

Multistate Mobility Performance



5th International Transportation Systems
Performance Measurement and Data Conference

June 2015

Peter Rafferty

Wisconsin TOPS Lab

Great Lakes Regional Transportation Operations Coalition

WISCONSIN TRAFFIC OPERATIONS AND SAFETY LABORATORY



WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON



WISCONSIN
TOPS

TRAFFIC OPERATIONS & SAFETY LABORATORY

David Noyce,
TOPS Lab Director

Steven Parker

Information Technology

- WisTransPortal
- Software Applications
- Real Time Data
- Traffic and Safety Data Archive

Peter Rafferty

**Transportation Systems
Operations**

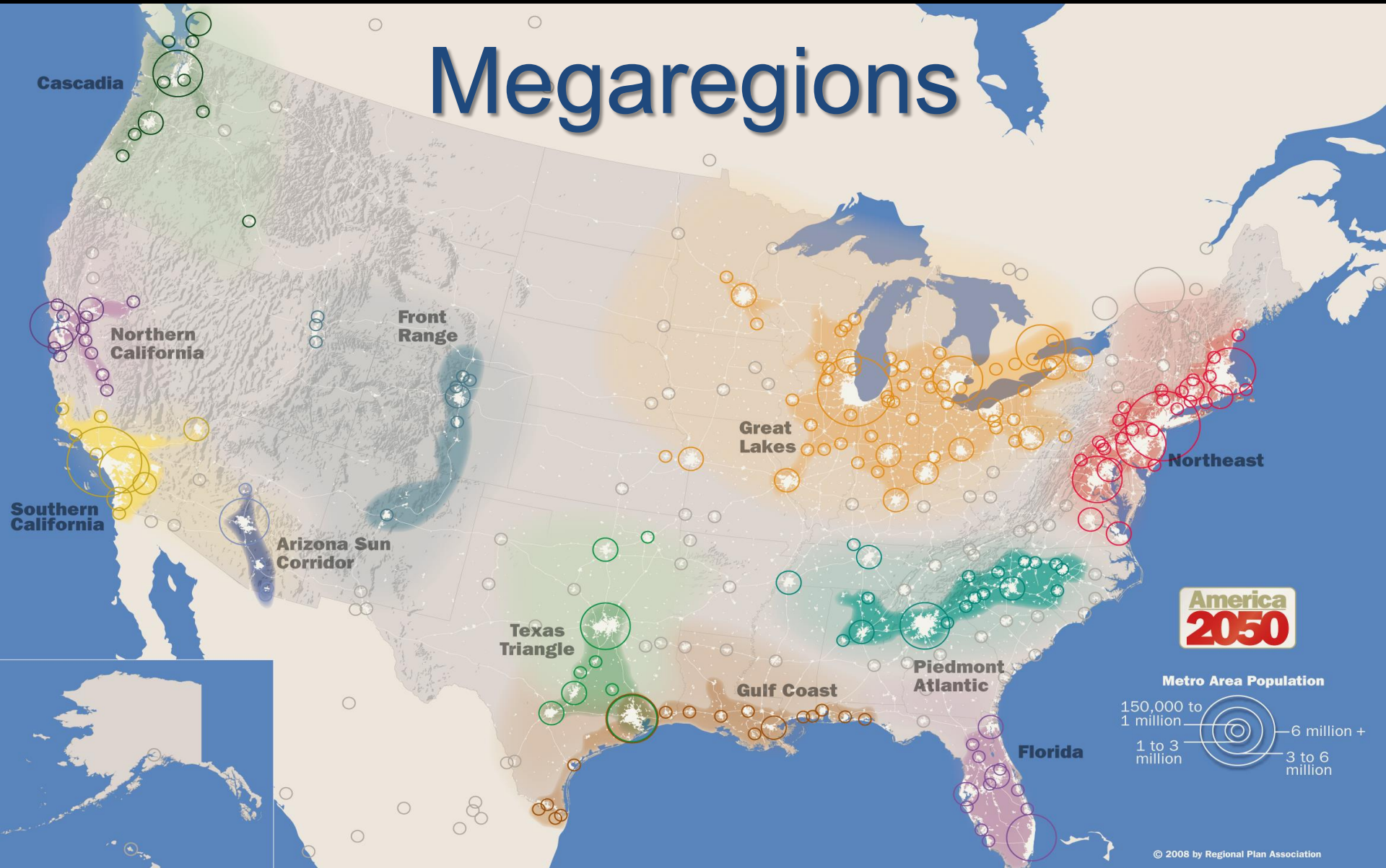
- Intelligent Transportation Systems
- Traveler Information
- Multistate Operations
- Performance Measures

Andrea Bill

**Traffic Safety and
Engineering**

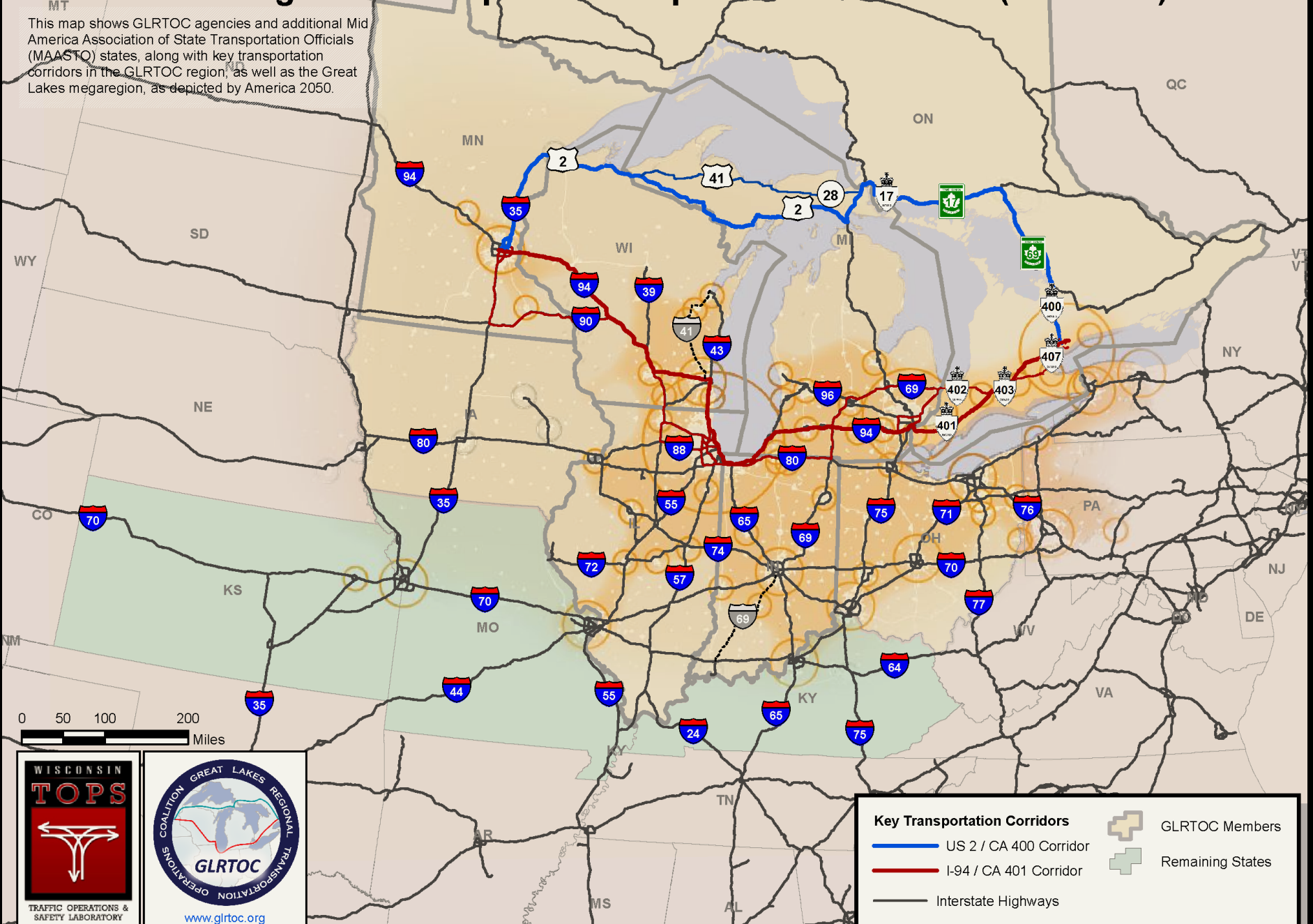
- Human Factors
- Driving Simulator
- Strategic Highway Safety Plan
- Intersection Control
- Traffic Simulation

Megaregions



Great Lakes Regional Transportation Operations Coalition (GLRTOC)

This map shows GLRTOC agencies and additional Mid America Association of State Transportation Officials (MAASTO) states, along with key transportation corridors in the GLRTOC region, as well as the Great Lakes megaregion, as depicted by America 2050.



- Megaregion basemap from America 2050* (<http://www.america2050.org/maps>)
 - State and transportation features from ESRI

Coast to Coast Collaboration



MCOM Program



How to Improve Performance on Corridors of National Significance

Publication #: FHWA-HIF-13-058

June 28, 2013



U.S. Department of Transportation
Federal Highway Administration

USDOT Implementation of MAP-21 Performance Provisions: Ten Interrelated Rules

Planning

Metropolitan and Statewide Planning Rule

- Establish a performance-based planning process at metropolitan and state level.
- Define coordination in the selection of targets, linking planning and programming to performance targets.

