

Welcome KYTC Partnering Conference Attendees

BlueTOAD - Probe Data

Lexington, KY

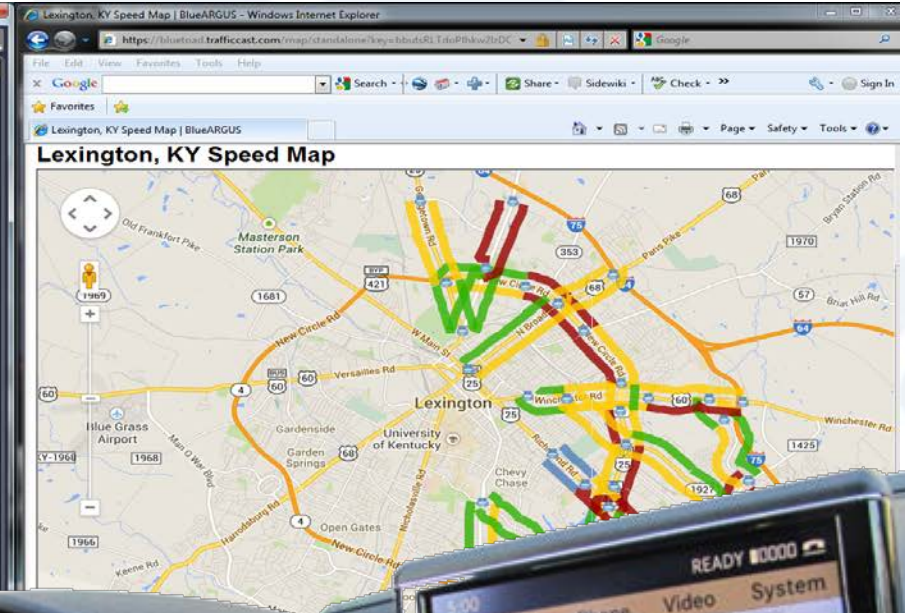
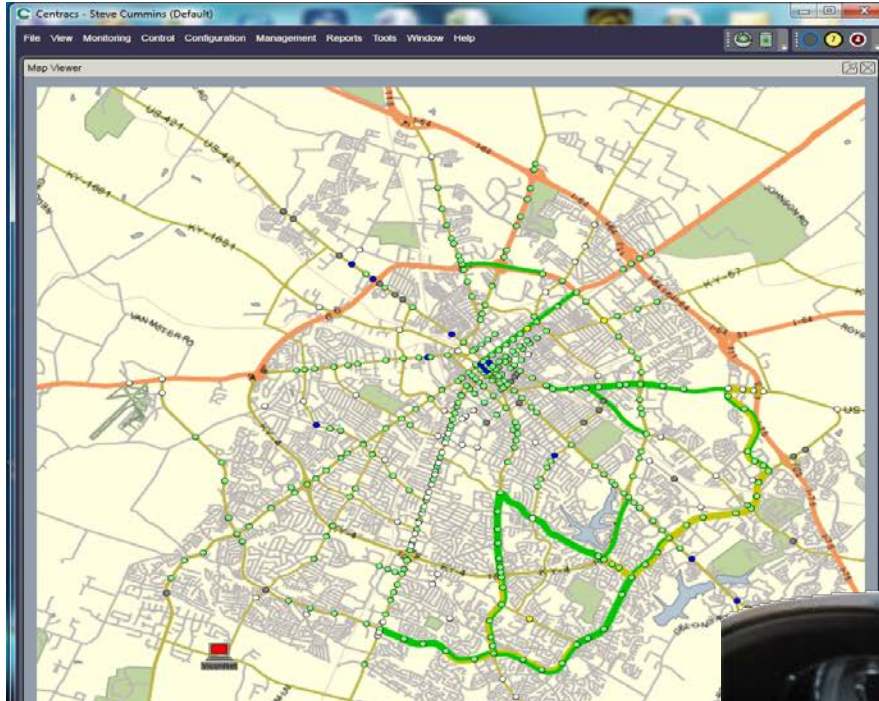




