ORIGIN & DESTINATION

Transformative Planning Partnerships and Big Data

AMPO

2017 Annual Conference

CORE COASTAL REGION MPO CAT RS&H

Presentation Agenda

- **Introduction/Presentation Summary**
- **Defining Big Data**
- **CAT and MPO Partnership**
  - Data Purchasing Process
  - Benefits (sample size, etc.)
- **How each agency used the data**
- **Lessons Learned**
- **Next Steps / Applying the Results**
- **Questions / Discussion**

Introduction

- **Transformative advantages of Partnerships and Big Data**
  - Recommendations to enhance the operational efficiency of the transit system
  - Analysis of travel patterns needed for congestion management process update.

Regional Overview

- Regional Population 276,406; 50% in Savannah
- Areas included: All of Chatham County, Richmond Hill (Bryan County) and portions of Effingham County
- Chatham Area Transit(CAT) operates 16 core routes within Savannah and portions of Chatham County; including shuttle and Belles Ferry
- The largest single container terminal & the fastest growing port in the US
- Significant infill and decentralized suburban growth pressures
- Historic Preservation: Nations largest Historic Landmark District
- Tourism: 13.7 Million Annual visitors
- Hunter Army Airfield & Fort Stewart

Defining Big Data

big da·ta

noun COMPUTING

- extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.

Source: dictionary.com

NPMRDS

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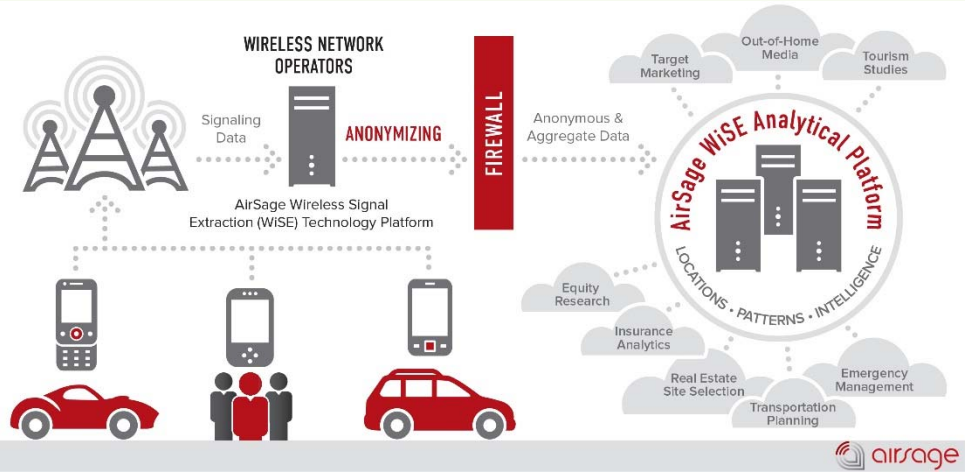
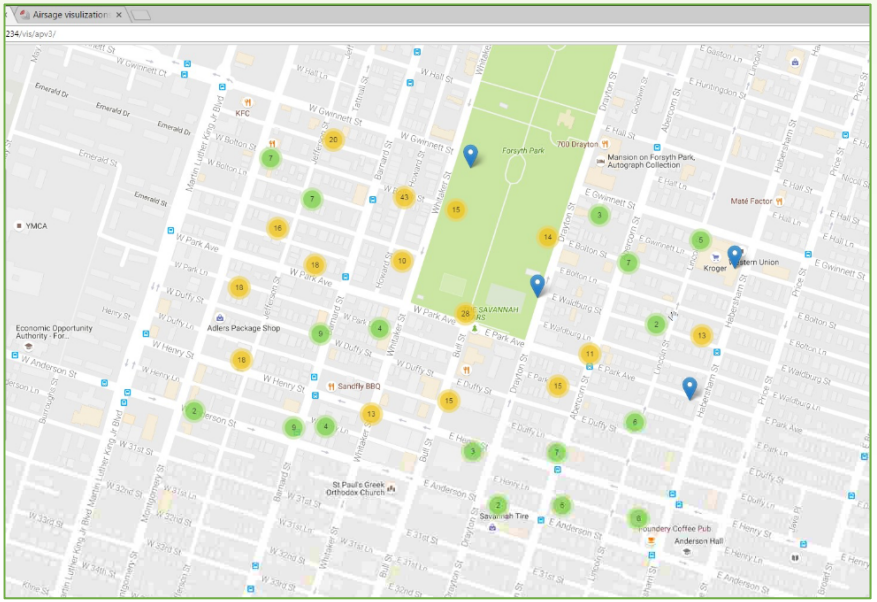
Defining Big Data





	A	B	C	D	E	F	G	H	I
1	Origin_Zone	Destination_Z	Start_Date	End_Date	Aggregation	Subscriber_C	Purpose	Time_of_Day	Count
2	94	37	20130702	20130731	WD	Visitor	OO	H00:H24	5.08
3	420	343	20130702	20130731	WD	Resident	HW	H00:H24	1.49
4	548	33	20130702	20130731	WD	Resident	WO	H00:H24	5.01
5	68	164	20130702	20130731	WD	Resident	OO	H00:H24	4.96
6	256	400	20130702	20130731	WD	Resident	HO	H00:H24	5.97
7	498	62	20130702	20130731	WD	Resident	HW	H00:H24	4.37

