VPP Suite User Group

October 13, 2015

Dial 1-719-867-1571 & enter 725437# at the prompt
Housekeeping Items

- Please call Joanna at 610-662-5569 for difficulties with the web or audio application
- This is a virtual meeting experience
  - Please keep your phone muted until asking a question or speaking (press *6 to mute/unmute individual phone lines)
  - Please do not place call “on hold” as your hold music will be heard by the group
- All materials & contact information will be available to participants after the webcast
# Meeting Participants

<table>
<thead>
<tr>
<th>#</th>
<th>Agency</th>
<th>Name(s)</th>
<th>#</th>
<th>Agency</th>
<th>Name(s)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Baltimore Metropolitan Council</td>
<td>Ed Stylc</td>
<td>9</td>
<td>Pennsylvania DOT</td>
<td>Scott Benedict</td>
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<tr>
<td>2</td>
<td>DVRPC</td>
<td>Jesse Buerk, Zoe Neaderland</td>
<td>10</td>
<td>Richmond Regional MPO</td>
<td>Tiffany Dubinsky, Greta Ryan</td>
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<td>3</td>
<td>Florida Turnpike</td>
<td>Kim Samson (AECOM), Ryan Brown (Jacobs)</td>
<td>11</td>
<td>Rhode Island DOT</td>
<td>Bill Nordstrom (Jacobs)</td>
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<td>4</td>
<td>Maryland SHA</td>
<td>Subrat Mahapatra</td>
<td>12</td>
<td>South Jersey TPO</td>
<td>David Heller, Andrew Tracy</td>
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<td>5</td>
<td>MWCOG/NCRTPB</td>
<td>Andrew Meese, Wenjing Pu</td>
<td>13</td>
<td>Virginia DOT</td>
<td>Sanhita Lahiri, Rose Lawhorne, Mena Lockwood, Paul Szatkowski, Ram Venkatanarayana</td>
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<td>6</td>
<td>New Jersey DOT</td>
<td>Neha Galgali, Sudhir Joshi, Kelly McVeigh, Simon Nwachukwku</td>
<td>14</td>
<td>UMD CATT Lab &amp; UMD CATT</td>
<td>Michael Pack, John Allen, Kaveh Farokhi Sadabadi, Karen Swick</td>
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<td>7</td>
<td>North Jersey TPA</td>
<td>Solomon Caviness, Keith Miller</td>
<td>15</td>
<td>KMJ Consulting (Coalition Support)</td>
<td>Karen Jehanian, Joanna Reagle</td>
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<td>North Carolina DOT</td>
<td>Kelly Wells, Thomas Chase (NC State)</td>
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Please confirm that your line is muted

*6

Thank you!

October 13, 2015
Welcome & Introductions

Karen Jehanian
For the I-95 Corridor Coalition
The co-chair’s vision, leadership and guidance will help provide for:

- A more comprehensive State & MPO perspective…
- that leads to better integration of Planning-Ops-Travel Info needs & considerations…
- for improved tools and products.
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30am to 10:35am</td>
<td>Welcome &amp; Introductions</td>
<td>Karen Jehanian, KMJ Consulting, Inc. for the I-95 Corridor Coalition</td>
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<tr>
<td>10:35am to 10:45am</td>
<td>Purpose of this Meeting</td>
<td>Jesse Buerk (DVRPC), VPP Suite User Group co-chair</td>
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<tr>
<td>10:45am to 11:00am</td>
<td>VPP Suite Probe Data Analytics Forum</td>
<td>Michael Pack, UMD CATT Lab</td>
</tr>
<tr>
<td>11:00am to 11:15am</td>
<td>VPP Suite Features – New &amp; Upcoming</td>
<td>Michael Pack, UMD CATT Lab</td>
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<td>11:15am to 11:30am</td>
<td>Use of the VPP Suite by User Group members</td>
<td>Kaveh Farokhi Sadabadi, UMD CATT</td>
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<td>11:30am to 11:40am</td>
<td>User Focus Group effort to develop consistent &amp; useful report formats for the Suite</td>
<td>Michael Pack, UMD CATT Lab</td>
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<td>11:40am to 11:55am</td>
<td>Agency Input Session to learn about what is working &amp; what needs some attention</td>
<td>All Discussion Facilitated by Michael Pack &amp; Kelly Wells (NCDOT), VPP Suite User Group co-chair</td>
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<td>11:50am to noon</td>
<td>Meeting Wrap Up</td>
<td>Karen Jehanian, KMJ Consulting, Inc. for the I-95 Corridor Coalition</td>
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Purpose of this Meeting

