

# Use of RITIS Tools in After Action Reviews

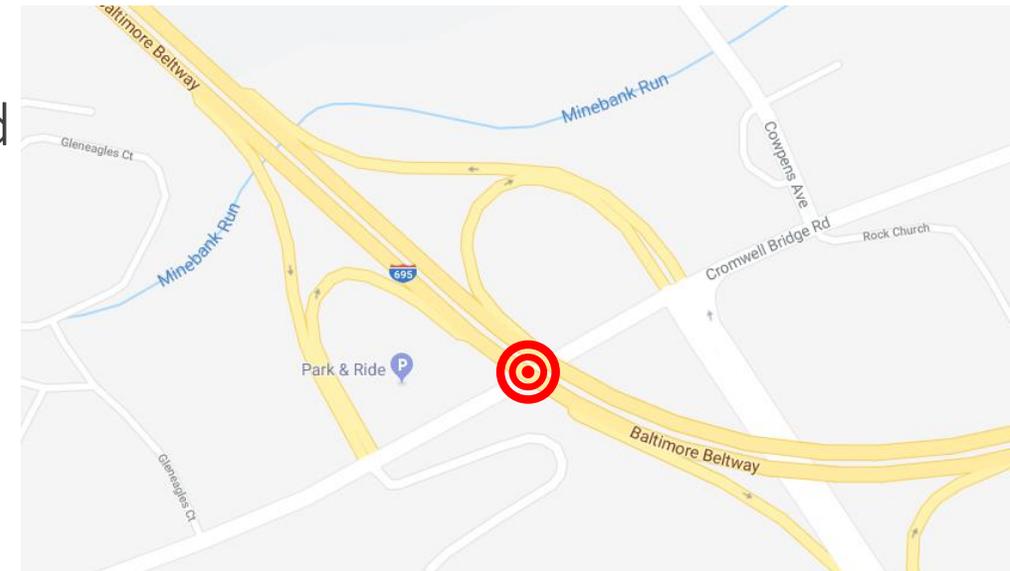
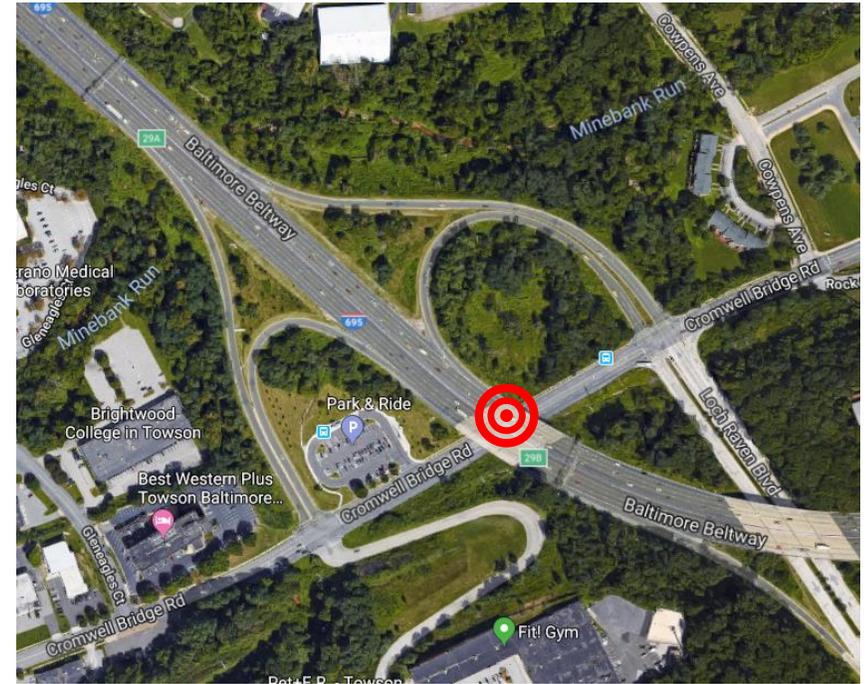
Jason Dicembre

Maryland Department of Transportation



# I-695 Super-Load Incident

- > Some background...
  - Began on August 2, 2018 at around 11:08 PM
  - Located on I-695 Inner Loop prior Exit 29
  - The trailer of a super load became detached from its tractor
  - The incident took over 2 days to reopen all lanes and fully clear



# I-695 Super-Load Incident

- › Several RITIS / PDA tools were used to conduct impact analysis and provide visual content as part of an After Action Review...

**EQT**  
Event Query Tool



EQT/ Incident Timeline

Region Explorer

Trend Map

Congestion Scan

User Delay Cost

# I-695 Super-Load Incident

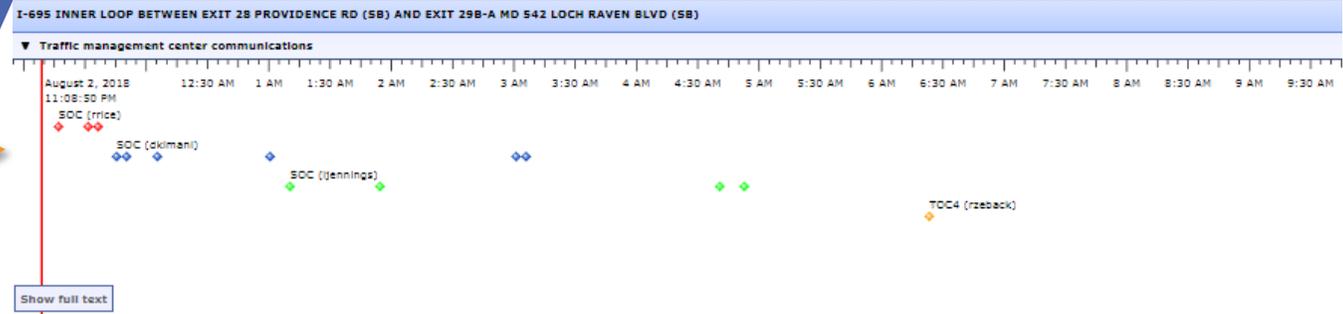
- › Incident Timeline...
  - Used to review responder response times, lane & event clearance times, and Operator notes.
  - Timeline graphics are inserted in to AARs
  - “Heat Map” is used to see trends in incident activity



