SHOPP Asset Management Pilot Request Form

SHOPPCPR: Ver 3 11/14

Submittal Date 08/14/2015

Caltrans

Division of Transportation Programming
State Highway Operation and Protection Program (SHOPP)

Project Manager: Aung Maung

Phone: (510) 286-4987

Dist	County	Route	Prefix	PM	Prefix	PM	EA	PPNO	Project ID
04	Alameda	980		1.2		1.2			

☐ Includes Multiple Locations (Complete Page 2 of this Form)

MPO: MTC

Project Location/Description (Include the nearest city, town or landmark)

This project proposes to upgrade the Advanced Transportation Management System (ATMS) and communications protocol interface used by the District 4 Transportation Management Center (TMC) located in the City of Oakland.

Need for project and proposed improvements (Elaborate using PID language)

Due to the age of the existing system software/hardware and the nature of expanded TMS needs (SMART corridors, adaptive ramp meeting, etc), the system and some of its interfaces/components experience scalability/stability issues and frequent crashes resulting in a lower overall performance. The proposed upgrade of the ATMS and communications protocol interface software and hardware will help attain the Strategic Management Plan's goals and is aligned with the Department's TMS standardization plan.

PA&ED / M200	02/01/2019	R/W Cert / M410	01/02/2020	CCA / M600	08/29/2025
PS&E / M380	11/01/2019	RTL / M460	02/03/2020	END Project / M800	11/21/2025

Capital ($1,000)
(Escalated to FY of Programming)

	FY	Cost
R/W	2020/21	$0
Construction	2020/21	$3,687
	Total Capital	$3,687

Support ($1,000)

	FY	Cost
PA & ED	2018/19	$111
PS & E	2018/19	$553
R/W	2019/20	$12
Construction	2020/21	$431
	Total Support	$1,107

Legislative District Numbers
(Separate multiple Districts with a comma)

State Assembly	18
State Senate	9
Congressional	13

☐ Approved ☐ Denied

CAPITAL CONSTRUCTION COST ESCALATION RATE: 3%

District SFP (Print)	Doanh Nguyen	District SFP (Sign)		Phone	(510) 286-6293
District Director (Print)	Bijan Sartipi	District Director (Sign)		Phone	(510) 286-5900
SHOPP Exec. (Print)		SHOPP Exec. (Sign)		Phone	

SHOPP Long Lead Request Form Attachment

04 -	Alameda	- 980
EA:	PPNO:	
EFIS:		

Multiple Locations Listing

Location	Perf Measure #	Performance Measure	County	Route	Prefix	PM	Prefix	PM	Bridge Number If Applicable
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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26									
27									
28									
29									
30									

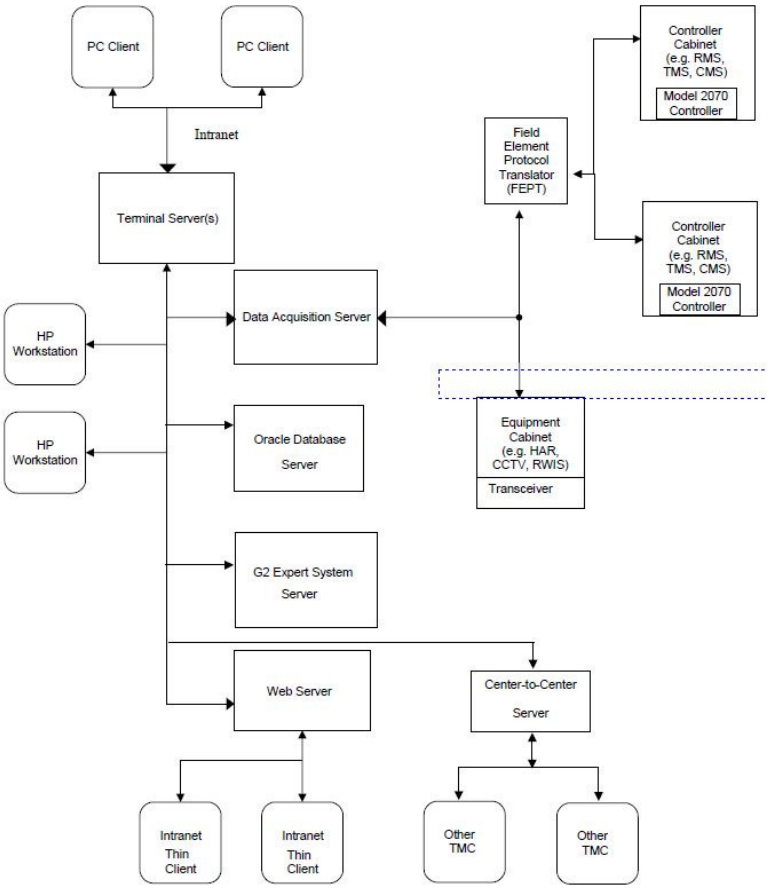
Note: Dist 4 ATMS manages over 4,000 active TMS elements.

