Independent Review

Automated Fingerprint Identification System (AFIS)

For the
State of Vermont Department of Public Safety and
Department of Information and Innovation

Submitted to the
State of Vermont, Office of the CIO
By

Strategic Technology Services

V1 Submission: 12/28/2015
V2 Submission: 3/8/2016
Final Version Submission (this version): 4/8/2016

Attachments:
1. Project Costing Spreadsheet (FINAL-REVIEW-SOV-DPS-AFIS-STS_Cost_Detail_FINAL.xlsx)
2. Risk Register (FINAL-REVIEW-SOV-DPS-AFIS-STS_Risk_Register_FINAL.docx)
3. DPS CJIS AFIS Audit (IAFIS_Audit_Final_12_23_13.pdf)
4. DPS CJIS IT Security Audit (ITSA Report 2013.pdf)
5. MorphoTrak CJIS Security Position (JeffWallinCJIS Security Memo 12_2015.pdf)
6. Follow up items coming out of 2/1/2016 IR Presentation to CIO (AFIS_IR_FollowUpItems_2016-02-26_V3.pdf)

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1. Executive Summary

Project Summary

1. This is a 10 year project including $4M in project costs and ~$3M in operational costs, totaling **$7M** and will involve:

   a. Design, Development of Workflows, and Implementation Services of MorphoTrak's latest generation AFIS known as the Morpho Biometric Identification Solution (MorphoBIS) for Department of Public Safety in VT, and equivalent agencies in States of Maine and New Hampshire. This group and the project collectively is known as "Tri-State AFIS Project".

   b. "Service Model Pricing" will be used, which is all inclusive pricing for an annual fee, and which includes all hardware (servers, workstations, scanners, printers, mobile scanning devices), software, data conversion/migration, implementation services, support, Disaster Recovery system, and a hardware and software refresh in Year 7.

   c. The specific delivered components include:

      i. Upgrade of the current PrintTrak AFIS application to MorphoBIS. This is essentially a complete data conversion and application replacement and will include the following central server applications:
         - Data Processing Services (DPS)
         - Morpho Biometrics Search Services (MorphoBSS) matching system
         - Advanced Data Services (ADS)
            a. Web Application Server (WAS)
            b. Data Exchange Services (DES)
         - Migration of data from the current Tri-State AFIS to the new MorphoBIS
         - Upgrade of communications and power requirements
         - A twelve-month implementation timeline
         - Disaster Recovery (DR)

      ii. Hardware (servers, workstations, scanners, mobile scanners, printers)

2. Senior Business Leadership, Technical Leadership, and Subject Matter Expertise are aligned to complete solution implementation.

Vendor Profile

1. Safran Group
   a. Safran Group (www.safran-group.com) is an International French conglomerate high-technology group and supplier of systems and equipment for aerospace, defense and security. Safran Group employs more than 8,600 people in 55 countries and generated revenues of more than €1.5 billion in 2014. It was formed by a merger between the aircraft and rocket engine manufacturer and aerospace component manufacturer group SNECMA and the security company SAGEM in 2005. Its headquarters are located in Paris. The company is a component of the Euro Stoxx 50 stock market index.

      The Safran Group was created on May 11, 2005, with the merger of Snecma and Sagem SA, and is divided into 3 main branches:
      i. Aerospace propulsion
      ii. Aircraft equipment
      iii. Defense and security, notably:
         1. Sagem: Technologies and services in optronics, avionics, electronics and safety-critical software
         2. Morpho: Multi-biometric technologies, smart cards, secure transactions, identity management solutions, explosives detection systems.

   b. In 2000, Motorola acquired Printrak International Inc.

   c. In 2008, Motorola agreed to sell its biometrics business called **Printrak** to Safran, as Motorola sought to exit non-core businesses ahead of its split into separately listed companies. As part of this strategy, Motorola at that time planned to spin off its struggling mobile-phone business from its broadband and equipment arm.

   d. In 2009, Safran merged **Sagem Morpho**, (www.morpho.com), a Safran Group subsidiary focused on the security sector with 2,000 employees at more than 15 U.S. locations, with **Printrak** to form **MorphoTrak**.

   e. MorphoTrak (formerly www.morphotrak.com/, now usa.morpho.com and usa.morpho.com/morpho-usa), previously known as Rockwell Autonetics, is a subsidiary of Morpho. MorphoTrak is a leader in multi-biometric technologies for fingerprint, iris and facial recognition. With 40 years' experience, Morpho has captured more than 3 billion fingerprints and Morpho products are used by more than 450 government agencies in over 100 countries. MorphoTrak is headquartered in Anaheim, CA, and maintain regional facilities throughout the United States. MorphoTrak became ISO 9001-2008 certified in 2012.

   f. The selected product, Morpho Biometric Identification Solution (MorphoBIS), is a release-based COTS product. The project includes implementation of MorphoBIS, and migration of all existing data from the existing Printrak AFIS system, MorphoIDent Mobile Devices, Disaster Recovery system, a Technical Refresh in Year 7, and maintenance for the term of the contract.

1.1 Cost Summary

IT Activity Lifecycle:	10 Years
Total Lifecycle Costs:*	**$ 7M**
PROJECT COSTS:	*$4M*
Total Software Costs:	*$ 1.11M*
Total Implementation Costs, including hardware, technology refresh in Year 7, Maintenance and Operations, Disaster Recovery:	*$ 2.9M*
Total DII PM/EA Costs:	*$120K*
NEW OPERATING COSTS:	*$3M*
Total Staffing Costs:	*$2.8M*
Telecom Costs:	*$200K*
CURRENT OPERATING COSTS:	**$ 3.7M**
Difference Between Current and New Operating Costs:	Increase of $3.3M (Total Cost of $7M less $3.3M of current operating costs)
Funding Source(s) and Percentage Breakdown if Multiple Sources:	State of VT General Fund: Dept. of Public Safety First Year Costs for AFIS (funding available in Year 1 only, and DPS expects to request and receive funding for subsequent years)

*Payment Schedule:

Description	Annual Service Fee for Vermont
Year 1 Payment *	$347,150
Year 2 Payment **	$357,564
Year 3 Payment **	$368,291
Year 4 Payment **	$379,339
Year 5 Payment **	$390,720
Year 6 Payment **	$402,441
Year 7 Payment **	$414,514
Year 8 Payment **	$426,950
Year 9 Payment **	$439,758
Year 10 Payment **	$452,951
TOTAL	**$3,979,678**

* Year 1 Payment is due upon system acceptance.

** Year 2 through Year-10 Payments are due 12 months after the previous year payment

Termination Fee Schedule:

Description	Percentage of Purchase Price
System Price	$1,113,000
Year 1 Termination Fee *	90% of System Price
Year 2 Termination Fee *	80% of System Price
Year 3 Termination Fee *	70% of System Price
Year 4 Termination Fee *	60% of System Price
Year 5 Termination Fee *	50% of System Price
Year 6 Termination Fee *	40% of System Price
Year 7 Termination Fee *	30% of System Price
Year 8 Termination Fee *	20% of System Price
Year 9 Termination Fee *	10% of System Price
Year 10 Termination Fee *	0% of System Price

*Fee is due upon contract termination including applicable sales tax.

1.2 Disposition of Independent Review Deliverables

Deliverable	Highlights from the Review *Include explanations of any significant concerns*
Acquisition Cost Assessment	Cost is reasonable per cost comparison details noted in this report.
Technology Architecture Review	See Technology Architecture section. The Technology Architecture review is limited due to this being a services contract.
Implementation Plan Assessment	The approach to defining and implementing security measures appears sound.
Cost Analysis and Model for Benefit Analysis	Cost analysis provides accurate annual cost. No explicit monetary benefits defined.
Impact Analysis on Net Operating Costs	Increase in operating costs per cost spreadsheet detail.

1.3 Identified High Impact &/or High Likelihood of Occurrence Risks

Risk Description	State's Planned Risk Response	Reviewer's Assessment of Planned Response
See Risk Register		

1.4 Other Key Issues

Recap any key issues or concerns identified in the body of the report.

1. No other issues identified.

1.5 Recommendation

It is recommended the project proceed as specified in this report, based on the following:

1. Suitable mitigation of the Risk Register items.
2. Review and acknowledgement of the follow up items coming out of 2/1/2016 IR Presentation to CIO as reflected in the attached document (AFIS_IR_FollowUpItems_2016-02-26_V3.pdf) by CIO office.

1.6 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.

3/8/2016

_____   _____
Signature   **Date**

1.7 Report Acceptance

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

_____   _____
DII Oversight Project Manager   **Date**

_____   _____
State of Vermont Chief Information Officer   **Date**

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 review of the contract

3. Sources of Information

3.1 Independent Review Participants

List the individuals that participated in this Independent Review.

Name	Employer and Title	Participation Topic(s)
Joe Flynn	SOV; Deputy Commissioner, Department of Public Safety, **PROJECT SPONSOR**	Discussed staffing/resource allocation, project priority in light of other active projects
Jeffrey Wallin	SOV; Director, Vermont Crime Information Center; **ADMINISTRATIVE PROJECT MANAGER**	Discussed functional requirements and desired outcomes, and project funding
Jon Creighton	SOV; Fingerprint Section Supervisor, Vermont Crime Information Center; **FUNCTIONAL PROJECT MANAGER**	Discussed functional requirements of proposed solution and experience from previous AFIS installation
Barb Cormier	SOV; DII Oversight Project Manager	Project Management Oversight
Al Gee	SOV; DPS; Administration, Department of Public Safety	Participated in project kick off meeting
Kim Prior	SOV; DPS; Assistant Director, Office of Technology Management, Department of Public Safety	Participated in project kick off meeting
John Hunt	SOV; DII Chief Technology Officer	Discussed technology architecture and security
Rick Owen	SOV; DII CTO Office; Security Analyst	Discussed technology architecture and security
Bart Zandbergen	MorphoTrak, Program Director	Roles, responsibilities, pricing model, comparable projects, how VT pricing compares to comparable projects, ability to meet security requirements, technical architecture, PM approach, Training approach, Implementation approach, Deployment Approach, Risk Management Approach
Matthew Ruel	Maine State Police, Director, State Bureau of Identification	Discussed desired outcomes and Tri-State experience thus far
Jeffrey Kellett	State of New Hampshire, Chief Administrator State Police Criminal Records Unit	Discussed desired outcomes and Tri-State experience thus far

3.2 Independent Review Documentation

Complete the chart below to list the documentation utilized to compile this independent review.

Document	Description	Document Name	Source
MorphoTrak 10yr Draft - Ver 13 JW 12012015.doc	Contract Draft	Morpho/Tri-State Contract	Barb Cormier
MorphoTrak 11yr Draft - Ver 3 Dec 15.jpj edits.doc	Contract Draft	Morpho/Tri-State Contract	John Hunt
7) Tri-State Sole Source Justification.docx	DPS justification to have MorphoTrak considered as a Sole Source solution	Sole Source Justification	Bruce Parizo (via Barb Cormier)
8) Tri-State AFIS MOU signed.pdf	MOU between VT, ME, and NH on AFIS solution	Tri-State Memo of Understanding	Barb Cormier
Vermont Tri-State 00-000655-A v04 FINAL.pdf	Proposal from MorphoTrak to Tri-State for AFIS solution	Proposal to: New England Tri-State Biometrics Group for Vermont Crime Information Center For: Morpho Biometric Identification Solution (MorphoBIS) Upgrade – Service Model	Barb Cormier
Morpho_Trak_BullheadCity.pdf	2013 Morpho 18 month maintenance agreement with Bullhead City, AZ	Bullhead City, AZ Maintenance agreement	Web
MorphoTrak_Miami.pdf	2010 Printrak Review station (2) contract and maintenance/support between MorphoTrak and Miami, FL Police Dept.	Miami, FL Purchase and Maintenance agreement	Web
IT_ABC_Form (AFIS upgrade) 2015.pdf	IT ABC Form for Printrak upgrade/replacement	IT Activity Business Case & Cost Analysis	Barb Cormier
Crosswalk_16V2.pdf	Budget summary showing funding source for AFIS project	All Department of Public Safety: FY 2015 As Passed	Jeff Wallin
JeffWallinCJIS Security Memo 12_2015.pdf	Memo from Jeff Wallin to Jack Green relaying MorphoTrak's position on CJIS Security Compliance	MorphoTrak CJIS Security Compliance	Jeff Wallin
CJIS Security Policy v5_4_20151006 -2.pdf	CJIS Security Policy V5.4	Criminal Justice Information Services (CJIS) Security Policy, October 6, 2016	Web
IAFIS_Audit_Final_12_23_13.pdf	FBI AFIS Audit Report	Integrated Automated Fingerprint Identification System Audit Report for Vermont, August 2013	Jeff Wallin
ITSA Report 2013.pdf	FBI IT Security Audit Report	Information Technology Security Audit Report for Vermont, August 2013	Jeff Wallin

4. Project Information

4.1 Historical Background

Since 1997 VT, ME, and NH, for economic reasons, have partnered in a single Automated Fingerprint Identification System (AFIS). The current Tri-State AFIS system is outdated and running on Windows NT Server and Windows XP Desktop platform that is no longer supported by Microsoft. The current AFIS system, called Printrak provided by Motorola, is built on 2006 technology and consists of older or obsolete hardware that is difficult to maintain and not upgradeable by the software vendor.

MorphoTrak indicates that the existing Printrak AFIS solution is not upgradable, citing that the model was to install their software on a specific hardware device/operating system, and each of those units cannot be upgraded to a new device and operating system. MorphoTrak still supports Printrak application, and has no End of Life announcements on the software.

Newer matching algorithms are crucial to the effectiveness of the system and the ability to provide the most accurate and timely information to assist agencies in their mission. The new environment is intended to provide expandable technology, higher speed and efficiency, the latest algorithms, and ongoing updates. Tri-State seeks a ten year contract software as a service model which eliminates a high upfront cost and provides a complete technology refresh in the seventh year, with the expectation that the product does not become obsolete during the contract period.

4.2 Project Goal

The primary objective of this initiative is to upgrade the AFIS software to take advantage of advances in application features and to move to a supported hardware platform. Specific application features and related process improvements include:

1. Faster response time to the AFIS workstations and faster submission and response from the FBI. States will now be able to submit palm prints and mugshots to the FBI for both ten print and latents.
2. The latest matching algorithms are showing a 30% increase in effectiveness in recording and matching against latent submissions.
3. Improved workflow: The new system is more robust and user friendly and simplifies many of the day to day operations for ten print and latent operators.
4. Faster response times from the FBI results in quicker positive identification of arrestees and a faster return of mission critical information that enhances officer and public safety.
5. The stronger matching capabilities for latent evidence results in a higher level of positive matches which in turn translates into more case resolution and arrests for criminal activity.
6. The ability for agencies to now submit palm prints for retention by the FBI adds a new level of identification capability as well as providing enhanced search functions for latent evidence.
7. Optional deployment of add-on modules such as facial recognition and mobile identification in the field.

4.3 Project Scope

Describe the project scope and list the major deliverables. Add or delete lines as needed.

At a summary level, the Project Scope is defined as:

1. Design, Development of Workflows, and Implementation Services of MorphoTrak's latest generation AFIS known as the Morpho Biometric Identification Solution (MorphoBIS) for Department of Public Safety in VT, and equivalent agencies in States of Maine and New Hampshire. This group and the project collectively is known as "Tri-State AFIS Project".

2. Implement Disaster Recovery Site to support Business Continuity.

3. Technical Refresh of entire solution in Year 7 of the 10 year contract.

Scope Detail includes (the numbered items (1, 2 and 3) below correspond to the numbered items in the summary section above)**:**

1. **Hardware, software, and services including:**

   (1) MorphoBIS Servers, including:
   - Advanced Data Services (ADS)
   - Web Application Server (WAS)
   - Data Exchange Services (DES)
   - Oracle 11g Standard Edition One
   - SAN Storage Subsystem
   - Web Application Server
   - System Cabinet
   - Backup Server
   - Storage Area Network with RAID & LTO Tape
   - Workflow Management Service
   - Backup Software Licenses
   - Data Processing Services (DPS)
   - Morpho Biometric Search Services (MorphoBSS)
   - SAN Storage Subsystem
   - System Cabinet

   Electronic Data Migration of Existing AFIS records:
   - 90,000 Tenprint Records (persons)
   - 1,400,000 Tenprint Records (incidents)
   - 360,000 Palm Records (incidents)
   - 21,000 Latent Finger Records
   - 11,000 Latent Palm Records

   (4) Expert Workstation (EW), including:
   - Control Computer, 24 inch LED Monitor, Keyboard and Mouse
   - Flatbed Scanner
   - Latent Camera Assembly and Lighting
   - Tenprint Expert Workstation Software
   - Latent Expert Workstation Software
   - Review Software

   (7) Tenprint Expert Workstation (TEW)
   - Control Computer, 24 inch LCD Monitor, Keyboard and Mouse
   - Flatbed Scanner
   - Tenprint Expert Workstation Software
   - Review Software

   (24) Review Software Licenses

   (3) Double-Sided Tenprint/Palmprint Card Printer

   (6) Color Laser Printers

   (2) Printer, Laser Mono

MorphoTrak Professional Services, including:
♦ Program Management
♦ Systems Engineering
♦ System Integration
♦ Installation and Test
♦ Site Acceptance Test
♦ Training

| **MORPHOIDENT**
 (NOT APPLICABLE FOR NEW HAMPSHIRE) |
|---|
| **(1) Morpho Mobile Gateway, includes FBI RISC workflow** |
| **(30) MorphoIDent Handheld Fingerprint Identification Devices for Maine** |
| **(30) MorphoIDent Handheld Fingerprint Identification Devices for Vermont** |
| **MorphoTrak Professional Services, including:**
 ♦ Program Management
 ♦ Systems Engineering
 ♦ System Integration
 ♦ Installation and Test
 ♦ Site Acceptance Test
 ♦ Training |

MorphoBIS consist of the following Database and Services:

MorphoBIS Database and Services	
Advanced Data Services (ADS)	♦ Data Management and Storage, Workflow Management, and User Security
Application Service	♦ Workflow Management
Morpho Biometric Search Services (BSS)	♦ Matching Services
Data Processing Services (DPS)	♦ Feature Extraction ♦ Quality Assessment
Data Exchange Services (DES)	♦ Data Interface Exchange

a. Advanced Data Services (ADS)

The Oracle 11g relational database powers the MorphoBIS Advanced Data Services (ADS) to provide a complete digital image repository of all processed records. A large amount of data can be stored for each individual. The data is intelligently incorporated into the matching process. Unlike older systems that only store a single record for each individual, the ADS stores multiple cases (arrests, bookings, applications, or enrollments) for each individual. The ADS supports a person-incident record storage structure. It uses a folder model to manage the storage of person and incident elements. Within the person folder, MorphoBIS not only stores general information about the person, but also stores other folders corresponding to various

incidents, such as arrests or applications. Each incident folder includes text, such as descriptors, demographics, and information about the incident, and images, such as rolled fingerprints, plain/flat fingerprints, slap print images, palmprints, facial images, scar/mark/tattoo images, and signatures.
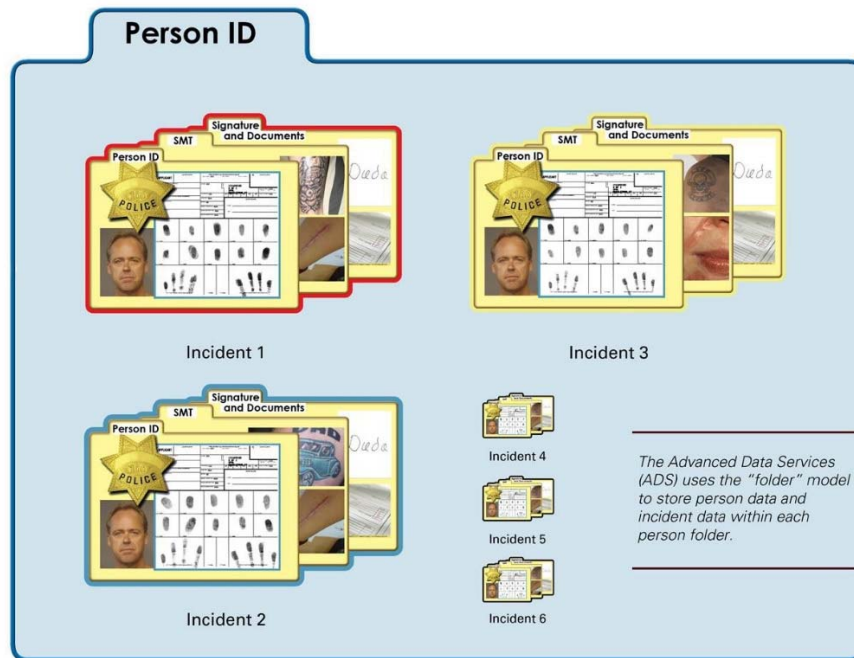
i. Workflow Management
One of the major functions of the ADS is Workflow Management. The major components of Workflow Management are the Workflow Engine (WFE) and the Workflow Manager database (WFM). The WFE manages the workflow process steps within the AFIS middle tier and servers. MorphoBIS business logic is defined by a set of states and state transitions. A group of states and transitions that performs one unit of business logic is referred to as a "workflow." Units of work, known as "actions," are associated with states and transitions. An example of a workflow would include states, transitions, and actions that receive a case, add that case to the ADS database, search that case against the known fingerprint database, and perform quality control and tenprint search verification, and finally, disposition the case. The WFM is an Oracle database that stores each step of a workflow. As a step in the workflow is completed, information about that step is stored. This information can be used by applications to manage workload, to monitor case states, and to produce reports.

