Stage 1 Business Analysis

Department of Technology, SIMM 19A, Revision 7/1/2015

1.1 General Information

Agency or State Entity Name:
Transportation, Department of

Organization Code:
2660

Proposal Name:
Transportation Asset Management System (TAMS)

Proposal Description:
The Department of Transportation (Caltrans) proposes the development of a centralized data repository and tools to improve transportation asset management, project prioritization and project initiation documentation development.

Proposed Start Date: **November, 2018**

Delegated Cost Threshold (Optional): (●) Over ( ) Under

Department of Technology Project Number: 2660-544

1.2 Submittal Information

Contact Information:

Contact First Name: Karen

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Submission Date: 11/21/2016

Submission Type:

(●) New Submission
( ) Updated Submission (Pre-Approval)
( ) Updated Submission (Post-Approval)
( ) Withdraw Submission

Project Approval Executive Transmittal:

1.3 Preliminary Assessment

1.3.1 Reportability Assessment

	Yes	No
1. Does the Agency/state entity anticipate requesting a budget action to support this proposal?	◉	○
2. Does the Agency/state entity anticipate the estimated total development and acquisition cost to exceed the Department of Technology's established Agency/state entity delegated cost threshold **and** the proposal does not meet the criteria of a desktop and mobile computing commodity expenditure?	◉	○
3. Does this proposal involve a new system development or acquisition specifically required by legislative mandate **or** is subject to special legislative reporting or review as specified in budget control language or other legislation?	○	◉

Anticipated Reportability

Is this proposal anticipated to be reportable?	◉	○

Planned Reporting Exemption

Does the Agency/state entity anticipate seeking an exemption from project reporting? (Answer only if Anticipated Reportability above is "Yes.")	○	◉

1.3.2 Impact Assessment

	Yes	No
1. Has the funding source(s) been identified for this proposal?	◉	○

If "Yes," select applicable funding source(s) and enter the fund availability date. If funding source is "Other Funds," specify below:

FUND SOURCE Mark all that apply	FUND AVAILABILITY DATE
☐ General Fund	FY 0000-00
☑ Special Fund	FY 2018-19
☐ Federal Fund	FY 0000-00
☐ Reimbursements	FY 0000-00
☐ Bond Fund	FY 0000-00
☐ Other Funds	FY 0000-00

2. Will the State possibly incur a financial sanction or penalty if this proposal is not implemented? If "Yes," provide details in Section 1.9 Business Problem or Opportunity Summary.	◉	○
3. Is this proposal anticipated to have high public visibility? If "Yes," provide details in Section 1.9 Business Problem or Opportunity Summary.	◉	○
4. On a scale of 1 to 3 (1 = None, 2 = Partially, 3 = Fully), indicate how well the current business processes are documented, communicated and available for review.	2	

1.4 Business Sponsor and Key Stakeholders

Executive Sponsors

Title	First Name	Last Name	Business Program Area
Chief Deputy Director	Kome	Ajise	Director's Office

Business Owners

Title	First Name	Last Name	Business Program Area
Principal Transportation Engineer	Michael	Johnson	Office of Asset Management

Key Stakeholders

Title	First Name	Last Name	Business Program Area/Group	External
Division Chief	Katie	Benouar	Transportation Planning	☐
Division Chief	Bruce	DeTerra	Programming	☐
Division Chief	James	Davis	Project Management	☐
Division Chief	Tony	Tavares	Maintenance	☐
Division Chief	Thomas	Hallenbeck	Traffic Operations	☐

1.5 Business Driver(s)

Mark all that apply

Financial Benefit:
- ☐ Increased Revenues
- ☐ Cost Savings
- ☐ Cost Avoidance
- ☐ Cost Recovery

Mandate(s):
- ☐ State
- ☐ Federal

Improvement:
- ☑ Better Services to Citizens
- ☑ Efficiencies to Program Operations
- ☐ Improved Health and/or Human Safety
- ☐ Technology Refresh

Security:
- ☐ Improved Information Security
- ☐ Improved Business Continuity
- ☐ Improved Technology Recovery

1.6 Statutes or Legislation

Statutes or Legislation:
- ○ New Statutes
- ○ Potential Legislation
- ○ Changes to Existing Legislation
- ○ Not Applicable

Bill Number:

