

Visualizing Big Data

Maryland Autonomous and Connected Vehicle Working Group

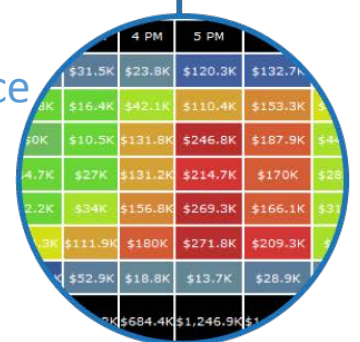
Thomas H. Jacobs, Director, Center for Advanced Transportation Technology

May 2, 2017



Enabling Decision Making & Effective Communication

Performance Measures



Planning



Operations



Communications



Presentation



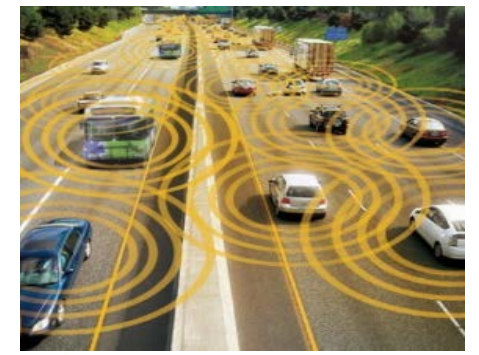
Planning



Operations

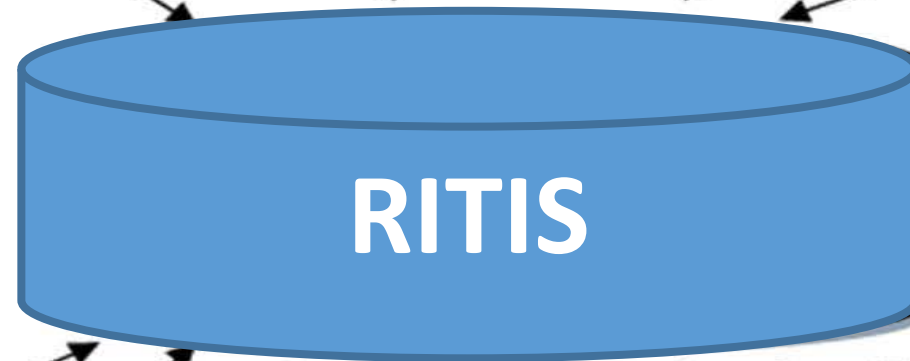


Travel Info



Research

Integration



Data



Traffic



Events



Parking



Weather



Signals



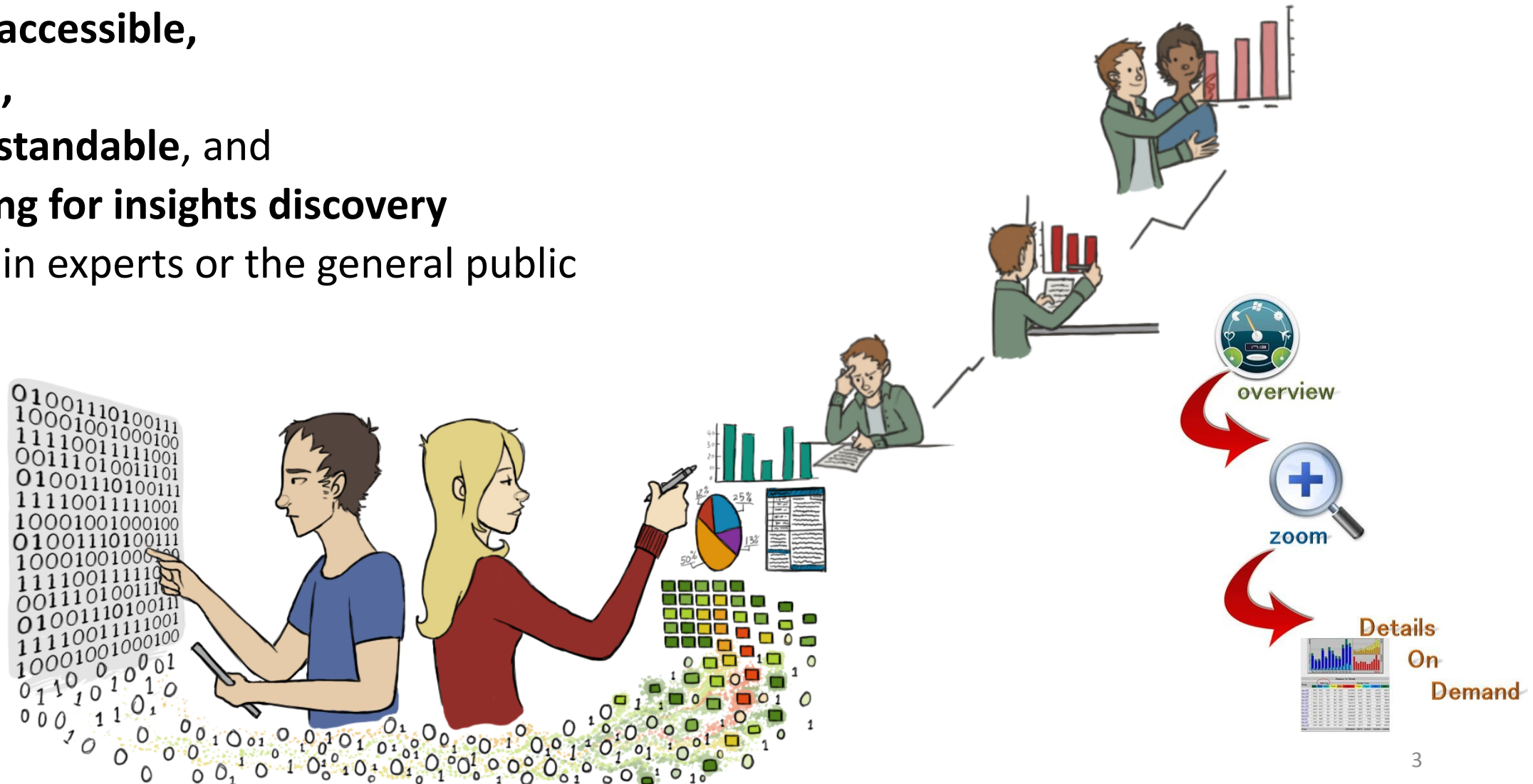
CAD

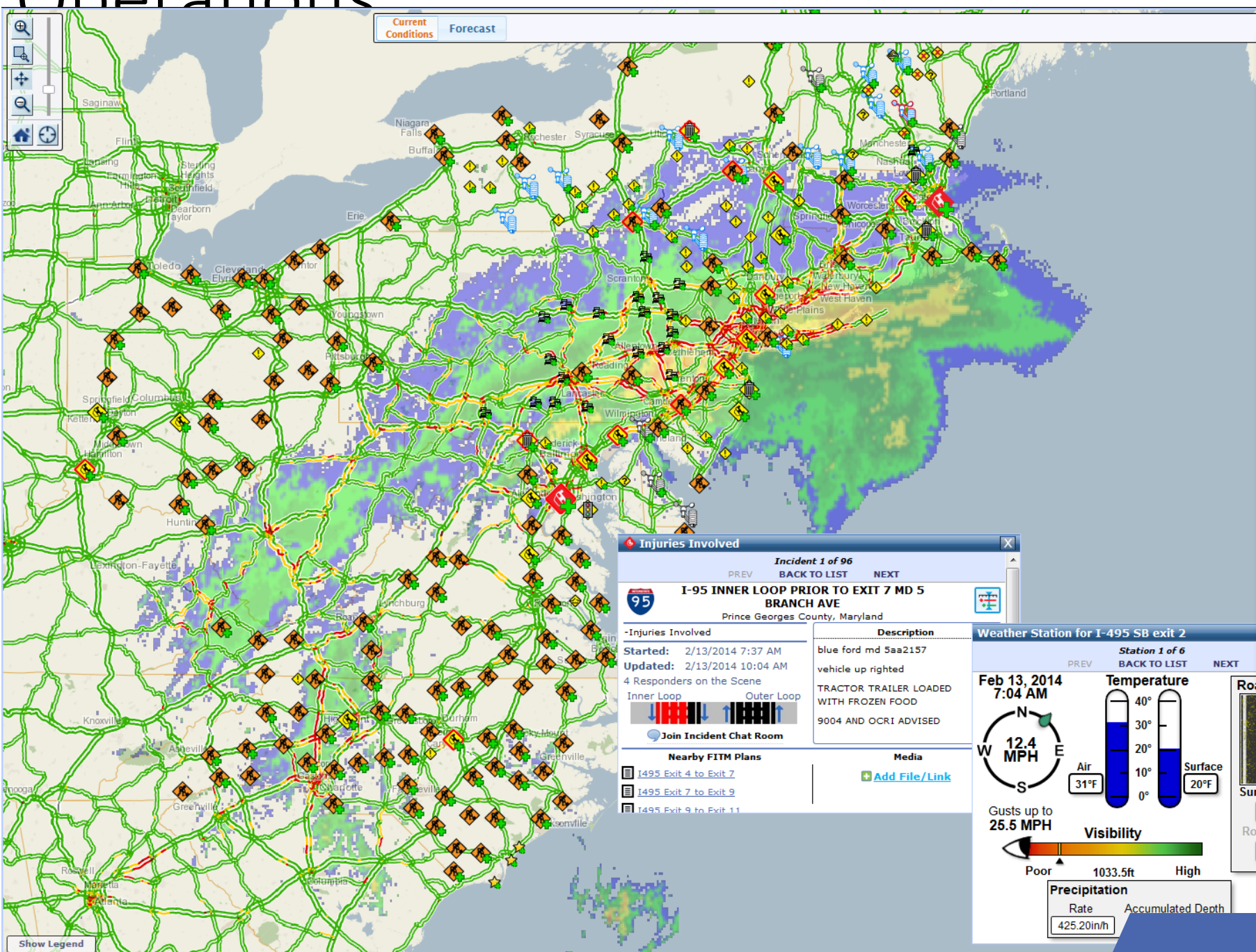


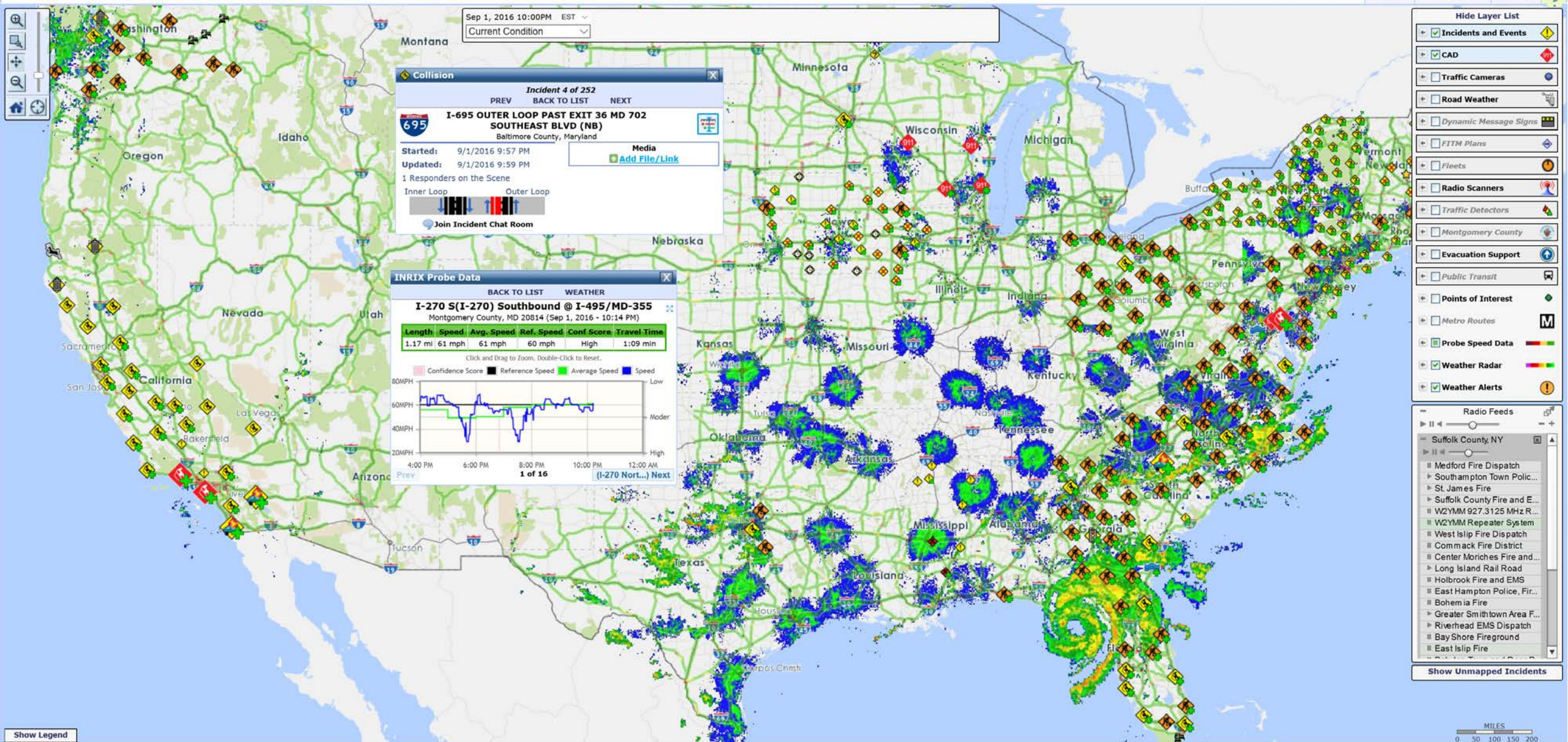
