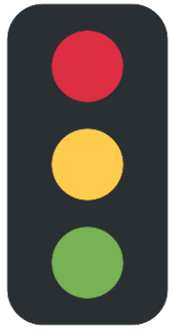
Georgia Connected Vehicles

SigOps | GDOT Office of Traffic Operations

July 2021

GDOT Signal and CV Investments



Traffic Signal Software

- Advanced traffic signal control software
- Advanced central management software
- Statewide license for all signalized intersections in the state of Georgia

Traffic Signal Communications

- 4G LTE communications for traffic signals across the state
- Remote monitoring for proactive management of signal systems

Open Data Resources

- Automated signal performance measures for entire state
- Aggregate corridor monitors of intersection and vehicle probe data
- Open platform for low latency traffic signal phasing and timing data

Connected Vehicle Software

- Software module for signal interface
- Interface with signal system for V2I based applications within 5.9 GHz
- Statewide license for all signalized intersections in the state of Georgia
- Data validation tools for field verification

SigOps

GA CV Progress

SigOps

GDOT Program Timeline

2017: AASHTO SPaT Challenge

- 54 Intersection Pilot
- Systems Engineering
- First deployment live June 2018
- Traffic signal based application demonstration

2018: Regional Operations Expansion

- Not just a pilot: a programmatic deployment to equip infrastructure across the region
- Target of 1,600 intersection in the metro Atlanta region
- Expanded application implementation to first responder and transit vehicle priority/preemption

2019: USDOT ATCMTD

- Added funding to expand regional deployment
- Federal partnership for continued infrastructure build-out

2020: Atlanta Regional Commission (ARC) Partnership

- Local participation for additional infrastructure deployment
- Additional 1,000+ intersections across the metro Atlanta region
- Public sector fleet vehicle application focus

2021: USDOT ATCMTD #2

- Additional USDOT award for emergency vehicle preemption project using connected vehicle technology
- Project focus in midtown Atlanta; solution scalable to any signalized intersection or system

