Signal Timing Analysis
(using trajectory data analytics)

Michael Pack, Director of CATT Laboratory

Enabling agencies through better communication, data-based decision making, advanced insights discovery, and enhanced operations and planning capabilities.
Travel Time Comparison

Travel time comparison allows you to compare a road’s travel time against two different time ranges to test an upgrade or downgrade in performance.

1. Select a road

- Roads
  - List of XD codes
  - Saved XD sets

- Your selected road
  - US 30

- Directions:
  - Eastbound
  - Westbound
  - Entire road

- Options:
  - 55 miles of roadway selected (52 XD segments)

- Report a problem with this road

- Save as XD set

2. Create one or more time periods

- Date(s)
  - 08/11/2017 - 08/15/2017

- Limit to specific days of the week
  - Sun, Mon, Tue, Wed, Thu

- Your selected time periods
  - 08/11/2017 - 08/15/2017

- Add time period

3. Choose one to three time ranges to analyze within each time period

- Use default Peak Hours
- Use custom hours
1. Select a road
   - Roads: List of XD codes, Saved XD sets
   - XDs from...
   - Search in Pennsylvania
   - Your selected road: US 39

2. Create one or more time periods
   - Date(s): 09/11/2017 - through - 09/15/2017
   - Limit to specific days of the week: Sun, Mon, Tue, Wed, Thu, Fri, Sat

3. Choose one to three time ranges to analyze within each time period
   - Use default Peak Hours
   - Use custom hours
   - Time periods: 12:00 AM, 12:00 PM, 12:00 AM

Submit
Travel Time Comparison

US 30 - Lancaster Ave

Before 08/21/2017 - 08/25/2017

After 09/11/2017 - 09/15/2017

Cumulative Distribution Charts

EASTBOUND
6 AM - 9 AM

Delta 3 min 30 sec Faster
09/11/2017 - 09/15/2017
60 min of readings at 47%
09/15/2017 - 09/15/2017
65 min of readings at 47%

Delta 2 min 56 sec Faster
09/21/2017 - 09/25/2017
60 min of readings at 47%
09/15/2017 - 09/15/2017
67 min of readings at 47%

Delta 4 min 1 sec Slower
09/21/2017 - 09/25/2017
62 min of readings at 47%
09/15/2017 - 09/15/2017
66 min of readings at 47%

WESTBOUND
6 AM - 9 AM

Delta 3 min 30 sec Faster
09/11/2017 - 09/15/2017
60 min of readings at 47%
09/15/2017 - 09/15/2017
65 min of readings at 47%

Delta 2 min 56 sec Faster
09/21/2017 - 09/25/2017
60 min of readings at 47%
09/15/2017 - 09/15/2017
67 min of readings at 47%

Delta 4 min 1 sec Slower
09/21/2017 - 09/25/2017
62 min of readings at 47%
09/15/2017 - 09/15/2017
66 min of readings at 47%

Cumulative Distribution Charts
### Travel Time Comparison

#### US 30 - Lancaster Ave

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Before Dates</th>
<th>After Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 AM - 9 AM</td>
<td>08/21/2017 - 09/25/2017</td>
<td>09/11/2017 - 09/15/2017</td>
</tr>
<tr>
<td>9 AM - 3 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 PM - 8 PM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### EASTBOUND

**6 AM - 9 AM**

<table>
<thead>
<tr>
<th>Change (mins)</th>
<th>Percent of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
</tr>
<tr>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>15</td>
<td>50%</td>
</tr>
</tbody>
</table>

**9 AM - 3 PM**

<table>
<thead>
<tr>
<th>Change (mins)</th>
<th>Percent of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
</tr>
<tr>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>15</td>
<td>50%</td>
</tr>
</tbody>
</table>

**3 PM - 8 PM**

<table>
<thead>
<tr>
<th>Change (mins)</th>
<th>Percent of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
</tr>
<tr>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>15</td>
<td>50%</td>
</tr>
</tbody>
</table>

#### WESTBOUND

**6 AM - 9 AM**

<table>
<thead>
<tr>
<th>Change (mins)</th>
<th>Percent of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
</tr>
<tr>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>15</td>
<td>50%</td>
</tr>
</tbody>
</table>

**9 AM - 3 PM**

<table>
<thead>
<tr>
<th>Change (mins)</th>
<th>Percent of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
</tr>
<tr>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>15</td>
<td>50%</td>
</tr>
</tbody>
</table>

