Moving Forward with Modern Processing

Dr. Catherine T. Lawson
University at Albany/AVAIL

Visualizing Transportation Big Data for Efficient Decision Making

Gainesville, FL

12/8/2017

Traditional Approach:
Data used for decision-making

Data as an "Agile Asset"

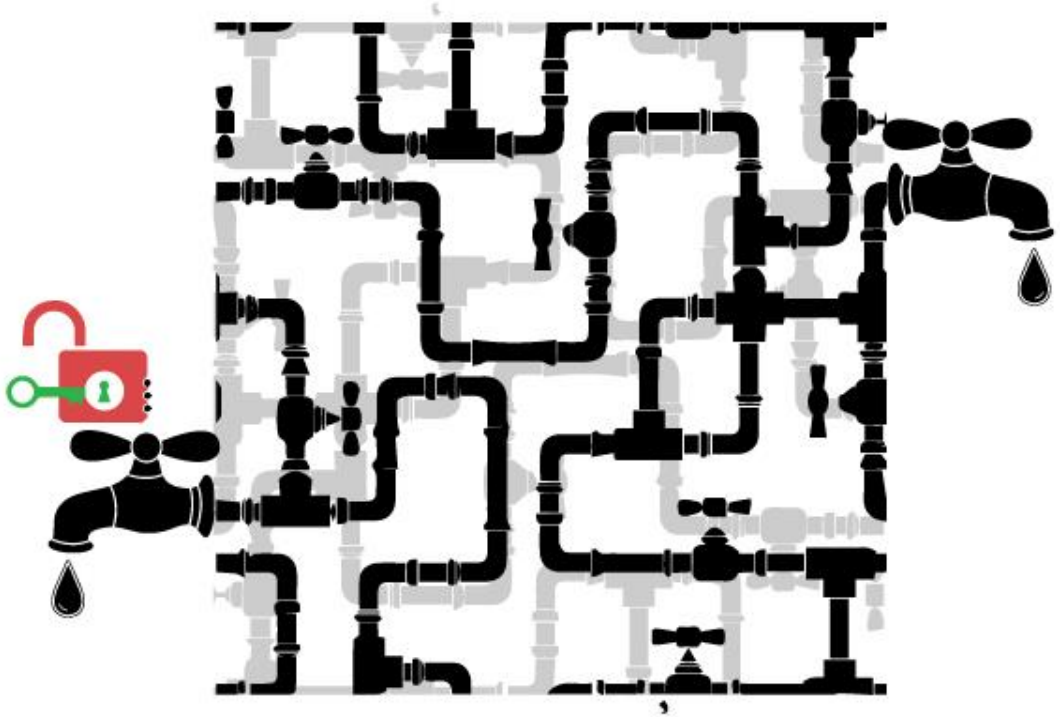
- New sources of data now changing standard practice:
  - The National Performance Management Research Dataset (NPMRDS)
  - Connected Vehicle (CV) data
  - Bridge sensor data

..... and so much more!

New York State DOT
Take on the challenge

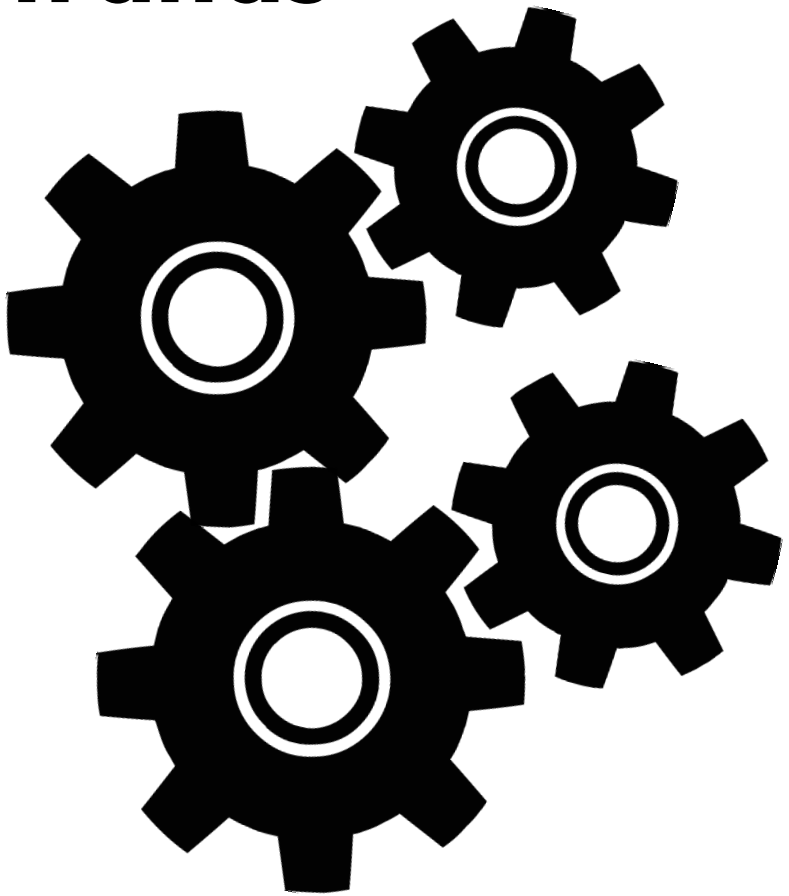
- Data delivery strategies
- Analytics options
- Organizational approach
- Relationship to workforce needs
- Internal/External dissemination
- Maintainability and investment longevity

