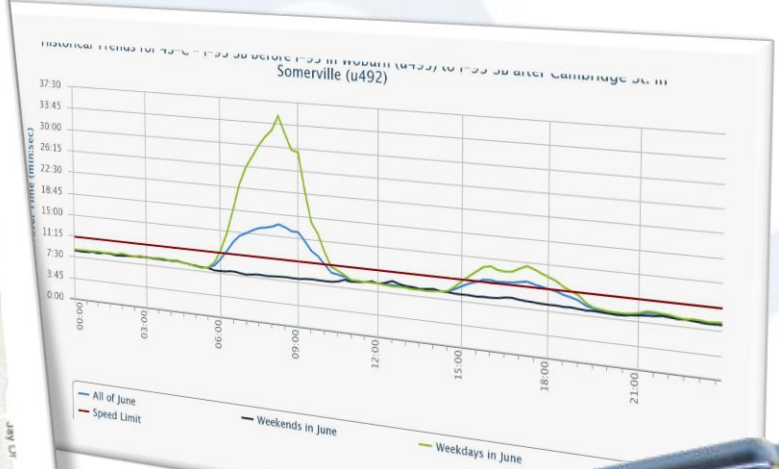
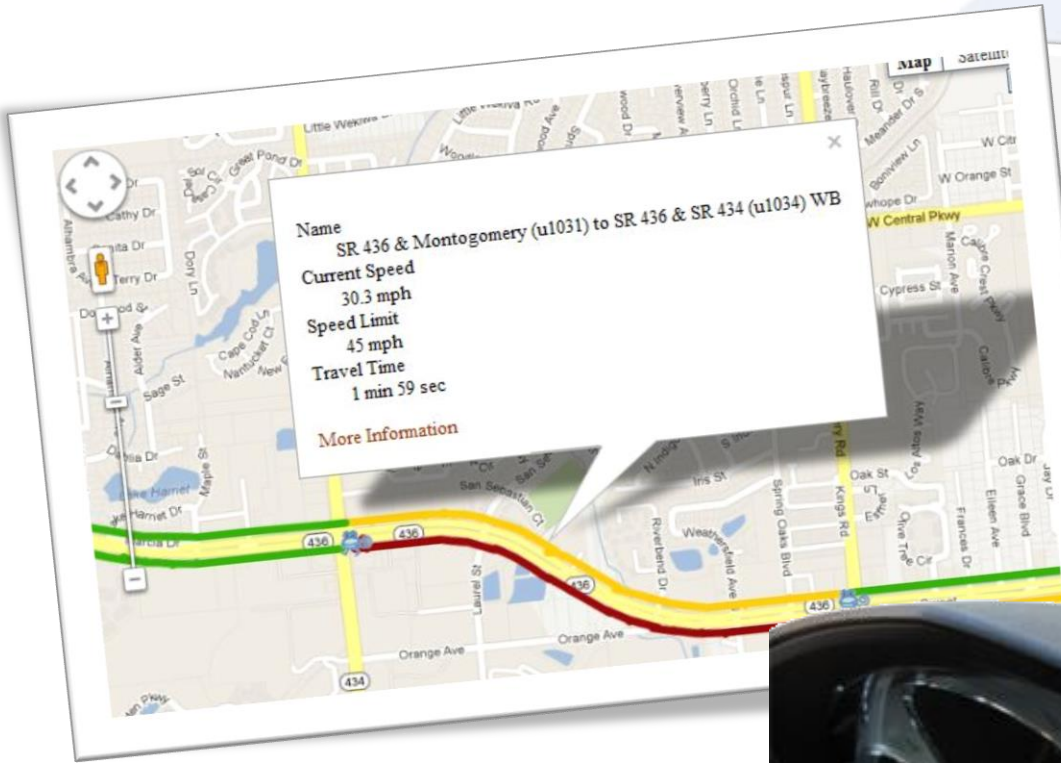




BlueTOAD

# Bluetooth® Travel-Time Recording and Reporting



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# TrafficCast – Data Software Company



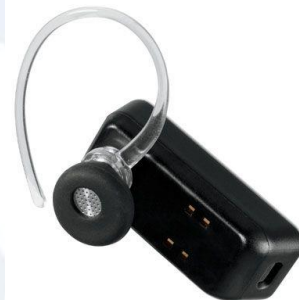
1999	TrafficCast Incorporated
1999 – 2002	R&D – Dynaflow GPS Probe Data
2002 – 2005	Penetrate Commercial Sales Channels (Yahoo, Google, Westwood One)
2006 – 2007	Commercialization, Product Development
2008 – 2010	Growth, Expansion (TomTom, deCarta)
2010	Introduction of BlueTOAD
2010	OnStar selects Dynaflow for Traffic Application
2010-2011	North American Sales Channel, OEM, Partnerships for BlueTOAD
2012	1,000 BlueTOAD installed
2014	Over 3,000 BlueTOAD's installed



