Stage 1 Business Analysis

California Department of Technology, SIMM 19A.2 (Rev. 2.4), Revised 4/2/2018

1.1 General Information

Agency or State Entity Name:	California Department of Transportation, Division of Traffic Operations
Organization Code:	2660
Proposal Name:	California Advanced Transportation Management System (CATMS) Project
Proposal Description:	The California Department of Transportation (Caltrans), Division of Traffic Operations, proposes to replace the various control systems in all 12 Caltrans Transportation Management Centers (TMC) with a single uniform system to manage traffic on the state's highway network. TMCs currently use 11 different systems in various combinations, some of which are 25 years old. The new system will allow the department to standardize processes and training, improve interoperability and redundancy across TMCs, and reduce system licensing and maintenance costs.
When do you want to start this project?	7/1/2021
Department of Technology Project Number:	2660-546

1.2 Submittal Information

Contact Information:

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Submission Date:	4/24/2020
Version Number:	0.23

Project Approval Executive Transmittal

Attachment: Include the Project Approval Executive Transmittal as an attachment to the submission.

1.3 Business Sponsorship

Executive Sponsors

Title	First Name	Last Name	Business Program Area
Division Chief, Division of Traffic Operations	Jasvinderjit	Bhullar	Traffic Operations

Select + to add additional Executive Sponsors

Business Owners

Title	First Name	Last Name	Business Program Area
Office Chief, Office of System Operations	Joseph	Rouse	Traffic Operations

Select + to add additional Business Owners

Program Background and Context

Caltrans operates 12 Transportation Management Centers (TMC) throughout the state. TMCs are the nerve centers for the state's urban freeway and highway systems. Real-time information is gathered from many sources—electronic sensors in the pavement, freeway call boxes, video cameras, 911 calls, officers on patrol, Caltrans highway maintenance crews, ramp meter sensors, earthquake monitors, motorist cellular calls, and commercial traffic reporters—which is sent to the TMC 24-hours per day, seven days per week.

California has 12 TMCs, one in each Caltrans district, as shown in Figure 1. TMC staff make decisions and take actions as the information is received in the TMC, including critical operational tasks such as -- dispatching traffic management teams, routing freeway service patrol tow trucks, dispatching hazardous materials clean-up crews, alerting motorists via changeable message signs and communicating traffic reports to the media. The transportation management systems used by the TMC collect, analyze, present, and store data so that TMC staff can provide fast, intelligent, and coordinated responses to traffic conditions. The picture below, Figure 2, shows the actual Transportation Management Center (TMC) for District 12.

Transportation Management Center	Location
District 1	Eureka
District 2	Redding
District 3	Rancho Cordova
District 4	Oakland
District 5	San Luis Obispo
District 6	Fresno
District 7	Los Angeles
District 8	Fontana
District 9	Bishop
District 10	Stockton
District 11	San Diego
District 12	Irvine

Figure 1: Locations of Caltrans Transportation Management Centers

Figure 2: District 12 Transportation Management Center

The Caltrans Headquarters Division of Traffic Operations (HQ) is responsible for setting statewide policy for all TMCs; collecting, analyzing, and disseminating traffic management data; and supporting districts as they plan and deploy transportation system management and operations strategies to better manage existing infrastructures more efficiently. HQ collects vehicle information from the TMCs using the Caltrans Performance Measurement System (PeMS), which provides conditions on the state freeways. HQ provides traveler information, such as travel times and alerts, to the public through QuickMap, 511, and the Caltrans Highway Information Network (CHIN).

Software and field elements (e.g., ramp meters, electronic pavement sensors) used to observe and manage the transportation system network are known as Intelligent Transportation Systems (ITS). Many of Caltrans' existing ITS systems have been operating for nearly 25 years. These systems have served the state well, allowing the TMC staff to manage traffic flows as the number of vehicles on the road and the number of highway lane miles to be managed have continued to increase. They have also helped the department partially meet the federal mandate for real-time system management information systems (23 CFR 511).

The high-level business functions that will need to be addressed by the proposed system cover the following areas:

- Transportation Management Center (TMC) Operations – This key operational area is the focus for operators and dispatchers within each of the districts and covers key functions such as Activity Logging, Configuration, Connected Vehicles, Electronic Message Boards and Environmental Information.
- Ramp Metering Operations & Support – This operational and support function focuses on maintaining the Ramp Metering Plans using Adaptive Ramp Metering, Configuration, High Occupancy Vehicles and Main Line Metering.
- Transportation Management System (TMS) Support – This support function entails maintaining the complex hardware, technologies, and processes for performing an array of functions, including data acquisition, command and control, computing, and communications. Disruptions or failures in the performance of these functions can impact traffic safety, reduce system capacity, and ultimately lead the traveling public to lose faith in the transportation network. System failures also have the potential to cause measurable economic loss and increase congestion, fuel consumption, pollutants, and traffic crashes. The problem is further complicated by the fact that

today's systems, subsystems, and components often are highly interdependent, meaning that a single malfunction can critically impact the ability of the overall systems to perform their intended functions.

- Central Systems Support – This support function allows for key administrative activities to be performed to maintain the central systems. Managing the support personnel's Single Sign-On roles, permissions and groups is a key function to maintain the strict security standards. This area also allows for reporting and the use of performance dashboards to monitor the on-going support of the systems.

Additional detail on the functional categories is included within the attachment, Attach 1 – Functional Business Category Descriptions CATMS.