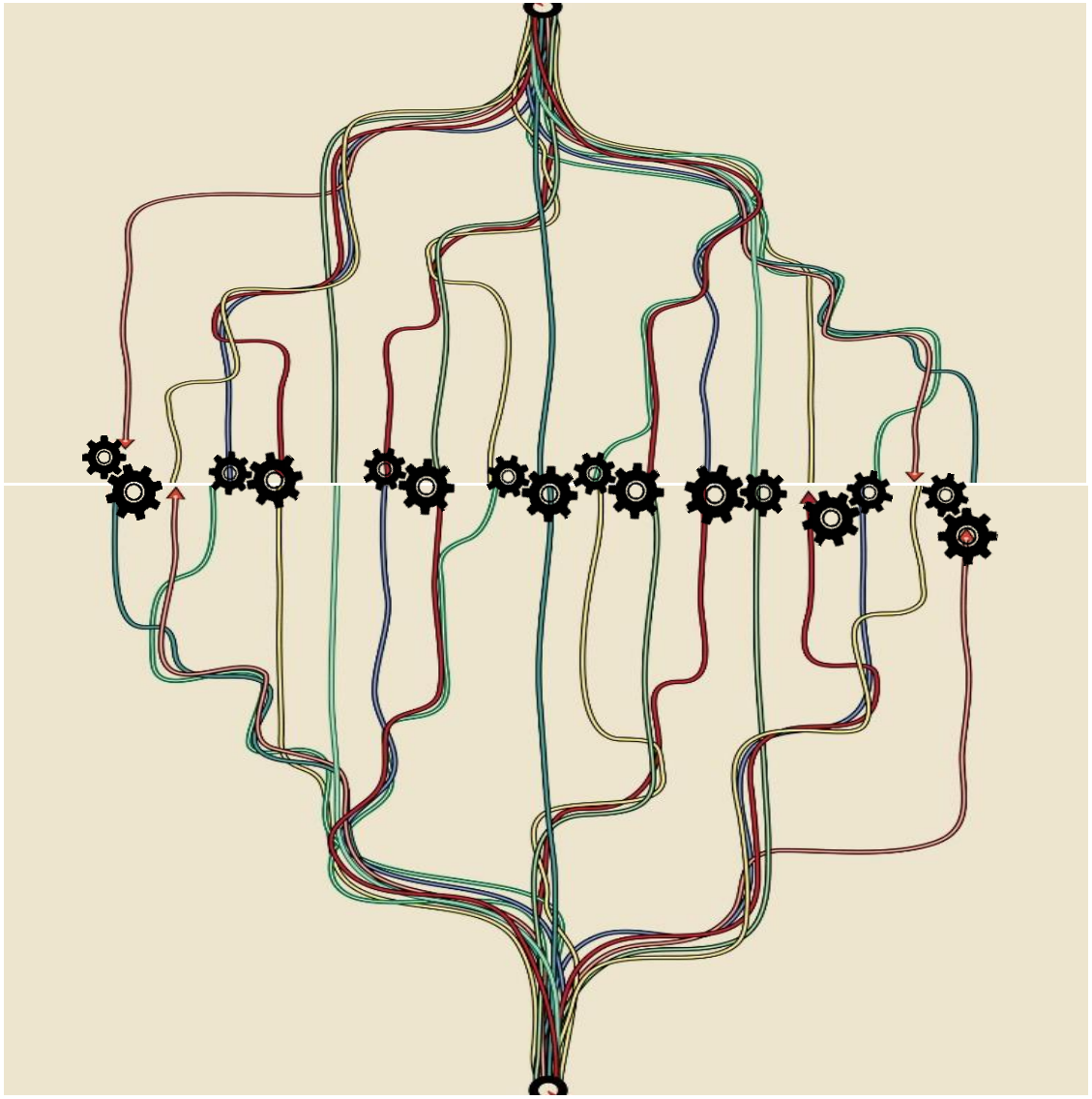
Thinking like a Data Scientist



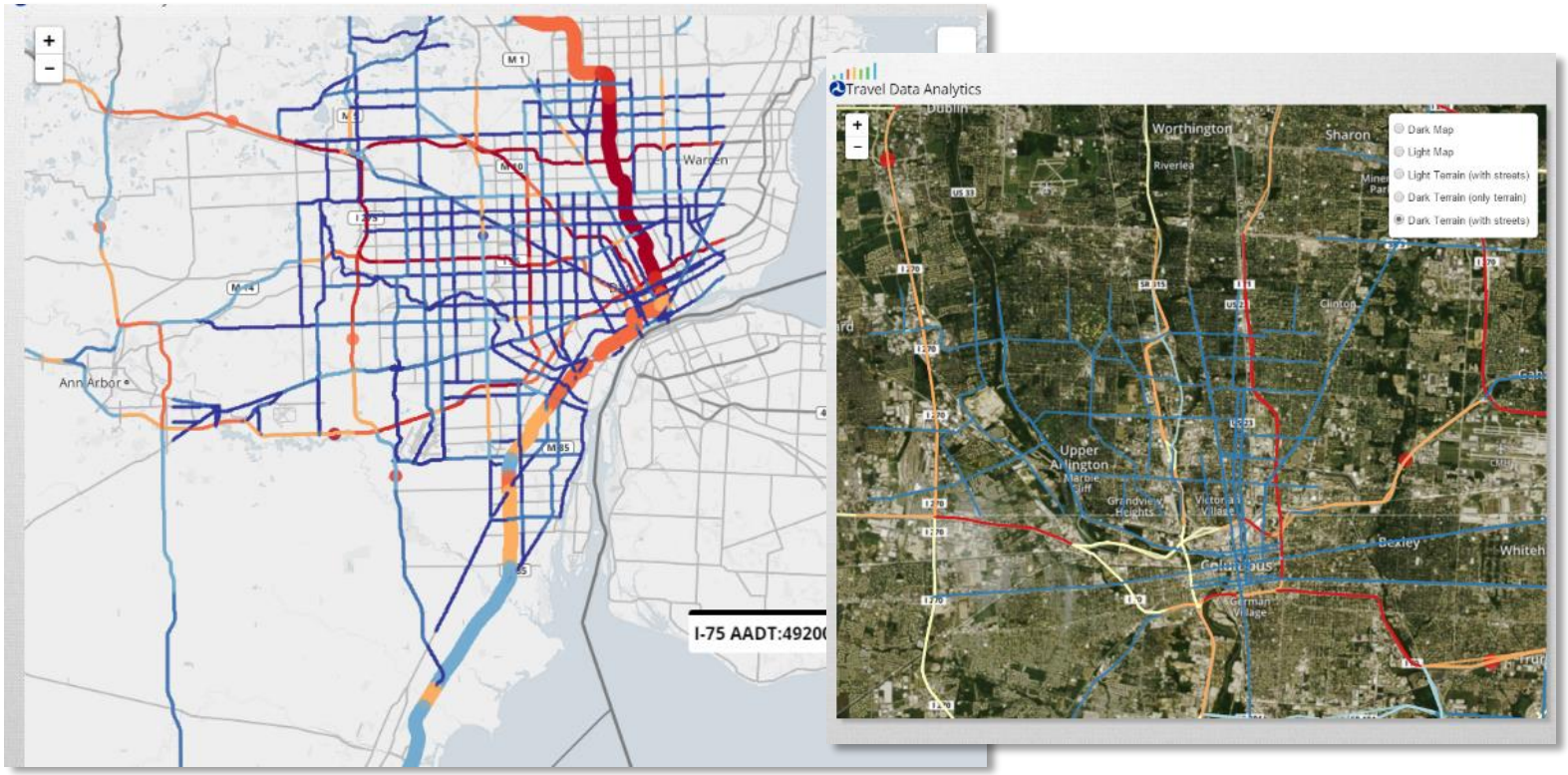
Application Programming Interfaces (APIs)