Legal Reference:	
Additional Information:	

1.7 Program Background and Context

Within Caltrans, the State Highway Operation and Protection Program (SHOPP) directs the expenditure of transportation funds for major capital improvements that are necessary to preserve and protect the State Highway System (SHS). Projects are limited to capital improvements relative to maintenance, safety, and rehabilitation of State highways and bridges that does not add a new traffic lane to the system. Multiple programs are funded by the SHOPP, including the Pavement Program, Bridge Program, Mobility Improvements, and Culvert Program. Program Managers are allocated a portion of the Caltrans total SHOPP funds for the management of transportation assets within their Program. Transportation assets in these Programs include such items as ramp meters, pavement, and culverts.

Programs identify their "needs" on the State Highway System. Examples of "needs" might include a deteriorating section of pavement, repair of a deficient culvert, or something as simple as a non-operative ramp meter that causes increased traffic. Each Program is responsible for tracking their assets' health, and may also be responsible for the maintenance of the assets that the SHOPP Program supports. These Program needs are prioritized within that Program only and do not consider the needs and priorities of other Programs to maximize the cost effectiveness and construction within similar project limits. Each of the Program's manage their assets according to its allocated budget, and project selection is based on the information and status of assets within that specific Program area. Information about the needs, system information, asset condition and location, schedule, and financial information are stored in individual Program specific systems. These systems include:

- District System Management Plan (DSMP) includes a list of all projects identified as a need on the State Highway System and is used to facilitate the development of the Project Initiation Document list every two years. It developed by each district and managed by the Division of Transportation Planning .
- Structures Maintenance Automated Report Transmittal System (SMART) stores structure characteristics, condition, engineering evaluations, work history, and inspection results and is managed by Office of Structures Maintenance and Investigations.
- Pavement Management System (PaveM) stores information about the prioritization, preservation, rehabilitation, and maintenance of highway pavement and is managed by the Division of Pavement.
- Culvert Inspection Program (CIP) captures and manages the statewide culvert inventory and is managed by the Office of Maintenance and Stormwater and Environmental Compliance. It is built upon a collection of individual District and Headquarters Microsoft Access 2007 databases.
- Traffic Management System (TMS) Inventory Database stores inventory data for field elements (e.g. traffic signals, ramp meters), communications (e.g. fiber optic networks), central applications (e.g. Road Weather Information System), and information delivery systems (e.g. Freeway Performance Measurement System) and is managed by the Division of Traffic Operations.
- Integrated Maintenance Management System (IMMS) is used for inventory and work order tracking for items requiring maintenance on the SHS and is managed by the Division of Maintenance .
- Transportation System Network (TSN) stores the highway inventory for all State highway facilities, including highway miles, ramps, and intersections and is managed by the Traffic Accident Surveillance and Analysis Unit.
- Statewide ITS Architecture (SWITSA) is a repository of current and planned ITS elements with Caltrans responsibility, as well as federally required Regional ITS Architectures. It identifies integration and information flows between elements, as well as identify necessary communication standards. It is managed by the Division of Traffic Operations with support from the Division of Transportation Planning.
- Performance Measurement Systems (PeMS) is used for processing and analyzing traffic data to assess the performance of the transportation systems using data such as volume/occupancy/speed data from automated detectors, traffic census counts, vehicle classification data, and the California Highway

Patrol's real-time incident data.

- Project Resourcing and Schedule Management System (PRSM) is an enterprise project management tool used for managing schedules and capital outlay support resources for all major projects on the SHS and is managed by the Division of Project Management.
- Enterprise Resource Planning Financial Infrastructure (EFIS) is the financial system of record for budget and expenditure data for all projects in PRSM.

Caltrans has historically defined projects by a single program element. Funding for projects is by SHOPP Program, with each Program Manager being allocated a portion of the Caltrans total SHOPP funds. Each Program manages the resources and project selection in its asset class independently of other Programs. The silo based allocation of funding discourages Program Managers from accommodating objectives other than their primary program objective, and deters execution of a goal-oriented project prioritization process without artificial funding barriers.