The proposed CATMS project would replace the various existing legacy ITS in the twelve Caltrans TMCs with a new solution. The Caltrans ITS systems that CATMS will replace include:

- Advanced Transportation Management System (ATMS) -- is a system used to monitor the freeway system using vehicle detectors and video from roadside cameras. The ATMS also sends Operator messages and travel times to variable message signs and controls roadside video cameras. The ATMS contains an event management application that monitors and tracks incidents and provides the Operator incident response plans that are used to manage incidents in real-time. Six Caltrans Districts use the ATMS.
- Intelligent Roadway Information System (IRIS) -- is a system that monitors the freeway system and roadside weather systems. IRIS also controls field devices such as variable message signs and roadside cameras. IRIS is used in four of the primarily rural Caltrans Districts.
- Satellite Operations Command and Control System (SOCCS) -- is a system to control variable message signs and roadside cameras. SOCCS is used in two different Caltrans Districts. In District 11, SOCCS is used as a back-up to ATMS in controlling Changeable Message Signs (CMS).
- Transportation Management Center Activity Log (TMCAL) -- is primarily an event recording system used to log activities of both the TMC Operators and TMC Dispatchers. TMCAL has interfaces to systems such as Caltrans Highway Information Network (CHIN), California Highway Patrol (CHP) Media CAD, and QuickMap. This system is used in 9 of the 12 Caltrans districts.
- Daily Incident Activity Log (DIAL) -- Web-based event recording systems used to log activities of Operators for incident management. DIAL has the capability to email detailed Incident History Reports and Incident Summaries. This system is used by Caltrans District 12.
- Transportation Management Computer Aided Dispatch (TMCAD) -- is primarily an event recording system used to log activities of both the TMC Operators and TMC Dispatchers. TMCAD is used by Districts 6 and 10.
- Bay Area Incident Response System (BAIRS) -- is primarily an event recording system used to log activities of both the TMC Operators and TMC Dispatchers. This system is used exclusively in District 4.
- PC Data Concentrator (PCDC) -- the PCDC provides the ATMS with the ability to interact with field equipment including Vehicle Detection Station (VDS), Ramp Metering System (RMS), Multi-Lane Metering System (MLMS) and Extinguishable Message Sign (EMS) devices. PCDC is utilized in District 4.
- Ramp Metering Information System (RMIS) -- collects traffic data from field devices every thirty (30) seconds then sends data to ATMS using an Extensible Markup Language (XML) file. RMIS is used in six different Caltrans Districts.
- Camera Control System (CCS) – the CCS is a camera control system used in District Transportation Management Centers to monitor traffic and confirm incidents. CCS is used by Districts 4 and 11.
- Fog Detection and Warning System (FDWS) – the FDWS consists of visibility sensors, speed detectors and cameras to detect congestion and visibility problems that could affect driver and passenger safety. FDWS is used in District 6.

The table below, Figure 3, shows the comparison of the impacted legacy systems that would be replaced by CATMS and the current business function that each system currently supports.

	SYSTEM										
Business Function	**ATMS**	**IRIS**	**SOCCS**	**TMCAL**	**DIAL**	**TMCAD**	**BAIRS**	**PCDC**	**RMIS**	**CCS**	**FDWS**
TMC Operations											
Activity Logging	X			X	X	X	X				
Camera Control	X	X	X							X	
Chain Control				X		X					
Dynamic Lane Control	X										
Electronic Message Boards	X										
Environmental Information											X
Incident Management	X										
Congestion Management	X	X									
Special Event Management	X										
Debris Management	X			X	X	X	X				
Highway Advisory Radio	X										
Integrated Corridor Management	X										
Changeable Message Signs	X	X	X								
Notification and Callouts							X				
Reporting	X	X	X	X	X	X	X	X	X	X	X
Travel Times	X	X									
Traveler Information	X	X									
User Interface	X	X	X	X	X	X	X	X	X	X	X
Video Wall	X										
Ramp Metering Operations & Support											
Adaptive Ramp Metering	X										
Configuration	X							X	X		
High Occupancy Toll/Managed Lanes	X										
Main Line Metering	X										
Ramp Metering	X							X	X		
Reporting	X							X	X		
TMS Field Support											
Camera Control	X	X	X							X	
Configuration	X	X	X					X	X	X	X
Highway Advisory Radio	X										
Changeable Message Signs	X	X	X								
Reporting	X	X	X					X	X	X	X
Roadway Weather Information System		X									X

Traffic Sensors	X	X						X	X		
Central Systems Support											
Administration	X	X	X	X	X	X	X	X	X	X	X
Configuration	X	X	X	X	X	X	X	X	X	X	X
Diagnostics	X	X	X	X	X	X	X	X	X	X	X
Reporting	X	X	X	X	X	X	X	X	X	X	X

Figure 3: Relationship of Legacy ITS Systems with Current Business Functions

The identified stakeholders for the proposed project include various levels of the Caltrans department. At the Executive level, the stakeholders include four of the Deputy District Directors from the Caltrans Districts that will serve on the Executive Steering Committee and also help to support the organizational change that will be necessary for transitioning from district-specific systems to a state-wide standardized system that will help the State meet the goal of interoperability.

At the functional level, a stakeholder group consisting of the Caltrans district functional managers who are acting as the subject matter experts for the proposed project. This group of key stakeholders will help drive the standardization necessary in a state-wide system and will ensure the varying needs of the different districts can be met within a new system. An additional stakeholder group at the functional level was included to highlight the maintenance function. The critical role that the maintenance of statewide traffic management system inventory of all traffic-related electrical devices and systems including roadway and street lighting, traffic signals is highlighted.

The project sponsor is also listed as a key stakeholder for the proposed project. As the Division of Traffic Operations Division Chief, the sponsor is committed to consolidating into one state-wide standardized system that will drive interoperability within the Caltrans Districts, while also advancing the technology to more efficiently manage the complex transportation landscape within the State.