SigOps

2,606

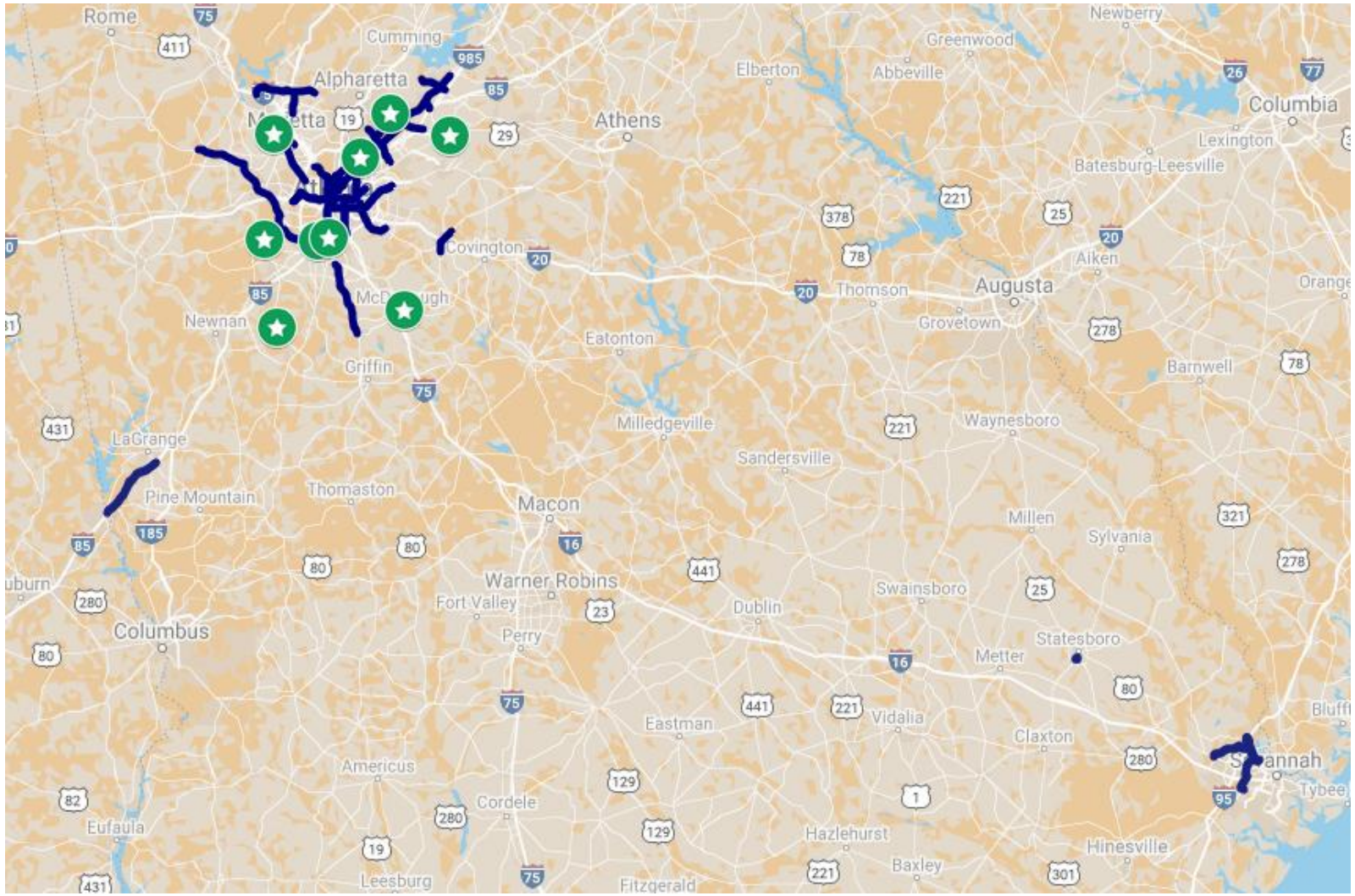
RSUs to be Deployed

Through regional and statewide programs

Statewide RSUs

- GDOT Deployments
- The Ray on I-85
- Atlanta Regional Commission Sites

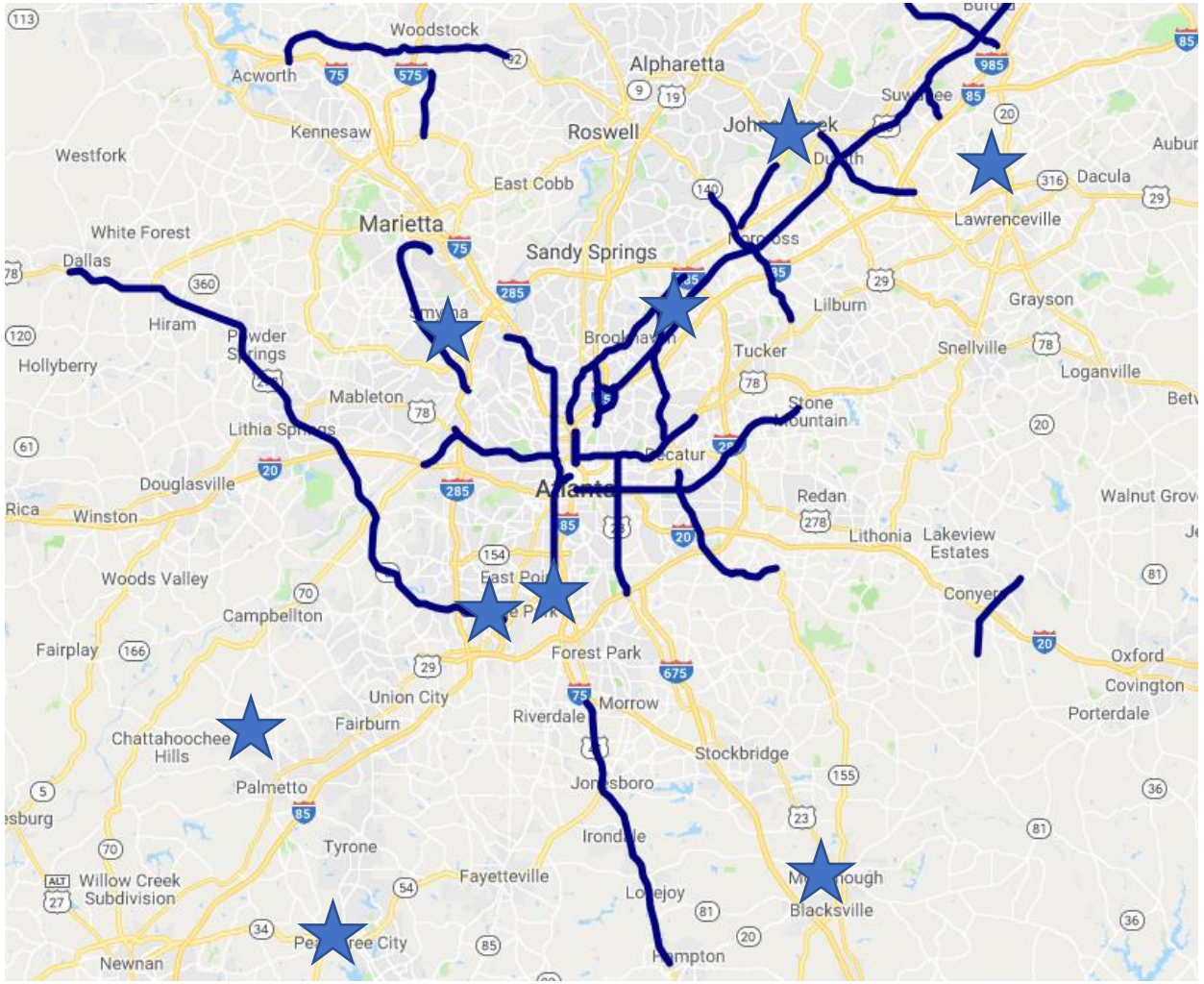
Any traffic signal running GDOT software is CV ready.



GDOT Connected Vehicles

Programmatic View

- 1,600 traffic signals in metro Atlanta – GDOT
- 1,000 traffic signals planned – local governments
- **Regional deployments - Not pilot programs: a deliberate inter-agency deployment across the entire metro Atlanta region**

