Operations Activities and Use of Inrix Data in the Baltimore Region

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AMPO Operations Work Group

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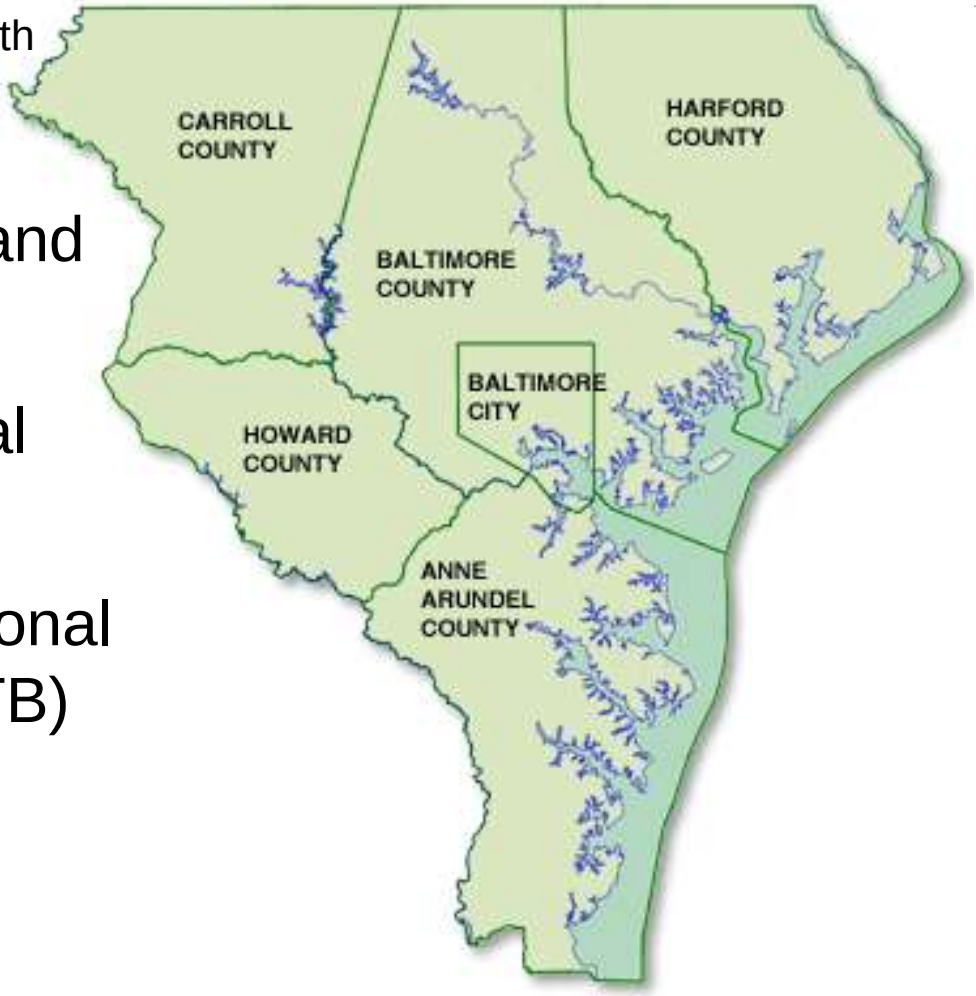
Overview

- The Baltimore Region
- Overview of Operations Activities
- Overview of Use of Inrix Data / VPP

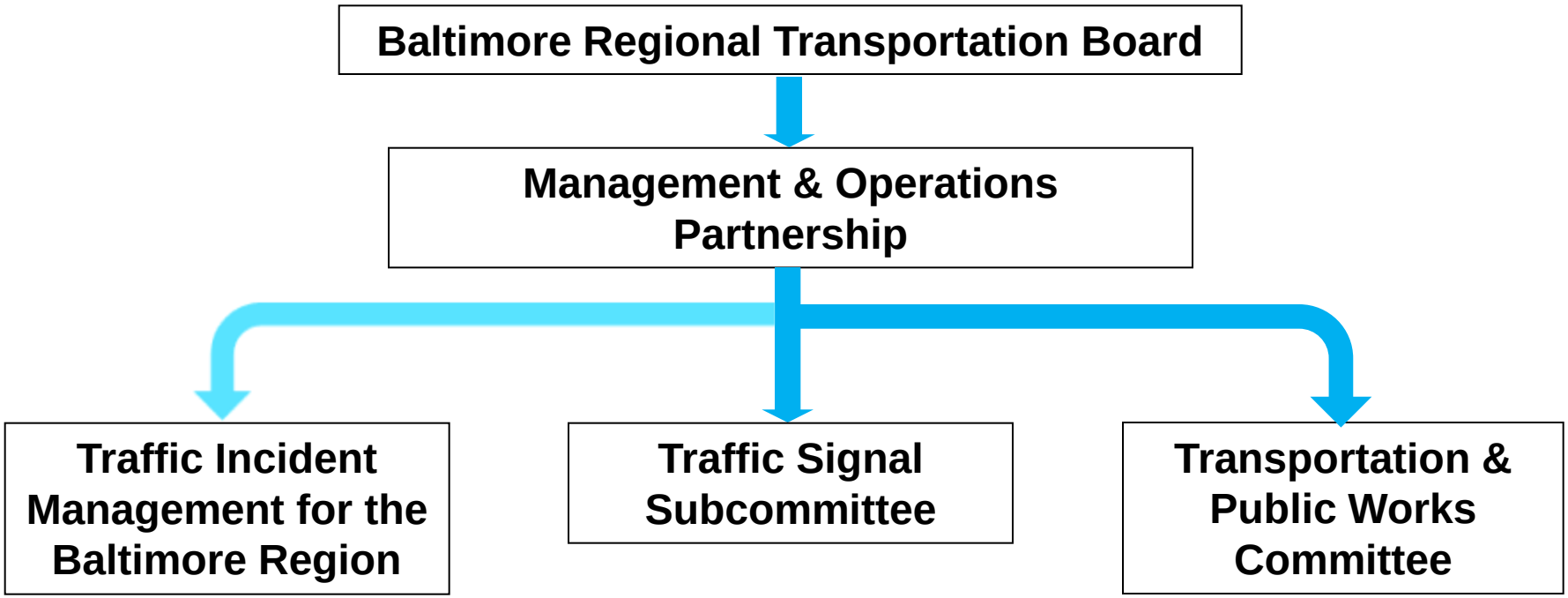
The Baltimore Region

- Over 2.6 million people, 20th most populous metro area
- Major employment center and tourist destination
- Adjacent to National Capital Region
- MPO is the Baltimore Regional Transportation Board (BRTB)



Operations Activities

Regional Operations Committees



Traffic Incident Management for the Baltimore Region (TIMBR)

