

# Multistate Mobility Performance



5<sup>th</sup> International Transportation Systems  
Performance Measurement and Data Conference

June 2015

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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**

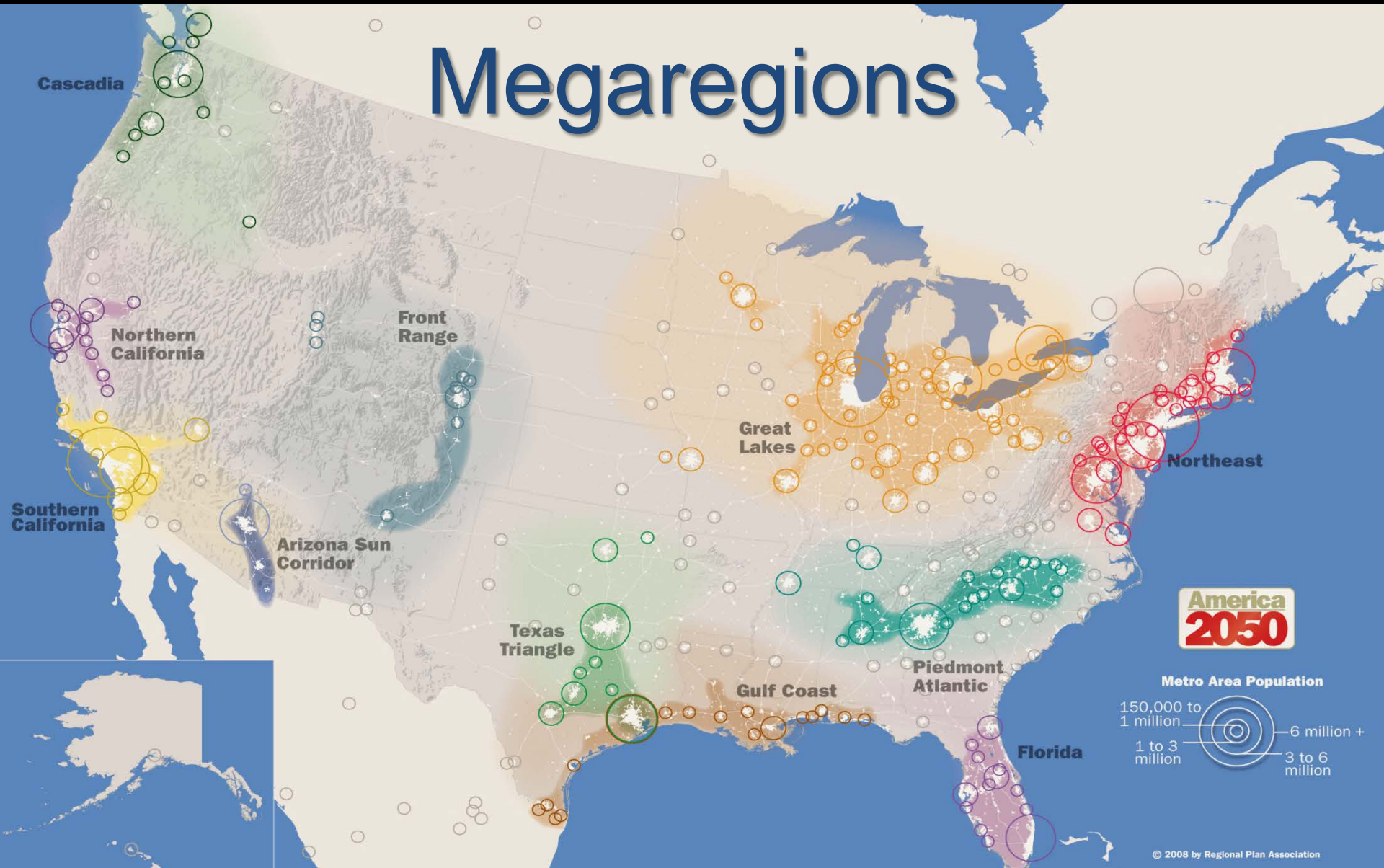
- Intelligent Transportation Systems
- Traveler Information
- Multistate Operations
- Performance Measures

**Andrea Bill**

**Traffic Safety and  
Engineering**

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

# Megaregions





# 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

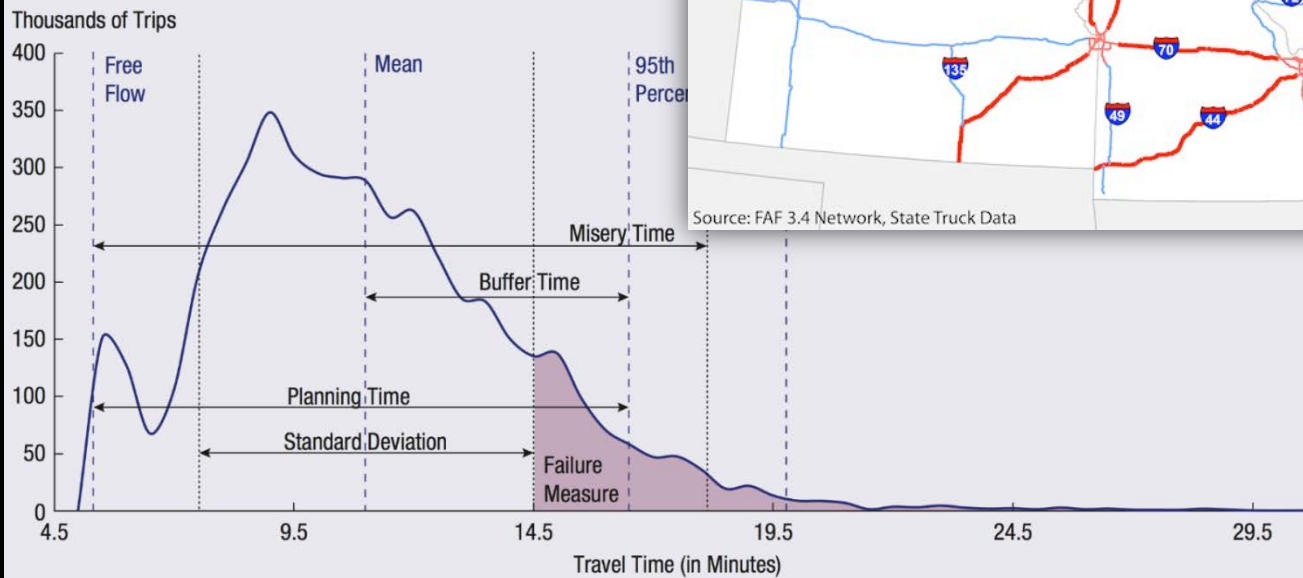
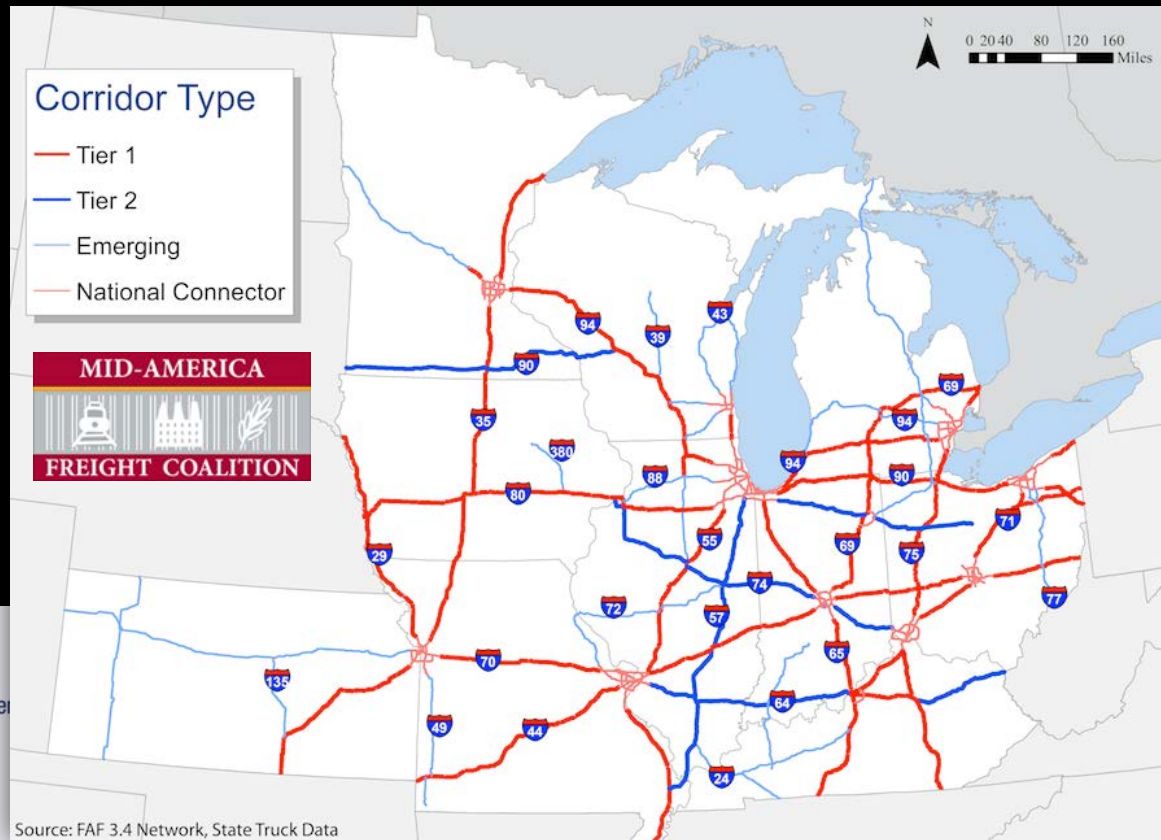
- Define state of good repair and establish state of good repair performance measures
- Require transit providers to set targets and report on progress
- Transit asset management plans