ii. Data Management
The ADS contains relational database management software (RDBMS) to store and retrieve case data from an Oracle database. The proposed configuration is specifically designed to meet the Tri-State's anticipated database capacity requirements. A large amount of data for each individual can be stored. The data is intelligently incorporated into the matching process. Unlike older systems that only store a single record for each individual, the ADS stores multiple cases (bookings, applications, or enrollments) for each individual. In addition, MorphoBIS is not limited to the storage of ten rolled fingers; the ADS can be configured to store plain/flat fingerprints, slap print images, palmprints, facial images, scar/mark/tattoo images, and signatures.
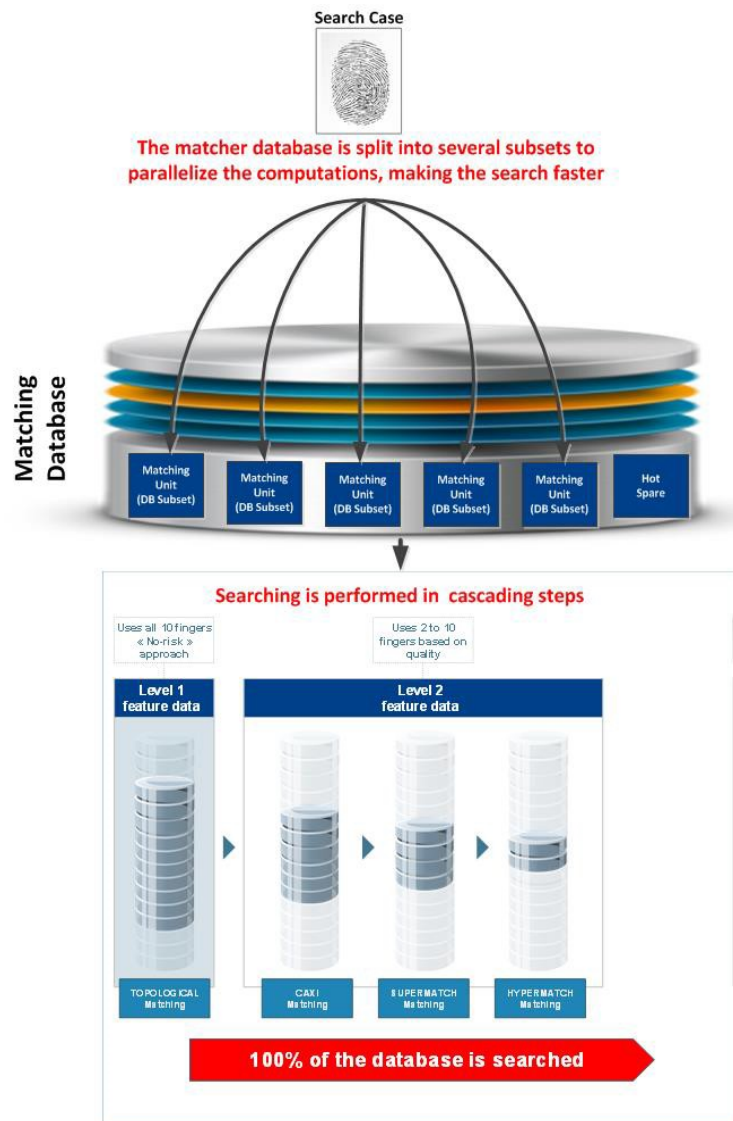
The data management system, which incorporates a scalable architecture, uses Storage Area Network (SAN) technology. The SAN provides data protection, high availability, exceptional performance, and high capacity for the most demanding storage requirements.

iii.   User Security
The ADS provides the functionality of managing the privileges assigned to each system user. The ADS uses OpenLDAP as the protocol for storing the user data. OpenLDAP is an open source implementation of the Lightweight Directory Access Protocol (LDAP). Other components of the MorphoBIS will use the information stored in the LDAP database to ensure that each user is given access to his or her specific authorized functions. Each workflow step is stored in the Oracle database. As each step is completed, information about that step is stored. This information can be used by applications to manage workload, monitor case states, and produce reports.

b.   Morpho Biometric Search Services (MorphoBSS)
The Morpho Biometric Search Services (MorphoBSS) is a powerful biometric search engine, designed for both accuracy and speed. The MorphoBSS subsystem is a full software solution that uses commercial software packages, and therefore preserves the long-term value of the initial investment by eliminating the use of proprietary hardware. The MorphoBSS uses multiple matching stages, and ensures that true matches are always retained – match sets discovered at any stage are never discarded. The MorphoBSS architecture provides flexibility to balance workloads, and offers high reliability and system availability. The MorphoBSS uses the Biometric Search Services Adapter (BSSAdapter) to provide an interface to the MorphoBIS. As illustrated in Figure 4, each Matching Unit performs comparisons on a dedicated part of the biometric template database. Searches are performed in parallel on sub-databases, thus increasing matching performance.

Search Case

The matcher database is split into several subsets to parallelize the computations, making the search faster

Matching Database

| Matching Unit (DB Subset) | Matching Unit (DB Subset) | Matching Unit (DB Subset) | Matching Unit (DB Subset) | Matching Unit (DB Subset) | Hot Spare |

Searching is performed in cascading steps

Uses all 10 fingers « No-risk » approach

Uses 2 to 10 fingers based on quality

Level 1 feature data

Level 2 feature data

TOPOLOGICAL Matching

CAXI Matching

SUPERMATCH Matching

HYPERMATCH Matching

100% of the database is searched

c. Data Processing Services (DPS)

The Data Processing Services (DPS) application automatically extracts MorphoBSS feature data. The DPS uses an advanced print processing algorithm that extracts all features, including minutiae and pattern classification, for rolled and plain fingerprints. The algorithm also extracts feature data for each palmprint. The DPS performs the following actions:

- Segmentation of slap images into individual plain images
- Feature extraction of rolled and plain fingerprint images and palmprint images
- Assessment of rolled and plain print image quality and overall quality
- Pattern classification of rolled and plain print images
- Roll-to-slap discrepancy detection (when rolls and slaps are available), ensuring correct sequencing
- Fingerprint duplicate check ensuring the submission does not have duplicate fingers
- Palm consistency checks ensuring the fingers in the upper palm match the corresponding fingers in the lower palm

d. Data Exchange Services (DES)

The Data Exchange Services (DES) component provides **interoperability and communications between MorphoBIS and external systems**. The DES ensures that all formats, standards, and interoperability functions are supported.

e. CentralView

CentralView is a cost-effective tool for powerful centralized biometric infrastructure management. CentralView provides effective system management tools not only for individual stations, but also for the overall biometric infrastructure.

Key benefits of CentralView include:
*   User-Friendly GUI: It has user-friendly tools and dashboard views that display system information in an easy to understand, ergonomically correct Graphical User Interface (GUI).
*   Process Control: It provides easy, system-wide control of processes and policies, and overall cost efficiency of biometric infrastructure management.
*   Monitoring and Reporting: It comes with powerful auditing and reporting functions that can provide the operational status of the central AFIS and remote workstations. It allows authorized users monitor the system, diagnose system issues, establish workflow decision logic, and create system reports.
*   Software Updates: It can be used to distribute and run software updates on networked workstations, to monitor the progress of an update, and to back-out an update if necessary.
*   Account Management: It supports management of user accounts. A privileged user can add and delete user accounts, create and assign user roles, edit existing user privileges, and manage the user licenses. MorphoBIS user account information is stored in a Lightweight Directory Access Protocol (LDAP) database. Each user account is assigned one or more user roles and each user role is assigned certain privileges. When a user logs on to a MorphoBIS workstation, the system queries the LDAP database to determine the user's privileges.

As shown in the figure below, the typical CentralView GUI displays the following tabs: System Status, Configuration, Licensing, Quota, Reports, CV Agent Tools, Users and Groups, Utilities, and Workflows.
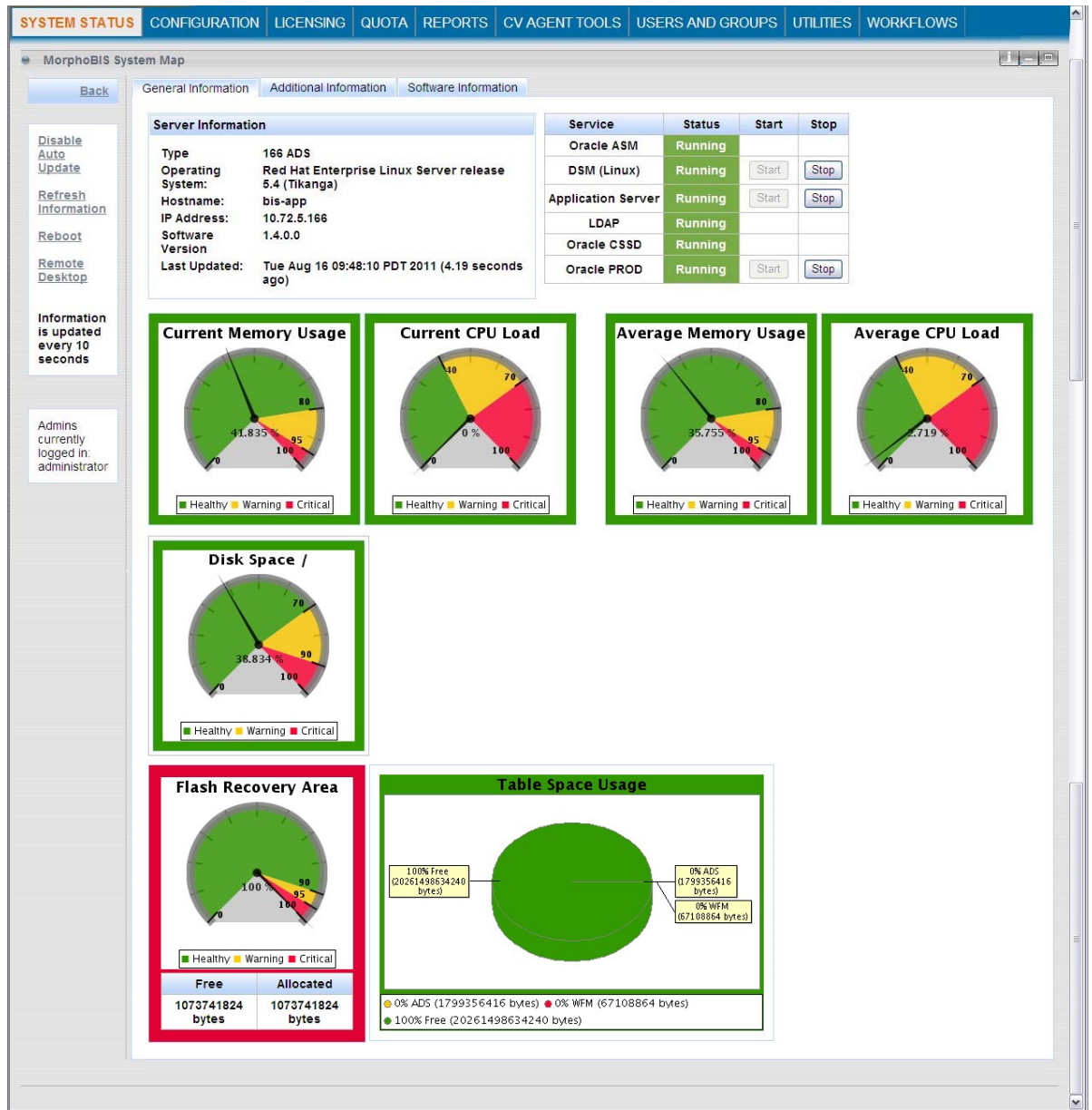
Database Capacity:

File Type	Database Record Size (current)	Current Record Count	Database Record Capacity (7 years)
Tenprint File	1,600,000	1,195,715	2,300,000
Unsolved Latent File (ULF)	50,000	2,374	132,000
Latent Case Database (ea.)	100,000	2,374	132,000
Palmprint File (PPF)	500,000	265,253	905,000
Unsolved Latent Palm (ULP) File	10,000	188	78,000
Mugshot Incidents	N/A	402,070	1,200,000

Database Throughput:

Category / Activity	Current Daily Rate	Proposed Daily Rate
Daily Entries		
Tenprint Records	100	400
LiveScan Records	300	
Latent Records	50	50
Daily Searches		
Tenprint: Tenprint File	400	400
Tenprint: Unsolved Latent File	400	400
Latent: Tenprint File	50	50
Latent: Unsolved Latent File	50	50
Palmprint: Unsolved Latent Palm File	100	250
Latent Palm: Palmprint File	30	30
Latent Palm: Unsolved Latent Palm File	30	30
Face Search		525

Additional Sizing Metrics:

Type of Matching	Repository Count	Penetration Rate	% Oriented	# Hours / day	Daily Through put	# Peak Hours	Hourly Peak Through put
TP/TP (10R+S)	2,300,000 (incidents)	N/A	N/A	23	400	5	80
2-Finger search (mobile)	2,300,000 (incidents)	N/A	N/A		565	5	115
LT/TP	2,300,000 (incidents)	40%	70%	16	50	8	7
TP/UL	132,000 (ULF)			23	400	20	20
LP/PP	905,000 (incidents)	40%	75%	16	30	8	4
PP/UP	78,000 (ULP)			16	250	2	13
Face	1,200,000 (incidents)				525	5	105

Additional Sizing Assumptions:

1. Multi-incident storage of tenprint data will be used.
2. All tenprint and palm images are 500 pixels per inch (ppi).
3. All latent images will be acquired at 1000 ppi.
4. The new MorphoBIS system has been sized based upon a seven year capacity projection.
5. For all types of matchers, the peak throughput is the dimensioning factor.
6. The sizing assumes that all peak throughputs will not be met in parallel.
7. Matching is sized for six palm segments per palm incident (lower, upper, and writer's palms).
    i. It is assumed that as of go-live, all palm incidents have four palm segments.
    ii. Beginning with go-live, the customer may begin to collect six (6) palm segments per palm incident. The sizing of the system takes this assumption into account.
8. TP/TP (Identification) searches will be done against a per-incident based repository.
9. LT/TP and LP/PP (crime solving) searches will be done against a per-incident based repository.
10. Assumptions regarding TP/TP Transactions:
    i. 60% Recidivist rate (new incident of enrolled person)
        1. This affects the rate of growth of the number of persons.
    ii. 25% Applicants
        1. All criminal records are assumed to have mugshots
        2. All applicant records are assumed NOT to have mugshots.
    iii. It is assumed that up to 80% of new criminal bookings will have palms included.
11. Assumptions regarding latent transactions:
    i. LT/TP matching assumes that 70% of searches have known orientation. LP/PP matching assumes that 75% of searches have known orientation.
    ii. LP/PP filtering rate of 40% means that on average, only 40% of the area of each repository palm being searched must be used. The areas of the palm to be searched are specified for each search by the operator by using the workstation interface "hand graphic" control.

Workstation Upgrade to new software (vendor terms this Workstation Mapping):

The table below shows a summary of the features of each workstation type, following by a table showing what each state is acquiring:

Workstation/Application	Services
Tenprint Expert Workstation (TEW)	♦ Tenprint and Palmprint Card Entry ♦ Home Page Record Management ♦ Quality Control ♦ Search Verification ♦ Database Maintenance ♦ Record Comparison
Expert Workstation	♦ Tenprint and Palmprint Card Entry ♦ Latent Entry ♦ Evidence Management ♦ Home Page Record Management ♦ Quality Control ♦ Search Verification ♦ Database Maintenance ♦ Record Comparison
Review SW Workstation	♦ Home Page Record Management ♦ Quality Control ♦ Search Verification ♦ Database Maintenance ♦ Record Comparison

Existing BIS Workstation	New MBIS Workstation
MAINE	
Tenprint Section	
1 MultiPrint Station	1 Tenprint Expert Workstation
1 PrintScan Station	1 Tenprint Expert Workstation
3 Review SW Licenses in use	3 Review SW Licenses**
Latent Section	
1 MultiPrint Station	1 Expert Workstation
1 Review SW License in use	1 Review SW License**
5 Additional Available Review SW Licenses*	
NEW HAMPSHIRE	
Tenprint Section	
1 MultiPrint Station	1 Expert Workstation
2 PrintScan Stations	2 Tenprint Expert Workstations
9 Review SW Licenses in use	9 Review SW Licenses**
Latent Section	
1 MultiPrint Station	1 Expert Workstation

6 Review SW Licenses in use	6 Review SW Licenses**
0 Additional Available Review SW Licenses*	
VERMONT	
Tenprint Section	
3 PrintScan Stations	3 Tenprint Expert Workstations
4 Review SW Licenses in use	4 Review SW Licenses**
Latent Section	
1 MultiPrint Station	1 Expert Workstation
1 Review SW License in use	1 Review SW License**
1 Additional Available Review SW License*	

Printers:
   1 Double-Sided Tenprint/Palmprint Card
   1 Color Laser Mono
   3 Laser Mono	

TOTALS:	4 Expert Workstations 7 Tenprint Expert Workstations 24 Review SW Licenses**

a. Review Application

The Review application provides access to the MorphoBIS Server subsystem, allowing properly privileged users to review fingerprints and palmprints. It provides access to the MorphoBIS Home Page, and allows the user to perform **search verification, quality control, database maintenance, and record comparison.** In addition, the Review application is available at any MorphoBIS workstation, depending upon the assigned user privileges. The Review application uses dockable windows to allow users to control the appearance of some of their screens. Dockable windows are independent sections of the screen that users can click-and-drag to enlarge, reduce, or move to match their personal preference for screen layout. Dockable windows appear on the Home Page screen, verification screens, and database maintenance screens.

b. Tenprint Expert Workstation (TEW)

The Tenprint Expert Workstation (TEW) application supports tenprint and palmprint card processing, and verification of fingerprints and palmprints. Images from fingerprint cards are captured by a high-resolution flatbed document scanner. An entire fingerprint/palmprint card can be captured at 500 ppi in 256 shades of gray. At the TEW, the operator scans the images on the card into the application, and enters text associated with the tenprint record. After a card is scanned and submitted, MorphoTrak's advanced print processing algorithm automatically separates the four-finger slap image into individual fingers for processing, while retaining the original image. Next, the system prepares the prints for feature extraction, extracts feature data, evaluates image quality, and identifies data inconsistencies, such as errors resulting from slap-to-roll comparison. All of these processes are automatic, requiring no operator intervention or special fingerprint training.

c. Latent Expert Workstation (LEW)

The Latent Expert Workstation (LEW) application provides capabilities to scan, process, and manage evidence images. The user-friendly interface allows operators to manage their assigned latent case work and efficiently make identifications. The LEW application uses a secure Relational

Database Management System (RDBMS) for latent case management, and role-based access control to limit user access to the workstation capabilities.

At the LEW, operators can quickly create a new case, or search for an existing case. Once a case has been created, the operator can capture evidence images with a digital camera or flatbed scanner, or import images from a digital file. In order to improve the chances for getting a Hit, the proposed scanner captures images at 1000 ppi, and the new MorphoBIS is sized to store these larger image files. After an image is captured, the operator enters evidence descriptors pertinent to the image; for example, where the evidence was found, or any processing performed to obtain the evidence. Multiple latent prints may be extracted from each evidence image. The LEW provides filters and image enhancement tools to help operators accurately and efficiently encode the extracted latent prints. The LEW includes a Latent Case Management (LCM) system. The LCM provides a complete set of data elements for crime case management. All case data, including evidence images, evidence descriptors, latents extracted from the evidence, latent descriptors, and a comprehensive search history, is stored in the RDBMS. The LCM uses a criminal case data model. Evidence images are stored so that all latents captured within a lift are visible, allowing operators to see the physical relationship between the latent prints. The case data model retains each encoding of a print, including feature data, classification, image enhancements, and the descriptor and filter values. In this way, operators can review the difference between each subsequent search of the latent print.

d. Expert Workstation

The Expert Workstation provides all the capabilities of the TEW and LEW, including tenprint and palmprint card processing, latent print management, and verification/validation of fingerprint and palmprint search results.