Data Scientists reweave data strands --



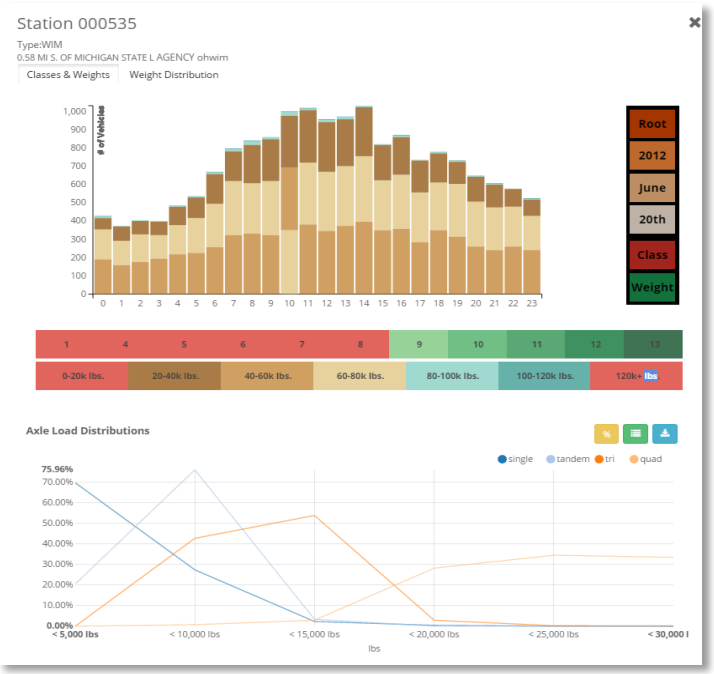


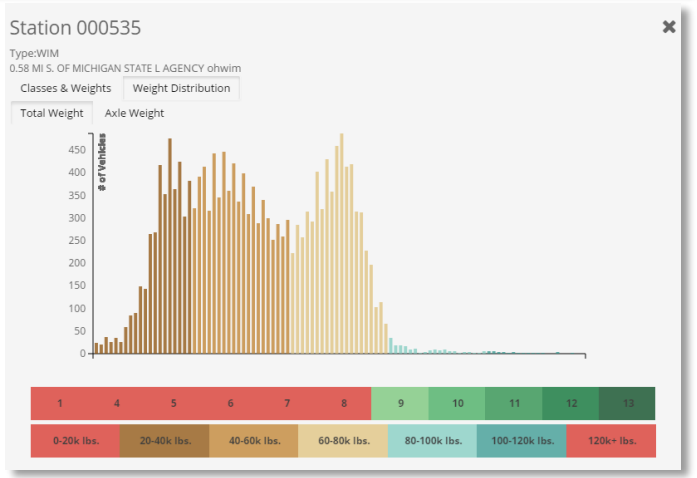
To create web-based dashboards requiring only a browser–



accessing & analyzing data "on-the-fly"