#### 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. <b>The PTI is the recommended measure because it gives intuitive and consistent results.</b>

# Fortran

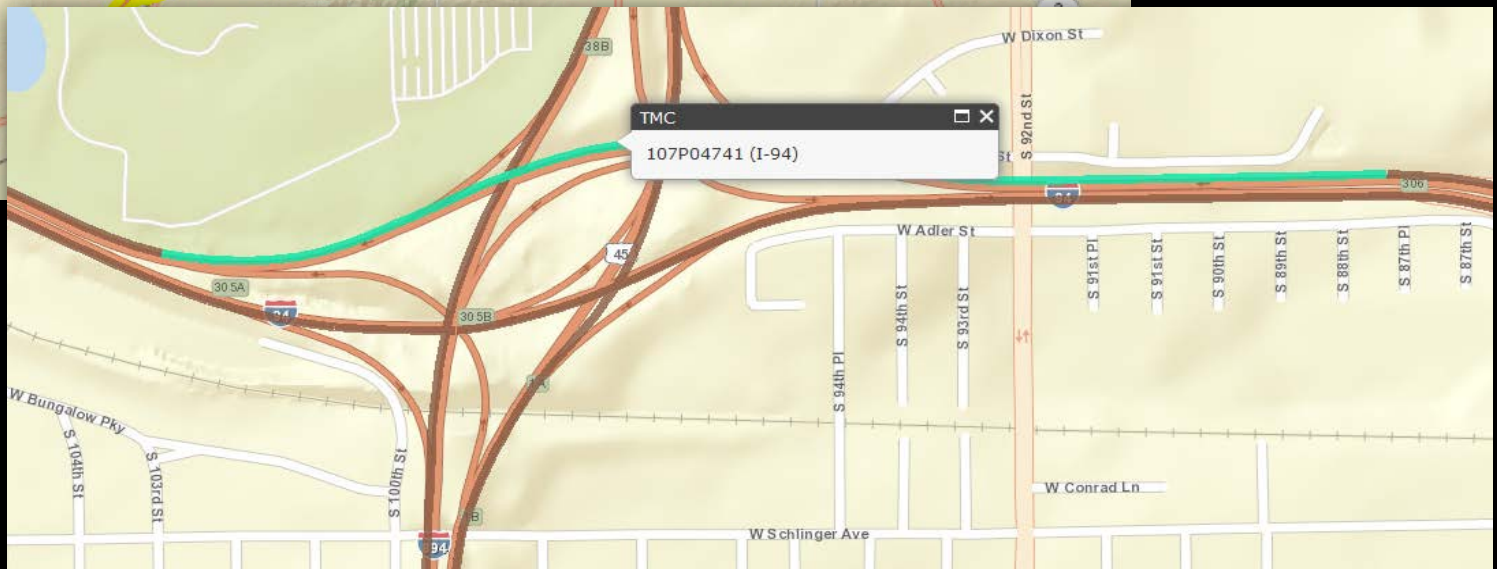
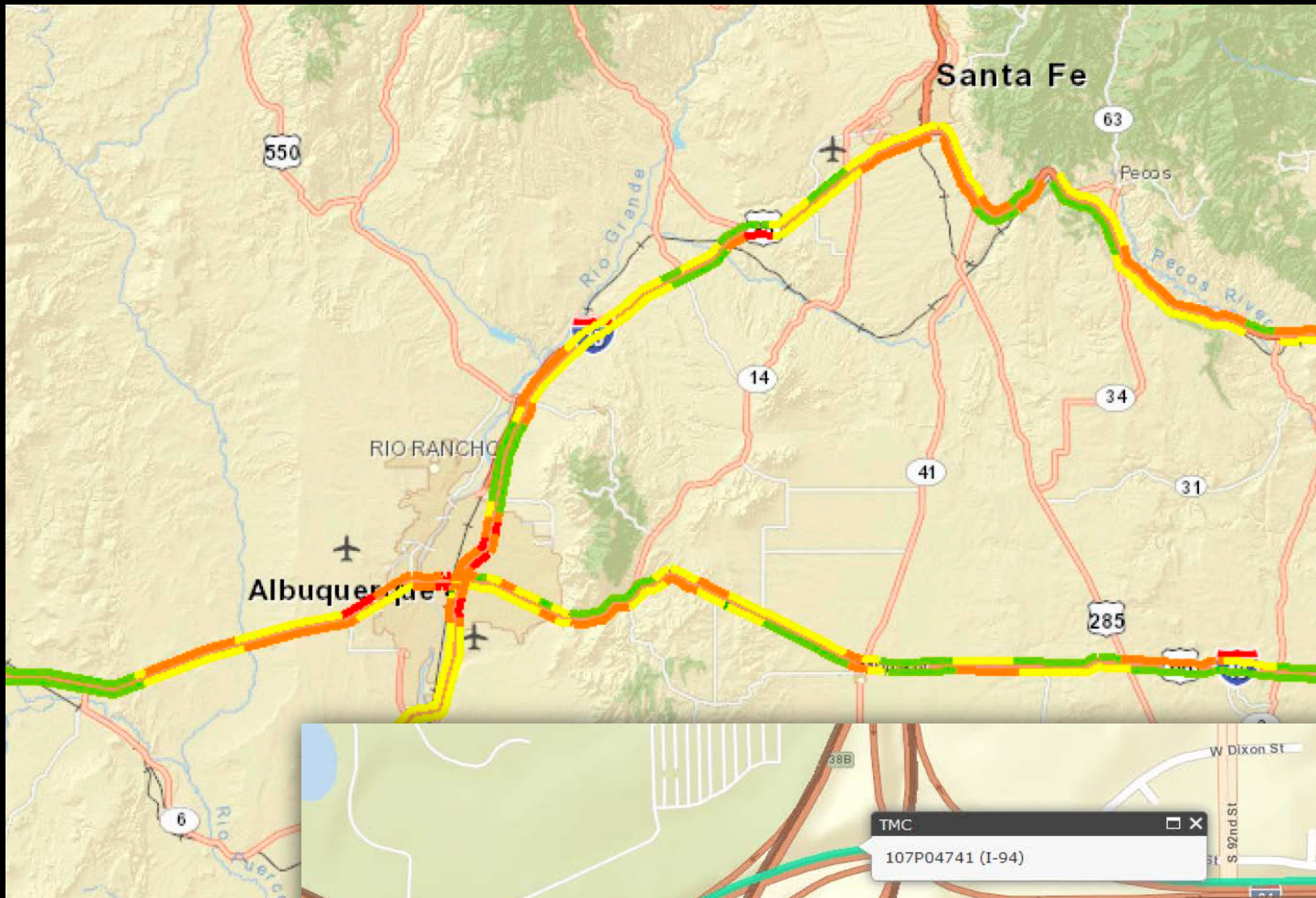
AUTOMATIC CODING SYSTEM  
FOR THE IBM 704



