

Bentley

# Garth Donahue

VP, Johnson, Mirmiran &  
Thompson, Inc.



**Illuminate**  
**2025**  
Atlanta

An aerial photograph showing a multi-lane highway with a large construction site in the foreground. A tall crane is visible, and several concrete pillars are being installed. Traffic is moving on the highway lanes. The background shows a curved road and some greenery.

# MODERNIZING INFRASTRUCTURE ON I-95 RAPPAHANNOCK RIVER CROSSING CONSTRUCTION PROJECT

JUNE 24, 2025

PRESENTED TO: BENTLEY - ILLUMINATE ATLANTA

# INTRODUCTION



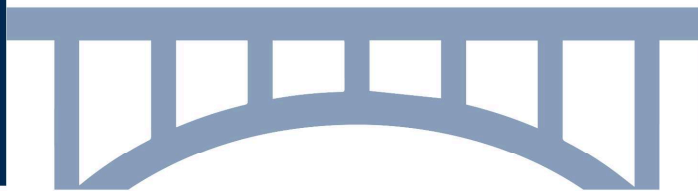
**Garth Donahue, PE**

JMT Design Center of Excellence Director

**50**  
**OFFICES**  
ACROSS THE US



**#24** ENR RANKED  
TOP BRIDGES  
**FIRM**



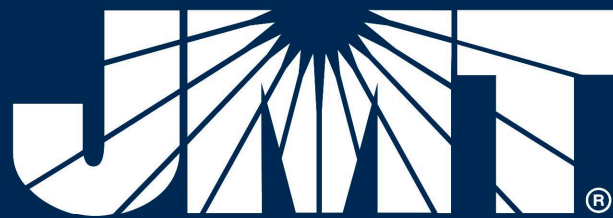
**AWARD**  
WINNING  
**DESIGN TEAM**



**JOHNSON, MIRMIRAN & THOMPSON**



**2,300**  
EMPLOYEE  
**OWNERS**

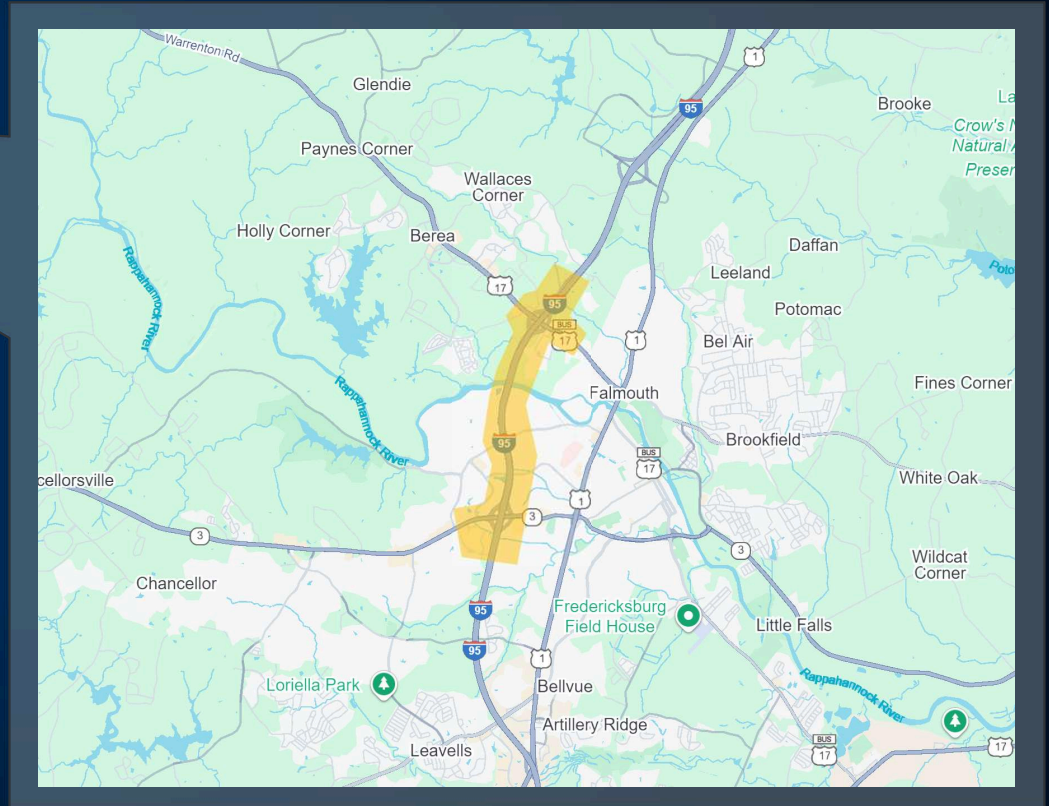
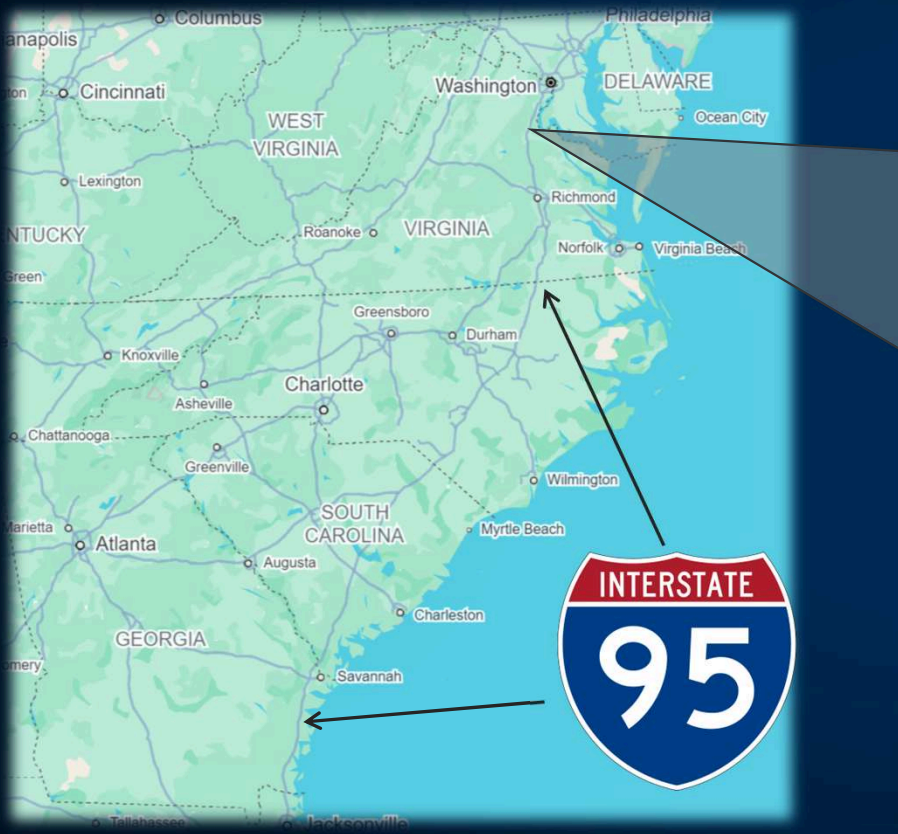


SINCE **1971**

**#9** ENR RANKED  
TOP HIGHWAY  
**FIRM**



# PROJECT LOCATION



# PROJECT DESCRIPTION



**JMT was the lead designer for both I-95 Southbound and Northbound design-build projects to add six miles of six new general-purpose lanes. The lanes were added to the existing median of I-95, and the existing lanes were converted to a collector-distributor road between Route 3 and Route 17.**

# PROJECT DESCRIPTION



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- I-95 Northbound project included multiple bridges with two **1,200 foot-long, 100-foot-high bridges** over the Rappahannock River
- Environmental sensitivity to the Chesapeake Bay
- VDOT Initiative – **Improve 95: Building a Better Ride**
- Over **150,000** Vehicles per day
- Enhance safety on I-95 and improve traffic flow
- Ease congestion and improve access for local communities

““

I study traffic patterns. You hit the breaks for a second; just tap them on the freeway, you can literally track the ripple effect of that action across a two hundred mile stretch of road. Because traffic has a memory, it's amazing, it's like a living organism.

