Project Name: Mobile Terrestrial Laser Scanning (MTLS)

OCIO Project #:
Department: Transportation
Revision Date: 9/15/10

Concept Statement

Description

Brief description of the proposed project:

Mobile Terrestrial Laser Scanning (MTLS) is a remote sensing technology that combines laser scanners, the Global Navigation Satellite Systems (GNSS), and an Inertial Measurement Unit (IMU) on a moving vehicle to collect and produce large amounts of geo-referenced data points called point clouds. Objects are created from the point clouds for export to CADD, GIS, Caltrans Roadway Design Software (RDS) and other programs. MTLS collects data at speed (or near speed), so no highway lane closures are required. Data collection is safer and faster with less disruption to the traveling public. This IT project will define the data storage, network transfer speed and software application requirements to efficiently archive, process, utilize and integrate MTLS point cloud data.

Need Statement

High Level Functional Requirements:

• Provide hardware and software, including a motor vehicle, necessary to perform data collection utilizing the new mobile technology.
• Provide data storage and backup capacity necessary to store large data files (i.e. point clouds) produced by the MTLS.
• Provide upgraded network infrastructure and more robust computer workstations to process and utilize the point cloud data.
• Provide software applications to support processing of the point cloud data.
• Provide the ability to archive and retrieve point cloud data.
• Provide the capability to integrate data collected by MTLS with data collected through other techniques such as stationary and airborne laser scanners and other forms of remote sensing.
• Develop proposals and processes for utilizing the point cloud data to improve Caltrans business processes.

What is Driving This Need?

The need to collect accurate survey data faster and more safely on pavement surfaces and restricted access areas has always been present. Design engineers cannot finalize project plans without timely and accurate survey data. This technology has the potentional to significantly reduce the time it takes to collect survey data to help accelerate the delivery of construction projects. Until recently, the technology was not available, but MTLS is now being implemented.

Risk to the Organization if This Work is Not Done:

1) Current survey methods will continue on congested freeways; 2) No improvements will be made to worker safety; 3) The project data will continue to be collected in limited volumes; 4) Caltrans survey crews' access to facilities will continue to be encumbered increasing the time required for project delivery; 5) Traffic control & lane closures will continue to be required to mitigate safety risks for survey crews collecting data on operating facilities, resulting in traffic congestion, delays for the traveling public, & a drain on project funds; 6) Server storage capacity will be inadequate for MTLS and other project data; 7) Insufficient hardware processing power and software application functionality will limit the efficient usage of point cloud data; 8) An opportunity for Caltrans to take the lead in the implementation & usage of an efficiency increasing technology will be lost resulting in an advantage for private firms competing for STIP dollars.

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Benefit Statement

Intangible Benefits

Process Improvements (describe the nature of the process improvement):

1. Less exposure to traffic will increase safety for survey workers.
2. Elimination of lane closures to conduct surveys, since the survey equipment is mobile and in most cases moves at the speed limit thus reducing the impediment for the traveling public.
3. Ten to twenty miles of freeway, data collection per day is possible, versus 1/2-1 mile using current terrestrial based technologies.

Other Intangible Benefits:

1. MTLS is able to produce 3D data products.
2. Project delivery accelerated, as survey data is more readily available.

Tangible Benefits

Revenue Generation (describe how revenue will be generated):

Does not apply.

Cost Savings (describe how cost will be reduced):

1. Time is saved when ten to twenty miles of State Highway, data collection per day is possible versus 1/2 - 1 mile using the current based technologies.

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Cost Avoidance (describe the cost and how avoided):

1. New method avoids lane closures that can be costly in delays of the motoring public.

Risk Avoidance (describe the risk and how avoided):

1. Survey crew exposure to traffic.
2. Traffic lane closures and resulting increased accident dangers.

Improved Services:

1. Speed of data collection.
2. Ability to provide data to design engineers when needed.
3. Possibility of 3D products.

Consistency

"No" Responses →		Rationale	Action Required
Enterprise Architecture	Yes		
Business Plan	Yes		
Strategic Plan	Yes		

Impact to Other Entities

Nature of Impact to Other Entities

Entity: To Be Determined in the Feasibility Study

Describe the nature of the impact:

Entity:

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Describe the nature of the impact:

Entity:
Describe the nature of the impact:

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Solution Alternatives

Alternative 1:
To Be Determined in the Feasibility Study.

Technical Considerations for Alternative 1:		
ROM Cost:	to	**Note: high end of range must not exceed 200% of low end of range**

Alternative 2:

Technical Considerations for Alternative 2:		
ROM Cost:	to	**Note: high end of range must not exceed 200% of low end of range**

Alternative 3:

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Technical Considerations for Alternative 3:		
ROM Cost:	to	**Note: high end of range must not exceed 200% of low end of range**

Recommendation

Comparison:

Alternative 1	ROM Cost			Risk
To Be Determined in the Feasibility Study.	$0	-	$0	
Alternative 2	**ROM Cost**			**Risk**
	$0	-	$0	
Alternative 3	**ROM Cost**			**Risk**
	$0	-	$0	

Conclusions:

1	
2	
3	
4	

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Recommendation:

Project Approach *(if known)*

System Complexity:				System Business Hours: *(e.g., 24x7, 9am-5pm) :*	To Be Determine in the Feasibility Study.	
Architecture	☐ Mainframe	☐ Client Server	☐ Web Based		Num. of New Databases:	
Technology	☐ New	☐ New to Staff	☐ In-House Experience		Interfaces:	
Implementation	☐ Central Site	☐ Phased Roll-out			Num. of Sites:	
M & O Support	☐ Contractor	☐ Data Center	☐ Project	☐ In House		
Procurement Approach:					Number of Procurements:	
Open Procurement?		Delegated Procurement?				
Scope of Contract	☐ Development	☐ Implementation	☐ M & O	☐ Other:		
Anticipated Length of Contract:		Years /	extensions for	years		