

Clarus & RITIS

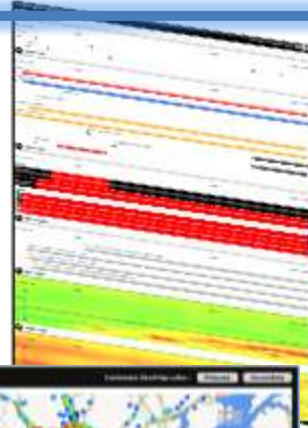
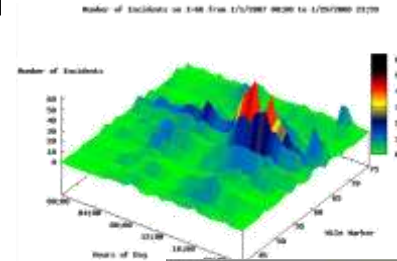
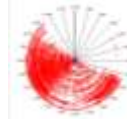
Integrating & analyzing
Clarus data with other
transportation data sets.

Michael L. Pack, University of Maryland
CATT Laboratory



The Regional Integrated Transportation Information System (RITIS)

- Fusing, Disseminating, & Archiving Transportation Data from Six States
- Situational Awareness
- Performance Measures & Visual Analytics Tools



Presentation



Researchers



Media/3rd Parties



Travel Info



Travelers

Integration



Data



Traffic



Events



Parking



Weather



Signals



CAD



Transit

Real-time Data

Users Include:

- DOTs
- Transit Providers
- Metropolitan Planning Organizations
- Emergency Management Agencies
- FEMA
- US Army, Air Force, & NorthCom
- U.S. Secret Service
- U.S. Capitol & Park Police
- Fire & Rescue
- Law Enforcement
- NSA
- US Office of Personnel Management
- 3rd Party Trav Info Providers
- University Researchers

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RITIS Components

- Three main components

1. Real-time data feeds

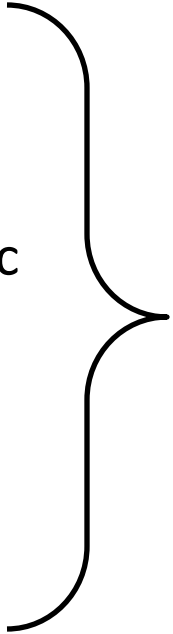
- For integrating RITIS data into your own system

2. Real-time web site

- For those who don't have their own systems
- For those who don't want to integrate
- Will be modified for the media and the public

3. Data Archive

- Performance Measures
- Analysis and Studies
- After Action Reviews



Our focus
for today

Our REAL Challenge

- Our Challenge: Make ALL of this data easily accessible, usable, and understandable to end users and ITS applications...
- Our “Design Mantra”
 - Towards no user manuals...
 - Visually pleasing...
 - Web accessible...
 - Useful!!!
 - Afford freedom to explore...
 - Overview, Zoom, Details on Demand

RITIS Website



Welcome packml@umd.edu! (Logout)

Transportation System Status

Address Book

Data Archive

Performance Measures

User Settings

Incident List

Traffic Map

RSS Incident Feed

Add Filter...



Interactive RITIS Website



Welcome packml@umd.edu! ([Logout](#))

[Transportation System Status](#)

[Address Book](#)

[Data Archive](#)

[Performance Measures](#)

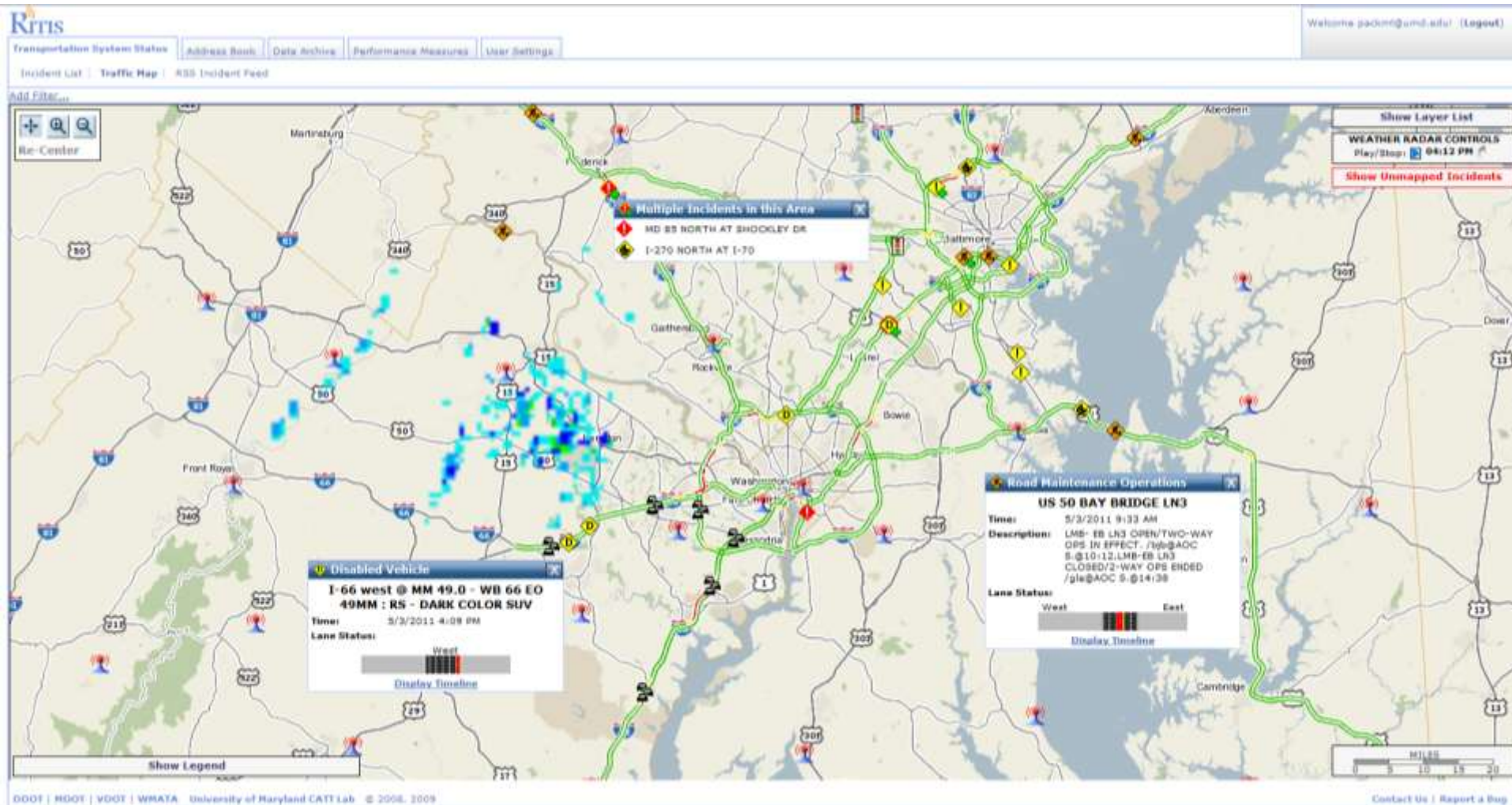
[User Settings](#)

[Incident List](#) | [Traffic Map](#) | [RSS Incident Feed](#)

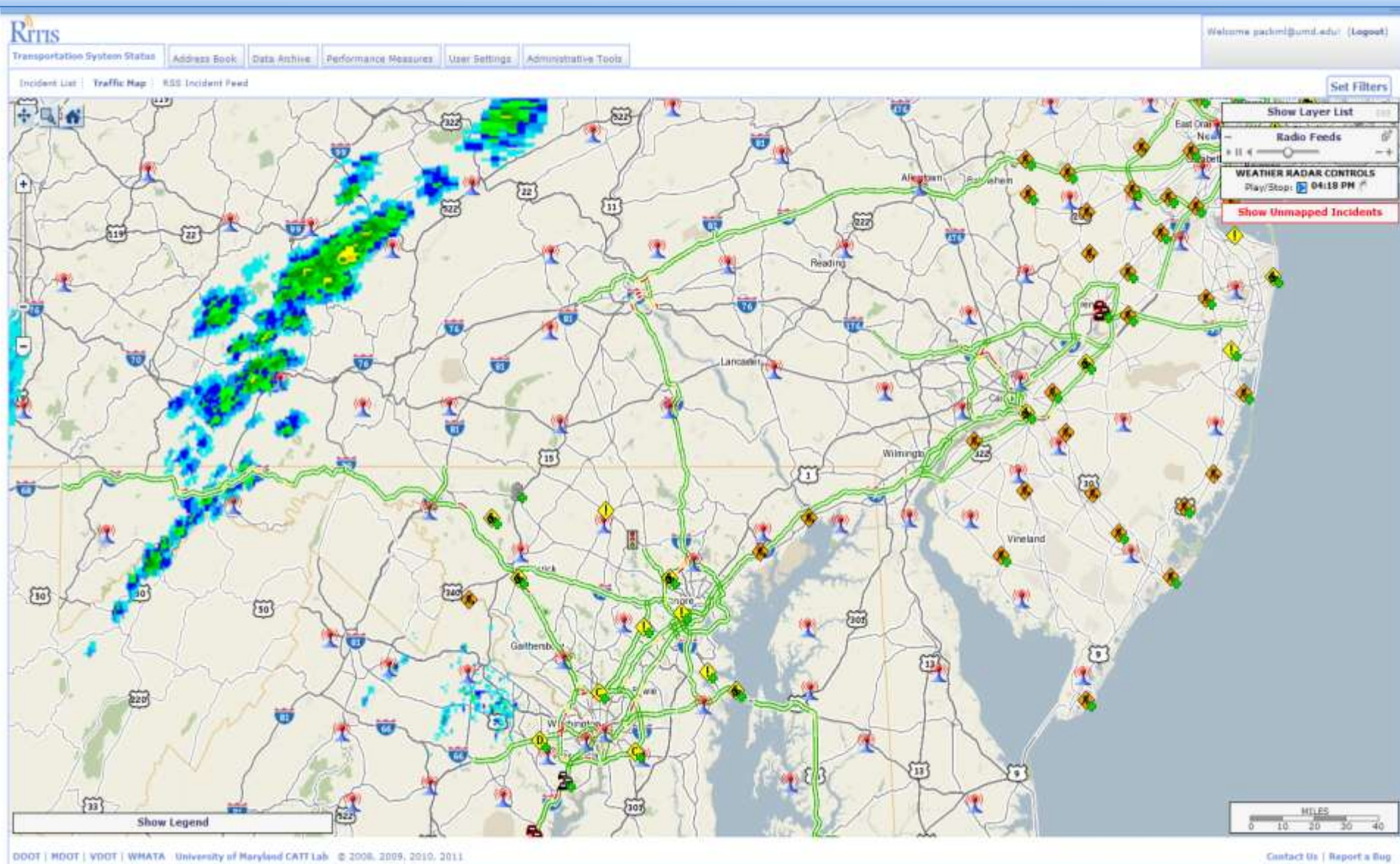
Add Filter...

