



Enhancing Regional TSMO through Advanced Technology Pilot Deployment

ITS GA Annual Meeting
10/07/2019



Regional TSMO and ITS Architecture Update

1. Develop a Regional TSM&O Vision
2. Document Current TSM&O Inventory
3. Research Data Governance Best Practices
4. Regional ITS Architecture Update
5. Identify Pilot Concepts for Advanced Technology Deployment
6. Develop Local Agency Deployment Guide
7. Develop Regional Technology Assessment and Strategic Deployment Plan

TSMO Vision and Goals



Transportation systems across the Atlanta region are managed and operated to **optimize safe, reliable, and efficient travel for all system users – people and freight – contributing to sustainable economic growth and a high quality of life.**

Key Outcomes / Goals



Optimizing safety

Applying technology and context-sensitive approaches to achieve zero fatalities



Reliable travel times

Managing planned and unplanned disruptions to reduce unexpected delays



Efficient, seamless travel

Coordinated systems across jurisdictions and modes; accessible, real-time travel information



Equitable access

People of all ages, abilities, languages, backgrounds, and incomes have access to safe, reliable, efficient mobility options

Foundational Elements



Operations philosophy focuses on moving people and goods, rather than vehicles



Collaboration across jurisdictional boundaries, public and private sectors, and service providers



Data sharing across public and private data providers and users



Fostering a culture of innovation and adaptability to change

Pilot Projects

- 56 Project Ideas Submitted
 - 49 Determined to be Applicable
- Variety of Sources
 - State
 - County
 - Municipal
 - Consultants
 - Vendors

ARC CALL FOR PILOT PROJECT IDEAS

Transportation systems management and operations (TSMO) is a recognized means of improving safety and mobility. The Atlanta Regional Commission (ARC) is developing the ARC Regional TSMO Plan and Intelligent Transportation Systems (ITS) Architecture update.

To support this planning process, ARC is requesting pilot projects ideas from stakeholders like YOU! Please share your ideas for TSMO-related projects (technology, data, SmartCity transportation initiatives, collaboration, etc.) for future pilot deployments.

WHEN: By Friday, May 24th

HOW: Submit details for your pilot project
<https://form.jotform.com/kimleyhorn/arc-tsmo>

ARC TSMO Call for Pilot Project Ideas

Project Title

Submitting Organization

Point of Contact at Submitting Organization (Name)

Point of Contact at Submitting Organization (Email)

Point of Contact at Submitting Organization (Phone #)

Brief Project Description

Upload Supporting Documents (if applicable)

Pilot Project Evaluation Framework

- Screening Assessment

- Prioritization Framework

PILOT PROJECT TITLE	SUBMITTING ORGANIZATION	PILOT PROJECT DESCRIPTION	PROJECT TYPE	SPECIFIC LOCATION	CHAMPION	CONCEPTUALITY	COMPLEXITY	RELATIVE COST	GOALS	REGIONAL IMPACT
Virginia Avenue Smart Corridor (CISRC v. Cellular V2X Pilot)	Aerospac Atlanta CDS	Conduct a DSRC v. Cellular V2X (4G LTE and 5G) pilot study along the Virginia Avenue Smart Corridor as a follow-up to the Virginia Avenue Smart Corridor Study	Vehicle Mobility	Green	Green	1	Green	\$\$	Green	Green
Emergency Vehicle Preemption Technology	Tempe	Use connected vehicle preemption technology to provide green lights at traffic intersections to allow safe passage of the emergency vehicle while bringing all public vehicles safely to a halt. Specifically, this is a concern in rural areas where speeds at signalized intersections are high	Vehicle Mobility	Red	Red	1	Green	\$\$	Green	Red
Wrong Way Detection	MH Corth, LLC	Utilize existing radar sensor camera infrastructure (ConnectiCS) to detect, verify, and alert in real-time wrong-way driving vehicles and send information to the TMC/Clearing agencies	Vehicle Mobility	Red	Red	1	Green	\$	Green	Red
Smart Corridor Study	Sandy Springs	Conduct a smart corridor study on Mount Vernon Hwy corridor between Sandy Springs MARTA Station and Sandy Springs City Center	Vehicle Mobility	Green	Green	2	Green	\$	Green	Red
			Vehicle Mobility	Red	Red	4	Yellow	\$\$	Green	Red
			Vehicle Mobility	Green	Green	4	Green	\$\$	Green	Red
			Vehicle Mobility	Red	Green	5	Yellow	\$\$\$	Green	Green
			Vehicle Mobility	Green	Green	5	Red	\$	Green	Red
			Vehicle Mobility	Red	Green	5	Red	\$	Green	Red
			Freight	Green	Green	1	Yellow	\$\$	Green	Red
			Freight	Red	Red	1	Green	\$	Green	Red
			Freight	Green	Green	1	Green	\$	Green	Red
			Freight	Green	Green	3	Yellow	\$\$	Green	Red
			Freight	Green	Green	5	Red	\$\$\$	Green	Red
			Freight	Green	Green	2	Yellow	\$\$	Green	Red
			Transit	Green	Green	1	Green	\$\$	Green	Red
			Transit	Red	Green	1	Green	\$\$	Green	Green

