

# How Big Data Helped Atlanta during the I-85 Bridge Collapse



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AMPO Annual Conference  
Response, Recovery & Resiliency  
by

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# Introduction & Context

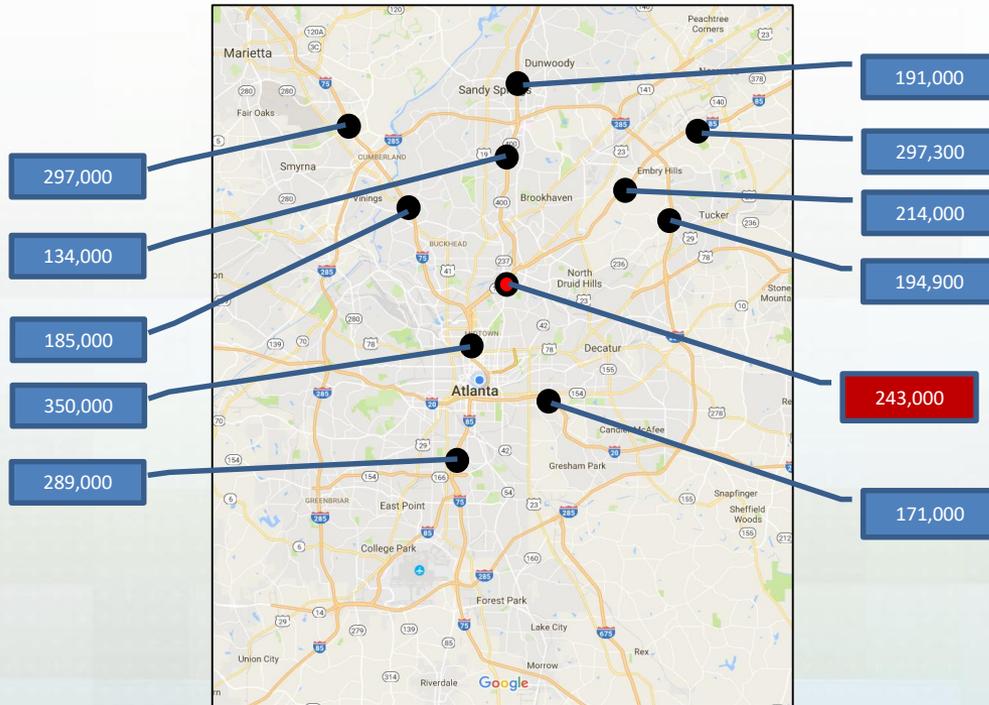
- March 30: Fire underneath I-85 caused the bridge to collapse and altered the commutes for hundreds of thousands of commuters.
- Around 243,000 trips go through the impacted area each weekday.
- Eastern half of the I-285 perimeter impacted the most, but travel was impacted all throughout the region, with a minimum of 30% increase in volumes across network.
- Many MARTA stations, especially those in the northern part of the region, have experienced large increases in ridership after the bridge collapse.
- 75% of the businesses in the area have experienced a loss of customers due to the collapse.
- Bridge reopened on May 15, 6 weeks later ...



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# Historic Traffic Counts

- Around 243,000 trips travel through the affected area daily



Source: Georgia DOT Traffic Counts  
2015 Average Annual Daily Traffic (AADT)  
<http://geocounts.com/gdot/>



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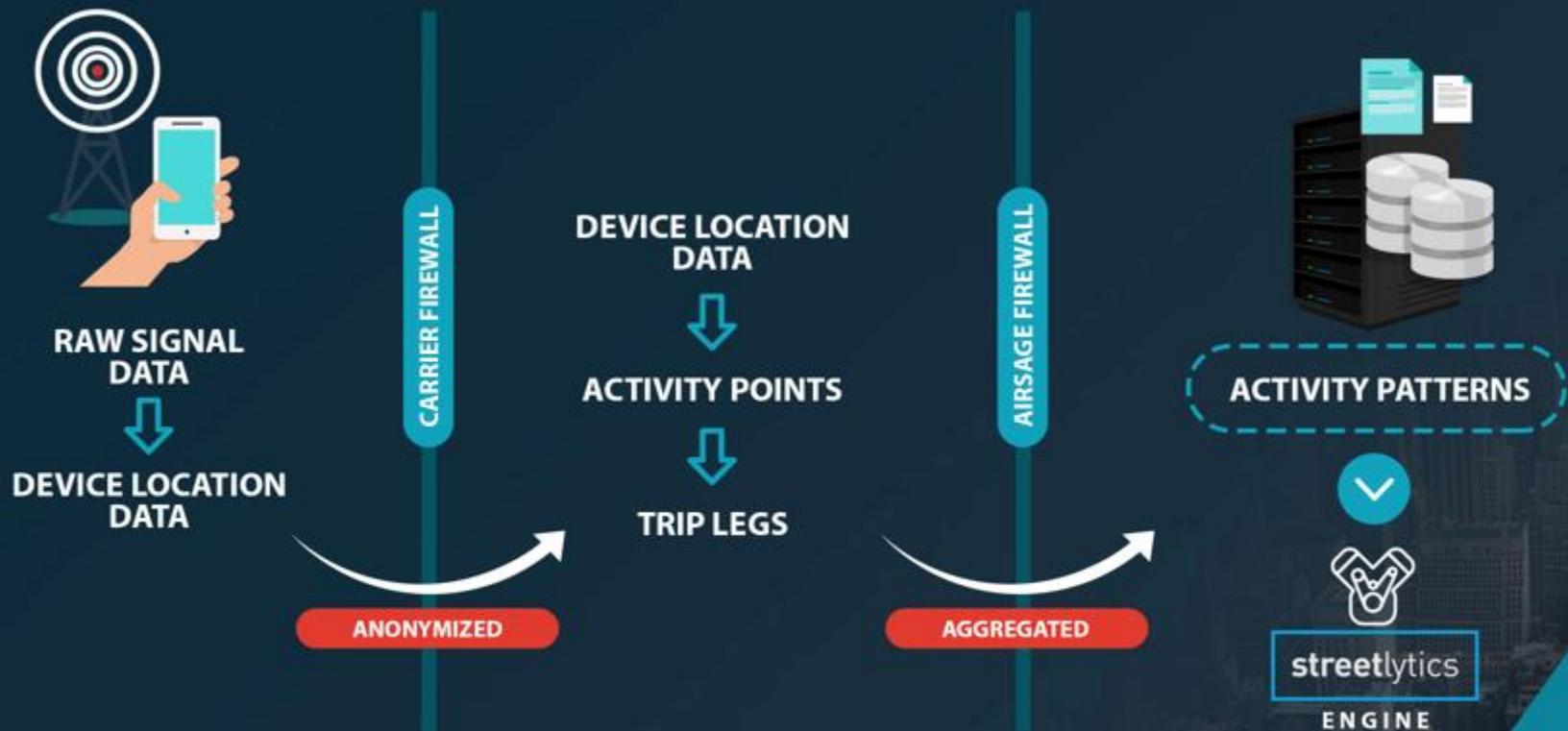
How to Leverage the Strength of All Available Data