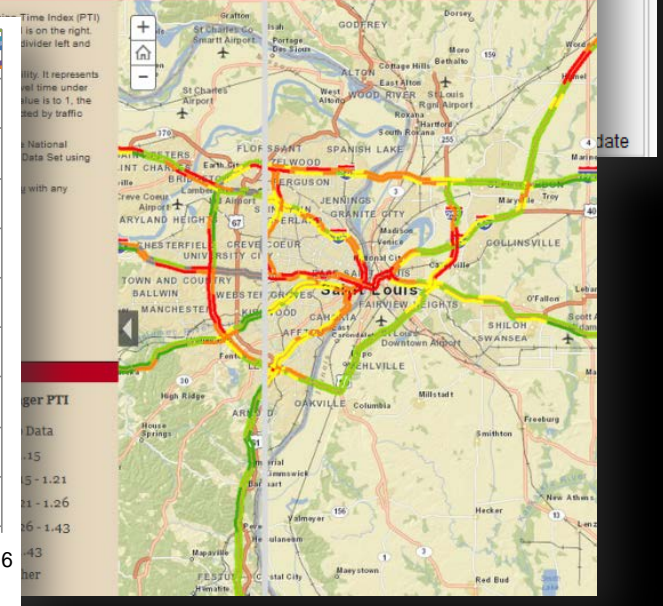
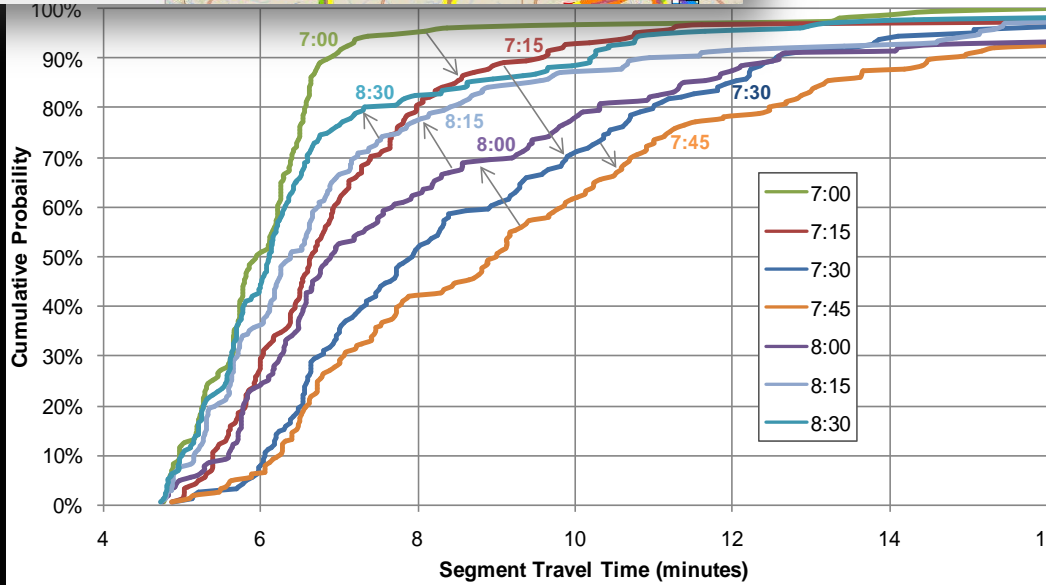
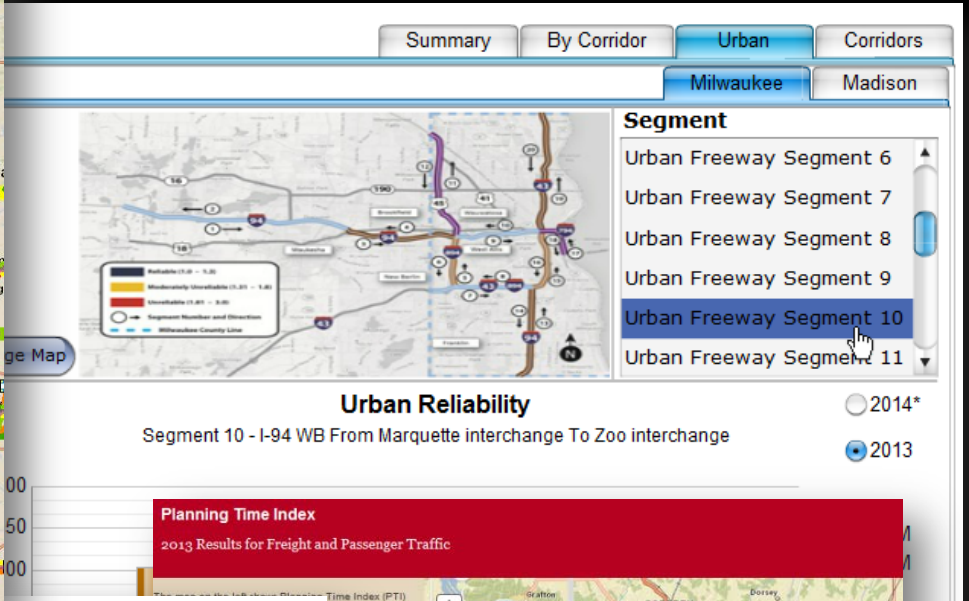
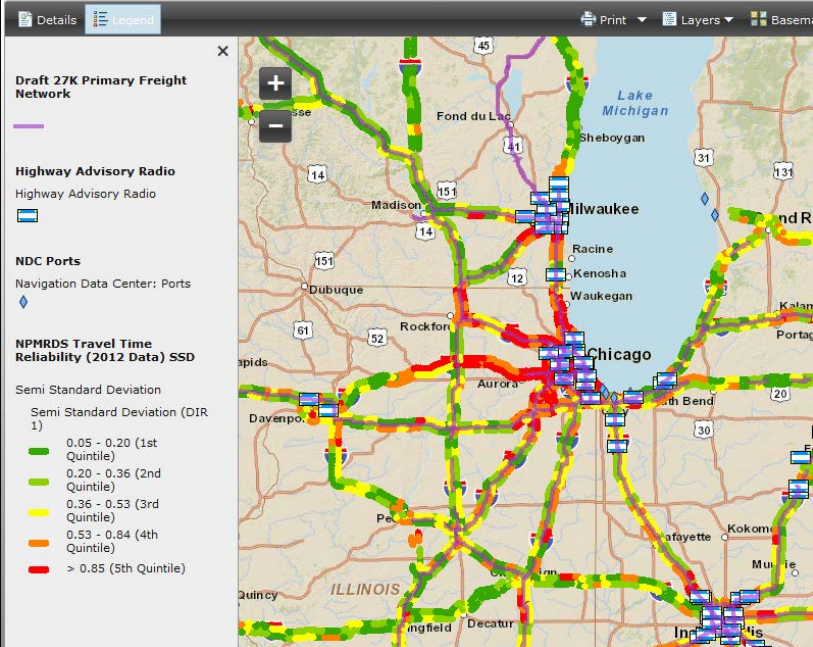