The general traveling public who uses the California roadways has been identified as an external stakeholder for the CATMS project. The traveling public would benefit from an effectively managed automated transportation management system that would manage travelers throughout the state and have a positive impact on travel times and safety.

The California Highway Patrol (CHP) has also been identified as an external stakeholder group. The CHP and the Caltrans TMCs work in close coordination in responding to traffic events on the California roadways. The CHP is often the first agency to be alerted to an emergency on California's highways. Once the notification is passed along to the District TMC the operations team will assist in managing the event to its conclusion and coordinate the clean-up and critical steps in returning the highways to a safe and fully functional status.

Information Technology also plays a significant role within the stakeholder community and will work very closely with their business partners in Traffic Operations to validate the key technology decisions required in implementing a state-wide system.

1.4 Stakeholders

Key Stakeholders	
Org. Name	Name
Caltrans Deputy District Directors from Caltrans Districts 2, 4, 6 and 7 (Executive Level)	Don Anderson (District 2), Sean Nozzari (District 4), John Liu (District 6) and Rafael Molina (District 7)

Internal or External?	☒ Internal ☐ External	
When is the Stakeholder impacted?		
Input to Business Process	During the Business Process	Output of the Business Process
☐	☐	☒

How are Stakeholders impacted?

Output of the business process: The Executive level stakeholders are primarily Deputy District Directors from four of the Caltrans districts. The stakeholders are impacted through an operational change of this proposed system replacing the TMC personnel's primary ITS for managing traffic in the district. Caltrans District executive staff are responsible for the timely and accurate delivery of traffic information to California travelers. The business processes and systems under evaluation generate performance data on traffic control and traffic safety. This information is used by the Caltrans District executive staff to submit performance and program evaluation to control agencies such as the Federal Highway Administration (FHWA), California State Transportation Agency (CalSTA) the California Legislature, and other transportation agencies.

How will the Stakeholders participate in the project?

District executives from Caltrans District 2, 4, 6 and 7 will participate in:

- Monthly Executive Steering Committee meetings
- Approval/denial of project authorization documents (e.g., Project Approval Lifecycle documents, vendor contracts)
- Respond/resolve escalated items requiring Executive Steering Committee attention
- Monitor project progress to ensure adherence to department policies and procedures
- The Executive Steering Committee is accountable to the control agency for communications related to the proposed project

Org. Name	**Name**
Caltrans District Functional Managers (Subject Matter Experts)	Each of the 12 Caltrans Districts is providing a Manager to cover the key functional areas of: • Transportation Management Center (TMC) Operations • Ramp Metering Operations & Support • Transportation Management Systems (TMS) Support • Central Systems Support
Internal or External?	☒ Internal ☐ External

When is the Stakeholder impacted?		
Input to Business Process	During the Business Process	Output of the Business Process
☒	☒	☒

How are Stakeholders impacted?

The Transportation Management Center operators and dispatchers will have their primary ITS for managing traffic in the district replaced.

Inputs to the business processes include:

- Environmental factors such as weather that would trigger a specific usage of a system (i.e. Fog Detection)
- Notification of traffic issues from external sources such as the California Highway Patrol (CHP) Media Computer Aided Dispatch (CAD), call-in reporting by vehicle passengers and media reporting

During the business process the stakeholders participate by:

- Dispatching the appropriate personnel based upon the scenario being monitored
- Engaging Caltrans District Emergency Operation Center (EOC) depending upon the severity of the incident
- Ensure the Caltrans Highway Information Network (CHIN) and Caltrans QuickMap have the current status of the roadway based upon the scenario being monitored.

Outputs from the business processes include:

- Monitoring the corrective action taken by the TMC staff to assess if it had the desired result.
- Applying preventive measures to correct the traffic situation by using various traffic management strategies such as ramp metering and changeable message signs.

How will the Stakeholders participate in the project?

Relevant TMC staff/functional area specialists will participate in the project as follows:

- Monthly stakeholder meetings
- Monthly project management meetings
- Requirements definition and validation
- Provide interface specifications (e.g., interface control documents) for interfaced ITS field elements, as necessary
- Configuration design with the solution vendor
- Development of test strategies and scripts
- User acceptance testing
- End-user training

District management will participate in:

- Periodic Change Control Board meetings

Org. Name	**Name**
Caltrans Office of Traffic Systems Maintenance	Jaswinder Bhullar, Chief, Office of Traffic Systems Maintenance
Internal or External?	☒ Internal ☐ External

When is the Stakeholder impacted?

Input to Business Process	During the Business Process	Output of the Business Process
☒	☒	☒

How are Stakeholders impacted?

The Transportation Management System (TMS) Maintenance Engineers (TME's) will have their primary ITS for managing traffic in the district replaced.

Inputs to the business processes include:

- Develop efficient troubleshooting and repair processes to minimize the Transportation Management System (TMS) unit downtime.
- Scheduled preventive maintenance events to traffic monitoring equipment or response to a detected error or malfunction in the monitoring equipment.

During the business process the stakeholders participate by:

- Dispatching the appropriate personnel based upon the scenario being monitored
- Performing preventative maintenance checks and functional tests on TMS units
- Managing all TMS unit inventory including communication systems and subcomponents

Outputs from the business processes include:

- Monitoring the corrective action taken by the TMC staff to assess if it had the desired result.
- Advise Traffic Operations of TMS units with chronic performance issues for early life cycle replacement
- Verify that recurring maintenance plans are being followed to keep traffic monitoring equipment up to date and fully functional.