BlueTOAD®



Bluetooth® Travel-Time Monitoring



TRAFFICCAST



Discussion Points



BlueTOAD™

- What is BlueTOAD
- What is Bluetooth and a MAC address
- How does BlueTOAD use Bluetooth to generate Travel-Times & Speeds
- BlueTOAD Applications
- BlueTOAD Configurations
- BlueTOAD Website:
 - Real-time speed map
 - Real-time Information
 - Real-time vs Historical Reports
 - Archived Data



TRAFFICCAST



BlueTOAD

Bluetooth Travel-Time Origin And Destination



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



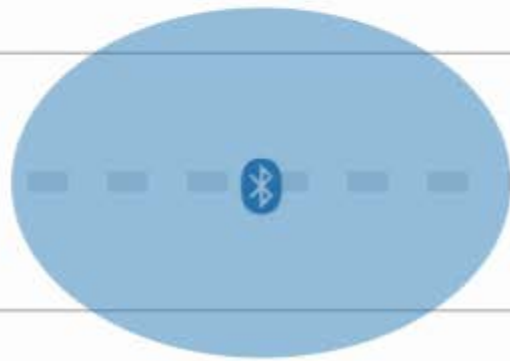
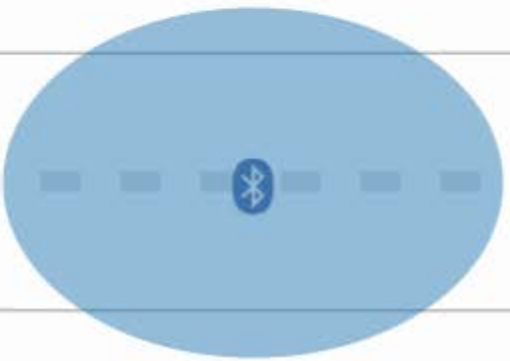
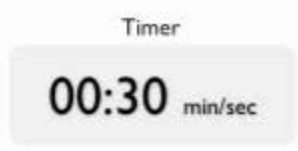
How does BlueTOAD work with Bluetooth..



TRAFFICCAST



WWW.TRAFFICCAST.COM



TRAFFICCAST





Key Features of The BlueTOAD System:

- Completely non-intrusive installation (~30-60 min. install)
- Reliable Data using MAC address pairing
- Limited or no configuration
- Stand alone System or use existing cabinet
- Cellular and/or Ethernet Communications
- For use in Arterials and Freeways
- Real-time network and device monitoring
- Over-the-Air software downloading
- Web Based GUI
- Future expansion design



BlueTOAD Turnkey Solution



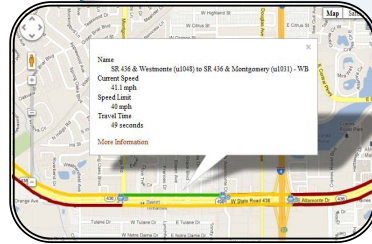
Hardware:

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



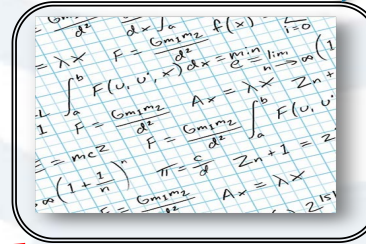
Web based Backend:

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



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



Effectively Filter Data Outliers in Real-Time



Pair ID

Pair Name *

From Device *

From Device Name

To Device *

To Device Name

- Save Pair
- Add Reverse
- Cancel

Attributes

Distance * <input type="text" value="0.500"/> mi/km	Direction * <input type="text" value="SE"/>	Speed Limit * <input type="text" value="35"/> mph	Road Class <input type="text" value="None"/>	Smoothing Method * <input type="text" value="Two Stage Mean"/>
---	---	---	--	--

XF1 (user-defined)

XF2 (user-defined)

- Two Stage Mean
- Two Stage Mean
- 85th Percentile
- Two Stage 85th Percentile
- Two Stage Median
- FreeFlow Long Distance
- Multiple Speeds