# HOW BIG DATA CAN HELP



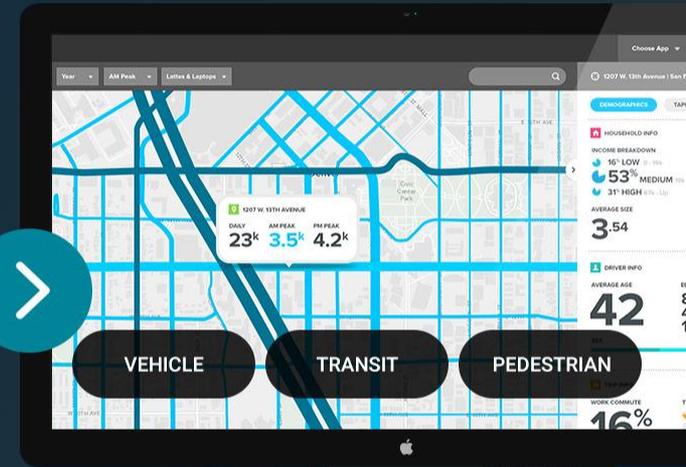
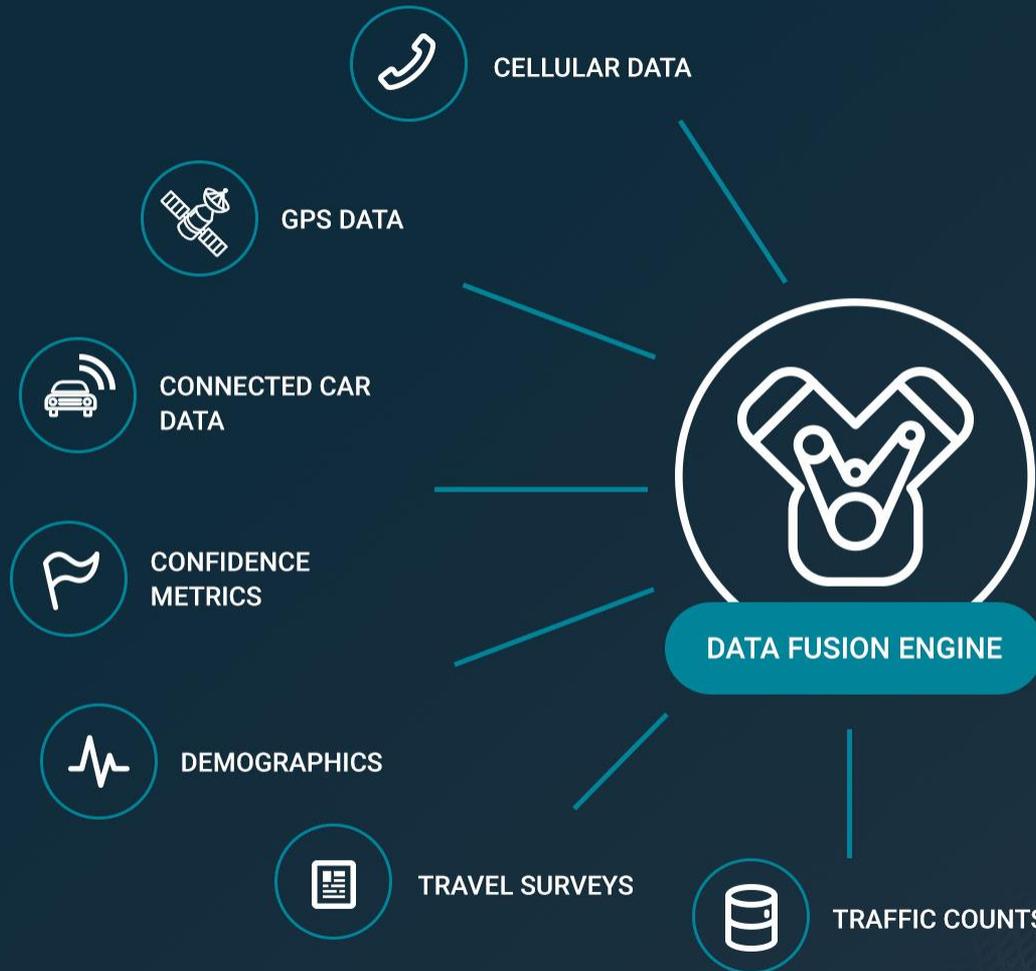
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# Mobile Location Contribution to Streetlytics Fusion Engine



