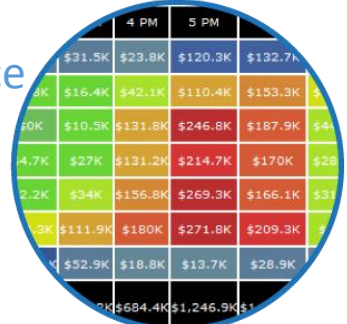


Watermelons, Milk, and Other Heavy S#&!

Virtual Weigh Stations in Action



Performance Measures



Planning



Operations



Communications



Real-time Operations & Analytics with Virtual Weigh Stations

What's the problem?

- Over size and over weight load activity on bypass roads
- Road damage – grossly over weight loads
- Over size/over weight load permit fraud – ‘gaming the system’
- Unpredictable routes based on enforcement behavior
- Community interest - reduce local heavy vehicular traffic

- Safety is the major focus, followed by weight enforcement
- Efficient use of law enforcement personnel
- Damage prevention on roads and structures (bridges, tunnels, etc)



Example 1: Dairy trucks trying to bypass stations



Example 2: School buses used to transport watermelons



Virtual Weigh Stations

Dave Czorapinski

Chief, Motor Carrier Division
Office of Traffic & Safety



Maryland Motor Carrier Handbook
Revised DECEMBER 2014

In Cooperation with:

- ❖ Maryland Port Administration*
- ❖ Maryland Transportation Authority*
- ❖ Maryland State Police*
- ❖ Motor Vehicle Administration*
- ❖ Public Service Commission*
- ❖ Comptroller of Maryland*
- ❖ Maryland Department of the Environment*
- ❖ Maryland Department of Transportation*