- Initiated in 2000 as the Baltimore Regional Operations Coordination (B-ROC) Committee
- Meets bi-monthly
- Mission: Enhance communication, cooperation, and coordination across jurisdictions, agencies, and modes to improve responder and motorist safety, enhance mobility, and ultimately, improve traffic incident management.
- Receives consultant support funded by Maryland State Highway Administration
- No funding is allocated for large regional TIM projects

Member Agencies

- Local
  - Public works/transportation
  - Police
  - Fire
  - Emergency management
- State
  - Transportation (highway, transit, port)
  - Police
  - Fire
  - Emergency management
  - Environment
  - Medical Examiner
- Federal
  - Naval Academy
  - Transportation
  - US Coast Guard
  - US Park Service
- Other
  - Consultants
  - Baltimore Metropolitan Council
  - Metro. Washington Council of Governments
  - Towing & Recovery Professionals of MD
  - University of Maryland

Overview of TIMBR Activities

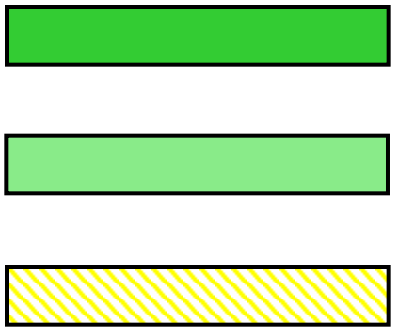
- **Field Guides / Forms**
  - Spanish Language Field Guide
  - Maryland Statewide Incident Management Coordination Field Guide
  - Medical Examiner Form
- **Training / Awareness**
  - Traffic Incident Management Conferences
  - On-line Traffic Incident Management Training Course
  - Traffic Incident Management Self Assessments
  - FHWA Traffic Incident Management Workshop
- **Plans**
  - Contingency Transportation Emergency Management Plan
  - Traffic Incident Response Coordination Plan
- **Topic-Specific Task Forces**
  - Escorted Motor Ride Task Force
  - Funeral Procession Task Force
- **Agreements**
  - Memorandum of Regional Cooperation

Overview & Status of TIMBR Activities

- Summary table showing:

  Topic, Project, Status, Result

- Result Legend



Completed, in use, well-received

In development, progressing well

May be completed but not in use / product not maximized

Overview & Status of TIMBR Activities

Topic	Project	Status	Result
Field Guides / Forms	Spanish Language Field Guide	▪ Completed	▪ Printed and distributed throughout the State ▪ Used widely
	Maryland Statewide Incident Management Coordination Field Guide	▪ Needs to be updated	▪ Guide needs to be updated ▪Could then be sent electronically ▪Costly to print
	Medical Examiner Form	▪ Completed	▪ Available, but need to educate police about its use
Training / Awareness	Traffic Incident Management Conferences	▪ Sept 19-20, 2001 ▪ Nov 20, 2003 ▪ Apr 15, 2008	▪Very successful ▪ Interest in future events ▪Funding needed to hold future events
	On-line Traffic Incident Management Training Course	▪In development	▪ Will be completed in July 2012 ▪Anticipated to be useful when completed
	TIM Self Assessments	▪ Conducted as a region in 2003, 2004, 2007, 2009	▪ Initiated productive discussions about needs and potential projects
	FHWA TIM Workshop	▪Conducted in September 2011	▪Helped identify some next steps / action items for TIMBR

Overview & Status of TIMBR Activities

Topic	Project	Status	Result
Plans	Contingency Transportation Emergency Management Plan	▪ Completed	▪ Compiled useful information ▪ Incorporated into Regional Protective Action Coordination Guidelines ▪Will be included in Evacuation Support Documents currently being developed
	Traffic Incident Response Coordination Plan	▪ Completed	▪ Compiled useful information ▪ Information will be added to Maryland Statewide Incident Management Coordination Field Guide
Topic-Specific Task Forces	Funeral Procession Task Force	▪Task Force has completed its work	▪Completed Funeral Procession Guidelines; distributed to police and fire chiefs from elected officials, and to SHA ▪Created Funeral Procession Contact List that is updated quarterly by BMC staff
	Escorted Motor Ride Task Force	▪Started Fall 2011, on-going	▪Issue of concern and interest by law enforcement in the region, and in neighboring regions ▪Anticipate outcome will include common guidelines for the region
Agreements	Memorandum of Regional Cooperation	▪Signed by all jurisdictions, MDOT, MSP ▪Implemented as pilot in Carroll County	▪Manual notification is difficult to implement / maintain ▪ Full implementation not likely until automated

Traffic Signal Subcommittee

- Initiated in 2002
- Provide a forum for the region's traffic signal engineers, managers, and field staff to discuss issues of common concern
- Identify and undertake projects that improve the operation and coordination of the region's traffic signals

Regional Signal Forum

- 5 Signal Forums held since 2004
- 6th scheduled for November 7, 2012
- Brings together signal technicians, managers, operators, equipment vendors, state, local, federal and private sector representatives
- Over 100 attendees
- Link to the 2011 Signal Forum http://www.baltometro.org/transportation-planning/2011-baltimore-regional-traffic-signal-forum

CMAQ Funding

- 4 local projects supported by the signal subcommittee received CMAQ funds for Adaptive Signal Control Technology (ASCT) application – approx. total $800,000
- 1 project in Anne Arundel County – completed – 8% reduction in overall daily travel time, 26% reduction in delay, 13% reduction in fuel usage and 8% reduction in emissions