How will the Stakeholders participate in the project?

Relevant TMS Maintenance Engineers/functional area specialists will participate in the project as follows:

- Monthly stakeholder meetings

- Monthly project management meetings
- Requirements definition and validation
- Provide interface specifications (e.g., interface control documents) for interfaced ITS field elements, as necessary
- Configuration design with the solution vendor
- Development of test strategies and scripts
- User acceptance testing
- End-user training

Org. Name	**Name**
CATMS Project Sponsor	Jasvinderjit Bhullar Division Chief, Division of Traffic Operations
Internal or External?	☒ Internal ☐ External

When is the Stakeholder impacted?

Input to Business Process	During the Business Process	Output of the Business Process
☐	☐	☒

How are Stakeholders impacted?

The CATMS project sponsor serves as a contact for the overall accountability of the project. This key project driver plays a vital leadership role to ensure that the project delivers the agreed-upon business benefits and acts as the representative of the Caltrans' organization. As the Division of Traffic Operations Division Chief, the sponsor is committed to consolidating into one state-wide standardized system that will drive interoperability within the Caltrans Districts, while also advancing the technology to more efficiently manage the complex transportation landscape within the State of California.

Output of the business process related to the Project Sponsor: The Project Sponsor is impacted through an operational change of this proposed system replacing the TMC personnel's primary ITS for managing traffic in the district. Caltrans District executive staff are responsible for the timely and accurate delivery of traffic information to California travelers. The business processes and systems under evaluation generate performance data on traffic control and traffic safety. This information is used by the Caltrans executive staff to submit performance and program evaluation to control agencies such as the Federal Highway Administration (FHWA), California State Transportation Agency (CalSTA), the California Legislature, and other transportation agencies.

How will the Stakeholders participate in the project?

The CATMS Project Sponsor will participate in:

- Monthly Executive Steering Committee meetings
- Approval/denial of project authorization documents (e.g., Project Approval Lifecycle documents, vendor contracts)
- Respond/resolve escalated items requiring Executive Steering Committee attention
- Monitor project progress to ensure adherence to department policies and procedures
- The Project Sponsor is accountable to the control agency for communications related to the proposed project
- Any escalation needed for decisions and issues that are beyond the authority of the project manager

Org. Name	**Name**
General Traveling Public within the State of California	
Internal or External?	☐ Internal ☒ External

When is the Stakeholder impacted?

Input to Business Process	During the Business Process	Output of the Business Process
☐	☐	☒

How are Stakeholders impacted?

The general traveling public who uses the California roadways has been identified as an external stakeholder for the CATMS project. While the traveling public would not directly interact with the proposed CATMS system, the public would benefit from an effectively managed automated transportation management system that would manage travelers throughout the state and have a positive impact on travel times and safety.

Caltrans provides multiple sources of traveler information, such as travel times and alerts, to the general traveling public through QuickMap, 511, and the Caltrans Highway Information Network (CHIN). Caltrans also operates the Commercial Wholesale Web Portal (CWWP) that includes information such as:

- Vehicle Speed and Volume Traffic Data
- Closed Circuit Television (CCTV) Video Images
- Changeable Message Sign (CMS) Traffic Messages posted on electronic variable message signs
- Lane Closure System (LCS) Data
- Roadside Weather Information System (RWIS) Weather and Fog information

How will the Stakeholders participate in the project?

The general driving public within the State of California will not be directly involved within the CATMS project, but will benefit from the Caltrans usage of a more efficient automated transportation management system that assists in the operational improvements in the following key functional areas managed by the 12 Caltrans Districts:

- Transportation Management Center (TMC) Operations
- Ramp Metering Operations & Support
- Transportation Management Systems (TMS) Support
- Central Systems Support.

Org. Name	**Name**
California Highway Patrol (CHP) and Freeway Service Patrol (FSP) (External Agencies)	
Internal or External?	☐ Internal ☒ External

When is the Stakeholder impacted?

Input to Business Process	During the Business Process	Output of the Business Process
☒	☐	☐

How are Stakeholders impacted?

The California Highway Patrol (CHP) and the Freeway Service Patrol (FSP), which is a jointly managed program with Caltrans that assists in keeping the California roadways safe, have been identified as external stakeholders for the CATMS project. Continued collaboration between Caltrans and the CHP will help to drive efficiencies and a new automated transportation management system would assist in the coordination of emergencies on California's highways.

The Freeway Service Patrol (FSP) program would gain some efficiencies in the new automated system that could assist the FSP by helping to achieve the goal of reducing freeway congestion by using the fleets of roving tow trucks and service trucks that look for disabled vehicles and minor accidents and quickly clear them from the highways.

Input to the business processes include:

- Notification of traffic issues from external sources such as the California Highway Patrol Media Computer Aided Dispatch (CAD).
- Notification reporting from motorists and the media.
- Using data coming from the CHP Media CAD system to capture FHWA performance measures for traffic incident management.

- The CHP's Emergency Notification and Tactical Alert Center (ENTAC) will distribute critical emergency information to mobile phones in the affected geographic area through the Wireless Emergency Alerts (WEA) program.

How will the Stakeholders participate in the project?

The California Highway Patrol will not have heavy involvement with the CATMS project, but will benefit along with the general driving public from the Caltrans usage of a more efficient automated transportation management system that assists in the operational improvements in the following key functional areas managed by the 12 Caltrans Districts:

- Transportation Management Center (TMC) Operations
- Ramp Metering Operations & Support
- Transportation Management Systems (TMS) Support
- Central Systems Support.

Org. Name	**Name**
Caltrans Information Technology	IT functional area specialists
Internal or External?	☒ Internal ☐ External

When is the Stakeholder impacted?