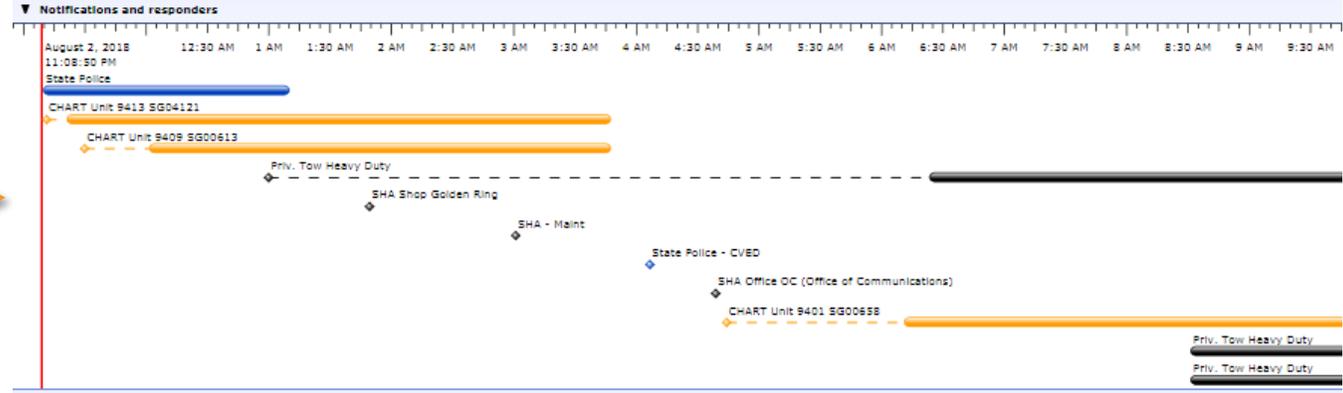
**EQT** analyzes your ATMS event data for insight into event impacts on your roadway system, through auto-created tables, charts and maps.

**Timeline** displays how an incident is being managed by showing the relationships between responder notifications & arrival times, lane status, traffic queues, clearance times, communication logs, CCTV, and DMS.