Source	Location	Type	Updated	Lane Status	Start Time/Description	Timeline
MDOT_CHART (new)	I-95 SOUTH PAST EXIT 50 M.M. 49.6	Disabled Vehicle	10/13/2010 8:45 AM	-	10/13/2010 8:31 AM 2 responder(s) on the scene.	Display
MDOT_CHART (new)	I-95 SOUTH AT TOLL LANE 24	Disabled Vehicle	10/13/2010 8:44 AM		10/13/2010 8:43 AM 1 responder(s) on the scene. 1 vehide(s) involved.	Display
MDOT_CHART (new)	I-95 SOUTH AT MP 55.7 (TOLL PLAZA) LANE 21	Injury Accident	10/13/2010 8:42 AM		10/13/2010 8:01 AM 3 responder(s) on the scene. 2 vehide(s) involved. FMT SB TOLL PLAZA LANE 21 BLOCKED FOR 10-50PD /LF@AOC C.@08:03,FMT SB TOLL PLAZA LANE 21 BLOCKED FOR 10-50PD/FACILITY DAMAGE... Display More	Display
MDOT_CHART (new)	US 15 NORTH AT US 40	Injury Accident	10/13/2010 8:42 AM	-	10/13/2010 8:45 AM	Display
MDOT_CHART (new)	I-95 SOUTH PRIOR TO EXIT 64	Traffic Congestion	10/13/2010 8:42 AM	-	10/13/2010 6:49 AM	Display
VDOT_NOVA (new)	I-95 south @ MM 163.0 - SB 95 AT EXIT 163 LORTON : SDN VS TOW TK	Accident	10/13/2010 8:40 AM		10/13/2010 8:38 AM	Display
MDOT_CHART (new)	I-695 OUTER LOOP AT WILKENS AVE	Disabled Vehicle	10/13/2010 8:40 AM	-	10/13/2010 8:39 AM 1 responder(s) on the scene.	Display
VDOT_NOVA (new)	I-66 west @ MM 57.1 - WB 66 AT MONUMENT	Disabled Vehicle	10/13/2010 8:38 AM		10/13/2010 8:26 AM	Display

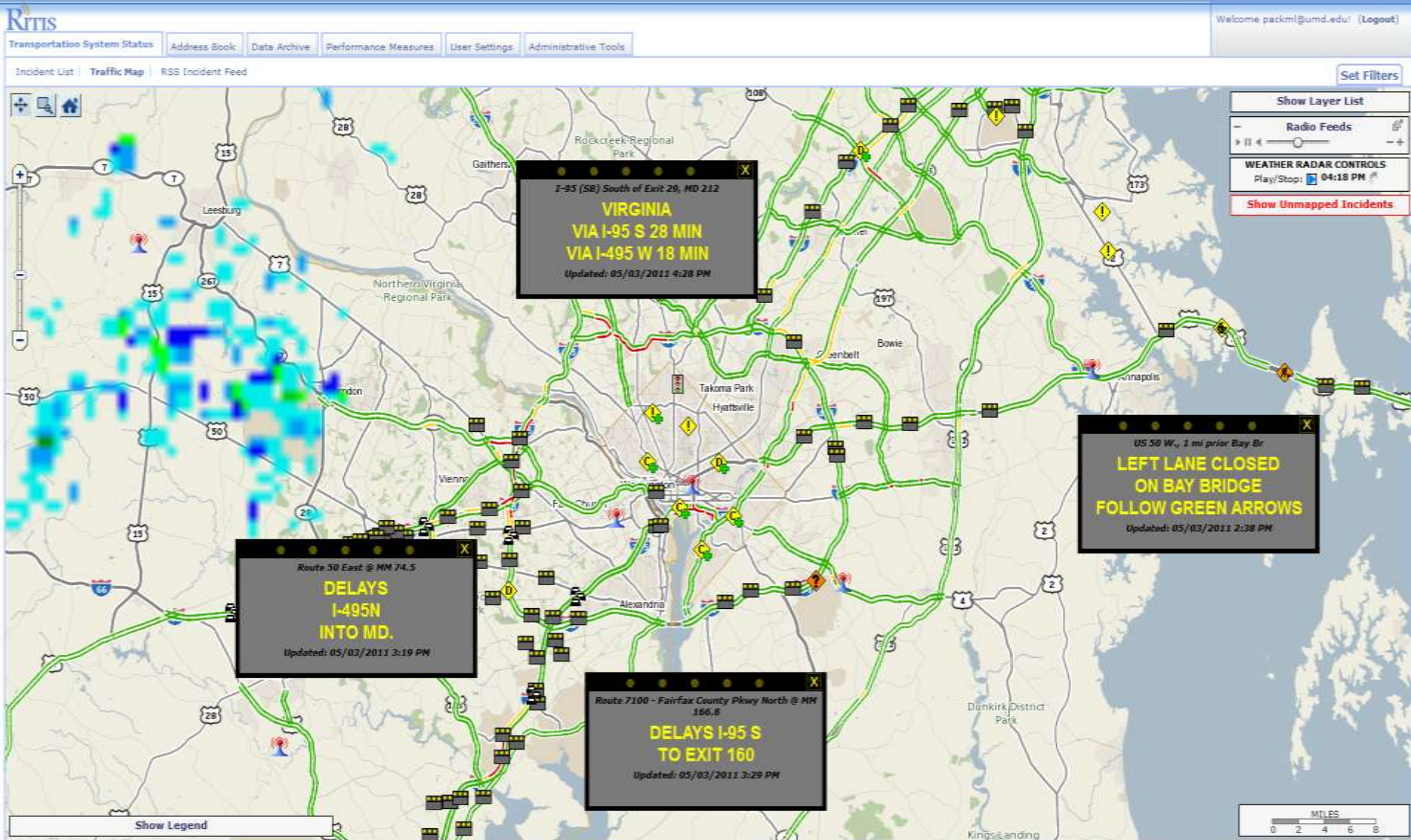
Interactive RITIS Website



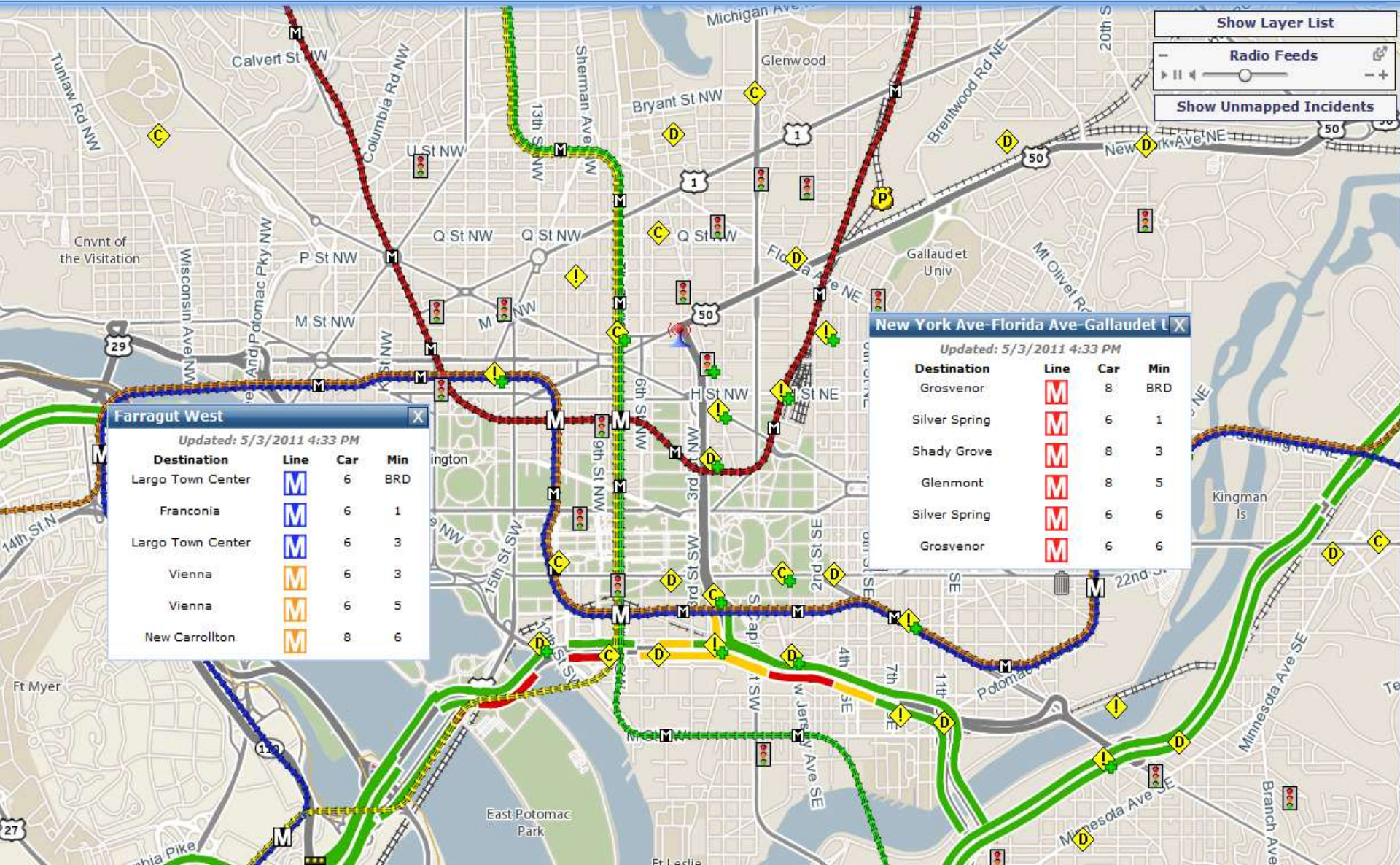
Weather Radar & NWS Alerts



Dynamic Message Signs & other Devices



Transit (Bus & Rail)



Show Layer List

Radio Feeds

Show Unmapped Incidents

Farragut West

Updated: 5/3/2011 4:33 PM

Destination	Line	Car	Min
Largo Town Center	M	6	BRD
Franconia	M	6	1
Largo Town Center	M	6	3
Vienna	M	6	3
Vienna	M	6	5
New Carrollton	M	8	6

New York Ave-Florida Ave-Gallaudet U

Updated: 5/3/2011 4:33 PM

Destination	Line	Car	Min
Grosvenor	M	8	BRD
Silver Spring	M	6	1
Shady Grove	M	8	3
Glenmont	M	8	5
Silver Spring	M	6	6
Grosvenor	M	6	6