# Streetlytics Process

From Data to Insights



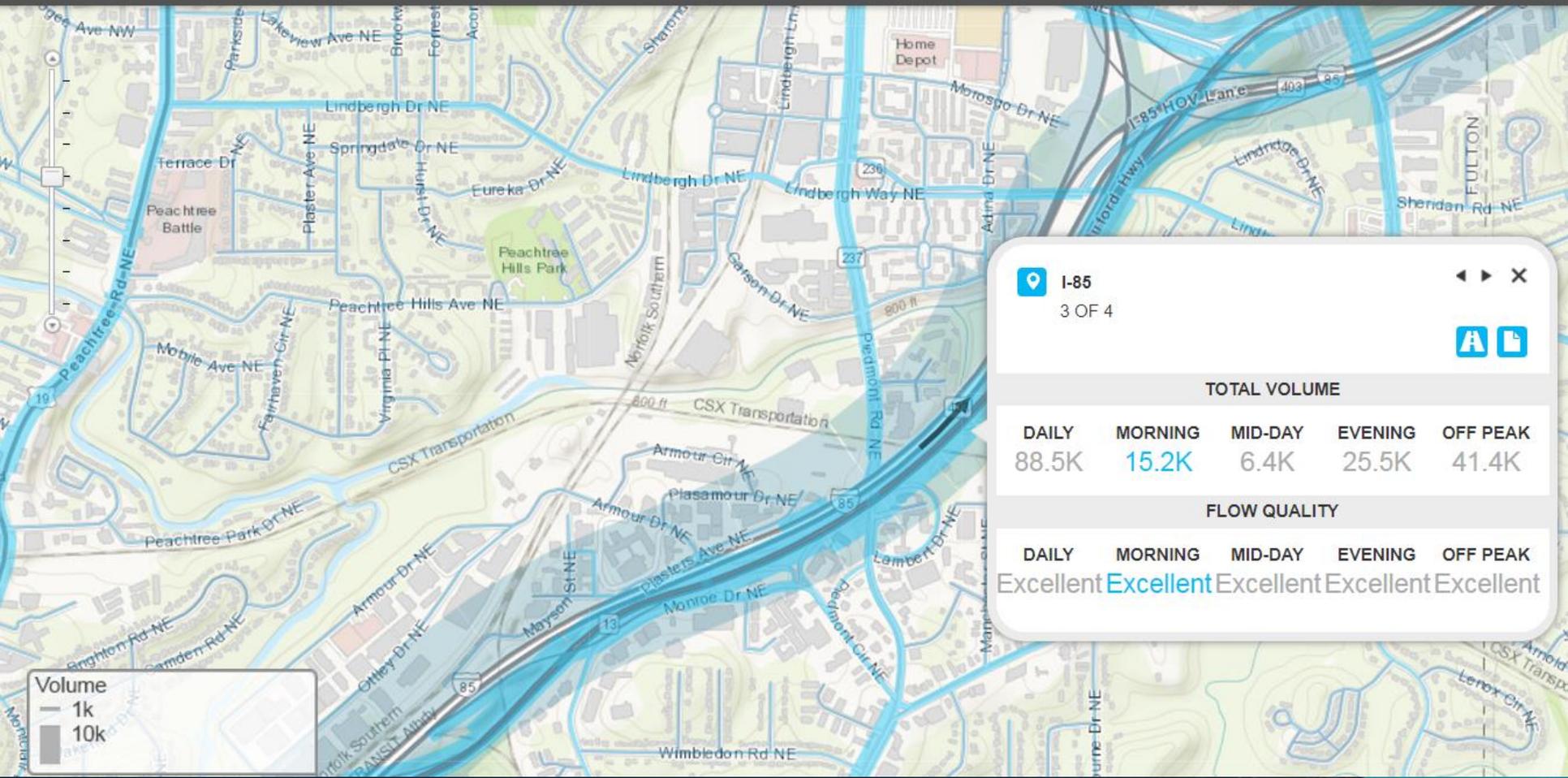
# What Can We Understand

# Vehicular Volumes

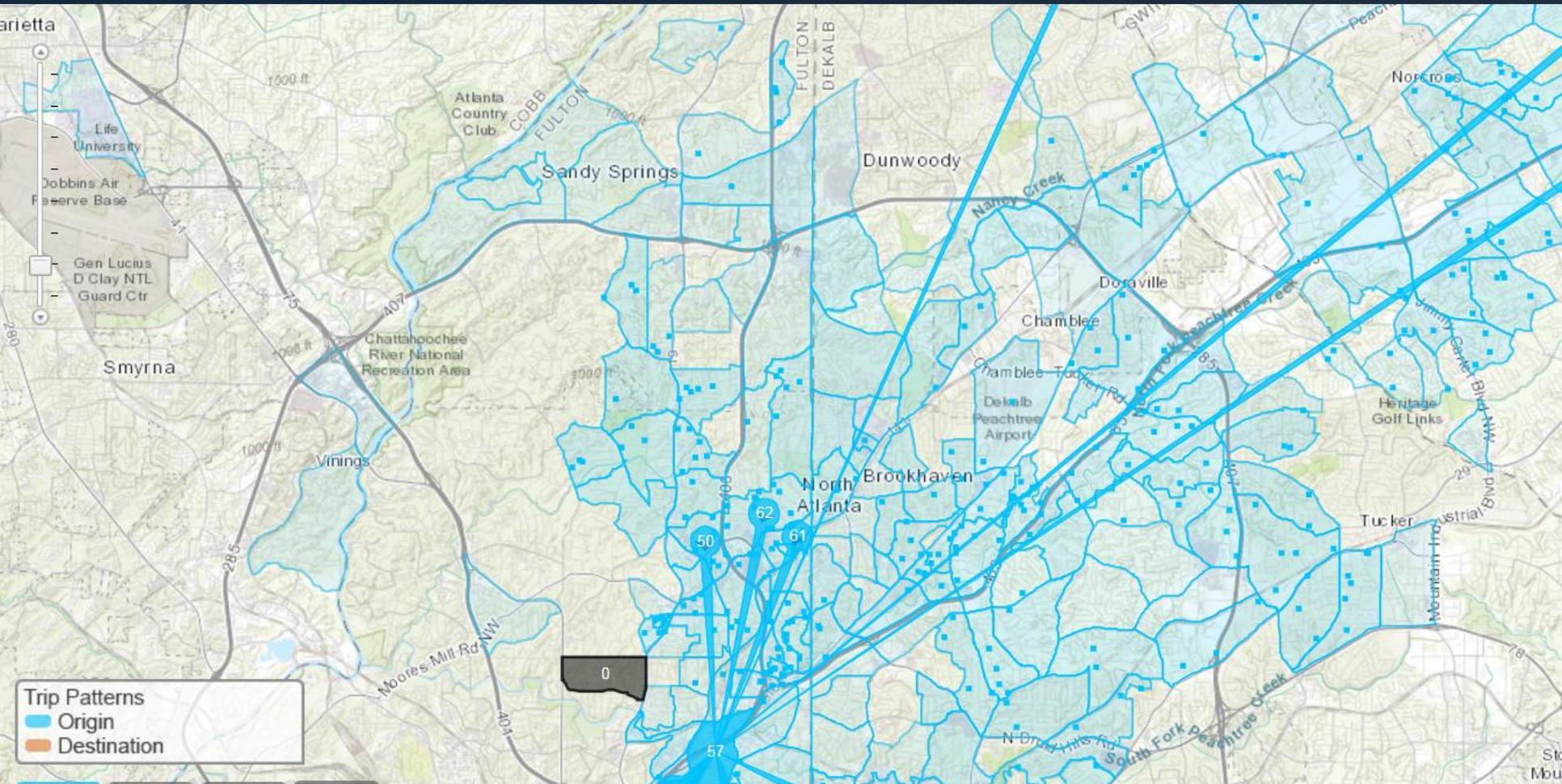
Trip Volumes ▾

Atlanta Region ▾

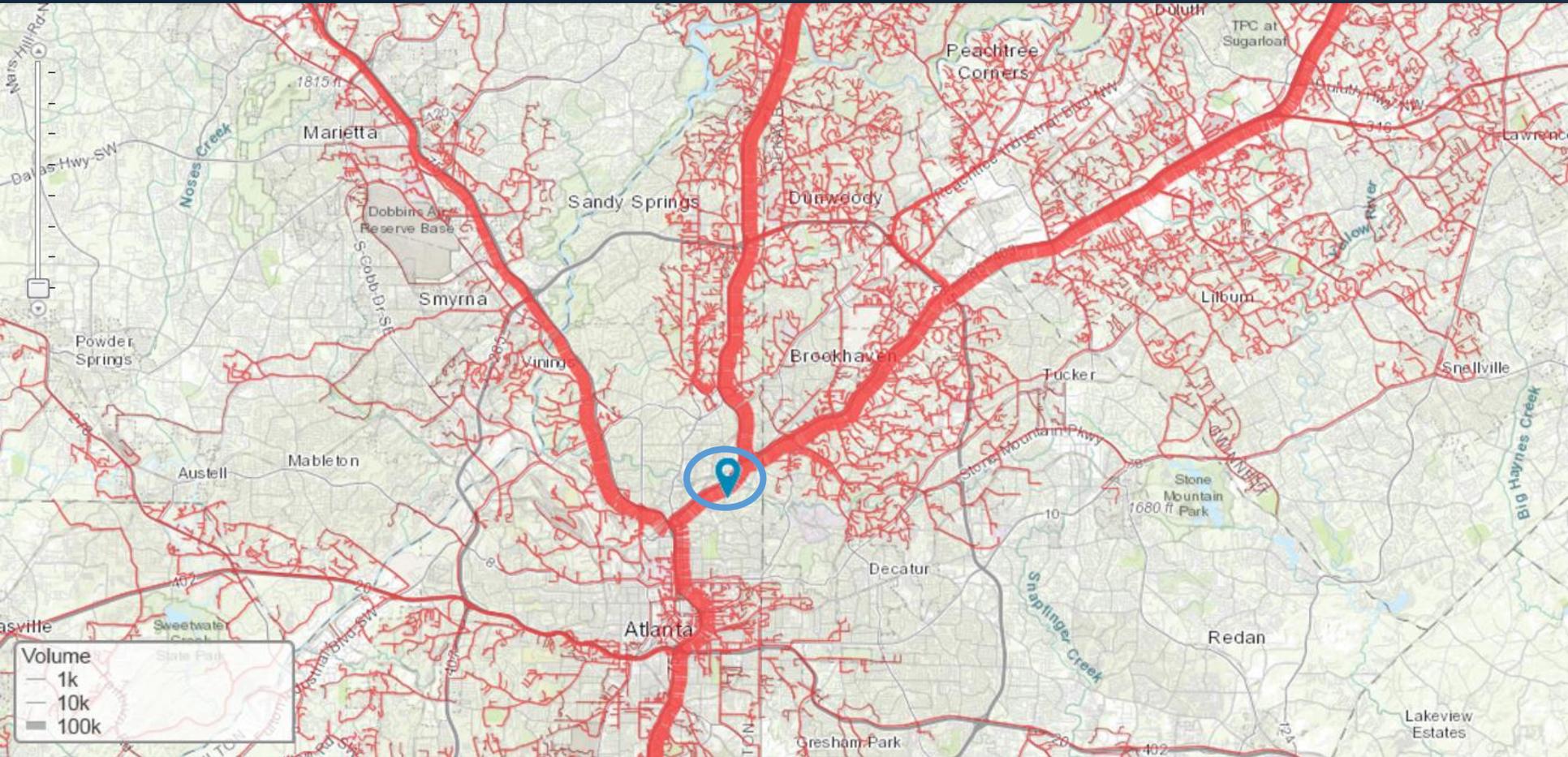
Morning Volume ▾



# Trip Patterns

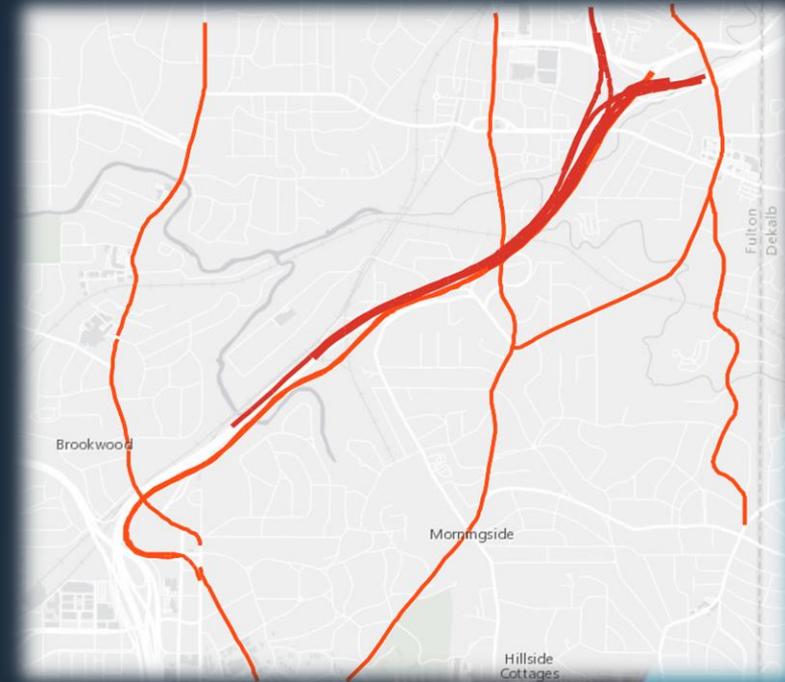