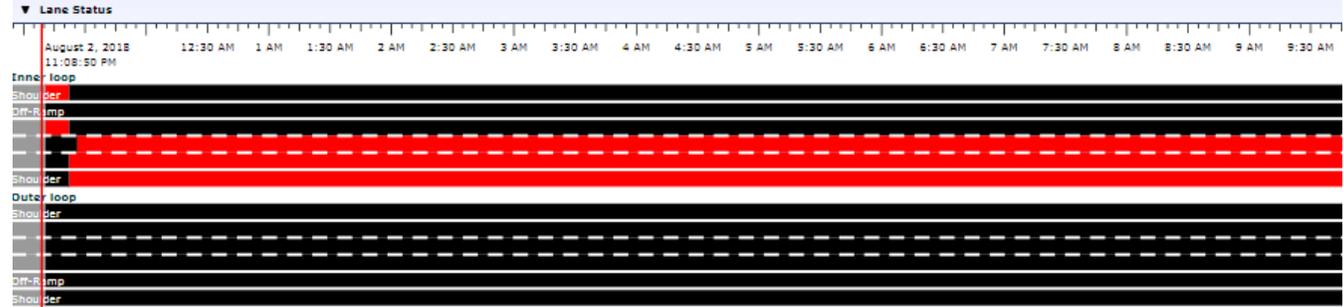
## TOC Communications



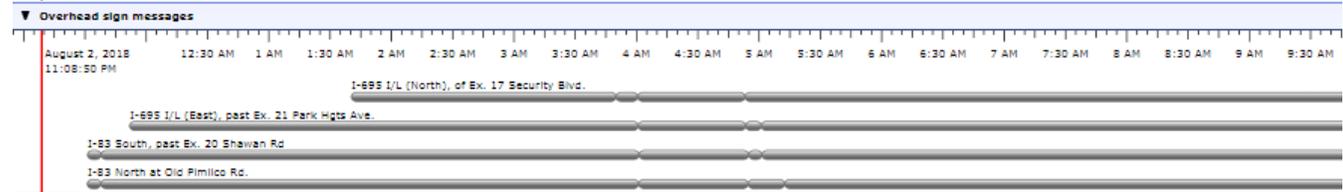
## Notifications & Responders



## Lane Status



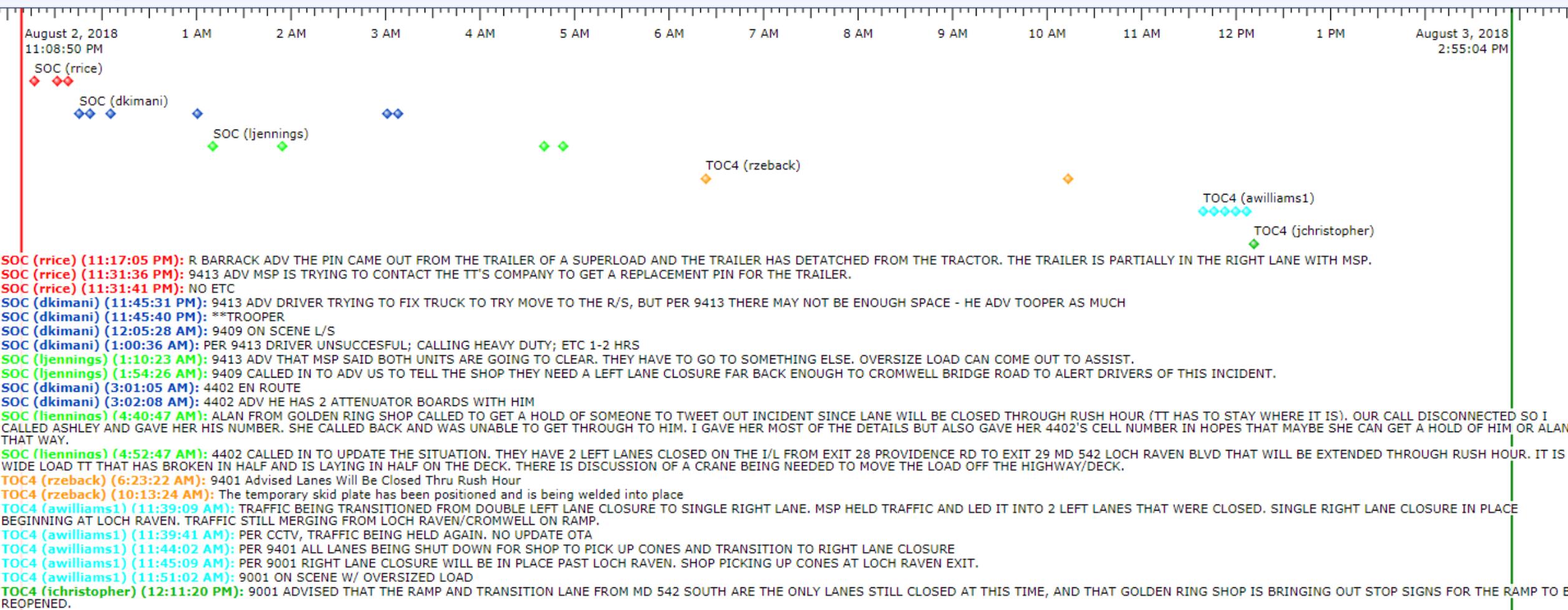
## Overhead Sign Messages



## Speed Readings

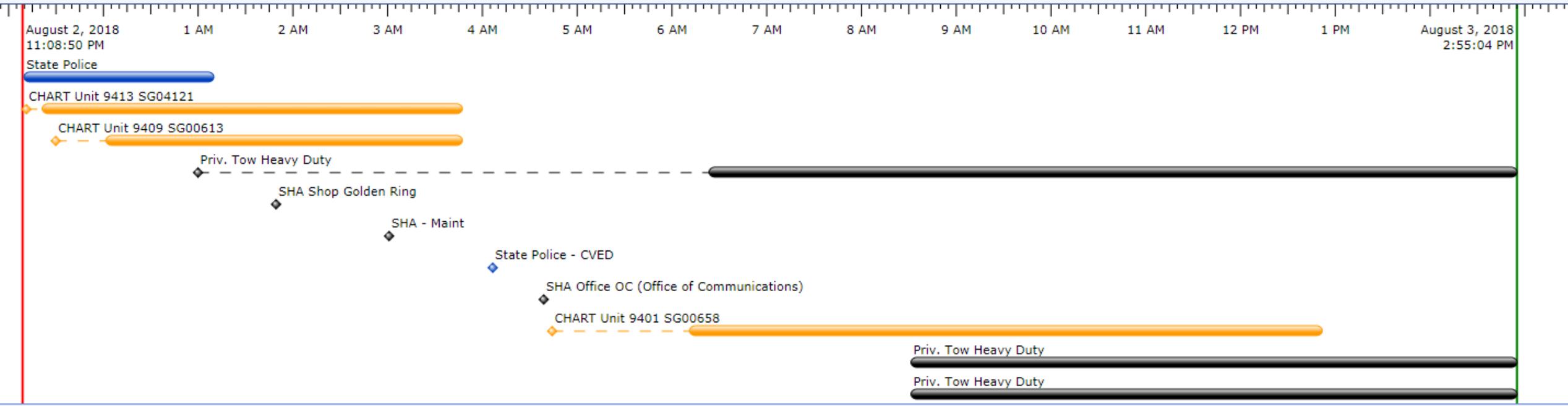


## ▼ Traffic management center communications

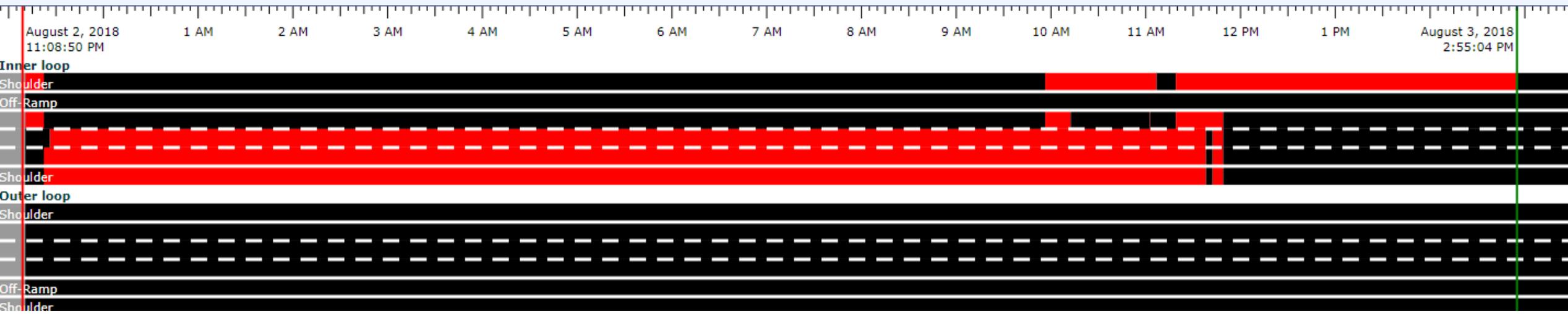


# Notifications & Responders

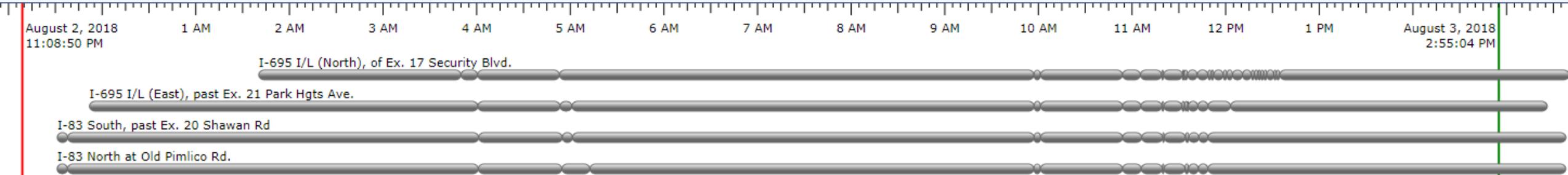
## ▼ Notifications and responders



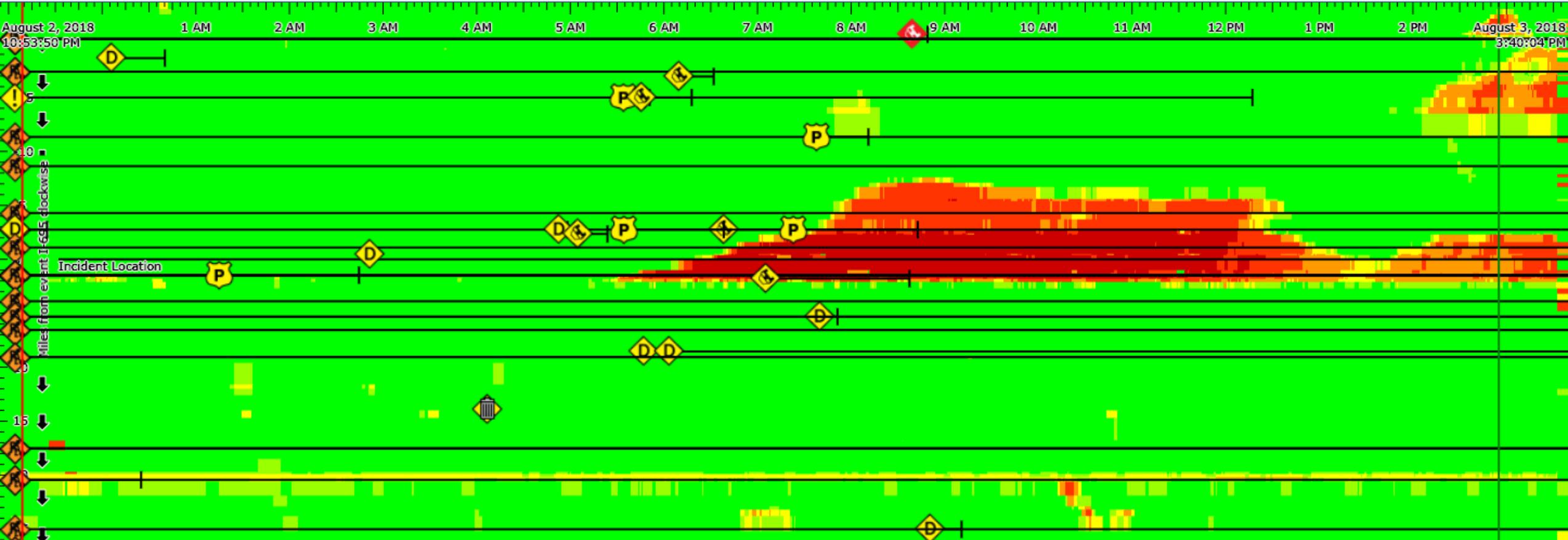
## ▼ Lane Status



# Lane Status, Sign Messages, Speeds



## ▼ Speed readings on I-695 clockwise (event's side of road)



# I-695 Super-Load Incident

- > Region Explorer...
  - Used to determine the choke points of traffic during the incident, and future detour points
  - Helps improve Quick Clearance practices by honing in on the effects on tertiary roadways



An interactive traffic conditions app that can be used to explore the impacts of bottlenecks and incidents along a road, in real-time, or previous point in time.