# Intro to Bluetooth and MAC address...



- **Bluetooth** is an open wireless technology standard for exchanging data over short distances from fixed and mobile devices, creating personal area networks (PANs) with high levels of security.
- **Bluetooth** uses a radio technology called frequency-hopping spread spectrum and is in the 2.4 GHz short-range radio frequency band
- **A Media Access Control address (MAC address)** is a unique identifier assigned to network interfaces for communications on the physical network segment

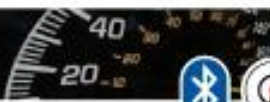
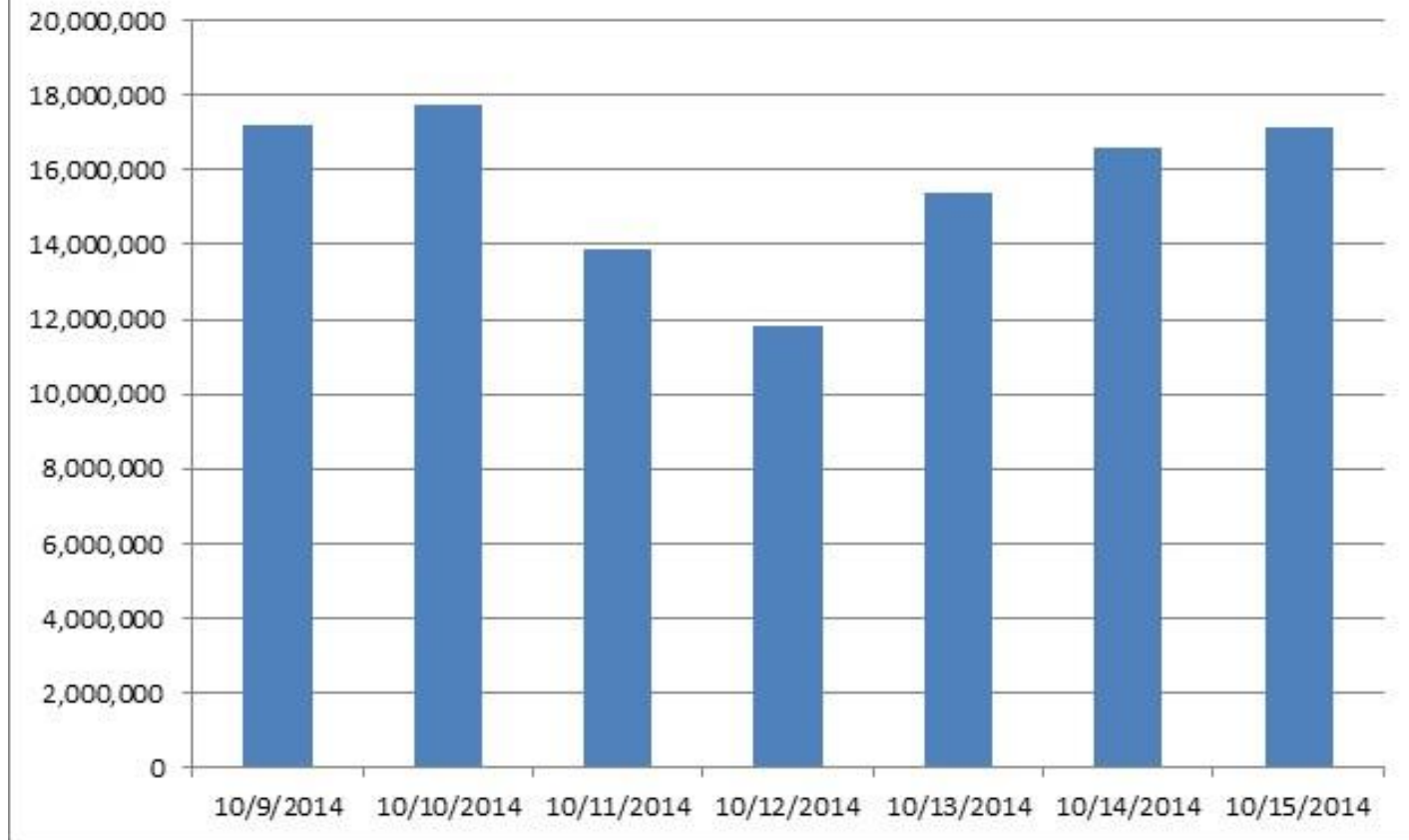


# Bluetooth Detects



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## BlueTOAD Detections per Day National Server



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# How does Bluetooth detection work



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WWW.TRAFFICCAST.COM

Servers



Timer

00:30 min/sec

BlueTOAD - A



BlueTOAD - B



**TRAFFICCAST**





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# Data to Information Cycle

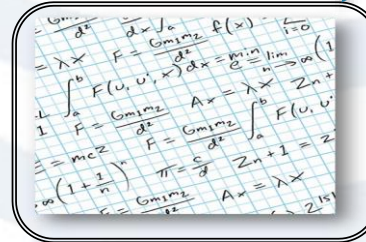
## Hardware:

- AC or DC Power
- Ethernet and/or Cellular
- Stand alone or existing cab.



