

DOTD's DSRC Pilot for Connected Vehicles

SimCap Louisiana Chapter Meeting

Dec. 8, 2020

Presented by: Clarke Chauvin, ITS LLC



History of Connected & Autonomous Vehicles (CAV)

Autonomous



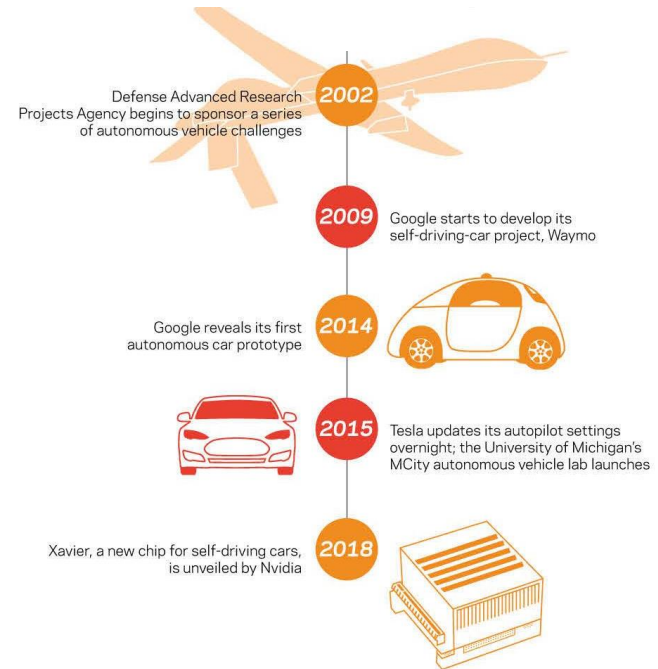
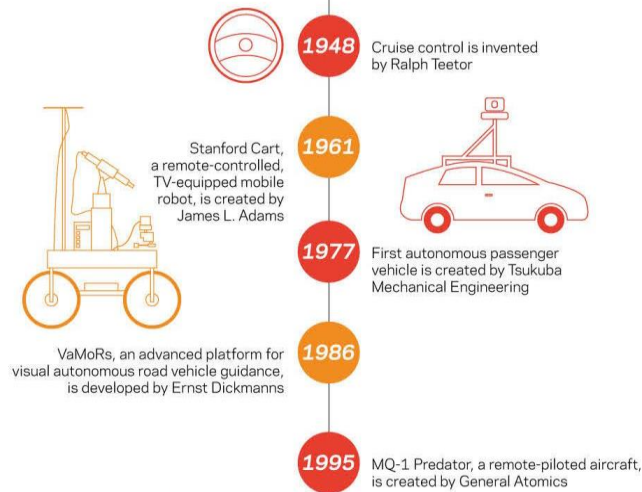
Connected



History of Connected & Autonomous Vehicles (CAV)

Getting Out of the Driver's Seat

Autonomous vehicle development throughout history



Sources: "10 Major Milestones in the History of Self-Driving Cars." *Digital Trends*, Feb. 2019.
"A Brief History of Autonomous Vehicle Technology." *Wired*, Aug. 2016.

History of Connected & Autonomous Vehicles (CAV)

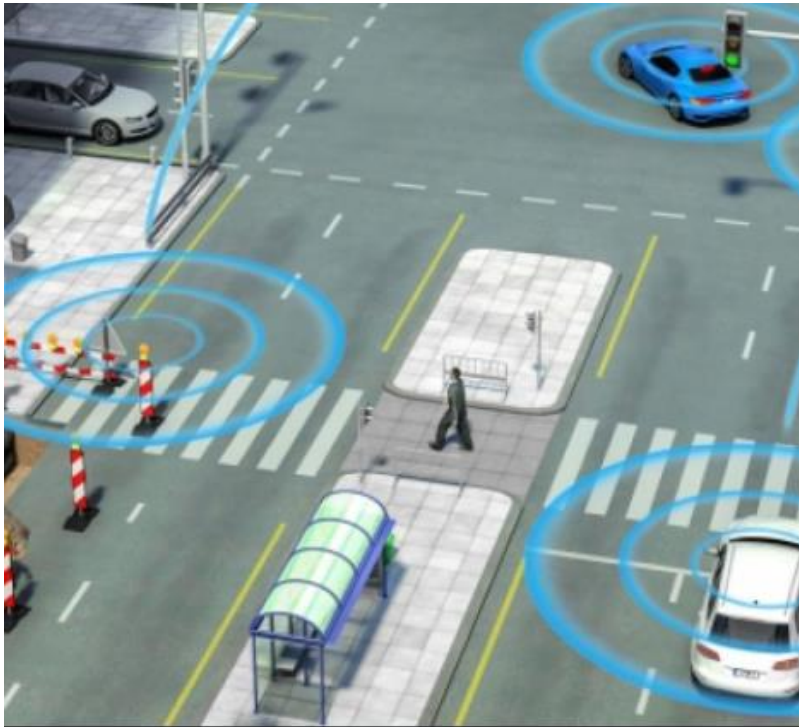
DSRC

- * Dedicated Short Range Communications
- * FCC allocated bandwidth
- * 2017 Cadillac CTS sedan first mass produced with DSRC
- * Well received by global automakers

5G LTE

- * 5th Generation Long-Term Evolution cellular communication
- * Prevalent with cell phones
- * Greater interoperability, wider bandwidth

Dedicated Short Range Communications (DSRC)



- * In 1999, US allocated 75 MHz of 5.9 GHz band to be used by ITS
- * In June 2017, Utah DOT demonstrated DSRC with a bus system
- * In November 2020, FCC reallocated 45 of the 75 MHz to not be reserved for ITS

Why should I care?