Federal and State legislation have directed that the Department develop a Transportation Asset Management Plan that will allow Caltrans to focus on making project-based investments that take into account the needs of the entire State Highway System. Transportation asset management promotes decisions that reflect the optimal performance of the infrastructure compared to the resources required to operate and maintain it. Additionally, it uses investment timing tools and economic analysis to ensure the effective use of available funds. Economic analysis tools allow activities such as evaluation of the overall cost-benefit advantages of conducting regular pavement preservation efforts (Capital Preventive Maintenance) as compared to resurfacing and replacement, evaluation of programmatic life cycle costs, or investment trade off analysis.

Stakeholders of this proposal include staff from each of the program areas responsible for monitoring transportation assets and prioritizing projects impacting their condition.

1.8 Strategic Business Alignment

Strategic Business Goals	Alignment
Caltrans Strategic Management Plan 2015-20 Strategic Goal 2: Stewardship and Efficiency, Money counts. Responsibly manage California's transportation-related assets.	The proposed project is in alignment with the Department's strategic objective to "effectively manage transportation assets by implementing the asset management plan, embracing a fix-it-first philosophy".
Strategic Plan Last Updated	3/1/2015

1.9 Business Problem or Opportunity Summary

The implementation of a transportation asset management plan has been mandated by federal and state law.

- The CA Government Code Section 14520-14534.1 (formerly Senate Bill 486), 14526.4 states that "(a) The department, in consultation with the commission, shall prepare a robust asset management plan to guide selection of projects for the state highway operation and protection program required by Section 14526.5. The asset management plan shall be consistent with any applicable state and federal requirements and be implemented by the year 2020." Without a robust tool for performing the comparative analysis necessary, Caltrans would be unable to implement such a transportation asset plan. Failure to develop the asset management plan, as required by state law, puts the Department in a position of losing credibility with the California Transportation Commission, Legislators, Governor, and the citizens of California. In addition, the CTC has the power to deny approval of the 2020 SHOPP cycle if the Department fails to comply with state law.

- In addition, federal law (MAP-21(2012), FAST Act (2015)) has declared "beginning with the second fiscal year after [effective date of final rule, expected Oct. 2016] and in each fiscal year thereafter, if a State

DOT has not developed and implemented an asset management plan consistent with the requirements of 23 U.S.C. 119 and this part, the maximum Federal share for National Highway Performance Program projects shall be reduced to 65 percent for that fiscal year." The expected date of the Final Rule of the asset management portion of this law is currently set for October 17, 2016. If Caltrans were unable to implement its transportation asset management plan, it could result in millions of dollars in lost highway funding.

The current process of prioritizing projects within the individual SHOPP Programs results in the loss of efficiencies that could be realized when location is considered during the project delivery cycle. Consider an example where the Pavement Program has a project for pavement rehabilitation within a section of roadway where there is also a culvert issue and the need for ramp metering repair. Because projects are funded without regard to assets in other SHOPP Programs, location and overlapping projects are not considered. With projects prioritized within silos, communication between the Programs is challenging and the economies and efficiencies that could be realized through combining these projects is often not attained. There is a need to be able to efficiently identify all needs in a location, bundle these needs into a transportation project, and then logically prioritize them into a listing of projects to maximize available funding.

It is difficult to get a clear picture of all the improvements needed in a project because needs and asset information of the various program areas are stored in multiple separate systems, with no interfaces between them. This makes it challenging to compare the system performance improvement benefits between projects to determine which ones yield the highest benefits to the Department, and then develop a prioritized list of projects that transparently maximizes the value per dollar spent.

This proposed Information Technology effort will implement the federal and state requirements for an asset management plan and provide the opportunity for improvements in the project prioritization process, including:

- Manual and automated updates of Caltrans' and local partners' assets, needs, location and condition information in one centralized data repository.
- Spatial visualization of system needs, as well as planned and in-process projects.
- Increase the likelihood that transportation agencies across the state will coordinate planning to maximize the impact of combined transportation improvement funding.
- Statewide consistency in Project Initiation Document planning, estimating and development.
- A direct correlation of system needs to specific project(s).
- Identification and selection of asset management criteria by Program.
- Prioritization and selection of SHOPP Program projects using defined asset management criteria.
- Better management of SHOPP Program funds by fiscal year with a real-time SHOPP checkbook.
- More accurate and timely SHOPP reporting to State and Federal oversight agencies.
- Use of financial investment analysis tools in project determination.