## Filters/Algorithms:

- Proprietary algorithms that smooth the data based upon road classes (i.e. arterial, expressways, etc.)
- Traffic engineering and data analysis that check to see if the data is accurate



## Web based Backend:

- Real time speed and travel time information displayed on website hosted by TrafficCast
- Statistical data reports covering speed, travel time, origin/destination





# Agencies Information Needs

BlueTOAD™

National Traffic Signal Report Card 2012	
Management	D
Traffic Signal Operations	C
Signal Timing Practices	C
Traffic Monitoring and Data Collection	F
Maintenance	C
<b>OVERALL</b>	<b>D+</b>



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# Bluetooth Applications

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- Arterial Travel-Times (operations, OD, message boards, before/after studies, Adaptive analysis)
- Freeway Travel-Times (operations, OD, message boards)
- Work Zone applications
- 511/Traveler Information Systems
- Planning/Modeling
- Incident Management
- Wealth of experience....



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# Data versus Information

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**“Let’s not be data rich and information poor.” FDOT**



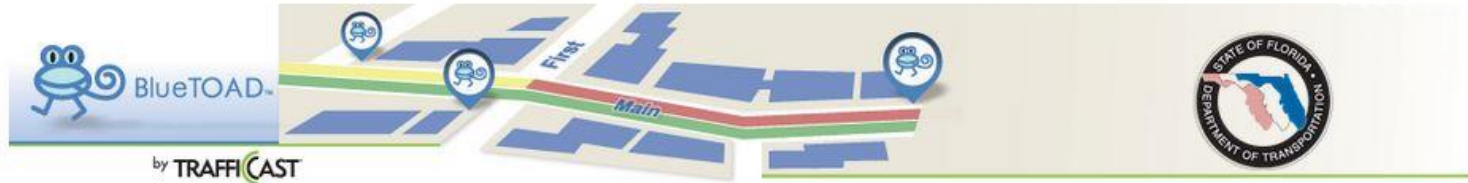
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# Web based software



BlueTOAD™



Dashboard Speed Map Devices Pairs Routes Reports O/D Studies MiniTOAD Alarms Docs Account Admin Log Out

tci\_FDOTD4\_admin

## Reports

Pair/Route Report Comparison Report Historical Report Device Report Alarm Report

Generate Report

### BlueTOAD Pair / Route

Pair 7060: (Belvedere Rd - Military Trail to I-95)

Show inactive pairs/routes

Start Date \*

10/23/2014

Format: 10/23/2014

End Date \*

10/23/2014

Format: 10/23/2014

Start Time \*

00 00

End Time \*

23 59

Daily Start/End Times

Report Type \*

Smoothed Speed (5-min)

Show previous value if no current data (smoothed reports only)

Display Level of Service (LOS) ...not available - Road Class not specified for pair/route

Add Comparison Index

Output Type \*



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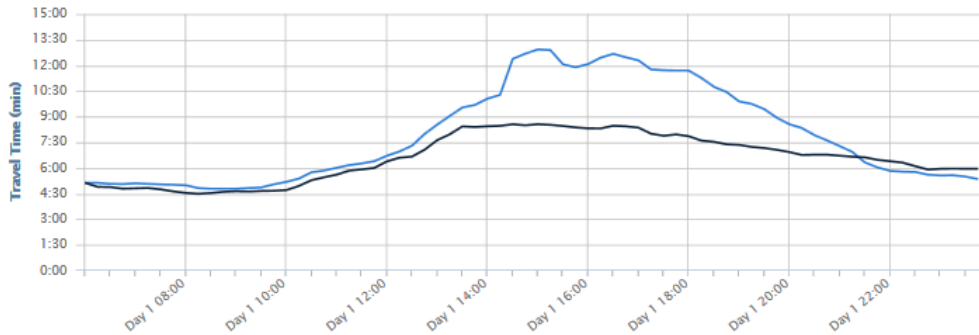




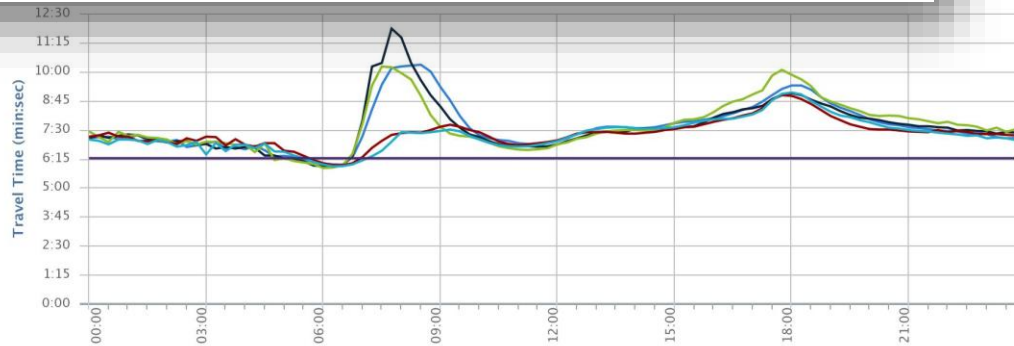
# Reporting Information

Comparison Report: Realtime Smoothed Speeds: 15 min aggregate

Time Interval: 06:00:00 - 23:59:00



— Route Barrett Pkwy Eastbound - (2012-11-23 - 2012-11-23)  
— Route Barrett Pkwy Eastbound - (2013-11-29 - 2013-11-29)