Highway Safety

Safety Performance Measure Rule

- Propose and define fatalities and serious injuries measures, along with target establishment, progress assessment and reporting requirements.
- Discuss the implementation of MAP-21 performance requirements.

Highway Safety Improvement Program (HSIP) Rule

- Integration of performance measures, targets, and reporting requirements into the HSIP.
- Strategic Highway Safety Plan updates.

Highway Safety Program Grants Rule *

* Interim Final Rule issued by NHTSA in January 2013.

- State target establishment and reporting requirements.
- Highway safety plan content, reporting requirements, and approval.

Highway Conditions

Pavement and Bridge Performance Measure Rule

- Propose and define pavement and bridge condition measures, along with minimum condition standards, target establishment, progress assessment and reporting requirements.

Asset Management Plan Rule

- Contents and development process for asset management plan.
- Minimum standards for pavement and bridge management systems.

Congestion/System Performance

System Performance Measure Rule

- Define performance of the interstate system, non-interstate national highway system, and freight movement on the interstate system.
- Finalize interpretation of scope of CMAQ performance requirements, including congestion and on-road mobile source emissions.
- Summarize MAP-21 highway performance measure rules

Transit Performance

Transit Asset Management Rule

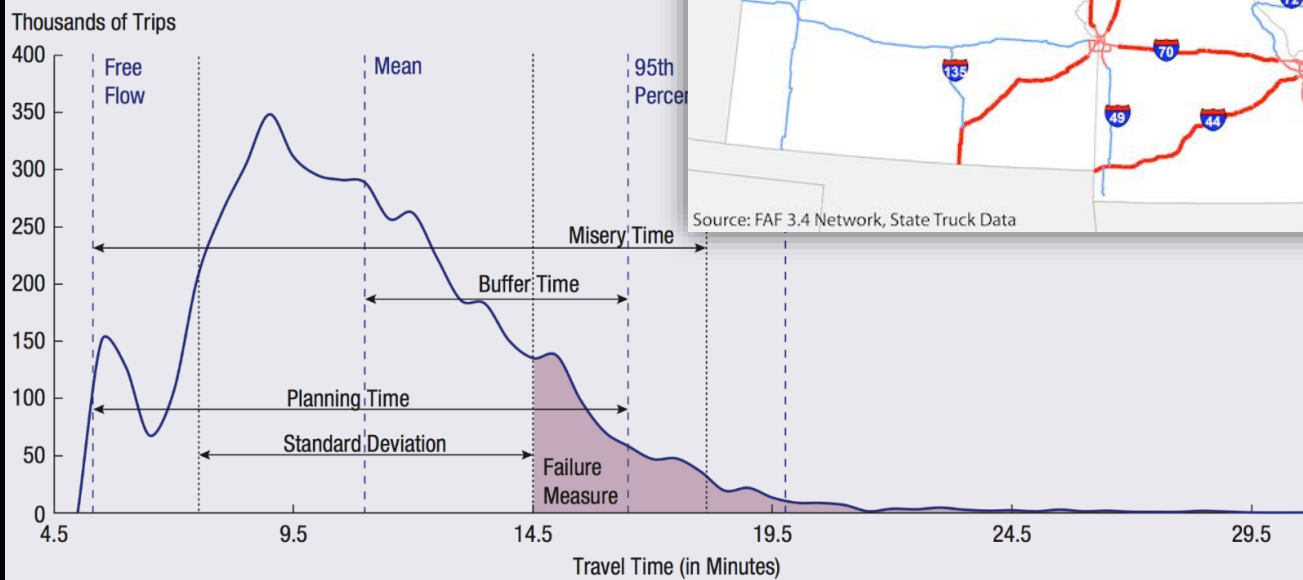
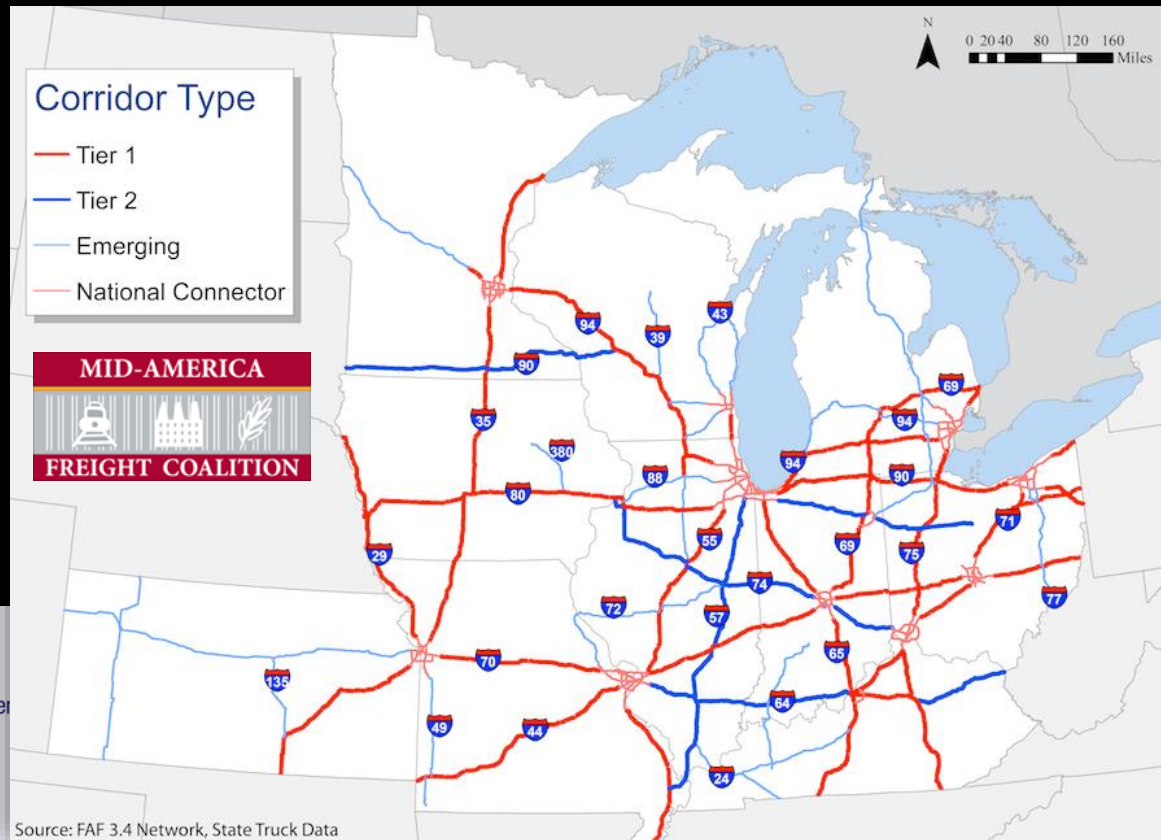
- Define state of good repair and establish state of good repair performance measures
- Require transit providers to set targets and report on progress
- Transit asset management plans

National Transit Safety Program Rule

- Define transit safety criteria and standards
- Include definition of state of good repair

Transit Agency Safety Plan Rule

- Transit safety plan content and reporting requirements
- Target setting requirements for transit agencies and States



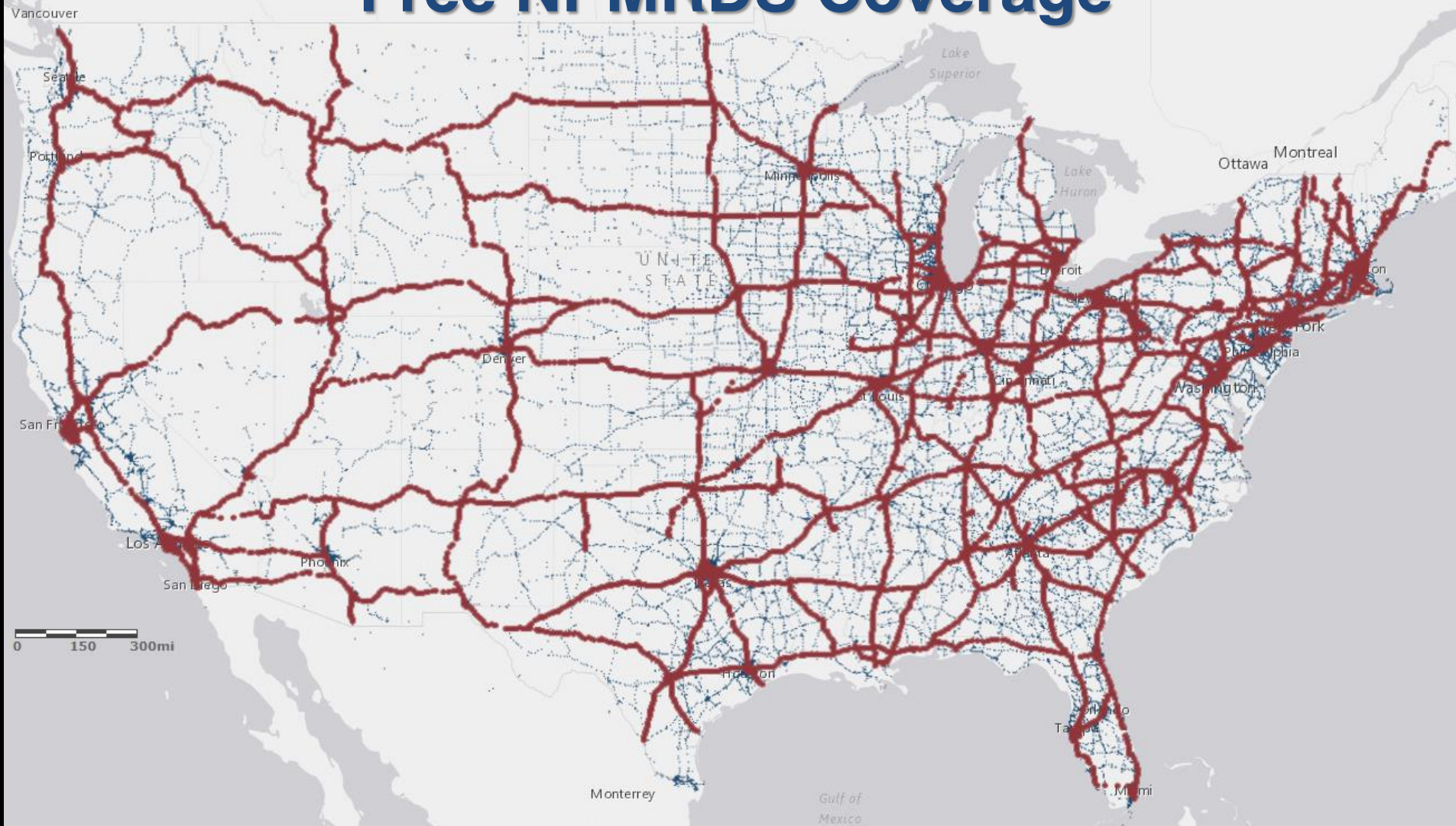
MEASURE	CALCULATION	DESCRIPTION
Planning Time Index* (PTI)	$\frac{95th\ Percentile\ of\ TT}{Free\ Flow\ TT}$	The extra time required to arrive at a destination "on time" 95 percent of the time. Can be calculated for trips, corridors, or segments. The PTI is the recommended measure because it gives intuitive and consistent results.