# Select Link Analysis



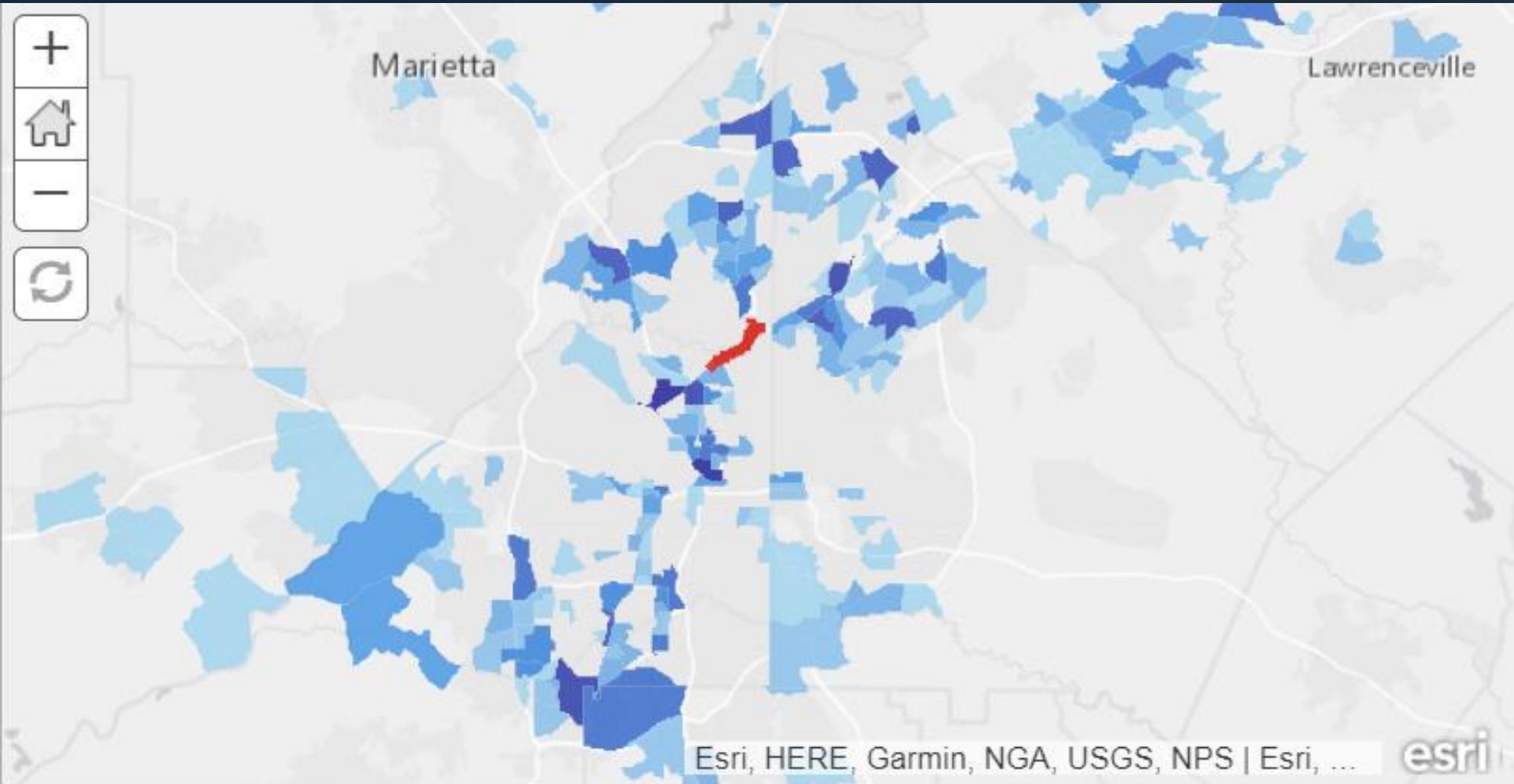
# What Do We Want to Know

- What are the vehicular volumes and trip patterns throughout the day
  - AM Peak vs. PM Peak travel
- What are the vehicular volumes and trip patterns of adjacent roadways
- ArcGIS Online Story Map created to demonstrate impact