- * Reduced congestion, travel times, and increased safety through
 - * Improved platooning
 - * Live traffic updates & rerouting
 - * Respond to incidents before they can be seen

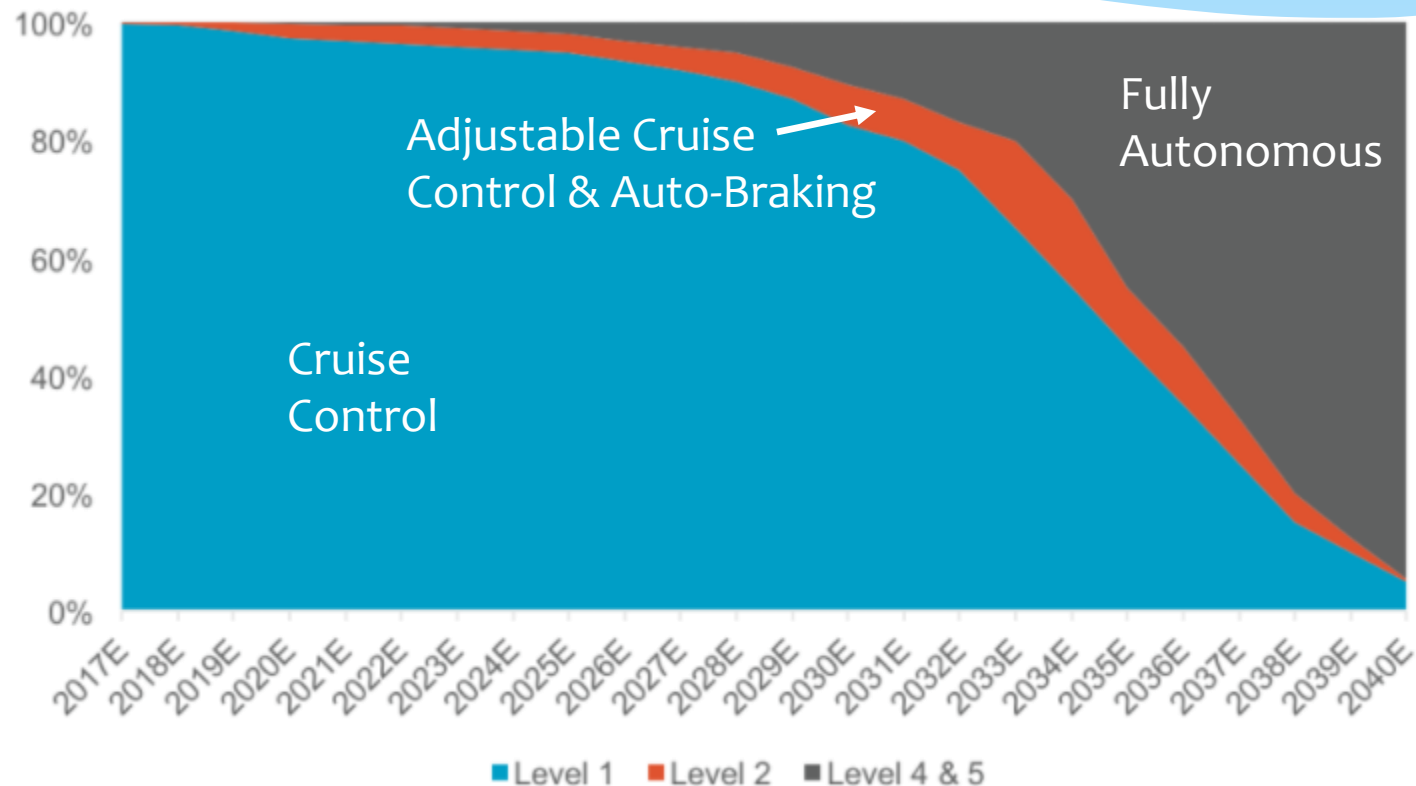


Why should I care?

- * This is SimCap Louisiana
 - * You are interested or working with roadway capacity
- * Many Louisiana roadways are above capacity
- * It's our future and it's pretty neat!