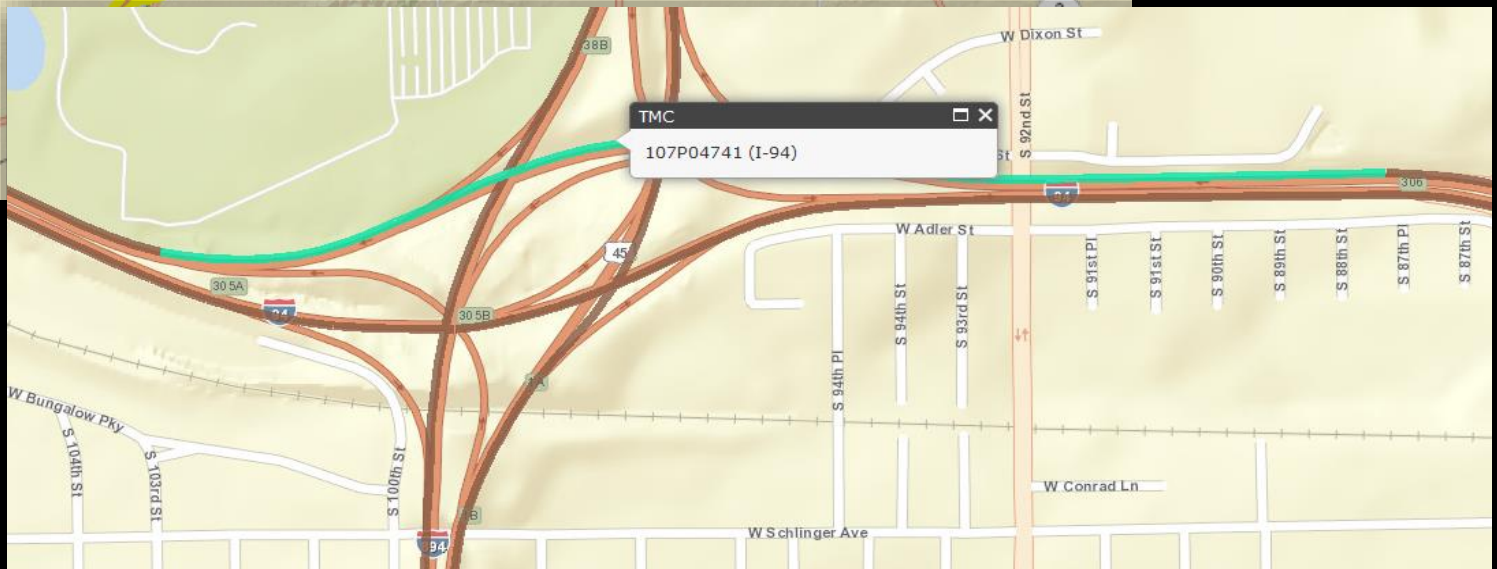
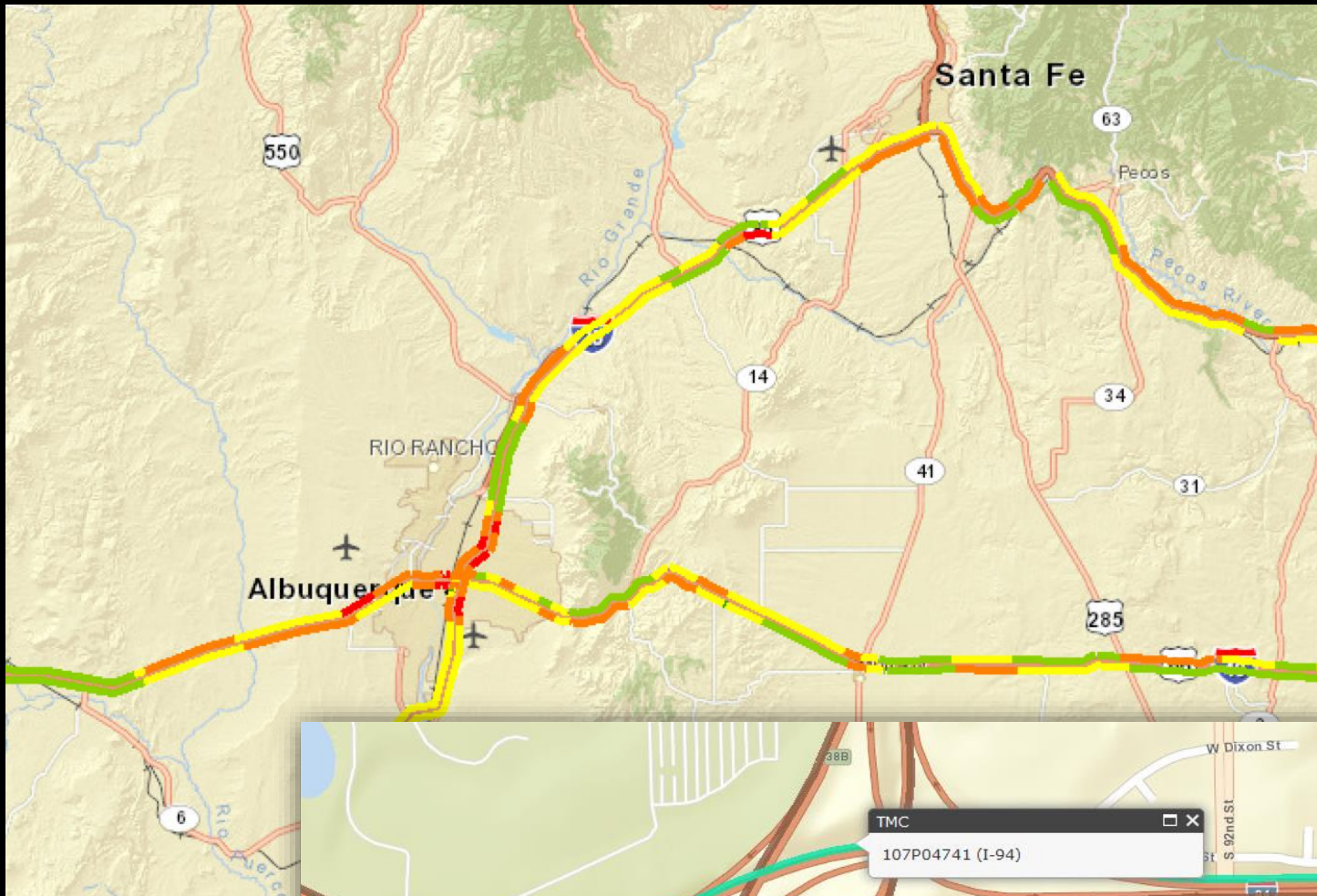
Fortran