Maryland Virtual Weigh Station Technology

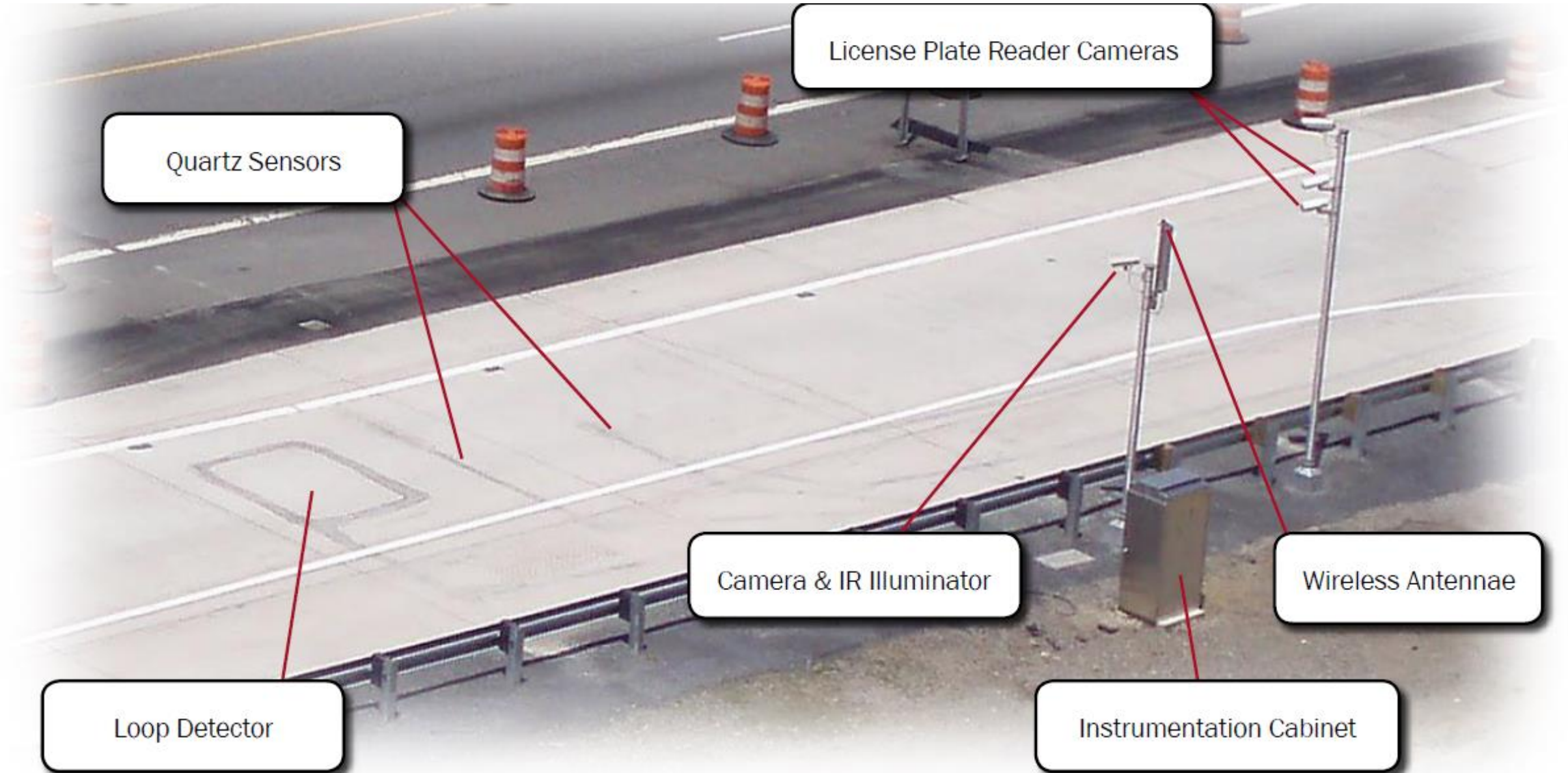


Weight: 103530 lbs **Speed:** 55.6 mph **Length:** 64.2 ft **Class:** 10
Flags: Overweight gross, overweight bridge, overweight axle, overweight tandems

VIOLATION

Spacing:	4.2	4.2	34.6	4.5	16.7
Axles:	⊙	⊙	⊙	⊙	⊙
Wt.:	16.1	18.9	17.4	20.5	21.3
				9.5	

What does it look like?



There were problems with the fields comms/server technology.

- Didn't support enough concurrent real-time users
- Didn't support enough querying/analytics capabilities
- Needed to broadly and reliably reach a large audience



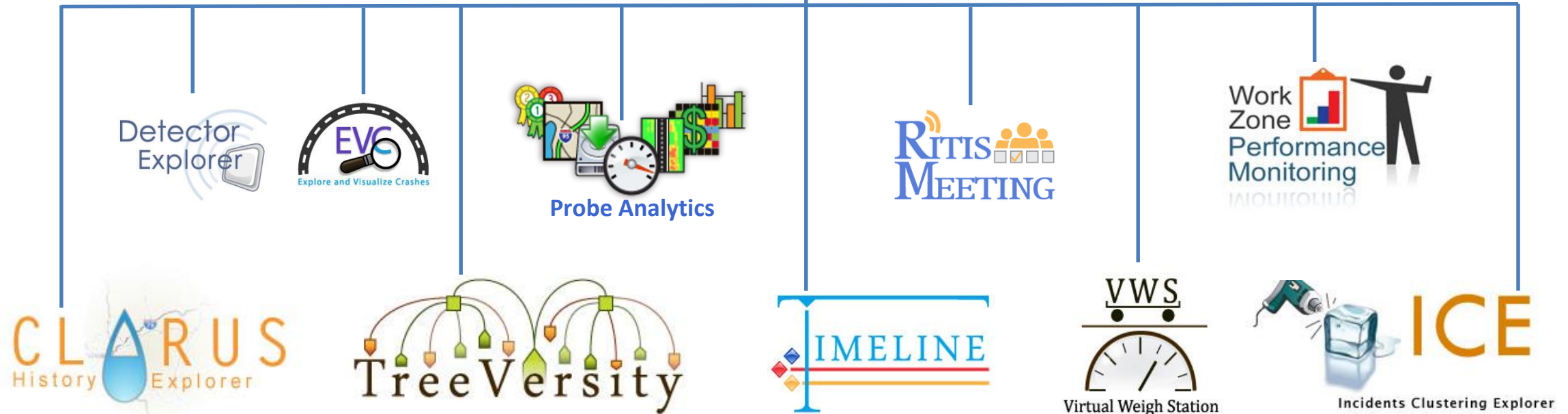
What is RITIS?

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



Seeing your data, your neighbor's data, weather, CCTV, first responder radios, etc.

Current Conditions **Forecast**

Injuries Involved

Incident 1 of 96

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

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

Feb 13, 2014 7:04 AM

Temperature

Air 31°F Surface 20°F

Wind

12.4 MPH
Gusts up to 25.5 MPH

Visibility

1033.5ft

Precipitation

Rate 425.20in/h Accumulated Depth 5.65in

CCTV Feeds:

- I-95/495 AT I-295
- I-495 U OF MD-87
- I-495 WEST VIEW
- US-28 AT MD-32
- I-95/495 AT TRIPLE LANE
- I-495 N OF MD 301
- 2885th Battle Creek Crk
- I-495 E OF I-270
- US-28 AT INTERCHANG AND POND
- I-95/495 U OF I-5-1
- MD 100 PRINCE GEORGE
- I-95/495 AT I-270
- I-95/495 AT I-270
- I-95/495 AT I-270
- I-95/495 AT I-270

Show Legend


Show Layer List

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

MILES
0 30 60 90 120

Virtual Weigh Station

Lock selection to newest vehicle

-  11:27:19 AM | Class 9
-  11:27:13 AM | Class 3
-  11:27:03 AM | Class 4
-  11:24:53 AM | Class 5