A transportation asset management system will result in a more efficient and transparent investment of SHOPP transportation dollars. Caltrans will be able to do more with each transportation dollar, whether it is spent on the State Highway System, or used to leverage locally available funds to advance each party's needs sooner than could be done individually. Well planned use of each transportation dollar will allow more transportation projects to be implemented sooner, and facilitate Caltrans' achievement of its strategic business goals.

A high level functional overview of Caltrans' proposed TAMS system is attached as Attachment A.

1.10 Business Problem or Opportunity and Objectives Table

ID	Problems or Opportunities
1	Efficiencies to Program Operations/Better Services to Citizens: Caltrans lacks the tools to successfully

implement a transportation asset management plan, resulting in an inability to meet federal and state requirements.

Obj #	Objective
1.1	Implement a solution with the tools necessary to implement a transportation asset management plan meeting state and federal requirements.

Metric	Baseline	Target	Measurement Method
System existence	None	Functionality to meet state and federal requirements	Observe and verify

Obj #	Objective
1.2	Evaluation of performance that can be achieved with a defined budget, as well as identification of future funding needs associated with achieving defined performance objectives.

Metric	Baseline	Target	Measurement Method
Availability of interactive dashboards	Custom reports and spreadsheets	Interactive dashboards and reports	Observe and verify

ID Problems or Opportunities

2 Efficiencies to Program Operations/Better Services to Citizens: Caltrans does not have a centralized repository of SHS assets and needs for Caltrans or its local partners, resulting in a lack of assurance that projects being developed provide the highest value or fully leverage locally available funds. Additionally, it results in an inability to comprehensively address the needs of the SHS thru facilitation of project awareness of assets and needs for other modal choices such as freight and bicycles, and from other initiatives like Complete Streets and the Americans with Disabilities Act.

Obj #	Objective
2.1	Implement tools that will allow Caltrans to identify and maintain SHS assets and needs.

Metric	Baseline	Target	Measurement Method
Solution existence	Custom reports, spreadsheets and non-integrated systems	Functionality for Caltrans to identify and maintain assets and needs	Observe and verify

Obj #	Objective
2.2	Implement tools that will allow local partner needs from regional and statewide planning efforts to be identified and maintained.

Metric	Baseline	Target	Measurement Method
Solution existence	None	Functionality for local partners to identify and maintain needs	Observe and verify

ID Problems or Opportunities

3	Efficiencies to Program Operations/Better Services to Citizens: Caltrans develops and funds projects within a specific SHOPP program, an approach that discourages accommodating needs and priorities in other programs, as well as other needs that exist within a project's location. This results in projects being developed primarily considering the needs of a single program, and may not maximize value, economy of scale or improvements to the SHS.

Obj #	Objective
3.1	Develop a Project Initiation Document planning and development setup assistant to facilitate project development using Caltrans and local needs and asset condition information within the project limits.

Metric	Baseline	Target	Measurement Method
Solution existence	Custom reports and spreadsheets	Functionality to select needs, bundle them into a project, generate a cost estimate, and maintain the costs to implement needs and improve conditions	Observe and verify

Obj #	Objective
3.2	Implement tools that will provide the information necessary to allow Caltrans to develop and prioritize projects across asset classes based on value and quantifiable performance improvements.

Metric	Baseline	Target	Measurement Method
Solution existence	Custom reports and spreadsheets	Functionality to prioritize projects across asset classes	Observe and verify

Obj #	Objective
3.3	Implement tools to directly correlate how SHS needs are being addressed by planned, on-going and completed projects.

Metric	Baseline	Target	Measurement Method
Solution existence	None	Functionality to correlate needs with projects	Observe and verify

ID Problems or Opportunities

4	Efficiencies to Program Operations/Better Services to Citizens: Caltrans manages a multi-billion dollar portfolio of SHOPP projects, and for a variety of reasons change is inevitable on some projects (e.g. delay in environmental permits). When there are changes to projects, funds from multiple sources need to be reallocated or they could be lost. Caltrans does not have a system that shows the real-time balance of all SHOPP commitments by fiscal year and sometimes as part of the reallocation process the opportunity to leverage matching funds could be lost.

Obj #	Objective
4.1	Implement the tools and associated business process to provide a real-time SHOPP checkbook by fiscal year for all available funding sources.