CAV Market Penetration Estimate



DSRC Pilot Project



Planned 5 DSRC units along Airline Hwy in Baton Rouge



~3.25 miles



Provide live SPaT data to drivers and fixed points for DSRC

Bluetoad Spectra RSU



DSRC antennas for V2X communications

Bluetooth antennas for traditional travel time detection

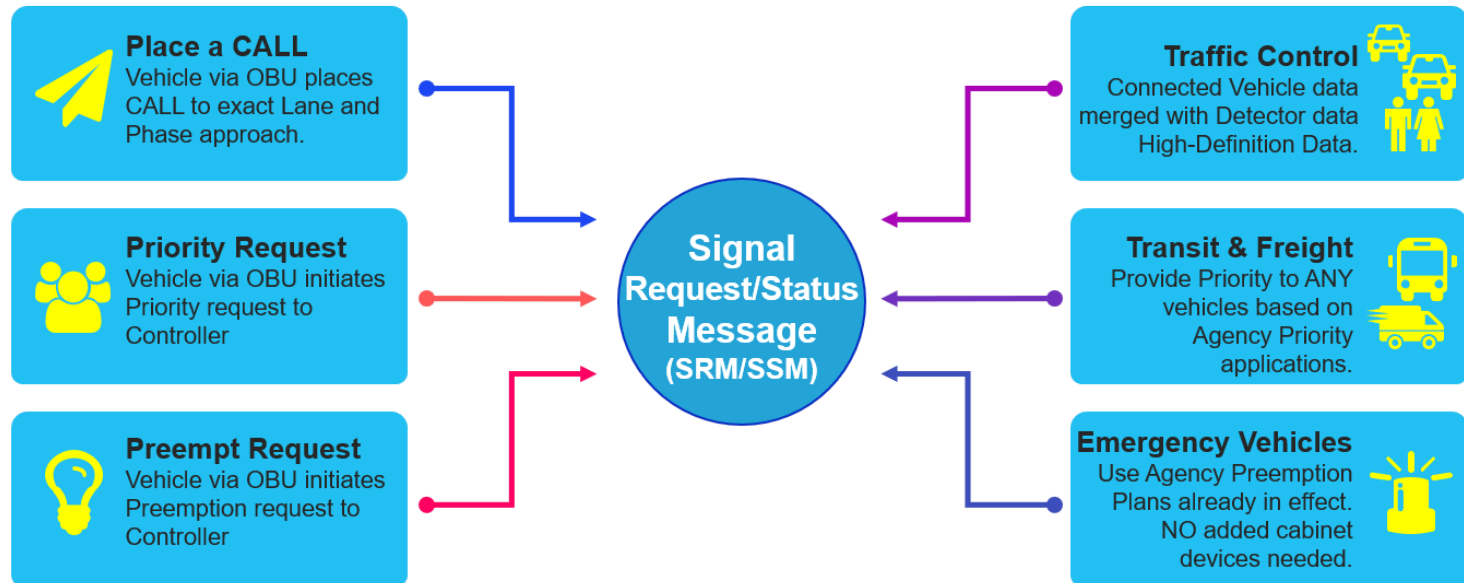
Bluetoad Spectra RSU

Vehicle Basic Safety Message (BSM) Data Aggregation



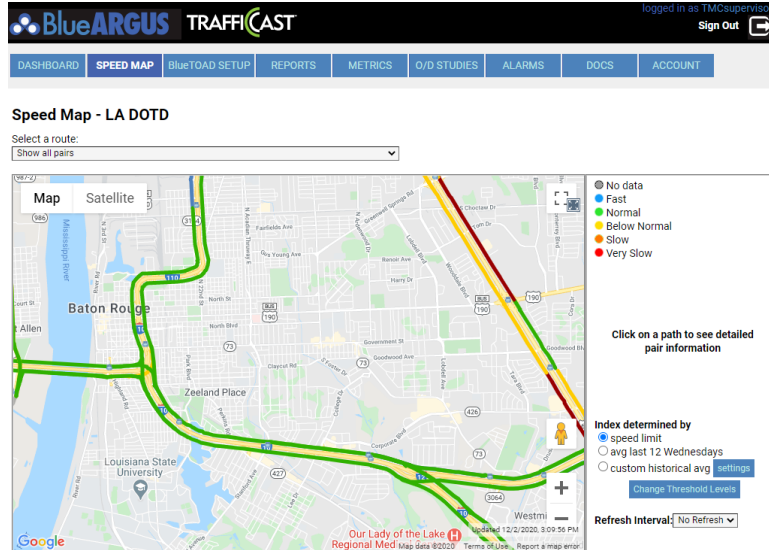
Bluetoad Spectra RSU

Signal Priority Applications to Increase Traffic Flow...



Bluetoad Spectra RSU

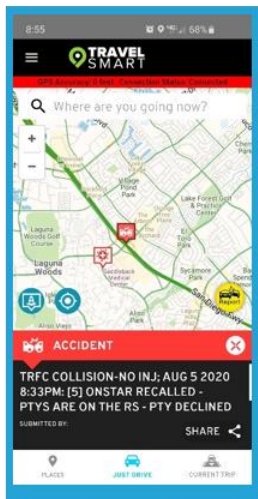
BlueARGUS Software Suite



- * TrafficCast hosted Cloud solution
- * Web-based GUI with unlimited users
- * 3 Main components:
 - * Simple setup of pairings and routes
 - * Real-time information and alarms
 - * Historical Reports and Analysis
- * Over 3,500 BlueARGUS Users Worldwide

