

# ATLANTA REGIONAL TRUCK PARKING ASSESSMENT STUDY



## APPENDICES



March 2018



## **Appendix 2-A**

### **Stakeholder Engagement Plan**



# ATLANTA REGIONAL TRUCK PARKING ASSESSMENT STUDY

## Stakeholder Engagement Plan



June 2017

## Purpose

This Stakeholder Engagement Plan outlines the ways in which the Atlanta Regional Commission (ARC) Atlanta Regional Truck Parking Assessment Study (Truck Parking Study) project team will engage and communicate with the identified Stakeholder Group over the course of the project. The stakeholder group will provide consultation to the project team to achieve the following outcomes:

- Better data gathering and planning results through stakeholder engagement
- A plan for affordable, accessible, and efficient parking locations through collaboration and partnering

The framework sets out a strategic approach to stakeholder engagement that includes:

- Project Background
- Key Stakeholders
- Principles to guide the engagement approach
- Details of Stakeholder Consultation
- Stakeholder identification

Stakeholder involvement is a key element in the Truck Parking Study because of the various layers of information regarding truck parking availability. With both publicly and privately held spaces, information from stakeholders with direct knowledge of the facilities will form the framework of the study.

## PROJECT BACKGROUND

The Federal Highway Administration (FHWA) has identified truck parking shortages as a national safety concern. An inadequate supply of truck parking spaces can result primarily in two negative consequences. First, tired truck drivers may continue to drive because they have difficulty finding a place to park for rest. Second, truck drivers may choose to park at unsafe locations such as on the shoulder of the road, exit ramps, or vacant lots, if they are unable to locate a suitable parking location.

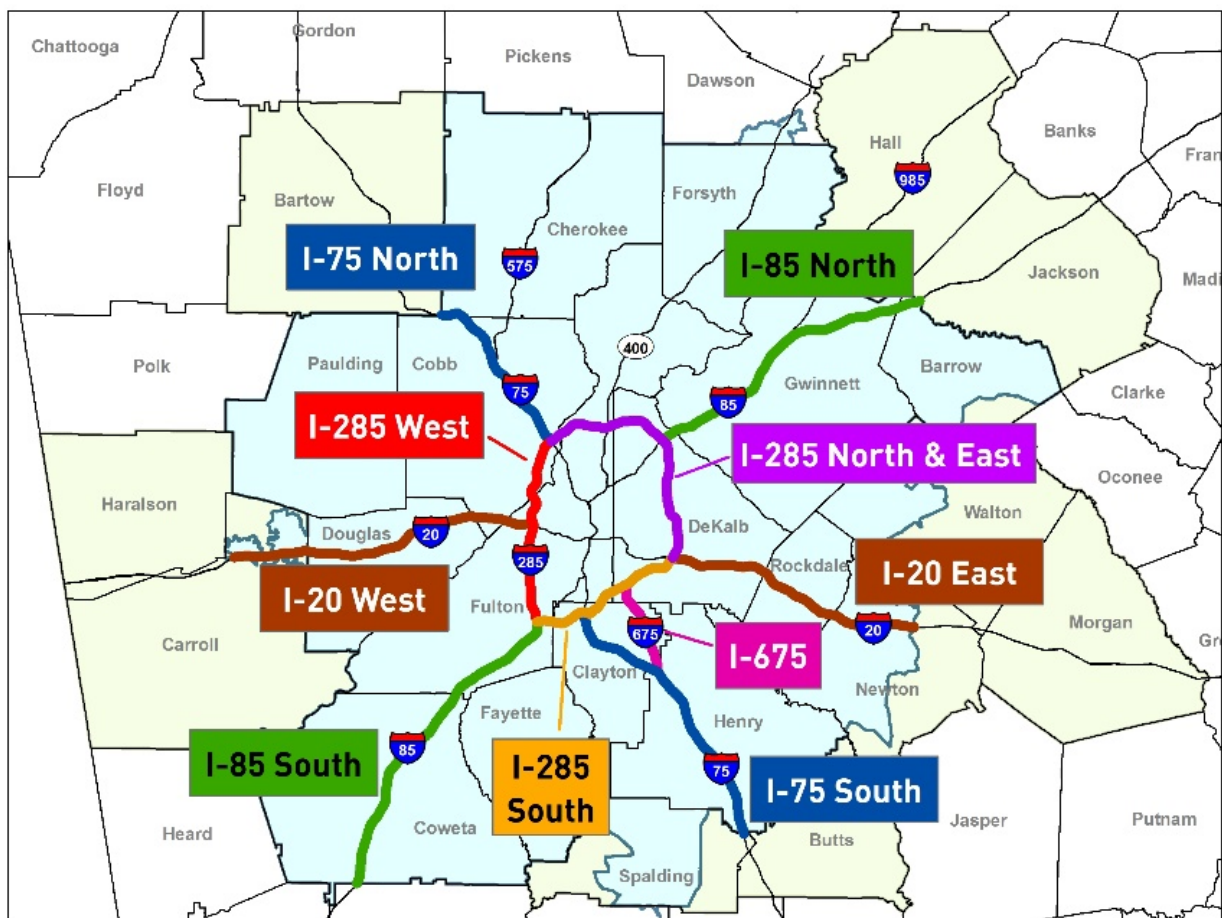
The *2016 Atlanta Regional Freight Mobility Plan Update* identified inadequate truck parking as an issue for the Atlanta Region. Elected leaders, transportation staff, and other stakeholders in the Atlanta Region said that they encountered trucks parked in unofficial, unsafe locations in their communities. These truck drivers may be seeking overnight parking due to hours-of-service regulations or may be seeking locations for short-term parking prior to their scheduled pickup/delivery appointment. The freight plan update projects that total freight movement in the Atlanta Region will grow by 76% between 2013 and 2040. Traffic congestion is also expected to grow by 2040, slowing truck movements in the Atlanta Region. Additionally, a rule adopted by the FMCSA in 2015 will require all truck drivers to use electronic logging devices (ELDs) by the end of 2017. The usage of ELDs may result in an increased demand for truck parking.

With the introduction of ELDs to the trucking industry, a 76% increase in freight movement by 2040 in the Atlanta Region, and growing traffic congestion, the need for truck parking is also expected to grow significantly. The purpose of the Atlanta Regional Truck Parking Assessment Study is to assess the current and future needs for truck parking in the Atlanta Region and identify ways to potentially address these needs. Data-driven analysis, federal regulations, national research, and input from the private and public sector stakeholders will guide the plan's assessment and recommendations.

This project will focus on the 20-county ARC area. For data and discussion purposes the major corridors will be aggregated as follows, as shown on Figure 1:

- I-75 south of I-20
- I-85 south of I-20
- I-20 west of I-75/85
- I-20 east of I-75/85
- I-75 north of I-20
- I-85 north of I-20
- I-285 south
- I-285 north
- I-285 east
- I-285 west

*Figure 1 – Truck Parking Assessment Study Corridors*



The Stakeholder Engagement Plan details the ways in which input from the private and public stakeholders will be gathered.

## KEY STAKEHOLDERS

The key stakeholders in this project consist of the ARC's planning partners, private industry, and law enforcement. The project team is utilizing the existing Freight Advisory Task Force (FATF) as the technical advisory committee. The additional stakeholders that will be asked to participate in the project include:

- ARC's Transportation Coordinating Committee (TCC)
- ARC's Transportation & Air Quality Committee (TAQC)
- ARC's Land Use Coordinating Committee (LUCC)
- Trucking Associations
- Enforcement Officials
- Truck Stop Operators
- Truckers

## PRINCIPLES FOR ENGAGEMENT

The project team has adopted five key principles to guide stakeholder engagement activities. The principles set the standards to which we aspire in building consistent, open, and respectful working relationships.

*Purposeful – The project team and stakeholders group begin every engagement with a clear understanding of what we want to achieve*

- While the project team's engagement will be driven by our strategic priorities, we must be aware of our stakeholders' objectives, environment, and expertise.
- When the project team has a clear understanding of the outcomes we wish to achieve from each interaction, it is easier to conduct focused and meaningful engagement.
- By planning our communication and clearly stating our purpose, we hope to create an environment that allows participants to demonstrate their expertise on project issues.

*Inclusive – The project team identifies relevant stakeholders and makes it easy for them to engage*

- The project team identifies and enables the participation of those people and organizations who contribute to, influence, or are affected by the truck parking issue.
- The project team provides the stakeholder group with the information they need to participate in a meaningful way.

*Timely – The project team involves stakeholders from the start and agrees on how and when to engage*

- The project team will clearly identify and explain the engagement process and will identify meeting times and locations as early as possible.

*Transparent – The project team will be open and honest in our engagement and will set clear expectations*

- The project team will provide information so stakeholders can participate in a meaningful way, and will foster a culture of sharing ideas.
- We will clearly identify and explain the engagement process, the role of stakeholders in the project, and communicate how their input will inform the project.

*Respectful – The project team will acknowledge and respect the expertise, perspective, and needs of the stakeholders group*

- The project team understands that engagement is a two-way process. We will be open to alternative views and to listen as well as speak.
- The project team respects our stakeholders' expertise and appreciates the benefits of mutual learning.

## STAKEHOLDER CONSULTATION

The Stakeholder Consultation will seek to involve stakeholders in identifying planning needs, goals, and objectives; existing conditions; and conducting a needs assessment. Outreach activities for this project will consist of meetings, interviews, and surveys. Outreach communications will take place in person, via telephone, and online.

### 1.1 MEETINGS

The project team will meet in person with the FATF at four (4) of their regularly scheduled meetings. The following agenda items may be covered at each meeting, with specific content being created prior to each meeting:

- **MEETING 1**
  - Introduce Study
  - Present Draft Study Goals
  - Receive Feedback
- **MEETING 2**
  - Peer / Literature Review Results
  - Stakeholder Interview Results
  - Existing Conditions Summary
  - Receive Feedback
- **MEETING 3**
  - Existing and Future Needs
  - Receive Feedback
  - Present initial draft recommendations
- **MEETING 4**
  - Present Final Recommendations
  - Receive Feedback / Obtain Consensus

Additionally, the project team is available to present to the TCC, TAQC, and LUCC at regularly scheduled meetings to obtain input.

### 1.2 Interviews

Targeted interviews with specific stakeholders will also be used to gather information. These targeted interviewees include:

- Owner-Operator Independent Drivers Association
- National Minority Trucking Association
- National Association of Truck Stop Operators
- Georgia Department of Public Safety, Motor Carrier Compliance Division

- Southeastern Freight Lines
- Georgia Motor Trucking Association
- Wal-Mart
- Cisco – Global Logistics Division
- Truck Driver
- Geo H. Green Oil, Inc.
- Federal Highway Administration
- Mullins International Solutions
- Florida Department of Transportation
- Mid-America Freight Coalition

The targeted interviews will be conducted via telephone or in person, and will include determination of the following:

- Locations with large disparities between truck parking supply and demand, and potential recommendations and solutions
- Potentially challenging areas where truckers may have difficulty locating truck parking, and potential solutions
- State of communication of truck parking supply and improvement recommendations
- Locations of unauthorized parking and potential recommendations to mitigate

### 1.3 SURVEYS

The project team will complete a dual-track survey that includes both truck drivers as well as other stakeholders. Both the surveys will be conducted online.

#### *TRUCKER INDUSTRY SURVEY*

The project team will develop and execute a trucker industry survey using ATRI's trucker industry contact database. The survey will also be distributed to other trucker industry groups that may be available. The survey questions will focus on data confirmation, identification of corridors or corridor segments where finding available truck parking in safe locations is difficult, and receipt of input including potential recommendations and priorities. The survey will be conducted using Survey Monkey, which will allow for anonymous responses and data aggregation.

#### *STAKEHOLDER SURVEY*

The project team will also conduct a separate survey geared towards the other stakeholders (non-truck drivers), including:

- Local jurisdiction – staff or elected official
- Law Enforcement
- Industry Representatives / Carriers
- Commercial/Retail Stakeholders

This stakeholder survey may include some similar questions to the trucker industry survey, but will focus upon identifying unauthorized areas where truckers currently park or other similar parking issues. The electronically-based Stakeholder Survey will start using Survey Monkey®, to allow for respondents to

provide non-geographically located information. Additionally, specific locations will be identified using Wikimapping®. The map will include the ten identified corridors, as well as provide the opportunity to add points to indicate:

- Locations with large disparities between truck parking supply and demand
- Potentially challenging areas where truckers may have difficulty locating truck parking
- Locations of unauthorized parking

When each of these types of points is added, the survey will request input on and potential recommendations to mitigate the problem. The mapping will result in three GIS layers and associated data, which can be used for geographic hot-spot analysis as well as aggregated data.

The survey results from both the trucking industry and the other stakeholders will be compiled and used to gain an understanding of existing and future needs. They will also be helpful as recommendations are developed for the final document.

## STAKEHOLDER LIST

Table 1 is a complete list of all the stakeholders the project team plans to contact. This list may expand through the in-person or via-telephone interactions. Additionally, we will encourage the stakeholders to forward the online surveys to others who may wish to provide input.



Table 1- Stakeholder List

| ID# | Affiliation / Agency  | Name                      | Title  | Location          |
|-----|---|---------------------------|--|-------------------|
| 1   | Owner-Operator Independent Drivers Association (OOIDA)                        | Scott Grenerth            | Director of Regulatory Affairs                               | Grain Valley, MO  |
|     |   | Tom Weakley               | Director of Operations                                       | Grain Valley, MO  |
| 2   | National Minority Trucking Association (NMTA)                                 | Jason Allen               | Member Services  | College Park, GA  |
| 3   | National Association of Truck Stop Operators (NATSO)                          | Tiffany Wlazlowski Neuman | VP, Public Affairs   | Alexandria, VA    |
|     |   | David Fialkov             | VP, Government Relations, Legislative and Regulatory Counsel |                   |
| 4   | Georgia Department of Public Safety, Motor Carrier Compliance Division (MCCD) | Major Johnny Jones        | Commanding Officer   | Atlanta, GA       |
|     |   | Major Billy Boulware      | MCCD Administration  |                   |
| 5   | Southeastern Freight Lines  | Kris Northup              | International Business Development Manager                   | Conley, GA        |
| 6   | Georgia Motor Trucking Association  | Nathan Goolsby            | Director of Development                                      | Marietta, GA      |
|     |   | Ed Crowell                | President  | Marietta, GA      |
| 7   | Wal-Mart  | Brock Toole               | General Transportation Manager at distribution center        | Monroe, GA        |
| 9   | Cisco - Global Logistics  | Chris Garrett             | Program Manager  | Lawrenceville, GA |
| 19  | American Trucking Association   | Danny Smith               | Truck Driver - Big G Express                                 | TN                |
| 20  | Geo. H. Green Oil, Inc.   | Ed Wyatt                  | President  | Fairburn, GA      |
| 11  | Georgia Department of Transportation  | Andrew Heath, P.E.        | State Traffic Engineer                                       | Atlanta, GA       |
|     |   | Tom McQueen, AICP         | Asst. Administrator, Office of Planning                      |                   |
| 12  | FHWA  | Tom Kearney               | Truck Parking Project Manager                                | Washington, DC    |
|     |   | Jeff Purdy                | n/s  | Washington, DC    |
| 13  | GA Department of Economic Development   | Jannine Miller            | Director, Center of Innovation for Logistics                 | Georgia           |
| 14  | Metro Atlanta Chamber   | Troels Adrian             | Director, Supply chain & Advanced Manufacturing              | Atlanta, GA       |
| 15  | Mullins International Solutions   | Donna Mullins             | President  | Ellenwood, GA     |
| 16  | FDOT  | Jeff Frost                | Program manager for Commercial Vehicle Operations            | Tallahassee, FL   |
| 17  | Mid-America Freight Coalition (MAFC)  | Ernie Perry               | MAFC Program Manager   | Madison, WI       |
| 18  | Real Women in Trucking  | Desiree Wood              | President  | Florida           |

## **Appendix 2-B**

### **Freight Advisory Task Force Meeting 1**

# ***Atlanta Regional Truck Parking Assessment Study***



*ARC Freight Advisory Task Force Meeting  
March 2, 2017*





# *AGENDA*

*Background*

*Approach*

*Schedule*

*Questions*



# Study Team



| Firm  | Key Staff   | Role   |
|---|---|--|
|    | <div data-bbox="591 305 788 496">  </div> <div data-bbox="523 525 880 562"> <p><b>Steve Cote, PE, AICP</b></p> </div> <div data-bbox="1043 319 1222 496">  </div> <div data-bbox="971 525 1315 562"> <p><b>Beverly Davis, AICP</b></p> </div> | <ul style="list-style-type: none"> <li>• Project Management</li> <li>• Client Liaison</li> <li>• Technical Analysis</li> </ul> |
|    | <div data-bbox="606 654 801 848">  </div> <div data-bbox="614 882 794 919"> <p><b>Jeff Short</b></p> </div> <div data-bbox="1054 665 1234 836">  </div> <div data-bbox="1045 868 1257 911"> <p><b>Dan Murray</b></p> </div>                   | <ul style="list-style-type: none"> <li>• GPS Truck Data</li> <li>• Stakeholder Survey</li> <li>• Industry Liaison</li> </ul>   |
|  | <div data-bbox="848 1011 1043 1205">  </div> <div data-bbox="784 1239 1145 1276"> <p><b>Caroline Evans, AICP</b></p> </div>   | <ul style="list-style-type: none"> <li>• Outreach</li> <li>• Database Development</li> </ul>                                   |

# Background



- » Atlanta Regional Freight Mobility Plan Update (2016)
- » FHWA – Jason’s Law Truck Survey
- » Federal Truck Driver Rules
  - Hours-of-Service (HOS)
  - Electronic Logging Devices (ELD)

## **Atlanta Regional Freight Mobility Plan Update**

*Final Report*

May 2016



U.S. Department  
of Transportation

**Federal Highway  
Administration**

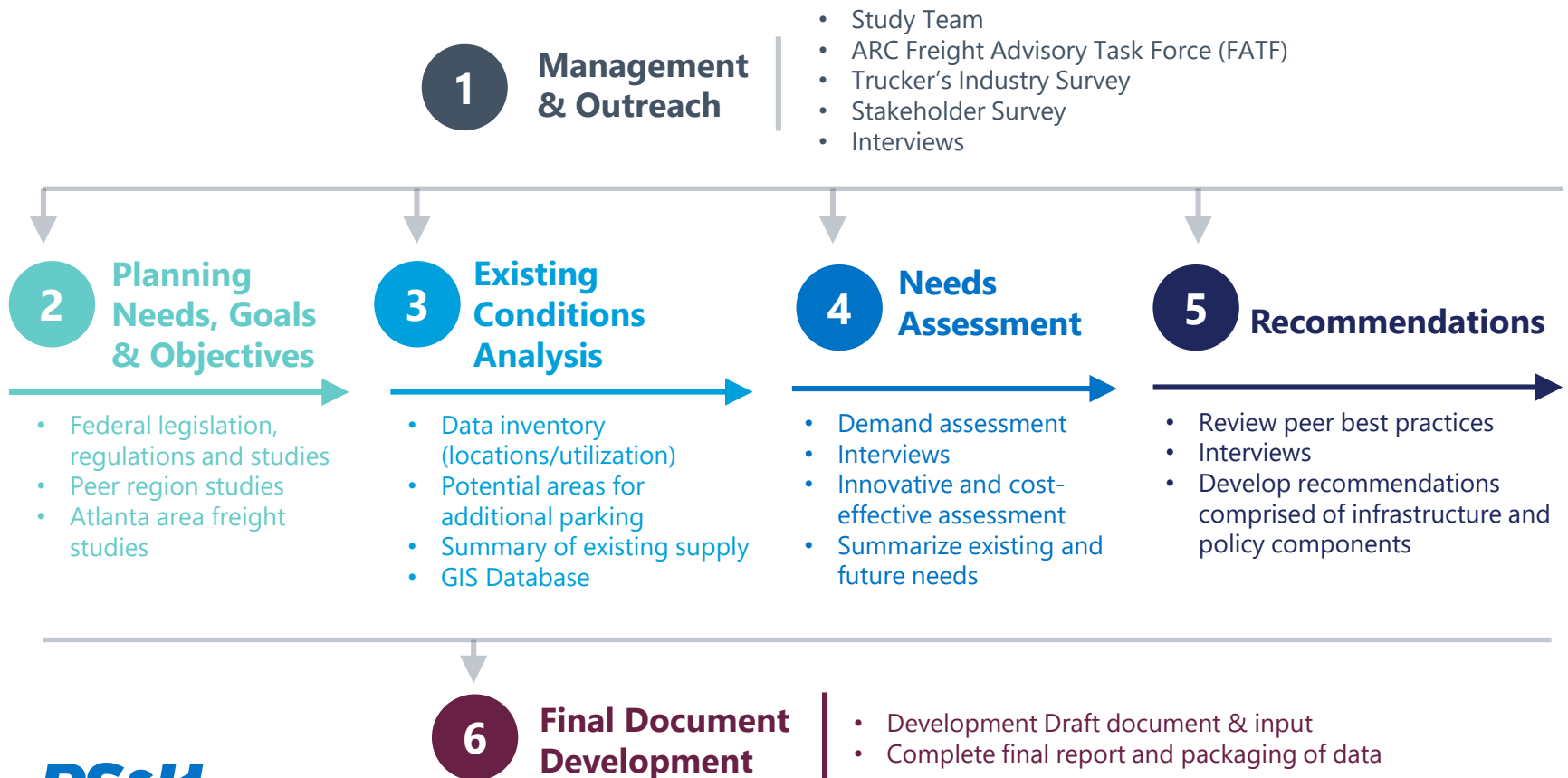
Office of Freight Management and Operations

Jason’s Law Truck Parking Survey Results  
and Comparative Analysis

# Approach



## Atlanta Regional Truck Parking Assessment Study





# 1 Management & Outreach *Freight Advisory Task Force (FATF)*



- » Four (4) Meetings Anticipated
  - No. 1: Introduce Study (**Today**)
  - No. 2: Existing Conditions
    - *Literature/Peer review*
    - *Interview Results*
  - No. 3: Existing/Future Needs
  - No. 4: Recommendations



# 1 Management & Outreach

## *Other Key Stakeholders*



- » Truckers
- » Industry Representatives
  - Trucking Associations
  - Enforcement Officials
  - Truck Stop Operators
- » ARC Committees
  - TAQC, TCC, LUCC



# 1 Management & Outreach

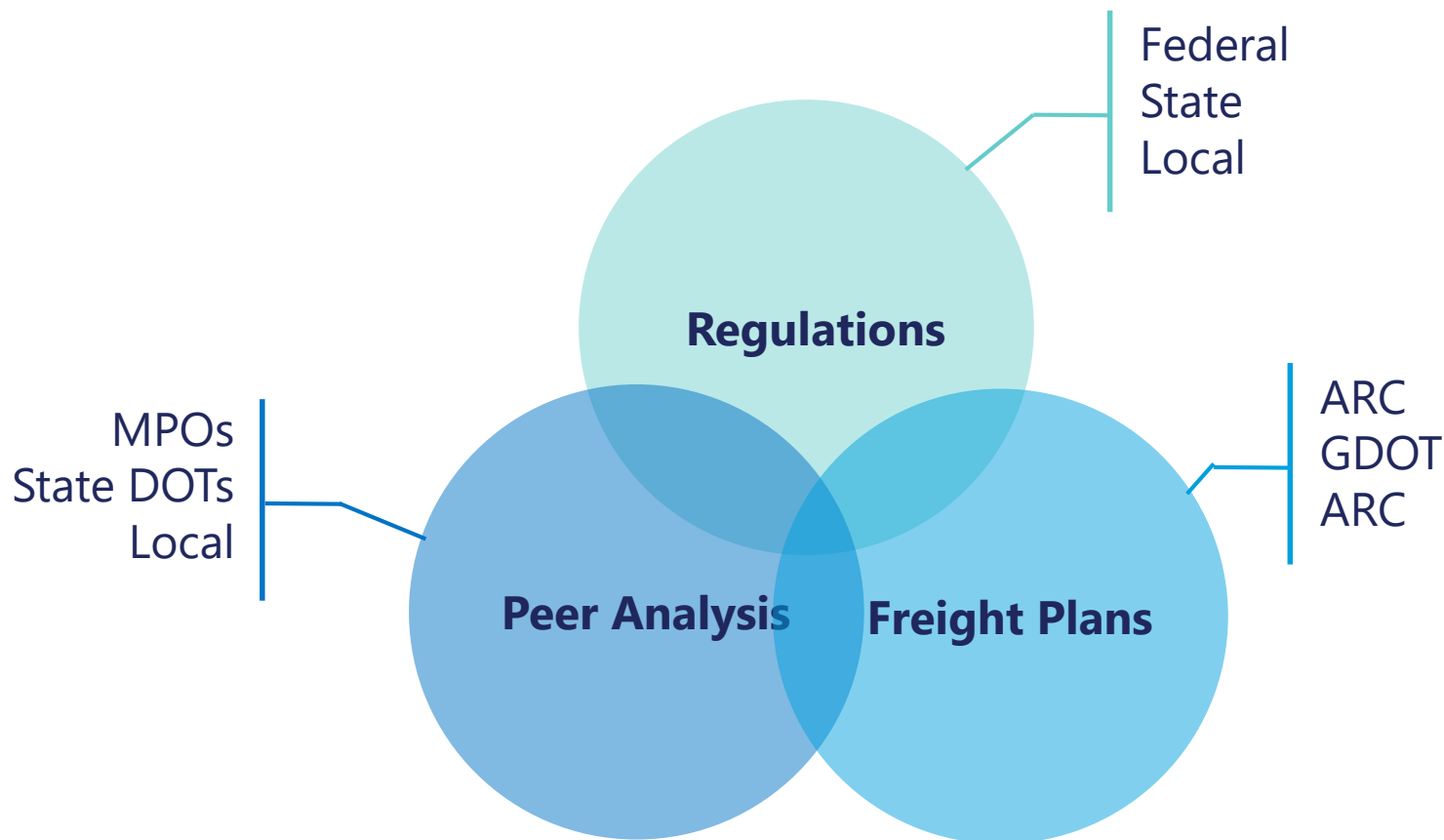
## *Outreach Activities*

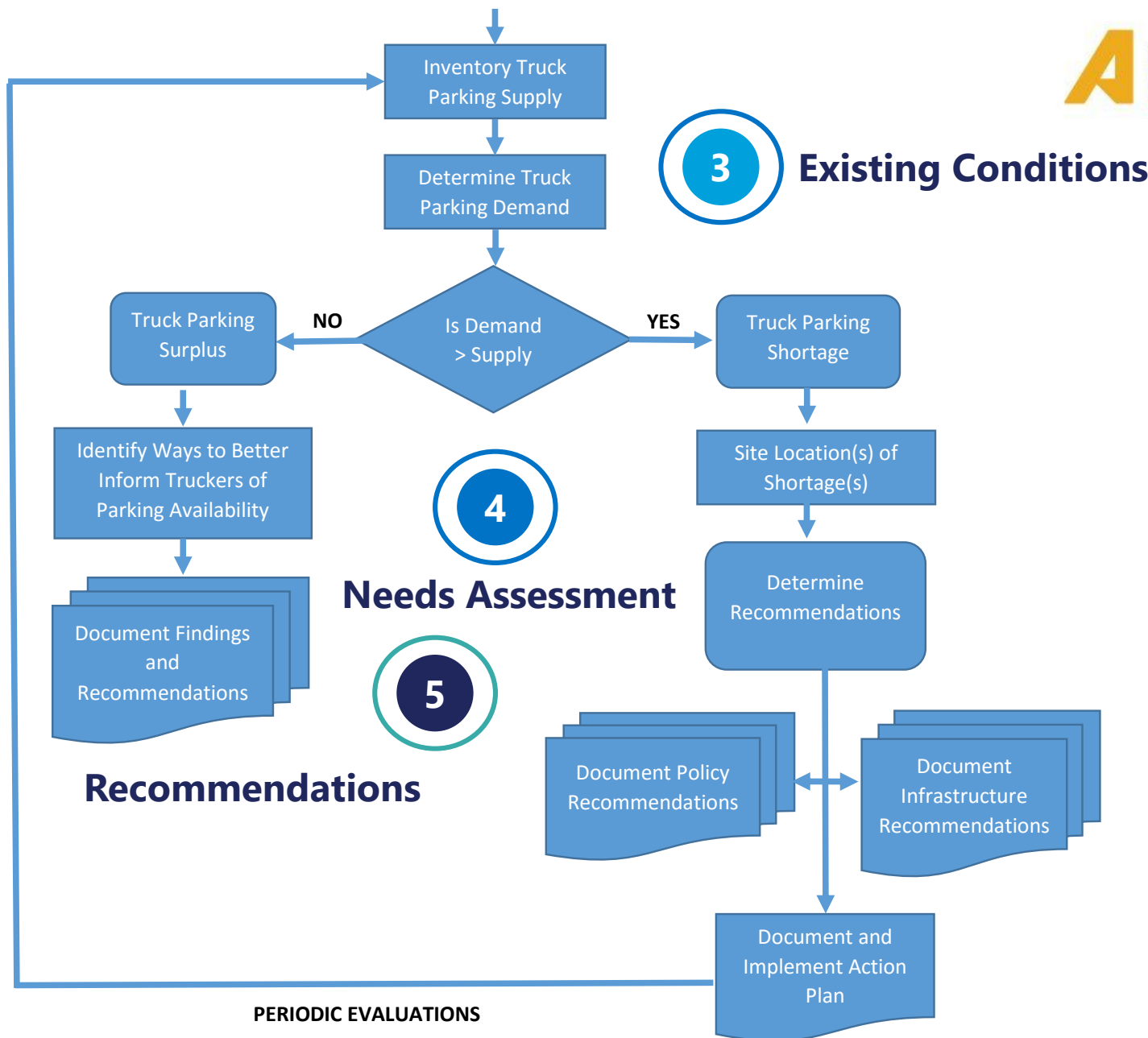


- » Surveys
  - Truckers
  - Other Stakeholders
    - *WikiMapping*<sup>®</sup>
- » Interviews
- » Meetings
  - FATF
  - ARC Committees



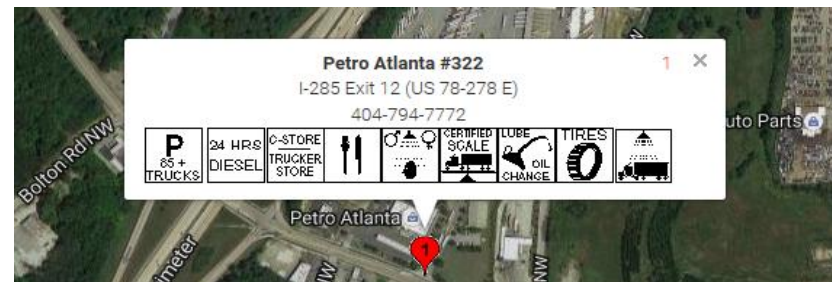
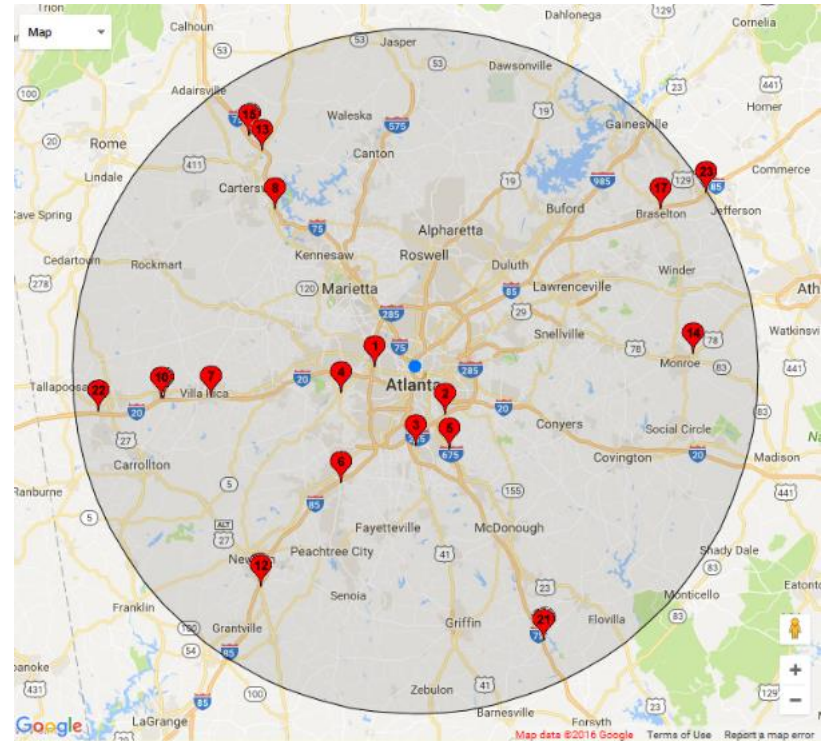
## 2 Planning Needs, Goals & Objectives





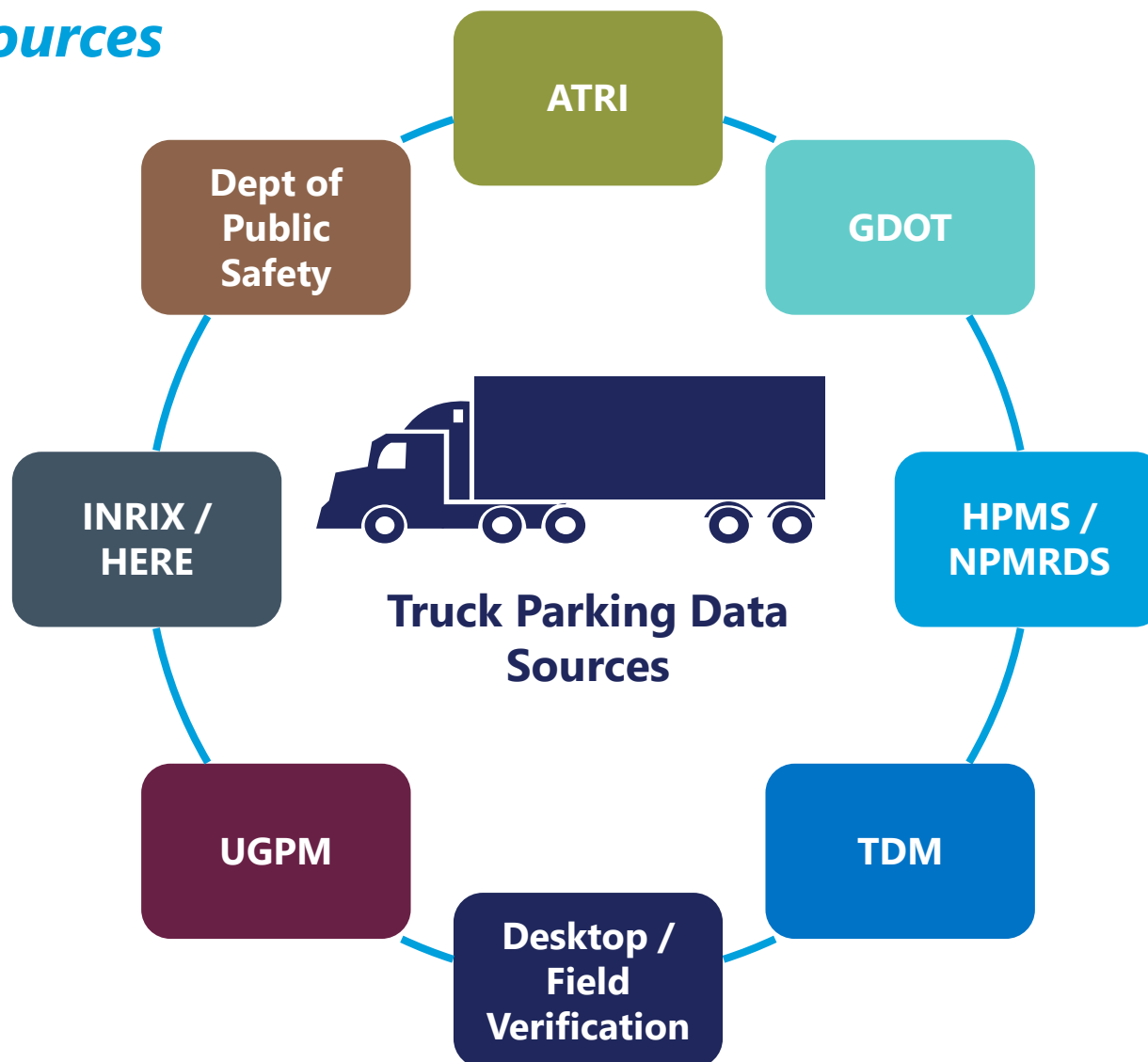
## Key Items

- Data Inventory
- Parking Supply
- Additional Needs
- GIS Database



### 3 Existing Conditions Analysis

#### Data Sources





### 3 Existing Conditions Analysis



## *Smart Phone Apps and Technologies*



Truck  
Parking  
USA



TRUCKER PATH



Truck Parking  
Availability Sensors

# 3 Existing Conditions Analysis



## Supply Inventory



### Truck Parking Tiers

1

#### Publicly-Controlled

- Rest Areas
- Weigh-in-Motion Areas

2a

#### Privately-Owned Primary

- Truck Stops
- Commercial Transport Services

2b

#### Privately-Owned Secondary

- Restaurants / Commercial Areas
- Hotels/Motels
- Shippers

3

#### Unauthorized

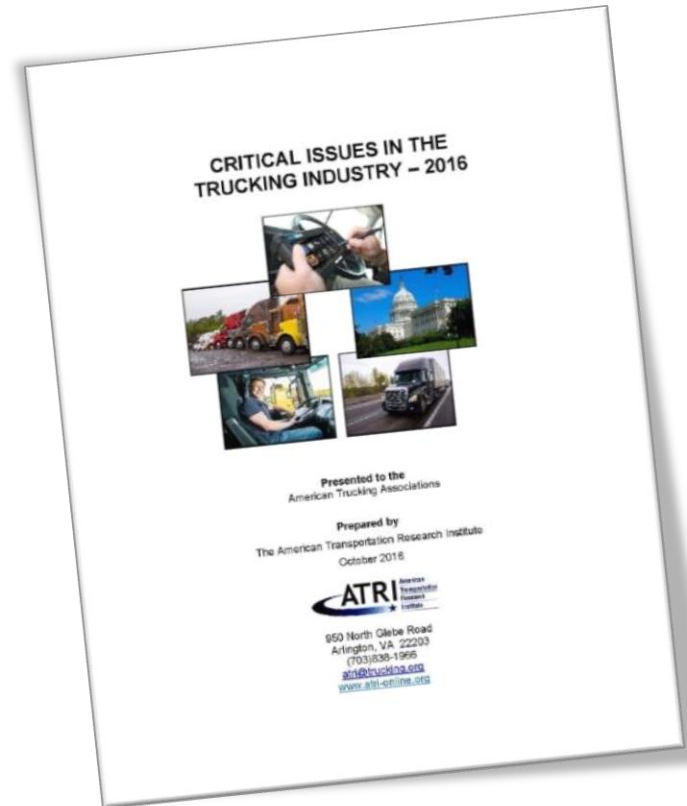
- Interstate Ramps
- Vacant / Abandoned Lots

## 4 Needs Assessment



### *Key Items*

- Supply vs. Demand
- Summarize Existing / Future Needs



## 4 Needs Assessment

### *Example – GPS Data*



## 5 Recommendations



### *Key Items*











## 6 Final Document Development



### *Reports and Summaries*



# Schedule

| Project Tasks / Meetings / Deliverables  | Feb | Mar   | Apr | May   | Jun | Jul   | Aug | Sep   | Oct                  | Nov             | Dec   |
|--|-----|---|-----|---|-----|---|-----|---|----------------------|-----------------|---|
| <b>Contracting / Scope Development</b>   |     |   |     |   |     |   |     |   |                      |                 |   |
| <b>Task 1: Project Management and Stakeholder</b>  |     |  |     |  |     |  |     |  | 1 <sup>st</sup> Read | 2 <sup>nd</sup> |  |
| <b>Task 2: Planning Need, Goals, and Objectives</b>  |     |   |     |   |     |   |     |   |                      |                 |   |
| <b>Task 3: Existing Conditions Analysis</b>  |     |   |     |   |     |   |     |   |                      |                 |   |
| <b>Task 4: Needs Assessment</b>  |     |   |     |   |     |   |     |   |                      |                 |   |
| <b>Task 5: Recommendations</b>   |     |   |     |   |     |   |     |   |                      |                 |   |
| <b>Task 6: Final Documentation / Adoption</b>  |     |   |     |   |     |   |     |   |                      |                 |   |
|  Potential FATF Meeting |     |   |     |   |     |   |     |   |                      |                 |   |





*Questions?*

**RS&H**



## **Appendix 2-C**

### **Freight Advisory Task Force Meeting 2**

# MEETING AGENDA

Location: Harry West Room, ARC's Offices  
40 Courtland Street, NE, Atlanta, Georgia 30303



**Thursday, May 18<sup>th</sup>, 2017**

**7:30 AM to 8:00 AM: Coffee, breakfast, and networking**

**8:00 AM to 9:30 AM: Meeting – discussion topics below**

## **Welcome and Introductions**

### **Atlanta Regional Truck Parking Study**

The consultant team for the truck parking assessment study will present existing conditions data, show where truck parking is located in the Atlanta Region, seek input from FATF members on truck parking issues and needs, and discuss initial steps for the Needs Assessment.

### **RTP/TIP Amendment #3**

John Orr, ARC, will provide an overview and lead a discussion on ARC TIP Amendment #3, which will include GDOT's Major Mobility Improvement Projects. These projects are tied to Georgia's Transportation Funding Act (TFA) of 2015, which provides nearly \$1 billion per year in additional funding to GDOT for an extensive list of maintenance, operations, and capacity projects statewide. For more information, please visit [www.GAroads.org](http://www.GAroads.org).

## **Other Items**

- Member Introduced Topics
- Announcements
  - South Fulton CID Multimodal Study – Alternative Land Use Workshop:
    - Date/Time: May 18<sup>th</sup>, 4 PM or 5 PM (Pick the time that works best for you)
    - Location: US Foods, 7950 Spence Road, Fairburn, GA 30213
    - Please go to the visitor entrance and state you are here for the public workshop. Then proceed to the visitor entrance of the building.
  - **ARC is moving** to Peachtree Center, 229 Peachtree Street, NE, STE 100, Atlanta, GA 30303. Our offices will close on the afternoon of June 14<sup>th</sup> and will re-open on June 20<sup>th</sup>.