AUTOMATIC CODING SYSTEM
FOR THE IBM 704

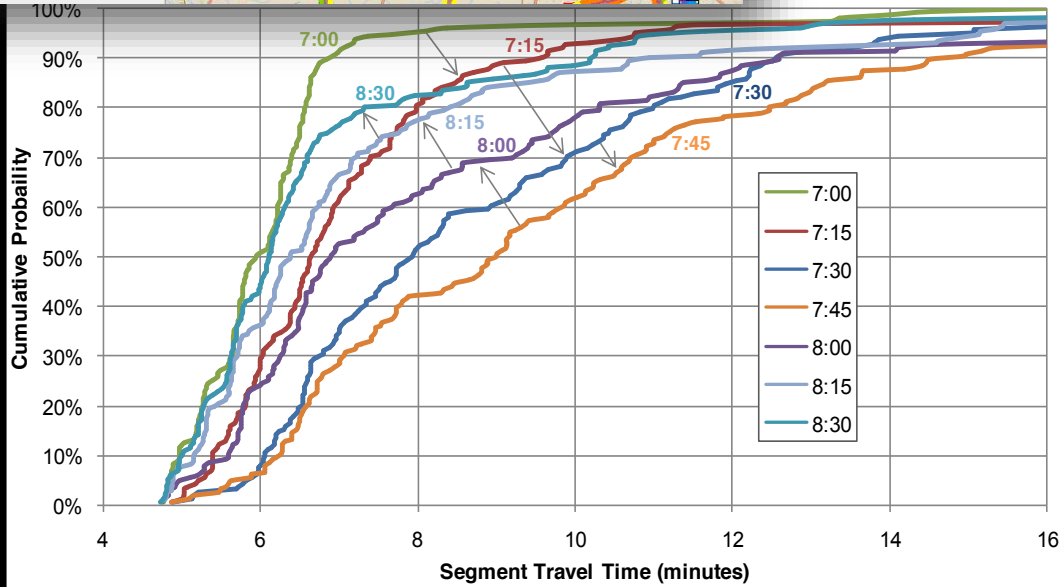
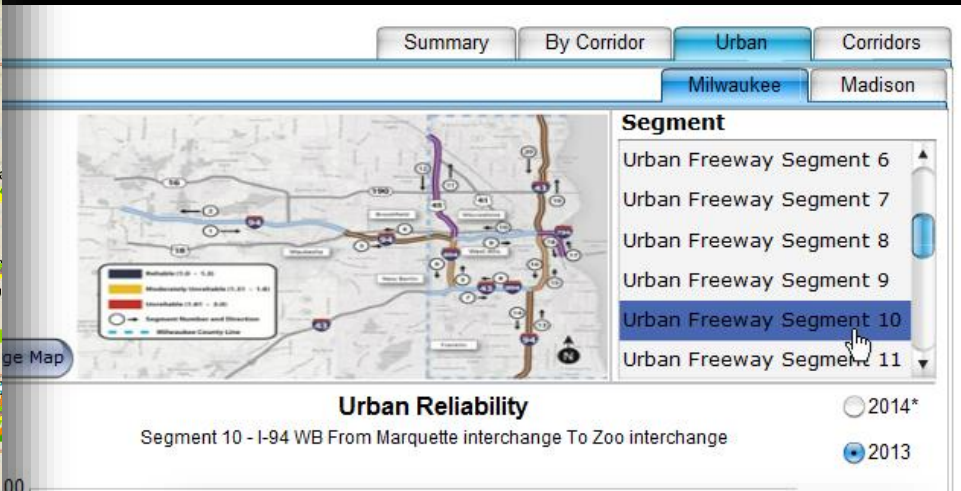
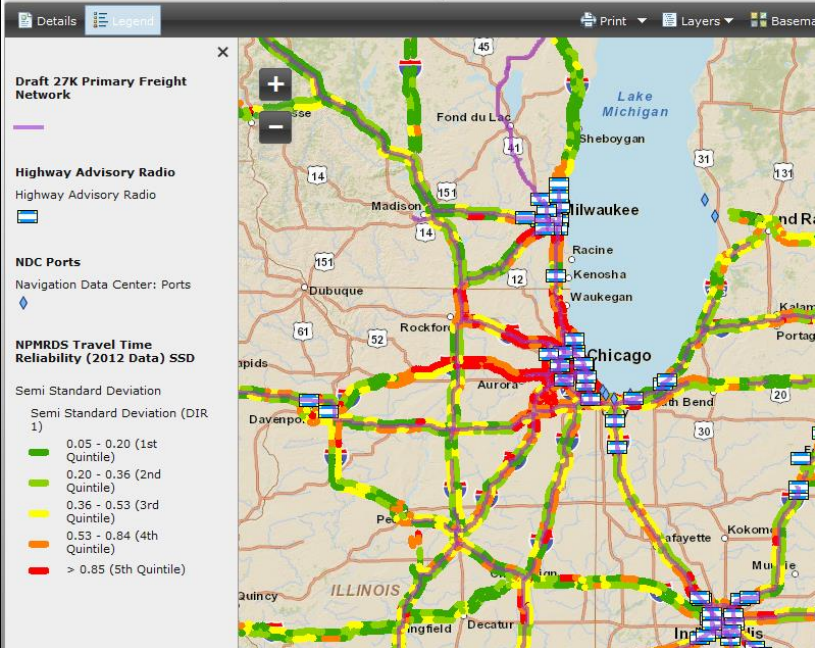


