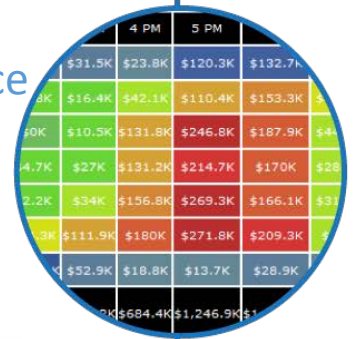


# Virtual Weigh Stations

Protecting our Infrastructure



Performance Measures



Planning



Operations



Communications



Real-time Operations & Analytics with Virtual Weigh Stations





**road damage from  
one 18-wheeler is  
equivalent to 9,600  
cars**

- US Government Accountability Office

**~99% of all road  
damage is caused by  
commercial vehicles**









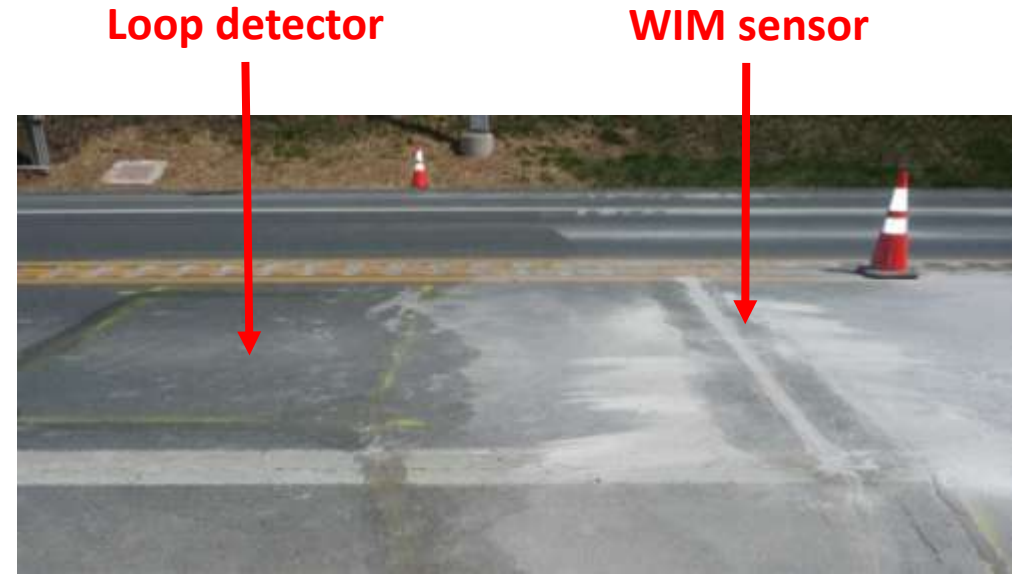
## Goals:

- Minimize infrastructure damage
- Improve safety
- Deploy limited resources more efficiently
- Develop understanding of patterns and behaviors
- Educate operators about safety and law requirements





