PENNSYLVANIA ASPHALT PAVEMENT ASSOCIATION

PennDOT Digital Delivery Program

JANUARY 21, 2026

Pennsylvania
Department of Transportation

AGENDA

- Introduction to Digital Delivery
- Digital Delivery Projects
- Impacts to PAPA
- Engagement
- Summary

INTRODUCTION TO DIGITAL DELIVERY

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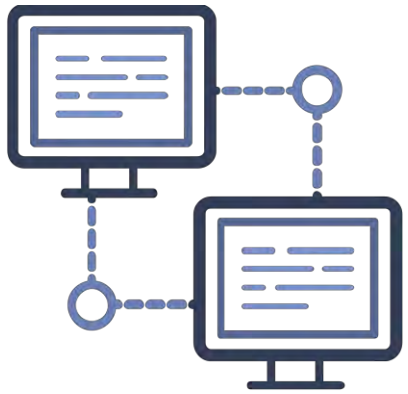
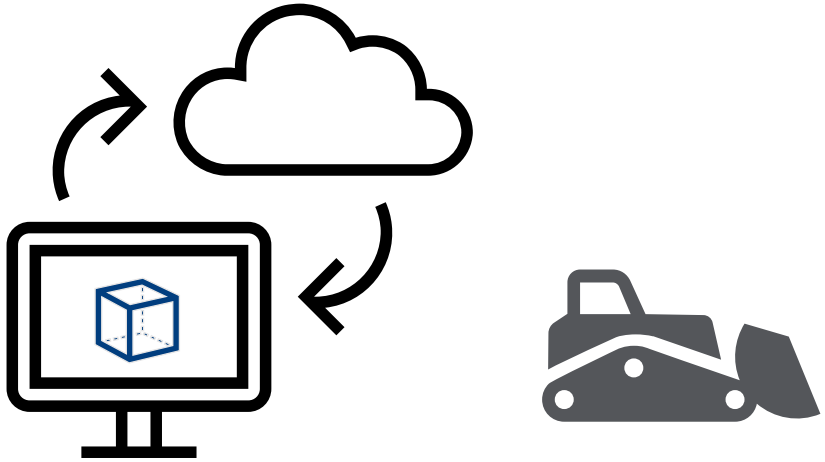
WHAT IS DIGITAL DELIVERY

A modernized approach to project delivery processes and contract media that incorporates digital data.



DIGITAL WORKFLOWS are data-based exchanges, in which information can be easily transferred to a computer system with little to no manual entry.



DIGITAL DELIVERY of project data in which 3D models and other files are created and delivered to enhance design, facilitate construction and incorporate digital information to support the asset management lifecycle

WHAT DOES DIGITAL DELIVERY MEAN TO PENNDOT

Collaboration through data driven workflows

Connecting data rather than recreating or manually entry

Providing model deliverables that retain a source of truth with changes

Vision Statement:

By 2025, construction projects will have the ability to be bid using 3D technology and will no longer be in a traditional construction plan format.

Digital Delivery Program Roadmap

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2020-2024

Initial Pilots

- Existing Ground Confidence Level (EGCL)
- Bridge
- Drainage and Utilities

2025-2027

Advanced Pilots

- Model as the Legal Deliverable (MALD)
- Advanced Digital Construction Management System (ADCMS) IFC Bridges

2027-2030

Digital Delivery Projects Advertised

- In 2027 – 2 projects per District
- In 2028 – 3 projects per District
- In 2029 – 4 projects per District
- In 2030 – 5 projects per District

2029-2030

Projects Starting Preliminary Design (MALD)

- In 2029, all integral abutment bridges < 90’ in length
- In 2030, all new construction or reconstruction

PILOT PROJECTS

Purpose of pilot project program:

- Develop and test design modeling workflows to produce models for construction

New deliverables include:

- 3D model of the project design
- 2D details and exports for surfaces and alignments (.xml files)
- Use of a cloud-based model viewer for non-CADD users which includes data visualization and different views for

Excavation for new intersection to meet SR 6 in Tioga County

CREATING DIGITAL DELIVERY GUIDANCE

The guidance documents provide standardized processes for stakeholders to use to produce consistent deliverables.

Digital Delivery documents:

- Digital Delivery Interim Guidelines
- Modeling Standards Manual
- Model Element Breakdown Structure

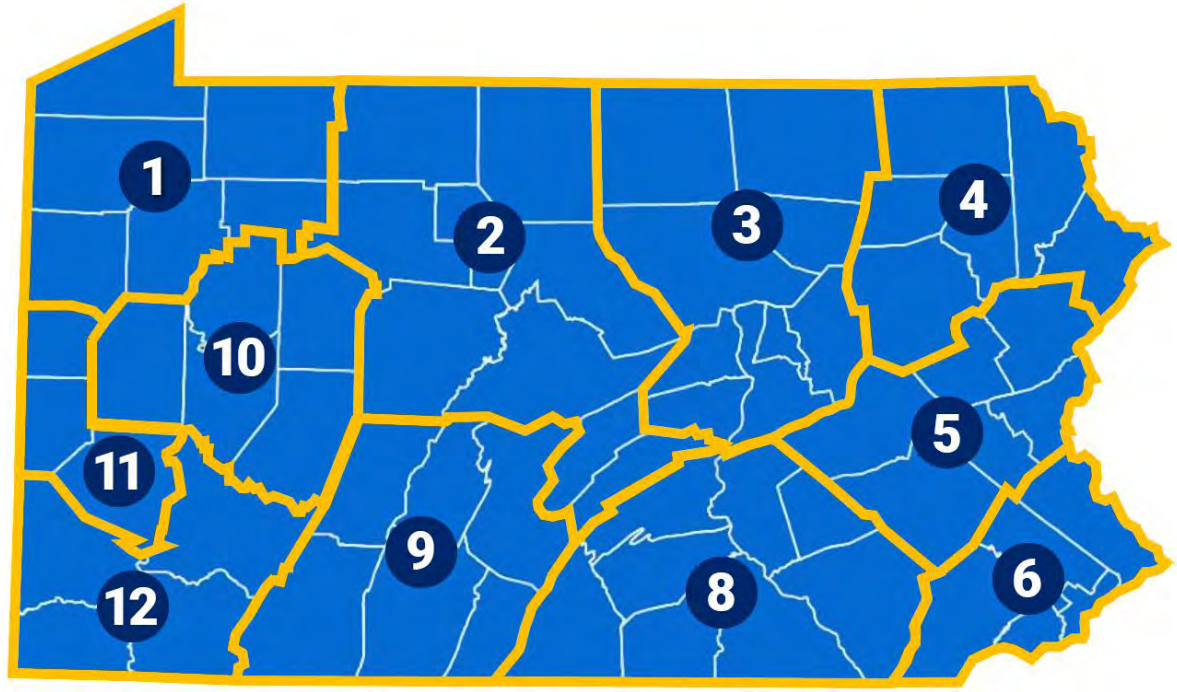
QUALITY MANAGEMENT

Quality Management processes to review 3D models & types of model-based reviews:

- Model Integrity Review
- Modeling Standards Review
- Survey Review
- Design Compliance / Discipline
- Spatial Coordination

PILOT PROJECT PROGRESS

- 6 projects constructed using digital deliverables
- 5 projects in construction
- Over 40 projects current in design or advertised
- Developed workflows to add pay items to each model element to run quantity and location reports



The pilot project program provided the opportunity to manage the pace of change, making stakeholders feel empowered, which has led to the institutionalization of digital delivery throughout PennDOT