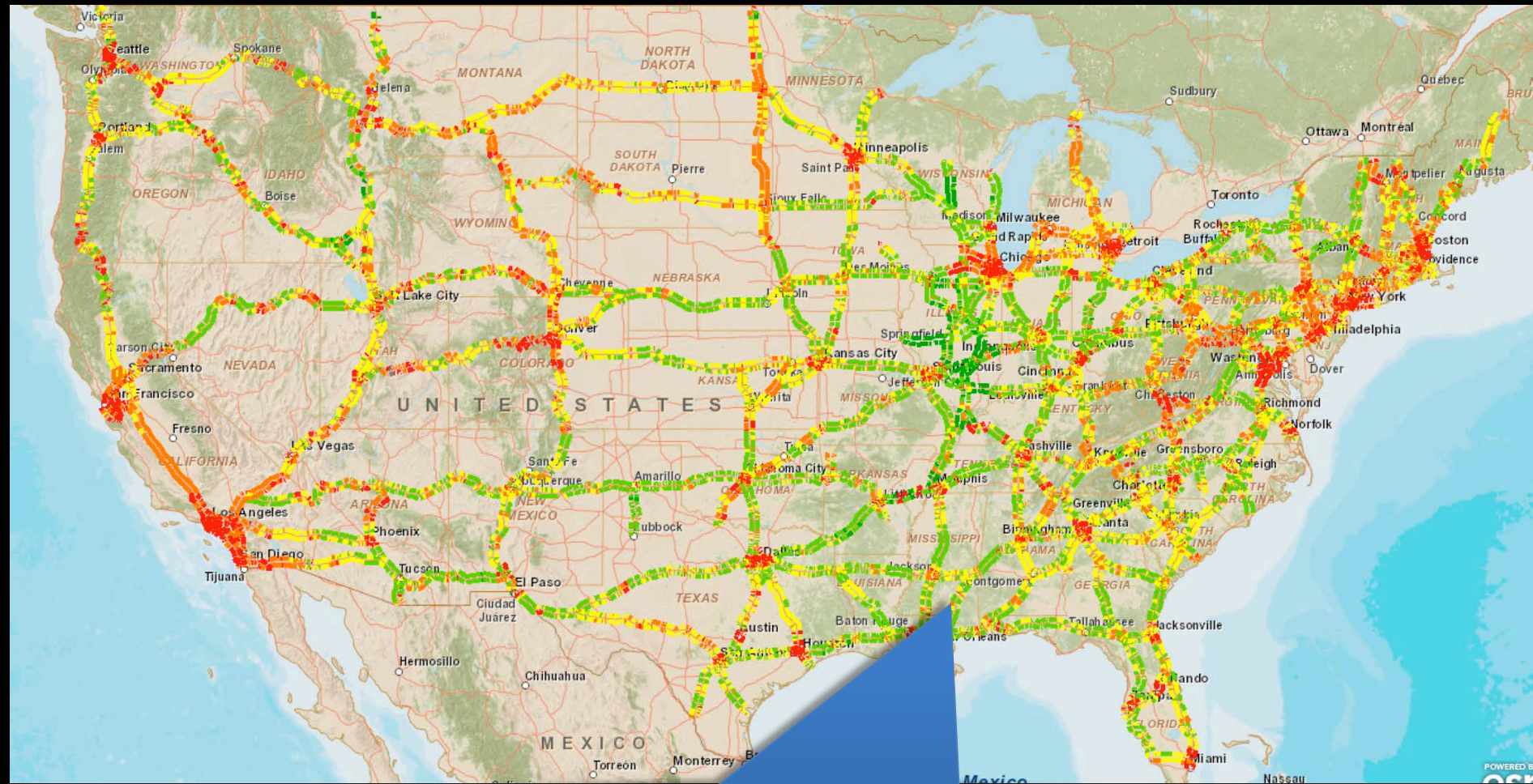
# Free NPMRDS Coverage





# Mid-America Transportation Operations

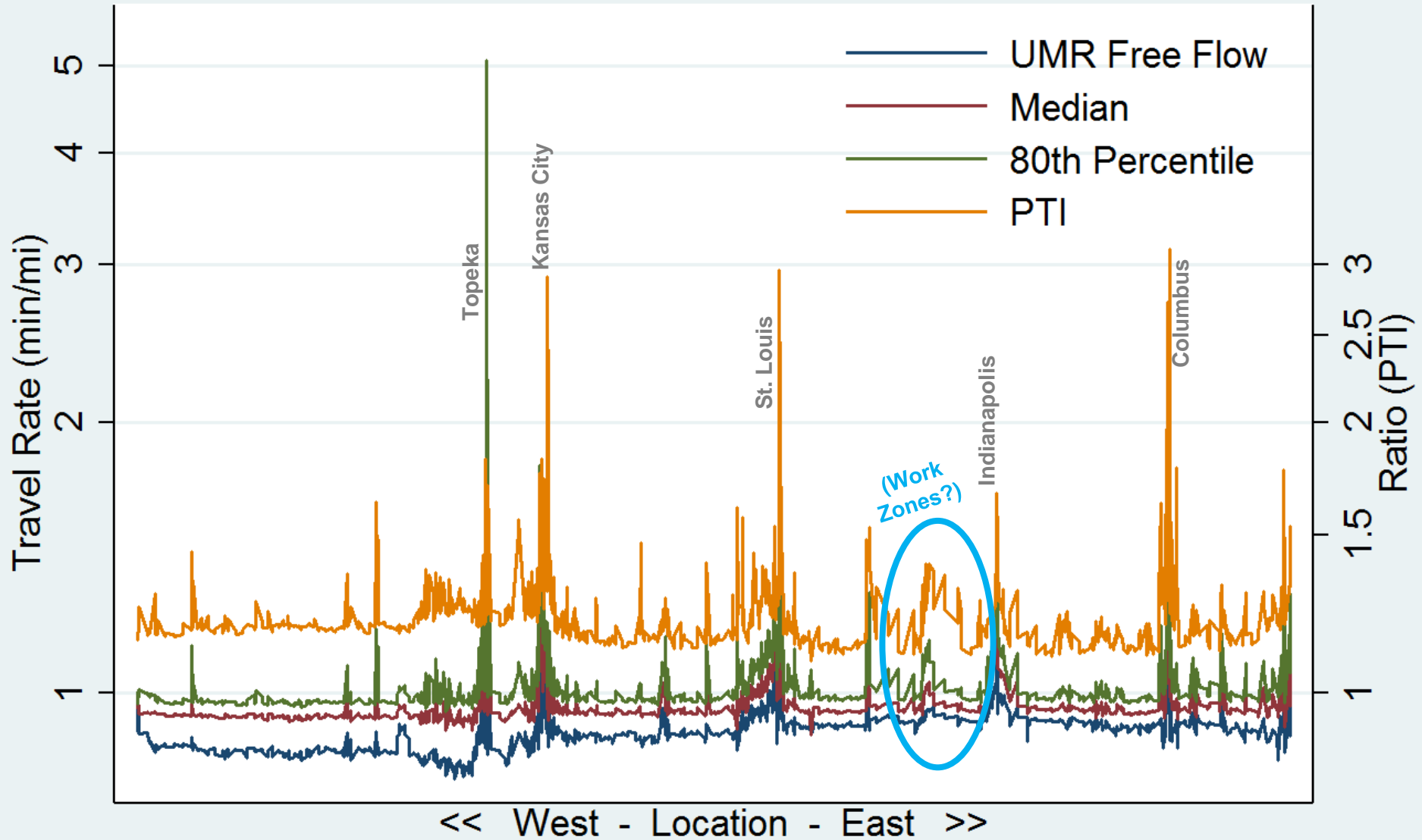




Map Online at  
[www.glrto.org/map/npmrds](http://www.glrto.org/map/npmrds)