TravelSmart App

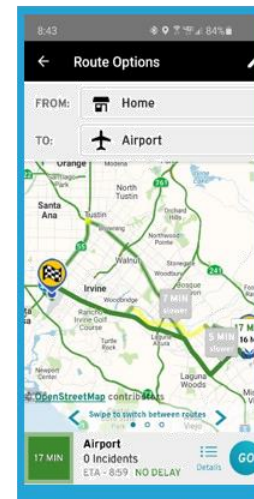
TravelSMART Smartphone Mobile App



Incidents



Routing

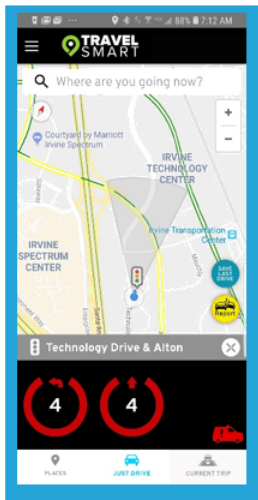


Navigation

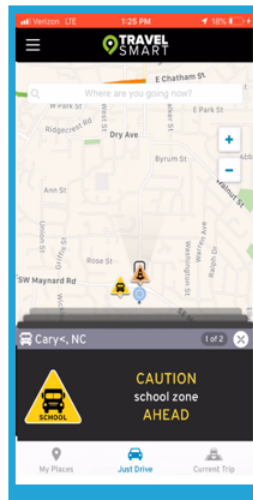


TravelSmart App

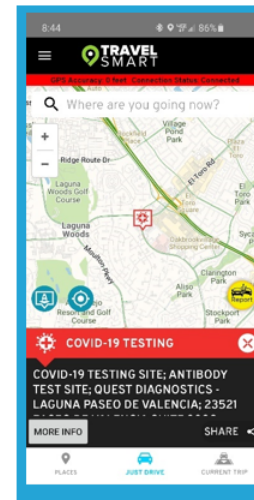
TravelSMART Smartphone Mobile App



**12X
Information**



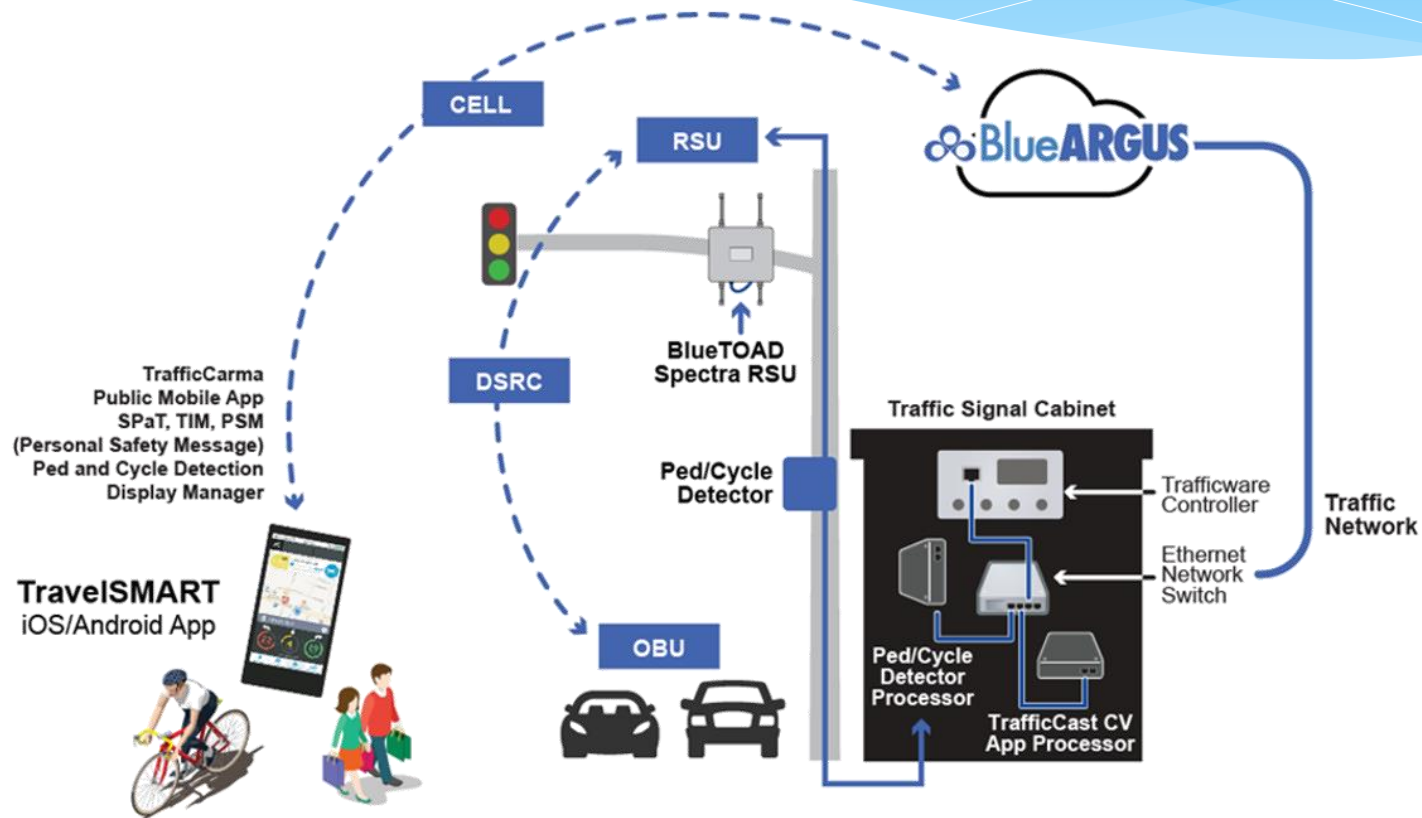
**Localized
TIM**



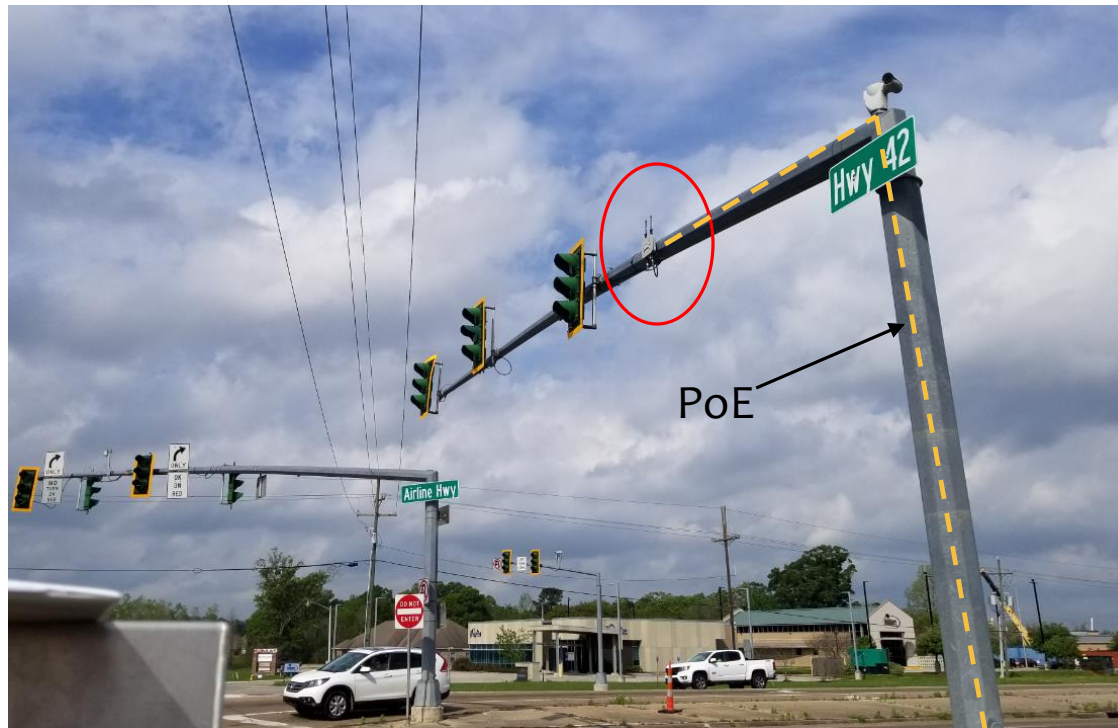
**Public
Service
Announcements**



Bluetoad Spectra RSU



Installation



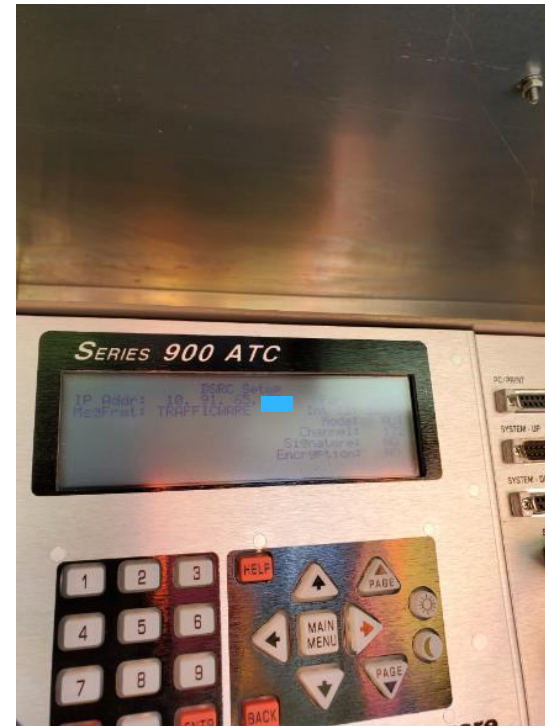
Installation



Installation

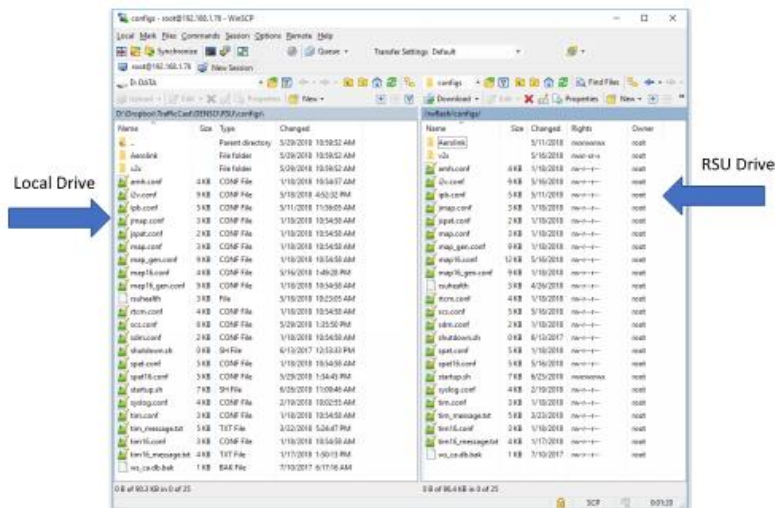


Configuration

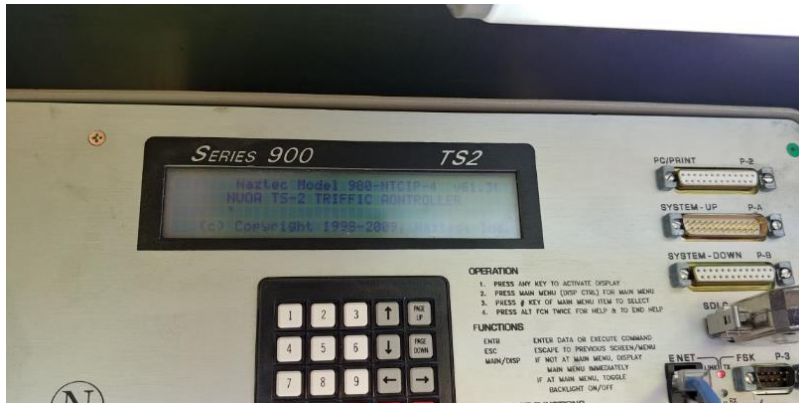


Configuration

- * Configuration tool not ready
- * Rewrote code and uploaded to device
- * Helped TrafficCast develop configuration procedures



Integration