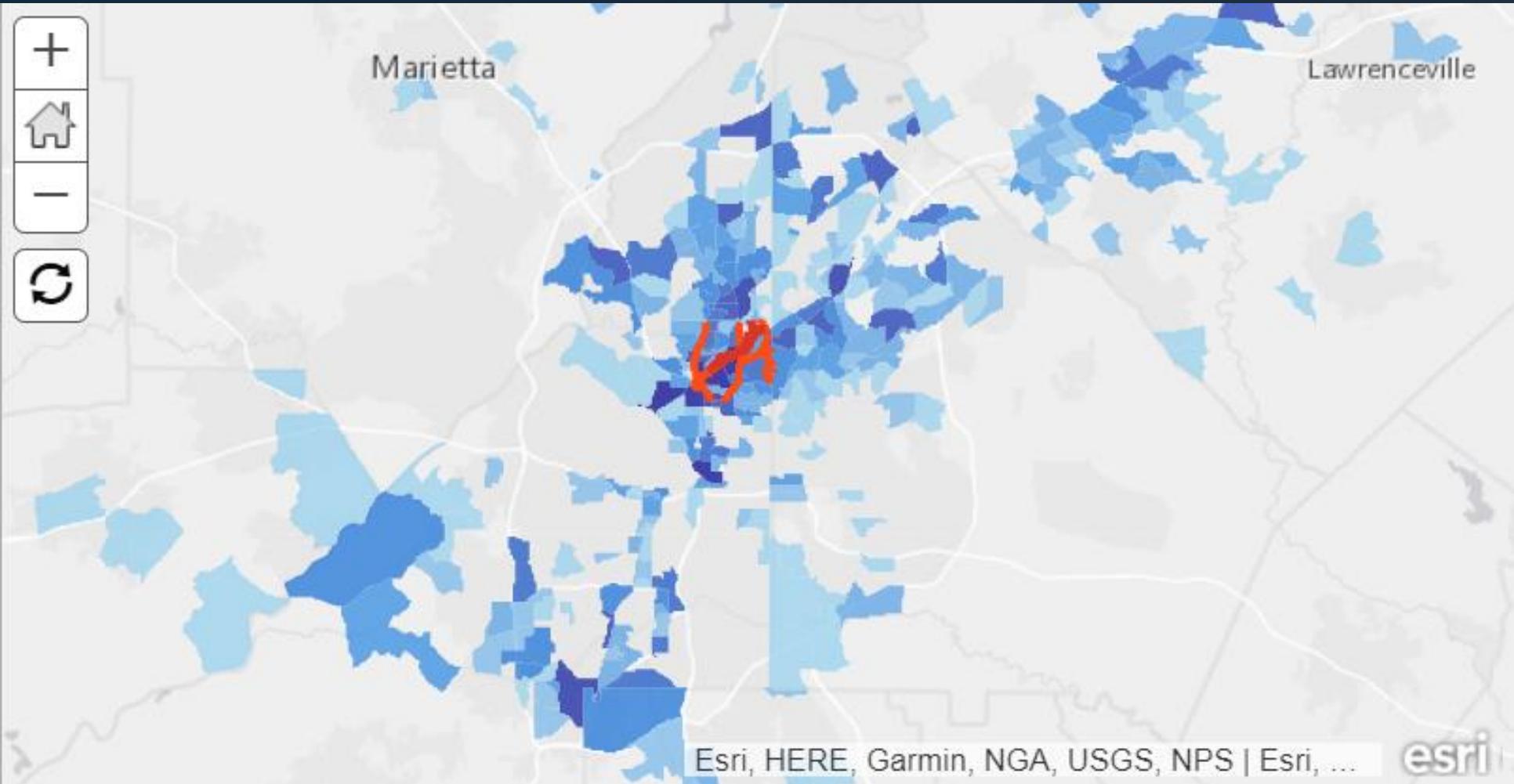


<http://arcg.is/0LC1mW>

# AM Trip Destinations



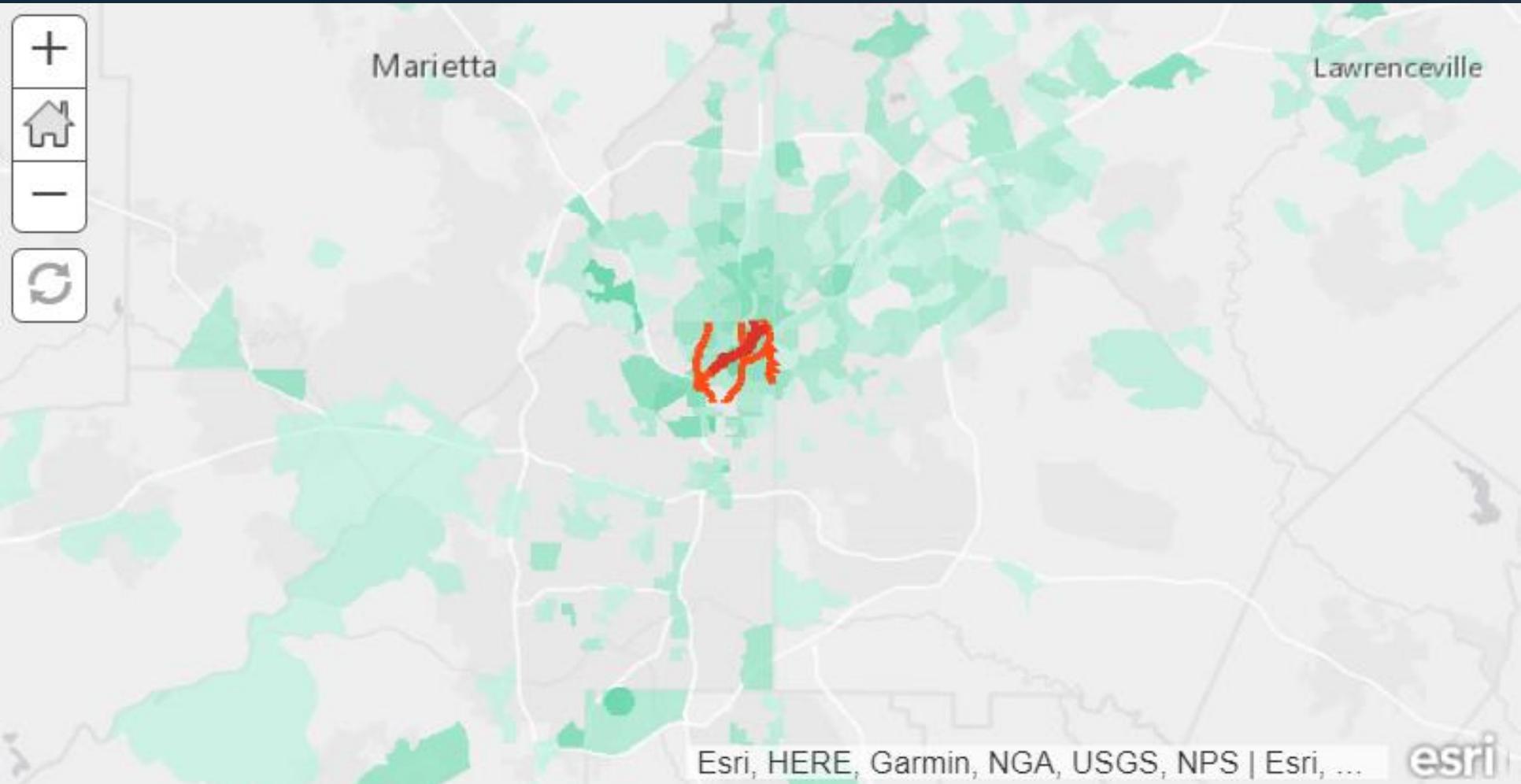
# AM Trip Destinations



# AM Trip Origins

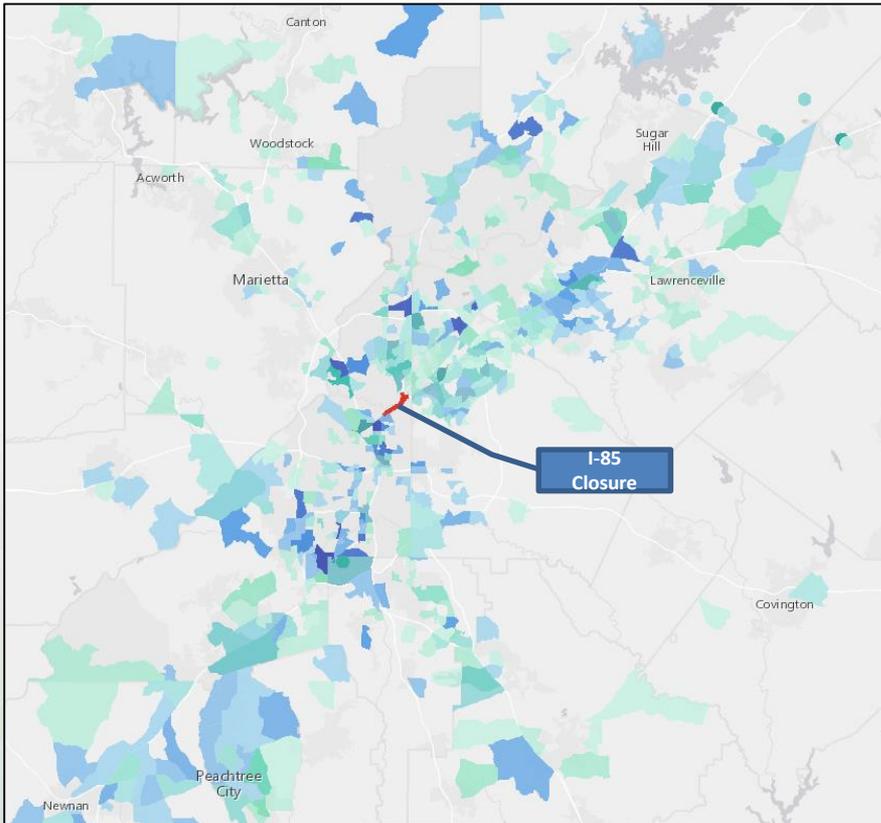


# AM Trip Origins



# Who travels on I-85?

- The affected area on I-85 is a critical link in the transportation network
- In the morning travel period, trips routinely flow from as far south as Newnan and from as far north as Cumming



## Trip Origins



## Trip Destinations



**Green** = trip origins  
**Blue** = trip destinations

Source: Citilabs Analysis for ARC using Streetlytics  
<https://www.streetlytics.com/>