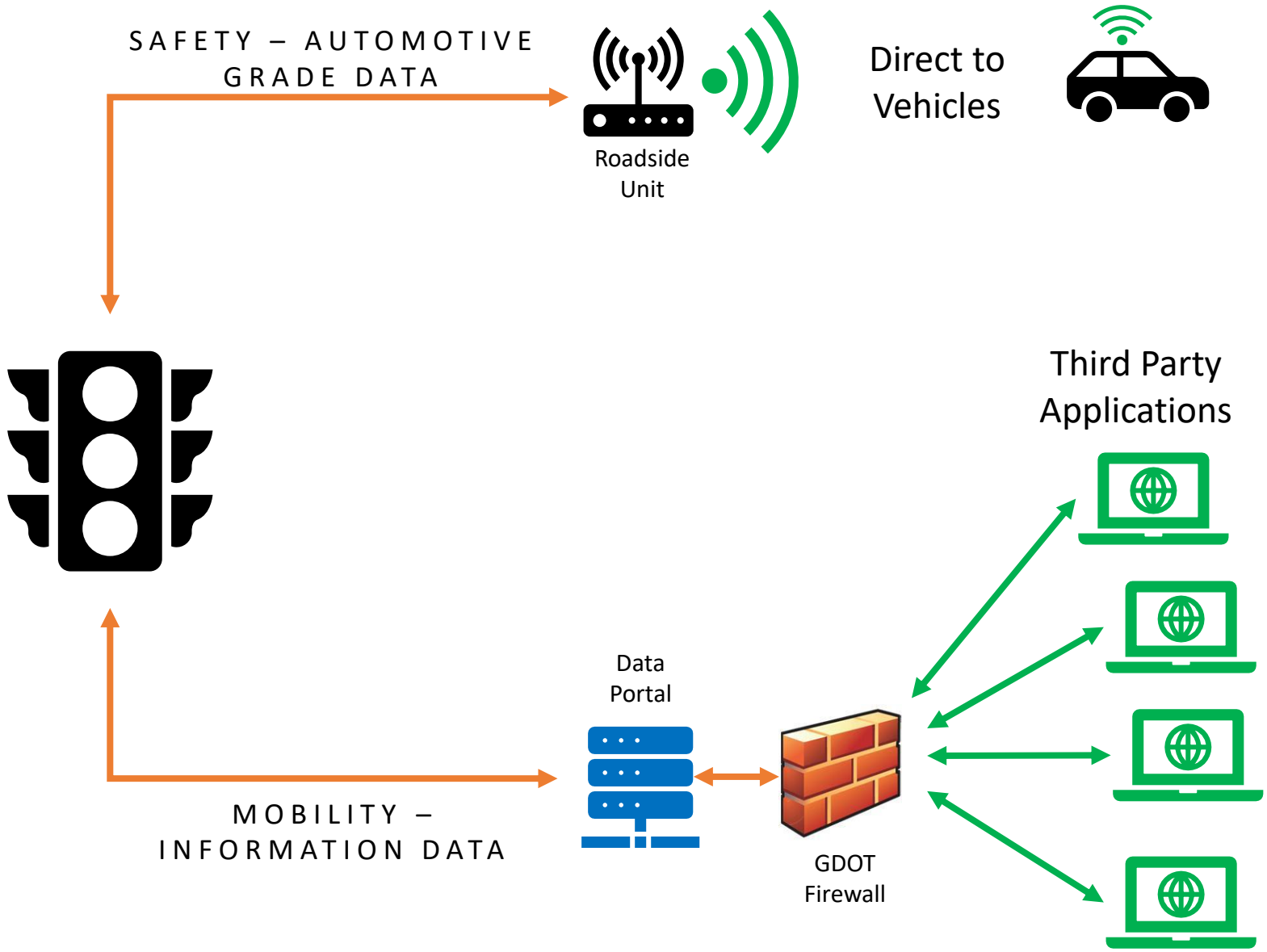


SigOps

V2X Framework

Safety and mobility applications achieved through multiple means. The application drives the method the data arrives to a user.

Close attention needs to be made to data quality, security, and accuracy - especially for data used for safety applications.



Applications Enabled

Emergency Vehicle Preemption

Demonstration in Gwinnett County of the use of V2X for emergency vehicle Preemption on a fire truck.

Transit Signal Priority

Pilot of Transit Signal Priority on Xpress buses in Midtown Atlanta using V2X.

Freight Priority and Information

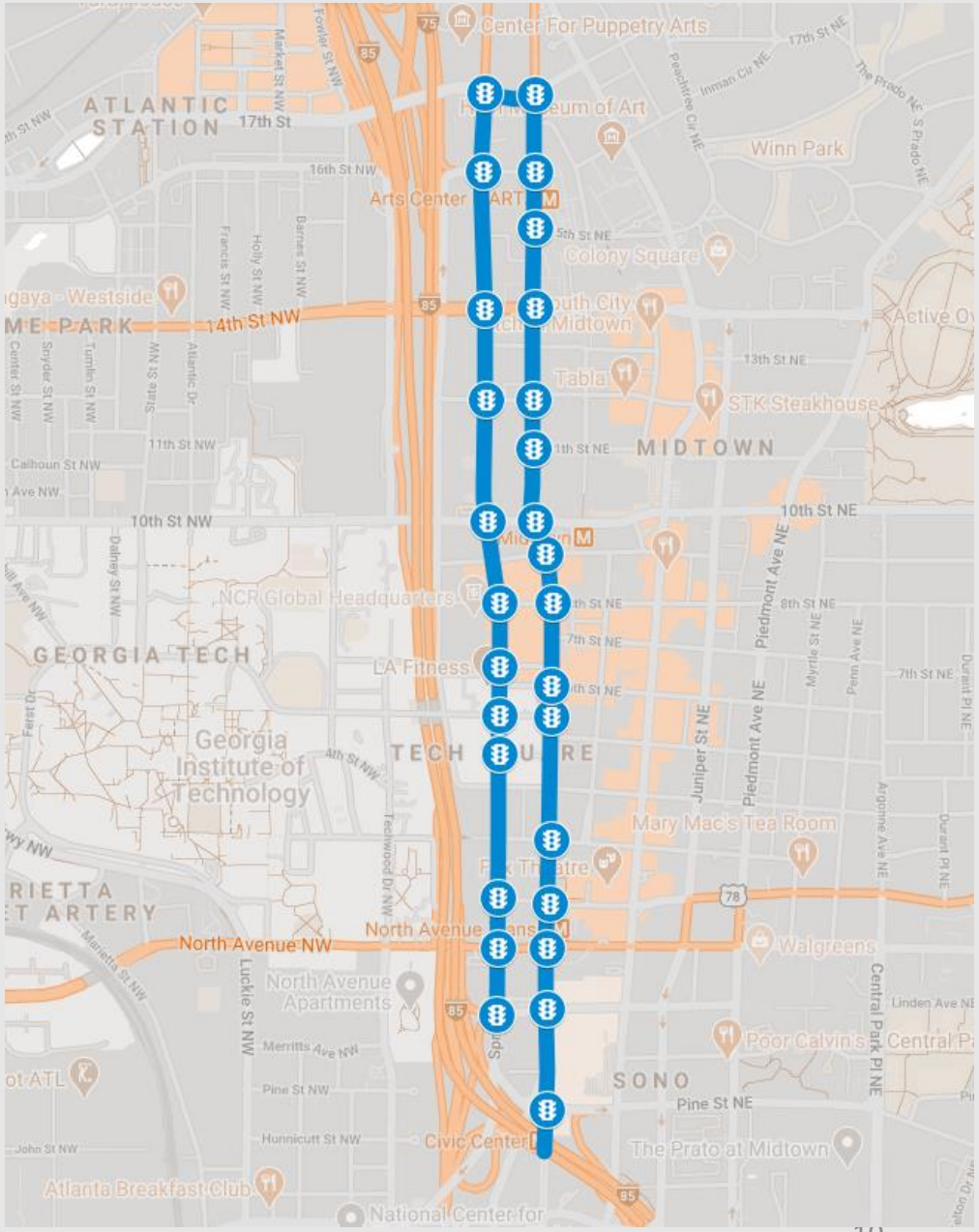
Equipping freight vehicles in Savannah to request signal priority and receive information regarding blocked at-grade rail crossings.