WIM sensor



Loop detector

WIM sensor

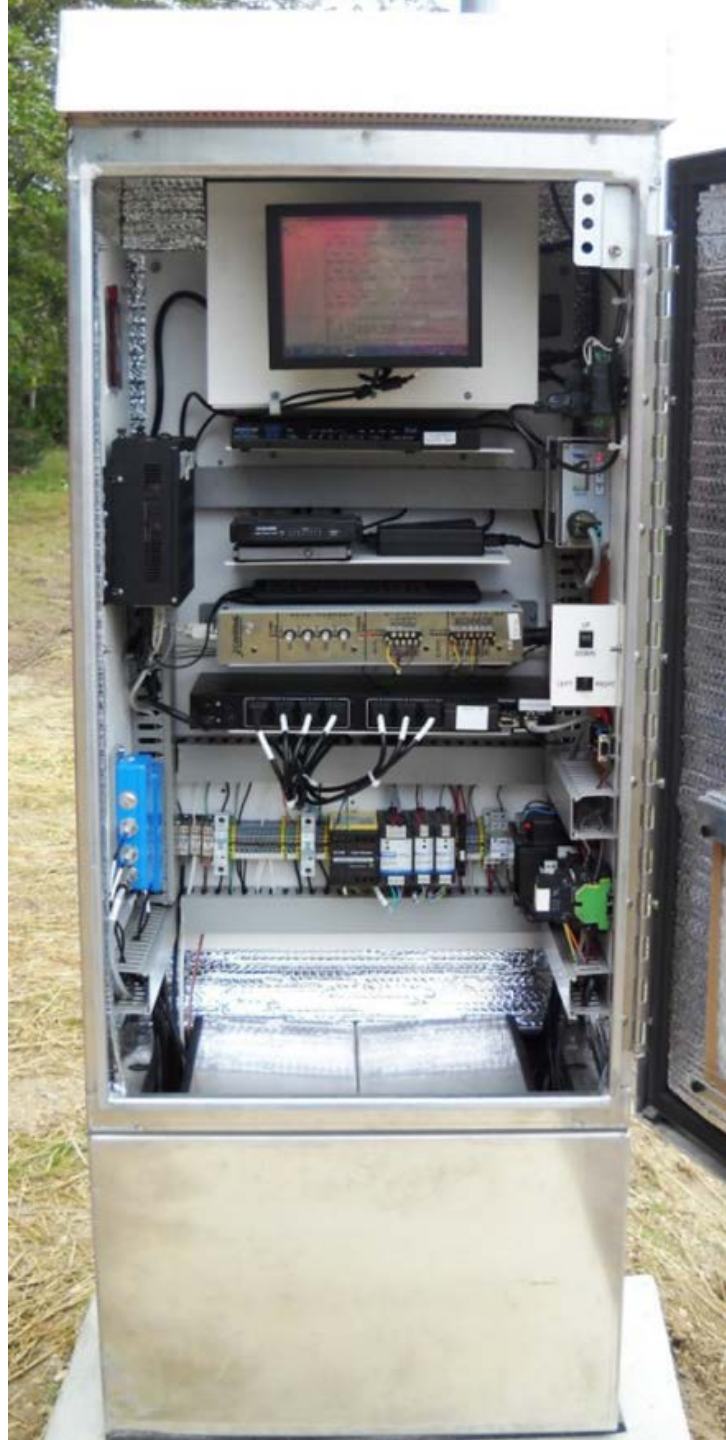


Over height detector



Camera and IR

There were  
problems with the  
technology.



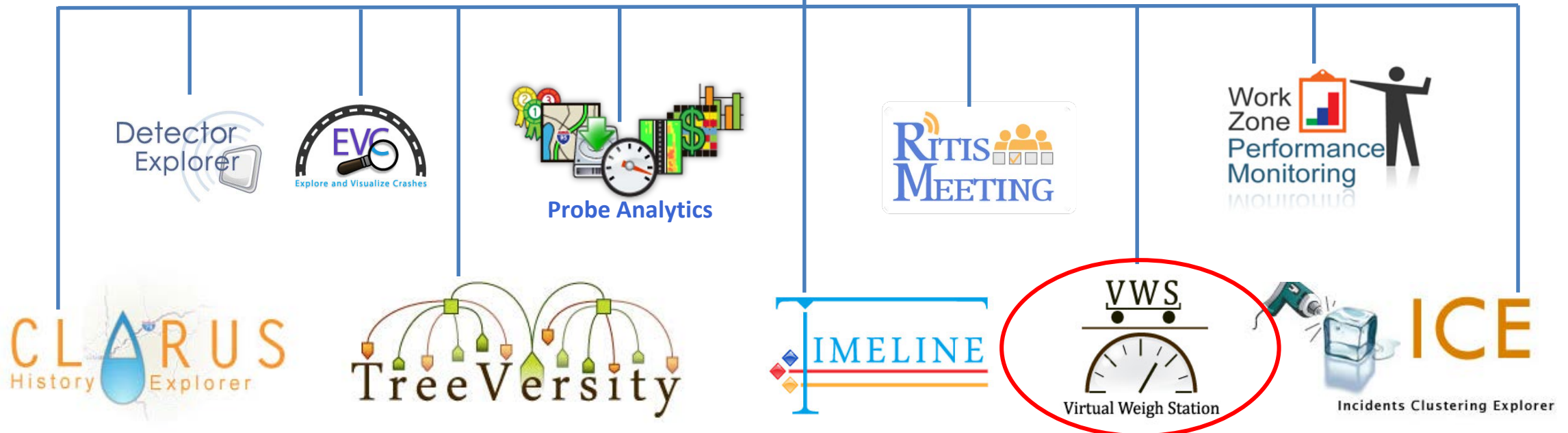
# What is RITIS?

