



A. JAMES CLARK
SCHOOL OF ENGINEERING

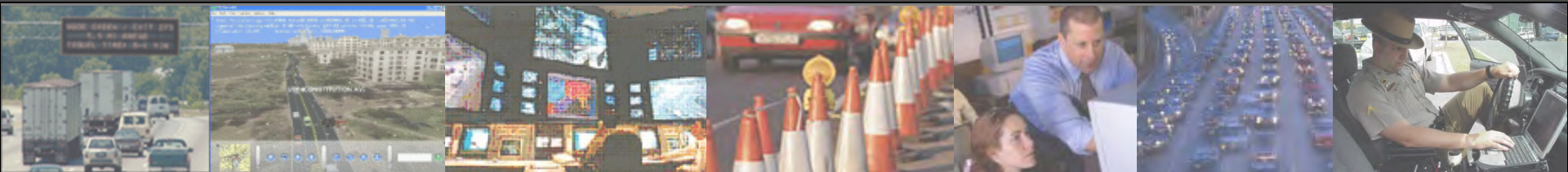
CATT

CENTER FOR ADVANCED
TRANSPORTATION TECHNOLOGY

WZ Probe Data – MD SHA

Work Zone Performance Management Peer Exchange Workshop

May 8, 2013





Presentation Agenda

- Background on RITIS/VPP Data and Tools
- MD WZ Probe Data Project
- Work Zone Performance Management Application Demo



Background

- Regional Integrated Transportation Information System (RITIS)
 - Real-time data feeds
 - Real-time situational awareness tools
 - Archived data analysis tools

RITIS | Regional Integrated Transportation Information System

File Edit View History Bookmarks Tools Help

rits.org https://staging.rits.org/map/chartVid.html

I-270 S OF SPLIT 4:57:49S U OF US-1
I-495 N OF AFB I-495 SOUTH VILC
I-95 SOUTH VILC

Vehicle Accident @ SB 495 AT 45.5MM - Event Timeline - Mozilla Firefox

rits.org https://timeline.rits.org/timeline/?incidentid=VDOT_NOVA_NOVA1920569

SB 495 AT 45.5MM Vehicle Accident Map

Weather Station for 166 HAY MARKET
Apr 17, 2012 4:15 PM
Temperature: Air 70°F Surface 93°F
Wind: 3.1 MPH
Gusts up to 12.3 MPH
Visibility: Poor to High
Precipitation: Rate, Accumulated Depth

Road Surface
Surface Status: Dry
Road Salinity: --

Road Widening
US-1N north @ MM 167.20
Start Time: 3/27/2012 11:56 AM
Description: The left turn lane is closed.
Lane Status: North South

Collision
Incident 1 of 2
BACK TO LIST NEXT
SB 495 AT 45.5MM
Start Time: 4/17/2012 4:34 PM
Lane Status: South

Twinbrook
Updated: 4/17/2012 4:39 PM

Destination	Line	Car	Min
Glenmont	M	6	BRD
Glenmont	M	2	4
Shady Grove	M	6	5
Glenmont	M	8	10
Shady Grove	M	6	11
Shady Grove	M	8	16

MDOT Detector
I-95 @ MD 32
Direction: North
Detector Type: Microwave Radar
Updated: 4/17/2012 4:28 PM
Avg. Speed: 44 mph
Ref Speed: 55 mph
Volume: 503 vehicles per min

Speed Data Volume Data

Multiple Incidents in this Area
Unknown Location
Unknown Location

Road Data
Crain Hwy / Blue Star Memorial Hwy SOUTHBOUND @ McKendree Rd / Cedarville Rd
Length of Segment(miles): 1.689214
Speed(MPH): 16
Average Speed(MPH): 32
Reference Speed(MPH): 55
Confidence Score: High
Travel Time(min): 6:21

Route 1 - Jeff Davis Hwy North @ MM 156.0
DELAYS I-95 S TO EXIT 148
Updated: 04/17/2012 3:33 PM

Hide Layer List

- Road Weather
- Incidents and Events
- Dynamic Message Signs
- CCTV Feeds
- Traffic Detectors
- Radio Scanners
- FITM Plans
- Evacuation Support
- Metro Routes
- INRIX Speed Data
- Comparative Speed
- Weather Alerts
- Weather Radar

Radio Feeds

- Montgomery County, MD
- Prince William County, VA
- Montgomery County Fire...
- NCR - Public Safety Inte...
- Montgomery County Poli...
- Montgomery County Poli...
- National Hurricane Cent...
- Prince William County, VA
- Prince William Police Eas...
- Prince William County R...
- NCR - Public Safety Inte...
- Prince William County Fir...
- Prince William County Fire
- National Hurricane Cent...
- Fairfax (County) County, VA
- WA4TSC 147.300Mhz Bl...
- Fairfax County Police De...
- Fairfax County Fire and ...
- Metropolitan Washingto...
- NCR - Public Safety Inte...
- National Hurricane Cent...

