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At a Glance

Challenges

- Combining crash data across various agencies
- Less-than-user friendly data analytics tools
- Limited access to crash data for stakeholders

Benefits

- Data analytics shared easily with municipalities and police departments
- Time to pull queries and build reports cut by 50%
- Greater ability to turn data into action on safety challenges

CASE STUDY

How Greater Data Accessibility is Driving New Jersey to Safer Roadways

The ability to share robust data visualization and exploration tools is uniting state agencies, municipalities, and police departments around the state's key roadway safety challenges—and the solutions to those problems.

As one of five elite academic research institutions sanctioned and supported by the U.S. Department of Transportation, the Rutgers Center for Advanced Infrastructure and Transportation (CAIT) is dedicated to tackling infrastructure issues—including roadway safety—head-on. This has put CAIT at the forefront of promoting safety on the streets and highways of its home state, New Jersey.

In addition to the multi-disciplinary center's work to test and improve bridge and roadway safety features, CAIT also became a critical source of data for New Jersey's safety-minded organizations. This includes 560 law enforcement agencies, a number of transportation management associations (TMAs), and nonprofit organizations like the Brain Injury Alliance, New Jersey Safe Kids, Mothers Against Drunk Driving (MADD), and the American Automobile Association (AAA). Heading up this effort was transportation safety analyst Joseph Weiss.

As the survivor of a fatal motor vehicle crash, Joseph was driven to make driving safer for his fellow New Jersey residents—and he knew that data was the best way to accomplish this goal.

One of the many government employees who relied on Joseph for crash data was Kevin Bartels, head of the New Jersey State Police's Safe Corridors unit and liaison to the 53 municipalities that are home to one of the state's 12 Safe Corridors (10-mile stretches of roadway that record 1,000 or more crashes over a three-year span or six fatal crashes within the same three years). For police departments throughout New Jersey, Kevin was a critical resource for much-needed crash statistics.

"I continuously had police departments throughout the state calling or emailing me and requesting assistance for a particular roadway, town, or county, looking for crash stats," remembers Kevin. "They would ask how many crashes had alcohol involved, how many involved pedestrians, and so on."

Similarly, Laura Cerutti of TransOptions, one of New Jersey's eight transportation management associations, depended on CAIT's crash data to promote pedestrian safety programs with the state's towns and police departments. The more she could target the behaviors that led to pedestrian-involved crashes in the state, the better she could work with municipalities to reduce these accidents.

For Joseph, however, the process of getting truly reliable numbers out to the state's municipalities was proving to be fraught with problems.

The Challenge

Difficulty sharing traffic and safety data between the state's agencies had been a problem for some time. To get a clear picture of how fatal crashes lined up with the state's overall crashes,

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— Kevin Bartells, Head of Safe Corridors Unit, New Jersey State Police

Joseph had to manually combine CAIT's crash data—which he received from the New Jersey Department of Transportation—with the fatal crash data Kevin brought from the New Jersey State Police. It was a short-term solution, at best.

Another barrier to getting reliable data to municipalities was the usability of their tools. A tool that CAIT had developed previously brought together the needed data, but its interface was prohibitively difficult to use for most of the people who needed statistics.

"I had a difficult time using it," Kevin recalls. "It was confusing and seemed like it was geared more toward engineers. If you didn't put in every bit of criteria that you needed, you wouldn't get the information you were looking for."

This forced Kevin to print out reports and compare statistics on paper. "If I wanted to compare the past three years, I would have to print it out on paper and just look at it and compare. 'Are they increasing? Are they decreasing?'"

Of this program, Laura simply says, "It was just the way it was." Fortunately, she could lean heavily on her expertise with Microsoft Excel to tease out the insights she needed. Still she admits, "It was definitely more time consuming."

Ultimately, for the state's municipalities and police departments, this left a gaping hole in their ability to act to reduce crashes.