**RITIS** – the **Regional Integrated Transportation Information System** – is a automated data fusion and dissemination platform that augments real-time operations coordination between agencies, planning & performance measures, analytics, and visualization with several embedded tools:

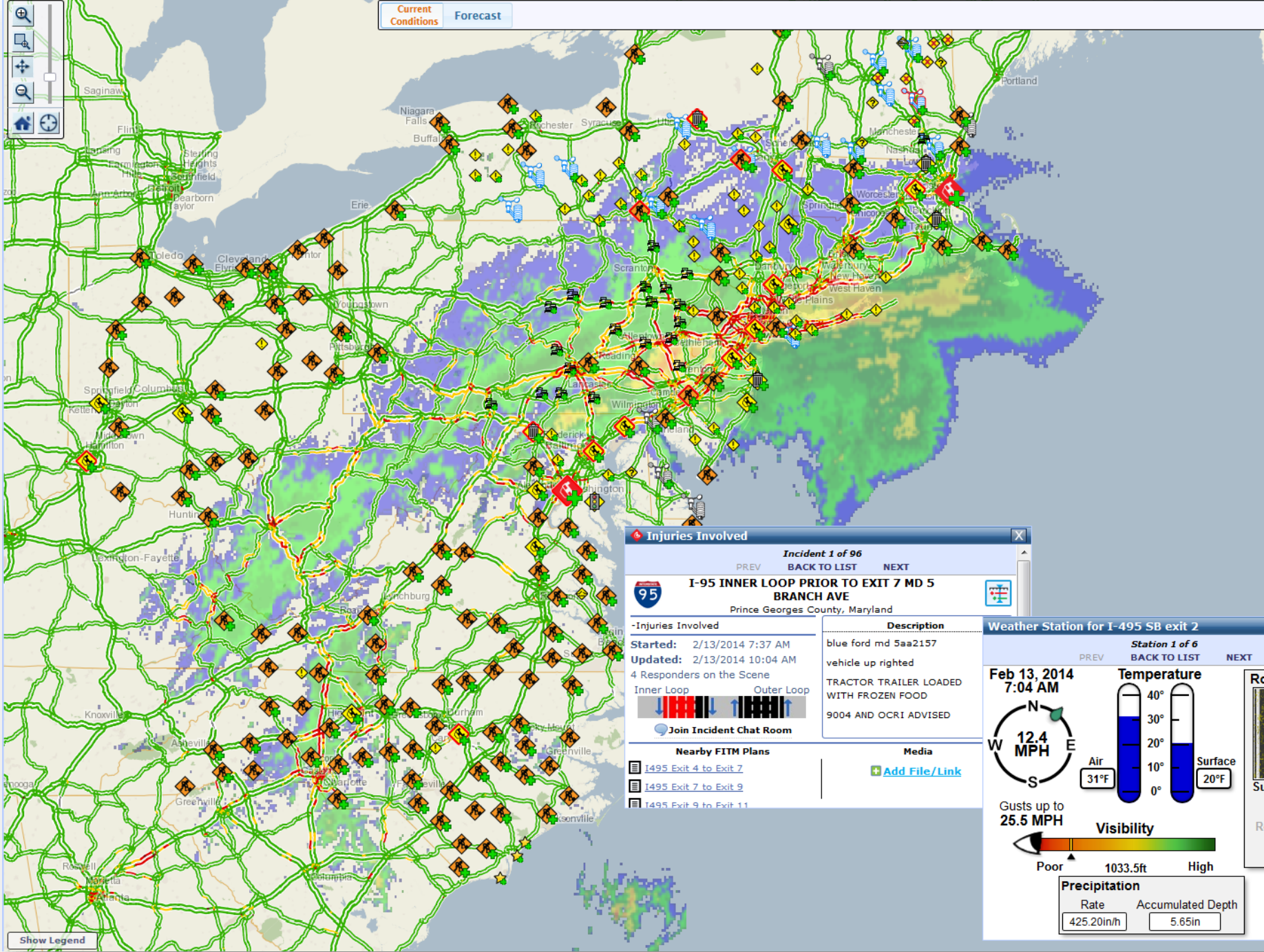
# RITIS

There are three main RITIS components:

- real-time data feeds
- real-time situational awareness tools
- archived data analysis tools