- *Mission Impossible Task Force Agent, Ethan Hunt  
whose cover story is that he is a VDOT traffic engineer*

”

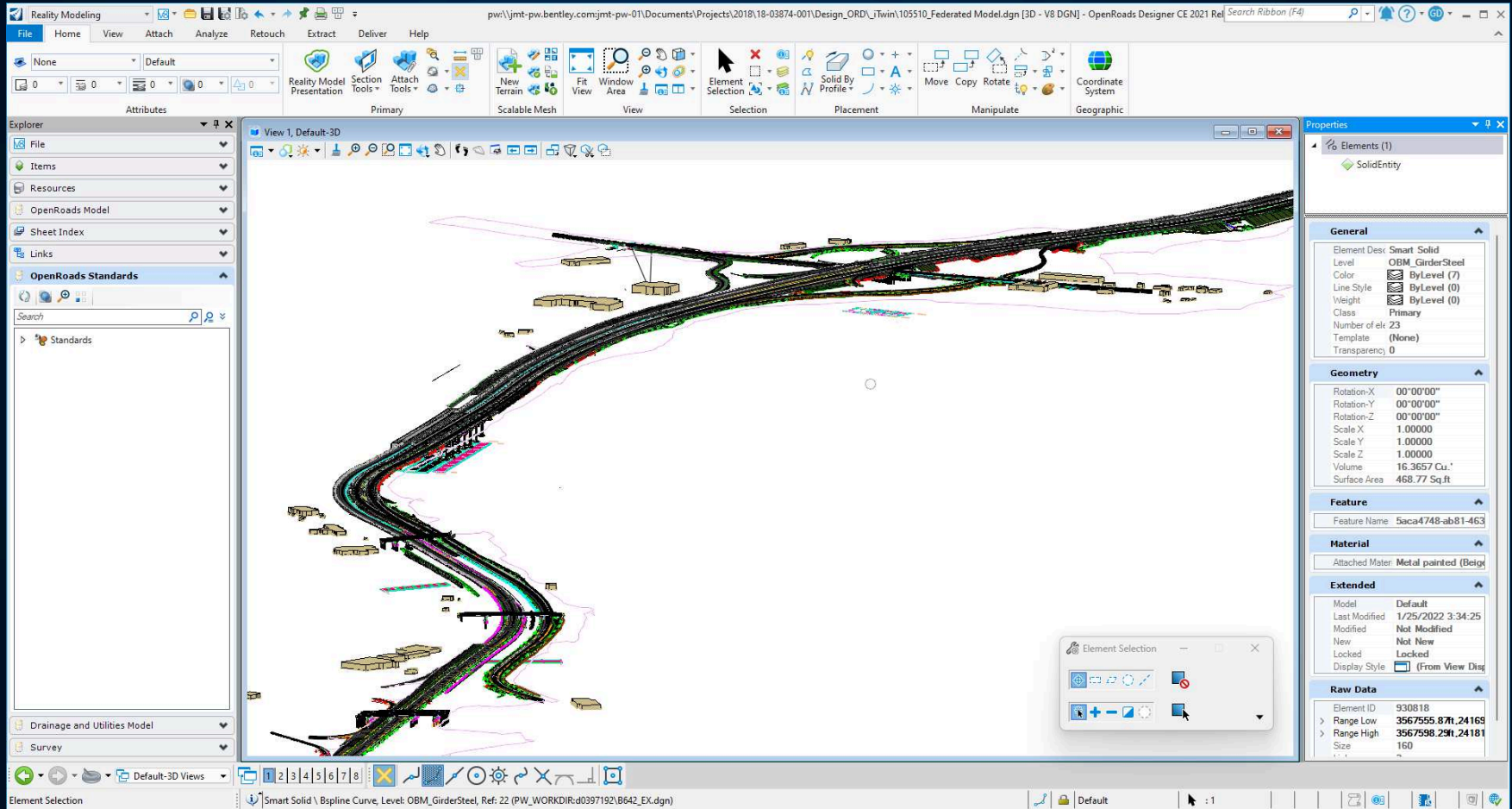


## TECHNOLOGY USED

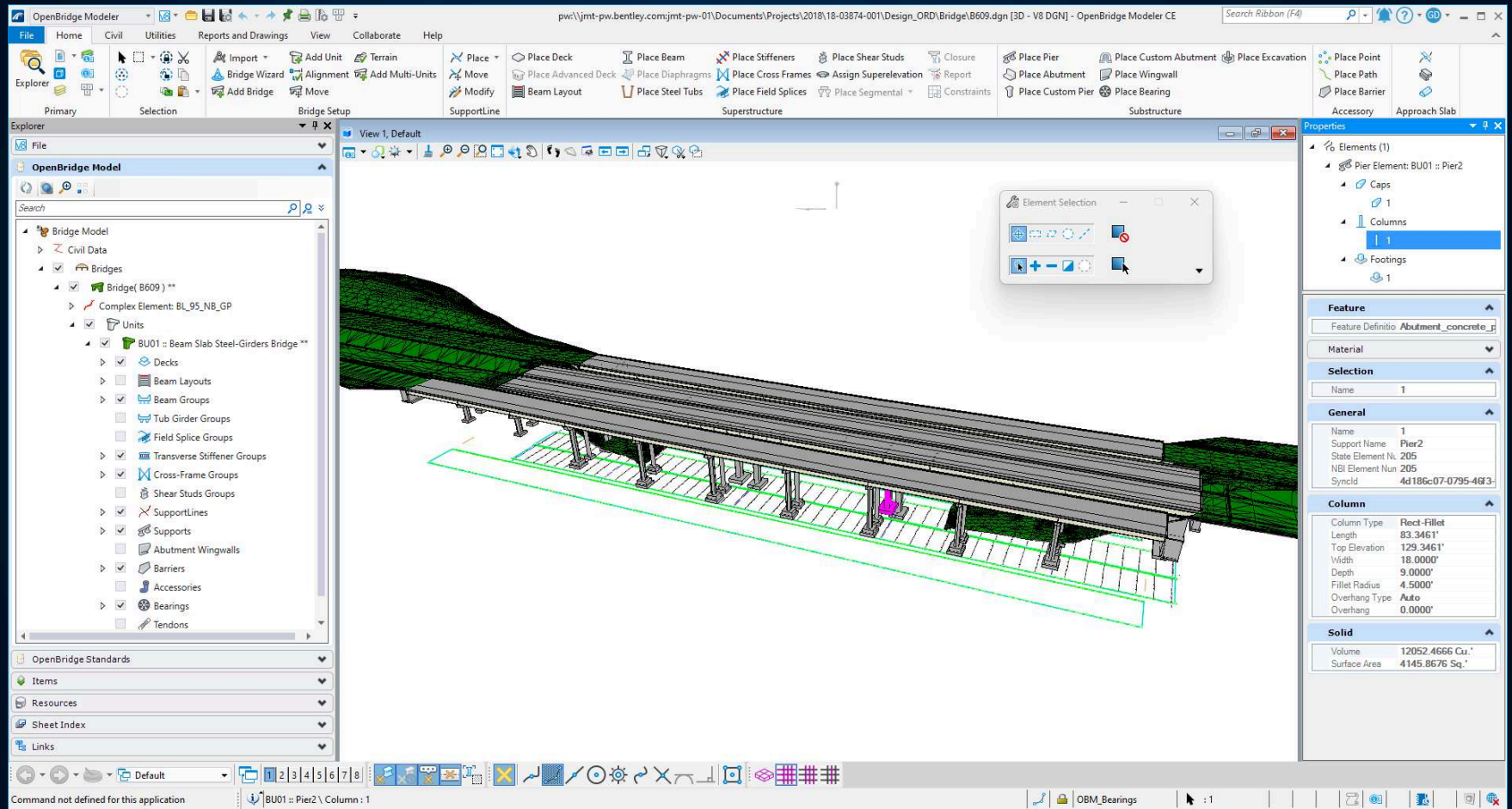
By using Bentley products from start to finish, the project team created more than just paper documents, but a whole digital journey that would have been virtually unthinkable without Bentley's "Open" Design platforms.



# TECHNOLOGY USED



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The screenshot displays the Bentley ProjectWise interface. The central 3D view shows a detailed model of a bridge structure, including piers, girders, and deck, spanning a river valley. The interface is divided into several panels:

- Left Panel (Civil Reports):** A tree view showing report categories: Geometry Reports (Horizontal Alignment, Vertical Alignment), and Quantity Reports (Along Alignment, By Area).
- Right Panel (Models):** A hierarchical tree of model components, including OCP\_Rappahannock Crossing, OCP\_MasterContainer\_UTM18N, Container-3D, OCP\_MasterContainer\_J, Bridge-604, B604.dgn, Default, OBM\_Abutments, OBM\_Barriers, OBM\_Bearing\_Seats, OBM\_Bearings, OBM\_Caps, OBM\_Columns, OBM\_D\_Bearing\_Group, OBM\_D\_CrossFrames, OBM\_D\_Deck\_Outline, OBM\_D\_Stiffeners, OBM\_Deck, OBM\_Footings, OBM\_GirderSteel, OBM\_GroutPad, OBM\_Haunch, SB\_CrossFrames\_CrossFrames, and SB\_Stiffeners\_Stiffeners.
- Bottom Panel (Forms):** A table with the following data:

Task	Display Name	Subject	State	Status	Created By	Assigned To	Due Date	Priority
	Check This Cross Brace	Check This Cross Brace	Draft	Draft	Nathaniel Gant	Nathaniel Gant	Oct 11, 2023	

Additional interface elements include a top navigation bar with a URL, a search bar, and a bottom status bar with options like 'Presentation', 'Snap Mode', and 'Scope: Top Assembly'.





localhost:3000/viewer?iTwInId=6756a3fa-768b-46f3-bff8-bab4e38119ab&ModelId=6564a2ad-def7-4bfc-bdef-9ef06456d086

Pan View does not have tool settings.

The main view shows a 3D perspective of a bridge with multiple spans supported by concrete piers. The bridge is rendered in a light grey color. Below the bridge, a terrain map is visible, showing green vegetation and brown earth. A dashed line on the map indicates a boundary or path. The background is a dark, textured surface representing the ground.

**View Controls**

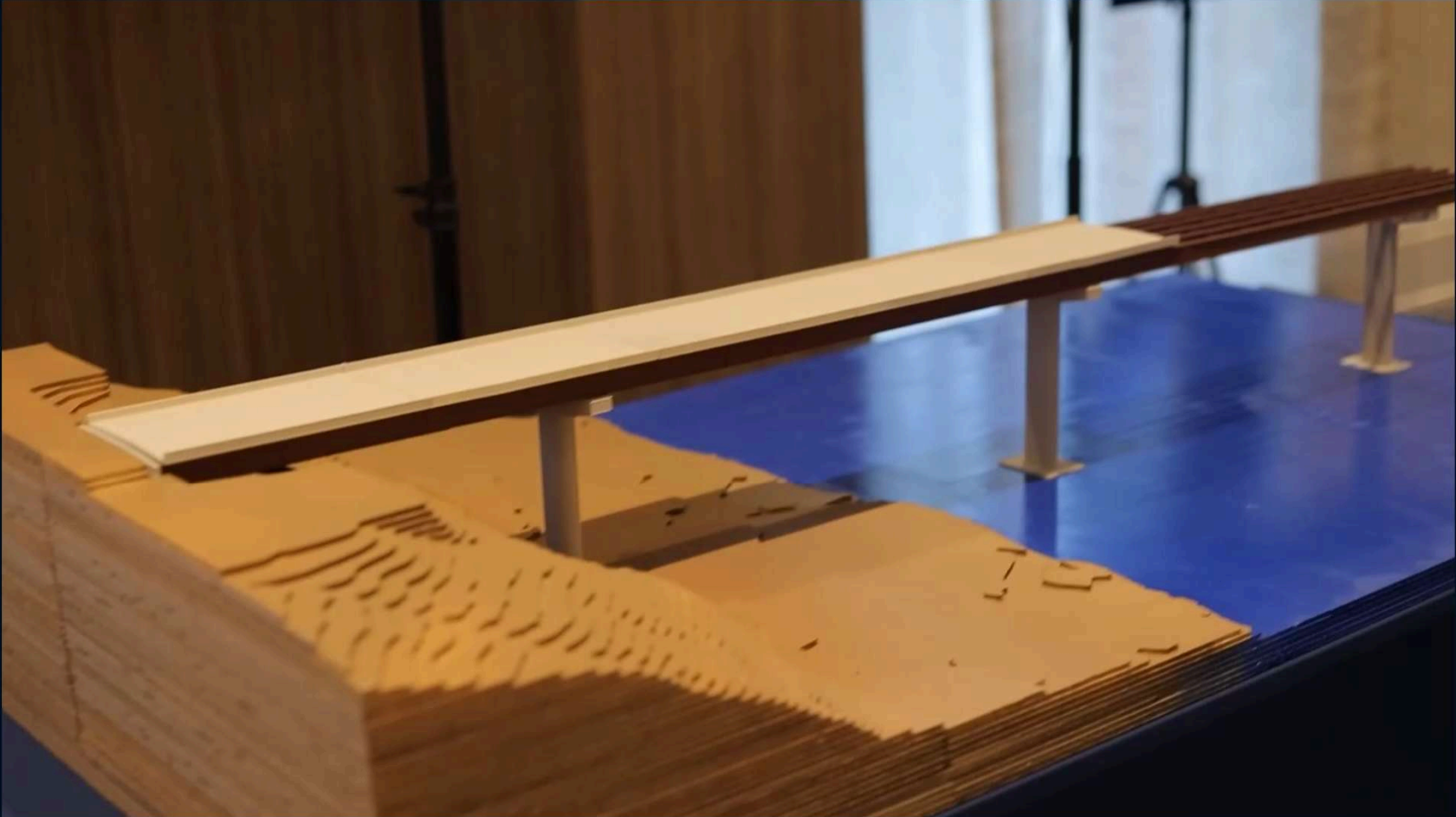
- Render Mode: Sunlight
- Select View: Initial