Input to Business Process	During the Business Process	Output of the Business Process
☐	☒	☐

How are Stakeholders impacted?

Caltrans Information Technology (IT) is responsible for the administration and support of the department's computer information systems. Current IT support of the TMCs is limited to infrastructure and network support. ITS software applications are currently supported by business teams or third-party vendors.

How will the Stakeholders participate in the project?

Relevant IT functional area specialists will participate in the project as follows:

- Monthly stakeholder meetings
- Periodic project management meetings
- Ensure the solution meets the department's requirements
- Requirements definition and validation
- Configuration design with a solution vendor
- Development of test strategies and scripts
- IT Resources are identified for future IT support needs
- Participate in project software development lifecycle (SDLC) including project management and oversight functionalities
- Definition, design, and buildout of future IT network and infrastructure

IT management will participate in:

- Periodic Change Control Board meetings

Select + to add additional Stakeholders

1.5 Business Program

Org. Name	**Name**
Caltrans HQ Division of Traffic Operations	Joseph Rouse

When is the unit impacted?

Input to the Business Process	During the Business Process	Output of the Business Process
☒	☐	☒

How is the business program unit impacted?

The Headquarter Division of Traffic Operations stakeholders is primarily the executive and management layer of the organization representing the business unit of Traffic Operations. Caltrans executive staff are responsible for the timely and accurate delivery of traffic information to California travelers. The business processes and systems under evaluation

generate performance data on traffic control and traffic safety. This information is used by the Caltrans District executive staff to submit performance and program evaluation to control agencies such as the California State Transportation Agency (CalSTA) the California Legislature, the Federal Highway Administration (FHWA) and other transportation agencies.

Inputs to the business processes include:

- Transportation Policies and Standards

Outputs from the business processes include:

- Reporting of performance data on traffic control and traffic safety.
- Submittal of performance and program evaluation to control agencies such as the California State Transportation Agency (CalSTA), the Federal Highway Administration (FHWA) and other transportation agencies.

How will the business program participate in the project?

Relevant HQ functional area specialists will participate in the project as follows:

- Monthly stakeholder meetings
- Monthly project management meetings
- Requirements definition and validation
- Provide interface specifications (e.g., interface control documents) for interfaced systems
- Configuration design with the solution vendor
- Development of test strategies and scripts
- User acceptance testing
- End-user training

HQ executives will participate in:

- Monthly Executive Steering Committee meetings
- Approval/denial of project authorization documents (e.g., Project Approval Lifecycle documents, vendor contracts)

HQ management will participate in:

- Periodic Change Control Board meetings

Select + to add additional Business Programs

1.6 Business Alignment

Business Driver(s)

Financial Benefit

Increased Revenue	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	Technology End of Life

☒	☒	☒	☒

Strategic Business Alignment	
Strategic Plan Last Updated – This is the original submittal of the Stage 1 Business Analysis	11/30/2016
Strategic Business Goal	Alignment
Safety and Health	Improve the health and safety of the workers and users, by providing a safe transportation system that promotes health through active transportation and reduced pollution in communities.
Strategic Business Goal	Alignment
Stewardship and Efficiency	Improve the effectiveness, maintainability, and sustainability of Caltrans traffic management elements, by aligning the operations and support processes; thereby promoting better stewardship of the Departments Transportation assets.
Strategic Business Goal	Alignment
System Performance	Provide a roadmap for Caltrans traffic management elements in identifying the common and unique features, functions, and reports, thereby improving the integration and operation of the Caltrans transportation system.
Strategic Business Goal	Alignment
Organizational Excellence	Provide a broader view of Caltrans traffic management functions to interface better with Regional Partners, thereby improving a collaborative partnership with agencies.
Select + to add additional Business Goals and Alignment	

Executive Summary of the Business Problem or Opportunity

Twenty-five years ago Caltrans was at the forefront of ITS usage in the country. In the interim, ITS technology has changed considerably, and districts have independently updated the ITS in their TMCs to meet their business needs in each district. This lack of a standardized state-wide ITS has resulted in several significant problems.

Interoperability and Remote Management

Although the original vision of the TMCs statewide was that they would all be interconnected and able to support each other after normal business hours or in the event of an emergency, this is not the case today. There is a lack of interoperability, remote management, and redundancy across TMCs. Each district's highway network can be managed by only one TMC. When a TMC is negatively impacted by a significant failure (e.g., electrical outage, fire, flood, etc.), the district's highway network cannot be managed from another location. For example, in the Summer of 2018, District 2 TMC was overcome by a wildfire and TMC personnel had to be evacuated. The TMC's operations could not be located to another location, and Caltrans was unable to manage the highway network remotely during this emergency. If a TMC was adversely affected with a shortage of personnel due to an issue like the COVID-19 response, the TMC may continue to operate, but the TMC staff may not be able to effectively operate the systems in another TMC location due to a lack of familiarity with the unique set of systems used by each District.

Technology Refresh for Outdated Technology

The CATMS project provides the opportunity to consolidate legacy systems and refresh the TMCs' ITS technology. In the case of the legacy Advanced Transportation Management System (ATMS) deployed in six districts, the key system elements have surpassed their end-of-life and are no longer supported by the vendor. Also, without a common system, any future ITS growth in the districts will utilize systems that are already divergent. This critical system update and standardization of procedures will allow the department to reach the goal of interoperability while providing a solid foundation for operating the state's highway network into the future. The creation of an updated infrastructure will

allow the State to safely manage future large-scale transportation-related events such as the Super Bowl (February 2022), FIFA World Cup (Summer 2026), and the Summer Olympics (July/August 2028). Also, the State will benefit from a reduction in the risk of cyber-security vulnerabilities associated with multiple system logins, permissions and groups while eliminating the risk of core incident management systems failures that result from using technology that is no longer supported by the vendor.