Free NPMRDS Coverage



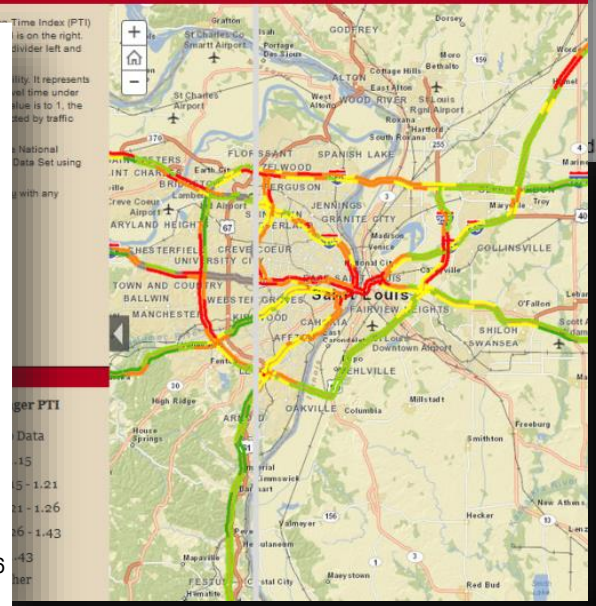


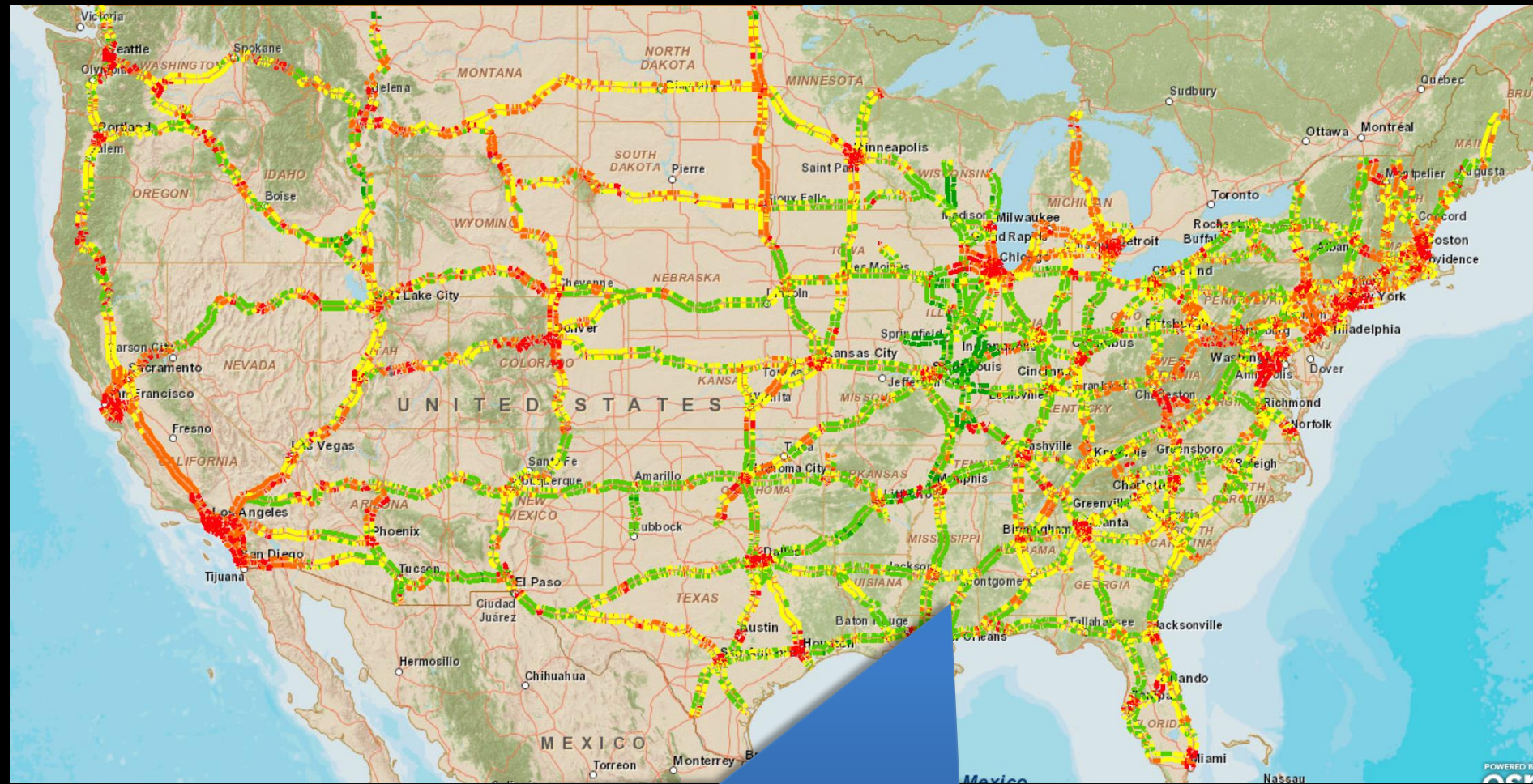
Mid-America Transportation Operations



Planning Time Index

2013 Results for Freight and Passenger Traffic

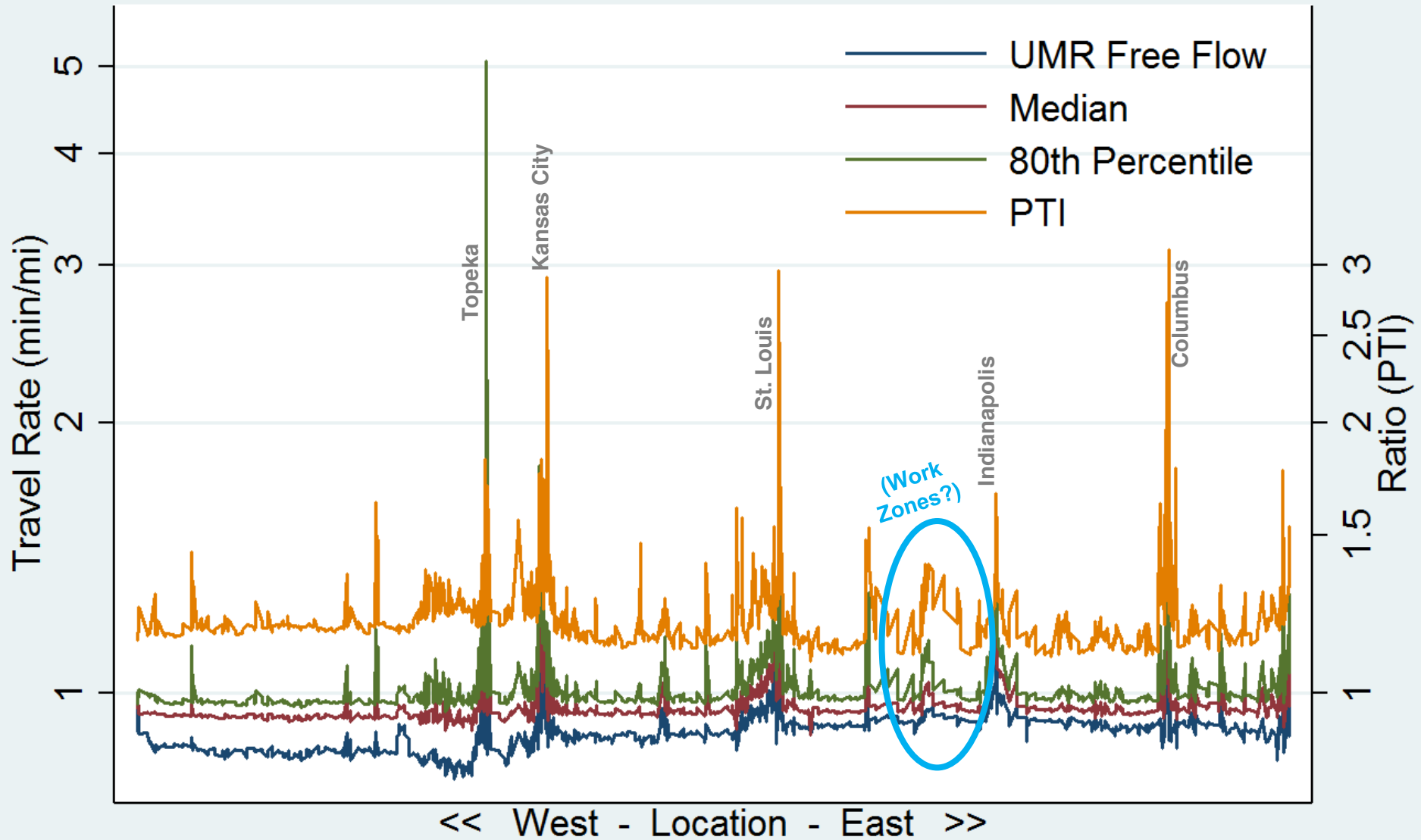




Map Online at
www.glrto.org/map/npmrds

I-70 Mobility Measures

Kansas - Missouri - Illinois - Indiana - Ohio



Source: NPMRDS 7/1/13-6/30/14 (~1200 miles)