Tenprint/Palmprint Capabilities
The automated tenprint features at the Expert Workstation answer the needs of customers who want accuracy and efficiency in their AFIS solution, without the burden of costly manual labor. Like TEW operators, Expert Workstation operators can scan fingerprint and palmprint cards into the application with a flatbed scanner, enter text descriptors, and initiate searches powered by the MorphoBIS advanced algorithm.

Latent Capabilities
The Expert Workstation supports latent processing, latent print management, and verification of search results. Like LEW operators, Expert Workstation operators can create cases with new evidence, and search for existing cases. Evidence can be added to the cases by digital camera, flatbed scanner, or digital file. The LEW's Latent Case Management capability is available at the Expert Workstation, and is used to store original evidence images, as well as each search, complete with a history of filters and enhancements for each search.

e. MorphoIDent Mobile Device

The MorphoIDent mobile devices provide on-the-spot identity checks in real-time. The biometric capture data and search results transmitted to the MorphoIDent are transferred via Bluetooth® or USB to a PC, laptop, or Morpho approved PDA running the MorphoMobile application. Demographic data may be captured using the MorphoMobile application. This application provides a secure connection to the AFIS, in addition to configuration and device management.

**The following workflows will be supported. *Additional workflows will be defined as part of the Design Phase:* <mark>(VT differences highlighted in yellow</mark>*)*

Maine State Police	New Hampshire State Police	Vermont Crime Information Center
♦ Maine Criminal/Juvenile Workflow	♦ New Hampshire Criminal/Juvenile Workflow (w/CCH)	♦ Vermont LiveScan Criminal Workflow
♦ Maine Applicant Non-Retained Workflow	♦ New Hampshire Applicant Workflow	♦ <mark>Vermont Card Entry Criminal Workflow</mark>
♦ Maine Applicant Retained Workflow	♦ New Hampshire Palm Only Card Entry Workflow	♦ <mark>Vermont Criminal Defendant Arraigned Workflow</mark>
♦ Maine Palm Only Card Entry Workflow	♦ New Hampshire Training LiveScan Workflow	♦ Vermont LiveScan Juvenile Workflow
♦ Maine Training LiveScan Workflow	♦ New Hampshire Latent Workflow	♦ <mark>Vermont Card Entry Juvenile Workflow</mark>
♦ Maine Latent Workflow	♦ New Hampshire Remote Latent Feature Search Workflow	♦ <mark>Vermont Juvenile Final Disposition Workflow</mark>
♦ Maine Remote Latent Feature Search Workflow		♦ <mark>Vermont Civil Applicant Workflow</mark>
		♦ <mark>Vermont Civil Applicant FBI Submit Workflow</mark>
		♦ Vermont Applicant Workflow
		♦ <mark>Vermont Deceased Person Workflow</mark>
		♦ <mark>Vermont Missing Person Workflow</mark>
		♦ Vermont Palm Only Card Entry Workflow
		♦ Vermont Training LiveScan Workflow
		♦ Vermont Latent Workflow
		♦ Vermont Remote Latent Feature Search Workflow

2. **Disaster Recovery Site**
   a. The proposed Disaster Recovery (DR) option includes an Active/Passive DR solution. The Primary and DR sites will be connected via a dedicated, customer-provided, high-speed network connection. The majority of the servers at the DR site will remain idle while the servers at the primary site are performing the AFIS tasks, such as searching, matching, quality control, and verification. The databases are synchronized in using VMware VSphere. The solution includes full server hardware complement at the DR site:
      i. Three physical servers with virtual guest hosts
      ii. One tape library with LT04 drive
      iii. One storage appliance (ISSCI SAN)
      iv. Network switches
   b. Data replication between the primary and DR sites will be managed by VMware vSphere replication. This allows balancing the Recovery Point Objective (RPO) with the network bandwidth available for replication. A lower RPO will reduce potential data loss, but will use more bandwidth and system resources. VMware vSphere flexibly supports RPOs between 15 minutes and 24 hours.
   c. Vendor noted in their proposal the following: "At the time of project initiation, the DR location will be established and the project team will confirm network bandwidth is sufficient."
      i. This item is reflected in the Risk Register.

3. **Hardware and Software Refresh in Year 7**
   a. When implementing the proposed Year 7 technical refresh, MorphoTrak will be responsible for installing the new system on new hardware platforms at the Tri-State facilities. MorphoTrak will work with Tri-State to develop transition plans.
   b. MorphoTrak will closely coordinate the technical refresh with Tri-State. The technical refresh will include the following:

Hardware (owned by MorphoTrak):

Central Site System -
- ♦ Replace MorphoBIS servers
- ♦ Replace storage and backup servers
- ♦ Replace MorphoBIS workstations and peripherals
  - o 4 Expert Workstations (EW) (no furniture)
  - o 7 Tenprint Expert Workstations (TEW) (no furniture)
  - o Replace 3 Double Sided Tenprint/Palmprint Card Printers
  - o Replace 6 Laser Printers
  - o Replace 3 Laser Mono Printers
- ♦ Replace Mobile Gateway server

Disaster Recovery Site System -
- ♦ Replace MorphoBIS servers
- ♦ Replace storage and backup servers

Note: The proposed database and throughput capacity for the Central Site System and Disaster Recovery System (which is based on 10 years of operation) will remain unchanged.

Software:

The technical refresh includes the latest operational system technology (AFIS and MorphoBIS Face Expert) within the same functional scope as installed initially.

Professional Services:
- ♦ Program/Project Management
- ♦ Systems Engineering
- ♦ System Integration
- ♦ Installation and Test
- ♦ Training (at Central Site – as per Section 4.7)
- ♦ Factory Acceptance Test (FAT)
- ♦ Site Acceptance Test (SAT)
- ♦ Data Migration

4.3.1 Major Deliverables

	Name	Customer Approval Required
1	Project Plan and Milestones Schedule	Yes
2	Requirements Definition Document (RDD)	Yes
3	Data Dictionary	Yes
4	Interface Control Document(s) (ICDs) – one per interface **Note:** Tri-State AFIS should provide an ICD for any existing CCH interface.	Yes
5	Status Reports	No
6	Site Preparation Survey and Recommendations	Yes
7	Conversion/Migration Plan (If Conversion/Migration is required)	Yes
8	Acceptance Test Procedure	Yes
9	Training Plan	Yes
10	Installation/Transition Plan	Yes
11	User Manuals	No
12	System Administrator Manuals	No
13	Hardware as described in the Proposal and/or requirements specification (hardware is owned by MorphoTrak)	No
14	Software as described in the Proposal and/or requirements specification	No
15	Third-party software licenses	No
16	Training courses	No
17	Final Acceptance Certificate	Yes
18	Service Plan, including MorphoTrak service commitments	Yes

Also see Section 4.4 below, which describes the Milestones and Schedule.

4.4 Project Phases, Milestones and Schedule

The Implementation Schedule is a 1 year duration, the phases of which are tied to the milestones summarized in the table below.

Customer milestones are incorporated into the project's Master Schedule. If these tasks are not completed by the dates listed in the schedule, the schedule may have to be re-planned once the tasks are completed. The schedule slip may be more or less than the actual delay, based on the affected dependencies. Significant schedule changes required as a result of missed customer milestones may result in a billable Change Order.

Milestone	Date
Design Review	T0+4 months
Conversion Startup	T0+4.5 months
Factory Acceptance Testing Start (aka FAT)	T0+9 months
Site Acceptance Testing Start (aka SAT)	T0+10.5 months
Training	After SAT before Go-Live
Go-Live	T0+12 months

5. Acquisition Cost Assessment

List all acquisition costs in the table below (i.e. the comprehensive list of the one-time costs to acquire the proposed system/service). Do not include any costs that reoccur during the system/service lifecycle. Add or delete lines as appropriate. Based on your assessment of Acquisition Costs, please answer the questions listed below in this section.

The following chart represents the out of pocket <u>Acquisition Costs</u> over a 10 year period.

Acquisition Costs	Cost	Comments
Software Costs	$1.11M	
Other:	$2.9M	Includes items below
Hardware Costs, including Year 7 refresh	$0	
Implementation Services	$0	
Maintenance and Operations	$0	
Disaster Recovery	$0	
DII PM/EA Services	$120K	
Total Acquisition Costs	**$4M**	**All items above included as a "Service Model" contract, with annual payments made over a 10 year period.**

Additional Operational Costs of ~$3M including staffing and telecommunications costs. As this is a "Service Model" contract including all software, hardware and services included and paid for annually over the 10 year life cycle, and considering that payments start when the solution is operational, all costs are considered "Operational Costs".

5.1 Cost Validation

Describe how you validated the Acquisition Costs.

The Acquisition Costs were validated through the following methods:

1. <u>Comparison of Hourly Rates of similar Services:</u>
The table below provides the current hourly rates for any MorphoTrak work to be performed beyond the scope of the proposed solution. The rates have been in place for at least 3 years, given analysis of other MorphoTrak contracts.

COVERAGE HOURS (Principal Period Maintenance - PPM)	BILLABLE RATES (Outside the scope of a current Maintenance and Support Agreement)
8 a.m.-5 p.m. M-F (local time)	$160 per hour, 2 hours minimum
After 5 p.m., Saturday, Sunday, Seller Holidays	$240 per hour, 2 hours minimum

COVERAGE HOURS (PPM)	BILLABLE RATES (WITHOUT AN AGREEMENT)
8 a.m.-5 p.m. M-F (local time)	$320 per hour, 2 hours minimum
After 5 p.m., Saturday, Sunday, Seller Holidays	$480 per hour, 2 hours minimum

2. Comparison with Projects of Similar Scope:
    a. The National Capitol Region (NCR) is similar in scope in terms of functionality. The NCR includes two counties that share an AFIS (Prince George's and Montgomery Counties). In this case, they each have their own system but search each other, compared to this solution, where it is one system with all searching their own and each other.
    b. Reviewed proposals or contracts gathered from the web for MorphoTrak and other clients, but unable to draw comparisons due to dissimilarities between the projects.
    c. There are many projects of similar scope in terms of records sizing.   See the record sizing charts below.

File Type	Database Record Size (current requirement)	Current Record Count	Proposed Database Record Capacity (over 7 years)
Tenprint File	1,600,000	1,195,715	2,300,000
Unsolved Latent File (ULF)	50,000	2,374	132,000
Latent Case Database (ea.)	100,000	2,374	132,000
Palmprint File (PPF)	500,000	265,253	905,000
Unsolved Latent Palm (ULP) File	10,000	188	78,000
Mugshot Incidents	N/A	402,070	1,200,000
TOTAL DATABASE RECORD CAPACITY	2,260,000	1,867,974	4,747,000

Category/Activity	Current Daily Rate	Proposed Daily Rate
Daily Entries		
Tenprint Records	100	400
LiveScan Records	300	0
Latent Records	50	50
TOTAL Daily Entries		**450**
Daily Searches		
Tenprint: Tenprint File	400	400
Tenprint: Unsolved Latent File	400	400
Latent: Tenprint File	50	50
Latent: Unsolved Latent File	50	50
Palmprint: UnsolvedLatent Palm File	100	250
Latent Palm: Palmprint File	30	30
Latent Palm: Unsolved Latent Palm File	30	30
Face Search		525
TOTAL Daily Searches		1735

3. The solution as defined costs $4M over a 10 year period, with $1.1M of that for software, and $2.9M for hardware, support, hardware refresh, and disaster recovery. We are unable to develop a pricing comparison based on the data we have. We asked the vendor to provide breakout pricing for hardware, support, hardware refresh, and disaster recovery, but they indicated they are "unable to do so".

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4. As this is the first "Service Model" pricing model put forth by the vendor, there are no other "Service Model" projects to compare with.

5. In an attempt to develop cost metrics, we developed the cost comparison table below. The vendor provided 3 Cost of Storage Per Record data points: $2.23, $0.64, and $0.78. As such, we can compare DPS costs to other project costs. Note: The cost (numerator) is based on the $4M total vendor fees over 10 years, for an average of $400K annually. The denominators are taken from the respective metric in charts above in **Section 5.1.2**.

Metric	Formula	Cost Per Metric
Annual Cost Per Daily Entry (assume 250 days of work annually, 450 daily entries)	$400,000/112,500	$3.56
Annual Cost Per Daily Search (assume 250 days of work annually, 1735 daily searches)	$400,000/433,750	$0.92
Total Per Record Cost of Total Database Record Capacity (total cost / total record capacity)	$4,000,000/4,747,000	$0.84

Using the last metric, "*Total Per Record Cost of Total Database Record Capacity*", DPS shows a favorable cost comparison in being closer to the low end of the spectrum vs. the high end:

Option	Cost Per Record	Delta Cost vs. VT	Delta as a Percentage of Cost
1	$2.23	$1.39	62%
2	$0.64	($0.20)	-31%
3	$0.78	($0.06)	-8%
VT	$0.84	$0.00	0%

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)?

Point of Comparison	Measure
Hourly Rates:	Rates are comparable to market rates
Similarly Scoped Projects:	Costs are comparable when using the Cost Metric comparison above. See description below*.

5.3 Cost Assessment

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

The Acquisition Costs are appropriate using the "Points of Comparison" table above.

Additional Comments on Acquisition Costs:
None.

6. Technology Architecture Review

After performing an independent technology architecture review of the proposed solution, please respond to the following.

This initiative utilizes that the vendor calls a "Service Model" agreement, whereby the vendor provides use of all required hardware and software for the life of the contract (10 years), for an annual fee.

In short, the technology provided in this agreement consists of:
   a. Vendor Commercial Off The Shelf Application Software
   b. Database Software (Oracle 10g)
   c. Hardware:
      a. Servers
      b. Workstations
      c. Scanners (on premise and mobile)
      d. Printers
   d. Implementation services, including training and data conversion/migration
   e. Disaster Recovery Active/Passive hardware (site to be determined)
   f. Hardware refresh at the 7 year mark

1. **State's IT Strategic Plan:** Describe how the proposed solution aligns with each of the State's IT Strategic Principles:
      i. Leverage successes of others, learning best practices from outside Vermont.
      ii. Leverage shared services and cloud-based IT, taking advantage of IT economies of scale.
      iii. Adapt the Vermont workforce to the evolving needs of state government.
      iv. Apply enterprise architecture principles to drive digital transformation based on business needs.
      v. Couple IT with business process optimization, to improve overall productivity and customer service.
      vi. Optimize IT investments via sound Project Management.
      vii. Manage data commensurate with risk.
      viii. Incorporate metrics to measure outcomes.

   b. The following describes how this project exploits these principles:
      i. Leverage successes of others, learning best practices from outside Vermont.
         1. *The proposed solution is proven and in place in many other public safety organizations. The one major difference is the proposed "Service Model" where all hardware, software and services are included for a 10 year price, paid annually. This is the first time this model is being proposed by the vendor, and is in response to the request by Tri-State. Vendor typically sells in a COTS model.*
      ii. Leverage shared services and cloud-based IT, taking advantage of IT economies of scale.
         1. *This solution does leverage shared services, in that, 3 states (VT, ME, NH) are partnering on this project. It does not leverage traditional cloud-based technology in terms of a 3rd party host, but rather, does leverage a cloud model for VT and ME, in that, the solution is hosted at State of NH Data Center.*
      iii. Adapt the Vermont workforce to the evolving needs of state government.

1. *The proposed solution nearly mirrors the existing solution. To the extent that DPS has evolving needs outside of those currently met in the existing solution, this measure is not entirely applicable. Having said that, there are some additional features in the proposed solution that may be used by VT, but it is not yet clear whether those will in fact be implemented. Iris scanning and facial recognition are two such examples.*

    iv. Apply enterprise architecture principles to drive digital transformation based on business needs.
1. *As the vendor is providing the entire hardware and software stack, they have not clearly identified the underlying hardware brand, model, specifications and operating systems, therefore, those items are unknown at present, so this cannot be clearly addressed. The only known technology is Oracle database version 11g, which is not the current version (12g is the current version).*

    v. Couple IT with business process optimization, to improve overall productivity and customer service.
1. *This initiative improves productivity and customer service by improving the accuracy and speed with which prints are processed.*

    vi. Optimize IT investments via sound Project Management.
1. *Both the vendor and SOV are expecting to provide PMI-based Project Management services on this initiative.*

    vii. Manage data commensurate with risk.
1. *The security model is user role-based with encryption for data in transit and at rest. So long as the system is configured correctly, it is expected that data risk will be managed as well.*

    viii. Incorporate metrics to measure outcomes.
1. *There are no specific accuracy metrics defined in the scope of work.*

2. **Service Level(s):** What is the desired service level for the proposed solution and is the technical architecture appropriate to meet it?

There are no defined service levels defined as part of the procurement process. As such, we have no point of reference against which to measure whether the technical architecture is appropriate.

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

As the vendor is providing the entire hardware and software stack, and as they have not clearly identified the underlying hardware brand, model, specifications and operating systems, those items are unknown at present, so sustainability cannot be addressed.

4. **License Model:** What is the license model (e.g., perpetual license, etc.)?

The proposed solution utilizes the Tri-State requested "Service Model", where all hardware, software and services, including technology refresh in Year 7, are included for a 10 year price, paid annually.

This is the first time this model is being proposed by the vendor, and is in response to the request by Tri-State. Vendor typically sells in a COTS model.

5. **Security:** Does the proposed solution have the appropriate level of security for the proposed activity it will perform (including any applicable State or Federal standards)? Please describe.

Security Architecture and Design: Describe the Vendor's proposed approach to support technical controls and technology solutions that must be secured to ensure the overall security of the System:

1. Application Security Model
   a. MorphoBIS workstations use role-based access control.
   b. ADS uses OpenLDAP as the protocol for storing the user data.
   c. Security is assured by a multi-level access control system with user names and passwords; task availability is based on user roles and privileges granted by the System Administrator.

2. Data Security Model
   a. The following are examples of features available in our MorphoBIS solutions that can be implemented to support compliance with CTM IT and CJIS Security Policy for handling criminal history record information (CHRI) and personally identifiable information (PII).
      - MorphoBIS workstations support antivirus software, which is kept up-to-date using a central update server.
      - MorphoBIS communications between workstations and back-end servers support *SSL encryption to safeguard information in transit*.
      - MorphoBIS solutions support the encryption of its Oracle database using *Transparent Data Encryption to safeguard information at rest*.
      - MorphoBIS solutions support either standalone LDAP directory mode or integration with your existing Active Directory.
      - MorphoBIS solutions support the regular synchronization of clocks between sub-systems to maintain consistency of log timestamps.
      - MorphoBIS and the Morpho Maestro mobile gateway support authorization of mobile devices and enforce authorization and auditing of third-party system transactions.

3. Hosting Environment
   a. The solution is being hosted at State of New Hampshire Data Center.
   b. State of New Hampshire indicates their data center is CJIS compliant.

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

Vendor indicates they shall comply with Section 508 of the Rehabilitation Act (29 USC 794d), Subpart B, Technical Standards, § 1194.21- Software applications and operating systems.

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

a. The proposed Disaster Recovery hardware and active/passive model is sound.
b. <mark>It is not yet known where that DR site is going to be located. This is reflected in the Risk Register.</mark>

8. **Data Retention:** Describe the relevant data retention needs and how they will be satisfied for or by the proposed solution.
   a. Vendor suggests the New Hampshire Data Center identify the needs of and provide support for backup and data retention.
   b. The New Hampshire CTO indicates: "*We follow CJIS Policy at a minimum for all CJIS data, and they require a minimum of one year retention for backups.*"

9. **Service Level Agreement:** What is your assessment of the service level agreement provisions that the proposed vendor will provide? Are they appropriate and adequate in your judgment?

There were no Service Level Agreements defined in a RFP, however, DPS indicates they accept the Service Level Agreements described below.

RESPONSE SERVICE LEVEL

In summary, support is provided Monday – Friday, 8am-5pm.

The table below provides a summary of the maintenance services and support. Items designated as Optional are not included in any stated pricing.