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# The Impact: Traffic Congestion

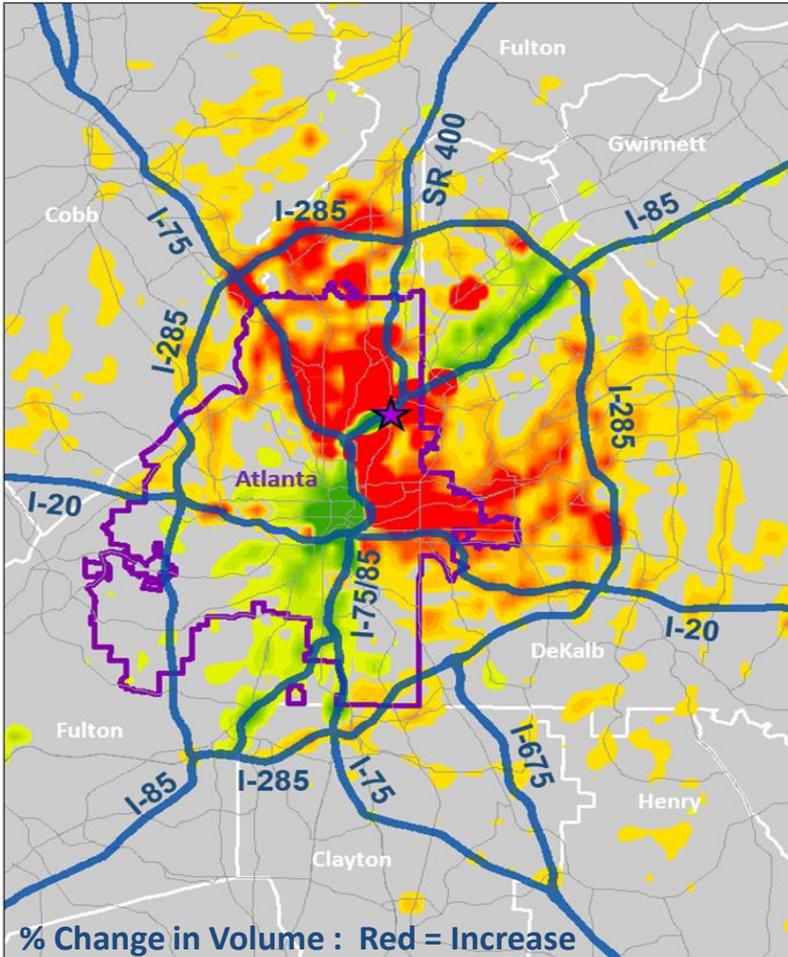
## AM Peak Period Traffic Congestion

- System-Wide Impacts

- Minimum of 30% increases in volume throughout network; some areas 50%

- Congestion on Arterials
- Congestion in Unexpected Places
- Slower Travel Speeds

- “Peak Spreading”: Starting Earlier & Ending Later



Source: ARC Activity Based Travel Model, Network 2015  
Model Simulation Parameters: I-85 Closure, Piedmont partially open with operational restrictions  
Time Period: AM Peak (6-10 AM)  
<http://www.atlantaregional.com/transportation/modeling>