# 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

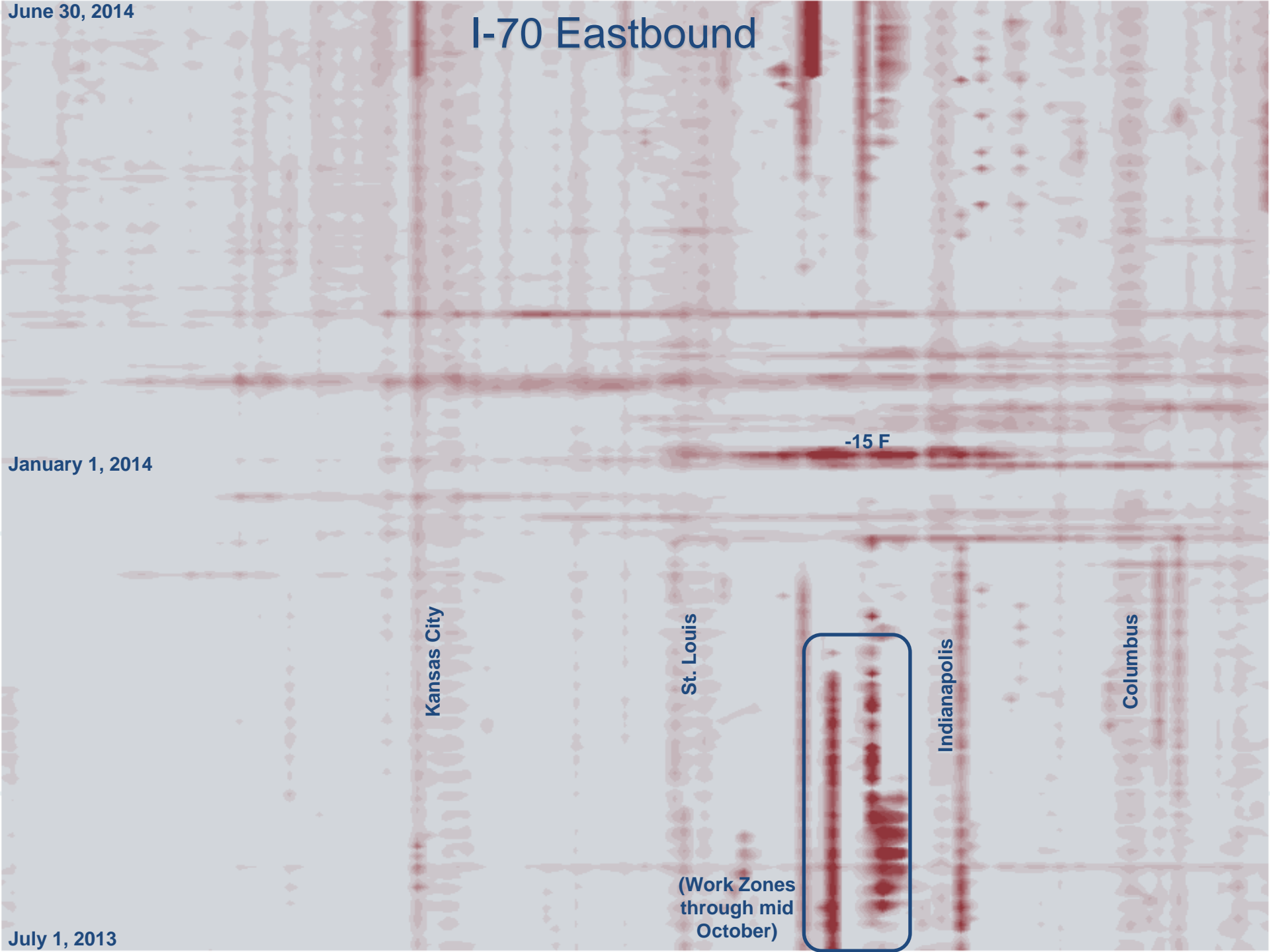
St. Louis

Indianapolis

Columbus

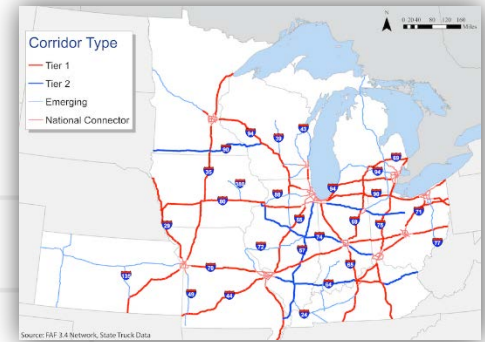
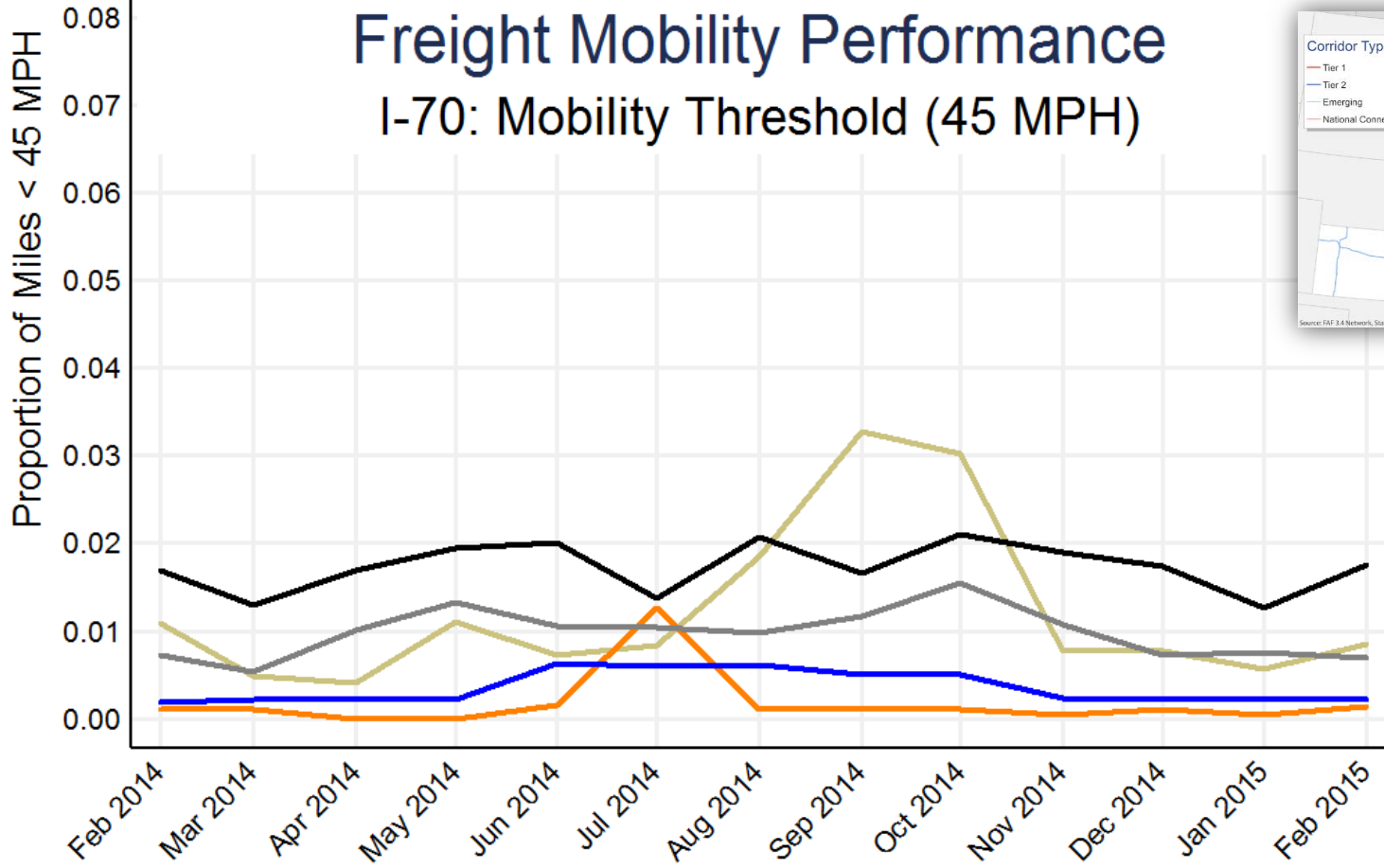
(Work Zones  
through mid  
October)