**Layers**

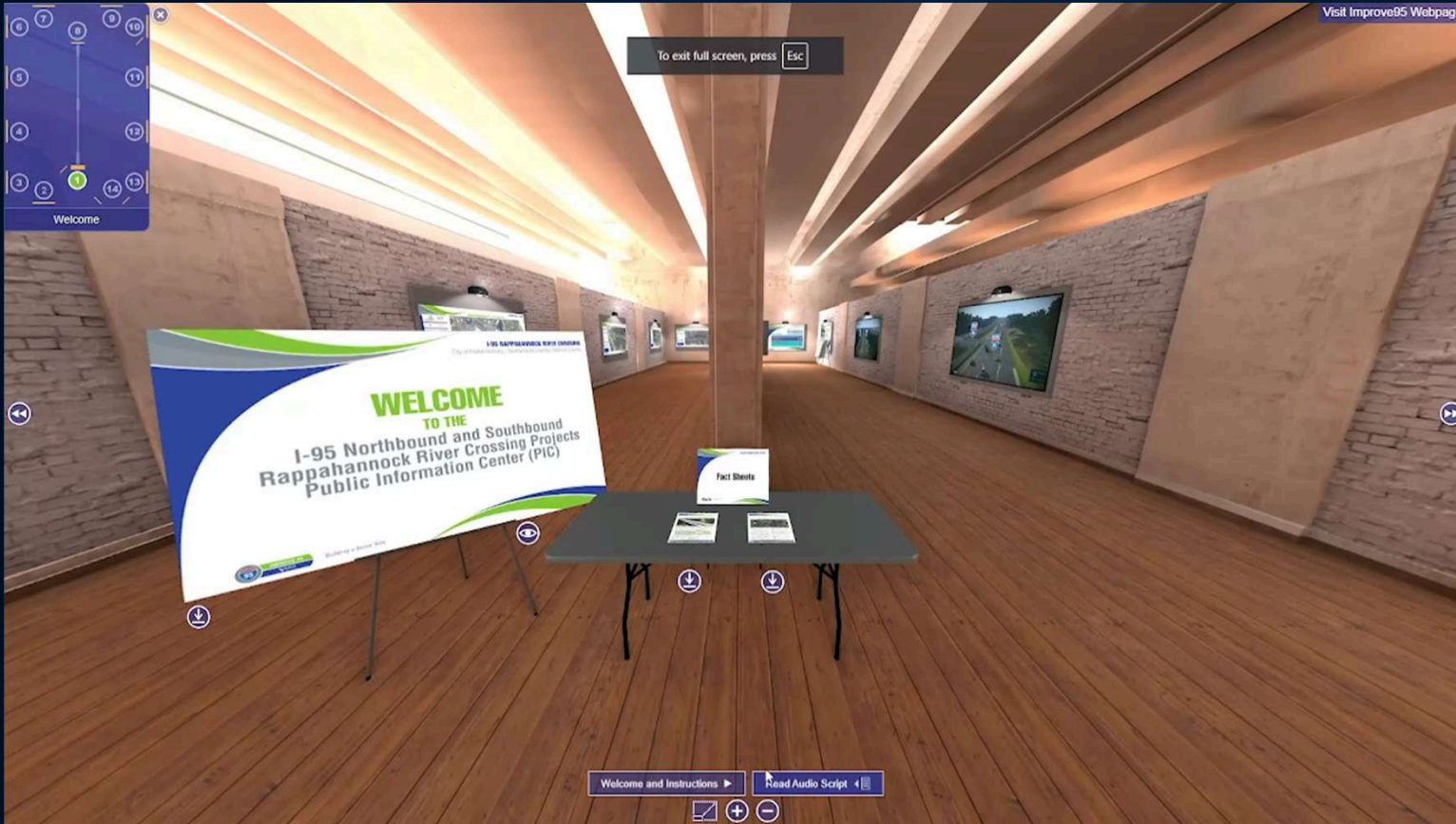
- Background Map:
- Terrain:
- DTM:
- Reality Data:
- Bridge Decking:
- Horizontal Support:
- Vertical Supports:
- 2D:
- All Else:

**GeoRSS Feeds**

- Video:  (12)
- Traffic Incidents:  (0)
- DMS Signs:  (19)







The virtual meeting saw

**3x**

higher attendance vs.  
in-person meeting

BUILT ON  
**VIRTUAL  
SPACES**



# PROJECT OUTCOMES

Aside from the common challenges posed by any construction project, the success of this project hinged on minimizing the impacts of construction on the community and clear and transparent communication with stakeholders and the public that drive that stretch of I-95.

## Minimizing the impact of construction

- **\$3M** cost reduction and environmental impact
- Projects Approximately **\$110 million** each
- Improved access for local traffic

## Clear and transparent communication with stakeholders

- Received **96.8** score from Virginia's Construction Quality Improvement Program (CQIP), highest in state
- **3X** greater reach using digital public outreach

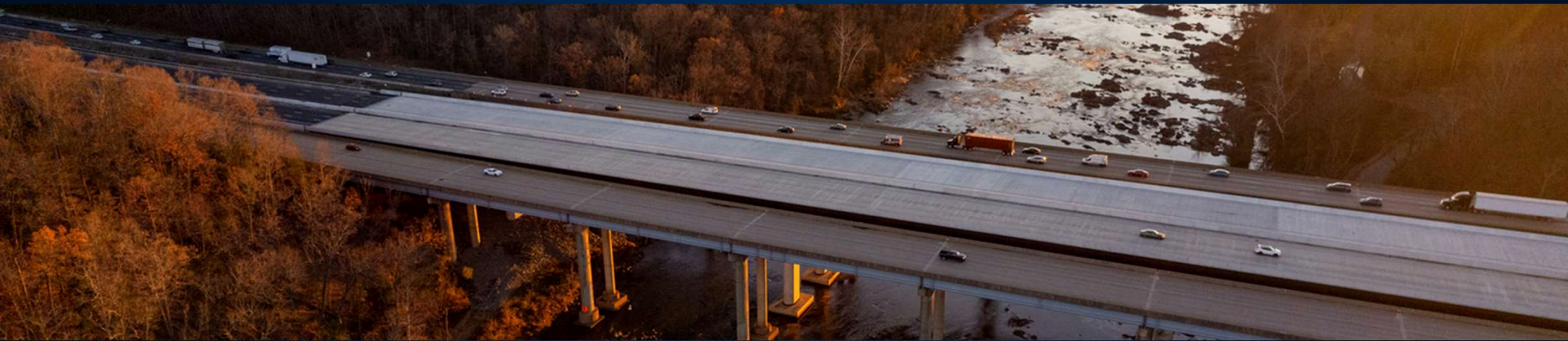
# PROJECT AWARDS



# YII GOING DIGITAL AWARDS 2024



# CONCLUSION



- **Modeling helps us see the project risks**
- **Simulations can be developed using models**
- **ProjectWise Infrastructure Cloud iModels can be utilized to tell the story and project needs for those who cannot visualize using a 2D plan**
- **Lessons learned from the Southbound project were applied to the Northbound project**

# CONTACT US:

## **Garth T. Donahue, PE**

Design Center of Excellence  
Virginia Beach, VA  
757-552-1057  
[gdonahue@jmt.com](mailto:gdonahue@jmt.com)