— All of August      — All of September      — All of October  
— All of June      — All of July      — Speed Limit

- Before and After reports on all pairs and routes
- Historical Indexing
- TOD selectable (AM or PM Peak)
- HTML, CSV and graphing outputs





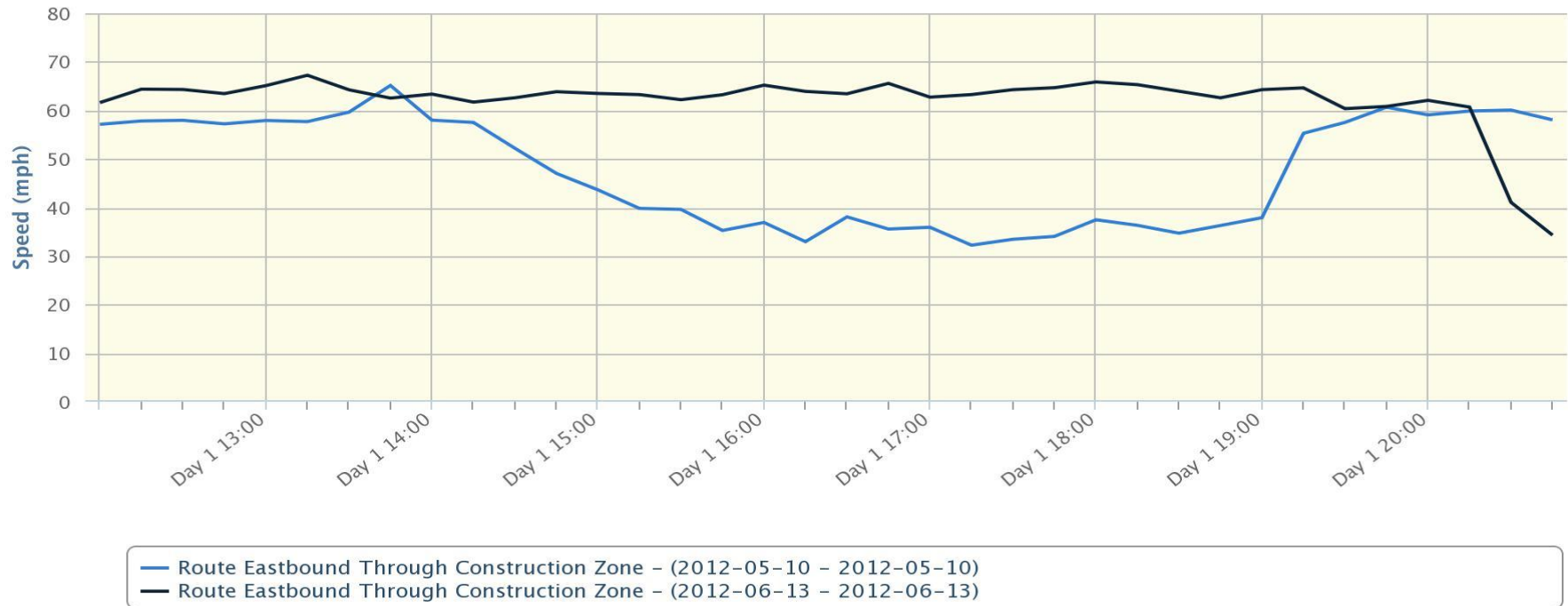
# Easy Performance Measures

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- Freeway or Arterial performance

Comparison Report: Smoothed Speed (15-min)

Time Interval: 12:00:00 - 20:59:00



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# Historical Information

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1	3942: (Eastbound Through Construction Zone)			
2	Historical Average of all days of the week: From 2012-05-01 to 2012-05-31			
3	Historical Average of all days of the week: From 2012-06-01 to 2012-06-30			
4				
5	May, Eastbound through construction (speed)	May, Eastbound through construction (time)	June, Eastbound, post construction (speed)	June, Eastbound, post construction (time)
56	52.5	7:00	61.7	5:58
57	50.8	7:14	60.8	6:03
58	48.9	7:31	59.3	6:12
59	47	7:50	56.6	6:30
70	45.7	8:03	59.3	6:12
71	43.1	8:32	55.8	6:35
72	42	8:45	54.8	6:43
73	39.9	9:13	57.5	6:24
74	41.4	8:53	57.7	6:22
75	41.1	8:57	55.5	6:38
76	40.7	9:02	57.1	6:26
77	41.9	8:47	57.7	6:22
78	44.2	8:19	58.2	6:19
79	45.9	8:01	58.7	6:16
30	47.7	7:43	58.2	6:19
31	51.3	7:10	59.2	6:13
32	55.6	6:37	60.1	6:07
33	57.4	6:24	61	6:02
34	58.5	6:17	62.2	5:55
35	59.5	6:11	63.1	5:50
36	57.5	6:24	64.2	5:44
37	54.6	6:44	61.6	5:58
38	52.9	6:57	54.2	6:47
39	52.9	6:57	50.6	7:16