Jesse Buerk (DVRPC)
VPP Suite User Group co-chair
Purpose of This Meeting

• Thoughts and vision for leading the User Group
• Quarterly report-outs of tool enhancements
• Update on what others are doing with the tools
• We need to hear from you!
# Action Item Status

1. Ira Levinton (NJDOT) had questions regarding selecting by county/selecting by partial roadway. Ira compiling a list of various items for discussion.

2. Ram Venkatanarayana (VCTIR/VOR) said time of Day is not clear on some Congestion Scans, and that input variables be included with output. In Progress (see Advanced Time Selection – Date Range Summary slide)

3. Kelly Wells (NCDOT) requested having the choice of military time or regular time. Submitted to the developers for inclusion in a future upgrade.

4. Zoe Neaderland (DVRPC) would like to coordinate on a response when the MAP-21 NPRM comes out. The Coalition will work with agencies and the “Partners” on a coordinated response.
VPP Suite
Probe Data Analytics Forum

Michael Pack
UMD CATT Laboratory
Probe Data Analytics Forum

• An open forum to:
  – Share ideas and best practices
  – Answer questions
  – Discuss issues with a larger audience
  – Promote your work
Probe Data Analytics Forum on the Coalition’s Website

- Register
- Set your preferences
- Post stuff or reply to other people’s posts
- Receive emails when people update the forum

www.I95Coalition.org
Use Cases Posted...

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>REPLIES</th>
<th>VIEWS</th>
<th>LAST POST</th>
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<td>Fortify Travel Time Monitoring</td>
<td>0</td>
<td>1</td>
<td>by Julian35 Mon Oct 12, 2015 5:46 am</td>
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<tr>
<td>Amtrak Derailment in Philadelphia</td>
<td>0</td>
<td>1</td>
<td>by Julian35 Mon Oct 12, 2015 5:29 am</td>
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<td>Using Archived Operations Data to Support I-95 Reconstruction in Philadelphia</td>
<td>0</td>
<td>1</td>
<td>by Julian35 Mon Oct 12, 2015 5:05 am</td>
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</table>

- New Topic
- Return to Board Index

Forum Permissions
- You can post new topics in this forum
- You can reply to topics in this forum
- You can edit your posts in this forum
- You can delete your posts in this forum
- You can post attachments in this forum

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American English Language Pack © Paul Sorensen
Administration Control Panel
Fortify Travel Time Monitoring

Preview: Fortify Travel Time Monitoring

- **Project:** "Fortify" travel time monitoring of the rebuilding of I-40 in the Raleigh area
- **Project Type:** Work Zone/Traffic Management
- **Timeframe:** Stage II start late 2014; Stage III end late 2016
- **Lead Agency:** NCDOT
- **Supporting Agency:** N/A
- **VPP Suite Tools Used:** Massive Data Downloader

**Description:** There are significant traffic impact on heavily travelled Interstate and surrounding areas from the I-40 rebuild project. NCDOT generates daily reports from the previous day's peak period travel times of those impacted alternate routes, and provides them to the State Traffic Engineer, Work Zone Traffic Control, Communications Office, construction firms, news agencies, researchers, etc.

**Highlights:** First project with this type of reporting. Considering doing for all large construction projects in the future.
Amtrak Derailment in Philadelphia

Project: Media-ready, quick turnaround visualizations of the impacts of the Amtrak derailment in Philadelphia
Timeframe: Accident occurred Tuesday, May 12, 2015
Lead Agency: DVRPC
Supporting Agency: Southeastern Pennsylvania Transportation Authority (SEPTA, Regional Transit Agency)
VPP Suite Tools Used: Congestion Scan

Description: At the request of news reporters, the Delaware Valley Regional Planning Commission (DVRPC) used Congestion Scan along with other graphics to show the impact of increased traffic on I-95 due to SEPTA’s local rail service (Trenton Line) being shut down while the Amtrak accident was being investigated.