# Bottleneck Locations 8/2 to 8/5/18

## #1 Bottleneck Ranking - Using INRIX data

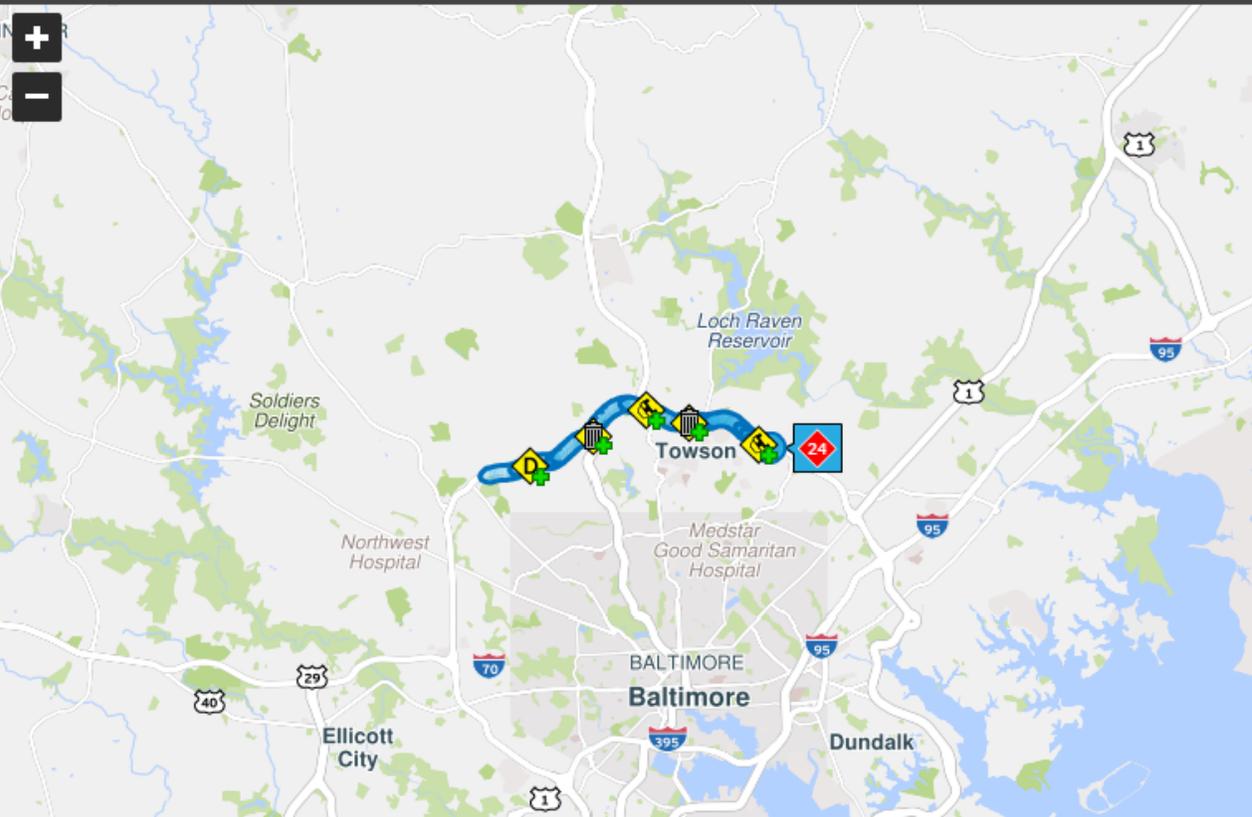
Bottleneck Ranking Table for I-695 Clockwise between MD-26/Exit 18 and MD-542/Loch Raven Blvd/Exit 29 between August 2, 2018 and August 5, 2018 (13 total)

Display Options

Rank	Map	Head Location (approximate)	Bottleneck Profile			Influences		Base impact weighted by				External Tool Links
			Average ma...	Average daily d...	Total duration	All Events/Incid...	▼ Base Impact	Speed differential	Congestion	TOTAL DELAY		
1	<input type="checkbox"/>	I-695 CW @ MD-542/LOCH RAVEN BLVD/EXIT 29	3.41	5 h 47 m	23 h 10 m	24	4,937.80	217,983.98	23,264.39	18,345,237,834.08	 	
2	<input type="checkbox"/>	I-695 CW @ I-83/MD-25/EXIT 23	2.64	58 m	3 h 55 m	9	629.24	20,893.27	861.44	1,943,256,048.77	 	
3	<input type="checkbox"/>	I-695 CW @ PROVIDENCE RD/EXIT 28	2.95	25 m	1 h 43 m	16	243.68	9,896.23	719.22	853,483,719.47	 	
4	<input type="checkbox"/>	I-695 CW @ MD-26/EXIT 18	2.33	13 m	55 m	10	140.49	4,584.42	203.78	461,964,838.77	 	
5	<input type="checkbox"/>	I-695 CW @ MD-45/YORK RD/EXIT 26	1.15	17 m	1 h 08 m	7	80.21	2,870.44	172.40	241,821,088.47	 	
6	<input type="checkbox"/>	I-695 CW @ GREENSPRING AVE/EXIT 22	1.70	10 m	41 m	7	69.61	2,140.60	87.86	200,105,422.96	 	
7	<input type="checkbox"/>	I-695 CW @ STEVENSON RD/EXIT 21	1.51	7 m	30 m	5	46.14	1,395.72	57.21	130,946,941.40	 	