Signal Phasing and Timing

Demonstration of red-light running and optimal green speed applications to inform drivers for improved safety and mobility.

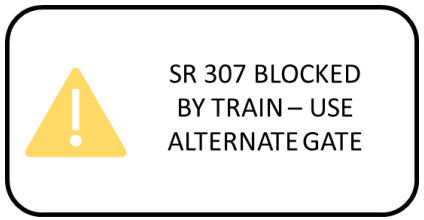
ATL Transit Signal Priority Pilot

- Installation of RSUs at signalized intersections along
- Broadcasting SPaT and MAP, traveler information messages for road conditions
- Demonstration and implementation of transit signal priority
- Outfitting fleet vehicles to demonstrate applications and benefit
- In operation as of March 2021

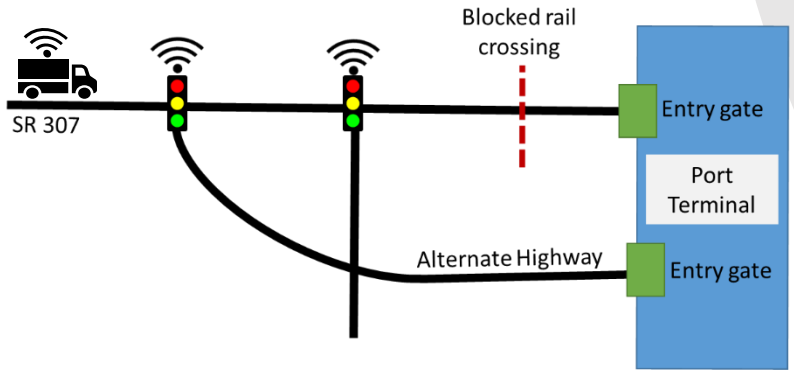


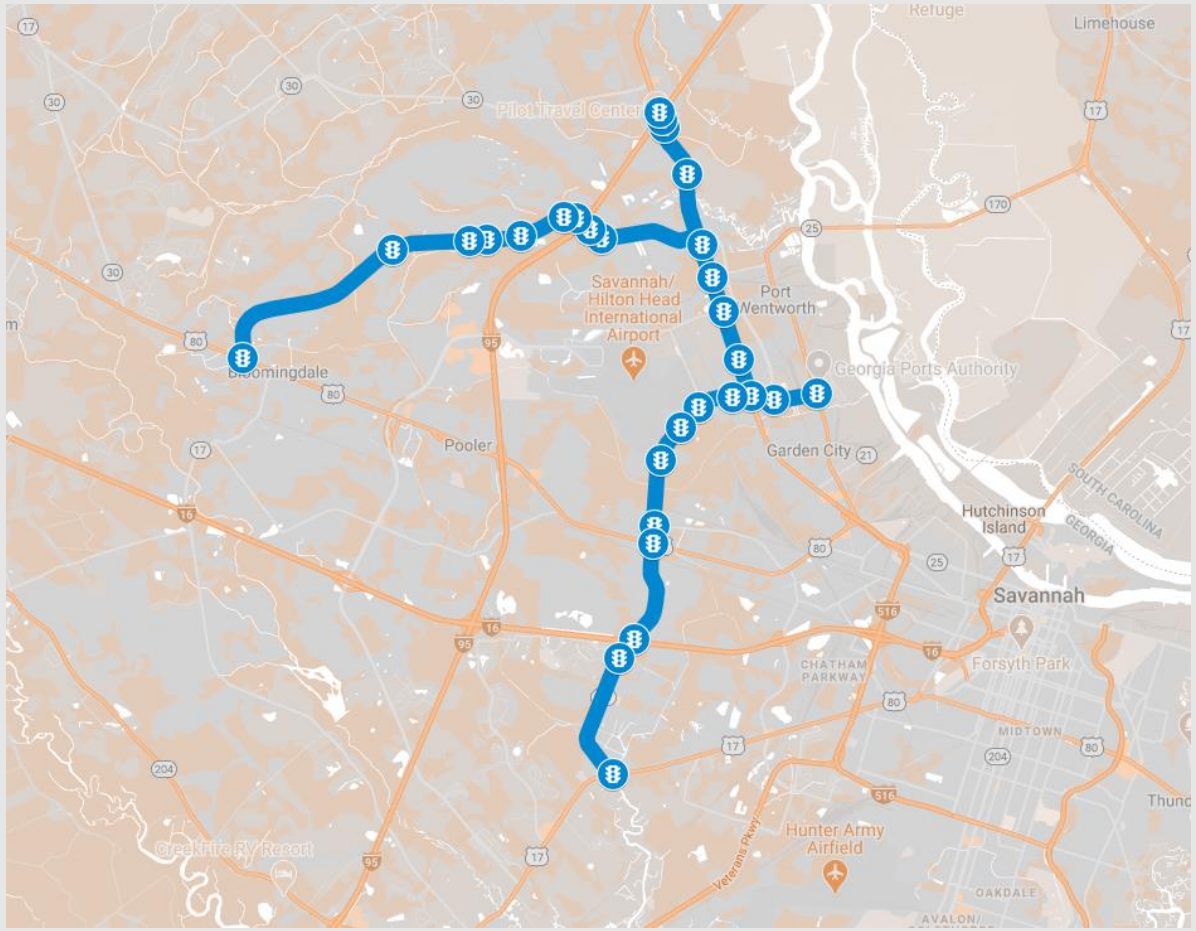
GPA Freight Signal Priority Pilot

- Installation of RSUs at signalized intersections around port ingress/egress routes
