Use of RITIS Tools in After Action Reviews

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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/ 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 Event Query Tool

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

Traffic management center communications

August 2, 2018
11:09:50 PM
SOC (rice)

SOC (diamani)

SOC (Jennings)

TOC4 (rzehabak)

TOC4 (awilliams)

TOC4 (christopher)

SOC (rice) (11:18:05 PM): R BARRACK ADV THY PIN CAME OUT FROM THE TRAILER OF A SUPERLOAD AND THE TRAILER HAS DETACHED FROM THE TRACTOR. THE TRAILER IS PARITIONLY IN THE RIGHT LANE WITH M.S.
SOC (rice) (11:31:36 PM): 9413 ADV MSP IS TRYING TO CONTACT THE TT’S COMPANY TO GET A REPLACEMENT PIN FOR THE TRAILER.
SOC (rice) (11:31:36 PM): NO ETC
SOC (diamani) (11:45:31 PM): 9413 ADV DRIVER TRYING TO FIX TRUCK TO TRY MOVE TO THE R/S, BUT P/R 9413 THERE MAY NOT BE ENOUGH SPACE - HE ADV TOOPER AS MUCH
SOC (diamani) (11:45:40 PM): **TROOPER
SOC (diamani) (12:05:28 AM): 5403 ON SCENE L/V
SOC (diamani) (1:00:36 AM): P/R 9413 DRIVER UNSUCCESSFUL CALLING HEAVY DUTY; ETC 1-2 HRS
SOC (Jennings) (1:03:36 AM): 9413 ADV THAT M.S. SAID BOTH UNITS ARE GOING TO CLEAR THEY HAVE TO GO TO AOMTHING ELSE, OVERSIZE LOAD CAN COME OUT TO ASSIST
SOC (Jennings) (1:04:26 AM): 9413 CALLED IN TO ADV TO THE SHOP THEY NEED A LEFT LANE CLOSURE FAR BACK ENOUGH TO CROMWELL BRIDGE ROAD TO ALERT DRIVERS OF THIS INCIDENT
SOC (Jennings) (3:01:05 AM): 4402 EN ROUTE
SOC (diamani) (3:02:08 AM): 4402 ADV HE HAS 2 ATTENUATOR BOARDS WITH HIM
SOC (Jennings) (4:52:47 AM): 4402 CALLED IN TO UPDATE THE SITUATION. THEY HAVE 2 LEFT LANE CLOSED ON THE L/F FROM EXIT 28 PROVIDENCE RD TO EXIT 25 MD 542 LOCH RAVEN BLVD THAT WILL BE EXTENDED THROUGH RUSH HOUR. IT IS A WIDE LOAD TT THAT HAS BROKEN IN HALF AND IS HANGING IN HALF ON THE DECK. THERE IS DISCUSSION OF A CRANE BEING NEEDED TO MOVE THE LOAD OFF THE HIGHWAY/DECK.

TOC4 (rzehabak) (6:23:22 AM): 9401 ADVISED LANES WILL BE CLOSED THRU RUSH HOUR
SOC (rzehabak) (10:31:24 AM): THE TEMPORARY SKID PLATE HAS BEEN POSITIONED AND IS BEING WELDED INTO PLACE
TOC4 [awilliams] (11:30:08 AM): TRAFFIC BEING TRANSITIONED FROM DOUBLE LEFT LANE CLOSURE TO SINGLE RIGHT LANE, M.S.P. HELD TRAFFIC AND LED IT INTO 2 LEFT LANES THAT WERE CLOSED. SINGLE RIGHT LANE CLOSURE IN PLACE BEGINNING AT LOCH RAVEN. TRAFFIC STILL Merging FROM LOCH RAVEN/CRUMWELL ON RAMPS.
TOC4 [awilliams] (11:44:02 AM): PER 9401 ALL LANES BEING SHUT DOWN FOR SHOP TO PICK UP CONES AND TRANSITION TO RIGHT LANE CLOSURE
TOC4 [awilliams] (11:46:09 AM): PER 9401 RIGHT LANE CLOSURE WILL BE IN PLACE PAST LOCH RAVEN. SHOP PICKING UP CONES AT LOCH RAVEN EXIT.
TOC4 [awilliams] (11:51:02 AM): 9501 ON SCENE W/ OVERSIZED LOAD
TOC4 (christopher) (12:11:20 PM): 9501 ADVISED THAT THE RAMP AND TRANSITION LANE FROM MD 542 SOUTH ARE THE ONLY LANES STILL CLOSED AT THIS TIME, AND THAT GOLDEN RING SHOP IS BRINGING OUT STOP SIGNS FOR THE RAMP TO BE REOPENED.