Biometrics Support Features	
Software Support M-F 8am-5pm Customer Local Time	**Included**
Unlimited Telephone Technical Support	√
Two Hour Telephone Response Time	√
Remote Dial-in Analysis	√
Software Standard Releases <mark>(these are bug fixes only, not additional feature set)</mark>	√
Software Supplemental Releases <mark>(these are bug fixes only, not additional feature set)</mark>	√
Automatic Call Escalation	√
Software Customer Alert Bulletins	√
Hardware Support-Onsite M-F 8am-5pm Customer Local Time	**Included**
On-Site Response	√
On-Site Corrective Maintenance	√
On-Site Parts Replacement	√
Preventive Maintenance	√
Escalation Support	√
Hardware Service Reporting	√
Hardware Customer Alert Bulletins	√
Parts Support	**Included**

Advanced Exchange Replacement Parts	√
Telephone Technical Support for Parts Replacement	√
Parts Customer Alert Bulletins	√
Software Uplifts	
Hours of Coverage Available up to 24 Hours Per Day, 7 Days/Week	Optional
One Hour Telephone Response	Optional
Hardware Uplifts	
Hours of Coverage Available up to 24 Hours Per Day, 7 Days/Week	Optional
Up to 4 Hours On-site Response	Optional

SYSTEM AVAILABILITY and SUPPORT SERVICE LEVEL AGREEMENT

There is no System Availability Service Level Agreement.

For description of "Support Service Level", see relevant items in "Response Service Level" chart above and the table below which was collected from the contract draft (Note: The contract is not yet finalized).

SEVERITY LEVEL	DEFINITION	RESPONSE TIME	TARGET RESOLUTION TIME
1	Total System Failure - occurs when the System is not functioning and there is no workaround; such as a Central Server is down or when the workflow of an entire agency is not functioning.	Telephone conference within 1 hour of initial voice notification	Resolve within 24 hours of initial notification
2	Critical Failure - Critical process failure occurs when a crucial element in the System that does not prohibit continuance of basic operations is not functioning and there is usually no suitable work- around. Note that this may not be applicable to intermittent problems.	Telephone conference within 3 Standard Business Hours of initial voice notification	Resolve within 7 Standard Business Days of initial notification
3	Non-Critical Failure - Non-Critical part or component failure occurs when a System component is not functioning, but the System is still useable for its intended purpose, or there is a reasonable workaround.	Telephone conference within 6 Standard Business Hours of initial notification	Resolve within 180 days in a contractor - determined Patch or Release.
4	Inconvenience - An inconvenience occurs when System causes a minor disruption in the way tasks are performed but does not stop workflow.	Telephone conference within 2 Standard Business Days of initial notification	At the contractors discretion, may be in a future Release.
5	The State request for an enhancement to System functionality is the responsibility of the contractors Product Management.	Determined by The contractors Product Management.	If accepted by The contractor's Product Management, a release date will be provided with a fee schedule, when appropriate.

10. **System Integration:** Is the data export/reporting capability of the proposed solution consumable by the State? What data is exchanged and what systems will the solution integrate/interface with*? **Please create a visual depiction** and include as **Appendix 1** of this report. Will the solution be able to integrate with the State's Vision and financial systems (if applicable)?

In summary, MorphoBIS Data Exchange Services (DES) component provides interoperability and communications between MorphoBIS and external systems. The DES ensures that all formats, standards, and interoperability functions are supported.

Integration with State's VISION and Financial Systems is not applicable.

See **Appendix 1** for more detail.

Additional Comments on Architecture:
   None.

7. Assessment of Implementation Plan

7.1 Implementation Readiness

After assessing the Implementation Plan, please comment on each of the following.

1. **The reality of the implementation timetable**
   a. The overall proposal contemplates a 1 year period of solution implementation followed by 10 years of solution usage, with a system refresh in Year 7.
   b. The project is contemplated to be broken down into 6 major tasks, as per the chart below. Also see **Section 4.4**.

Milestone	Date
Design Review	T0+4 months
Conversion Startup	T0+4.5 months
Factory Acceptance Testing Start (aka FAT)	T0+9 months
Site Acceptance Testing Start (aka SAT)	T0+10.5 months
Training	After SAT before Go-Live
Go-Live	T0+12 months

2. **Training of users in preparation for the implementation**

The training plan used by the vendor is described below. The training takes place after Site Acceptance Testing and before Go Live. The training plan is effective and proven.

MorphoTrak will provide classroom instruction and hands-on training for 5 to 10 Tri-State trainees per session. This person-to-workstation ratio will enable each person to gain hands-on operational experience. The classes will address each of the topics listed in the table below.

MorphoTrak uses a modular approach to **system training** (shaded in grey in the table below), tailoring it to the specific configuration and workflows of the proposed solution. Each training module focuses on task groups as they function within the defined workflow. Instructors provide **system training** by using a combination of lecture and hands-on lab sessions. Classroom lecture presentations cover conceptual and theoretical aspects of the system, and hands-on lab sessions develop skill in performing specific MorphoBIS operations and procedures. This method enables trainees to practice on the installed system, which reinforces the classroom instruction. All training sessions are limited in size to enable each student to receive one-on-one, hands-on instruction with the trainer.

Training courses include **user guides, system administrator guides, and training materials** as appropriate. Each student receives a set of training materials for personal use during and after training (one soft copy for each student, and one hard copy per workstation). Each lab module presents new terms and provides step-by-step instructions for workstation procedures. A review section at the end of each module lists the new skills the operator should have learned and mastered. Users keep their training materials for future reference, allowing them to review information when needed to further enhance their skills.

Type of Training	Central Site (New Hampshire)	Maine	Vermont	Number of Trainees per Session	Duration for each Session	Total Number of Sessions
Tenprint Expert Workstation (TEW) and Review Workstation	X	X	X	2 per workstation	2 days	6
Latent Expert Workstation (LEW) and Review Workstation	X	X	X	2 per workstation	3 days	3
MorphoBIS - System Administrator	X			5 max	2 days	1
Disaster Recovery – System Administration	X			5 max	1 day	1

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:**

    A. Project Management
    B. Training
    C. Testing
    D. Design
    E. Conversion (if applicable)
    F. Implementation planning
    G. Implementation

The short answer is yes. The Milestones and associated timeline are outlined in the Milestones Section above (4.4) which also has a formal acceptance process attached to it, described below, providing adequate detail to hold the vendor accountable.

Additionally, the "Activities and Deliverables" table at the end of this section describes the roles and responsibilities of both vendor and DPS in demonstrating a clear sense of who owns what.

Acceptance Process:

The acceptance process is characterized by running an acceptance test, documenting any anomalies with a plan to fix, signing the acceptance certificate, and putting the project into maintenance support mode. The table below provides a description of the Final Acceptance process.

	Final Acceptance Process
1	Tri-State AFIS and MorphoTrak run the previously agreed-to acceptance test procedure using an agreed-upon set of test data. This procedure includes a detailed set of tests covering all the requirements specified in the RDD.
2	Any anomalies are documented in the acceptance punch list. A plan to fix these anomalies by a specific date is entered into the punch list. MorphoTrak's standard Severity Definitions are provided in the table below as a reference. **Note:** Minor omissions or variances in the System that do not materially impair the operation of the System as a whole will not postpone Initial System Acceptance. These minor omissions or variances will be corrected according to a mutually agreed upon schedule prior to Final System Acceptance
3	After completion of the acceptance test procedures and depending on the severity of documented anomalies, Tri-State AFIS may elect to accept the system for operational production use, commencing Initial System Acceptance. Tri-State AFIS will provide agreement in writing for Initial System Acceptance to occur. This may be in the form of executing a Conditional Acceptance certificate.
4	Upon resolution of all documented anomalies found during acceptance testing, the Final Acceptance Certificate is signed with the following: ♦ A reference to the punch list. ♦ A help desk support telephone number.
5	Once the acceptance certificate is signed (Conditional or Final), the Tri-State AFIS may use the system in a production environment; that is, the system can go live.
6	If the Tri-State AFIS does not want to sign the acceptance because of a major issue, MorphoTrak will work to fix the issue as soon as possible. During this time, the Tri-State AFIS is not authorized to put the system into production.

Severity Definitions:

Severity	Definition
Severity 1	**Severe**: Any failure that renders an entire system or an essential component of a system non-operational.
Severity 2	**Critical**: Any failure that renders a crucial component of the system non-operational, or seriously impacts the overall system, has no work-around, but does not render the system unusable.
Severity 3	**Non-Critical**: Any failure where a system component is not functioning but there is a work-around. This also applies to inadequate documentation to install, integrate, or use the system.
Severity 4	**Inconvenience**: Any failure that does not significantly impact normal operation but makes it inconvenient or confusing to use the system or one of its components.
Severity 5	**Enhancement**: A feature or capability that is not in the current product specification, but will be added in the future.

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.**

    a. DPS plans to utilize two project managers in the following manner:

        i. Jeff Wallin, Vermont Crime Information Center Director, as the Oversight/Administration Project Manager, providing Executive level assurance for meeting deadlines, setting direction, getting policy-related items addressed, etc. It is expected that up to 30% of Jeff's time will be allocated to this project on a regular basis, and up to 100% at certain times.

        ii. Jon Creighton, Fingerprint (Identification) Section Supervisor, and the "boots on the ground" Project Manager, responsible for delivery of the day-to-day tasks of the project. It is expected that up to 50% of Jon's time will be allocated to this project on a regular basis, and up to 100% at certain times.

    b. Given the combination of subject matter expertise and executive-level expertise both people bring to this project, the team has the skills and experience to be successful on this project.

5. **Readiness of impacted divisions/ departments to participate in this solution/project**

    a. Mr. Wallin, Mr. Creighton, 3 additional fingerprint analysts in the department, and 1 analyst in the forensics area, are all expected to contribute to the project, and are the primary people involved with the outcomes of this project.

    b. They all appear ready and able to take this project on from a skill set and time availability standpoint.

6. **Adequacy of design, conversion, and implementation plans**

    We begin this section by describing how MorpoTrak is staffing this project. The services will be performed by MorphoTrak using the following roles assigned to this project:

    a. Project Manager
    b. Quality Engineer
    c. Technical Authority / Engineering Manager
    d. Tech Lead
    e. System Engineer (SE)
    f. Deployment
    g. Tester
    h. Data Migration Lead
    i. Training
    j. Documentation

Project Manager (PjM) is in charge of:

- Defining and implementing the organization and means necessary for the correct launch and execution of the project in conformity with cost, schedule, performance and scope commitments
- Getting the resources (technical, human, in terms of training, in terms of skills, etc.) required for the project implementation
- Managing internal teams, coordinating external project production teams and ensuring the cohesion of the technical tasks
- Implementing and ensuring compliance with the applicable methodology (quality reference base, tools, etc.)
- Defining / managing the test strategy and overall test needs of the project
- Decision-maker for all test requirements of the project
- Creation of the PMPS in collaboration with the PgM
- Technical relations with the client
- The quality of the deliveries
- Leading the change requests analysis at PgM request, validating changes of scope and the associated quotations and change requests execution once approved
- Proposing areas for improvement (methods, tools, etc.) consolidated by the PjM Director and QA
- Managing alerts raised by the PjM and/or by the PgM and/or QE and escalating them, if necessary
- Accountable for Data Migration Plans and Reviews

Quality Engineer (QE) is in charge of:

- Training and assisting the project team in applying MorphoTrak process;
- Participating in the risk analysis
- Assisting the Project Manager in the production of the specific project development plan and its adjustment, and also in the setting up of methodological procedures
- Ensuring, through targeted verifications, the application of the processes and the project development plan, and in particular :
    - o ensuring that the reviews planned for the project are held
    - o participating in project reviews
    - o verifying the application of the planned controls
- Controlling the quality of the project deliveries via delivery assessment reviews
- Verifying the production of project monitoring indicators
- Ensuring the effective handling of non-conformities (alerts, customer complaints, etc.) and their use as feedback from experience
- Raising alerts in the event of non-compliance with MorphoTrak process and, if need be, escalating them
- Administering the End of Project Feedback Invitation

Technical Authority / Engineering Manager is in charge of:

- Assigning test engineers
- Supporting test engineers on providing any specific needs outside of project, i.e. capital equipment expenditure, tools, S/W etc.
- Facilitating any issues stemming from schedule/resource conflicts
- Addressing personnel performance issues
- Accountable for SW Customization and Contract BOM

Tech Lead is in charge of:

- Monitoring the production of the functional solution and the associated documents (SDD, ICD, DD, migration ICD), as well as the BOM and reviewing those documents
- Producing the project technical documents (site preparation plan, etc.) and to ensure the reviews
- Steering solution review and architecture meetings
- The consistency of the solution, including its sub-systems
- Recommendations for architecture, technical environment and platform dimensioning (development, integration, qualification, target)
- Providing the technical support to development and sub-systems teams, oversight and reporting on these activities
- The implementation of the tools within the project framework. In this connection, the Tech Lead ensures the re-use, as well as possible, of existing tools
- The implementation of the various system platforms with the support of the Deployment
- The system integration (its content in relation to the definition established with the System Engineer), the integration tests and test progress reports
- The configuration management, release notes and preparation of deliveries
- The oversight of the defects resolution

System Engineer (SE) is responsible for the functional solution. The SE is in charge of:

- Producing the RDD and the functional specification documents (SDD, ICD, DD, migration ICD) and BOM
- Analyzing the change requests as part of change management (change of the scope to be implemented)
- Providing functional support to development and customization

Deployment is mainly responsible for the deployment activities on the customer site, in charge of:

- Preparing for the on-site installation whether on a new site or on an already operational system
- Preparing, coordinating, participating to the on-site installation, and reporting on these activities
- Performing the on-site validation, integration tests, pre-run of the SAT and reporting on these activities
- Coordinating and providing support during the deployment of the remote sites and reporting on these activities
- Providing support during the SAT, the training and the transition activities
- For conversion and migration, deployment is in charge of the setup, integration, administration, monitoring and de-commissioning of the system

Tester is in charge of:

- Creating all project test plans / procedures / reports as defined as needed by the PjM
- Executing all test procedures according to the plan
- Providing test status to the project team
- Providing input to project manager on test schedule, and raise any and all concerns about test coverage/strategy of the project and provide input on solutions
- Alerting PjM of schedule concerns in order to get additional support as needed

Data Migration Lead is in charge of:

- Defining the Migration Plan
- Participating to the RDD, DD, Conversion Plan and Migration ICD reviews
- Participating in the review of the test cases related to Migration and Conversion
- Coordinating all Migration setup, development and execution activities

- Providing required data sets for testing purposes
- Providing support related to migrated data throughout the project
- Providing Migration reports

Training is in charge of:

- Implementing the training intended for the Customer (creating the training plans, preparation of training material, organization of training sessions, etc.)

Documentation is in charge of:

- The production of project system documents intended for the Customer, e.g. user guides, administration guides, Integration guides etc. as defined by the contract project deliverables.

Regarding the adequacy of design, conversion, and implementation plans, the following summarizes each of these areas:

a. The **Design** work largely involves mapping process workflows, most of which are already in use by the current solution and do not expect to be significantly changed. Once defined, they will need to be configured into the new system. The approach utilized by the vendor is sound.

b. The **Conversion/Migration** plan is summarized as follows:
   i. Data migration will be performed at vendor data migration facility in Anaheim, California using the Tri-State provided electronic copy of the existing AFIS database. See table below for the Data Migration Statistics.
   ii. MorphoTrak uses proven tools and scripts that take data from existing systems and versions of those system to convert to MorphoBIS. In this case, conversion from Printrak V9.x to MorphoBIS V4.2 has been done and is proven.
   iii. There are typically 2 rounds of data migration: Initially the main migration then one residual migration. User feedback between these rounds is incorporated into the conversion logic.

Data Conversion Records Summary:

	Tenprint	Palmprint	Latent Finger	Latent Palm	Mugshot
Anticipated Number of Records	90,000 Persons 1,400,000 Incidents	360,000 Palm Incidents	21,000	11,000	512,000
Origin	Legacy BIS	Legacy BIS	Legacy BIS	Legacy BIS	Legacy BIS
Extract	Yes	Yes	Yes	Yes	Yes
Data Format	Legacy BIS	Legacy BIS	Legacy BIS	Legacy BIS	Legacy BIS
Resolution	500 ppi	500 ppi	500/1000 ppi	500/1000 ppi	N/A
Dup Check	No	No	No	No	No
Output Format	MBIS	MBIS	MBIS	MBIS	MBIS
BSS	Multi-Incident (TP/TP) Multi-Incident (LT/TP)	Multi-Incident	N/A	N/A	For MorphoBIS

Additional Data Migration roles and responsibilities are provided below:

		MorphoTrak Responsibilities for Electronic Data Migration
	1	Provide a migration plan describing how the data migration will be performed.
	2	Extract all electronic data from the legacy system, if the legacy system is a MorphoTrak system.
	3	Work with the Customer to define file formats for the foreign electronic records, if the legacy system is not a MorphoTrak system.
	4	Process the data to: a. Re-extract and replace all matching features for the tenprint data where the quality of the images permits. b. Preserve the expert minutiae for latent images from the unsolved latent file (MorphoTrak systems only), and add new auto-extracted features where the quality of the images permits. c. Convert descriptor data from the legacy format to the replacement system format. d. Add default values for new mandatory fields.
	5	Add tenprint, palmprint, and latent data to the new system.
	6	Create both the Advanced Data Services (ADS) database and the Morpho Biometric Search Services (MBSS) database.
	7	Perform both a primary migration and subsequent residuals to capture all the data up to the time of cutover.
	8	Duplicate checking (cross-searching) is not included in this proposal (as previously stated in the Technical Section 4.2 - Electronic Migration – Table 3).
	9	Provide a migration report, listing which records were migrated successfully and which could not be migrated, with explanations for the exceptions.

		Tri-State AFIS Responsibilities for Electronic Data Migration
	1	Review and approve the Data Migration Plan: a. One aspect of migration is mapping fields from the legacy system to descriptors in the new database. The Customer must review the migration plan and verify that the mapping is correct, otherwise additional migration scripts may have to be run after the database load. b. Additions to the proposed migration scope or changes after the Migration Plan has been approved require a Change Order. MorphoTrak reserves the right to charge for Change Requests that involve additional equipment, functionality, or labor.
	2	Provide access to the legacy system in order to copy the existing data as either a backup or an Oracle export, whichever is appropriate.
	3	Provide remote access into the legacy system and replacement system for migration personnel for the duration of migration.
	4	Ensure the quality of the data being provided.

c. The approach to **Implementation** is described below, and appears sound and adequate:
   i. A PMI-based Project Management methodology is used, with formal plans to manage the effort, including Deliverables Acceptance process (described above), and Change Control process, described below.

   MorphoTrak's **change control/issue resolution process** defines the procedures by which the project scope may be changed, either during the project implementation or after acceptance. It includes the paperwork, tracking systems, and approvals necessary for authorizing changes. The **Change Order** process ensures that the overall effect of the requested change is considered prior to the implementation of the change, and that the effect on the project work plan and schedule is considered. The table below provides a description of the Change Order process.

	Change Order Process
1	Tri-State AFIS Change Requests are documented and submitted to the MorphoTrak Program Manager.
2	The project team evaluates the proposed change and its impact to the project schedule and costs (if any).
3	The MorphoTrak Program Manager drafts a Change Order for your review, including a description of the solution and the price, if any. *Note:* No-cost Change Orders may be provided to track changes.
4	MorphoTrak and the Tri-State AFIS review and then formally reject, postpone, or accept changes based on need, overall effect, cost, and schedules.
5	The Change Order is finalized and purchased by being signed by both parties prior to the Change Order's expiration date.
6	Once the Change Order has been approved, the MorphoTrak Program Manager makes any necessary adjustments to the Design Documents, project work plan, and any other impacted deliverables, such as the BOM.

7. **Adequacy of support for design/conversion/implementation activities**

   a. **DESIGN:**
      i. DPS and Vendor have adequate support for Design activities. It is expected that Jon Creighton will lead this effort for DPS with approval/sign off by Jeff Wallin.
   b. **CONVERSION:**
      i. DPS and Vendor have adequate support for Conversion/Data Migration activities. It is expected that Jon Creighton will lead this effort for DPS with approval/sign off by Jeff Wallin.
   c. **IMPLEMENTATION:**
      i. DPS and Vendor have adequate support Implementation activities. It is expected that Jon Creighton will lead this effort for DPS with approval/sign off by Jeff Wallin.

8. **Adequacy of agency and partner staff resources to provide management of the project and related contracts (i.e. vendor management capabilities)**
   a. As noted above, this will largely be the role of Jeff Wallin as the Executive level member of the team.

