Developing a Strategic Roadmap for Caltrans Implementation of VDC/CIM

Evaluate Caltrans’ readiness for VDC and CIM solutions for existing process improvements.

WHAT IS THE NEED?

California Department of Transportation (Caltrans) is continuously looking for ways to deliver high quality transportation projects more safely and efficiently. In order to produce high-quality projects and optimize limited transportation funds, Caltrans needs to constantly innovate and improve existing processes and procedures taking advantage of new technologies, such as Virtual Design Construction (VDC) and Civil Integrated Management (CIM).

VDC/CIM are emerging technologies showing benefits in improving transportation project planning and delivery in terms of quality, safety, cost effectiveness and timing. Several State Department of Transportation (DOT) have already developed implementation plans of these technologies for pilot projects as well as their workflows.

The need of developing a comprehensive evaluation of the use of VDC/CIM and a roadmap for implementation in Caltrans workflow is especially relevant today, due to availability of several studies on implementation of these technologies in transportation which Caltrans can leverage, such as National Cooperative Highway Research Program (NCHRP) Report 831: CIM for DOT. Several other State DOT’s VDC/CIM case studies and solutions are included in the reports written by academia.

Caltrans can learn and expand from the studies and include plans for 4D and 5D implementation of VDC/CIM that will include addition of time and project costs respectively, in support of life cycle transportation asset management.
WHAT ARE WE DOING?

Caltrans has taken initiatives and has piloted implementation of some emerging technologies, and it is necessary to develop self-assessment, investment analysis, maturity model, and roadmap for future implementation of VDC/CIM throughout Caltrans organization.

This proposed research is to evaluate Caltrans' readiness for VDC/CIM solutions and identify ways to further incorporate and integrate these solutions into Caltrans project workflow. As a result, the researchers will develop a strategic roadmap and document it in a final report.

WHAT IS OUR GOAL?

The purpose of this research is to evaluate Caltrans' readiness for VDC/CIM solutions, including the spectrum from 3D to 4D and 5D implementations, and identify ways to further incorporate and integrate these solutions into Caltrans' transportation project life cycle workflow. The goal is to develop a Caltrans Strategic Roadmap for VDC/CIM implementation.

WHAT IS THE BENEFIT?

The expected benefits from VDC/CIM integration in relevant to Caltrans operations include:

- Fundamentally changing project delivery and asset management through integrated digital data workflows and 3D to 5D models.
- Improved ability to handle design and engineering changes more efficiently and seamlessly.
- Reduced waste, inefficiency, rework, cost overruns, etc.
- Shorter delivery times, while maintaining high quality projects.
- Easy-to-understand methodologies to convey complex planning and design issues.
- Education and outreach materials to increase understanding of VDC/CIM concepts and benefits.
- A roadmap for prioritizing capital investment, coordinating teamwork, and VDC/CIM task prioritization.

WHAT IS THE PROGRESS TO DATE?

The researcher team is currently gathering information and assessing the levels of use and maturity of use of VDC/CIM component technologies within Caltrans. The researchers will prepare a Quarterly report by the end of July 2018.