Transit

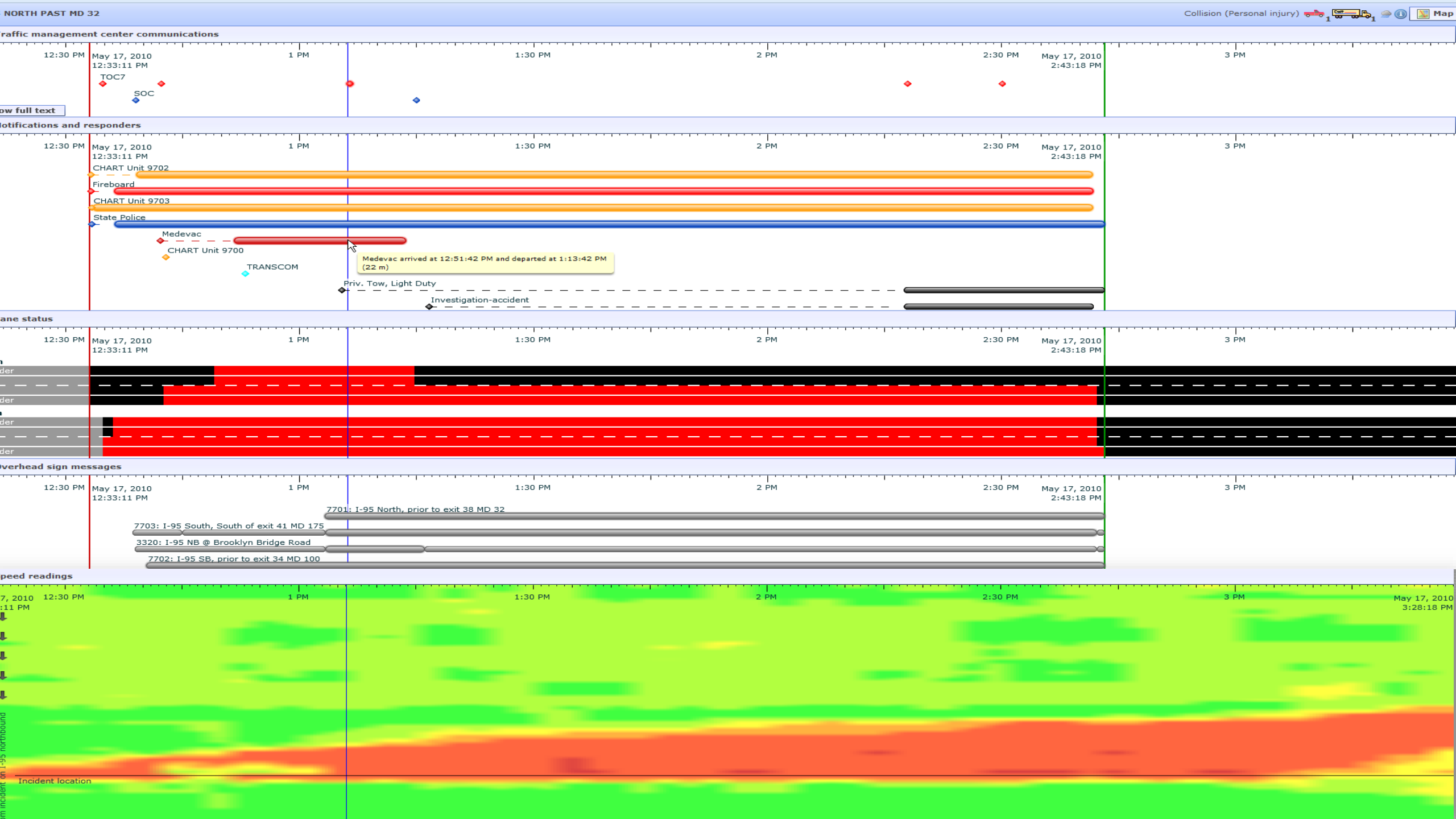
Our Goal with RITIS is to:

- Provide tools to make data
 - easily accessible,
 - usable,
 - Understandable, and
 - allowing for insights discovery
- To domain experts or the general public

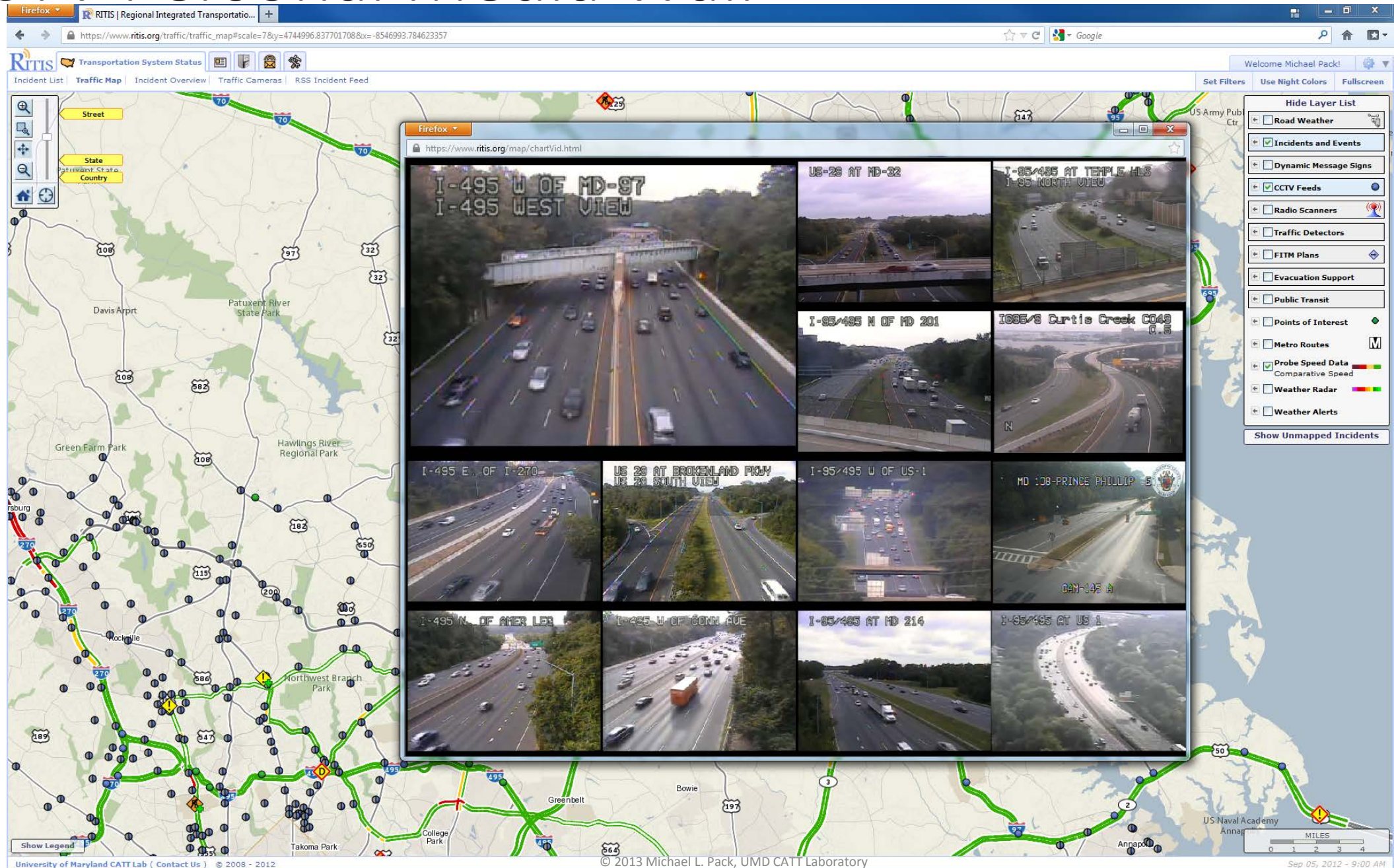


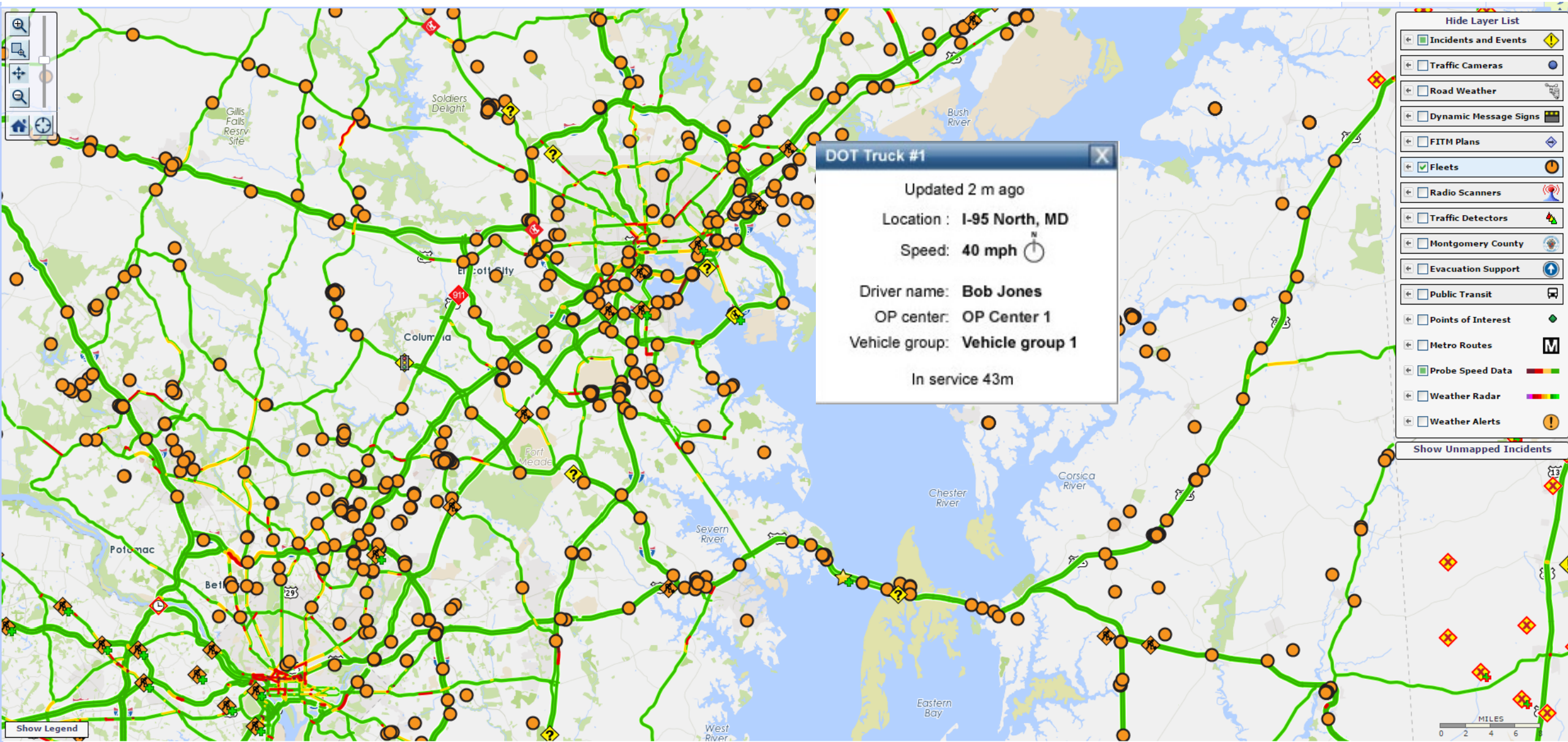


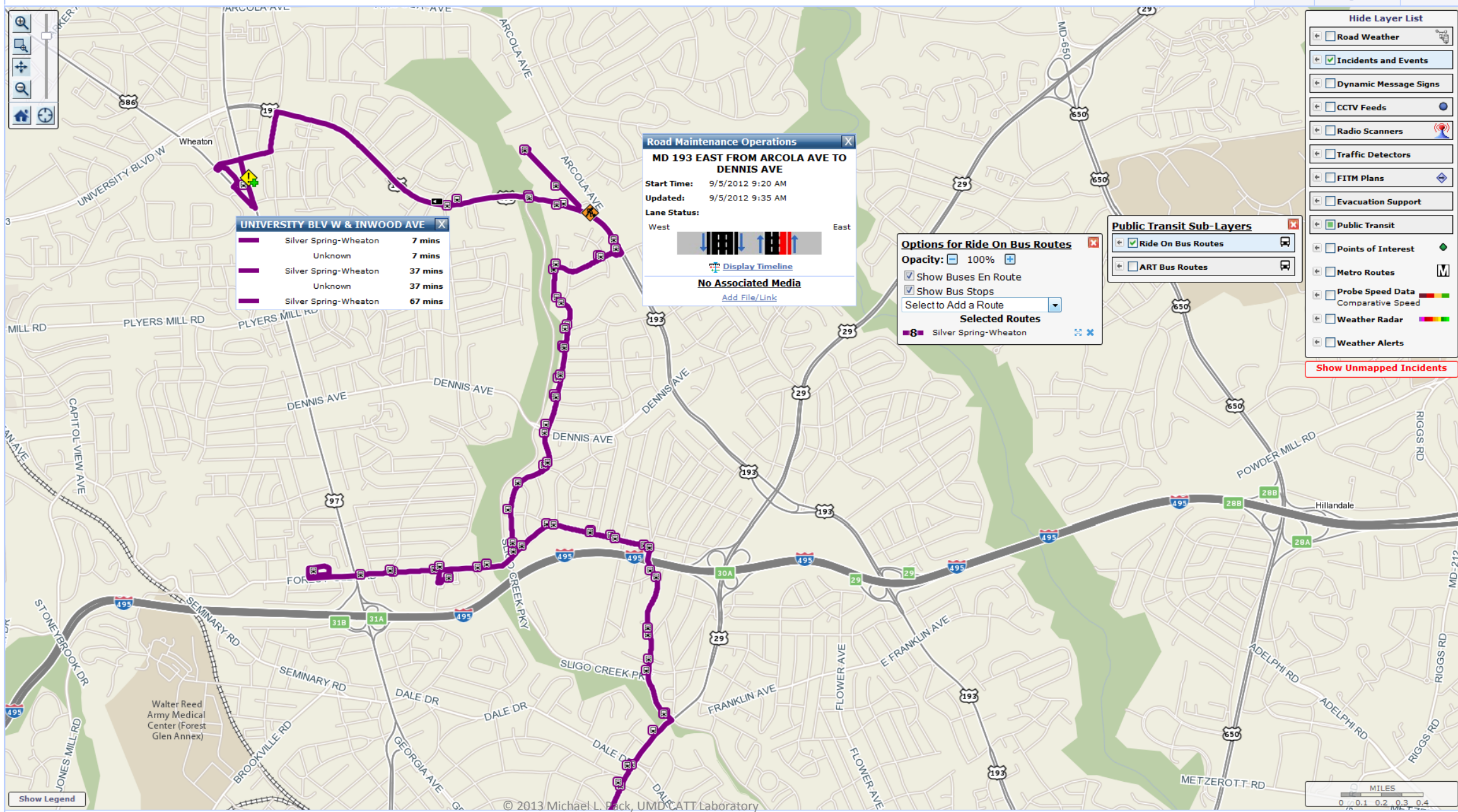




CCTV Personal Media Wall







Virtual Weigh Station

Lock selection to newest vehicle



11:30:38 AM | Class 7



11:29:51 AM | Class 5



11:28:56 AM | Class 9



11:25:43 AM | Class 7



11:24:30 AM | Class 9

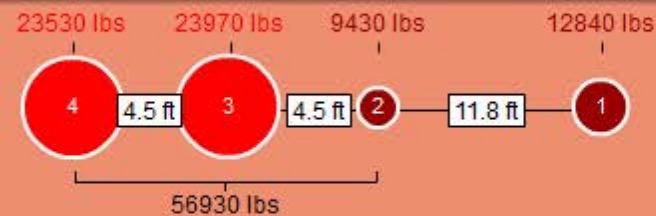
Over-weight axle
Over-weight bridge
Over-weight (tandems)