July 1, 2013



# Freight Mobility Performance

## I-70: Mobility Threshold (45 MPH)

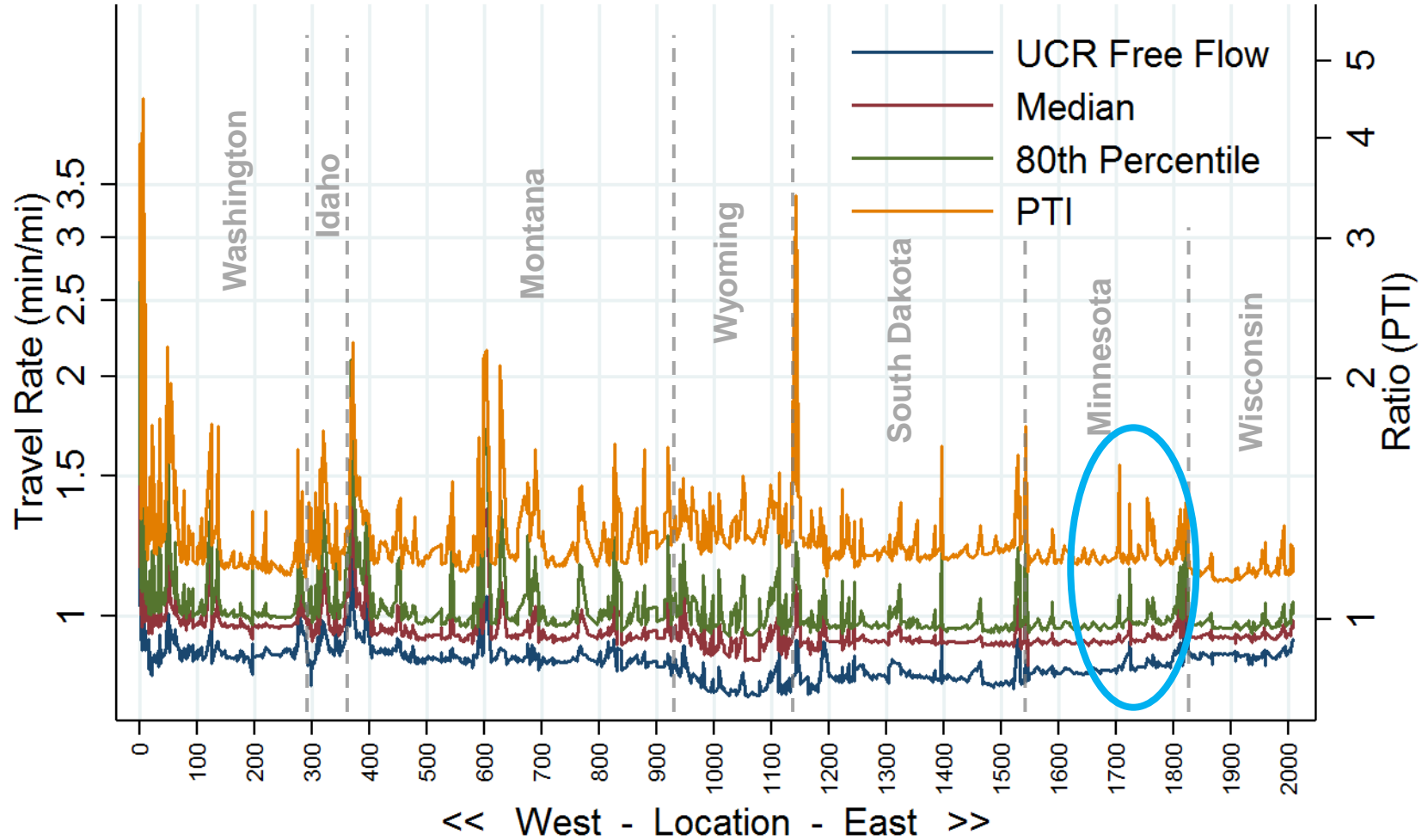


- Indiana
- Illinois
- Kansas
- Missouri
- Ohio

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**

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

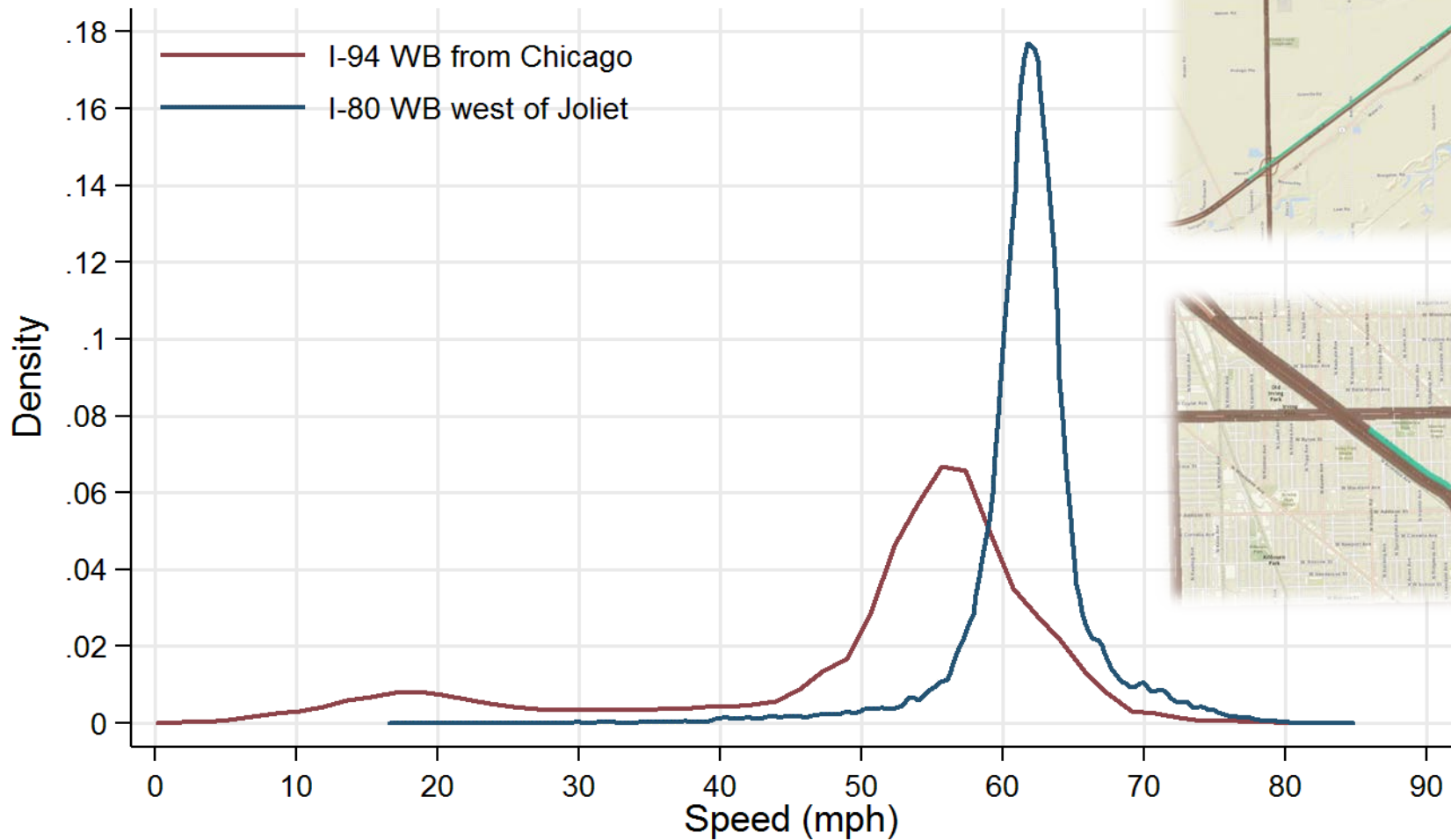
Mobility Impact	Speed	Observations	Duration	Distance
Recurring Congestion	-	-	-	-
Major Incident	↓	?	Short	Short
Work Zone	↓	-	Long	Varies
Winter Weather	↓	-	Medium	Long
Full Closure	↓ (upstream)	↓	Short	Short