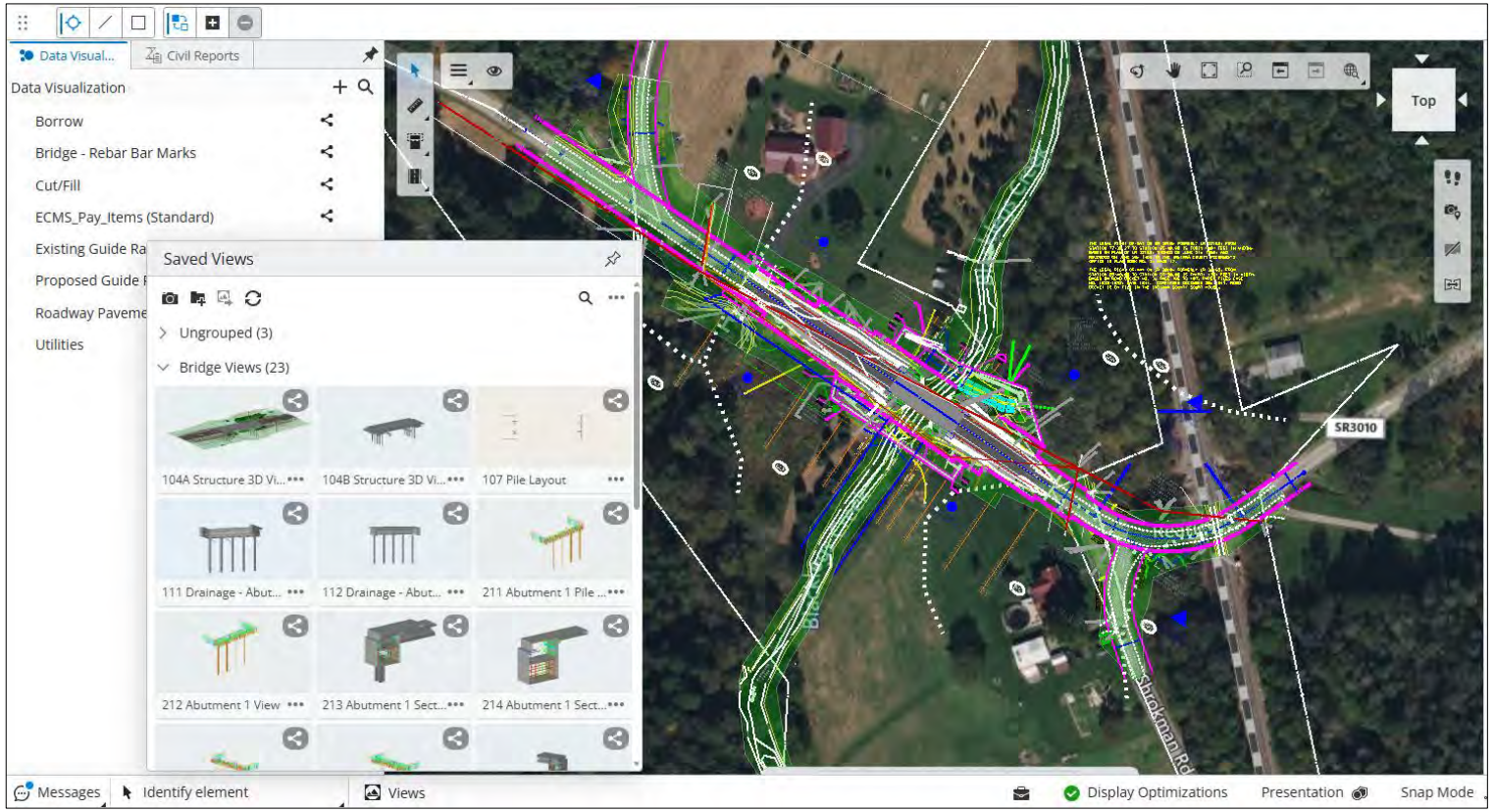
ADCMS BRIDGE PILOTS

Advanced Digital Construction Management Systems Grant

Two Bridge projects using IFC

Deliverables

- IFC Bridge files signed and sealed
- Certification Memo
- Model Element Breakdown Structure
- Digital File Index
- Model Download instructions
- Data visualizations



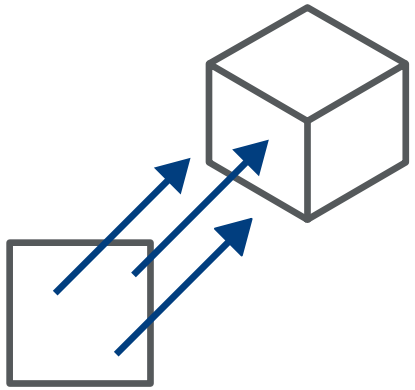
D1 – Crawford County – Steel Bridge

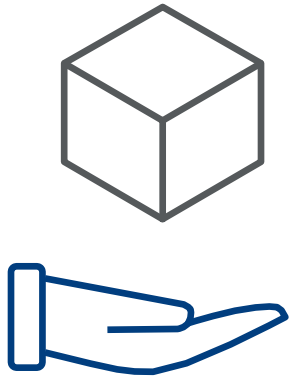
D10 – Indiana County – Integral Abutment

National Impacts

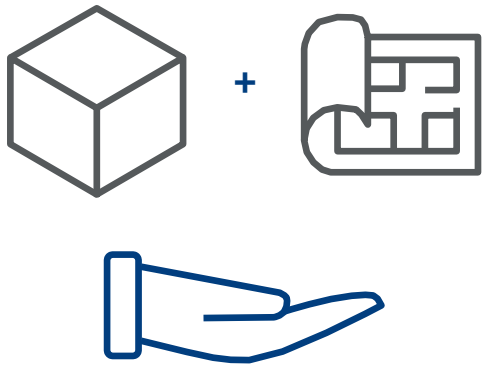
Model-Based Deliverable Maturity Framework

