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
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
Defining Big Data

Wireless Network Operators
- Signaling Data
- AirSat Wireless Signal Extraction (WiSE) Technology Platform
- Anonymizing
- Firewall

AirSat WiSE Analytical Platform
- Location + Patterns Intelligence
- Equity Research
- Insurance Analytics
- Real Estate site Selection
- Transportation Planning
- Emergency Management
- Tourism Studies
- Out-of-Network Media
- Target Marketing

Table:

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<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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CORE
- Coastal Region MPO

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

*Counties selected based on census commute data.*
Data Procurement

- AirSage data purchase driven by the following criteria:

<table>
<thead>
<tr>
<th>Option 1: Base Data Set</th>
<th>Option 2: Premium Data Set</th>
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</thead>
<tbody>
<tr>
<td>• 1 month sample</td>
<td>• 1 month sample</td>
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<tr>
<td>• Average weekdays (T-Th)</td>
<td>• Average weekdays (T-Th)</td>
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<tr>
<td>• AM Peak, Mid-day, PM Peak, 24 hour total</td>
<td>• AM Peak, Mid-day, PM Peak, 24 hour total</td>
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<tr>
<td>• 3-class trip purposes: HBW, HBO, OBO</td>
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</tr>
<tr>
<td>• 2 Resident Classes: Visitors and Residents</td>
<td>• 6 Resident Classes: Res Worker, Home Worker, In-Commuter, Out-Commuter, Short-Term Vis, Lg-Term Vis)</td>
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</table>

390 Zones

230 Zones
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

- AirSage travel patterns
- Census household/employment data
- CAT ridership data – stop & route level
- CORE Data Source 1
- CORE Data Source 2

Travel Patterns

- CAT Origin Destination Analysis
- CORE Congestion Management Process

NPMRDS

Georgia Department of Transportation
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.
Travel Time and Type of Traveler:
• Morning (7:00 AM – 10:00 AM)
• “Home” Based “Work”
• “Resident Worker”

Dataset: April 2016
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
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
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
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).
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
External Trip Makers
Functional Class by Zone

Source: April 2016 AirSage Data
### Strategies

<table>
<thead>
<tr>
<th>Road</th>
<th>Description: Congestion issues and Ongoing Projects</th>
<th>CMP Actions/Projects</th>
<th>Time Frame for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR 21 Between I-95 and I-516</strong></td>
<td>GDOT opened the diverging diamond at SR 21/I-95 (PH# 0012722).</td>
<td>Continue to monitor this segment and revisit after data has been collected after the project completion.</td>
<td>Project completed but data will be captured in next CMP</td>
</tr>
<tr>
<td></td>
<td>2040 MTP has I-95 at SR 21 / Augusta Rd Interchange Reconstruction in Cost Band Three.</td>
<td>2040 MTP has I-95 at SR 21 / Augusta Rd Interchange Reconstruction in Cost Band Three.</td>
<td>Long Range: MTP cost band 3</td>
</tr>
<tr>
<td></td>
<td>Effingham Parkway and Benton Boulevard projects are expected to relieve some traffic off SR 21.</td>
<td>Continue to monitor this segment and revisit after data has been collected after the project completion.</td>
<td>Project underway: Design and Engineering Phase</td>
</tr>
<tr>
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<td>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.</td>
<td>Study after projects are completed in next CMP.</td>
<td>Right of way and utilities certified. Construction expected in FY 2018.</td>
</tr>
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<td>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.</td>
<td>Study after project is completed.</td>
<td>Total completion of the Multi-Modal Connector is projected for 2021.</td>
</tr>
<tr>
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<td>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.</td>
<td>Identified in the Park and Ride lot study</td>
<td>Long range</td>
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<td>GDOT is working on SR 25 Connector between I-516 to the Bay Street Viaduct (PH# 0002923), whose completion might help congestion relief on the I-516 side of this SR 21 segment.</td>
<td>Study after project is completed.</td>
<td>Project under construction</td>
</tr>
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<td>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.</td>
<td>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.</td>
<td>Grange Road Widening is under construction. Brampton Road Connector right-of-way acquisition is ongoing. Monitor in future CMP update.</td>
</tr>
</tbody>
</table>
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
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?