Show Unmapped Incidents

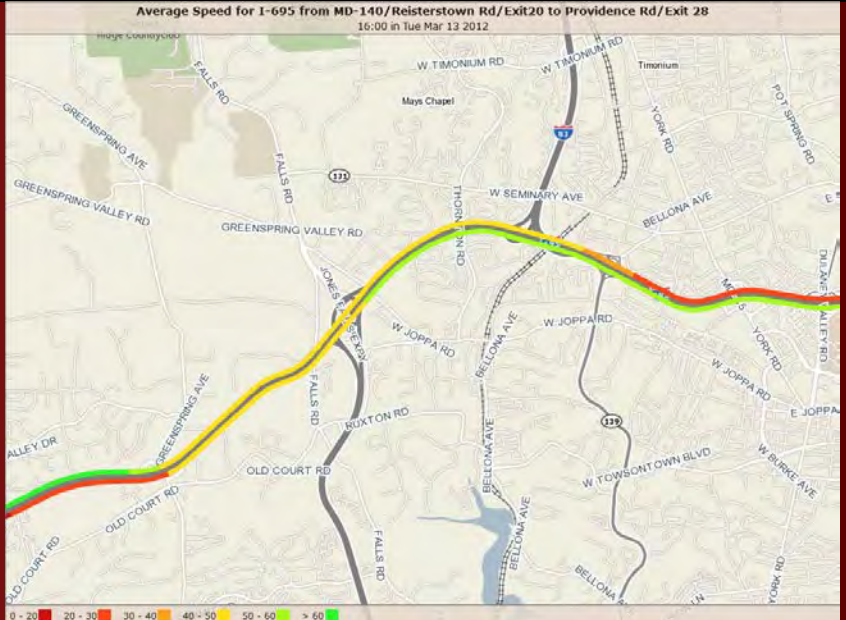
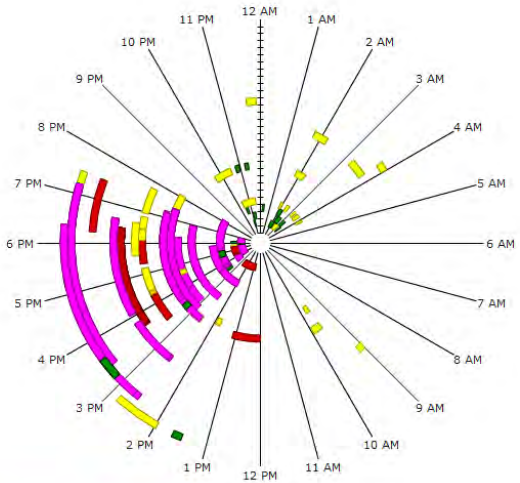
MILES 0 2 4 6 8



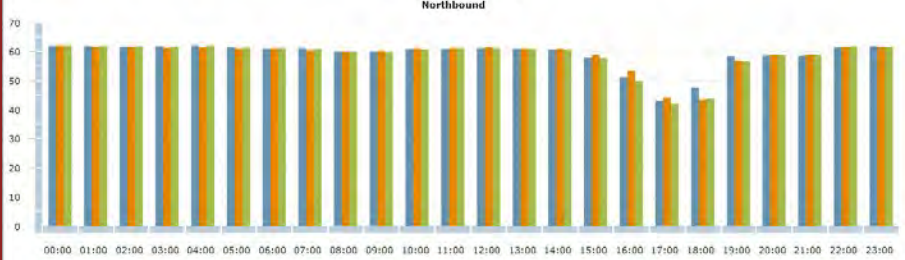
Background

- Vehicle Probe Project (VPP) Tool Suite
 - Real-time & Historic Speed Data
 - Travel Time Index
 - Travel Time Reliability metrics
 - Queue Measurements
 - Statewide bottleneck ranking
 - Corridor Congestion Charts
- VPP Growth in Use
NJ, PA, DE, MD, VA, NC, FL, GA, SC, CT, RI, MA, NH,
ME (8,000 freeway miles, 30,000 arterial miles)