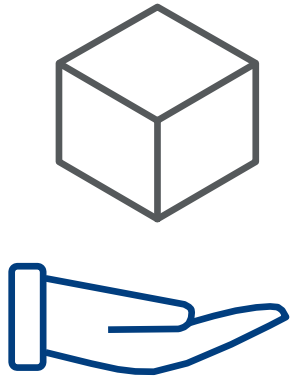
AASHTO JTCEES – August 2022

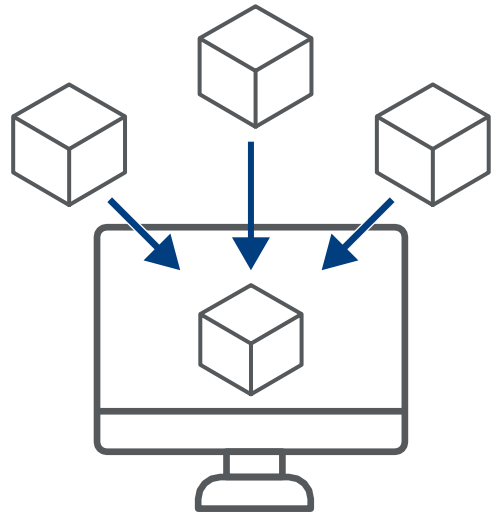




For Information Only







Digital As-Built using the 3D model

LEVEL 1
Transition from 2D to 3D for plan production

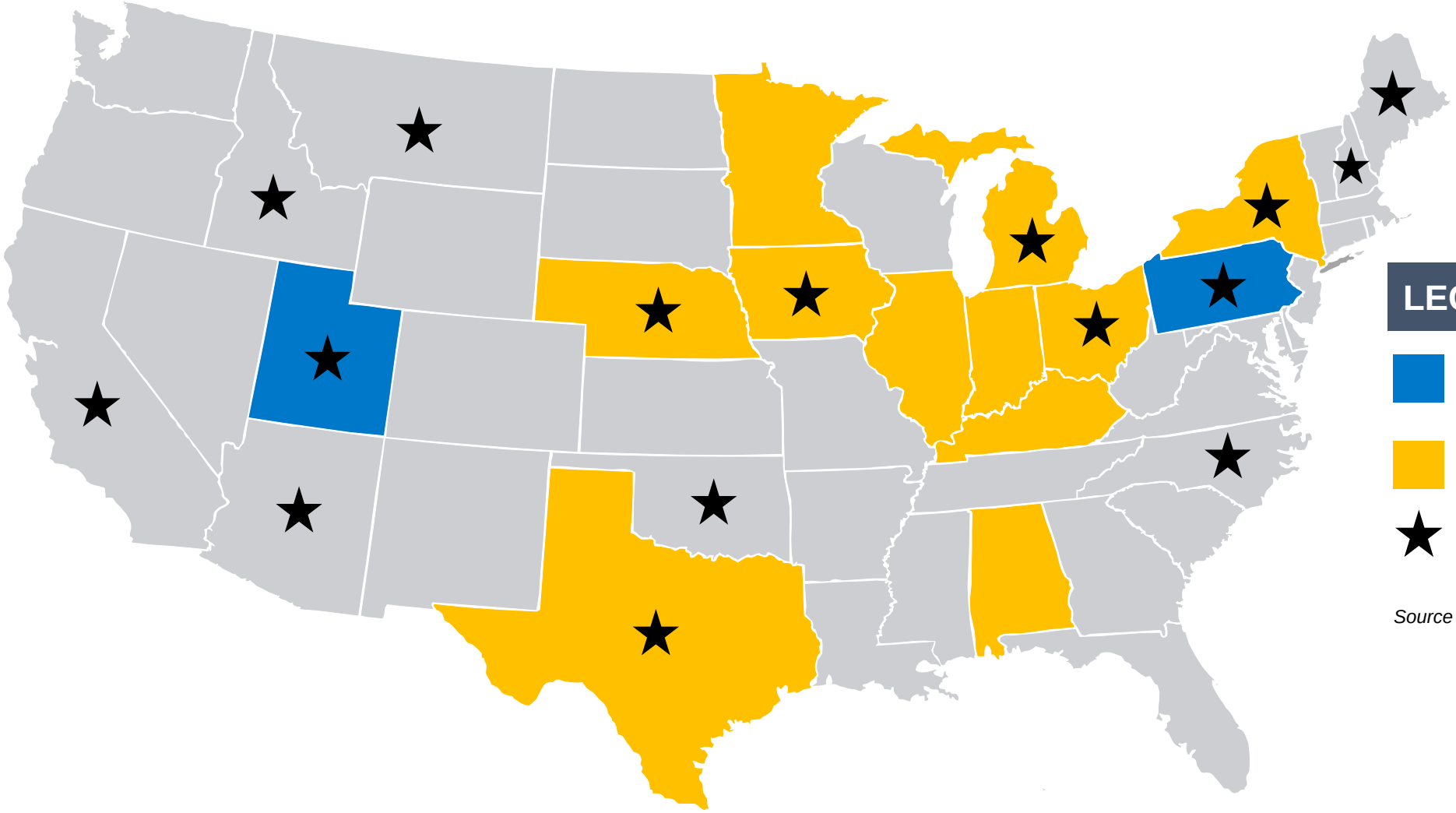
LEVEL 2
Deliver 3D model for information only

LEVEL 3
Deliver 3D model contractually with conventional plans

LEVEL 4
Deliver 3D model contractually without plans

LEVEL 5
Collect digital as-builts

National Impacts



LEGEND

- Level 4 – Contractual Model Deliverables
- Level 3 – Contractual Models and Plans
- ★ Strategically Planning for Digital Delivery

Source : HDR – December 2025

DIGITAL DELIVERY PROJECT IN DEPTH

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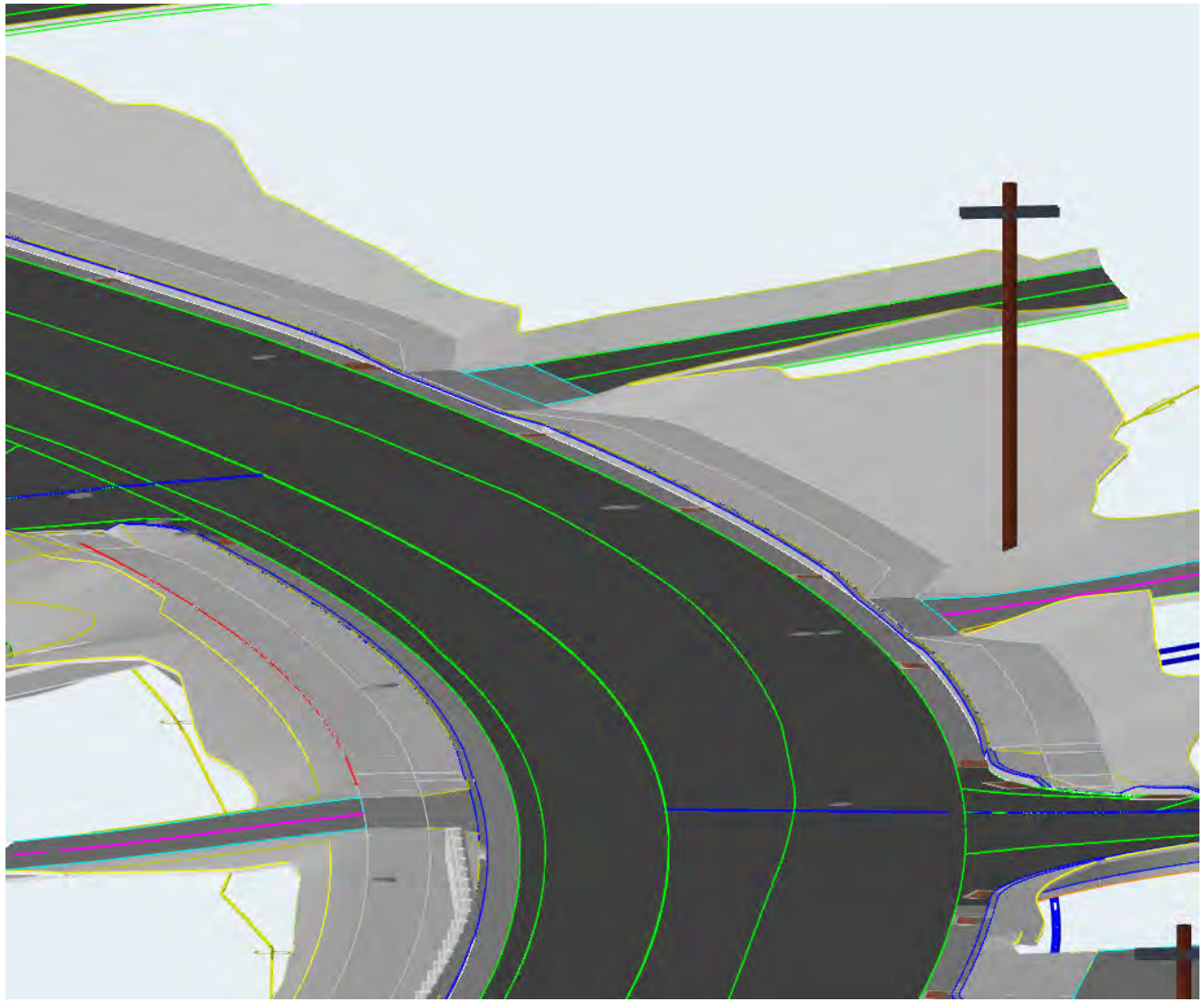
DIGITAL MODELS