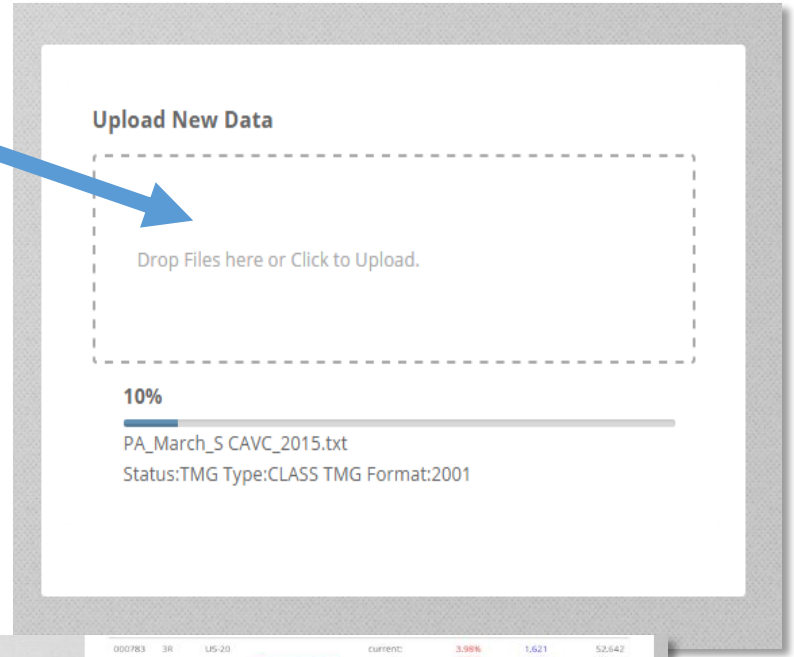
I-75 Michigan



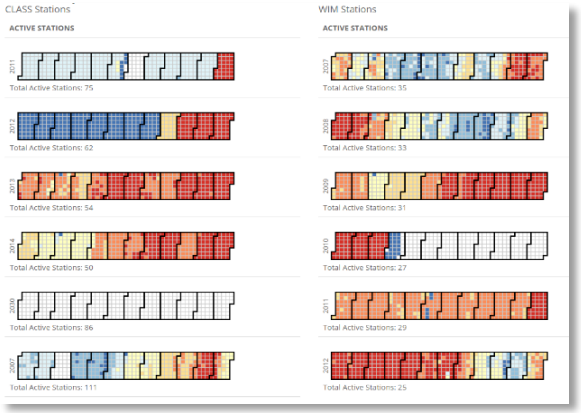


FHWA Pooled Fund Study

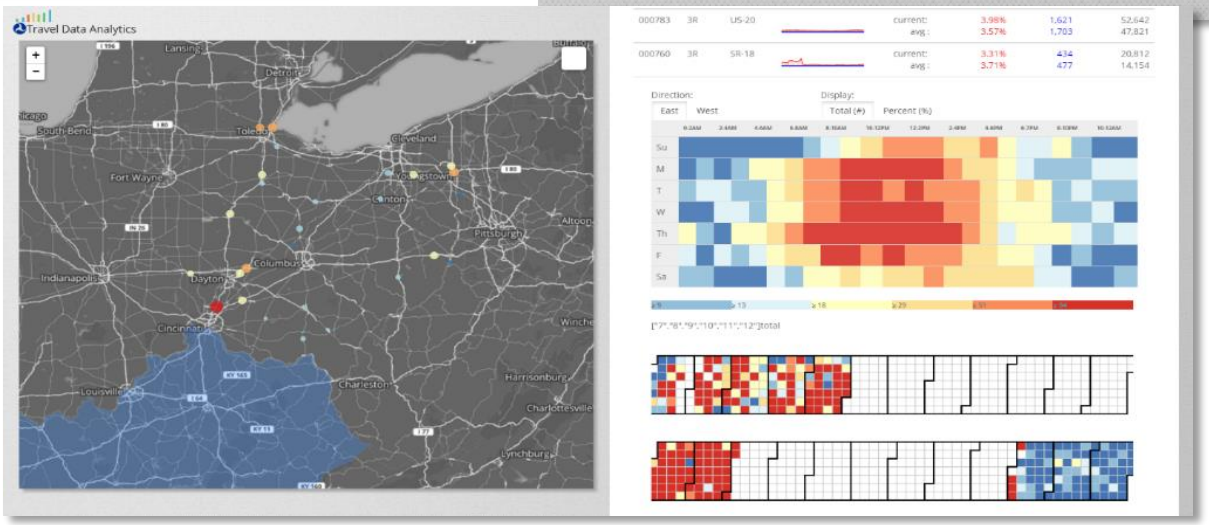
Where data can be easily “dragged and dropped” into the tool



Checked for completeness



And interactively interrogated by location or metric

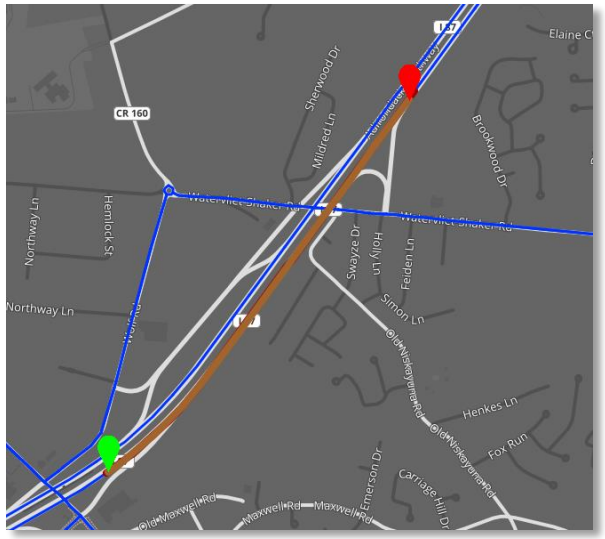


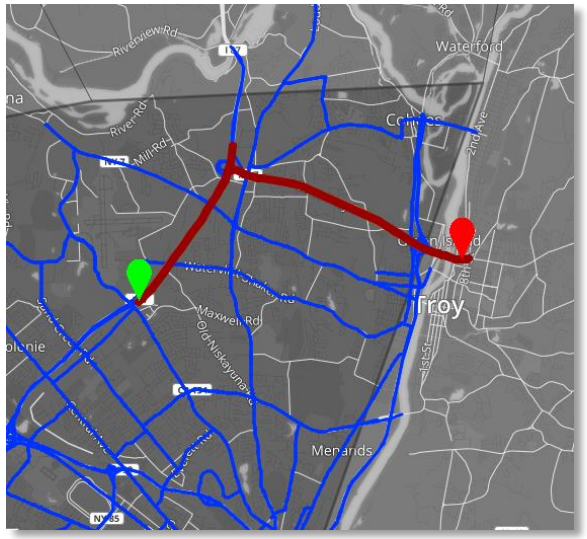
NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Multi-Geographic Resolution:

Segment || Route || Multi-Route Corridor || Network





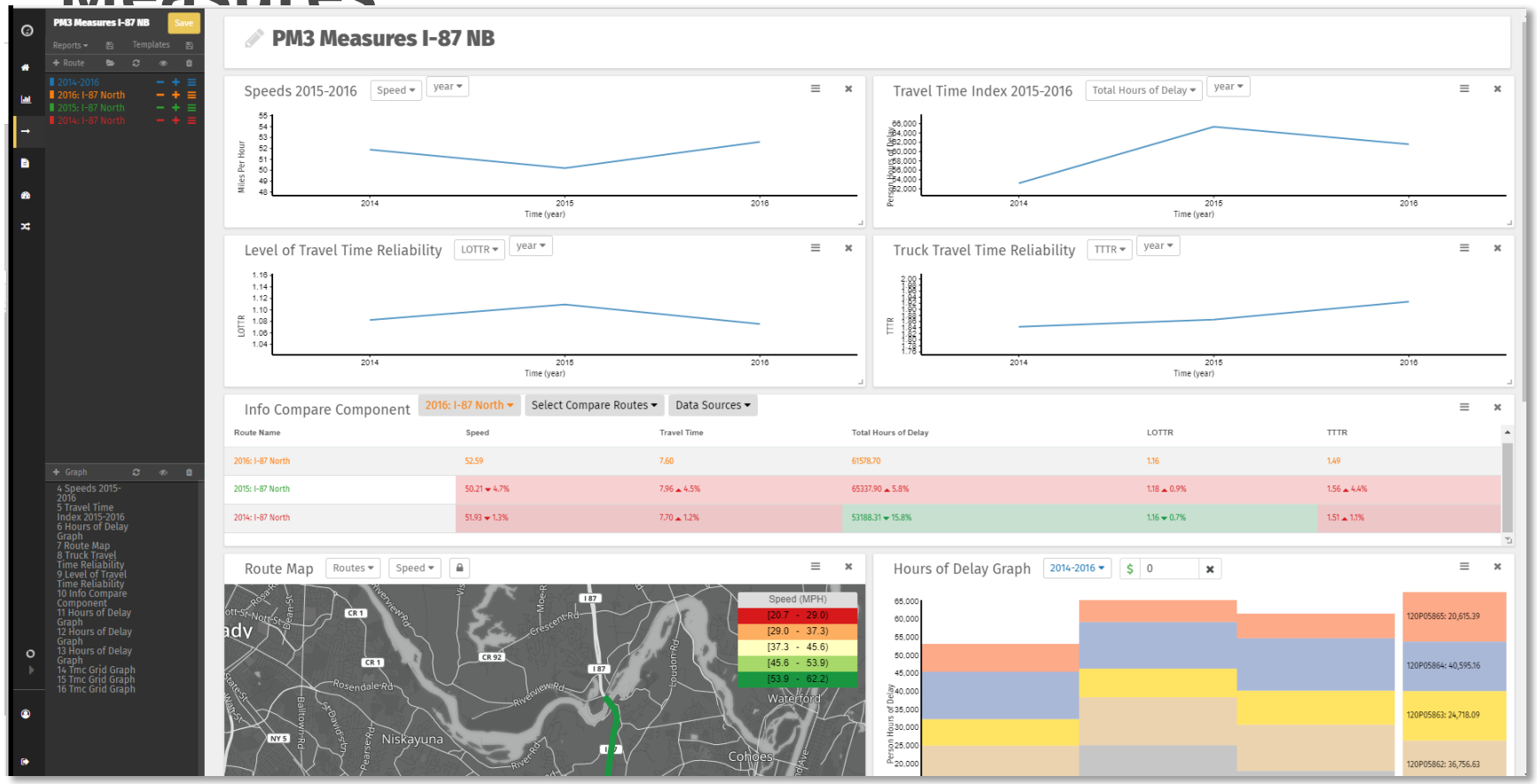
Creation and editing tools make your geographies fully customizable

Albany Visualization and Informatics Lab

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Pinpoint Analysis of PM3 Performance Measures