Current Conditions Forecast

Show Layer List

Firefox <https://www.ritis.org/map/chartVid.html>

### I-95/495 AT I-295

#### Injuries Involved

Incident 1 of 96

PREV BACK TO LIST NEXT

### I-95 INNER LOOP PRIOR TO EXIT 7 MD 5 BRANCH AVE

Prince Georges County, Maryland

Injuries Involved

Started: 2/13/2014 7:37 AM

Updated: 2/13/2014 10:04 AM

4 Responders on the Scene

Inner Loop Outer Loop

Join Incident Chat Room

Nearby FITM Plans

- I-495 Exit 4 to Exit 7
- I-495 Exit 7 to Exit 9
- I-495 Exit 9 to Exit 11

Media

Add File/Link

Description

blue ford md 5aa2157 vehicle up righted

TRACTOR TRAILER LOADED WITH FROZEN FOOD

9004 AND OCRI ADVISED

#### Weather Station for I-495 SB exit 2

Station 1 of 6

PREV BACK TO LIST NEXT

Feb 13, 2014 7:04 AM

W 12.4 MPH E

Gusts up to 25.5 MPH

Temperature

Air 31°F

Surface 20°F

Visibility

Poor 1033.5ft High

Precipitation

Rate	Accumulated Depth
425.20in/h	5.65in

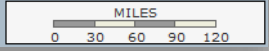
#### Road Status

Surface Status

Chem


Road Salinity


Show Legend







Lock selection to newest vehicle


 02:08:19 PM | Class 5


 02:07:56 PM | Class 9


 02:05:20 PM | Class 5


 02:02:30 PM | Class 5


 02:00:26 PM | Class 8


 01:59:56 PM | Class 5


 01:59:50 PM | Class 7

 01:58:31 PM | Class 5


 01:57:38 PM | Class 6

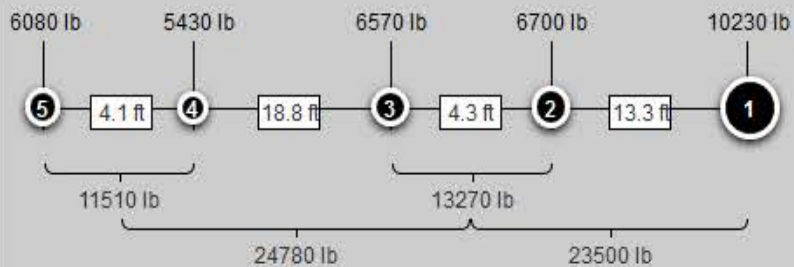
 01:55:48 PM | Class 6

 01:47:20 PM | Class 9

 01:47:14 PM | Class 4

 01:42:51 PM | Class 6

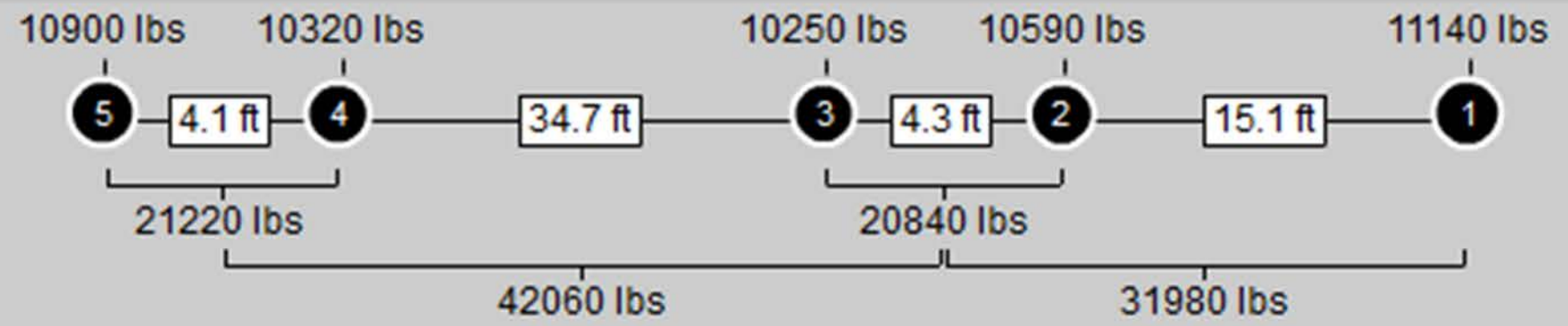
 01:41:29 PM | Class 5





Class 9  
Speed: 52.8 mph  
Length: 58 ft  
Gross: 53200 lbs

1.1 seconds difference