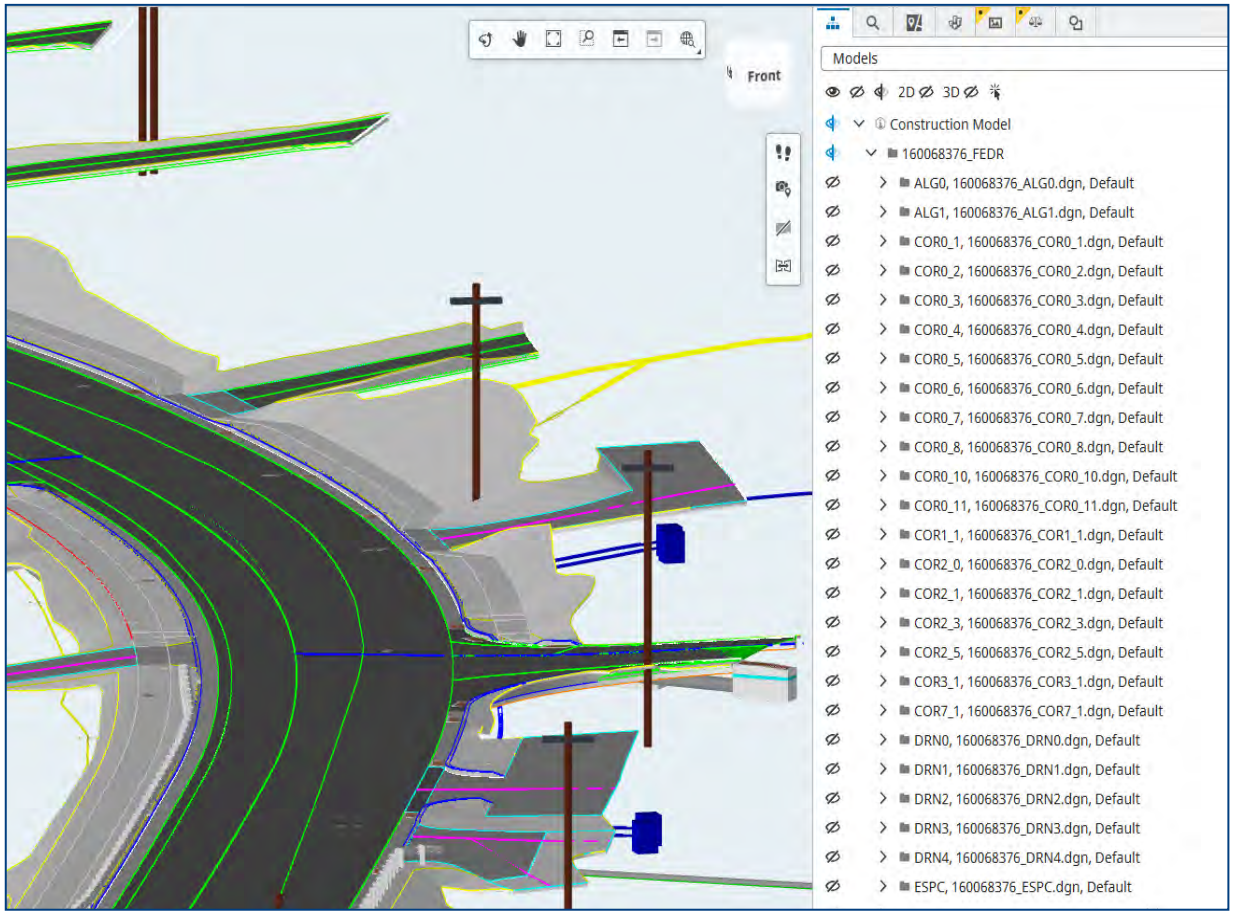
Digital Model is a structured representation of an infrastructure asset or system that integrates geometric, spatial, and attribute data.

Benefits for users:

- Simulate real world conditions
- Enables analysis and visualization
- Promotes earlier collaboration and decision making