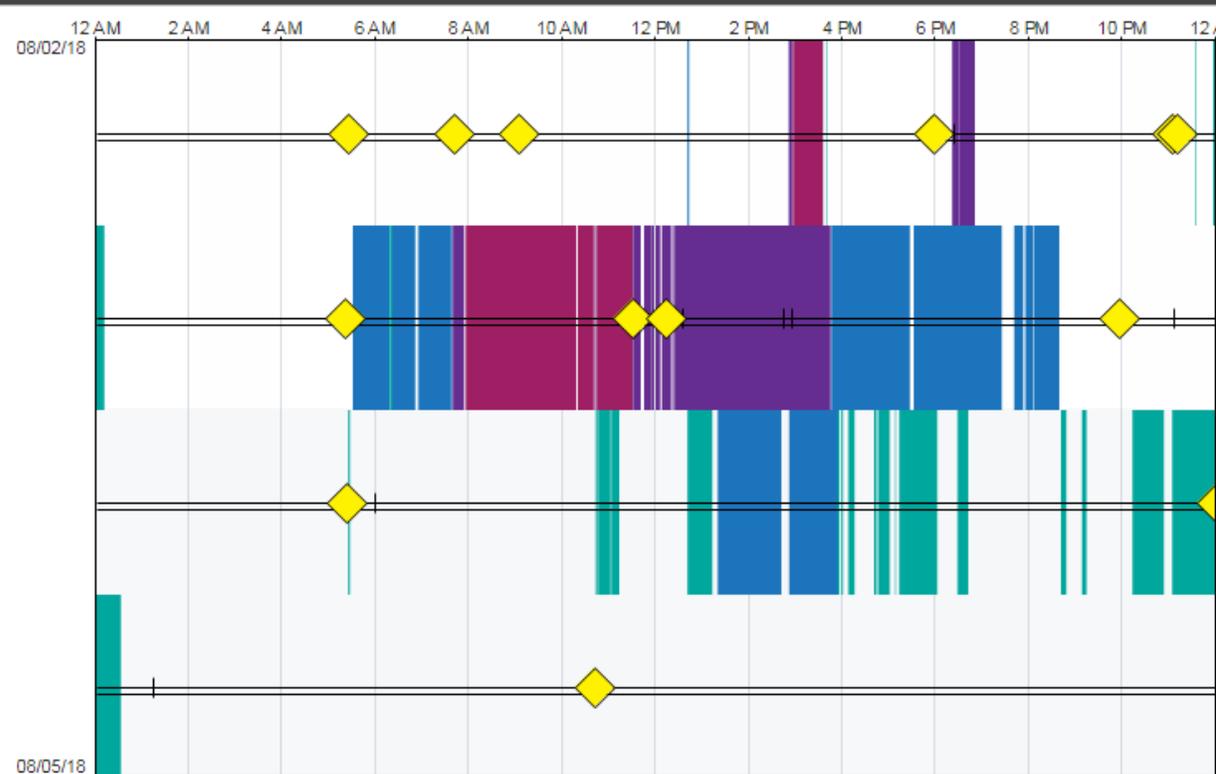
Map for I-695 CW @ MD-542/LOCH RAVEN BLVD/EXIT 29

Display Options



Timeline for I-695 CW @ MD-542/LOCH RAVEN BLVD/EXIT 29

Display Options



Maximum queue length in miles  Greyscale  Compact View

 Icon Legend

# I-695 Superload Incident

- Trend Map...
  - Used it to determine the significance of the delay over the time of the incident's duration
  - Using it as a case to promote Quick Clearance practices



An animated congestion and event conditions map that dynamically displays changes over time.

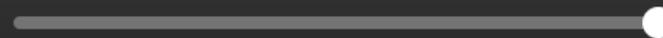
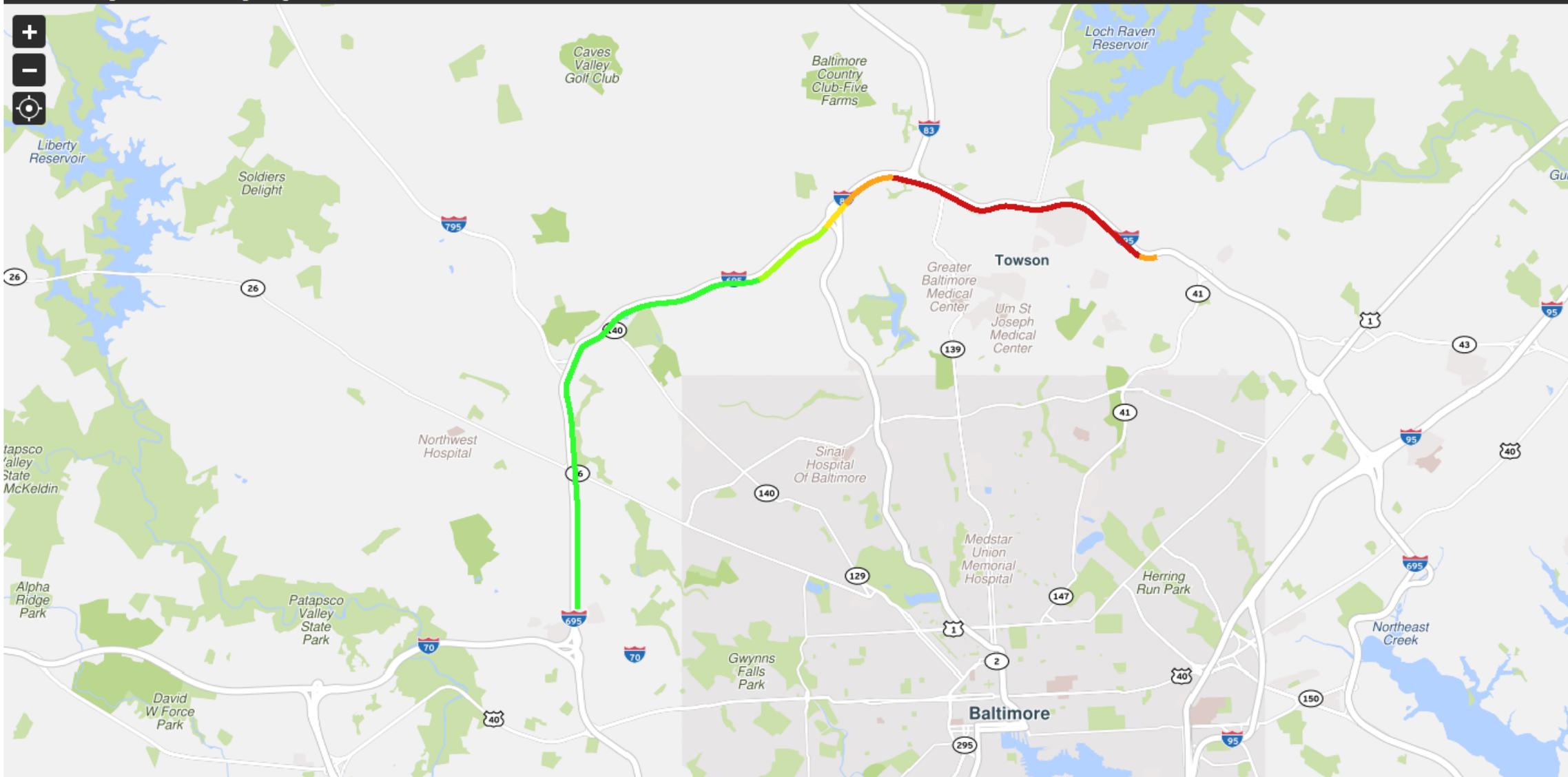
# Congested Locations at 12:15 PM on 10.29.2016