- Broadcasting SPaT and MAP, traveler information messages for road conditions
- Demonstration of freight signal priority
- Outfitting fleet vehicles (2 providers)



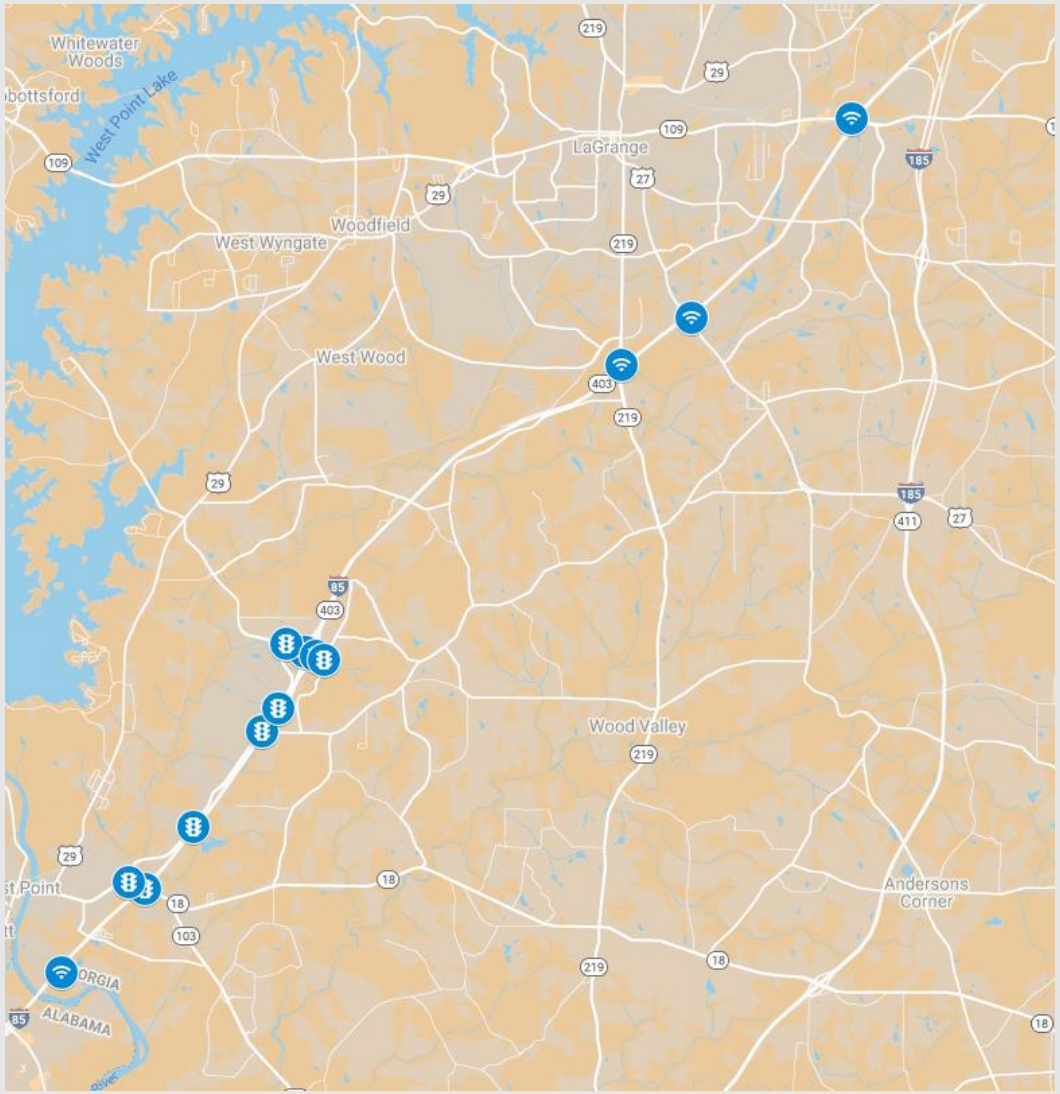
Example in-cab message





The Ray on I-85

- LTE-CV2X and DSRC RSUs deployed along 18 mile stretch of I-85 (dual-active)
- Partnership with the Ray C. Anderson Foundation, Panasonic, KIA, HATCI, and FHWA
- Demonstration of interstate safety applications (Crash alert, queue warning, weather alert)
- Data platform (Cirrus) for BSM capture and analysis
- 4 GDOT Vehicles equipped with LTE-CV2X OBUs
- 10 KIA Executive Fleet vehicles
- BrandMotion HMI interface
- Future partnership/intersection deployments for freight



The Path Forward.