Now, multiple vendors are offering viable, commercial ITS that provide out-of-the-box capabilities equal to or surpassing current Caltrans ITS. One of the key differences is the commercial products contain up-to-date technologies built on platforms that can easily expand in the future to address growth and be interconnected to provide interoperability among the districts.

Lack of Statewide Standardization for Training, Maintenance and Operations

The number of divergent systems means that the state cannot standardize procedures across districts and users must be trained on different systems. California Polytechnic State University (Cal Poly), San Luis Obispo, runs a TMC training program for Caltrans. However, because of the number of different systems in each district, this training facility does not run the same traffic management software as many of the district TMCs. This means that TMC staff are trained on one set of software and then must learn another set of software when they return to their districts. Finally, multiple systems must be administered separately in each district and maintenance contracts for the separate systems are more than $600,000 annually.

All of the business objectives described below would be achieved within 3 months of the successful implementation or "Go Live" of the system and will all be measured and reported upon during the formal project closedown.

Business Problem or Opportunity and Objectives Table	
1	Improved Business Continuity and Improved Technology Recovery: Each district's highway network can be managed by only one TMC. When a TMC is negatively impacted by a significant failure or event (e.g., electrical outage, fire, flood, pandemic), the district's highway network does not allow for remote interoperability from another TMC, thereby not addressing the safety issues related to the TMC's critical operations and leaving the California roadways at risk.
Objective ID	1.1
Objectives	Within 3 months of the successful completion of a solution each of the 12 TMCs statewide will have a standardized set of software that will allow their vital business operations to be relocated or managed remotely from another facility within a set amount of time in accordance with the Business Continuity Procedures.
Metric	The number of TMCs whose vital business operations can be relocated or managed remotely from another facility within an amount of time that is in accordance with the Business Continuity Procedures.
Baseline	0 TMCs
Target	12 TMCs
Measurement Method	Observation and verification. Review the number of TMCs whose vital business operations can be relocated to another facility, verified by a successful Business Continuity test as part of the successful implementation of the proposed system.
Select + to add additional Objectives	
2	Technology End of Life: Traffic Operations Division delivers business functionality, as identified in Figure 3 above, by operating the Advanced Transportation Management System (ATMS) from a Commercial-Off-The-Shelf (COTS) software that is no longer supported by the vendor and does not allow for system recovery in the case of disaster.
Objective ID	2.1

Objectives	Within 3 months of the successful completion of the CATMS project, the delivery of the new business functions identified in Figure 3 above will be in a system that is 100% supportable through a maintenance and support agreement with the maintenance vendor.
Metric	The vendor supportability of the Advanced Transformation Management System in percent (%) support.
Baseline	0% support for ATMS
Target	100% support for business functionality within CATMS
Measurement Method	Observation and verification. Review of the vendor maintenance contract managed by Caltrans to verify that the proposed system is supportable by the new vendor.
Problem ID	Problems/Opportunities
3	Improve System Performance: Traffic Operations Division is committed to providing real-time traffic and travel conditions on the State highways to the pubic, which allows the public to make informed travel choices. Currently, there is no consistency in using tools for logging actions, activities and a reporting system among the 12 Caltrans districts, which could lead to data quality issues and errors in reporting information to the public.
Objective ID	3.1
Objectives	Within 3 months of the successful implementation of a solution, the processes for reporting information in 6 key functional areas would be consistently followed by each of the TMCs allowing for better quality data and more accurate information provided to the public.
Metric	The key operational processes in generating reporting in the following 6 business areas would be consistent throughout all of the TMCs: • Traveler Information (CHIN) • Incident Management • Managed Lanes • TMC Operations • Traffic Signals • Ramp Metering
Baseline	Multiple processes for reporting information from various sources, reporting requirements, collection methods and communication to Caltrans HQ.
Target	A single standardized process for reporting information in each of the 6 business areas identified.
Measurement Method	Observation and verification. Review of the formal reports at Headquarters to account for consistency in the source of the data being reported, reporting requirements, collection methods and distribution of the information to Headquarters.
Select + to add additional Objectives	
4	Efficiencies to program operations: The Cal Poly TMC training center does not run the same traffic management software as many of the district TMCs. Therefore, trained users return to their home TMCs to use systems that are different than the systems they were trained on, thereby reducing the effectiveness of their training.
Objective ID	4.1
Objectives	Within 3 months of the successful completion of a solution the standardized system installed within the 12 TMCs statewide will be successfully installed at the Cal Poly TMC training center allowing for consistent training of the TMC staff at a facility that mirrors the District's production environment making the staff better prepared for their job and more capable of handling safety issues.