Highlights: Congestion Scan results clearly showed significant decreases in speeds (resulting in increased travel times) on I-95 SB for the two days after the derailment, likely due to the Trenton Line riders ending up driving.
Using Archived Operations Data to Support I-95 Reconstruction in Philadelphia

Project: Major widening of I-95 with interchange reconstruction/reconfigurations
Project Type: Major Capacity Increase; Bottleneck Mitigation
Timeframe: Started in late 2011; 10 year project
Lead Agency: PennDOT
Supporting Agency: DVRPC
VPP Suite Tools Used: Congestion Scan, Performance Charts

Description: The Delaware Valley Regional Planning Commission (DVRPC) is providing planning assistance to PennDOT in the reconstruction and widening of I-95 for approximately 9 miles in Philadelphia. VPP Suite is being used during the project to help understand travel conditions and to plan, justify and refine strategies to mitigate congestion during the reconstruction.

Highlights: Using the tool visualizations to show significant increase in weekday peak hour travel and planning times helped justify $41 million flex to SEPTA for purchase of bi-level rail cars on parallel Trenton Rail Line.
VPP Suite Features
New & Upcoming

Michael Pack
UMD CATT Laboratory
New Features
Deploying Later this Week
Download by Quality (continued)
5. Data Sources, Fields and Quality

- HERE
- INRIX
  - Speed
  - Historic average speed
  - Reference speed
  - Travel time
  - Confidence score
  - C-Value

Select quality threshold for INRIX Confidence score:

- 30
  - **Real Time Data:** Any segment that has adequate data, at any time of day, will report real time data.

- 20
  - **Historic Average:** Between 4 am and 10 pm, any segment without sufficient real time data will show the historical average for that segment during that day/time period (15 minute granularity).

- 10
  - **Reference Speed:** From 10 pm to 4 am, any segment without sufficient real time data will show the reference speed for that segment. Any segment that does not have calculated historical averages will show the reference speed 24 hours a day if there is not sufficient real time data.
MAP-21 Widgets
(Multi-state, State, Urban Area, County, etc.)
MAP-21 Widgets (continued)
Map-21 Widgets
(caveats and restrictions)
Deploying in the next 3-weeks
The Congestion Scan lets you analyze traffic conditions on a single stretch of road. If you choose to analyze a single day, traffic events and incidents will be plotted on the road, each spanning the time range when it was active. If you choose more than one day, the readings displayed will be averaged across the date range, and traffic events will not be shown.

1. Select a road.
   - [ ] Save THC set
   - [ ] Advanced
   - [ ] Search in Maryland
   - [ ] Remove all
   - Your selected roads
   - The following roads will be displayed and stitched together in the order below, even if the roads do not geographically connect. Click and drag to reorder selected roads.
     - [ ] I-95 between MD-315/Washington Ave and NG...
     - [ ] Route between MD-212 and I-695
     - [ ] MD-27 between MD-90/Keystone Rd and 1-795
     - [ ] Save THC set

2. Create one or more time periods to analyze.
   - [ ] Add time period
   - [ ] October 07, 2015
   - A maximum of 7 days is allowed within a single date range
   - 10/01/2015 - 10/07/2015
   - [ ] Create a single time period for this range
   - [ ] Limit to specific days of the week
   - [ ] Create a time period for each day within this range
   - Your selected time periods
   - [ ] Remove all

3. Data source
   - [ ] Here
   - [ ] INRIX
   - [ ] BPRHDS (Passenger vehicles)
   - [ ] BPRHDS (Trucks and passenger vehicles)
   - [ ] BPRHDS (Trucks)

4. Granularity
   - [ ] 1 minute
   - [ ] 5 minutes
   - [ ] 10 minutes
   - [ ] 15 minutes
A little further away
The Lab Wants to Make Your Feedback Easy!

We’re considering building a survey feature into the tools so you can quickly and easily give us your feedback:

So instead of this:

You’ll get this:

Clicking on “Sure” will open a tab to a short survey.
Upcoming Features
Advanced Time Selection - Date Range Summary

A detail of your date range selection criteria will be provided in the summary output (an example for Congestion Scan; will be similar in other tools—see next).

