



Caltrans Division of Research,
Innovation and System Information

Research

Notes

Right of Way
and
Land Surveying

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Project Title:
Evaluating Mobile Lasering Scanning

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Expanding Mobile Terrestrial Laser Scanning (MTLS) Capability and Capacity throughout Caltrans

Fully integrate the rapid, evolving MTLS technology into Caltrans workflow for the benefit of Caltrans projects statewide.

WHAT IS THE NEED?

Caltrans is required to collect survey grade and lower accuracy measurements for the delivery of projects. MTLS can produce accurate and precise geospatial data at or near highway speeds. In addition, mobile laser scanners have been effectively used in pavement condition surveys and have proven to accelerate project delivery for many of Caltrans projects in the northern California region.

However, additional research is imperative to properly integrate the rapid, evolving MTLS technology into current Caltrans workflow, develop standards and specifications and to develop best practices in using MTLS for various Caltrans projects statewide.

WHAT ARE WE DOING?

The researchers plan to continue deployment support of the MX8, Caltrans' mobile laser scanner system, on Caltrans projects throughout Districts 1, 2, 3 and 4. Deployment support includes, but is not limited to, assisting Caltrans District and Headquarters personnel in resolving any technical issues encountered during deployment. The research team will summarize and document the deployment results from the northern California Districts.

The summarized deployment results can provide insightful information for deploying the MX8 system throughout the central and southern Districts in California. Prior to deployment in the central and southern regions, training materials will be developed and presented to the central and south region MTLS Technical Advisory Group (TAG) teams. Training materials will focus on data collection, post-processing, usage guidelines, data handling/storage, and workflow best practices. In addition to providing training materials, live training sessions will be provided regarding on-site data collection and in-office data post-processing. After the completion of the training, pilot projects will be run with the central and southern district surveyors.



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knowledge that improves
California's transportation system

Upon completion of the training sessions, the deployment of the MX8 system in the central and southern districts will be initiated. The deployment effort includes communicating with the District TAG representatives to establish MTLs surveyor teams as part of the new deployment. Next, on-site support will be provided for the actual field use for each Caltrans customer group. Also, the research team will assist in gathering feedback for hardware, software and workflow enhancements. Based on the enhancements, existing and newly developed workflow standards will be migrated into the central and southern California operations. Similar to the northern California region, the central and southern California deployment results will be summarized and documented. Like the past stationary 3D laser scanning research effort, case studies will be performed on specific MTLs Caltrans projects.

In addition to the training and deployment support efforts, the research team under the guidance of Caltrans Office of Land Surveys (OLS) will conduct a needs assessment to determine whether to share the MX8 system or whether to procure another mobile laser scanning system. The MTLs specifications will be developed and modified based on the experiences and lessons gained from the prior acquisition and the field use of the MX8 system. The central and southern Districts' Information Technology (IT) resource needs for MTLs post-processing will be evaluated. Finally, a review and recommendations will be provided for overall MTLs related IT infrastructure requirements.

WHAT IS OUR GOAL?

The anticipated outcome of the research will be MTLs standards and specifications, best practices and workflow documentation including recommendations on data storage, data network infrastructure, and data management. In addition, a needs assessment along with recommendations on whether to purchase another MTLs system or utilize the existing MX8 system throughout California will be provided to Caltrans.

WHAT IS THE BENEFIT?

Collecting and processing data efficiently, accurately, and safely saves the Department money while significantly reducing Caltrans' land survey crews' and other work crews' exposure to direct traffic. Limited exposure to direct traffic

minimizes injuries to Caltrans' workers, costs related to injuries, and roadway congestion for traveling motorists. Further deployment of MTLs, as provided by this research, will promote these efficiency and safety gains

WHAT IS THE PRODUCT OF THIS RESEARCH?

The product will be an Integrated Dynamic Transit Operation lab prototype system and demonstration of the laboratory prototype system.

WHAT IS THE PROGRESS TO DATE?

On Jan. 14, 2014 representatives from Caltrans Division of Research, Innovation and System Information (DRISI) met with the customer representatives from Caltrans OLS and with the UC Davis AHMCT researchers to discuss the next steps on how a new potential research task can aid in addressing the customer's on-going needs regarding the MTLs technology. Based on the discussions from the Jan. 14, 2014 meeting, the AHMCT research team drafted a rough scope of work outline for OLS and DRISI to review and provide any feedback. The draft outline was revised and finalized based on feedback from the TAG, OLS and DRISI.

Next, the AHMCT researchers drafted a detailed scope of work for the new potential MTLs research task. Once the scope of work received final approval from the TAG, OLS, and the DRISI research team, the DRISI research task manager submitted a new contract request package to the DRISI Office of Management Services (OMS) team for review. After OMS approved the new contract request package, OMS submitted the contract request package to Caltrans Division of Procurement and Contracts (DPAC) for processing. DPAC drafted a new contract, and the DRISI research task manager reviewed and approved the proposed new contract. DPAC recently submitted the proposed new contract to Caltrans Legal, and the new contract currently awaits review and approval from Caltrans Legal.