Settings

Match-Speed Limits **Make Like**

Min Speed * <input type="text" value="Automph"/>	Max Speed * <input type="text" value="30mph"/>	Stale Time * <input type="text" value="30min"/>
--	--	---

Speed Map Color Thresholds (% of speed limit)

Yellow * <input type="text" value="28.5714"/> %	Orange * <input type="text" value="28.5714"/> %	Green * <input type="text" value="57.1429"/> %	Blue * <input type="text" value="100"/> %
---	---	--	---

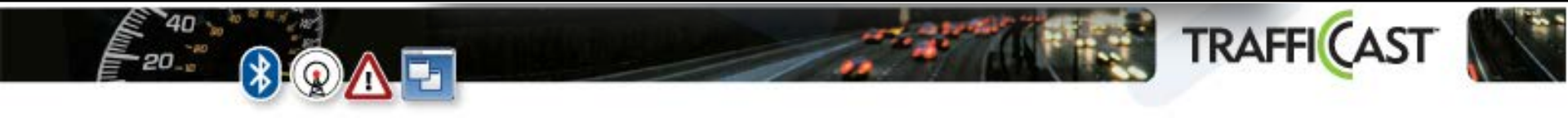
O/D Only

Alarms

Preset Alarms

Use the Alarms menu to create new alarms

Falls below 26
From 06:00 to 20:00 (MTWRF)



BlueTOAD Applications



BlueTOAD™

- **Arterial Travel-Times**
 - Operation Performance, OD, Before/After Analysis
- **Freeway Travel-Times (OD, DMSs)**
- **Work Zone applications**
 - Timing Mods based on Travel Speeds or Travel Times
- **511/Traveler Information Systems**
- **Planning/Modeling**
- **Incident Management**
 - Trigger Traffic Responsive via Threshold Alarms



TRAFFICCAST



BlueTOAD Configuration Options



Solar/Cellular BlueTOAD



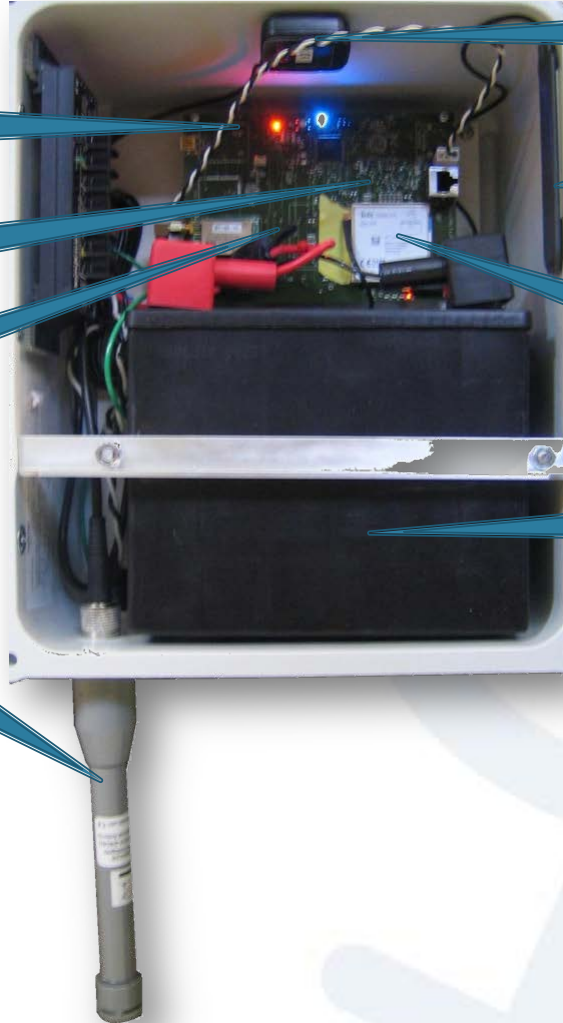
Ethernet BlueTOAD

For all Configurations...