11:25:43 AM



Class 7
Speed: 34.1 mph
Length: 21 ft
Gross: 69770 lbs

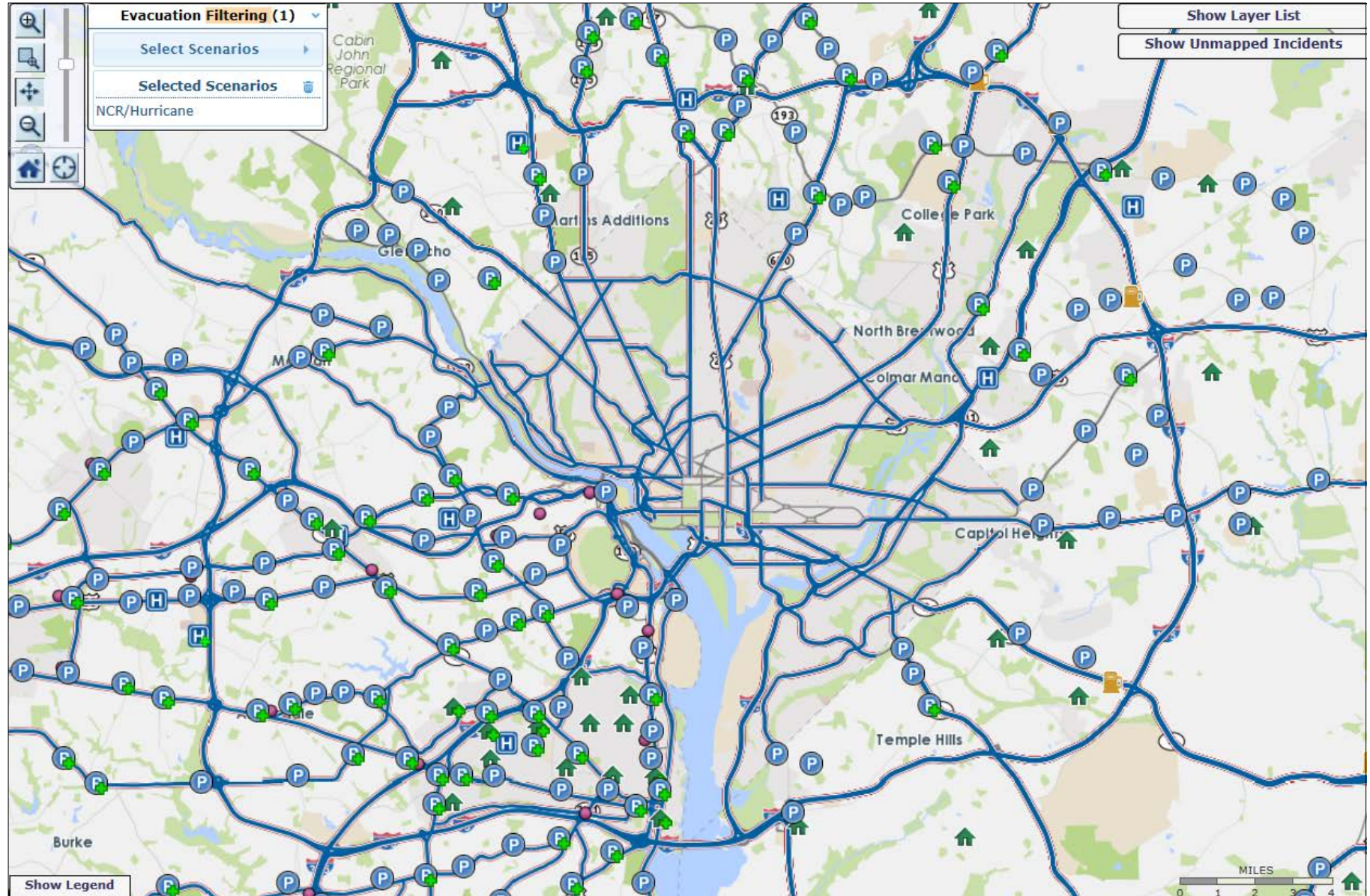
-3.4 seconds difference



Evacuation Support

Evacuation Support Sub-Layers

- ☒ Staging Areas (P)
- ☒ Comfort Station/Travel Services (P)
- ☒ Public Shelters (H)
- ☒ Hospitals (H)
- ☒ Traffic Control Points (P)
- ☒ Gov't Vehicle Fueling Stations (P)
- ☒ Evacuation Routes (P)



Evacuation Support

Traffic Control Point at US 11/Winchester Ave @ CR 32 & Novak Dr

US 11/Winchester Ave @ CR 32 & Novak Dr

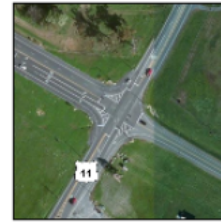
1-267 Novak Dr

WV 25405

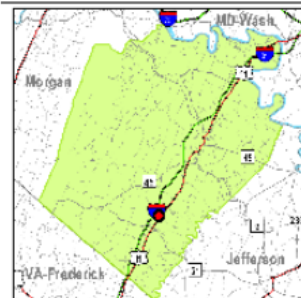
Berkeley County

NCR/Hurricane

Traffic Control Point at US 11/Winchester Ave @ CR 32 & Novak Dr



Source: maps.bing.com



- KEY**
- Personnel
 - Road Block
 - Cones / Barrels
 - Traffic signal
 - Evac Traffic
 - Traffic Lane
- Deploy indicated traffic control devices as resources permit

FINAL DRAFT
FOR OFFICIAL USE ONLY
NO PUBLIC RELEASE

Berkeley County
NCR/Hurricane
Scenario

TCP 02-T04
US 11/
Winchester Ave @
CR 32 & Novak Dr

Area at Langley Park Shopping Center

PG-S84: MD 193 (University Blvd) WB

Staging Area at Langley Park Shopping Center

4 of 6
PREV BACK TO LIST NEXT

Langley Park Shopping Center
7901 New Hampshire Ave
Langley Park Cdp, MD
Prince George's County

Function: Shopping Center Parking

Surface Type: Paved

Avail. Space: 396

Lot Size: Medium

Truck Access: No

Area Information



PG-S84

RITIS for collaborative decision-making



The RITIS Meeting tool provides a hassle-free way to conference up to 300 participants before, during, and after major events.

RITIS Meeting

MATOC D...

Checklist

Map

Show Document

Upload File

Clear All

Share Cursor Position

10/16/2015 9:00 AM

Conference Call: (123) 456-7890

Code: 1234

Location: Prince Georges County, Maryland

Description: This is a demonstration of RITIS Meeting functionality

Timeline

DC METRO AREA FORECAST

REST OF TODAY...SUNNY. HIGHS IN THE UPPER 50S. NORTH/WEST WINDS 10 TO 15 MPH WITH GUSTS UP TO 25 MPH.

TONIGHT...MOSTLY CLEAR. COLD WITH LOWS IN THE LOWER 40S IN THE DOWNTOWN AREAS...IN THE UPPER 30S IN THE SUBURBS. NORTHWEST WINDS 5 TO 10 MPH.

Utility Problem. MD-355 NB/SB at

Incident: Water Main Break

Location: MD-355 NB/SB at Cedar Lane, Montgomery County, MD.

All northbound lanes are being diverted onto Cedar Lane. Two southbound left lanes are blocked, one right lane gets by.

Expect major disruption to AM & PM commutes. Clean up and restoration will require a multi-day closure of this roadway.

RITIS Event Timeline

<https://timeline.ritis.org/timeline/>

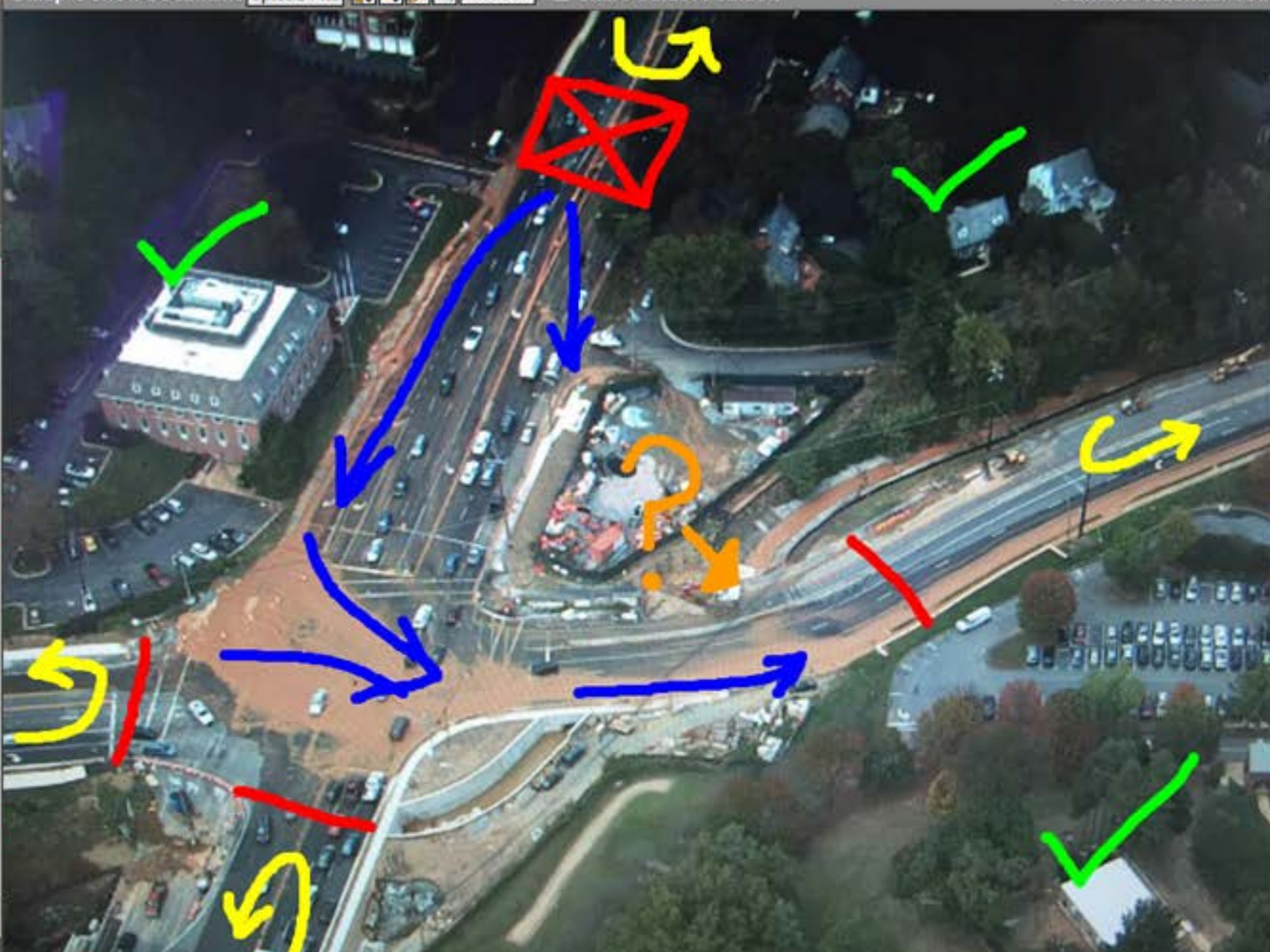
Add Another Entry

Meeting Notes and Recommendation

Host: Taran Hutchinson | End Meeting

Current Presenter: You

Poll Results



▼ #1

How long do you estimate restoration of roadway will take?

1 day

(0)

2 days

(0)

3 days

(1)

4 days

(3)

5 days

New Poll

Attendance(5)

Questions

▼ Host

Taran Hutchinson

▼ Presenter

Taran Hutchinson

▼ Participants (4)

▼ VDOT(1)

▼ DDOT(1)

Jacqui Stapleton

▼ MDOT(1)

Robert Franklin

▼ WMATA(1)

Louise Mortimer

Winter Sto... Checklist

09/17/2014 2:00 PM
Conference Call: (123) 456-7890
Code: 123456
Location: Maryland
Description: Maryland state wide winter storm preparedness call - Test

Forecast

8am - 12pm
A strong storm will be advancing through the area with potential wind gusts of 35mph.

12pm - 4pm
The storm will move to the east of Springfield by 3pm, and weaken as it approaches St. Louis.

4pm - 8pm
The storm will move out of the region completely by 8pm.