Transportation & Public Works Committee

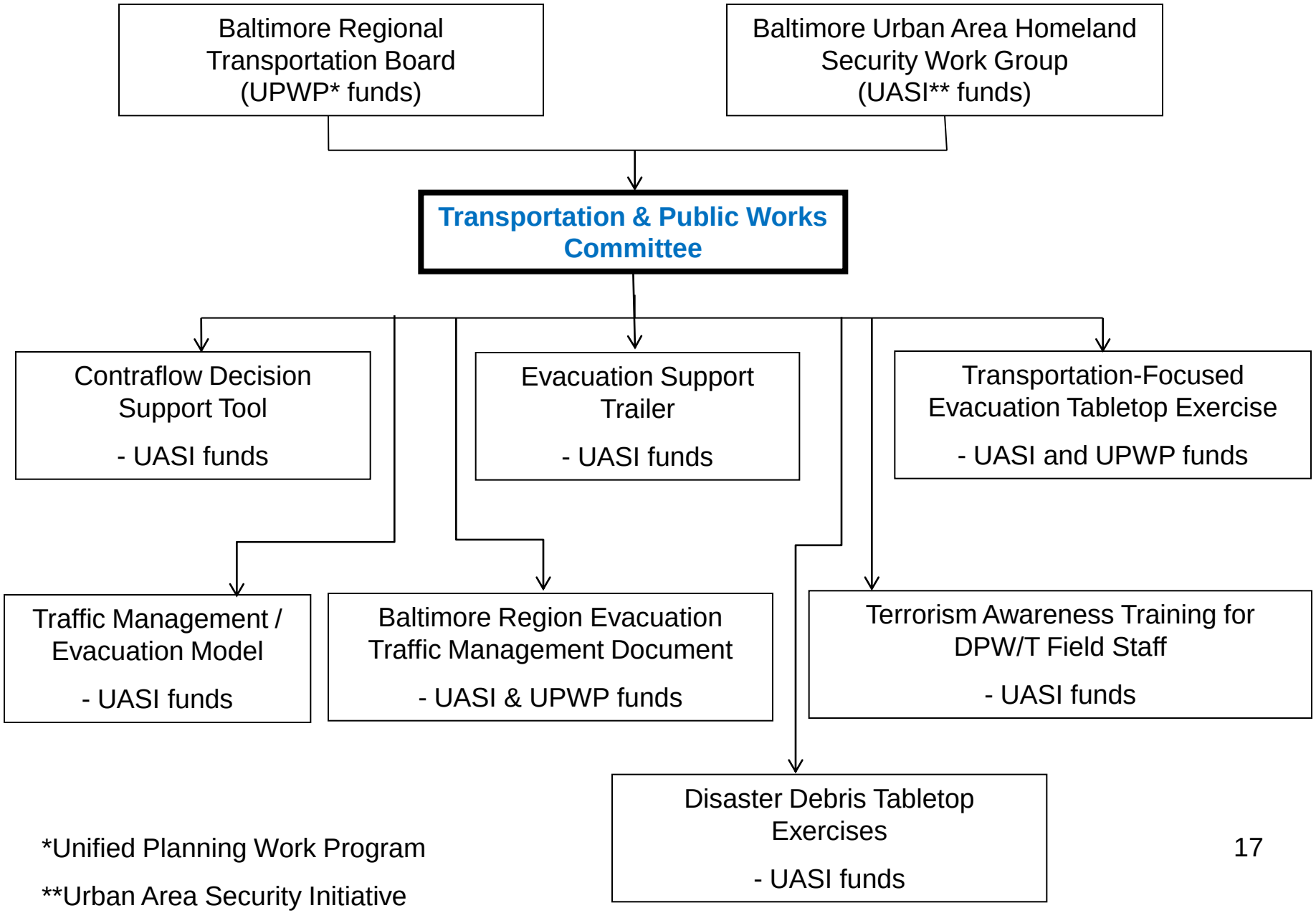
- Initiated in 2006 under BRTB and Urban Area Homeland Security Work Group to address day-to-day operations as well as emergency operations in public works

- Members include operations representatives from local and state DPW/DOT agencies

Overview of T&PW Activities Supporting Day-to-Day Operations

- Held 3 half-day operations forums on the following topics:
  - Snow Plow Operations
  - Roadside Mowing / Street Sweeping / Tree Trimming
  - Road Maintenance
- Low cost (host jurisdiction provided bagels and coffee)