- **Focus on our own:** target deployments of infrastructure and application development that supports public fleet use cases.
- **Regional partnerships:** Framework development for transit signal priority to guide targeted deployments of V2X infrastructure.
- **Hedging technology**: pursue radio agnostic platforms and transition infrastructure deployments to LTE C-V2X.
- **Open data:** continue to invest in and develop data portals to support industry needs for transportation operations data.

Focus on our own

Leverage existing and planned deployments to facilitate public fleets, improved first responder and incident management operations, and targeted implementation.

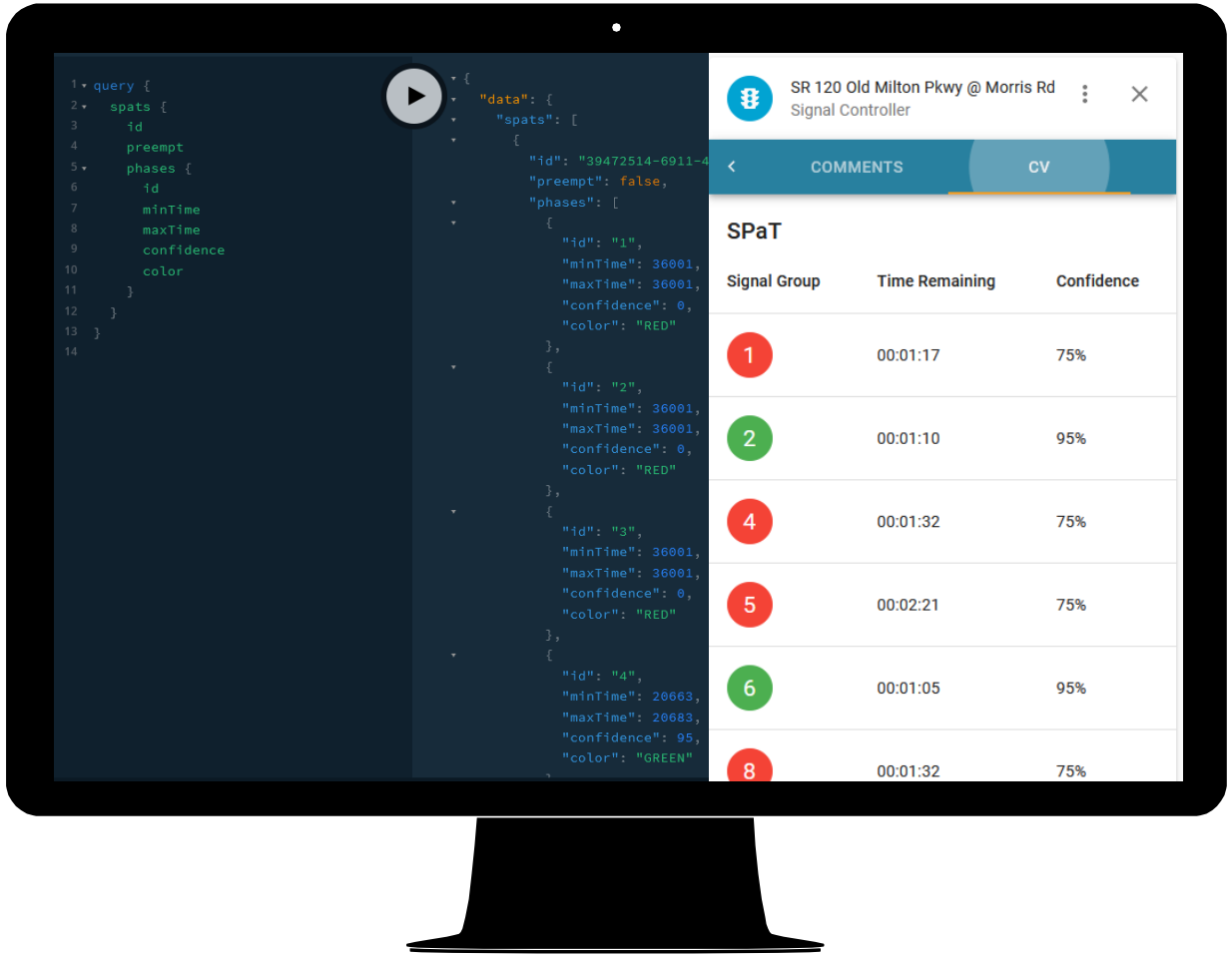
Framework for the future – ATCMTD grant demonstrating the benefit to HEROs and ambulances in midtown Atlanta.

Built to scale to the entire state.

Open data access

Open data portals to traffic signal and ATMS data for third parties to develop and launch mobility platforms.

Open data platforms – rely on medium agnostic systems that can adapt to market and regulatory trends.



The future of V2X is full of challenges.