## **Adjourn**



ATLANTA REGIONAL COMMISSION

# Atlanta Regional Truck Parking Assessment Study



## Freight Advisory Task Force

Needs, Goals, Existing Conditions, and Launch of Surveys

*May 18, 2017*



# Study Team

| Firm  | Key Staff   | Role   |
|---|---|--|
|    | <div data-bbox="465 304 664 499"></div> <div data-bbox="401 522 726 559">Steve Cote, PE, AICP</div> <div data-bbox="830 445 1010 625"></div> <div data-bbox="772 644 1081 681">Beverly Davis, AICP</div> <div data-bbox="1168 311 1360 498"></div> <div data-bbox="1089 518 1425 556">Kai Zuehlke, PE, AICP</div> | <ul style="list-style-type: none"> <li>• Project Management</li> <li>• Client Liaison</li> <li>• Technical Analysis</li> </ul> |
|     | <div data-bbox="631 759 809 935"></div> <div data-bbox="633 955 795 989">Jeff Short</div> <div data-bbox="1008 753 1192 929"></div> <div data-bbox="1000 952 1195 989">Dan Murray</div>   | <ul style="list-style-type: none"> <li>• GPS Truck Data</li> <li>• Stakeholder Survey</li> <li>• Industry Liaison</li> </ul>   |
|  | <div data-bbox="836 1093 1031 1286"></div> <div data-bbox="782 1310 1108 1348">Caroline Evans, AICP</div>   | <ul style="list-style-type: none"> <li>• Outreach</li> <li>• Database Development</li> </ul>                                   |

# Today's Meeting

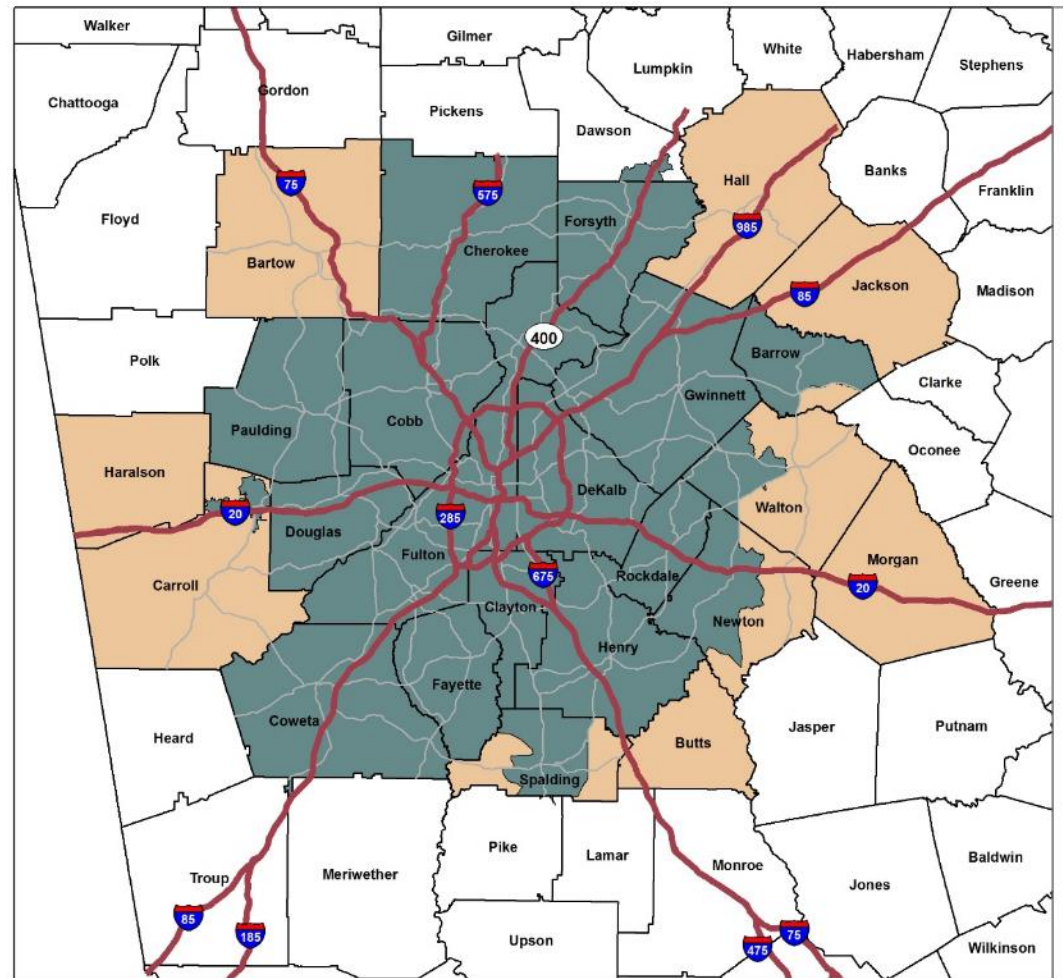
- Background
- Need, Goals and Objectives
- Peer and Literature Review
- Existing Conditions Update
- Outreach Update
- Next Steps
- Questions





# Background

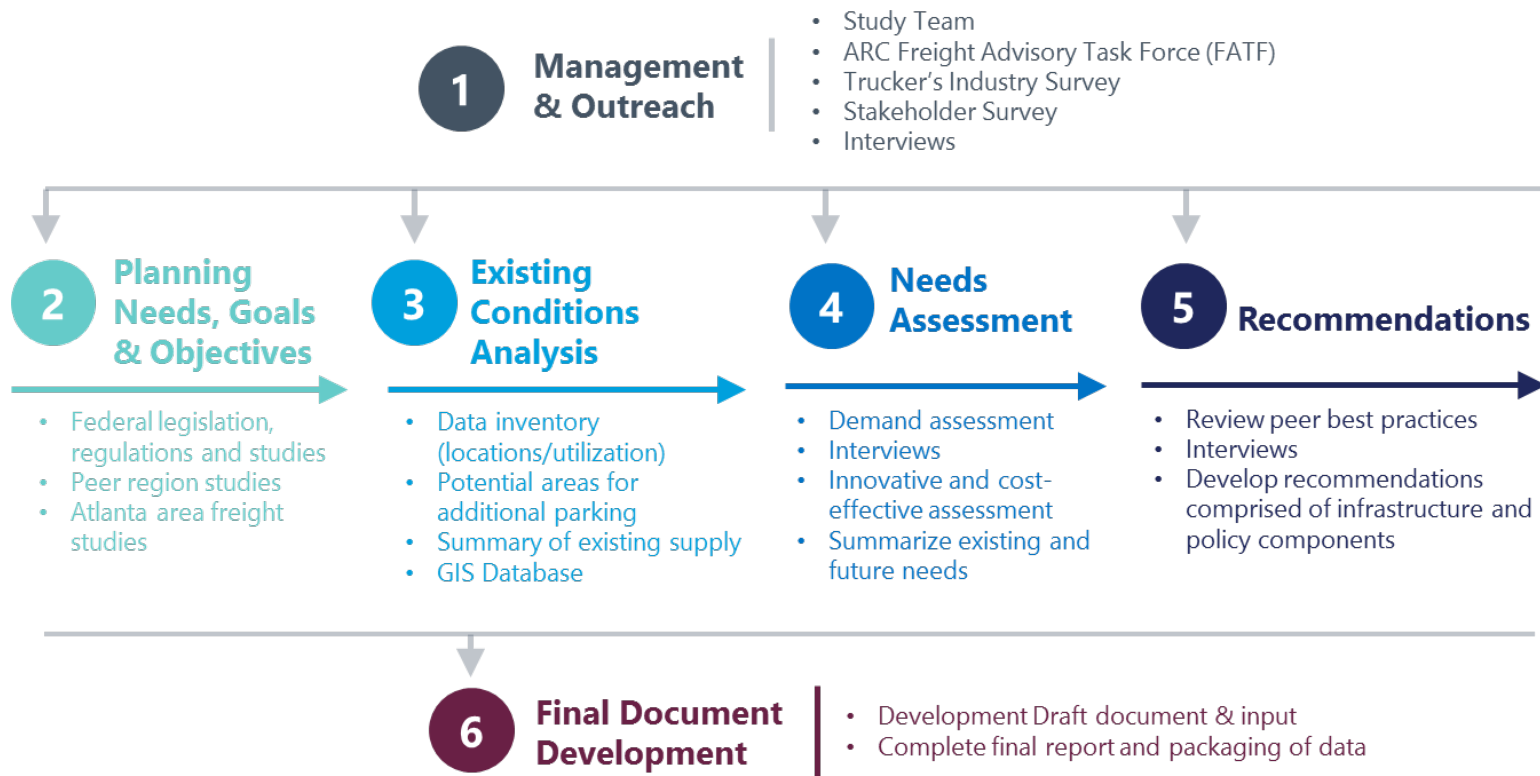
- Existing and Future Truck Parking Needs
- Study Completion: Dec. 2017
- Study Area:
  - ARC MPO
  - Key Adjacent Counties



# Study Approach



## Atlanta Regional Truck Parking Assessment Study





# Study Approach



## Atlanta Regional Truck Parking Assessment Study

### 1 Management & Outreach

- Study Team
- ARC Freight Advisory Task Force (FATF)
- Trucker's Industry Survey
- Stakeholder Survey
- Interviews

### 2 Planning Needs, Goals & Objectives

- Federal legislation, regulations and studies
- Peer region studies
- Atlanta area freight studies

### 3 Existing Conditions Analysis

- Data inventory (locations/utilization)
- Potential areas for additional parking
- Summary of existing supply
- GIS Database

### 4 Needs Assessment

- Demand assessment
- Interviews
- Innovative and cost-effective assessment
- Summarize existing and future needs

### 5 Recommendations

- Review peer best practices
- Interviews
- Develop recommendations comprised of infrastructure and policy components

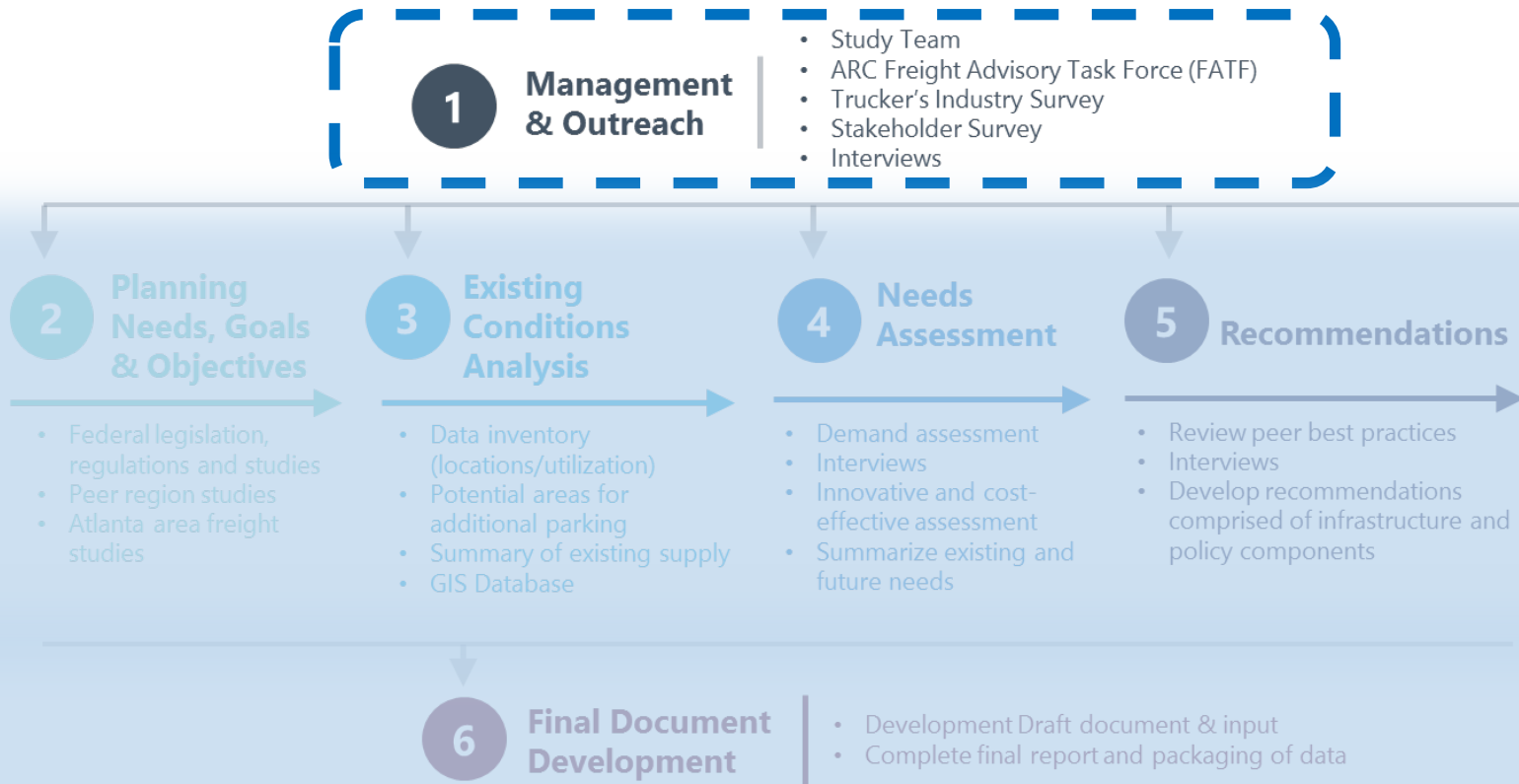
### 6 Final Document Development

- Development Draft document & input
- Complete final report and packaging of data

# Study Approach



## Atlanta Regional Truck Parking Assessment Study





ATLANTA REGIONAL COMMISSION

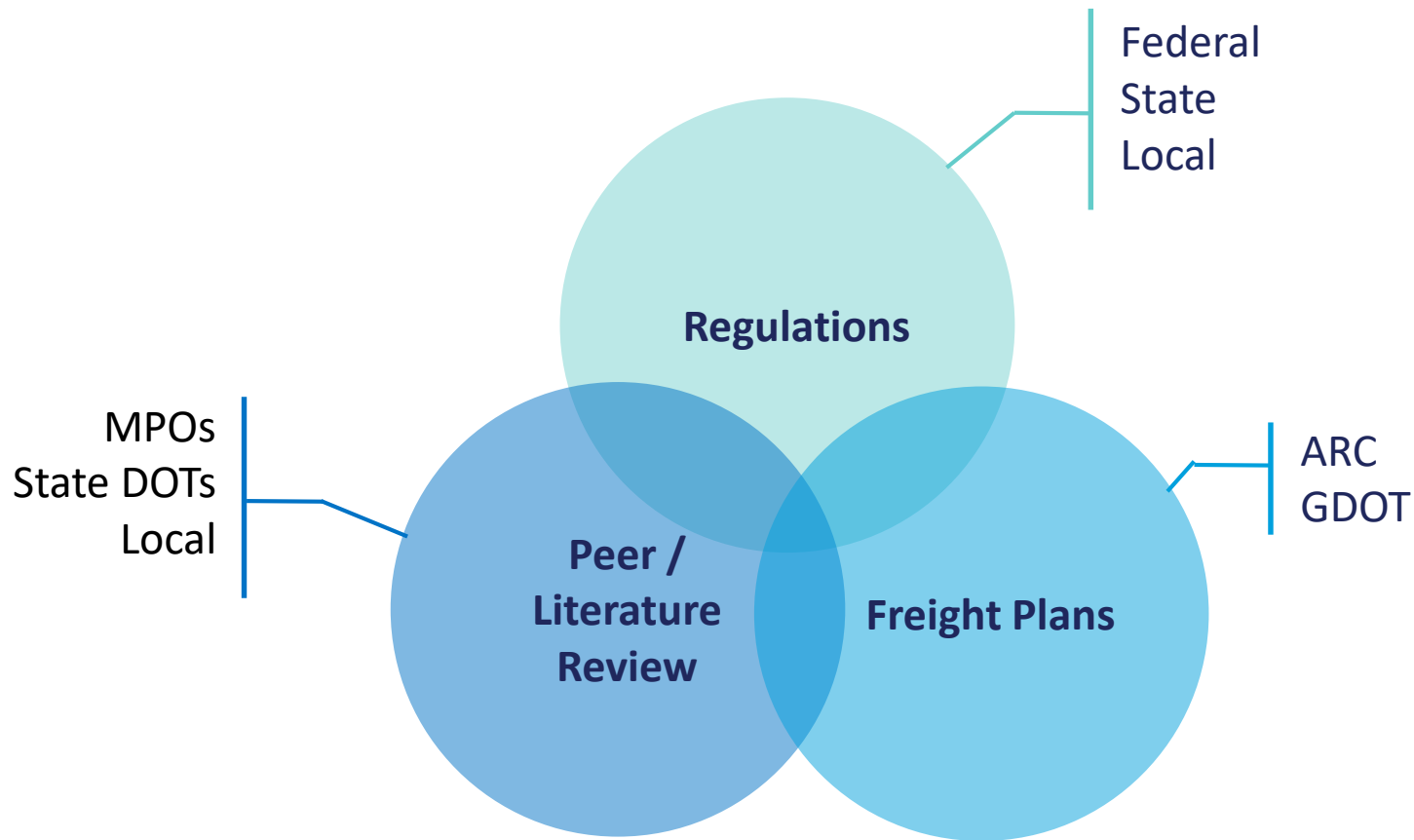
# Atlanta Regional Truck Parking Assessment Study



## Needs, Goals and Objectives

Study Task 2

# Study Needs, Goals and Objectives



# Federal Regulations

*Albany, NY Times Union (3/10/2009)*

- Section 1401 of MAP-21 "Jason's Law" (10/1/2012)
- "National priority on addressing the shortage of long-term parking for commercial motor vehicles on the National Highway System to improve the safety of motorized and non-motorized users and for commercial motor vehicle operators."

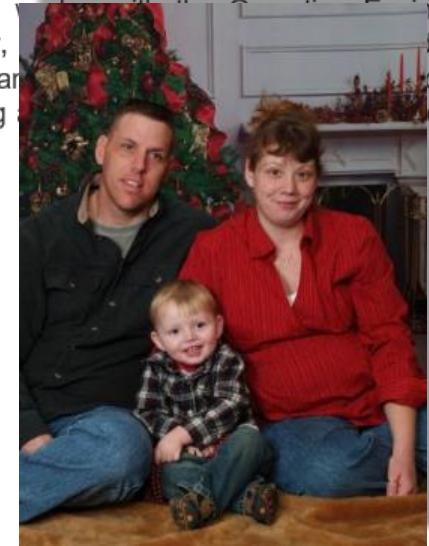
## Jason H. Rivenburg

### Obituary



Rivenburg, Jason H. FULTONHAM Jason H. Rivenburg, 35, of Tetterbark Rd., died unexpectedly Thursday, March 5, 2009 in Orangeburg, S.C. Jason was born in Cobleskill, N.Y. on October 28, 1973 the son of Dawn (Cater) and Hezekiah Rivenburg Jr.

Jason was a 1991 graduate of Schoharie Central School. He was a construction worker for years. He was a member of Local 106 in Albany, where he worked on tractor trailers for many years. He also had his own vehicle cleaning business.



# Survey Responses

## Federal Regulations - Jason's Law

### Survey Responses

| Survey  | Target Survey Group  | Number of Responses |
|---|--|---------------------|
| AASHTO/State DOT  | State DOT Personnel  | 50 States           |
| CVSA/State Motor Carrier Safety Officials                       | State and Federal Motor Carrier Safety Enforcement Officials | 50 States           |
| NATSO/Private Sector Truck Parking Facility                     | Travel Plaza and Truck Stop Owners and Operators             | 391 Truck Stops     |
| Trucking Industry Firm Management and Logistics personnel - ATA | Trucking Industry Professionals                              | 249 Dispatchers     |
| Interstate Truck Driver - ATA                                   | Trucking Industry Drivers                                    | 820 Drivers         |
| Interstate Truck Driver - OOIDA                                 | Independent Truck Drivers                                    | 7,333 Drivers       |

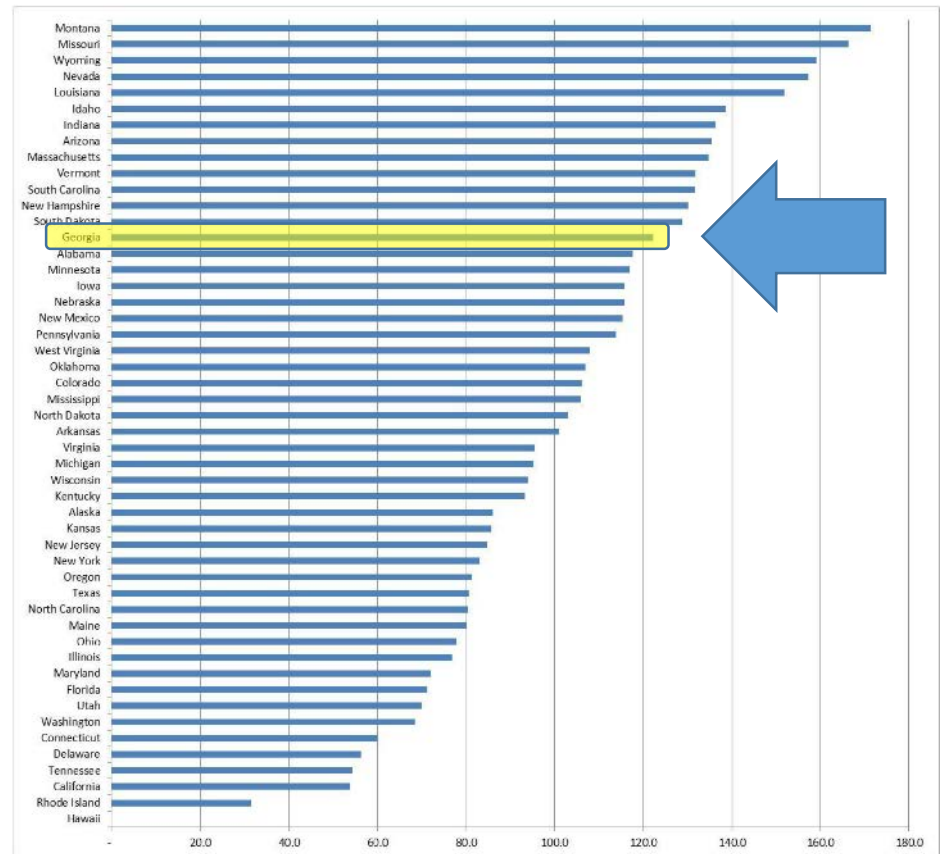
AASHTO = American Association of State Highway and Transportation Officials •  
 ATA = American Trucking Associations • CVSA = Commercial Vehicle Safety Alliance •  
 NATSO = National Association of Truck Stop Operators • OOIDA = Owner Operator  
 Independent Drivers Association

*FHWA, Jason's Law Truck Parking Survey Results and Comparative Analysis (August 2015)*

# Survey Findings: GA Infrastructure

## Federal Regulations - Jason's Law

- **Georgia Truck Parking**
  - Truck Spaces Per Daily 100K Miles of Truck VMT
  - Ranked #14
  - 265 Private Truck Stops / 12,017 spaces
  - 47 Public Facilities / 1,701 spaces
  - Private-to-Public: 7.1 spaces



Source: 2015 Trucker's Friend

FHWA, Jason's Law Truck Parking Survey Results and Comparative Analysis (August 2015)



# Survey Findings: Perceptions of GA

## Federal Regulations - Jason's Law



Table 11 - Upper and Lower Quartile Results from OOIDA, ATA, and CVSA Surveys

| Quartile | OOIDA States with Parking Shortages | OOIDA States with Sufficient Supply | Mentions in OOIDA Comments about Parking Problems | ATA Drivers States with Parking Shortages | ATA Professionals States with Parking Shortages | ATA Drivers States with Sufficient Supply | ATA Professionals States with Sufficient Supply | Mentions in ATA Comments of Parking Problems | CVSA Reports of Illegal Parking |
|----------|-------------------------------------|-------------------------------------|---|---|---|---|---|--|---------------------------------|
| Highest  | New Jersey                          | Texas                               | New Jersey  | Illinois                                  | California                                      | Texas                                     | Arizona   | California                                   | Maryland                        |
|          | New York                            | Iowa                                | Kansas  | New Jersey                                | Pennsylvania                                    | Kentucky                                  | Texas   | New Jersey                                   | S. Carolina                     |
|          | Illinois                            | Wyoming                             | California  | New York                                  | New York  | Georgia                                   | Iowa  | New York                                     | California                      |
|          | Connecticut                         | Indiana                             | New York  | Tennessee                                 | Virginia  | Alabama                                   | Nebraska  | Pennsylvania                                 | Nevada                          |
|          | Maryland                            | Missouri                            | Texas   | Indiana                                   | Illinois  | Iowa                                      | Wyoming   | Texas  | Michigan                        |
|          | Massachusetts                       | Ohio                                | Florida   | Pennsylvania                              | Maryland  | Tennessee                                 | Alabama   | Virginia                                     | N. Dakota                       |
|          | Pennsylvania                        | Georgia                             | Indiana   | California                                | New Jersey                                      | Ohio                                      | Colorado  | Arizona                                      | N. Carolina                     |
|          | Virginia                            | Nebraska                            | Virginia  | Connecticut                               | Georgia   | Wyoming                                   | Idaho   | Illinois                                     | Idaho                           |
|          | California                          | Oklahoma                            | Ohio  | Georgia                                   | Massachusetts                                   | Indiana                                   | Kansas  | Connecticut                                  | Utah                            |
|          | Indiana                             | Kentucky                            | Washington  | Virginia                                  | Connecticut                                     | Kansas                                    | Minnesota                                       | Maryland                                     | Indiana                         |
|          | Delaware                            | Kansas                              | Illinois  | Massachusetts                             | N. Carolina                                     | Missouri                                  | Missouri  | Arkansas                                     | Maine                           |
|          | Florida                             | Alabama                             | Maryland  | Kentucky                                  | Indiana   | Arizona                                   | Nevada  | Colorado                                     | Washington                      |
|          | Georgia                             | Arizona                             | Pennsylvania                                      | Maryland                                  | Tennessee                                       | New Mexico                                | New Mexico                                      | Georgia                                      | W. Virginia                     |

OOIDA = Owner Operator Independent Drivers Association • ATA = American Trucking Associations • CVSA = Commercial Vehicle Safety Alliance

FHWA, Jason's Law Truck Parking Survey Results and Comparative Analysis (August 2015)

# Survey Findings: Perceptions of GA

## Federal Regulations - Jason's Law



OOIDA = Owner Operator Independent Drivers Association • ATA = American Trucking Associations • CVSA = Commercial Vehicle Safety Alliance

*FHWA, Jason's Law Truck Parking Survey Results and Comparative Analysis (August 2015)*

# Hours-of-Service (HOS)

## Federal Regulations

- **Effective since 07/01/13**
- **Requirements vary for Property-Carrying versus Passenger-Carrying CMV Drivers**
- **Property-Carrying CMV Drivers**
  - **Daily Driving Limit / 11-hour Driving Limit:** may drive a maximum of 11 hours after 10 consecutive hours off duty
  - **14-Hour Driving Window / 14-Hour Limit:** may not drive beyond the 14<sup>th</sup> consecutive hours after coming on duty, following 10 consecutive hours off-duty. Off-duty time does not extend the 14-hour period.
  - **Rest Breaks / 30-Minute Break:** may drive only if eight (8) hours or less have passed since end of driver's last off-duty or sleeper berth period of at least 30 minutes [49 CFR 397.5 mandatory "in attendance" time may be included in break if no other duties performed]
  - **60/70-Hour On-Duty Limit:** may not drive after 60/70 hours on-duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.
  - **Sleeper Berth Provision / Team Driving:** drivers using this provision must take at least 8 consecutive hours in the sleeper berth, plus a separate two (2) consecutive hours in the sleeper berth, off duty, or any combination of the two (2).

# Electronic Logging Devices (ELDs)

## Federal Regulations

- **ELD**

- Co

- De

- Re

- Dr

- Dr

- in

### **Bottom-Line:**

**Demand for truck parking  
will likely surge after Dec.  
2017 when ELDs are  
MANDATED**

filed

AOBRD – Automatic Onboard Recording Device (Less than 20% of existing trucks have AOBRDs per 3/2016 survey by TruckStop.com)

# Atlanta Regional Freight Mobility Plan Update – May 2016

## Recommended Completion of a Regional Truck Parking Assessment Study

- **Purpose:**

- Identify and address truck parking needs in the Atlanta Region

- **Objectives:**

- Consider short-haul and long-haul truck parking needs
- Consider needs of emerging mixed use facilities.

- **Factors:**

- Cities and counties must be considered due to the relevance of local codes and zoning ordinances that [may] regulate where trucks can operate, times of operation, and the design of mixed use facilities.

*ARC, Atlanta Regional Freight Mobility Plan Update (May 2016)*

# Studies & Plans Reviewed

- ARC Freight Plan Update (2016) and Initial Plan (2010)
- GDOT Statewide Freight and Logistics Plan (2012, Updated 2015)
- Regional Economic Competitiveness Strategy (ARC, 2013)
- Georgia Competitiveness Initiative Report (Georgia Department of Economic Development and Chamber of Commerce, 2012)
- Land Use (Unified Growth Policy Map – UGPM)
- Statewide Strategic Transportation Plan (SWTP/SSTP)

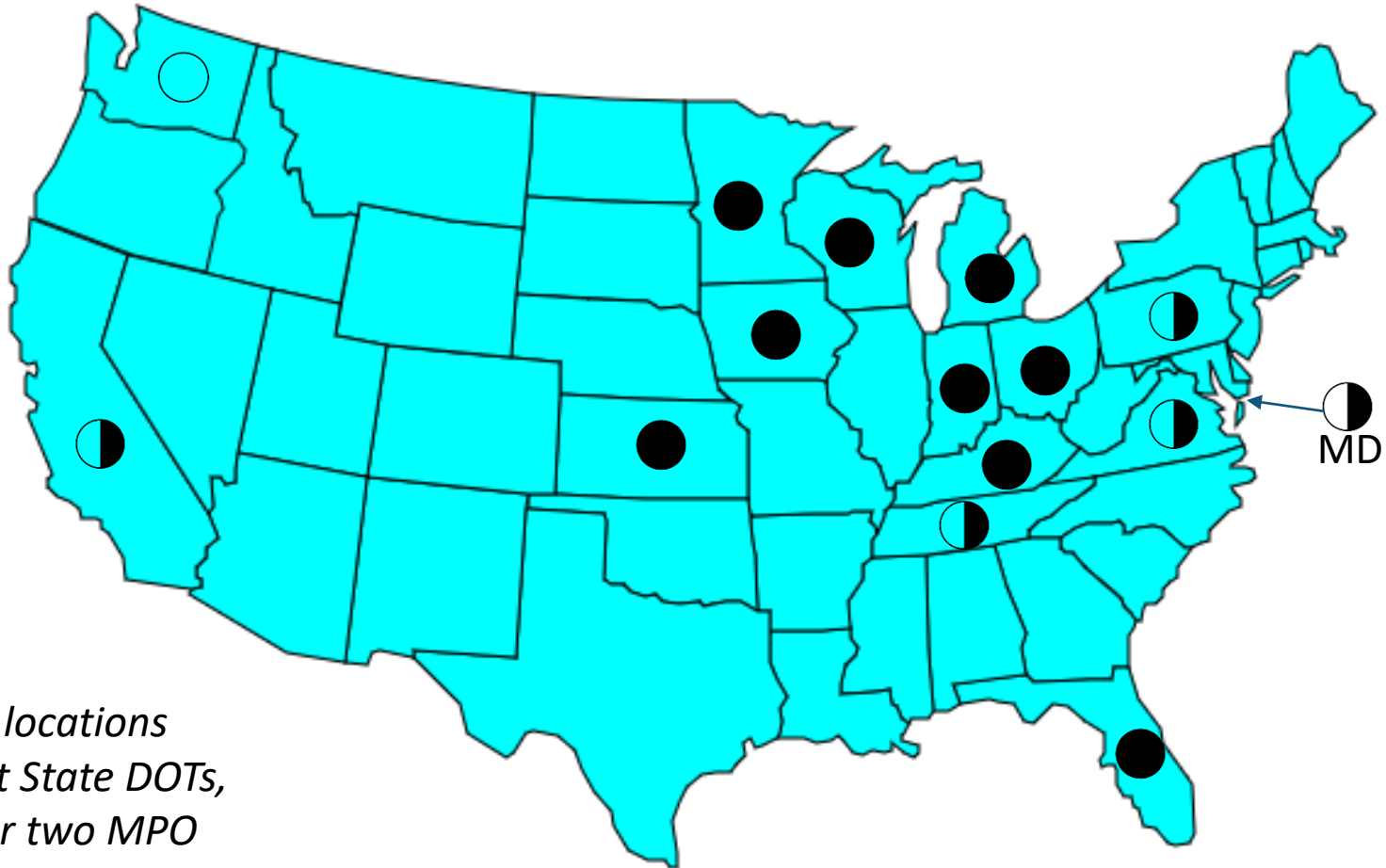
# Draft Goals and Objectives

***Purpose/Vision:*** To ensure a well-planned regional truck parking network that meets existing and future needs/demand by facilitating:

| Goals   | Objectives  |
|---|---|
| Safety  | Provide adequate truck parking supply within the Atlanta region for truck drivers to meet federal Hours-of-Service requirements |
|   | Enable truck drivers to exercise risk management  |
| Quality of Life                               | Provide for truck driver well being   |
|   | Enable 24 hour delivery   |
| Efficient Operation                           | Minimize travel time and costs  |
|   | Reduce early or late breaks   |
|   | Minimize queuing (for fueling, waiting for truck parking, and staging)  |
| Economic Development / Logistics and Commerce | Ensure a competitive operating environment for regional freight transportation  |
|   | Advance public policies that make metro Atlanta and the state of Georgia more attractive and competitive places to do business  |
|   | Invest in physical and social infrastructure that supports economic competitiveness   |
| Coordinated Planning and Development          | Enable expansion or development of new truck stops in strategic locations   |
|   | Preserve communities / areas with incompatible land uses (e.g., residential)  |
|   | Improve land use planning and the siting/development of freight-logistics industries  |
|   | Plan and preserve industrial land uses to support job creation and provided needed goods and services                           |



# Peers



*Note: All locations represent State DOTs, except for two MPO subarea studies*

# Peer Review

| Agency   | Geographic Area  | Study, Pilot or System Funded or Completed |       |            |
|--|--|--|-------|------------|
|  |  | Study                                      | Pilot | System     |
| Baltimore DOT  | One truck stop   |  | 2013  |            |
| Baltimore Metropolitan Council                                     | Two Interchanges   | 2006                                       |       |            |
| California DOT (CALTRANS)  | State of California  | 1999                                       | 2015  |            |
| Florida DOT  | Initially seven rest areas, then statewide                               |  |       | 2017 /2018 |
| I-95 Corridor Coalition  | Two truck stops in Maryland and Virginia                                 |  | 2011  |            |
| Kansas Turnpike Authority (KTA) and Kansas DOT                     | State of Kansas  | 2016                                       |       |            |
| Michigan DOT   | State of Michigan  | 2012                                       | 2014  | 2015       |
| Mid America Association of State Transportation Officials (MAASTO) | Kansas, Kentucky, Indiana, Iowa, Michigan, Minnesota, Ohio and Wisconsin | 2015                                       |       | 2015       |
| Minnesota DOT  | State of Minnesota   | 2008 / 2010                                | 2014  | 2015       |
| Pennsylvania DOT   | I-81   |  | 2015  |            |
| TN DOT   | Two truck stops  |  | 2016  |            |
| Virginia DOT   | State of Virginia  | 2015                                       |       |            |
| Washington DOT   | State of Washington  | 2005 /2008 /2016                           |       |            |
| Wilmington, DE (Wilmington Area Planning Council, or WILMAPCO)     | Port of Wilmington, DE   | 2013                                       |       |            |
| Wisconsin DOT  | State of Wisconsin   | 2009                                       |       |            |

# ATRI Surveys

- Driver Surveys: over 1,400 collected
- Also completed benefit-cost analysis of truck parking reservation systems – impacts on productivity and safety
- Impacts of lost capacity



September 2015

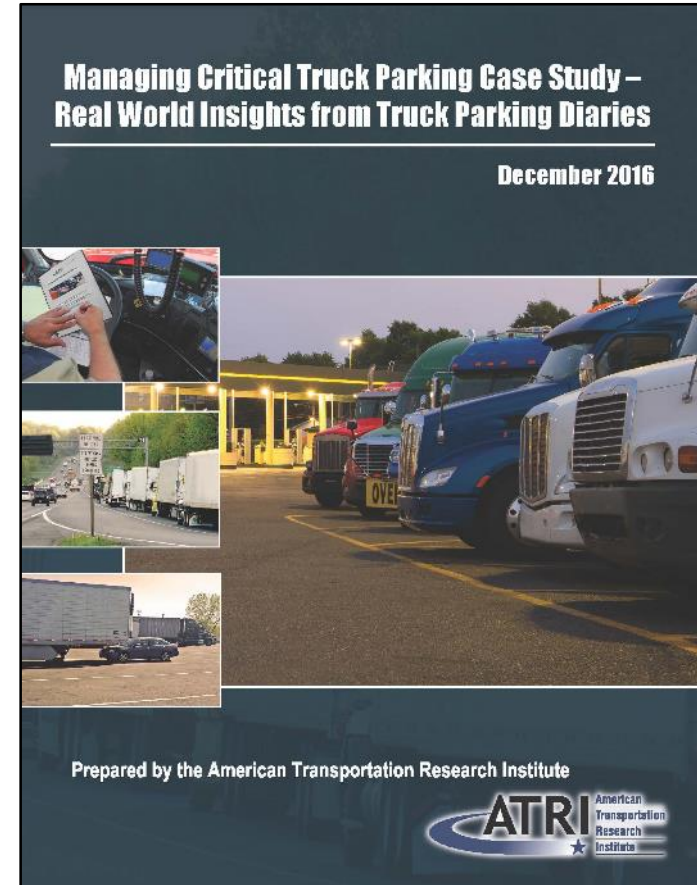
Caroline Boris  
Research Analyst  
American Transportation Research Institute  
Minneapolis, MN

Matthew A. Johnson  
Research Analyst  
American Transportation Research Institute  
Minneapolis, MN



# ATRI Diaries

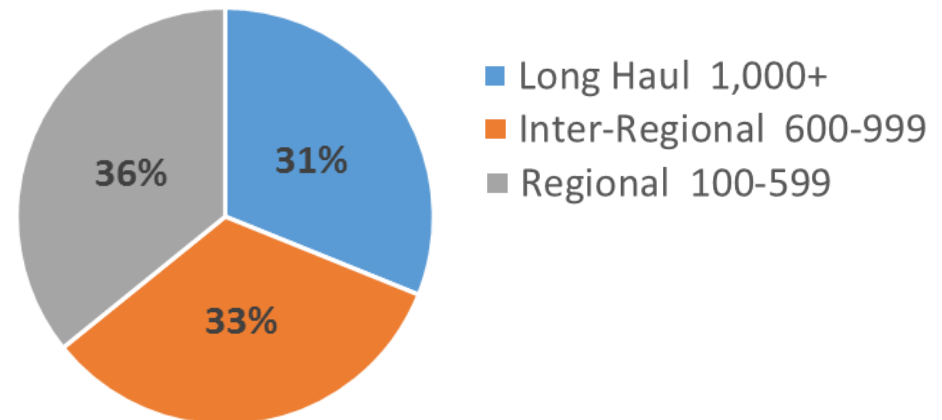
- Truck Parking Diaries
  - 148 completed covering 14 days of activity (Jun – Sep 2016)
  - 2,035 days of truck parking activity
  - 4,763 unique stops
  - When, where, how long to find a spot, Non-CMV parked vehicles, etc



# ATRI Diaries – Key Findings

| Region           | Average Percent of Operating Miles | Percent of Diary Stops |
|------------------|------------------------------------|------------------------|
| Midwest          | 35.5%                              | 34.5%                  |
| Northeast        | 18.6%                              | 11.3%                  |
| <b>Southeast</b> | <b>28.9%</b>                       | <b>32.7%</b>           |
| Southwest        | 19.2%                              | 9.3%                   |
| West Coast       | 18.7%                              | 10.4%                  |
| Canada           | 4.3%                               | 1.7%                   |

**ATRI Diary National Respondents:  
Trip Length (miles per trip)**



## Real Reason for Parking Location

| Importance of Factor                    | Percent of Responses |
|---|----------------------|
| Proximity to Route / Destination        | 96.5%                |
| Restroom / Showers                      | 79.8%                |
| Expected Parking Availability           | 75.5%                |
| Width of Parking Space / Ease of Access | 31.9%                |
| Restaurant                              | 30.5%                |
| Security                                | 20.3%                |
| Company Policy / Loyalty Program        | 18.1%                |
| Internet                                | 6.9%                 |
| Laundry                                 | 4.0%                 |
| Maintenance / Service Center            | 3.7%                 |
| Weather Conditions                      | 3.6%                 |

# Anecdotal Data - ATRI Diaries

## Exceptions to Private Truck Stops?

*"I am reluctant to eat by myself in a sit down restaurant. The women I know would rather think ahead, go grocery shopping and prepare a healthy, quiet meal in the truck while watching our favorite program on DVD. We would also rather use our own porta-potty instead of public facilities, especially at night. So since we have everything we need in our micro homes, all we need is a legal parking space. Rest areas also have more RV dumps and are much quieter at night."*

*- Female Truckload Driver from Missouri*

## Lost Time and Revenue?

*"I've been kicked out of truck stops due to overcrowding. I've been kicked out of rest areas wondering if I will have a safe haven for my 10-hour break. It is the most stressful aspect of the job."*

Flatbed Driver from Alabama





# Driver Perspectives - Parking Issues

- Seeking parking is primarily motivated by **Hours-of-Service** compliance
- Common issues:
  - Parking only available in **unsafe locations**
  - Parking only available on **road shoulders/ramps**
- Finding available parking is **difficult at public rest areas and private truck stops**
- Finding parking is most difficult during the **evening (7PM – midnight)**, followed by **early morning (midnight – 5 AM)**
- Finding parking is more difficult on **weekdays** than on weekends
- Drivers **generally not willing to pay** for reserved parking

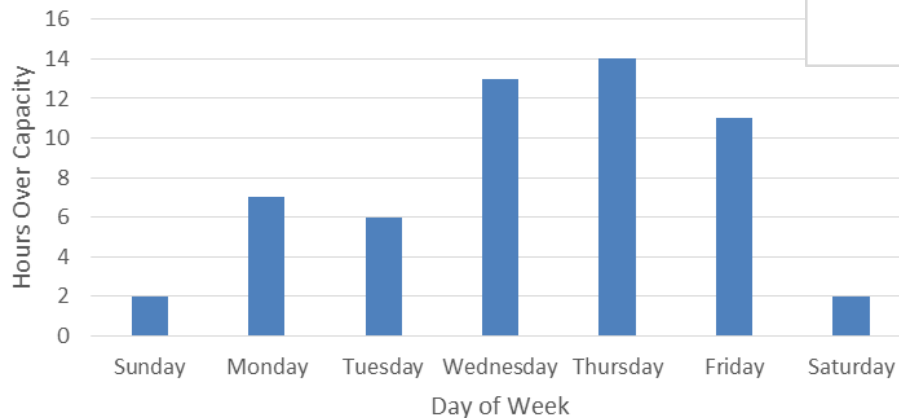
# Driver Perspectives: Technology and Truck Parking

- Smartphones are the most commonly used technology for accessing the internet
- Preferred mechanism for receiving parking availability information:
  - 1) Smartphone applications
  - 2) Dynamic roadside signs
- Drivers prefer to receive parking availability information 20 miles ahead of a parking location