8pm - 12am
Significantly colder air will settle over the region causing rapid freezing on the roadways.

Add Next Box

Map Show Document Clear All Share Cursor Position

Sep 17, 2014 1:58:45 PM
Current Condition

School Closing

When should the schools be closed?

☒ 8am

☐ 10am

☐ 12pm

☐ No closing needed

Edit PollEnd Poll in 10 SecondsCancel Poll

Hide Layer List

☐ Incidents and Events

☐ Dynamic Message Signs

☒ Road Weather

☒ Weather Alerts

☒ Weather Radar

☒ Probe Speed Data

Evacuation Support

Weather station for Gorham (IL 3 @ UP/Missouri RR)

Sep 17, 2014 1:49 PM

Temperature

3.7 MPH

Air 66°F

Surface 70°F

Visibility

Poor1.1miHigh

Precipitation

RateAccumulated Depth

0.00in/h

Weather Alert for Webster County

Flash Flood Warning issued September 17 at 11:55AM CDT until September 17 at 3:00PM CDT by NWS Springfield

Display More

Current Presenter: You

Poll Results

There are no available poll results...

New Poll

Attendance(6) Questions

▼ Host

Nikola Ivanov

▼ Presenter

Nikola Ivanov

▼ Participants (5)

▼ DDOT(1)

JJ Biel-Goebel

▼ CATT Lab(4)

Pat Redding

Kevin Van

Pyae

Walter

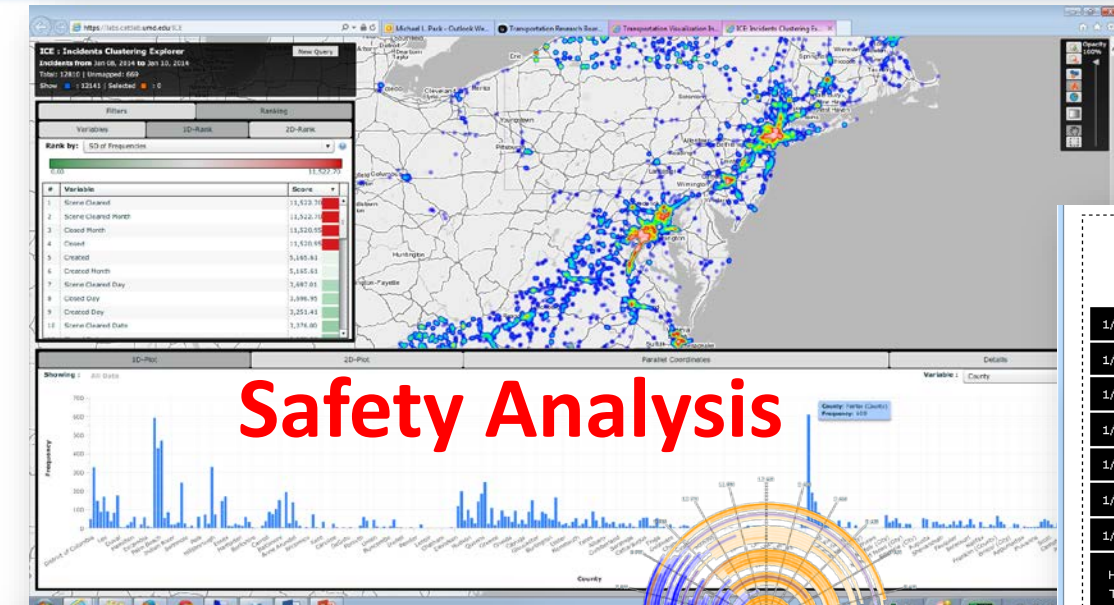
Planning & Research

Congestion Analysis

Safety Analysis

Weather Analysis

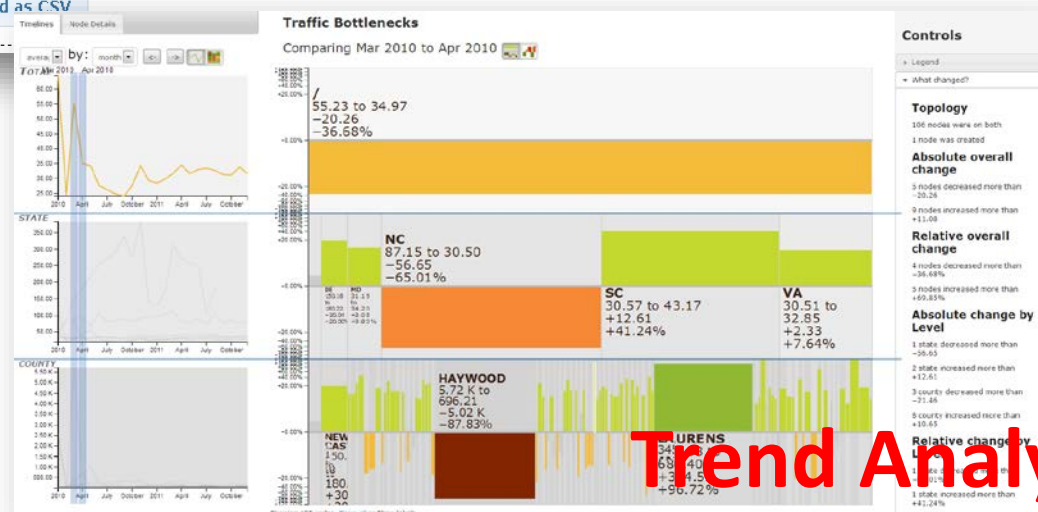
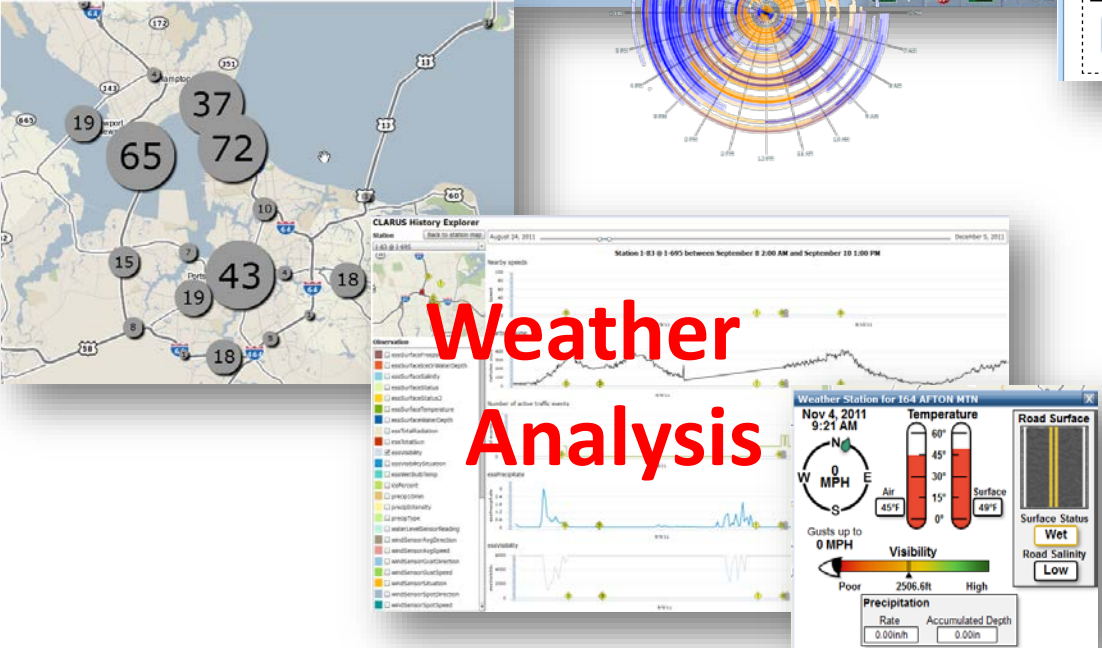
Trend Analysis & MAP-21 Reporting



Combined passenger and commercial delay (in thousands of dollars)

	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Daily Total
1/14/13	\$0.2K	\$0.1K	\$0.1K	\$0.1K	\$0.2K	\$0.1K	\$0.2K	\$11.9K	\$16.2K	\$2.7K	\$0.5K	\$0.2K	\$0.1K	\$0.2K	\$0.1K	\$1.4K	\$7.7K	\$10K	\$1K	\$0.1K	\$0.1K	\$0.1K	\$0.3K	\$0.1K	\$5.1K
1/15/13	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0.4K	\$12.9K	\$17.6K	\$2.7K	\$0.1K	\$0.2K	\$0.1K	\$0K	\$0.2K	\$5.8K	\$12.9K	\$21K	\$8.5K	\$3.1K	\$0K	\$0.1K	\$0.1K	\$0K	\$8.8K
1/16/13	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$12.1K	\$14.4K	\$0.9K	\$0.1K	\$0.1K	\$0K	\$0K	\$0.6K	\$4.4K	\$14.9K	\$21.4K	\$6.5K	\$0.1K	\$0K	\$0.1K	\$0K	\$0K	\$7.1K
1/17/13	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.3K	\$12.2K	\$14.8K	\$2.1K	\$0K	\$0.4K	\$0.1K	\$0K	\$0.2K	\$4.3K	\$19.6K	\$25.8K	\$6.5K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$8.1K
1/18/13	\$0K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$9K	\$7K	\$0.2K	\$0K	\$0.4K	\$0.1K	\$0K	\$0.2K	\$4.3K	\$19.6K	\$25.8K	\$6.5K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$8.1K
1/19/13	\$0.1K	\$0.1K	\$0.2K	\$0.1K	\$0K	\$0.1K	\$0K	\$0.1K	\$0.1K	\$0.2K	\$0K	\$0.1K	\$0.1K	\$0.2K	\$0K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0.1K	\$0.1K	\$0K	\$2.1K
1/20/13	\$0K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0K	\$0.1K	\$0K	\$0.1K	\$0.1K	\$0.2K	\$0K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0.1K	\$0.1K	\$0K	\$1.1K
Hourly Totals	\$0.5K	\$0.5K	\$0.6K	\$0.3K	\$0.4K	\$0.2K	\$1.1K	\$58.4K	\$70.2K	\$8.8K	\$0.8K	\$0.8K	\$0.8K	\$0.8K	\$0.8K	\$93K	\$23.5K	\$3.6K	\$0.4K	\$0.4K	\$1.2K	\$0.5K	\$0.5K	\$0.5K	\$125.5K

Download as CSV



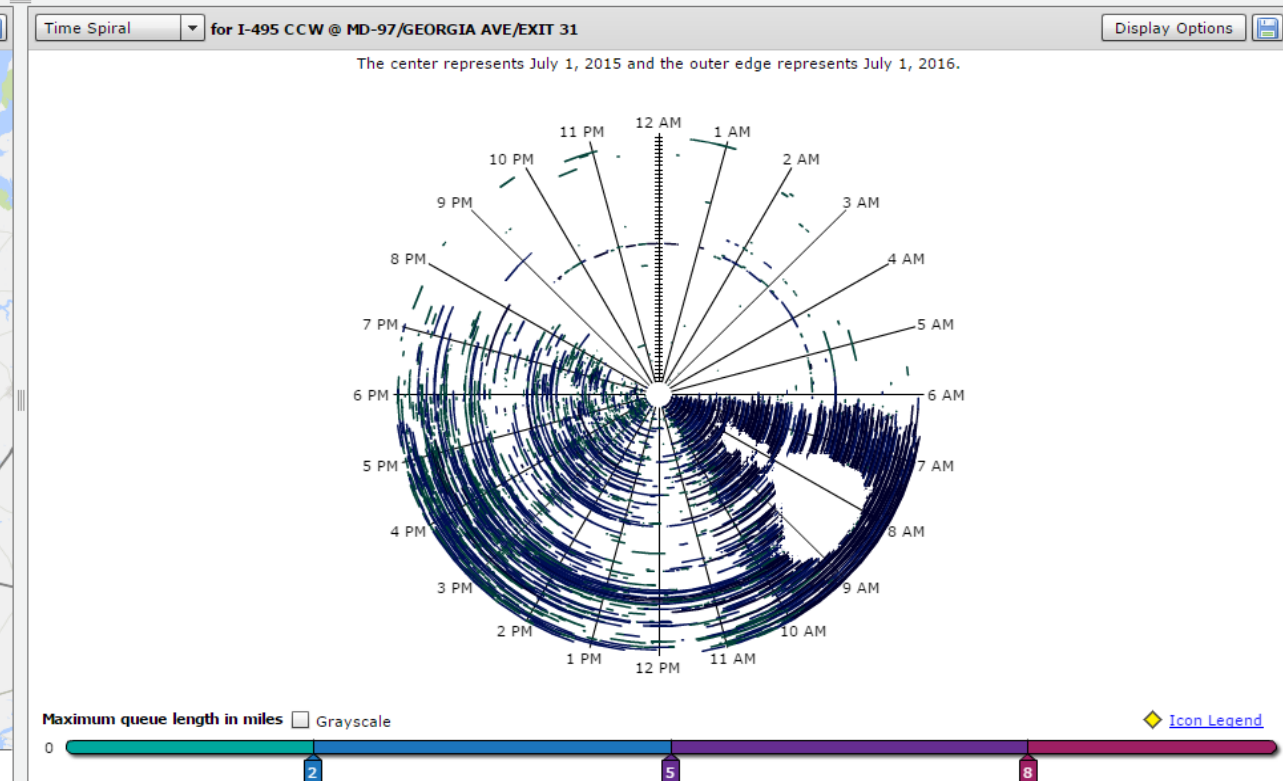
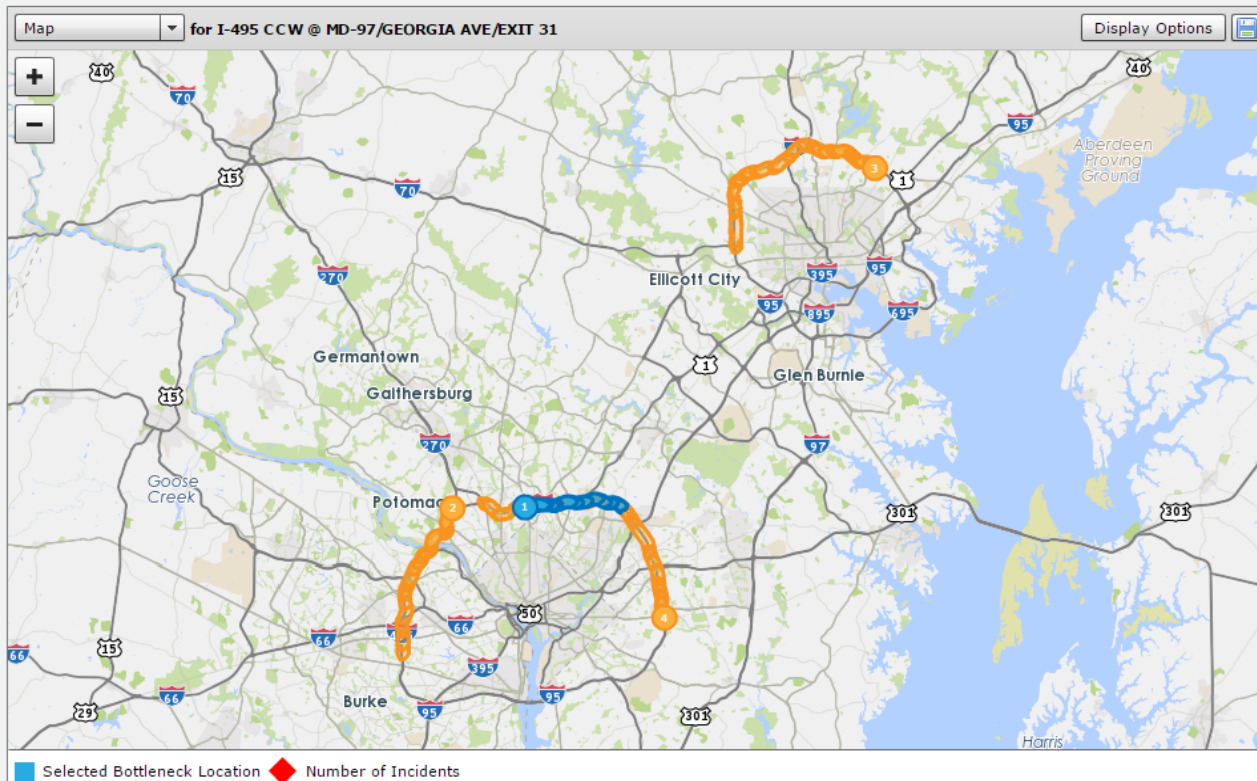
Top (worst) Interstate Locations