[Image of a vehicle probe project suite showing a congestion scan using HERE data with time ranges and color thresholds for data type and color thresholds.]
Advanced Time Selection - Date Range Summary

12:00 AM - December 1, 2014 - January 31, 2015

Using data for All days except for Jan 2015 snow storms that occurs on every day of week and in every month, during the hours of 12:00 AM to 11:59 PM.

Speed for I-270

Averaged by 1 hour from December 1, 2014 through January 31, 2015. Hide exceptions...

Using data for All days except for Jan 2015 snow storms, that occurs on every day of week and in every month, during the hours of 12:00 AM to 11:59 PM.

Bottleneck locations from I-270 between December 1, 2014 and January 31, 2015 (4 total)

Using data for All days except for Jan 2015 snow storms, that occurs on every day of week and in every month, during the hours of 12:00 AM to 11:59 PM.
Delay by TMC - Slider

Change the color coding of each cost by using the slider bars (both weekday and weekend).

You can also choose your own color palate.
Delay by TMC – Display Options

You will be able to display multiple roads, by direction.

You will have the flexibility to choose what display tabs you want in Excel exports.
New Bottleneck Algorithm

We’re continuing to work on the bottleneck algorithm. Here’s a “story board” for the dynamics over time of two separate bottlenecks, and their various elements:
New Bottleneck Algorithm

Also working on various graphic and mapping display options…
Use of the VPP Suite by User Group members

Maryland Mobility Report

Kaveh Farokhi Sadabadi
University of Maryland CATT
Maryland Mobility Report

Kaveh Farokhi, Ph.D.
Post-Doctoral Associate
Center for Advanced Transportation Technology (CATT)
University of Maryland, College Park

VPP Suite User Group Webcast
October 13, 2015
Outline

- Strategic Focus on Performance Measurement
- Data Needs (Volume/Speed)
- Network Conflation
- Bottleneck Identification
- Performance Measurement (Mobility/Reliability)
  - Segment level
  - Corridor level
- Takeaways
Strategic Focus

- Moving Ahead for Progress in the 21st Century (MAP-21) Legislation
- MD-SHA Business Plan (FY 2012-2015)
  - Goal:
    - Support Maryland’s Economy and Communities through enabling reliable movement of people and goods
  - Strategic focus areas:
    - Mobility and reliability
    - Incident management and traveler information systems
    - Multi-modalism and smart growth
    - Freight
  - Mobility is a Key Performance Area (KPA) at MD-SHA
  - Mobility Report assists in MD-SHA’s
    - Performance-based mobility efforts
    - Driving investment related decisions
National and State Level

• National
  – Urban Mobility Report (TTI)
  – Since 2010 based on probe speed data

• States
  – Washington (WSDOT)
    • The Gray Notebook
  – Maryland (SHA)
    • Mobility Report (Since 2012)
  – Indiana (IDOT)
  – ...
Data Needs – Speed

• Probe-based speed data
  • Provided by INRIX™ through the VPP
  • Data archived and accessed in the VPP Suite
• Spatial coverage
  • 1,998 TMC Segments
  • 1,698 directional freeway/expressway miles
• Temporal coverage
  • 1 minute granularity
  • 365/24/7
• More than 5.7 billion data points
• Big data challenges in archiving, retrieving, and querying
Data Needs – Volume/Count

• AADT and hourly profiles
  – Provided by MD-SHA Highway Information Services Division (HISD)

• Spatial coverage
  – 79 permanent continuous Automatic Traffic Recorders (ATRs), and
  – Over 3,800 short term (48 hour) Program Count locations throughout the state
  – Of the 79 ATRs, 18 are presently equipped to perform vehicle classification counts based on the 13 FHWA vehicle classifications

• Temporal resolution
  – AADT and hourly percentages in days/hours
Data Conflation

• Volume data is given at point counters
• Speed data is given on road segments
• Mismatch b/w two segmentation standards
  – MD-SHA highway linear referencing system
  – Industry adopted TMC segments
• Data conflation performed manually to ensure maximum accuracy
• ESRI® ArcMap™ 10.0
Bottleneck Identification