Overview of T&PW Emergency Prep Activities



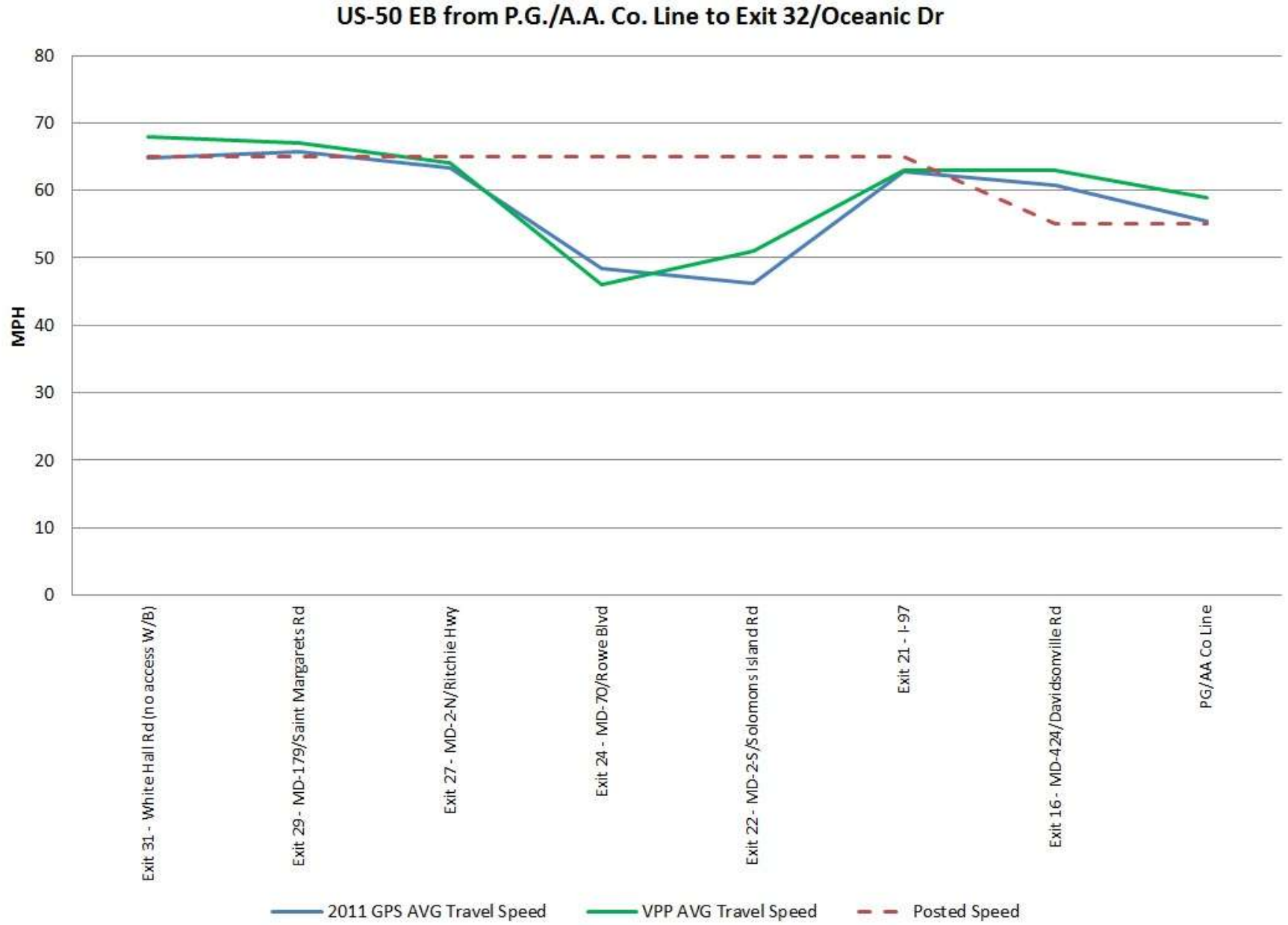
*Unified Planning Work Program

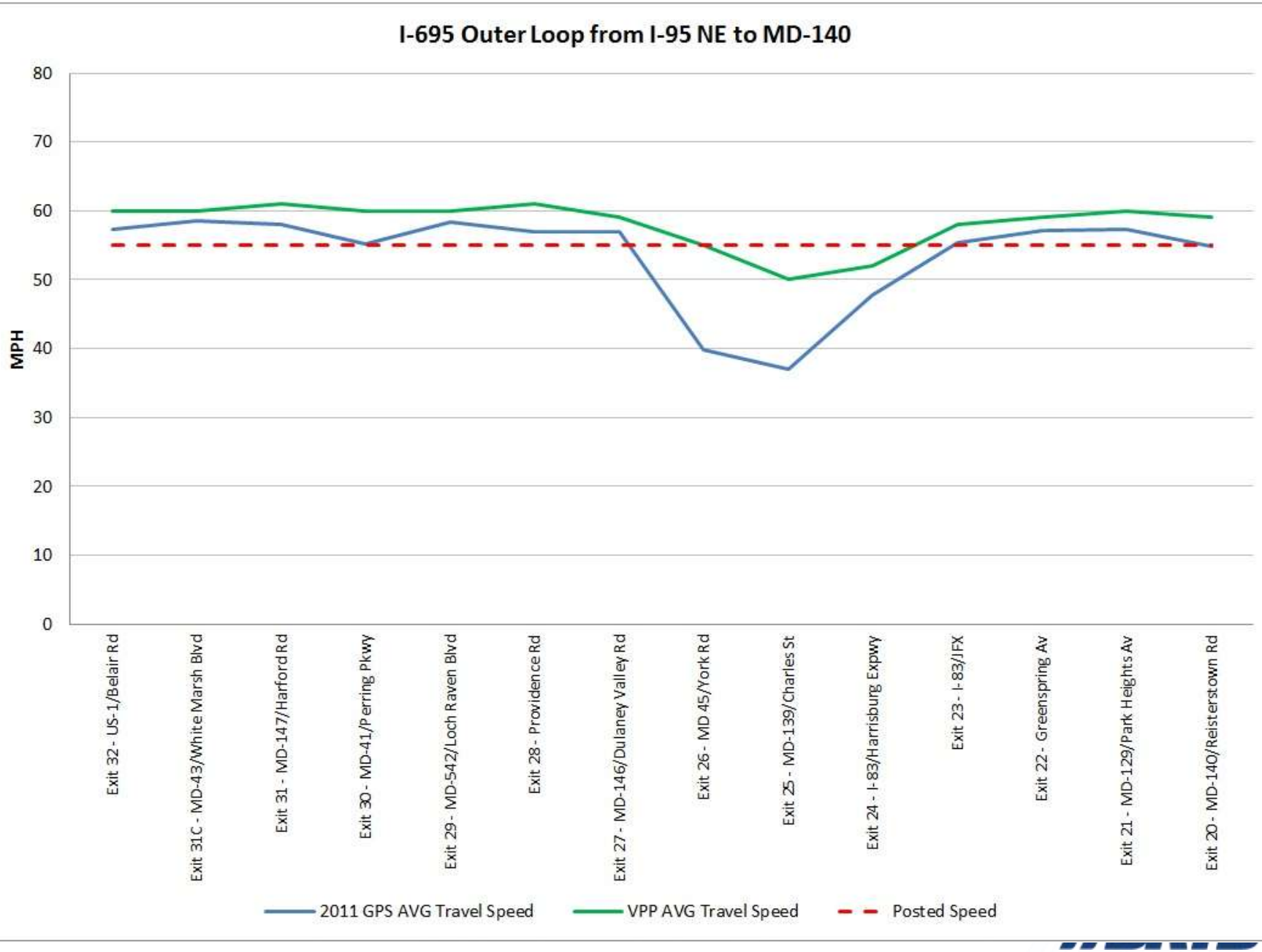
**Urban Area Security Initiative

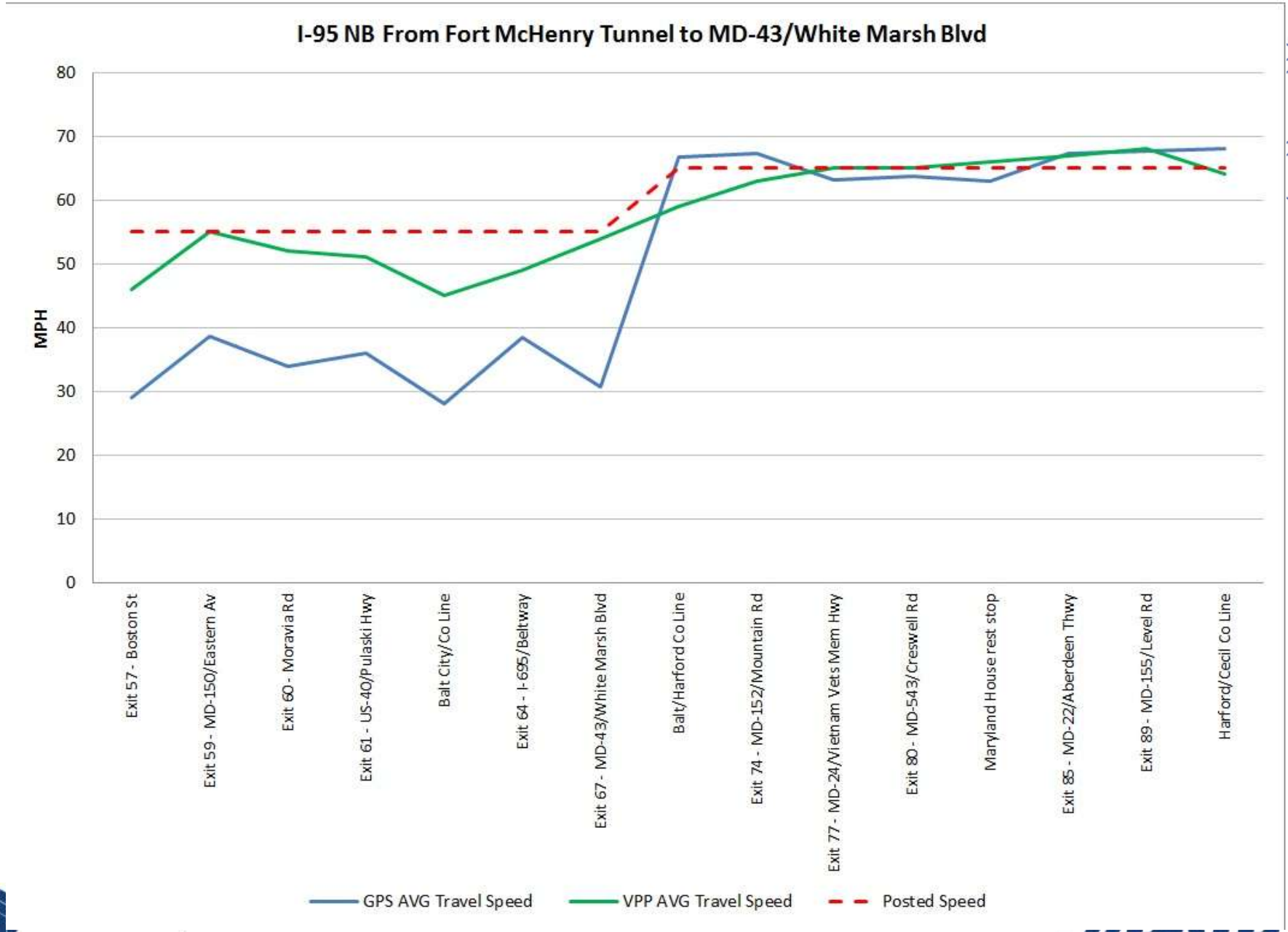
Using Inrix Data through Vehicle Probe Project Suite