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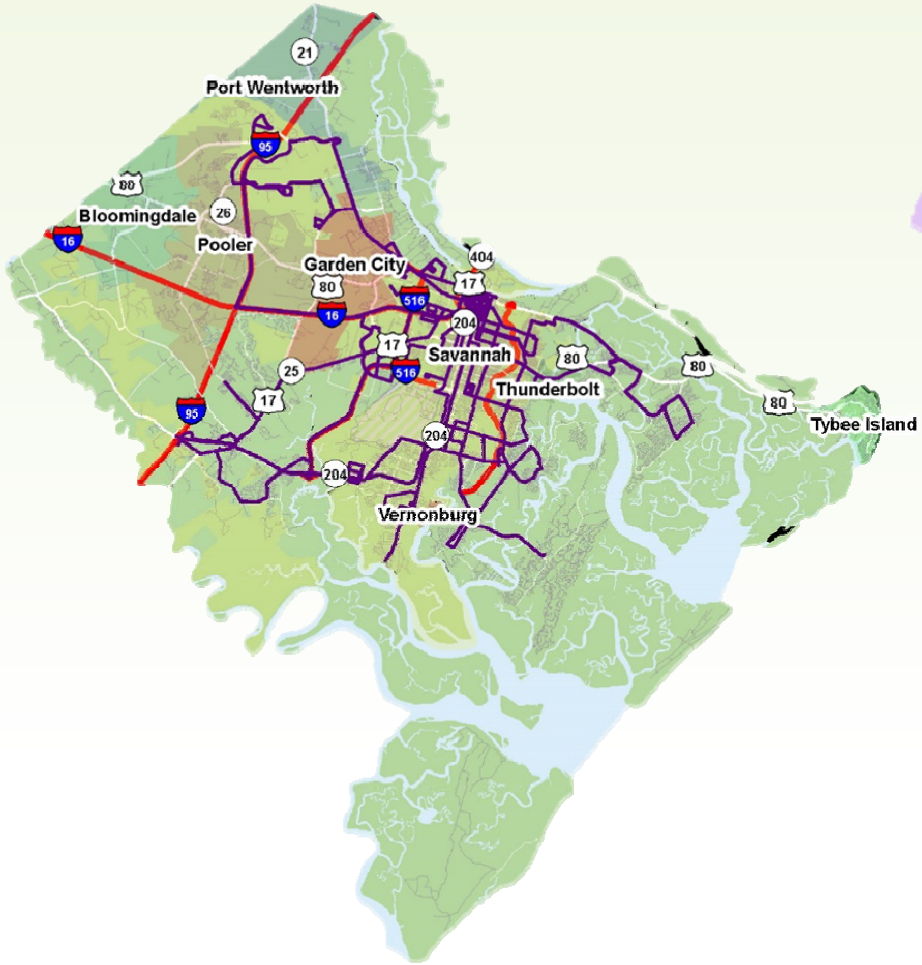
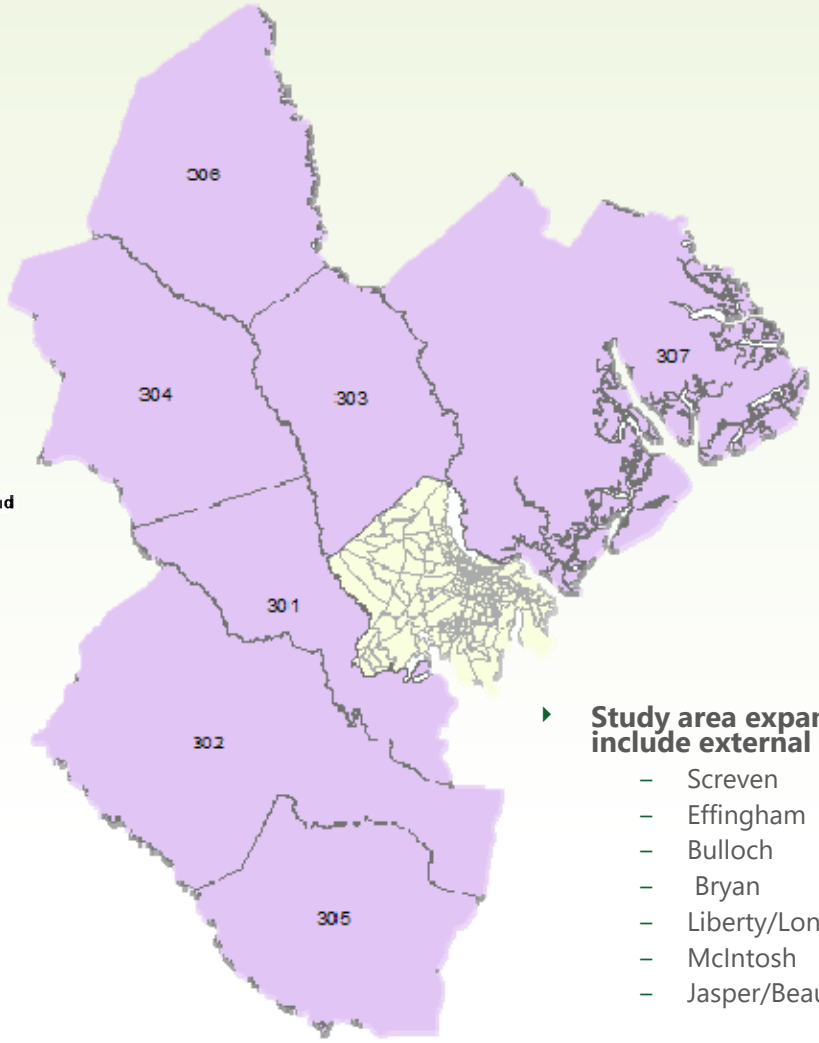
Data Procurement





- **Study area expanded to include external trip data.**
  - Screven
  - Effingham
  - Bulloch
  - Bryan
  - Liberty/Long
  - McIntosh
  - Jasper/Beaufort

*Counties selected based on census commute data.

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Data Procurement

- AirSage data purchase driven by the following criteria:

Option 1: Base Data Set

- 1 month sample
- Average weekdays (T-Th)
- AM Peak, Mid-day, PM Peak, 24 hour total
- 3-class trip purposes: HBW, HBO, OBO
- 2 Resident Classes: Visitors and Residents

390 Zones

Option 2: Premium Data Set

- 1 month sample
- Average weekdays (T-Th)
- AM Peak, Mid-day, PM Peak, 24 hour total
- 3-class trip purposes: HBW, HBO, OBO
- 6 Resident Classes: Res Worker, Home Worker, In-Commuter, Out-Commuter, Short-Term Vis, Lg-Term Vis)

230 Zones

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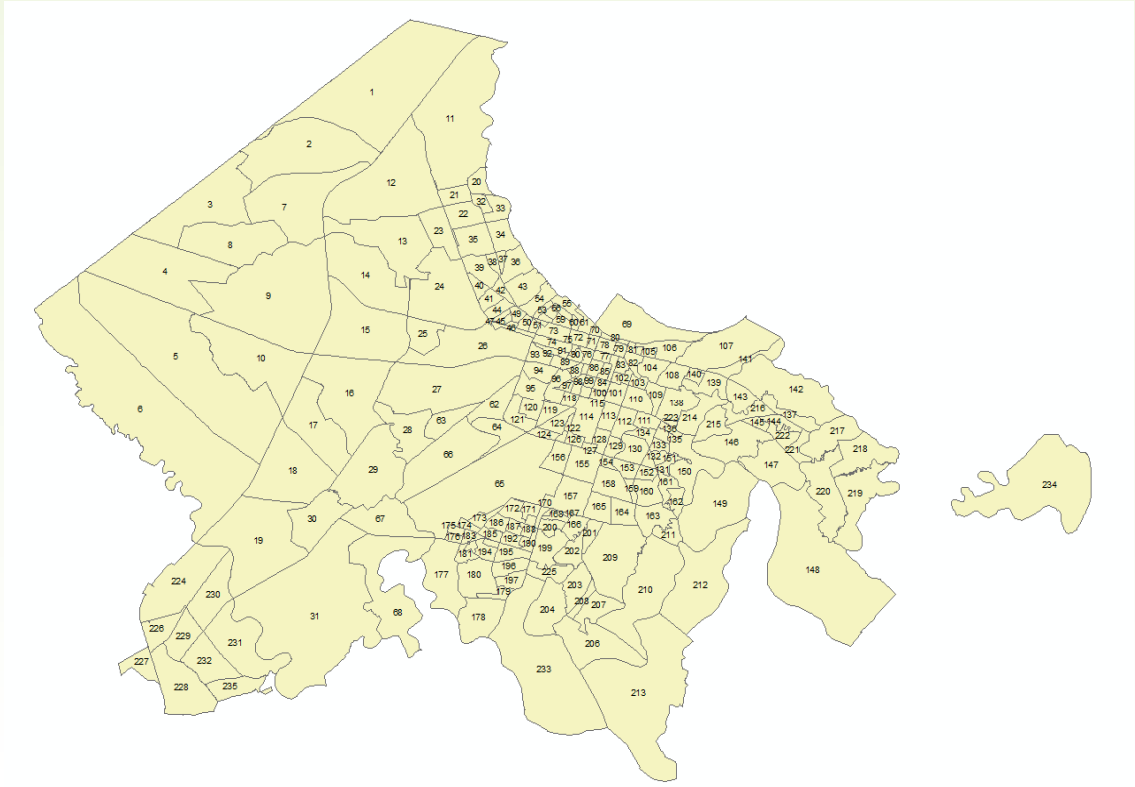
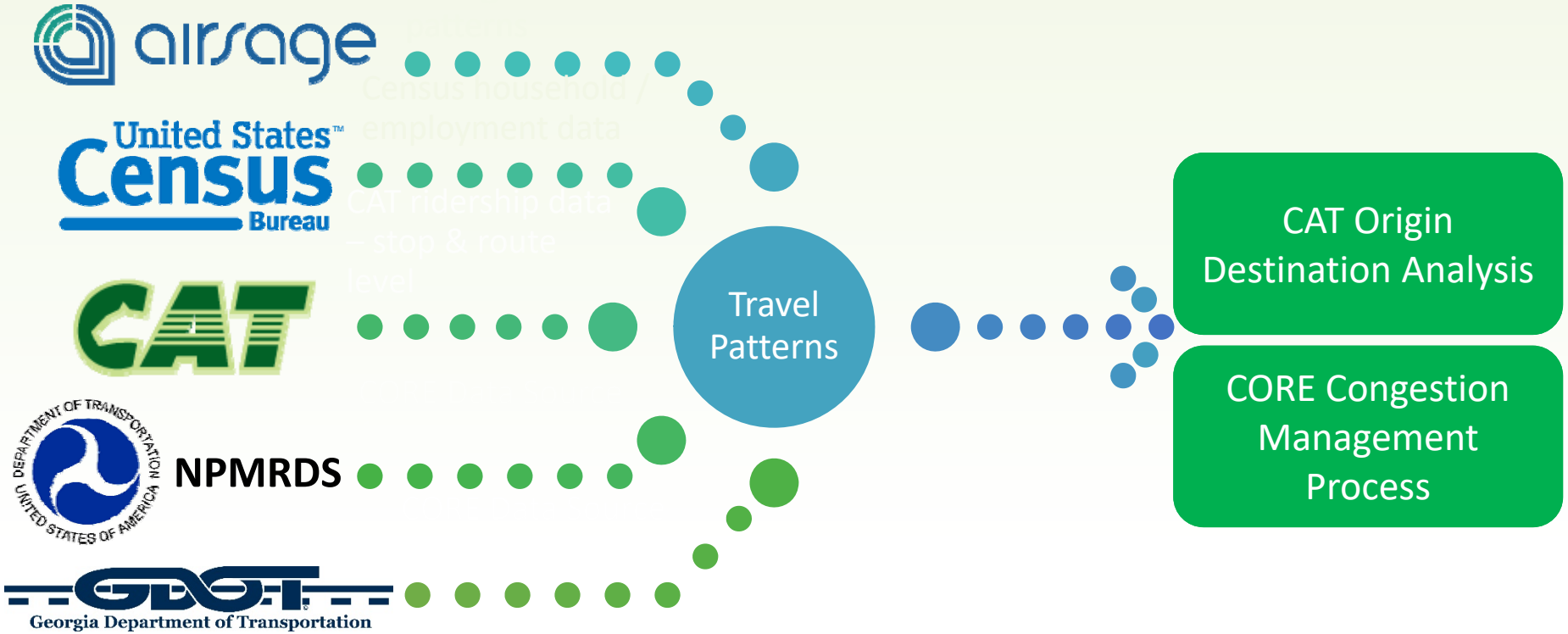
Data Purchase Partnership