**3 PM - 8 PM**

<table>
<thead>
<tr>
<th>Change (mins)</th>
<th>Percent of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
</tr>
<tr>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>15</td>
<td>50%</td>
</tr>
</tbody>
</table>
Travel Time Delta Ranking

1. Select roads
   - Roads: List of XD codes
   - Saved XD sets

<table>
<thead>
<tr>
<th>Roads</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>XDs from</td>
<td></td>
</tr>
<tr>
<td>Search in Pennsylvania</td>
<td></td>
</tr>
</tbody>
</table>

   - US 30 between US-202 and Lancaster Ave
   - US 202 Parkway between Welsh Rd and PA 31

2. Create two time periods
   - Day(s) Month(s) Year(s)

<table>
<thead>
<tr>
<th>Date</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>09/11/2017</td>
<td></td>
</tr>
<tr>
<td>through</td>
<td></td>
</tr>
<tr>
<td>09/15/2017</td>
<td></td>
</tr>
</tbody>
</table>

   - Limit to specific days of the week
   - Sun Mon Tue Wed Thu Fri Sat

3. Choose a time range to analyze within each time period
   - Use default Peak Hours
   - Use custom hours

<table>
<thead>
<tr>
<th>Time Range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 AM</td>
<td></td>
</tr>
<tr>
<td>12:00 PM</td>
<td></td>
</tr>
<tr>
<td>12:00 AM</td>
<td></td>
</tr>
</tbody>
</table>
Travel Time Delta Ranking

| Rank | Map | Corridors                           | Direction | Median Before | Median After | | | IGR Before | IGR After | | Δ IGR | Incidents |
|------|-----|------------------------------------|-----------|---------------|--------------| | |            |            |             |          |         |          |
| 1    |     | US 1 - State Rd - Tappan Rd - City Ave | W         | 16.4          | 144%         | | | 123%       | -21        | | 97%     | 54%        | -3        | 0        |
| 2    |     | US 1 - State Rd - Tappan Rd - City Ave | E         | 16.3          | 172%         | | | 157%       | -15        | | 37%     | 21%        | -18       | 1        |
| 3    |     | US 222 - Delco Pk                   | N         | 10.6          | 125%         | | | 130%       | -8         | | 24%     | 15%        | -3        | 1        |
| 4    |     | US 38 - Lancaster Ave                | W         | 16.4          | 125%         | | | 119%       | -6         | | 64%     | 78%        | 14        | 3        |
| 5    |     | US 222 - Delco Pk                   | S         | 10.5          | 117%         | | | 113%       | -4         | | 24%     | 12%        | -12       | 0        |
| 6    |     | US 38 - Lancaster Ave                | E         | 16.4          | 156%         | | | 162%       | 8          | | 6%      | 60%        | -7        | 2        |
| 7    |     | US 222 Parkway - Welsh Rd to PA 313  | W         | 15.4          | 113%         | | | 126%       | 13         | | 6%      | 47%        | 41        | 3        |
| 8    |     | US 222 Parkway - Welsh Rd to PA 313  | E         | 15.8          | 145%         | | | 167%       | 22         | | 70%     | 81%        | 11        | 2        |
What is Trajectory Data?

> Waypoints for trips...
A day in D.C.

05:00 am
How can it be helpful?

Mid-block travel time analysis...

Turning Movement support...

O-D, trips, marketing, etc...
Total trip travel time:
2 minutes 53 seconds
Total trip travel time: 2 minutes 53 seconds
Total trip travel time:
2 minutes 53 seconds
INTERSECTION ANALYSIS TOOL

1. Select a region or intersection
   - Region
     - Select a state: New York
     - Select a county: New York
     - Select a zip code: Enter zip code...
   - Intersection

2. Select a date range: 05/10/2018 -through- 05/10/2018
   - Select days of week: Sun, Mon, Tue, Wed, Thu, Fri, Sat

Find Intersection
### Intersection
8th Ave and W 23rd St

**Date range:** 05/10/2018

#### Metric
- Number of vehicles passed through

<table>
<thead>
<tr>
<th>Midblock</th>
<th>Trips from intersection to midblock</th>
<th>6AM - 9AM</th>
<th>12PM - 3PM</th>
<th>9PM - 9AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midblock 1</td>
<td>1207</td>
<td>415</td>
<td>246</td>
<td>544</td>
</tr>
<tr>
<td>Midblock 2</td>
<td>2430</td>
<td>830</td>
<td>526</td>
<td>1071</td>
</tr>
<tr>
<td>Midblock 3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Midblock 4</td>
<td>2385</td>
<td>802</td>
<td>787</td>
<td>796</td>
</tr>
</tbody>
</table>

0 - 500  500 - 1000  1000 - 1500  1500 - 2000  2000 - 2500
INTERSECTION ANALYSIS TOOL

Explore different intersections and the impact of movements between and around them.