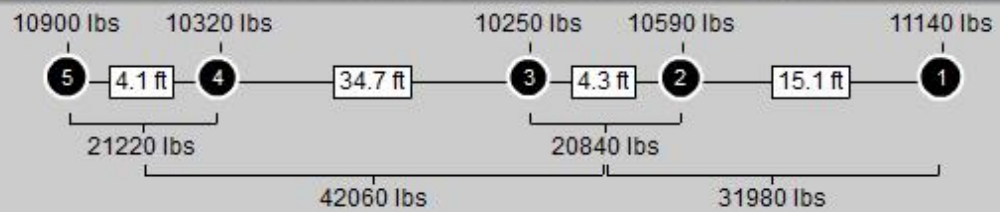
No violation

11:27:19 AM



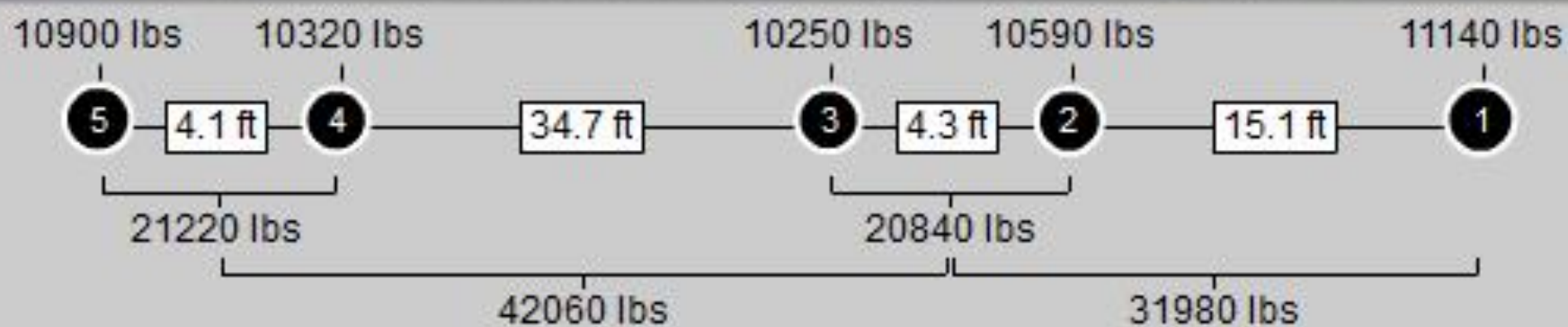
Class 9
Speed: 52.8 mph
Length: 58 ft
Gross: 53200 lbs

1.1 seconds difference



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

1.1 seconds difference



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



11:24:30 AM | Class 9

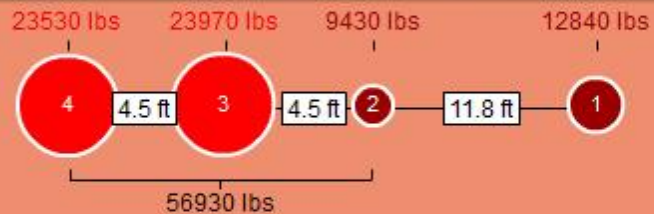
Over-weight axle
Over-weight bridge
Over-weight (tandems)

11:25:43 AM



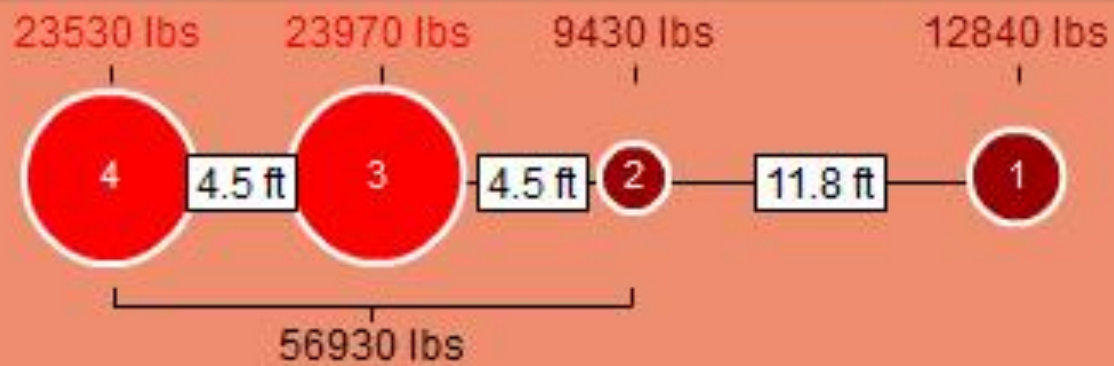
Class 7
Speed: 34.1 mph
Length: 21 ft
Gross: 69770 lbs