- Premium Data Set
- 2 months sample
- Average weekdays (T-T)
- AM Peak, Mid-day, PM Peak, 24 hour total
- 3-class trip purposes: HBW, HBO, OBO
- 6 Resident Classes: Res Worker, Home Worker, In-Commuter, Out-Commuter, Short-Term Vis, Lg-Term Vis)
- 242 Zones



DATA APPLIED

Applying the Data



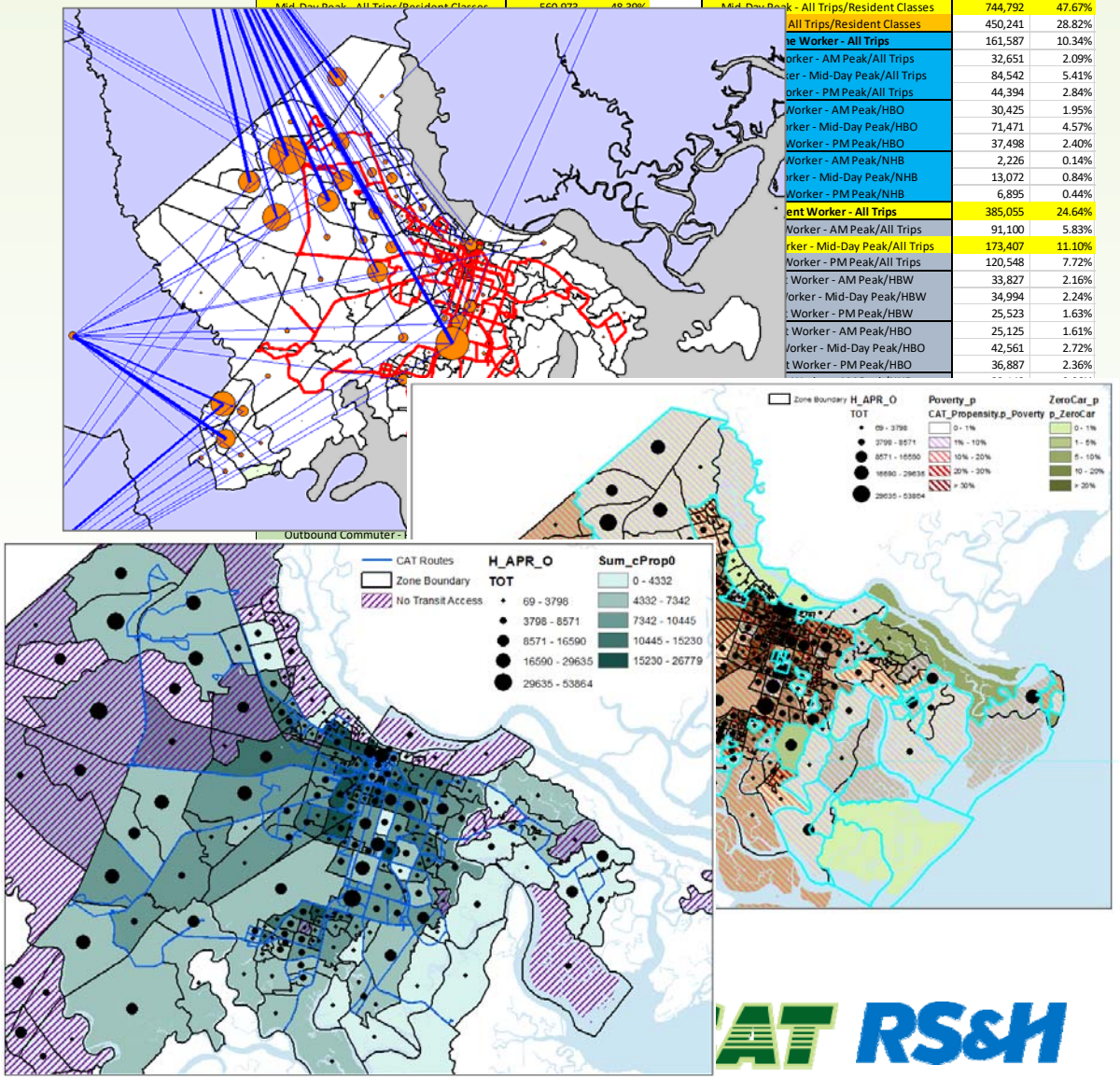
ORIGIN & DESTINATION

Analysis Process

- AirSage data contains various details, including trip purpose, time of day, and subscriber types (resident, visitor, etc.)
- Analysis consisted of 73 possible data combinations that were each mapped / assessed.
- Travel behaviors were layered with transit and census data.

Category (April 2016)	Aggregate	Percenta
24-Hour Counts*	1,445,268	N/A
Day Period Counts**	1,159,165	100%
AM Peak - All Trips/Resident Classes	271,771	23.45%

Category (October 2015)	Aggregate	Percenta
24-Hour Counts*	1,452,606	N/A
Day Period Counts**	1,562,488	100%
AM Peak - All Trips/Resident Classes	367,454	23.52%
Mid-Day Peak - All Trips/Resident Classes	744,792	47.67%
All Trips/Resident Classes	450,241	28.82%
e Worker - All Trips	161,587	10.34%
orker - AM Peak/All Trips	32,651	2.09%
er - Mid-Day Peak/All Trips	84,542	5.41%
orker - PM Peak/All Trips	44,394	2.84%
Worker - AM Peak/HBO	30,425	1.95%
rker - Mid-Day Peak/HBO	71,471	4.57%
Worker - PM Peak/HBO	37,498	2.40%
Worker - AM Peak/NHB	2,226	0.14%
rker - Mid-Day Peak/NHB	13,072	0.84%
Worker - PM Peak/NHB	6,895	0.44%
ent Worker - All Trips	385,055	24.64%
Worker - AM Peak/All Trips	91,100	5.83%
rker - Mid-Day Peak/All Trips	173,407	11.10%
Worker - PM Peak/All Trips	120,548	7.72%
Worker - AM Peak/HBW	33,827	2.16%
orker - Mid-Day Peak/HBW	34,994	2.24%
Worker - PM Peak/HBW	25,523	1.63%
Worker - AM Peak/HBO	25,125	1.61%
orker - Mid-Day Peak/HBO	42,561	2.72%
Worker - PM Peak/HBO	36,887	2.36%