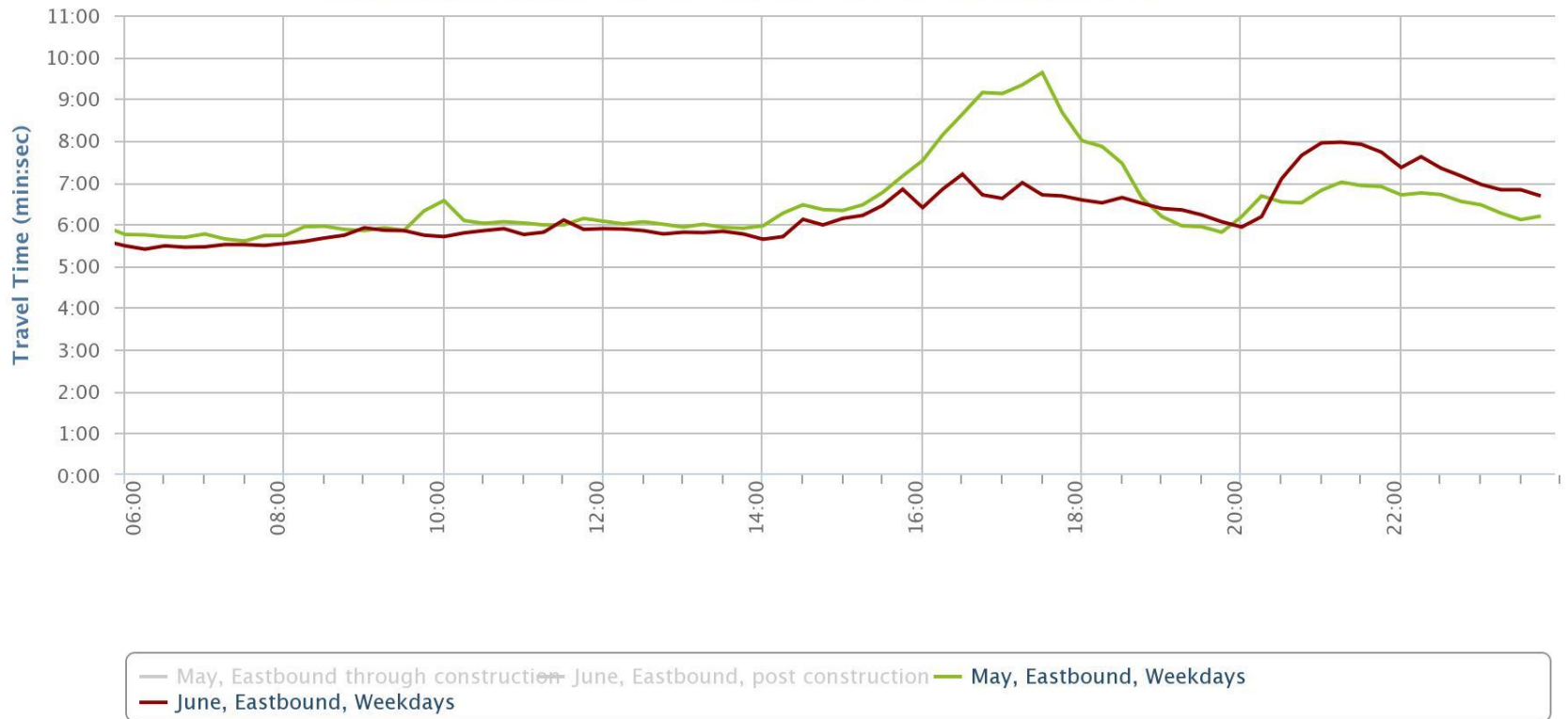




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# May Weekday vs June Weekday

### Historical Trends for Eastbound Through Construction Zone



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# Think Bigger!