CCTV Personal Video Wall



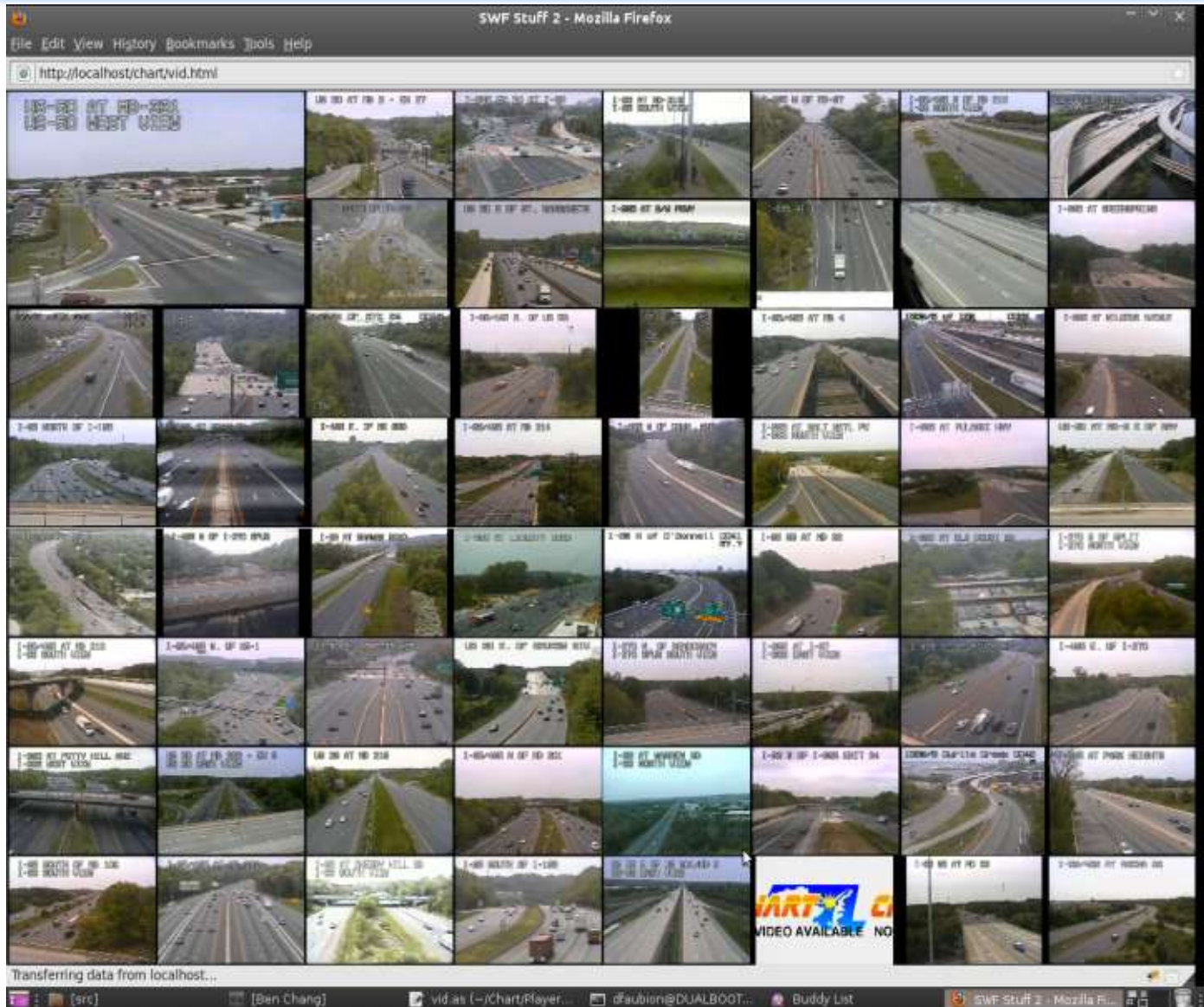
CCTV Personal Video Wall



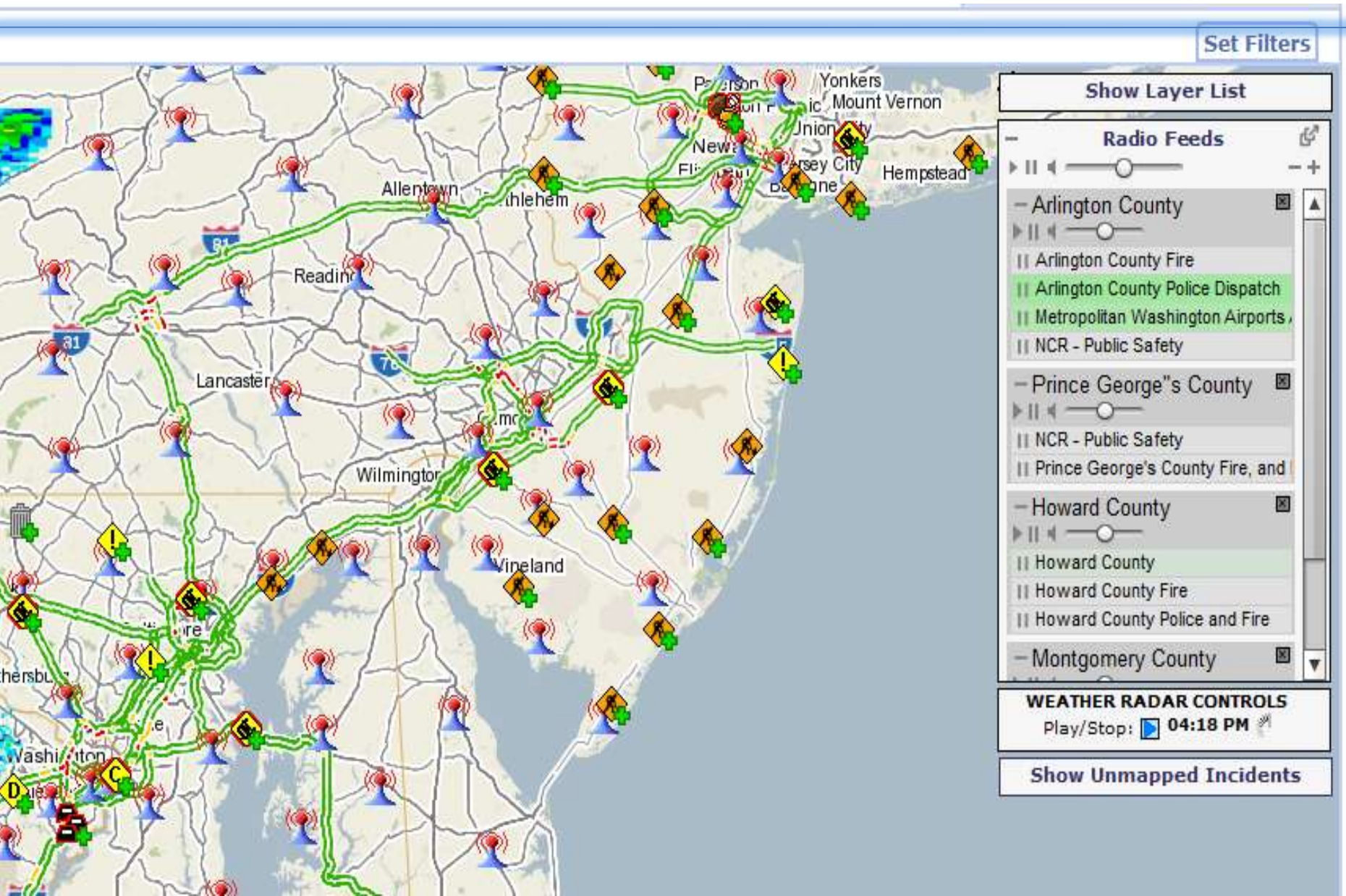
CCTV Personal Video Wall



CCTV Personal Video Wall



Police, Fire, EMS, & Other Radio Feeds



The screenshot displays a software interface for monitoring radio feeds. The main area is a map of the Washington D.C. metropolitan area, showing major roads like I-495 and I-270. The map is populated with numerous icons: blue radio tower symbols, yellow diamond-shaped hazard icons, and green plus signs. A network of green lines connects various points across the map, likely representing radio signal paths or network connections.

On the right side, there is a control panel with the following sections:

- Set Filters** (button)
- Show Layer List** (button)
- Radio Feeds** (section header)
 - Volume control slider and play/pause buttons.
 - Arlington County** (expanded)
 - Arlington County Fire
 - Arlington County Police Dispatch (highlighted)
 - Metropolitan Washington Airports
 - NCR - Public Safety
 - Prince George's County** (expanded)
 - NCR - Public Safety
 - Prince George's County Fire, and
 - Howard County** (expanded)
 - Howard County
 - Howard County Fire
 - Howard County Police and Fire
 - Montgomery County** (collapsed)
- WEATHER RADAR CONTROLS** (section header)
 - Play/Stop: 04:18 PM
- Show Unmapped Incidents** (button)

