

BlueTOAD Spectra and BlueARGUS Used for Traffic Responsive Applications in Fort Collins, CO

Introduction

The City of Fort Collins, Colorado, a BlueTOAD user since 2014, recently began using real-time BlueTOAD Spectra data to drive their Traffic Responsive applications. The City is using Traffic Responsive methods in an effort to manage fluctuating congestion on two problem corridors as well as an intersection that is impacted by a rail crossing. The use of BlueTOAD data is making the process easier to setup and maintain and is offering added benefits not achieved by the loops used in typical Traffic Responsive applications.

Using the City's Advanced Traffic Management System (ATMS), vehicle speeds collected from BlueTOAD devices are being monitored in real-time and, based on user defined speed thresholds, intersection signal timing plans are being changed accordingly. This real-time data allows for a quick response to fluctuating traffic congestion, providing an innovative approach to Traffic Responsive Signal Control that is not only cost effective, but extremely accurate and reliable.

Application

The City is using the BlueTOAD travel-time system combined with a Traffic Responsive application to rapidly react to detected traffic conditions. With the use of the BlueTOAD Spectra dual radio system that detects both discoverable and non-discoverable Bluetooth MAC addresses, coupled with the BlueARGUS data processing software, the City is now able to collect high quality and high-density speed data. The BlueARGUS data processing system provides the necessary data responsiveness needed to effectively activate a Traffic Responsive strategy to aid in the mitigation of undesirable traffic conditions.

By utilizing a predetermined timing plan to handle the real-time traffic conditions, the City's standard time-of-day (TOD) plan is replaced with the appropriate plan to clear congestion. In the City's ATMS, an event is triggered when the speed thresholds in BlueARGUS meet the prescribed speed levels. This event trigger instructs the ATMS to send the appropriate timing plan to the associated traffic controller. And, when the speed threshold levels go back up to normal, the event trigger reverts the timing plan back to the standard TOD Plan.

The following are the roadway link threshold levels and associated colors, as used by the City:

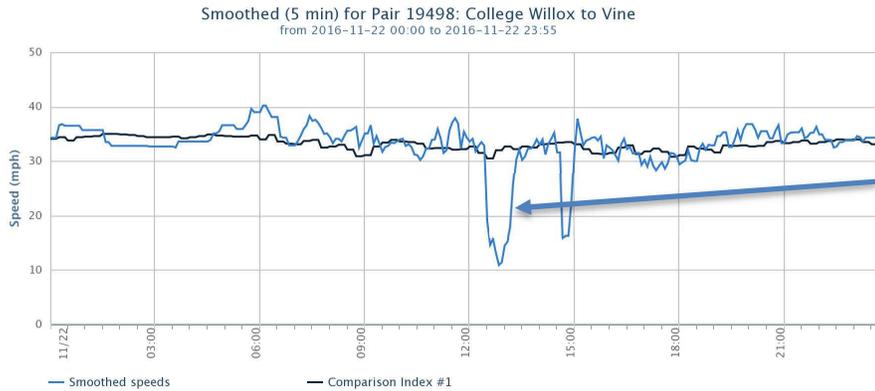
Free Flow Speeds:	Green
< 50% of Free Flow Speeds:	Yellow
< 40% of Free Flow Speeds:	Orange
< 30% of Free Flow Speed:	Red



BlueTOAD Traffic Responsive Locations

1. North College Avenue Corridor

The North College Avenue corridor (U.S. 287) includes eight (8) intersections on a 2-mile length of road. US 287 has occasional high density truck traffic related to weather events in Wyoming, which causes unpredictable changes in traffic flow. This occurrence is referred to as the “Truck Parade” by the City. When this non-recurring condition is detected by the BlueTOAD system, essentially identifying real-time Speed threshold activations, the ATMS triggers the Traffic Responsive plan selection of the City’s special “Truck Plan” which maximizes truck throughput to reduce congestion and move traffic back to optimal efficiency.



North College Avenue Corridor, traffic congestion caused by an influx of trucks diverting off of I-80 in Wyoming due to inclement weather.