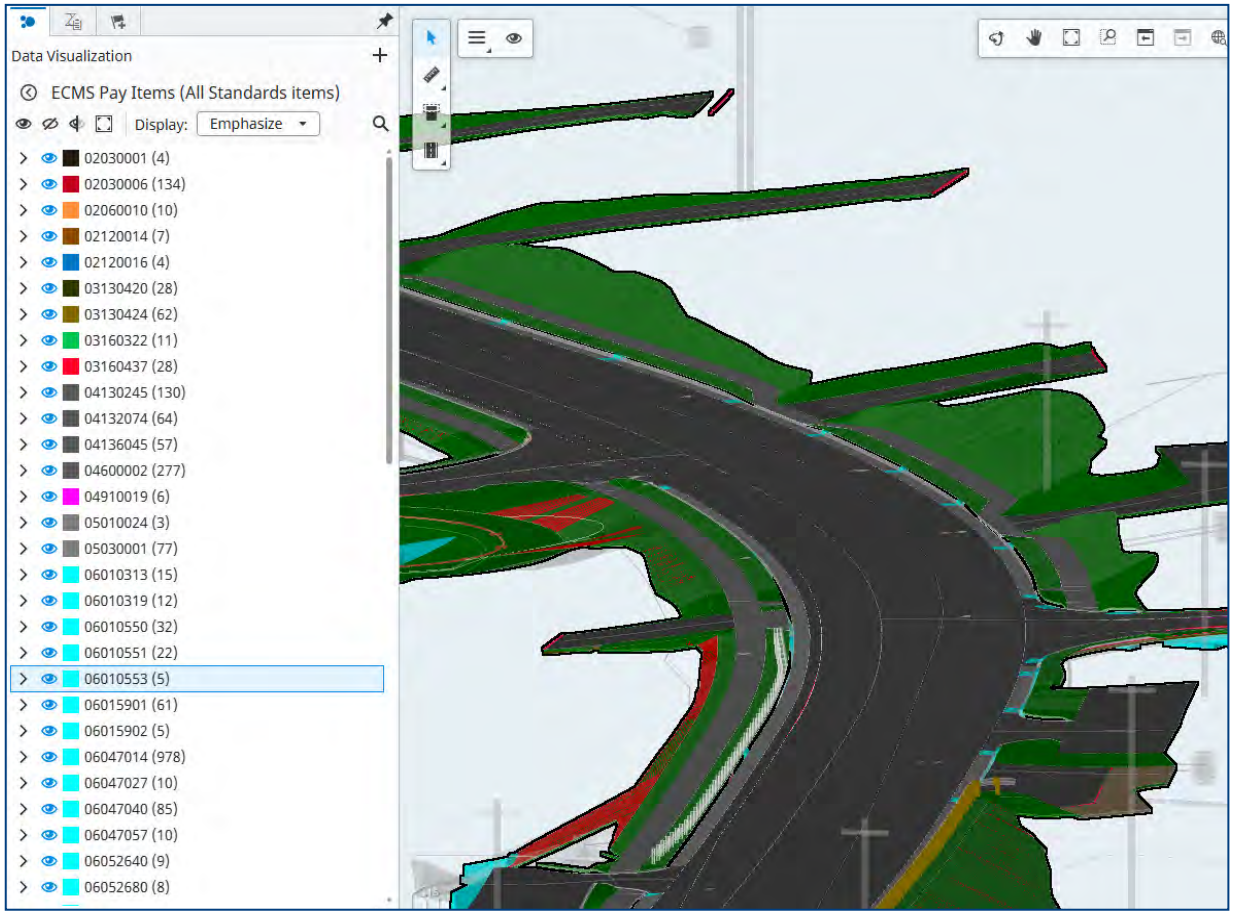


DIGITAL MODELS



Federated Model

Aggregated from multiple design files



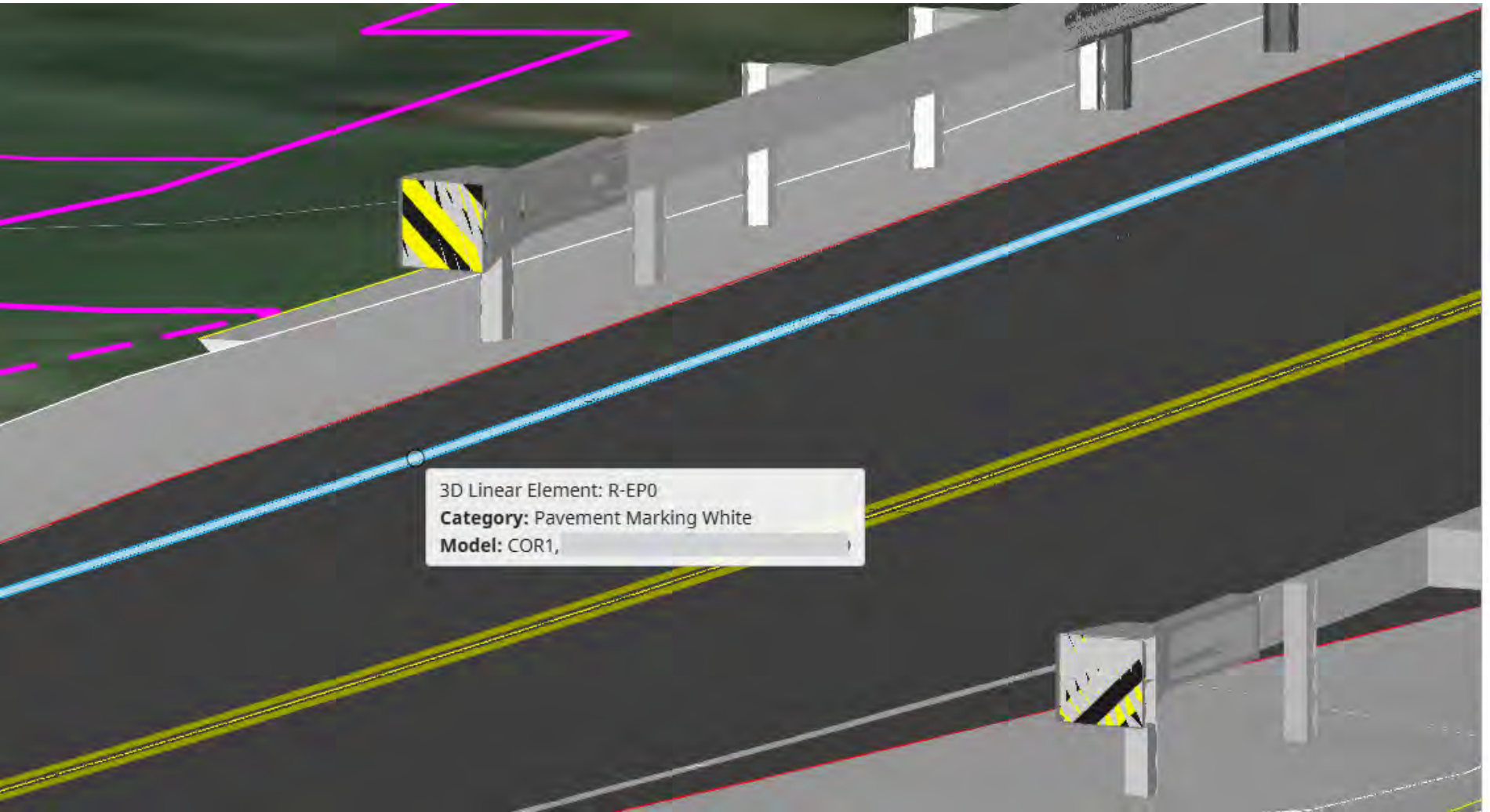
Pay Items Association

Assigned through item types

MODEL INFORMATION

STRIPING AND DIGITAL DELIVERY

Traffic striping elements can be added to design models as 3D linear elements or 3D cells. 2D details can be created for signal designs that are associated to 3D objects for connection to the models. Phasing can be modeled for complex projects



3D Linear Element: R-EP0 [3-EC9]
Linear\Pavement Marking\Single Solid\Pavt Marking ...

Selected Item(s)

Category:	Pavement Marking White
Model:	COR1,
User Label:	3D Linear Element: R-EP0

Geometry

Start Point:	X: 1526323.1821 ft (US S...
End Point:	X: 1526683.0227 ft (US S...
Length:	344.0033 ft (US Survey)