- * Firmware upgrades
- * Controller licensing
- * Definitely did not put signal into flash (oops!)
- * DOTD's security breach in Feb 2020
 - * Local DNS needed

Integration



- * Updated firmwares
- * DOTD's security breach in Feb 2020
 - * Local DNS
 - * Work with OTS to open up firewall

Integration

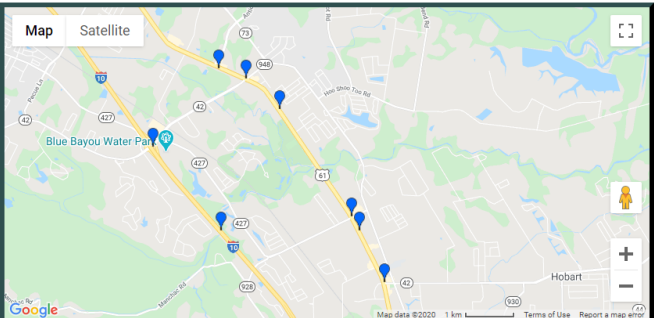
BlueARGUS TRAFFICCAST logged in as TMCsupervisor Sign Out

DASHBOARD SPEED MAP BlueTOAD SETUP REPORTS METRICS O/D STUDIES ALARMS DOCS ACCOUNT

Devices Pairs Routes Intersections

Devices - LA DOTD

☒ Show Active Devices ☐ Show Inactive Devices



Map Satellite

Map data ©2020 1 km Terms of Use Report a map error

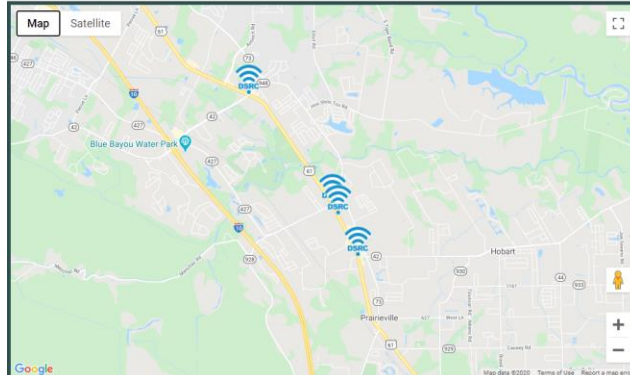
ADD DEVICE
IMPORT DEVICES
EDIT DEVICE
ZOOM TO DEVICE
CLEAR SELECTION
HELP

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Devices Pairs Routes Intersections