9. **Adequacy of testing plan/approach**
    a. There is a specific role vendor assigns to this project called "Tester", who is in charge of:
        i. Creating all project test plans / procedures / reports as defined as needed by the Vendor Project Manager
        ii. Executing all test procedures according to the plan
        iii. Providing test status to the project team
        iv. Providing input to project manager on test schedule, and raise any and all concerns about test coverage/strategy of the project and provide input on solutions
        v. Alerting Vendor Project Manager of schedule concerns in order to get additional support as needed
    b. As noted above, there are two key Test Stages: Factory Acceptance Testing (**FAT**), and Site Acceptance Testing (**SAT**).
    c. FAT:
        i. See the **FACTORY TESTING** section in the "*Roles and Responsibilities of both vendor and DPS in Activities and Deliverables" table below.*
    d. SAT:
        i. See the **SITE ACCEPTANCE TEST** section in the "*Roles and Responsibilities of both vendor and DPS in Activities and Deliverables" table below.*

10. **General acceptance/readiness of staff**
    a. DPS staff on this project, as noted above, all appear ready and able to take this project on from a **skill set** and **time availability** standpoint to address the "readiness" question, and are eager to adopt the new solution, addressing the "acceptance" question.

Additional Comments on Implementation Plan:

The following tables are provided as detail to support sections above.

LAN and WAN speeds:

	Current	To Be
LAN	Waterbury location currently supports 1Gbps.	Waterbury location currently supports 1Gbps.
WAN	Current WAN Speed is 1.54Mbps from Vermont to Concord, NH. NH receives 5Mbps service to accommodate both VT and ME.	Current plan is to upgrade existing service to 10 Mbps or 20Mbps with one of multiple vendors. Early estimates for pricing (at 20Mbps) is approximately $1,180 (Fairpoint) per month for service (compared to current $590 per month).

Roles and Responsibilities of both vendor and DPS in Activities and Deliverables.

MT Responsibility	Tri-State AFIS Responsibility
Project Management Services	

1. Provide a Program/Project Manager (PM) to coordinate all design definition, engineering efforts, procurement, factory integration and testing, shipment, installation, site integration, acceptance testing, training, transition, and support activities.
2. The PM will also:
  a. Serve as primary customer contact and develop a close team environment among all personnel to facilitate a continuous transfer of knowledge throughout the contract.
  b. Conduct the project's status meetings and provide status reports.
  c. Create and maintain an Action Item Log.
  d. Resolve deviations from the project scope and administer change control.
	1. Provide a Program/Project Manager to review/approve all deliverables, final acceptance, and any change orders.
	2. Your PM should also:
	  a. Serve as MT's primary point of contact.
	  b. Coordinate Customer activities, including site preparation, installation support, integration testing support, acceptance testing, and training of your personnel.
	  c. Act as liaison with your third-party agencies.
	  d. Work with our personnel to verify the resolution of Action Item Log issues.
	  e. Ensure the MT personnel have the necessary site access and a safe work environment.

Project Design Documentation	
1. Draft all Design Documentation in the List of Deliverables and provide to the Tri-State AFIS for review, comment, and approval.	1. Provide information regarding current system performance and functionality. 2. Review, provide feedback on, and approve the Project Design Documents by the scheduled deadline and in accordance with the procedure described in Table 28 of this Statement of Work. 3. Issue Change Requests for any required changes to the approved documents in accordance with the procedure described in Table 31 of this Statement of Work.
Electronic Data Migration	
Please see Data Migration section above.	Please see Data Migration section above.
Purchasing	

1. Verify that the proposal BOM is still valid and that no items have gone End-of-Life (EOL). Replacement items will be identified if necessary and you will be notified of the changes. 2. Procure the hardware and third-party software listed on the BOM. 3. Inventory the material. 4. Stage the equipment as needed for factory testing.	1. Obtain the Customer-provided hardware, if any, ensuring it meets the requirements specified in the approved Design Documentation. 2. If required, ship Customer-provided hardware to MT for factory staging.
Engineering Integration	
1. Configure the commercial-off-the-shelf (COTS) software per the requirements in the approved Design Documents: 　a. Develop, test, and implement all the workflows. 　b. Develop, test, and implement the interfaces on MT software side required for the system operation, as defined in the Interface Control Documents (ICDs). 　c. Provide simulators/test files for the MT software side to allow the Customer to test the external system interfaces prior to the on-site integration. Simulators will reflect functionality only, and unless otherwise specified, will not simulate performance of the actual system. 　d. Configure and test the language, user interfaces, access rights, scanning and printout formats, and reports for MT software according to the Requirements Definition Document (RDD). 　e. Configure the data storage, backup, security, and user management for the items that are under MT responsibility. 2. Load the software and converted/migrated data on the staged equipment and perform basic functionality testing to verify the system is ready for Qualification testing.	1. Develop, test, and implement any required interfaces from the Customer systems to the new MT system as required by the ICD(s). 2. Provide test files/simulators for the external systems to allow MT to perform testing prior to the on-site integration. 3. Configure the data storage, network (LAN/WAN), security, user management, and backup according to the RDD.
==*Factory Testing*==	
1. Draft a Test Plan for Customer review and approval. The Test Plan is designed to validate the approved requirements. 2. Perform Qualification testing per the approved Test Plan. Note that interfaces are simulated for all factory testing. 3. Note any issues and their severity in the MT System Product Report (SPR) database and track the resolution. 4. Conduct a Factory Acceptance Test (FAT) per the approved Test Plan. 5. 5. Track any issues found during the FAT on a punch list and provide a plan for resolution.	1. Review, provide feedback on and approve the Test Plan. 2. Attend the FAT and participate in the testing. 3. For each test scenario, either provide approval or note discrepancies.

Site Preparation	
1. Perform site surveys as needed. 2. Provide site preparation documentation identifying the power, network, air conditioning, space, cabling, access, security, and equipment layout requirements for system implementation.	1. Approve the scheduling of the hardware/COTS/MT software delivery. 2. Identify the locations for each item procured. Provide a physical address, contact name, and contact phone number for each site. 3. Provide access to the sites for site surveys by MT if necessary, and assist in the surveys. 4. Provide the required layout information on the sites as well as any known constraints. 5. Review the site preparation documentation and confirm that there are no compliance issues. 6. Prepare the sites and the interconnection of the sites according to the site preparation documentation. 7. The Tri-State AFIS is responsible for the local area and wide area networks. Performance will be affected by network bandwidth. MT requires a minimum 20 Mbit/sec WAN for a central site or recovery site connection, and at least 10 Mbit/sec dedicated network connection for each remote Review Station. 8. The Tri-State AFIS is responsible for network and power reliability and availability. Failure in these areas cannot be counted against MorphoTrak's reliability and availability of contractual requirements. 9. Provide a formal notice for MT indicating that the site preparation has been completed and validated, and the interconnection is operational before equipment is shipped to the sites. 10. If the network is not functioning per the specifications when MT arrives for installation, the Tri-State AFIS should address requests for correction within one day. Delays will impact the schedule and may result in additional charges for labor, lodging, and per diem for the employees on site for the duration of the extension. 11. Provide a temporary storage area for the delivered hardware if required.
Shipping and Delivery	
1. Provide a schedule for shipping and delivery to each site. 2. Securely crate or palletize all deliverables. 3. Provide shipping manifests that identify all items, including serial numbers. 4. Arrange for the secure shipping of all hardware, and third-party and MT software to the designated target sites. 5. Obtain any necessary export licenses, if applicable.	1. Approve the schedule for shipment and delivery of the hardware and software for each site. 2. Provide assistance as required to ensure shipments clear Customs, if applicable. 3. Pay import taxes and duties, if applicable. 4. Receive all material and immediately notify MT of any visible damage to shipping containers. 5. Provide temporary storage for the delivered hardware if required.

Installation and On-Site Integration Testing	
1. Propose the installation schedule in advance of delivery. 2. Unpack, inventory and install all equipment. 3. Power up the equipment and verify connectivity between components. 4. Troubleshoot any installation issues. 5. Run on-site integration tests with the external systems. 6. Identify any open issues prior to Acceptance Testing.	1. Confirm the installation schedule in advance of delivery. 2. Provide access to the sites for MT and MT sub-contractors as required. 3. Provide the support for site and security issues. 4. Ensure timely IT support availability for addressing network issues. 5. Arrange for access to test beds for interfaced systems (for example, FBI, CCH, etc.). 6. Provide access to the site 8 a.m. to 8 p.m., Monday through Saturday, with escort if required.
Site Acceptance Test (SAT)	
1. Organize the SAT and run the tests according to the approved Test Plan. 2. Track any issues found during the SAT on a punch list and provide a plan for resolution. 3. Fix the punch list issues, re-run the failed tests, and issue a report for a SAT re-test.	1. Participate in the SAT, sign off on passed tests, and identify any failed requirements. 2. Validate the fixes during re-testing and sign off on the SAT. *Note*: Expected results for accuracy and/or performance are described in the technical proposal. Conformance and potential deviations on specific tests will be reviewed with respect to expected results, data quality, and other potential factors, in reference with FBI standards and Industry practices.
Training Documentation	
1. Deliver the user manuals for MT applications (format and language to be verified). 2. Deliver the administrator manual(s) for the system (format and language to be verified).	1. The Tri-State AFIS may make unlimited electronic copies for internal use.
Training	
1. Draft a training schedule based upon the Tri-State's AFIS organizational and contractual requirements. 2. Provide operator workstation training and system administrator training per the approved schedule. 3. Provide attendance sheets and training certificates. 4. Provide, collect, and review feedback forms. 5. Trainers provide contact information for follow up questions.	1. Review, comment on, and approve the training schedule. 2. Ensure availability of the trainees and confirm they meet any prerequisite requirements. 3. Provide a meeting room and projection equipment for the classroom training. 4. Trainees are encouraged to provide feedback on the training courses.

System Operations, Monitoring, and Administration tasks.

The table below describes the expected roles and responsibilities for system operations, monitoring, and administration tasks.

MT Responsibility	Tri-State AFIS Responsibility
System Operations Report	
1. Capacity and Throughput reporting.	1. Run system operations reports.
LAN/WAN Administration and Supervision	
	1. Provide all LAN/WAN administration, supervision, and support.
User Management	
1. As directed by Tri-State AFIS, system administrators will be responsible for user management including: a. Creating users. b. Establishing and modifying user access rights. c. Enabling and disabling user accounts. d. Deactivating users.	
Help Desk	
1. Provide Call Center support per your service agreement, including a 1-800 number and email access. 2. Record and track all service calls in our database. 3. Dispatch local Customer Support Engineers as required per your service support agreement.	
Delivery of Consumables	
	1. Provide data backup tapes, ink cartridges, paper, batteries, and other consumables.
System Monitoring	
1. CSEs are responsible for monitoring, which includes: a. In-process transactions. b. Services, interfaces, and databases. c. Notifications when an abnormal event is detected.	
System and Transaction Management	
1. CSEs will manage key components of the system, including: a. Stopping and re-starting all transactions in the system. b. Enabling and purging transactions. c. Changing transaction priority. d. Starting and stopping all services, interfaces, and databases of the system.	

Storage Space Monitoring	
1. Monitor storage space, system capacity and throughput; to include taking the appropriate action.	
Data Backup Management	
1. Perform periodic backups of the system databases and verify the backups.	

System Maintenance Tasks:

The table below describes the expected roles and responsibilities for System Maintenance:

MT Responsibility	Tri-State AFIS Responsibility
Hardware Preventive Maintenance	
1. Perform all necessary preventive hardware maintenance.	N/A
Software Preventive Maintenance	
1. Perform log analysis and software updates, and load any software patches required to ensure software is performing per specification.	1. Confirm which software updates may be loaded and approve the schedule.
Anti-Virus	
1. Run Windows anti-virus software on the system prior to shipping. 2. Assist Tri-State AFIS IT personnel with implementation of anti-virus update schema.	1. Manage virus protection after the system is installed on your site, including definition downloads, virus checking, and reporting.
Performance Analysis and Tuning	
1. Conduct monthly reviews of system capacity, usage, performance indicators, and event logs to identify potential problems. 2. Routinely evaluate performance indicators, and make recommendations for altering system parameters and configurations to maintain optimum performance. Implement approved changes.	1. Review and approve configuration changes.

Remedial Maintenance Support	
1. Repair, replace, or upgrade hardware as necessary to ensure that failed or degraded hardware is performing per specification within the conditions of the maintenance contract. 2. Perform log analysis and technical investigations as necessary to diagnose system events. 3. Produce software updates and fixes within the conditions of the maintenance contract. This may include source code analysis and patch creation. 4. Test and install software updates and fixes in the production environment within the conditions of the maintenance contract.	N/A
Spares Management	
1. Maintain and manage an appropriate inventory of spare parts and install spare parts	N/A
Data Management	
1. Perform record analysis as necessary to address issues such as missed identifications or other record processing anomalies. 2. If the need arises, we will be responsible for restoring system data to correct any data loss or corruption of the permanent databases within the limits of the maintenance contract.	1. Notify MT of any known anomalies, such as missed identifications.

7.2 Risk Assessment & Risk Register

*After performing a Risk assessment in conjunction with the Business, please create a **Risk Register** as an **Appendix 2** to this report that includes the following:*

1. ***Source of Risk**: Project, Proposed Solution, Vendor or Other*
2. ***Risk Description**: Provide a description of what the risk entails*
3. ***Risk ratings to indicate**: Likelihood and probability of risk occurrence; Impact should risk occur; and Overall risk rating (high, medium or low priority)*
4. ***State's Planned Risk Strategy**: Avoid, Mitigate, Transfer or Accept*
5. ***State's Planned Risk Response**: Describe what the State plans to do (if anything) to address the risk*
6. ***Timing of Risk Response**: Describe the planned timing for carrying out the risk response (e.g. prior to the start of the project, during the Planning Phase, prior to implementation, etc.)*
7. ***Reviewer's Assessment of State's Planned Response**: Indicate if the planned response is adequate/appropriate in your judgment and if not what would you recommend.*

See **Appendix 2.**

Additional Comments on Risks:

None.

8. Cost Benefit Analysis

1. **Analysis Description:** Provide a narrative summary of the cost benefit analysis conducted: The approach used was to gather all costs associated with project for a 10 year period, identify revenue sources for the project, and identify tangible and intangible benefits that might also be used as revenue sources or expense reductions.

    a. COST COMPONENT: See the attached spreadsheet referenced in **Appendix 3** to gain an understanding of:
        i. Source of Funds
        ii. Use of Funds
        iii. Change in Operating Costs

    b. BENEFIT COMPONENT:
        i. See the Tangible and Intangible Benefits described below.

2. **Assumptions:** List any assumptions made in your analysis.
    a. Staff reductions are not expected or contemplated through the implementation of this solution.
    b. There is no revenue recovery anticipated.
    c. The entire costs are considered **Operational Costs** due to the nature of the project. Specifically, there are no payments made until the solution is in production, and thereafter, payments are made on an annual basis. In short, payments are made when the solution is in Operational mode. Further, DPS and Tri-State requested a "Service Model" contract where the vendor provides the entire solution for an annual fee. As such, all costs are deemed to be **Operational Costs**.

3. **Funding:** Provide the funding source(s). If multiple sources, indicate the percentage of each source for both Acquisition Costs and on-going Operational costs over the duration of the system/service lifecycle.
    a. The primary source of funds include:
        i. State of VT General Fund: Department of Public Safety, 100%
    b. See the detailed spreadsheet referenced in **Appendix 3** for actual dollar amounts**.**

4. **Tangible 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).
    a. There are no tangible monetary benefits derived from this project.

5. **Intangible 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.
    a. Avoid hardware failure: Current server and workstation hardware and operating system (Windows XP and NT) no longer supported.
    b. Access to current biometric technology like facial recognition, iris scanning, submission of palm prints and mugshots to the FBI, and mobile (field) fingerprint scanning/identification.
    c. Improved accuracy through upgraded matching algorithms resulting in more case resolution and arrests for criminal activity and enhancing officer and public safety.
    d. Improved system response to the AFIS workstations and faster submission and response from the FBI.

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.
    a. There is no monetary value assigned to the intangible benefits. As a cost of doing business, so long as DPS needs to have AFIS functionality, DPS needs to upgrade this system to remain on currently supported technology. At roughly $400K/annually to support the State of VT AFIS obligation, the costs seem reasonable given the functionality to be maintained and gained.

7. **IT ABC Form Review:** Review the IT ABC form (Business Case/Cost Analysis) created by the Business for this project. Is the information consistent with your independent review and analysis? If not, please describe.
    a. Reviewed the IT ABC Form (IT_ABC_Form (AFIS upgrade) 2015.pdf) dated 9/22/14.
    b. It is a comprehensive and accurate cost summary.

Additional Comments on the Cost Benefit Analysis:
No additional comments.

9. Impact Analysis on Net Operating Costs

1.) Perform a lifecycle cost impact analysis on net operating costs for the agency carrying out the activity, minimally including the following:
a) Estimated future-state ongoing annual operating costs, and estimated lifecycle operating costs. Consider also if the project will yield additional revenue generation that may offset any increase in operating costs.
b) Current-state annual operating costs; assess total current costs over span of new IT activity lifecycle
c) Provide a breakdown of funding sources (federal, state, one-time vs. ongoing)
2.) Create a table to illustrate the net operating cost impact.
3.) Respond to the items below.

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

		Year 1 (FY17)	Year 2 (FY18)	Year 3 (FY19)	Year 4 (FY20)	Year 5 (FY21)	Year 6 (FY22)	Year 7 (FY23)	Year 8 (FY24)	Year 9 (FY25)	Year 10 (FY26)	TOTAL
Proposed Operating Costs:												
Total Operating Costs		$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Total: Proposed Operating Costs:		**$652,525**	**$663,251**	**$674,300**	**$685,679**	**$697,402**	**$709,474**	**$721,909**	**$734,719**	**$747,911**	**$761,500**	**$7,048,668**
Current Operating Costs:												
Staffing: 4 staff members	$36/hr x 52 wks x 37.5 hours/wk x 4 people	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$2,808,000
WAN Costs	T1 (1.5 Mbps) Service @ $590/month	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$70,800
Annual Maintenance of Current Solution		$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$850,000
Total: Current Operating Costs:		**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$372,880**	**$3,728,800**
Net Operating Cost Decrease/(Increase)		**($279,645)**	**($290,371)**	**($301,420)**	**($312,799)**	**($324,522)**	**($336,594)**	**($349,029)**	**($361,839)**	**($375,031)**	**($388,620)**	**($3,319,868)**

This represents an 89% increase in Operating Costs.

2. Provide a narrative summary of the analysis conducted and include a list of any assumptions.
    a. The detailed spreadsheet provided with this analysis breaks out costs as follows:
        i.   <u>Project Costs</u>: Costs tied specifically to the Vendor, plus DII EPMO/EA costs. In other words, those costs that are incurred because we are undertaking the project.
        ii. <u>Operating Costs</u>: Internal costs, consisting of AFIS staffing and telecommunication costs.
        iii. <u>Total Costs</u>: Project Costs plus Operating Costs.

    b. The Total Costs are considered **OPERATING COSTS** due to the nature of how the contract and payments are being structured. Specifically, there are no payments made until the solution is in production, and thereafter, payments are made on an annual basis. In short, payments are made when the solution is in Operational mode. Further, DPS and Tri-State requested a "Service Model" contract where the vendor provides the entire solution for an annual fee. As such, all costs are deemed to be Operational.

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.
    a. All funding is State funding. There is no Federal funding.
    b. Funding has been approved for Year 1 only.
    c. There is a Net Increase in Operating Costs as outlined in the chart above.

4. What is the break-even point for this IT Activity (considering implementation and on-going operating costs)?
    a. There is no break-even measure for this project as the cost of doing this project exceeds the cost of continuing with the current solution.

Appendix 1 - Illustration of System Integration

SYSTEM INTEGRATION/INTERFACES

MorphoBIS Data Exchange Services (DES) component provides interoperability and communications between MorphoBIS and external systems. The DES ensures that all formats, standards, and interoperability functions are supported.

The anticipated external interfaces include:
1. LiveScan units
   a. Of note: When asked if current LiveScan units in place are compatible, vendor indicates the following: "*All LiveScans are unique to the customers AFIS Implementation. The LiveScans Vermont has now will be compatible with the proposed upgrade, and we can deliver new LiveScans to Vermont that are compatible with both the current Printrak BIS and will also be compatible with the proposed MorphoBIS Upgrade.*"
2. CCH system: (CCH – Computerized Criminal History Program – FBI - CCH file was to contain the detailed criminal history of each offender whose record was entered by the States into the system)
3. FBI NGI (Next Generation Identification), which includes:
   a. Advanced Fingerprint Identification Technology (AFIT)
   b. Repository for Individuals of Special Concern (RISC)
   c. Interstate Photo System
   d. Latents and National Palm Print System (NPPS)
   e. Rap Back Service (notification of criminal, and, in limited cases, civil activity of individuals that occurs after the initial processing and retention of criminal or civil transactions)
   f. Iris Recognition (IR)

Additional detail is provided below, extracted from the contract draft (Note: The contract is not yet finalized):

1. CCH Interface:
   The Vermont DES shall support a descriptor data interface from the Vermont CCH to MorphoBIS. The one-way interface shall be implemented using NIST-formatted files with Type-1 (header) and Type-2 (descriptors) records which shall be sent via FTP from the CCH system to MorphoBIS.