Other Features

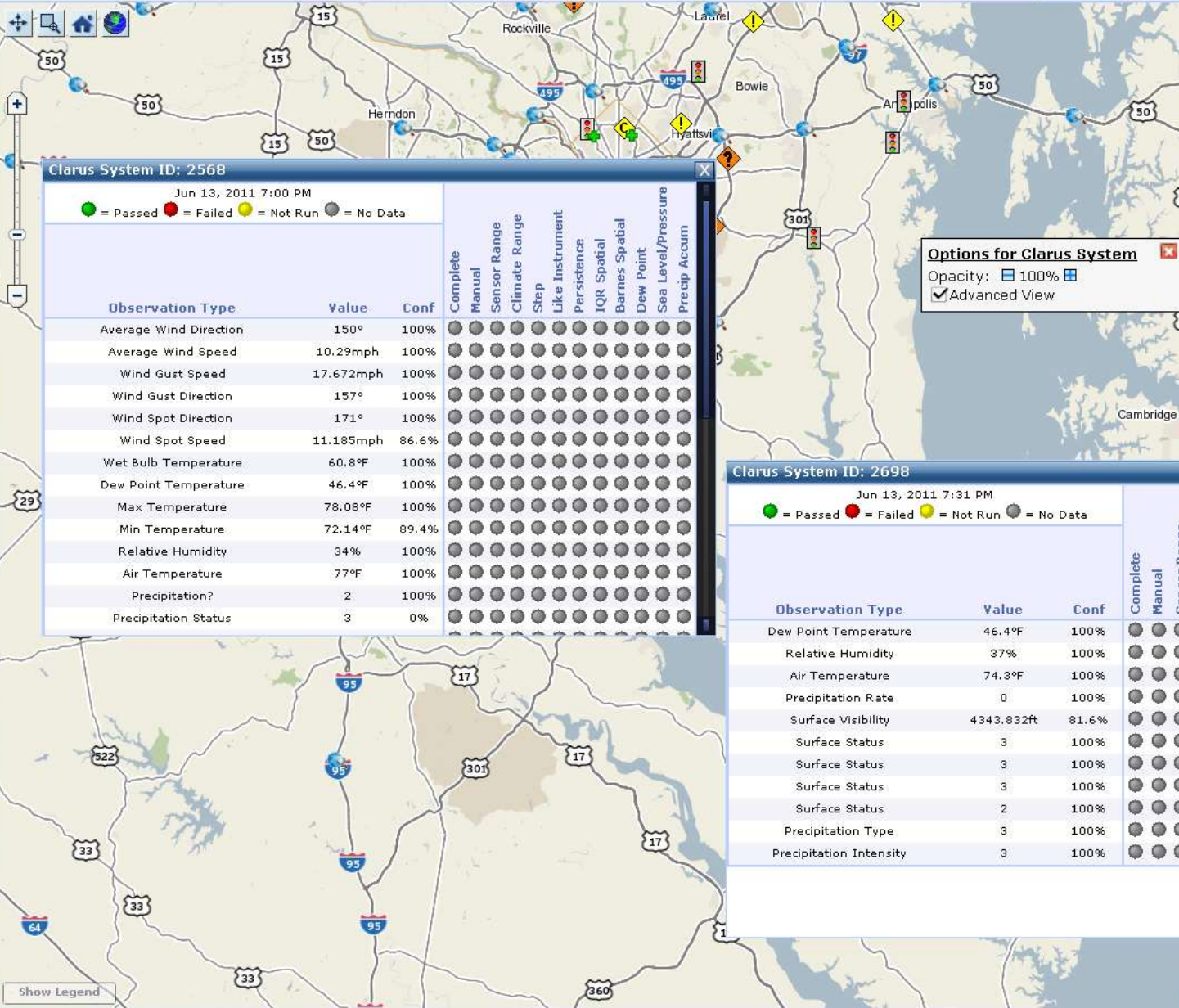
- Agency Emergency Contacts
- FITM Plans
- Evacuation Routes
- Detector Data Trends
- Comparative Speeds
- Queues



Adding the Clarus Data

Latest Progress

- ALL Clarus data integrated into RITIS
- Building applications for various user groups:
 - Real-time
 - Ops
 - Power Users
 - Travelers
 - Archive
 - Researchers
 - Planners
 - Etc.



Clarus System ID: 2568
 Jun 13, 2011 7:00 PM
 ● = Passed ● = Failed ● = Not Run ● = No Data

Observation Type	Value	Conf	Complete	Manual	Sensor Range	Climate Range	Step	Like Instrument	Persistence	IQR Spatial	Barnes Spatial	Dew Point	Sea Level/Pressure	Precip Accum
Average Wind Direction	150°	100%	●	●	●	●	●	●	●	●	●	●	●	●
Average Wind Speed	10.29mph	100%	●	●	●	●	●	●	●	●	●	●	●	●
Wind Gust Speed	17.672mph	100%	●	●	●	●	●	●	●	●	●	●	●	●
Wind Gust Direction	157°	100%	●	●	●	●	●	●	●	●	●	●	●	●
Wind Spot Direction	171°	100%	●	●	●	●	●	●	●	●	●	●	●	●
Wind Spot Speed	11.185mph	86.6%	●	●	●	●	●	●	●	●	●	●	●	●
Wet Bulb Temperature	60.8°F	100%	●	●	●	●	●	●	●	●	●	●	●	●
Dew Point Temperature	46.4°F	100%	●	●	●	●	●	●	●	●	●	●	●	●
Max Temperature	78.08°F	100%	●	●	●	●	●	●	●	●	●	●	●	●
Min Temperature	72.14°F	89.4%	●	●	●	●	●	●	●	●	●	●	●	●
Relative Humidity	34%	100%	●	●	●	●	●	●	●	●	●	●	●	●
Air Temperature	77°F	100%	●	●	●	●	●	●	●	●	●	●	●	●
Precipitation?	2	100%	●	●	●	●	●	●	●	●	●	●	●	●
Precipitation Status	3	0%	●	●	●	●	●	●	●	●	●	●	●	●

Options for Clarus System

Opacity: 100%

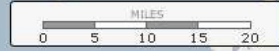
Advanced View

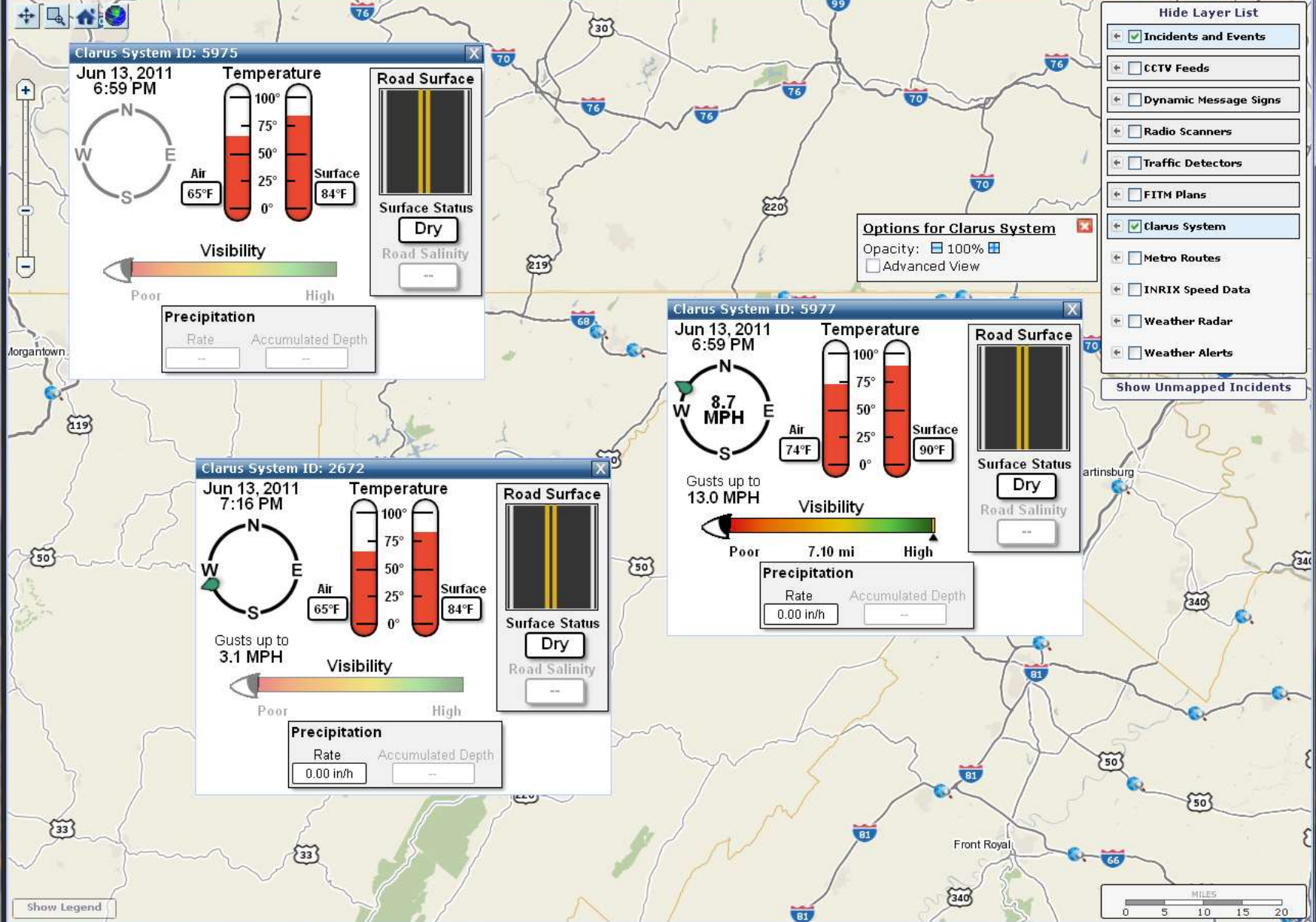
- Hide Layer List**
- Incidents and Events
 - CCTV Feeds
 - Dynamic Message Signs
 - Radio Scanners
 - Traffic Detectors
 - FITM Plans
 - Clarus System
 - Metro Routes
 - INRIX Speed Data
 - Weather Radar
 - Weather Alerts

Show Unmapped Incidents

Clarus System ID: 2698
 Jun 13, 2011 7:31 PM
 ● = Passed ● = Failed ● = Not Run ● = No Data

Observation Type	Value	Conf	Complete	Manual	Sensor Range	Climate Range	Step	Like Instrument	Persistence	IQR Spatial	Barnes Spatial	Dew Point	Sea Level/Pressure	Precip Accum
Dew Point Temperature	46.4°F	100%	●	●	●	●	●	●	●	●	●	●	●	●
Relative Humidity	37%	100%	●	●	●	●	●	●	●	●	●	●	●	●
Air Temperature	74.3°F	100%	●	●	●	●	●	●	●	●	●	●	●	●
Precipitation Rate	0	100%	●	●	●	●	●	●	●	●	●	●	●	●
Surface Visibility	4343.832ft	81.6%	●	●	●	●	●	●	●	●	●	●	●	●
Surface Status	3	100%	●	●	●	●	●	●	●	●	●	●	●	●
Surface Status	3	100%	●	●	●	●	●	●	●	●	●	●	●	●
Surface Status	3	100%	●	●	●	●	●	●	●	●	●	●	●	●
Surface Status	2	100%	●	●	●	●	●	●	●	●	●	●	●	●
Precipitation Type	3	100%	●	●	●	●	●	●	●	●	●	●	●	●
Precipitation Intensity	3	100%	●	●	●	●	●	●	●	●	●	●	●	●





Clarus System ID: 5975

Jun 13, 2011 6:59 PM

Temperature

Air 65°F Surface 84°F

Road Surface

Surface Status: Dry

Road Salinity: --

Visibility

Poor High

Precipitation

Rate: -- Accumulated Depth: --

Clarus System ID: 5977

Jun 13, 2011 6:59 PM

Temperature

Air 74°F Surface 90°F

Road Surface

Surface Status: Dry

Road Salinity: --

Visibility

Poor High 7.10 mi

Precipitation

Rate: 0.00 in/h Accumulated Depth: --

Gusts up to 13.0 MPH

Clarus System ID: 2672

Jun 13, 2011 7:16 PM

Temperature

Air 65°F Surface 84°F

Road Surface

Surface Status: Dry

Road Salinity: --

Visibility

Poor High

Precipitation

Rate: 0.00 in/h Accumulated Depth: --

Gusts up to 3.1 MPH

Options for Clarus System

Opacity: 100%

Advanced View

Hide Layer List

- Incidents and Events
- CCTV Feeds
- Dynamic Message Signs
- Radio Scanners
- Traffic Detectors
- FITM Plans
- Clarus System
- Metro Routes
- INRIX Speed Data
- Weather Radar
- Weather Alerts

