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SOLUTIONS

# Mind the Gap

## Esri Is Fundamental to HDR's Cutting-Edge DOT Deliverables

MARC GOLDMAN



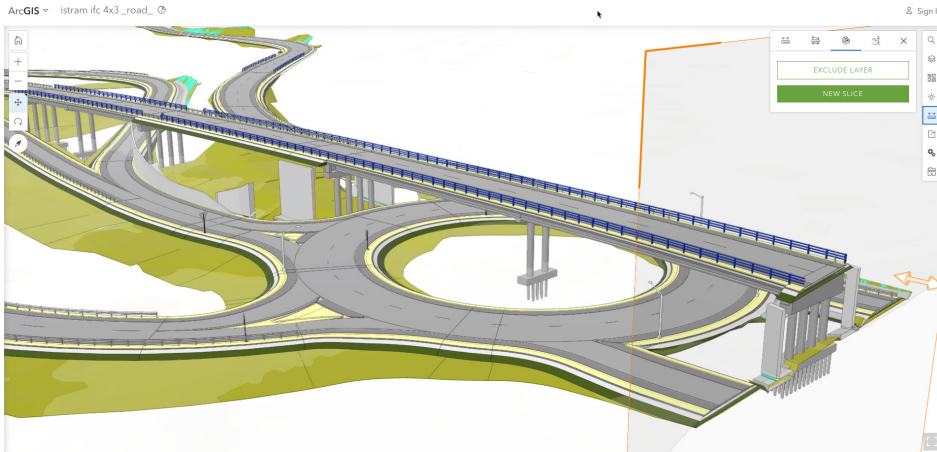
HDR's Alexa Mitchell is a civil engineer, BIM consultant and self-described "digital delivery technology enthusiast." She has more than 20 years of experience in project delivery and she's currently heading a four-person team working with state Departments of Transportation. She and her team study their vision, goals and objectives then create strategic plans for them to achieve the vision in the timeline they want. Most importantly, HDR then helps the DOTs execute the activities within that project delivery plan. It sounds a little mysterious, but basically ... "I ask people, 'Where do you think you are, and where do you want to be?'"

Mitchell calls the initiative a "gap assessment," and it addresses a growing idea within project planning that HDR is helping DOTs to realize. In Pennsylvania, for example,

where PennDOT is modernizing project-delivery processes and contract document media, her work focuses on the move to incorporate digital data. Simply stated, by 2025, construction projects will be bid using 3D technology and no longer be in a traditional construction plan format. HDR is helping PennDOT to achieve "3D2025," a four-fold initiative intended to deliver:

1. Improved Design Quality
2. Reduced Risks and Project Costs or Delays
3. Increased Construction Efficiency
4. Improved As-Built Records

HDR is essentially inventing the methods that will help DOTs onboard 3D digital delivery and perhaps revolutionize highway project planning and completion as a result. "We



Model provided by Istram

think we have something special here,” adds Mitchell. “It’s very new and complex, so we try as much as possible to work with our technology partners, like Esri.”

## Where Does Esri Come In?

“Esri is an important component of the process we’re developing, specifically in two areas,” explains Mitchell. “One is GIS, obviously. The other is LRS.”

LRS stands for “Linear Referencing System,” a method of spatial referencing in engineering and construction—specifically in highway layout and construction—in which the locations of physical features along a linear element are described in terms of measurements from a fixed point. It’s a dominant method of spatial organization in Esri’s ArcGIS Roads and Highways that allows designers to manage multiple linear referencing methods (LRMs) within a single LRS.

LRM typically was a feature of design software, but Esri has seen the spatial system expand into reality capture along highway corridors applied to GIS+BIM workflows. ArcGIS GeoBIM, for example, allows users to integrate and visualize GIS data with engineering documents, based on LRM, to make coordinated decisions across project teams.

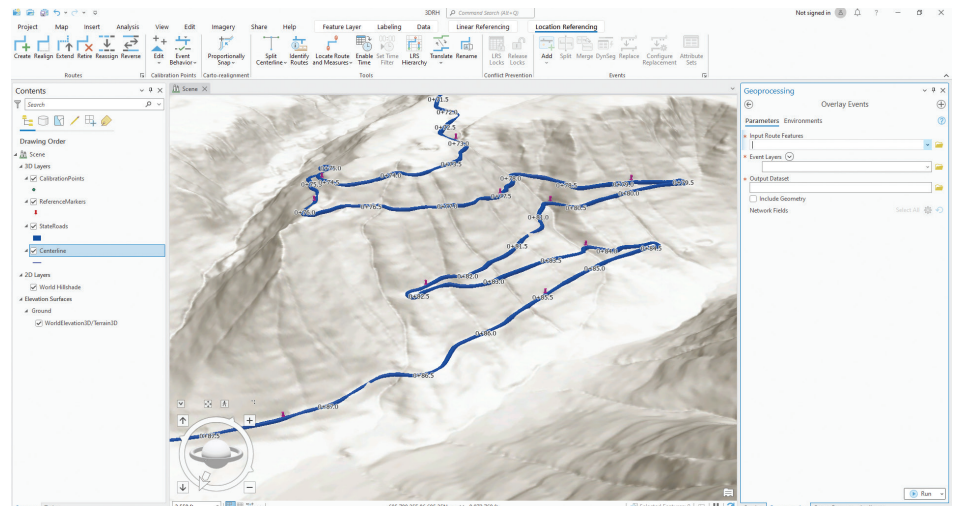
Mitchell and HDR now are integrating LRM and GIS into project planning, gap assessment and digital delivery, sometimes in very granular ways. “Part of what we’re doing is strategic planning—developing standards and best practices—for delivering information about asset systems that are software agnostic. We don’t actually deliver any project files whatsoever. Instead, we create organizing schemes and standards that ‘fill the gap’ between current deliverable standards and the desired 3D deliverables.”

## By the Manual

Sometimes this takes the form of an “Information Delivery Manual” as proposed and defined by AASHTO in January 2023. About the concept, HDR says, “As transportation infrastructure design moves toward a future where plans are delivered digitally as models, it’s key to understand what needs to be in those models. An information delivery manual lays out those technical requirements in narrative format, explaining what data is necessary for the contractor to bid and construct the bridge and

what data is needed for the bridge fabricator to initiate their process. By following the manual, each part of a bridge will be categorized, with its relevant properties organized in a pre-determined data structure.”

For Mitchell, it means that “if I’m working with a state DOT that is interested in properly modeling a bridge and exporting the data for bidding, construction and initiation of fabrication, I can tell them how, specifically, to do that. What attributes are needed and how they’re assigned to objects, for example. It can become very detailed.”



And in all cases, location is a fundamental component of planning, project organizations and deliverables. And since location has been fundamental to every Esri solution since 1969, Esri is likely to be a major part of the cutting-edge project delivery methods HDR is developing today.

To learn more about these capabilities, email: [aecinfo@esri.com](mailto:aecinfo@esri.com). **II**

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