Lock selection to newest vehicle

02:10:26 PM | Class 5

02:09:40 PM | Class 9

02:09:29 PM | Class 5

02:09:15 PM | Class 5

02:09:05 PM | Class 3

02:05:09 PM | Class 5

02:04:47 PM | Class 5

02:04:28 PM | Class 7

02:03:24 PM | Class 7

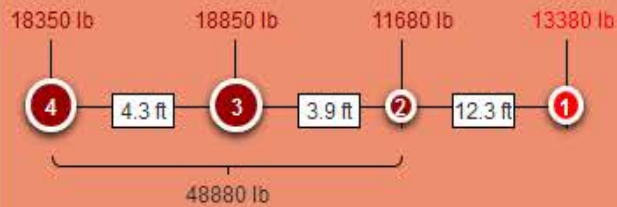
02:02:56 PM | Class 3

02:01:11 PM | Class 9

02:00:01 PM | Class 5

01:59:53 PM | Class 9

01:59:46 PM | Class 9







iPad

5:11 PM

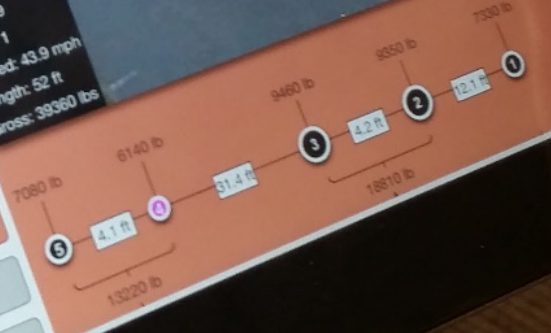
vws-test.ritis.org

# Virtual Weigh Station

- 05:09:17 PM | Class 9
- 05:07:38 PM | Class 9
- 05:07:06 PM | Class 5
- 05:04:55 PM | Class 9
- 05:01:41 PM | Class 6
- 04:55:14 PM | Class 9
- 04:49:31 PM | Class 4
- 04:43:50 PM | Class 9
- 04:41:26 PM | Class 7
- 04:37:54 PM | Class 6
- 04:36:39 PM | Class 3
- 04:36:22 PM | Class 7
- 04:34:39 PM | Class 8

Unbalanced

Class: 9  
 Lane: 1  
 Speed: 43.9 mph  
 Length: 52 ft  
 Gross: 39360 lbs



1.2 seconds difference

## Search Options

Date range  to

- Station**
- All
  - I-83 North
  - I-95 North
  - MD-213 South
  - MD-32 East
  - US-301 North
  - US-301 South (Bay Bridge)
  - US-50 East

- Lanes**
- All
  - 1  2

- Classes**
- All
  - 1  2  3  4  5
  - 6  7  8  9  10
  - 11  12  13  14  15

**Weight** Minimum   
Maximum

**Axle Weight** Any vehicle with an individual axle weight within the provided range will be included in the search results.  
Minimum   
Maximum

- Flags**
- All
  - Off scale
  - Over height
  - Over length
  - Over speed
  - Over weight axle
  - Over weight bridge
  - Over weight gross
  - Over weight tandems
  - Random
  - Speed change
  - Stopped
  - Too close