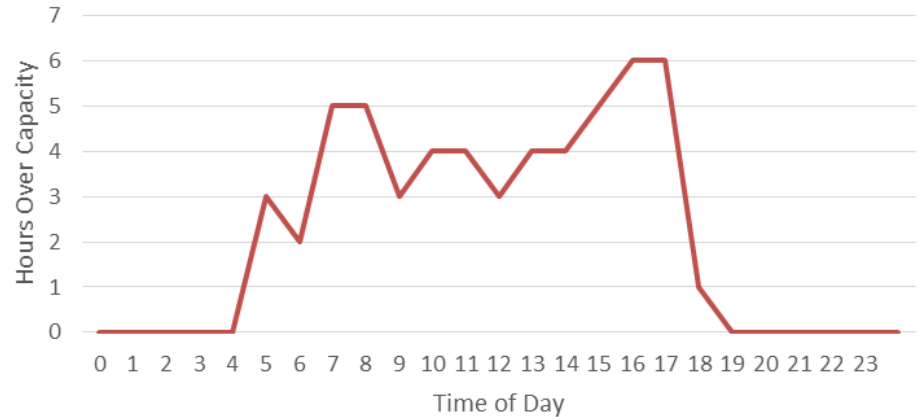
# Parking Supply and Demand

## Previous Studies

Overcapacity by Day of Week  
(October 2015)



Overcapacity by Time of Day  
(October 2015)





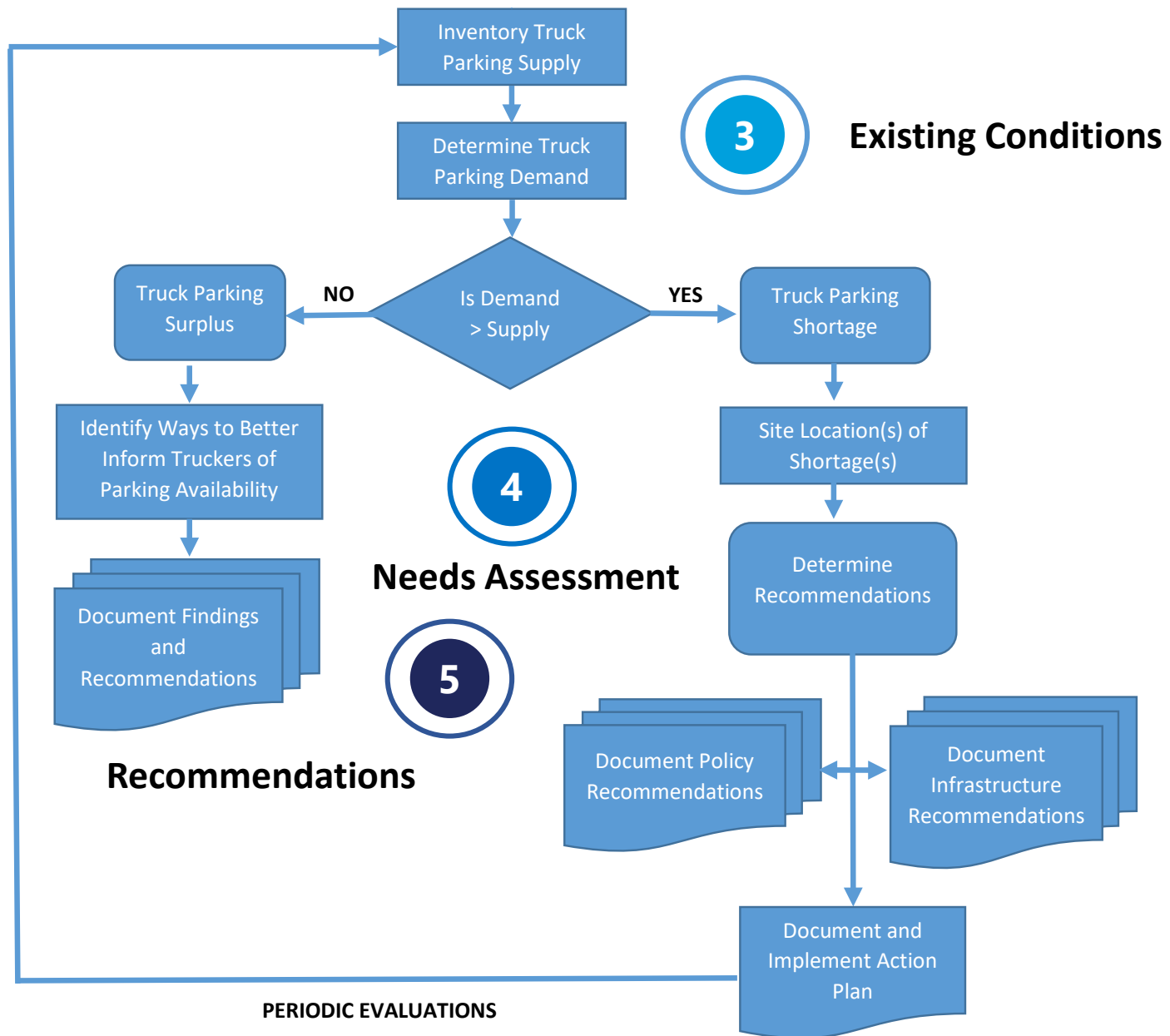
ATLANTA REGIONAL COMMISSION

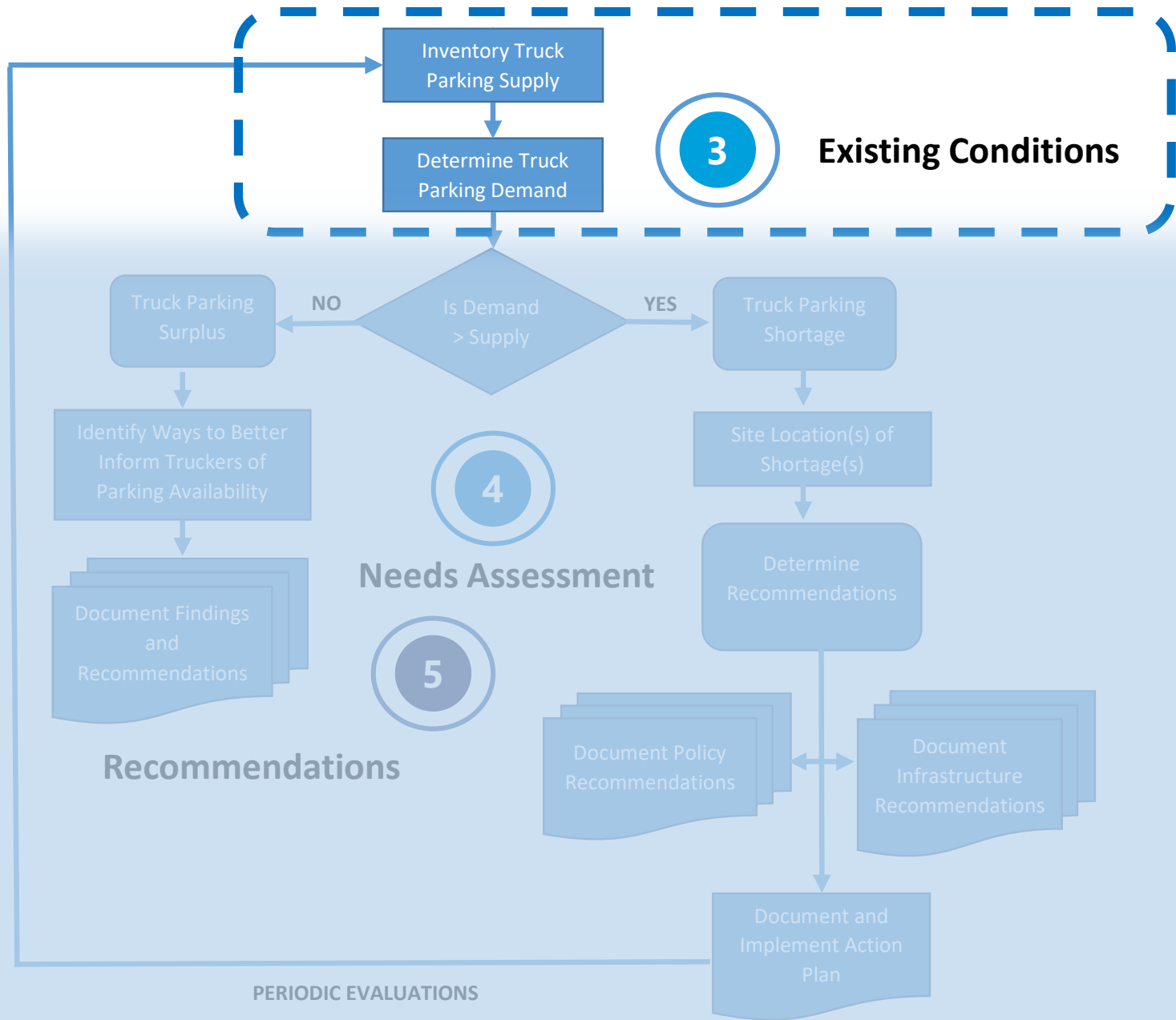
# Atlanta Regional Truck Parking Assessment Study



## Existing Conditions Assessment

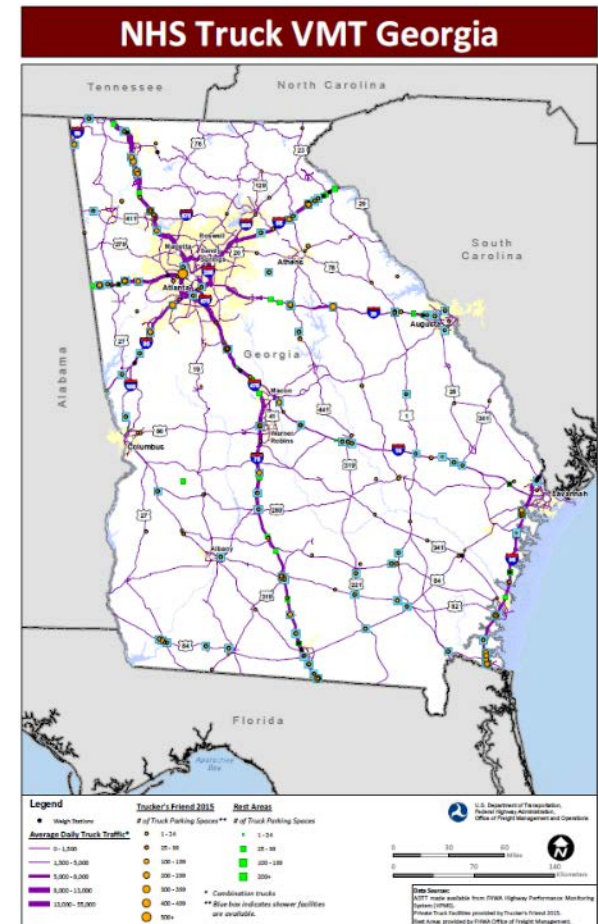
Study Task 3





# Truck Parking Inventory

- ARC Data
- GDOT Data
- Jason's Law Survey Results
- Truck Stop Owners/Operators
- Truck Driver Apps
- GA Environmental Protection Division (EPD)





# Truck Parking Inventory Data

- Name & Store No.
- Source
- Location / Lat-Long
- Exit Number
- No. of Spaces
- Amenities
- Restaurants
- Utilization (TBD)

| Date       | Full Name       | Age | PERSONAL INFORMATION |             |            |             |            |            |              |             |            |            | RELIGION  | CITY          | COUNTRY      | REMARKS                                 |
|------------|-----------------|-----|----------------------|-------------|------------|-------------|------------|------------|--------------|-------------|------------|------------|-----------|---------------|--------------|---|
|            |                 |     | First Name           | Second Name | Third Name | Fourth Name | Fifth Name | Sixth Name | Seventh Name | Eighth Name | Ninth Name | Tenth Name |           |               |              |   |
| 2020-01-01 | John Doe        | 30  | John                 | Doe         |            |             |            |            |              |             |            |            | Christian | New York      | USA          | First Name: John, Last Name: Doe        |
| 2020-01-02 | Jane Smith      | 25  | Jane                 | Smith       |            |             |            |            |              |             |            |            | Muslim    | Los Angeles   | USA          | First Name: Jane, Last Name: Smith      |
| 2020-01-03 | Michael Johnson | 35  | Michael              | Johnson     |            |             |            |            |              |             |            |            | Hindu     | Chicago       | USA          | First Name: Michael, Last Name: Johnson |
| 2020-01-04 | Emily White     | 28  | Emily                | White       |            |             |            |            |              |             |            |            | Buddhist  | San Francisco | USA          | First Name: Emily, Last Name: White     |
| 2020-01-05 | David Brown     | 32  | David                | Brown       |            |             |            |            |              |             |            |            | Jewish    | London        | UK           | First Name: David, Last Name: Brown     |
| 2020-01-06 | Sarah Green     | 27  | Sarah                | Green       |            |             |            |            |              |             |            |            | Sikh      | Delhi         | India        | First Name: Sarah, Last Name: Green     |
| 2020-01-07 | Robert Black    | 31  | Robert               | Black       |            |             |            |            |              |             |            |            | Christian | Paris         | France       | First Name: Robert, Last Name: Black    |
| 2020-01-08 | Lisa Taylor     | 26  | Lisa                 | Taylor      |            |             |            |            |              |             |            |            | Muslim    | Beijing       | China        | First Name: Lisa, Last Name: Taylor     |
| 2020-01-09 | James Wilson    | 33  | James                | Wilson      |            |             |            |            |              |             |            |            | Hindu     | Mumbai        | India        | First Name: James, Last Name: Wilson    |
| 2020-01-10 | Alice Davis     | 29  | Alice                | Davis       |            |             |            |            |              |             |            |            | Buddhist  | Tokyo         | Japan        | First Name: Alice, Last Name: Davis     |
| 2020-01-11 | Benjamin Miller | 34  | Benjamin             | Miller      |            |             |            |            |              |             |            |            | Jewish    | Jerusalem     | Israel       | First Name: Benjamin, Last Name: Miller |
| 2020-01-12 | Olivia Moore    | 28  | Olivia               | Moore       |            |             |            |            |              |             |            |            | Sikh      | Amritsar      | India        | First Name: Olivia, Last Name: Moore    |
| 2020-01-13 | William Clark   | 36  | William              | Clark       |            |             |            |            |              |             |            |            | Christian | London        | UK           | First Name: William, Last Name: Clark   |
| 2020-01-14 | Grace King      | 27  | Grace                | King        |            |             |            |            |              |             |            |            | Muslim    | Mecca         | Saudi Arabia | First Name: Grace, Last Name: King      |
| 2020-01-15 | Henry Lee       | 31  | Henry                | Lee         |            |             |            |            |              |             |            |            | Hindu     | Varanasi      | India        | First Name: Henry, Last Name: Lee       |
| 2020-01-16 | Ivy Scott       | 26  | Ivy                  | Scott       |            |             |            |            |              |             |            |            | Buddhist  | Phnom Penh    | Cambodia     | First Name: Ivy, Last Name: Scott       |
| 2020-01-17 | Jack Adams      | 32  | Jack                 | Adams       |            |             |            |            |              |             |            |            | Jewish    | London        | UK           | First Name: Jack, Last Name: Adams      |
| 2020-01-18 | Karen Baker     | 29  | Karen                | Baker       |            |             |            |            |              |             |            |            | Sikh      | Amritsar      | India        | First Name: Karen, Last Name: Baker     |
| 2020-01-19 | Leo Hall        | 35  | Leo                  | Hall        |            |             |            |            |              |             |            |            | Christian | London        | UK           | First Name: Leo, Last Name: Hall        |
| 2020-01-20 | Mia Young       | 28  | Mia                  | Young       |            |             |            |            |              |             |            |            | Muslim    | London        | UK           | First Name: Mia, Last Name: Young       |
| 2020-01-21 | Noah Gray       | 33  | Noah                 | Gray        |            |             |            |            |              |             |            |            | Hindu     | London        | UK           | First Name: Noah, Last Name: Gray       |
| 2020-01-22 | Oliver King     | 27  | Oliver               | King        |            |             |            |            |              |             |            |            | Buddhist  | London        | UK           | First Name: Oliver, Last Name: King     |
| 2020-01-23 | Peter Lee       | 31  | Peter                | Lee         |            |             |            |            |              |             |            |            | Jewish    | London        | UK           | First Name: Peter, Last Name: Lee       |
| 2020-01-24 | Quinn White     | 26  | Quinn                | White       |            |             |            |            |              |             |            |            | Sikh      | London        | UK           | First Name: Quinn, Last Name: White     |
| 2020-01-25 | Rachel Brown    | 32  | Rachel               | Brown       |            |             |            |            |              |             |            |            | Christian | London        | UK           | First Name: Rachel, Last Name: Brown    |
| 2020-01-26 | Samuel Green    | 29  | Samuel               | Green       |            |             |            |            |              |             |            |            | Muslim    | London        | UK           | First Name: Samuel, Last Name: Green    |
| 2020-01-27 | Tina Black      | 34  | Tina                 | Black       |            |             |            |            |              |             |            |            | Hindu     | London        | UK           | First Name: Tina, Last Name: Black      |
| 2020-01-28 | Uma White       | 28  | Uma                  | White       |            |             |            |            |              |             |            |            | Buddhist  | London        | UK           | First Name: Uma, Last Name: White       |
| 2020-01-29 | Victor Black    | 31  | Victor               | Black       |            |             |            |            |              |             |            |            | Jewish    | London        | UK           | First Name: Victor, Last Name: Black    |
| 2020-01-30 | Wendy White     | 27  | Wendy                | White       |            |             |            |            |              |             |            |            | Sikh      | London        | UK           | First Name: Wendy, Last Name: White     |
| 2020-01-31 | Xavier Black    | 33  | Xavier               | Black       |            |             |            |            |              |             |            |            | Christian | London        | UK           | First Name: Xavier, Last Name: Black    |
| 2020-02-01 | Yara White      | 26  | Yara                 | White       |            |             |            |            |              |             |            |            | Muslim    | London        | UK           | First Name: Yara, Last Name: White      |
| 2020-02-02 | Zoe Black       | 32  | Zoe                  | Black       |            |             |            |            |              |             |            |            | Hindu     | London        | UK           | First Name: Zoe, Last Name: Black       |

STUDY AREA PUBLIC TRUCK PARKING FACILITIES

| Parking spaces & Ter location source |                                |                |         |           |            |         |    |       |             |
|--------------------------------------|--------------------------------|----------------|---------|-----------|------------|---------|----|-------|-------------|
| Source                               | Rest Stop                      | City           | County  | Latitude  | Longitude  | PARKING |    |       |             |
|                                      |                                |                |         |           |            | EPD     | JL | Hours | Utilization |
| EPD                                  | I-20 WB (MM 108)               | Rutledge       | Morgan  | 33.346646 | -83.343880 | 41      |    |       |             |
| EPD                                  | I 20 FB (MM 143)               | Rutledge       | Morgan  | 33.361027 | -83.394163 |         |    |       |             |
| EPD01                                | I-20 Ga Veterans Cir (MM 1)    | Parisison      | Parason | 33.577721 | -85.320966 | 55      | 47 | 21    |             |
| EPD01                                | I-20 WB (MM 15)                | Brewen         | Carroll | 33.696    | -85.045    | 30      | 52 | 24    |             |
| Jason's Law                          | GA Veterans Station EB (MM 43) | Lithia Springs | Douglas | 33.772    | -85.393    |         | 13 | 20    |             |

# Truck Parking Tiers



## Truck Parking Tiers

1

### Publicly-Controlled

- Rest Areas
- Weigh-in-Motion Areas

2a

### Privately-Owned Primary

- Truck Stops
- Commercial Transport Services

2b

### Privately-Owned Secondary

- Restaurants / Commercial Areas
- Hotels/Motels
- Shippers

3

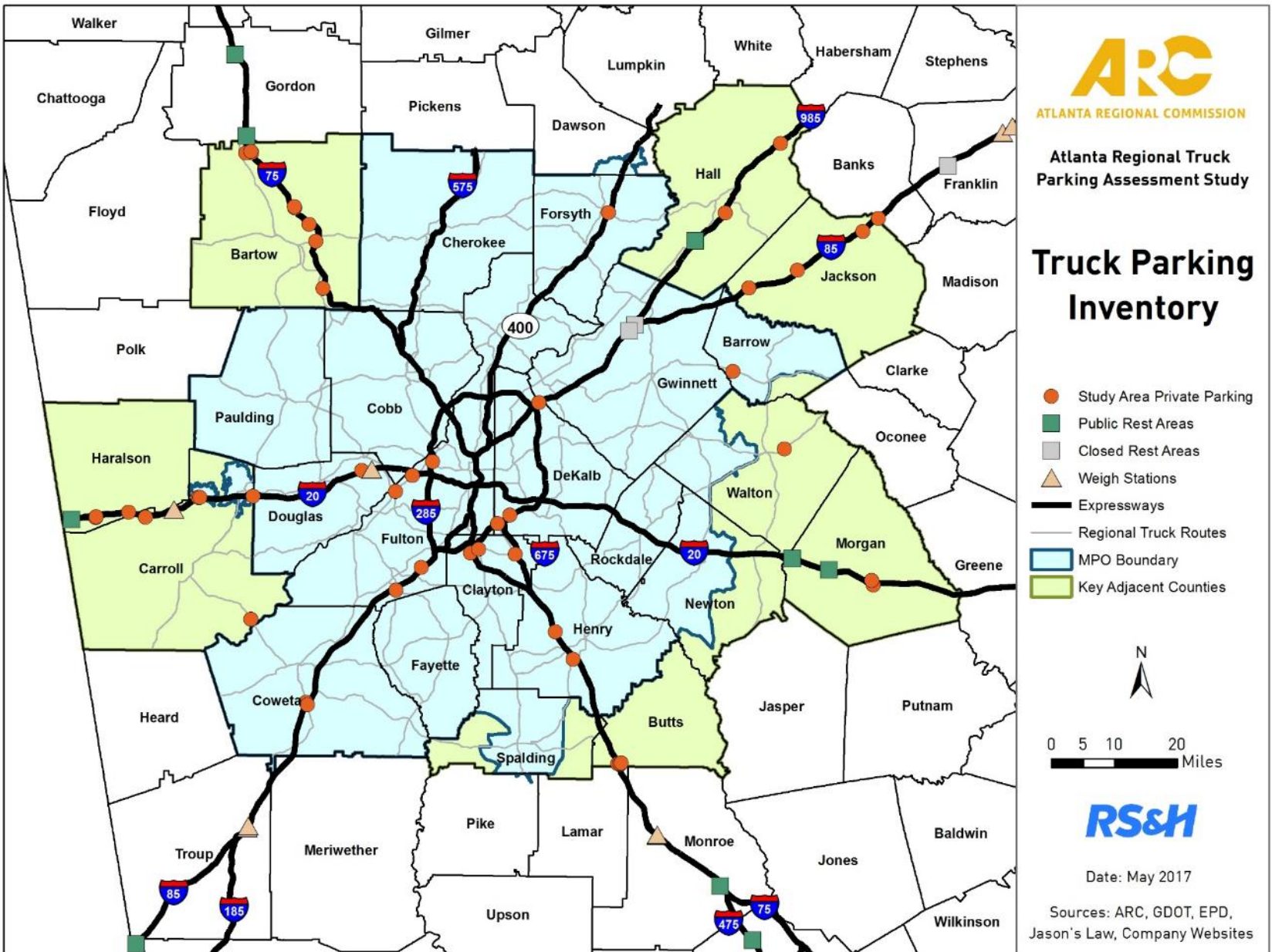
### Unauthorized

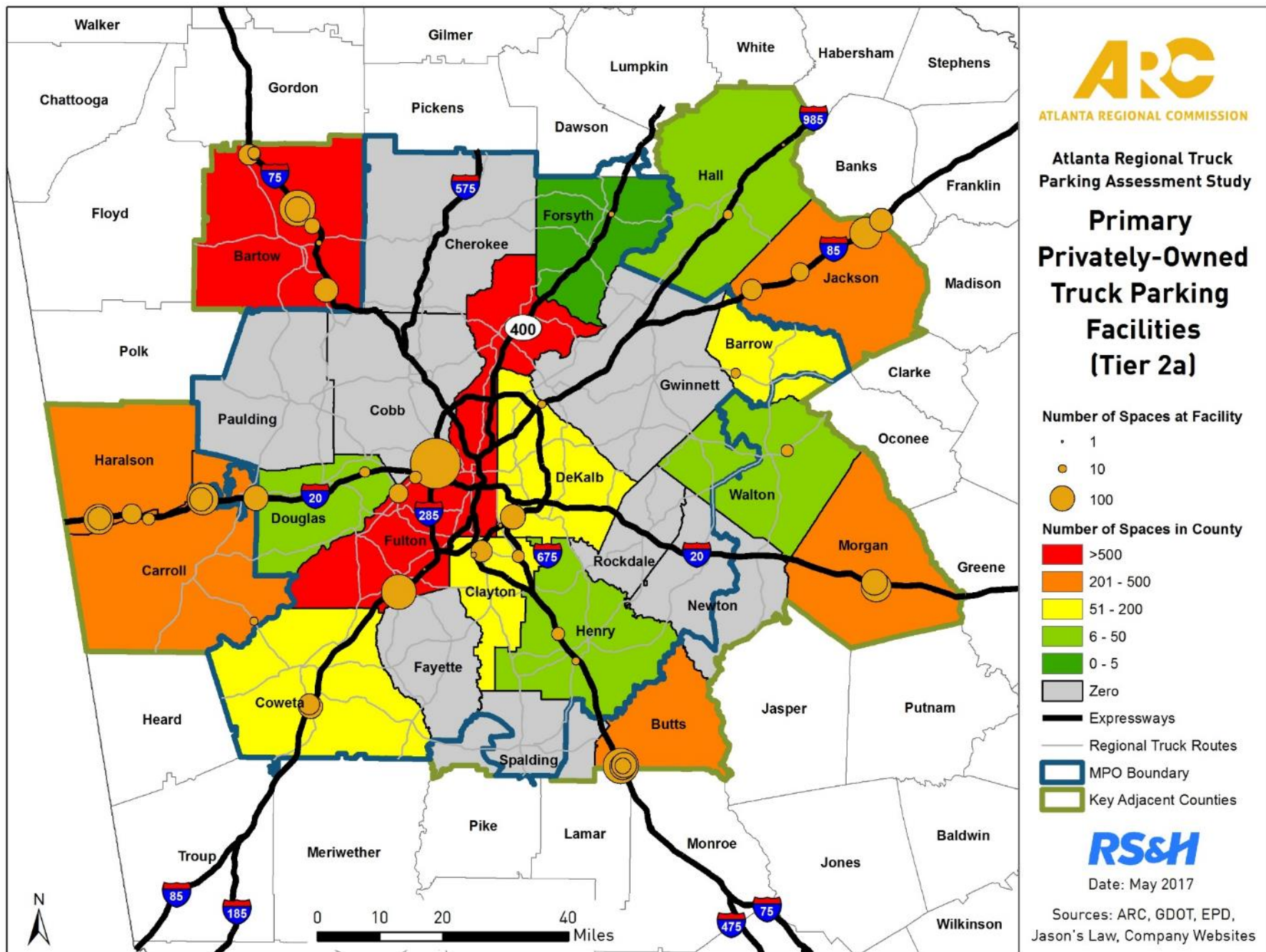
- Interstate Ramps
- Vacant / Abandoned Lots







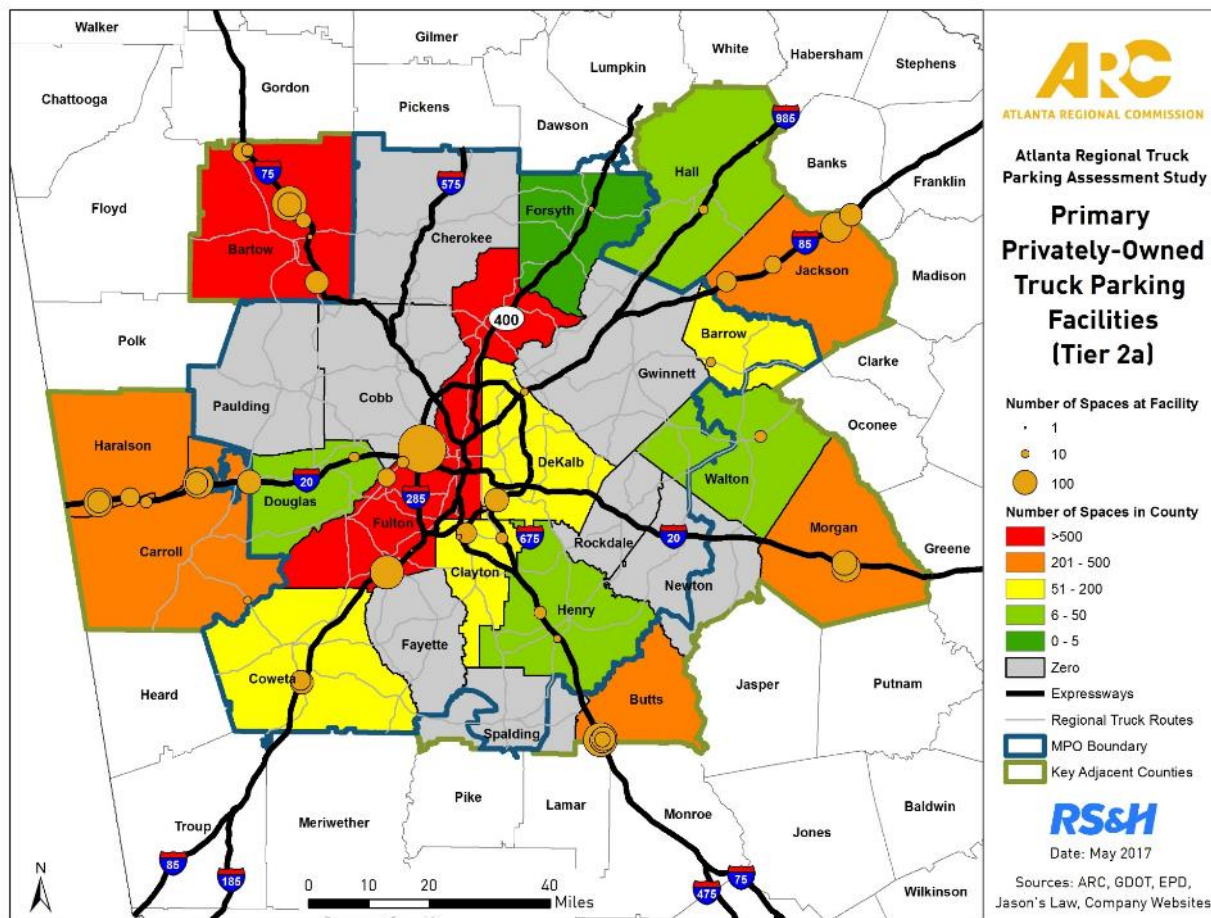






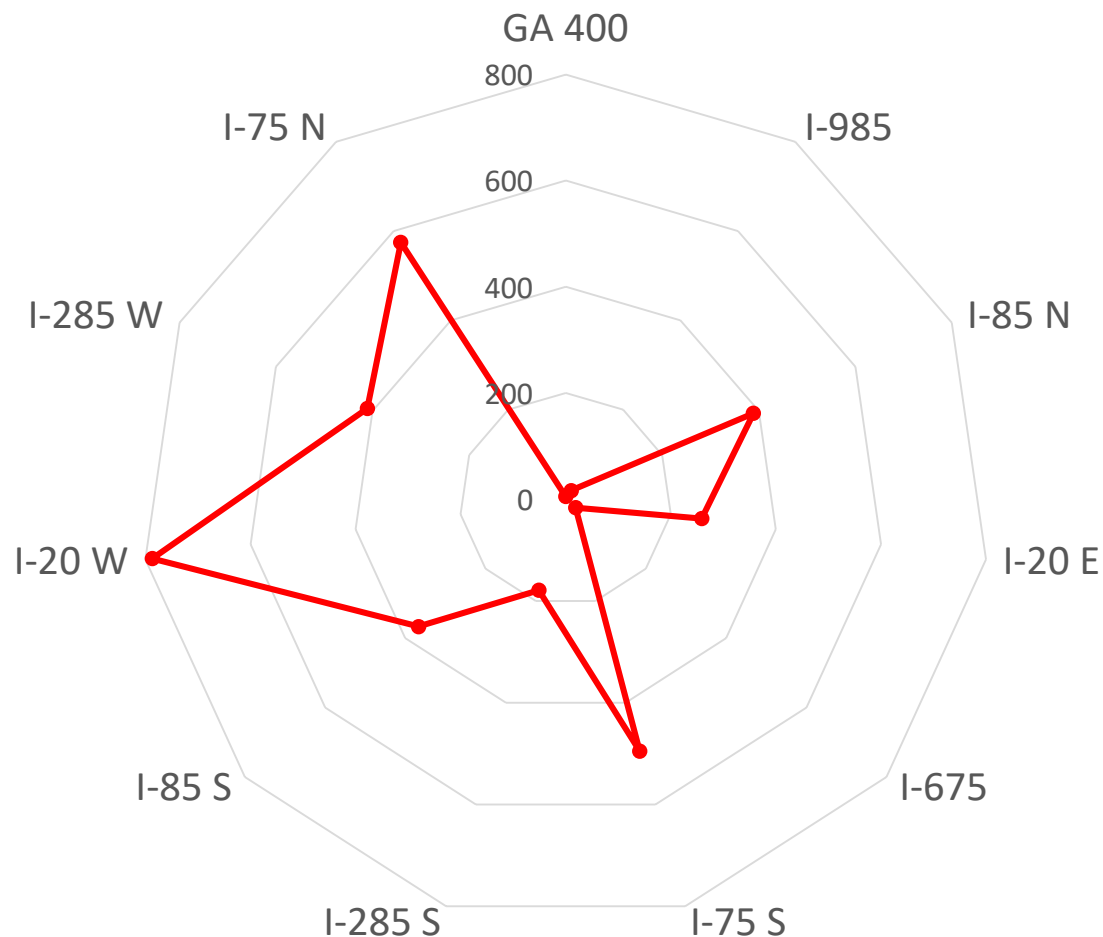
# Private Spaces by County

| County   | Spaces |
|----------|--------|
| Fulton   | 698    |
| Bartow   | 575    |
| Butts    | 450    |
| Carroll  | 360    |
| Haralson | 332    |
| Jackson  | 309    |
| Morgan   | 259    |
| Coweta   | 165    |
| DeKalb   | 114    |
| Clayton  | 105    |
| Barrow   | 85     |
| Henry    | 40     |
| Walton   | 25     |
| Douglas  | 20     |
| Hall     | 19     |
| Forsyth  | 5      |
| Total    | 3,561  |



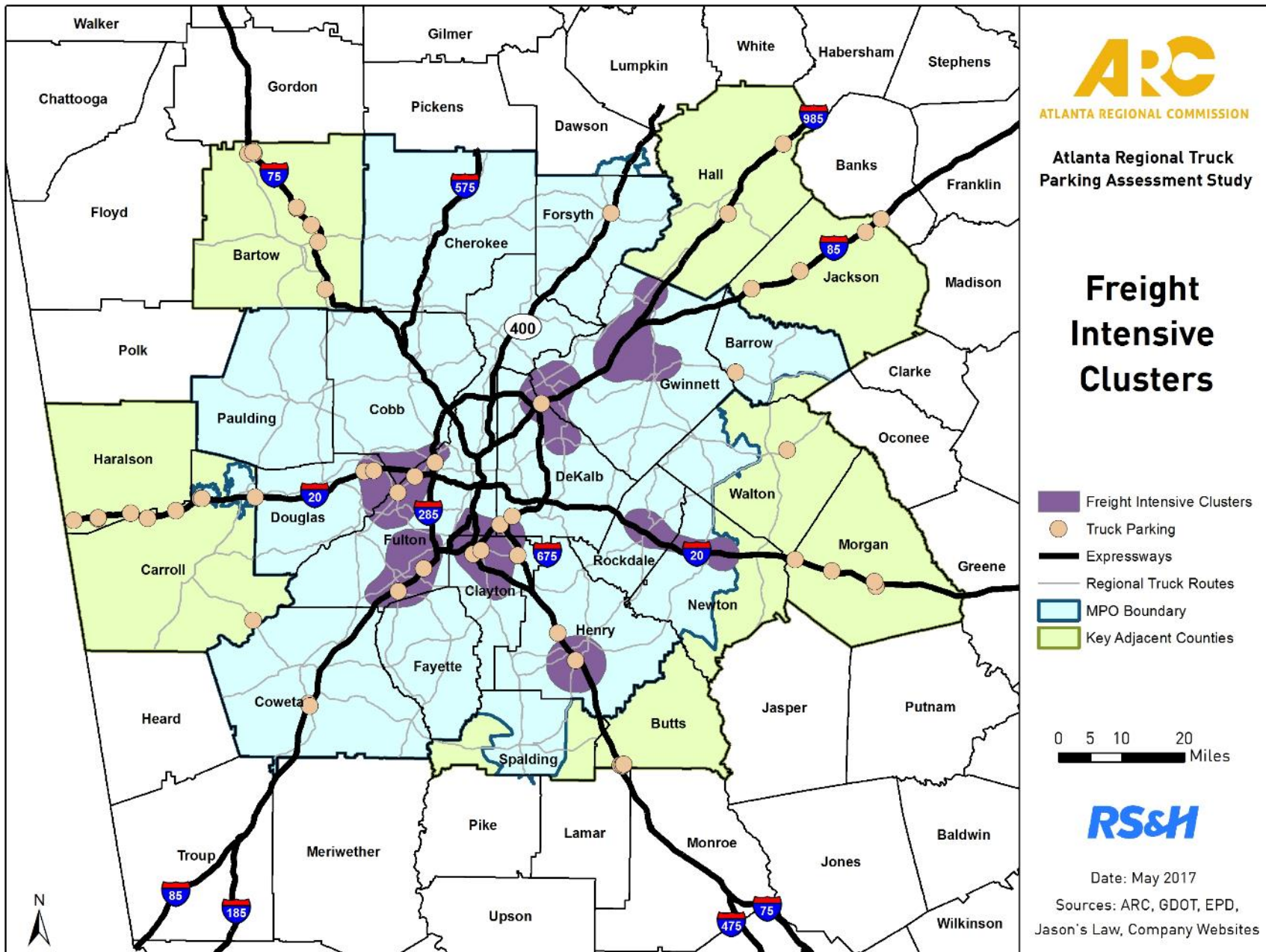
# Private Spaces by Corridor

| Corridor  | MPO | Adjacent | Total |
|-----------|-----|----------|-------|
| GA 400    | 5   | 0        | 5     |
| I-985     | 0   | 19       | 19    |
| I-85 N    | 10  | 379      | 389   |
| I-285 N&E | 0   | 0        | 0     |
| I-20 E    | 0   | 259      | 259   |
| I-675     | 25  | 0        | 25    |
| I-75 S    | 45  | 450      | 495   |
| I-85 S    | 367 | 0        | 367   |
| I-285 S   | 179 | 0        | 179   |
| I-20 W    | 355 | 432      | 787   |
| I-285 W   | 411 | 0        | 411   |
| I-75 N    | 0   | 575      | 575   |













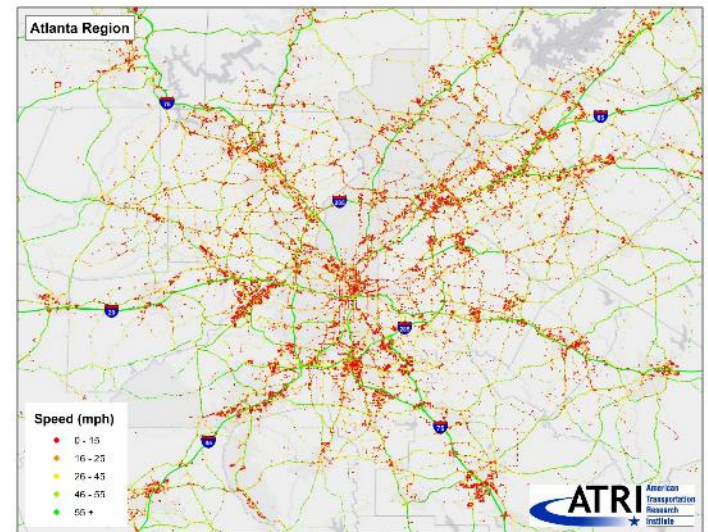






# GPS Truck Data

- Maintained by the American Transportation Research Institute (ATRI)
- Evaluation of stopped/parked trucks by time period
- Parking location utilization and/or unauthorized parking





# Atlanta Region

11/5/16 – 11/20/16

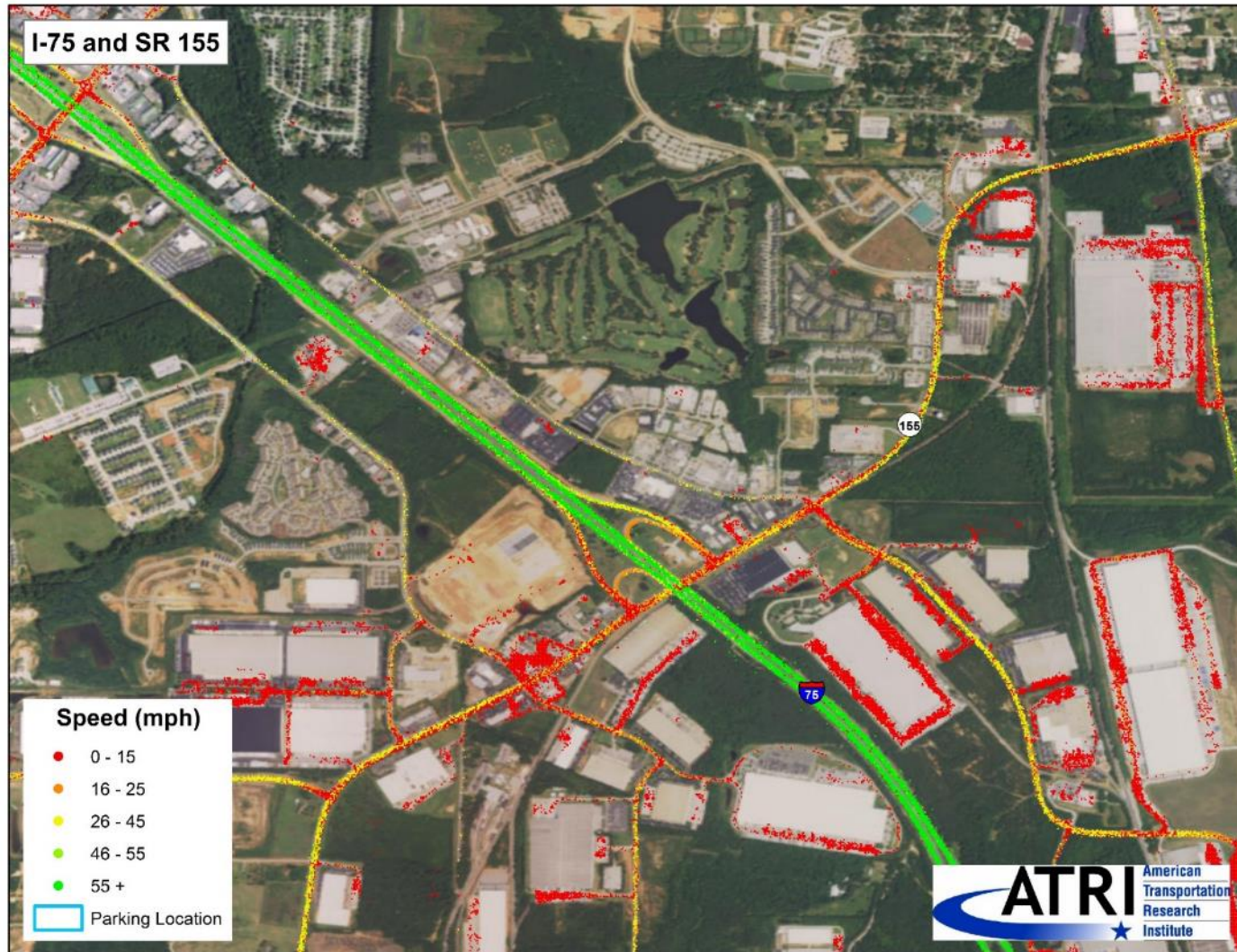
## Speed (mph)