June 30, 2014

I-70 Eastbound

January 1, 2014

-15 F

Kansas City

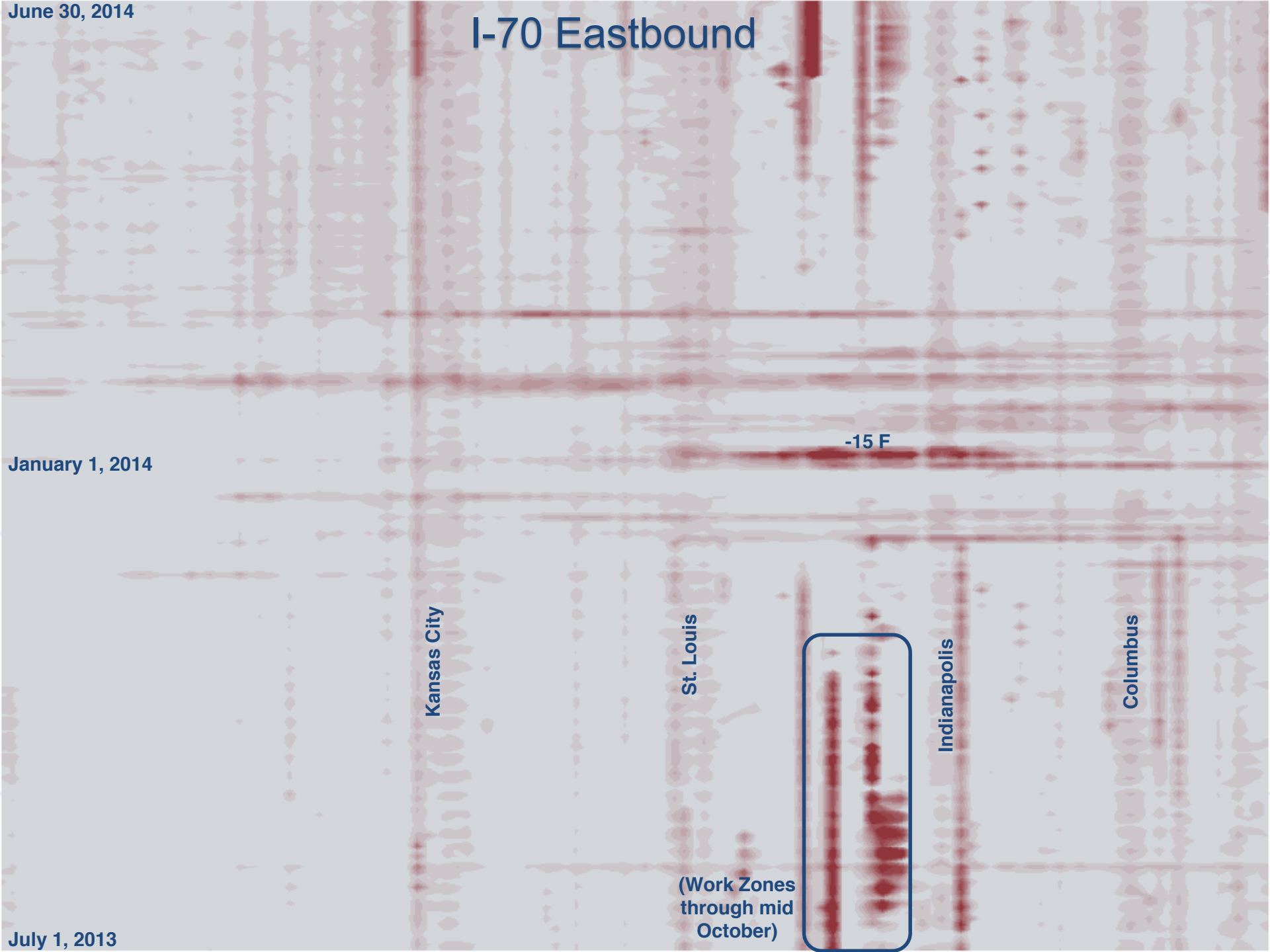
St. Louis

Indianapolis

Columbus

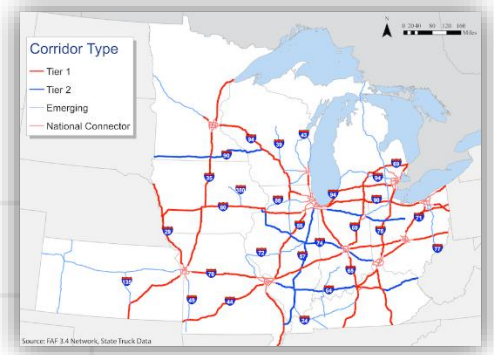
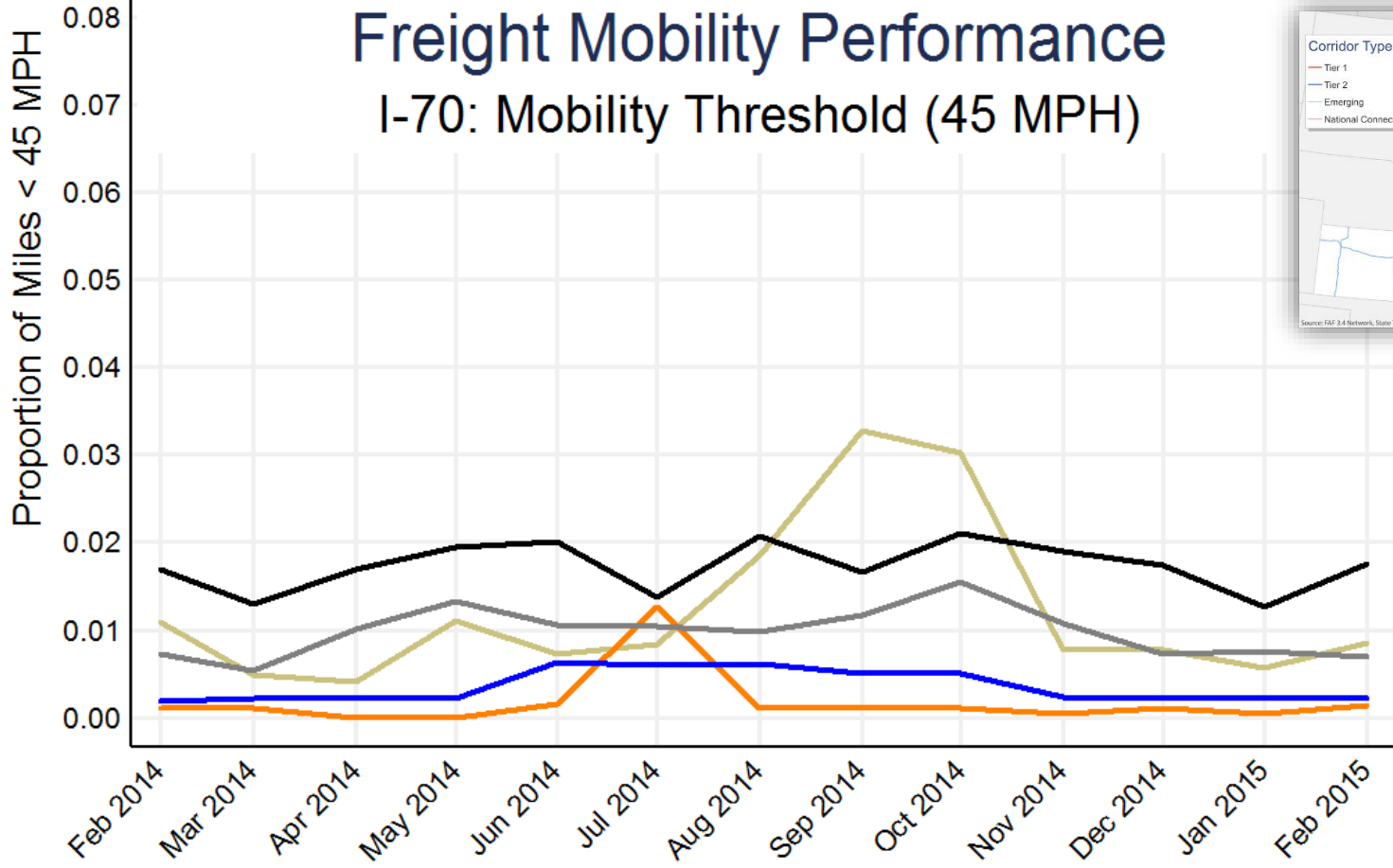
(Work Zones through mid October)

July 1, 2013



Freight Mobility Performance

I-70: Mobility Threshold (45 MPH)

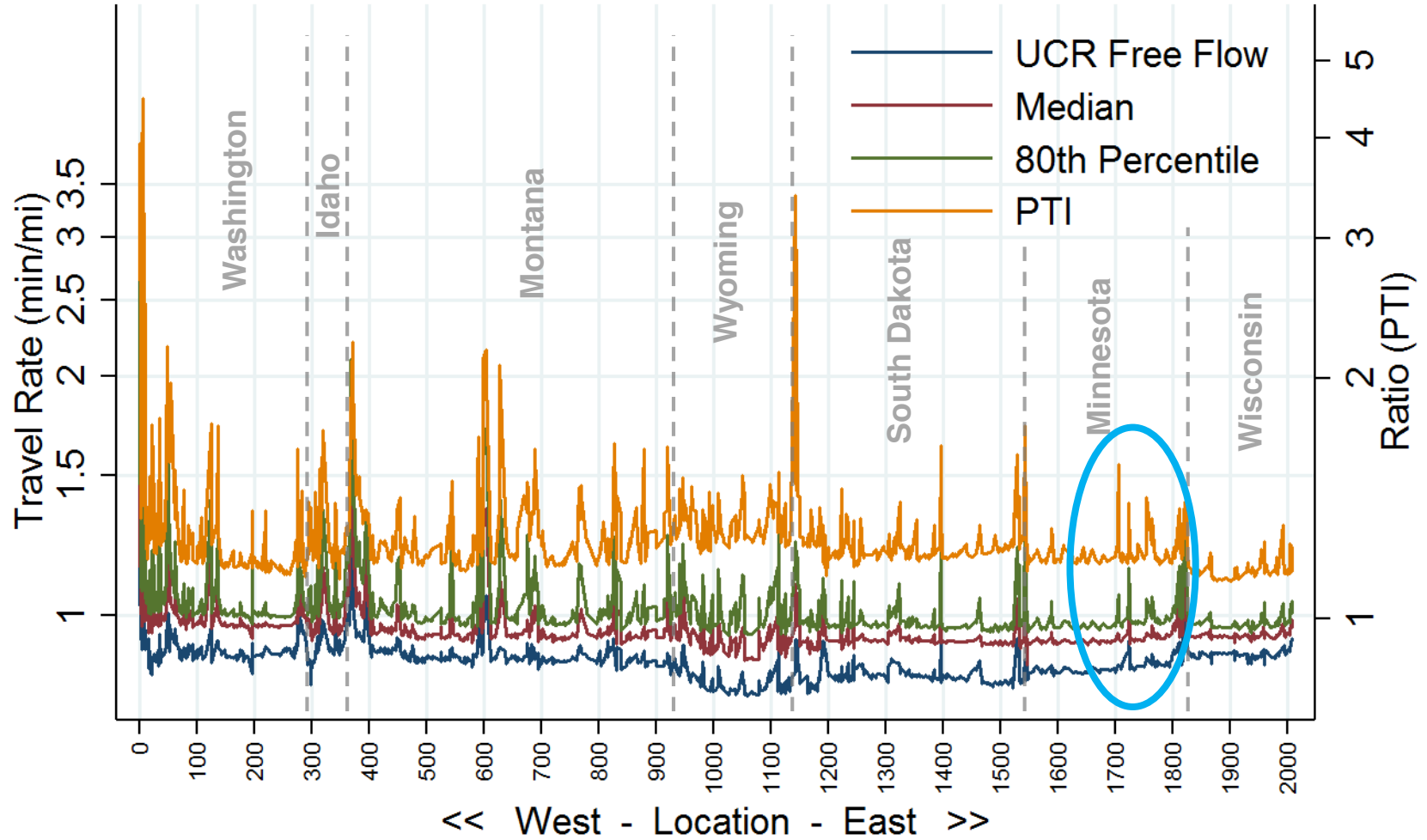


- Indiana
- Illinois
- Kansas
- Missouri
- Ohio

Source: NPMRDS, weekday non-holiday peak periods, ten-state Mid-America region

I-90 Mobility Measures

North/West Passage Coalition



Source: NPMRDS 7/1/13-12/31/14 (18 months, ~2000 miles)

Dec 31, 2014

I-90 Eastbound Mobility

North/West Passage

Jul 1, 2014

Jan 1, 2014

Seattle

Washington

Idaho

Montana

Bozeman

I-94...

Wyoming

Rapid City

South Dakota

Minnesota

Rochester

...I-94

Wisconsin

Jul 1, 2013



Work Zone [Close]

4/11/2014 to 10/11/2014

Location: 1 Mile east of US 63 to 4 miles east of US 52

MEDIUM Impact: Single lane traffic in EB direction.

Scanning Tool

Anomalous Data

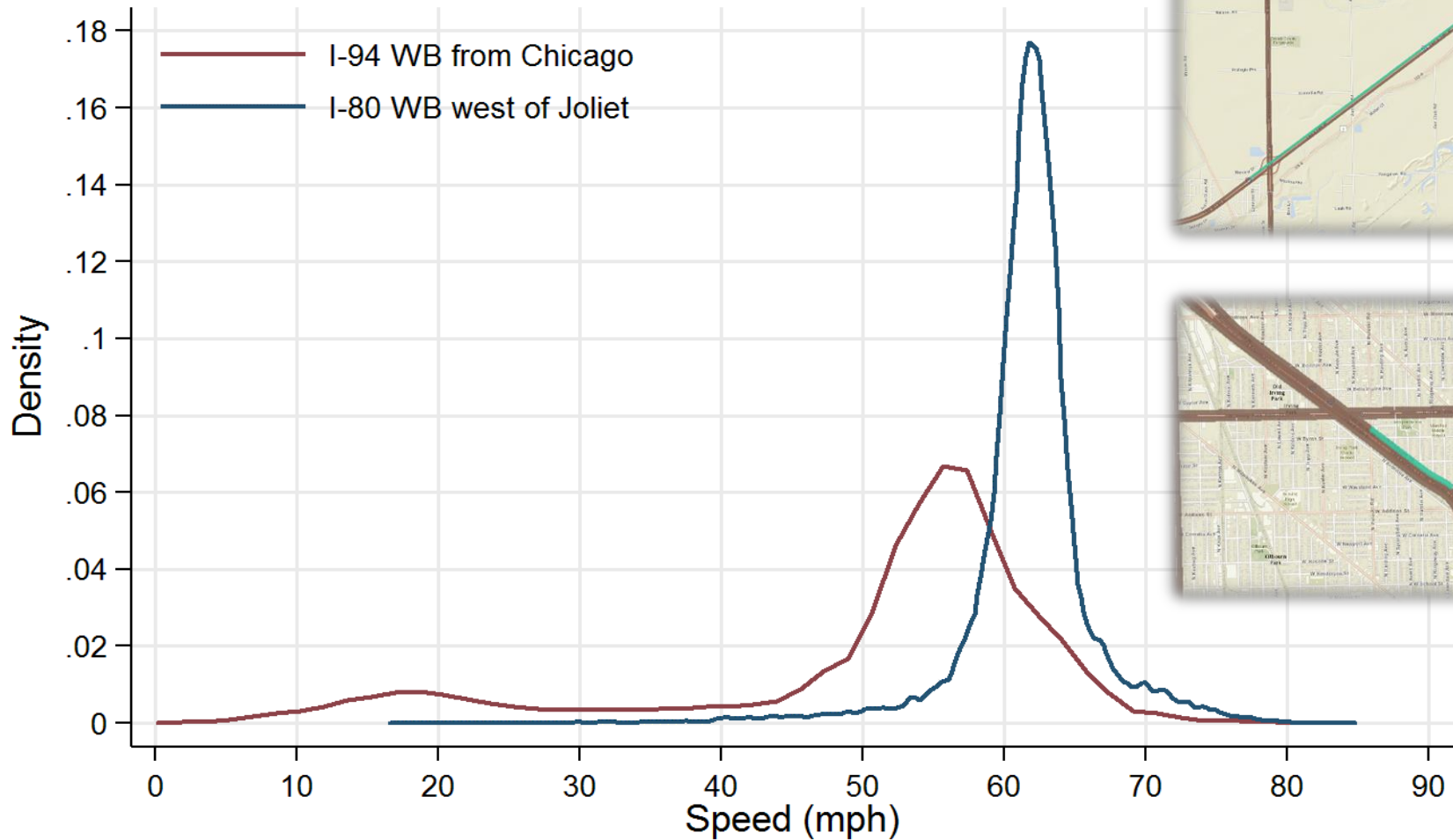
Mobility Impact	Speed	Observations	Duration	Distance
Recurring Congestion	-	-	-	-
Major Incident	↓	?	Short	Short
Work Zone	↓	-	Long	Varies
Winter Weather	↓	-	Medium	Long
Full Closure	↓ (upstream)	↓	Short	Short