Metric	Baseline	Target	Measurement Method
Solution existence	Custom reports and spreadsheets	Functionality to manage fund commitments and program capacity	Observe and verify

ID Problems or Opportunities

ID	Problems or Opportunities
5	Efficiencies to Program Operations/Better Services to Citizens: Caltrans does not have a centralized database to report on the overall performance of the transportation system, resulting in a lack of transparency and accountability to external stakeholders.

Obj #	Objective
5.1	Implement tools to provide spatial visualization of system needs, conditions and projects.

Metric	Baseline	Target	Measurement Method
Solution existence	None	Functionality for spatial visualization and interactive reporting	Observe and verify

Obj #	Objective
5.2	Provide access to real time information reflecting current State Highway System conditions and estimated costs of needs and performance.

Metric	Baseline	Target	Measurement Method
Solution existence	Custom reports and spreadsheets	Interactive dashboards and reports	Observe and verify

1.11 Business and Stakeholder Capacity

1.11.1 Business Program Priorities

	Yes	No
Does this proposal share resources (state staff, vendors, consultants or financial) with other business program priorities within the Agency/state entity?	◉	○

Implementation of TAMS is important to the Department so that commitments to comply with Federal and State mandates can be fully and efficiently implemented. Given TAMS' importance and impact on multiple programs within the Department, the project sponsor will be the Chief Deputy Director. Sponsorship at this level will ensure that the correct personnel from multiple programs will participate when they are needed and for as long as they are needed, to ensure that the project maintains the level of commitment needed to complete it successfully. Sponsorship at this level of management will also facilitate the adoption of TAMS' future organizational change management plans so that the system will be used as intended and the complete benefits to the Department can be fully realized. Redirection of staff from multiple programs within Caltrans to participate in TAMS' development and implementation will impact individual program priorities. However, since each of these programs directly report to the Project Sponsor, the Department's overall commitment to TAMS will be maintained at potentially the expense of each individual program's priorities.

In addition to TAMS' high level of project sponsorship, upon approval of the Stage 1 Business Analysis the Department will redirect one full time person to act as the business side project manager to lead development

and approval of the remaining Project Approval Lifecycle stages. This full time project manager will monitor project workload and capacity and add additional personnel and/or consulting resources as necessary to further ensure the success and implementation of the project.

1.11.2 External Stakeholder Involvement

1.11.3 New or Changes to Business Processes

	Yes	No
Does the Agency/state anticipate this proposal will result in the creation of new business processes?	◉	○
Does the Agency/state entity anticipate changes to existing business process?	◉	○

This proposal will have a significant impact on Caltrans staff, including technological, procedural, and behavioral changes.

1.12 Organizational Readiness

1.12.1 Governance Structure

	Yes	No
Does the Agency/state entity have an established governance structure for combined business and IT decision making, including information security and privacy?	◉	○

Caltrans has established a collaborative governance model for technology that requires decision-making at the executive level. Divisions submit requests for new projects and initiatives and the IT Project Management Office reviews them and presents them for approval and prioritization. The IT Project Management Office leads concept refinement, requirements analysis, planning and execution of new IT projects, ensuring compliance with State IT project, procurement, and security policies. Business owners request changes, enhancements, and priorities within approved limits. This governance model helps the effective management of Caltrans' technology portfolio.

1.12.2 Leadership Participation

Identify the levels of leadership that are aware of and engaged in addressing the business problem(s)/ opportunity(ies) identified in this proposal (check all that apply):

- ☑ Executive
- ☑ Senior Management Business/Program
- ☑ Mid-level Management Business/Program
- ☑ Senior Management IT
- ☑ Mid-level Management IT
- ☑ Enterprise Architect

The following briefly describes each level of leadership's involvement in the various phases of the proposed project:

- **Executive.** Caltrans' Executive Board initially develops Caltrans business priorities, which drive IT priorities, project approval, and funding. During project execution, the Director and Deputy Directors will receive regular briefings on the IT portfolio and individual project highlights. Issues will be escalated to the Director level as needed. Additionally, the Deputy Director for the business program will serve as an executive sponsor and participate in the Executive Steering Committee.
- **Senior Management Business/Program.** The Chief of the Business Division serves as the business project sponsor. As part of the governance model, projects are only internally moved forward for consideration after the business division chief approves the business case. The Chief also serves on the Executive Steering Committee and is a key point in the escalation process. If multiple business divisions

are involved, each chief is also involved.