CAT RS&H

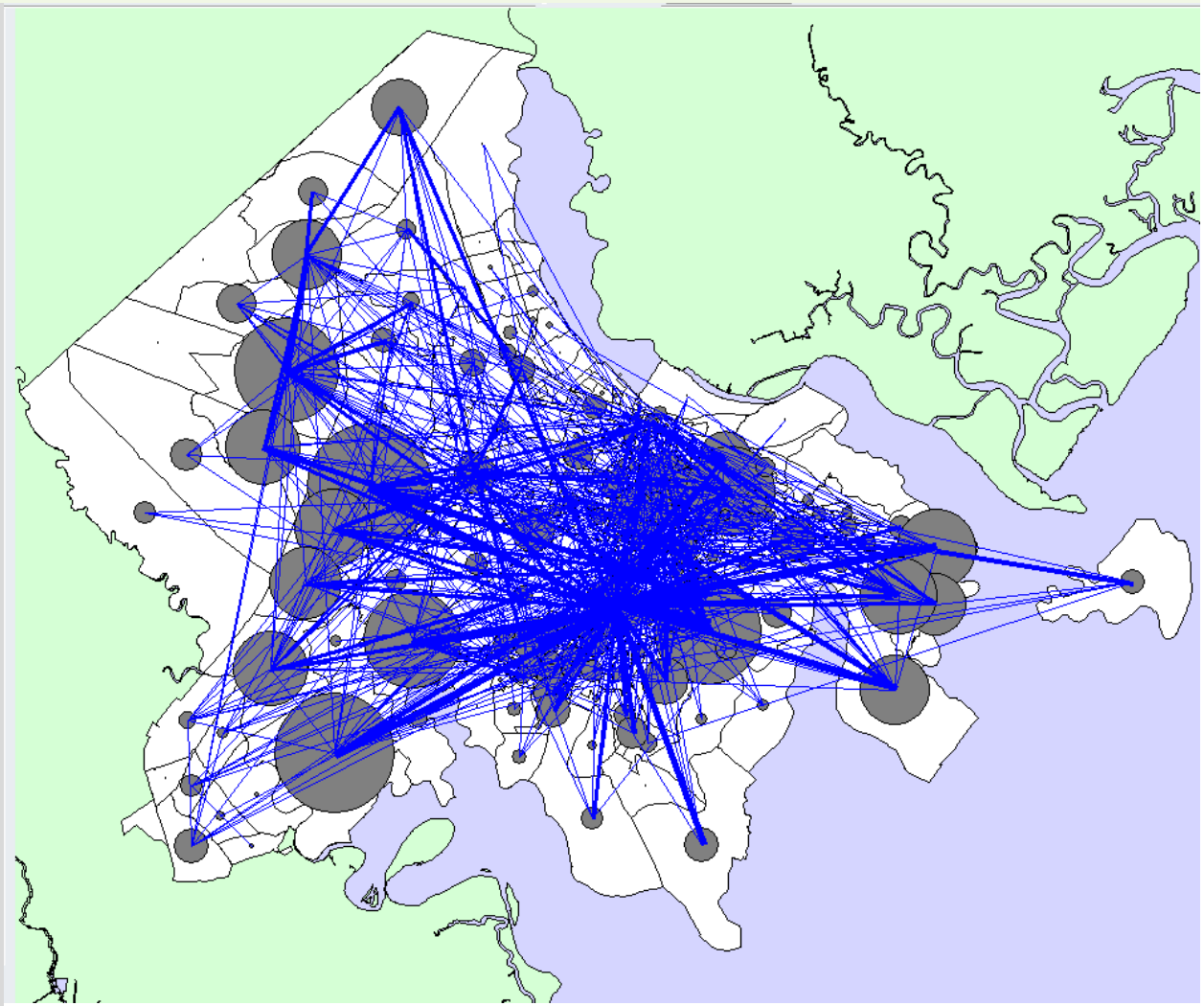
Origins

Travel Time and Type of Traveler:

- Morning (7:00 AM – 10:00 AM)
- “Home” Based “Work”
- “Resident Worker”

Origins and Desire Lines

Dataset: April 2016



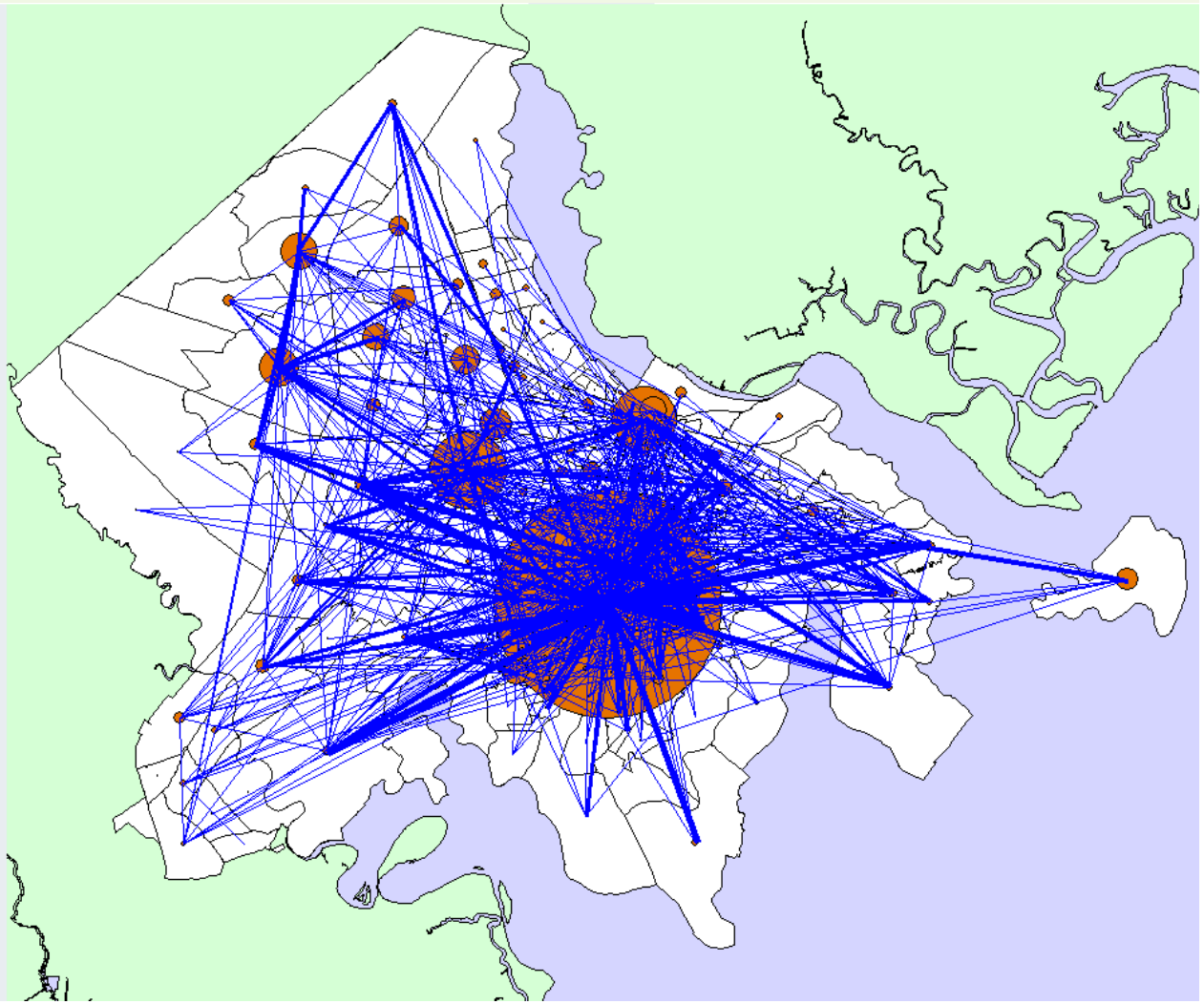
Destinations

Travel Time and Type of Traveler

- Morning (7:00 AM – 10:00 AM)
- “Home” Based “Work”
- “Resident Worker”

