

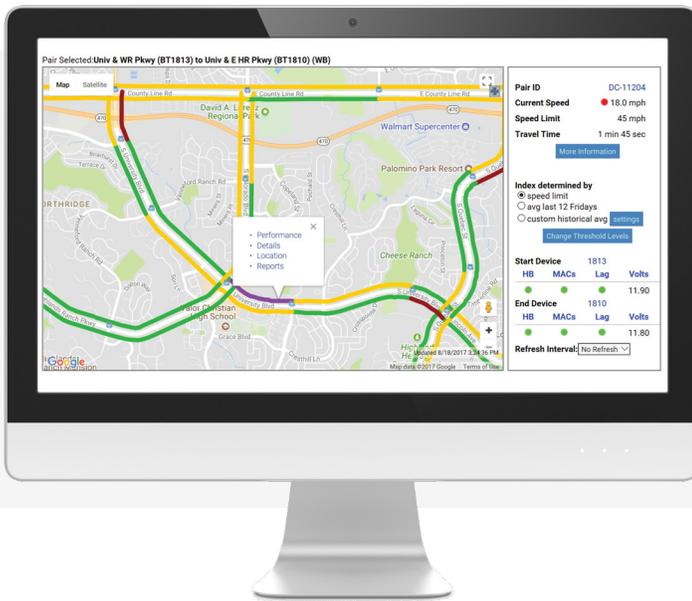


# BlueARGUS™

## BlueTOAD® Travel-Time-Based Performance Software

### BlueTOAD Travel-Time System Real-Time & Historical Features of the BlueARGUS Software Suite

The ability to see accurately what is occurring on your road network in real-time is an essential ITS operations management utility. In addition, having the ability to report on travel-times and speeds using a host of reporting options is an important performance-based tool for the Traffic Engineer and Civil Planner. The BlueARGUS software suite combines both real-time features, along with reporting features to deliver the most comprehensive travel-time system in the market. The BlueTOAD system consists of two main components in the BlueARGUS software — Real-Time information and Historical archived data.



### Interactive, Real-Time Speed Maps

The BlueTOAD system provides a real-time speed map that provides easy access to every roadway segment and all the corresponding information, such as travel-time and average speed. In addition, the BlueTOAD speed map allows the user to view the color indication based on either the speed limit or historical average. Right-Click on a Pair's color-coded Speed indication line for quick access to road segment information, Performance data and reporting tools.

### Real Time Signal, Phase and Timing (SPaT) and Connected Vehicle Data

Now including Connected Vehicle data collection and processing, the BlueARGUS software suite combines both real-time features, along with reporting features to deliver the most comprehensive Smart City travel-time system on the market.

The BlueARGUS live intersection view displays real time SPaT information as broadcast over 5.9 GHz spectrum using Dedicated Short Range Communications (DSRC) or Cellular Vehicle to Everything (C-V2X) available with the BlueTOAD Spectra Roadside Unit (RSU) for Vehicle-to-Infrastructure (V2I) information exchange with vehicles. The BlueARGUS system collects and processes lane-by-lane data and its associated signal phase information to initiate signal priority and preemption requests to the local traffic controller.

**Intersection Lanes, Movements and Signal Timing**  
Intersection 59234: South Anaheim Boulevard and East Vermont Avenue

ID	Coordinate	Dist	Total Lanes	Lane Width	Signal Phase and Time Remaining (in seconds)							
59234	33.823170, -117.909805	16.6 mi	17	366 cm	1	2	4	5	6	8	Network Latency: -1.91	
					23	23	18	23	23	18		

Map Satellite

Signal Phase 1

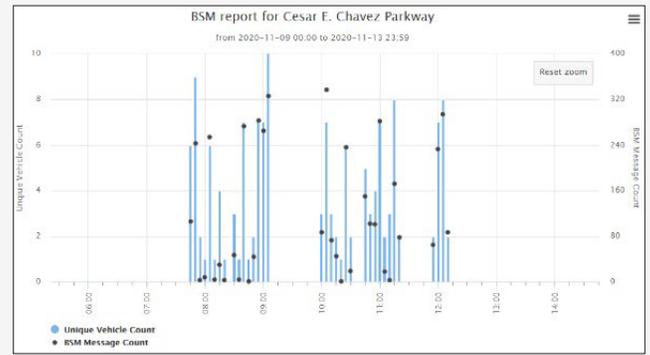
From Lane	To Lane	Movement Types	Signal Phase	Signal State	Time Remaining (in seconds)
3	5	U-Turn	1	●	23
3	9	Left	1	●	23

BlueARGUS Live Intersection View - SPaT & BSM display

BlueARGUS also collects vehicle movement data via capture of the vehicle's Basic Safety Message (BSM) broadcasts (location, approach, speed, etc.), including Connected Vehicle counts and location speed captures.