Color Thresholds

Comparative speed (%)



08:00 AM - August 02, 2018 through August 05, 2018



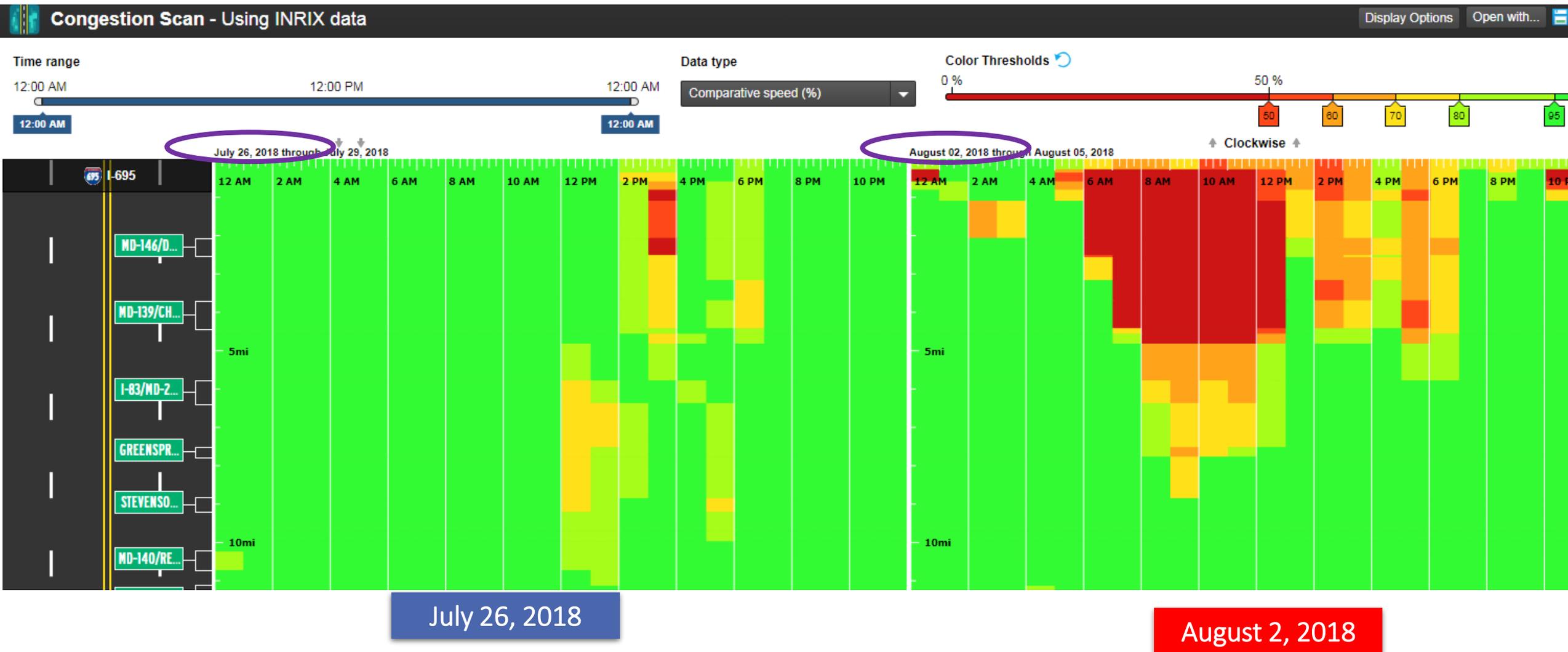
# I-695 Superload Incident

- > Congestion Scan...
  - Used to view historical extent of the queue
  - Queue graphics are inserted into AARs for emphasis



Analyze temporal and spatial conditions on one or more stretches for road, selecting from several mobility and reliability performance metrics.

# Comparing to the Prior Week



# I-695 Superload Incident

- > User Delay Cost...
  - The tool we have started to use the most heavily
  - Helps put things into dollars and cents to prove the value of our TSMO program
  - Crucial to our program's funding is to prove the benefit of Quick Clearance practices
  - By analyzing the cost of a long-duration incident, we can better make the case for additional or improved resources.



Combine speed data with volume data to estimate the cost of delay (and other measures) due to congestion.