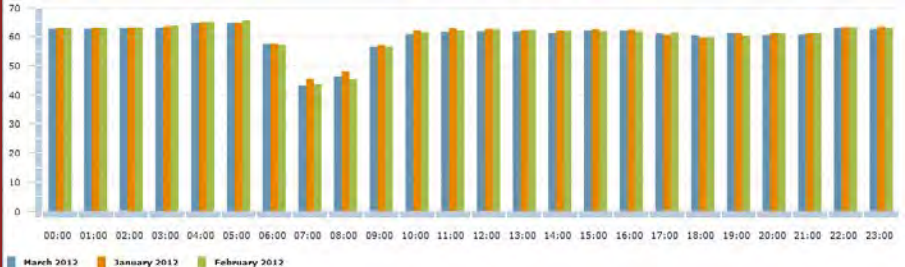
In this time spiral each trip around the circle represents a .
The center represent April 1, 2012 and the outer edge represents May 1, 2012.



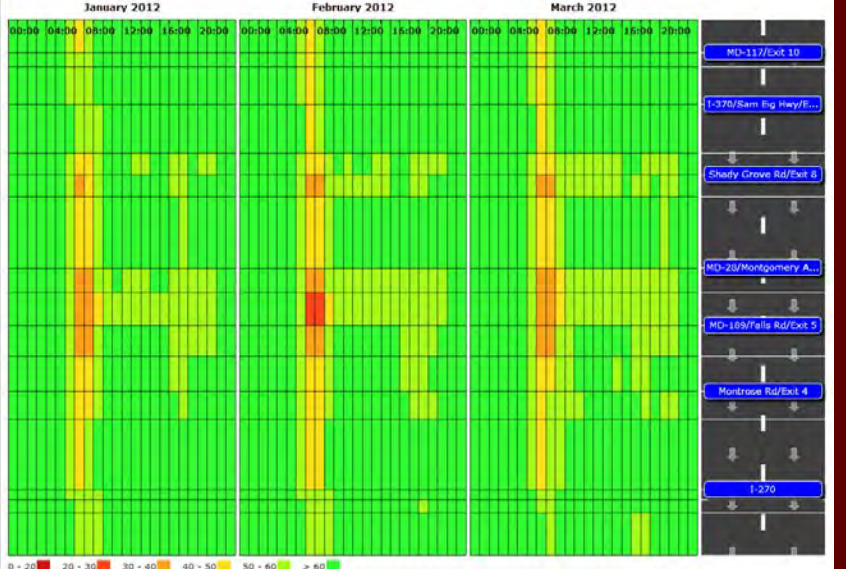
Average Speed (mph) over Hour of day for I-270 from MD-187/Old Georgetown Rd/Exit 1 to MD-117/Exit 10
Averaged for every weekday



Southbound



Average Speed for I-270 from MD-187/Old Georgetown Rd/Exit 1 to MD-117/Exit 10 - Southbound
Averaged for every weekday





MD WZ PM Project

– Phase 1- Foundational Research

- Determine **Adequacy of 3rd Party Probe Data** for Real-time and Historical Work Zone Performance
- Develop Agreed Upon **Work Zone Performance Measures**
- Develop **PROTOTYPE user interface “dashboard”**
- Conduct **meeting with potential users**
- **Validate WZ PM output** (based on 3rd party probe data) Using Bluetooth devices in 1 work zone