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## BlueTOAD Pair / Route

Route 12429: (SR 7 - Southern Blvd to Okeechobee Blvd) ▼

- Show inactive pairs/routes
- Show speed limit

Tuesday - Thursdays in June

- Default Historical Average (12 Weeks)
- Custom Historical Average

Remove Comparison

Save these settings

### Days of the Week

- All
- Sun
- Mon
- Tue
- Wed
- Thu
- Fri
- Sat

### Range

- 12 Weeks Before Now
- or
- 06/02/2014 to 06/30/2014  
Format: 10/23/2014      Format: 10/23/2014

Tuesday - Thursdays in August

- Default Historical Average (12 Weeks)
- Custom Historical Average

Remove Comparison

Save these settings

### Days of the Week

- All
- Sun
- Mon
- Tue
- Wed
- Thu
- Fri
- Sat

### Range

- 12 Weeks Before Now
- or
- 08/01/2013 to 08/31/2013  
Format: 10/23/2014      Format: 10/23/2014

Add Comparison Index



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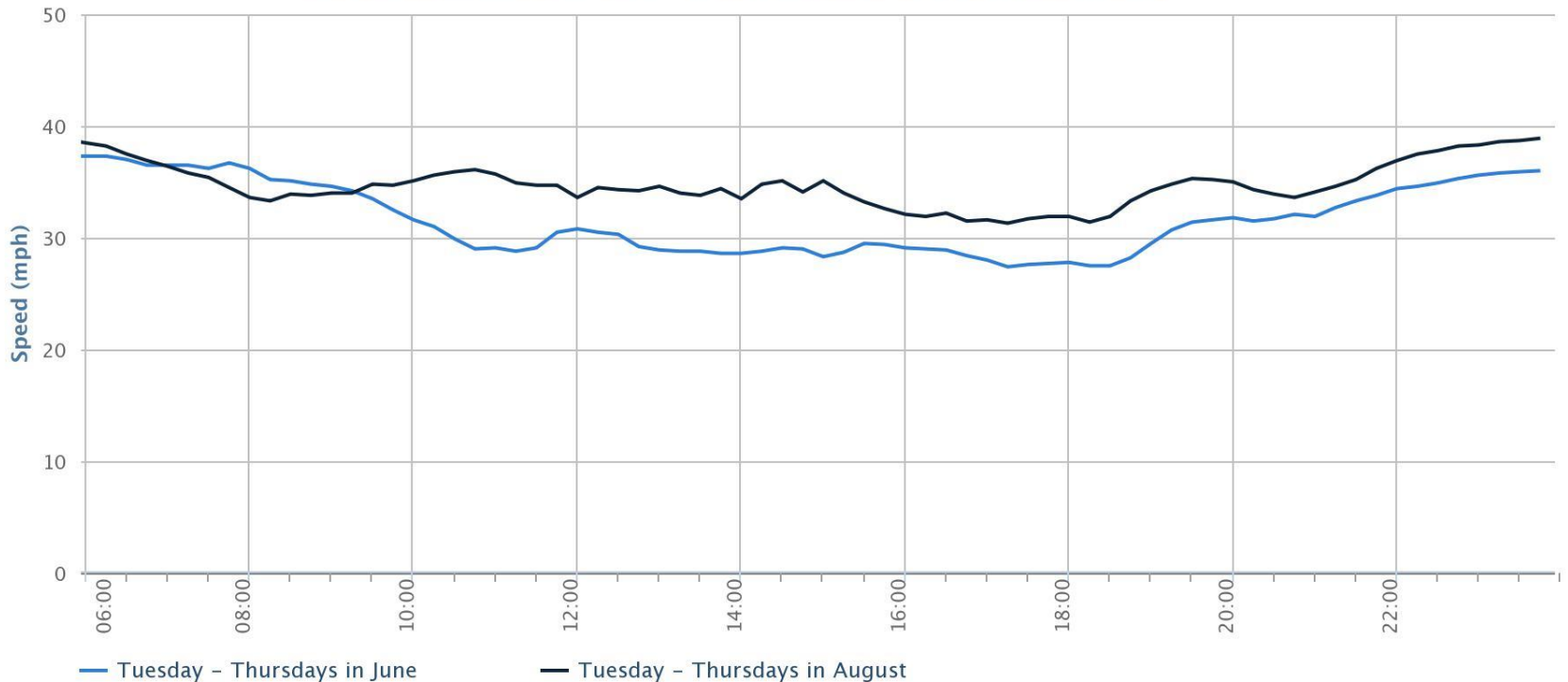




# Month vs Month for Modeling

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Historical Trends for SR 7 – Southern Blvd to Okeechobee Blvd



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# Month vs Month for Modeling