-3.4 seconds difference



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

-3.4 seconds difference





iPad

5:11 PM

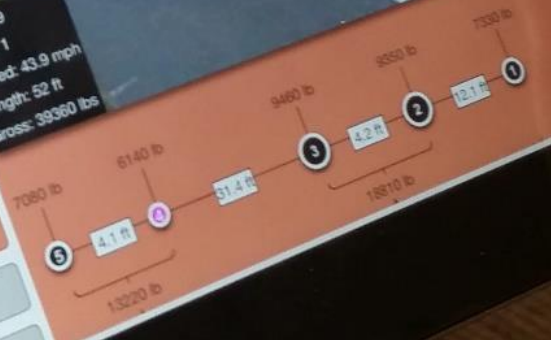
vws-test.ritis.org

Virtual Weigh Station

Unbalanced

- 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

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



1.2 seconds difference

Date range

- Station All
 I-95 North
 MD 213 South

Weigh Station Analytics

Vehicle count per hour per day

	6am					12pm					6pm													
Wed Aug 29	2	2	3	6	5	2	11	9	11	9	5	5	6	13	13	11	3	3	5	2	1	3	4	
Thu Aug 30	2	2	5	6	6	15	8	13	9	11	3	9	19	6	10	5	6	2	3	2	5	1	3	
Fri Aug 31	3	3	3	7	7	7	13	5	14	18	8	9	8	3	9	5	4		4		1		2	
Sat Sep 1	2		3	8	3	1	2	4	2	8	4	1	2		2	2	7	1	2	4	2	1	3	
Sun Sep 2		1		2	3	3	3	1	2	2	2	1	2	1	1	2	1	1		5	1		3	
Mon Sep 3		1	2		2		2	1	4	3	4	6	7	2	4	6	3	5	5	4		1	1	
Tue Sep 4	3	2	10	7	4	3	6	11	8	10	11	14	9	6	4	9	7	1	1	1	1	1	3	6
Wed Sep 5	1	4	3	1	7	4	11	8	9	20	3													

9/5/12 10:00 AM : 20 vehicles (click to see list)

Include vehicles without any flags

Virtual Weigh Station Analytics

Search options

Date range

Station

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

Classes

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

Weight

Minimum ✘

Maximum

Flags

- All
- Off scale

- Vehicle count by date and hour
- Vehicle count by date and hour**
- Vehicle count by speed
- Vehicle count by class
- Vehicle count by date
- Vehicle count by day of week
- Vehicle count by hour of day
- Vehicles with nested axle details
- Cardinal-style table of vehicles
- Cardinal-style class count by date
- Cardinal-style speed count by date
- Spiral