- 0 - 15
- 16 - 25
- 26 - 45
- 46 - 55
- 55 +



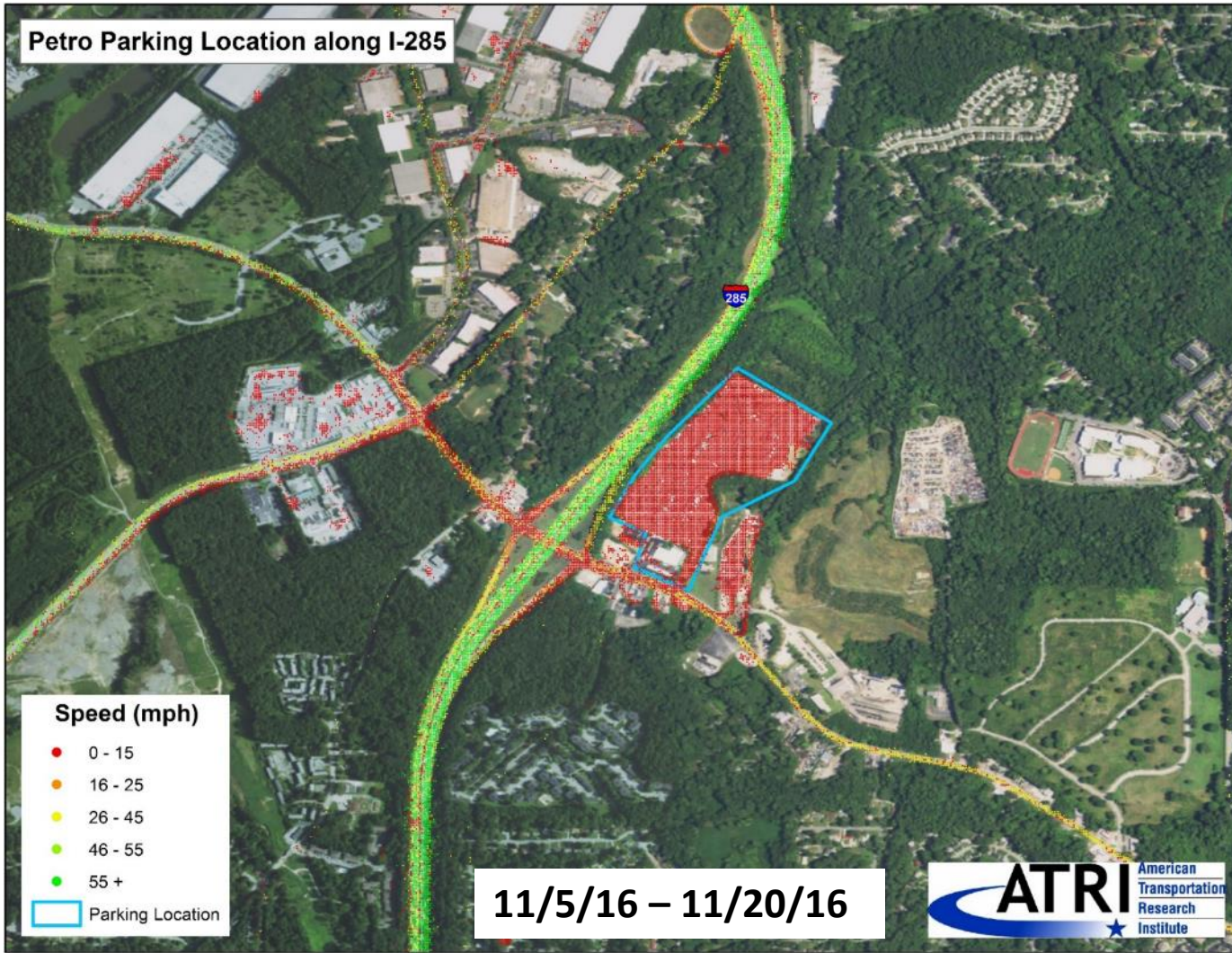
# I-75 at SR 155

11/5/16 – 11/20/16



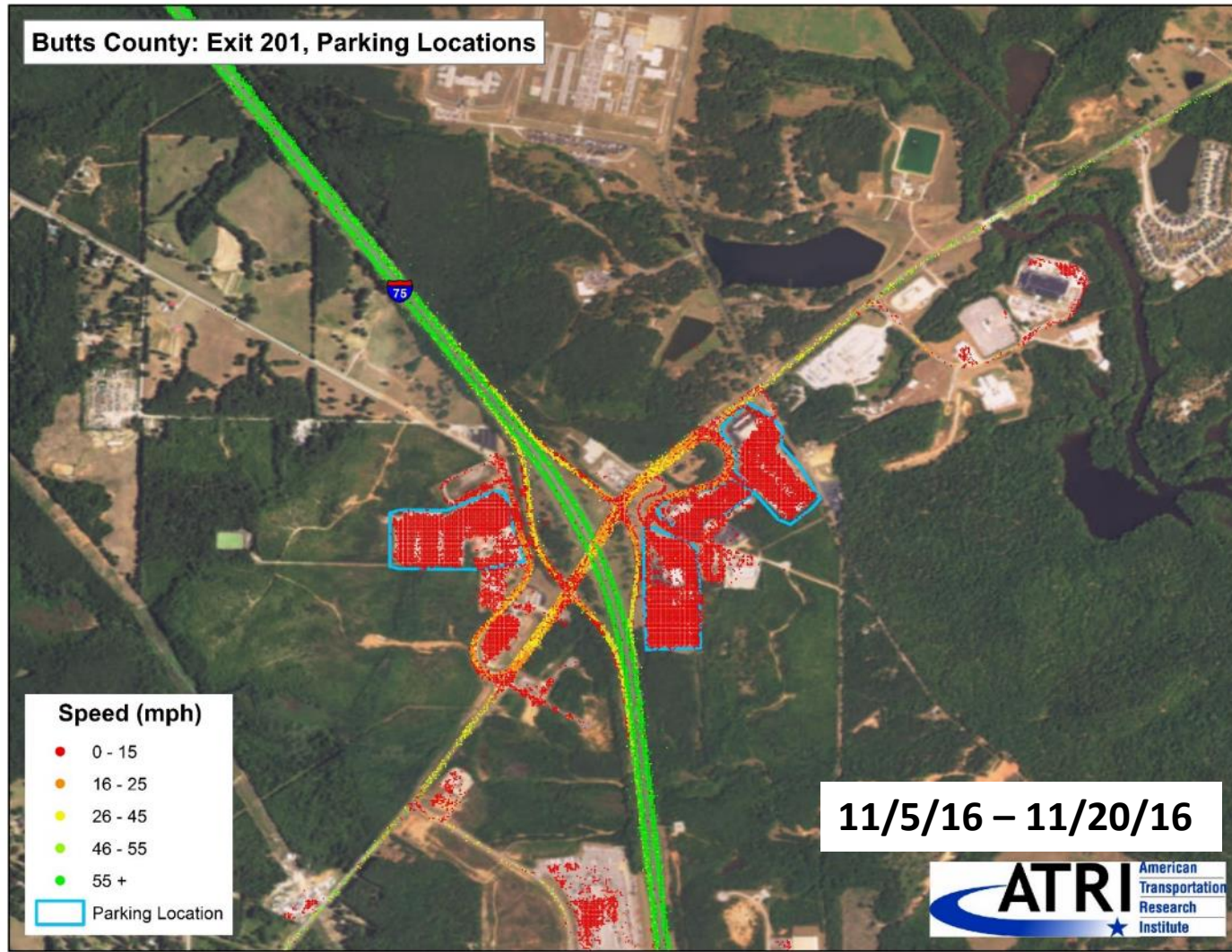


# I-285 at US 78 / Hollowell Parkway





# I-75 at SR 36 (Butts County)





ATLANTA REGIONAL COMMISSION

# Atlanta Regional Truck Parking Assessment Study



## Outreach Update

# Outreach Activities

## ■ Surveys

- Truck Drivers
- Stakeholders
  - Local Jurisdictions & CIDs
  - Law Enforcement Officials
  - Truck Stop Owners/Operators
  - Shippers/Receivers & Private Fleets



## ■ Stakeholder Interviews

## ■ Meetings

- Freight Advisory Task Force (FATF)
- ARC Committees

# Truck Driver Survey

- Background / Demographic Data
- Rating of Regional Corridors by Truck Parking Availability
- Other Qualitative Information About Truck Parking

| Regional Routes                                 | Availability of Existing Truck Parking<br>(5 = Sufficient Parking; 1 = Parking Not Available) |   |   |   |   | Route Not Used |
|---|---|---|---|---|---|----------------|
|   | 5   | 4 | 3 | 2 | 1 |                |
| I-75 North                                      |   |   |   |   |   |                |
| I-85 North                                      |   |   |   |   |   |                |
| I-20 East                                       |   |   |   |   |   |                |
| I-675   |   |   |   |   |   |                |
| I-75 South                                      |   |   |   |   |   |                |
| I-85 South                                      |   |   |   |   |   |                |
| I-20 West                                       |   |   |   |   |   |                |
| I-285 North & East<br>(I-75 north to I-20 east) |   |   |   |   |   |                |
| I-285 South (I-20 east to I-85 south)           |   |   |   |   |   |                |
| I-285 West (I-85 south to I-75 north)           |   |   |   |   |   |                |





# Stakeholder Survey

Stakeholder's Survey with WikiMapping@/Atlanta Regional Truck Parking Assessment Study

Contact Information

The Atlanta Regional Commission (ARC) is conducting this survey to assess the current and future truck parking needs within the Atlanta Region. We are requesting your name and contact information for informational purposes only for ARC and the Study Team; it will not be shared or sold to any third parties.

1. Name:

2. Organization:

3. Email Address:

4. Phone number (optional)

5. What industry do you work in?

☐ Local jurisdiction Community Improvement District (CID) (staff or elected official)

☐ Law enforcement

☐ Own or operate a private truck stop or convenience store (or something related)

☐ Trucking company, shipper, or company with a private fleet

<https://www.surveymonkey.com/r/ARCTruckParking>

# Stakeholder Survey

## 5. What industry do you work in?

- ☒ Local jurisdiction Community Improvement District (CID) (staff or elected official)
- ☐ Law enforcement
- ☐ Own or operate a private truck stop or convenience store (or something related)
- ☐ Trucking company, shipper, or company with a private fleet

Next

# Stakeholder Survey

9. What are some devices, tools, or technologies your jurisdiction employs or could employ to communicate with truckers?

10. What are your top 3 issues with truck parking in your jurisdiction?

Issue 1:

Issue 2:

Issue 3:

11. What are your top 3 strategies for addressing the issues with truck parking in your jurisdiction?

Strategy 1:

Strategy 2:

Strategy 3:

**Please follow this link to finish the survey in Wikimapping:**

**[Wikimapping Local Jurisdiction Survey](#)**

Prev

Next



# Trucking company, shipper, or company with a private fleet

13. Using the above map, please indicate the rating you could give to each corridor listed. 

|  | Parking not available | Limited parking / Rarely available | Limited parking / Sometimes available | Sufficient parking / Sometimes available | Sufficient Parking / Always available | Unfamiliar with this route |
|--|-----------------------|------------------------------------|---------------------------------------|--|---------------------------------------|----------------------------|
| I-75 North                                   | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-85 North                                   | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-20 East                                    | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-675  | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-75 South                                   | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-85 South                                   | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-20 West                                    | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-285 North & East (I-75 north to I-20 east) | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-285 South (I-20 east to I-85 south)        | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |
| I-285 West (I-85 south to I-75 north)        | <input type="radio"/> | <input type="radio"/>              | <input type="radio"/>                 | <input type="radio"/>                    | <input type="radio"/>                 | <input type="radio"/>      |

Other regional routes (please specify major ones)



**Arc**  
WITH NO OTHER EDITORS



1. Where your truck stop is located.
2. Where you think there is a need for an additional private truck stop(s).
3. Where you think there is a need for expansion to an existing private truck stop(s).

You may add as many points per category as you wish, by clicking on the "Points" tab. Detailed instructions on how to do this can be found under the "About & Help" tab located in the blue header at the top of the map. Once you click on the tab a menu will drop down allowing you to then click on instructions.

Use your email address to login and make comments, and to receive project notifications.

Email Address

Continue To Map

# WikiMapping

**Atlanta Regional Truck Parking Assessment (Truck Stop or Convenience Store Survey)** About & Help ▾ Points

caroline.evans@bluecypress-consulting.com | Draft Project

**Points**

Select point type and then place on map.

- ☐ Your Truck Stop
- ☐ Potential New Truck Stop
- ☐ Potential Expansion



# WikiMapping



Atlanta Regional Truck Parking Assessment (Truck Stop or Convenience Store Survey)

About & Help

Points

I'm Here

caroline.evans@bluecypress-consulting.com | Draft Project



Description

Category: ☒ Potential New Truck Stop

What makes this location ideal for a private truck stop?

What challenges would you foresee in trying to locate a private truck stop in this location?

Submit Cancel



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# Atlanta Regional Truck Parking Assessment Study



## Next Steps

# Next Steps – Technical

- Complete truck GPS analysis
- Complete peer and literature review
- Begin parking demand analysis
- Documentation



# Next Steps – Outreach

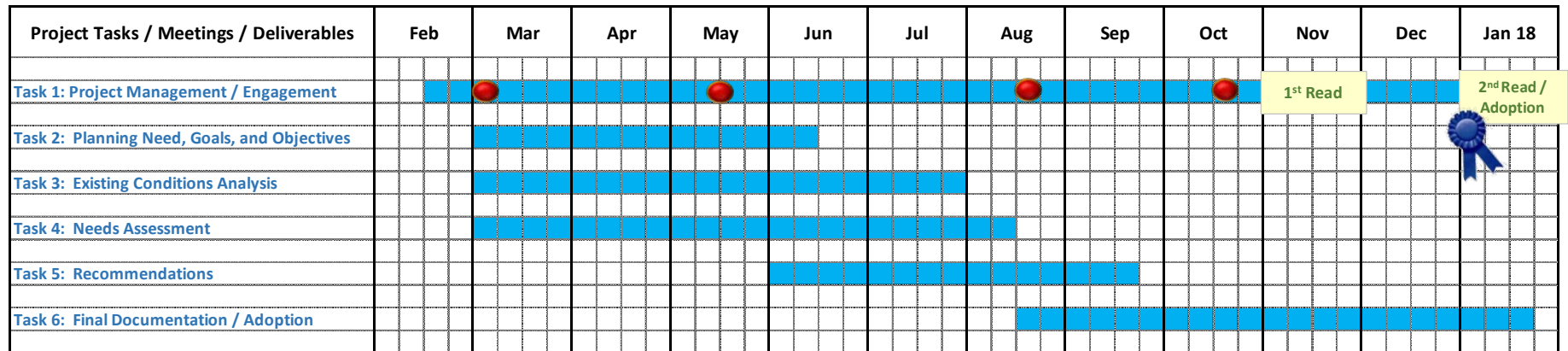
- Present to TCC (5-19-17)
- Distribute Surveys to Stakeholder and ATRI contact databases
- Initiate Stakeholder Interviews
- Prepare for next FATF Meeting – August 2017






# Next Steps

## Proposed Project Schedule Atlanta Regional Truck Parking Assessment Study (2017-2018)



 Potential FATF Meeting

Revised: 05-15-17





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# Atlanta Regional Truck Parking Assessment Study



## Questions?

## **Appendix 2-D**

### **Freight Advisory Task Force Meeting 3**

# Atlanta Regional Truck Parking Assessment Study



## Needs Assessment

Freight Advisory Task Force (FATF)

*August 14, 2017*

# Today's Discussion

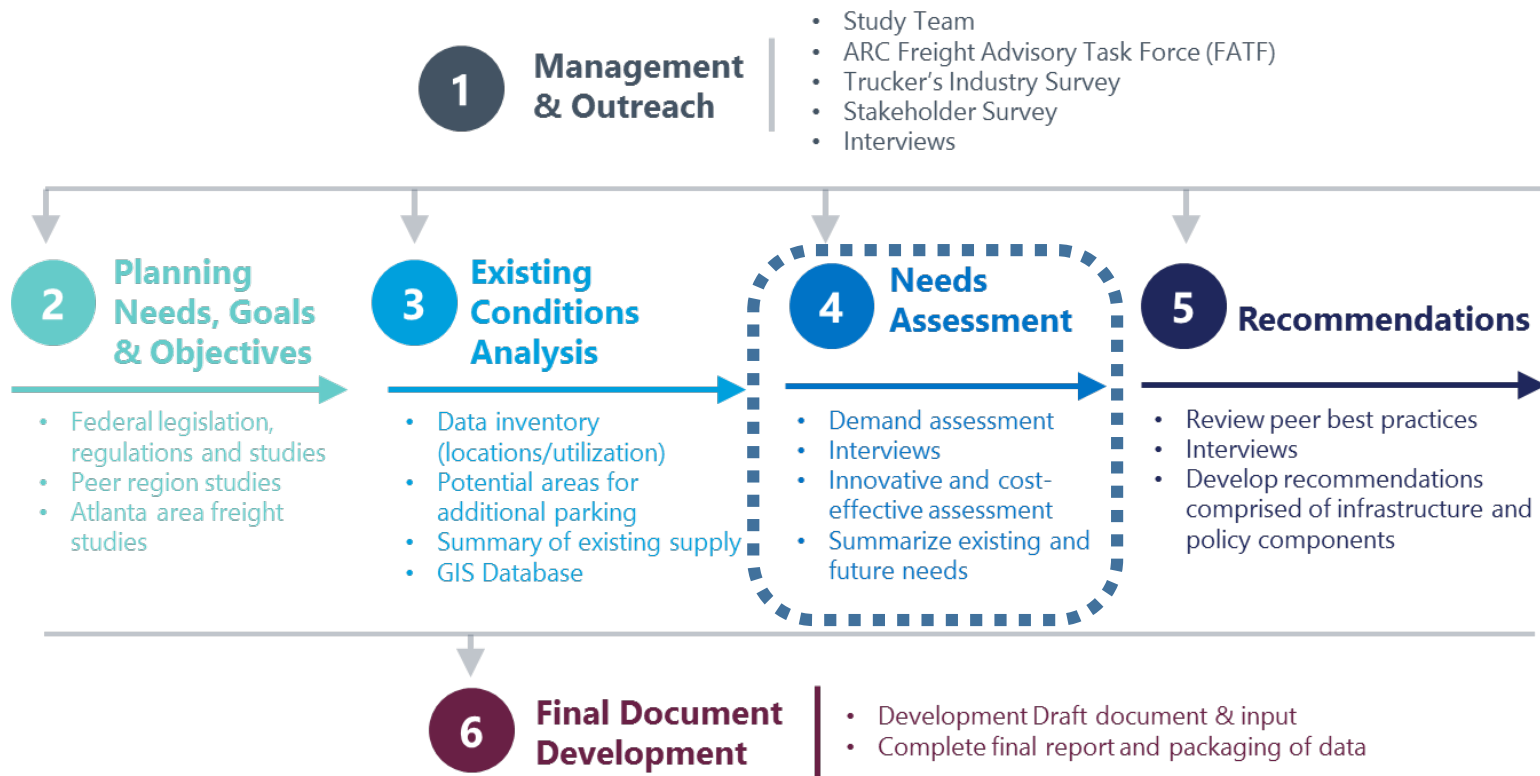
- Technical Analysis Update
- Outreach Update
- Summary of Needs
- Next Steps



# Study Approach



## Atlanta Regional Truck Parking Assessment Study





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# Atlanta Regional Truck Parking Assessment Study

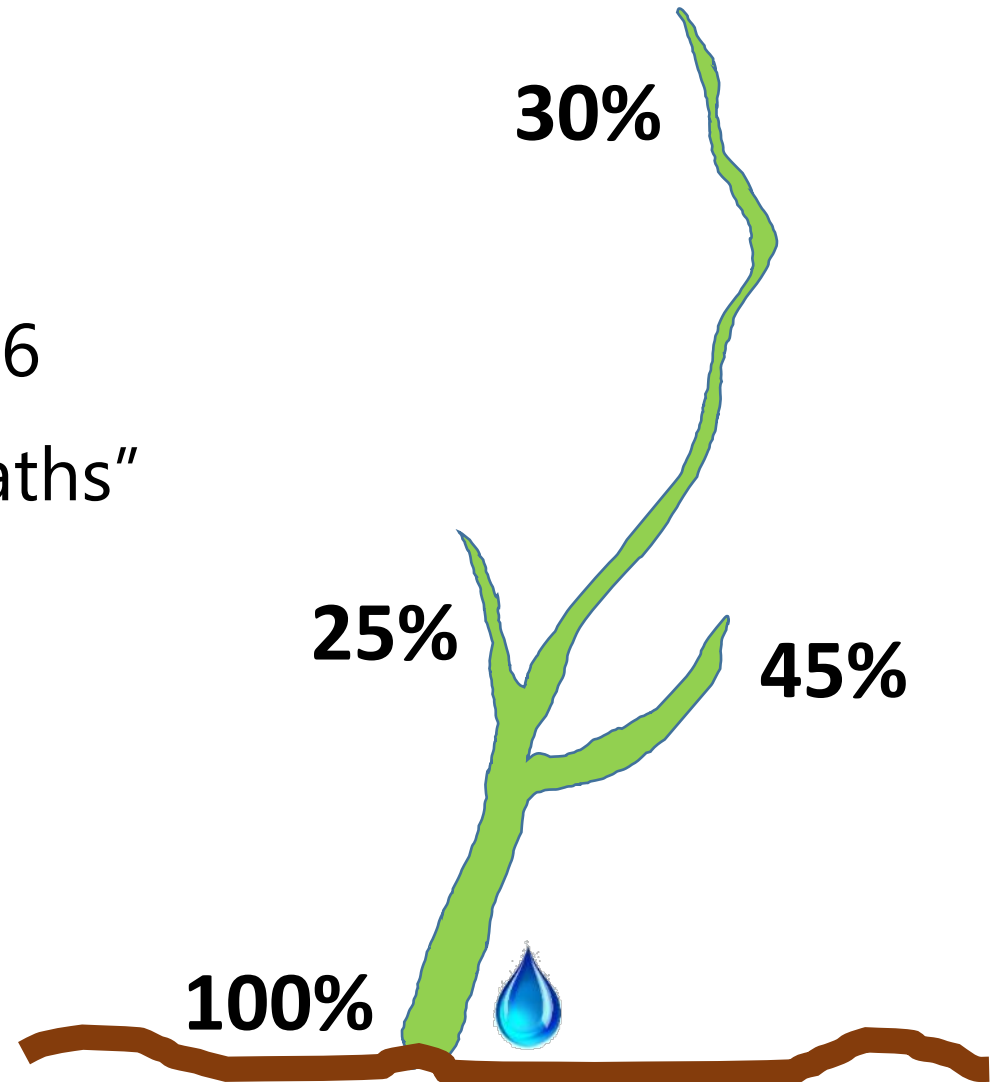


## Technical Analysis Truck Freight Flows

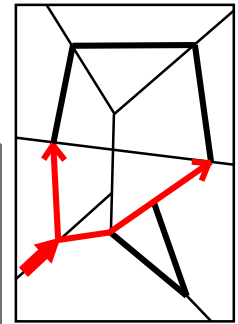
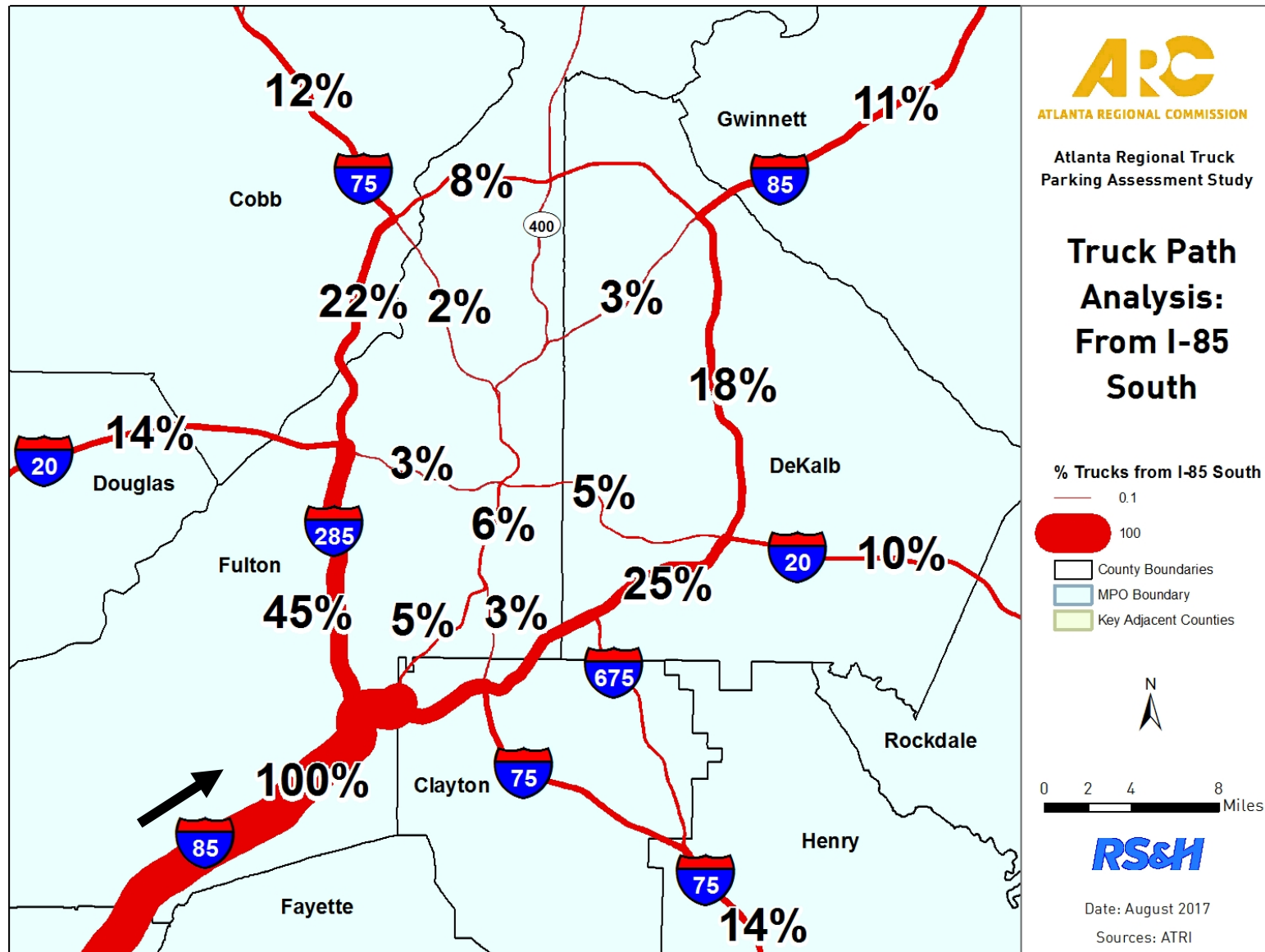


# Methodology

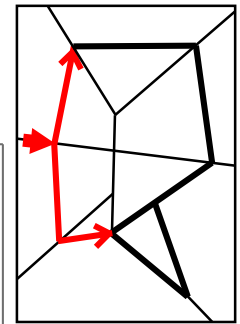
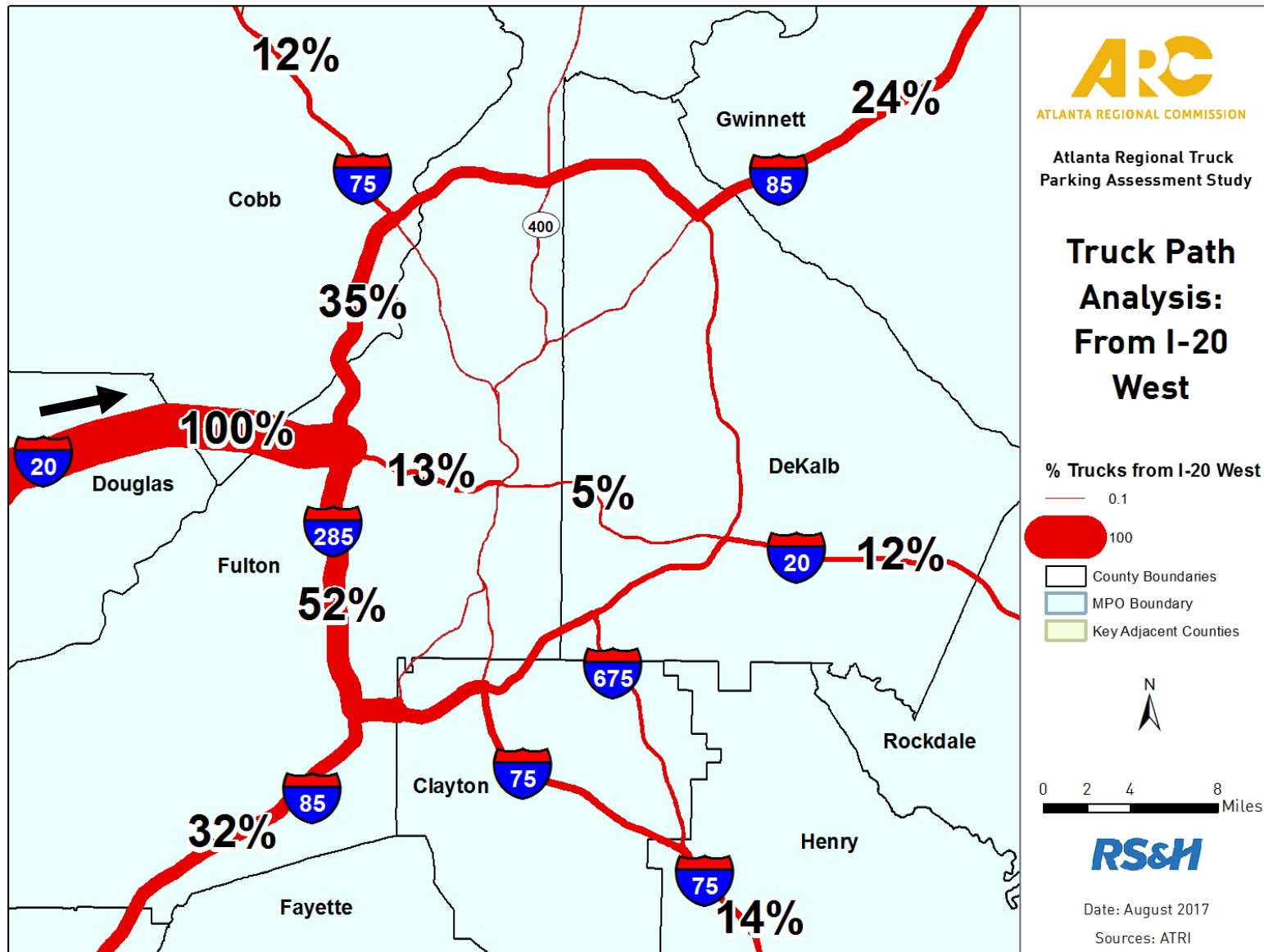
- ATRI GPS Truck Data
- November 5 – 20, 2016
- Approximate truck “paths” by percent of original



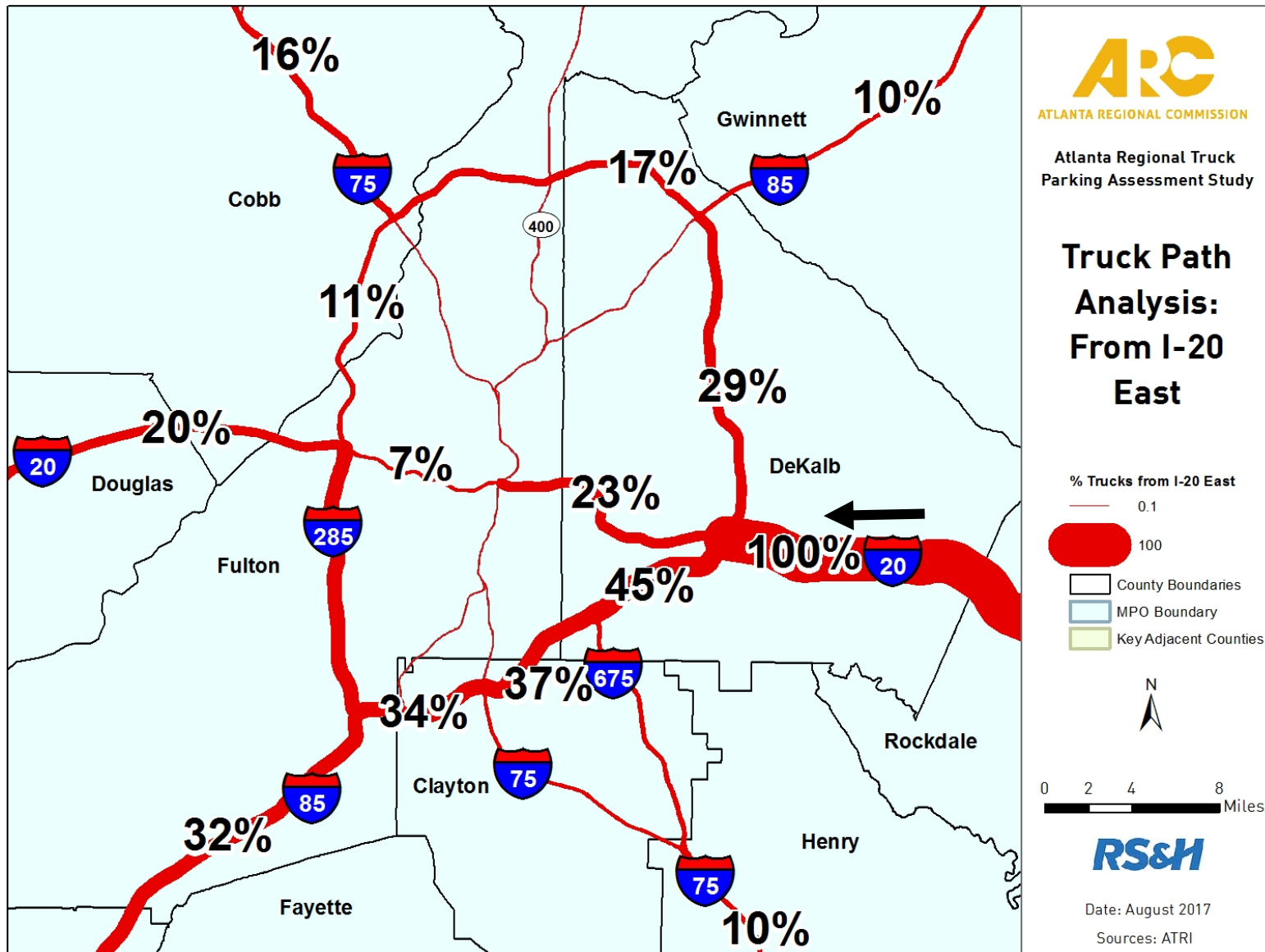
# I-85 from the South: Perimeter



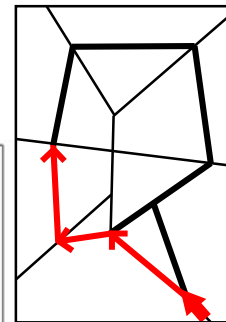
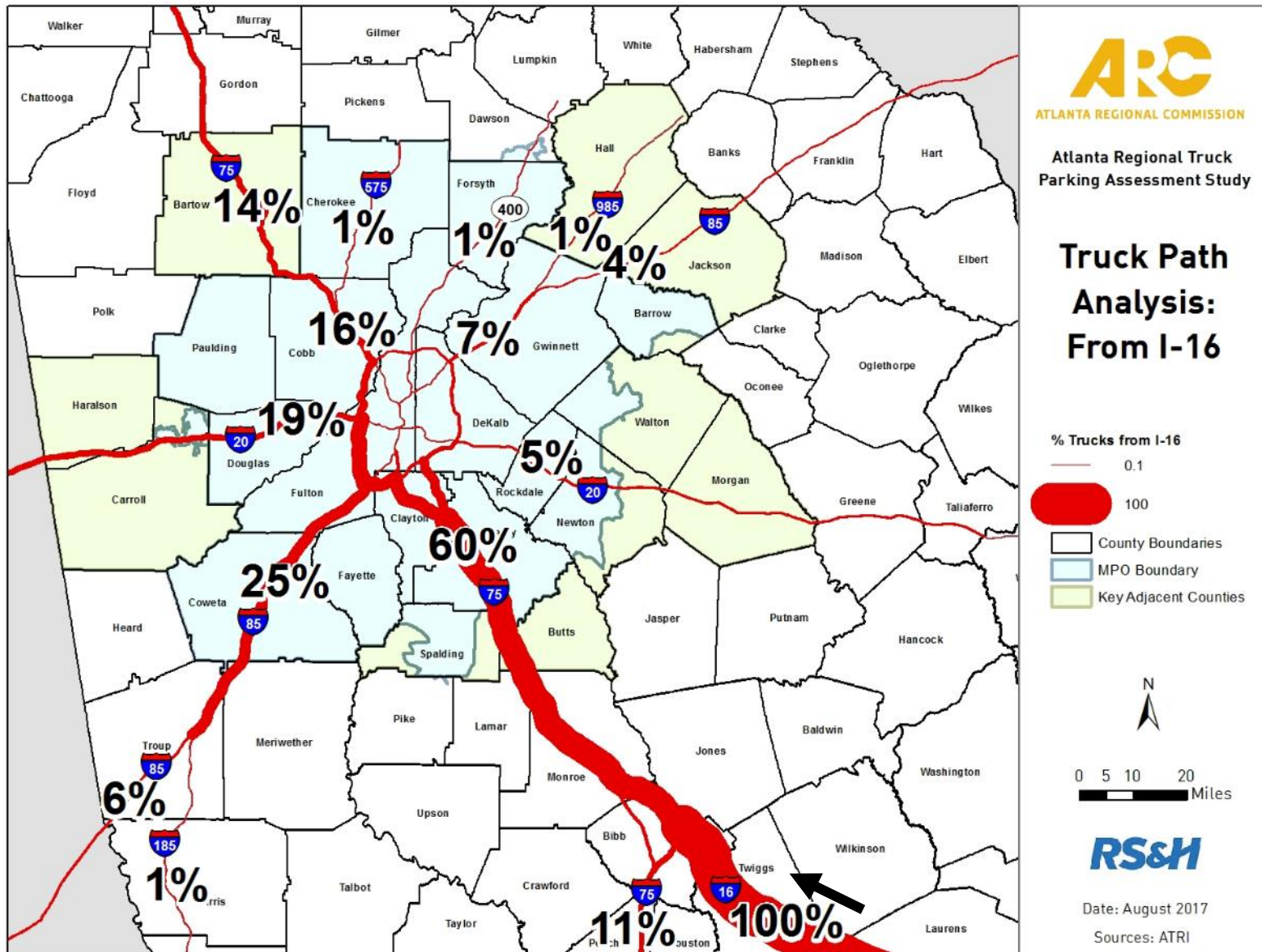
# I-20 from the West: Perimeter



# I-20 from the East: Perimeter



# I-16 from the South: Region





# Atlanta Regional Truck Parking Assessment Study



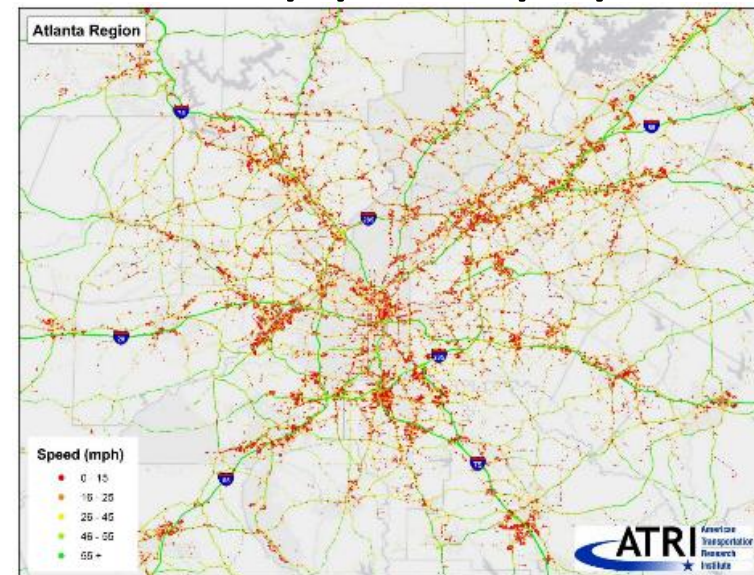
## Technical Analysis Truck Parking Utilization



# ATRI GPS Truck Data Coverage

- ATRI data: 600,000 trucks<sup>1</sup>
- US Total: 2,750,000+ trucks<sup>2</sup>
- **Estimate 22% ATRI coverage**