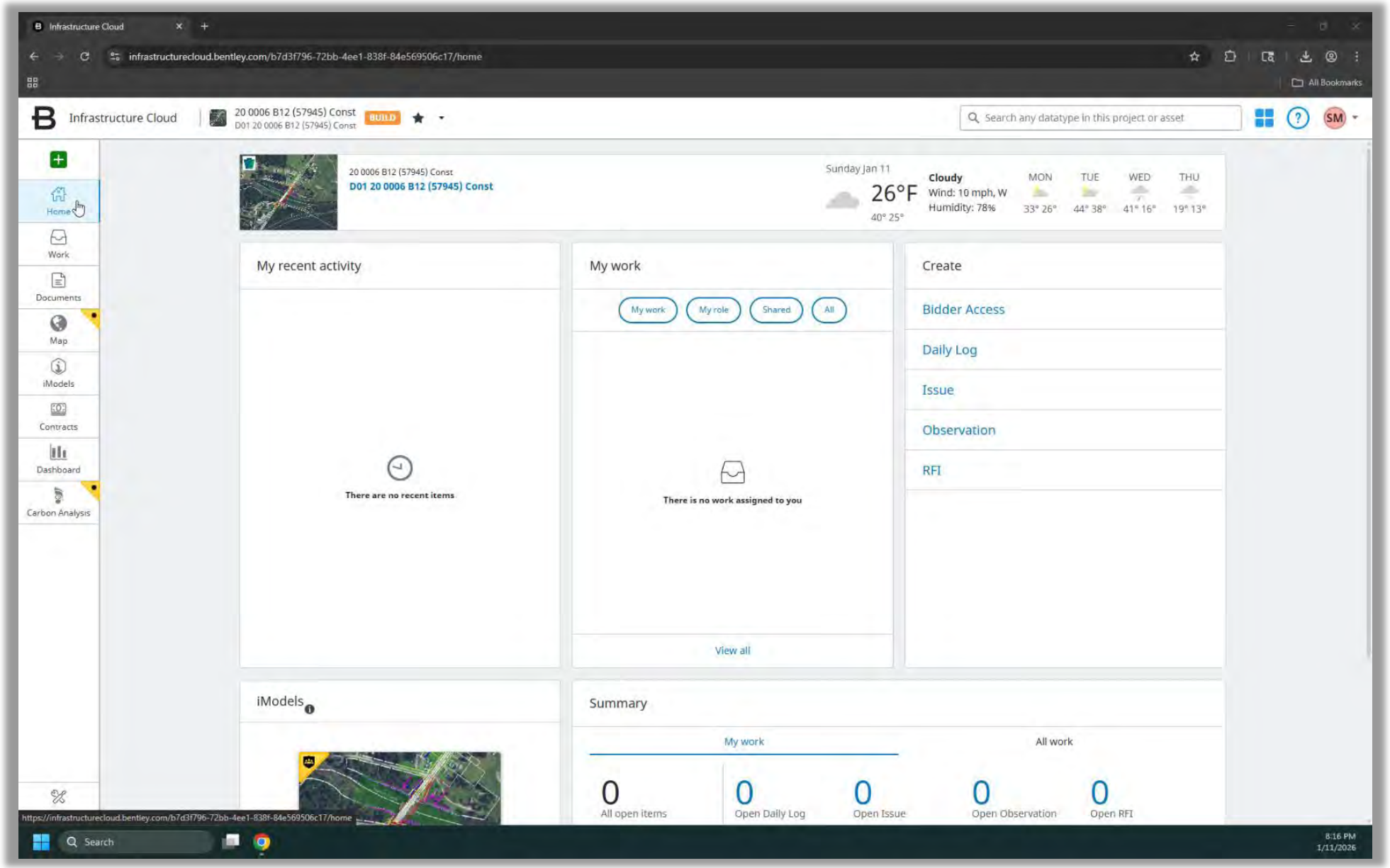
Feature

Feature Definiti...	Linear\Pavement Marki...
Feature Name:	R-EP0

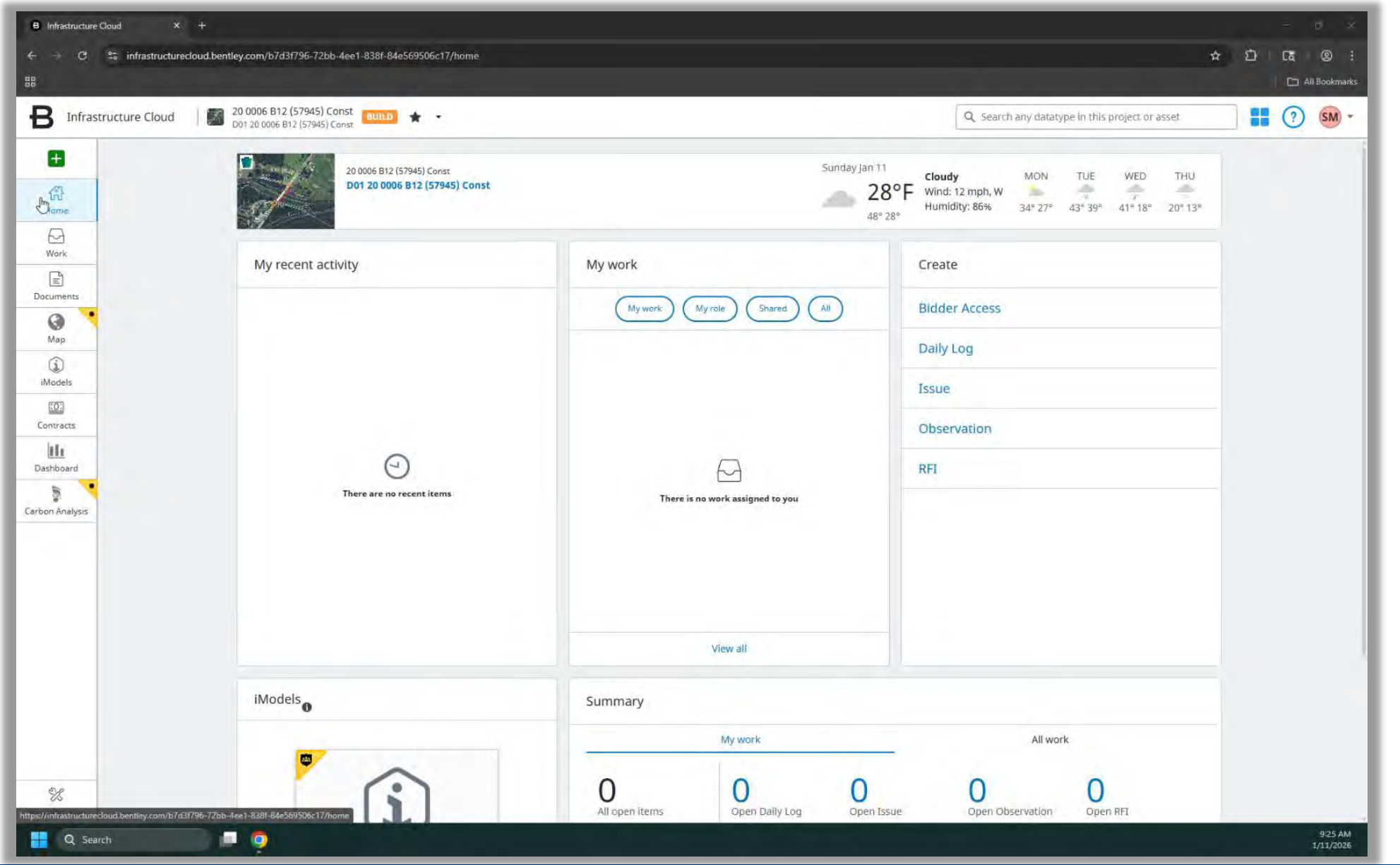
Corridor

Source Information

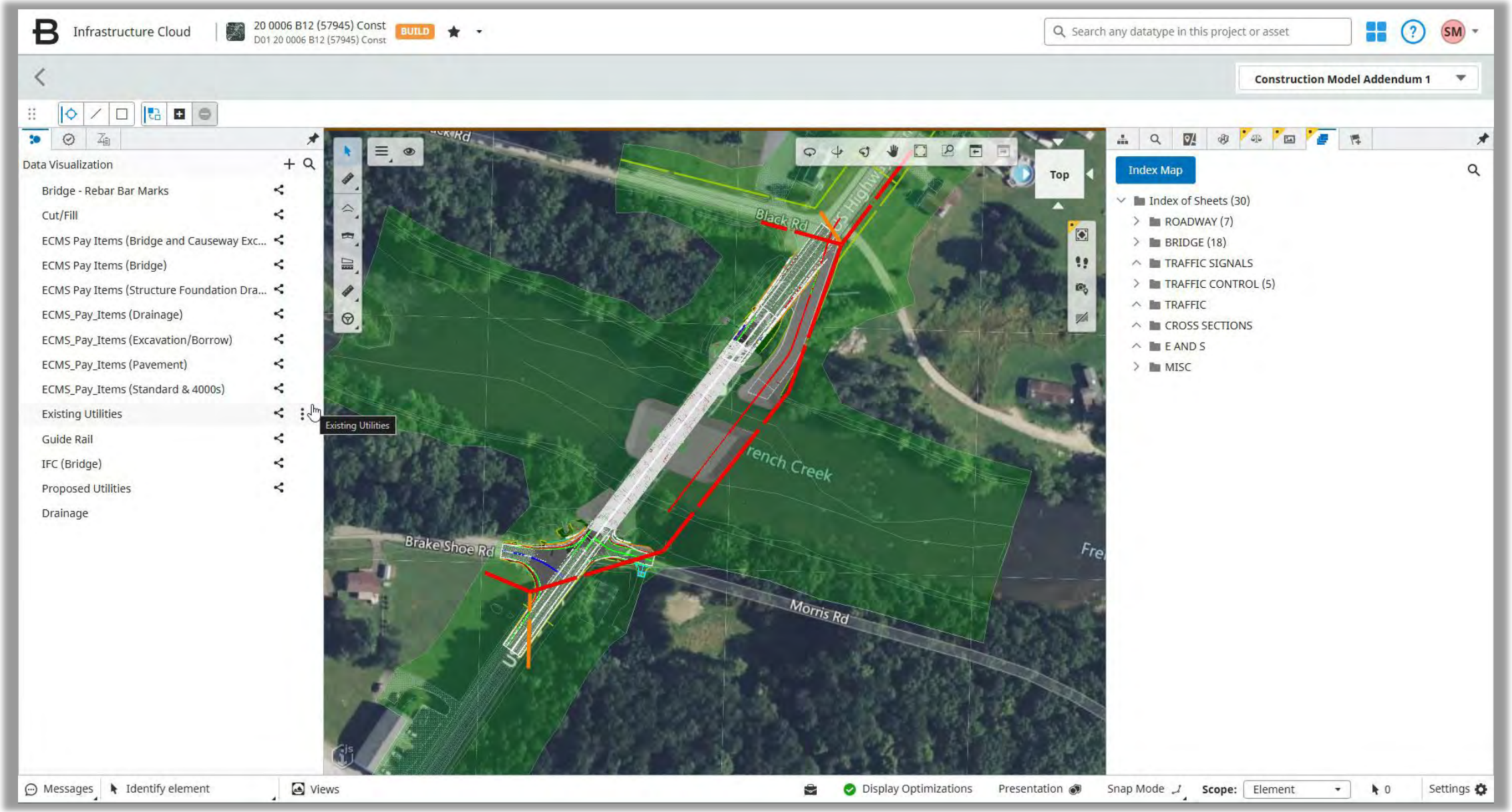
PAVEMENT INFORMATION



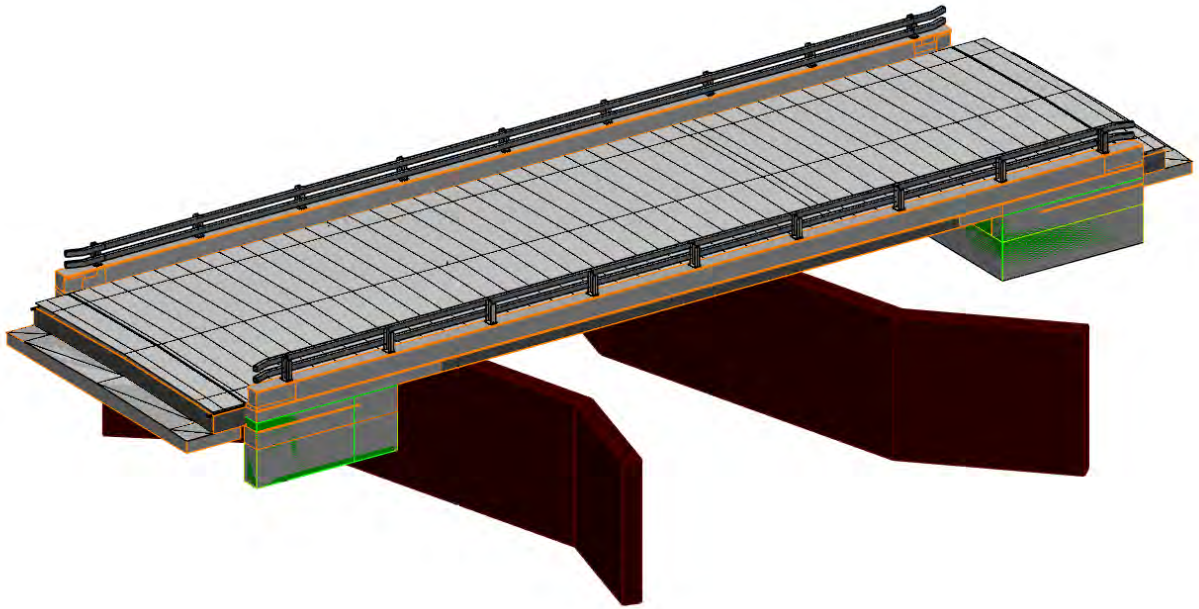