Destinations and Desire Lines

Dataset: April 2016



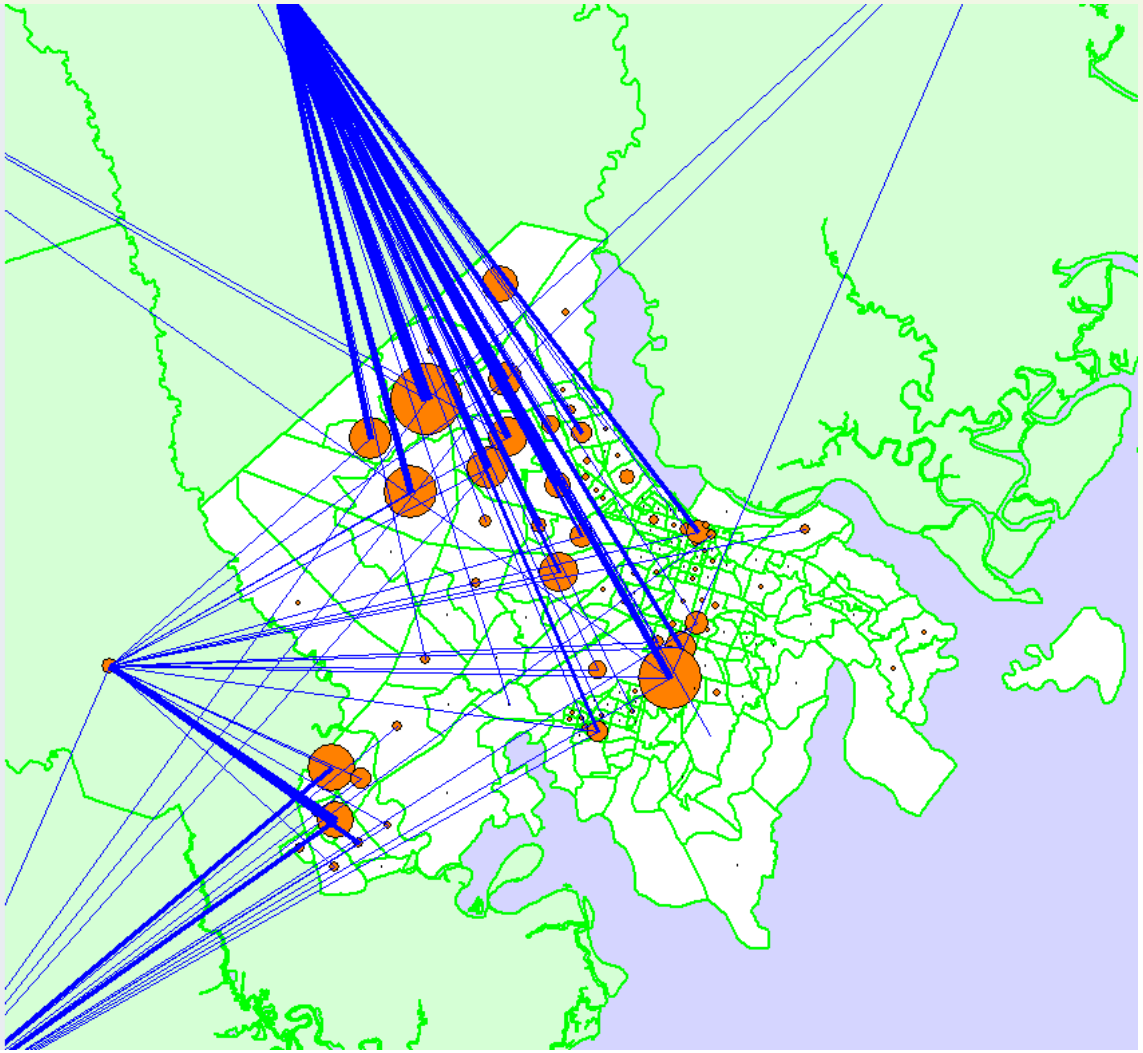
Destinations – Incoming Commuters

Travel Time and Type of Traveler

- Morning (7:00 AM – 10:00 AM)
- "Home" Based "Work"
- "Inbound Commuter"

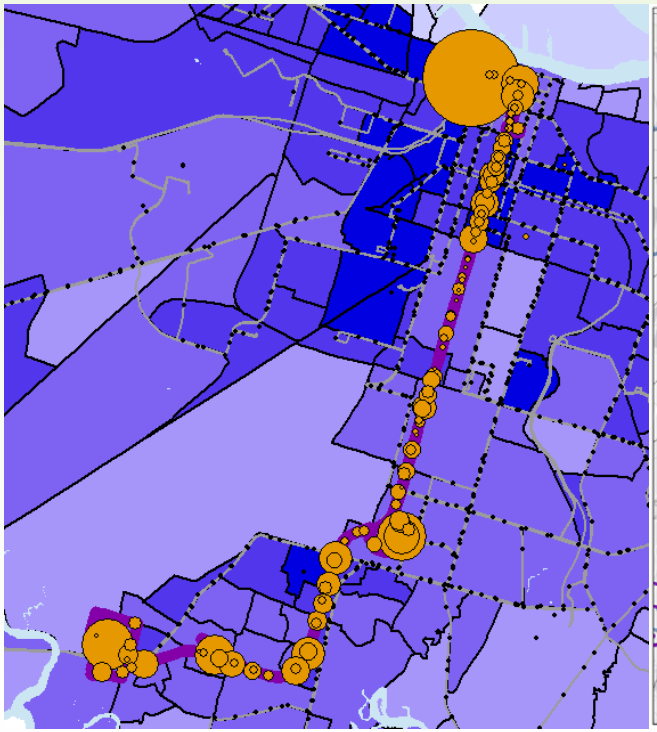
Destinations and Desire Lines

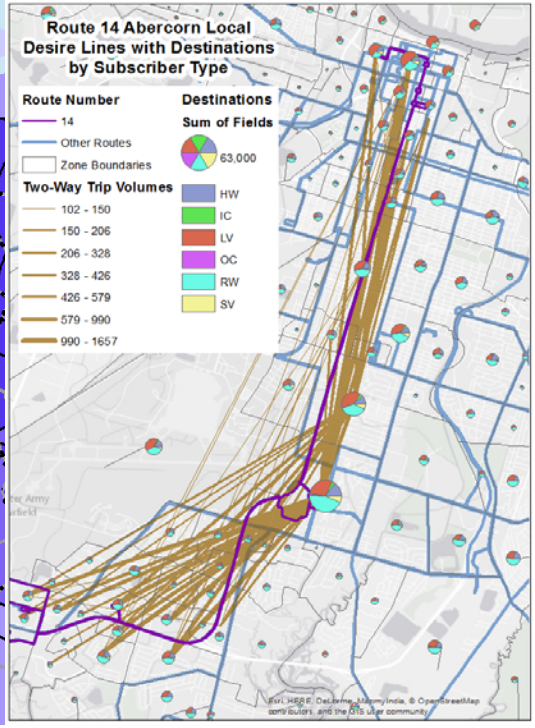
Dataset: April 2016



Sample: Applied Analysis

- **Boardings**
  - Ridership: > 50,000 monthly riders
  - Primary boarding locations
    - Transit Center: 500+ daily
    - Savannah Mall & Oglethorpe Mall: ~140 daily
- **Key Areas Served / Major Destinations**
  - Oglethorpe Mall area
  - St. Joseph's Hospital
  - Armstrong State University
  - Walmart on Fulton Rd.
  - Savannah Mall
- **High propensity**
- **Primary Transfers**
  - To Route 14 From: 3, 6, 25
  - From Route 14 To: 3, 6, 25, 27, 31
  - Transfer Location: Transit Center
- **Origins and Destinations**
  - Route activity is dominated by downtown trips.