Vehicle BSM data is also available to share with other Agency stakeholders and traffic management systems via REST API.

*BlueARGUS BSM Report display. >*

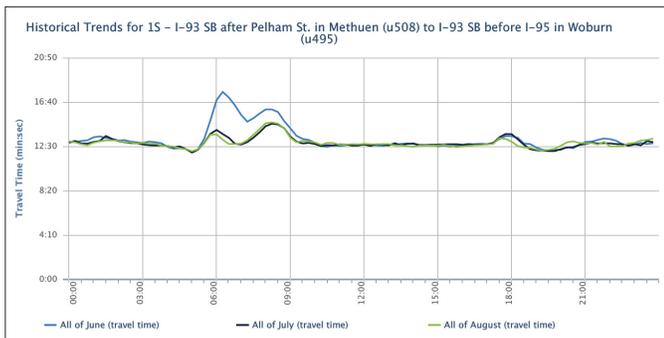


## Historical Data Reports

The BlueARGUS reporting tool provides access to historical, archived data in multiple usable formats. All graphs can be saved as a JPG, PNG or PDF and all data can be downloaded to a CSV spreadsheet format. ALL reports can now be scheduled for automated report delivery. The BlueARGUS reports consist of the following:

### Pair/Route Report

Customers can create a pair/route report in 5 or 15-minute increments based on travel-time or speed, with the option of individual speeds and number of matches. These reports can be exported as HTML, CSV or Graph formats. The Pair/Route report has the additional feature of allowing the user to overlay a comparison index to the data reported.



*See Historical Trends over time – differences in travel time in the month of June, July and August.*

### Comparison Report

The user can compare any Pair/Route to another Pair/Route (or the same one) with different dates. For example, the user can compare travel-times before and after a signal upgrade project to gauge the impact it has on travel times. Also, the user can add multiple pairs and routes while not being limited to just two comparisons.

### Historical Report

With the use of historical reports, the user can aggregate and compare data in virtually any combination of days, weeks, months or years. Once the information has been generated into graphical format, the user can simply include the legend data and it will appear in the reports.

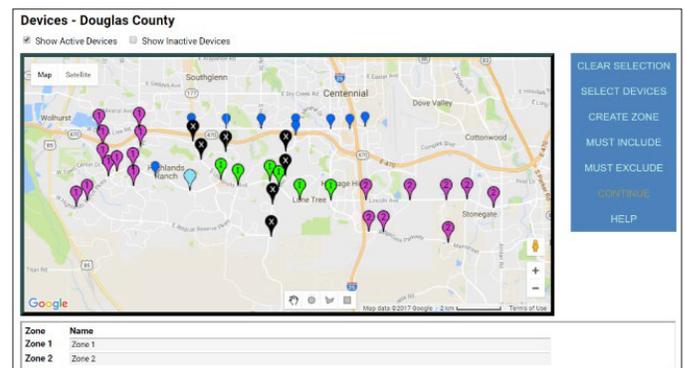
### Travel-Time Reliability Report

Travel Time Reliability is a new approach to measure the driver experience by quantifying variability from the driver's prospective, in addition to providing an average travel-time. Utilizing the Travel Time Reliability report, traffic engineers can analyze their roadway network's performance based on reoccurring congestion, non-reoccurring congestion and volatility. Travel Time Reliability (TTR) is an index based on three factors:

- Travel Time Index (TTI)
- Buffer Time Index (BTI)
- Planning Time Index (PTI)

### Origin and Destination (OD) Studies

The Origin and Destination (OD) feature of BlueARGUS allows the user to select various combinations of installed BlueTOAD detectors to monitor traffic flow patterns and driver behavior. This data not only shows where trips began and ended, but also the sequence or chain of events that lead from the starting point to the end point of their trip. Users can create OD location zones made up of single or multiple BlueTOAD devices to represent a business district, university campus, or residential development, etc.



*Enhanced Zone-Based Origin & Destination Studies OD Matrix from: Devices to Devices, Zones to Zones or Devices to Zone(s)*