ATRI : 11/5/16 – 11/20/16

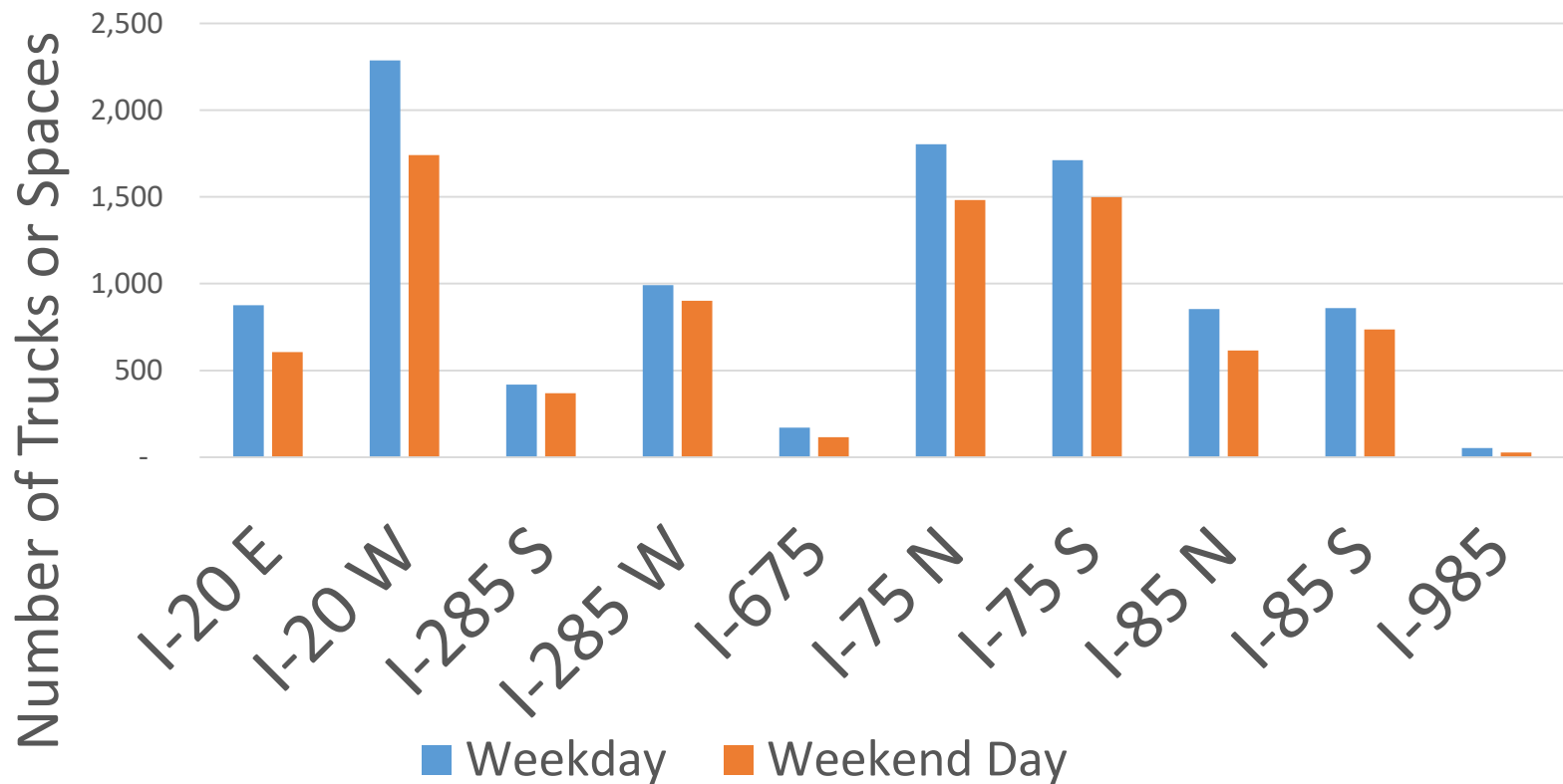


<sup>1</sup> FHWA and MNDOT (ATRI contains mostly large, interstate traveling trucks)

<sup>2</sup> FMCSA 2017 Pocket Guide to Large Truck and Bus Statistics, combination trucks/tractor-trailers

# Estimated Truck Parking Utilization

Estimated Parking Utilization from Midnight to 4 am



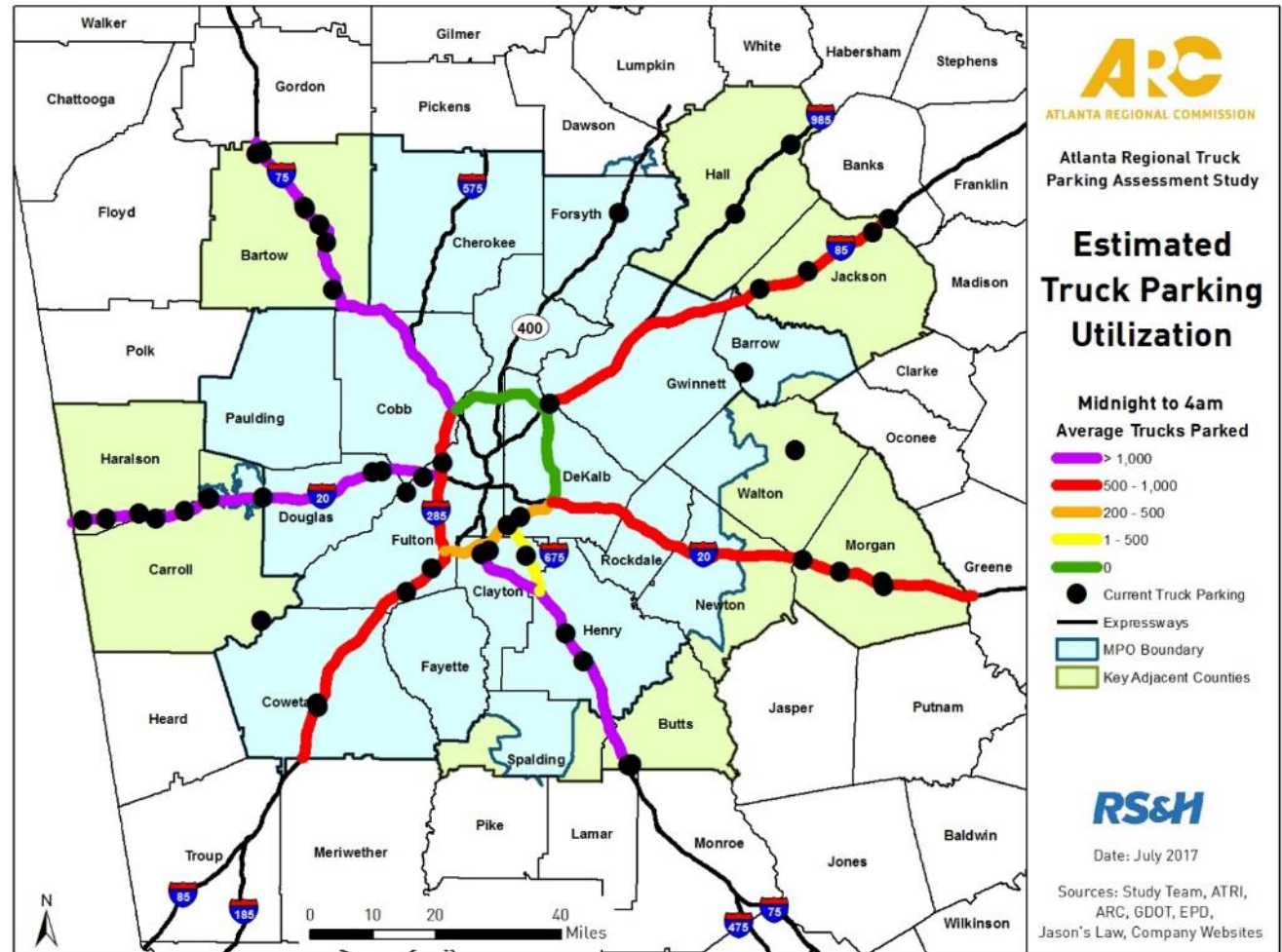
# Estimated Truck Parking Utilization

Corridor Rankings by Parking Capacity and  
Utilization From Midnight to 4 am

| Corridor | Capacity | Weekday | Weekend |
|----------|----------|---------|---------|
| I-20 W   | 1        | 1       | 1       |
| I-75 N   | 2        | 2       | 3       |
| I-75 S   | 3        | 3       | 2       |
| I-285 W  | 4        | 4       | 4       |
| I-85 S   | 5        | 6       | 5       |
| I-20 E   | 6        | 5       | 7       |
| I-85 N   | 7        | 7       | 6       |
| I-285 S  | 8        | 8       | 8       |
| I-675    | 9        | 9       | 9       |
| I-985    | 10       | 10      | 10      |

# Estimated Truck Parking Utilization

| Corridor | Estimated Utilization |
|----------|-----------------------|
| I-20 W   | 2,290                 |
| I-75 S   | 1,710                 |
| I-75 N   | 1,800                 |
| I-285 W  | 990                   |
| I-85 S   | 860                   |
| I-20 E   | 880                   |
| I-85 N   | 850                   |
| I-285 S  | 420                   |
| I-675    | 170                   |
| I-985    | 50                    |
| Total    | 10,020                |





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# Atlanta Regional Truck Parking Assessment Study



## Technical Analysis Unauthorized Parking

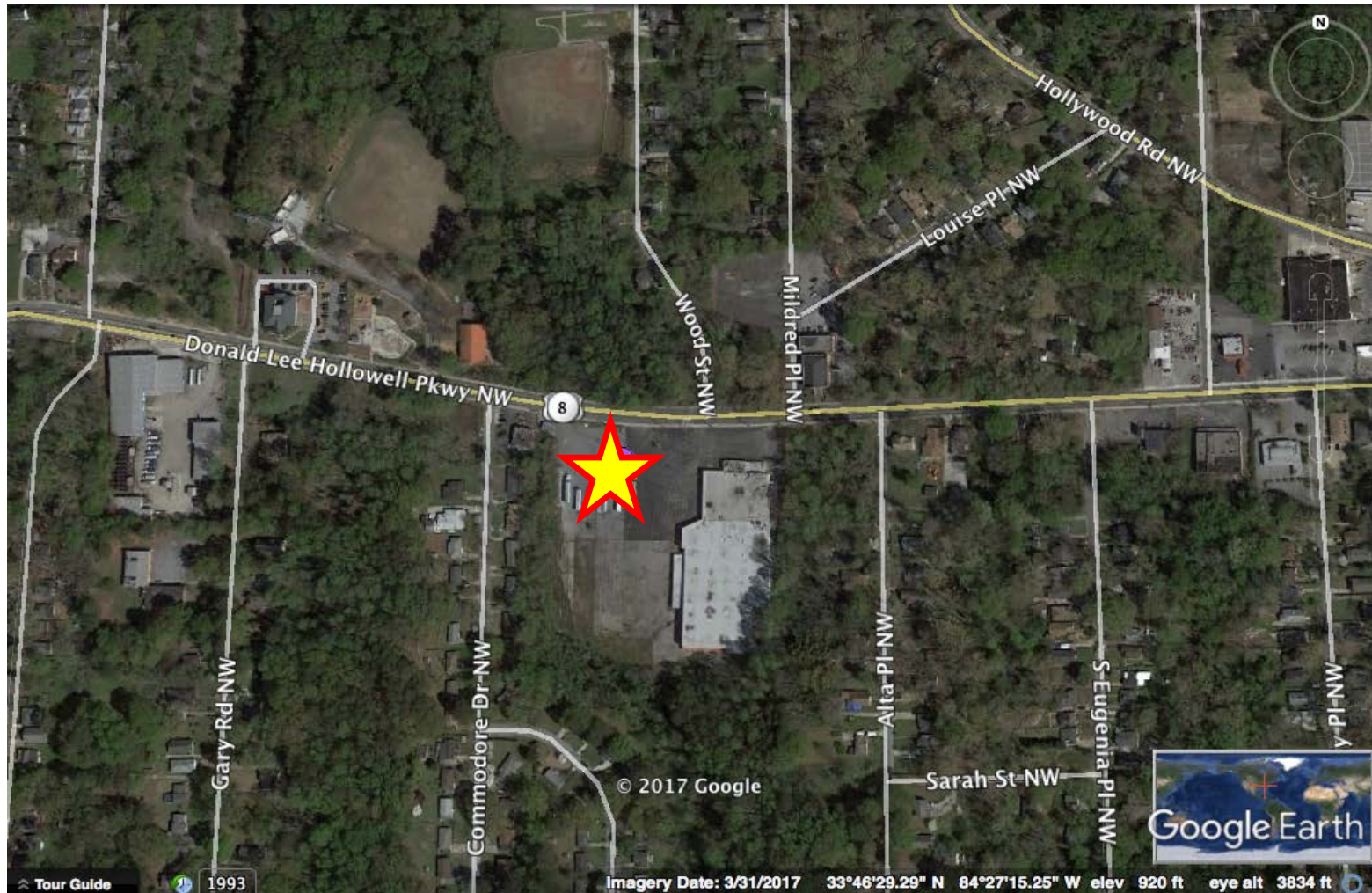


# Thornton Rd: Douglas County



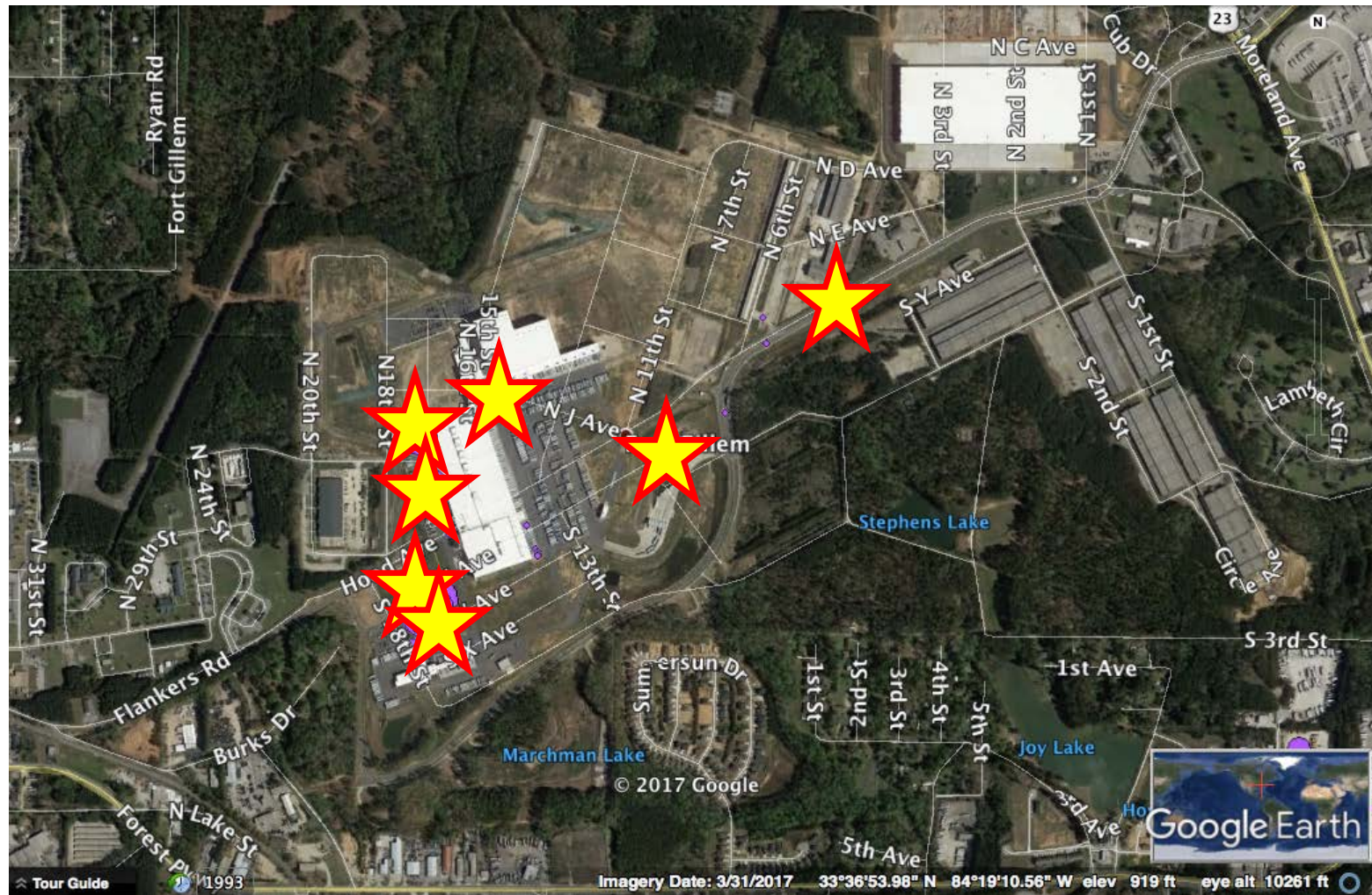


# Hollowell Pkwy Vacant Lot





# Gillem Logistics Center, Forest Park



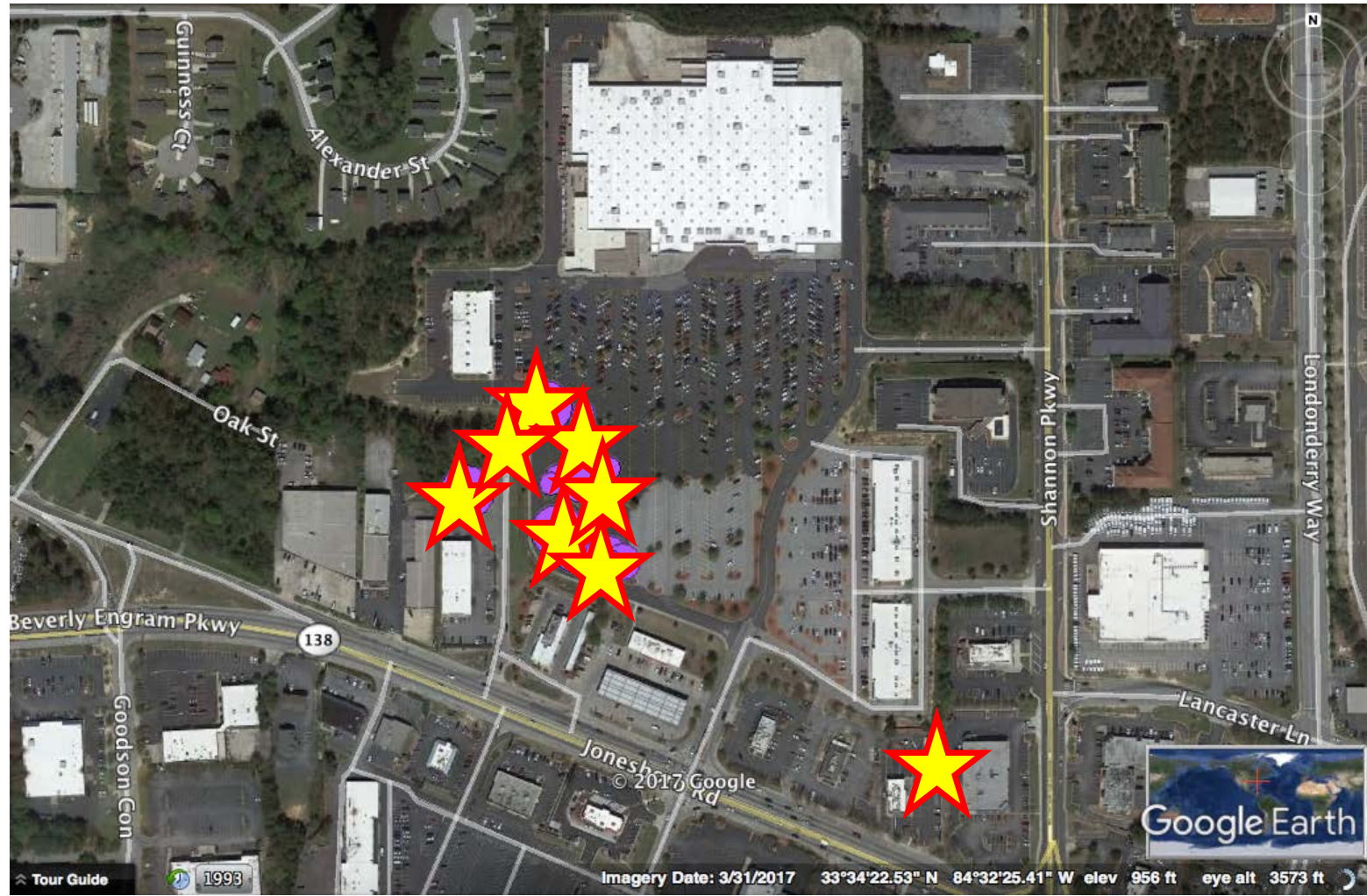


# I-675 at Anvil Block Road





# Jonesboro Rd at Shannon Parkway



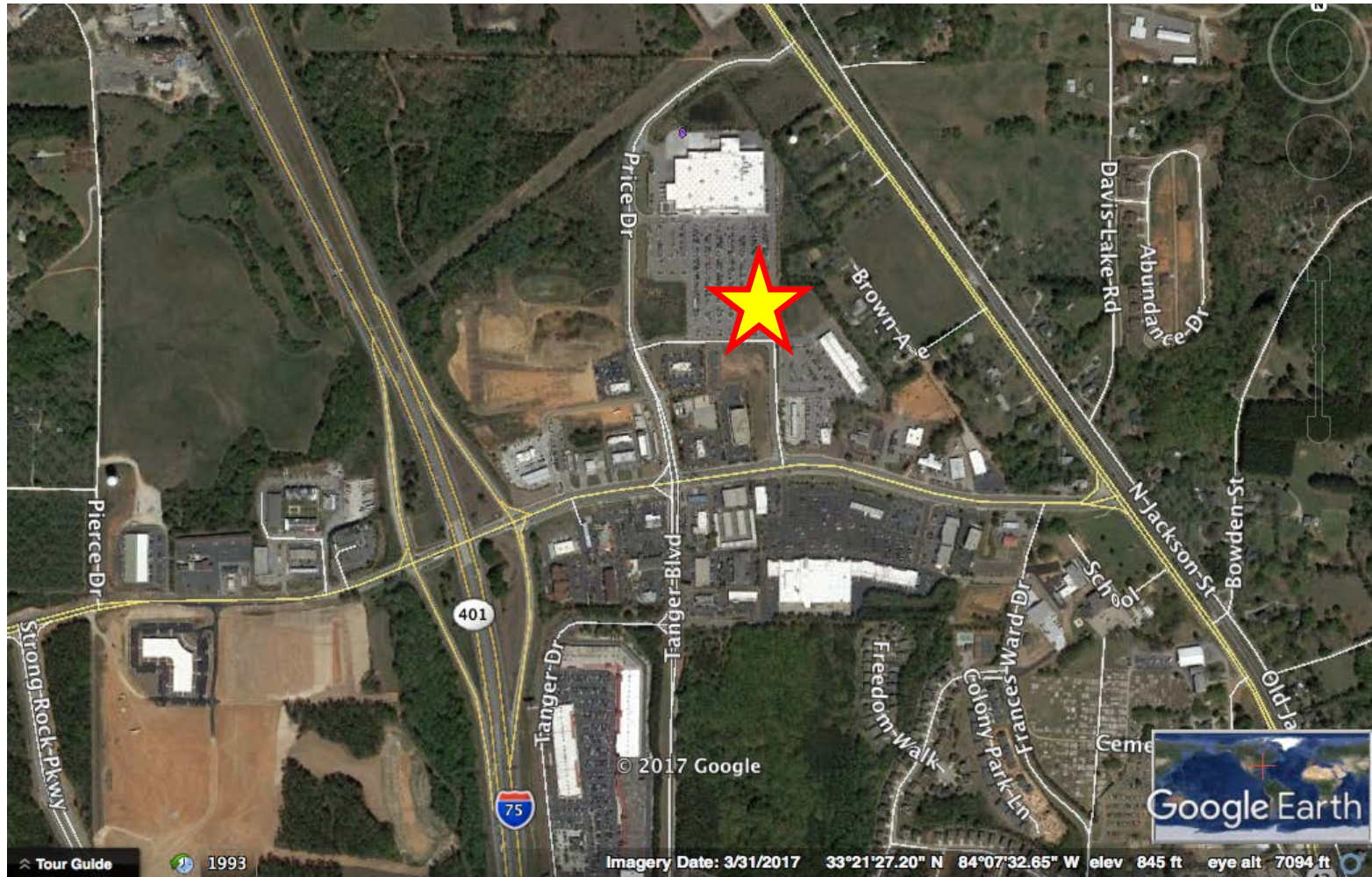


# I-75 at SR 155 Henry County



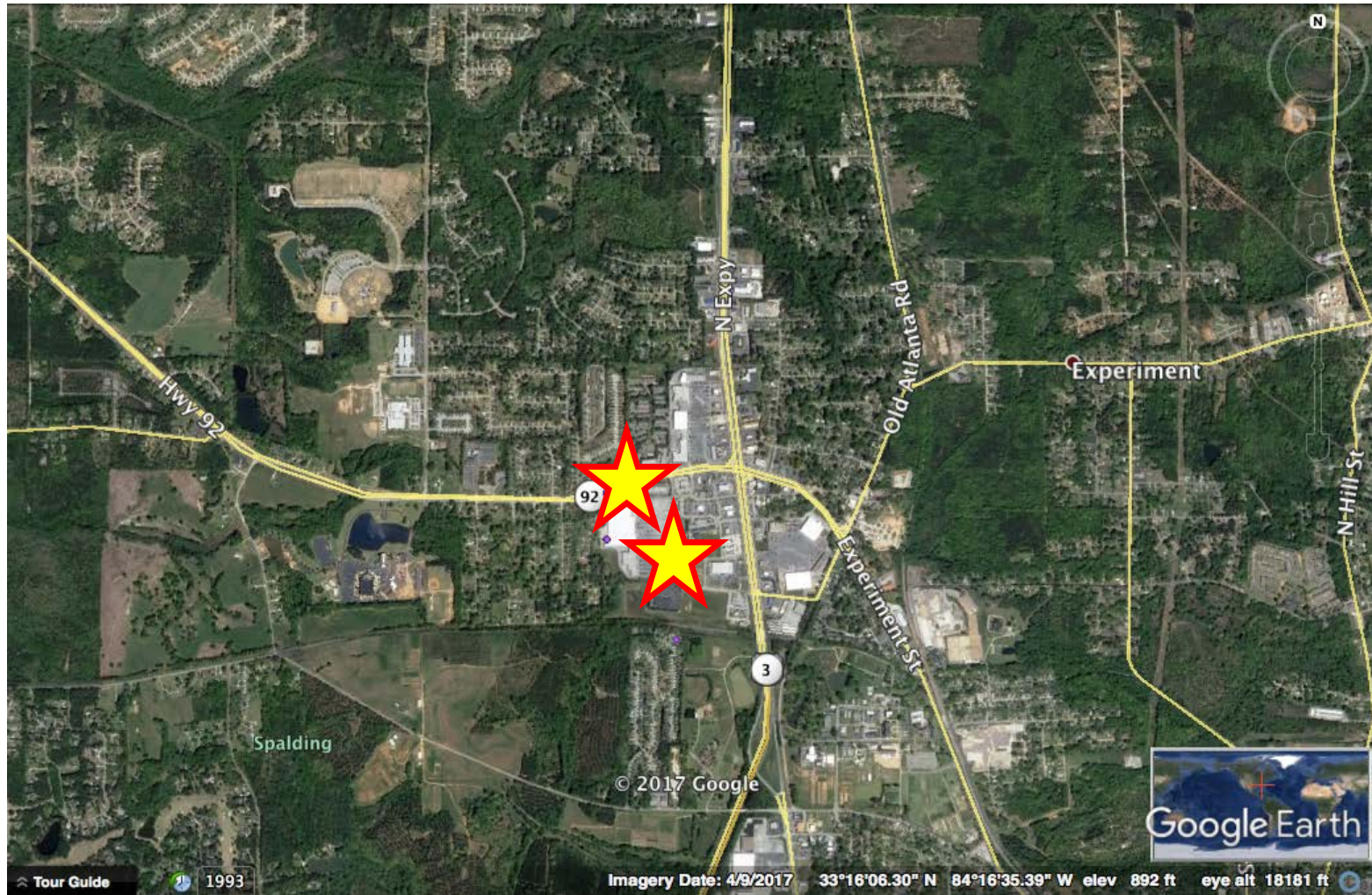


# I-75 at Bill Gardner / Locust Grove



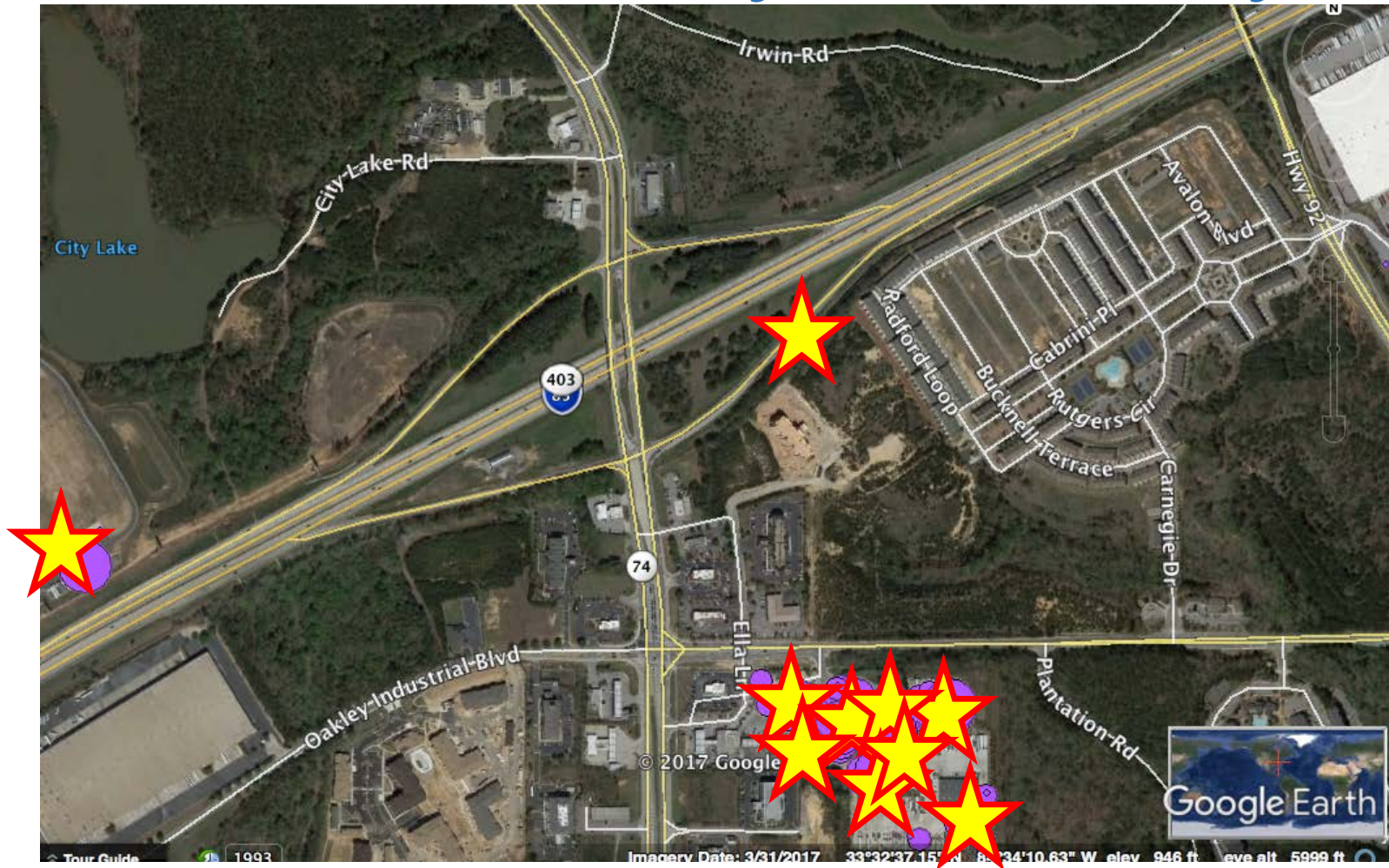


# SR3 at SR 92: Spalding County





# I-85 at SR 74: Fayette County



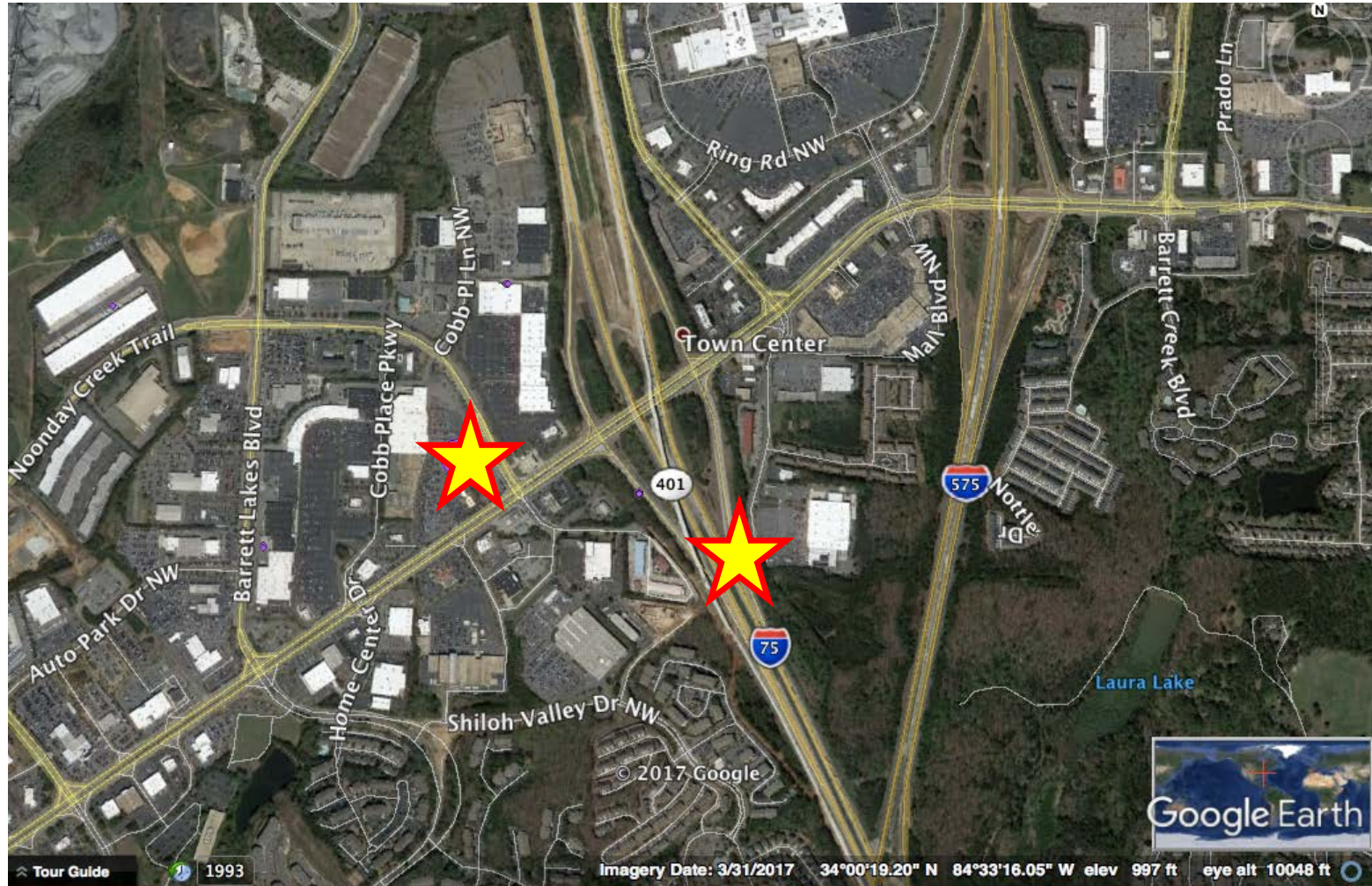


# I-85 S at SR 34: Coweta County





# I-75 N at Barrett Pkwy: Cobb Co.





# I-75 N at Cass White Rd: Bartow Co.



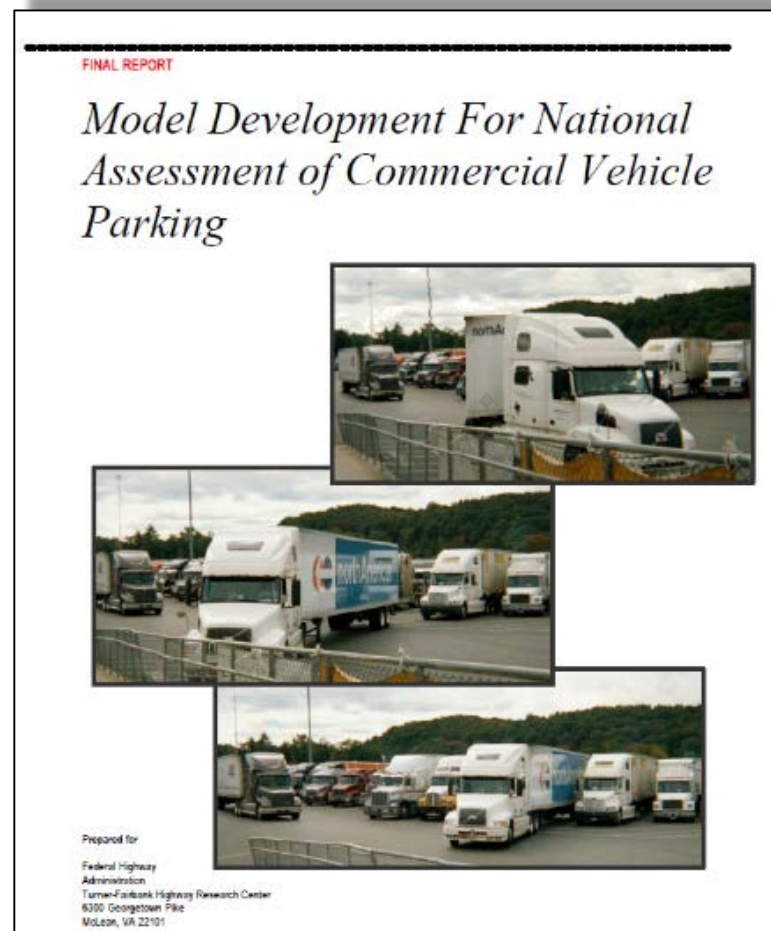
# Atlanta Regional Truck Parking Assessment Study



## Technical Analysis Parking Demand Model

# FHWA Truck Parking Demand Model

- Estimates corridor-level truck parking demand
- Input
  - Volumes
  - Corridor segment length
  - Speed
- Parameters
  - Truck driver service hour limits
  - Long haul parameters

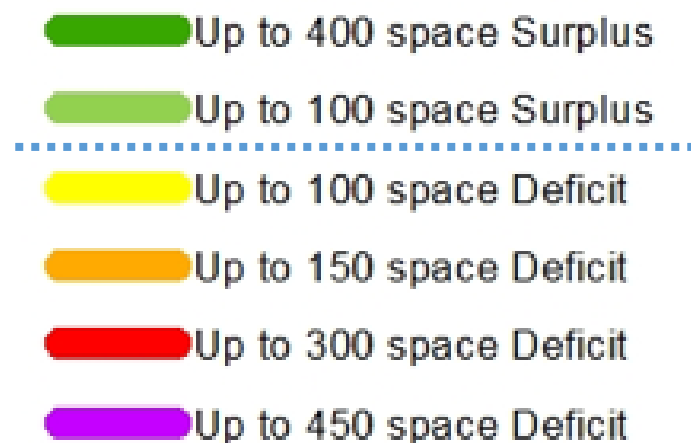




# FHWA Truck Parking Demand Model

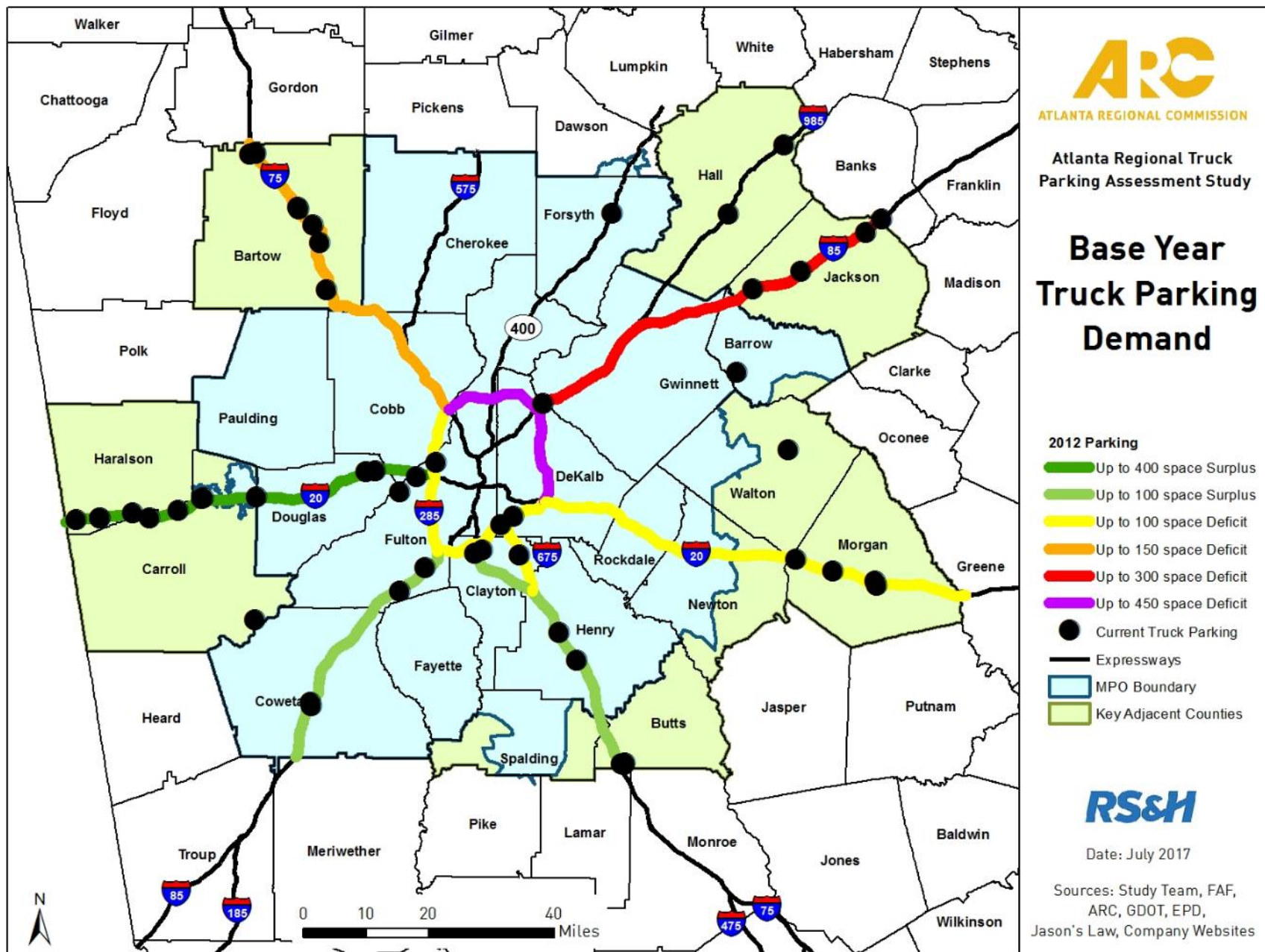
Result: Between 2012 and 2045 truck parking demand is estimated to increase by approximately **76%**