Asset Management Pilot Project Nomination

This pilot project proposes to utilize the asset management pilot program to upgrade the Advanced Transportation Management System (ATMS) and communications protocol interface used by the District 4 Transportation Management Center (TMC) located at the District Headquarters in the City of Oakland. This project meets the Strategic Management Plan's objectives and is aligned with the Department's Transportation Management Systems (TMS) Standardization Plan.

Project Background

The Bay Area freeway network is one of the most extensive and complex metropolitan freeway systems in the country. Several corridors in the Bay Area exceed an average daily traffic volume of 225,000 vehicles. The District 4 TMC operates a freeway management system to enable real-time monitoring and strategy implementation on the region's freeways as well as to provide support to services such as Metropolitan Transportation Commission's (MTC) 511 Traveler Info, Freeway Service Patrol, and California Highway Patrol lead incident management. District 4 freeway management system is comprised of TMS field elements, communications and TMC software/hardware components. TMS field elements consist of, among other things, ramp meters (RM), changeable message signs (CMS), closed circuit TV cameras (CCTV), traffic monitoring stations (TMS), and arterial traffic signals. District 4 has over 4,000 active TMS elements. The freeway management system connection diagram is shown below:



ATMS is composed of a collection of inter-operating software applications which assist traffic operations personnel/TMC operators with the management of freeway operations. Some of the software component applications include traffic data acquisition, CMS, ramp metering management.
Field Element Protocol Translator (also called as PC-based Data Concentrator PCDC) serves as an interface which manages the communications protocol and the commands/traffic data (vehicle count, occupancy, speed, etc) transfer between ATMS and the TMS field devices.

In order to better manage the existing transportation infrastructure with limited capacity, the operational strategies (Integrated Corridor/SMART Corridor, Express lanes, Adaptive Ramp Metering, etc) that are focused on proactive, real-time operations, and actively managing the multimodal network across jurisdictional boundaries are desirable now. Those strategies require not only a robust and reliable transportation management system that meets the current needs, but is also scalable for the future system expansion.

Challenges

The existing PCDC and some components of the ATMS were originally installed over ten to fifteen years ago. Patches/updates to the legacy software/application and temporary workarounds were implemented to accommodate the current needs. As a result, the current system experiences reduced reliability and limited functionality, which impact the overall TMS performance.

Propose

This project proposes to develop during the project development phase the specifications for the ATMS and PCDC which satisfy not only the current needs, but also future system growth. It is anticipated that it might take up two years for the design/implementation of the system based on the developed specifications. Due to the nature of project type, a service contract is a better method to deliver the project.