Show Unmapped Incidents



= Low Visibility



= Slippery/Icy



= High Winds

RITIS

Welcome packml@umd.edu! (Logout)

Transportation System Status | Address Book | Data Archive | User Settings | Administrative Tools

Incident List | **Traffic Map** | RSS Incident Feed

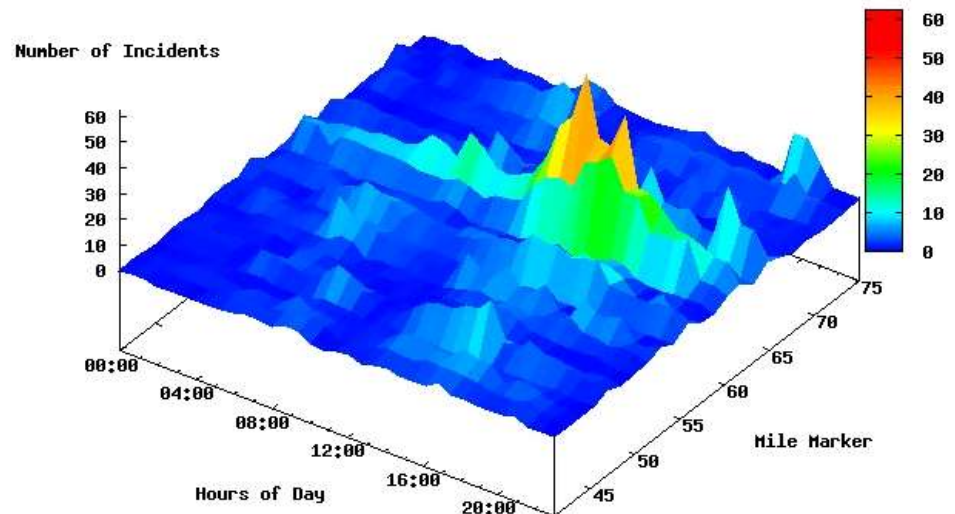
Set Filters



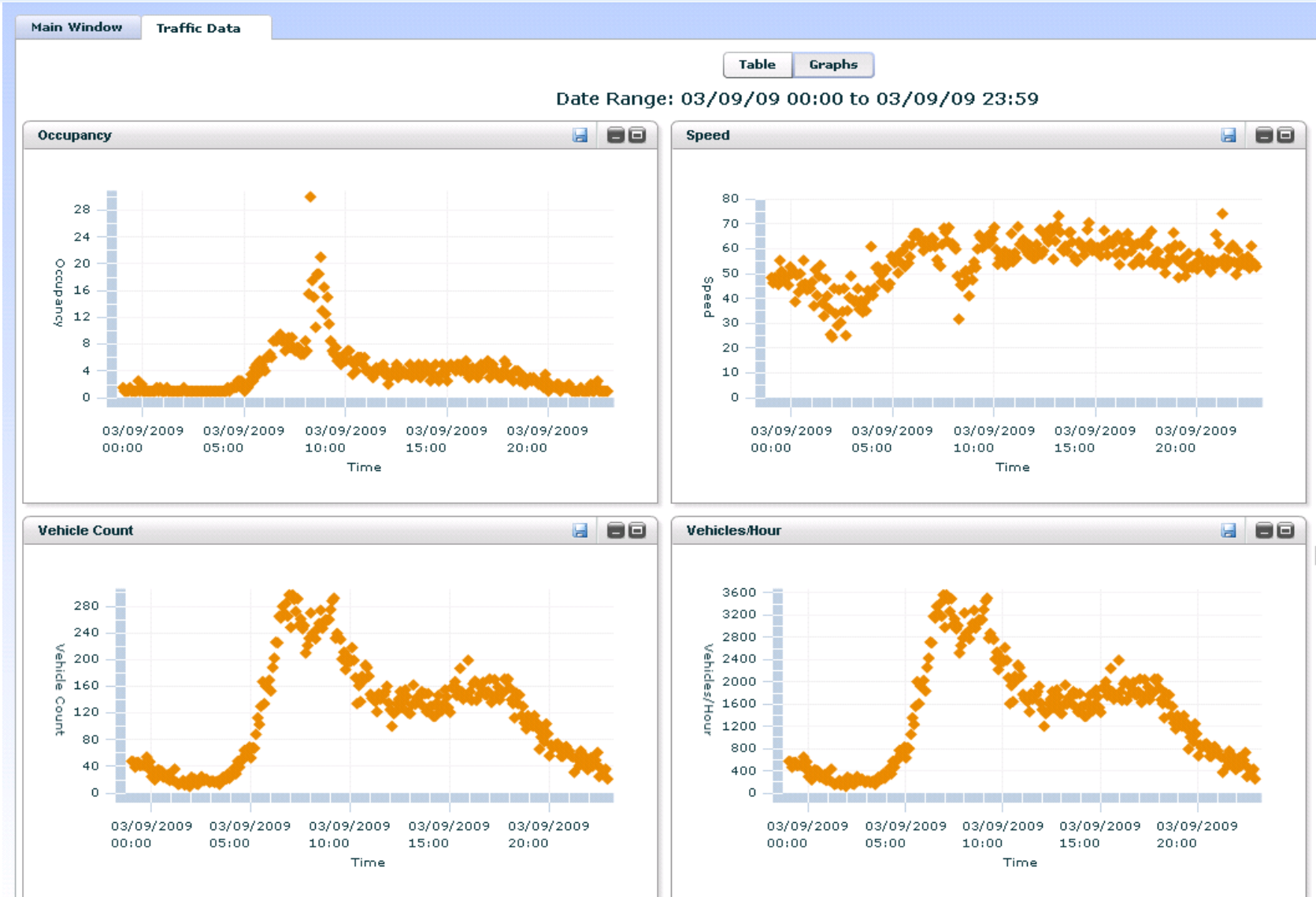
Historical Data

- Performance Measures
- After Action Reviews
- Planning & Operations Research
- Safety Analysis
- Cost/Benefit Analysis

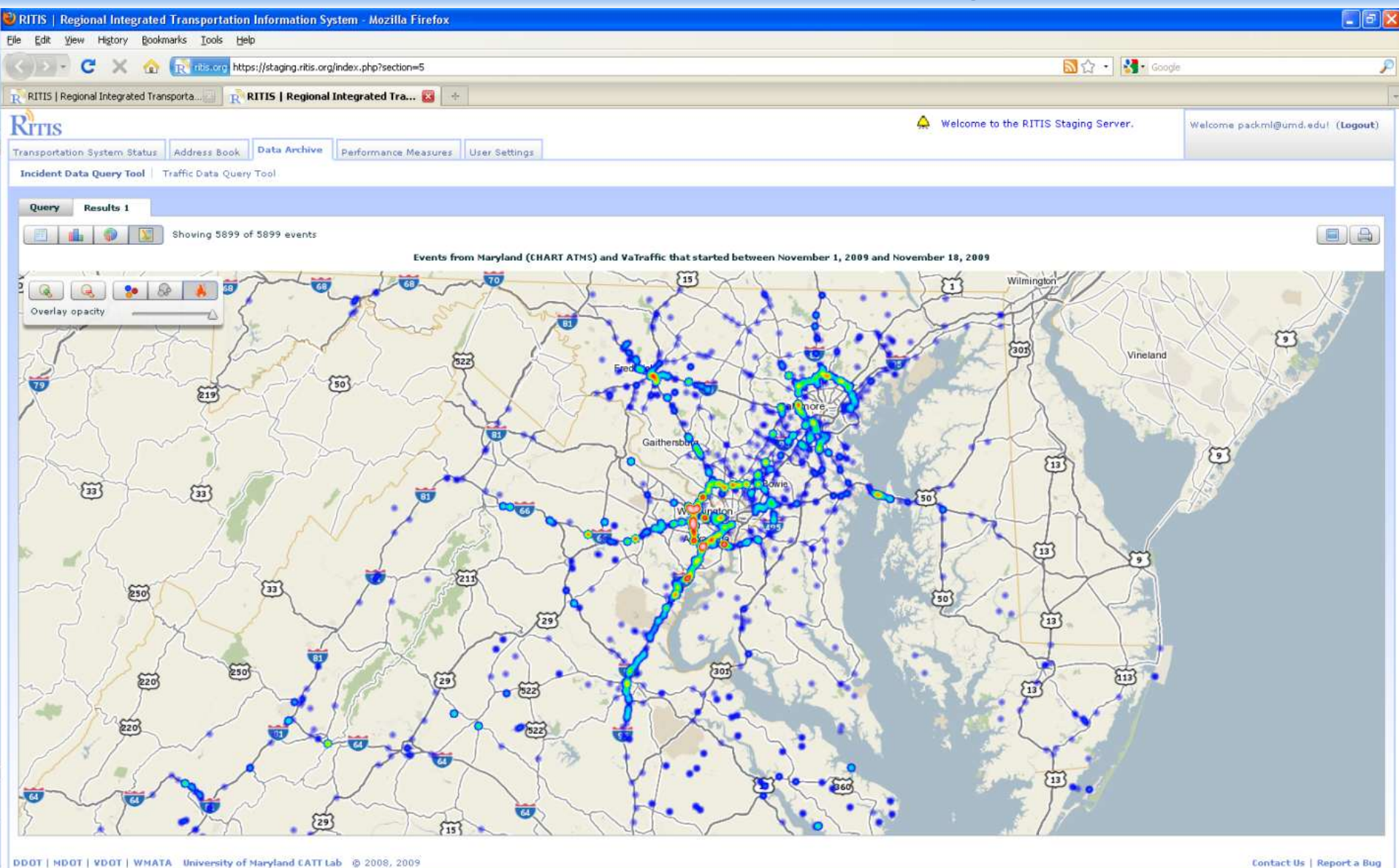
Number of Incidents on I-66 from 3/1/2007 00:00 to 3/10/2009 23:59