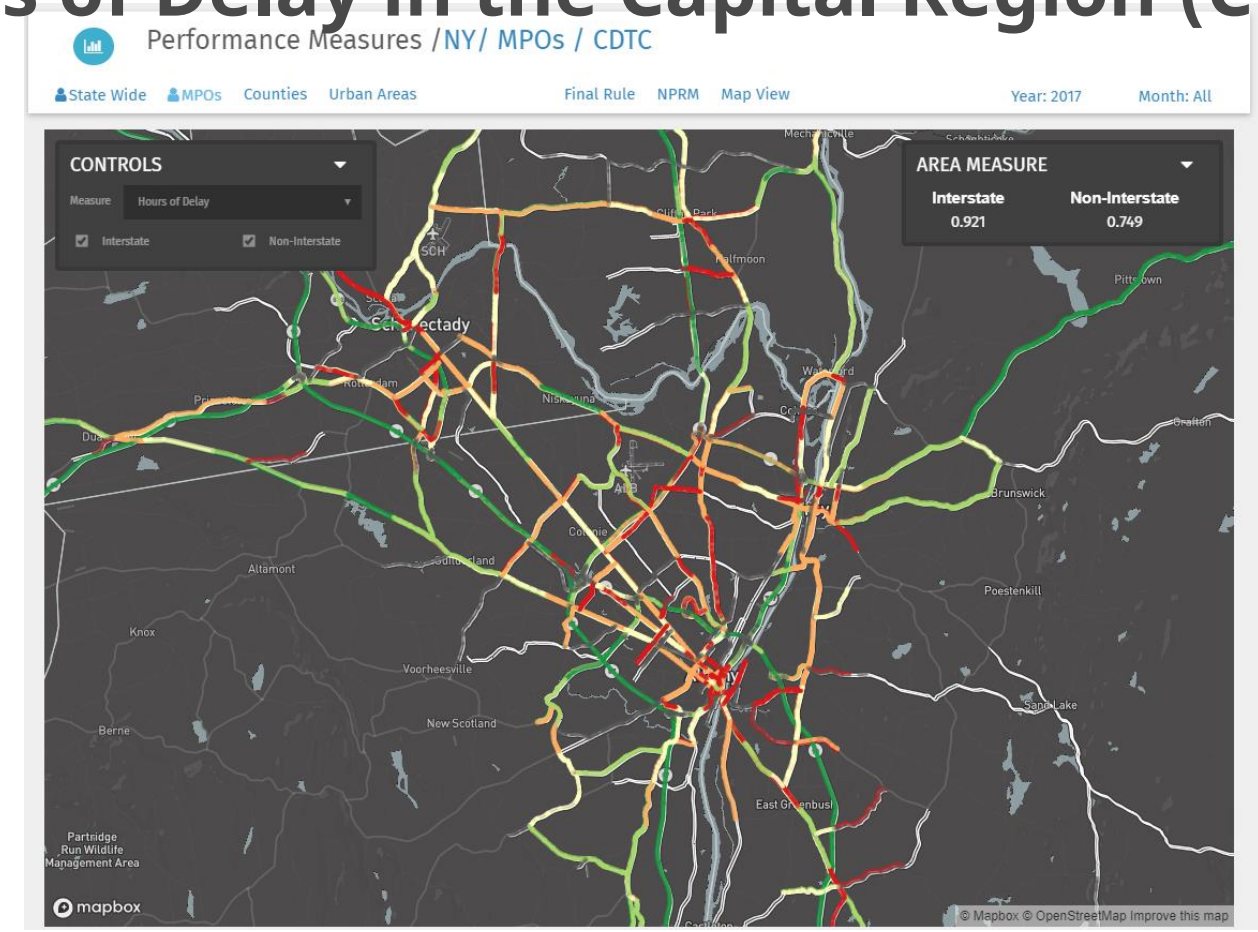


Albany Visualization and Informatics Lab

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Performance Measure Scores by Segment Hours of Delay in the Capital Region (CDTC)



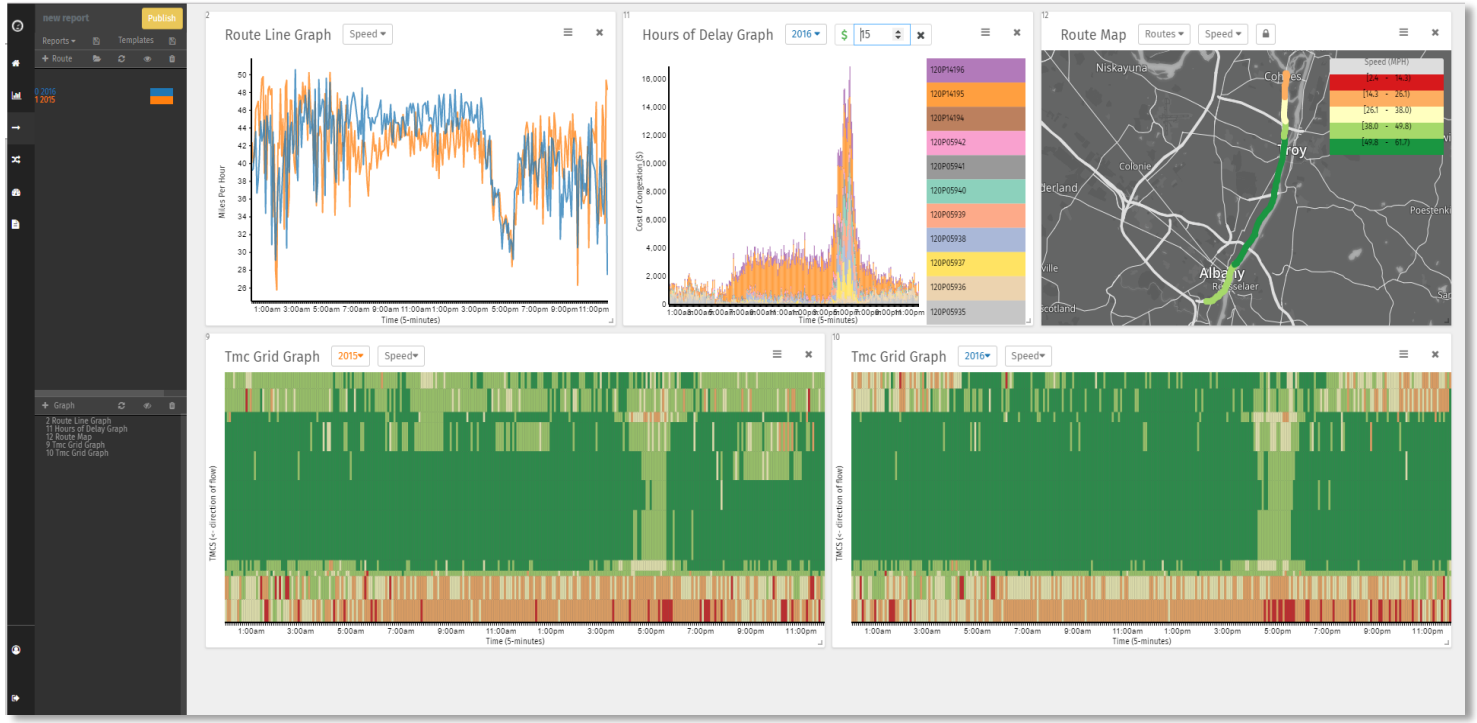
Albany Visualization and Informatics Lab

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Leveraging NPMRDS for uses beyond FHWA performance measurement requirements

- Corridor Analysis
- Network Analysis
- Bottleneck Identification
- Project Prioritization
- Post-Project Analysis
- Incident Post-mortem Analysis

