Regional ITS Inventory Summary

Regional Transportation System Management and Operations (TSMO) Vision and ITS Architecture Update

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Prepared for

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Introduction

This document provides a summary of the intelligent transportation systems (ITS) inventory data that has been collected and consolidated as part of the Atlanta Regional Transportation System Management and Operations (TSMO) Vision and Intelligent Transportation Systems (ITS) Architecture Update effort. Agencies within the Atlanta Regional Commission (ARC) were sent a request to provide ITS device inventory data. Those ITS assets that were available in ArcView GIS shapefile format were received and are described herein. In addition, Kimley-Horn and Associates has an extensive data set of ITS inventory data which has been consolidated and included as well. Inventoried assets within ArcView GIS include:

- Traffic signals
- CCTV cameras
- ITS equipment cabinets
- Fiber optic cable

In addition, a separate effort to understand existing transit technology-based deployments was performed. A transit data request was sent to agencies regarding current and planned deployments. This information is summarized and provided as a baseline to understand existing conditions.

Purpose

The purpose of developing a baseline ITS inventory is to establish existing conditions such that it may be used in future planning efforts as well as a reference for stakeholders within the Region. In addition, the identified assets and supporting systems have been included in the ITS Architecture update. It is envisioned that this data will continue to evolve and be refined and updated throughout planning cycles for years to come.

ITS Asset Inventory

The Atlanta region is composed of 20 counties and involves multiple public and private entities that manage and operate key components of the transportation system, including highways, arterial streets, transit rail, buses, bicycle and pedestrian facilities, and parking facilities. Figure 1 displays the location of GIS ITS asset inventory data to provide a high-level understanding of where general deployments currently exist. It is expected that the shapefile data will be used and referenced rather than the image below.
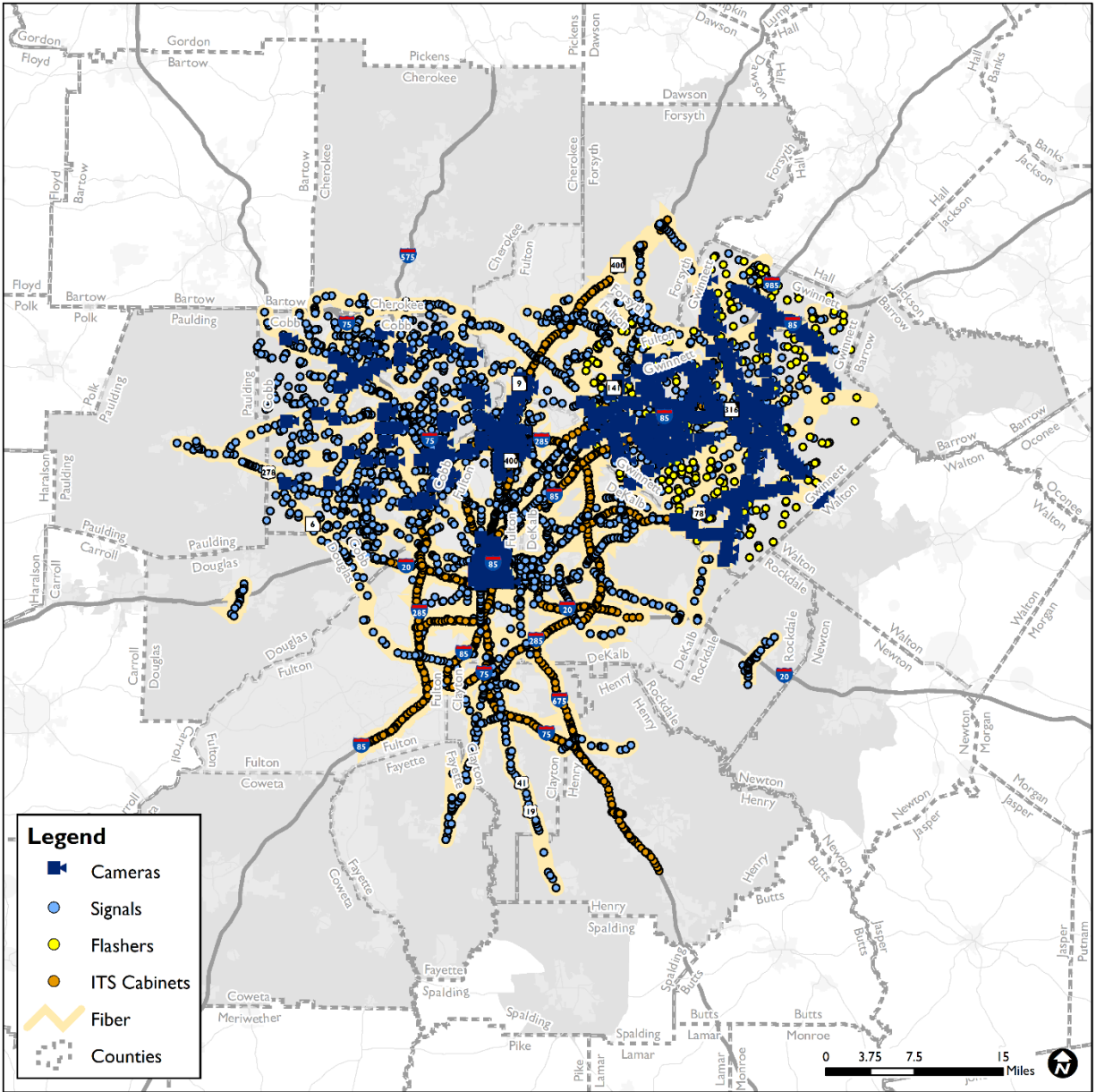
Figure 1: ITS Asset Inventory Map