Scanning Tool

Time Series and Z Score

Speed Density Plots

Two TMCs in Illinois

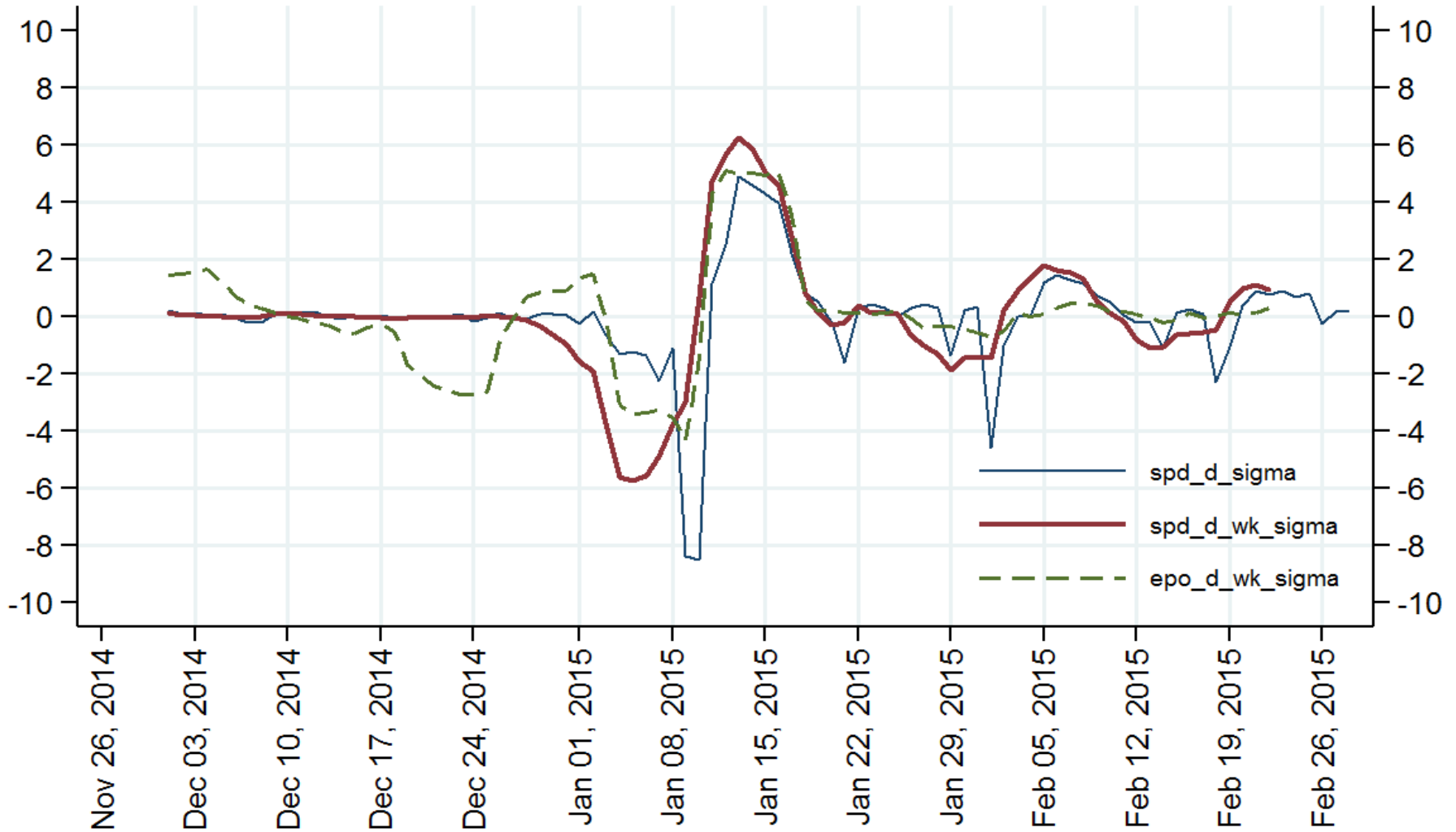


Scanning Tool

Major Incident Example

I-94 Mobility Performance (EKG)

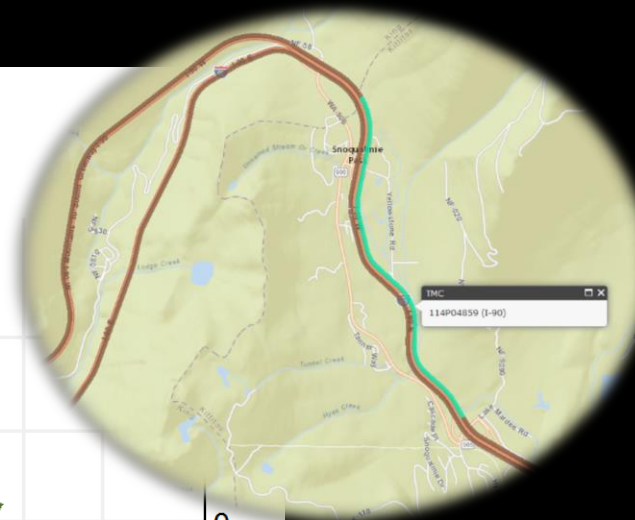
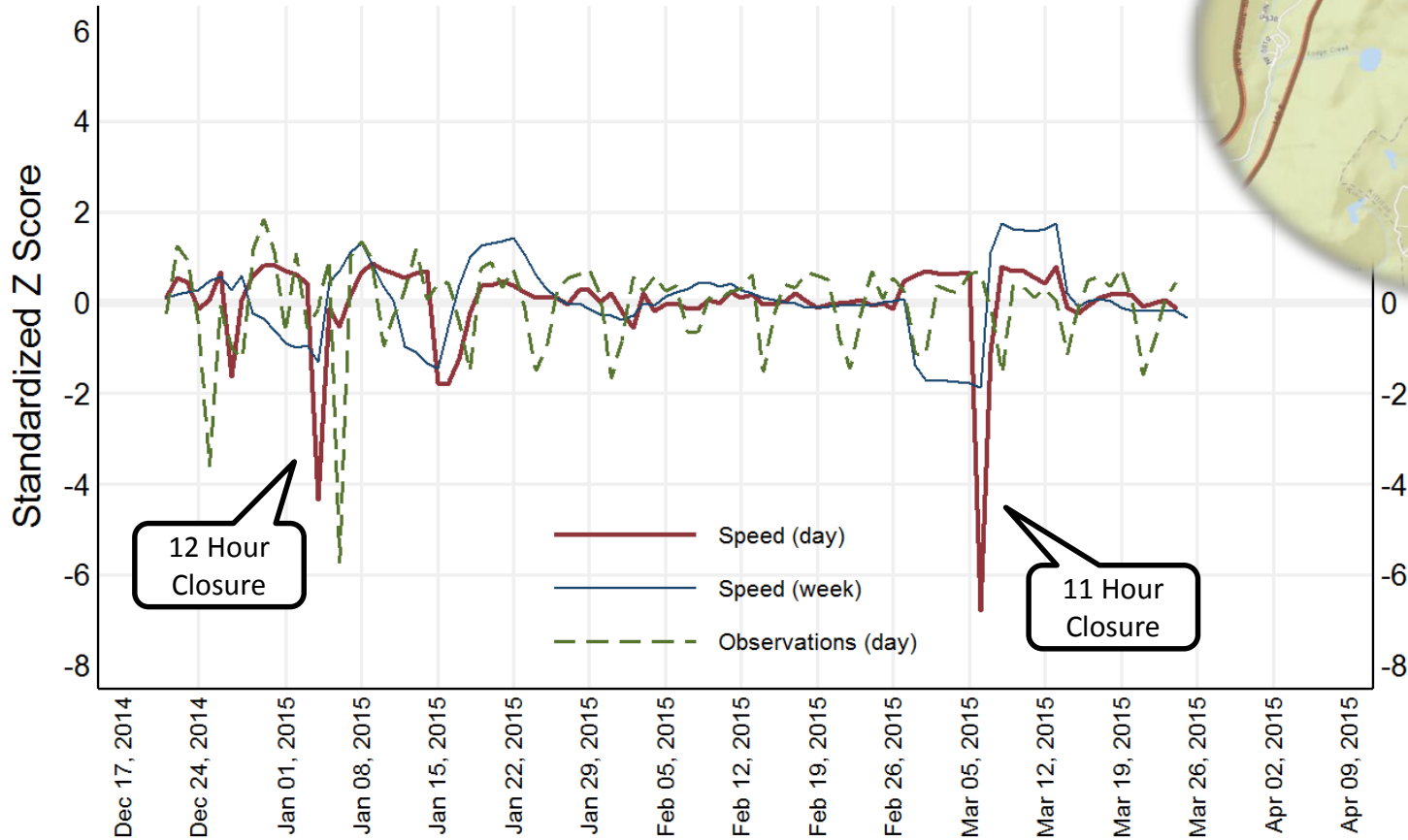
Michigan January 9 Crash Example