BlueTOAD™

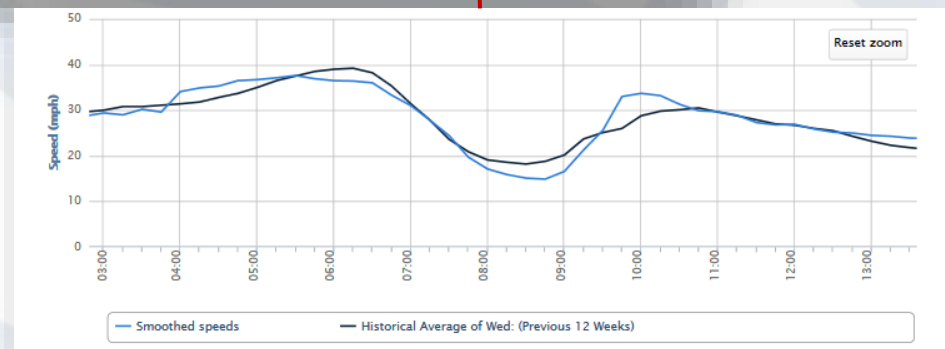
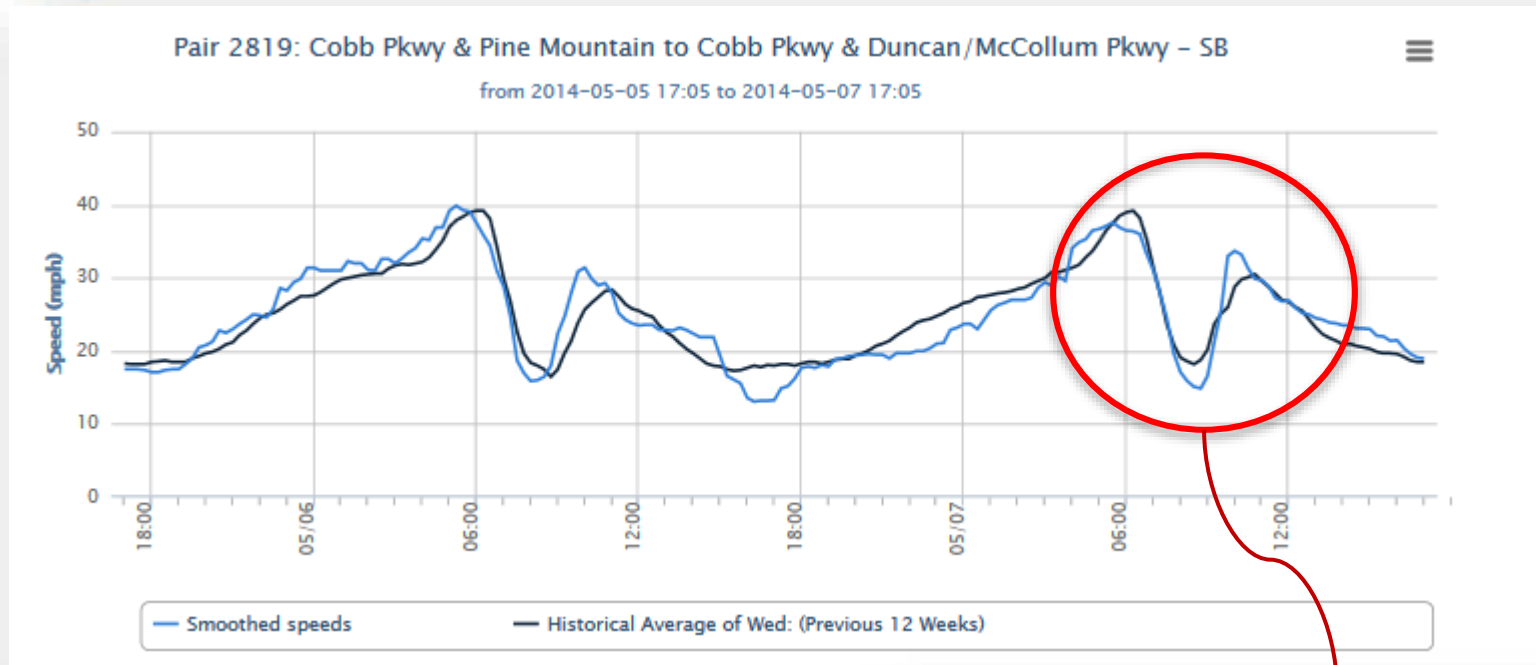
1	BlueTOAD Historical Report					
2						
3	Pair/Route	12429: (SR 7 - Southern Blvd to Okeechobee Blvd)				
4	Entire month of June	Historical Avg of Tue/Wed/Thu: From 2014-06-02 to 2014-06-30				
5	All of August	Historical Avg of Tue/Wed/Thu: From 2013-08-01 to 2013-08-31				
6						
7	Time	Entire month of June (speed)	Entire month of June (time)	All of August (speed)	All of August (time)	
2	6:00	37.3	3:13	38.5	3:07	
3	6:15	37.3	3:13	38.2	3:08	
4	6:30	37	3:15	37.5	3:12	
5	6:45	36.5	3:17	36.9	3:15	
6	7:00	36.5	3:17	36.4	3:18	
7	7:15	36.5	3:17	35.8	3:21	
8	7:30	36.2	3:19	35.4	3:23	
9	7:45	36.7	3:16	34.5	3:29	
0	8:00	36.2	3:19	33.6	3:34	
1	8:15	35.2	3:25	33.3	3:36	
2	8:30	35.1	3:25	33.9	3:32	
3	8:45	34.8	3:27	33.8	3:33	
4	9:00	34.6	3:28	34	3:32	
5	9:15	34.2	3:31	34	3:32	
6	9:30	33.5	3:35	34.8	3:27	
7	9:45	32.5	3:42	34.7	3:27	