GIS ITS Inventory Summary

Table 1 provides a summary of data resources that are provided within the GIS shapefiles submitted. The asset type, original file name, agency, and approximate date of data are provided for reference as well.

Table 1: Data Resources

ASSET	ORIGIONAL FILE NAME	AGENCY	APPROX DATE
Traffic Signal	DEKALB_SIGNALS_ATLANTA	COA (from DeKalb CTP)	3/2013
Traffic Signal	traffic_signals	COA (from DeKalb CTP)	3/2013
Fiber	traffic_communications	COA (from DeKalb CTP)	3/2013
Traffic Signal	SIGNALEQUIPMENT	Cobb County	2/2019
Traffic Signal	SIGNALS	Cobb County	2/2019
Fiber	SIGNALFIBEROPTICCBL	Cobb County	2/2019
Camera	TRAFFICCAMERAS	Cobb County	2/2019
Fiber	DTOP_Fiber_Lines_2018_09	GDOT - DTOP	9/2018
Traffic Signal	SignalsDTOP	GDOT - DTOP	12/2018
Camera	ProposedCCTV_2018_1010	GDOT - DTOP	10/2018
Fiber	GDOT_FIBER_ATL	NexusWorx Export	3/2019
Conduit	GDOT_CONDUIT	NexusWorx Export	3/2019
Communication Field Hub	GDOT_HUBS	NexusWorx Export	3/2019
Traffic Management Center	GDOT_TMCs	NexusWorx Export	3/2019
Equipment Cabinet	GDOT_EQUIP_CABS_ATL	NexusWorx Export	3/2019
Fiber	Fiber	Gwinnett	2/2019
Traffic Signal	Traffic_Signals	Gwinnett	2/2019
Traffic Signal - Flasher	Flashers	Gwinnett	2/2019
Camera	CCTVs	Gwinnett	2/2019
Fiber	PublicWorksITSConduitLines	Johns Creek	2/2019
Traffic Signal	PublicWorksTrafficPedestrianSignals	Johns Creek	2/2019
Traffic Signal	PublicWorksTrafficSignalCabinets	Johns Creek	2/2019
Traffic Signal	PublicWorksTrafficSignaledIntersections	Johns Creek	2/2019
Traffic Signal	PublicWorksTrafficSignalHeads	Johns Creek	2/2019
Traffic Signal	PublicWorksTrafficSignalPoles	Johns Creek	2/2019
Traffic Signal	Existing_RTOP_Signals_FINAL	GDOT - RTOP	2/2019
Traffic Signal	RTOP_Signals_Line_Updated	GDOT - RTOP	2/2019
Fiber	SandySpringsFiberCable	Sandy Springs	1/2019
Traffic Signal	Signal_Heads_Traffic_School_etc.Sandy_Springs_Georgia	Sandy Springs	1/2019
Camera	Traffic_Cameras_Sandy_springs_Georgia	Sandy Springs	1/2019