- Permanent or Temporary deployments
- Ethernet and/or Cellular communications
- AC or DC Solar Power



Solar/Cellular BlueTOAD



Solar Charge Controller

Bluetooth Radio

Patent Pending Detection & Control Circuitry

Environmental Bluetooth Antenna

GPS Antenna

High-Performance GSM Blade Antenna

GSM Cellular Data Modem

7 Day Backup Battery



Ethernet BlueTOAD



Ethernet BlueTOAD

- Power Over Ethernet (POE) for simple installation
- IP addressable – static or DHCP
- Outbound network traffic only
- Ethernet 10Base-T/100Base-T
- Cellular Option
- Free of knockdowns & Vandalism
- No drilling in to the cabinet; possibly voiding the warranty

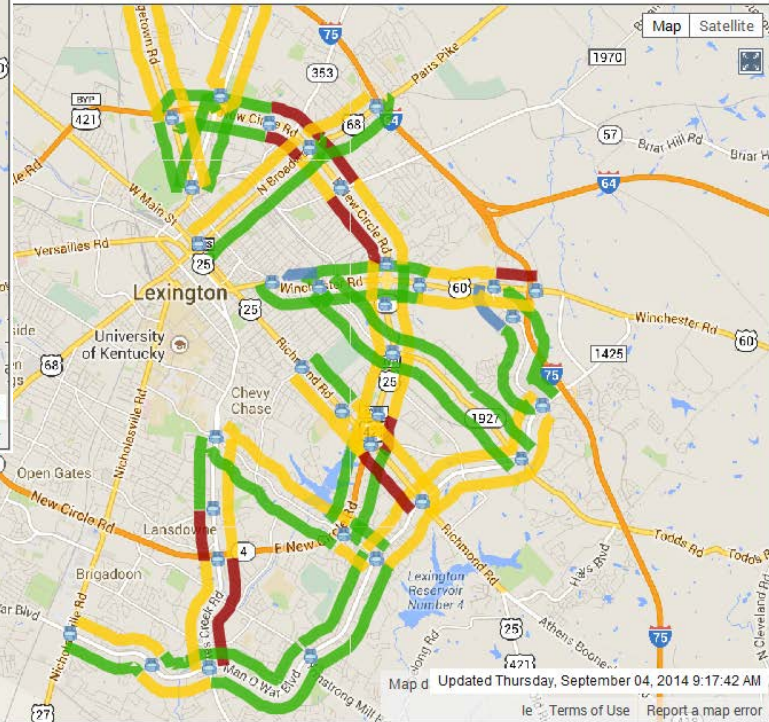
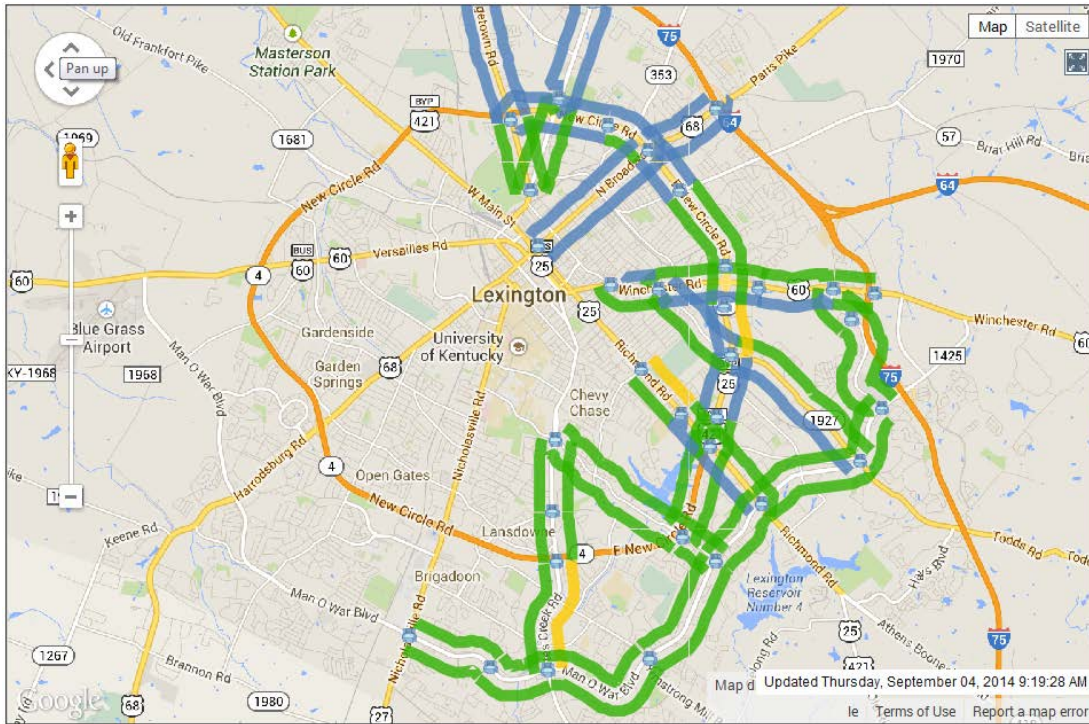