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— Joseph Weiss, Safety Analyst, Rutgers University Center for Advanced Infrastructure and Transportation

"They knew they'd had 500 crashes in the last year, but they didn't know the time of day that these crashes were occurring or the day of the week or how old the drivers were, how many people were speeding or drunk driving, how many of them were pedestrians, how many times the pedestrian was at fault, or how many times the driver was at fault," Joseph remembers. "They weren't able to ask those granular questions and really understand why crashes were occurring on our roads."

Joseph knew he had only a few months to figure out how to turn existing data into something the law enforcement community and its partner agencies could use. This time, they would not have years to build and implement a solution from scratch.

The Solution

Prior to this time, Joseph had heard about the success the Utah Department of Transportation had experienced with Numetric. Faced with the challenge of quickly getting a better data analytics tool up and running for CAIT and its constituents, Joseph wondered if Numetric might be just what he needed.

"I gave Numetric a call and told them my predicament," he recalls. Numetric, in turn, was confident that it could get CAIT's crash data into its system and operational within his timeframe. Joseph started working with Numetric in November of 2016, and they had a beta version ready to go by mid-January of 2017, which officially went live at the beginning of February. "Time was of the essence, and that's where Numetric shined."

For Joseph, the answer felt almost like an out-of-the-box solution, albeit with the benefit of some customizability. "We were able to leverage Numetric's traffic and safety app as the basis for our new crash analysis software. They took the data and built a system around it. You could say Numetric provided the engine, and we provided the gas."

The Benefits

Numetric has not only restored the access to the crash data Joseph, Kevin, Laura, and others badly needed to better promote safety on New Jersey's roadways—it has opened a world of new possibilities in terms of how quickly all of their stakeholders can access and visualize the data and how deeply they can dig into it.

A More Data-Driven State

Perhaps one of the biggest benefits of using Numetric is that Joseph can give all stakeholders and partners direct access to the crash data they needed. After minimal training, representatives from any municipality or police department could log in, type in the name of their town, and see a visual breakdown of crashes by time of day, day of the week, those that involved alcohol, and more. As if that were not enough, any user could apply more filters to see the leading causes of accidents on a particular day of the week, for instance.

"It's a fast, easy-to-use, and exploratory model," says Joseph. "Even without knowing what problem they were trying to identify, they can go in and see what the problems are."

Joseph could also easily configure his stakeholders' Numetric Workbooks to provide the statistics that would be most relevant to them, while still giving them the ability to drill into the data to discover underlying causes. For instance, he was able to create searchable columns for Distracted Driving-Involved Crashes, Unsafe Speed-Involved Crashes, Younger and Older Driver-Involved Crashes, and several more categories—those stats most requested by his stakeholders in municipalities and police departments. What seemed like only a minor improvement yielded search results that were far easier for his stakeholders to understand and act upon.

For those police departments and municipalities that do not yet have access to Numetric, Kevin can respond to their requests for statistics in a fraction of the time it used to take him.

"I've been actually able to tell these police departments, 'I can get that data, literally, in a couple minutes,'" Kevin says, noting how Numetric allows him to go above and beyond in delivering useful data. "I'll give them information they're looking for, plus some. Numetric has made it so simple. Clicking a couple different stats within those charts, I can give them a ton of data that they didn't even know was possible. It's absolutely increased my credibility and trust with them."