Georgia Department of Transportation (GDOT) manages their ITS communication assets with the asset management software, NexusWorx. The NexusWorx data was exported to a GIS shapefile format; providing a significant inventory of regional ITS and communication assets.

A geodatabase has been created to organize the shapefiles. Original shapefiles have been provided for documentation purposes. However, these files contain several extraneous fields that are not relevant for ARC purposes. In addition, the original files have been modified to have consistent fields. In some cases, these fields are not populated, however, it is recommended that this data be requested from partner agencies such that over a period of years, a consistent data set will be created for regional use. The following fields have been provided per asset type:

ITS Device:

   ObjectID – Unique ID assigned by creation
   Shape – Identification assigned by creation
   Device_Type – Type of ITS asset identified, i.e. camera, blue toad, etc.
   Device_Owner – Owner of identified asset
   Device_ID – Owner assigned identification
   Make_Model – Vendor information of the identified asset
   Status – Current function of the identified asset
   Location 1 – Physical location of the identified asset. This could describe the intersection or the primary roadway where the asset resides.
   LAT – approximate latitude coordinate of the location of the device
   LONG – approximate longitude coordinate of the location of the device
   Comment – any pertinent comments for additional information

Traffic Signals:

   FID – Unique ID assigned by creation
   Shape – Identification assigned by creation
   Device_Type – traffic signal or flasher
   Device_Owner – Owner of identified asset
   Device_ID – Owner assigned identification
   System – identification of signal system that the signal is managed by, i.e. RTOP, COSS, etc.
   Software – identification of signal system software
   Comm_Method – the method by which the traffic signal communicates with the central system
   Location – Physical location of the identified traffic signal
   LAT – approximate latitude coordinate of the location of the traffic signal
   LONG – approximate longitude coordinate of the location of the traffic signal
   Comment – any pertinent comments for additional information

<u>Fiber:</u>

ObjectID – Unique ID assigned by creation

Shape – Identification assigned by creation

Fiber_ID – Owner assigned identification

Owner – Owner of identified asset

Install_Type – Type of installation, i.e. underground or overhead

Count – Number of fibers contained in the identified cable

Cable_Length – Approximate length of asset

Location – Primary roadway of asset

Comments – any pertinent comments for additional information

Recommended ITS Inventory Updates

It is recommended that the ITS inventory data be updated on a regular cycle. It is recommended that ITS inventory data be requested as part of the comprehensive transportation planning (CTP) cycle such that agencies will provide current ITS inventory asset shapefiles with other CTP files. It is further recommended that the common requested fields be shared with agencies such that they may work towards providing consistent data across the region.

Transit Asset Inventory

A comprehensive questionnaire was provided to each agency to obtain information regarding the specific technologies utilized. The depth of the questions addressed areas such as whether the agency owns, operates, or maintains specific technologies/devices. Specific technologies were identified within the functions of Traveler Information, Communication, Operations, Data Collection, Security/Safety, and Field Equipment (not on vehicles). Additional information requested pertained to the quantity of each technology as well as a request for comments on upcoming changes anticipated. Original transit data responses have been provided with the GIS shapefile data.