Stand Alone Speed Map



BlueTOAD™

Thresholds based on either Speed Limit or Historical Average



Real-Time Information



Dashboard - Lexington, KY

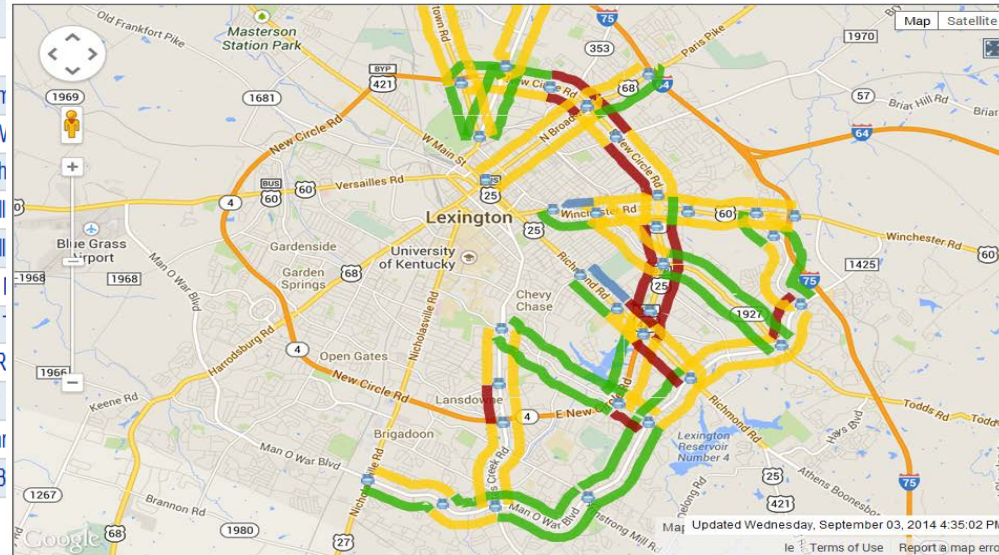
Show Pairs Show Routes

Type	ID	From	To	Name	Speed	Time	Last Match
Pair	17063	1551	2173	Alumni/New Circle (outer) to Richmond/New Circle(outer)	37 mph	2:16	09-03 16:48
Pair	11643	1551	1557	Alumni/New Circle (outer) to Tates Creek/Alumni	26 mph	4:34	09-03 16:49
Pair	17084	2118	2117	Georgetown/ Citation to Georgetown/New Circle(Inner)	26 mph	3:28	09-03 16:44
Pair	17083	2117	2118	Georgetown/New Circle(Inner) to Georgetown/ Citation	31 mph	2:55	09-03 16:46

Speed Map - Lexington, KY

Pair	17053	2117	2124	Georgetown/New Cir
Pair	17085	2117	2115	Georgetown/New Cir
Route	12212	1546	1551	I75 to New Circle
Route	12207	1550	1546	Man O War - East
Route	12208	1546	1550	Man O War - West
Pair	11513	1545	1551	MOW/Alumni to Alun
Pair	11512	1545	1552	MOW/Alumni to MOV
Pair	11515	1545	1547	MOW/Alumni to Rich
Pair	11511	1552	1545	MOW/Armstrong Mill
Pair	11510	1552	1539	MOW/Armstrong Mill
Pair	11500	1581	1550	MOW/Clearwater to I
Pair	11501	1581	1539	MOW/Clearwater to
Pair	11499	1550	1581	MOW/Nicholasville R
Pair	17065	1584	2128	MOW/Todds to New
Pair	11518	1584	1547	MOW/Todds to Richr
Pair	11519	1584	1546	MOW/Todds to Sir B