   VT CCH to AFIS Request

CCH Request	Code
Descriptor Request	DESC

2. Vermont FBI Interface:
   The Vermont DES shall format Type-1 (header), Type-2 (descriptors), and Type-4 (fingerprint images) data for FBI submissions according to the Electronic Fingerprint Transmission Specification (EFTS), Version 7.0. Table below lists the supported submissions and responses.

Table 3. VT IAFIS Transactions

Submission	TOT
Criminal Ten-Print Submission (Answer Required)	CAR
Miscellaneous Applicant Civil	MAP
Non-Federal Applicant User Fee	NFUF
Unknown Deceased	DEU
Known Deceased	DEK
Missing Person	MPR
Fingerprint Image Submission	FIS
Response	
Submission Results – Electronic	SRE
Ten-Print Transaction Error	ERRT
Fingerprint Image Submission Response	FISR
Image Transaction Error	ERRI

3. Mugshot Interface:
   The Vermont DES shall support an interface to a mugshot system. DES shall place NIST-formatted files containing Type-1 (header), Type-2 (descriptors), and Type-10 (mugshot images) records in a DES directory. The order of capture of the mugshots shall be frontal, left profile, right profile followed by SMTs. The mugshot system will transfer the files from the directory to the mugshot system.

4. Foreign Livescan:
   The MorphoBIS shall support the following submission and response transactions with foreign livescan stations.

Workflow	Submission Transaction	TOT	Response Transaction
Criminal	Criminal Ten-Print Submission (Answer Required)	CAR	Reject Hit/No-Hit
Juvenile			
Applicant	Miscellaneous Applicant Civil	MAP	Reject Hit/No-Hit
Civil Applicant	Non-Federal User Applicant Fee	NFUF	Reject Hit/No-Hit

Appendix 2 - Risk Register

See attached document: FINAL-REVIEW-SOV-DPS-AFIS-STS_Risk_Register_FINAL.pdf

Appendix 3 – Lifecycle Costs and Change in Operating Costs

See attached document: FINAL-REVIEW-SOV-DPS-AFIS-STS_Cost_Detail_FINAL.xlsx

Appendix 4 – Technology Infrastructure

SYSTEM ARCHITECTURE

The figure below illustrates the architecture of the proposed system and its integration. The diagram shows the Central Site located in New Hampshire and the optional Disaster Recovery site located in Maine (although the actual DR site has not been selected).
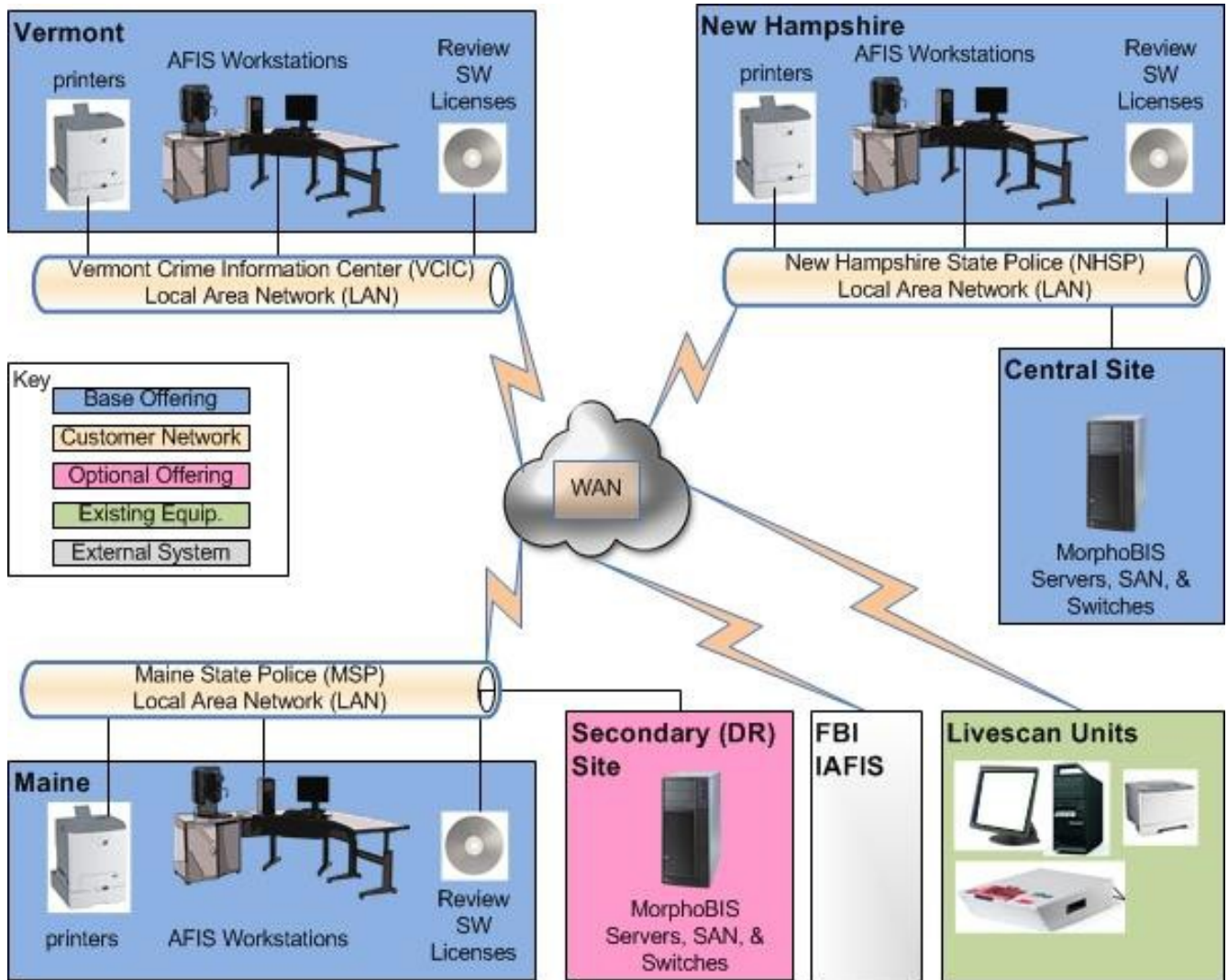
APPLICATION ARCHITECTURE

The MorphoBIS solution is based on service-oriented architecture (SOA). A solution based on SOA provides the following advantages:

- The solution can be updated to improve matching algorithms as technology evolves.
- Advanced biometrics such as face, scar/mark/tattoo, iris, and fused modalities can be incorporated as modalities mature.
- The system can be expanded as new sites or devices are integrated.
- The system can be updated to meet new security requirements.

The following figure illustrates the MorphoBIS architecture:
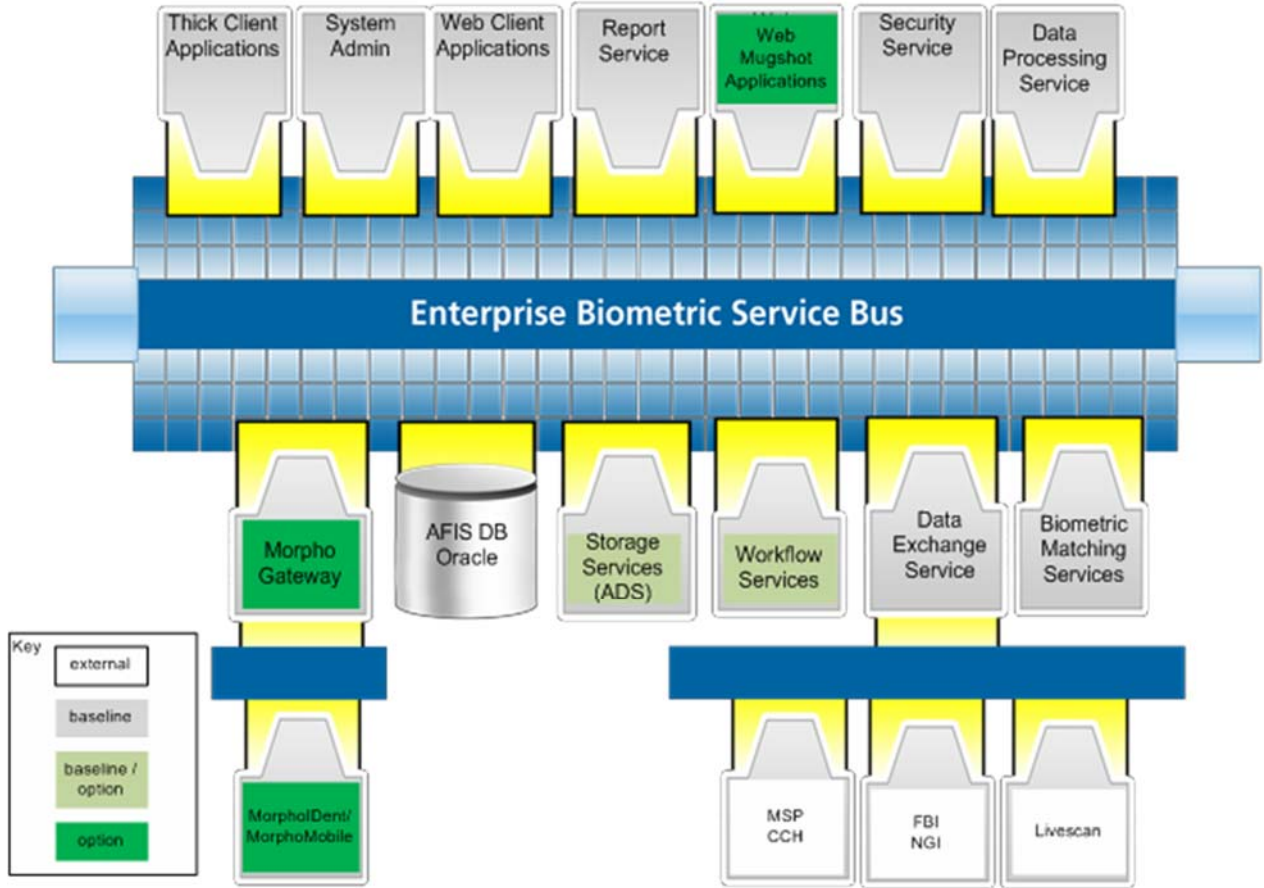
SERVER ARCHITECTURE

- The vendor has indicated that the server operating system is Windows Server Standard 2012 R2.
- Vendor indicates server specs are: Hewlett-Packad DL160G9-8SFF, 2-4C-E5-2623v3-3.0GHZ-10MB, 2x8GB, 2-300GB-SAS-10K-SFF, 1-FC-HBA, 2P-NIC, 1-800W.

DATABASE

- The Oracle 11g relational database is used within the MorphoBIS Advanced Data Services (ADS) to store a complete digital image repository of all processed records.

CLIENT

- MorphoTrak delivers the client side solution on a Windows PC, typically using the most recent version of Windows, although not explicitly stated.
- Windows 10 operating system not known. Brand unknown. Not shared by vendor.

DEVELOPMENT ENVIRONMENT
- Unknown. Not shared by vendor.

HOSTING

The central hosting environment is expected to be at State of New Hampshire Data Center, which is understood to be CJIS compliant.

There has been an attempt to reach out and discover which of the following compliance standards have been met but only CJIS compliance is known:
- FBI CJIS 5.4
- ISO 27001/27002
- SOC 1/SSAE 16/ISAE 3402 and SOC 2
- FedRAMP
- FISMA

DISASTER RECOVERY/BUSINESS CONTINUITY

The proposed Disaster Recovery (DR) option includes an Active/Passive DR solution. The Primary and DR sites will be connected via a dedicated, customer-provided, high-speed network connection. The majority of the servers at the DR site will remain idle while the servers at the primary site are performing the AFIS tasks, such as searching, matching, quality control, and verification. The databases are synchronized in using VMware VSphere. The solution includes full server hardware complement at the DR site:

a. Three physical servers with virtual guest hosts
b. One tape library with LT04 drive
c. One storage appliance (ISSCI SAN)
d. Network switches
e. Data replication between the primary and DR sites will be managed by VMware vSphere replication. This allows balancing the Recovery Point Objective (RPO) with the network bandwidth available for replication. A lower RPO will reduce potential data loss, but will use more bandwidth and system resources. VMware vSphere flexibly supports RPOs between 15 minutes and 24 hours.

Vendor noted in their proposal the following: "At the time of project initiation, the DR location will be established and the project team will confirm network bandwidth is sufficient." This item is reflected in the Risk Register.

BACKUP

- Daily; Weekly full, incremental otherwise
- Recovery Point Objective: 24 hours
- Recovery Time Objective:

1. Services Provided. The Services provided are based on the Severity Levels as defined herein. Each Severity Level defines the actions that will be taken by Seller for Response Time, Target Resolution Time, and Resolution Procedure for reported errors. Because of the urgency involved, Response Times for Severity Levels 1 and 2 are based upon voice contact by Customer, as opposed to written contact by facsimile or letter. Resolution Procedures are based upon Seller's procedures for Service as described below.

SEVERITY LEVEL	DEFINITION	RESPONSE TIME	TARGET RESOLUTION TIME
1	Total System Failure - occurs when the System is not functioning and there is no workaround; such as a Central Server is down or when the workflow of an entire agency is not functioning.	Telephone response within 1 hour of initial voice notification	Resolve within 24 hours of initial notification
2	Critical Failure - Critical process failure occurs when a crucial element in the System that does not prohibit continuance of basic operations is not functioning and there is usually no suitable work-around. Note that this may not be applicable to intermittent problems.	Telephone response within 3 Standard Business Hours of initial voice notification	Resolve within 7 Standard Business Days of initial notification
3	Non-Critical Failure - Non-Critical part or component failure occurs when a System component is not functioning, but the System is still useable for its intended purpose, or there is a reasonable workaround.	Telephone response within 6 Standard Business Hours of initial notification	Resolve within 180 days in a Seller-determined Patch or Release.
4	Inconvenience - An inconvenience occurs when System causes a minor disruption in the way tasks are performed but does not stop workflow.	Telephone response within 2 Standard Business Days of initial notification	At Seller's discretion, may be in a future Release.
5	Customer request for an enhancement to System functionality is the responsibility of Seller's Product Management.	Determined by Seller's Product Management.	If accepted by Seller's Product Management, a release date will be provided with a fee schedule, when appropriate.

SUMMARY OF HARDWARE INVENTORY (owned by MorphTrak)

Qty	MorphoBIS Upgrade
	Description
1	**MorphoBIS Servers, including:** ♦ Advanced Data Services (ADS) ♦ Web Application Server (WAS) ♦ Data Exchange Services (DES) ♦ Oracle 11g Standard Edition One ♦ SAN Storage Subsystem ♦ Web Application Server ♦ System Cabinet ♦ Backup Server ♦ Storage Area Network with RAID & LTO Tape ♦ Workflow Management Service ♦ Backup Software Licenses ♦ Data Processing Services (DPS) ♦ Morpho Biometric Search Services (MorphoBSS) ♦ SAN Storage Subsystem ♦ System Cabinet
	Electronic Data Migration of Existing AFIS records: ♦ 90,000 Tenprint Records (persons) ♦ 1,400,000 Tenprint Records (incidents) ♦ 360,000 Palm Records (incidents) ♦ 21,000 Latent Finger Records ♦ 11,000 Latent Palm Records
4	**Expert Workstation (EW), including:** ♦ Control Computer, 24 inch LED Monitor, Keyboard and Mouse ♦ Flatbed Scanner ♦ Latent Camera Assembly and Lighting ♦ Tenprint Expert Workstation Software ♦ Latent Expert Workstation Software ♦ Review Software
7	**Tenprint Expert Workstation (TEW)** ♦ Control Computer, 24 inch LCD Monitor, Keyboard and Mouse ♦ Flatbed Scanner ♦ Tenprint Expert Workstation Software ♦ Review Software
24	**Review Software Licenses**
3	**Double-Sided Tenprint/Palmprint Card Printer**
6	**Color Laser Printers**

3	**Laser Mono Printers**
1	**MorphoTrak Professional Services, including:**
	◆ Program Management
	◆ Systems Engineering
	◆ System Integration
	◆ Installation and Test
	◆ Site Acceptance Test
	◆ Training

	MORPHOIDENT MOBILE DEVICES
Qty	**Description**
1	**Morpho Mobile Gateway, includes FBI RISC workflow**
30	**MorphoIDent Handheld Fingerprint Identification Devices for Maine**
30	**MorphoIDent Handheld Fingerprint Identification Devices for Vermont**
1	**MorphoTrak Professional Services, including:**
	◆ Program Management
	◆ Systems Engineering
	◆ System Integration
	◆ Installation and Test
	◆ Site Acceptance Test
	◆ Training

DISASTER RECOVERY	
Qty	**Description**
1	**SAN-to-SAN Disaster Recovery System MorphoBIS** **Servers, including:** ♦ Advanced Data Server (ADS) ♦ Oracle 11g Standard Edition One ♦ SAN Storage Subsystem ♦ Web Application Server ♦ Morpho Biometric Search Services (MorphoBSS) ♦ System Cabinet
1	**MorphoTrak Professional Services, including:** ♦ Program Management ♦ Systems Engineering ♦ System Integration ♦ Installation and Test ♦ Site Acceptance Test ♦ Training

DPS AFIS Project
RISK REGISTER DESCRIPTION:
1. <u>Risk Description</u>: Provide a description of what the risk entails
2. <u>Source of Risk</u>: Project, Proposed Solution, Vendor or Other
3. <u>Risk Rating</u>: Risk ratings to indicate: Likelihood and probability of risk occurrence; Impact should risk occur; and Overall risk rating (high, medium or low priority)
4. <mark><u>Risk Strategy</u>: State's Planned Risk Strategy: **Avoid, Mitigate, Transfer or Accept**</mark>
    a. <u>Avoid</u>: Avoid the activity; activities with a high likelihood of loss and large impact.
    b. <u>Mitigate</u>: Develop a plan to reduce risk to reduce the risk of potential loss; activities with a high likelihood of occurring, but impact is small.
    c. <u>Transfer</u>: Outsource risk (or a portion of the risk - Share risk) to third party or parties that can manage the outcome; activities with low probability of occurring, but with a large impact. Often times this is transferred back to vendor.
    d. <u>Accept</u>: Take the chance of negative impact, eventually budget the cost (i.e. a contingency budget line); activities where cost-benefit analysis determines the cost to mitigate risk is higher than cost to bear the risk, then the best response is to accept and continually monitor the risk.
5. <u>Timing of Risk Response</u>: Describes the suggested timing for carrying out the risk response (e.g. prior to the start of the project, during the Planning Phase, prior to implementation, etc.)
6. <mark><u>State's Planned Risk Response</u>: Describe what the State plans to do (if anything) to address the risk (See Risk Response table)</mark>
7. <u>Reviewer's Assessment of State's Planned Response</u>: Indicate if the planned response is adequate/appropriate in your judgment and if not what would you recommend.

DPS Action Step: Respond to the sections highlighted in yellow (Risk Strategy, State's Planned Risk Response) and send copy back to David Gadway for review

NOTE: Hyperlinks are used on the Risk ID. From the Risk Register, CTL-CLICK on a link to see the Risk Response, or from the Risk Response, CTL-CLICK on a link to go back to the Risk Register.