SCREENING METHODOLOGY	
COST	Low: Requires significant investment of time and/or money to implement
	Medium: Requires moderate investment of time and/or money to implement
	High: Requires minimal investment of time and/or money to implement
GOALS	SAFETY Applying technology and context-sensitive approaches to achieve zero fatalities
	EFFICIENT, SEAMLESS TRAVEL Coordinated systems across jurisdictions and modes; accessible, real-time travel information
	EQUITABLE ACCESS People of all ages, abilities, languages, backgrounds, and incomes have access to safe, reliable, efficient mobility options
COMPLEXITY	Low: Build off of existing initiative/infrastructure
	Medium: New initiative, but concept of operations is vetted and understood
	High: Significant integration, research, development, and/or multi-jurisdictional coordination required
REGIONAL IMPACT	High: Project expected to impact the region significantly
	Medium: Project expected to impact multiple jurisdictions
	Low: Project expected to impact local jurisdiction only
CONCEPTUALITY	1: Builds off of existing initiative and/or infrastructure
	2: Location defined, Goal defined
	3: Idea moderately refined, further development required
	4: Deployment requested, needs extensive research beforehand
	5: Study/research/non-deployment project






THE ARC TIP PROJECT EVALUATION FRAMEWORK

"The Project Evaluation Cookbook"

Atlanta Regional Commission
Winter 2017


























Screening Assessment

- Location   
- Champion  
- Project Type:

TECHNOLOGY TYPE	PROJECTS
App	10
AV	4
CV	20
Data	9
Smart City	6

Screening Assessment

- Screening Assessment Rubric
- Selected 5 Pilot Projects for Further Consideration

SCREENING METHODOLOGY	
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 GOALS	 SAFETY Applying technology and context-sensitive approaches to achieve zero fatalities
	 EFFICIENT, SEAMLESS TRAVEL Coordinated systems across jurisdictions and modes; accessible, real-time travel information
	 EQUITABLE ACCESS People of all ages, abilities, languages, backgrounds, and incomes have access to safe, reliable, efficient mobility options
	 RELIABLE TRAVEL TIMES Managing planned and unplanned disruptions to reduce unexpected delays
 COMPLEXITY	 Low: Build off of existing initiative/infrastructure
	 Medium: New initiative, but concept of operations is vetted and understood
	 High: Significant integration, research, development, and/or multi-jurisdictional coordination required
 REGIONAL IMPACT	 High: Project expected to impact the region significantly
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Pilot Projects: Application Information

DRAFT

Virginia Avenue Smart Corridor: DSRC v. Cellular V2X Pilot (CV)