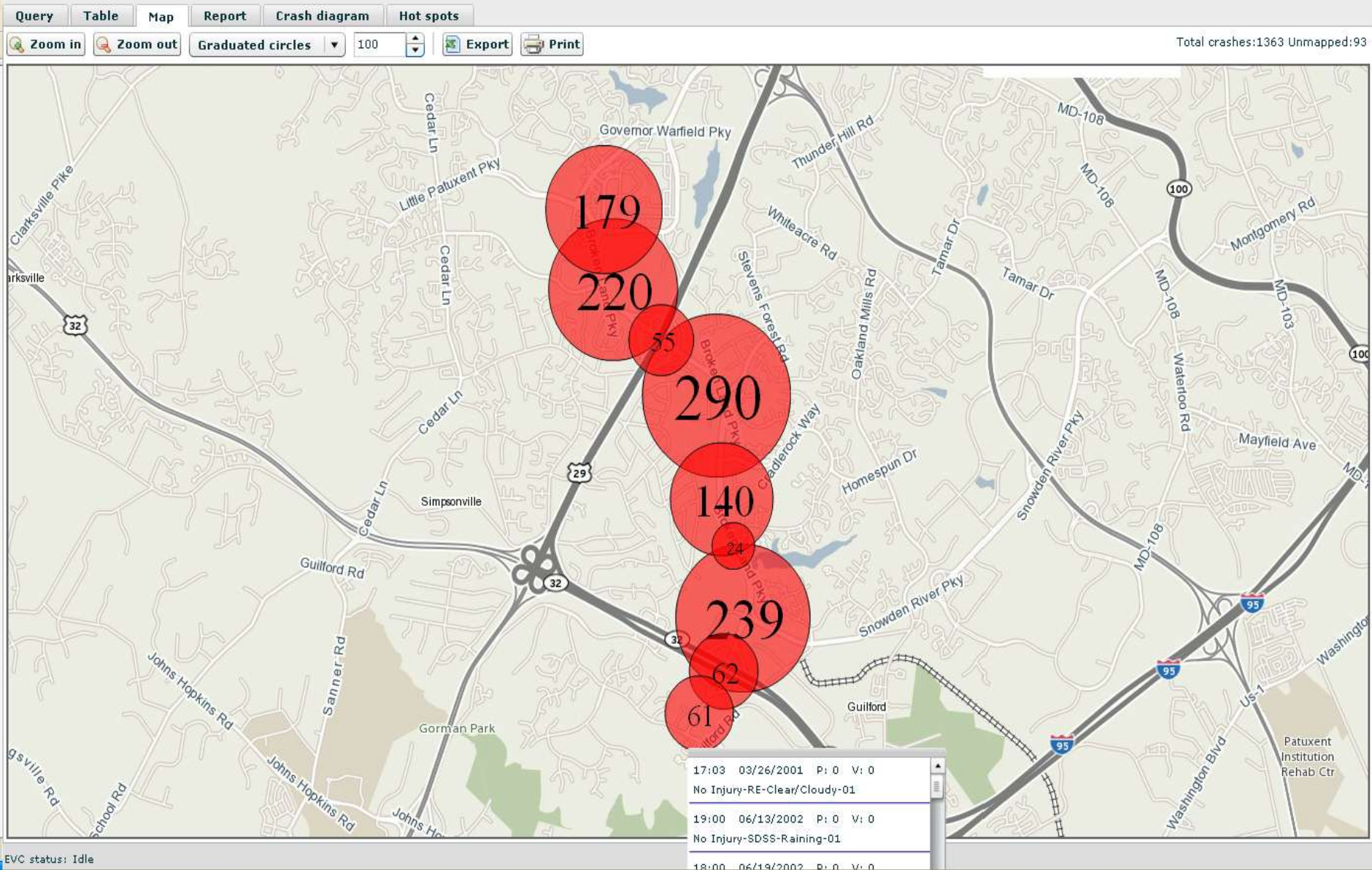
Detector Data Analysis



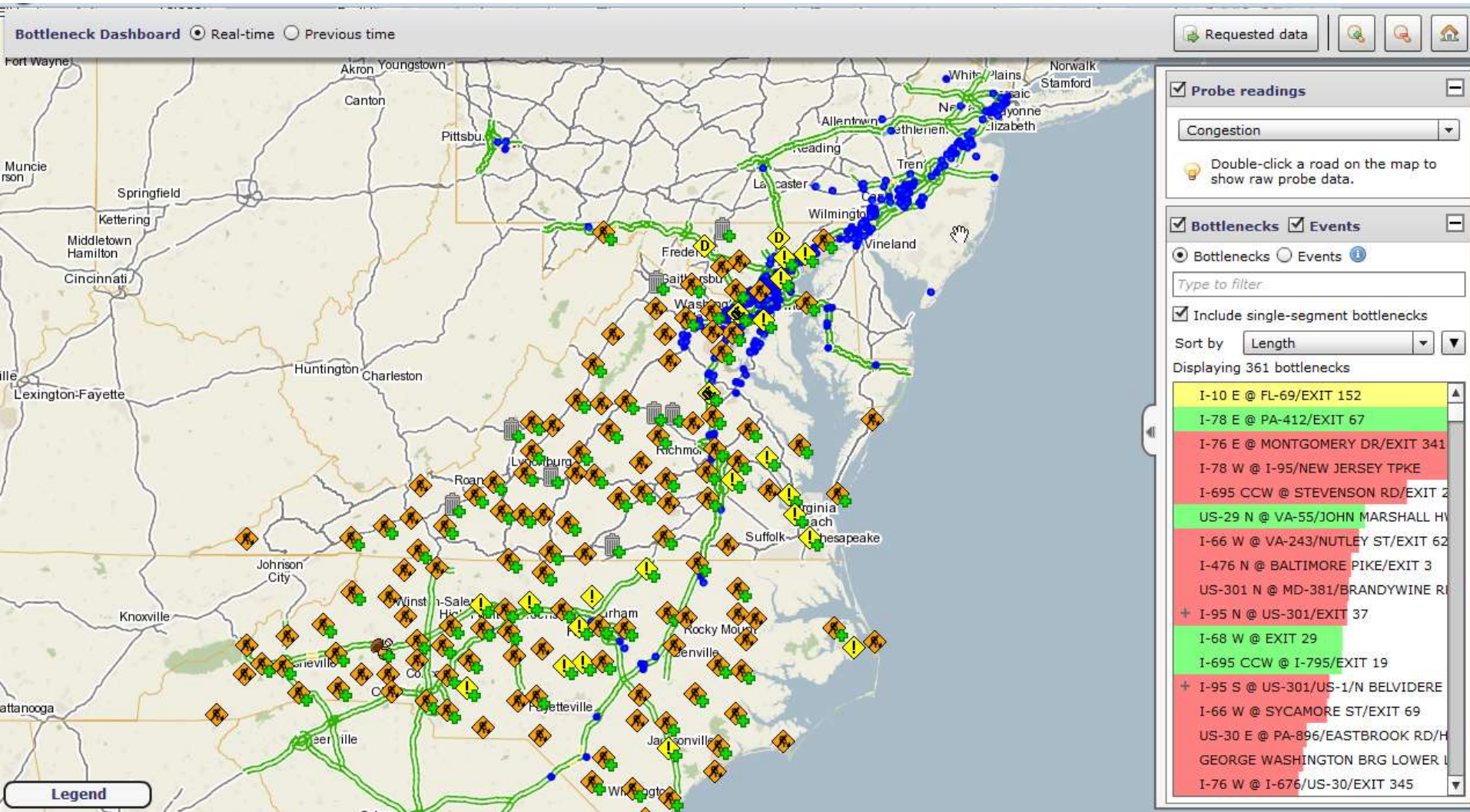
Incident Heat Maps



Corridor Incident Locations



Bottleneck Analysis



Some examples: Congestion Scan

I-495

Beginning at: EXIT 27
Ending at: VA-123/CHAIN BRIDGE RD/EXIT 11

Thursday, Mar 12, 2009 (15 minute intervals)

Show Incidents

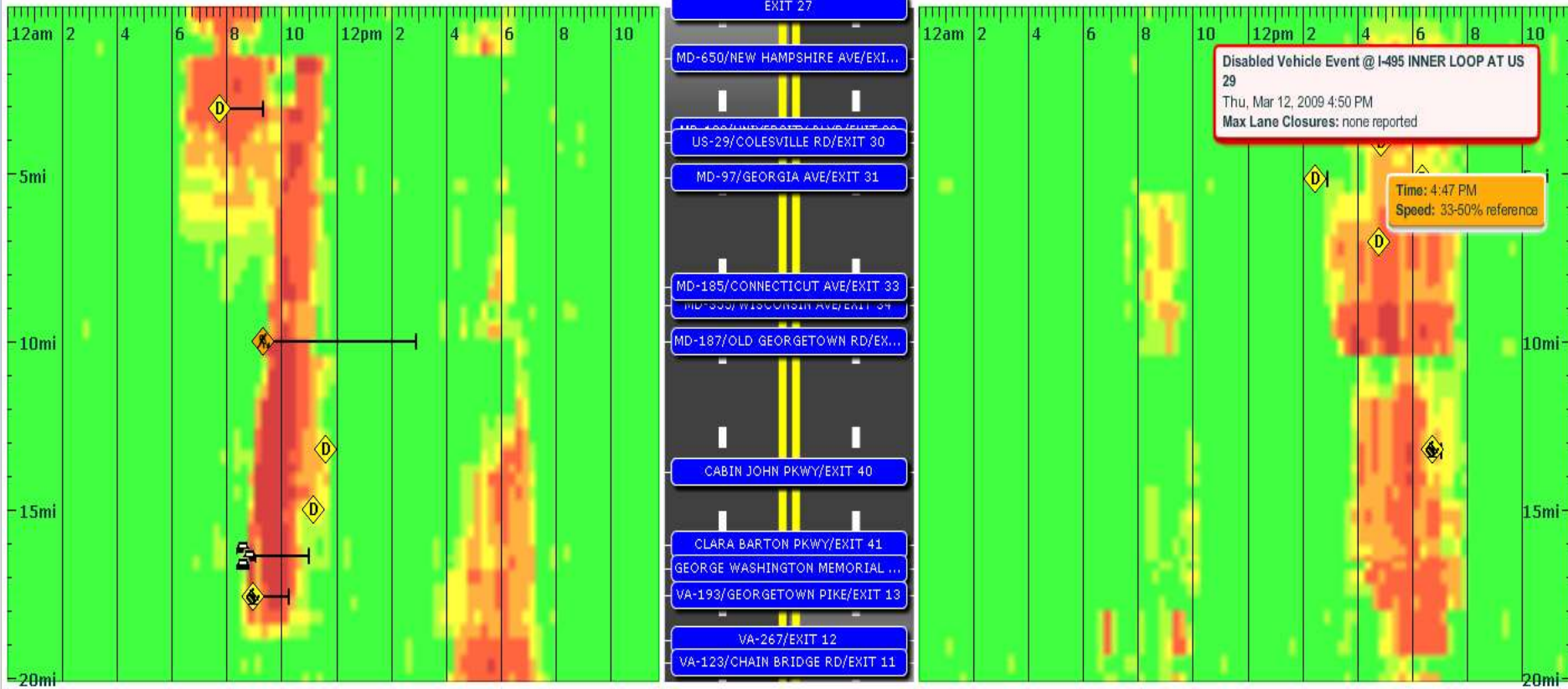
New Query

Data Options	<input type="radio"/> % Reference Speed	 < 15	 50 - 66
	<input type="radio"/> % Avg. Speed	 15 - 33	 66 - 85
	<input type="radio"/> Recorded Speed	 33 - 50	 >= 85