**SEARCH**

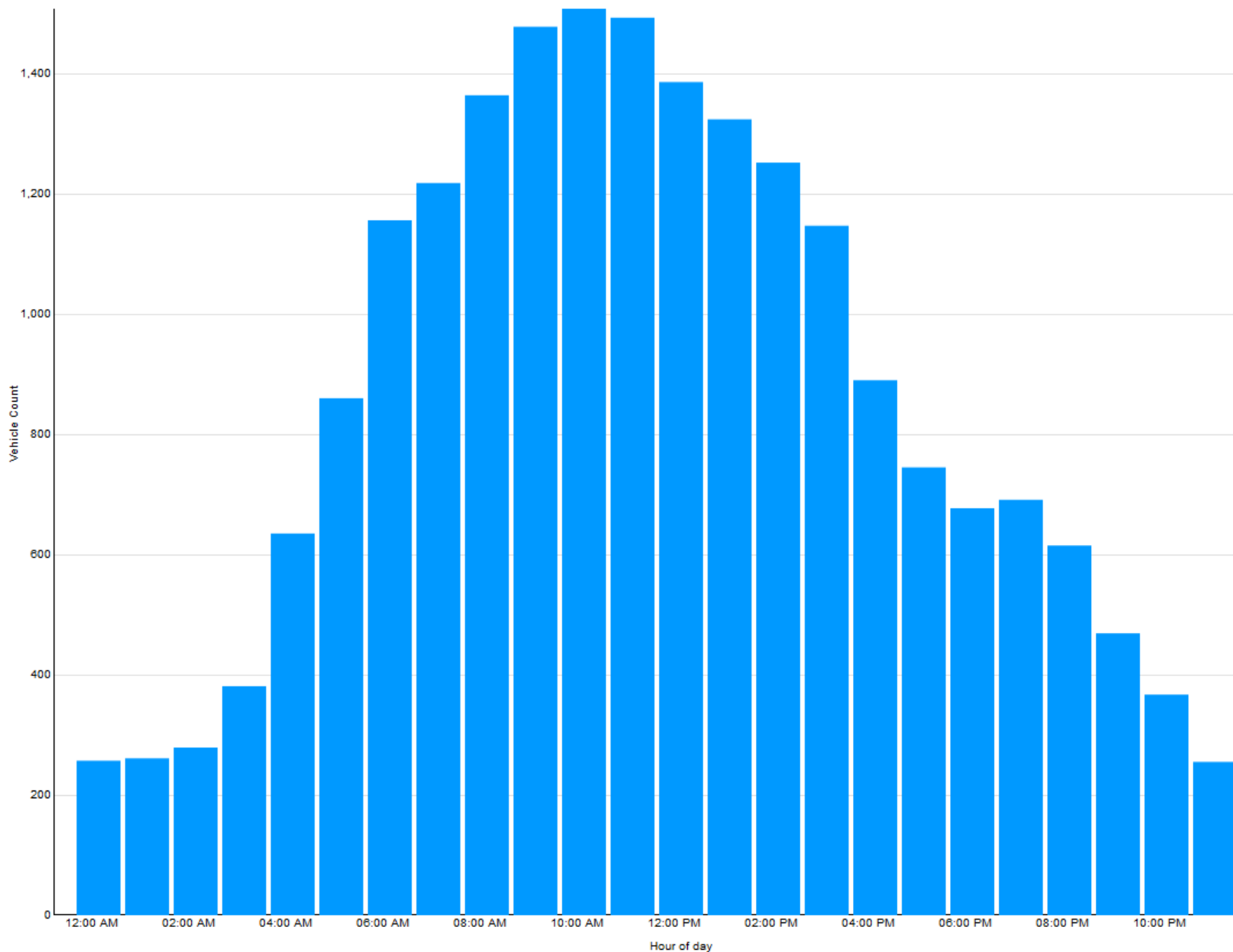
Vehicle count by hour of day

View as Table

View as Text

Save screenshot

Vehicle count by hour of day



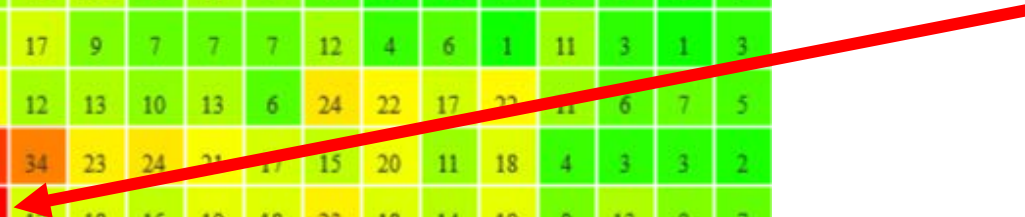


Vehicle count by date and hour

	6am									12pm					6pm									
Sun Nov 01	3	1		1	2	2	2			3	2		4	2	3	1	1	4	2	1	3	2		
Mon Nov 02	4	3	5	11	12	13	3	13	22	28	23	25	17	24	12	13	15	7	4	2	3	5	3	
Tue Nov 03	4	5	2	2	14	11	15	11	11	26	34	23	12	19	13	11	15	9	13	7	2	4	6	5
Wed Nov 04	10	8	4	3	15	18	16	16	17	32	22	15	16	12	13	12	15	9	10	3	6	3	4	1
Thu Nov 05	3	2	1	11	10	5	21	3	9	25	24	14	11	11	5	4	4	7	3	4	3	5	5	4
Fri Nov 06	2	6	3	5	7	8	7	5	5	10	9	10	9	3	3	5	1	3	1	2	2		3	3
Sat Nov 07	2	1	3		2	2	3	2	2	2	2	2	1	1	2	2	1	2		1	2		1	1