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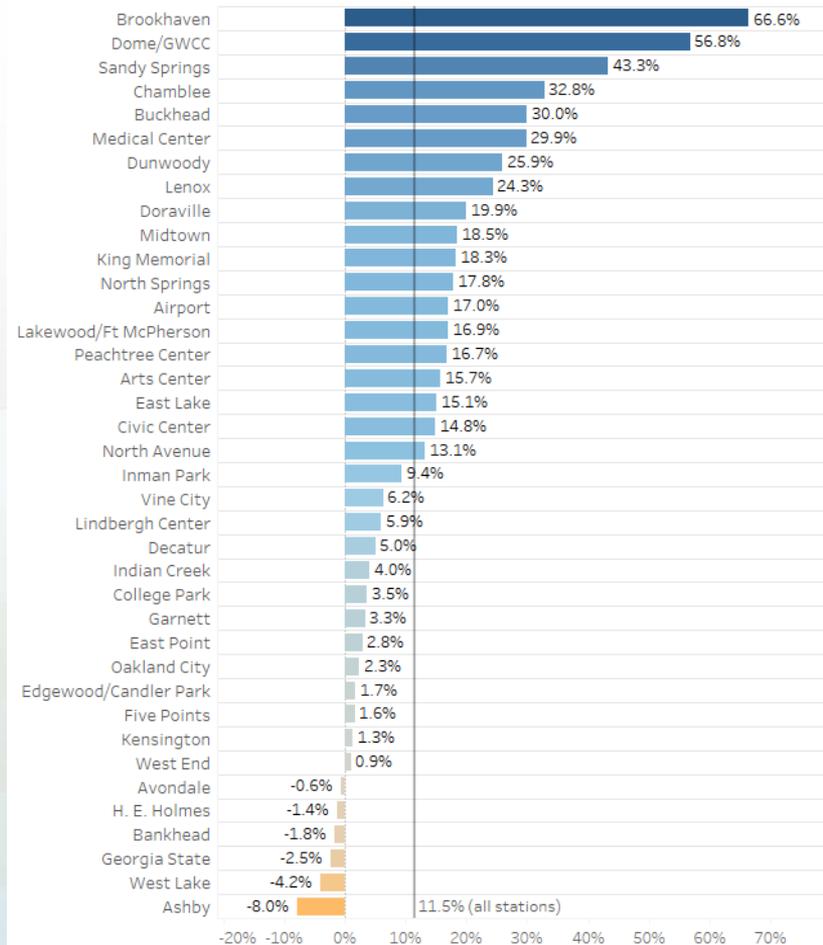
# Transit Usage

This chart uses MARTA ridership data to show the change in average weekday ridership by rail station before and after the I-85 bridge collapse.

- The chart compares the average number of riders boarding stations on weekdays during March 31 – April 29 (after the collapse) to the average number of riders during weekdays March 24 – 31 (before the collapse).
- The MARTA stations in **blue** had the greatest % increase in ridership. Many of the northern stations experienced large increases, such as the Brookhaven station which had a 67% increase in ridership.

Source: MARTA ridership data

MARTA average weekday ridership changes before/after I-85 bridge collapse \*



\*Weekday average ridership during March 24 - 31 compared to March 31 - April 29



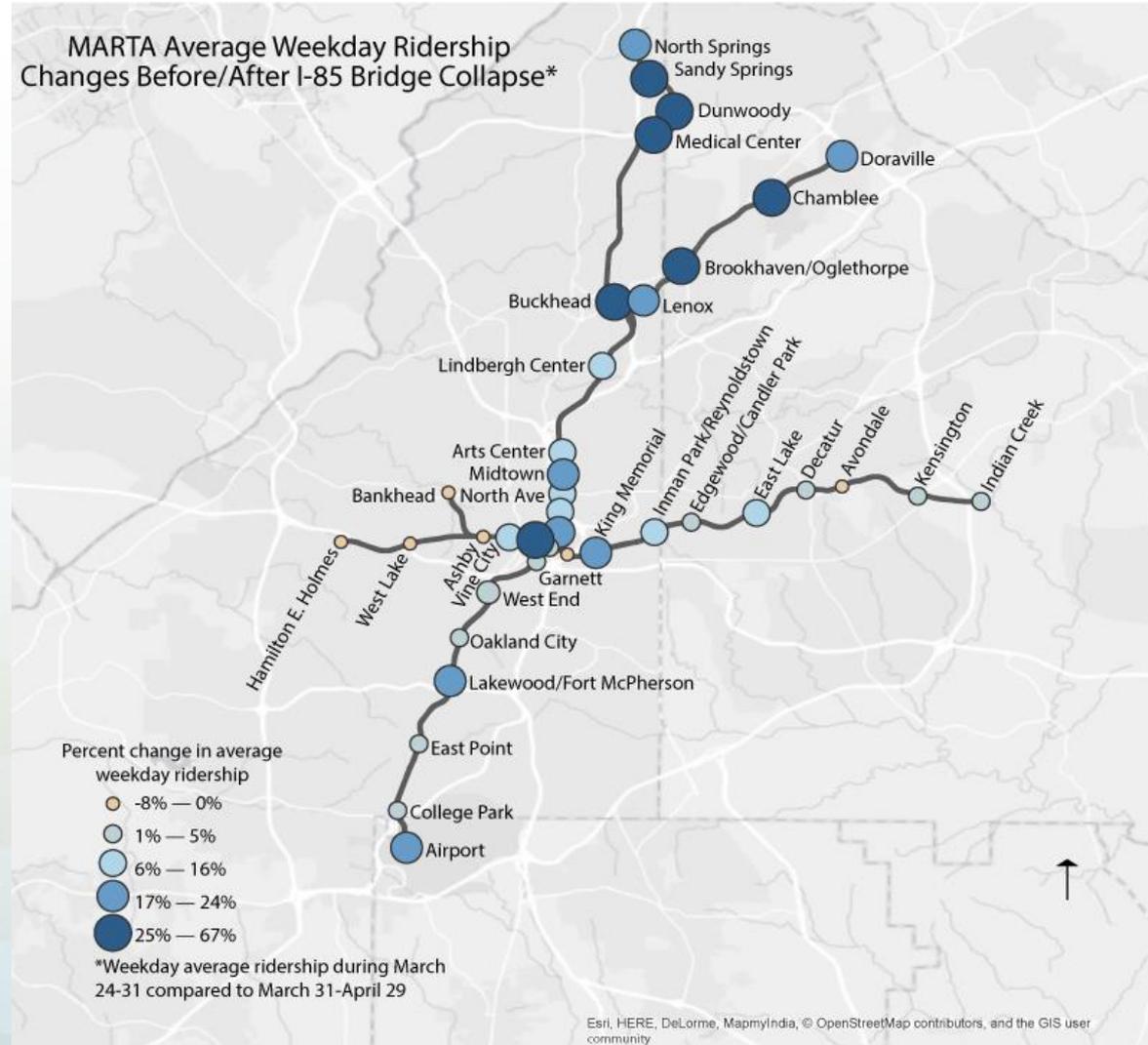
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# Transit Usage

This map uses the same MARTA ridership data to show the change in average weekday ridership by station.

- The circles are symbolized by the % values shown in the previous chart.
- The MARTA stations symbolized by large **blue** circles had the greatest % increase in ridership. Many of the northern stations experienced large increases.