# User Delay on I-695

	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	
7/26/18	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$2.3K	\$3.5K	\$0.7K	\$4.1K	\$7.1K	\$7.8K	\$8.1K	\$15.8K	\$23.3K	\$6.4K	\$0K	\$0K	\$0.1K	\$0.1K	\$0K	\$79.1K	
7/27/18	\$0.3K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0.2K	\$0K	\$0K	\$0K	\$0K	\$3.1K	\$10.3K	\$9.3K	\$12.1K	\$11.2K	\$2.4K	\$10.9K	\$17.4K	\$0.3K	\$0K	\$0K	\$0K	\$0K	\$77.5K	
7/28/18	\$0.2K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$0K	\$0K	\$0.6K
7/29/18	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$18.9K	\$7K	\$4.6K	\$20.3K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.2K	\$0.1K	\$0K	\$51.4K	
Hourly Totals	\$0.5K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.3K	\$0K	\$0K	\$2.3K	\$3.5K	\$3.8K	\$33.2K	\$23.4K	\$24.5K	\$39.5K	\$18K	\$34.1K	\$23.8K	\$0.3K	\$0K	\$0.4K	\$0.3K	\$0.1K	Grand Total \$208,661.61	

Previous Week =  
\$208k

	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	
8/02/18	\$0.2K	\$0K	\$0K	\$0.7K	\$0.3K	\$0K	\$2.4K	\$0.2K	\$16.4K	\$27.4K	\$22.2K	\$38.8K	\$21.3K	\$0K	\$0K	\$0K	\$0K	\$0.1K	\$130.3K							
8/03/18	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$63.2K	\$89.7K	\$94.8K	\$85K	\$82K	\$44.4K	\$6.8K	\$13.3K	\$12.3K	\$8.8K	\$19.1K	\$11K	\$2.7K	\$2.2K	\$0.2K	\$0K	\$0.2K	\$564.6K	
8/04/18	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.2K	\$0.3K	\$0.3K	\$5.4K	\$5K	\$8.3K	\$3.1K	\$0.3K	\$1.1K	\$0.2K	\$0K	\$0.1K	\$0.1K	\$0.1K	\$3K	\$5.9K	\$33.1K
8/05/18	\$1.3K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.2K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$2K						
Hourly Totals	\$1.6K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0K	\$63.2K	\$89.7K	\$95.4K	\$85.5K	\$82.4K	\$52.1K	\$12K	\$38.2K	\$42.9K	\$31.4K	\$58.8K	\$32.4K	\$2.7K	\$2.3K	\$0.3K	\$3.1K	\$6.1K	Grand Total \$730,088.49	

Aug 2-5 = \$730k  
~522k worse than  
the week before

## I-695 INNER LOOP AT CROMWELL BRIDGE ROAD

DATE OF INCIDENT:..... August 2, 2018  
 EVENT OPEN TIME:..... 11:08 PM  
 VEHICLES INVOLVED:..... 1 Tractor Trailer  
 CHART UNIT RESPONSE TIME:..... 10 minutes  
 LANE CLEARANCE TIME:..... 2 days, 6 hours, 51 min  
 DURATION OF INCIDENT:..... 2 days, 9 hours, 44 min  
 PRIMARY DIRECTION PEAK CONGESTION:..... 11.5 miles  
 OPPOSITE DIRECTION PEAK CONGESTION:..... 5.5 miles  
 SECONDARY COLLISIONS REPORTED:..... 0  
 ESTIMATED USER DELAY COST:..... \$522,000 - \$594,000

Area of Network Examined: I-695 Inner between Exit 20 MD 140 and Exit 29 MD 542

Figure 1 (Delay Cost)

	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM
8/02/18	\$0.2K	\$0.1K	\$0.4K	\$0.2K	\$0K	\$0K	\$0K	\$0K	\$0K	\$0.7K	\$0.3K	\$0K
8/03/18	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$2.1K	\$26.8K	\$83.2K	\$89.7K	\$94.8K	\$85K	\$82K
8/04/18	\$0K	\$0K	\$0K	\$0.1K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0.2K	\$0.3K
8/05/18	\$1.3K	\$0.1K	\$0K	\$0K	\$0K	\$0.1K	\$0.1K	\$0K	\$0K	\$0K	\$0K	\$0K
Hourly Totals	\$1.6K	\$0.3K	\$0.4K	\$0.2K	\$0.1K	\$2.2K	\$26.9K	\$83.2K	\$89.7K	\$95.4K	\$85.5K	\$82.4K
	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM
8/02/18	\$2.4K	\$0.2K	\$16.4K	\$27.4K	\$22.2K	\$38.8K	\$21.3K	\$0K	\$0K	\$0K	\$0K	\$0.1K
8/03/18	\$44.4K	\$6.8K	\$13.3K	\$12.3K	\$8.8K	\$19.1K	\$11K	\$2.7K	\$2.2K	\$0.2K	\$0K	\$0.2K
8/04/18	\$5.4K	\$5K	\$8.3K	\$3.1K	\$0.3K	\$1.1K	\$0.2K	\$0K	\$0.1K	\$0.1K	\$3K	\$5.9K
8/05/18	\$0K	\$0K	\$0.2K	\$0.1K	\$0K							
Hourly Totals	\$52.1K	\$12K	\$38.2K	\$42.9K	\$31.4K	\$58.8K	\$32.4K	\$2.7K	\$2.3K	\$0.3K	\$3.1K	\$6.1K

# I-70 Fatality Incident

## > Takeaways...

- Now I get it
  - Tools provide quick access to data and show the benefits of quick clearance practices and the value of TSMO Programs
- It is all about justification.
  - Gives ammunition for requests for funding, positions, and equipment
- It is not a perception, it's a reality.
  - Tools provide data-backed conclusions for After-Action Reports
  - Assists with making cases to external (and internal) partners about improving current practices
  - Over time, we can analyze trends along individual corridors

# Thanks!



For more information, please contact:

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