New search

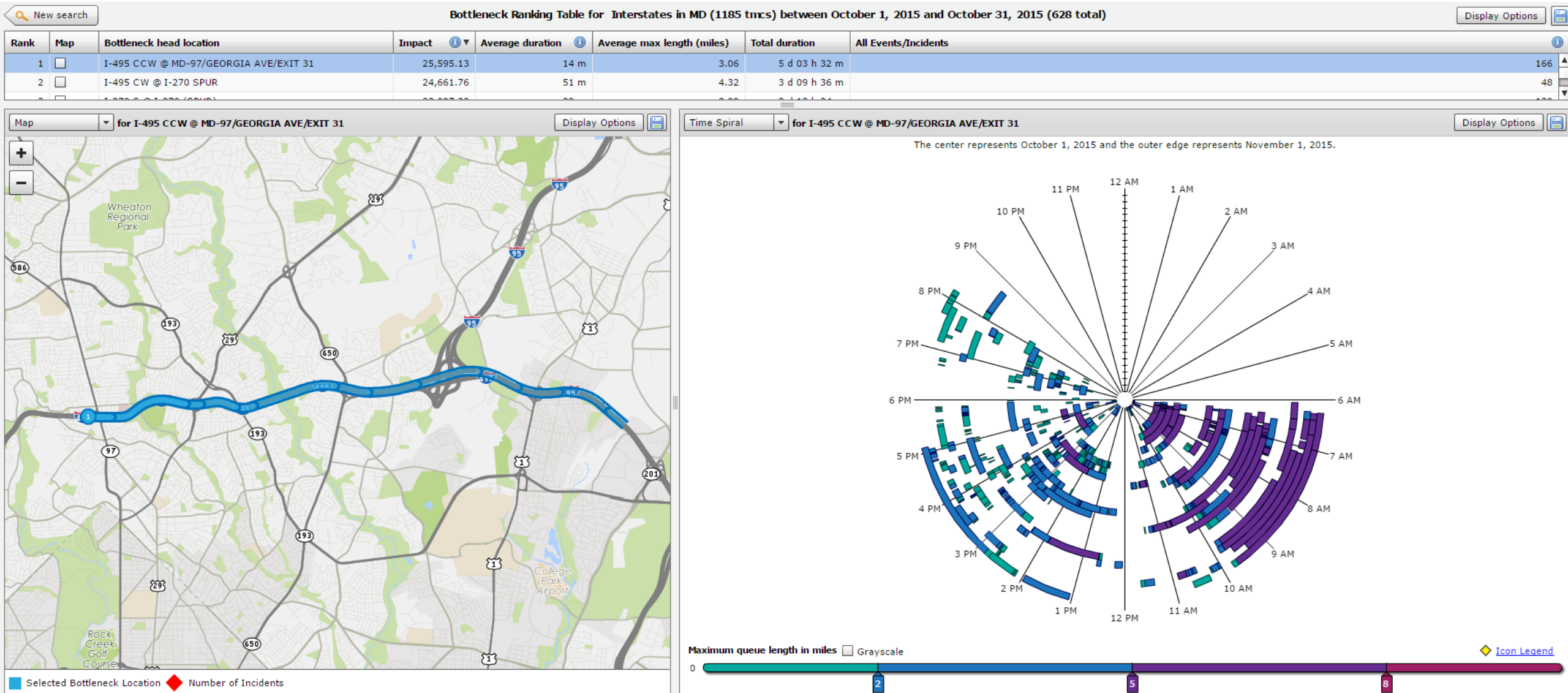
Bottleneck Ranking Table for Interstates in MD (1185 tmc) between July 1, 2015 and June 30, 2016 (629 total)

Display Options

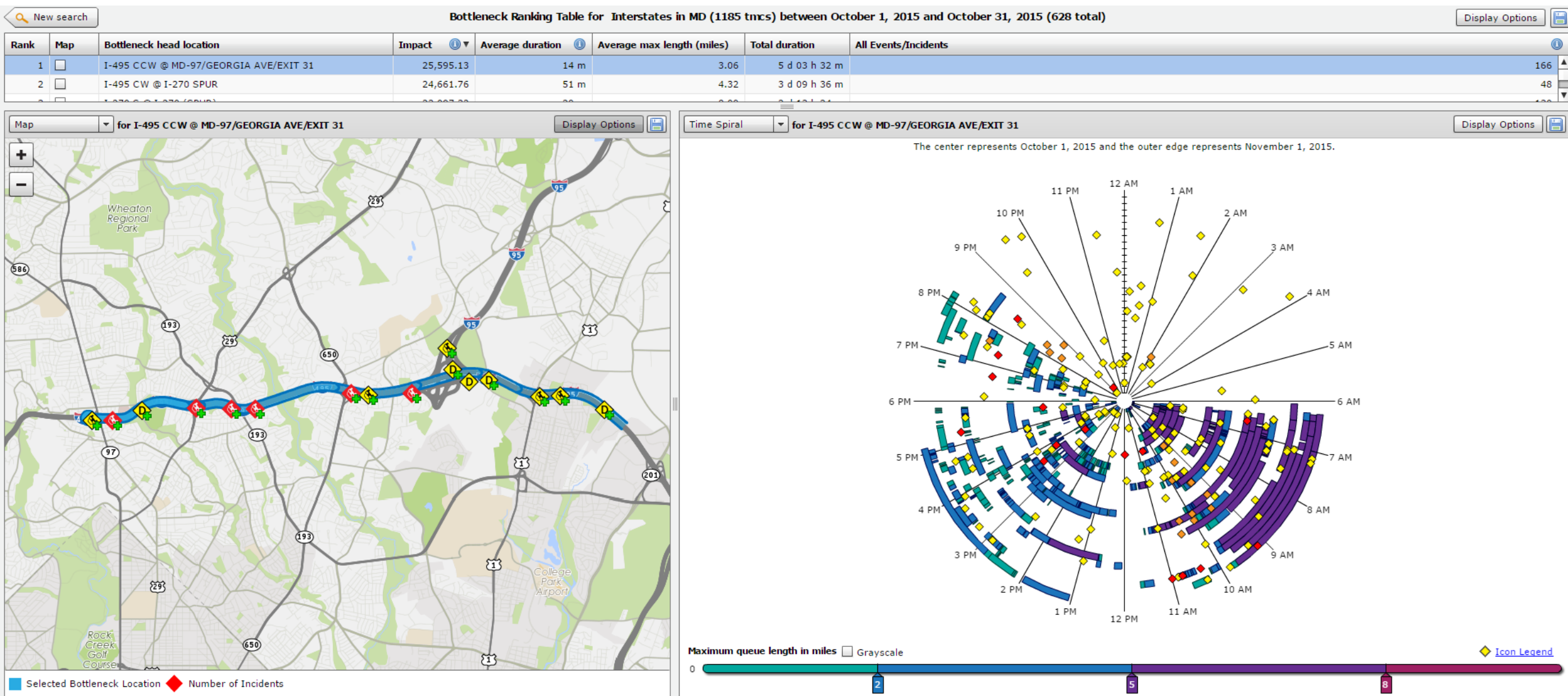
Rank	Map	Bottleneck head location	Impact	Average duration	Average max length (miles)	Total duration	All Events/Incidents
1	<input checked="" type="checkbox"/>	I-495 CCW @ MD-97/GEORGIA AVE/EXIT 31	277,380.79	12 m	3.07	57 d 23 h 54 m	1955
2	<input checked="" type="checkbox"/>	I-495 CW @ I-270 SPUR	267,730.65	50 m	4.73	36 d 10 h 28 m	612
3	<input checked="" type="checkbox"/>	I-695 CW @ MD-41/PERRING PKWY/EXIT 30	222,505.61	16 m	3.41	38 d 23 h 15 m	2332
4	<input checked="" type="checkbox"/>	I-495 CW @ MD-214/CENTRAL AVE/EXIT 15	197,208.44	26 m	3.04	56 d 04 h 58 m	4065
5	<input type="checkbox"/>	I-495 CW @ CLARA BARTON PKWY/EXIT 41	195,678.47	10 m	2.81	54 d 21 h 41 m	211
6	<input type="checkbox"/>	I-695 CCW @ EDMONDSON AVE/EXIT 14	188,656.90	6 m	5.67	25 d 02 h 12 m	3045
7	<input type="checkbox"/>	I-270 S @ MD-109/EXIT 22	170,751.35	15 m	3.80	31 d 12 h 44 m	681

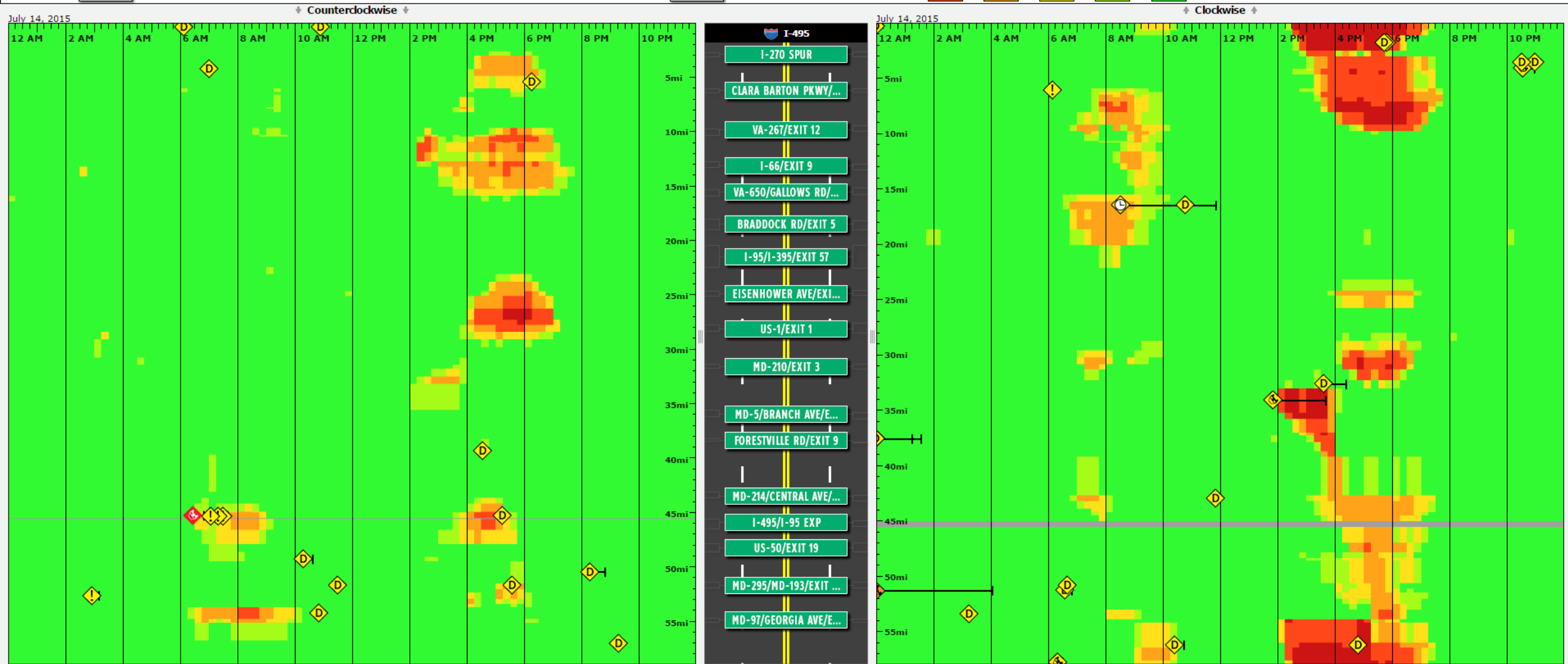
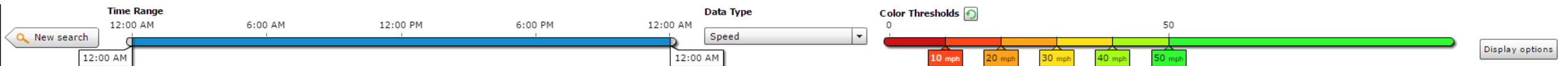


When is it congested?