- **Refined standards are needed**: when it comes to safety of life applications, we have to get things right.
- **The technology needs to be settled**: IOOs can't change radios every two years.
- **Regulatory certainty is needed**: OEMs and IOOs can't invest in infrastructure dependent on spectrum that must always be defended.
- **The fleet must be enabled**: V2X benefits are centered around production systems in vehicle fleets.
- **FCC Uncertainty** – Adequacy of 30Mhz, Potential for interference, application priority

Quick Note - EV

- Building on existing assets, the Electric Mobility and Innovation Alliance will offer policy recommendations intended to further enhance the state's attractiveness to the electric mobility industry and foster innovation in related fields, including drones, autonomous vehicles, connected vehicles, battery technology, and more. The five EMIA committees will develop a multi-step approach that sets objectives for Supply Chain, Infrastructure, Workforce, Innovation, and Policy/Initiatives.
- Housed in Economic Development
- Georgia.org/mobility

Gov. Kemp Announces Statewide Initiative to Accelerate Georgia's Electric Mobility Industry

JULY 20, 2021

Atlanta, GA – Today, Governor Brian P. Kemp announced a statewide initiative to strengthen Georgia's position as a national leader in the electric mobility industry. Driven by the Georgia Department of Economic Development (GDEcD), the Electric Mobility and Innovation Alliance (EMIA) includes partners from the private and public sectors ranging from government, industry, electric utilities, education, nonprofits, and other stakeholders, focused on advancing Georgia's role in developing the electric mobility industry and its supply chain. In conjunction with the initiative, GDEcD has launched new website assets at: georgia.org/mobility.

"Georgia has a proven record of investing early in the resources and infrastructure needed to connect it to the world and develop jobs of the future," **said Governor Kemp**. "The Electric Mobility and Innovation Alliance will ensure that our state is positioned to continue leading the nation in the rapidly growing electric mobility industry. I appreciate these key stakeholders for joining this new partnership and look forward to the innovative solutions and strategies to come."

In addition to the nearly $2.6 billion SK Innovation electric vehicle (EV) battery manufacturing facilities in Jackson County, in recent months, Georgia has continued to attract numerous other international investments. These include Dutch e-mobility charging systems leader Heliox, Turkish EV-parts manufacturer TEKLAS, German-owned lightweight automotive-body parts manufacturer GEDIA, and SK-supplier EnChem of Korea. In 2018, Georgia Made school bus manufacturer Blue Bird introduced their all-electric buses, and the company recently reported its 500th delivery or sale of electric buses

SigOps

Thank You!

Follow the Georgia Department of Transportation

SigOps | GDOT Office of Traffic Operations
935 United Ave SE
Building 24, Floor 4
Atlanta, GA, 30316
404.635.2832 Office
404.694.6578 Cell

SigOps

GDOT
Georgia Department of Transportation

2021-2022 Traffic Subcommittee GPTQ Update

GPTQ

The Georgia Partnership for Transportation Quality (GPTQ) is a longstanding partnership between ACEC Georgia, and the Georgia Department of Transportation. Its mission is to strengthen the working relationships between the parties that are responsible for designing, building, operating and maintaining Georgia's transportation infrastructure, with the overarching goal of making Georgia's transportation system the best that it can be.

2021-2022 Traffic Subcommittee Membership

GPTQ CRC Traffic Subcommittee		
GDOT Co-Chair	**Andrew Heath**	**GDOT - State Traffic Engineer**
ACEC/G Co-Chair	**Andrew Antweiller**	**KCI Technologies**
	Mike Holt	Stantec
	Sunita Nadella	Parsons Transportation Group
	Jason Dickerson	CHA Consulting
	Marco Friend	Jacobs
	Zachary Puckett	Pond & Company
	Bill Ruhsam	Michael Baker International
	Abdulai Abdul-Majeed	Thompson Engineering

2021-2022 Traffic Subcommittee Activities

Traffic Analysis Guidance Matrix

The Motive: For all projects and permits involving GDOT Management/Review/Oversight of Traffic Analysis…..

- **What** are we asking for?
  - Performance metrics
  - Analysis Tools
  - Documentation
- **Who** is reviewing?
  - Submittal
  - Approval Routing

2021-2022 Traffic Subcommittee Activities

Traffic Analysis Guidance Matrix

The Motive: For all projects and permits involving GDOT Management/Review/Oversight of Traffic Analysis…..

- **What** are we asking for?
  - Performance metrics
  - Analysis Tools
  - Documentation
- **Who** is reviewing?
  - Submittal
  - Approval Routing

2021-2022 Traffic Subcommittee Activities

Traffic Analysis Guidance Matrix

Table 1 identifies 10 project categories, the documentation method, and the TE Analysis Level.
The TE Report/Memo required components are identified: "Y" means required; "P" means Potentially. In some cases, a schematic layout may be replaced with the Concept Report Layout.

Table 1 - TE Project Categories				Document (TE Report or Memo) required components													
#	Project Categories	Documentation Method	TE Analysis Level (refer to Table 2)	Volume Data			Traffic Forecasting		Crash Analysis		Capacity Analysis		GDOT Roundabout Tool	Signal Warrant Analysis	ICE Policy	Turn Lane Bay Calculations	Schematic Layout
				Vehicle	Pedestrian	Bicycle	Standard	Limited for Bridge	Intersection	Corridor Rate	Existing	Future					
1	Access Permit	Memo	Level 1	Y								Y			Y	Y	
2	Median Break	Memo	Level 2	Y								Y			Y	Y	
3	Signalization (new signal)	Report	Level 2	Y	P	P			Y		Y	Y	P	Y	Y	Y	Y
4	Signalization (modification)	Report	Level 2	Y					Y		Y	Y	P		Y	Y	Y
5	Passing Lane	Memo	Level 3	Y			Y			Y					P		
6	Bridge Replacement	Memo	Level 4	Y				Y									
7	Intersection Improvement (including roundabouts and interchange ramp terminals)	Report	Level 5	Y	Y	Y	Y		Y		Y	Y	P		Y	Y	Y
8	Corridor Operations/Safety	Report	Level 5	Y	Y	Y	Y		Y	Y	Y	Y			Y	Y	P
9	Corridor Capacity Improvement (Road widening or turn lanes)	Report	Level 5	Y			Y		Y	Y	Y	Y			Y	Y	P
10	Interchange / Freeway	Report	Level 4 OR 5	Y			Y		Y	Y	Y	Y			Y	Y	Y

2021-2022 Traffic Subcommittee Activities

Traffic Analysis Guidance Matrix

Table 2 summarizes the five levels of TE analysis and the GDOT Offices to coordinate with. For local municipalities or developers initiating projects which touch the state roadway system, the initial GDOT office to contact is indicated. The table indicates the office responsible for the first review, second review, and final approval. In some cases, FHWA will review and/or approve.

