How Data Science is Pushing Transportation into the Future

Data-driven technologies like artificial intelligence (AI) and machine learning are giving transportation leaders a plethora of opportunities to improve safety and prepare for the coming age of autonomous vehicles. How should transportation technologists respond to this shift? We asked Kristin Hempstead, North American business development manager for data science with Z by HP.

What are the biggest trends shaping the future of transit and transportation?
The big ones for us are:

- Self-driving cars, trucks and trains. We see a lot of companies getting into autonomous transportation, which is going to change the management of roadways.
- Sustainable transportation, with drivers and cities using electric and solar cars and buses.
- AI solutions for traffic management and safety. Departments of transportation (DOTs) are deploying applications to help drivers reduce travel time, avoid hazards and take alternate routes.
- Collecting and analyzing data for making decisions, optimizing planning and predicting outcomes.

How can better data help transportation officials improve safety and reduce congestion?
Collecting, searching and analyzing data for certain outcomes helps you understand current and future issues and needs. For instance, the city of Pittsburgh deployed real-time traffic signal controls, which use AI and traffic theory to coordinate the flow of vehicles, cyclists, pedestrians and transit. This tool helped reduce travel times by 25%, wait times at signals by 40% and emissions by 20%.

DOTs can use AI and machine learning models to build out datasets and model outcomes to help make more effective and efficient decisions. This also proactively saves money and time, increasing safety and allowing agencies to be more prepared for unforeseen events.

How can agencies make the most of funds from the Infrastructure Investment and Jobs Act and other sources?
First, they need to understand their current and future goals and what success looks like. It sounds simple, but we can all get wrapped around the axle when we think about some of these more complicated transportation tasks. Look back at projects that have or haven’t worked — and why. Once these goals are clear, start implementing tools and building datasets and models to reach them.

Talk to other departments of transportation to see what’s working and what isn’t. Look around the globe for similar cityscapes and highway systems that have already implemented successful traffic and safety tools with AI and machine learning.

Work to future-proof your agency as much as possible. As data collection and analysis increase in importance, you want to make sure the solutions you choose can meet your needs for at least three to five years.

There’s also a chance for DOTs to shape and push for innovative solutions that they desperately need. Talk to vendors, find the right type of solution and push to get it built and completed. It’s important that transportation agencies communicate with all of us in technology — so we have what they need over the next 10 years.

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