7,000	
Campaign Finance IT Infrastructure	$4,000	
Lobbyist IT Infrastructure	$4,000	
TOTAL 10 YEAR COSTS TO MAINTAIN CURRENT SOLUTION:		**$1,620,000**
TOTAL INCREMENTAL COST TO IMPLEMENT NEW SOLUTION:		**$1,714,409**
Less:		
QUANTIFIABLE BENEFITS		**$288,000**
NON-QUANTIFIABLE BENEFITS		**$130,000**
NET (COST)/BENEFIT TO IMPLEMENT NEW SOLUTION:		**($1,296,409)**

SoS PROJECT COSTS (SoS out of pocket costs as HAVA funding covers the remainder)

SoS COSTS		
Costs to implement new system:		
Software	$42,450	
Implementation	$782,400	
Software Maintenance and Support	$139,500	
Software Hosting	$67,200	
SoS Implementation Tasks	$158,037	
DII Fee	$29,136	
TOTAL 10 YEAR COSTS TO IMPLEMENT NEW SOLUTION:		**$1,218,723**
Less:		
Current Costs to maintain systems:	**Annual**	**10 Year Cost**
Voter Registration	$22,500	
Absentee Ballot	$21,600	
Voter Reg and Absentee Ballot IT Infrastructure	$2,100	
Campaign Finance IT Infrastructure	$4,000	
Lobbyist IT Infrastructure	$4,000	
TOTAL 10 YEAR COSTS TO MAINTAIN CURRENT SOLUTION:	**$54,200**	**$542,000**
SoS INCREMENTAL COST TO IMPLEMENT NEW SOLUTION:		**$676,723**
Less:		
QUANTIFIABLE BENEFITS		**$288,000**
NON-QUANTIFIABLE BENEFITS		**$130,000**
NET (COST)/BENEFIT TO IMPLEMENT NEW SOLUTION:		**-$258,723**

APPENDIX 8 – PROCUREMENT ADVISORY SERVICES

There is one primary STANDARD CONTRACT contemplated with PCC in draft form, which also contains several Attachments, including:

1. Attachment A – Specifications of Work to be Performed
   a. Exhibit 1 – Tools and Functionality
   b. Exhibit 2 – Master Project Work Plan
2. Attachment B – Payment Provisions
3. Attachment C – Standard State Provisions for Contracts and Grants
4. Attachment D – Other Provisions
5. Attachment E – Software License Terms
6. Attachment F – Service Level Agreement ("SLA")

The order of precedence is the Standard Contract, followed by Attachments D, C, A, B, F, and E.

The Standard Contract and Attachments have been reviewed and comments submitted to Ms. Johnson and Mr. Mattera. There is expected to be additional reviews and revisions to the Standard Contract and Attachments in the intervening time prior to contract signing.

Additionally, we have reviewed PCC's contract and contract addendum for AWS GovCloud services, and have no exceptions to those agreements.