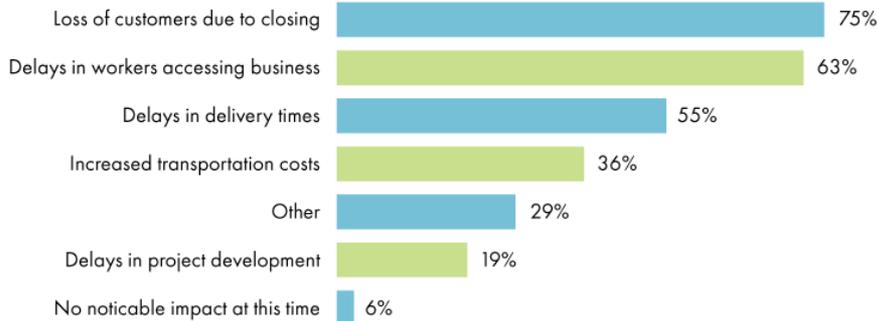
Source: MARTA ridership data



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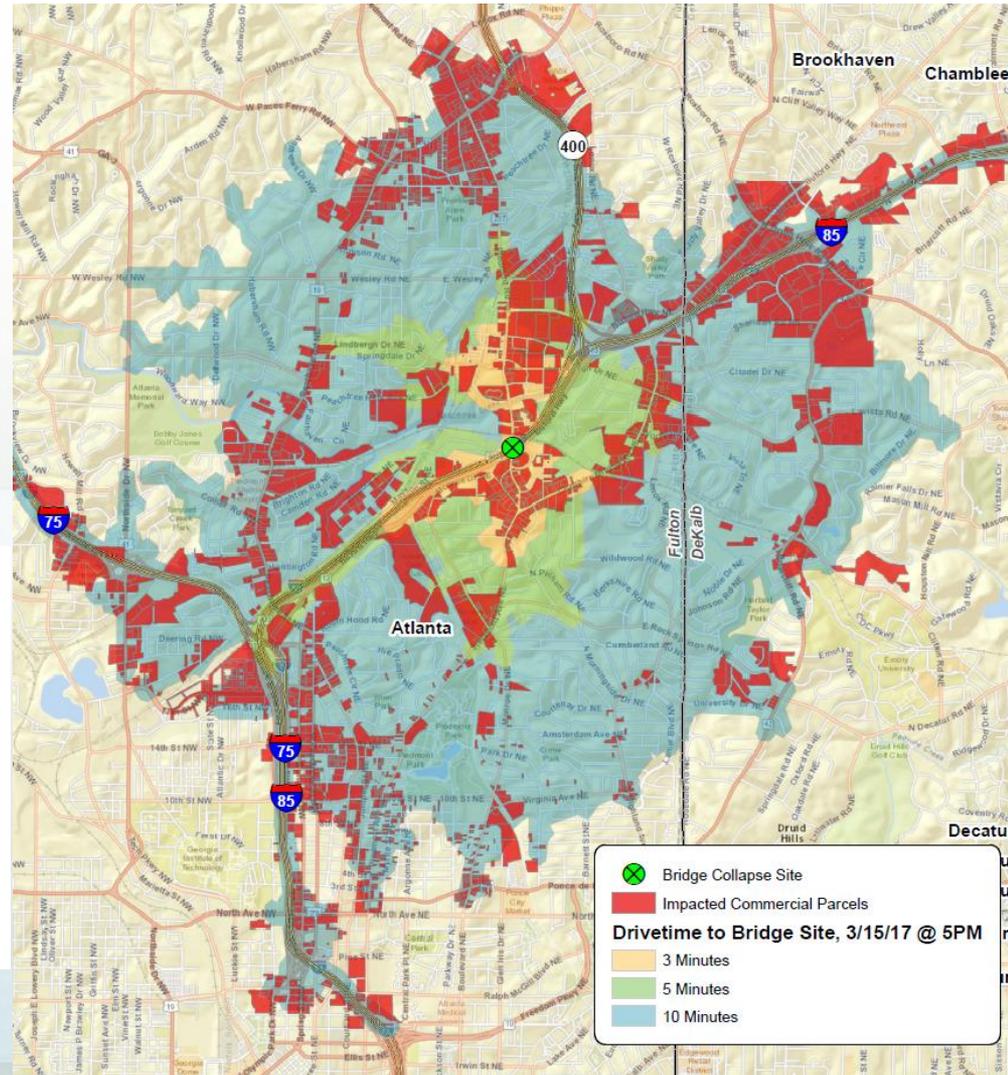
# Business / Economic Impact

- The red on the map shows commercial parcels within 3, 5, and 10 minutes drive to the site of the bridge collapse under normal conditions
- The Invest Atlanta “I-85 Business Impact Survey” found that 75% of impacted businesses in the area had experienced a loss of customers due to the I-85 closure.



Data as of May 2, 2017

Source: ARC analysis, Fulton County parcels; [Invest Atlanta](#)



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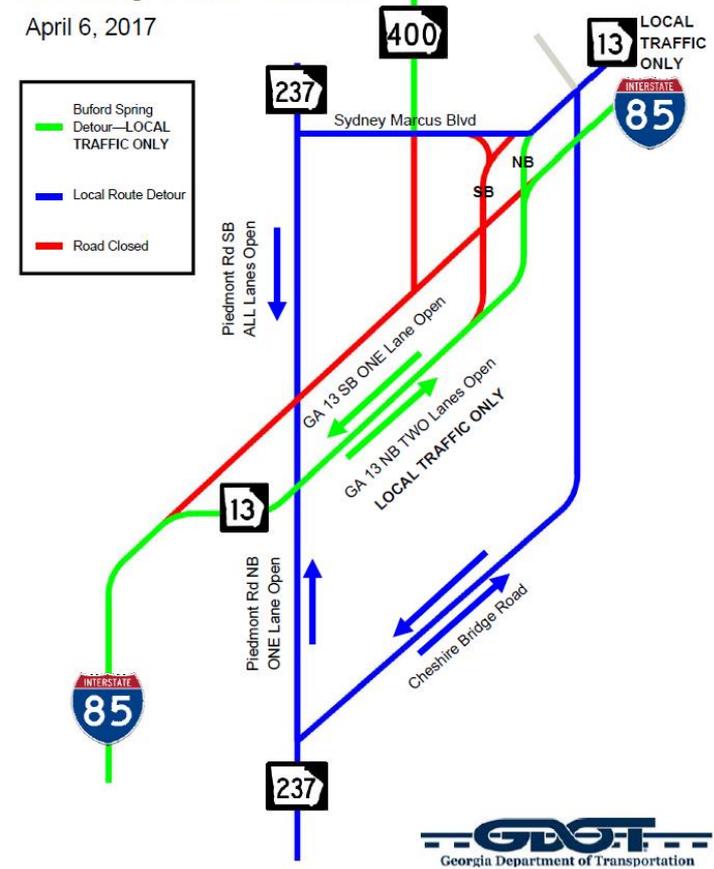
# Examples of Responses

- Detours, Reroutes & Closures in place
  - Alter Signal Timing
  - Increase Capacity Substantially on Arterials
- Local governments adding police to intersections to ensure that people “Don’t Block the Box”  

- City of Atlanta suspending all non-essential roadwork
- Transit systems have implemented route adjustments to avoid the I-85 closure
- MARTA has increased headways on rail system during peak travel periods and added nearly 1,200 new parking spaces
- Gwinnett County and GRTA added routes from park and ride lots to MARTA’s Chamblee and Doraville stations

## I-85 Bridge Closure Detours

April 6, 2017



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# Conclusion & Lessons Learned

- Invest in “Big Data” & Traffic Models
- Work with Planning Partners & Stakeholders
- Analyze Effective Connections between Specific Origin-Destination Pairs
- Freight Planning & Distribution Logistics
- Develop a Resiliency Framework:
  - Network Redundancy
  - Travel Alternative Diversity
  - Network Spare Residual Capacity



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