TYPICAL SECTIONS

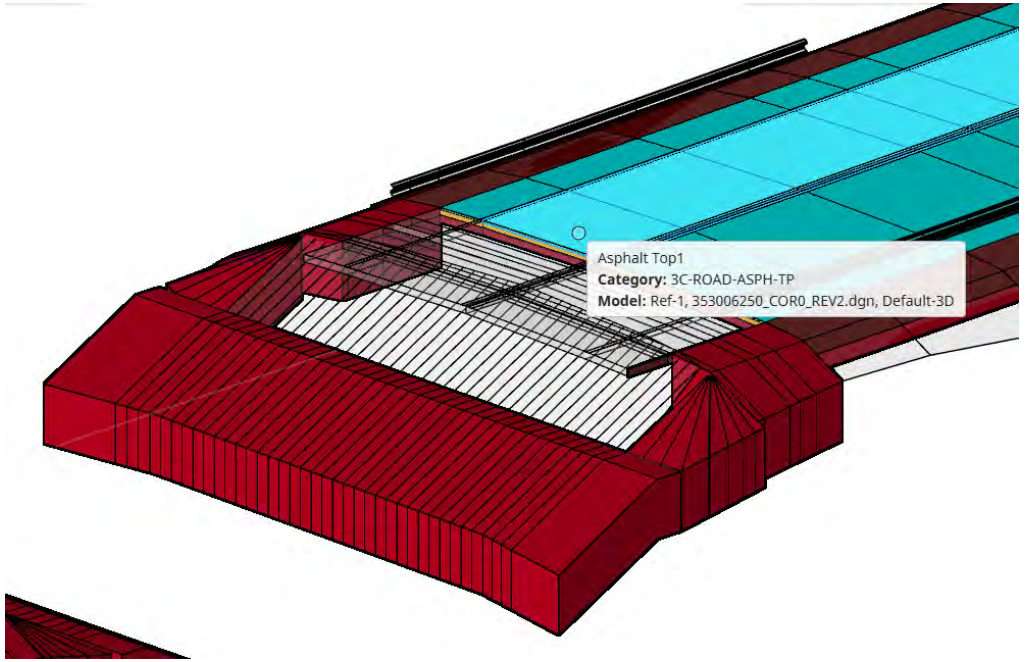


PAVEMENT SECTIONS



CONSTRUCTION





IMPACTS TO PAPA

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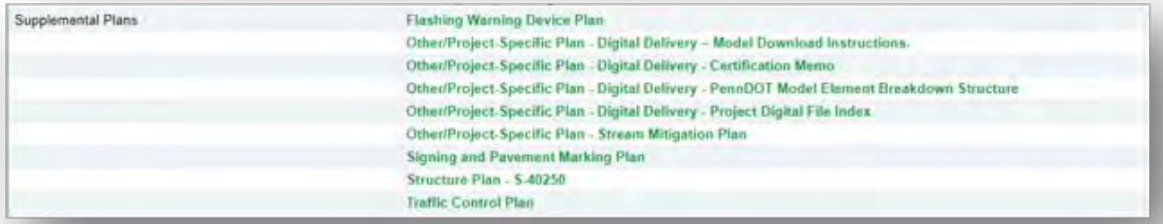
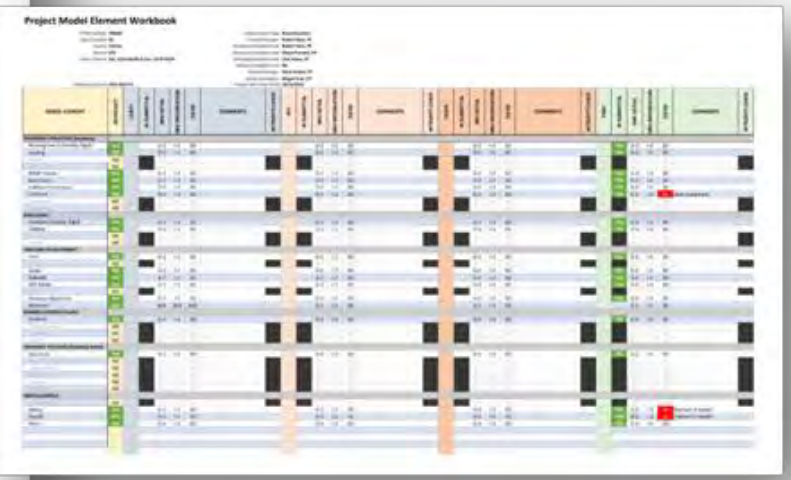
WORKING ON A DIGITAL DELIVERY PROJECT