1. Select a region or intersection

   □ Region
   - Select a state
     - New York
   - Select a county
     - New York
   - Select a zip code
     - Enter zip code

   □ Intersection

2. Select a date range

   05/10/2018 through 05/10/2018

   Select days of week

   Find Intersection
## Ranked intersection movements in the 10011 zip code for the date range of 05/06/18 through 05/12/18

<p>| Rank | Map | Intersection          | Approach | Movement | Volume | User Delay Cost | Average Travel Time | 25th Percentile | 75th Percentile | 5th Percentile | 95th Percentile |
|------|-----|-----------------------|----------|----------|--------|----------------|---------------------|------------------|----------------|----------------|----------------|----------------|
| 1    | ☑   | 8th Ave at W 23rd St  | Northbound | Left     | 486    | $4,235.00     | 5.5 mins            | 2.5 mins         | 7.2 mins        | 1.5 mins        | 7.5 mins        |
| 2    |     | W 20th St at 8th Ave | Eastbound | Through  | 761    | $4,194.00     | 5.2 mins            | 2.1 mins         | 7.0 mins        | 1.4 mins        | 7.1 mins        |
| 3    |     | W 15th St at 8th Ave | Westbound | Left     | 504    | $4,985.00     | 5.0 mins            | 3.1 mins         | 8.8 mins        | 1.4 mins        | 9.9 mins        |
| 4    |     | W 23rd St at 8th Ave | Eastbound | Through  | 210    | $2,305.00     | 4.9 mins            | 1.7 mins         | 7.1 mins        | 1.2 mins        | 7.2 mins        |
| 5    |     | W 30th St at 8th Ave | Westbound | Left     | 354    | $3,204.00     | 4.7 mins            | 1.8 mins         | 8.0 mins        | 1.3 mins        | 8.8 mins        |
| 6    |     | 7th Ave at W 17th St | Southbound | Through  | 159    | $2,087.00     | 4.7 mins            | 1.5 mins         | 8.3 mins        | 1.2 mins        | 8.0 mins        |
| 7    |     | W 10th St at 11th Ave| Westbound | Left     | 263    | $2,515.00     | 4.6 mins            | 1.4 mins         | 9.0 mins        | 1.1 mins        | 9.5 mins        |
| 8    |     | W 10th St at 8th Ave | Westbound | Right    | 186    | $1,424.00     | 4.4 mins            | 0.8 mins         | 5.8 mins        | 0.6 mins        | 6.2 mins        |
| 9    |     | W 14th St at 7th Ave | Eastbound | Through  | 216    | $1,548.00     | 4.3 mins            | 1.5 mins         | 5.0 mins        | 1.0 mins        | 5.0 mins        |
| 10   |     | W 21st St at 10th Ave| Eastbound | Left     | 138    | $1,294.00     | 4.2 mins            | 0.7 mins         | 5.3 mins        | 0.5 mins        | 5.0 mins        |</p>
<table>
<thead>
<tr>
<th>Rank</th>
<th>Map</th>
<th>Intersection</th>
<th>Approach</th>
<th>Movement</th>
<th>Volume</th>
<th>User Delay Cost</th>
<th>Average Travel Time</th>
<th>25th Percentile</th>
<th>75th Percentile</th>
<th>5th Percentile</th>
<th>95th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓</td>
<td>8th Ave at W 23rd St</td>
<td>Northbound</td>
<td>Left</td>
<td>489</td>
<td>$4,235.00</td>
<td>5.5 mins</td>
<td>2.5 mins</td>
<td>7.2 mins</td>
<td>1.5 mins</td>
<td>7.6 mins</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>W 20th St at 8th Ave</td>
<td>Eastbound</td>
<td>Through</td>
<td>781</td>
<td>$4,104.00</td>
<td>5.2 mins</td>
<td>2.1 mins</td>
<td>8.9 mins</td>
<td>1.4 mins</td>
<td>7.1 mins</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>W 14th St at 8th Ave</td>
<td>Westbound</td>
<td>Left</td>
<td>504</td>
<td>$4,985.00</td>
<td>6.0 mins</td>
<td>2.1 mins</td>
<td>8.8 mins</td>
<td>1.4 mins</td>
<td>8.0 mins</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>W 23rd St at 8th Ave</td>
<td>Eastbound</td>
<td>Through</td>
<td>210</td>
<td>$2,305.00</td>
<td>4.9 mins</td>
<td>1.7 mins</td>
<td>7.1 mins</td>
<td>1.2 mins</td>
<td>7.2 mins</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>W 20th St at 8th Ave</td>
<td>Westbound</td>
<td>Left</td>
<td>354</td>
<td>$3,204.00</td>
<td>4.7 mins</td>
<td>1.8 mins</td>
<td>8.6 mins</td>
<td>1.3 mins</td>
<td>8.8 mins</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>7th Ave at W 17th St</td>
<td>Southbound</td>
<td>Through</td>
<td>150</td>
<td>$2,907.00</td>
<td>4.7 mins</td>
<td>1.5 mins</td>
<td>8.5 mins</td>
<td>1.2 mins</td>
<td>8.6 mins</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>W 15th St at 11th Ave</td>
<td>Westbound</td>
<td>Left</td>
<td>253</td>
<td>$2,516.00</td>
<td>4.5 mins</td>
<td>1.4 mins</td>
<td>8.0 mins</td>
<td>1.1 mins</td>
<td>8.5 mins</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>W 10th St at 8th Ave</td>
<td>Westbound</td>
<td>Right</td>
<td>186</td>
<td>$1,426.00</td>
<td>4.4 mins</td>
<td>0.8 mins</td>
<td>6.5 mins</td>
<td>0.6 mins</td>
<td>6.2 mins</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>W 14th St at 7th Ave</td>
<td>Eastbound</td>
<td>Through</td>
<td>218</td>
<td>$1,548.00</td>
<td>4.3 mins</td>
<td>1.5 mins</td>
<td>8.0 mins</td>
<td>1.0 mins</td>
<td>8.0 mins</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>W 21st St at 10th Ave</td>
<td>Eastbound</td>
<td>Left</td>
<td>135</td>
<td>$1,204.00</td>
<td>4.0 mins</td>
<td>0.7 mins</td>
<td>5.5 mins</td>
<td>0.5 mins</td>
<td>6.0 mins</td>
</tr>
</tbody>
</table>
Next Steps