Sun Nov 08	2	2	2	2	3		1	3	1	3		1	1	1	1	1	2	5	4	3		3	4	3
Mon Nov 09	2	1	4	8	6	6	6	11	9	5	11	13	14	8	11	9	6	2	2	2	4	3	1	3
Tue Nov 10	2	3	7	4	8	13	6	11	5	12	13	17	9	7	7	7	12	4	6	1	11	3	1	3
Wed Nov 11		2	8	3	12	10	9	17	15	14	20	12	13	10	13	6	24	22	17	22	11	6	7	5
Thu Nov 12	7	11	7	16	15	20	16	15	26	21	39	34	23	24	21	17	15	20	11	18	4	3	3	2
Fri Nov 13	5	8	12	12	22	16	12	4	23	26	43	17	18	15	19	18	23	18	14	19	8	13	9	7
Sat Nov 14	4	5	7	4	8	7	13	10	5	13	15	10	9	12	12	12	8	10	5		2	2	2	2

Friday, November 13  
10am to 11am



Sun Nov 15	1	2	3	1	1	2	5	3	5	2	6	8	9	3	8	6	5	4	7	8	6	6	4	2
Mon Nov 16	1	3	5	4	10	16	13	20	16	23	32	27	25	19	24	17	12	19	12	12	13	14	5	1
Tue Nov 17	1	2	1	5	20	16	6	23	23	14	17	29	28	29	24	24	14	8	10	22	11	1	1	3
Wed Nov 18	2	2	2	4	7	20	14	12	19	43	24	13	8	4	16	7	5	10	11	11	12	10	9	6
Thu Nov 19	8	8	3	9	13	19	19	15	17	37	35	29	21	24	12	14	9	11	9	9	8	9	5	8
Fri Nov 20	6	4	13	11	7	10	15	12	16	39	41	24	18	16	19	25	21	16	18	20	15	7	5	1
Sat Nov 21	1		1		1	8	6	9	6	9	12	8	8	10	17	5	4	6	7	4	4	1	1	



Vehicle ID: [20151113105017-7-658472](#) [Printable report](#) [Pre-populated field notice](#)  
 Date: 11/13/2015 10:50:17 AM  
 Lane: 1  
 Weight: 82750 lbs  
 Speed: 55.2 mph  
 Length: 53.6 ft  
 Class: 10  
 Flags: Over weight gross, over weight bridge **VIOLATION**

Spacing: 4.4 4.4 23.3 4.4 17.1  
 Axles: ● ● ● ● ● ● ●  
 Wt: 15.5 15.1 7.5 16.7 17.1 10.9



Vehicle ID: [20151113105025-11-490907](#) [Printable report](#) [Pre-populated field notice](#)  
 Date: 11/13/2015 10:50:25 AM  
 Lane: 1  
 Weight: 99020 lbs  
 Speed: 58.9 mph  
 Length: 66.2 ft  
 Class: 10  
 Flags: Over weight gross, over weight axle, over weight bridge, over weight tandems **VIOLATION**

Spacing: 4.5 4.5 36.2 4.4 16.6  
 Axles: ● ● ● ● ● ● ●  
 Wt: 15.7 15.7 15.1 21.1 21.3 10.2



Vehicle ID: [20151113105330-7-658557](#) [Printable report](#) [Pre-populated field notice](#)  
 Date: 11/13/2015 10:53:30 AM  
 Lane: 1  
 Weight: 93100 lbs  
 Speed: 47.3 mph  
 Length: 71.1 ft  
 Class: 10  
 Flags: Over weight gross, unbalanced **VIOLATION**

Spacing: 4.5 4.5 4.5 35.1 4.4 4 14.1  
 Axles: ● ● ● ● ● ● ● ● ●  
 Wt: 13.2 12.8 12.9 12.0 12.5 13.2 6.5 10.0