2. Lemay Avenue and East Vine Drive Intersection with Rail Crossing

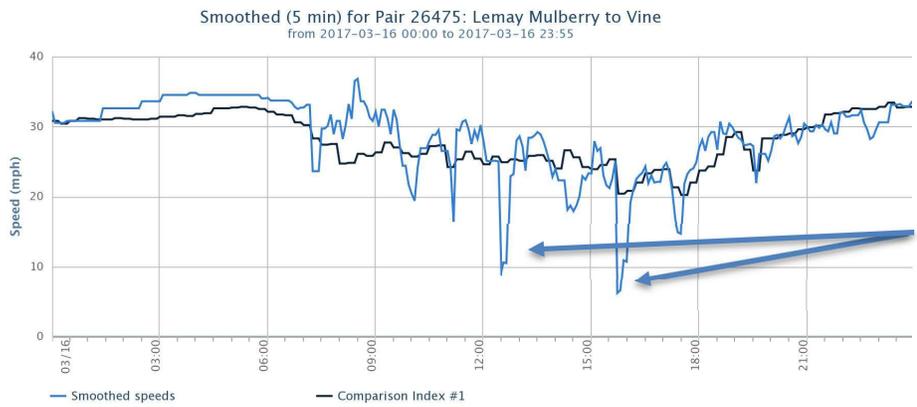
The BlueTOAD Spectra is deployed at the Lemay Avenue and East Vine Drive intersection for Speed and Travel-Time detection. Lemay and Vine are low-capacity roads susceptible to traffic backups because of their proximity to a nearby rail yard. Consequently, during evening peak-hours, traffic may back up because of train traffic at the Lemay crossing. This location is near a rail yard, and therefore train movement can also stop traffic longer than normal.



Lemay Avenue and East Vine Drive Intersection with Rail Crossing



When the trains cause traffic backups, a real-time Speed threshold is activated, then the ATMS triggers the Traffic Responsive plan selection of the City’s “Flush Plan” to maximize throughput after the train leaves.

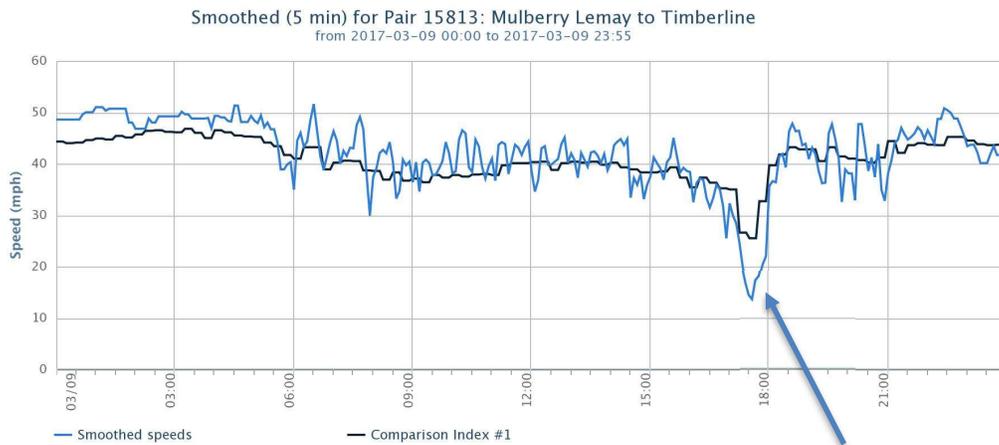


Lemay and Vine close-up view Smoothed Speeds during afternoon travel.

Examples of possible TR plan implementation.

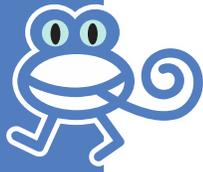
3. Mulberry Street, State Hwy 14 Corridor

The Mulberry Street, State Hwy 14 corridor includes six (6) intersections instrumented with BlueTOAD detection equipment, on a 2-mile length of road. This corridor is impacted by traffic congestion on Prospect, a parallel arterial. Prospect was closed for upgrades in the summer of 2016, but driver behavior as evidenced in BlueARGUS shows that traffic is still detouring away from Prospect. Accordingly, when a real-time Speed threshold is activated, the ATMS triggers the Traffic Responsive plan selection of the City’s special “Congestion Plan” to move traffic through the corridor as quickly as possible.



Example of possible TR plan implementation.

Mulberry Street Corridor monitored speeds between BlueTOAD Mulberry Lemay to Timberline.



Summary

In many traffic management centers, it is common practice for a coordinated traffic signal to operate different timing plans at different times of the day and days of the week. Coupling that practice with an effective Traffic Responsive strategy, can serve as a very effective way to manage the excess capacity of the traffic signal's phase and movement. Using the BlueTOAD travel-time system to identify sudden changes in speed, working in unison with an advanced traffic management system to manage queues that grow over multiple cycles, provides the perfect congestion mitigation and mobility solution for optimizing traffic flow.

Whether to accommodate platoons of vehicles, dealing with traffic backups caused by recurring events or simply managing unwanted driver behavior, the BlueTOAD Spectra and BlueARGUS travel-time system provides the higher resolution data needed to effectively implement a unique and highly-effective Traffic Responsive strategy.

For more information or questions please contact:

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