Description

The Virginia Avenue Smart Corridor Study pilot project is a proposed continuation of an ongoing effort by Aerotropolis Atlanta CIDs (AACIDs) to ultimately improve safety and mobility along the 2-mile corridor near the airport. Utilizing an ARC LCI grant, AACIDs determined through preliminary assessment that connected vehicle technology integration has the potential to significantly improve the corridor's safety and mobility. Inadequate real-world understanding of emerging technologies like Dedicated Short-Range Communication (DSRC) or Cellular Vehicle-to-Everything (C-V2X) presents a barrier for practitioners and agencies when deciding how to best use technology within specific corridor contexts. The proposed project will test and compare the two primary methods of connected vehicle communication, DSRC and C-V2X (4G LTE or 5G), by distributing different systems across the ten existing traffic signals along the corridor. Metrics will be developed for each intersection based on the connectivity, latency, and intended function of the use case to determine the best telecommunications fit for each. AACIDs intends to develop operational, system, and safety metrics to determine the optimal communication method per use case. The intent is to share these results publicly to inform the Atlanta region and the larger industry.

Goals and Benefits

This project seeks to determine the preferred method of communication for optimal connected vehicle applications. The results of this study will provide enhanced:

Safety

CV safety applications have the potential to greatly reduce crashes and severity. Warnings and alerts to drivers can assist in crash avoidance.



Reliable Travel Times

CV mobility applications have the potential to improve operational efficiency through communication of SPaT data to drivers. Improvements in travel time and reliability result from a reduction in congestion due to improved operations and a decrease in unplanned events.



Virginia Avenue Project Corridor

High-level Cost Estimate

High-level cost estimates were based on the following equipment and labor-based assumptions:

- The DSRC and C-V2X unit will be funded and deployed through the Connected Vehicle Program at all existing signals, totaling 10 units - \$0
- GDOT will provide on-board vehicle units for a minimum of two vehicles - \$0
- GDOT will provide access to the connected vehicle central system database for data access - \$0
- GDOT will make intersection upgrades to traffic signals, software, and cabinets as is currently planned - \$0
- Post processing of data will be included in the cost of the research and analysis
- Expenses will include any diagnostic applications and hardware required to assess performance metrics
- An engineering study will be performed which will include data collection, analysis and reporting or results

Cost Estimate: \$100,000



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Gwinnett County DOT: Connected Vehicle Applications



Description

The Gwinnett County DOT Connected Vehicle (CV) Applications pilot project seeks to implement CV applications that build upon previous efforts and align with the current Connected Vehicle Technology Master Plan to improve safety, reliability, accessibility, and efficiency of the transportation system. Gwinnett County intends to demonstrate the benefits of CV across a variety of users that allow for scalability across the County and transferability to other jurisdictions. The tiered CV application approach will first focus on leveraging proven technologies, and building off of existing GDOT work to provide a mature "sandbox" in which to consider additional CV applications.

Building on the success of the first generation applications, the ARC pilot project concept will focus on additional applications that may include some or all of the following:

- Transit, conditional priority based on transit schedule adherence
- Transit, conditional priority based on bus occupancy
- Transit/pedestrian, driver alert for pedestrian presence when bus or transit door is opened
- Pedestrian, driver alert for mid-block pedestrians
- Pedestrian, applications that support the visually impaired

It is anticipated that this project will help to inform a consistent regional approach to the integration of CV infrastructure that adheres to regional goals and contributes to a sustainable transportation future.

Goals and Benefits

Safety
This project is focused on providing enhanced safety for pedestrians through CV application deployments.



Reliable Travel Times
This project focused on improving travel reliability by demonstrating the mobility impacts of consistent deployment of CV applications.



Efficient, Seamless Travel
This project aims to improve efficiency and connectivity within the transportation system by leveraging technology to enhance communication and streamline operations.



Equitable Access
This project addresses equitable access goals by representing under-served roadway system users in the proposed CV applications.



