Project Delivery Directive

Number: PDD-16

To: Project Delivery Employees

References: N/A

Effective Date: August 4, 2025

Supersedes: New

TITLE: Building Information Modeling for Infrastructure (BIM4I) Implementation

DIRECTIVE

The California Department of Transportation (Caltrans) is committed to implement and integrate BIM4I throughout the project delivery process for transportation projects and their lifecycle management. BIM4I will be used to collaborate, design, and construct transportation projects. When the project is complete, the digital as-built model will be used to improve management of transportation assets.

The Caltrans BIM4I Program, within the Division of Project Management, will oversee and manage the development of policies, procedures, standards, guidance, tools, and training. Districts, Divisions, and Programs' involvement and collaboration is essential for a successful implementation and integration.

BIM4I will be implemented through a phased approach utilizing pilot projects to help develop standards and procedures. Full implementation will occur over several years. During this phased implementation period, this directive will only apply to those projects that have been selected for utilization of BIM4I practices.

BACKGROUND

Traditionally, transportation projects are designed and constructed based on two-dimensional plan sets which represent the design intent of the project that is built in the three-dimensional (3D) real world. BIM4I is a collaborative approach that enhances project delivery and reduce costs throughout the entire project lifecycle by using a Project Information Model (PIM) to design and construct transportation infrastructure projects. As construction progresses, design and field-collected as-built information is transitioned into an Asset Information Model (AIM), which

can be used for maintenance and operations, asset management, and planning.

In April 2023, Caltrans published the "BIM4I Initiative Implementation Plan," outlining the framework for using PIM and digital files to convey design intent for construction. The plan emphasizes the importance of capturing design and field-collected data throughout project delivery, culminating in the AIM to support ongoing maintenance, operations, and asset management.

While Caltrans was developing the "BIM4I Initiative Implementation Plan," the Legislature passed, and the Governor signed Assembly Bill (AB) 1037 (2022) which requires Caltrans to develop an implementation plan for the use and integration of digital construction management technologies. The Caltrans Construction Contract Administration Systems Implementation Plan (December 2023) further details the roadmap for digital construction management processes, in compliance with AB 1037 (2022).

By adopting the BIM4I collaborative approach, Caltrans aims to improve safety, project delivery, external engagement, asset management, and planning through a shared, reliable information source throughout the project lifecycle.

This Project Delivery Directive outlines the responsibilities throughout Caltrans.

DEFINITIONS

Asset Information Model (AIM) is the digital record of the built asset, derived from the PIM and supplemented with field-collected as-built information. It reflects what was constructed and includes information essential for operations, maintenance, and asset management.

BIM4I implementation is the process of adopting and applying BIM4I methodologies, technologies, and workflows including, but not limited to, policies, standards, guidelines, procedures, training, integration of technologies, and data management to support the development and use of PIMs, digital as-builts, and AIMs.

BIM4I integration is to seamlessly combine BIM4I workflow and interoperability with Caltrans practices so that they become a unified whole.

BIM4I Execution Plan (BEP) is a project-level document that outlines how BIM4I processes and workflows will be applied and managed on a project.

Building Information Modeling for Infrastructure (BIM4I) is a collaborative work method for structuring, managing, and using data and information about transportation assets throughout their lifecycle. This process is supported by technologies that create a digital representation of a project's physical and functional characteristics. These digital models integrate geometry, structured data, and documentation from multiple sources to support decision-making and information exchange throughout the asset lifecycle from planning and design through construction, operations, and maintenance.

Lifecycle management is the process of capturing, organizing, and using project data from planning, design, and construction through operations, maintenance, and asset management.

Project Information Model (PIM) is the digital model developed during the planning and design phases of a project. It may contain details of project geometry, attributes, specifications, performance requirements, and construction-related data such as scheduling, cost, and digital as-built. The PIM is used to convey the design intent, support construction activities, and forms the foundation for developing the AIM.

RESPONSIBILITIES

BIM4I Program Director:

- Serves as the lead for the BIM4I Program and for implementation across Caltrans, coordinating with all relevant divisions and external partners.
- Manages the BIM4I Program development and implementation of policies, procedures, guidance, and support resources for training and tools at the program level.
- Ensures alignment with and reports on the requirements put in place by state mandates.
- Fosters ongoing communication across divisions, programs, functional units, and external partners.

District Directors:

- Ensures implementation of this directive.
- Ensures appropriate support resources for the activities outlined in this directive.
- Ensures this directive is shared with functional units responsible for delivering products and services related to capital projects.
- Collaborates and supports the BIM4I Program and implementation.
- Champions the implementation of BIM4I within district-led projects.
- Allocates necessary resources, supports training, and fosters collaboration between district functional units.

Chief, Division of Project Management:

- Appoints, provides general guidance to, and supervises the BIM4I Program Director.
- Supports the corporate and resource management of the BIM4I Program.