Virtual Weigh Station Analytics

Search options

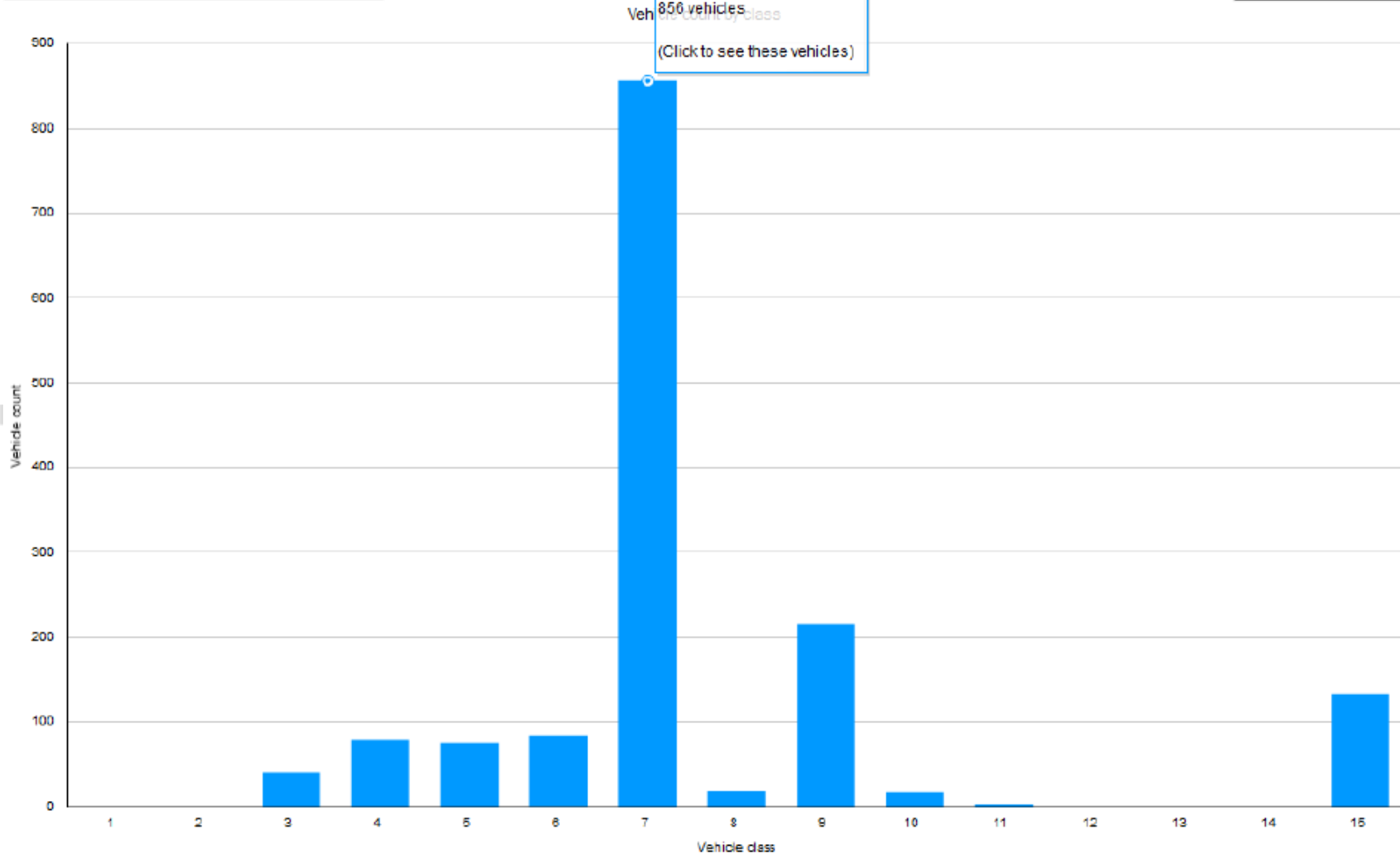
Date range: 10/02/2012 - 10/09/2012

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

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

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
 Unbalanced

Vehicle count by class



7
850 vehicles
(Click to see these vehicles)



Vehicle ID: [20160427091645-10-819664](#) [Printable report](#) [Pre-populated field notice](#)
Date: 04/27/2016 9:16:45 AM
Lane: 1
Weight: 67960 lbs
Speed: 59.9 mph
Length: 67.3 ft
Class: 10
Flags: Over height **VIOLATION**

Spacing: 4.5 4.5 37.1 4.6 16.6
Axles: ● ● ● ● ● ●
Wt: 8.9 9.0 9.6 16.4 15.3 8.8



Vehicle ID: [20160427092144-11-99485](#) [Printable report](#) [Pre-populated field notice](#)
Date: 04/27/2016 9:21:44 AM
Lane: 1
Weight: 79330 lbs
Speed: 58.2 mph
Length: 42.8 ft
Class: 10
Flags: Over weight bridge **VIOLATION**

Spacing: 4.1 4.1 13.8 4.3 16.5
Axles: ● ● ● ● ● ●
Wt: 18.0 14.6 11.2 13.3 12.6 9.7



Vehicle ID: [20160427092453-10-819789](#) [Printable report](#) [Pre-populated field notice](#)
Date: 04/27/2016 9:24:53 AM
Lane: 1
Weight: 98370 lbs
Speed: 45.8 mph
Length: 68.7 ft
Class: 10
Flags: Over weight gross, over weight axle, over weight bridge, over weight tandems **VIOLATION**

Spacing: 4.5 4.5 37.2 4.5 18
Axles: ● ● ● ● ● ●
Wt: 13.9 14.2 14.1 23.7 23.2 9.4



Vehicle ID: [20160427092728-10-819820](#) [Printable report](#) [Pre-populated field notice](#)
Date: 04/27/2016 9:27:28 AM
Lane: 1
Weight: 95720 lbs
Speed: 49.1 mph
Length: 66.8 ft
Class: 10
Flags: Over weight gross, over weight axle, over weight bridge, over weight tandems **VIOLATION**