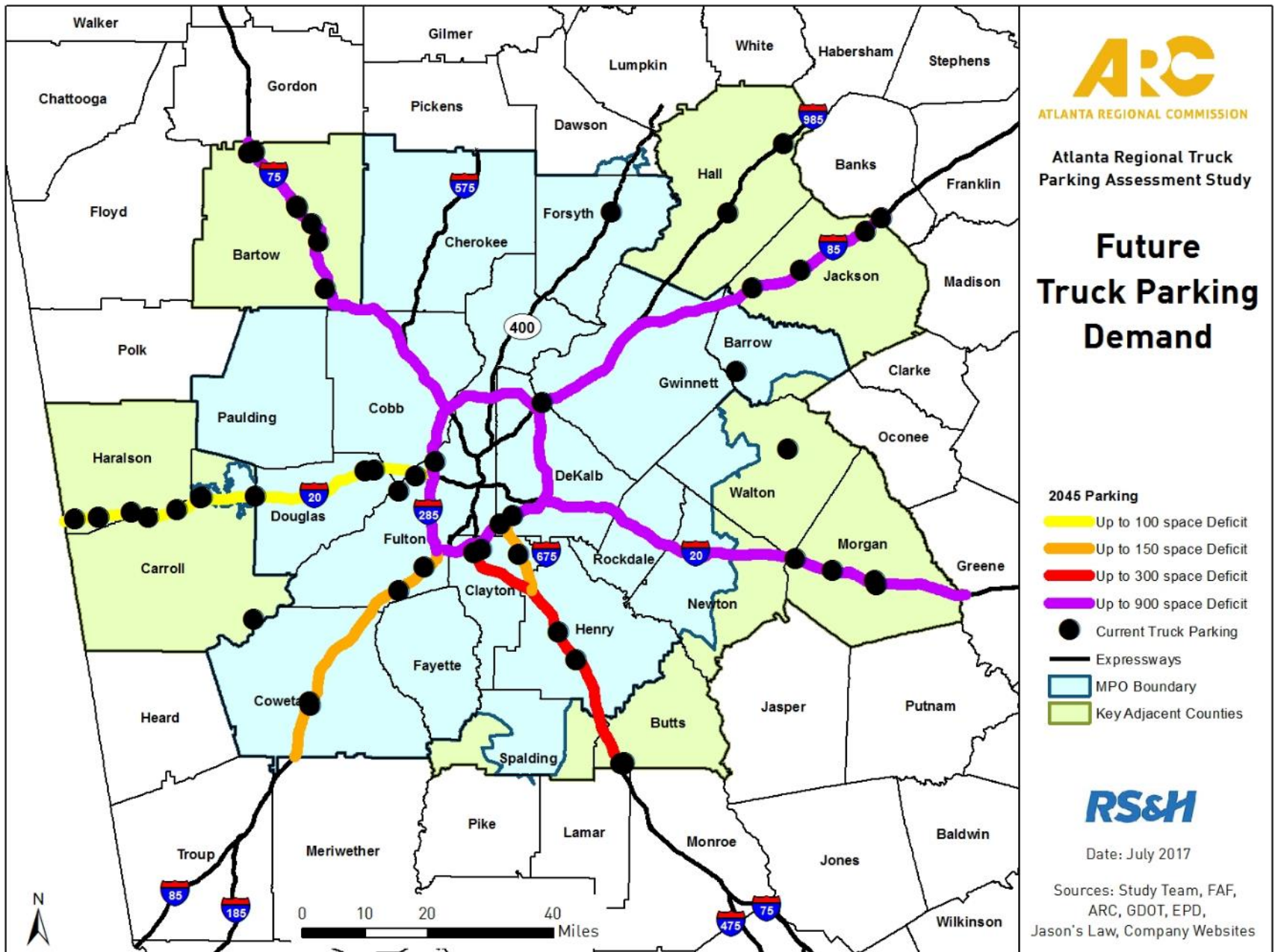
## Legend - Corridor Level Results



## Parking Surplus or Deficit

| Corridor    | 2012  | 2045 |
|-------------|-------|------|
| I-20 West   | (368) | 37   |
| I-85 South  | (96)  | 110  |
| I-75 South  | (87)  | 223  |
| I-285 West  | 21    | 349  |
| I-675       | 50    | 106  |
| I-20 East   | 88    | 413  |
| I-285 South | 97    | 307  |
| I-75 North  | 147   | 695  |
| I-85 North  | 303   | 830  |
| I-285 NE    | 456   | 802  |







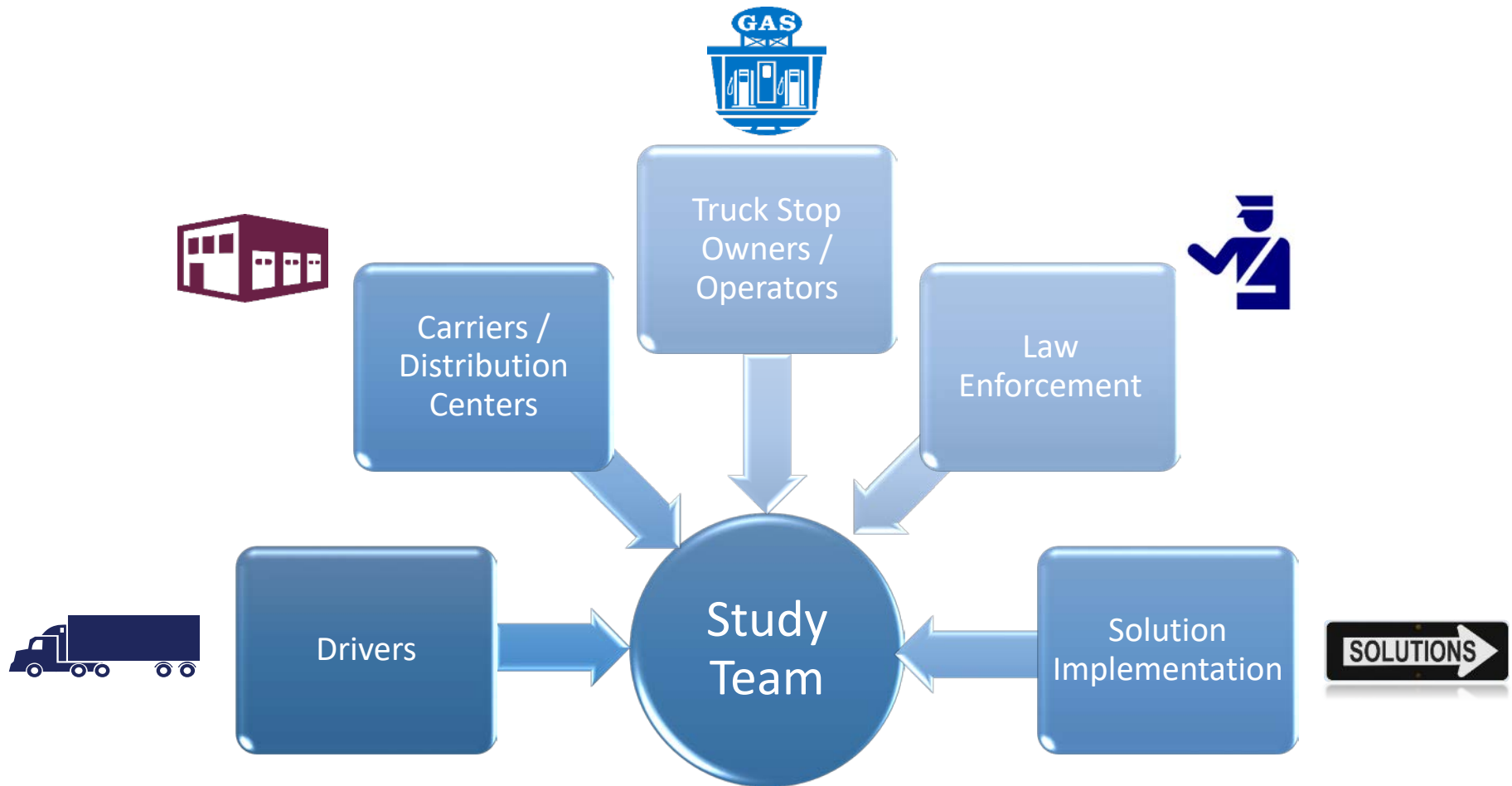
# Atlanta Regional Truck Parking Assessment Study







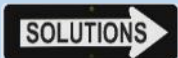
Outreach Update  
**Stakeholder Interviews**



# Stakeholder Groups







# Stakeholders Interviewed

| Affiliation / Agency  |  |  |  |  |  |
|---|---|--|---|---|---|
|   | Drivers   | Carriers / Distribution Centers  | Truck Stop Owners / Operators   | Law Enforcement   | Solution Implementation   |
| Owner-Operator Independent Drivers Association (OOIDA)                        | X   |  |   |   |   |
| Truck Driver  | X   |  |   |   |   |
| National Association of Truck Stop Operators (NATSO)                          |   |  | X   |   |   |
| Geo. H. Green Oil, Inc.   |   |  | X   |   |   |
| Southeastern Freight Lines  |   | X  |   |   |   |
| Wal-mart – Driver (FHWA Webinar)  | X   |  |   |   |   |
| Wal-mart - Distribution Center  |   | X  |   |   |   |
| Air Cargo Industry Liaison (Mullins International Solutions)                  |   | X  |   |   |   |
| Georgia Motor Trucking Association  |   |  | X   |   |   |
| Cisco - Global Logistics  |   |  |   |   | X   |
| Georgia Department of Public Safety, Motor Carrier Compliance Division (MCCD) |   |  |   | X   |   |
| Georgia Department of Transportation  |   |  |   |   | X   |
| FHWA  |   |  |   |   | X   |
| FDOT (adjacent State DOT Peer)  |   |  |   |   | X   |
| Mid-America Freight Coalition (MAFC)  |   |  |   |   | X   |





# Stakeholder Interviews

## Common Issues

| Issues   |  |  |  |  |
|--|--|---|---|---|
|  | Drivers  | Carriers /<br>Distribution<br>Centers   | Truck Stop<br>Owners /<br>Operators   | Law<br>Enforcement  |
| Finding Safe and Authorized Parking is a Challenge   | X  | X   | X   |   |
| Zoning, Land Use, and Noise Ordinances are an impediment to finding and siting truck parking   | X  | X   | X   |   |
| Truck parking demand is greater than supply of parking spaces, which creates issues with traffic and staging for delivery                    | X  | X   | X   | X   |
| Lack of parking results in less driving time and impacts to bottom-line as substantial time is spent searching for safe, authorized parking. | X  | X   |   |   |

# Stakeholder Interviews

## Common Findings

| Issues  |  |  |  |  |
|---|--|---|---|---|
|   | Drivers  | Carriers /<br>Distribution<br>Centers   | Truck Stop<br>Owners /<br>Operators   | Law<br>Enforcement  |
| Most truckers just need a clean restroom, and well-lit, safe, parking area - most carry their own food and supplies.                | X  | X   | X   |   |
| Finding parking is mostly handled by drivers through GPS, apps, and local knowledge   | X  | X   | X   |   |
| The most common truck parking violations are those parking on interstate ramps and in emergency lanes                               |  |   |   | X   |
| Industrial areas bring increased truck traffic; many communities want the increased tax revenue, but don't realize the side effects | X  | X   | X   |   |
| Electronic Logging Device (ELD) requirements will increase truck parking challenges   | X  | X   | X   | X   |



# Recommendations from Interviews

## Finding Safe & Authorized Parking



More parking in urban areas

Distribution centers provide parking

“Micro” truck stops

Convert former rest areas into truck parking

More rest area parking spaces

**Drivers**



Educate truck drivers to find safe havens for parking

Provide safe waiting areas for delivery staging

**Carriers / Distribution Centers**



Policy coordination

Educate surrounding residents about the need

**Truck Stop Owners / Operators**



Truck drivers should plan their routes in advance and identify legal parking areas

MCCD identified two (2) weigh stations in our study area and three (3) others in North Georgia that typically have free spaces for truck parking

**Law Enforcement**

# Recommendations from Interviews

## Zoning, Land Use & Noise Issues



Local, state, and Federal governments need to work together to find a solution to the problem

Allow real-time, accurate signage about available parking

**Drivers**



Educate law enforcement about noise levels for Aux Power Units (APUs)

Educate communities about the need for truck parking near industrial areas

**Carriers / Distribution Centers**



Large corporate chains may employ staff who help navigate zoning, land use, and noise issues / permitting during development of new locations

**Truck Stop Owners / Operators**



Sees most of the problems in the Atlanta suburban ring counties (Henry, Gwinnett, Douglas) not as much in the urban counties of Fulton and DeKalb

**Law Enforcement**

# Recommendations from Interviews

## Solutions Implementation

- Multi-level agency collaboration
- Public-private collaboration
- Educational component
- Importance of technology

**FHWA**

- Rapid technology advances challenge investment level
- Sharing culture / WAZE effect
- Innovative solutions using existing assets
- Data availability: public vs private
- Small investments by many versus large investments by few

**Mid-America Freight  
Coalition / FDOT / CISCO**

# Atlanta Regional Truck Parking Assessment Study



Outreach Update  
**Stakeholder Surveys**



# Stakeholder Surveys



## ■ Distribution

- ARC Committees: TCC, TAQC, LUCC
- Freight Advisory Task Force (FATF)
- Interviewees and their networks
- Georgia Tech Supply Chain & Logistics Institute

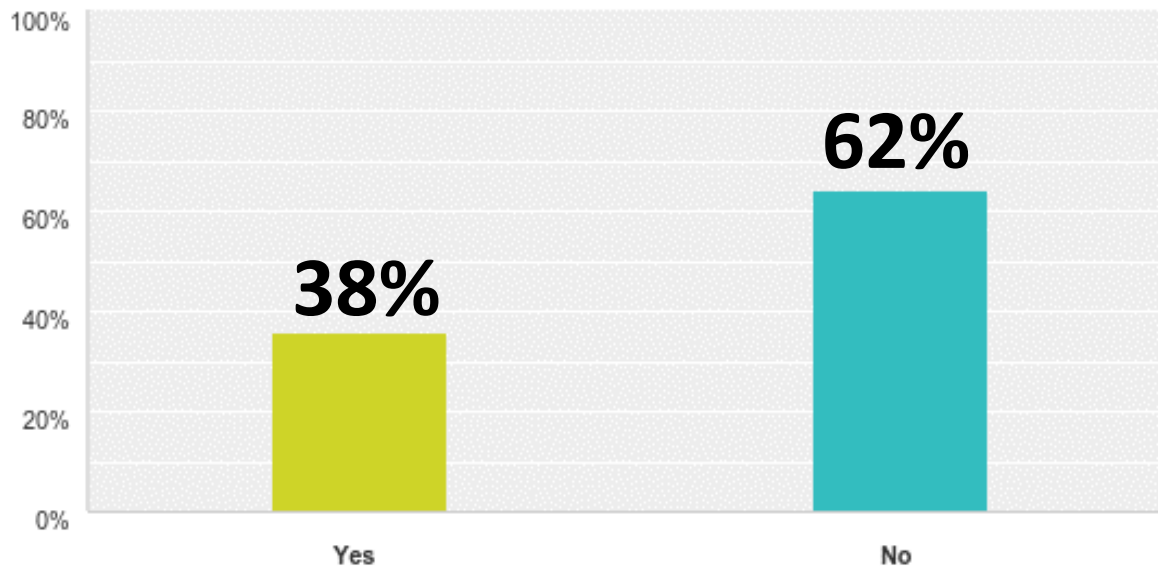
*Survey open from 5/15/2017 to 7/17/2017*

## ■ 97 Responses

- |                                 |              |
|---------------------------------|--------------|
| ■ Local Jurisdictions/CIDs      | 45 responses |
| ■ Trucking Companies / Shippers | 27 responses |
| ■ Law Enforcement               | 19 responses |
| ■ Truck Stop Owner / Operators  | 6 responses  |

# Stakeholder Surveys

- **Does your jurisdiction have any programs, policies, or strategies in place to address truck parking?**



# Stakeholder Surveys

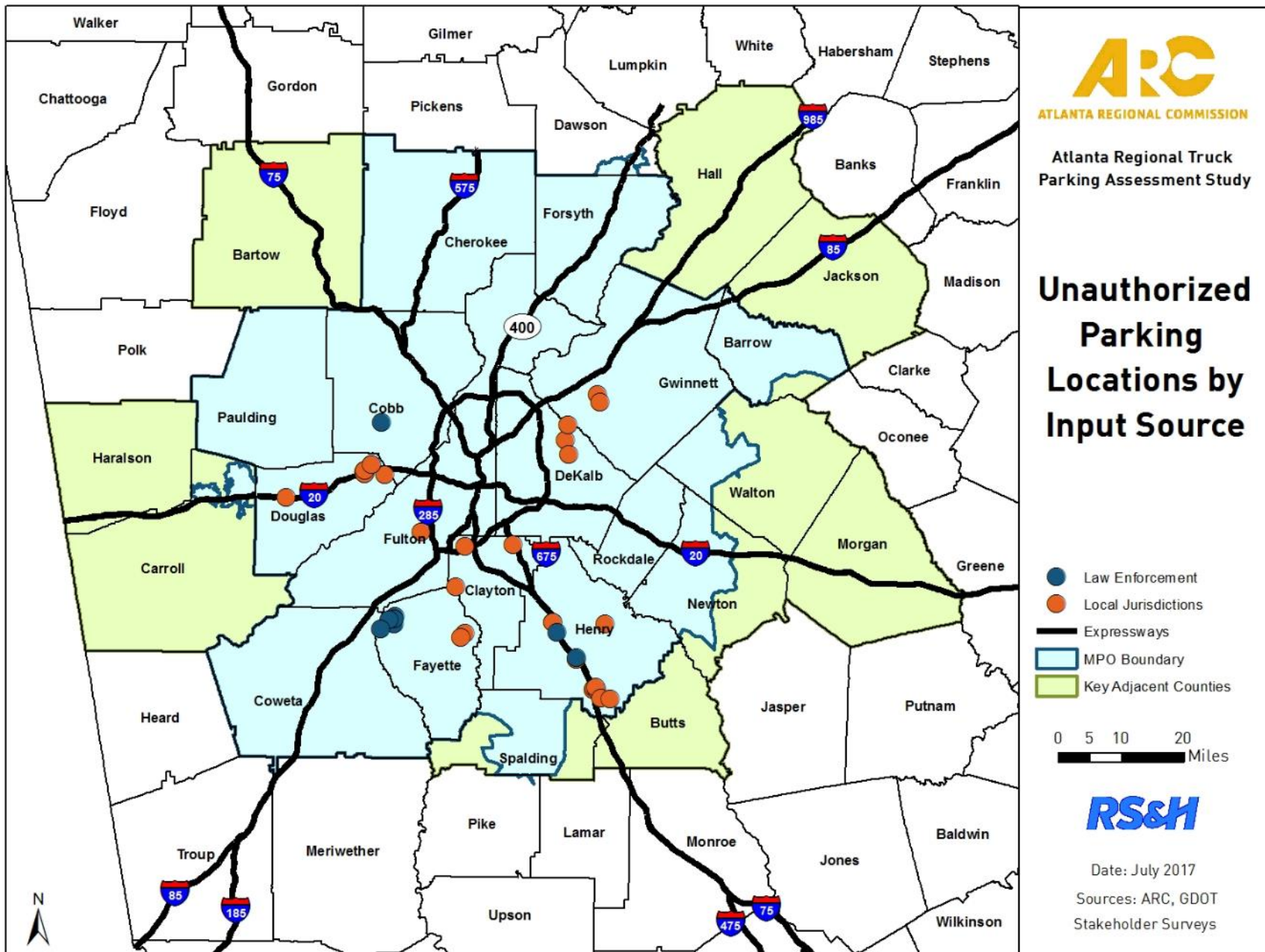
- What are the programs, policies, and/or strategies?
  - Zoning 64%
  - Signage and Enforcement 21%
  - Private property 14%

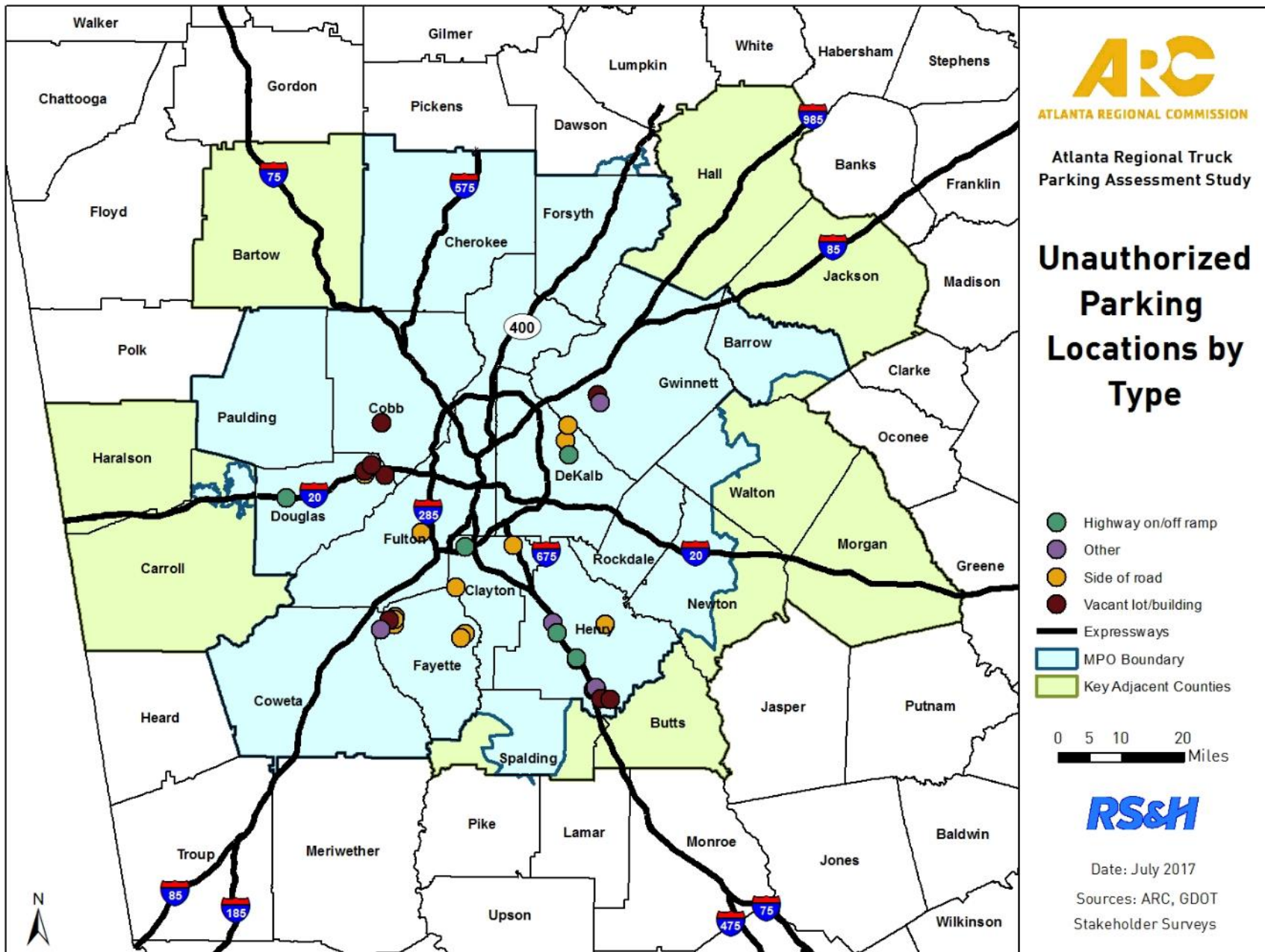
# Stakeholder WikiMapping Unauthorized Parking

- **13 separate respondents** provided **39 different** responses (locations)
  - Local Jurisdictions / CIDs      31 responses
  - Law Enforcement      8 responses
- Unauthorized truck parking locations
  - Where?
  - How Often?









# Unauthorized Truck Parking Location

| County         | Side of Road | Highway Ramp | Vacant Lot / Building | Other      | Total       | Percent     |
|----------------|--------------|--------------|-----------------------|------------|-------------|-------------|
| Clayton        | 1            | 1            |                       |            | 2           | 5%          |
| Cobb           |              |              | 1                     |            | 1           | 3%          |
| DeKalb         | 2            | 1            |                       |            | 3           | 8%          |
| Douglas        | 2            | 4            | 4                     |            | 10          | 26%         |
| Fayette        | 6            |              | 1                     | 1          | 8           | 21%         |
| Fulton         | 1            |              |                       |            | 1           | 3%          |
| Gwinnett       |              |              | 1                     | 1          | 2           | 5%          |
| Henry          | 2            | 4            | 3                     | 3          | 12          | 31%         |
| <b>Total</b>   | <b>14</b>    | <b>10</b>    | <b>10</b>             | <b>5</b>   | <b>39</b>   | <b>100%</b> |
| <b>Percent</b> | <b>36%</b>   | <b>26%</b>   | <b>26%</b>            | <b>13%</b> | <b>100%</b> |             |



ATLANTA REGIONAL COMMISSION

# Atlanta Regional Truck Parking Assessment Study



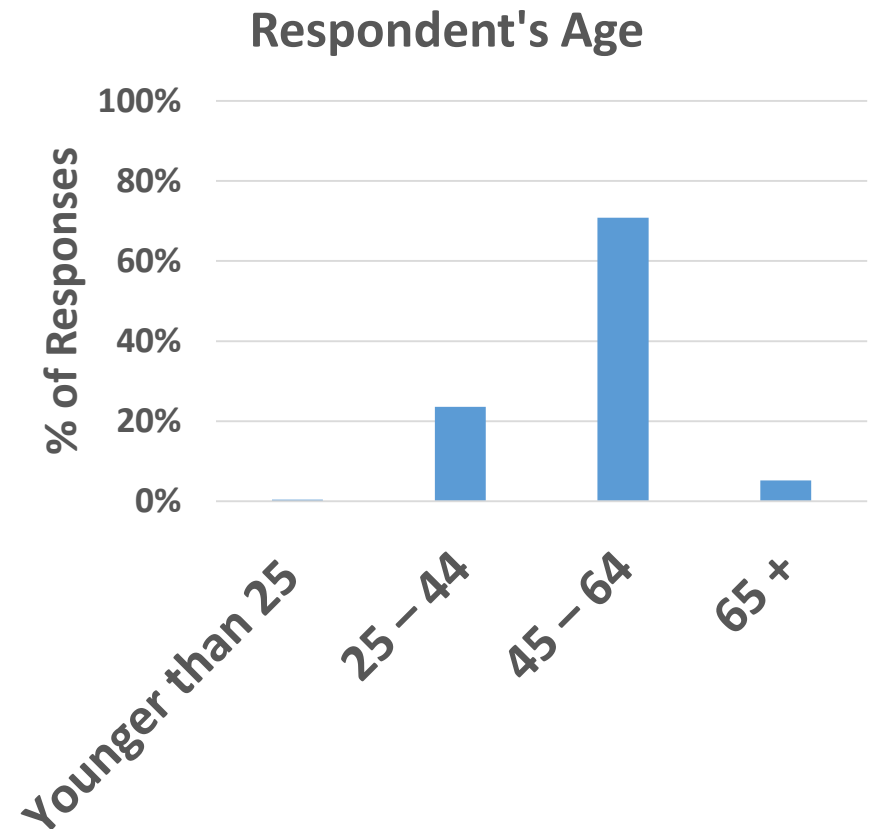
## Outreach Update Truck Driver Surveys

**RS&H**



# Truck Driver Survey Results

- 277 respondents
- 88.4% truck drivers / 11.6% non-drivers
- 79.2% male / 20.8% female



# Truck Driver Survey Results

- What segment of the trucking industry do you primarily operate?

| Segment    | Response |
|------------|----------|
| For-Hire   | 76.7%    |
| Private    | 21.3%    |
| Don't Know | 2.0%     |

# Truck Driver Survey Results

- Which of the following best describes your employment?

| Employment  | Response |
|---|----------|
| Employee Driver   | 69.1%    |
| Owner-Operator (O-O) /<br>Independent Contractor leased to a<br>motor carrier | 23.5%    |
| O-O With Own Authority  | 7.4%     |
| Don't Know  | 0.0%     |

# Truck Driver Survey Results

- Average Length of Haul

| Length of Haul                          | Response |
|---|----------|
| Local (less than 100 miles)             | 0.0%     |
| Regional (100-499 miles per trip)       | 22.3%    |
| Inter-Regional (500-999 miles per trip) | 49.3%    |
| Long-Haul (1,000+ miles per trip)       | 28.4%    |

- How often do you need to temporarily park in the Atlanta Region for staging before a scheduled pick-up and/or drop-off time?
  - **84% of respondents**



# Truck Driver Survey Results

| Amenities to Rate        |
|--------------------------|
| Restrooms                |
| Fueling Services         |
| Restaurant               |
| Vending Machines         |
| Showers                  |
| Retail Store             |
| Adequate Lighting        |
| Adequate Security        |
| Internet Access / Wi-Fi  |
| Access to the Interstate |
| Hotel / Motel            |
| Other                    |

| Amenities Rated by Importance |                          |                          |
|-------------------------------|--------------------------|--------------------------|
| 1st                           | 2nd                      | 3rd                      |
| Restrooms                     | <b>Adequate Lighting</b> | <b>Adequate Lighting</b> |
| <b>Adequate Security</b>      | Fueling Services         | Showers                  |
| Access to the Interstate      | Restaurant               | Fueling Services         |
| Showers                       | Restrooms                | Restrooms                |
| Fueling Services              | Showers                  | Restaurant               |

# Truck Driver Survey Results

- How long does it usually take you to find truck parking in the Atlanta region?

| Length of time       | Response |
|----------------------|----------|
| Less than 15 minutes | 1.3%     |
| 15 – 30 minutes      | 6.5%     |
| 30 minutes – 1 hour  | 41.3%    |
| More than 1 hour     | 51.0%    |

- When parking in the Atlanta region, where is it more difficult to find available truck parking?

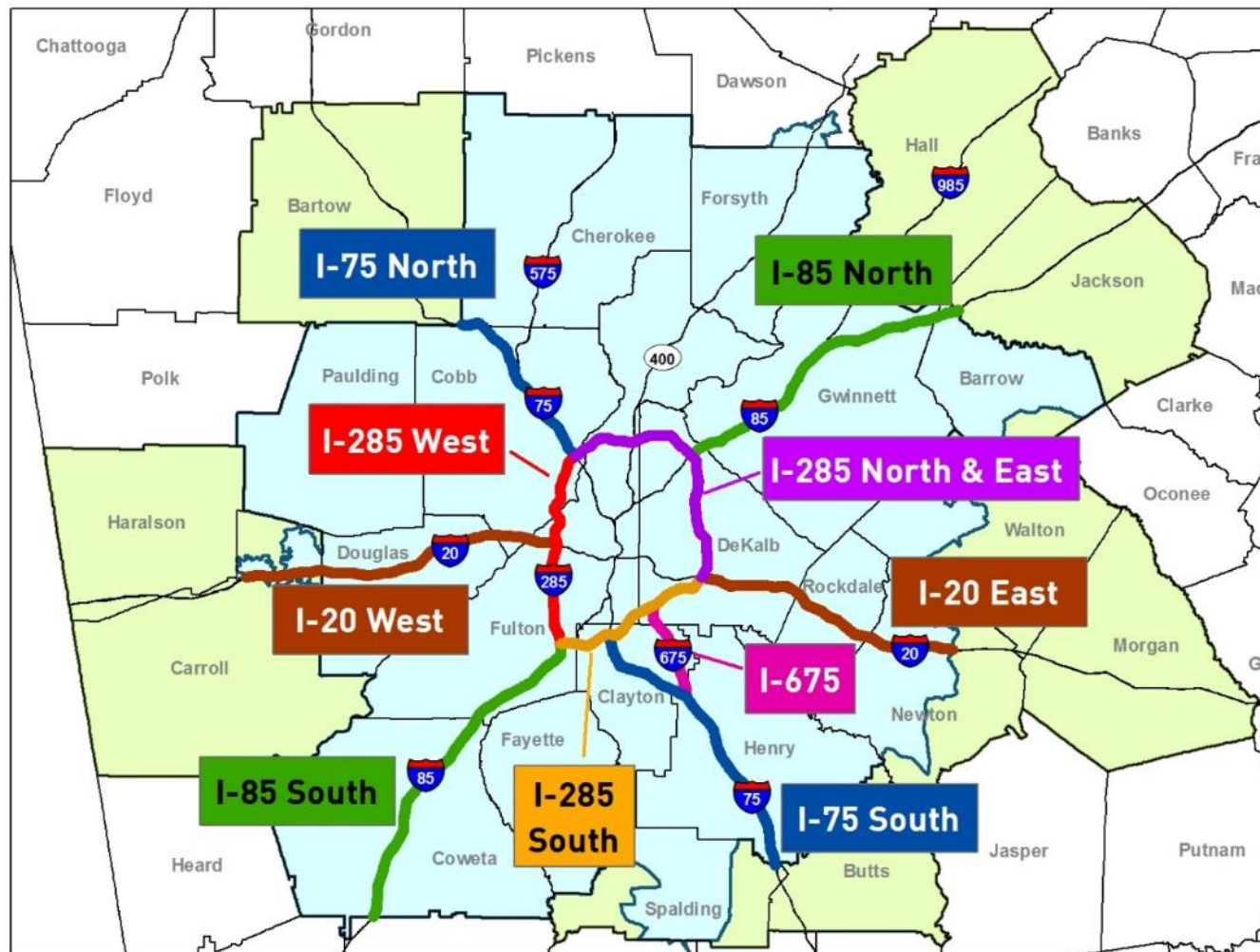
| Location            | Response |
|---------------------|----------|
| Public rest stops   | 80.8%    |
| Private truck stops | 88.5%    |
| Shipper / Receiver  | 71.8%    |

# Truck Driver Survey Results

- What method do you utilize to find truck parking when traveling within or around the Atlanta region?

| Method  | Response |
|---|----------|
| Continue driving until a safe parking location is found | 68.8%    |
| Smartphone Application                                  | 55.4%    |
| I am aware of my destination in advance                 | 47.1%    |
| Internet / Website Information                          | 38.2%    |
| Onboard Communications / Computer System                | 14.6%    |
| Roadside Changeable Message Signs                       | 4.5%     |
| Dispatcher Contact                                      | 3.8%     |
| 511 System  | 0.6%     |

# Corridor Designations





# Corridor Ratings

**Percentage of Respondents Who Consider Truck Parking to be Limited/Rarely Available or Not Available**

| Corridor                                       | Truck Drivers | Stakeholders |
|--|---------------|--------------|
| I-285 North and East (I-75 north to I-20 east) | 91%           | 62%          |
| I-285 West (I-85 south to I-75 north)          | 90%           | 62%          |
| I-285 South (I-20 east to I-85 south)          | 89%           | 64%          |
| I-85 North                                     | 79%           | 29%          |
| I-20 East                                      | 76%           | 36%          |
| I-85 South                                     | 74%           | 29%          |
| I-75 South                                     | 73%           | 50%          |
| I-20 West                                      | 73%           | 36%          |
| I-75 North                                     | 69%           | 46%          |
| I-675  | 68%           | 69%          |

# Summary of Needs

- Lack of parking supply throughout region
- I-285 is particularly challenging
- ELDs will increase demand
- Proposed solutions vary based upon perspective
- Solutions must:
  - Include coordination
  - Maximize use of technology
  - Be adaptable / flexible
  - Leverage existing assets



# Potential Recommendations

## Coordination

- Education
- Needs and Concerns
- Solutions
- Who?
  - Truck drivers
  - Freight industry
  - Government agencies
  - Development industry



# Potential Recommendations

## Example: Distributor Parking Program



- Drivers Must:
  - Wear safety vests at all times
  - Carry a flashlight at night
  - Follow safety rules
  - De-couple tractor from trailer
  - May not move tractor
  - Preferential treatment for no-idle cabs

# Potential Recommendations

## Maximize Use of Technology



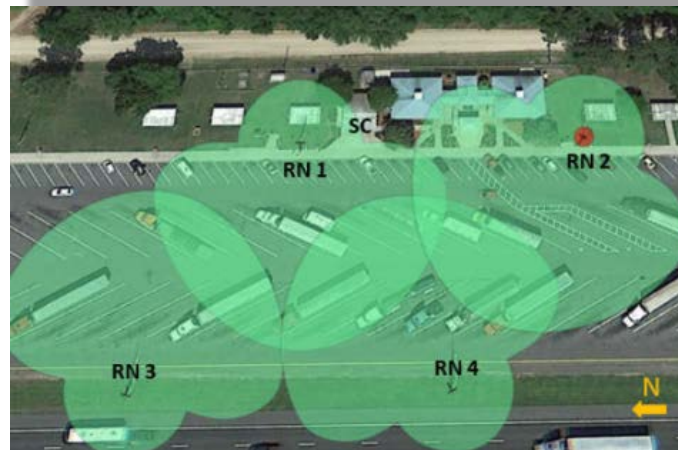
### Parking sensors headed to truck stops; to be tested in Orlando

Jul 26, 2017, 2:41pm EDT

Subscriber-Only Article Preview | For full site access: [Subscribe Now](#)

The Florida Department of Transportation has issued a request for proposals for a firm to design and test the technology.

**Veronica Brezina**  
Staff Writer  
*Orlando Business Journal*





# Potential Recommendations

## Adaptable / Flexible Solutions



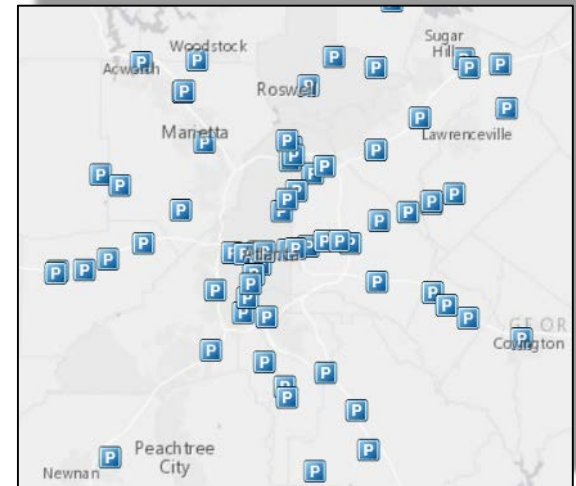
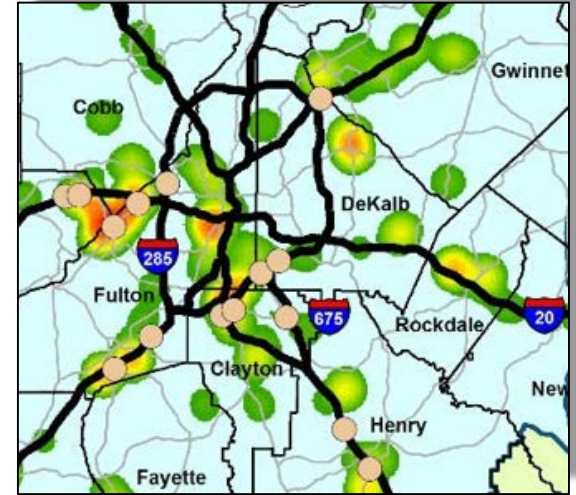
## QT Store Truck Parking

### Jonesboro Road at Foster Place, Henry County

# Potential Recommendations

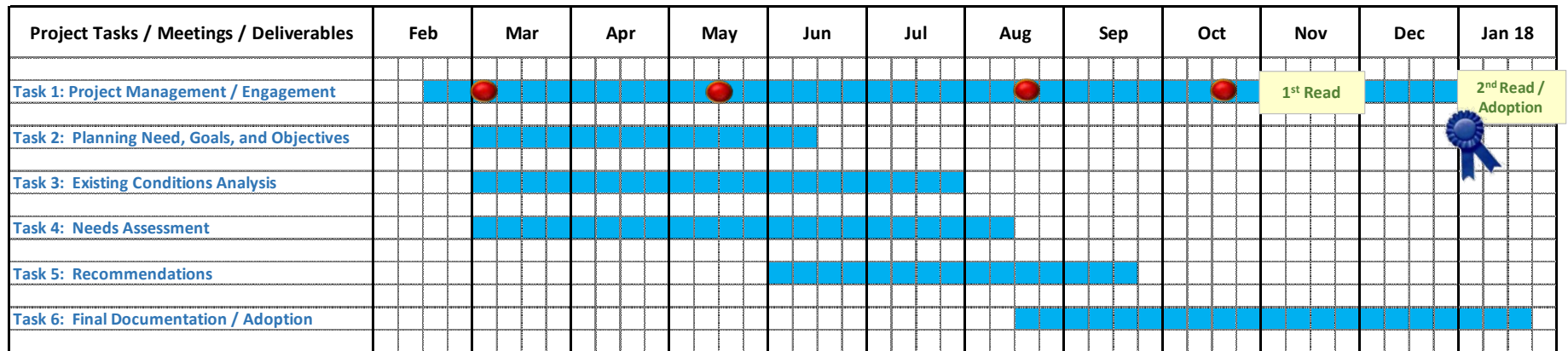
## Leverage Existing Assets


- Vacant Industrial Space
- Brownfield Sites
- Industrial Parks
- Existing or closed rest areas
- Park-and-ride lots (PM only)



# Next Steps

## Proposed Project Schedule Atlanta Regional Truck Parking Assessment Study (2017-2018)



 Potential FATF Meeting

Revised: 05-15-17

# Atlanta Regional Truck Parking Assessment Study



## Questions?

## **Appendix 2-E**

### **Freight Advisory Task Force Meeting 4**



# Atlanta Regional Truck Parking Assessment Study



## Recommendations

Freight Advisory Task Force (FATF)