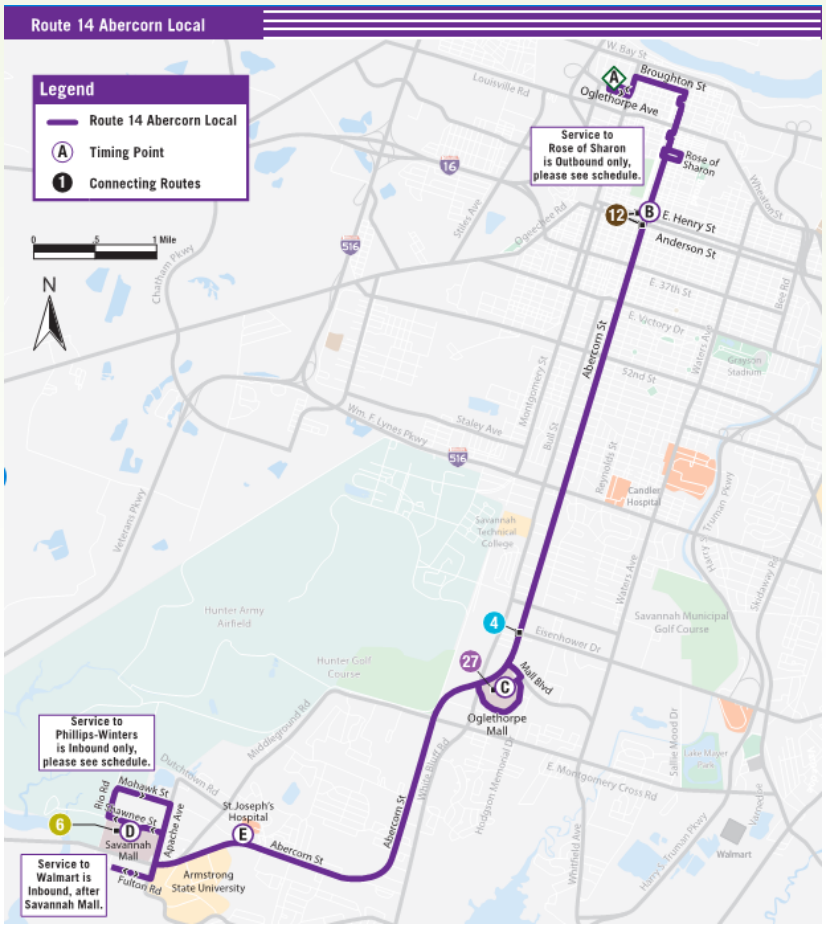




Sample: Recommendations

Recommendations:

- Enhance frequency between Oglethorpe Mall and Downtown Transfer Center.
- **Phase I**
  - Split Route 14 at Oglethorpe Mall
  - Utilize 4 peak buses on North leg of route to improve frequency to downtown.
  - Maintain service on South leg of route using remaining 2 vehicles.
- **Phase II**
  - Add frequency on North leg of Abercorn using new electric buses.



Route Analysis Synopsis:

- Significant demand between downtown and Oglethorpe Mall area, which is the primary opportunity for trips coming from West side of town to get to the desired mall area zone most quickly/directly.
- Only approx. 20% of transit trips originating at the Downtown Station continue beyond the Oglethorpe Mall.
- Roughly 60% of trips originating south of Oglethorpe Mall continue into the downtown area.

Recommendation Results:

- Service Hours Increase: Maintain current service hours using existing buses.
- Frequency Impacts: Extended 15 minute headways on North alignment

General Findings

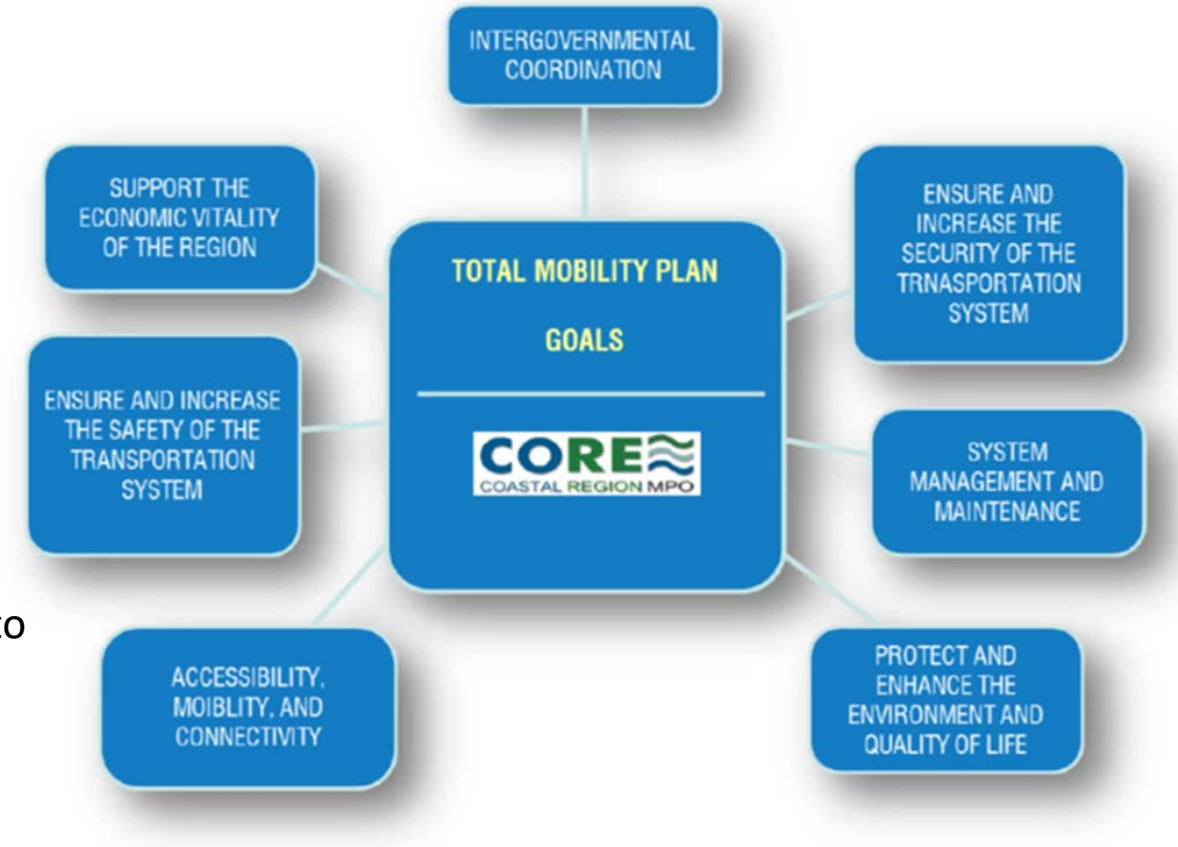
- **AirSage data provided insights into areas where transit service could be considered and service streamlining.**
- **AirSage data provided confirmation where routes are underperforming due to travel behavior discrepancies when compared to service lines.**
  - i.e. ridership performance is not projected to improve with reasonable route modification.
- **Data highlighted critical destinations for local travel.**
- **Much travel occurs within the region and jobs/shopping/services located on the outer perimeter of the study area.**
- **Travel patterns are primarily North and South oriented inside the urban core.**

Congestion Management Process

CMP Overview

Objectives

- Develop congestion management measures.
- Reduce non-recurring congestion duration.
- Evaluate travel time reliability to 95th percentile.
- Consider the full range of congestion management strategies.
- Acceptable Level of Service (LOS).