Virtual Weigh Station Analytics

Search options

Date range 10/02/2012 - 10/09/2012

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

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

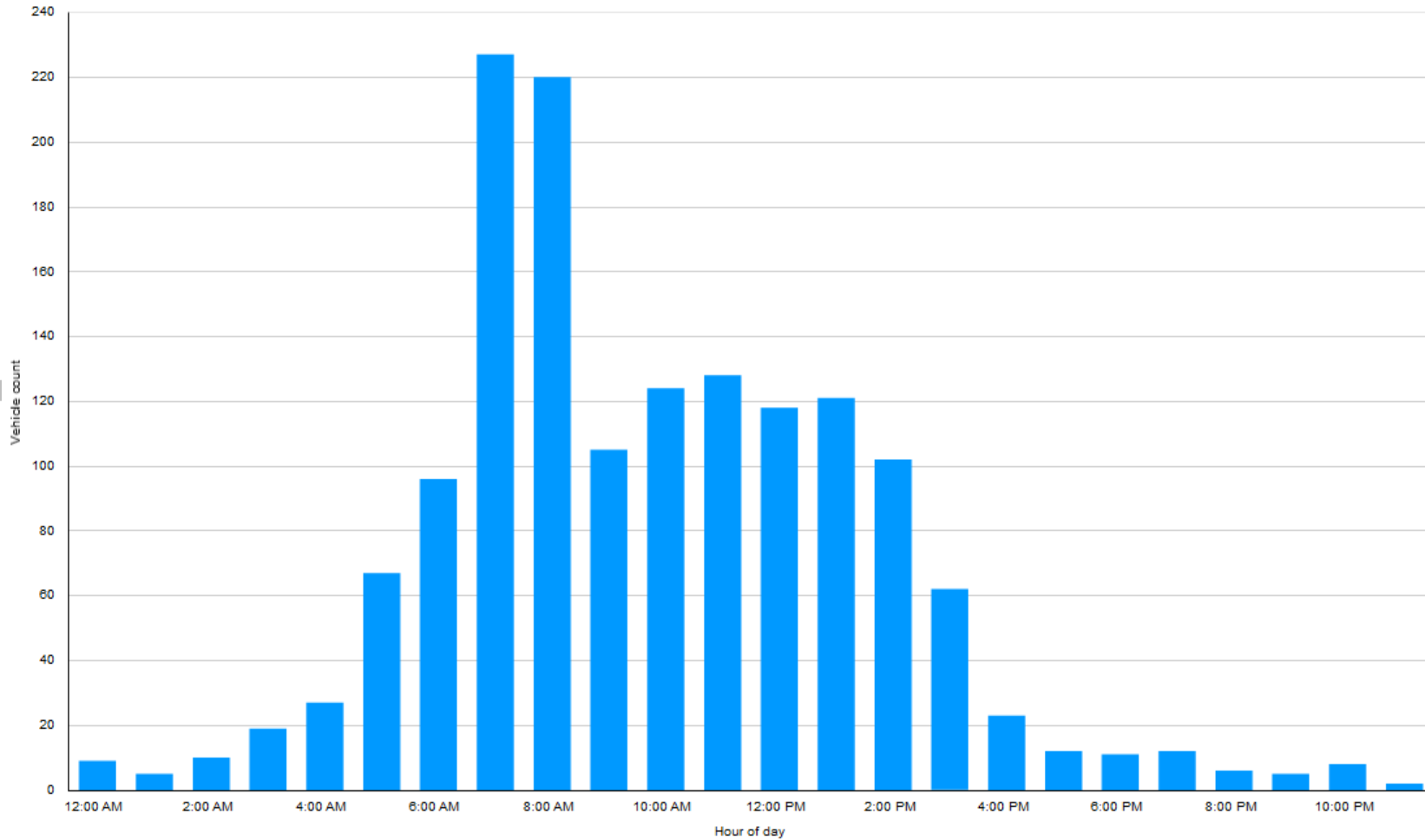
- Flags
- All
 - Off scale
 - Over height
 - Over length
 - Over speed
 - Over weight axle
 - Over weight bridge
 - Over weight gross
 - Over weight tandems
 - Random
 - Speed change
 - Stopped
 - Too close
 - Unbalanced