Start Time 00 : 00 End Time 23 : 45

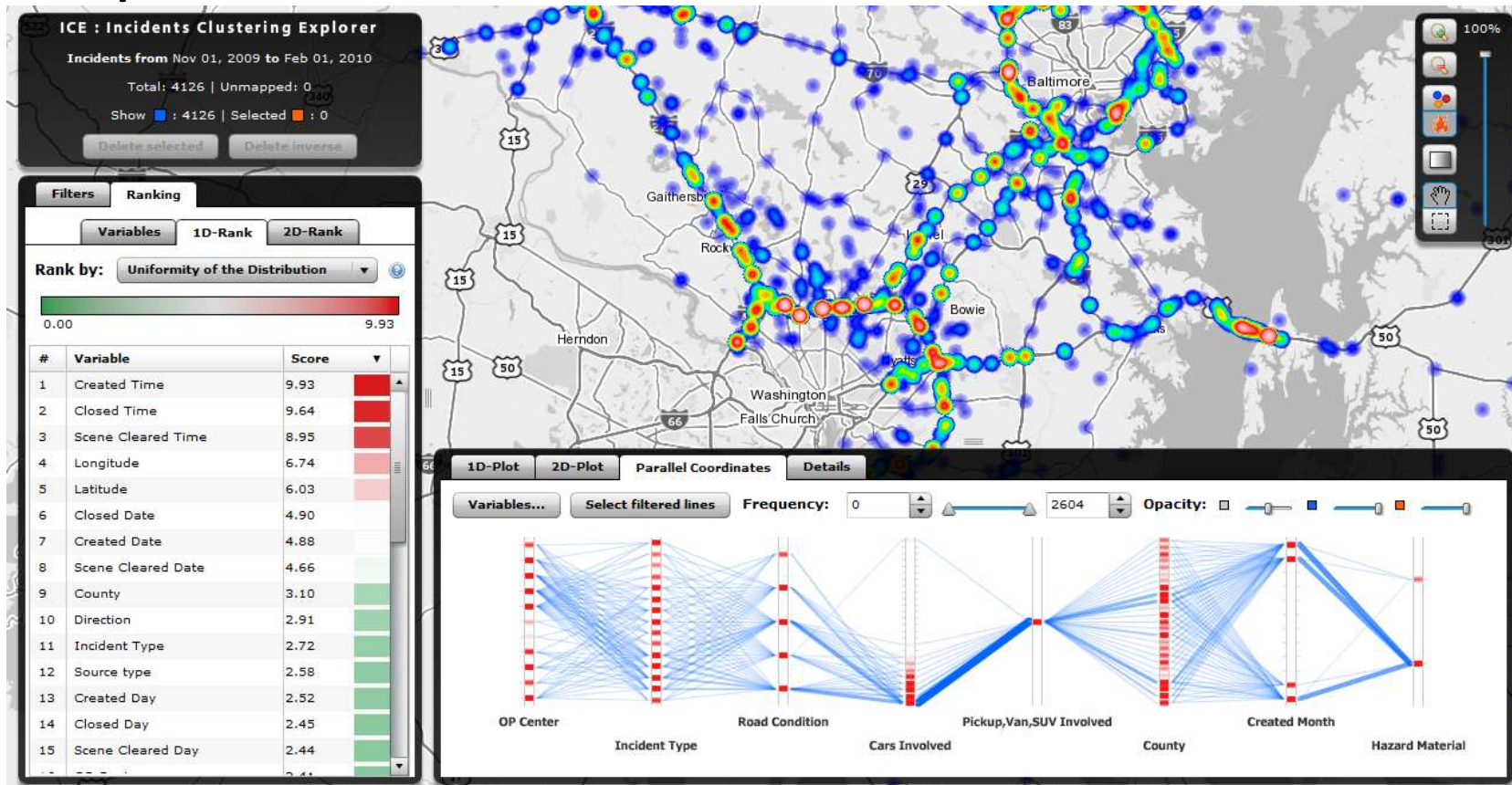
↓ OUTER LOOP ↓

↑ INNER LOOP ↑



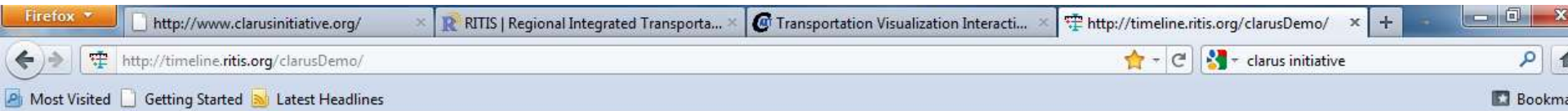
Making Use of the Archive

- Visual Analytics: What they are? How are they different?
- Examples...