High-level Cost Estimate

High-level cost estimates were based on the following assumptions:

- DSRC or C-V2X units will be funded and deployed through the Connected Vehicle Program at existing signals - \$0
- GDOT will provide access to the connected vehicle central system database for data access - \$0
- Intelight is making necessary modifications to MaxView software to accommodate Transit Signal Priority - \$0
- Automated Passenger Count equipment is installed on Gwinnett County buses - \$0
- Automatic Vehicle Location equipment is installed on Gwinnett County buses with real time data feed - \$0
- Development of the CV application and integration of the data feeds for operation - \$100,000
- Passive pedestrian detection near transit stops and downtown with data integration - \$150,000

Cost Estimate: \$250,000



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Connected Data Platform Expansion (DATA)



Description

The Georgia Department of Transportation (GDOT) seeks to expand the utility of the Connected Data Platform (CDP) for additional users and applications. Building on the success of the first phase of CDP development, GDOT, in partnership with ARC, intends to increase the user base and the number of data sets ingested by the CDP. Reflecting the region's collaboration at the FHWA Data Business Plan workshop held in May 2019, there is a strong desire to share data with multiple agencies and the public. The pilot project will apply concepts identified within the GDOT Data Aggregation Master Plan, possibly including a public-facing data analytics website, publicly accessible safety data sets, and the obtainment and importation of transit vehicle data, railroad activity data, oversized vehicle activity data, truck freight, shipping container, port, and aviation activity data, first responder and law enforcement vehicle data, and asset management data. The project will aim to expand the utility and availability of the data, leading to an improvement of performance metrics and overall understanding of the transportation system.



Goals and Benefits

This project aims to expand the utility of data collected by multiple agencies, and to make the data available to the appropriate data users with an easy-to-use interface. Expanding the data ingested by the CDP will enrich the performance measures, dashboards, and standard reports already available.

Safety and Reliable Travel Times

The CDP provides a launching point for improving the collective knowledge of the transportation system, enabling transportation agencies and the public to better understand how the transportation system is influenced with respect to efficiency and safety by many different variables; providing a way to better optimize network performance.



Equitable Access

The CDP will provide an equitable source of transportation data and analytics to all ARC stakeholders.



Efficient, Seamless Travel

The CDP will provide a holistic view of the transportation system which will support approaches to managing the transportation system in a manner that leads to greater utility and sustainability.



High-level Cost Estimate

High-level cost estimates were based on the following equipment and labor-based assumptions:

- GDOT will provide monthly hosting fees that will be incurred through the usage of the CDP - \$0
- Education and training costs will be outside of the scope of this project
- Continual software development and integration will be required for additional datasets, improvements, and refinements

Cost Estimate: \$800,000 to \$1,000,000



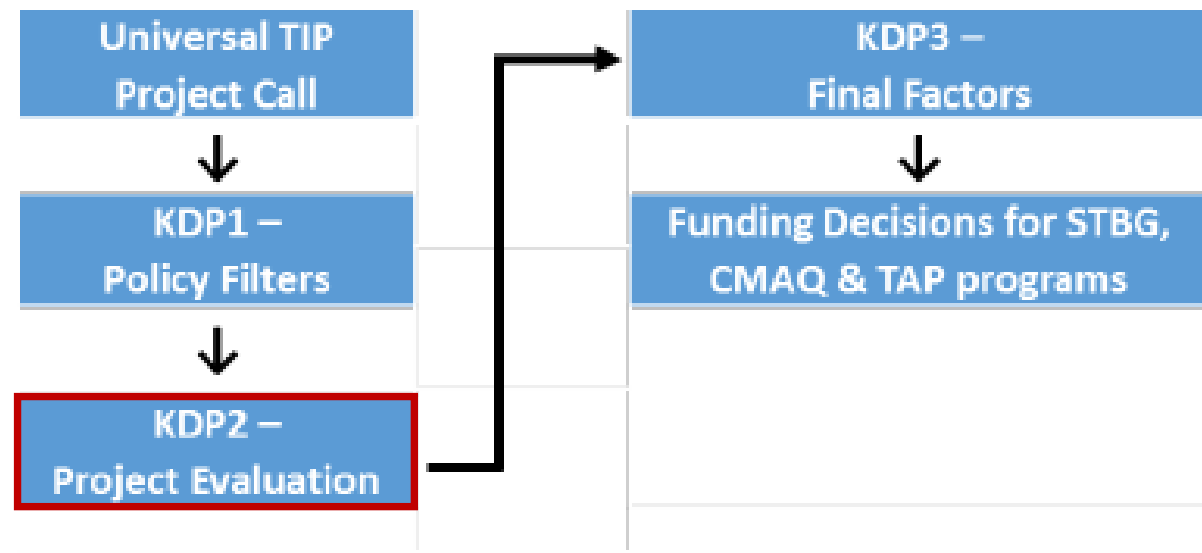
ARC TIP Project Evaluation Framework

THE ARC TIP PROJECT
EVALUATION FRAMEWORK

“The Project Evaluation Cookbook”