Project Cost Estimate

Description of Work	Capital Outlay Construction Cost (in 1,000)
ATMS Application Upgrade	$2,000
ATMS Server Replacement	$500
PCDC Hardware and Software upgrade	$500
System Maintenance (3 years)	$180
Total	$3,180
Escalated to FY20/21 Cost (3% per year rate)	$3,687

Escalated Capital Outlay Construction Cost	$3,687
Capital Outlay Support Cost (30%)	$1,107
Total Capital	$4,794

Note: Contingency included in the line item estimate.

Project Schedule

Milestone	Target
PID Approval	4/2/2018
TIP Approval	10/1/2018
PA&ED	2/1/2019
PS&E	11/1/2019
RW Cert	1/2/2020
RTL	2/3/2020
CTC Vote	3/2/2020
Advertise Contract	7/1/2020
Award Contract	9/1/2020
Accept Contract	8/29/2025
End Contract	11/21/2025

Meeting Strategic Goals

Stewardship and Efficiency

Strategic Objective:

Effectively manage transportation assets by implementing the asset management plan, embracing a fix-it-first philosophy.

Achieving This Objective:

The proposed upgrades to the District's Advance Transportation Management System (ATMS) not only embraces the fix-it-first philosophy of the Department's Strategic Plan by improving the components of the system that are directly related to these upgrades, but also by making the use of the District's ITS components that are connected to ATMS more reliable and efficient. With the more fully integrated management system that an upgraded ATMS will provide, the use of ITS assets such as ramp meters, vehicle detection stations, closed circuit television cameras, and changeable message signs can be better managed. Additionally, moving to the upgraded system will allow for legacy field equipment that frequently goes down, such as Type 170 Controllers, to be replaced with more current hardware, such as Type 2070 Controllers, that is more reliable and can be remotely accessed, resulting in fewer field visits and more efficient use of the District's repair resources. All of these improvements will aid in achieving the Strategic Plan target of achieving 90% or better ITS element health by 2020.

Sustainability, Livability, and Economy

Strategic Objective:

Improve the quality of life for all Californians by providing mobility choice, increasing accessibility to all modes of transportation, and creating transportation corridors not only for conveyance of people, goods, and services, but also as livable public spaces.

Achieving This Objective:

As described earlier, the upgrades to the District's ATMS will result in better management and more efficient use of the District ITS components. Ultimately, the better management and efficient use of ITS components will result in better incident management and more reliable travel information being provided to the public, which allows the travelling public to make better mobility choices throughout all aspects of their lives.

System Performance

Strategic Objective:

Improve travel time reliability for all modes.

Reduce peak period travel times and delays for all modes through intelligent transportation systems, operational strategies, demand management, and land use/transportation integration.

Improve integration and operation of the transportation system.

Achieving These Objectives:

One of the overriding reasons for upgrading the District's ATMS is to improve the reliability of collecting vehicle detection station data. This data is use for, among many other things, determining travel time information that is provided to the travelling public via changeable message signs and 511.org. When this data is not available, the accuracy of travel time information is affected and travel time reliability is directly impacted. Upgrading of ATMS will decrease the amount of downtime related to detection data collection and aid in improving travel time reliability. Additionally, as described earlier, the upgrades to the ATMS will improve the District's ability to manage traffic incidents. This will aid in reducing traveler delay.

Organizational Excellence

Strategic Objectives:

Improve internal and external communication to better demonstrate professionalism and service levels to the public and stakeholders.

Improve partnerships with agencies, industries, municipalities, and tribal governments.

Achieving These Objectives:

The District's ATMS is the data backbone supporting the District 4 TMC. It is the hub through which information from the District's ITS field components is collected and disseminated to not only incident responders within the TMS, but also to outside agencies and the public via programs such as Caltrans' Performance Management System (PeMS), the MTC's 511 Traveler Info, and Traffic.com. With the proposed upgrades to ATMS, this data collection and distribution can be performed with much higher reliability and efficiency and allow the District's ITS assets to be used to their full potential, which will improve the Department's reputation as an agency that uses its resources appropriately and provides a discernible public service.