Metric	The standardized systems at each district TMC are the same as the systems at the Cal Poly TMC training center.
Baseline	Non-standard set of systems at TMCs
Target	One standardized system at the Cal Poly TMC and the 12 District TMCs.
Measurement Method	Observation and verification. Review the Cal Poly training center formal training plan for the proposed system to validate that the system is functioning as designed and is the same system installed within the 12 TMCs statewide.
Select + to add additional Objectives	
5	Federal Mandate compliance for Program Operations: Traffic Operations is only partially compliant with the traffic and travel condition reporting requirements to meet the federal mandate for real-time system management information systems (23 CFR 511).
Objective ID	5.1
Objectives	Within 3 months of the successful completion of a solution data will be stored to meet the format and time requirements for blocking incidents, weather observations, and travel times for the following Routes of Significance: Sacramento (50 and 99), San Francisco (24, 92, and 101), San Jose (101), Los Angeles (55, 57, 60, 91, 101, 134, and 210), Riverside (60 and 91), and San Diego (15, 52, 54, 94, 163, and 905).
Metric	The number of routes of significance meeting the requirements of federal mandate 23 CFR 511.
Baseline	10 Routes of Significance fully align with the federal mandate in Sacramento, Riverside, and San Diego.
Target	21 Routes of Significance fully align with the federal mandate in Sacramento, San Fransisco, San Jose, Los Angeles, Riverside, and San Diego.
Measurement Method	Observation and verification. Validation to confirm the availability of data for all 21 routes of significance within the CWWP and that it meets the format, accuracy and time requirements of federal mandate 23 CFR 511.
6	Organizational Excellence: The Traffic Operations Division needs to retain all core business functions within the four main business areas of TMC Operations, Ramp Metering Operations and Support, TMS Field Support and Central Systems Support, thereby assuring no negative impacts to TMC Operations performance, while creating a single platform for accomodating changes needed to support emerging technologies.
Objective ID	6.1
Objectives	Within 3 months of the successful implementation of a solution, the functional business areas of the TMC Operations, Ramp Metering Operations and Support, TMS Field Support and Central System Support will be retained within a single system for the 12 TMCs statewide, thereby realizing continued service excellence by the TMC Operations staff.
Metric	The number of different systems required to support the four main business areas of TMC Operations, Ramp Metering Operations and Support, TMS Field Support and Central Systems Support.
Baseline	11 different systems support the four key business functional areas
Target	1 standardized state-wide system supporting the four key business functional areas
Measurement Method	Observation and verification. Review the business functionality of the single standardized state-wide system and verify that the four main business functional area requirements are included and accepted by the TMC Operations user group as part of formal acceptance of the system.
Select + to add additional Problems	
Project Approval Lifecycle Completion and Project Execution Capacity Assessment	

1. Does the proposal development or project execution anticipate sharing resources (state staff, vendors, consultants or financial) with other priorities within the Agency/state entity (projects, PALs, or programmatic/technology workload)?	
(●) Yes ( ) No ( ) Clear	
2. Does the Agency/ state entity anticipate this proposal will result in the creation of new business processes or changes to existing business processes?	
( ) No ( ) New Processes ( ) Existing Processes (●) Both New and Existing ( ) Clear	

1.7 Project Management

Project Management Risk Score:	0.8
Attach completed Statewide Information Management Manual (SIMM) Section 45 Appendix A:	Include the completed SIMM 45 Appendix A as an attachment to your email submission. Attachments related to this section include: Attach 2 – SIMM_45_Appendix_A_PM Risk Assessment CATMS Attach 3 – DG1 – Data Governance Org Chart Attach 4 – DG3 – SP2017-01_SaaS_Security_Practice Attach 5 – DG3 – SP2017-02_Information_Storage Attach 6 – DG3 – SP2018-03_TMC_Network_Segmentation Attach 7 – DG3 – SP2018-04_Tech_Recovery_Planning Attach 8 – DG3 – SP2018-05_Remote_Access_Management Attach 9 – DG3 – SP2018-06_Continuous_Monitoring_and_Scan_Mgmt Attach 10 – DG3 – SP2019-01_Third-Party_Access Attach 11 – DG3 – SP2019-02_Non-Employee_Accounts Attach 12 – DG4 – SIMM_25_IT_Accessibility_Resource_Guide

Existing Data Governance and Data

1. Does the Agency/state entity have an established data governance body with well-defined roles and responsibilities to support data governance activities? If an existing data governance org chart is used, please attach.	( ) Unknown (●) Yes ( ) No ( ) Clear	If applicable, include the data governance org chart as an attachment to your email submission.
2. Does the Agency/state entity have data governance policies (data policies, data standards, etc.) formally defined, documented, and implemented? If yes, please attach the existing data governance plan, policies or IT standards used.	( ) Unknown ( ) Yes (●) No ( ) Clear	If applicable, include the data governance policies as an attachment to your email submission.
3. Does the Agency/state entity have data security policies, standards, controls, and procedures formally defined, documented, and implemented? If yes, please attach the existing documented security policies, standards, and controls used.	( ) Unknown (●) Yes ( ) No ( ) Clear	If applicable, include the documented security policies, standards, and controls as an attachment to your email submission.

	○ Unknown ◉ Yes ○ No ○ Clear	
		If applicable, include the data migration plan as an attachment to your email submission.
6. If data migration is required, please rate the quality of the data.	Some issues identified with the existing data	

1.8 Criticality Assessment

Business Criticality

Legislative Mandates:	N/A ☐	
Bill Number(s)/Code(s):		23 CFR 511 -- Traffic Operations is only partially compliant with the provisions for traffic and travel condition reporting requirements to meet the federal mandate for real-time system management information systems.
Language that includes system relevant requirements:		
Business Complexity Score	2.4	Include the completed SIMM 45 Appendix C as an attachment to your email submission. Attachment included: Attach 13 – SIMM_45_Appendix_C_ComplexityAssessment CATMS

Noncompliance Issues

Indicate if your current operations include noncompliance issues and provide a narrative explaining how the business process is noncompliant.