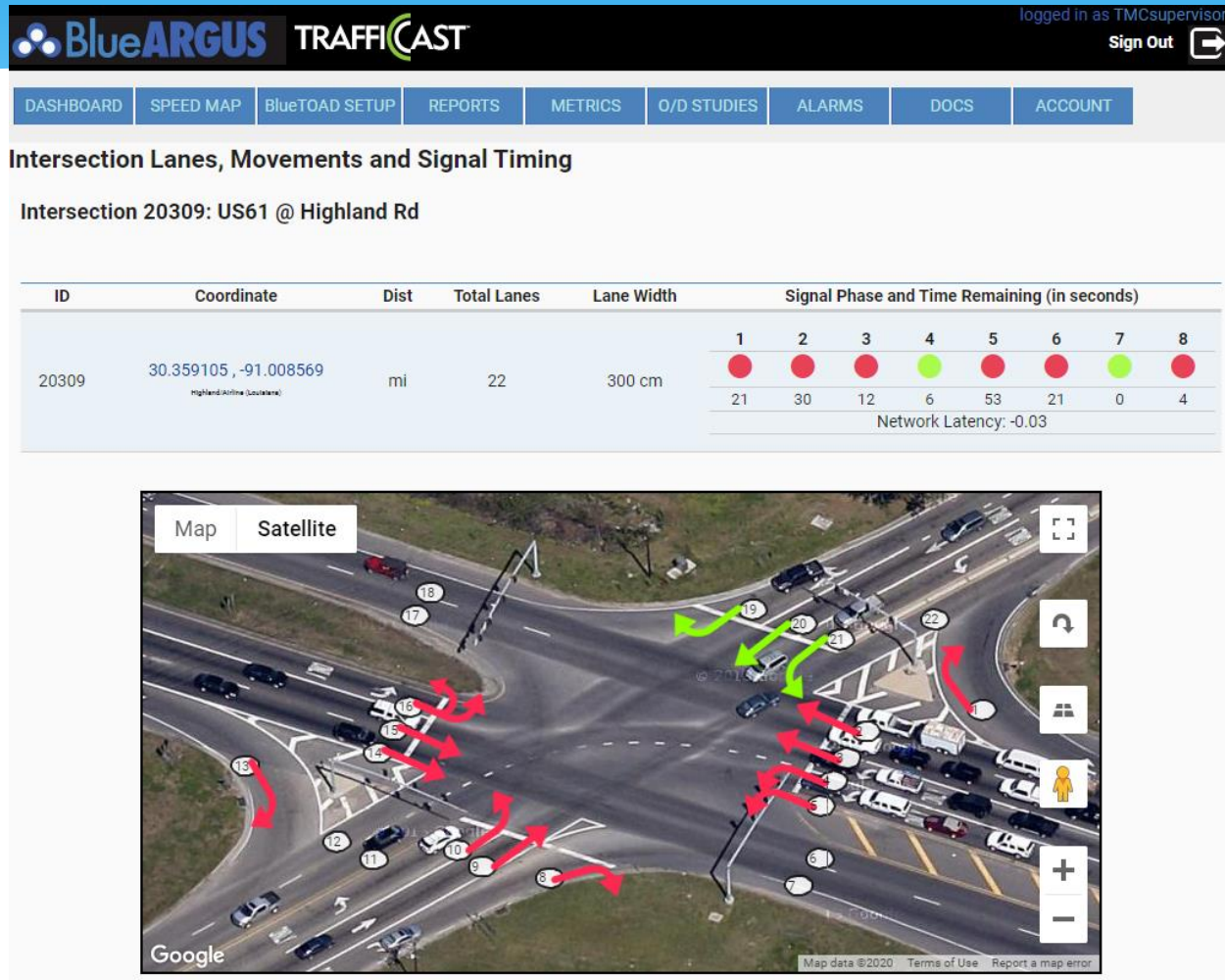
Intersections - LA DOTD




Map Satellite


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US 61 (Airline) at Highland



US 61 (Airline) at Perkins









 **TRAFFICCAST**

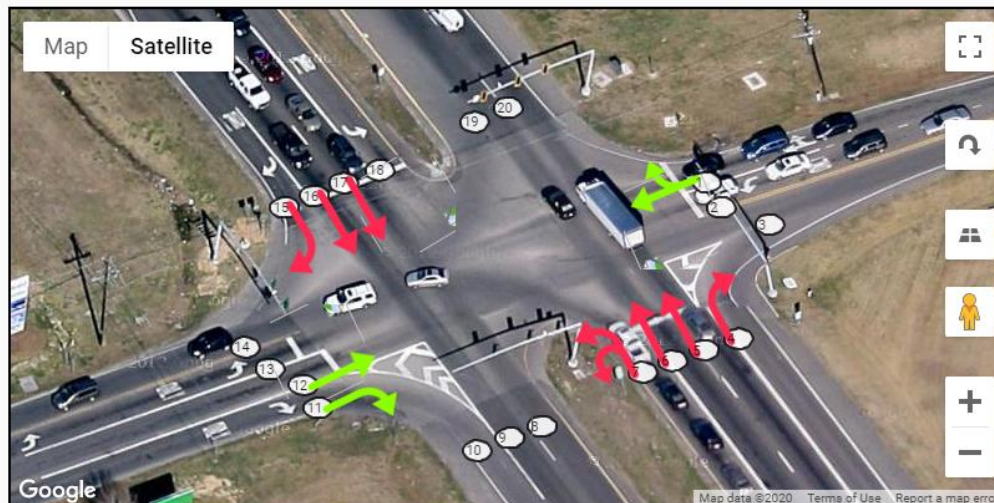
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Sign Out 

DASHBOARD | SPEED MAP | BlueTOAD SETUP | REPORTS | METRICS | O/D STUDIES | ALARMS | DOCS | ACCOUNT

Intersection Lanes, Movements and Signal Timing

Intersection 18773: US61 @ Perkins Rd

ID	Coordinate	Dist	Total Lanes	Lane Width	Signal Phase and Time Remaining (in seconds)							
18773	30.332972, -90.985360 <small>Perkins/Airline (Louisiana)</small>	mi	20	300 cm	1	2	3	4	5	6	7	8
												
					30	10	0	3	0	10	0	3
Network Latency: 0.04												



US 61 (Airline) at Wal-Mart

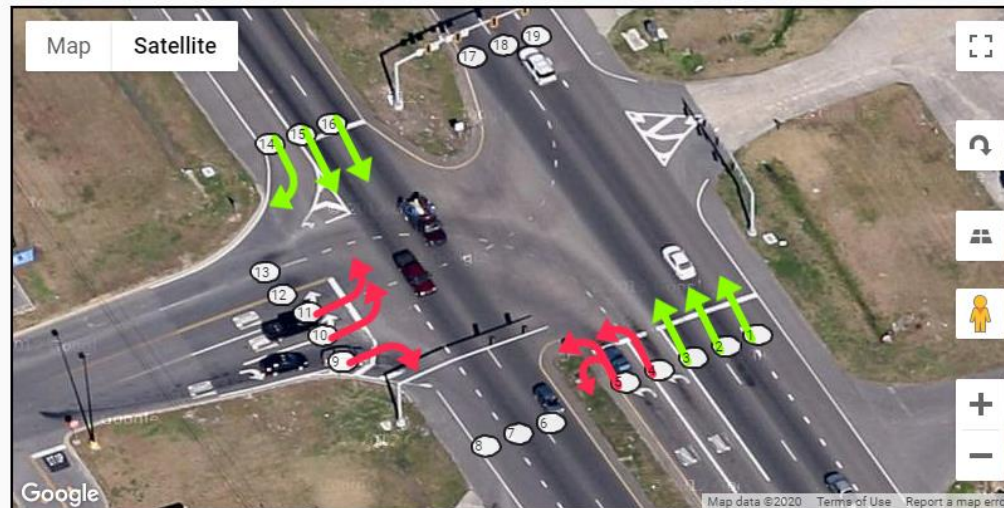
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DASHBOARD SPEED MAP BlueTOAD SETUP REPORTS METRICS O/D STUDIES ALARMS DOCS ACCOUNT