Regional Integrated Traffic Information System

- Automated data sharing, dissemination, and archiving system
- Developed by University of Maryland CATT Lab
- Functions include:
  - real-time fusion and exchange of regional transportation data
  - data archiving


US-50 EB from P.G./A.A. Co. Line to Exit 32/Oceanic Dr
MPH
80
70
60
50
40
30
20
10
0
Exit 31 - White Hall Rd (no access W/B)
Exit 29 - MD-179/Saint Margarets Rd
Exit 27 - MD-2-N/Ritchie Hwy
Exit 24 - MD-70/Rowe Blvd
Exit 22 - MD-2-S/Solomons Island Rd
Exit 21 - I-97
Exit 16 - MD-424/Davidsonville Rd
PG/AA Co Line
2011 GPS AVG Travel Speed
VPP AVG Travel Speed
Posted Speed


I-695 Outer Loop from I-95 NE to MD-140
MPH
80
70
60
50
40
30
20
10
0
Exit 32 - US-1/Belair Rd
Exit 31C - MD-43/White Marsh Blvd
Exit 31 - MD-147/Harford Rd
Exit 30 - MD-41/Perring Pkwy
Exit 29 - MD-542/Loch Raven Blvd
Exit 28 - Providence Rd
Exit 27 - MD-146/Dulaney Valley Rd
Exit 26 - MD 45/York Rd
Exit 25 - MD-139/Charles St
Exit 24 - I-83/Harrisburg Expwy
Exit 23 - I-83/JFX
Exit 22 - Greenspring Av
Exit 21 - MD-129/Park Heights Av
Exit 20 - MD-140/Reisterstown Rd
2011 GPS AVG Travel Speed
VPP AVG Travel Speed
Posted Speed


I-95 NB From Fort McHenry Tunnel to MD-43/White Marsh Blvd
MPH
80
70
60
50
40
30
20
10
0
Exit 57 - Boston St
Exit 59 - MD-150/Eastern Av
Exit 60 - Moravia Rd
Exit 61 - US-40/Pulaski Hwy
Balt City/Co Line
Exit 64 - I-695/Beltway
Exit 67 - MD-43/White Marsh Blvd
Balt/Harford Co Line
Exit 74 - MD-152/Mountain Rd
Exit 77 - MD-24/Vietnam Vets Mem Hwy
Exit 80 - MD-543/Creswell Rd
Maryland House rest stop
Exit 85 - MD-22/Aberdeen Thwy
Exit 89 - MD-155/Level Rd
Harford/Cecil Co Line
GPS AVG Travel Speed
VPP AVG Travel Speed
Posted Speed

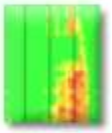
Vehicle Probe Project Suite

Vehicle Probe Project Suite Dashboard

Explore the impacts of and relationships between bottlenecks and traffic events in real-time and at previous points in the past.

Massive Raw Data Downloader

Download raw probe data from our archive.



Congestion Scan

Explore the rise and fall of congested conditions on a stretch of road.

Historic Probe Data Explorer

View aggregated data from previous points in time.

Bottleneck Ranking

Rank bottlenecks and discover which ones have the greatest impact.

FAQs

Frequently asked questions and their answers.

Tutorials

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

How We Are Using the VPP

- Congestion Management Process
  - Significant component
  - Initiated Quarterly Bottleneck Reports
- Quickly investigate impacts of special events / construction
- Supplement GPS speed data
- Performance Measures (in development)
  - Travel Time Index, Others TBD
  - Working with MPOs from DC to NYC

Quarterly Bottleneck Report

Top 10 Bottlenecks in the Baltimore Region
1st Quarter 2012

By Impact Factor (Number of Occurrences x Average Duration in Minutes x Average Length)

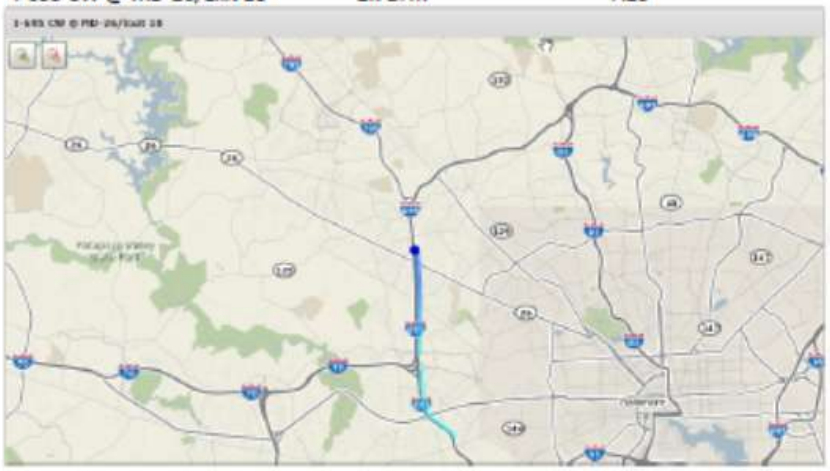
Location	Average Duration	Average max length (miles)	Occurrences	Impact Factor
I-695 CW @ MD-26/Exit 18	2h 17m	7.29	160	159,757
I-95 N @ MD-100/Exit 43	1h 43m	7.33	107	80,816
I-695 CCW @ Edmondson Ave/Exit 14	1h 25m	4.74	185	74,501
I-695 CW @ MD-147/Harford Rd/Exit 31	1h 50m	6.71	89	65,656
I-695 CCW @ MD-139/Charles St/Exit 25	1h 11m	3.65	218	56,553
I-95 N @ MD-43/White Marsh Blvd/Exit 67	2h 13m	8.57	36	41,055
I-95 S @ MD-155/Exit 89	58m	3.98	156	36,044
I-695 CCW @ MD-2/Ritchie Hwy/Exit 3	1h 35m	3.40	106	34,227
I-695 CCW @ MD-144/Frederick Rd/Exit 13	1h 30m	8.86	41	32,683
I-695 CW @ MD-41/Perring Pkwy/Exit 30	1h 23m	4.64	76	29,243

If the reported speed falls below 60% of the reference speed, the road segment is flagged as a potential bottleneck.
If the reported speed stays below 60% for five minutes, the segment is confirmed as a bottleneck location.