- Development is in-progress
- Hoping to test with agencies in the next few months
- Experimenting with data density
- Developing additional features, functionality, and usability

RITIS + Trajectory Data + Signal Counts (for select features) =
For Additional Information, contact:

Michael Pack
UMD CATT Lab
PackML@umd.edu
The Probe Data Analytics Suite provides complete system performance analysis

**Region Explorer**
Show the relationships between bottlenecks and traffic events and their impacts on traffic conditions in real-time or points in the past.

**Trend Map**
Create animated maps of roadway conditions to dynamically display changes over time, that can be used in presentations or web pages.

**Bottleneck Ranking**
Identify, rank and explore bottleneck locations and their impact on the roadway system – with or without event data.

**Massive Data Downloader**
Export large amounts of archived probe data as a CSV file for offline analyses.

**Performance Charts**
Present data in a number of different charts for various metrics (speed, congestion and various indices) and their percentile ranges.

**User Delay Cost Analysis**
Combine probe speed data with volume data to estimate the cost of delay due to congestion, with user-defined parameters.

**NPMRDS Coverage Map**
Explore the coverage completeness of the NPMRDS on a month-by-month basis.

**Congestion Scan**
Analyze traffic conditions (speed, congestion, travel time and buffer indices, and events) for one or more stretches of road.

**Performance Summaries**
Report on seven different travel time metrics grouped by day of week, weekdays, weekends and all days combined.

**Dashboard**
Create your own personal dashboards to monitor corridor performance in regions of interest.

**Tutorials**
Learn how to use each of the tools in the suite.

**MAP-21**
Create a dashboard widget to monitor states', MPOs', and Urbanized Areas' performances against the new MAP-21 ruling.
Congestion Reporting Examples

- System Performance Reporting
- Problem Identification
- Project Prioritization
- After Action Incident Review
- Before & After Studies
- Operations
- Travel Time Analysis
- Work Zone Monitoring
**Build and save Dashboards for single event or on-going traffic monitoring, impact mitigation assessment or after action reviews.**

---

**PDA Dashboard**

Create speed/travel time & bottleneck “widgets” for real time traffic monitoring.