*November 2, 2017*

# Today's Discussion

- Study Recap
- Recommendations & Group Discussion
- Next Steps





ATLANTA REGIONAL COMMISSION

# Atlanta Regional Truck Parking Assessment Study

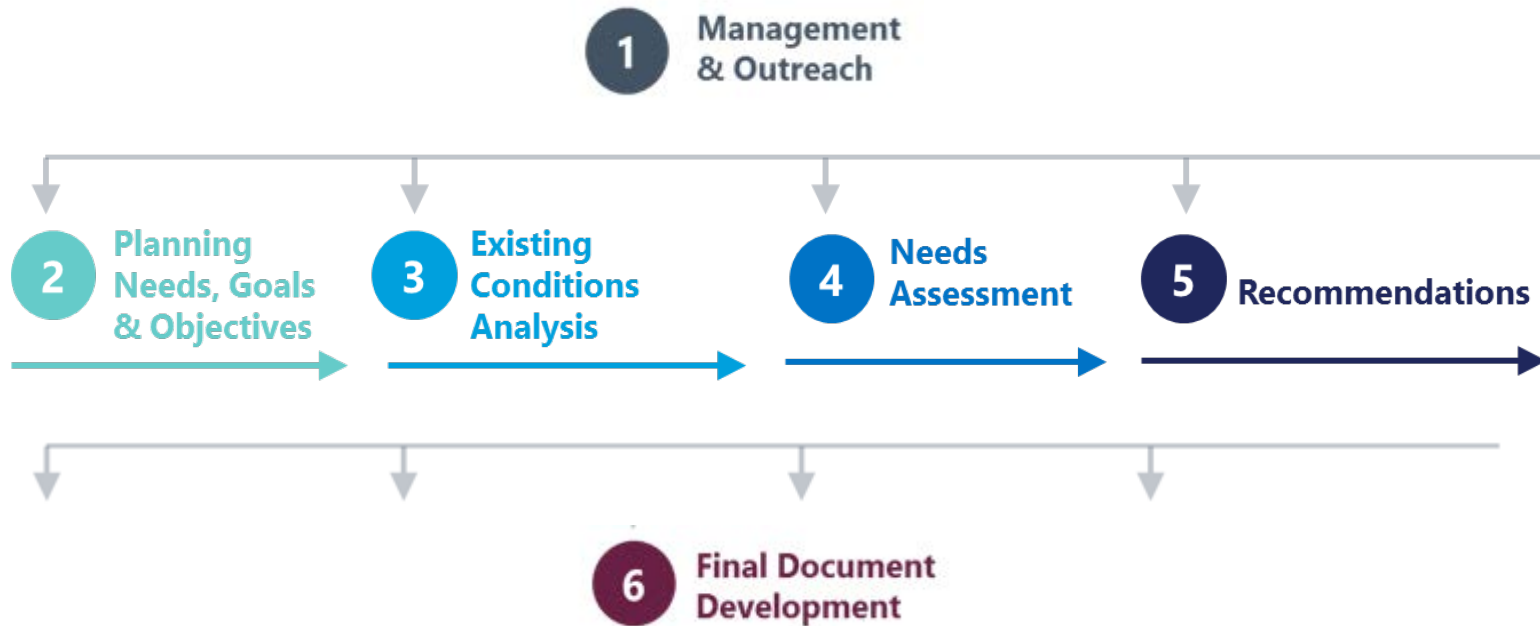


## Study Recap

# Study Approach



## Atlanta Regional Truck Parking Assessment Study



# Regulatory “Perfect Storm”

**Hours of  
Service (HOS)  
Requirements**

**Electronic  
Logging Devices  
(ELDs) Dec. 2017**





# Goals & Objectives

| Goals  | Objectives  |
|--|---|
| <b>Safety</b>  | <ul style="list-style-type: none"><li>▪ Assist truck drivers with meeting federal Hours-of-Service requirements</li><li>▪ Assist truck drivers with exercising risk management</li></ul>  |
| <b>Quality of Life</b>                               | <ul style="list-style-type: none"><li>▪ Provide for truck driver well being</li><li>▪ Assist with 24 hour delivery</li></ul>  |
| <b>Efficient Operation</b>                           | <ul style="list-style-type: none"><li>▪ Minimize wasted travel time and costs</li><li>▪ Reduce early or late breaks</li></ul>   |
| <b>Economic Development / Logistics and Commerce</b> | <ul style="list-style-type: none"><li>▪ Support a competitive operating environment for regional freight transportation</li><li>▪ Advance public policies that make metro Atlanta and the State of Georgia more attractive and competitive places to do business</li><li>▪ Invest in physical and social infrastructure that supports economic competitiveness</li></ul>  |
| <b>Coordinated Planning and Development</b>          | <ul style="list-style-type: none"><li>▪ Encourage expansion or development of new truck stops in strategic locations</li><li>▪ Preserve communities / areas with incompatible land uses (e.g., residential)</li><li>▪ Improve land use planning and the siting/development of freight-logistics industries</li><li>▪ Plan and preserve industrial land uses to support job creation and provide needed goods and services</li></ul> |

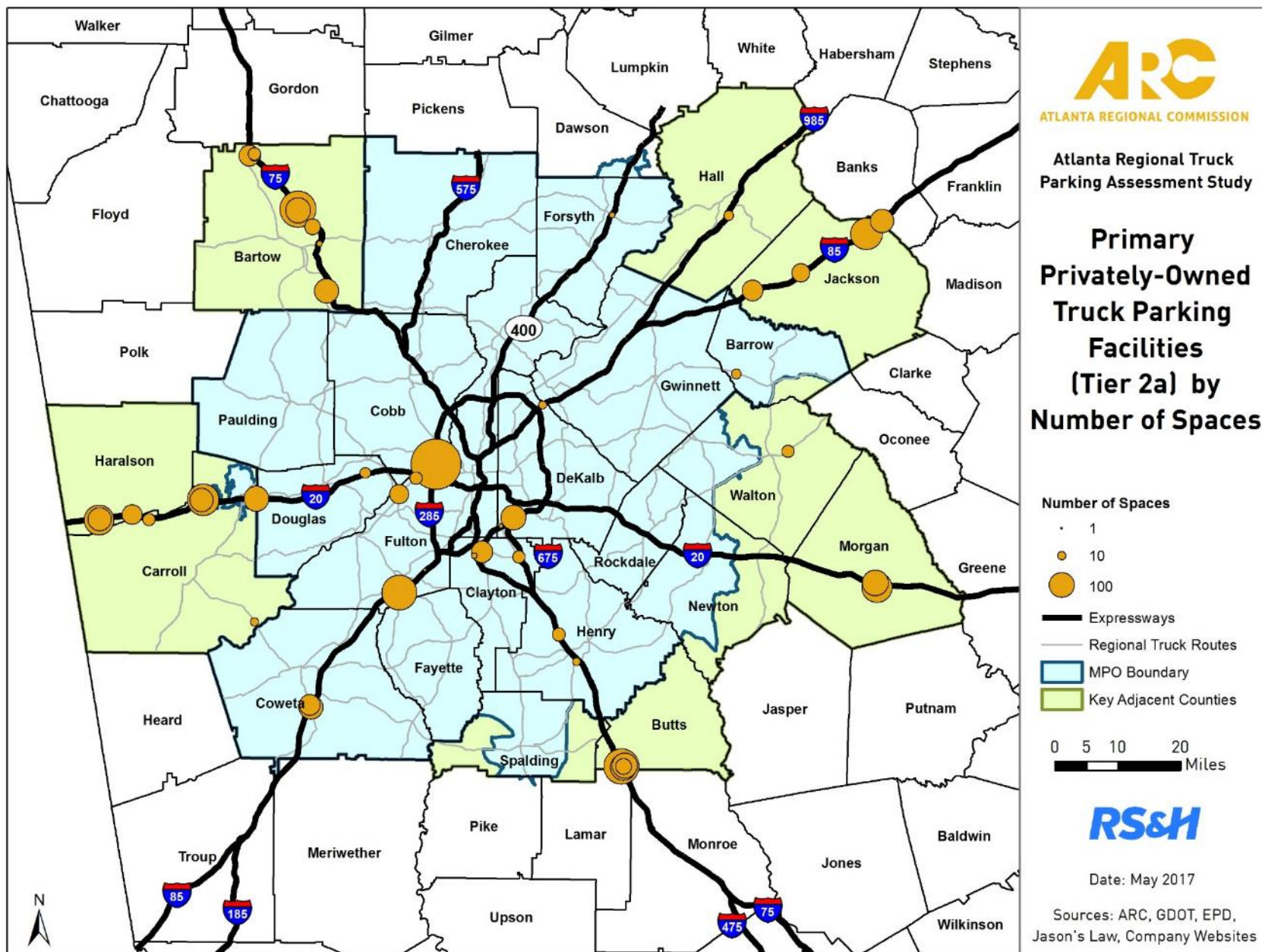


ATLANTA REGIONAL COMMISSION

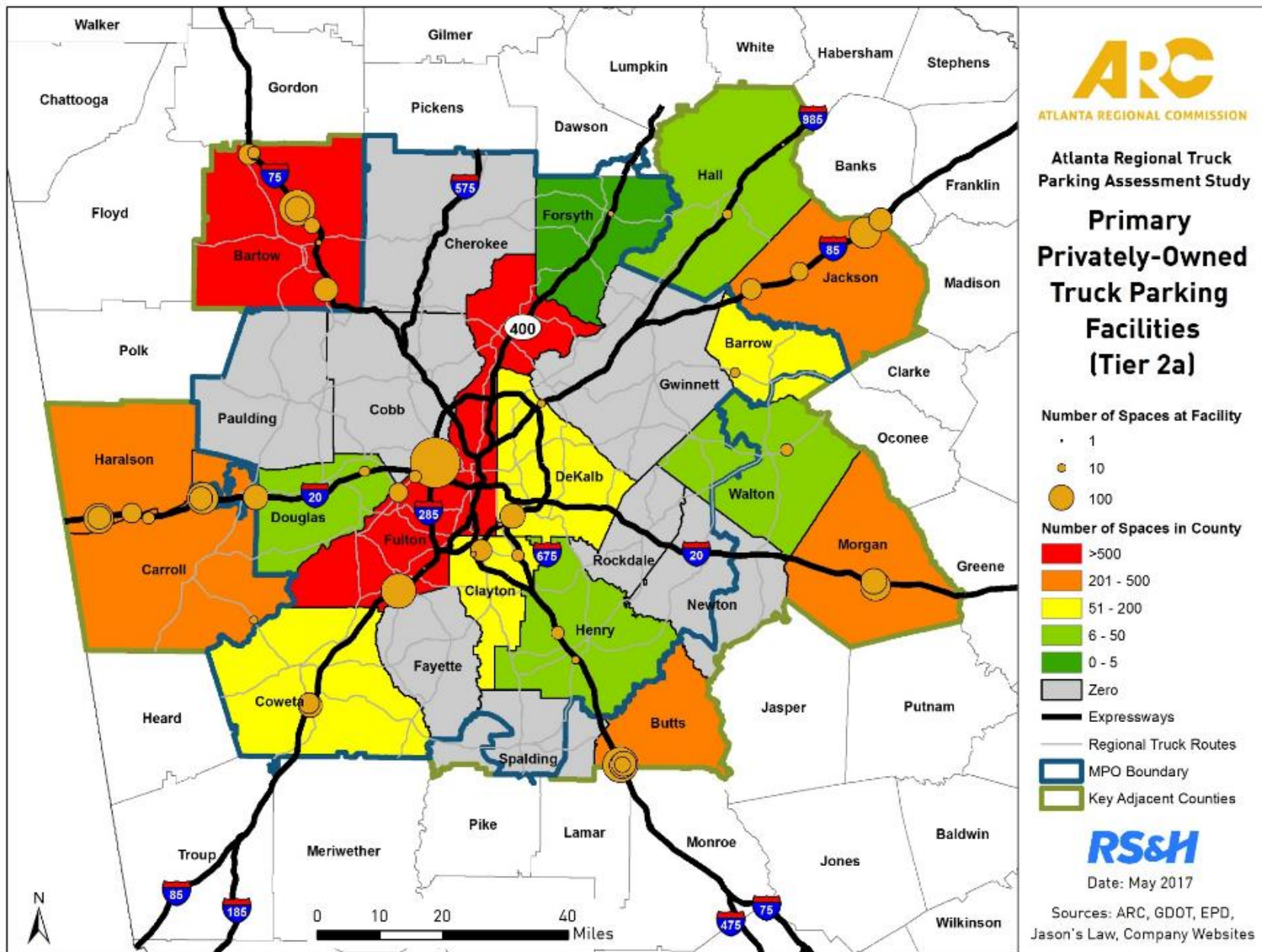
# Atlanta Regional Truck Parking Assessment Study



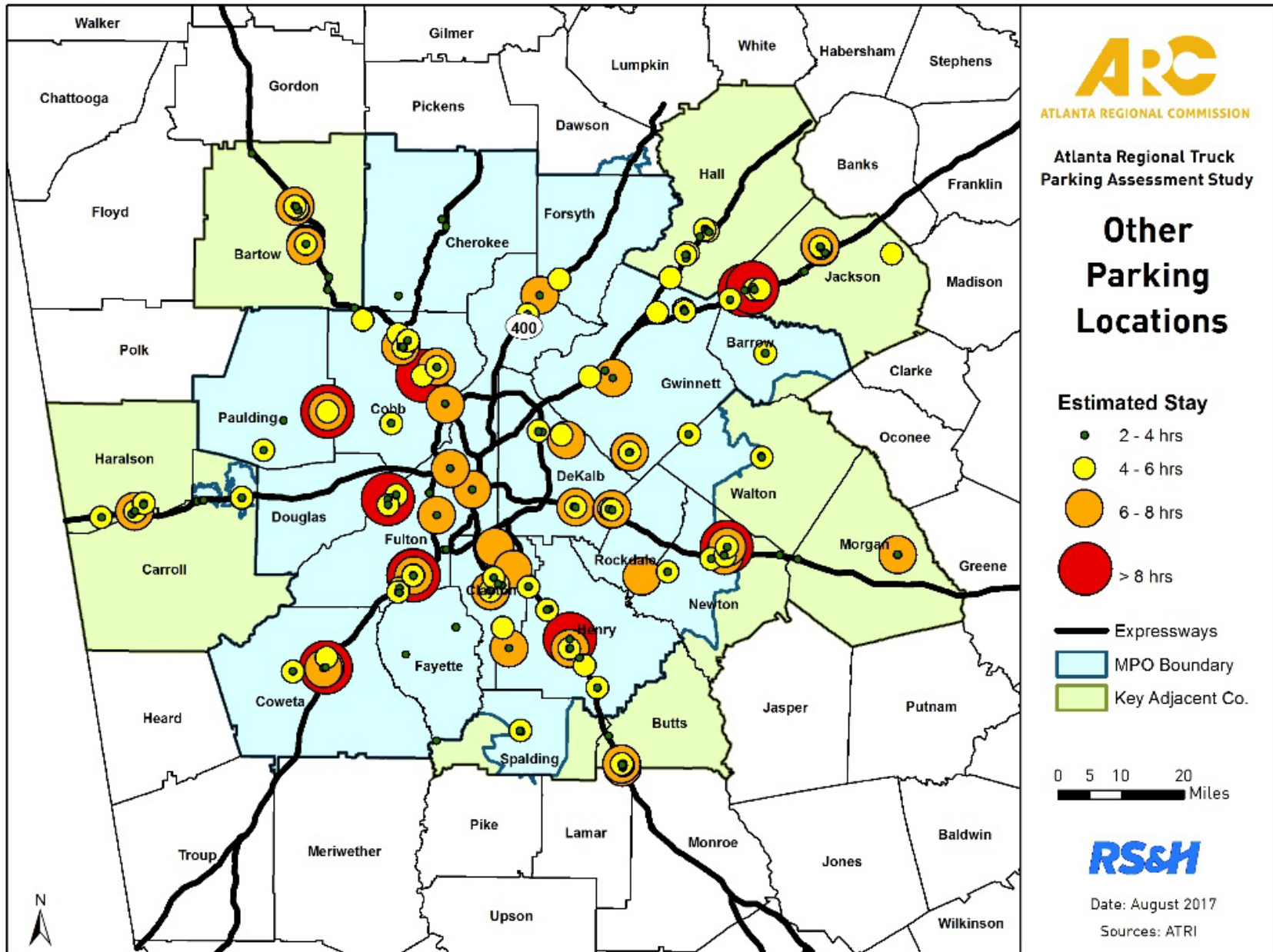
## Truck Parking Inventory







# Unauthorized & "Other" Locations





# Unauthorized & "Other" Locations

| Location Type                   | Approximate Share of Trucks Parked (%) |
|---------------------------------|--|
| Wal-Marts                       | 30%                                    |
| Roadway Cul-de-sac / Road stubs | 18%                                    |
| Ramps                           | 17%                                    |
| Unspecified Shopping Centers    | 12%                                    |
| Hotel/Motels                    | 5%                                     |
| Other                           | 6%                                     |
| Lowes                           | 3%                                     |
| Extra ROW                       | 3%                                     |
| Shoulders                       | 3%                                     |
| Dollar Stores                   | 2%                                     |
| Sam's Clubs                     | 1%                                     |



ATLANTA REGIONAL COMMISSION

# Atlanta Regional Truck Parking Assessment Study



## Outreach

# Stakeholder Surveys



## ■ Distribution

- ARC Committees: TCC, TAQC, LUCC
- Freight Advisory Task Force (FATF)
- Interviewees and their networks
- Georgia Tech Supply Chain & Logistics Institute

*Survey open from 5/15/2017 to 7/17/2017*

## ■ 97 Responses

- |                                 |              |
|---------------------------------|--------------|
| ■ Local Jurisdictions/CIDs      | 45 responses |
| ■ Trucking Companies / Shippers | 27 responses |
| ■ Law Enforcement               | 19 responses |
| ■ Truck Stop Owner / Operators  | 6 responses  |

# Truck Driver Survey Results

- **277 Responses**
- How long does it usually take you to find truck parking in the Atlanta region?

| Length of time       | Response |
|----------------------|----------|
| Less than 15 minutes | 1.3%     |
| 15 – 30 minutes      | 6.5%     |
| 30 minutes – 1 hour  | 41.3%    |
| More than 1 hour     | 51.0%    |

# Truck Driver Survey Results

- What method do you utilize to find truck parking when traveling within or around the Atlanta region?

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| Continue driving until a safe parking location is found | 68.8%    |
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# Summary of Needs

- Lack of parking supply throughout region
- I-285 is particularly challenging
- ELDs will increase demand
- Proposed solutions vary based upon perspective
- Solutions must:
  - Include coordination
  - Maximize use of technology
  - Be adaptable / flexible
  - Leverage existing assets



# Atlanta Regional Truck Parking Assessment Study



## Draft Recommendations & Group Discussion

# Today's Discussion Questions

- 1) Have we captured all recommendations, or are we missing anything ?
- 2) Are any strategies / recommendations unlikely or not feasible?
- 3) Which strategy / recommendation group do you think is most important? Most feasible?

# Draft Strategies



1. *Add / Expand* Truck Parking **Supply**
2. *Develop* Truck Parking **Policies**
3. *Develop* Truck Parking **Partnerships**
4. *Improve Sharing* of Truck Parking **Information**
5. *Monitor/Incorporate* Future Use of **Technology**

# Strategy 1: Add/Expand Supply

## 1.1 - *Comprehensive Transportation Plans (CTPs)*

- Authorized truck parking
- Unauthorized truck parking locations

## 1.2 - *Freight Cluster Plans*

- Inventory authorized & unauthorized parking
- Identify potential solutions
  - Addition of new spaces
  - Allowing parking at existing industrial facilities
  - Improved technology or other strategies



# Strategy 1: Add/Expand Supply *(con't)*

## 1.3 - *Local Government / Community Improvement District (CID) Solutions (as needed)*

- New truck stops
- Expand existing truck stops
- Shippers / receiver agreements
- Vacant industrial spaces / brownfield sites
- Existing / closed rest areas
- Park-and-ride lots (PM only)
- Shopping centers

Add / Expand Supply

# Example: Pilot Parking Program



- *Drivers Requirements:*
  - Wear safety vests at all times
  - Carry a flashlight at night
  - Follow safety rules
  - De-couple tractor from trailer
  - May not move tractor
  - Preferential treatment for no-idle cabs

Add / Expand Supply

# Example: Creative Local Solutions



## QT Store Truck Parking Jonesboro Road at Foster Place, Henry County

# Strategy 2: Policy Development

## 2.1 – *Share Warehouse/Distribution Costs/Benefits*

- Require/incentivize shippers/receivers to provide parking
  - Promote new truck parking
    - Industrial areas / freight clusters
    - CIDs

## 2.2 – *Review Development of Regional Impact (DRI) Requirements*

- Truck stops
- Warehouse / distribution centers

# Strategy 2: Policy Development (con't)

## 2.3 - *Incentivize Off-Peak Freight Operations*

- Allow truck drivers to get closer to shippers / receivers
- Reduce miles driven and air emissions,

## 2.4 - *Develop Template Zoning Language*

- Restrictions, permitted uses, design/aesthetic controls
- Examples: Buffers, plantings, lighting, electrification systems, and/or security

## 2.5 – *Promote Local Government Actions*

- Review zoning codes
- Address any truck parking deficits, as needed



## Policy Development

# Example: SW Thornton Master Plan

- Key Findings:
  - "...participants were not necessarily against industry/industrial uses, as long as it is well-designed and does not take away from the area's desirability."
- Land Use "Guiding Policies"
  - "...special attention should be paid to recommended buffers and landscaping elements in review phase..."



# Strategy 3: Partnerships

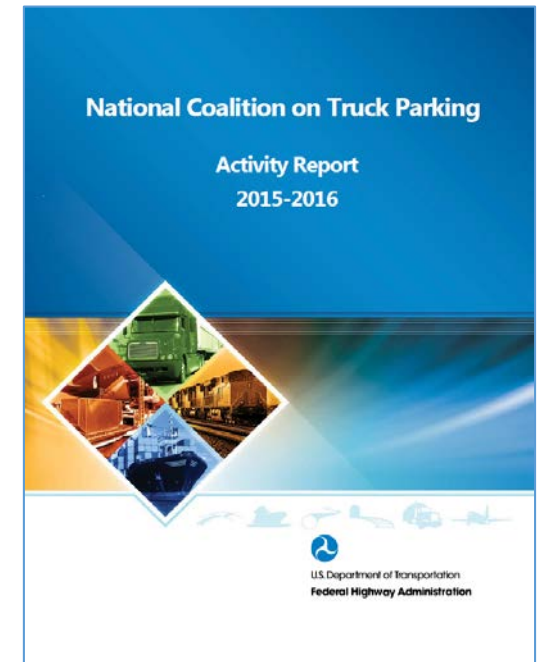
- 3.1 – *Provide ongoing updates to the Freight Advisory Task Force (FATF)*
- 3.2 - *Provide truck parking information and resources to stakeholders and planning partners*
- 3.3 - *Attend relevant meetings and participate in speaking opportunities*

# Strategy 3: Partnerships (con't)

- 3.4 - *Participate in FHWA National Coalition on Truck Parking / FHWA coordination*
- 3.5 – *Continue to discuss truck parking policy priorities, initiatives. and projects*

# FHWA National Coalition on Truck Parking

- June 2017 “Activity Report”
- Four (4) Working Groups to Assess:
  - Parking Capacity
  - Technology and Data
  - Funding, Finance and Regulations
  - State, Regional and Local Government Coordination



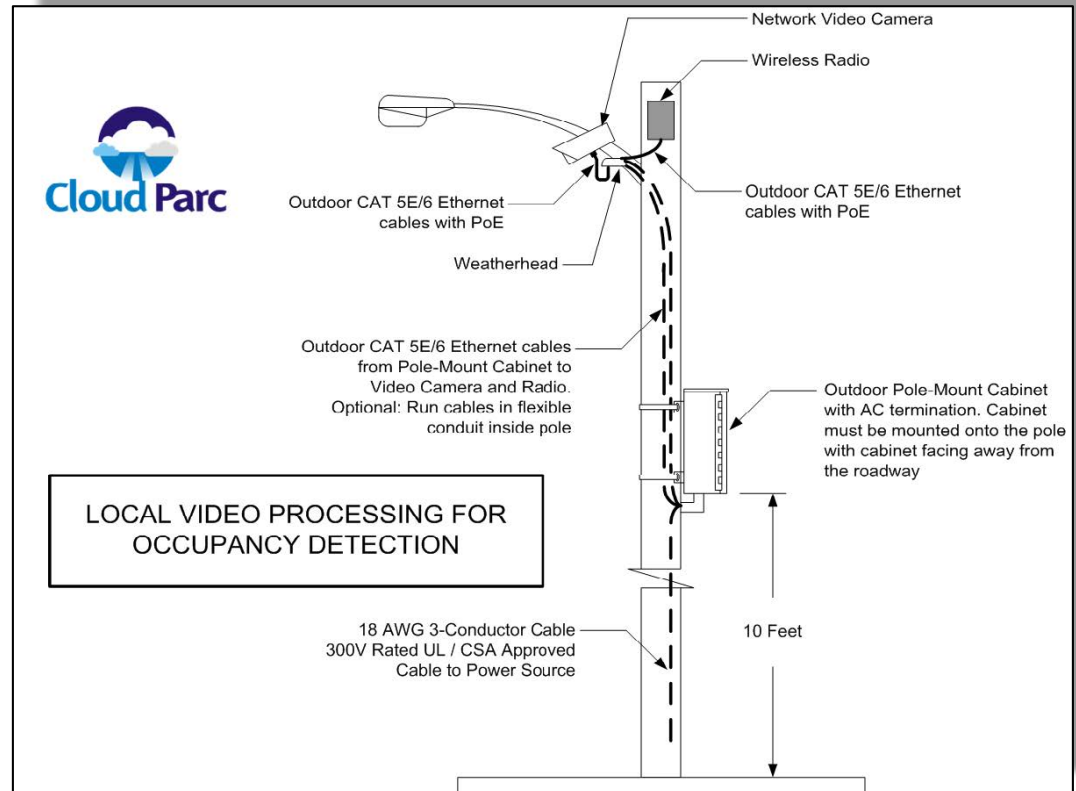
# Strategy 4: Information Sharing

- 4.1 – *Monitor opportunities to implement real-time truck parking availability systems or implement other technology solutions*
- 4.2 – *Serve as regional clearinghouse for truck parking information*



# Information Sharing

## Example: Parking Detection Devices



# Strategy 5: Monitor / Incorporate Future Technology

5.1 – *Connected /Autonomous Vehicles  
(CVs/AVs)*

5.2 – Internet of Things (*IoT*)-*Logistics/Freight*

5.3 – *Physical Internet*

# Monitor / Incorporate Technology

## Example: Autonomous Trucks

### Volvo Trucks Planning Chief Talks Tesla, Autonomous Vehicles and Platooning

CLARISSA HAWES || SEPTEMBER 28, 2017

|| SELF-DRIVING TRUCKS - AUTONOMOUS VEHICLES, TRUCKING TECHNOLOGY



Keith Brandis, director of product planning at Volvo Trucks North America. (Photo: Clarissa Hawes/Tr

DAILY NEWS 8 May 2015

### Autonomous truck cleared to drive on US roads for the first time



Now on Nevada highways.  
Daimler AG

### Here's how Tesla, Uber, and Google are trying to revolutionize the trucking industry



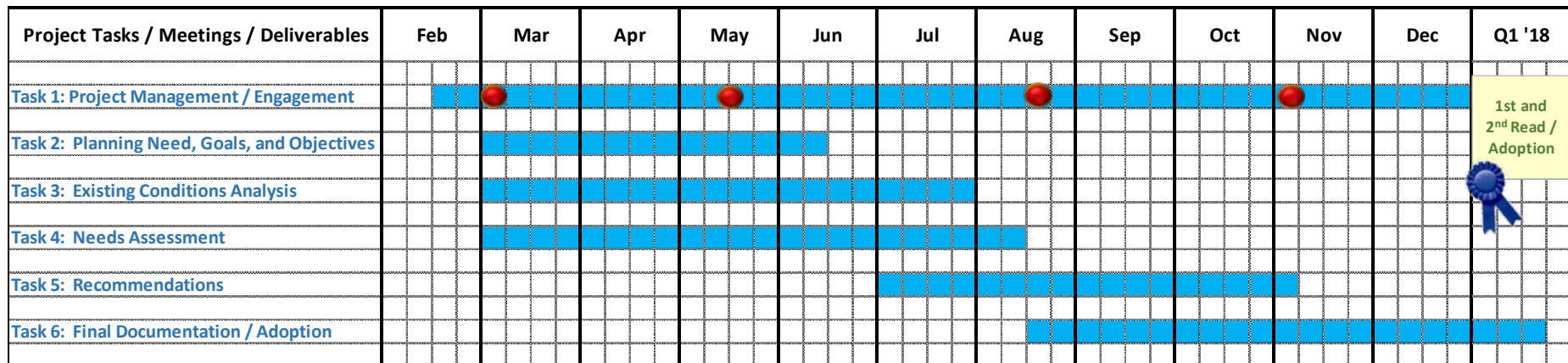
Danielle Muoio

Jun. 20, 2017, 9:07 AM

93,126

# Next Steps

**Project Schedule**  
**Atlanta Regional Truck Parking Assessment Study (2017-2018)**



1st and  
2<sup>nd</sup> Read /  
Adoption



 FATF Meeting

*Revised: 10-31-17*

# Atlanta Regional Truck Parking Assessment Study



# Thank You!



***Draft:* Summary of Proposed Action Items by Strategy (11-2-17)**  
**Atlanta Regional Truck Parking Assessment Study**

| Draft Strategies                                       | No. | Draft Action Items  | Stakeholders   |
|--|-----|---|--|
| <b>1. Add / Expand Truck Parking Supply</b>            | 1.1 | Require Comprehensive Transportation Plans (CTPs) to identify existing authorized truck parking spaces within the study area as well as any locations, if applicable, where unauthorized may be taking place.   | ARC, Local Governments                                 |
|  | 1.2 | Require project sponsors for ARC Freight Cluster Plans to assess localized truck parking needs in the study area: <ul style="list-style-type: none"> <li>Develop an inventory of authorized parking spaces and locations of unauthorized parking</li> <li>Identify ways that the project sponsor can address truck parking through the addition of new spaces, allowing parking at existing industrial facilities, improved technology, or other strategies.</li> </ul>   | ARC, Local Governments                                 |
|  | 1.3 | If local demand is greater than supply, local governments should assess feasibility of increasing truck parking supply through strategies such as: <ul style="list-style-type: none"> <li>New truck stops</li> <li>Expansion of existing truck stops / private lots</li> <li>Coordination with shippers/receivers to allow on-site parking</li> <li>Use of vacant industrial spaces and/or brownfield sites</li> <li>Adding truck parking spaces at existing and/or closed rest areas</li> <li>Utilizing park-and-ride lots (PM only)</li> <li>Potential arrangements with commercial shopping centers</li> </ul>   | ARC, Local Governments, Stakeholders                   |
| <b>2. Develop Truck Parking Policies</b>               | 2.1 | Evaluate polices that allow for sharing of costs and benefits, such as for new or expanded warehousing / distribution developments <ul style="list-style-type: none"> <li>Require or incentivize shippers and receivers to provide truck parking on site for truck drivers making pickups or drop-offs at their location via zoning requirements, permitting controls, changes to the Development of Regional Impact review process, and/or tax breaks or credits</li> <li>Promote new truck parking within industrial / freight clusters. Where available, Community Improvement Districts (CIDs) could construct and operate a truck parking lot for truck staging and/or overnight parking.</li> </ul> | ARC, Local Governments, Stakeholders                   |
|  | 2.2 | Review Development of Regional Impact (DRI) requirements for certain uses (truck stops, warehouse / distribution center development) in regards to truck trip generation and short- and long-range parking needs  | ARC, GRTA  |
|  | 2.3 | Review polices that incentivize shifting freight operations to off-peak hours to allow truck drivers to get closer to shippers and receivers and also help to reduce air emissions, particularly during the summer smog season  | ARC, Local Governments, Stakeholders                   |
|  | 2.4 | Develop truck parking model zoning language that could be used as a model for jurisdictions that may wish to permit truck parking, but with certain restrictions, permitted uses, and required design and aesthetic controls (i.e. buffers, plantings, lighting, electrification systems, and/or security requirements).  | ARC, Local Governments, Stakeholders                   |
|  | 2.5 | Encourage local governments with truck parking needs to review zoning codes and address any truck parking deficits, as needed   | ARC, Local Governments                                 |
| <b>3. Develop Truck Parking Partnerships</b>           | 3.1 | Provide ongoing updates to the Freight Advisory Task Force (FATF) regarding truck parking with a specific focus on issues within the Atlanta region   | ALL (ARC, FATF, GDOT, Local Governments, stakeholders) |
|  | 3.2 | Provide information and resources to stakeholders and planning partners, including the results of this study and other relevant truck parking data  | ARC, Local Governments, Stakeholders                   |
|  | 3.3 | Attend relevant meetings and participate in speaking opportunities to further educate regional leaders and planners on this issue.  | ARC, Local Governments, Stakeholders                   |
|  | 3.4 | Participate in FHWA National Coalition on Truck Parking activities to stay informed of best practices nationally and to coordinate with FHWA as needed.   | ARC, GDOT, FHWA  |
|  | 3.5 | Continue to discuss truck parking policy priorities, initiatives, and projects  | ARC, GDOT, FHWA, FATF                                  |
| <b>4. Improve Sharing of Truck Parking Information</b> | 4.1 | Monitor opportunities to implement real-time truck parking availability systems or implement other technology solutions   | ARC, GDOT, FATF  |
|  | 4.2 | Serve as regional clearinghouse for truck parking information.  | ARC, Local Governments, FATF, Stakeholders             |
| <b>5. Monitor / Integrate Future Technology</b>        | 5.1 | Monitor / Integrate future technological developments in the freight industry that may impact truck parking, including: <ul style="list-style-type: none"> <li>Connected and Autonomous vehicles (CVs/AVs)</li> <li>Internet of Things (IoT) – Logistics / Freight</li> <li>Physical Internet</li> </ul>  | ARC, GDOT, FHWA, GA Tech                               |

## **Appendix 2-F**

### **Transportation Coordinating Committee Meeting 1**

# ***Atlanta Regional Truck Parking Assessment Study***



TCC Meeting

March 17, 2017

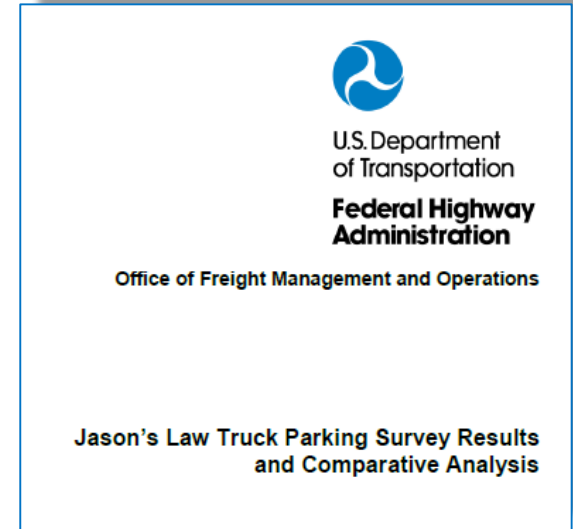
Daniel Studdard, AICP  
Principal Planner, ARC



# Background and Needs



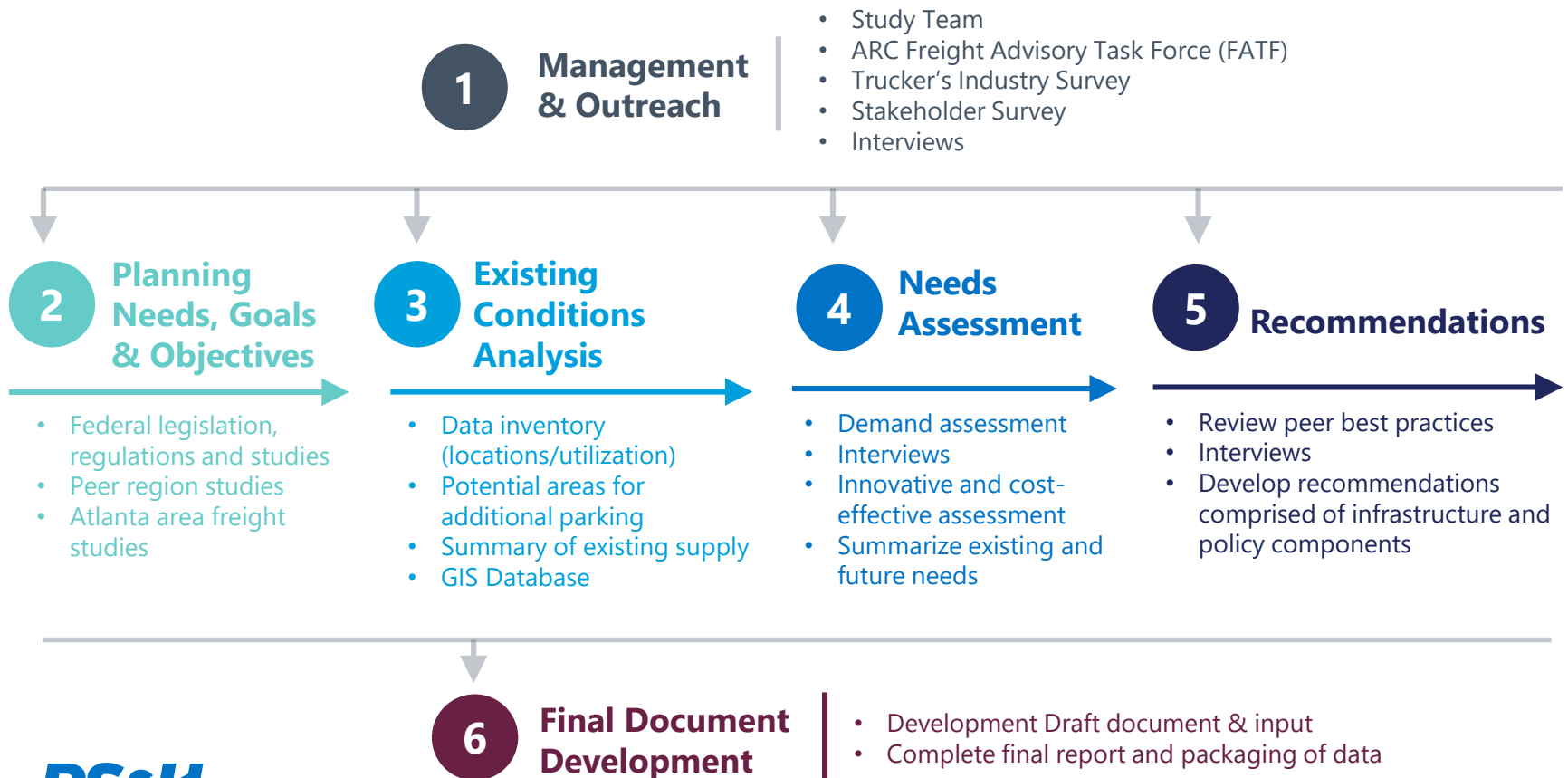
- » FHWA – MAP-21/Jason's Law Truck Survey
- » Federal Motor Carrier Safety Administration (FMCSA)
  - Hours-of-Service (HOS)
  - Electronic Logging Devices (ELD)
- » Atlanta Regional Freight Mobility Plan Update (2016)
- » Truck Staging near warehouses/distribution centers



# Approach



## Atlanta Regional Truck Parking Assessment Study





# 1 Management & Outreach

## *Key Stakeholders*



- » ARC Committees
  - Freight Advisory Task Force
  - TAQC
  - TCC
  - LUCC
- » Truck Drivers
- » Industry Representatives
  - Trucking Associations
  - Truck Stop Operators
  - Law Enforcement Officials



# 1 Management & Outreach

## *Outreach Activities*



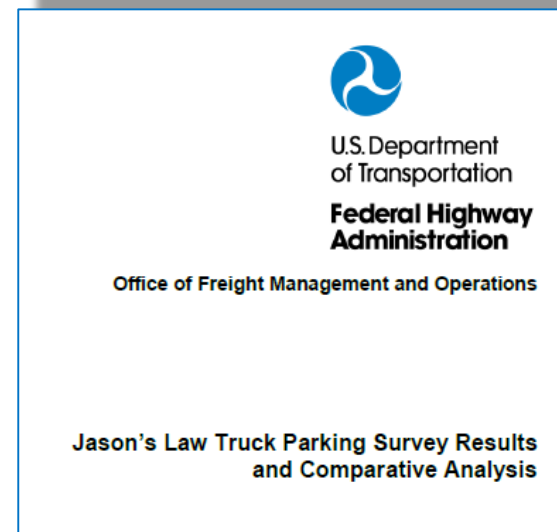
- » Surveys
  - Truck Drivers
  - Other Stakeholders
    - *WikiMapping*<sup>®</sup>
- » Stakeholder Interviews
- » Meetings
  - Freight Advisory Task Force
  - ARC Committees



## 2 Planning Needs, Goals & Objectives

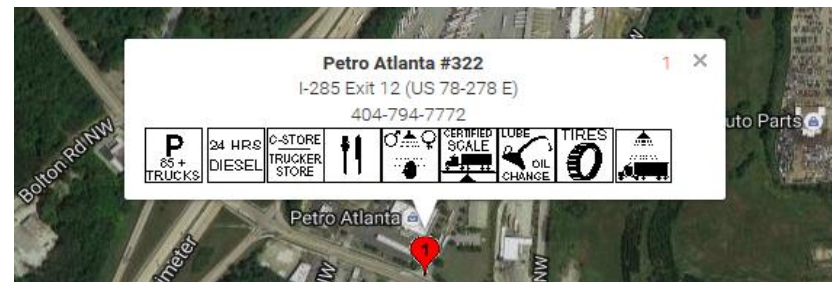
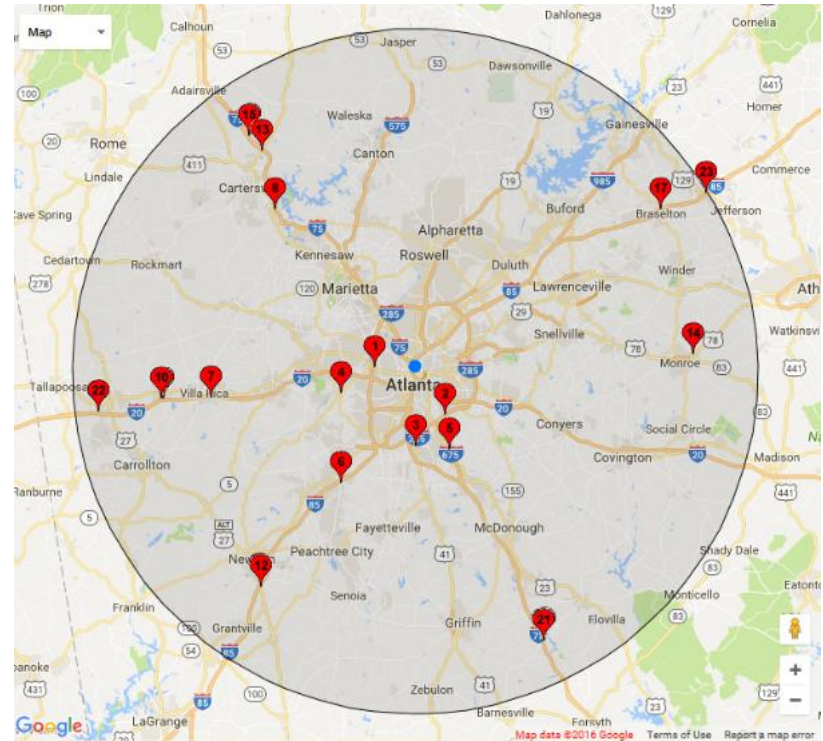


- » FHWA – MAP-21/Jason's Law Truck Survey
- » Federal Truck Driver Rules
  - Hours-of-Service (HOS)
  - Electronic Logging Devices (ELD)
- » Atlanta Regional Freight Mobility Plan Update (2016)
- » Peer Review of Similar Studies



## Key Items

- Data Inventory
- Parking Supply
- Additional Needs
- GIS Database



## 3 Existing Conditions Analysis



### *Supply Inventory*



## Truck Parking Tiers

1

### Publicly-Controlled

- Rest Areas
- Weigh-in-Motion Areas

2a

### Privately-Owned Primary

- Truck Stops
- Commercial Transport Services

2b

### Privately-Owned Secondary

- Restaurants / Commercial Areas
- Hotels/Motels
- Shippers

3

### Unauthorized

- Interstate Ramps
- Vacant / Abandoned Lots



### 3 Existing Conditions Analysis



## *Smart Phone Apps and Technologies*



Truck  
Parking  
USA



TRUCKER PATH



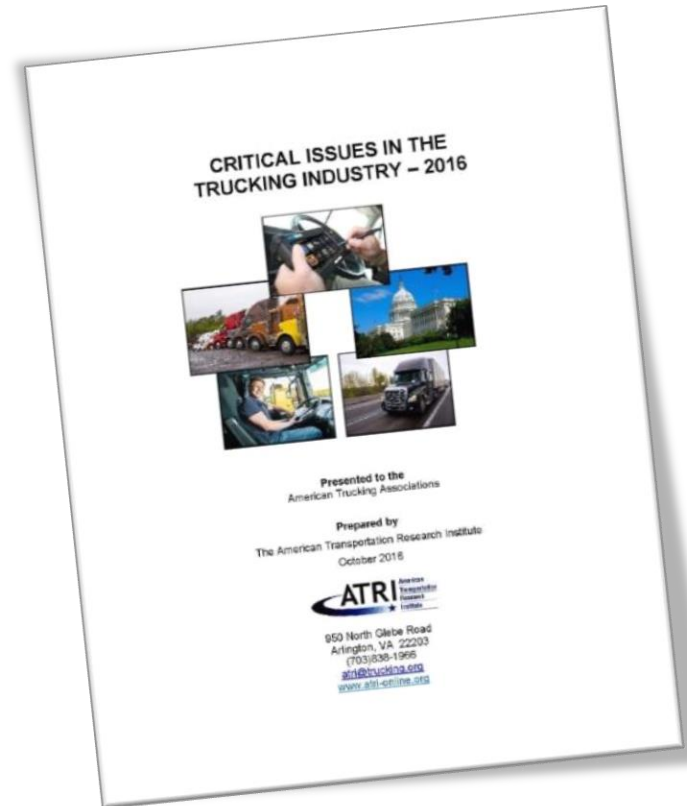
Truck Parking  
Availability Sensors

## 4 Needs Assessment



### *Key Items*

- Supply vs. Demand
- FHWA Truck Parking Demand Model
- Summarize Existing / Future Needs