RISK REGISTER:

Risk #:	Risk Description	Source of Risk	Risk Rating: Impact	Risk Rating: Probability	Risk Rating: Overall Risk	State Risk Strategy Summary (Avoid, Mitigate, Transfer, Accept)	Timing of Response	Reviewer Assessment of Response
1a	Budget/Funding: There is a commitment to fund the project only in Year 1 from the State of VT General Fund, Department of Public Safety First Year Costs for AFIS.	Project	High	Medium	Low through risk response plan	Accept	Prior to starting project	Risk Strategy Accepted
1b	Budget/Funding: The BC/DR site is not yet selected. This has potential cost implications for both the site costs as well as telecommunication costs. See Section 7.1 of the vendor proposal titled: "Active/Passive Secondary System", which states: *"The MorphoBIS upgrade includes an Active/Passive DR solution. The Primary and DR sites will be connected via a dedicated, customer-provided, high-speed network connection.* *The majority of the servers at the DR site will remain idle while the servers at the primary site are performing the AFIS tasks, such as searching, matching, quality control, and verification. The databases are synchronized in using VMware VSphere.* *Details on VMware vSphere replication is found at http://www.vmware.com/products/datacenter-virtualization/vsphere/replication.* *At the time of project initiation, the DR location will be established and the project team will confirm network bandwidth is sufficient."* *See Appendix 1 for detail on what is different between the primary site and proposed DR site. All of those items have cost risk, in that, those costs are not accounted for.*	Project	High	Medium	High	Transfer	Prior to starting project	*Risk Strategy is not accepted. It is clear to the Independent Reviewer that a DR location may be procured at an additional cost. Additionally, network bandwidth to that site may be required, also at an additional cost.*

2a	Contract Item: There are no specific accuracy metrics defined in the proposal, yet there are claims for improved accuracy metrics. Is there interest in defining this more clearly in the contract in order to ensure minimums are met and to provide a means to measure system acceptance?	Project	High	Medium	High	Mitigate	Prior to starting project	*Risk strategy is not accepted. Minimum acceptance standards should be defined in the contract.*
2b	Contract Item: There are no service levels defined by SOV as there was no formal RFP issued. Is what was proposed by MorphoTrak adequate (see Page 35 and 36 of IR report)?	Project	Medium	Medium	Low through risk response plan	Accept	Prior to starting project	Risk Strategy Accepted
2c	Contract Item: The proposed Pricing Model (annual fee for all-inclusive hardware and software solution) and associated Termination Fee Schedule is the first of its kind for MorphoTrak. Does the contract accurately protect DPS?	Project	High	Medium	Medium	Mitigate	Prior to starting project	Risk strategy accepted so long as contract amended as stated.
3a	Vendor Risk: Did anybody discuss this project with the vendor? http://fcir.org/2014/03/09/state-fingerprint-system-flawed-more-expensive-to-maintain-than-to-build-bondi-moye-barati-fdle-lave/	Project	Medium	Low	Low	Accept	Prior to starting project	Risk strategy accepted so long as contract amended as stated.
3b	Vendor Risk: The underlying technology/development tools used to develop the product is not known, therefore we are unable to assess compatibility with State of VT standards.	Project	Medium	Medium	Low through risk response plan	Mitigate	Prior to starting project	Risk Strategy Accepted
4a	SOV Service Level/Staffing: No risk noted.							N/A
5a	Project Management Staffing: No risk noted.							N/A
6a	Project Schedule: No risk noted.							N/A

7a	Infrastructure: Hardware Platform: The hardware brand and model and Operating System of the proposed servers, workstations, printers, and scanners are not clearly defined by vendor, therefore we are unable to assess compatibility with State of VT standards.	Project	High	Medium	High	Mitigate	Prior to starting project	Risk Strategy Accepted
7b	Infrastructure: Data Backup: The data backup methods and retention policies are not defined, nor are Recovery Point Objective (RPO) nor Recovery Time Objective (RTO).	Project	High	Medium	High	Transfer	Prior to starting project	Risk Strategy Accepted
7c	Infrastructure: Business Continuity/Disaster Recovery: See 1b above.							See 1b comment above
8a	Functionality: No risk noted.							N/A
9a	Interoperability: No risk noted.							N/A
10a	Compliance/Regulatory: We need clarification on State of VT position on State of New Hampshire Data Center compliance requirements. Does NH Data Center need to meet FedRAMP or other data center compliance requirements? Is NIST 800-53 or other similar compliance required?	Project	Medium	Medium	Medium	Mitigate	Prior to starting project	Risk mitigation accepted upon an MOU agreement with NH and ME to allow VT to see CJIS compliance audit results.
11a	Other: Vendor is not clear on their position regarding relationship between Printrak software end of life and hardware obsolescence that Printrak runs on. MorphoTrak indicates Printrak has no end of life announcements and they continue to support the software product, but when we question the hardware obsolescence and whether the vendor can run the software on current server operating systems other than Windows NT and current desktop operating systems other than Windows XP, they indicate they cannot migrate the software to those other platforms and/or cannot migrate to those platforms unless there is a contract in place from the outset. We may be upgrading the AFIS software due to hardware obsolescence when we may be able to use the current software with only a hardware upgrade if we pursue that avenue strongly.	Project	Low	Medium	Low through risk response plan	Accept	Prior to starting project	Risk Mitigated

RISK RESPONSE:

Risk #:	State's Planned Risk Response and Reviewer's Assessment of State's Risk Response
1a	**STATE'S RISK RESPONSE:** Accept. As the state of Vermont budget cycle is annual there is no way to specifically guarantee funding but this item is now considered part of ongoing mission-critical expenses. Additionally, during discussions with DPS administration, having a predictable yearly line item is much easier to manage than a single up front expense in the $3 - $4 million dollar range (which would be required for a traditional purchase arrangement). We expect the contract to have standard language provide an exit strategy for State of Vermont should funding not be available. Further, we will attempt to contractually modify the proposed vendor termination fee schedule, which has VT pay 90% after 1 year, 80% after 2 years, etc. to one of having annual payments end in the year that the contract needs to be terminated. **REVIEWER'S ASSESSMENT:** Risk strategy accepted.

1b	**STATE'S RISK RESPONSE:** Transfer. The contract language specifically isolates the state from any potential cost increases due to this issue as the responsibility for the DC/BR falls specifically on the vendor and requires no distinct funding from the state. Thus the majority of the risk is borne solely by the Vendor, with only potential line enhancement costs falling back to the state.
	
	Risk 1b – Disaster Recovery (response to reviewer's assessment)
	
	From the contract section 5 (Scope of Services):
	5.1 - DESCRIPTION OF SERVICES. Contractor agrees to provide and shall perform the Services described herein in accordance with and subject to the terms and conditions set forth in this Contract.
	c. Disaster Recovery (DR):
	      i. Disaster Recovery (DR) includes:
	            1. Full server hardware complement at the DR site
	                a. Three physical servers with virtual guest hosts
	                b. One tape library with LT04 drive
	                c. One storage appliance (ISSCI SAN)
	                d. Network switches
	      ii. Data replication between the primary and DR sites will be managed by VMware vSphere replication. This allows balancing the Recovery Point Objective (RPO) with the network bandwidth available for replication. A lower RPO will reduce potential data loss, but will use more bandwidth and system resources. VMware vSphere flexibly supports RPOs between 15 minutes and 24 hours.
	      iii. Active/Passive Secondary System
	            1. The MorphoBIS upgrade includes an Active/Passive DR solution. The Primary and DR sites will be connected via a dedicated, customer-provided, high-speed network connection.
	            2. The majority of the servers at the DR site will remain idle while the servers at the primary site are performing the AFIS tasks, such as searching, matching, quality control, and verification. The databases are synchronized in using VMware VSphere.
	            3. Details on VMware vSphere replication is found at: http://www.vmware.com/products/datacenter-virtualization/vsphere/replication.
	            4. At the time of project initiation, the DR location will be established and the project team will confirm network bandwidth is sufficient.
	
	From the contract Attachment B – Payment Provisions
	3 - Contractor shall be paid on a fixed fee basis for services as outlined below. The state shall not be responsible for any expenses of the Contractor unless specifically stated below: (the payment schedule is listed)

	5 - Expenses: The fee for services shall be inclusive of expenses.

As I read this language the DR site is the responsibility of the contractor and included in the stated payment provisions (inclusive of expenses).

REVIEWER'S ASSESSMENT:
1/4/2016: I read the proposal language differently. Can you provide the language from the contract that specifies WHERE and WHEN the DR site will be built at no cost to SOV?

1/5/2016: This is still an open item per 5.1.c: "the various specifics are broken down after including hardware, data replication etc.)."

Risk Strategy is not accepted. It is clear to the Independent Reviewer that a DR location may be procured at an additional cost. Additionally, network bandwidth to that site may be required, also at an additional cost. |
| 2a | **STATE'S RISK RESPONSE:**   Mitigate. Accuracy is directly related to the quality of the fingerprints placed into AFIS by local law enforcement agencies (i.e. if local law enforcement agencies submit poor quality prints that are not screened from the system the overall accuracy of any matches will degrade). Currently Vermont screens fingerprints before determining retention status and will continue to do so with the upgraded system. Additionally, the department will not sign-off on the system until benchmarking tests are complete which provide proof of increased system accuracy.

Risk 2a – Accuracy (response to reviewer's assessment)
It is extremely difficult to quantify a specific increase target due to the large number of variables that affect fingerprint matching. For example, while the MorphoBIS system may have more discrete algorithms to match fingerprints, if there is a corresponding degradation of the quality of fingerprints submitted by law enforcement agencies the net effect could be little or no improvement. As a remedy the Department will undertake standards testing against both systems to ensure accuracy is maintained/increased. This will be accomplished by testing a set of known fingerprints against both systems, requiring the upgraded MorphoBIS system return results consistent with, if not better than, the current system. If this result is not achieved then system acceptance will be delayed.

REVIEWER'S ASSESSMENT:
1/4/2016: Is there a specific measure you hope to achieve or is any increase acceptable? What is the baseline starting point from which you will hope to increase from?
1/5/2016: The response of delaying system acceptance provides a measure of protection for DPS and a remedy to ensure a minimum standard is achieved.   However, that measure is arbitrary, and the vendor may not accept what they consider to be unfounded or unwarranted withholding of system acceptance, based on an arbitrary measure, as there are no defined measures against which to evaluate.

Risk strategy is not accepted. Minimum acceptance standards should be defined in the contract. |
| 2b | **STATE'S RISK RESPONSE:**   Accept. The structure of the service parameters outlined in the contact are similar to current service parameters and have served the state and our law enforcement partners since system inception. In addition service parameters provided as part of the contract spell out vendor requirements for service interruption and target resolution times.

REVIEWER'S ASSESSMENT:
The priorities set forth by the vendor (low, medium, high) and associated time response parameters as outlined in the proposal and highlighted in the IR are acceptable by DPS. Risk strategy accepted. |
| 2c | **STATE'S RISK RESPONSE:**   Mitigate. Risk is generally transferred to the vendor as the department is purchasing a service with detailed functional requirements (including workflow processing, disaster recovery, and workstation support). Should costs (such as data storage, processing power, or dedicated support) increase these will be borne directly by the vendor instead of the department. This pricing and service model places the majority of financial risk on the vendor. Additionally, due to vendor's size the likelihood of the vendor being unable to meet any increased costs is extremely low. |

	We expect to contractually define the two big exposure items not yet clearly defined: technical architecture components and the termination fee schedule in the contract. The Technical Architecture component clause should have language relative to system performance and availability: for example, 2 second or less response time, and 99.9% uptime. **REVIEWER'S ASSESSMENT:** DPS indicates they will modify the contract so as to adequately protect them. ==Risk strategy accepted so long as contract amended as stated.==
3a	**STATE'S RISK RESPONSE:** Accept. The system referred to in the article was procured during 2007 from Motorola. During that time, a merger with the larger Safran Group was being undertaken and does not represent current system capabilities or business organization/structure. Additionally, we expect to limit the State's exposure in the Termination language and payment schedule.in addition to the current contract draft language related to system acceptance (i.e. no funds are paid on the project until system acceptance). **REVIEWER'S ASSESSMENT:** ==Risk strategy accepted so long as contract amended as stated.==
3b	**STATE'S RISK RESPONSE:** Mitigate. The underlying technology platform, including workstations, are supported directly by the vendor. Additionally these systems do not integrate with other networked resources and are not used for any other state business (i.e. departmental staff working on the project have dedicated AFIS workstations that are separate from their regular PCs). Connectivity to relevant national systems and Tri-State resources are solely the responsibility of the vendor. **REVIEWER'S ASSESSMENT:** Also discussed this with John Hunt, CTO, and he too has no issue with this risk. Risk strategy accepted.
4a	**STATE'S RISK RESPONSE:** N/A. No risk noted **REVIEWER'S ASSESSMENT:**
5a	**STATE'S RISK RESPONSE:** N/A. No risk noted **REVIEWER'S ASSESSMENT:**
6a	**STATE'S RISK RESPONSE:** N/A. No risk noted **REVIEWER'S ASSESSMENT:**
7a	**STATE'S RISK RESPONSE:** Mitigate. The underlying technology platform, including workstations, are supported directly by the vendor. Additionally these systems do not integrate with other networked resources and are not used for any other state business (i.e. departmental staff working on the project have dedicated workstations that are separate from their regular PCs). Connectivity to relevant national systems and Tri-State resources are solely the responsibility of the vendor. **REVIEWER'S ASSESSMENT:** After following up with vendor, we have learned that the desktop Operating system is Windows 10, the Database Operating System is Oracle 12c, and the Server Operating system is Windows Server 2012 R2. Risk strategy accepted.

<u>7b</u>	<mark>**STATE'S RISK RESPONSE:**</mark> Transfer. The specific responsibility for managing and maintaining the disaster recovery (DR) system falls upon the vendor and includes general specifications (including full server hardware compliment and data replication methodology). **REVIEWER'S ASSESSMENT:** This was more about backup and retention schedule, and less about DR. NH has since answered that they retain data to meet CJIS standards, with retention of at least 1 year, but what is still unknown are RTO and RPO. Risk strategy not accepted until we learn RTO and RPO from New Hampshire. As of 4/8: We now know daily backups are taken, 1 weekly, the remainder incremental, thus, RPO is 24 hours. RTO is defined in the following chart: Risk Strategy Accepted
<u>7c</u>	<mark>**STATE'S RISK RESPONSE:**</mark> See response to 1b above. **REVIEWER'S ASSESSMENT:** <mark>See 1b comment above</mark>
<u>8a</u>	**STATE'S RISK RESPONSE:** N/A. No risk noted **REVIEWER'S ASSESSMENT:**
<u>9a</u>	**STATE'S RISK RESPONSE:** N/A. No risk noted **REVIEWER'S ASSESSMENT:**
<u>10a</u>	<mark>**STATE'S RISK RESPONSE:**</mark> Mitigate. The system will be required to be capable of all necessary compliancy (including, but not limited to CJIS). As the New Hampshire data center is part of the vendor's responsibility it will be their requirement to make sure that the site meets any and all compliancy standards. As the Vermont CJIS Systems Agency (CSA) the Department will not sign-off on system acceptance until the system as implemented and delivered meets all security requirements. **REVIEWER'S ASSESSMENT:**

	NH has since answered that the data center meets CJIS standards.
	==Risk mitigation accepted upon an MOU agreement with NH and ME to allow VT to see CJIS compliance audit results.==
11a	**STATE'S RISK RESPONSE:** Accept. The current software package has been designed to operate with utilized network hardware. The likelihood that current software could be reconfigured to new hardware in a more economical manner than proposed is low and would also bypass updated matching algorithms (which compare and match fingerprints automatically). Additionally the ability to segregate each state within the shared processing platform and support future mobile search functionality would be significantly curtailed. Similarly the technology refresh built into the current project would be unavailable and any future hardware limitations would, by necessity, require additional expenditures by the state. **REVIEWER'S ASSESSMENT:** Also discussed this with John Hunt, CTO, and he too has no issue with this risk. Risk mitigation strategy accepted.

APPENDIX 1 – Risk Item 1b

Items in yellow highlight those items included in the primary site which are not also proposed in the DR site:

MorphoBIS Servers, including:	SAN-to-SAN Disaster Recovery System MorphoBIS Servers, including:
♦ Advanced Data Services (ADS)	♦ Advanced Data Server (ADS)
♦ Web Application Server (WAS)	
♦ Data Exchange Services (DES)	
♦ Oracle 11g Standard Edition One	♦ Oracle 11g Standard Edition One
♦ SAN Storage Subsystem	♦ SAN Storage Subsystem
♦ Web Application Server	♦ Web Application Server
♦ System Cabinet	
♦ Backup Server	
♦ Storage Area Network with RAID & LTO Tape	
♦ Workflow Management Service	
♦ Backup Software Licenses	
♦ Data Processing Services (DPS)	
♦ Morpho Biometric Search Services (MorphoBSS)	♦ Morpho Biometric Search Services (MorphoBSS)
♦ SAN Storage Subsystem	
♦ System Cabinet	♦ System Cabinet

Additionally, there are two items in the Morpho proposal which have potential cost implications:

1. At the time of contract signing, MorphoTrak recommends re-evaluating the available technologies in the event there is a superior solution to meet the needs of the Tri-State agencies.
2. At the time of project initiation, the DR location will be established and the project team will confirm network bandwidth is sufficient. Potential costs include:
   a. Telecommunication costs of at least 10mbps, with 20mbps recommended.
   b. Data center services to host the DR site.

DPS AFIS Project

STATEMENT OF: Use of Funds (Expenses), Source of Funds (Revenue), Cash Flow, and Net Change in Operating Cost

Click on the links to the left to go to that data

SUMMARY:		PROJECT and OPERATING COSTS:	
Total Cost Over 10 Years:	$7,048,668	Project Costs:	$4,099,068
Total Funding:	$7,048,668	New Operating Costs:	$2,949,600
State Funding:	$7,048,668	Current Operating Costs:	$3,728,800
Federal Funding:	$0	As this is paid as operations, Project and Ops are added	
Potential Revenue Recovery:	$0	NET CHANGE IN OPERATING COSTS-Decrease/(Increase):	$3,319,868
Funding Excess/(Shortage):	$0	State Decrease/(Increase):	($3,319,868)	-89.03%
		Federal Decrease/(Increase):	$0	0.00%

CASH FLOW ANALYSIS: Click Here

Description	Billing Milestone	Unit Price	# of Units	Total	State Funded	Fed Funded	Maint and Ops Year 1 (FY17)	Maint and Ops Year 2 (FY18)	Maint and Ops Year 3 (FY19)	Maint and Ops Year 4 (FY20)	Maint and Ops Year 5 (FY21)	Maint and Ops Year 6 (FY22)	Maint and Ops Year 7 (FY23)	Maint and Ops Year 8 (FY24)	Maint and Ops Year 9 (FY25)	Maint and Ops Year 10 (FY26)	Software Total
USE OF FUNDS - START																	
PROJECT-RELATED COSTS																	
VENDOR COSTS																	
SOFTWARE AND SERVICES																	
SOFTWARE ❶																	
Software Being Licensed:	Used by:	Included as SaaS Pricing															$0
Vermont:																	
Tenprint Expert, Latent Expert, Review	Expert Workstation		1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Tenprint Expert, Review	Tenprint Expert Workstation		3	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Latent Expert, Review	Latent Expert Workstation		0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Review (installed on a stand-alone PC other than Expert, Tenprint Expert, or Latent Expert Workstation)	Review Workstation		5	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Maine:																	
Tenprint Expert, Latent Expert, Review	Expert Workstation		1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Tenprint Expert, Review	Tenprint Expert Workstation		2	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Latent Expert, Review	Latent Expert Workstation		0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Review (installed on a stand-alone PC other than Expert, Tenprint Expert, or Latent Expert Workstation)	Review Workstation		4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Hampshire:																	
Tenprint Expert, Latent Expert, Review	Expert Workstation		2	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Tenprint Expert, Review	Tenprint Expert Workstation		2	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Latent Expert, Review	Latent Expert Workstation		0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Review (installed on a stand-alone PC other than Expert, Tenprint Expert, or Latent Expert Workstation)	Review Workstation		15	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Competitive Discount			1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SOFTWARE TOTAL				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SERVICES																	
IMPLEMENTATION SERVICES																	
1. Planning			1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2. Workflow Design and Development			1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3. Data Conversion/Migration			1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4. Training			1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5. Implementation			1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL: IMPLEMENTATION SERVICES				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SERVICES TOTAL				$0			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SOFTWARE AND SERVICES TOTAL				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MAINTENANCE AND OPERATIONS SUPPORT																	
Software Maintenance	5% increase annually			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hardware Refresh in Year 7	5% increase annually			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MAINTENANCE AND OPERATIONS SUPPORT TOTAL				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HARDWARE																	
All servers, workstations, printers, mobile identification devices				$0			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HARDWARE TOTAL				$0			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OTHER FEES																	
Contingency							$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Service Model Pricing							$347,150	$357,564	$368,291	$379,339	$390,720	$402,441	$414,514	$426,950	$439,758	$452,951	$3,979,678
OTHER TOTAL				$0	$0	$0	$347,150	$357,564	$368,291	$379,339	$390,720	$402,441	$414,514	$426,950	$439,758	$452,951	$3,979,678
TOTAL VENDOR COSTS				$0			$347,150	$357,564	$368,291	$379,339	$390,720	$402,441	$414,514	$426,950	$439,758	$452,951	$3,979,678
DII FEES																	
3% Charge for DII PMO/EA Services based on total Project and Operations Costs:				$0			$10,415	$10,727	$11,049	$11,380	$11,722	$12,073	$12,435	$12,809	$13,193	$13,589	$119,390