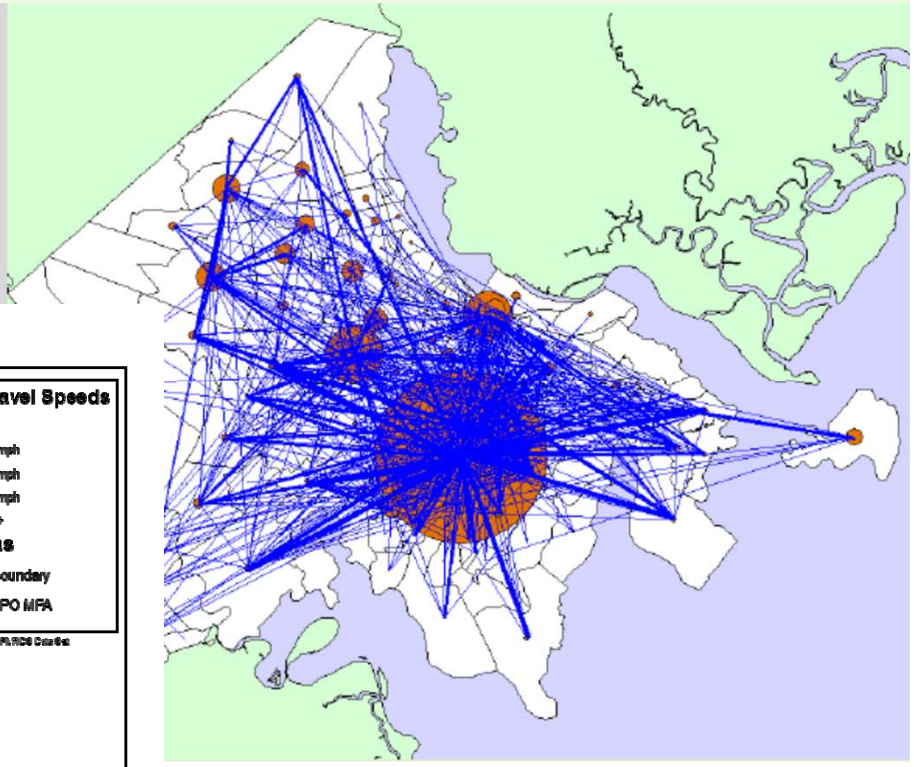
ORIGIN & DESTINATION

Sample: AM Commute

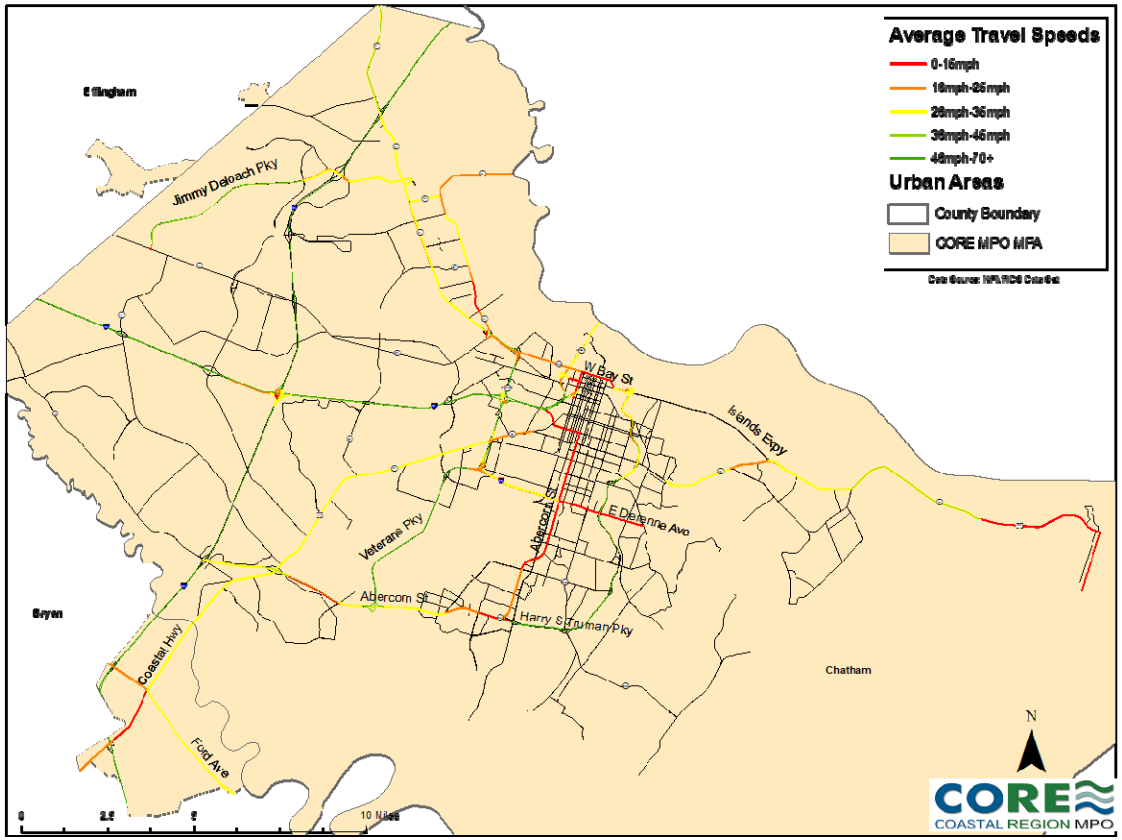
Scenario:
- Morning (7:00 AM – 10:00 PM)
- "Home" Based "Work"
- "Resident Worker"

Destinations and Desire Lines

Dataset: April 2016



Average Travel Speeds AM Peak (7-10am) October 2015



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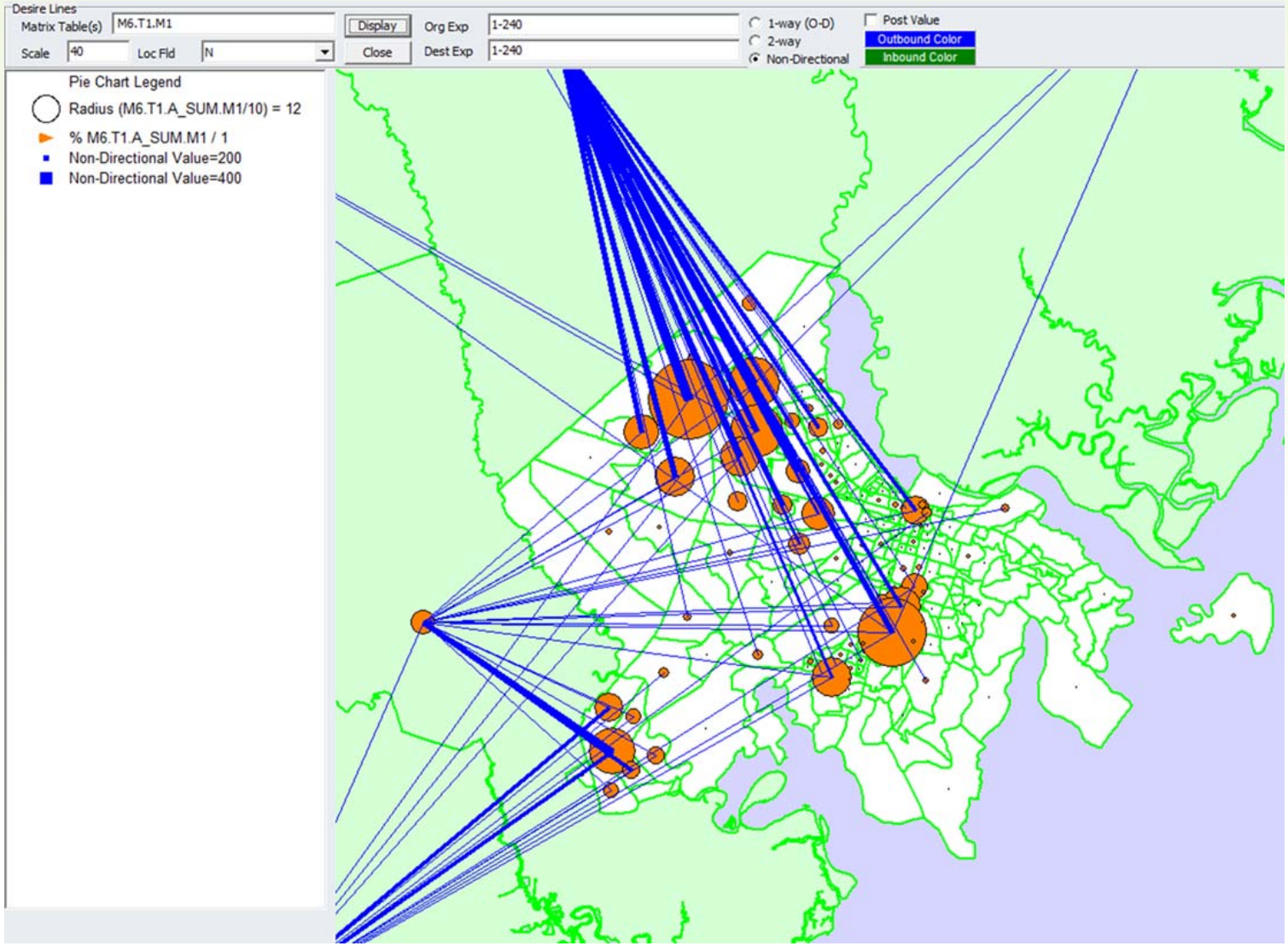
External Trip Makers