An Office of Program Delivery (OPD), Office of Innovative Delivery (OID), Operational Improvement Program, and GDOT Safety Program managed project will be initiated by the respective office and the GDOT Project Manager. The review and approval process will be facilitated by the GDOT Project Manager.

Table 2 - TE Analysis Levels

TE Analysis Level	GDOT Office - Initial Contact	GDOT Office - First Review	GDOT Office - Second Review	Final Approval
Level 1	District	District	State Traffic Operations	District (**Chief Engineer if limited access)
Level 2	District	District	State Traffic Operations	District Traffic Engineer, State Traffic Engineer, Director of Operations
Level 3	District	State Traffic Operations	**FHWA (if PoDI)	State Traffic Operations
Level 4	Planning	Planning	State Traffic Operations	Planning (**FHWA if PoDI)
Level 5	District	State Traffic Operations	Planning (if Interchange) **FHWA (if PoDI)	State Traffic Operations (**FHWA if PoDI)

Note: PoDI = Project of Division Interest

2021-2022 Traffic Subcommittee Activities

Traffic Analysis Guidance Matrix

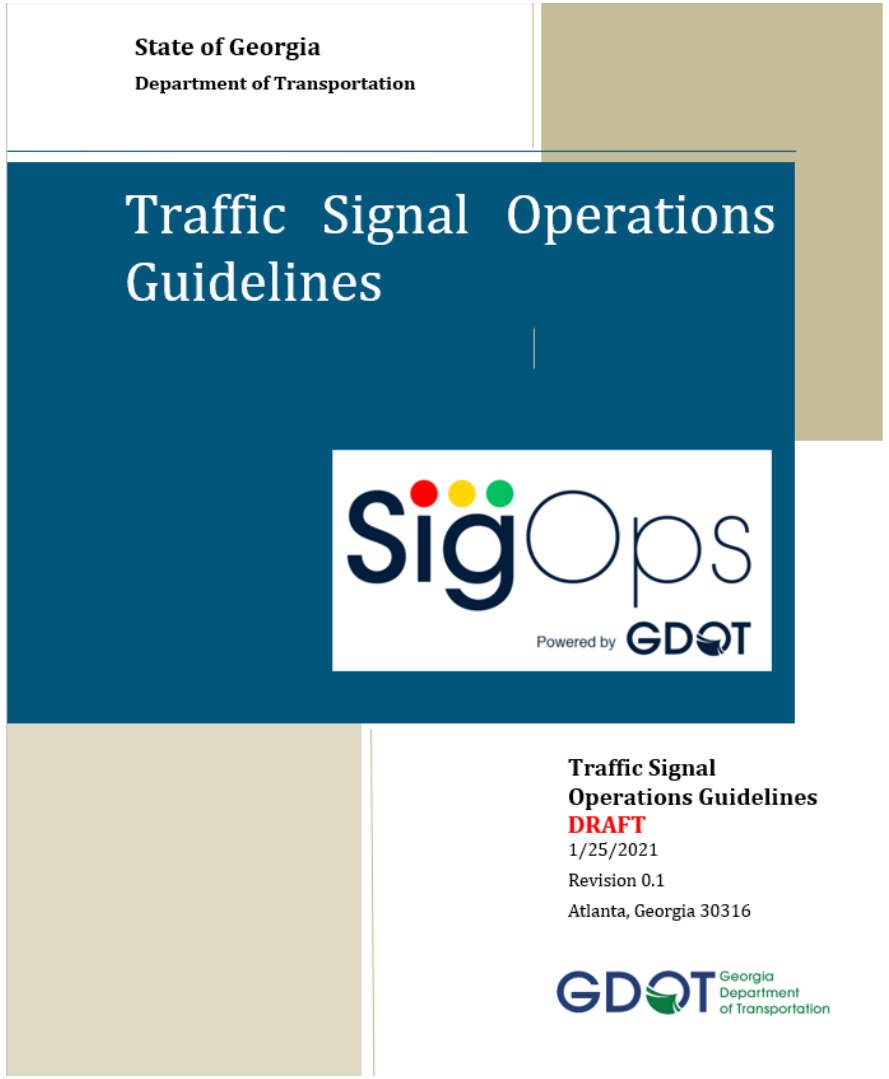
Next Steps

- Reviewed by:
  - GDOT Traffic Ops, Design Policy, Program Delivery, Planning, Roadway Design
  - GPTQ Innovative Delivery, Procurement, Program Delivery, Roadway Design Subcommittees
- Final Review by GDOT
- Publication to external website

2021-2022 Traffic Subcommittee Activities

Other Activities

- Traffic Signal Spec Reviews
- Traffic Signal Operations Guidelines Review
- **How else can we help?**



Thanks!

Andrew J. Heath, P.E. State Traffic Engineer
404-635-2828
aheath@dot.ga.gov