- Bidding Phase
- Access/Special provision (listed on the website, ECMS) – anyone can access
- Looking at upcoming DD projects





WORKING ON A DIGITAL DELIVERY PROJECT

- During Construction
  - Technology ingesting model information
  - Paving information, striping
  - Pavement ticketing - finding ways to connect data rather than manual entry
- How are you viewing and what additional info can you get to make your job easier.
- Post construction – feed digital data back into the ecosystem for asset mgmt.

ENGAGEMENT

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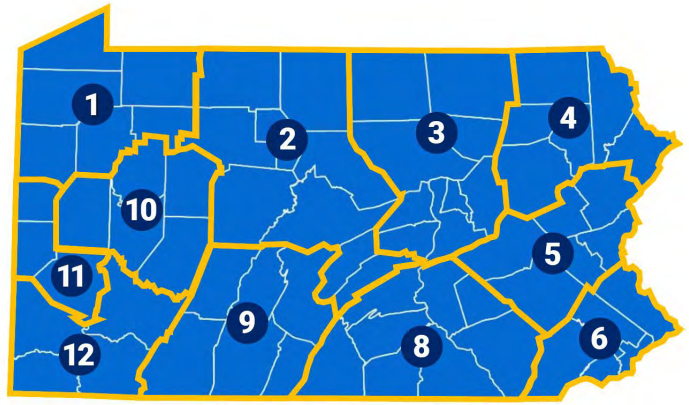
ENGAGING WITH PENNDOT AND THE INDUSTRY



INTERACTION WITH PAPA

The Central Office DD team can provide presentations and demonstrations at upcoming meetings

INTERACTION WITH ASPHALT INDUSTRY

Provide updates on pilot projects and advancements with model-based deliverables in terms of paving and striping

PILOT PROJECT OPPORTUNITIES

Opportunity to test out digital workflows on upcoming pilot projects for striping and pavement

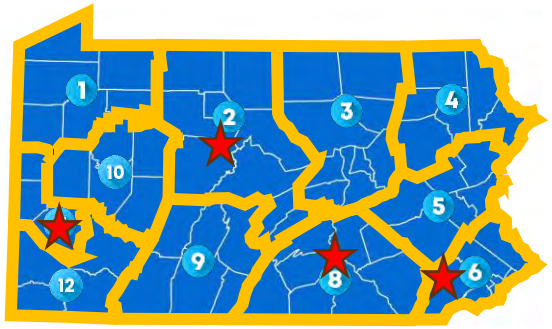
CONTRACTOR SUMMITS

Summits provided education and training to industry partners regarding the Digital Delivery Directive

- Provided understanding of terminology
- Hands on training with Synchro Control
- Information about pilot project workflows

Locations

- January 21, 2025 – Pittsburgh
- January 22, 2025 – Clearfield
- January 23, 2025 – Harrisburg
- January 24, 2025 – King of Prussia



CONTINUAL OUTREACH

Quarterly Session Demonstrations & Updates

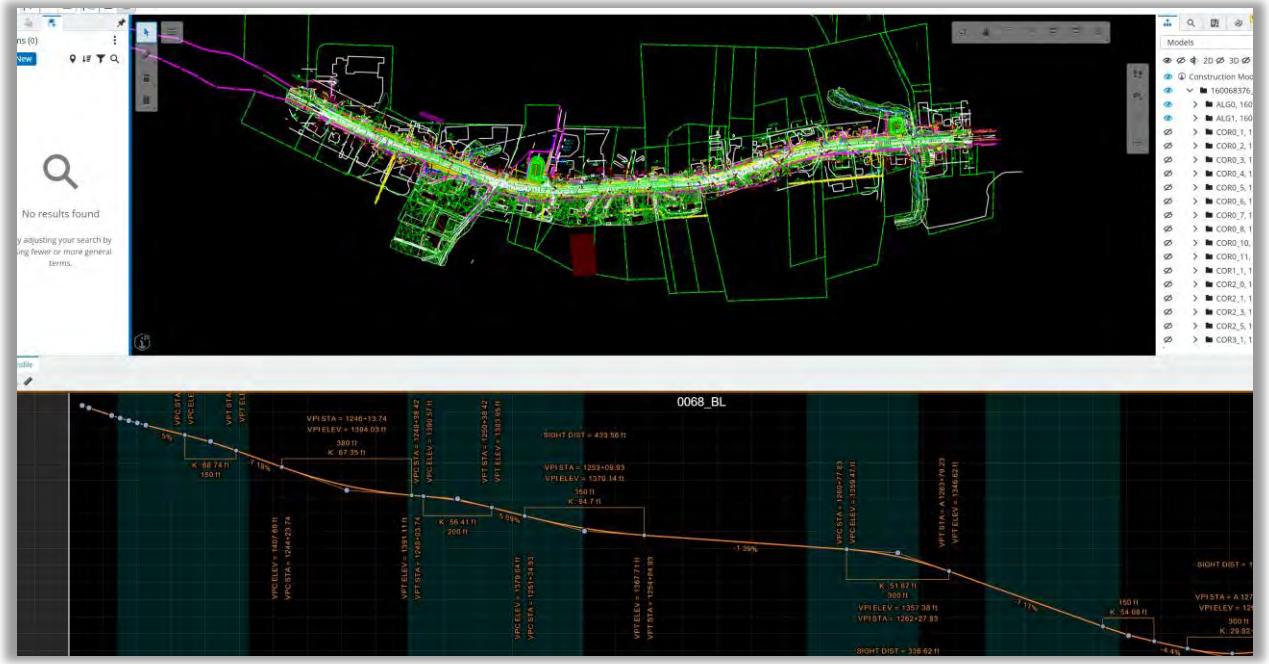
Informational Videos

Infrastructure Cloud and Synchro

Infrastructure Cloud Review Manual → Synchro User Guide

Click the playlist icon in the upper right corner of the video to view the playlist.

Infrastructure Cloud Sandbox – Anyone can be invited into the sandbox environment to test out how the model viewing tools and construction information can be utilized by different stakeholders.



HIGHER EDUCATION INITIATIVE

Vision – Digital 3-D workflows are promoted in curriculum development across the Commonwealth.

Mission – Our mission is to provide a platform for educators to advance digital delivery with students and industry professionals through educational and professional development activities.

1. **Curriculum Development Support** – Develop the process and information for the Digital Delivery Directive that supports educators in curriculum development.
2. **Project Database** – Consolidate a database of example projects to be used in student projects and professional development.
3. **Professional Development** – Develop, organize, and promote lunch-and-learn activities, webinars, and guest lectures.

SUMMARY

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SUMMARY

PennDOT is advancing digital delivery through pilot projects

3D models includes 2D details and 2D information

Working with industry partners

Working to plan opportunities for 2026/2027

QUESTIONS

Digital Delivery

PennDOT Digital Delivery Website

Digital Delivery Email:
RA-PDDigitalDelivery@pa.gov

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Chief of Digital Delivery