Motor Carrier Division  
 7491 Connelley Drive  
 Hanover, Maryland 21076

**FIELD OBSERVATION NOTICE**  
[Virtual Weigh Site Compliance & Education Program](#)



Vehicle ID: 20151113100155-7-656974  
 Date: 11/13/2015 10:01:55 AM  
 Lane: 1  
 Weight: 87510 lbs  
 Speed: 53.2 mph  
 Length: 52.6 ft  
 Class: 9  
 Flags: Over weight gross, over weight axle, over weight bridge, over weight tandems **VIOLATION**

Spacing: 4.1 29.4 4.4 14.7  
 Axles: ● ● ● ● ● ● ●  
 Wt: 18.0 18.4 20.6 19.3 11.3

Company Name: \_\_\_\_\_

DOT Number: \_\_\_\_\_

Location: \_\_\_\_\_

**THIS IS NOT A TRAFFIC CITATION!**

This notice is provided from Maryland State Highway Administration, Motor Carrier Division to improve safety awareness.

**The vehicle shown may be in violation of state or federal requirements**

The Motor Carrier Division is available to discuss information in detail and provide no cost training & education to assist in the prevention of safety violations.

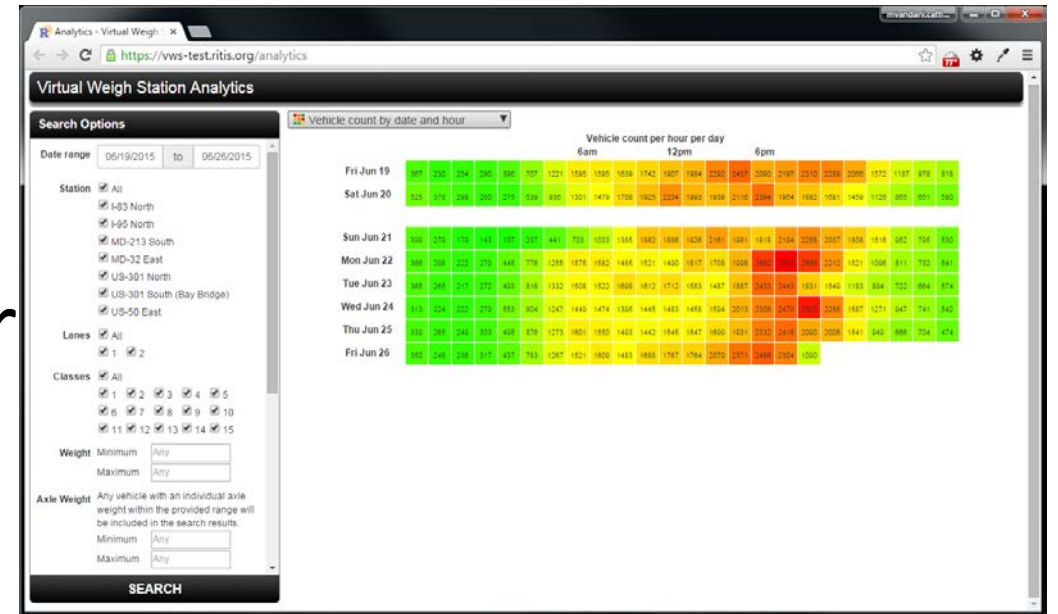
For information or inquiries please contact:

Duane W. Pearce  
 CVISN Data Manager – Safety, Training/Education & Compliance  
 Motor Carrier Division, Office of Traffic & Safety  
 dpearce@sha.state.md.us  
 410-582-5719



# Next Steps

- 25 new sites this year
- License Plate Recognition this year
- Hotlist integration
  - Stolen vehicles
  - Repeat offenders
- Integration with permitting system
- DMV lookups



Virtual Weigh Station

Lock selection to newest vehicle

- 11:30:38 AM | Class 7
- 11:29:51 AM | Class 5
- 11:28:56 AM | Class 9
- 11:25:43 AM | Class 7
- 11:30 AM | Class 9

Over-weight axle  
Over-weight bridge  
Over-weight (tandems)

Class 7  
Speed: 34.1 mph  
Length: 21 ft  
Gross: 69770 lbs

23530 lbs   23970 lbs   9430 lbs   12840 lbs

4   4.5 ft   3   4.5 ft   2   11.8 ft   1

56930 lbs

-3.4 seconds difference



Thank You!

**Nikola Ivanov**

[ivanovn@umd.edu](mailto:ivanovn@umd.edu)

301-405-3626

**CATT**  
LABORATORY