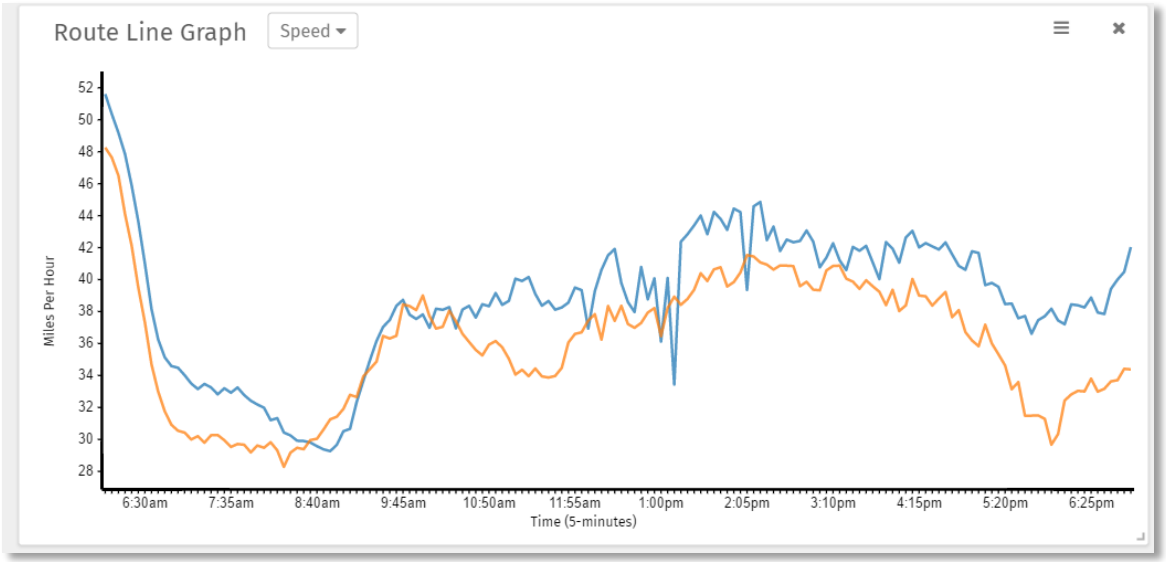


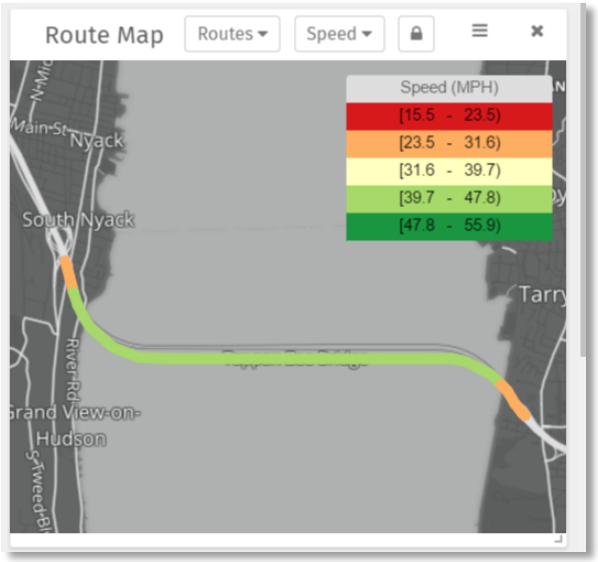
Albany Visualization and Informatics Lab

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Post Project Analysis Case Study: The Tappan Zee Bridge Cashless Toll Project





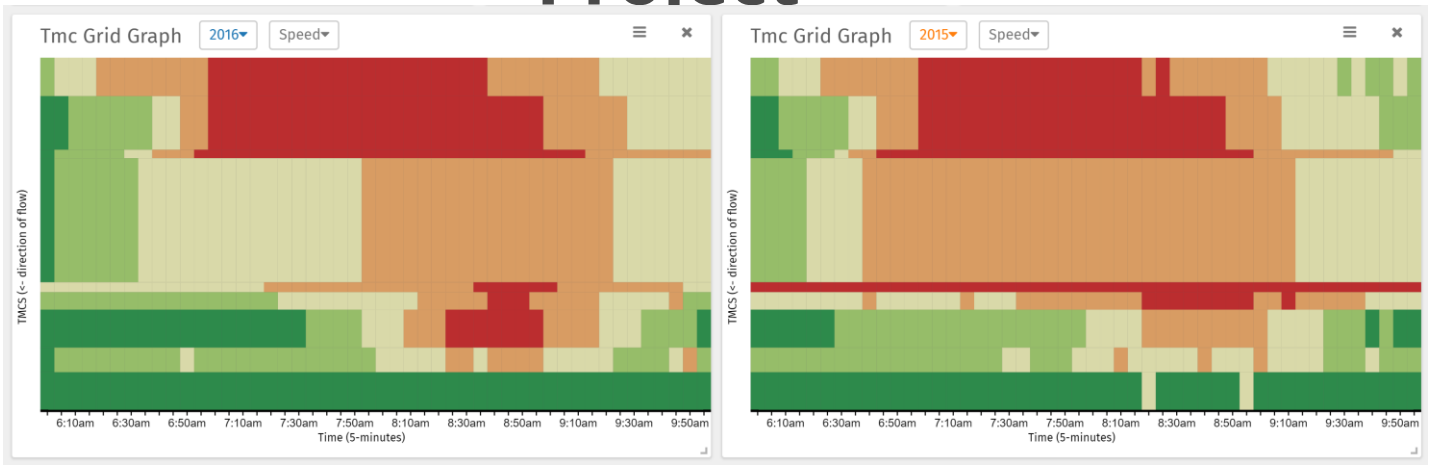
The graph on the left shows an average day in five minute epochs from 6am to 7pm. The blue line is for 2016 data. The orange line is for 2015 data.

Albany Visualization and Informatics Lab

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Post Project Analysis Case Study: The Tappan Zee Bridge Cashless Toll Project



2016 2015

The red line on the 2015 graph is the TMC segment where the toll booths were previously located. The graph from 2016 shows significant speed increases at that TMC segment.

Albany Visualization and Informatics Lab

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

Incident Case Study:
Beer Truck Rollover on the BQE

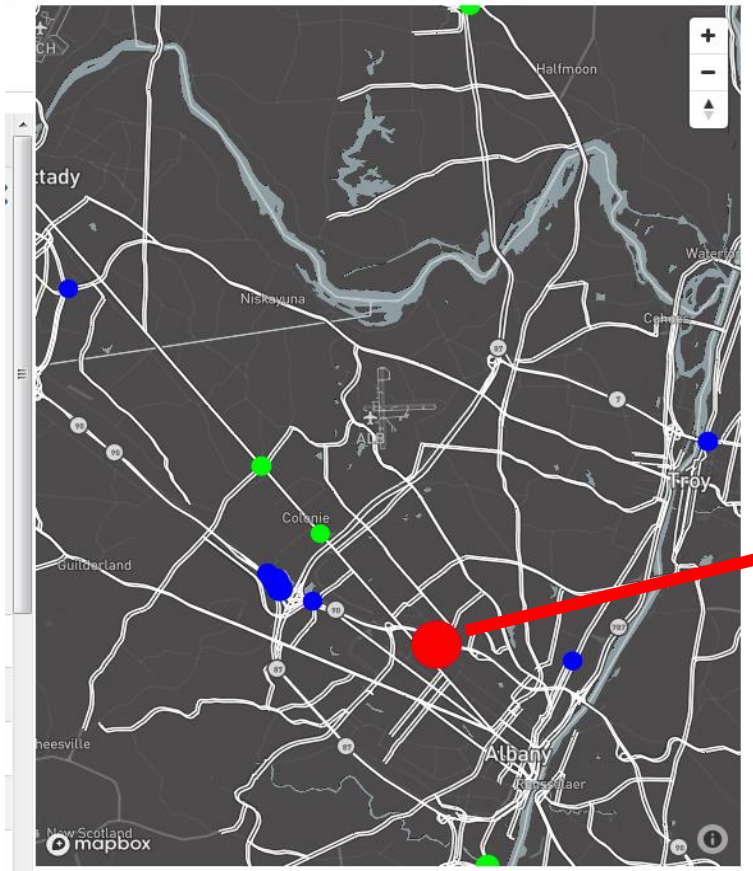
Albany Visualization and Informatics Lab