Quarterly Bottleneck Report

#1 Ranked Bottlenecks in the Baltimore Region - 1st Quarter 2012

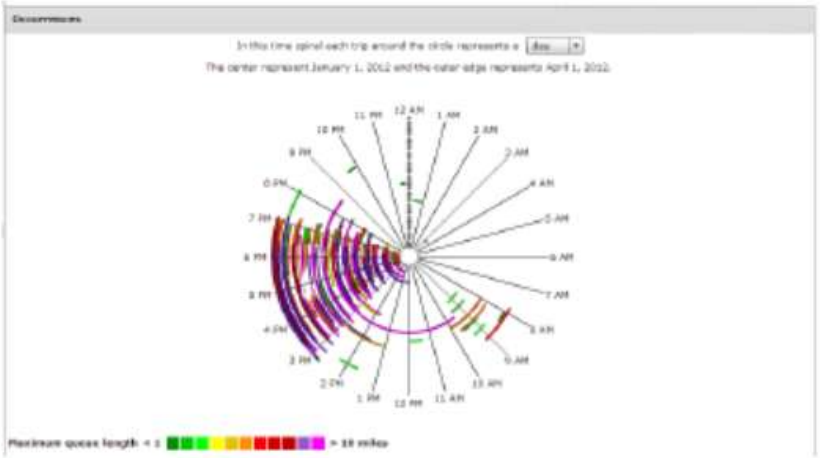
Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
I-695 CW @ MD-26/Exit 18	2h 17m	7.29	160	159,757