Chief, Division of Design:

- Develops and implements procedures, guidance, tools, and training to assist districts in the successful implementation of BIM4I related to roadway design activities.
- Develops BIM4I roadway design modeling workflows, standards, and project and asset information requirements.
- Ensures design teams follow statewide standards for 3D modeling and digital contract documents.
- Provides district support and training related to roadway design activities.
- Ensures collaboration and communication across divisions and functional units.
- Ensures participation in peer exchanges, national discussions, and research to refine BIM4I processes related to roadway design activities.

Chief, Division of Construction:

- Develops and implements procedures, guidance, tools, and training to assist districts in the successful

implementation of BIM4I related to construction activities.

- Leads the development and implementation of digital as-built processes and field activities.
- Integrates digital tools into construction workflows.
- Supports project and asset information requirements development.
- Provides district support and training related to construction activities.
- Ensures collaboration and communication across divisions and functional units.
- Ensures participation in peer exchanges, national discussions, and research to refine BIM4I processes.

Chief, Division of Engineering Services:

- Develops and implements procedures, guidance, tools, and training to assist districts in the successful implementation of BIM4I related to the work of the division, including structure design and construction, advertisement of digital information files, and materials and geotechnical engineering.
- Supports BIM4I modelling workflows and develops standardized project and asset information requirements for Infrastructure such as bridges, retaining walls, pump stations, etc.
- Provides oversight and guidance for technical aspects of modeling and data management of structures.
- Leads the development and implementation of digital as-built processes and field activities for structures.
- Provides district support and training related to the division's activities.
- Ensures collaboration and communication across divisions and functional units.
- Ensures participation in peer exchanges, national discussions, and research to refine BIM4I processes.

Chief, Division of Right of Way and Land Surveys:

- Develops and implements procedures, guidance, tools, and training to assist districts in the successful implementation of BIM4I related to the practice of land surveying.

- Leads the development and oversight of geospatial systems to support BIM4I workflows and data integration.
- Oversees the creation and delivery of survey control, cadastral, fixed-works, utilities, and terrain data, including LiDAR, CADD mapping, and GIS to support PIM creation and AIM updates.
- Ensures collaboration and communication across divisions and functional units.
- Ensures participation in peer exchanges, national discussions, and research to refine BIM4I processes.

Chief, Division of Environmental Analysis:

- Collaborates on permitting processes, ensuring environmental data and constraints are appropriately integrated into BIM4I workflows.
- Supports inclusion of environmental impact considerations in digital modeling, visualization, and project documentation.
- Ensures collaboration and communication across divisions and functional units.

HQ Deputy Directors, Division Chiefs, and Program Managers:

- Ensures implementation of this directive.
- Ensures functional managers providing products or services on capital projects, including non-Project Delivery functions, are aware of this directive.
- Collaborates with and supports the BIM4I Program and implementation.

District Project Delivery Managers, Functional Managers, and Task Managers:

- Provides staff support, training opportunities, and resources to ensure BIM4I requirements are met.
- Encourages teams to adopt innovative digital methods and coordinate with the BIM4I Program.

Project Managers:

- In consultation with the project development team, determines the minimum level of Work Breakdown Structure detail to which each portion of a project will be planned.

- Align project scope, schedule, and budget to incorporate BIM4I deliverables.
- Facilitates collaboration among design, construction, environmental, and other disciplines using BIM tools and information.
- Identifies resources needed.
- Ensures the BIM Execution Plan is developed.

Project Engineers:

- Validates design intent within the 3D model and coordinate with land surveyors and construction engineers on any model updates.
- Ensures data integrity throughout the design and construction phases. Develops and maintains complete 3D models (PIM) in alignment with BIM4I standards.
- Works closely with the Project Manager and Construction Engineer to ensure model updates are reflected promptly.
- Leads on developing the BIM Execution Plan for the design phase.

Project Land Surveyors:

- Establishes and maintains project control networks to support BIM4I workflows.
- Coordinates with project development team to ensure topographic and fixed-works data supports cross-discipline integration for PIM and digital as-builts for the AIM.
- Collaborate with project development team to verify that design models are complete, spatially accurate, and suitable for use in field operations.

Project Right of Way Engineers:

- Develops and manages models that represent right of way lines, centerlines, easements, agreements, monumentation, acquisitions, and property boundaries.
- Collaborate with project development team to verify that design models are complete, spatially accurate, and suitable for use in field operations.

District Construction Technology Coordinators:

- Act as the district's BIM4I single focal point for construction, and coordinate resources for tools and training, support pilot BIM4I projects, and provide first-tier support for concerns.
- Act as liaison to coordinate BIM4I efforts between districts and Headquarters for innovative efforts.

Construction Engineer, Resident Engineers/Structure Representatives, and/or Assistants:

- Collaborates with Design and Surveys to ensure PIM is complete.
- Ensures digital as-built data is accurately collected and integrated into the AIM.
- Leads on developing the BIM Execution Plan for the construction phase.
- Maintain project documentation in the Caltrans Falcon electronic document management system (FalconDMS) (Construction Policy Directive 21-11 compliance).

Donna Berry

08/26/2025

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Date Signed