# Scanning Tool

## Time Series and Z Score

### Speed Density Plots

Two TMCs in Illinois

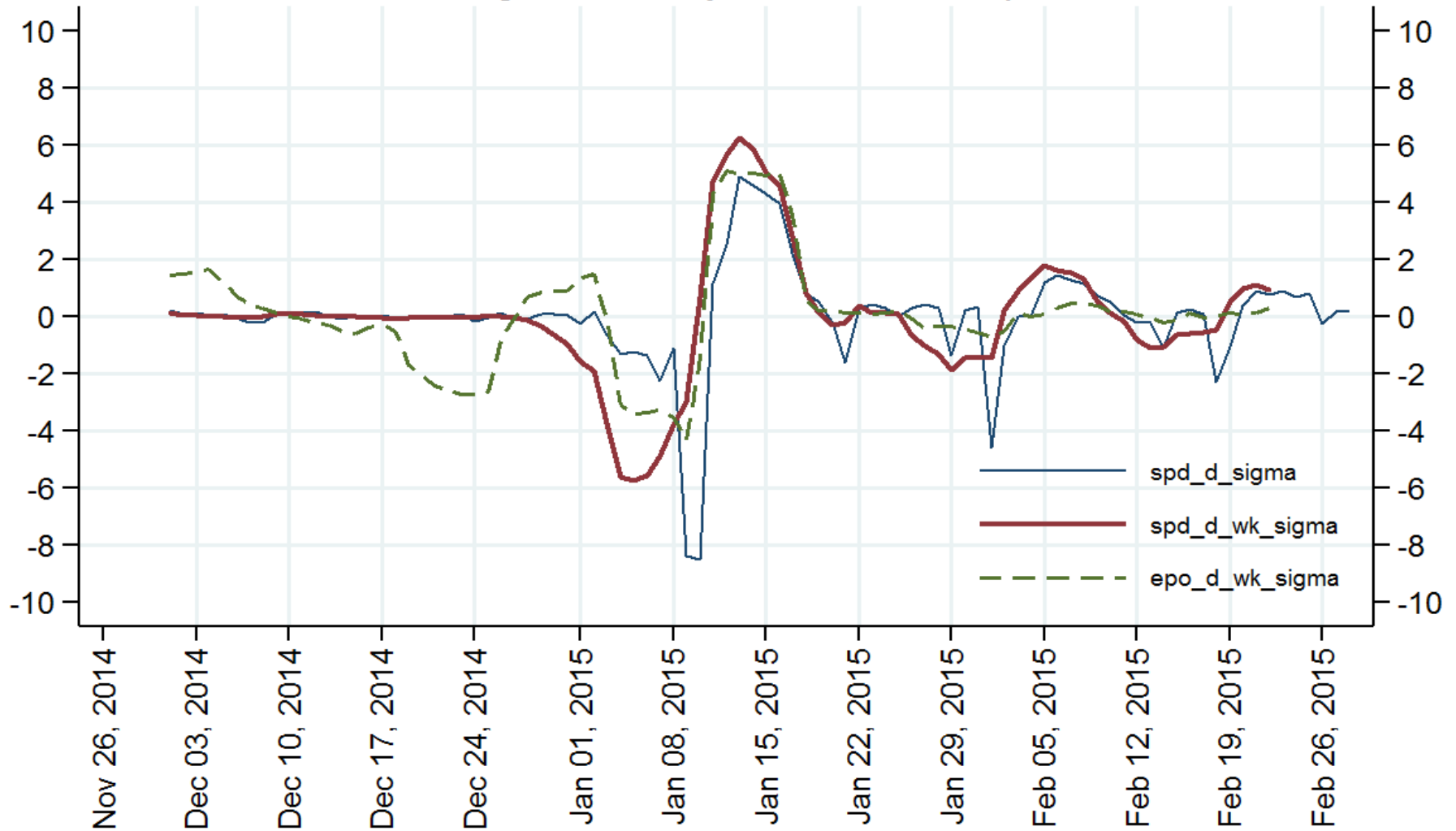


# Scanning Tool

## Major Incident Example

### I-94 Mobility Performance (EKG)

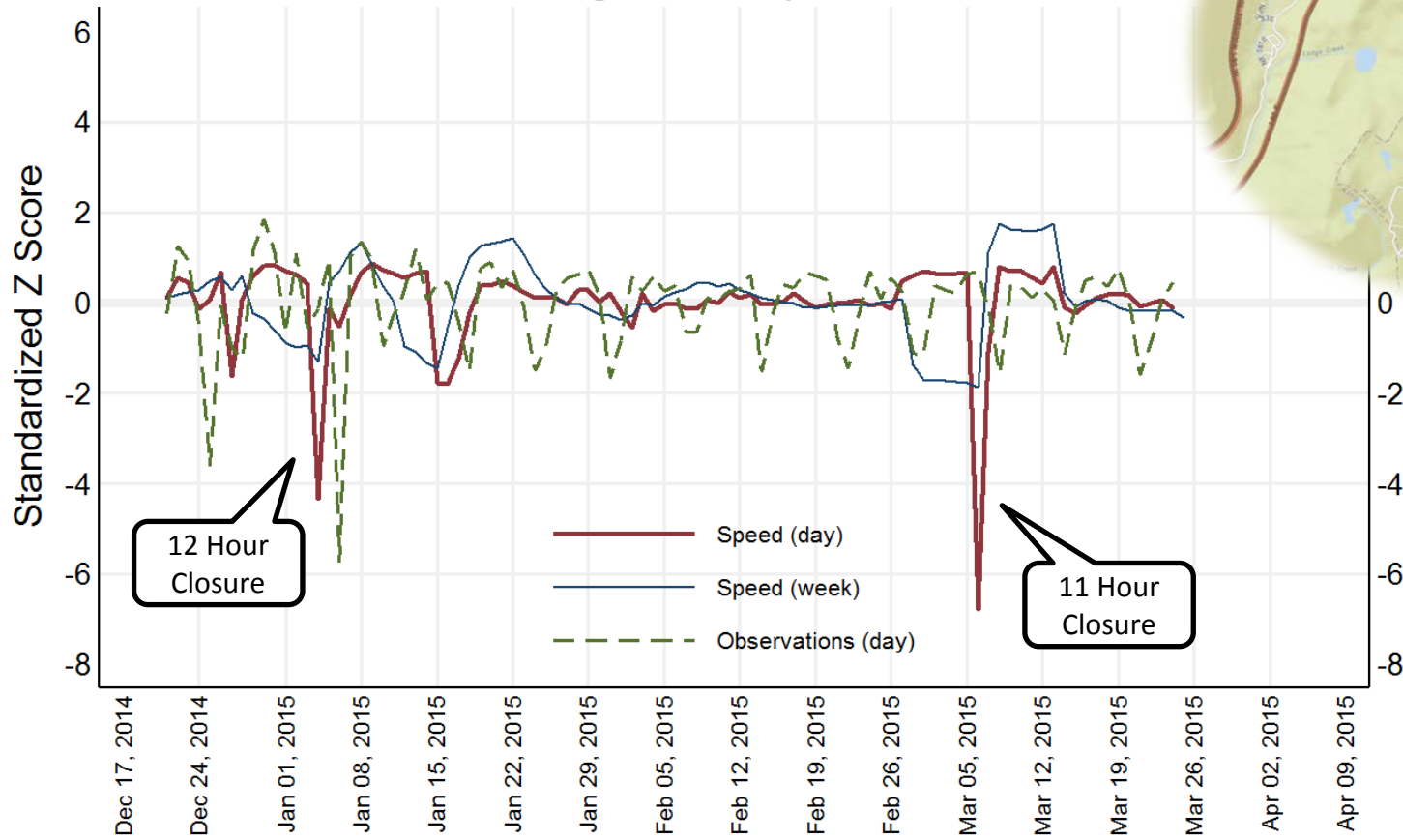
#### Michigan January 9 Crash Example



# Scanning Tool

## Mountain Pass Example

### I-90 Mobility Performance Washington, Snoqualmie Pass

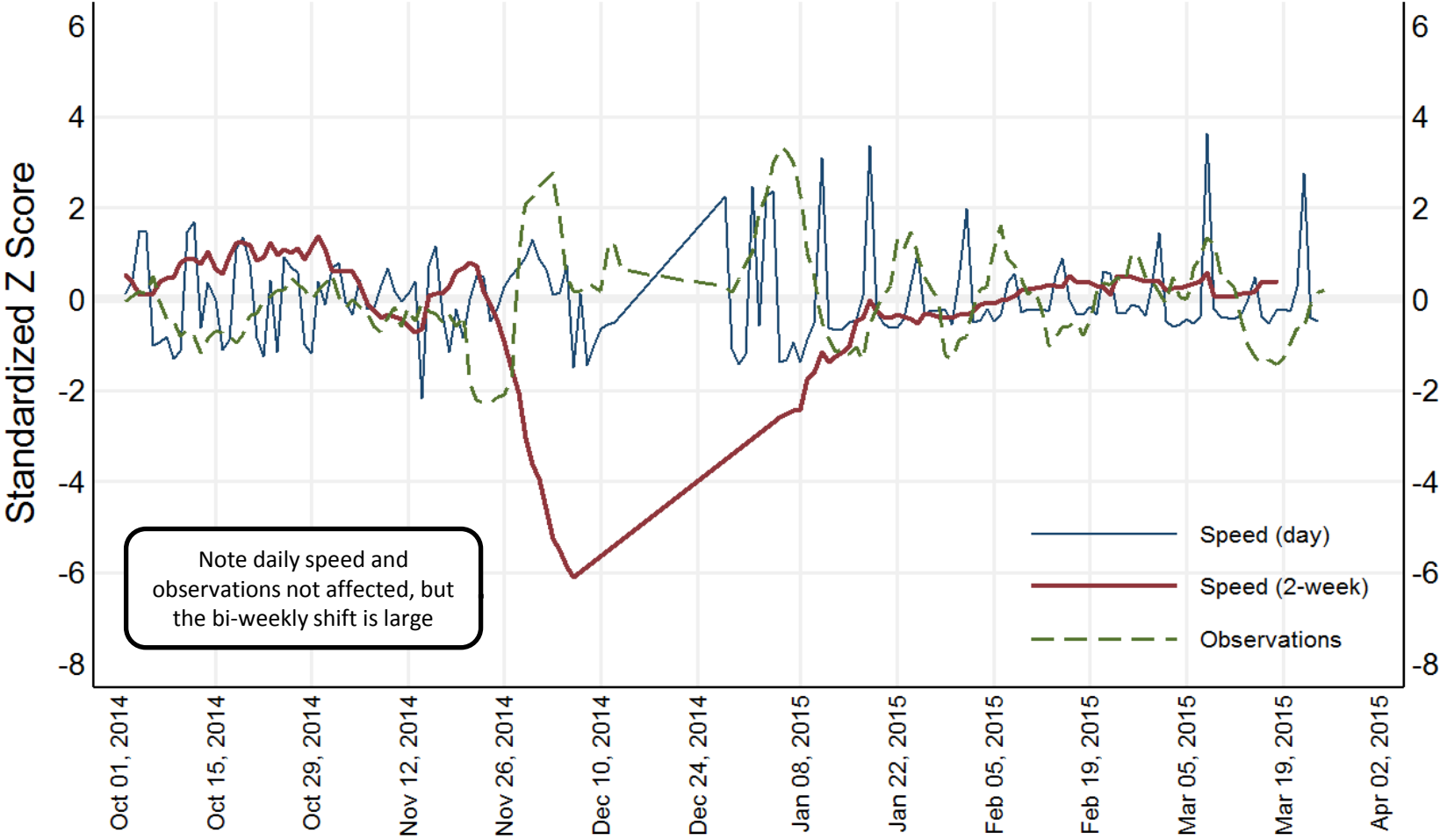