Scanning Tool

Mountain Pass Example

I-90 Mobility Performance Washington, Snoqualmie Pass

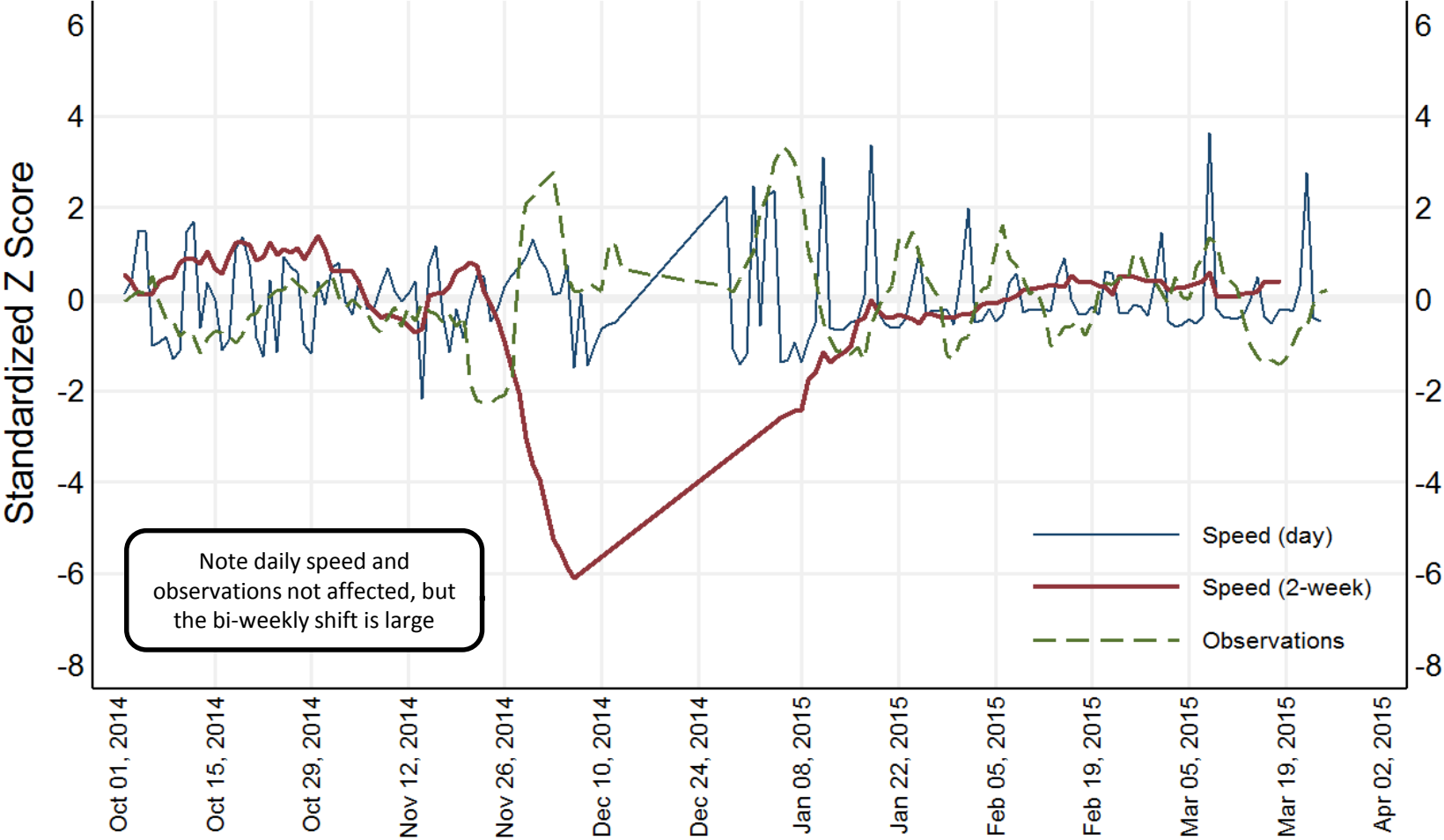


Source: NPMRDS

Scanning Tool

Work Zone Example

I-94 Mobility Performance Milwaukee, WB

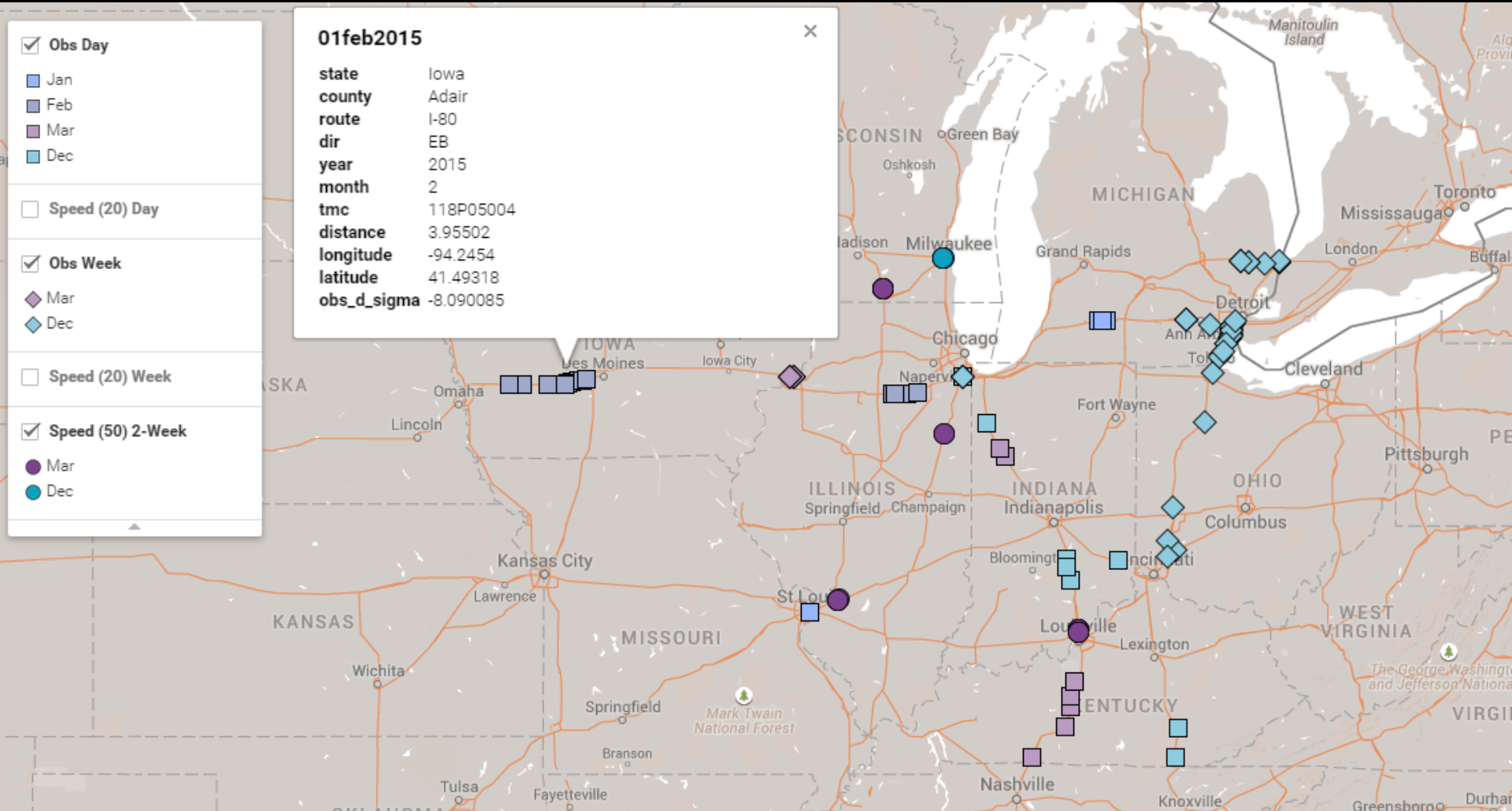


Note daily speed and observations not affected, but the bi-weekly shift is large

Speed (day)
Speed (2-week)
Observations

Scanning Tool

Monthly Performance Reporting



Multistate Mobility Performance



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