- **Mid-Level Management Business/Program.** A mid-level manager from the business program will serve as the business project manager. Additionally, other mid-level managers from the business program may serve on the steering committee or be involved in business process reengineering, organizational change, etc. It is also expected that the mid-level managers will participate in identifying staff and subject matter experts who can support the project as project resources.
- **Senior Management IT.** A senior management member from IT will serve as the IT project sponsor. The IT project sponsor will work collaboratively with the business sponsor.
- **Mid-Level Management IT.** The IT Project Management Office will assign an IT project manager to the project. Additionally, managers within each of the IT Divisions will be involved in key decisions about the project, its architecture, etc. As needed, other IT managers will be briefed on the status of the project and involved as it relates to their specific discipline.
- **Enterprise Architect.** The IT Infrastructure Division Chief and the Enterprise Architect are involved in every IT project, as it relates to the project's specific infrastructure needs. While some duties may be delegated to technical staff, the Chief will participate in the initial project review and internal approval, to ensure its consistency with the department's overall IT direction, capabilities, and standards.

Preparing Leaders for their Role in the Project

To prepare the Project Sponsors (both business and IT) for their role in the project, Caltrans will conduct an initial briefing/training which includes training/educational components related to the entire SDLC. This will help educate the business sponsors and non-IT staff on key IT terminology, the general flow of an IT project, and how to engage with the vendor and IT staff. The goal of this effort is to also aid both the sponsors and other key business staff in understanding how their business decisions translate into technical decisions, and their resulting impact. The preparation activities will be tailored based on the final roles/responsibilities within the project structure.

Leadership Availability and Commitment

Caltrans leadership team and the Project Sponsors (both business and IT) are committed to this project. The Project Sponsors will work closely with the Project Managers, and attend and actively participate in regularly scheduled status and steering committee meetings. Since the Project Sponsors serve as a point of escalation, the sponsors are committed to expedite key decisions related to project issues or other concerns that prevent or slow progress.

Leadership Experience with Organizational Change Management

Caltrans leadership team and the Project Sponsors (both business and IT) are familiar with various aspects of Organizational Change Management, including business process documentation and/or reengineering, communication, change management, training, leadership alignment, etc. As Caltrans progresses with the proposed project, the IT Program's Project Management Office will provide initial, base-level OCM support for the project start-up and anticipates requesting OCM services from the system vendor.

1.12.3 Resource Capability/Skills/Knowledge for Stage 2 Alternatives Analysis

	Yes	No
Does the Agency/state entity anticipate requesting additional resources, through a budget request, to further study this proposal and/or perform procurement analysis?	○	◉

Of the Agency/state entity resources identified to perform Stage 2 Alternatives Analysis for this proposal, enter the number of staff who have had experience with planning projects of a similar nature.

2

In addition to Caltrans IT-PMO Business Analysis staff, business personnel with extensive Program knowledge and experience will be involved in the development of requirements and the determination of alternative and recommended solutions. IT Technical Support, Infrastructure, Network, and Security staff will provide technical

expertise and the Division of Procurement and Contract staff with considerable Procurement experience will also participate in procurement of selected solution.

1.12.4 Training and Organizational Change Management

	Yes	No
With respect to the magnitude of this proposal, does the Agency/state entity have resources, processes, and methodologies in place to provide training and organizational change management services?	○	◉
Does this proposal affect business program staff located in multiple geographical locations? If "Yes," specify the city, state, number of locations and approximate staff in each location:	◉	○

City	State	Number of Locations	Approximate Number of Staff
Eureka - District 1	California	1	25
Redding - District 2	California	1	50
Marysville - District 3	California	1	100
Oakland - District 4	California	1	250
San Luis Obispo - District 5	California	1	50
Los Angeles - District 7	California	1	250
San Bernardino - District 8	California	1	100
Bishop - District 9	California	1	25
Stockton - District 10	California	1	100
San Diego - District 11	California	1	150
Irvine - District 12	California	1	100
Sacramento - HQ	California	1	75

Caltrans' IT Leadership, Management, and the IT PMO understand the importance of training and OCM and intend to require an appropriate level of both on this projects. Specifics of training and change management needs will be developed after solution analysis and selection. It is anticipated that the vendor, working with Caltrans staff, will provide these services. Resources will be budgeted within the proposed project to support these efforts.