Programmatic Regulations	HIPPA/CJIS/FTI/PII/PCI	Security	ADA	Other	N/A
☐	☐	☐	☐	☐	☒

1. What is the proposed project start date?	7/1/2020
2. Is this proposal anticipated to have high public visibility?	◉ Yes ○ No ○ Clear

If "Yes," please identify the dynamics of the anticipated high visibility below:

If a Transportation Management Center (TMC) were to be negatively impacted by a significant failure (e.g., electrical outage, fire, flood), the district's highway network cannot be managed from another location. For example, in the Summer of 2018, District 2 TMC was overcome by a wildfire and TMC personnel had to be evacuated. The TMC's operations could not be relocated to another location, and Caltrans was unable to manage the highway network remotely during this emergency, which could result in delays to services that impact public safety, traveling, and the integrity of the highway system.

3. If there is an existing Privacy Information Assessment, include as an attachment to your email submission.

4. Does this proposal affect business program staff located in multiple geographic locations?	◉ Yes ○ No ○ Clear

If "Yes," provide an overview of the geographic dynamics below and enter the specific information in the space provided.

The Caltrans Headquarters Division of Traffic Operations (HQ) is responsible for setting statewide policy for all TMCs. California has 12 TMCs, one in each Caltrans district. Each TMC manages the traffic on the highway network within the relevant district. This project will affect staff within each of the 12 Caltrans Districts as well as staff within Headquarters.

City	State	Number of Locations	Approximate Number of Staff
Sacramento (Headquarters)	CA	1	5
Eureka (District 1)	CA	1	5
Redding (District 2)	CA	1	5
Rancho Cordova (District 3)	CA	1	10
Oakland (District 4)	CA	1	20
San Luis Obispo (District 5)	CA	1	5
Fresno (District 6)	CA	1	10
Los Angeles (District 7)	CA	1	20
Fontana (District 8)	CA	1	10
Bishop (District 9)	CA	1	5
Stockton (District 10)	CA	1	10
San Diego (District 11)	CA	1	15
Irvine (District 12)	CA	1	10

Select + to add Locations

1.9 Funding

1. Does the Agency/state entity anticipate requesting additional resources through a budget action to complete the project approval lifecycle?	○ Yes ◉ No ○ Clear
2. Will the state possibly incur a financial sanction or penalty if this proposal is not implemented? If yes, please identify the financial impact to the state below:	○ Yes ◉ No ○ Clear
3. Has the funding source(s) been identified for this proposal?	◉ Yes ○ No ○ Clear

FUNDING SOURCE		FUND AVAILABILITY DATE
General Fund	☐	Date Picker
Special Fund	☒	8/1/2019
Federal Fund	☐	Date Picker
Reimbursement	☐	Date Picker
Bond Fund	☐	Date Picker
Other Fund	☐	Date Picker
If "Other Fund" is checked, specify the funding:	• HQ operating expense funds (August 2019)	

	• District 4 State Highway Operation and Protection Program (SHOPP) funds for advanced transportation management systems (March 2020)

1.10 Reportability Assessment

1. Does the Agency/state entity's IT activity meet the definition of an IT Project found in the State Administrative Manual (SAM) Section 4819.2? If "No," this initiative is not an IT project and is not required to complete the Project Approval Lifecycle.	(•) Yes ( ) No ( ) Clear
2. Does the activity meet the definition of Maintenance or Operations found in SAM Section 4819.2? If "Yes," this initiative is not required to complete the Project Approval Lifecycle. Please report this workload on the Agency Portfolio Report. And provide an explanation below.	( ) Yes (•) No ( ) Clear
3. Has the project/effort been previously approved and considered an ongoing IT activity identified in SAM Section 4819.2, 4819.40? If "Yes," this initiative is not required to complete the Project Approval Lifecycle. Please report this workload on the Agency Portfolio Report.	( ) Yes (•) No ( ) Clear
4. Is the project directly associated with any of the following as defined by SAM Section 4812.32? Single-function process-control systems; analog data collection devices, or telemetry systems; telecommunications equipment used exclusively for voice communications; Voice Over Internet Protocol (VOIP) phone systems; acquisition of printers, scanners and copiers. If "Yes," this initiative is not required to complete the Project Approval Lifecycle. Please report this workload on the Agency Portfolio Report.	( ) Yes (•) No ( ) Clear
5. Is the primary objective of the project to acquire desktop and mobile computing commodities as defined by SAM Section 4819.34, 4989? If "Yes," this initiative is a non-reportable project. Approval of the Project Approval Lifecycle is delegated to the head of the state entity. Submit a copy of the completed, approved Stage 1 Business Analysis to the CDT and track the initiative on the Agency Portfolio Report.	( ) Yes (•) No ( ) Clear
6. Does the project meet all of the criteria for Commercial-off-the-Shelf (COTS) Software and Cloud Software-as-a-Services (SaaS) delegation as defined in SAM 4819.34, 4989.2 and SIMM 22 If "Yes," this initiative is a non-reportable project. Approval of the Project Approval Lifecycle is delegated to the head of the state entity; however, submit an approved SIMM Section 22 form to CDT.	( ) Yes (•) No ( ) Clear
7. Will the project require a Budget Action to be completed?	( ) Yes (•) No ( ) Clear
8. Is it anticipated that the project will exceed the delegated cost threshold assigned by CDT as identified in SIMM 10?	(•) Yes ( ) No ( ) Clear

9. Are there any previously imposed conditions place on the state entity or this project by the CDT (e.g., Corrective Action Plan)? If "Yes," provide the details regarding the conditions below.	○ Yes ◉ No ○ Clear
10. Is the system specifically mandated by legislation?	○ Yes ◉ No ○ Clear

Department of Technology Use Only

Original "New Submission" Date	6/23/2020	
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Form Status Date	6/23/2020	
Form Disposition	Approved	If "Other," specify:
Form Disposition Date	11/13/2020	