Incident/Construction Impacts

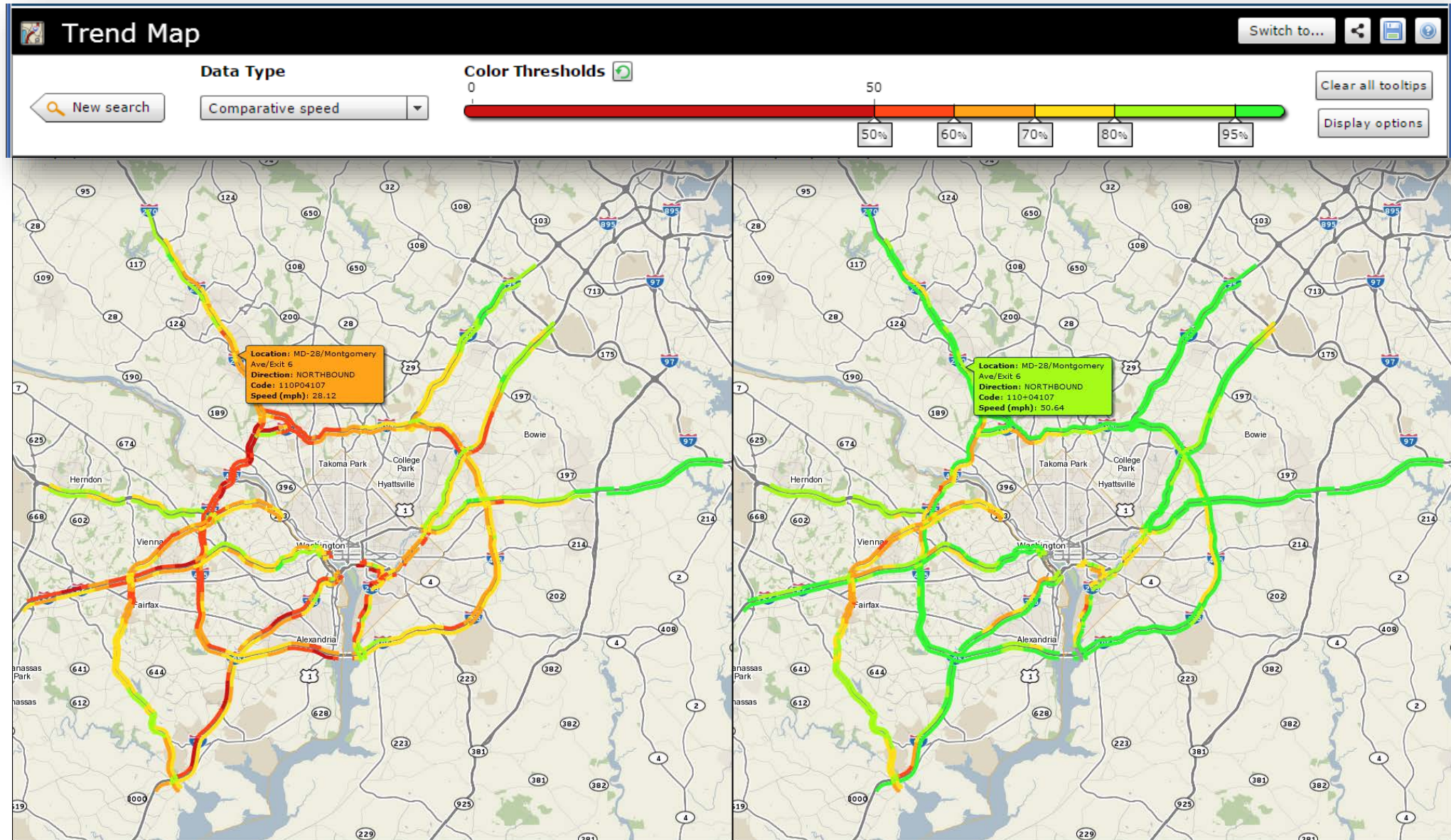




User Delay Cost at this Location: \$50.8M

	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Daily Totals				
7/01/15	\$0K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$10.5K	\$19.5K	\$65.7K	\$37.1K	\$13.5K	\$0.2K	\$0K	\$0K	\$0.9K	\$6.6K	\$2.9K	\$1.3K	\$0.3K	\$0K	\$0K	\$0K	\$0K	\$0K	\$158.6K				
7/02/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$5.4K	\$19.1K	\$56K	\$46K	\$20.1K	\$5.8K	\$0.2K	\$1K	\$16.9K	\$34.2K	\$20K	\$0.5K	\$20.7K	\$29.7K	\$1.7K	\$0K	\$0.2K	\$0K	\$277.6K				
7/03/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$0.2K	\$0K	\$0.1K	\$0.3K	\$0.1K	\$1K				
7/04/15	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.3K	\$0.9K	\$0K	\$0K	\$0K	\$0K	\$0.2K	\$1.5K	\$0.6K	\$0.2K	\$1.3K	\$0.1K	\$0K	\$0.1K	\$0.1K	\$5.7K				
7/05/15	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$1.3K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$1.7K				
7/06/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$4.2K	\$1.9K	\$10.8K	\$3.2K	\$0K	\$0K	\$0.1K	\$0.1K	\$1.9K	\$6.4K	\$3.1K	\$10.7K	\$2.9K	\$2.4K	\$0.6K	\$0.2K	\$0K	\$0K	\$48.5K				
7/07/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$10.6K	\$16.7K	\$58.9K	\$34.8K	\$5.2K	\$1.9K	\$27.7K	\$3.9K	\$0.2K	\$3.4K	\$1.3K	\$2.4K	\$5.7K	\$2.2K	\$0K	\$0K	\$0K	\$0K	\$175K				
7/08/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$8.3K	\$1.8K	\$36.3K	\$22.4K	\$2.8K	\$0K	\$0.2K	\$0.9K	\$0K	\$2.7K	\$0K	\$1.1K	\$1.5K	\$0.8K	\$0K	\$0.1K	\$0K	\$0K	\$78.9K				
7/09/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$9.8K	\$13.5K	\$47.5K	\$24.5K	\$3.1K	\$0K	\$0.1K	\$0K	\$0.2K	\$8.5K	\$2.8K	\$1.6K	\$1.4K	\$0.3K	\$0K	\$0.1K	\$0K	\$0.1K	\$113.5K				
7/10/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$4.4K	\$7.3K	\$36.3K	\$13.2K	\$0.8K	\$0K	\$1.2K	\$0.6K	\$1.5K	\$11.1K	\$4.6K	\$1.1K	\$1.4K	\$0K	\$0K	\$0.1K	\$0.1K	\$0.1K	\$83.9K				
7/11/15	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0.6K	\$6K	\$2.4K	\$0.7K	\$4K	\$7K	\$5.7K	\$4.3K	\$0K	\$0K	\$0.3K	\$0.3K	\$0.1K	\$31.8K				
7/12/15	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$1.4K	\$9.2K	\$4.7K	\$26K	\$4.4K	\$0.1K	\$0K	\$0K	\$0.2K	\$3.1K	\$0.1K	\$49.7K				
7/13/15	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$10.5K	\$41.6K	\$60.6K	\$45.9K	\$6.2K	\$0K	\$0.1K	\$0K	\$0.1K	\$2.2K	\$4.1K	\$36.9K	\$5.3K	\$0.5K	\$0K	\$0K	\$0K	\$0K	\$214.3K				
7/14/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$12.3K	\$17.7K	\$54K	\$12.3K	\$1.1K	\$0K	\$0K	\$0.1K	\$47.5K	\$74.9K	<div>Tuesday, July 14, 2015 3:00 PM</div> <div>Delay cost: Total: \$74,852.1 Per VMT: \$1.32</div> <div>Hours of delay: Person-hours: 3325h 53m 6s Vehicle-hours: 2715h 29s</div> <div>Vehicle miles traveled (VMT): Total: 49,012 miles Passenger: 44,111 miles Commercial: 4,901 miles</div> <div>Delay per VMT: 3.3237 mins / mile</div> <div>Data validity: 100%</div> <div>Click the table cell to see links to congestion scans</div>	\$51.3K	\$48.8K	\$8.4K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$204.7K
7/15/15	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$10.7K	\$33.2K	\$59.5K	\$54.8K	\$17.8K	\$0.3K	\$0.1K	\$0K	\$0.3K	\$6.9K		\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$204.7K			
7/16/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$11.9K	\$34.5K	\$56.7K	\$23.9K	\$6.5K	\$0.1K	\$0.6K	\$8.8K	\$18.6K	\$7.5K		\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$217.8K			
7/17/15	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$3.6K	\$3.4K	\$18K	\$2.6K	\$0K	\$0K	\$0K	\$0K	\$10K	\$31.9K		\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$71.3K			
7/18/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.3K	\$0.4K	\$1.3K	\$3.8K	\$5.7K	\$0.8K	\$4K	\$11.6K		\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.4K	\$0.3K	\$0.1K	\$0K	\$89.6K			
7/19/15	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0.2K	\$7.7K	\$7.6K		\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0.3K	\$0.1K	\$0K	\$0K	\$31.6K			
7/20/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$10.9K	\$18.6K	\$69K	\$47K	\$11.8K	\$1K	\$0.1K	\$0K	\$0.5K	\$1.3K		\$0.1K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0.1K	\$167.8K			
7/21/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$10.1K	\$7.9K	\$48K	\$22K	\$7.9K	\$1.9K	\$0.1K	\$0K	\$1K	\$4.7K	\$0.4K	\$1.8K	\$3K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$108.7K				
7/22/15	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$9.9K	\$34.5K	\$63.2K	\$40.5K	\$9.9K	\$0.5K	\$0K	\$0.1K	\$2K	\$3.8K	\$2.1K	\$6.9K	\$12.6K	\$1.8K	\$0K	\$0.1K	\$0.1K	\$0K	\$188.1K				
7/23/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$43.6K	\$41.8K	\$64.7K	\$37.8K	\$32.4K	\$17.7K	\$1.7K	\$0K	\$1.4K	\$13.1K	\$16.5K	\$4.1K	\$2.5K	\$1.6K	\$0.1K	\$0.2K	\$0.1K	\$0.1K	\$279.3K				
7/24/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$7.7K	\$11.3K	\$38.3K	\$21.7K	\$3.1K	\$0.1K	\$0.2K	\$8.5K	\$14.5K	\$18.6K	\$0K	\$1.1K	\$9.8K	\$3.6K	\$0K	\$0.1K	\$0.1K	\$0K	\$138.6K				
7/25/15	\$0K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$1.2K	\$0.2K	\$0K	\$0.1K	\$0.1K	\$4.4K	\$11.6K	\$4.1K	\$0K	\$0.2K	\$1.2K	\$0K	\$0.4K	\$0.3K	\$0.1K	\$24.1K				
7/26/15	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0.4K	\$4.8K	\$6K	\$6.3K	\$5K	\$3.8K	\$1.1K	\$0.4K	\$0.2K	\$0K	\$0K	\$28.2K				
7/27/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.4K	\$18.8K	\$17.5K	\$42.5K	\$13.7K	\$0K	\$0K	\$0K	\$0K	\$7.3K	\$16.5K	\$25.2K	\$18.6K	\$3.9K	\$0.1K	\$0K	\$0.2K	\$0.1K	\$0K	\$165.1K				
7/28/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$13.7K	\$22.5K	\$55.5K	\$30.4K	\$5.8K	\$0.1K	\$0.2K	\$0K	\$1K	\$6.8K	\$8.1K	\$8.5K	\$3.7K	\$0.1K	\$0K	\$0.1K	N/A	N/A	\$156.7K				
7/29/15	N/A	N/A	N/A	\$0K	\$0K	\$0K	\$17K	\$28.8K	\$54.8K	\$29.6K	\$6.3K	\$1K	N/A	\$0K	\$0K	\$4.2K	\$8.8K	\$5.6K	\$0.9K	\$0K	\$0K	\$0.1K	\$0.1K	\$0K	\$157.1K				
7/30/15	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$15.5K	\$11.8K	\$27.3K	\$23.6K	\$3.7K	\$0K	\$0K	\$0.6K	\$23.9K	\$24.4K	\$12.1K	\$4.7K	\$1.1K	\$0K	\$0K	\$0.1K	\$0.1K	\$0.1K	\$149.1K				