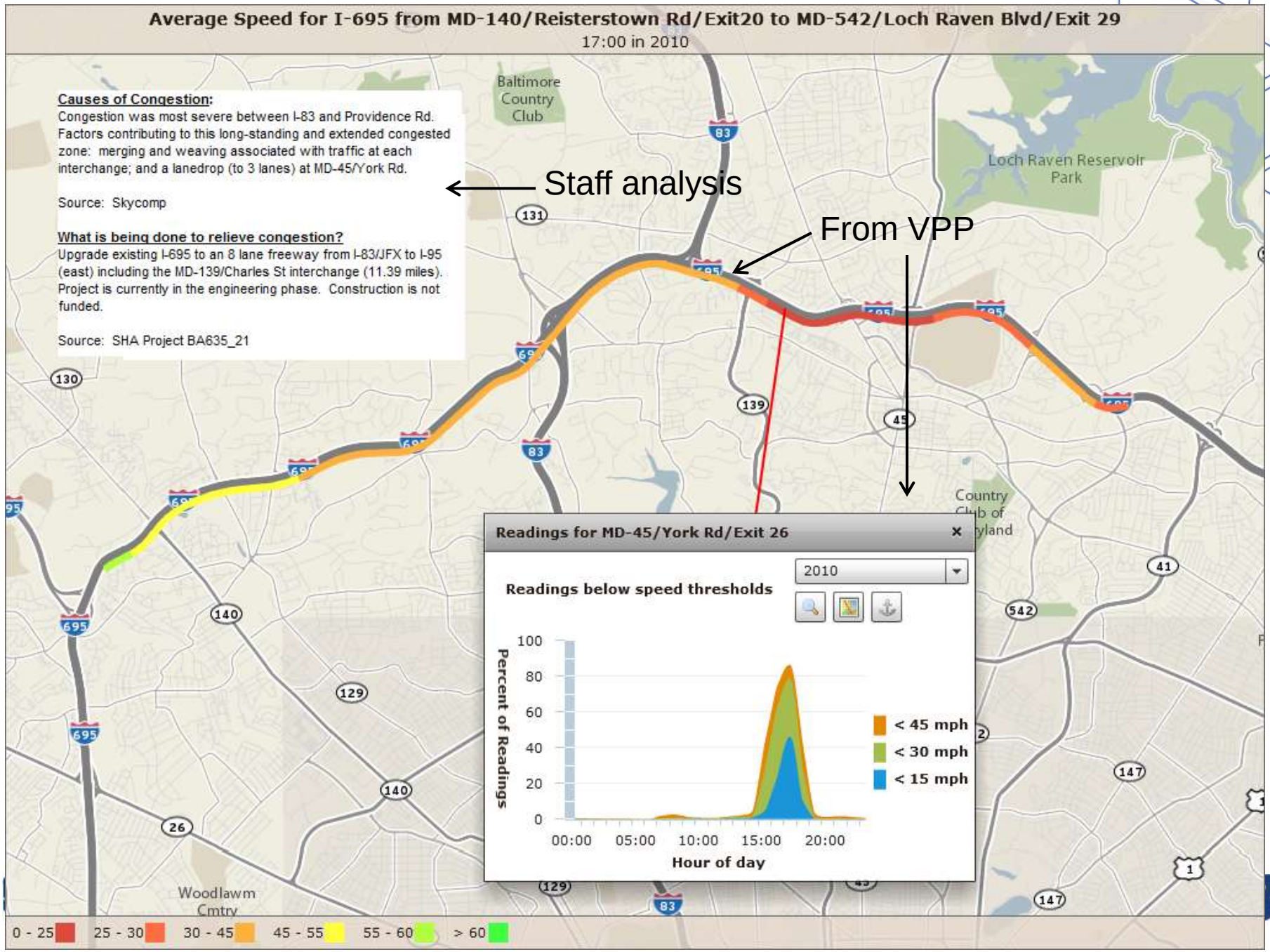


From VPP

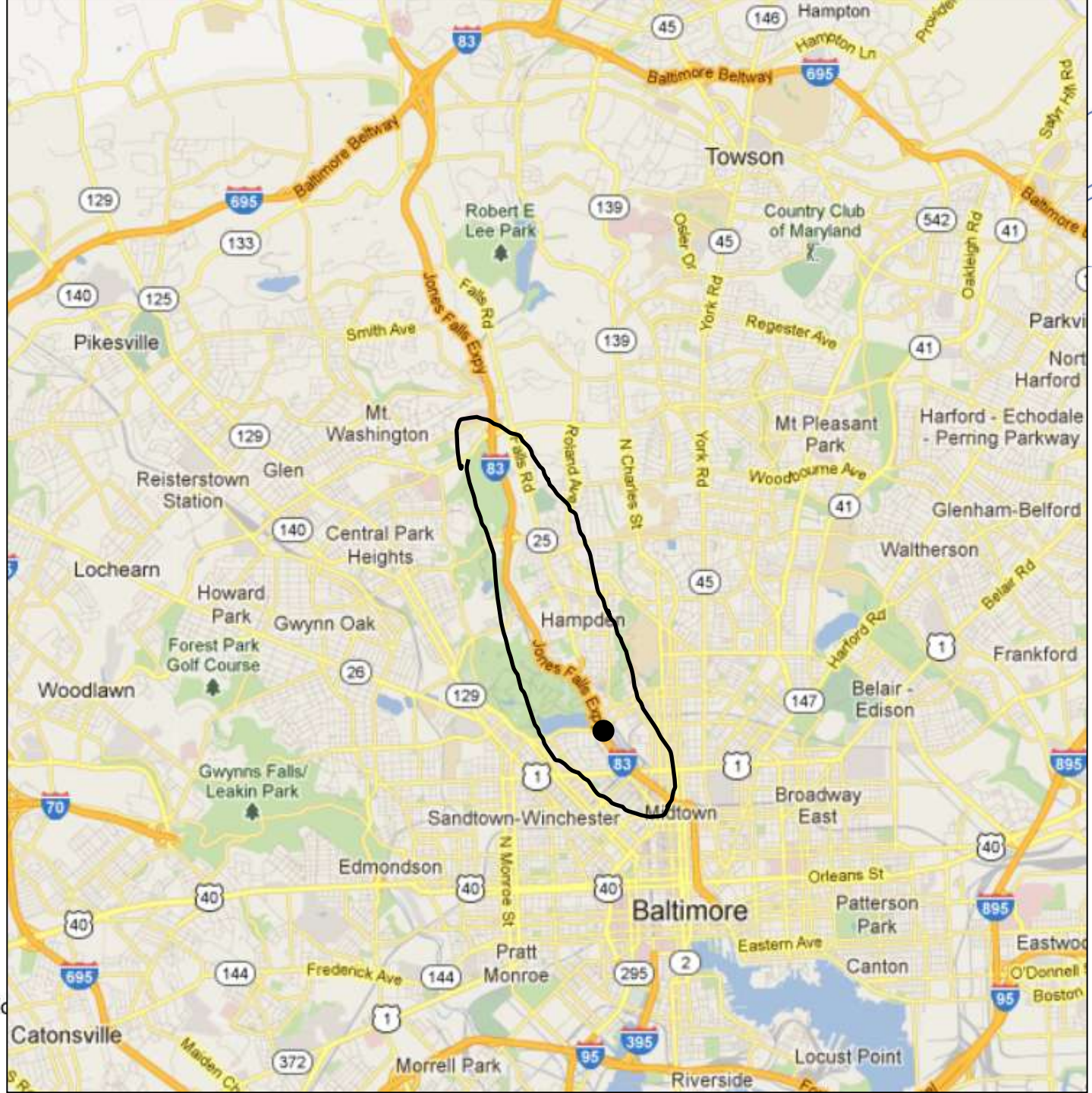
Notes: Normal inner-loop congestion extended from I-95 to Liberty Rd, with the greatest delays between MD 144 and the lane drop at I-70. High-volume ramps from Security Blvd, I-70 and US 40 contributed to the congestion.
Source: Skycomp report