I-95 Corridor Coalition • The Center for Advanced Transportation Technology Laboratory • MDOT SHA
Lane Status, Sign Messages, Speeds

August 2, 2018
11:08:50 PM

I-95 South, past Ex. 21 Park Hts Ave.
I-95 North at Old Pimlico Rd.

August 3, 2018
2:58:04 PM

I-95 South, past Ex. 20 Shawan Rd

Speed readings on I-95 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 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)**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Map</th>
<th>Head Location (approximate)</th>
<th>Average min.</th>
<th>Average daily delay</th>
<th>Total duration</th>
<th>All Events/incidents</th>
<th>Base Impact</th>
<th>Speed differential</th>
<th>Congestion</th>
<th>TOTAL DELAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>I-695 @ MD-542/Loch Raven Blvd/Exit 29</td>
<td>3.41</td>
<td>5 h 47 m</td>
<td>23 h 10 m</td>
<td>24</td>
<td>4,937.80</td>
<td>217,953.48</td>
<td>23,264.39</td>
<td>18,348,237.34</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>I-695 @ MD-26/Exit 18</td>
<td>2.04</td>
<td>55 m</td>
<td>3 h 55 m</td>
<td>9</td>
<td>802.24</td>
<td>20,803.27</td>
<td>901.44</td>
<td>1,943,250.48</td>
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<tr>
<td>3</td>
<td></td>
<td>I-695 @ MD-20/Catons Heroes Blvd/Exit 28</td>
<td>2.00</td>
<td>25 m</td>
<td>1 h 43 m</td>
<td>15</td>
<td>242.65</td>
<td>6,995.23</td>
<td>719.22</td>
<td>963,493.17</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>I-695 @ MD-26/Exit 18</td>
<td>2.33</td>
<td>13 m</td>
<td>55 m</td>
<td>10</td>
<td>140.49</td>
<td>4,854.42</td>
<td>203.76</td>
<td>491,944.38</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>I-695 @ MD-20/Catons Heroes Blvd/Exit 28</td>
<td>1.10</td>
<td>17 m</td>
<td>1 h 09 m</td>
<td>7</td>
<td>81.30</td>
<td>2,870.44</td>
<td>172.40</td>
<td>241,821.68</td>
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<tr>
<td>6</td>
<td></td>
<td>I-695 @ MD-20/Catons Heroes Blvd/Exit 28</td>
<td>1.70</td>
<td>10 m</td>
<td>41 m</td>
<td>7</td>
<td>60.61</td>
<td>2,140.80</td>
<td>87.36</td>
<td>209,108.42</td>
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<tr>
<td>7</td>
<td></td>
<td>I-695 @ MD-20/Catons Heroes Blvd/Exit 28</td>
<td>1.51</td>
<td>7 m</td>
<td>30 m</td>
<td>5</td>
<td>46.14</td>
<td>1,365.72</td>
<td>57.21</td>
<td>130,949,414.10</td>
</tr>
</tbody>
</table>

**Map**

For I-695 @ MD-542/Loch Raven Blvd/Exit 29

**Timeline**

For I-695 @ MD-542/Loch Raven Blvd/Exit 29

**Display Options**
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
I-695 Superload Incident

› Congestion Scan...

- Used to view historical extent of the queue
- Queue graphics are inserted into AARs for emphasis
Comparing to the Prior Week

July 26, 2018

August 2, 2018
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

|       | 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 |
|-------|------|------|------|-------|-------|-------|------|------|------|------|------|------|------|------|-------|-------|-------------|
| 7/29/18 | $0K  | $0K  | $0K  | $0K   | $0K   | $0K   | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K   | $0K   | $79.1K      |
| 7/30/18 | $0K  | $0K  | $0K  | $0K   | $0K   | $0K   | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K   | $0K   | $77.5K      |
| 7/31/18 | $0K  | $0K  | $0K  | $0K   | $0K   | $0K   | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K  | $0K   | $0K   | $51.4K      |

**Previous Week:** $208k

**Aug 2-5 =** $730k

~522k worse than the week before
INCIDENT IMPACT REPORT

1-695 INNER LOOP AT CROMWELL BRIDGE ROAD

DATE OF INCIDENT: .................................................., August 2, 2018

EVENT OPEN TIME: .................................................., 11:08 PM

VEHICLES INVOLVED: ............................................., 1 Tractor Trailer

COMMAND UNIT RESPONSE TIME: ............................, 16 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: 1-695 Inner between Exit 20 MD 140 and Exit 29 MD 342

User Delay Cost calculated using University of Maryland (UMD) Probe Data Analytics Suite User Delay Cost Analysis
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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