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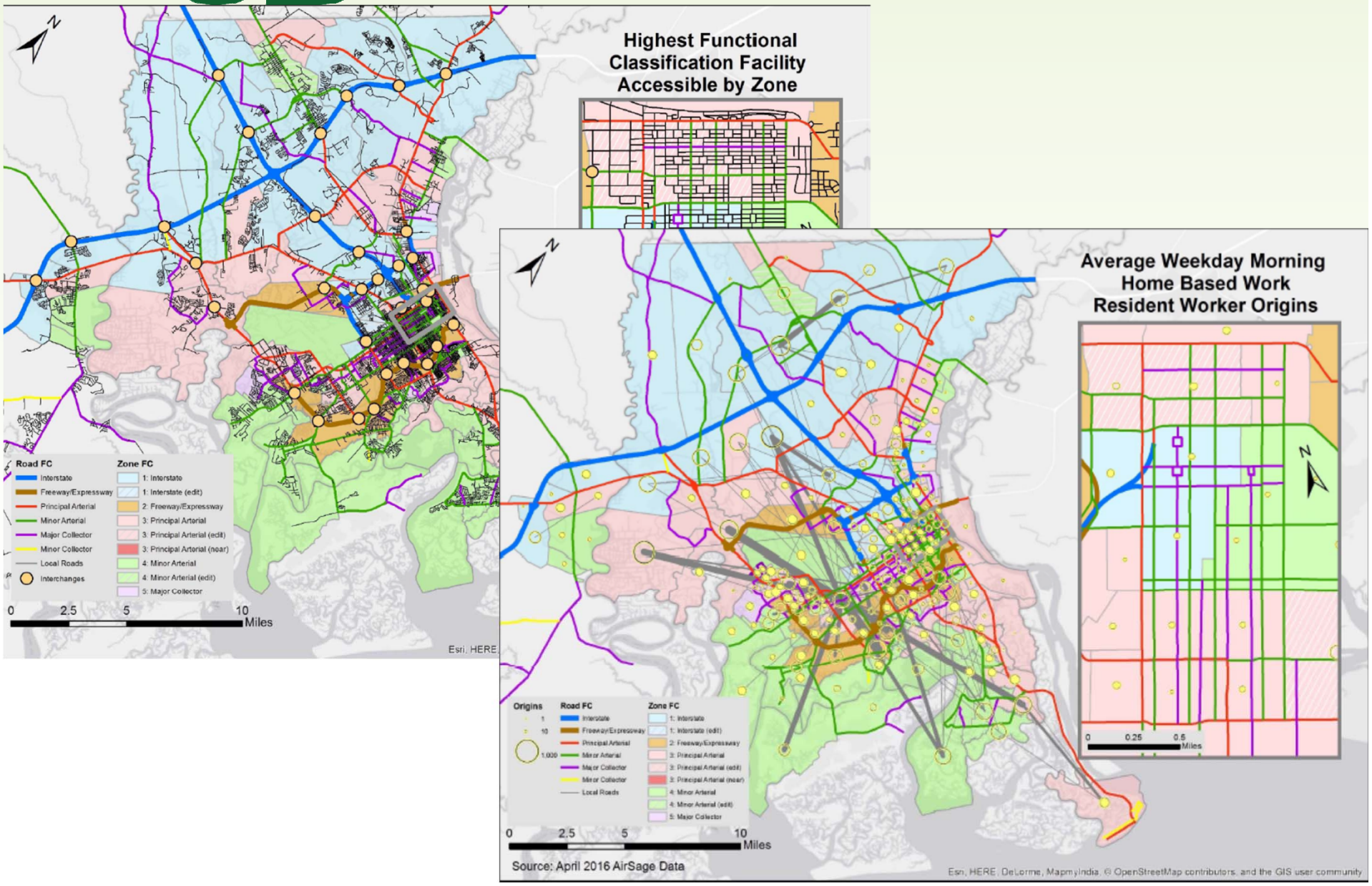
Functional Class by Zone



ORIGIN & DESTINATION

Strategies

Road	Description: Congestion issues and Ongoing Projects	CMP Actions/Projects	Time Frame for Action
SR 21 Between I-95 and I-516	GDOT opened the diverging diamond at SR 21/I-95 (PI# 0012722).	Continue to monitor this segment and revisit after data has been collected after the project completion. CORE MPO completed a corridor study of this segment in 2013.	Project completed but data will be captured in next CMP
	2040 MTP has I-95 at SR 21 / Augusta Rd Interchange Reconstruction in Cost Band Three.	2040 MTP has I-95 at SR 21 / Augusta Rd Interchange Reconstruction in Cost Band Three.	Long Range: MTP cost band 3
	Effingham Parkway and Benton Boulevard projects are expected to relieve some traffic off SR 21.	Continue to monitor this segment and revisit after data has been collected after the project completion.	Project underway: Design and Engineering Phase
	Completion of Jimmy DeLoach Parkway Extension from US 80 to I-16 (Phase 2) and Interchange at Jimmy DeLoach/US 80 will most likely relieve some of the truck traffic on SR 21.	Study after projects are completed in next CMP.	Right of way and utilities certified. Construction expected in FY 2018.
	The Savannah International Multi-Modal Connector is expected to increase the Port's rail capacity on site and allow for the railroad companies to provide faster and more frequent service. The rail efficiently will reduce rail/highway conflicts on SR 21 and SR 307, thus has the potential to reduce congestion on these roadways.	Study after project is completed.	Total completion of the Multi-Modal Connector is projected for 2021.
	Park and Ride lots at SR 21/I-95 and at SR 21 South of Rincon have potential to reduce congestion on SR 21, I-95 and I-16.	Identified in the Park and Ride lot study	Long range
	GDOT is working on SR 25 Connector between I-516 to the Bay Street Viaduct (PI# 0002923), whose completion might help congestion relief on the I-516 side of this SR 21 segment.	Study after project is completed.	Project under construction
	The SR 21 through Port Wentworth congested in the AM and PM. The diverging diamond at Exit 109 has helped reduce travel time. Truck traffic is not using the Jimmy Deloach extension as originally anticipated and has had no significant impact of diverting trucks off SR 21 or SR 25. The completion of Grange Road widening between SR 21 and SR 25 and Brampton Road Connector between SR 21/SR 25 to SR 21 Spur may offer relief.	Grange Road widening between SR 21 to East of SR 25 (MTP project PI 0007885 and identified in the freight plan) will access a new gate at GPA, and encourage greater utilization of JDL extension. Brampton Road Connector will facilitate better port access as well.	Grange Road Widening is under construction. Brampton Road Connector right-of-way acquisition is ongoing. Monitor in future CMP update.

LESSONS LEARNED

Lessons Learned

- We have BIG DATA, now what?
  - Data quality control
  - Readiness
  - Storage
  - Training
  - Local data sets to pair it with
  - Staff, timing, resources
    - Consultant support

NEXT STEPS

Next Steps

- We have BIG DATA, now what?
  - Resource to inform the decision makers
  - CAT applying the results to the Transit Development Plan Update
  - MPO applying it to the Long Range Plan and future CMP updates

Questions?

RS&H