Search

Vehicle count by hour of day

Save screenshot

Vehicle count by hour of day



Virtual Weigh Station Analytics

Search options

Date range 10/02/2012 — 10/09/2012

Station

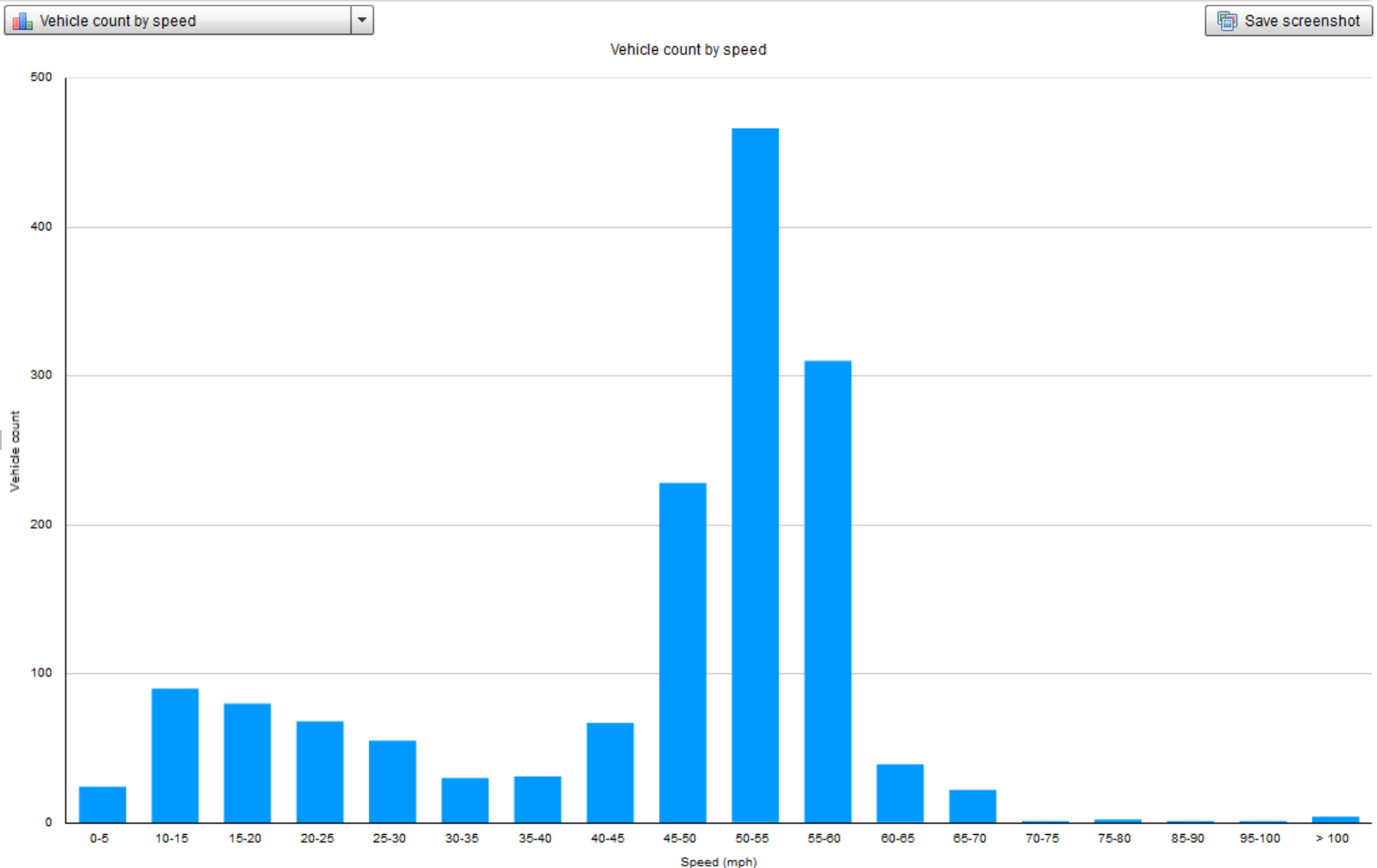
- All
- I-95 North
- MD-213 South
- MD-32 East
- US-301 North
- US-301 South (Bay Bridge)

Classes

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

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
- Unbalanced



Enforcement Examples

- Gross weight, axle weight, bridge/tandem weights, over height violation
- Additional Level 2 or Level 1 inspection based on initial observation
- OOS for safety violations
- Intentional un-balance (cheating the scale)
- Mandatory offload >5000 lb over gross
- Mandatory offload (depending on permit violations or fraud) for oversize loads
- Arrests for other serious violations (criminal record, DUI, etc)

Citations/Warnings



Motor Carrier Division
7491 Connelley Drive
Hanover, Maryland 21076

FIELD OBSERVATION NOTICE
Virtual Weigh Site Compliance & Education Program



Vehicle ID: 20130822144633-10-152297
Date: 08/22/2013 2:46:33 PM
Weight: 124070 lbs
Speed: 43.2 mph
Length: 67.9 ft
Class: 10
Flags: Over weight gross, over weight bridge, over weight axle, over weight tandems **VIOLATION**

Spacing:		4.5	4.5	36.3	4.5	18.1	
Axles:		●	●	●	●	●	●
Wt:		18.7	18.7	18.8	28.5	28.8	10.5

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.