Select a route:
 Show all pairs



- No data
- Fast
- Normal
- Below Normal
- Slow
- Very Slow

Click on a path to see detailed pair information

- Index determined by
- speed limit
 - avg last 12 Wednesdays
 - custom historical avg

Refresh Interval:

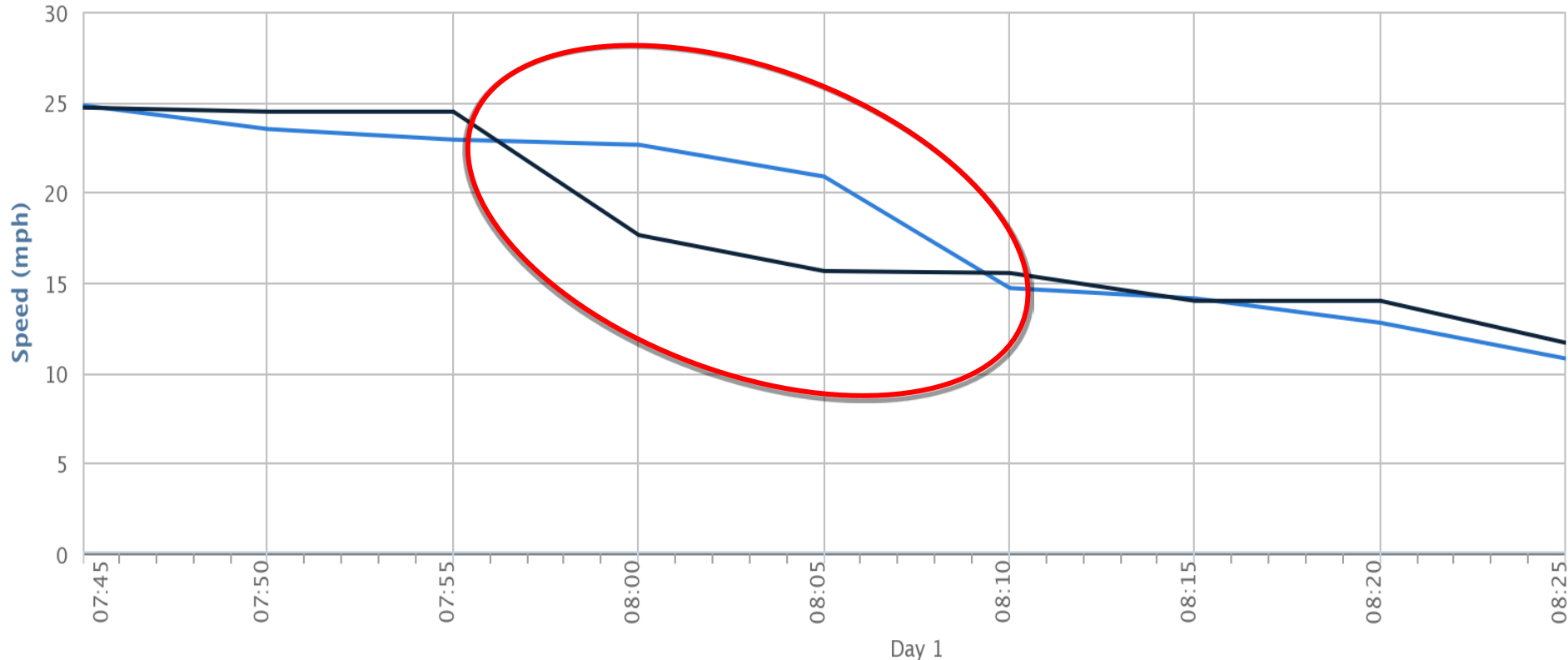


Real-Time vs. Historical



Comparison Report: Smoothed Speed (5-min)