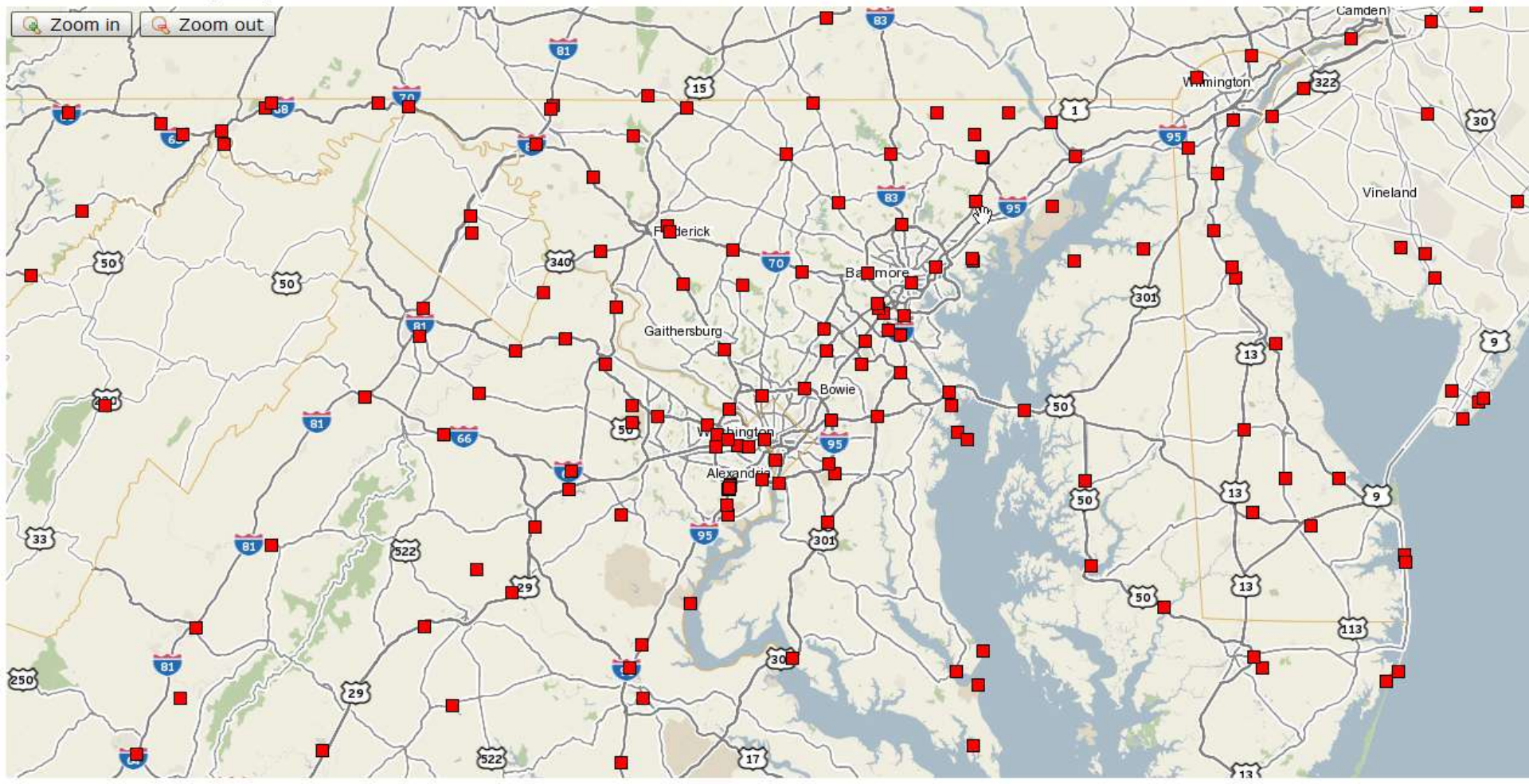


Clarus in the Archive

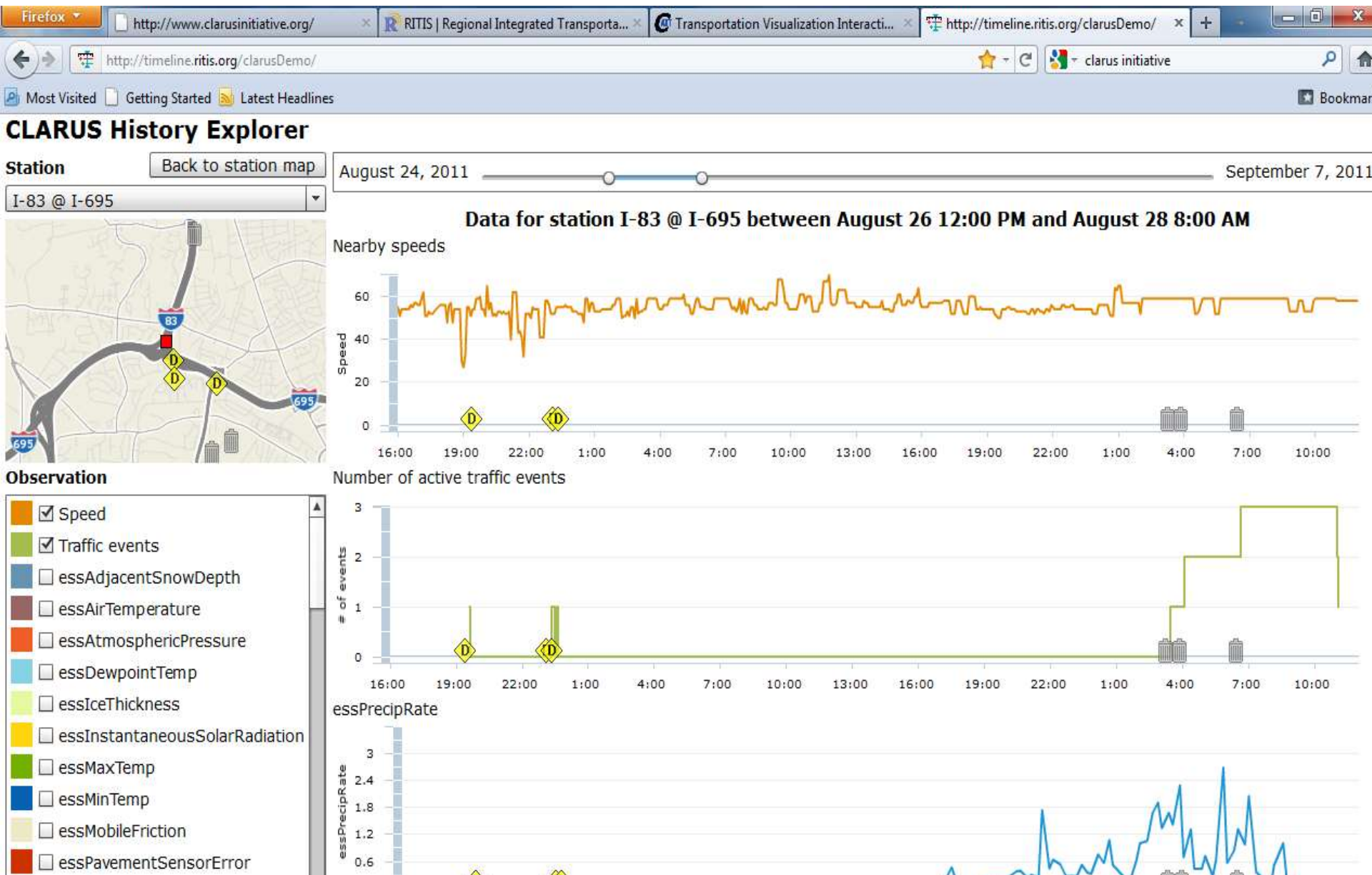
Choosing a Station



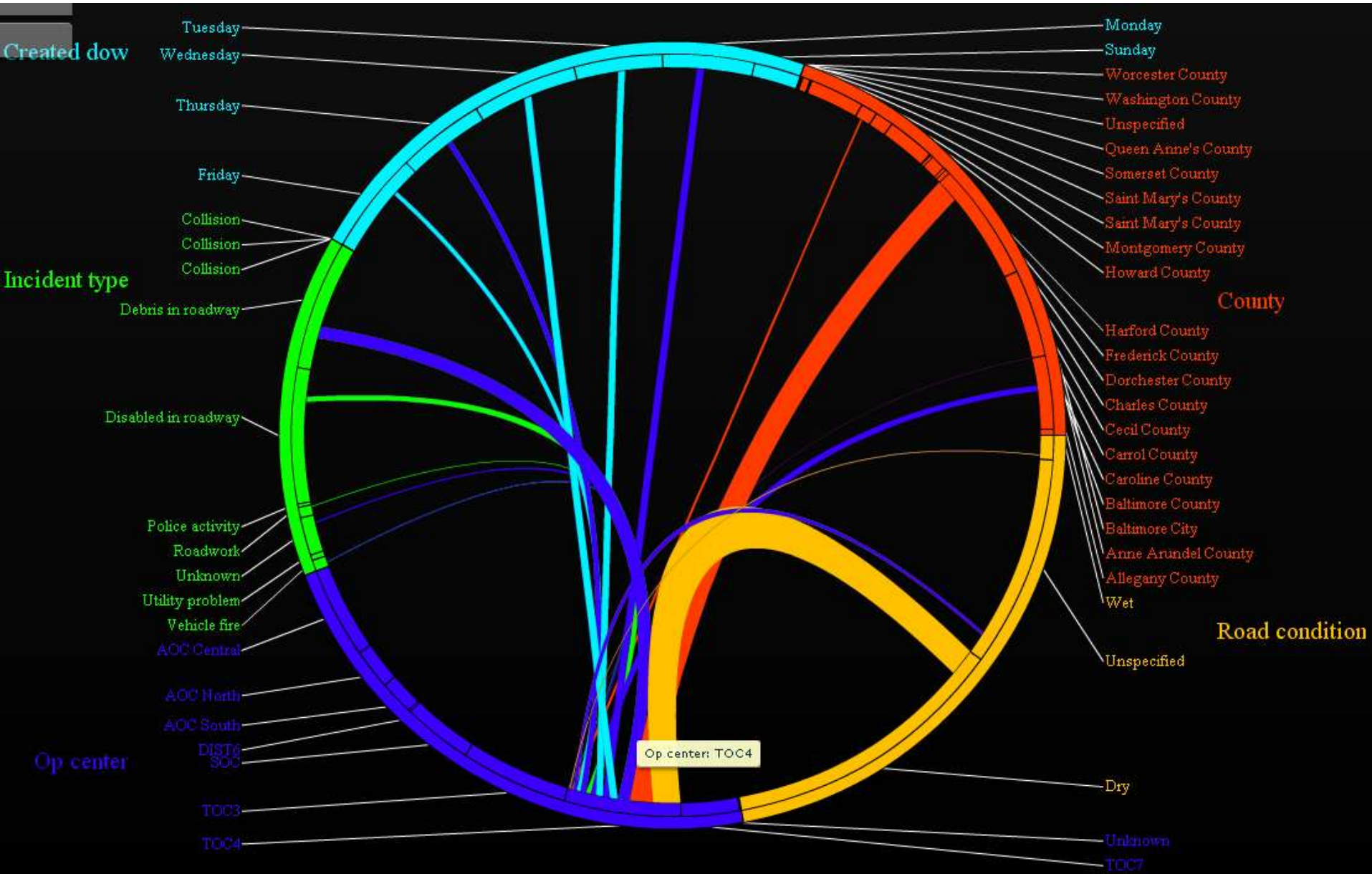
CLARUS History Explorer



Exploring the Data

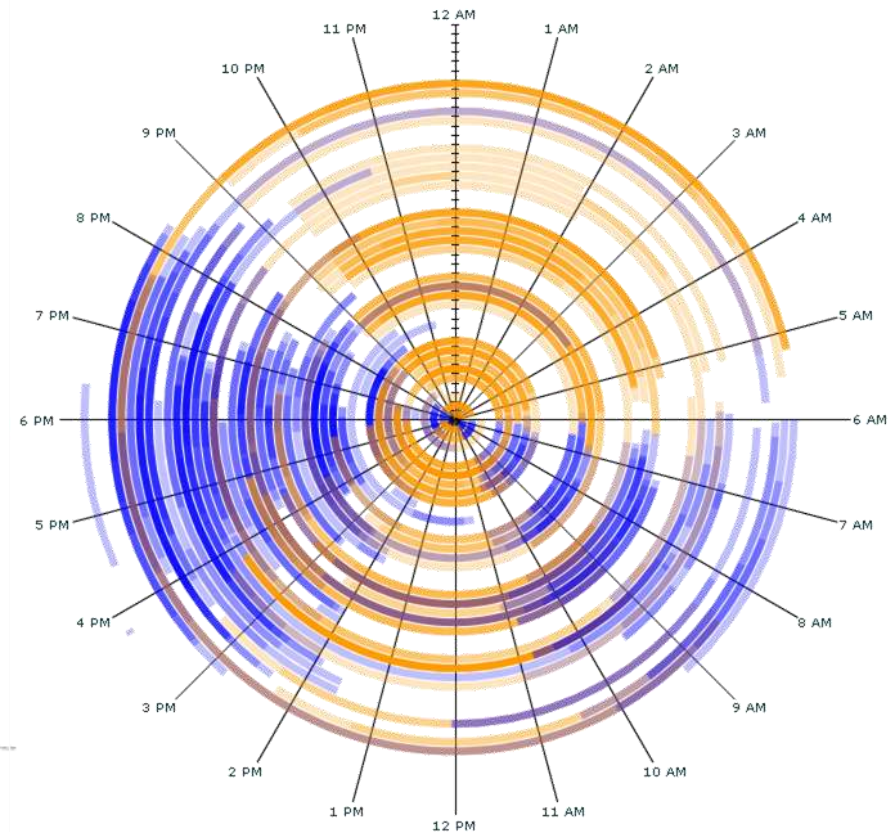
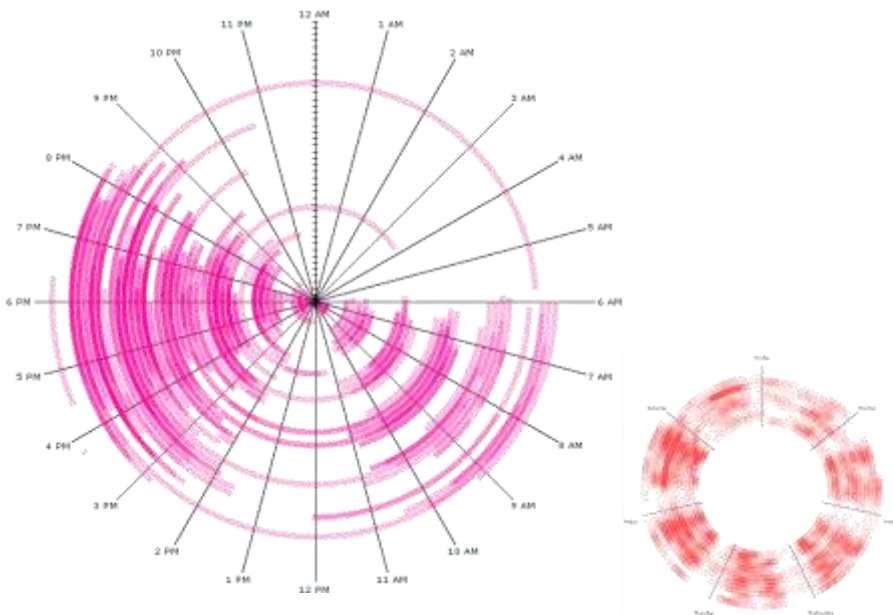


Multivariate Relationships



Next Steps

- Refine/Enhance visual tools: Speed, functionality, etc.
- MORE data integration: Radar, AVL, etc.
- More Vis tools:
 - Spiral Charts



www.cattlab.umd.edu/demo

Questions

For additional information contact

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PackML@umd.edu

301-405-0722



Demo Links

- [Clarus Data Viz Demo](#)
- [Spiral Demo](#)
- [RITIS \(production\)](#)
- [RITIS \(staging\)](#)
- [ArcChart](#)