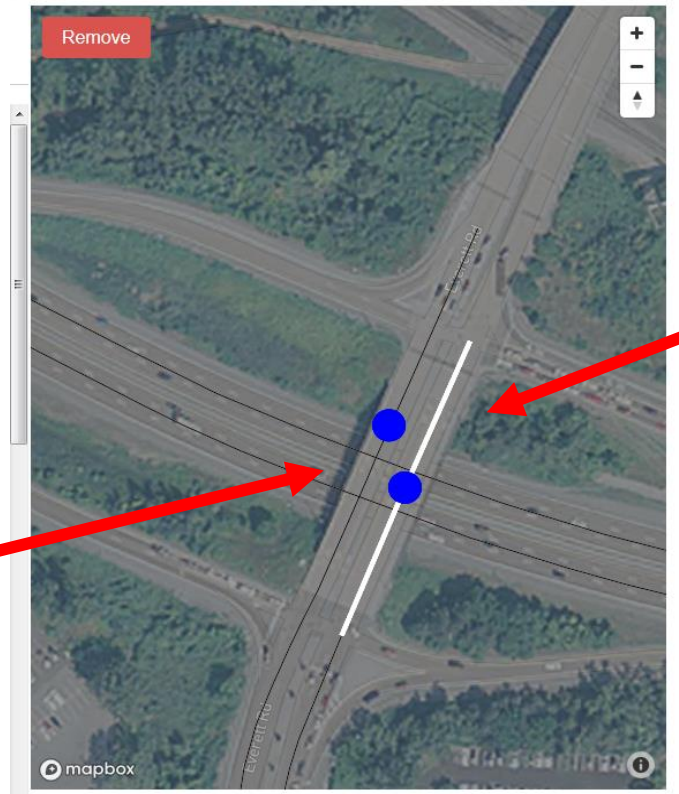
NEW YORK STATE OF OPPORTUNITY. Department of Transportation

AVAIL

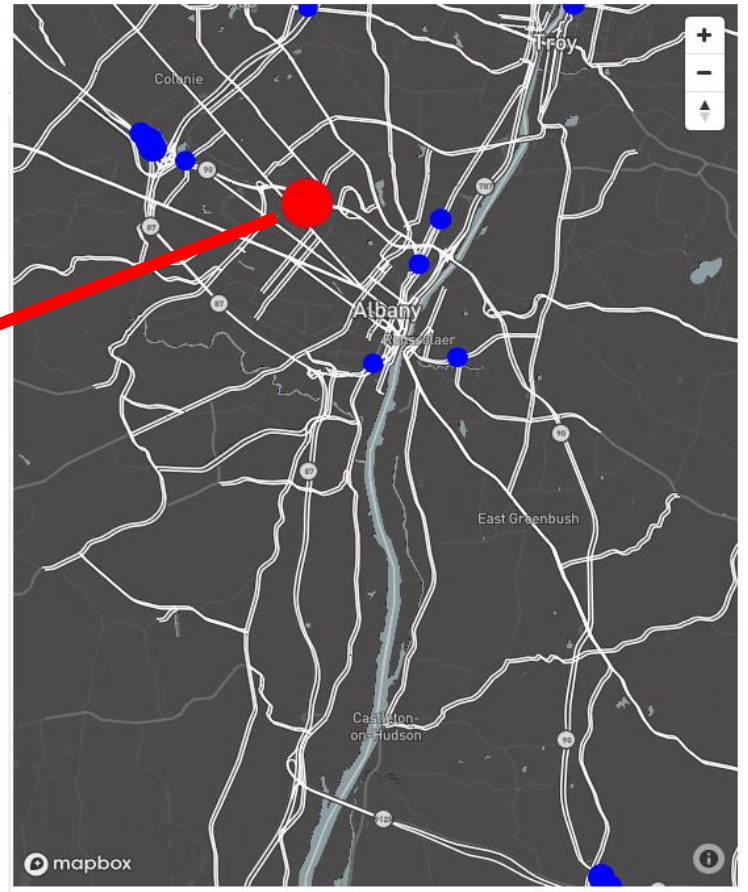
Bottleneck Analysis
Capital District June 2017

Single Unit Trucks





Tractor/Trailer Trucks



Albany Visualization and Informatics Lab

This data is as good as gold!!!!!

Modern Processing: The Way Forward

- Strategic Approach to Data
  - Platform Options (e.g., APIs, tools)
- Intra-agency Integration
- Multi-agency Integration
- Regional Integration
- Micro- to Mega-scale Geographies
- Day Forward Trajectory –

Opportunities for a AV/CV test-bed

- **Establish the production of electronic data that can be captured in real-time and archived for analysis;**
- **Determine benchmarking metrics; and**
- **Consider Open Source code and Open Data formats to accelerate transferability and implementation as an industry standard.**

Questions?

Contact Info:

Catherine T. Lawson

lawsonc@albany.edu

518-442-4775

Albany Visualization and Informatics Labs (AVAIL)

www.availabs.org