Intersection Lanes, Movements and Signal Timing

Intersection 12358: US61 @ Walmart Driveway

ID	Coordinate	Dist	Total Lanes	Lane Width	Signal Phase and Time Remaining (in seconds)			
					1	2	4	6
12358	30.330415, -90.983859 <small>Airline Commerce (Louisiana)</small>	mi	19	300 cm	<div></div> 14	<div></div> 7	<div></div> 23	<div></div> 18
					Network Latency: 0.01			



US 61 (Airline) at LA 42

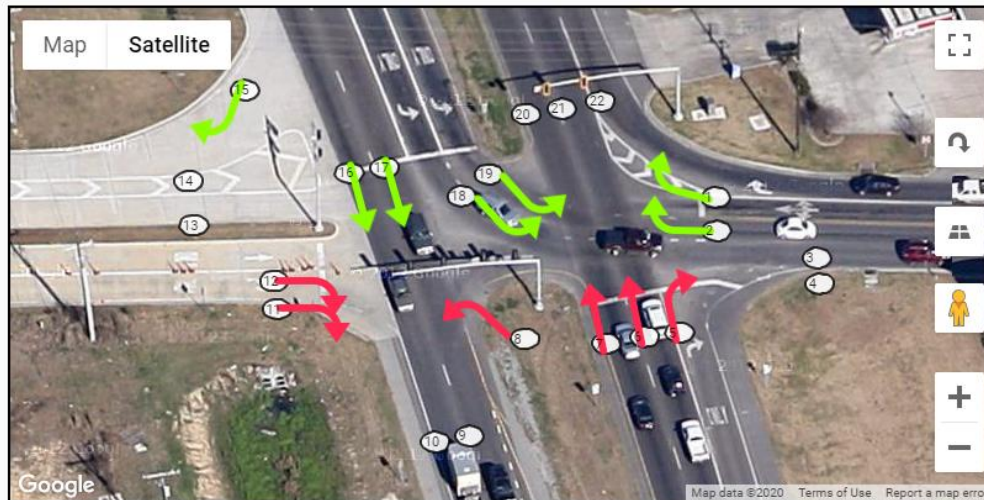
BlueARGUS **TRAFFICCAST** logged in as TMCsupervisor
Sign Out

DASHBOARD SPEED MAP BlueTOAD SETUP REPORTS METRICS O/D STUDIES ALARMS DOCS ACCOUNT

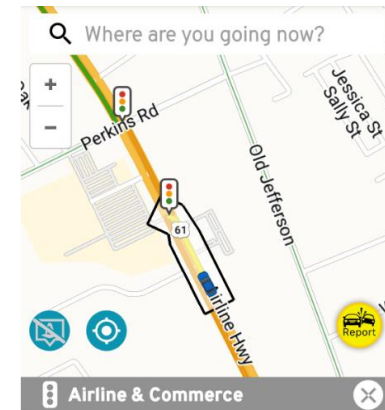
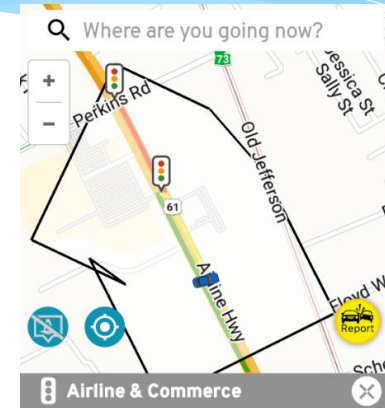
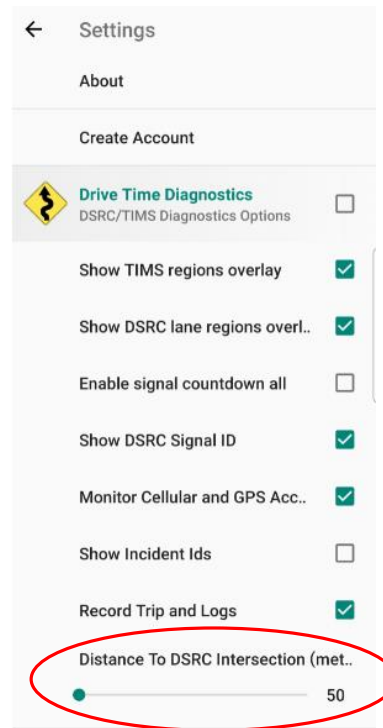
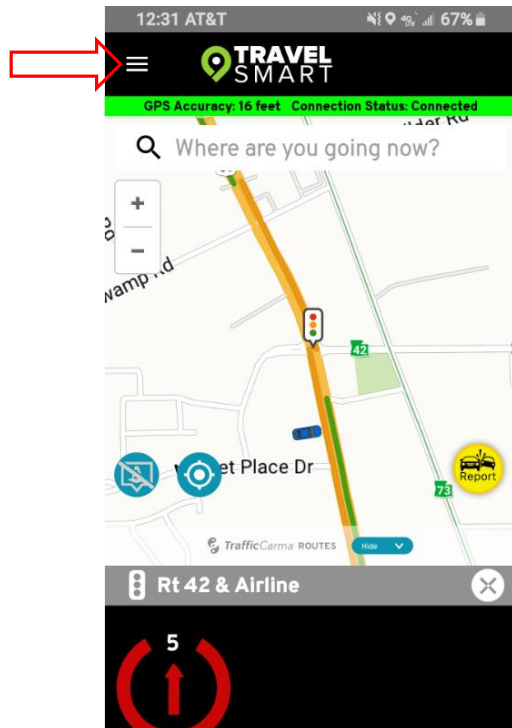
Intersection Lanes, Movements and Signal Timing