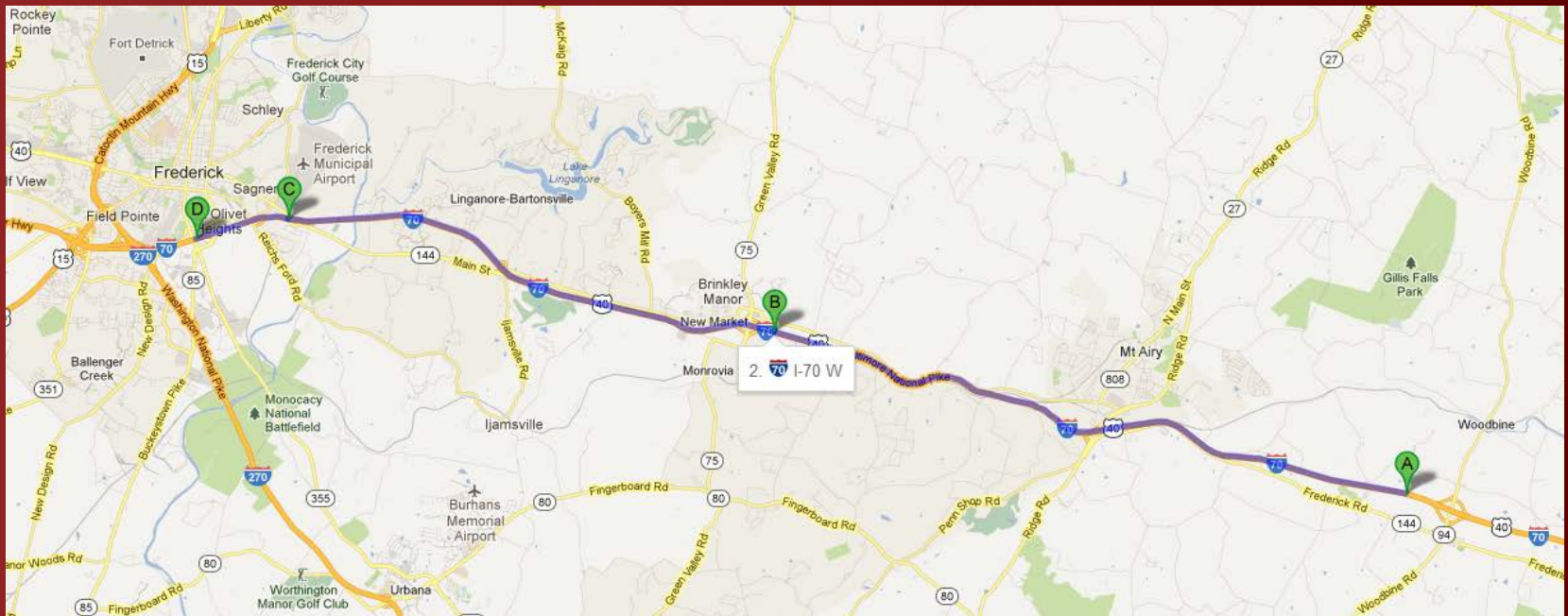
– Phase 2 – WZ PM Application Development