Time Interval: 07:45:00 - 08:30:00



- Richmond/New Circle(outer) to Richmond/St. Ann-Fontaine - (2014-09-02 - 2014-09-02)
- Richmond/New Circle(outer) to Richmond/St. Ann-Fontaine - (2014-09-04 - 2014-09-04)



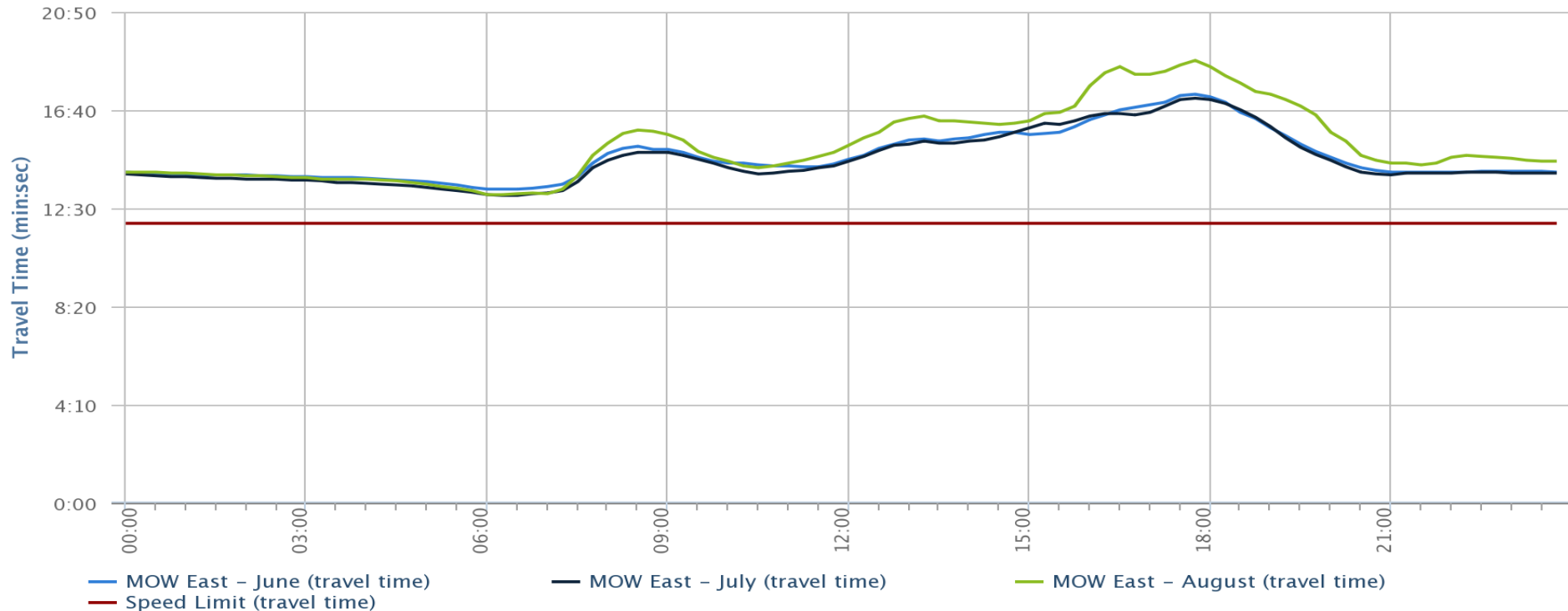
Archived Data - Reports



BlueTOAD™

Pair / Route
Route 12207: (Man O War - East)
Speed Limit
44mph
MOW East - June
Historical Avg of Fri: From 2014-06-01 to 2014-06-30
MOW East - July
Historical Avg of Fri: From 2014-07-01 to 2014-07-31
MOW East - August
Historical Avg of Fri: From 2014-08-01 to 2014-08-31

Historical Trends for Man O War - East



TRAFFICCAST™



Questions ?

Steven W. Cummins, P.E.
LFUCG Division of Traffic Engineering
Traffic Signal Systems Manager

stevec@lexingtonky.gov
859.258.3491