Summary of Transit Agency Provided Information

An ITS/ATMS questionnaire was sent to the regional agencies to establish a current baseline and a master color coded spreadsheet was assembled. Each agency responded and provided the requested information. The nine agencies contacted are identified in Table 2.

Table 2: Transit Agency Contacted

AGENCY	AGENCY CONTACT
Center for Pan Asian Community Services (CPACS)	Eugene Rhee
CobbLinc	Andrea Foard
ConnectDouglas	Gary Watson
Gwinnett County Transit	Karen Winger
Cherokee Area Transit System (CATS)	Kristy Johnson
Metropolitan Atlanta Rapid Transit Authority (MARTA)	Kirk Talbott
State Road and Tollway Authority (SRTA)	Jamie Fischer
State Road and Tollway Authority (SRTA) Express	Jamie Fischer
Henry County Transit	Tye Salters

Transit Center and Vehicle Information

Agency responses pertaining to specific Center and Vehicle information requested, provides useful insight into the available traveler information and the types of communication provided at each agency. Each agency has been color coded for ease of reference.

Key information regarding the types of Centers includes:

Dispatch Centers:	4 of 9
Garage/Depots:	6 of 9
Maintenance Centers:	7 of 9
Information Centers:	5 of 9
Sales Kiosks:	5 of 9
Vehicles:	2 of 9

Key information regarding the types of Vehicles includes:

Fixed Route Vehicles:	7 of 9
Emergency Vehicles:	2 of 9
Demand Response Vehicles:	7 of 9
Maintenance Vehicles:	6 of 9
Paratransit Vehicles:	1 of 9
Rail Vehicles:	2 of 9

Table 3: Center and Vehicle Information

		SRTA-PEACHPASS	SRTA-EXPRESS	GWINNETT	CPACS	COBB	MARTA	DOUGLAS	CHEROKEE	HENRY
Information Needed for ITS Architecture		**Yes/No**	**Yes/No**	**Yes/No**	**Yes/No**	**Yes/No**	**Yes/No**	**Yes/No**	**Yes/No**	**Yes/No**
Centers	Data Centers	Yes	Yes	No	No		Yes	No	No	Yes
	Dispatch Centers	No	Yes	Yes	Yes	Yes	Yes	Coming	Yes	Yes
	Garages/ Depots	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	Maintenance Centers	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
	Information Centers	Yes	Yes	Yes	No		Yes	Yes	No	No
	Sales Kiosks	Yes	Yes	No	Yes	Yes	Yes	No	No	No
	Vehicles	Yes					Yes	No		
	Other		Yes							
Vehicles	Fixed Route Vehicles	164		Yes	Yes	70	Yes	Yes	Yes	No
	Emergency Vehicles	0		No	No		Yes	No	No	Yes
	Demand Response Vehicles	0		Yes	Yes	30		Yes	Yes	Yes
	Maintenance Vehicles	3		No	No	Yes	Yes	Yes	No	Yes
	Paratransit vehicles						Yes			
	Rail Vehicles						Yes	Yes		
	Other	8				Yes		Staff	Admin	

Existing Transit Technology Based Solutions

Agency responses pertaining to specific Traveler and Communications information provides useful insight into the options available for traveler to access information and the types of communication provided at each agency.

Key Traveler Information includes:

Website:	9 of 9 – All agencies offer a website as a standard feature.
Smartphones apps:	5 of 9 – Douglas County planning to add App in the near future
Changeable Message Signs:	None
RTPI:	4 of 9 – Douglas County planning to add in the near future

Key Communications provided by the agencies includes:

Radio:	6 of 9
Wireless:	6 of 9

Table 4: Traveler and Communications Information

Function	Technology/Device	SRTA-PEACHPASS		SRTA-XPRESS		GWINNETT		CPACS		COBB		MARTA		DOUGLAS		CHEROKEE		HENRY	
		Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY
Traveler Information	Websites	Y	1	Y	1	Y		Y	1	Y		Y		Y		Y	1	Y	
	Smartphone Apps	Y	1	Y	1	Y		N		Y		Y		Coming		N	0	N	
	Changeable Message Signs - Roadway																		
	Real Time Passenger Information (RTPI)			Y	1	Y		N		Y		Y		Coming		N	0	N	
	Other	Y		Y						Y		Y		N					
Comm.	Electronic Transponder	Y																	
	Radio			Y		Y		N		Y		Y		N		Y	1	Y	35
	Wireless			Y		Y/N		N		Y		Y		N		Y	1	Y	4
	Other			Y						Y		Y		C-Phone	16				

The agencies also responded to requests for specific Operations, Data Collection and Security/Safety information which aides in determining the available ITS systems currently utilized.

Key Operations information includes:
Automatic License Plate Reader: 1 of 9
Electronic Transponder: 1 of 9
Toll rate signs: 1 of 9
Audit Cameras: 1 of 9
Laser Readers: 1 of 9
Electronic Fare Payment Systems: 6 of 9
Electronic Fare Collection Systems: 2 of 9
Computer-Aided Dispatch (CAD):   5 of 9
Signal Priority: 2 of 9
Image Review: 1 of 9

Key Data Collection information includes:
Electronic Transponder: 1 of 9
Microwave Detection Device (MDS):   2 of 9
Antennas and Readers: 1 of 9
Loop Detection: 1 of 9
Axle Readers: 1 of 9
Laser Readers: 1 of 9

Automatic Vehicle Location (AVL): 5 of 9
Automatic Passenger Counter (APC): 3 of 9

Key Safety/Security information includes:
Cameras - Audit, LPR, Toll Rate: 1 of 9
Cameras; Toll Points-Toll Maint Area, Hubs: 1 of 9
Cabinet Door Sensor: 1 of 9
Gate Locks/Hubs/Generators/Toll Maint: 1 of 9
Camera in Vehicle: 8 of 9
Camera in Stations: 3 of 9
Panic Buttons: 4 of 9
Electronic Hub Keys: 1 of 9

Table 5: Operations, Data Collection, and Security/Safety Information

Function	Technology/ Device	SRTA-PEACHPASS		SRTA-XPRESS		GWINNETT		CPACS		COBB		MARTA		DOUGLAS		CHEROKEE		HENRY	
		Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY
Operations	Automatic License Plate Reader	Y																	
	Electronic Transponder	Y																	
	Toll rate signs	Y																	
	Audit Cameras	Y																	
	Laser Readers	Y																	
	Electronic Fare Payment Systems			Y	3	Y	83+	N		Y		Y		N		Y	1	N	
	Electronic Fare Collection Systems									Y		Y							
	Computer-Aided Dispatch (CAD)			Y	1	Y		N		Y		Y		N		Y	1	N	
	Signal Priority			N		N		N		Y		Y		N		N	0	N	
	Image Review	Y																	
Data Collection	Electronic Transponder	Y																	
	Microwave Detection Device (MDS)	Y																	
	Antennas and Readers	Y																	
	Loop Detection	Y																	
	Axle Readers																		
	Laser Readers	Y																	
	Automatic Vehicle Location (AVL)			Y	1	Y	83+	Y	2	Y		Y		N	12	N	0	N	24
	Automatic Passenger Counter (APC)			N		Y	83+	N		Y		Y		N	12	N	0	N	
	Cameras - Audit, LPR, Toll Rate	Y																	