- **Develop functional WZ PM software application**



MD WZ PM Project

A->B: Upstream, B->C: Work Area, C->D: Downstream

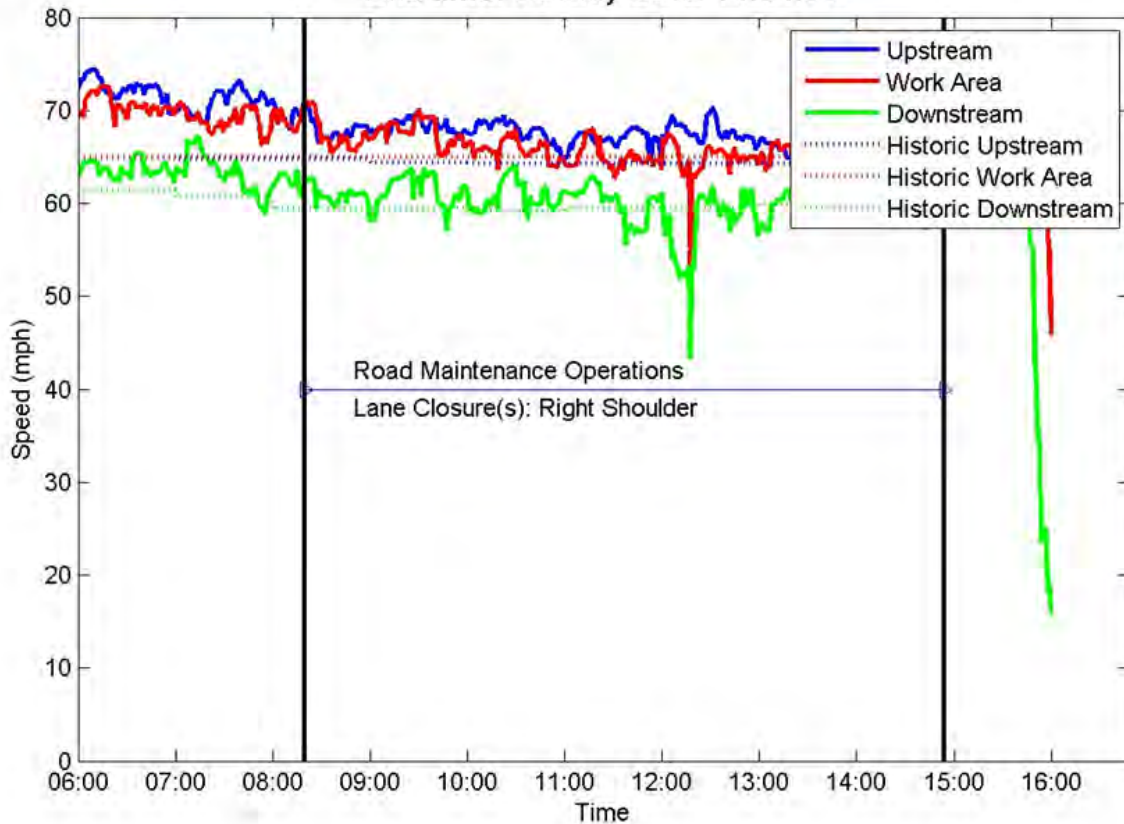


PM's: Average Delay, Maximum Delay, Queue Duration,
Average Queue Length, Max Queue Length, Percent Time
Queue Length Exceeds 1 Mile



MD WZ PM Project

Speed at Work Zone
I-70 WEST BETWEEN EXIT 62 MD 75 GREEN VALLEY RD AND LINGANORE RD
Start time: 08-May-2012 08:20:00
End time: 08-May-2012 14:54:00





Demonstration

Work Zone Management

MARYLAND 295 MD 295 Southbound near Good Luck Rd

Resurfacing

Work Permit: 1787J65
Schedule:
 March 1st - April 3rd 2012

Sun	Mon	Tue	Wed	Thu	Fri	Sat
✓	✓					✓

3PM - 7PM
Work Zone: 2 Miles
START: 295 near Good Luck Rd
END: 410 Exit

Queue Length: 5 Miles

Performance Comparison

Show Conditions for: Downstream Work Zone Upstream

Current Speed vs Historical Average Speed

Current Speed vs Historical Free Flow Speed

Southbound Northbound

Work Zone Dashboard

List			
Group by: Region Cost Duration Severity None			
Region/Event	# of events	Queue Length (miles)	UDC
▼ Maryland	120	225	\$263K
▼ Central	46	128	\$190K
▼ Baltimore	6	35	\$31K
🚧 I-695 @ Wilkens Ave		10	\$8K
🚧 I-695 @ I-70		3	\$4K
🚧 I-795 @ I-695		8	\$5K
🚧 I-83 @ Exit 24		10	\$10K
🚧 I-95 @ Rossville Blvd		3	\$1K
🚧 US-40 @ I-695		1	\$3K
▼ Baltimore City	3	20	\$18K
🚧 I-895 @ US-40		3	\$3K
🚧 I-95 @ Ft McHenry Tunnel		13	\$10K
🚧 US-1 @ MD-151		4	\$5K
▶ Carrol	5	12	\$29K
▶ Harford	7	5	\$15K
▶ Howard	10	25	\$75K
▶ Prince George's	15	31	\$22K
▶ Eastern Shore	35	40	\$50K
▶ Southern	20	22	\$23K

Top critical			
Group by: Region Cost Duration Severity None			
Severity/Event	Lane status	Queue length (miles)	UDC
Critical			
🚧 I-95 @ Ft McHenry Tunnel		10	\$10K
🚧 I-83 @ Exit 24		10	\$10K
🚧 I-695 @ Wilkens Ave		8	\$8K
Major			
🚧 I-95 @ Rossville Blvd		5	\$5K
🚧 US-40 @ I-695		3	\$4K



User delay cost by corridor and day of week					
	I-95	I-695	MD-32	US-50	Daily Totals
May 1, 2013	\$15K	\$21K	\$3K	\$3K	\$42K
May 2, 2013	\$21K	\$24K	\$15K	\$18K	\$78K
May 3, 2013	\$15K	\$18K	\$3K	\$3K	\$39K
May 4, 2013	\$9K	\$15K	\$21K	\$12K	\$57K
May 5, 2013	\$3K	\$12K	\$15K	\$18K	\$48K
Corridor Totals	\$63K	\$90K	\$57K	\$54K	Grand Total \$264K

Workzone on I-895 SOUTH/NORTH BETWEEN FRANKFURST AVE AND MD 2 RITCHEE HIGHWAY SPUR (4/5-7/5 W/LANE SHIFT NB)

Settings

Data Type...