Staff analysis



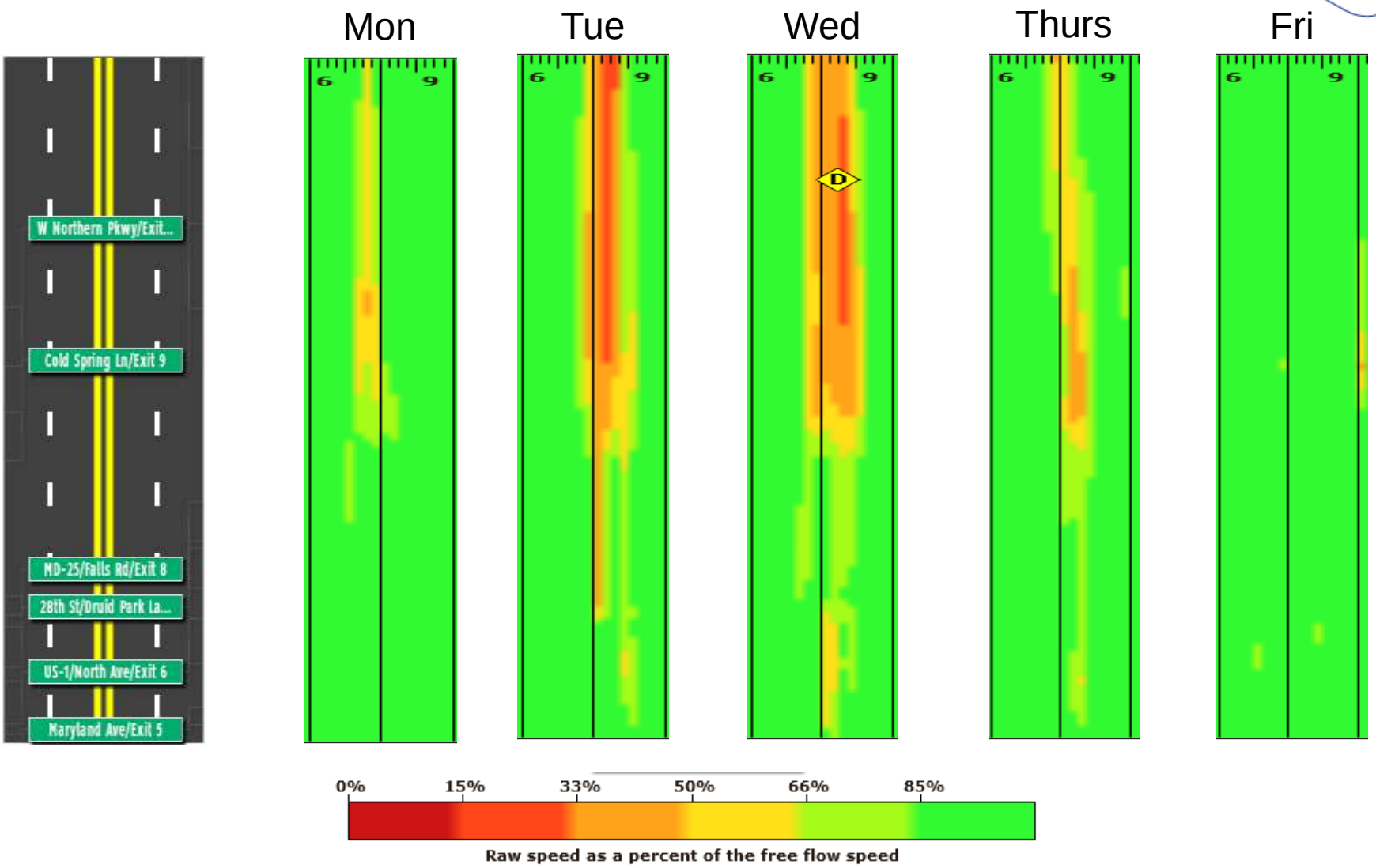

Average Speed for I-695 from MD-140/Reisterstown Rd/Exit20 to MD-542/Loch Raven Blvd/Exit 29
17:00 in 2010
Causes of Congestion:
Congestion was most severe between I-83 and Providence Rd. Factors contributing to this long-standing and extended congested zone: merging and weaving associated with traffic at each interchange; and a lanedrop (to 3 lanes) at MD-45/York Rd.
Source: Skycomp
What is being done to relieve congestion?
Upgrade existing I-695 to an 8 lane freeway from I-83/JFX to I-95 (east) including the MD-139/Charles St interchange (11.39 miles). Project is currently in the engineering phase. Construction is not funded.
Source: SHA Project BA635_21
Staff analysis
From VPP
Baltimore Country Club
Loch Raven Reservoir Park
Country Club of
Woodlawn Cmtry
Readings for MD-45/York Rd/Exit 26
2010
Readings below speed thresholds
Percent of Readings
100
80
60
40
20
0
00:00
05:00
10:00
15:00
20:00
Hour of day
< 45 mph
< 30 mph
< 15 mph
0 - 25
25 - 30
30 - 45
45 - 55
55 - 60
> 60

Impacts of Construction

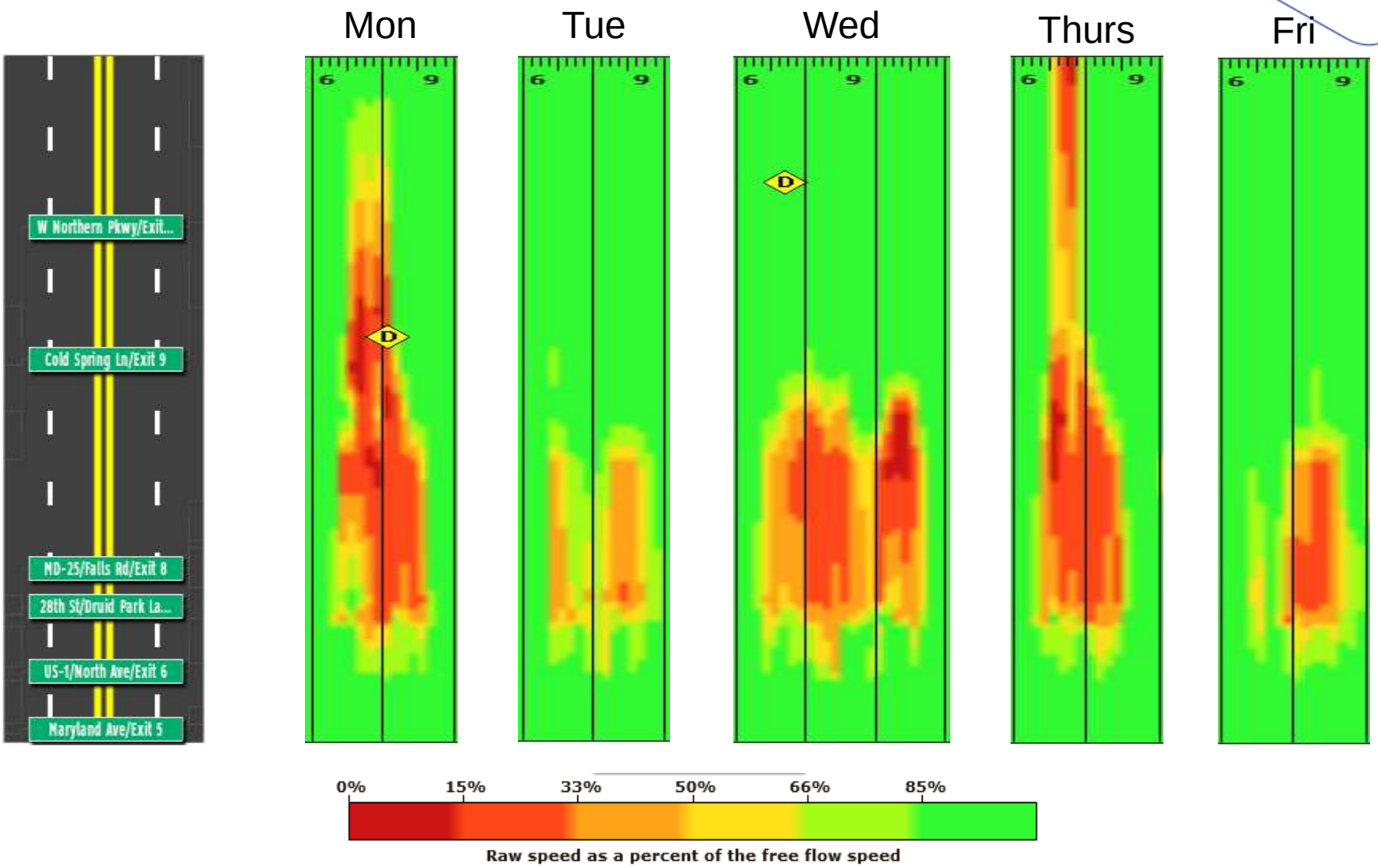


Baltimore Metropolitan Co

Congestion on 83 SB - 4/9-13 Morning Peak



Congestion on 83 SB - 4/16-20 Morning Peak



Advantages of VPP Probe Data

- Continuous monitoring (24/7/365)
- Probe-based speed data is superior to location-fixed detector speed data
- Complements other traffic data sources; enables more robust congestion analyses

Issues

- No traffic volumes
- Technical details regarding data collection and processing remain unrevealed
- Must rely on the VPP verification process
- Current VPP coverage is limited (esp. arterials)
- Uncertainty of funding for future data purchases

Conclusions

- VPP data shows congestion in the same locations as traditional GPS floating car trials
- Arterial coverage currently expanding; continue to supplement with GPS data
- VPP is very beneficial, cost effective tool
  - We will continue to identify uses for it

For More Information

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