---

**PennDOT created Speed and Travel Time widgets for traffic management impact and after action review of a bridge closure between the PA and NJ Turnpikes.**

---

**TMC operators were quickly alerted by dark red/high travel time on Dashboard and found a multi-vehicle accident had the right lane blocked.**
### Ranking Current Bottlenecks

<table>
<thead>
<tr>
<th>Route</th>
<th>Current Average Speed</th>
<th>Travel Time Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-71 S @ OH-17</td>
<td>40 mph</td>
<td>13 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>55 mph</td>
<td>14 min</td>
</tr>
<tr>
<td>I-71 N @ OH-17</td>
<td>53 mph</td>
<td>13 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>49 mph</td>
<td>14 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>49 mph</td>
<td>13 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>49 mph</td>
<td>14 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>49 mph</td>
<td>13 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>49 mph</td>
<td>14 min</td>
</tr>
<tr>
<td>I-71 S @ OH-17</td>
<td>49 mph</td>
<td>13 min</td>
</tr>
</tbody>
</table>

**Table:**

- **State:** I-71 S @ OH-17
- **Location:** GREENLAWN AVE / EXIT 105
- **Length/Miles:** 7.75
- **Duration:** 20 min

- **State:** I-71 S @ OH-17
- **Location:** 11TH AVE / EXIT 110
- **Length/Miles:** 6.68
- **Duration:** 15 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 6.17
- **Duration:** 18 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 5.58
- **Duration:** 21 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 5.58
- **Duration:** 23 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 4.54
- **Duration:** 48 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 4.27
- **Duration:** 20 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 4.17
- **Duration:** 06 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 3.77
- **Duration:** 46 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 3.42
- **Duration:** 1 hr 40 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 3.07
- **Duration:** 08 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 2.78
- **Duration:** 52 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 2.73
- **Duration:** 08 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 2.53
- **Duration:** 09 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 2.40
- **Duration:** 15 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 2.23
- **Duration:** 09 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 2.12
- **Duration:** 13 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 1.98
- **Duration:** 08 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 1.96
- **Duration:** 1 hr 49 min

- **State:** I-71 S @ OH-17
- **Location:** 570 / EXIT 35
- **Length/Miles:** 1.93
Queues and Bottlenecks
Pre-Project Selection: Identifying problem locations
On the horizon...
A day in D.C.

- 6 Heavy Braking events
- Fast Wiper Use by 300 vehicles
- Abnormal Fuel Consumption
- Red Signal in 2.5 seconds
- Rollover
- High % of abnormal freight re-routing
- 23 Traction Control Engagements
Origin/Destination Analytics

Soon for work zone analysis
Build an O/D Matrix

Get results fast

Set Up Your Origin and Destination Matrix

Origins
Select one or more geographies

Primary geography
- Maryland (23 counties selected)
- Districts
- Zip Codes

Other geography
- All available states
- My custom geographies
- Delaware (3 counties selected)
- Districts
- Zip Codes

Destinations
Select one or more geographies

Primary geography
- Maryland (23 counties selected)
- Districts
- Zip Codes

Other geography
- All available states
- My custom geographies
- Delaware (3 counties selected)
- Districts
- Zip Codes

Generate Matrix

February, June, July, and October 2015

14 of 204 geographies

12 of 204 geographies

Legend:
- Origin and Destination Matrix
- Origin and Destination Matrix

Selected data ranges: June and July 2015 and March 2016

100% of Trips

14 of 204 geographies

14 of 204 geographies
Complete control of time, day of week, month & year

Choose to exclude certain days (holidays, special events)

Choose vehicle type, trip type or how the trips are displayed

Matrix controls
- Show all other trips that only passed through the selected geographies.
- Show vehicle types
  - Light vehicles
  - Medium vehicles
  - Heavy vehicles
- Show trips that were...
  - Arriving
  - Departing
  - En Route ... during selected time period.
- Show trips as...
  - Percentages
  - Daily average
  - Total counts

Display options
- Sort Origins and Destinations
  - In order selected
- Group by
  - State
- Display as
  - Total percents
See destinations of trips that travel on a selected road segment

Use the Time Range controls for full temporal evaluation