- Measured Speeds
- Comparison to Historical Average

Show...

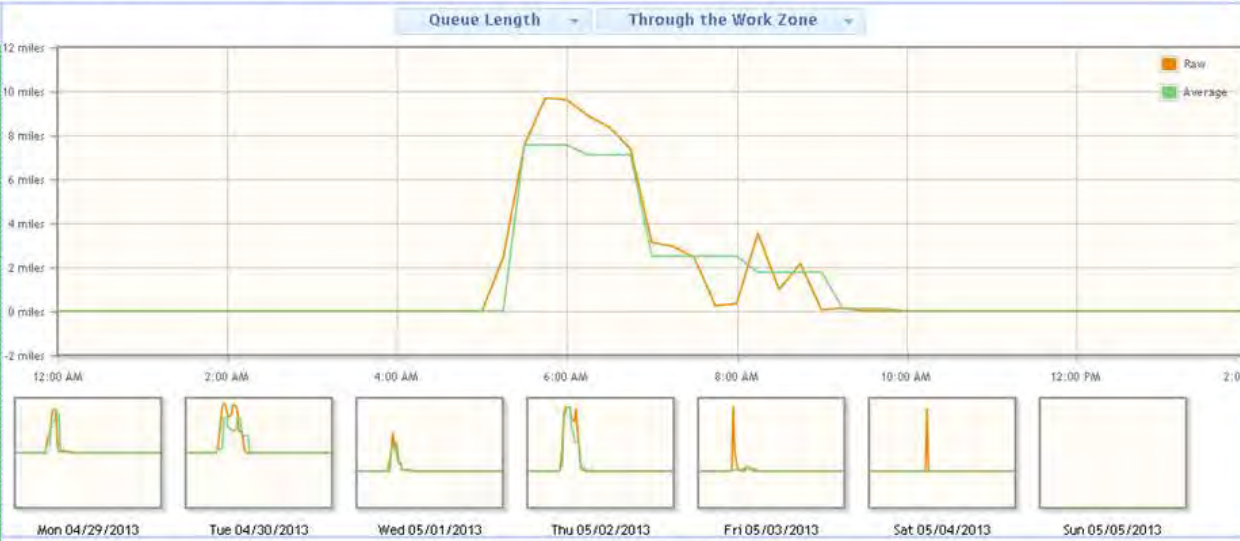
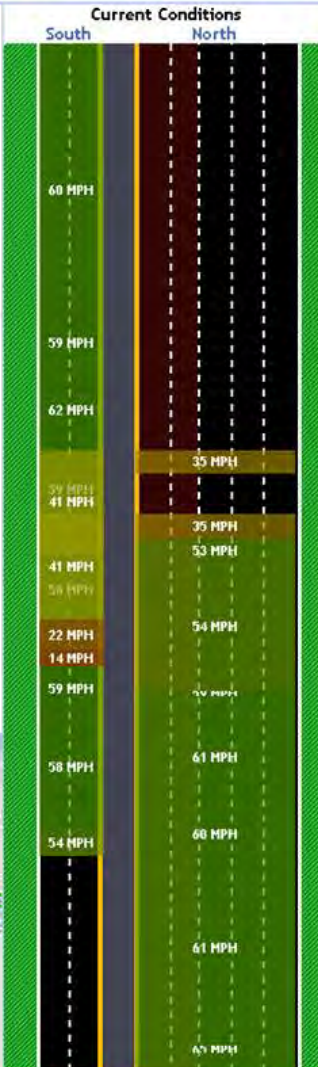
- Work Zone Bounds
- Posted Speeds
- Associated DMS
- Nearby CCTV
- Bottlenecks (when available)
- 5 miles upstream
- 5 miles downstream