Intersection 52238: US61 @ LA42

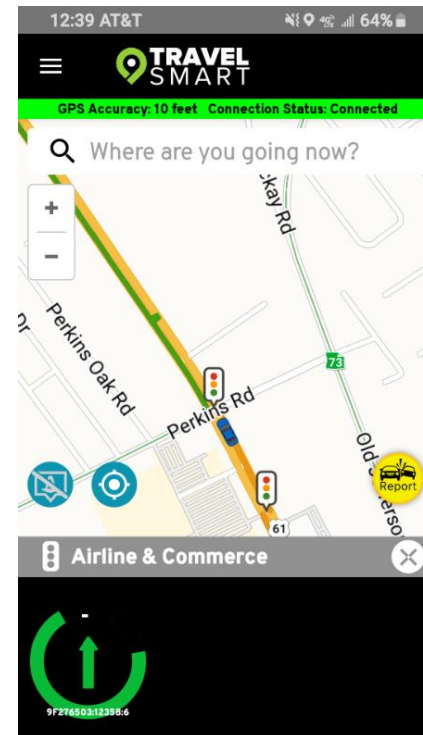
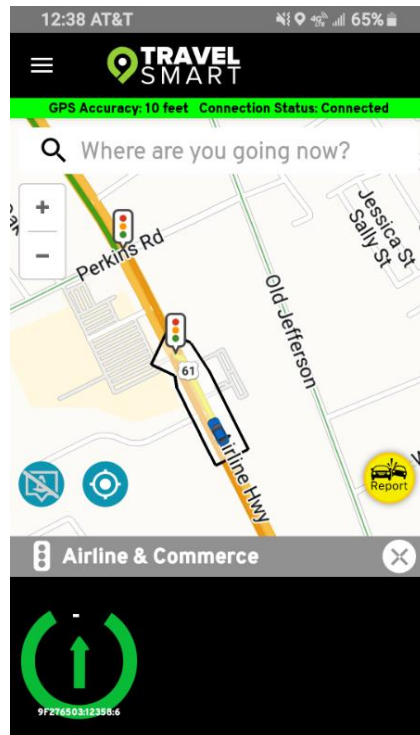
ID	Coordinate	Dist	Total Lanes	Lane Width	Signal Phase and Time Remaining (in seconds)			
52238	30.320445, -90.978271 <small>(Rt 42/Airline (Southbound))</small>	mi	22	300 cm	1	2	5	6
					41	33	5	11
					Network Latency: 0.03			



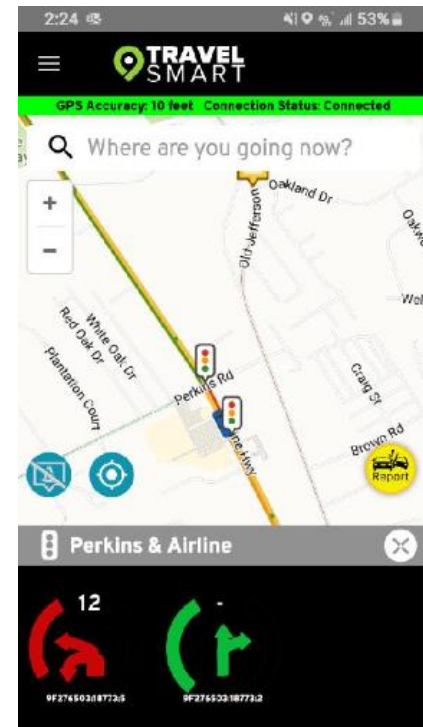
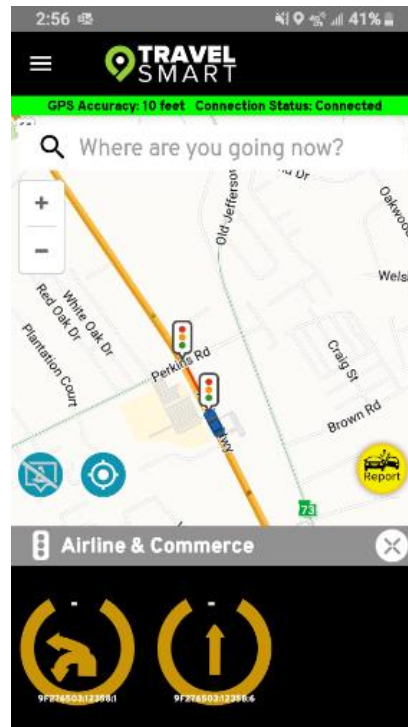
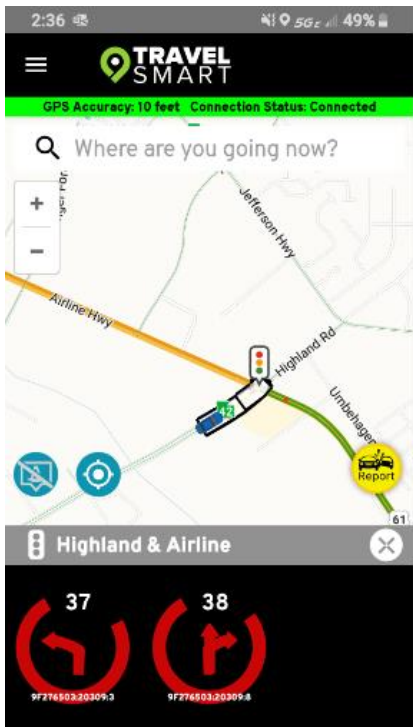
Results: More Troubleshooting



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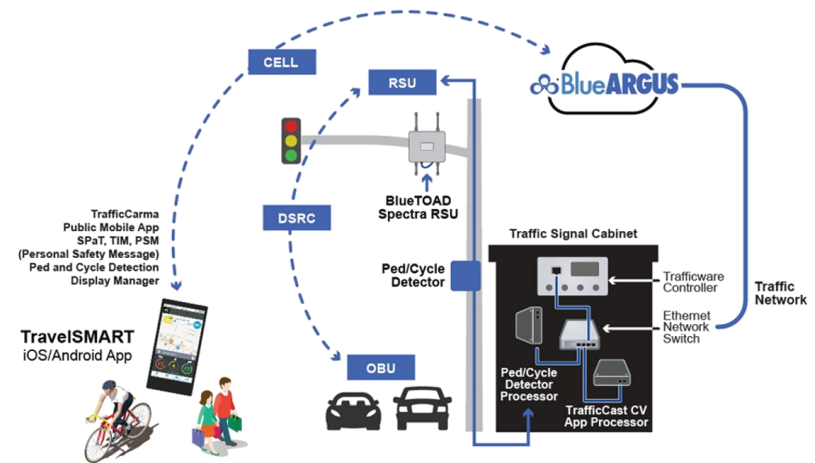


Improved Experience



Summary

- ✓ System fully operational
- ✓ Learned a lot
- ✓ Louisiana's first CV pilot
- ✓ Hopefully more technology is introduced to Louisiana



Questions?

Clarke Chauvin, P.E., PTOE, PMP
Project Engineer



Intelligent Transportation Systems LLC
Baton Rouge, LA
225-751-9300
clarke@itsanswers.com