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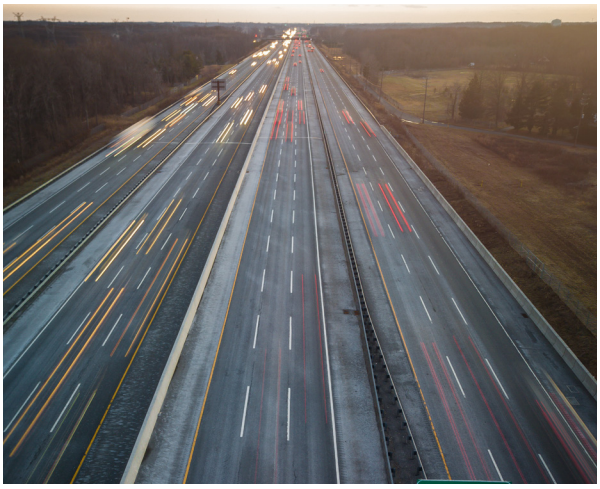
For Laura, direct access to data in Numetric means that she can perform deep-dive behavioral analysis into what is really causing the state's pedestrian-involved crashes. "I look into the demographics. What gender was the driver or the pedestrian? Where was the driver's place of residence? Was it the town where the crash occurred or somewhere else?"

As she attends meetings with municipal governments and police departments, this depth of data translates into instant credibility and trust that allow her to better influence pedestrian safety issues. "It shows that I've done my research, that I have some background on their city, especially the crashes that have happened there," says Laura. "They're usually impressed that we have a reliable source of record to do this. It makes for a great introduction with towns to get pedestrian safety campaigns moving with them."



As Joseph continues to get Numetric into the hands of more of his constituents, his role has changed from being a dispenser of statistics, one requester at a time, to being a facilitator of data discovery.

Joseph explains, "Instead of me crunching and organizing and summarizing data for people, it's giving them the ability to do their own research and enhance their methodologies. We've given them a tool to increase their intellectual ability to ask deeper questions and drill down into the data to get information that is going to better inform their policies and their decision making."

This, Kevin says, is a much-needed game-changer for the state's police departments. "It's going to be vital to a lot of departments. Once they get access to Numetric, they pick it up quick and they sit there and wonder, 'Where has this been? What's taken so long?'"

Easy Visualizations

According to Joseph, one aspect that has made Numetric the perfect tool for sharing data with stakeholders is its intuitive visualizations. For non-technical users, these tools make it easy to convey the insights that are usually locked away in millions of rows of data. One of Joseph's favorite visualizations is the map interface. "When you first sign on, you're immediately greeted with color-coded dots on a map where all of the crashes took place. The ability to see the specific location where any crash occurred is an enormous leap forward."

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Laura uses the same map interface to alert towns and police departments to their pedestrian crash hotspots and what they can do about them. "On the map, I'll show them where accidents are happening, where the hotspots are in terms of specific intersections, times of day, or weather conditions."

Numetric's striking visualizations make this data sharing easy. "When you're going to a town and trying to demonstrate the need, they don't want to see a big spreadsheet," she says. "They want to see visuals and graphs. It's easier on the eyes, so you get your point across and get the project moving."

Data in the Fast Lane

For Joseph, another benefit that makes Numetric so usable by so many people is the speed at which it queries data—literally seconds, compared to the minutes or hours other tools can take to perform similar tasks.

This has cut in half the time Joseph spends analyzing data. "I'll save 10 minutes on a quick reply that used to take me 20. A four-hour answer is down to two. On top of the new insight our end users now have, the impact on my job has been tremendous."

This same speed allows Numetric users around the state to get the data they need at a rate that facilitates fast-paced decision making.

Driving Greater Safety

Access to this data—which updates at the speed that new data is entered by the state's agencies—is making it possible for the state's municipalities, police departments, and transportation agencies to baseline and track their progress in meeting their roadway safety goals.

"With Numetric, I can get the location of these pedestrian crashes and make them available to police departments," Kevin explains. "Then they can concentrate on those locations and how they can improve the design to reduce the number of crashes that occur there."

Laura agrees, "Numetric makes it easier for me to drive concern in the community about pedestrian safety."

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Let Data Drive Your Decisions

Numetric empowers public transportation agencies to visualize crash, asset, and other data from multiple sources in real time. It gives anyone—from analysts to engineers to constituents to municipalities—the ability to perform crash queries, project estimates, cost-benefit analyses, and more. If your agency is ready to let data drive your projects, request a custom demo today.

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