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# Real-Time vs Historical Graphs





# Incident in Tampa area

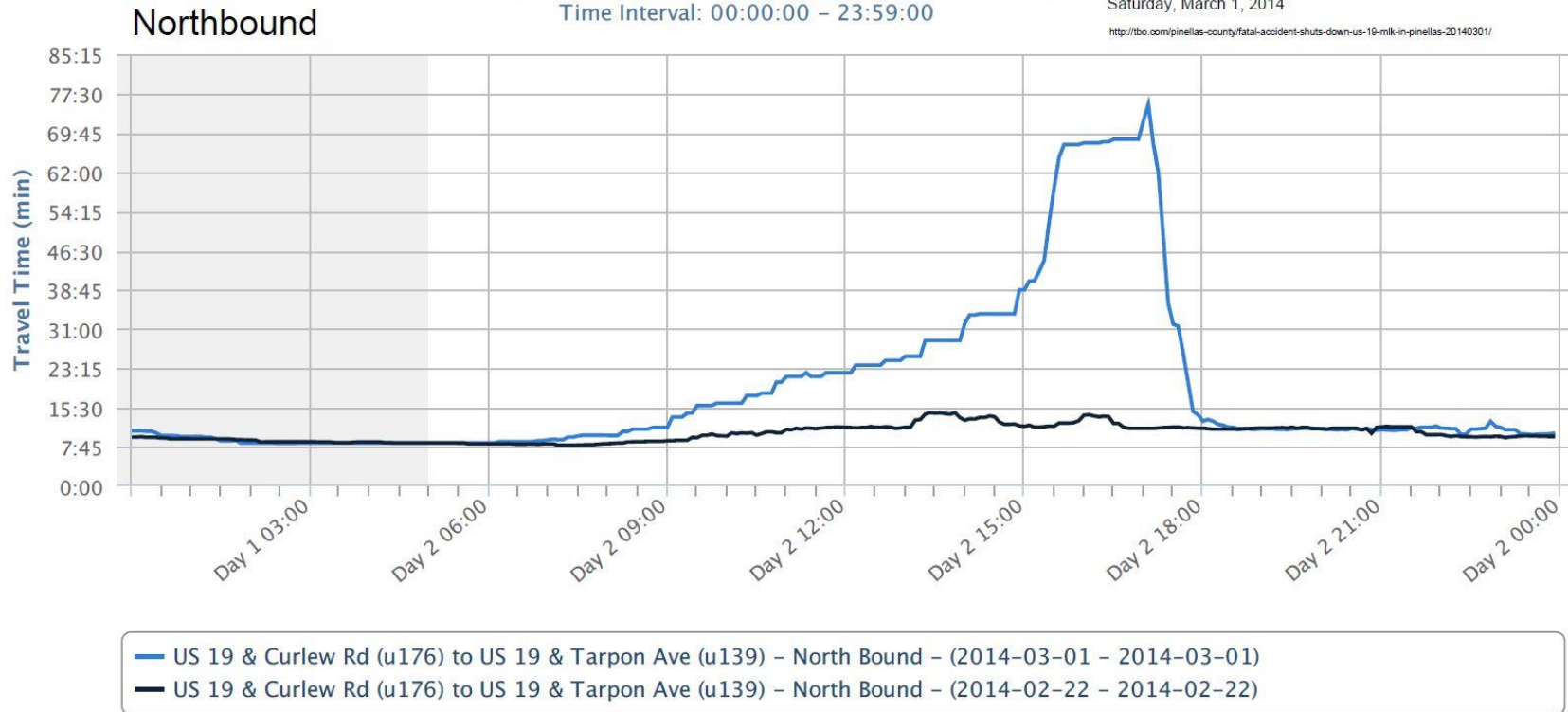
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- What was our normal performance of the roadway? (Historical Indexing tool)
- What was the duration of the incident? (Graphing tools)
- When did we officially recover? (Excel spreadsheets)
- How can we easily relay this to the public? (Graphs to the media if necessary)

Comparison Report: Smoothed Speed (5-min)  
Time Interval: 00:00:00 – 23:59:00

Fatal Crash Closes US 19 at M. L. King St, Tarpon Springs  
Saturday, March 1, 2014

<http://tbo.com/pinellas-county/fatal-accident-shuts-down-us-19-mlk-in-pinellas-20140301/>



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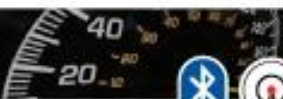




# The Next Evolution

BlueTOAD™

- Travel-Time Reliability
  - TTI: Travel Time Index
    - Issues
  - PTS: Planning Time Index
  - BTI: Buffer Time Index
  - Percent speed above XX mph (User Defined)
  - Percent speed below XX mph (User Defined)
  - 85% Percentile calculation



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# Thank you for your time.

## Contact information:

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[Scoke@trafficcast.com](mailto:Scoke@trafficcast.com)  
225-362-4575

