



Digital Innovation in Transportation

Transportation leaders face increasing pressure to deliver objective decision-making and to meet higher expectations for transparency – and all amid limited resources. Digital innovation is important for driving technology-based solutions that can help overcome these challenges and deliver more efficiency and data-driven decision-making.

Below is a Q&A on digital innovation in transportation with HNTB's Jeff Siegel, technology practice leader, and Darin Welch, national geospatial manager.

What are a few key challenges that transportation agencies are struggling to overcome that can be solved with digital innovation?

Jeff Siegel: The need to do more with less. Plus, an enhanced expectation of transparency requires a higher level of stakeholder coordination, information sharing and faster, more objective decision-making. Currently, there also is the need for enhanced knowledge capture due to the rising level of expertise leaving organizations as employees retire.

Darin Welch: We also see agencies struggle to understand what data they have and even whether they can rely on that data. Data can be so duplicative, unorganized and dense that it is nothing more than digital "exhaust." Take that same data but transform it into actively managed and organized information, and you can incorporate it into your organization to consume in a more meaningful way.

Is there a particular DOT or agency that represents a successful technology implementation

DW: In partnership with the Iowa DOT, we developed the Public Involvement Management Application (PIMA) to help them manage the full process of public engagement on its projects, including meeting registration, project comments,

location mapping and favorability. All of the input, which stakeholders and the general public enter electronically on mobile devices or provided tablets, is stored in the application so that Iowa DOT can look at analytics and trends, as they perform reporting for required federal submission, such as NEPA. Across all demographics and in urban and rural settings, we're seeing high adoption of PIMA because people feel like they're part of the conversation – so much so that we've deployed the application for a number of other agencies to help manage their PI efforts, including MassDOT, KDOT and several others.

JS: Technology also can simplify complex projects for a better understanding of what's happening. We've worked with the Florida Department of Transportation on advanced visualizations of their projects — instead of someone looking at a traditional plan set, they can interact with a virtual reality environment and animations, which guides them through the project so that they understand it better.

The Florida Turnpike System implemented augmented reality (AR) during a land acquisition project. Land owners could use an iPad or VR/AR goggles to see property lines and where new pavement and features will be so that they can understand what needs to happen in order to make a project work. This AR platform helped streamline discussions between appraisers, negotiators, land owners and the DOT, simplifying the land acquisition process.

For a DOT that hasn't yet made significant strides toward implementing digital innovation, what's the first step?

JS: When launching an enterprise initiative, it helps to start with strategic planning. And when you launch the implementation, the use of pilot projects or small, incremental roll-outs are effective ways to encourage cultural adoption and get employees on board.



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One example is the San Diego Association of Governments. They're in the process of an ambitious data governance project, the long-term intent of which is to completely change the way they govern and manage their data. They started with a small project that included discovery and maturity assessment around three specific use cases. That insight informed the creation of a pilot project that they're building to create an intentional, internal cultural infrastructure with the capability to handle agency-wide applications and advanced data analytics.

How can organizations implement new technology with limited funding?

JS: There are some innovative approaches to how you resource and fund digital transformation projects, including grant and shared-funding opportunities. The U.S. Department of Transportation offers advanced technology grants, mostly around ITS and mobility, but they've also funded projects like Smart Columbus to help turn the City of Columbus into a Smart City prototype for the country.

A lot of other agencies, especially tollways and turnpikes, have flexibility within capital projects to fund startup initiatives. And because most technology implementations result in improved efficiencies and cost savings, there can be a way to shift the operating budget to fund technology-related initiatives while also reaping more savings in the future.

What technology trend will have the biggest future impact on the transportation industry?

JS: If you structure your data to create a scalable, modern enterprise data architecture, ongoing advancements will make it easier for DOTs and transportation agencies to leverage into significant operational gains.

DW: If you can put the tools, processes and people in place that are connected to trustworthy and meaningful information (not just "data"), that helps improve efficiency and the ability to do more with less. Whether it's putting in place off-the-shelf tools, building your own solutions, or using automation, artificial intelligence or machine learning, getting your organization to the point where it can trust and rely on its data is key. ■

ABOUT THE AUTHORS:

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Darin Welch is a technology project manager for HNTB Corporation, where he's worked for the past 20 years. As national geospatial manager, he leads a team for the firm's most significant GIS consulting and asset management projects and also spearheaded the development of several asset-management focused applications that include bridge management, corridor planning, capital program prioritization and managing the public engagement process.

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