Table 5 (cont.): Operations, Data Collection, and Security/Safety Information

Function	Technology/ Device	SRTA-PEACHPASS		SRTA-XPRESS		GWINNETT		CPACS		COBB		MARTA		DOUGLAS		CHEROKEE		HENRY	
		Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY
Security/ Safety	Cameras - Toll Points, Toll Point Maintenance Area, Hubs	Y																	
	Cabinet Door Sensor	Y																	
	Gate Locks at Hubs, Generators, Toll Point Maintenance Area	Y																	
	Camera in Vehicle			Y	1	Y	4-8	Y	2	Y		Y		Y	12	Y	1	Y	29
	Camera in Stations			Y	2	N		N		N		Y		Y	16	N	0	NA	
	Panic Buttons			Y	1	Y		N		Y		N		Y	1	N	0	N	
	Other			Y	1							Y							
	Electronic Hub Keys	Y																	

Information pertaining to the agencies Field Equipment and other technologies was provided by the agencies:

Key Field Equipment information includes:
Microwave Detection Device (MDS):   1 of 9
Axle Readers: 1 of 9
Loop Detection: 1 of 9
Antennas and Readers: 1 of 9
Cameras - Audit and Toll Rate: 1 of 9
Laser Readers: 1 of 9
License Plate Cameras: 1 of 9
Generators: 1 of 9
Stop/Station Displays: 4 of 9
Parking Availability Sensors: 0 of 9
LED/LCD Signs: 4 of 9
Fare Collection Equipment: 4 of 9
Other Hardware: 2 of 9
Electric Charging Station: 1 of 9
Toll rate signs: 1 of 9
Network Security – MOMS: 1 of 9
General Transit Feed Specification (GTFS):   4 of 9

Any other future technologies: 6 of 9

Future technology information includes:

SRTA EXPRESS:
- P&R Tech Refresh
- Smart Lighting for state owned lots;
- 4 P&Rs under construction;
- CAD/AVL 2.0;
- New bus purchase - near term diesel buses, later electric bus and charging stations;

GWINNETT:
- Passenger Wi-Fi - On All Vehicles (Commuter, Local and Paratransit);
- Mobile ticketing is a potential future initiative of Gwinnett County Transit which would a) depend on a referendum and b) when MARTA starts rolling it out to the partners (GRTA is first).
- Use of a cloud-based program called Transtrack which rolls most of the data all into one platform

COBB:
- Full Breeze migration;
- Upgrades to DCU3;
- Mobile ticketing;
- Ticket vending machines at the transfer centers;
- "Smart" park-and-ride lots

MARTA:
- Plan to Updated mobile app;
- Revamped Fare Collection System;
- Video Analytics;
- Real Time Operational Management & Analysis (LiveEarth);
- MicroTransit Capabilities

CHEROKEE (CATS): Considering telematic and update on digital camera technologies.

HENRY: Planning to install tablets in all buses.

Table 6: Field Equipment and Other Information

Function	Technology/Device	SRTA-PEACHPASS		SRTA-XPRESS		GWINNETT		CPACS		COBB		MARTA		DOUGLAS		CHEROKEE		HENRY	
		Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY	Y/N	QTY
Field Equipment	Microwave Detection Device (MDS)	Y	187																
	Axle Readers	Y	36																
	Loop Detection	Y	99																
	Antennas and Readers	Y	499																
	Cameras - Audit and Toll Rate	Y	46																
	Laser Readers	Y	70																
	License Plate Cameras	Y	177																
	Generators	Y																	
	Stop/Station Displays			Y		Y		N		N		Y		Y	3	N	0	N	
	Parking Availability Sensors			N		N		N		N		N		N		N	0	N	
	LED/LCD Signs			Y		Y		Y	4	N		Y		N		N	0	N	
	Fare Collection Equipment			Y		Y	83+	Y	2	N		Y		N		N	0	N	
	Other Hardware			Y								Y		N		N	0	N	
	Electric Charging Station			N		N		N		Y		N		N		N	0	N	
	Toll rate signs	Y	46	N															
Other	Network Security - MOMS	Y																	
	General Transit Feed Specification (GTFS)			Y		Y		N		Y		Y		N		N	0	N	
	Future Upgrades?			Y		Y		N		Y		Y		N		Y		Y	