Atlanta Regional
Commission
Revised
July 2019

Figure 01 – KDP Flowchart



Evaluation Framework

Recommended Refinement

- CV Mobility & Congestion Example:
 - Current Metric = Change in VHD
 - Recommended Metric = Avg Daily Bottleneck Duration per Mile

Atlanta Region's Plan Goals	Performance Criteria	Project Types (Added)			
		Roadway Transportation Systems Management & Operations (existing)	Connected Vehicle Transportation Systems Management & Operations	Autonomous Vehicle Transportation Systems Management & Operations/Transit Expansion	Data / App / Other Transportation Systems Management & Operations
World Class Infrastructure	Mobility & Congestion	X	X	X	X
	Reliability	X	X	X	X
	Network Connectivity	X	X	X	
	Multimodalism	X	X	X	X
	Asset Management & Resiliency			X	X
Healthy Livable Communities	Safety	X	X	X	X
	Air Quality & Climate Change	X	X	X	X
	Cultural & Environmental Resources	X		X	X
	Social Equity	X	X	X	X
	Land Use Compatibility			X	
Competitive Economy	Goods Movement	X	X		X
	Employment Accessibility	X	X	X	X

Funding Opportunities for TSMO

Program	STBG	CMAQ	TAP
Emphasis Areas	<p>Last Mile Connectivity – Localized pedestrian and bicyclist safety, access and mobility with emphasis on correcting “hot spot” issues near transit & schools</p> <p>Roadway Safety^[1] – Address multimodal safety issues along key roadways, with emphasis on thoroughfares</p> <p>Freight Safety^[1] – Address multimodal safety issues along truck routes</p> <p>Livable Centers Initiative – Projects within designated LCI areas that are defined in LCI plan, linking transportation and land use to create sustainable, livable communities</p> <p>Transit Capital and Preventative Maintenance^[1] – Transit infrastructure projects to maintain state of good repair and/or improve overall patron experience</p>	<p>Travel Demand Management^[1] – Physical assets and services provide real-time information network performance and support better decision-making for travelers</p> <p>Clean Vehicle & Technology Programs – Purchase alternative fuel vehicles or convert fleets to run on alternative fuels</p> <p>Transit Service Start-up Operation^[1] – Transit facilities, operation assistance (3 year max), or vehicles (bus, rail, or van) associated with new mass transit service that expands current system</p> <p>Roadway ITS/Ops/Incident Management^[1] – Signal synchronization, traffic management, and traveler information systems, with emphasis on thoroughfare and truck routes</p> <p>Managed Lanes^[1] – Tolling infrastructure to enable tolling, marketing, public outreach, and support services</p>	<p>Regional Trail Networks – Shared-use paths that enhance mobility & access</p> <p>Safe Routes to Schools – Enhancing access to elementary and middle schools; can compliment education, outreach, and planning efforts to enhance safe access to schools</p> <p>Transit & Station Area Access^[1] – Increase access to regional transit systems and the first-mile and last-mile connectivity to the regional transit network</p> <p>Comprehensive Activity Center Strategy^[1] – Substantial safety and accessibility improvements to a geographically-focused activity center or high-demand destination</p> <p>Other – Any other federally-eligible TA project types as defined by FHWA that enhance safety, accessibility, and mobility for bicyclists, pedestrians, and transit riders</p>
Estimate ^[2]	\$80,000,000	\$30,000,000	\$7,000,000

^[1] Defined component of regional strategy in the adopted Decision-Making Framework for the PLAN 2040 RTP/TIP Update in 2014

^[2] Subject to Change

Contact Information

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