• Speed-based method

• Impact factor
  – Number of occurrences
  – Average maximum queue length
  – Average duration
Performance Measurement

• Congestion: Travel Time Index (TTI)
  – Refers to the ratio of expected (average) travel time to the (minimum) free flow travel time of the segment

• Uncongested (TTI<1.15)
• Light (1.15<TTI<1.3)
• Moderate (1.3<TTI<2.0)
• Severe (TTI>2.0)
Performance Measurement

• Reliability: Planning Time Index (PTI)
  – Refers to the ratio of extreme (95th percentile) travel time to the (minimum) free flow travel time

• Reliable (PTI<1.5)
• Moderately Reliable (1.5<TTI<2.5)
• Unreliable (PTI>2.5)
Corridor Level

- Regionally significant corridors (15)
  - Travel Time Index
  - Planning Time Index
  - Daily Variability
  - Speed profile
  - Location of top bottlenecks

- I-70 (Pennsylvania Border to US 40 (Frederick))
- I-70 (US 40 (Frederick) to I-695)
- I-81
- I-83
- I-95 (Capital Beltway to I-695 North)
- I-95 (I-695 North to Delaware State Line)
- I-97
- I-495 Capital Beltway
- I-695 Baltimore Beltway
- I-795
- I-895
- US-50 (D.C Line to William Preston Lane Bridge (Bay Bridge))
- MD 32
- MD 100
- MD 295
Main Takeaways

• Performance measurement and monitoring is playing a central role in decision making at both federal and state levels
• Probe speed data adequately support public sector needs for highway performance measurement
• Currently, at MD-SHA mobility performance measures inform the project development and selection process
Main Takeaways

- Since 2012 the MD-SHA has published annual Mobility Reports which summarize the state’s performance measurement efforts.
- The practice is becoming more common place as other states acquire and develop necessary resources.
Thank you!

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Subrat Mahapatra, Transportation Manager
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Baltimore, MD 21202
Tel: (410) 545-5649
smahapatra@sha.state.md.us
User Focus Group

Michael Pack

UMD CATT Laboratory
The 1st Focus Group Effort
Developing Performance Summary Report Templates

- Need: To create reports & summary documents quickly and easily in the Suite
- How: Performance summary report template feature
- Who: User Focus Group
- First Step: Looking for volunteers!

Contact John: jallen35@umd.edu
Agency Input Session

Facilitated by
Michael Pack, UMD CATT Laboratory
Kelly Wells (NCDOT), VPP Suite User Group
co-chair
Agency Input Session

Focus on New Features

Event Data Integration
Dashboard Functionality
MAP-21 Working Group

Any Other Topics of Interest?

Committed to ★ MAP-21 ★
Coming Soon

www.I95Coalition.org
### NCDOT: Overlapping Bottlenecks

#### VPP Suite Raw Output

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<tr>
<th>Rank</th>
<th>Location</th>
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<tr>
<td>1</td>
<td>I-77 S @ I-485, MM 19</td>
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<td>2</td>
<td>I-77 S @ GILEAD RD/EXIT 23</td>
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<tr>
<td>3</td>
<td>I-85 S @ NC-73/EXIT 55</td>
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<tr>
<td>4</td>
<td>I-77 N @ I-277/US-74/EXIT 9</td>
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<td>I-77 S @ WESTINGHOUSE BLVD/EXIT 1</td>
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<td>I-77 N @ LANGTREE RD / MM 31</td>
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<td>I-85 CCW @ NC-16/PROVIDENCE RD/EXIT 57</td>
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<td>14</td>
<td>I-40 W @ NEW HOPE CHURCH RD/EXIT 263</td>
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<td>I-77 S @ NATIONS FORD RD/EXIT 4</td>
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<td>16</td>
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#### NCDOT Final Report

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<td>I-40 WB @ N H CHURCH MM 263-274</td>
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</tbody>
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**NOTE:** 11 of the 30 bottlenecks are “repeat” bottlenecks
Next Steps & Meeting Wrap Up

Karen Jehanian
For the I-95 Corridor Coalition

Next User Group Meeting:
Wednesday, January 20, 2016
10:30am to noon
Contact Information

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VPP Suite questions/feedback
vpp-support@ritis.org
Thank You