Source: NPMRDS

# Scanning Tool

## Work Zone Example

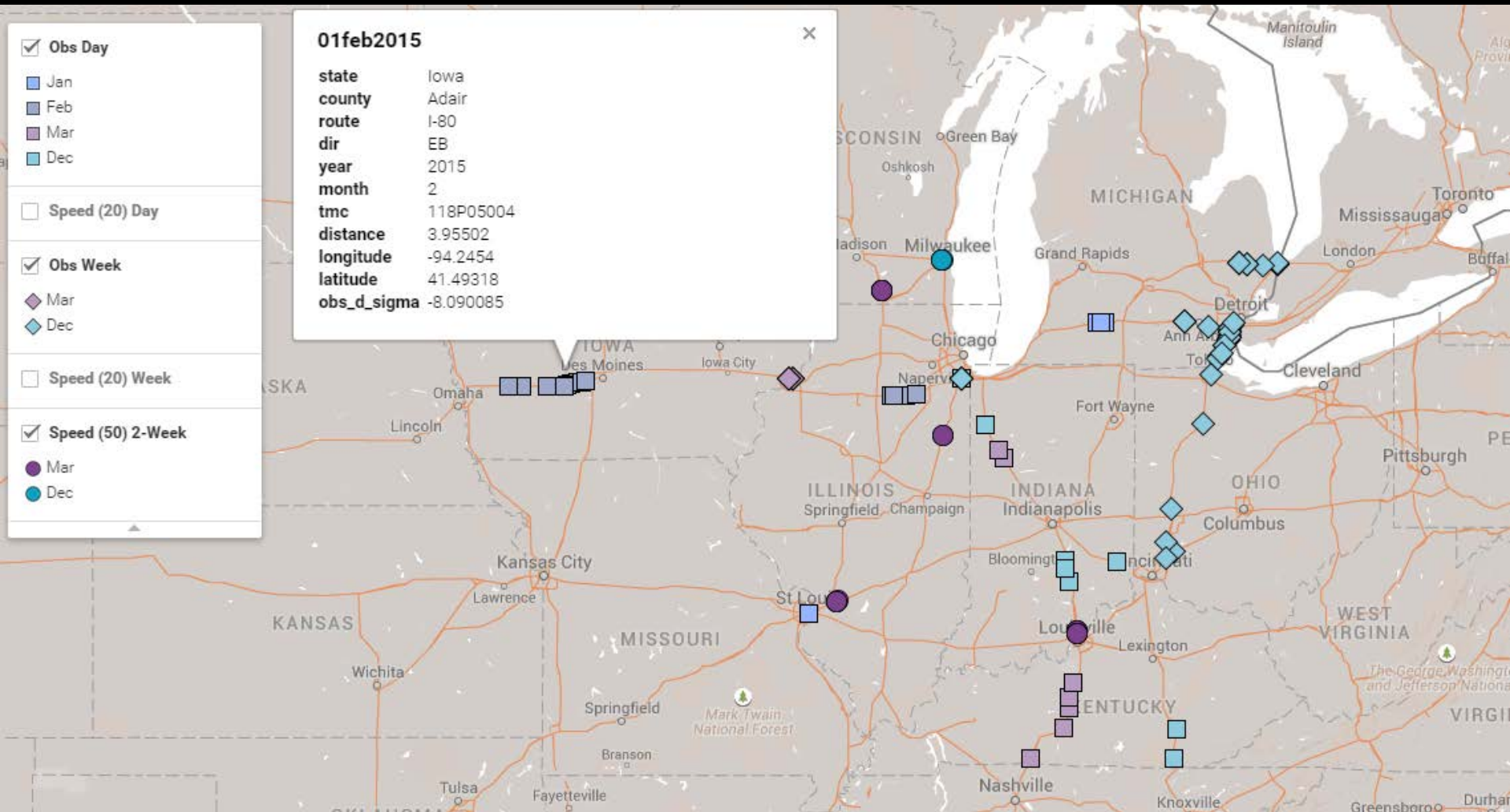
### I-94 Mobility Performance Milwaukee, WB



Source: NPMRDS

# Scanning Tool

## Monthly Performance Reporting



# Multistate Mobility Performance



Peter Rafferty

608-890-1218 or [prafferty@wisc.edu](mailto:prafferty@wisc.edu)

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