1.12.5 Enterprise Architecture

	Yes	No
Does the Agency/state entity have a documented target (or future state) enterprise architecture that provides the overall business and IT context for this proposal?	○	◉

Caltrans does not currently have a documented, future state enterprise architecture (EA). However, the department does have a general EA direction; this specific proposal is consistent with that direction. Further, this proposal is consistent with the business program-specific EA, and systems that integrate with this solution.

As noted in section 1.12.1, Caltrans recently implemented an initial enterprise IT Governance Framework that focuses on project approval, enterprise architecture, standards, portfolio and project management, change control and other functions. As part of that framework, an Enterprise Architecture Committee (EAC) has been established. The EAC's mission includes defining EA standards, as well as documenting the as-is and future state enterprise architecture. A key goal is to create an EA reference model that can aid in driving technology investment decisions. Caltrans recognizes the value of a defined and documented EA, particularly as it relates to

normalizing EA and the downstream benefits to maintenance ease and cost, and employee skills. The EAC is currently working to define EA standards, processes, procedures, practices, tools, and other elements that will eventually be applied to the enterprise.

1.12.6 Project Management

Project Management Risk Score: 0.7

1.12.7 Data Management

	Yes	No
1. Does the Agency/state entity have an established data governance body with well-defined roles and responsibilities to support data governance activities?	○	◉
2. Does the Agency/state entity have data governance policies (e.g., data policies, data standards, etc.) formally defined, documented and implemented?	○	◉
3. Does the Agency/state entity have data security policies, standards, controls, and procedures formally defined, documented and implemented?	○	◉

Currently, data governance is managed at the system level, rather than the data level. Caltrans' business programs/divisions have generally independent systems which are typically siloed and managed by the business area. Interfaces are often designed to share information needed to perform a transaction, but master data resides in the originating system; updates to data in downstream systems do not flow back to the originating master data. Storage, archival, back-up, and other procedures are often system-specific, based on when the system was architected and by whom, including whether a system integrator was involved. User Access and security are also defined at the system/application levels. However, Caltrans applies general guidelines to help ensure that business program/division-owned systems are protected. Caltrans also has specific procedures on security and addressing cyber attacks, from a broader network and security perspective, rather than only a data or system perspective.

That said, Caltrans is considering its approach to data governance, including master data management. Caltrans recognizes further data integration across current and next generation systems is critical to the future. For example, sharing data across the Project Delivery Lifecycle (e.g., roadway design, procurement/contracting, construction) is vital to improving the construction management process. It is also important to downstream processes like roadway maintenance and operations, as well as transparency and sharing information with other agencies and stakeholders.

As noted above, Caltrans data is governed at the system level, and managed by the business programs/divisions. Metadata management, data reconciliation, validation, and cleansing occur at the system level. User Access and security are also defined at the system/application levels. Data-related policies and standards exist at the system level. For example, the Integrated Maintenance and Management System (IMMS) has a specific taxonomy and directives around how data is to be captured and entered into specific IMMS fields, such as how a District or a given highway asset is represented in the system. The system also has data validations built into the individual systems to ensure that users enter valid data, such as a District.

However, there is not yet a defined and documented enterprise-wide data governance policy or standards. For example, from system to system, there may be slightly different taxonomies and standards, such as listing District 1 as D1, D01 or just 1 in a field named "District."

Caltrans recognizes that a key goal of its future data governance process is to define select data at an enterprise level so that it can more easily be shared across the organization.

To safeguard and maintain data confidentiality, integrity, protection, and availability, Caltrans' has information security policies and controls in place to protect the Department's information assets.

Caltrans Deputy Directive (DD55 r2) distributes policy responsibility and control implementation to applicable business units. Business units that manage data with regulatory requirements, such as PII, maintain strict

control over access and data use procedures. With distributed responsibility, Caltrans Information Security Office does not have visibility into the level of formality and documentation implemented by the business units. Caltrans' Audits and Investigations Office is responsible for the monitoring and reporting of security and privacy policies.

The CISO has identified data classification and incident management deficiencies in the Plan of Action and Milestones (POAM), which is forecasted to be completed by December 31, 2018.

Department of Technology Use Only

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