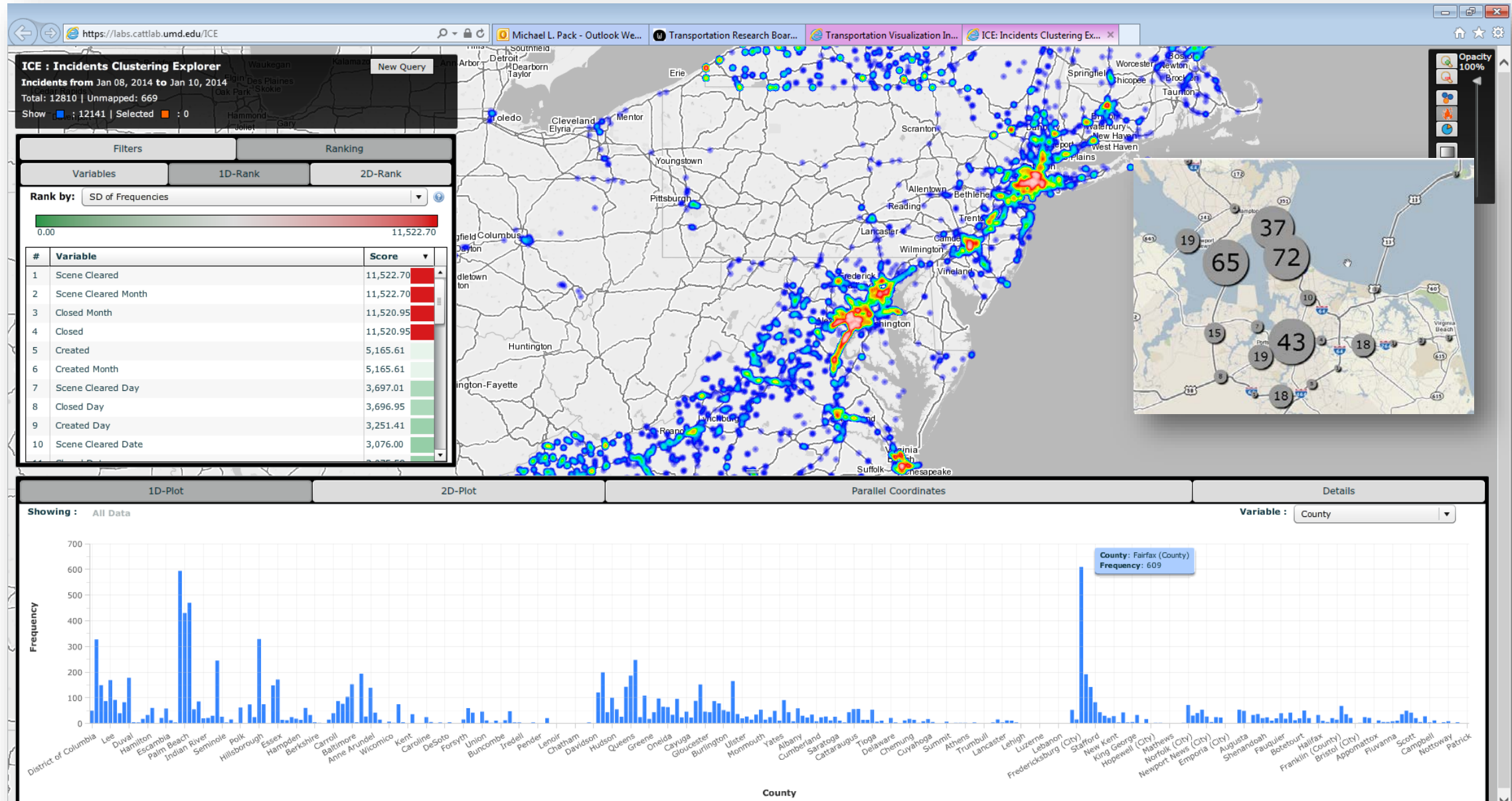
Press Releases: Pre-Thanksgiving traffic vs. normal



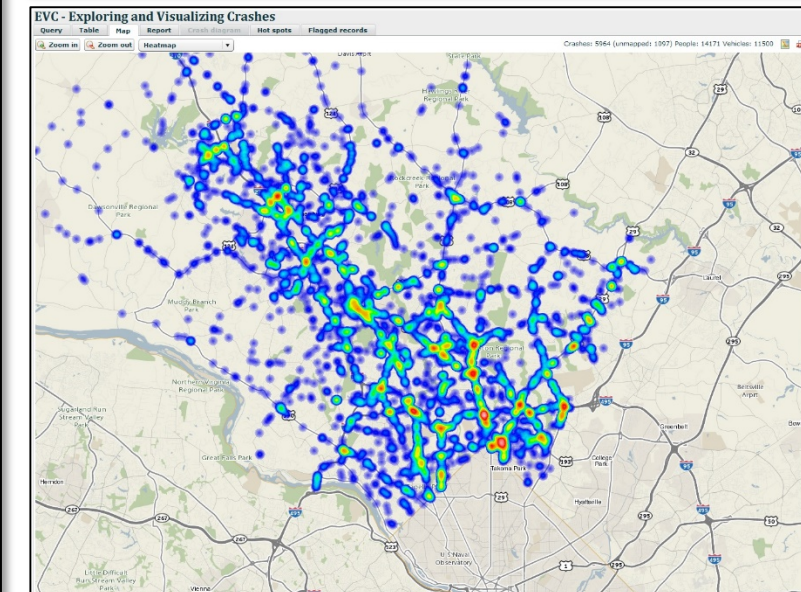
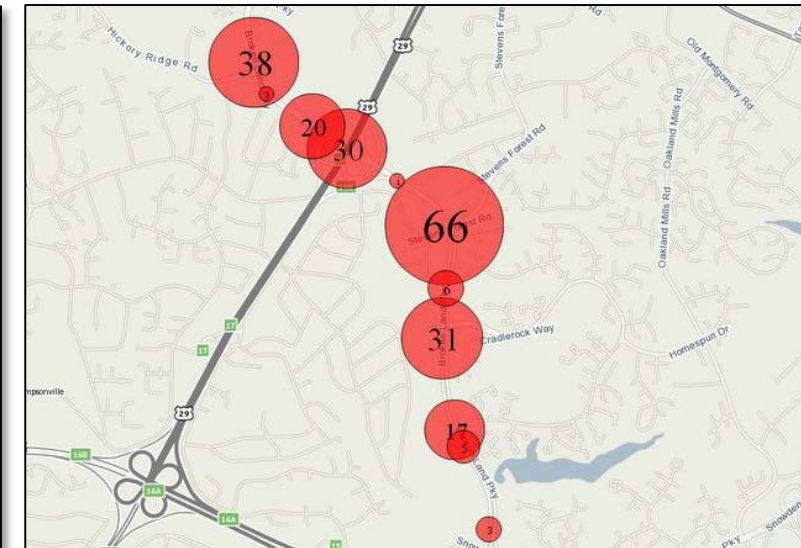
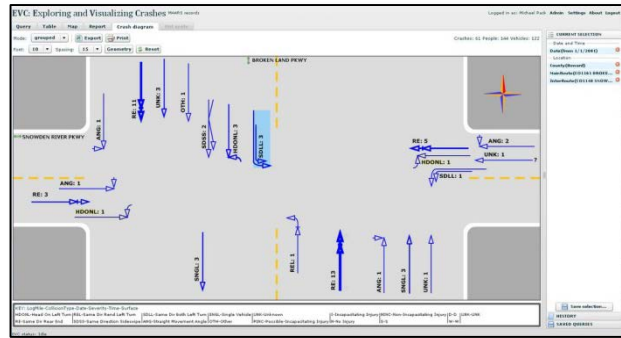
2PM Wed. Before Thanksgiving

2PM Normal Wednesdays in November

Incident Clustering Explorer



Safety Data Analysis & Reporting

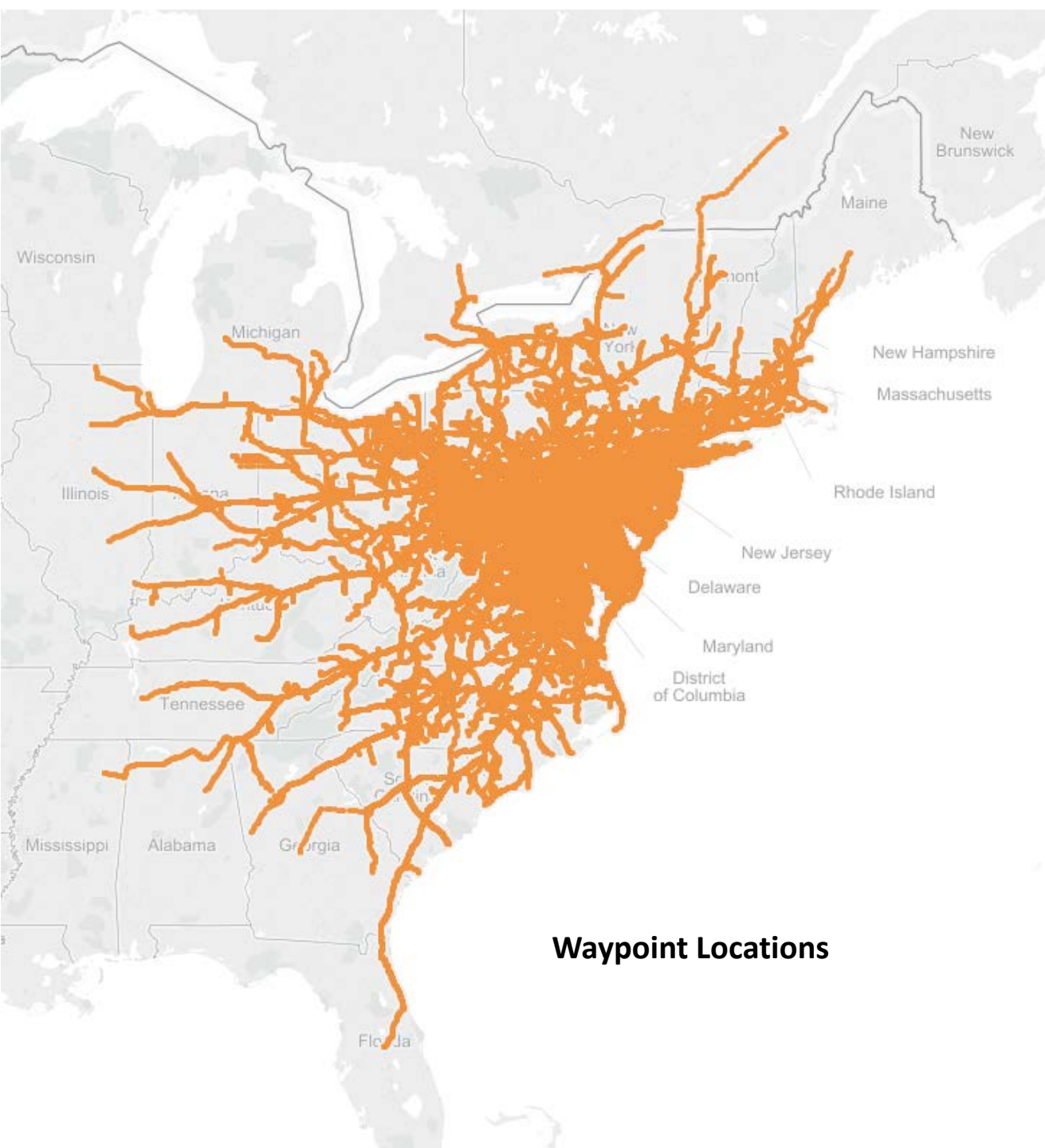


Trip & Movement Analysis

Trip Waypoints (July 2015)

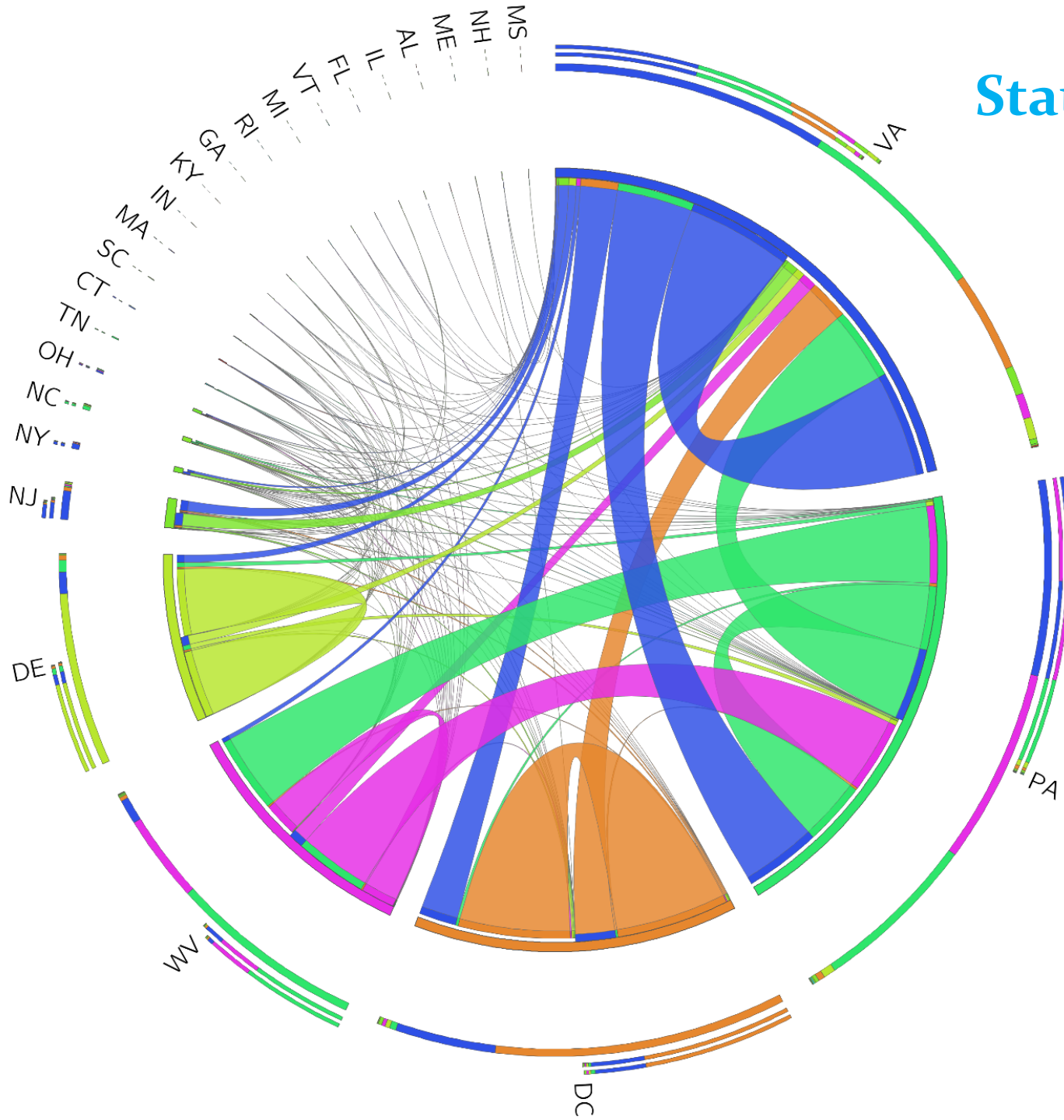
100 M waypoints (7 GB)