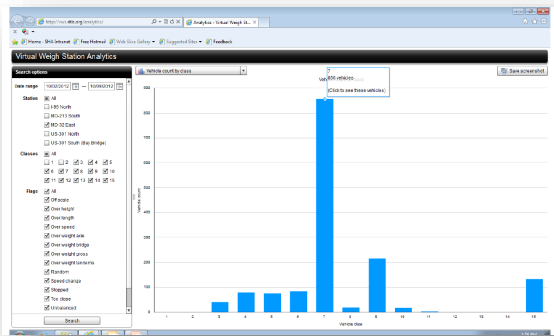
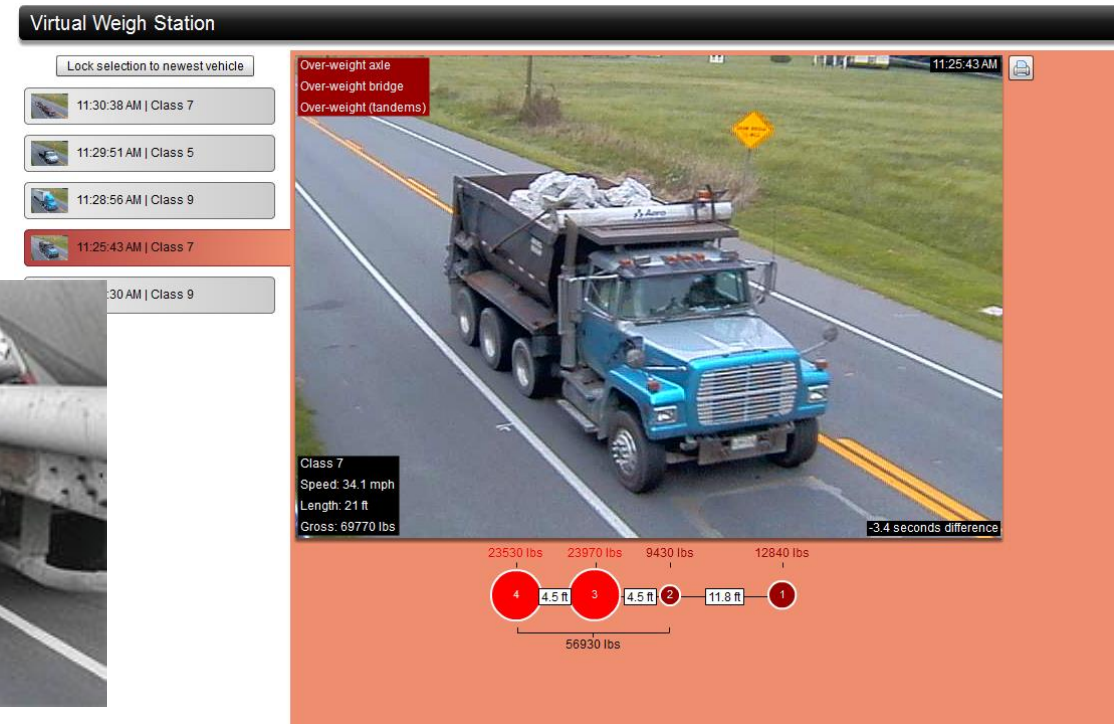
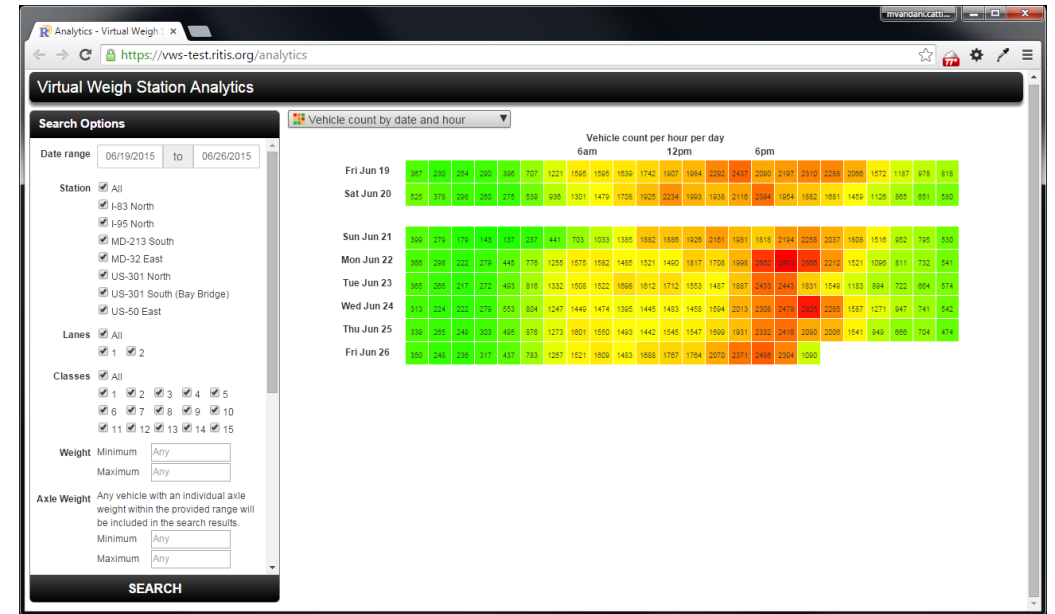
For information or inquiries please contact:

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

cc: Maryland State Police, Commercial Vehicle Enforcement Division (MSP-CVED)
cc: Maryland Transportation Authority Police, Commercial Vehicle Safety Unit (MDTA-CVSU)

Next Steps

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



Questions & Discussion

Michael L. Pack

PackML@umd.edu

301.405.0722

www.ritis.org/register