Permit Information

Project Documentation

Site Details

Configure Alerts



Total User Delay Cost

	2AM - 6AM	6AM - 10AM	10AM - 2PM	2PM - 6PM	6PM - 10PM	10PM - 2AM	Daily Totals
04/29/2013	\$0.0K	\$0.0K	\$0.1K	\$0.1K	\$0.3K	\$0.1K	\$0.6K
05/01/2013	\$0.0K	\$4.8K	\$0.2K	\$0.1K	\$0.1K	\$0.0K	\$5.2K
05/02/2013	\$0.0K	\$28.3K	\$1.0K	\$0.1K	\$0.1K	\$0.1K	\$29.5K
05/03/2013	\$0.0K	\$19.3K	\$0.3K	\$0.1K	\$0.1K	\$0.1K	\$19.9K
05/04/2013	\$0.0K	\$30.5K	\$4.7K	\$0.1K	\$0.1K	\$0.1K	\$35.5K
05/05/2013	\$0.0K	\$10.9K	\$0.4K	\$0.1K	\$0.1K	\$0.1K	\$11.6K
05/06/2013	\$0.0K	\$0.0K	\$0.1K	\$0.2K	\$0.1K	\$0.1K	\$0.6K
Hourly Totals	\$0.1K	\$84.9K	\$6.8K	\$0.8K	\$0.8K	\$0.6K	Grand Total: \$94.0K





Custom Alerts

Create a notification for this work zone

When would you like to be notified?

When an accident happens near this work zone
Within mile upstream or mile downstream

When there is a bottleneck that's head or queue include this work zone
Keep the formula for determining bottleneck conditions in mind

When speeds in the work zone reach a certain threshold

When speeds fall below mph

When speeds rise above mph

How would you like to be notified?

Send me an email
We'll send an email to *tjacobs@umd.edu*

Send me a text message
Enter your phone number



























Display the alert on screen
Be sure to keep at RITIS open in your browser.

FDOT data is temporarily unavailable.

Welcome Michael VanDaniker!

Applied Filters: Data Source is equal to MDOT_CHART, Incident Type is equal to roadwork.

Showing: 1 - 8 (of 8 incidents)

Source	Location	Type	Updated ↑	Lane Status	Start Time/Description
MDOT_CHART	 MD 100 WEST AT EXIT 13 I 97	 Road Maintenance Operations	5/5/2013 11:13 AM	West:  East: 	5/5/2013 7:43 AM
MDOT_CHART	 MD 213 WEST AT I-95	 Road Maintenance Operations	5/5/2013 11:13 AM	West:  East: 	5/2/2013 4:31 PM <ul style="list-style-type: none"> JIM PRICE 443-435-6075 P. E. WILLIAM SCHNIEDER 443-790-8126 Display More
MDOT_CHART	 I-895 NORTH RAMP FROM POTEE ST (LONG-TERM CONTINUOUS)	 Road Maintenance Operations	5/5/2013 11:13 AM	South:  North: 	4/5/2013 9:54 PM
MDOT_CHART	 I-895 SOUTH EXIT 6 PRIOR TO I 97 (LONG-TERM & CONTINUOUS)	 Road Maintenance Operations	5/5/2013 11:13 AM	South:  North: 	5/2/2013 8:47 AM
MDOT_CHART	 I-895 SOUTH/NORTH BETWEEN FRANKFURST AVE AND MD 2 RITCHIE HIGHWAY SPUR (4/5-7/5 W/LANE SHIFT NB)	 Road Maintenance Operations	5/5/2013 11:13 AM	South:  North: 	4/6/2013 3:05 AM
MDOT_CHART	 I-95 SOUTH PAST EXIT 80 MD 543(PERMANENT SHOULDER CLOSURE)	 Road Maintenance Operations	5/5/2013 11:13 AM	South:  North: 	11/27/2012 9:45 AM LONG TERM CLOSURE
MDOT_CHART	 I-895 NORTH RITCHIE SPUR PAST RAMP TO I-695 TOWSON (LONG TERM & CONTINUOUS THRU 5/01/13)	 Road Maintenance Operations	5/5/2013 11:13 AM	South:  North: 	12/18/2012 5:11 PM
MDOT_CHART	 I-95 NORTH PAST EXIT 74 MD 152 MOUNTAIN RD(PERMANENT SHOULDER CLOSURE)	 Road Maintenance Operations	5/5/2013 11:13 AM	South:  North: 	11/27/2012 9:49 AM