- Average distance: 0.9 miles
- Average duration: ~1.5 min

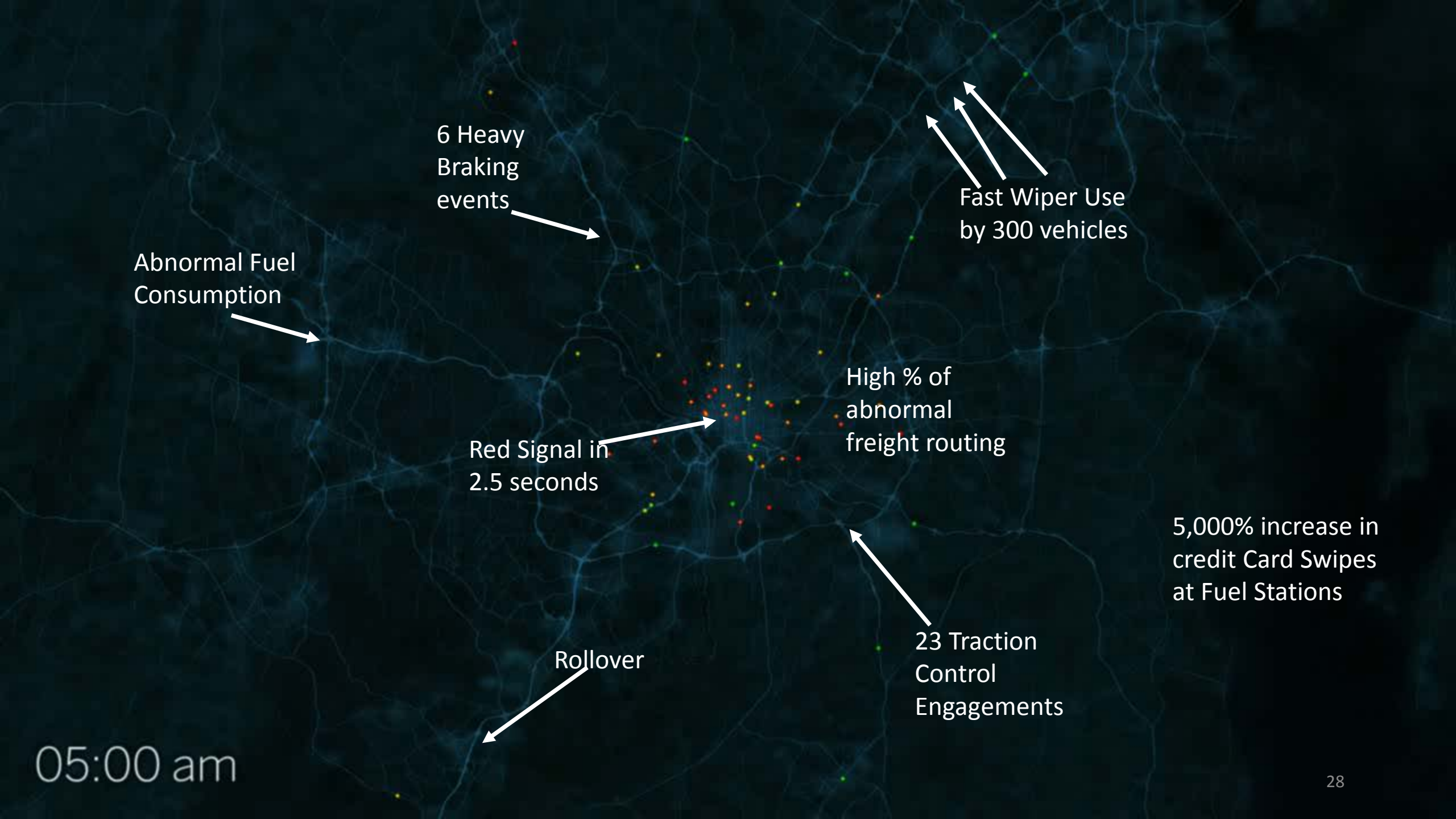


Waypoint Locations

State OD matrix visuals (July 2015)



- Trips with origins/destinations in MD are filtered out
- Focus: OD of trips that **traverse** MD



6 Heavy Braking events

Fast Wiper Use by 300 vehicles

Abnormal Fuel Consumption

High % of abnormal freight routing

Red Signal in 2.5 seconds

5,000% increase in credit Card Swipes at Fuel Stations

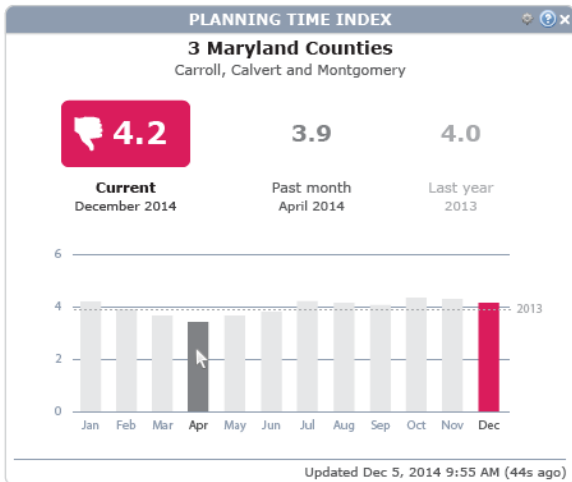
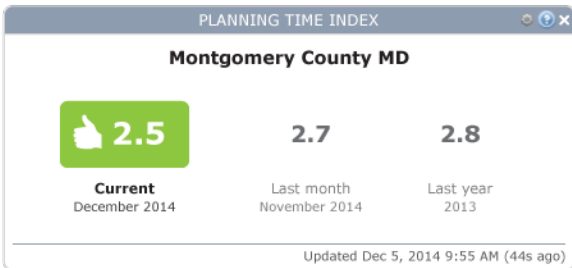
23 Traction Control Engagements

Rollover

05:00 am

Automating the Process: Self-creating, ever-changing Dashboards

Each widget can be laid out in a single page view that can be recalled by the user quickly and easily.



Top Bottlenecks

	State	Location	Length (miles)	Duration	
1	NJ	NJ-35 N @ HERBERT ST	6.6	12 min	
2	VA	I-95 N @ VA-7100/EXIT 166	5.4	25 min	
3	MD	I-495 CW @ MD-4/PENNSYLVANIA AVE/EXIT 11	4.7	34 min	
4	MD	MD-355 S @ MONTROSE RD/RANDALPH RD	3.3	12 min	
5	VA	I-66 E @ VA-7/LEESBURG PIKE/EXIT 66	3.1	5 h 35 min	
6	MD	MD-295 S @ I-195	2.9	38 min	
7	NJ	RTE-581 S @ NJ-49/QUINTON RD	2.9	14 min	
8	DC	CLARA BARTON PKWY E @ MARYLAND AVE	2.6	2 h 36 min	
9	NJ	NJ-72 E @ W BAY AVE	2.4	12 min	
10	VA	FURNACE RD S @ US-1/RICHMOND HWY (LORTON) (WEST)	2.3	1 h 02 min	

Updated Dec 5, 2014 9:55 AM (44s ago)

Maryland Performance

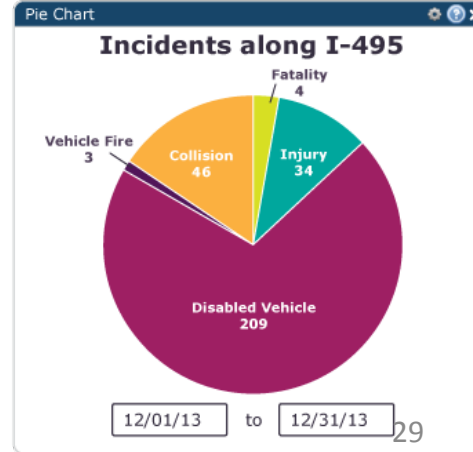
Corridor	Average Speed			Travel Time		
	Differential	Current	Historic	Differential	Current	Historic
I-270 Northbound Between MD-28/MONTG...	↑ 10	55 mph	45 mph	↓ 5	15 min	20 min
I-270 Southbound Between MD-28/MONTG...	↓ -2	45 mph	47 mph	↑ 3	22 min	19 min
I-495 Clockwise Between MD-295/MD-193...	↓ -18	24 mph	42 mph	↑ 8	30 min	22 min
I-495 Counter Clockwise Between MD-295...	↓ -37	10 mph	47 mph	↑ 9	28 min	19 min
Route 29 Northbound	-	45 mph	45 mph	-	22 min	22 min

Updated Dec 5, 2014 9:55 AM (44s ago)

Regional performance table

Region	PLANNING TIME INDEX			BUFFER TIME INDEX			TRAVEL TIME INDEX		
	Current	Last month	Last year	Current	Last month	Last year	Current	Last month	Last year
MD Montgomery County	2.5	2.8	3.0	4.3	4.6	4.1	3.6	3.2	3.4
MD Calvert County	2.5	2.8	3.0	4.3	4.6	4.1	3.6	3.2	3.4
MD Carroll County	3.8	3.6	3.9	3.8	3.6	3.9	3.8	3.6	3.9
DC	2.2	2.2	2.5	2.2	2.2	2.5	2.2	2.2	2.5

Updated Dec 5, 2014 9:55 AM (44s ago)



How Much Transportation Data in RITIS?

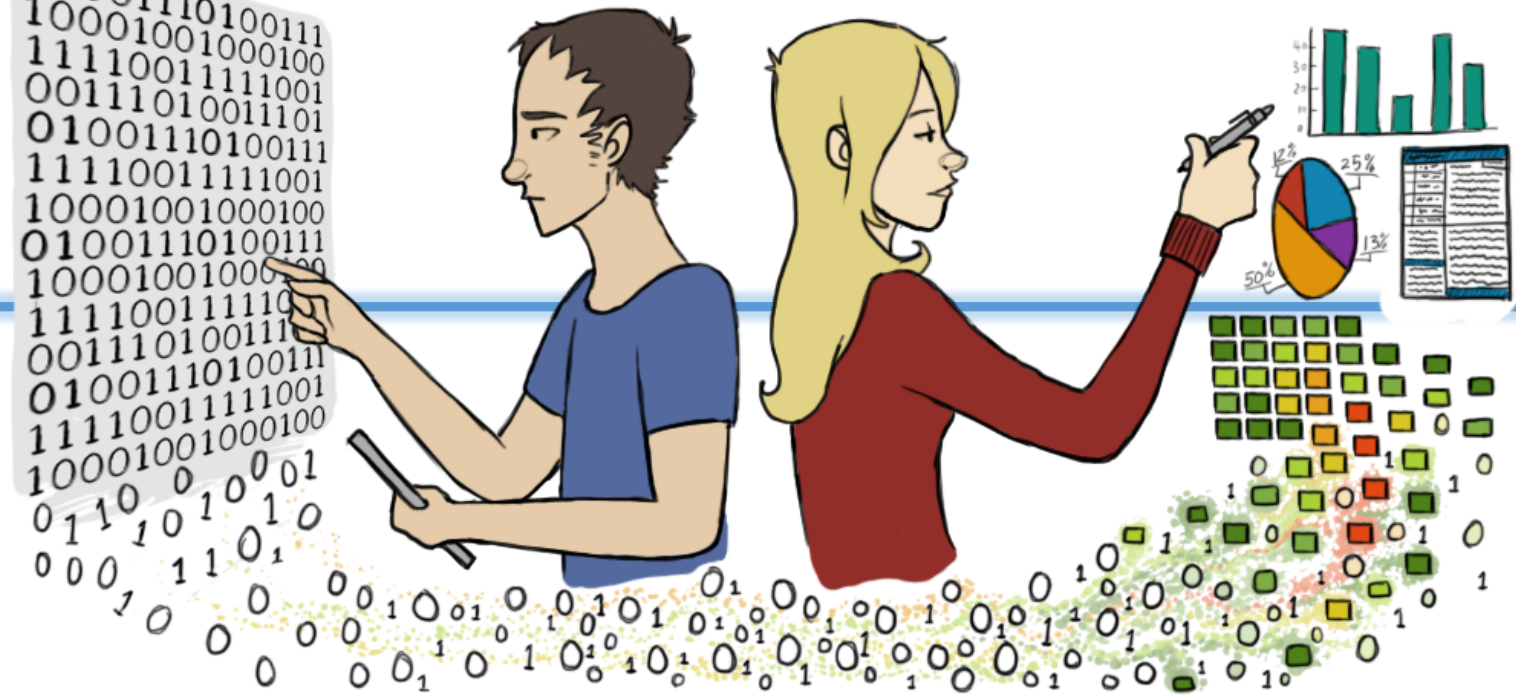
- RITIS System Today:

- Traffic accidents: 80,000 records per day: 0.002 Gb/day
- Traffic detectors: 35,000,000 records per day: 5 Gb/day
- Probe vehicle data: 6,300,000,000 records per day: 550 Gb/day (expected to jump to 8 Trillion)
- V2X & Automation data: ?,???,???,???,??? records per day: ??? ?b/day (Starting Soon)



The end result...

- Wise(r) investment decisions that lead to:
 - Safety improvements
 - Reductions in congestion and Delays
 - Lower costs of goods movement
 - Lower cost of doing business
- A better informed public
- Better informed Vehicles and Systems
 - Good information and travel decisions can save lives.
- A better way of life...



CV/AV Related Activities Underway/Planned @UMCP

- Transportation@Maryland
- Smart Cities 21st Century Campus
- Ford Motor Company Partnership
 - Road Network Analytics
 - Mobility on Demand as an Information Service
 - Impact of Autonomous Electric Vehicles on Land Use
 - Predictive Analytics for Consumer Behavior
- Recent Proposal to DOE – campus deployment of shared electric minibuses



These tools were developed by the
CATT Laboratory.

For more information, contact the
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