					Year 1 (FY17)	Year 2 (FY18)	Year 3 (FY19)	Year 4 (FY20)	Year 5 (FY21)	Year 6 (FY22)	Year 7 (FY23)	Year 8 (FY24)	Year 9 (FY25)	Year 10 (FY26)	TOTAL
DII FEES TOTAL					$10,415	$10,727	$11,049	$11,380	$11,722	$12,073	$12,435	$12,809	$13,193	$13,589	$119,390
TOTAL PROJECT-RELATED COSTS					$357,565	$368,291	$379,340	$390,719	$402,442	$414,514	$426,949	$439,759	$452,951	$466,540	$4,099,068

OPERATIONS-RELATED COSTS

DEPARTMENTAL INTERNAL COSTS

					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
Staffing Costs: ❷	Assume no change in current and future Internal Costs $36/hr x 52 wks x 37.5 hours/wk x 4 people														
4 staff members					$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$2,808,000
WAN Costs	20 Mbps Service @ $1180/month	Is MPLS a better price?			$14,160	$14,160	$14,160	$14,160	$14,160	$14,160	$14,160	$14,160	$14,160	$14,160	$141,600
DEPARTMENTAL INTERNAL COSTS TOTAL					$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$2,949,600
TOTAL OPERATIONS-RELATED COSTS					$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$294,960	$2,949,600
TOTAL COSTS (PROJECT and OPERATIONS)					$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668

USE OF FUNDS - END

SOURCE OF FUNDS - START

Revenue Source:					Year 1 (FY17)	Year 2 (FY18)	Year 3 (FY19)	Year 4 (FY20)	Year 5 (FY21)	Year 6 (FY22)	Year 7 (FY23)	Year 8 (FY24)	Year 9 (FY25)	Year 10 (FY26)	TOTAL
Project Related:															
State of VT General Fund: Dept of Public Safety First Year Costs for AFIS	Need validation of funding sources for subsequent years				$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Operations Related:															
State of VT General Fund: Dept of Public Safety First Year Costs for AFIS	Assuming no change														
TOTAL:					$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668

$0	$0	$7,048,668
$4,099,068	Project costs	
$4,099,068	Delta	
$0		
$2,949,600	Operations cost	
#REF!	Delta	

Summary by State and Federal:

			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
State Funding:	$7,048,668		$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500
Federal Funding:	$0		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

SOURCE OF FUNDS - END

PROJECT CASH FLOW - START

					Year 1 (FY17)	Year 2 (FY18)	Year 3 (FY19)	Year 4 (FY20)	Year 5 (FY21)	Year 6 (FY22)	Year 7 (FY23)	Year 8 (FY24)	Year 9 (FY25)	Year 10 (FY26)	TOTAL
Use					$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Source					$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Net Cash by Fiscal Year:					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow:					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Potential Revenue Recovery:					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Cash by Fiscal Year:					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow:					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

CASH FLOW - END

NET CHANGE IN OPERATING COSTS - START

					Year 1 (FY17)	Year 2 (FY18)	Year 3 (FY19)	Year 4 (FY20)	Year 5 (FY21)	Year 6 (FY22)	Year 7 (FY23)	Year 8 (FY24)	Year 9 (FY25)	Year 10 (FY26)	TOTAL
Proposed Operating Costs:															
Total Operating Costs					$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Total: Proposed Operating Costs:					$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Current Operating Costs:															
Staffing: 4 staff members	$36/hr x 52 wks x 37.5 hours/wk x 4 people				$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$280,800	$2,808,000
WAN Costs	T1 (1.5 Mbps) Service @ $590/month				$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$7,080	$70,800

Annual Maintenance of Current Solution	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$85,000	$850,000
Total: Current Operating Costs:	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$372,880*	*$3,728,800*
Net Operating Cost Decrease/(Increase)	($279,645)	($290,371)	($301,420)	($312,799)	($324,522)	($336,594)	($349,029)	($361,839)	($375,031)	($388,620)	($3,319,868)	-89.03%

Summary of Net Change in Operating Costs among Funding Sources: ❸

STATE:

Proposed State Funding Source		$652,525	$663,251	$674,300	$685,679	$697,402	$709,474	$721,909	$734,719	$747,911	$761,500	$7,048,668
Current State Funding Source	*100% of current operating costs*	$372,880	$372,880	$372,880	$372,880	$372,880	$372,880	$372,880	$372,880	$372,880	$372,880	$3,728,800
STATE Net Operating Cost Decrease/(Increase)		($279,645)	($290,371)	($301,420)	($312,799)	($324,522)	($336,594)	($349,029)	($361,839)	($375,031)	($388,620)	($3,319,868)	-89.03%

FEDERAL:

Proposed Federal Funding Source		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Current Federal Funding Source	*0% of current operating costs*	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FEDERAL Net Operating Cost Decrease/(Increase)		*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	0.00%

NET CHANGE IN OPERATING COSTS - END

NOTES / ASSUMPTIONS:

❶ Software licensed is listed to be clear about what solutions are being proposed and received

❷ No expected changes in staffing levels through this project

❸ No federal funding expected

Funding Shortage: $0

Description	Annual Service Fee for Vermont
Year 1 Payment *	$347,150
Year 2 Payment **	$357,564
Year 3 Payment **	$368,291
Year 4 Payment **	$379,339
Year 5 Payment **	$390,720
Year 6 Payment **	$402,441
Year 7 Payment **	$414,514
Year 8 Payment **	$426,950
Year 9 Payment **	$439,758
Year 10 Payment **	$452,951
TOTAL	**$3,979,678**

Description	Percentage of Purchase Price
System Price	$1,113,000
Year 1 Termination Fee *	90% of System Price
Year 2 Termination Fee *	80% of System Price
Year 3 Termination Fee *	70% of System Price
Year 4 Termination Fee *	60% of System Price
Year 5 Termination Fee *	50% of System Price
Year 6 Termination Fee *	40% of System Price
Year 7 Termination Fee *	30% of System Price
Year 8 Termination Fee *	20% of System Price
Year 9 Termination Fee *	10% of System Price
Year 10 Termination Fee *	0% of System Price

* Year 1 Payment is due upon system acceptance.
** Year 2 through Year-10 Payments are due 12 months after the previous year payment
Applicable sales tax will be applied to the annual payments when they are due.

*Fee is due upon contract termination including applicable sales tax.

Annual Cost Per Daily Entry (assume 250 days of work annually, 450 dail $400,000/112,500 $3.56

Annual Cost Per Daily Search (assume 250 days of work annually, 1735 d $400,000/433,750 $0.92

Per Record Cost of Total Database Record Capacity (total cost / total rec $4,000,000/4,747,000 $0.84 See comparison with other per record storage costs below
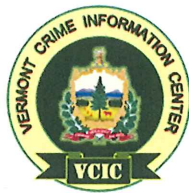
Option	Cost Per Record	Delta Cost vs. VT	Delta as a Percentage of Cost
1	$2.23	$1.39	62%
2	$0.64	($0.20)	-31%
3	$0.78	($0.06)	-8%
VT	$0.84	$0.00	0%

To: Jack Green
        AHS Information Security Director

From: Jeffrey Wallin
        CJIS Systems Officer, Vermont

Date: 12/14/2015

RE: MorphoTrak CJIS Security Compliance

MorphoTrak, LLC as the selected vendor for the Tri-State Automated Fingerprint
Identification System (AFIS) has provided the following description of their CJIS
security policy compliance measures:

*MorphoBIS Version 4 (the version included in the proposed contract) meets CJIS requirements.
This is of the upmost importance as we provide ~70 of all United State AFIS systems.*

*MorphoTrak solutions include features to safeguard sensitive information and to support
agencies in their efforts to secure their data and comply with applicable security policies. We
understand and support your desire to ensure the critical infrastructure required for enterprise-
level security, such as controlled facility access, firewall devices, Virtual Private Network
connections, secure user directories, required security updates to operating systems and servers,
and other sensitive security systems.*

*The following are examples of features available in our MorphoBIS solutions that can be
implemented to support compliance with CTM IT and CJIS Security Policy for handling
criminal history record information (CHRI) and personally identifiable information (PII).*

- *MorphoBIS workstations support antivirus software, which is kept up-to-date using a
  central update server.*
- *MorphoBIS communications between workstations and back-end servers support SSL
  encryption to safeguard information in transit.*
- *MorphoBIS solutions support the encryption of its Oracle database using Transparent
  Data Encryption to safeguard information at rest.*
- *MorphoBIS solutions support either standalone LDAP directory mode or integration
  with your existing Active Directory.*

- *MorphoBIS solutions support the regular synchronization of clocks between sub-systems to maintain consistency of log timestamps.*
- *MorphoBIS and the Morpho Maestro mobile gateway support authorization of mobile devices and enforce authorization and auditing of third-party system transactions.*

The specific installation timeline for all required CJIS security components will be determined during final development of the Project Plan (as outlined in the project management section of the proposed contract).

Follow Up Items from AFIS Independent Review Presentation Meeting of 2/1/2016:

The items highlighted in <mark>YELLOW</mark> represent items recommended to be addressed by State of VT.

WHAT	WHO	DISPOSITION	INDEPENDENT REVIEWER COMMENTS
1. Ask vendor (or other source) for traditional pricing options	Jeff	Please see attached MT document item 1.2. The lease option seems very reasonable	$11.7M purchase price vs. $11.9M lease price so costs are comparable, although lease is slightly more expensive. It is not clear if VT owns the equipment after year 10 nor whether there are other costs associated after year 10 (i.e. software licensing, software maintenance). Those cost may factor into the TCO as well.
2. Ask vendor (or other source) for pricing comparisons of this project to others	Jeff	Please see attached MR document item 1.1. When you compare the 2.3M records in the specification document for Tri-State the cost per tenprint falls in the middle of the spectrum.	VT pricing does not fall in the middle, rather it is closer to the high end than the low end. As noted in the 3 sample sizes shown below, while VT is lower by only 20% vs. the higher cost option, it is over 100% more expensive than the 2 lower cost options, based on 2.3M prints at $4.1M ($1.78 cost/print):

Option	Cost Per Record	Delta Cost vs. VT	Delta as a Percentage of Cost
1	$2.23	$0.44	20%
2	$0.64	-$1.14	-178%
3	$0.78	-$1.00	-129%
VT	$1.78	$0.00	0%

However, the vendor caveats that were included should also be considered as additional factors other than just price.

Additionally, the 2.3M prints used as the denominator represents the current database size. The proposed database capacity is 4.7M. Using that number, we have a cost of $.84, which bodes even better than the chart above, and puts VT at the lower end of the cost spectrum vs. the higher end:

Option	Cost Per Record	Delta Cost vs. VT	Delta as a Percentage of Cost
1	$2.23	$1.39	62%
2	$0.64	($0.20)	-31%
3	$0.78	($0.06)	-8%
VT	$0.84	$0.00	0%

#		Assignee	Response	Detail
3.	Ask vendor (or other source) for cost per fingerprint numbers	Jeff	See #2.	See #2.
4.	Ask vendor for hardware and software specs (at least versions and date stamp on hardware so we can at least assess maintaining CJIS security and end of life on hardware/software given the refresh is 7 years out (for example, Windows 7 reaches end of extended support on 1/14/2020 (no more security patches) which is 4 years out)	Jeff	Please see attached MT document item 1.3. Additionally, vendor confirmed that database will be running Oracle 12c.	The vendor has indicated that the desktop operating system is **Windows 10**. The vendor has indicated that the database operating system is **Oracle 12c**. The vendor has indicated that the server operating system **is Windows Server Standard 2012 R2**. Of note: DPS is currently in the situation of having to upgrade the solution at least in part due to the server operating system being Windows NT, which has already been deemed as END OF LIFE. Vendor indicates server specs are: **HP DL160G9-8SFF, 2-4C-E5-2623v3-3.0GHZ-10MB, 2x8GB, 2-300GB-SAS-10K-SFF, 1-FC-HBA, 2P-NIC, 1-800W**.
5.	Backup: a. What is the backup schedule? **DAILY, FULL ONCE PER WEEK, INCREMENTAL OTHERWISE** (Is this M-F, or M-Sun?) b. What is the data retention schedule? **ONE YEAR** c. Recovery Time Objective (RTO)? Not defined d. Recovery Point Objective (RPO)? Not defined	Jeff and Gerard.Wallace@dos.nh.gov		While NH states they meet CJIS compliance standards, there are unknowns, such as RTO and RPO. These have since been addressed with answers to the questions at left, specifically: 6. Backups Daily with 1 year of data retention (full backups weekly, incremental on the other days) 7. Recovery Point Objective: 24 hours 8. Recovery Time Objective:

1. **Services Provided.** The Services provided are based on the Severity Levels as defined herein. Each Severity Level defines the actions that will be taken by Seller for Response Time, Target Resolution Time, and Resolution Procedure for reported errors. Because of the urgency involved, Response Times for Severity Levels 1 and 2 are based upon voice contact by Customer, as opposed to written contact by facsimile or letter. Resolution Procedures are based upon Seller's procedures for Service as described below.

SEVERITY LEVEL	DEFINITION	RESPONSE TIME	TARGET RESOLUTION TIME
1	Total System Failure - occurs when the System is not functioning and there is no workaround; such as a Central Server is down or when the workflow of an entire agency is not functioning.	Telephone response within 1 hour of initial voice notification	Resolve within 24 hours of initial notification
2	Critical Failure - Critical process failure occurs when a crucial element in the System that does not prohibit continuance of basic operations is not functioning and there is usually no suitable work-around. Note that this may not be applicable to intermittent problems.	Telephone response within 3 Standard Business Hours of initial voice notification	Resolve within 7 Standard Business Days of initial notification
3	Non-Critical Failure - Non-Critical part or component failure occurs when a System component is not functioning, but the System is still useable for its intended purpose, or there is a reasonable workaround.	Telephone response within 6 Standard Business Hours of initial notification	Resolve within 180 days in a Seller-determined Patch or Release.
4	Inconvenience - An inconvenience occurs when System causes a minor disruption in the way tasks are performed but does not stop workflow.	Telephone response within 2 Standard Business Days of initial notification	At Seller's discretion, may be in a future Release.
5	Customer request for an enhancement to System functionality is the responsibility of Seller's Product Management.	Determined by Seller's Product Management.	If accepted by Seller's Product Management, a release date will be provided with a fee schedule, when appropriate.

#	Item	Owner	Status	Comment
9.	Revise MOU to allow VT to view CJIS Audit results and consider including language specifically requiring CJIS compliance	Jeff	Will add addendum after all three states have completed necessary reviews. However, as language currently exists requiring federal compliance this item is already generally covered.	Per Mr. Wallin, this will be addressed via the Contract, which is the appropriate place for this activity.
10.	The Risk Register item 1b indicates that the proposed DR Site will be an additional cost. Mr. Wallin indicates it is not an additional cost. Who should comment on this?	Jeff and Jaye Johnson?	Still pending	==Remains a Risk in the Risk Register.==
11.	Review WAN Cost Options (is MPLS via State Contract more cost effective?)	Jeff	As this is not an item specifically determined by the MT contract the most cost-effective option will be pursued once the project reaches the necessary phase. Other, more cost effective options than the MPLS or WAN may become available.	There is an opportunity for cost savings here. The only question is when is the right time to undertake exploring that opportunity. Mr. Wallin suggests post contract discussions, but does not say exactly when. ==It would be most beneficial to complete this before solution is put into a test environment.==
12.	Review Risk Register	Jeff and David		Completed.
13.	CONTRACT: Clarify security maintenance plan ensuring CJIS compliance	Jeff	Will be directly clarified in contract (already covered in federal requirements).	==Per Mr. Wallin, this will be addressed via the Contract, which is the appropriate place for this activity.==
14.	CONTRACT: Ask vendor for exit costs commensurate with usage (i.e. instead of paying 90% of solution after year 1, pay 10% after year 1, as we only used the system for 10% of the total 10 year plan)	Jeff	Will be directly clarified in contract (already covered in federal requirements).	==Per Mr. Wallin, this will be addressed via the Contract, which is the appropriate place for this activity.==
15.	CONTRACT: Add NON FUNCTIONAL items to contract (not the least of which, in order to meet security objectives like NIST 800-53)	Jeff (get Non-Functional Requirements content from John Hunt)		==Per Mr. Wallin, this will be addressed via the Contract, which is the appropriate place for this activity.==

The detail below is provided from David Gadway to Jeff Wallin in order to facilitate having the question provide the answer sought. Jeff will provide David the answers obtained in order to have David update the Indep. Review Report.

1. Ask vendor (or other source) for traditional pricing options
   a. We've asked for SERVICE MODEL pricing to include hardware, software, and hardware/software refresh at Year 7. Can you provide 10 year pricing for the following models:
      i. True Software as a Service, where we pay for software on an annual subscription model assuming a 10 year horizon. Please provide specs for hardware that we would buy in this model, or, if you don't allow clients to purchase the hardware that you put the software on, price the hardware separately.
      ii. Traditional software license model, where this an upfront software licensing fee, annual maintenance/support, and hardware (see hardware note above)
   b. **RESPONSE:**
      i. See Chart item #1 above.

2. Ask vendor (or other source) for pricing comparisons of this project to others
   a. Here is the question that has been asked thus far: What other projects have you completed that compare to Tri-State in terms of record counts and workflows?
   b. **RESPONSE:**
      i. See Chart item #2 above.

3. Ask vendor (or other source) for cost per fingerprint numbers
   a. We wish to compare our total out of pocket costs divided by number of fingerprints completed annually to others. We want a sample size of at least 3 other organizations.
   b. Commissioner Boes posed this question: "*My question about the number of states or jurisdictions using AFIS was to show that we must have comparison points. The fact that AFIS is used by over 70 entities in the US means that finding a point of comparison should be relatively easy. Our cost metric on this project appears to be $25 per person identified (700,000/28,000). How does that compare with other entities? If that is not the metric, what cost metric should we use to evaluate the reasonableness of this purchase?*"
   c. **RESPONSE:**
      i. See Chart item #3 above

4. Ask vendor for hardware and software specs (at least versions and date stamp on hardware so we can at least assess maintaining CJIS security and end of life on hardware/software given the refresh is 7 years out (for example, Windows 7 reaches end of extended support on 1/14/2020 (no more security patches) which is 4 years out).
   a. Considering the proposed Service Model anticipates a hardware and software refresh 7 years out, and given that we have not been given the specific hardware nor software specifications, we wish to understand where we stand relative to:
      i. Compliance with State of VT infrastructure standards
      ii. Ability to meet CJIS and NIST 800-53 compliance standards
   b. **BACKGROUND INFORMATION on END OF LIFE:**
      i. <u>Server Operating System:</u>

1. Windows Server 2008: End of Life on **Mainstream Support** of 1/13/2015 and End of Life on **Extended Support** of 1/14/2020
2. Windows Server 2012: End of Life on **Mainstream Support** of 1/9/2018 and End of Life on **Extended Support** of 1/10/2023

ii. Database Operating System:
1. Oracle 12g, with Premier Support providing a standard five-year support policy for Oracle Technology products. You can extend support for an additional three years with Extended Support for specific releases or receive indefinite technical support with Sustaining Support. In short, no end of life so long as support is paid for.

iii. Client Operating System:
1. Windows 10, with End of Life on **Mainstream Support** of 10/13/2020 and End of Life on **Extended Support** of 10/14/2025

Type of support	Mainstream support phase	Extended support phase	Self-help online support
Request to change product design and features	✓	✗	Access to freely available online content, such as Knowledge Base articles, online product information, and online support WebCasts
Security updates	✓	✓	
Non-security updates	✓	☆	
Complimentary support[1] included with license, licensing program[2] or other no-charge support programs	✓	✗[3]	
Paid-support (including pay-per-incident Premier and Essential Support)	✓	✓	

✓ Available	✗ Not available	☆ Only available with Extended Hotfix Support / Not available for Desktop Operating System consumer products

*Please Note: Microsoft's Support Lifecycle Policy does not apply to all products. To see the specific support start and end dates by applicable product, you can search the Support Lifecycle Product Database.

[1] Refers to phone support and online support options.

[2] For example, support incidents acquired through the Software Assurance program for server products.

[3] Limited complimentary support may be available (varies by product).

c. **RESPONSE:**
i. Server Operating System:
1. The vendor has indicated that the server operating system is Windows Server Standard 2012 R2.
2. Vendor indicates server specs are: Hewlett Packard DL160G9-8SFF, 2-4C-E5-2623v3-3.0GHZ-10MB, 2x8GB, 2-300GB-SAS-10K-SFF, 1-FC-HBA, 2P-NIC, 1-800W.
ii. Database Operating System:
1. Oracle 12c

iii. Client Operating System:
    1. Windows 10