## 4 Needs Assessment

### *Example – GPS Data*



## 5 Recommendations



### *Key Items*





## 6 Final Document Development



Complete During 2017







*Are there other important issues that should be assessed from a local or regional perspective?*

*Other Questions?*

Daniel Studdard, AICP  
dstuddard@atlantaregional.com  
Principal Planner, ARC



## **Appendix 2-G**

### **Transportation Coordinating Committee Meeting 2**

# Atlanta Regional Truck Parking Assessment Study



## Needs Assessment

Technical Coordinating Committee (TCC)

*August 4, 2017*

# Today's Discussion

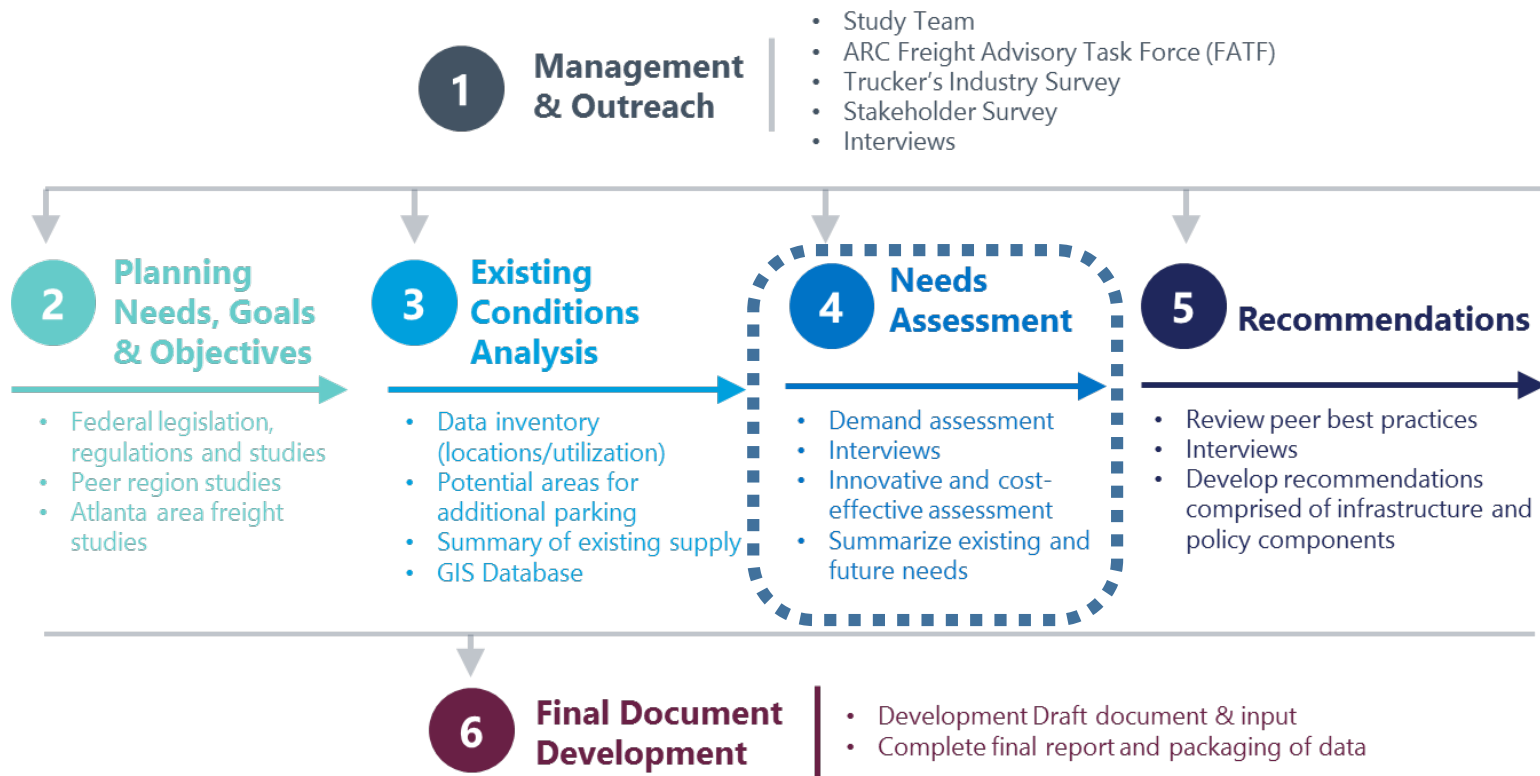
- Technical Analysis Update
- Outreach Update
- Summary of Needs
- Next Steps



# Study Approach



## Atlanta Regional Truck Parking Assessment Study





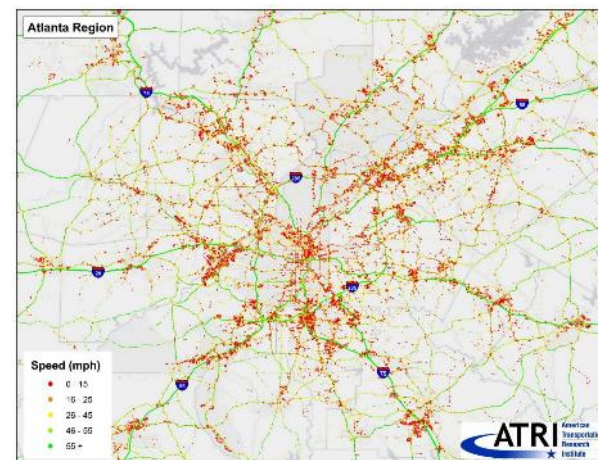
# Atlanta Regional Truck Parking Assessment Study



## Technical Analysis Truck Parking Utilization

# ATRI GPS Truck Data Coverage

- ATRI data: 600,000 trucks<sup>1</sup>
- US Total: 2,750,000+ trucks<sup>2</sup>
- **Estimate 22% ATRI coverage**



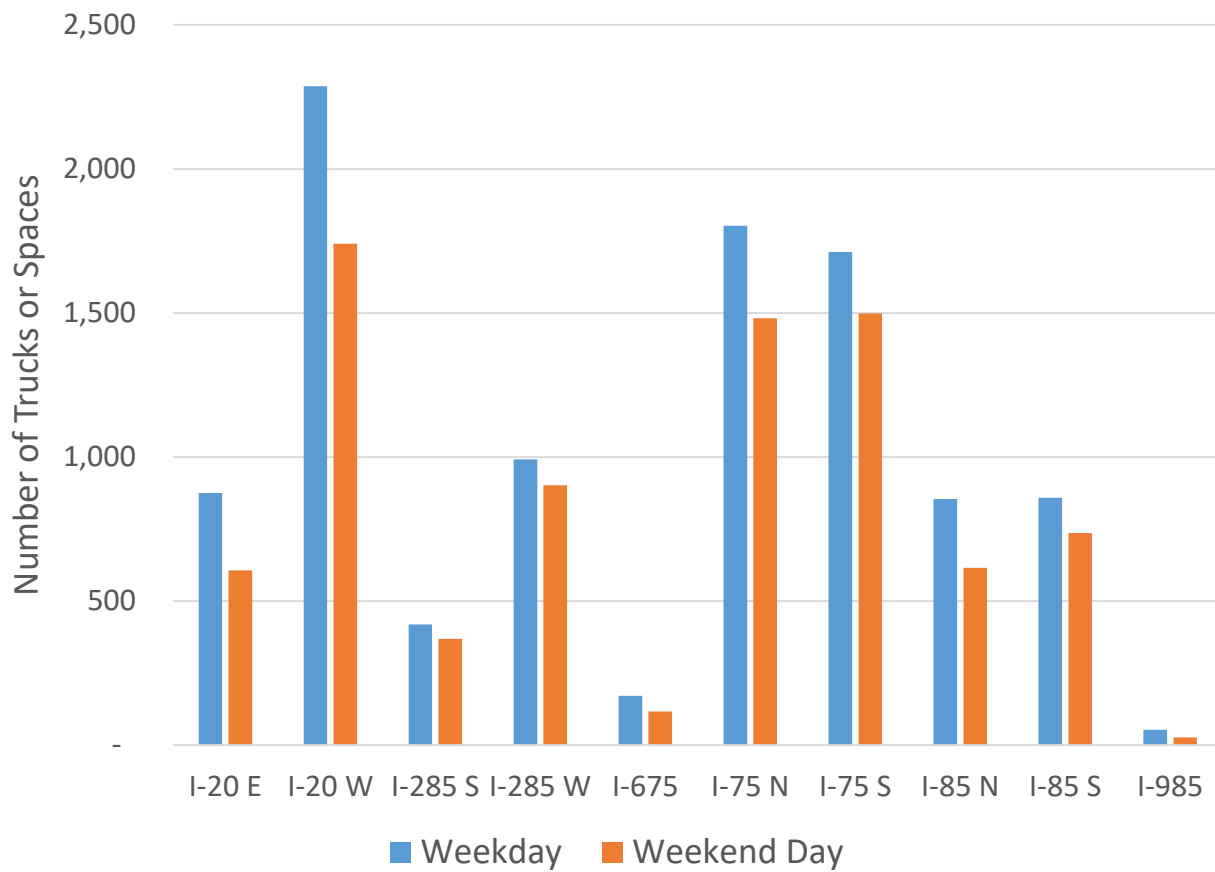
ATRI : 11/5/16 – 11/20/16

<sup>1</sup> FHWA and MNDOT (ATRI contains mostly large, interstate traveling trucks)

<sup>2</sup> FMCSA 2017 Pocket Guide to Large Truck and Bus Statistics, combination trucks/tractor-trailers

# Estimated Truck Parking Utilization

Estimated Parking Utilization from Midnight to 4 am

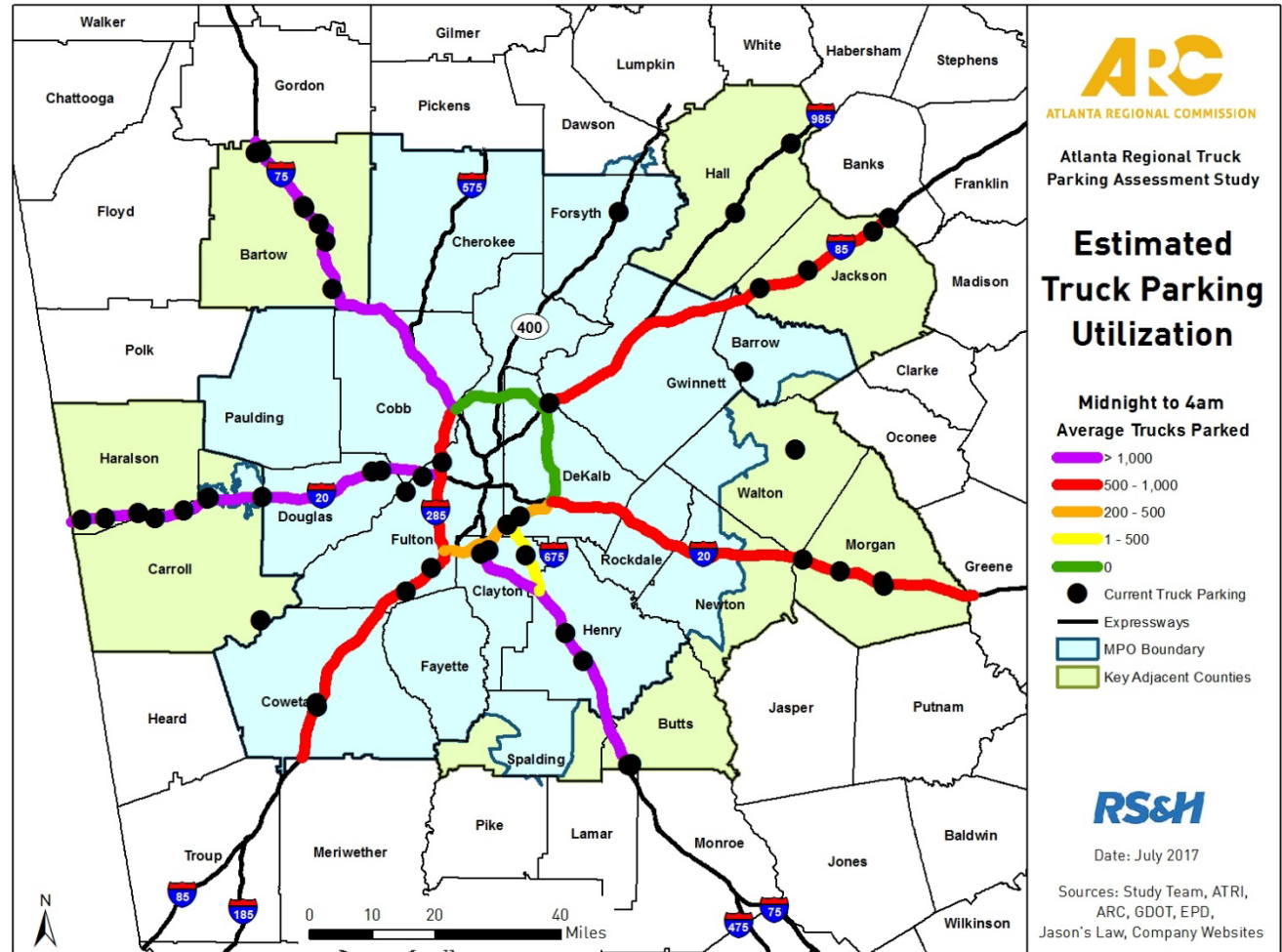


Corridor Rankings by Utilization  
From Midnight to 4am  
and Parking Capacity

| Corridor | Capacity | Weekday | Weekend |
|----------|----------|---------|---------|
| I-20 W   | 1        | 1       | 1       |
| I-75 N   | 2        | 2       | 3       |
| I-75 S   | 3        | 3       | 2       |
| I-285 W  | 4        | 4       | 4       |
| I-85 S   | 5        | 6       | 5       |
| I-20 E   | 6        | 5       | 7       |
| I-85 N   | 7        | 7       | 6       |
| I-285 S  | 8        | 8       | 8       |
| I-675    | 9        | 9       | 9       |
| I-985    | 10       | 10      | 10      |

# Estimated Truck Parking Utilization

| Corridor | Estimated Utilization |
|----------|-----------------------|
| I-20 W   | 2,290                 |
| I-75 S   | 1,710                 |
| I-75 N   | 1,800                 |
| I-285 W  | 990                   |
| I-85 S   | 860                   |
| I-20 E   | 880                   |
| I-85 N   | 850                   |
| I-285 S  | 420                   |
| I-675    | 170                   |
| I-985    | 50                    |
| Total    | 10,020                |



# Atlanta Regional Truck Parking Assessment Study

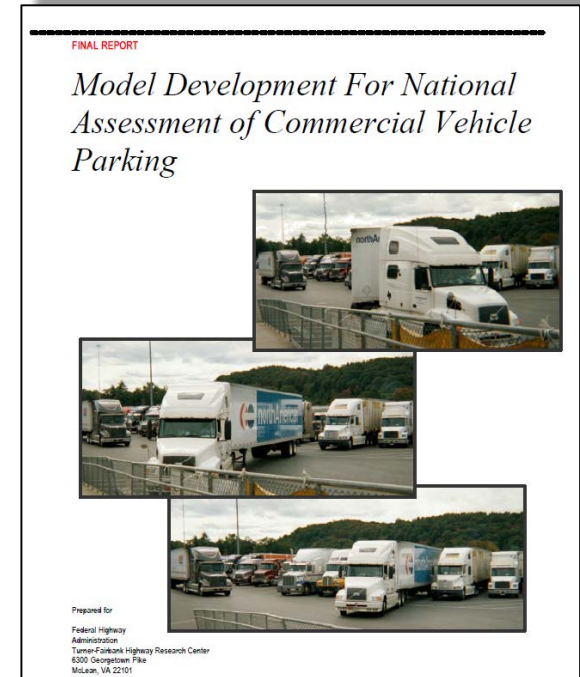


## Technical Analysis Parking Demand Model



# FHWA Truck Parking Demand Model

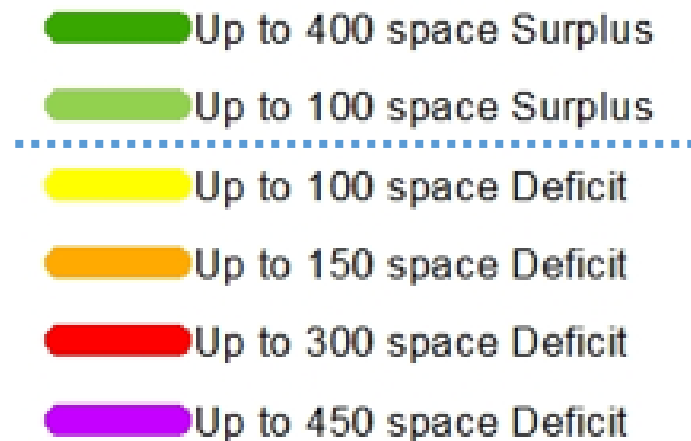
- Estimates corridor-level truck parking demand
- Input
  - Volumes
  - Corridor segment length
  - Speed
- Parameters
  - Truck driver service hour limits
  - Long haul parameters



# FHWA Truck Parking Demand Model

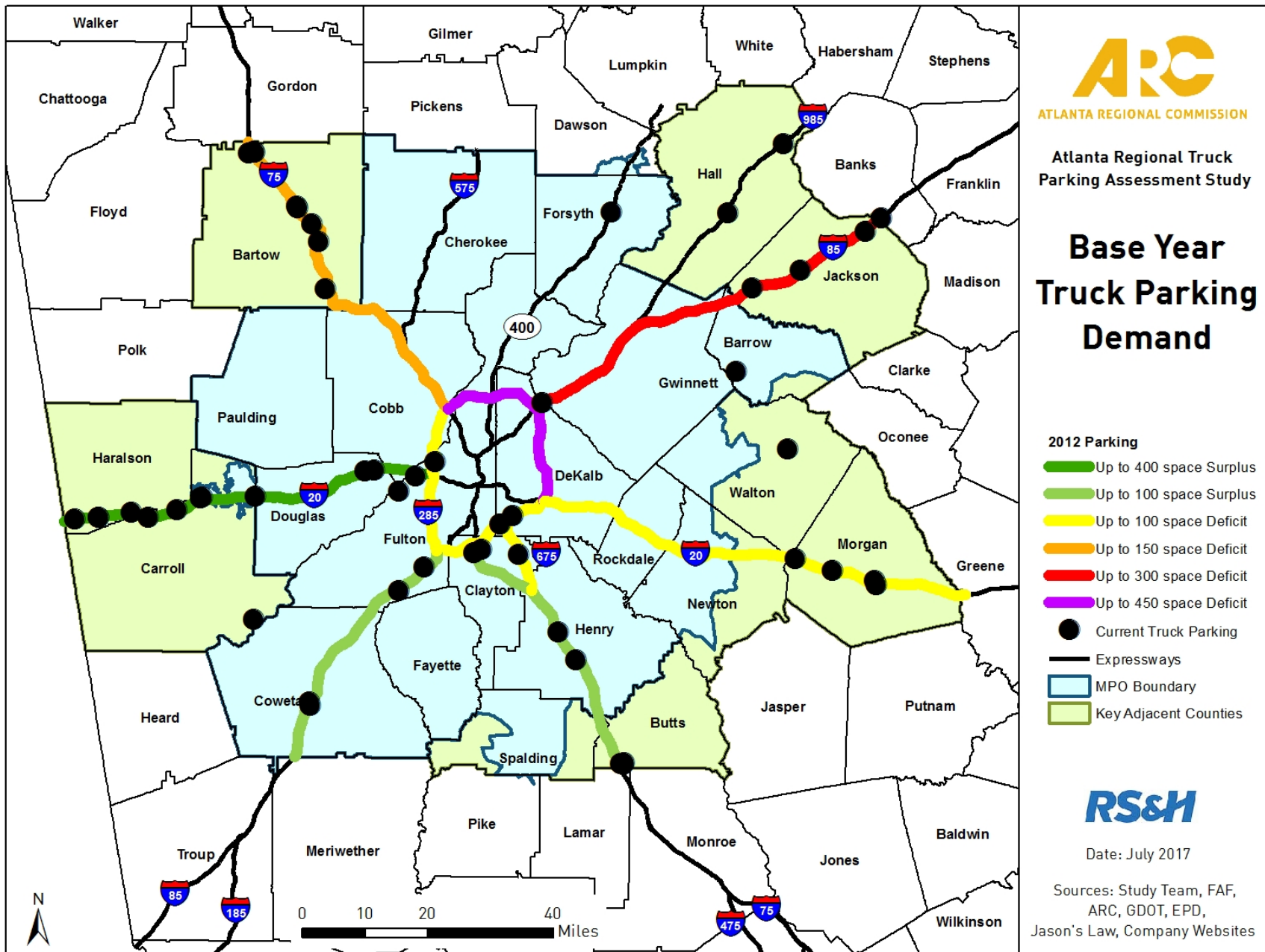
Result: Between 2012 and 2045 truck parking demand is estimated to increase by approximately **76%**

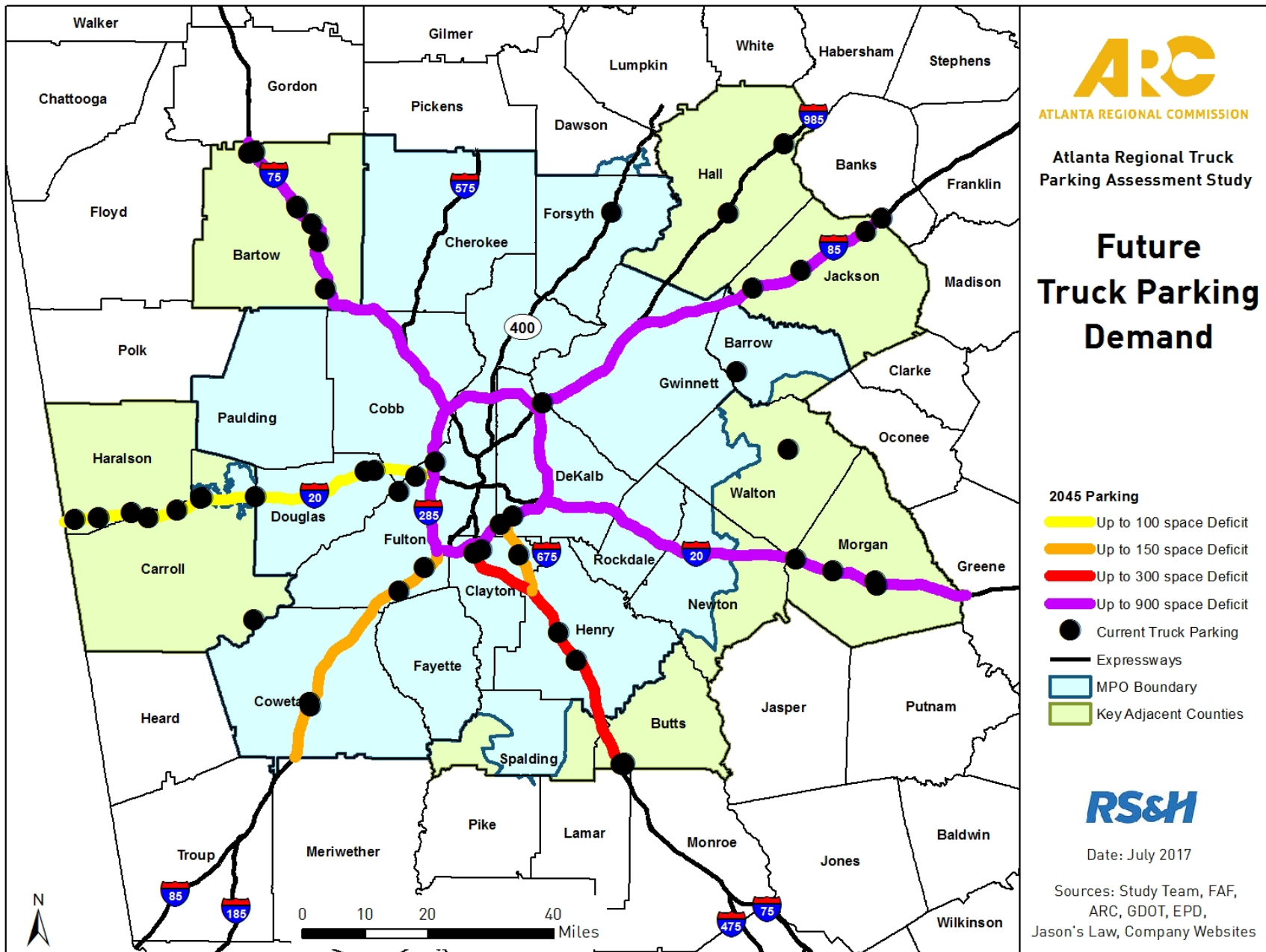
## Legend - Corridor Level Results



## Parking Surplus or Deficit

| Corridor    | 2012  | 2045 |
|-------------|-------|------|
| I-20 West   | (368) | 37   |
| I-85 South  | (96)  | 110  |
| I-75 South  | (87)  | 223  |
| I-285 West  | 21    | 349  |
| I-675       | 50    | 106  |
| I-20 East   | 88    | 413  |
| I-285 South | 97    | 307  |
| I-75 North  | 147   | 695  |
| I-85 North  | 303   | 830  |
| I-285 NE    | 456   | 802  |





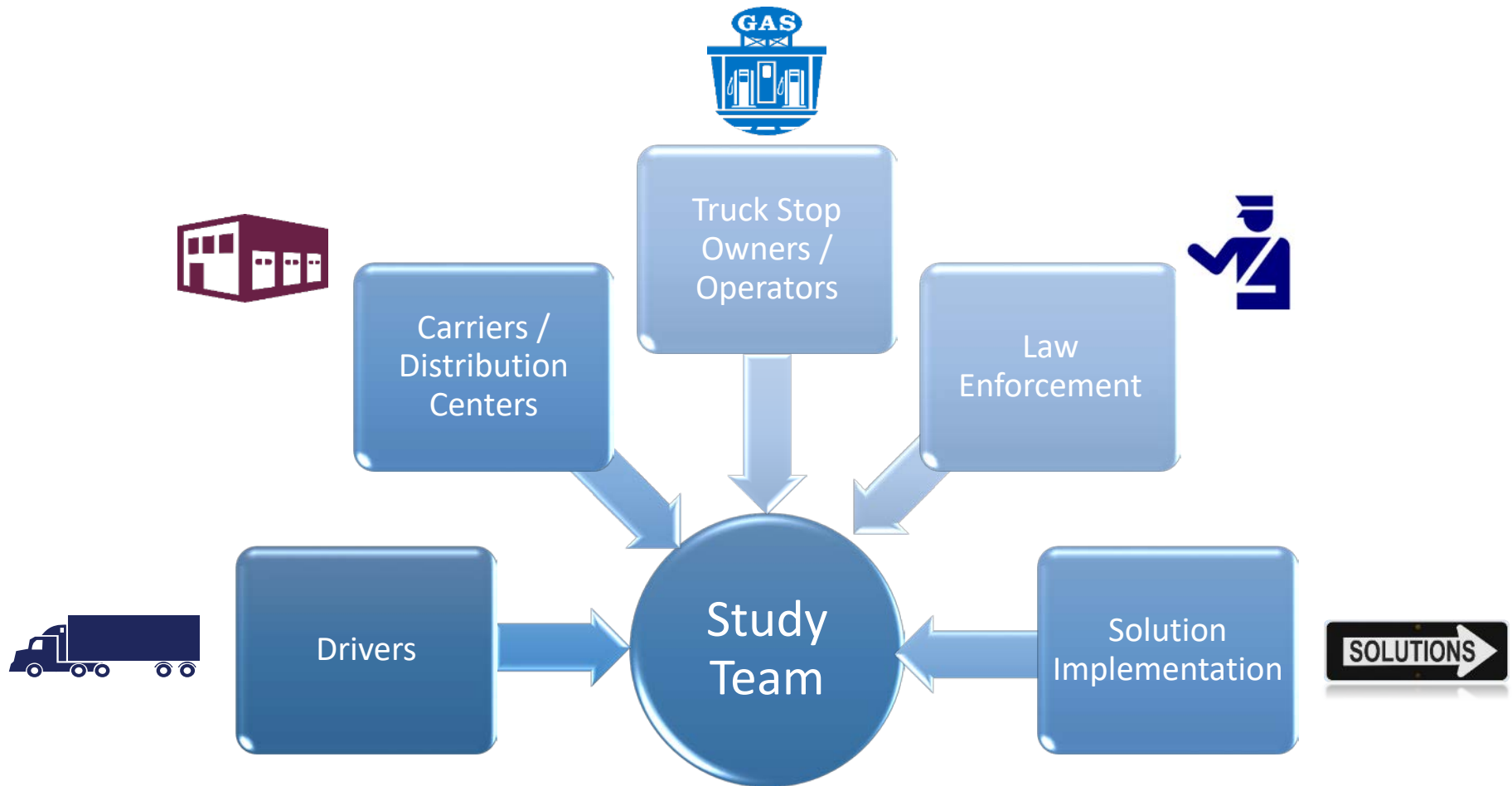
# Atlanta Regional Truck Parking Assessment Study







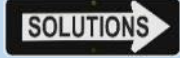
Outreach Update  
Stakeholder Interviews



# Stakeholder Groups







# Stakeholders Interviewed

| Affiliation / Agency  |  |  |  |  |  |
|---|---|--|---|---|---|
|   | Drivers   | Carriers / Distribution Centers  | Truck Stop Owners / Operators   | Law Enforcement   | Solution Implementation   |
| Owner-Operator Independent Drivers Association (OOIDA)                        | X   |  |   |   |   |
| Truck Driver  | X   |  |   |   |   |
| National Association of Truck Stop Operators (NATSO)                          |   |  | X   |   |   |
| Geo. H. Green Oil, Inc.   |   |  | X   |   |   |
| Southeastern Freight Lines  |   | X  |   |   |   |
| Wal-mart – Driver (FHWA Webinar)  | X   |  |   |   |   |
| Wal-mart - Distribution Center  |   | X  |   |   |   |
| Air Cargo Industry Liaison (Mullins International Solutions)                  |   | X  |   |   |   |
| Georgia Motor Trucking Association  |   |  | X   |   |   |
| Cisco - Global Logistics  |   |  |   |   | X   |
| Georgia Department of Public Safety, Motor Carrier Compliance Division (MCCD) |   |  |   | X   |   |
| Georgia Department of Transportation  |   |  |   |   | X   |
| FHWA  |   |  |   |   | X   |
| FDOT (adjacent State DOT Peer)  |   |  |   |   | X   |
| Mid-America Freight Coalition (MAFC)  |   |  |   |   | X   |





# Stakeholder Interviews

## Common Issues

| Issues   |  |  |  |  |
|--|--|---|---|---|
|  | Drivers  | Carriers /<br>Distribution<br>Centers   | Truck Stop<br>Owners /<br>Operators   | Law<br>Enforcement  |
| Finding Safe and Authorized Parking is a Challenge   | X  | X   | X   |   |
| Zoning, Land Use, and Noise Ordinances are an impediment to finding and siting truck parking   | X  | X   | X   |   |
| Truck parking demand is greater than supply of parking spaces, which creates issues with traffic and staging for delivery                    | X  | X   | X   | X   |
| Lack of parking results in less driving time and impacts to bottom-line as substantial time is spent searching for safe, authorized parking. | X  | X   |   |   |

# Stakeholder Interviews

## Common Findings

| Issues  |  |  |  |  |
|---|--|---|---|---|
|   | Drivers  | Carriers /<br>Distribution<br>Centers   | Truck Stop<br>Owners /<br>Operators   | Law<br>Enforcement  |
| Most truckers just need a clean restroom, and well-lit, safe, parking area - most carry their own food and supplies.                | X  | X   | X   |   |
| Finding parking is mostly handled by drivers through GPS, apps, and local knowledge   | X  | X   | X   |   |
| The most common truck parking violations are those parking on interstate ramps and in emergency lanes                               |  |   |   | X   |
| Industrial areas bring increased truck traffic; many communities want the increased tax revenue, but don't realize the side effects | X  | X   | X   |   |
| Electronic Logging Device (ELD) requirements will increase truck parking challenges   | X  | X   | X   | X   |

# Recommendations from Interviews

## Finding Safe & Authorized Parking



More parking in urban areas

Distribution centers provide parking

“Micro” truck stops

Convert former rest areas into truck parking

More rest area parking spaces

**Drivers**



Educate truck drivers to find safe havens for parking

Provide safe waiting areas for delivery staging

**Carriers / Distribution Centers**



Policy coordination

Educate surrounding residents about the need

**Truck Stop Owners / Operators**



Truck drivers should plan their routes in advance and identify legal parking areas

MCCD identified two (2) weigh stations in our study area and three (3) others in North Georgia that typically have free spaces for truck parking

**Law Enforcement**



# Recommendations from Interviews

## Zoning, Land Use & Noise Issues



Local, state, and Federal governments need to work together to find a solution to the problem

Allow real-time, accurate signage about available parking

**Drivers**



Educate law enforcement about noise levels for Aux Power Units (APUs)

Educate communities about the need for truck parking near industrial areas

**Carriers / Distribution Centers**



Large corporate chains may employ staff who help navigate zoning, land use, and noise issues / permitting during development of new locations

**Truck Stop Owners / Operators**



Sees most of the problems in the Atlanta suburban ring counties (Henry, Gwinnett, Douglas) not as much in the urban counties of Fulton and DeKalb

**Law Enforcement**

# Recommendations from Interviews

## Solutions Implementation

- Multi-level agency collaboration
- Public-private collaboration
- Educational component
- Importance of technology

**FHWA**

- Rapid technology advances challenge investment level
- Sharing culture / WAZE effect
- Innovative solutions using existing assets
- Data availability: public vs. private
- Small investments by many versus large investments by few

**Mid-America Freight Coalition / FDOT / CISCO**

# Atlanta Regional Truck Parking Assessment Study



Outreach Update  
Stakeholder Surveys

# Stakeholder Surveys



## ■ Distribution

- TCC
- LUCC
- TAQC
- Freight Advisory Task Force (FATF)
- Interviewees and their networks
- Georgia Tech Supply Chain & Logistics Institute

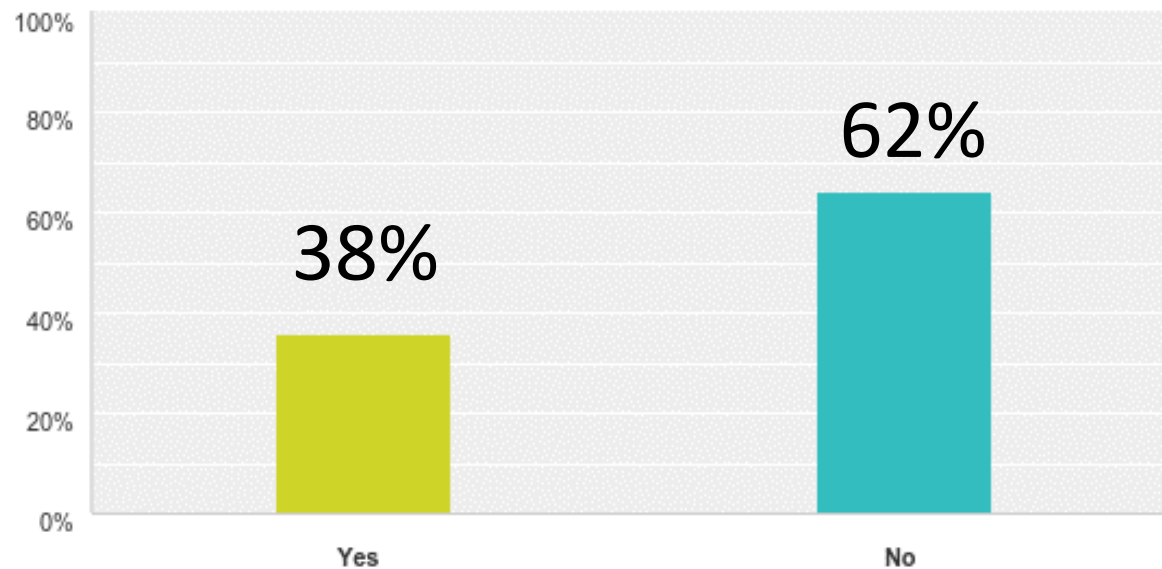
*Survey open from 5/15/2017 to 7/17/2017*

## ■ 97 Responses

- |                                 |              |
|---------------------------------|--------------|
| ■ Local Jurisdictions/CIDs      | 45 responses |
| ■ Trucking Companies / Shippers | 27 responses |
| ■ Law Enforcement               | 19 responses |
| ■ Truck Stop Owner / Operators  | 6 responses  |

# Stakeholder Surveys

- Does your jurisdiction have any programs, policies, or strategies in place to address truck parking?





# Stakeholder Surveys

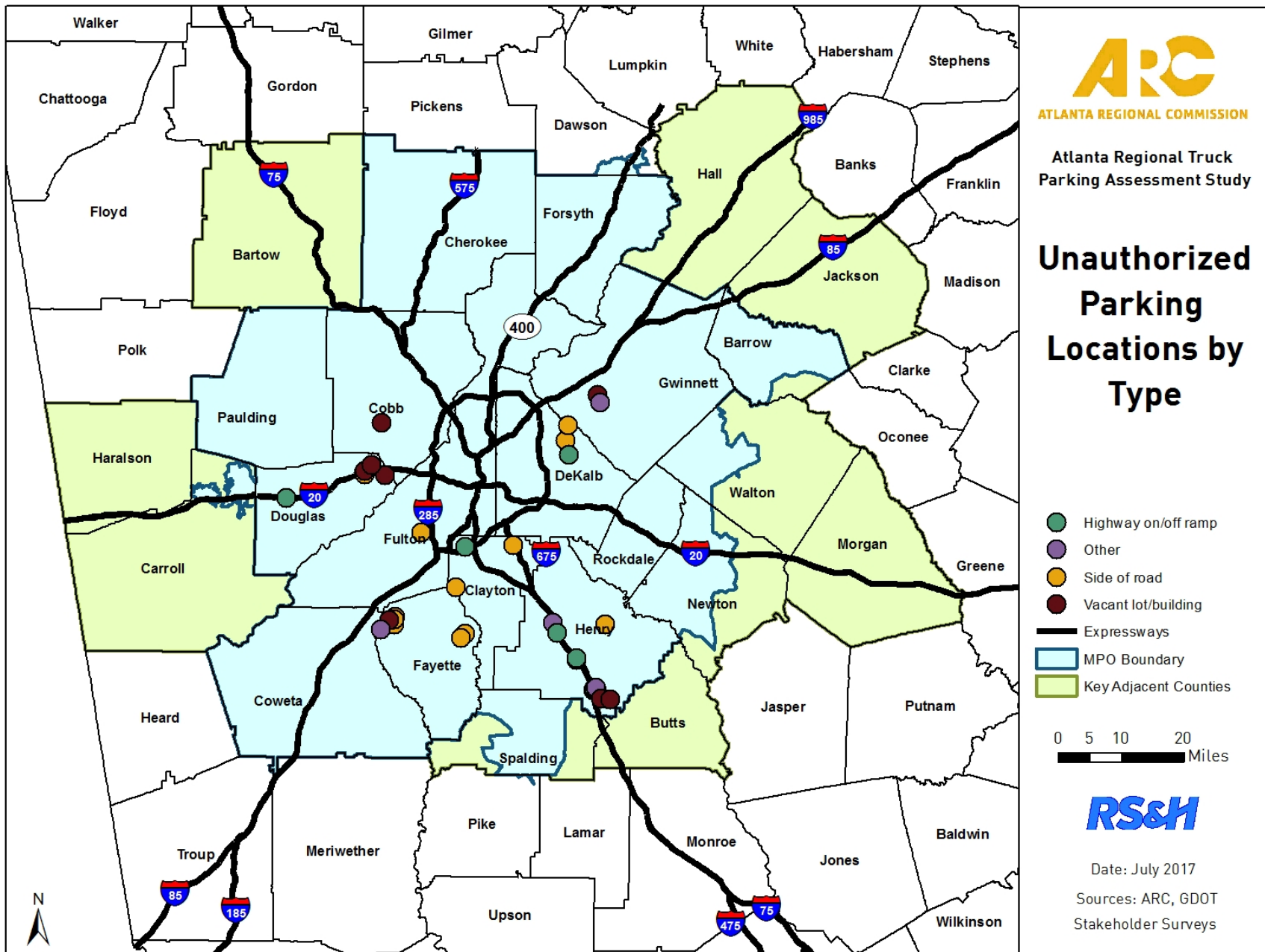
- What are the programs, policies, and/or strategies?
  - Zoning 64%
  - Signage and Enforcement 21%
  - Private property 14%

# Stakeholder WikiMapping Unauthorized Parking

- **13 separate respondents** provided **39 different** responses (locations)
  - Local Jurisdictions / CIDs      31 responses
  - Law Enforcement      8 responses
- Unauthorized truck parking locations
  - Where?
  - How Often?







# Unauthorized Truck Parking Location

| County         | Side of Road | Highway Ramp | Vacant Lot / Building | Other      | Total       | Percent     |
|----------------|--------------|--------------|-----------------------|------------|-------------|-------------|
| Clayton        | 1            | 1            |                       |            | 2           | 5%          |
| Cobb           |              |              | 1                     |            | 1           | 3%          |
| DeKalb         | 2            | 1            |                       |            | 3           | 8%          |
| Douglas        | 2            | 4            | 4                     |            | 10          | 26%         |
| Fayette        | 6            |              | 1                     | 1          | 8           | 21%         |
| Fulton         | 1            |              |                       |            | 1           | 3%          |
| Gwinnett       |              |              | 1                     | 1          | 2           | 5%          |
| Henry          | 2            | 4            | 3                     | 3          | 12          | 31%         |
| <b>Total</b>   | <b>14</b>    | <b>10</b>    | <b>10</b>             | <b>5</b>   | <b>39</b>   | <b>100%</b> |
| <b>Percent</b> | <b>36%</b>   | <b>26%</b>   | <b>26%</b>            | <b>13%</b> | <b>100%</b> |             |





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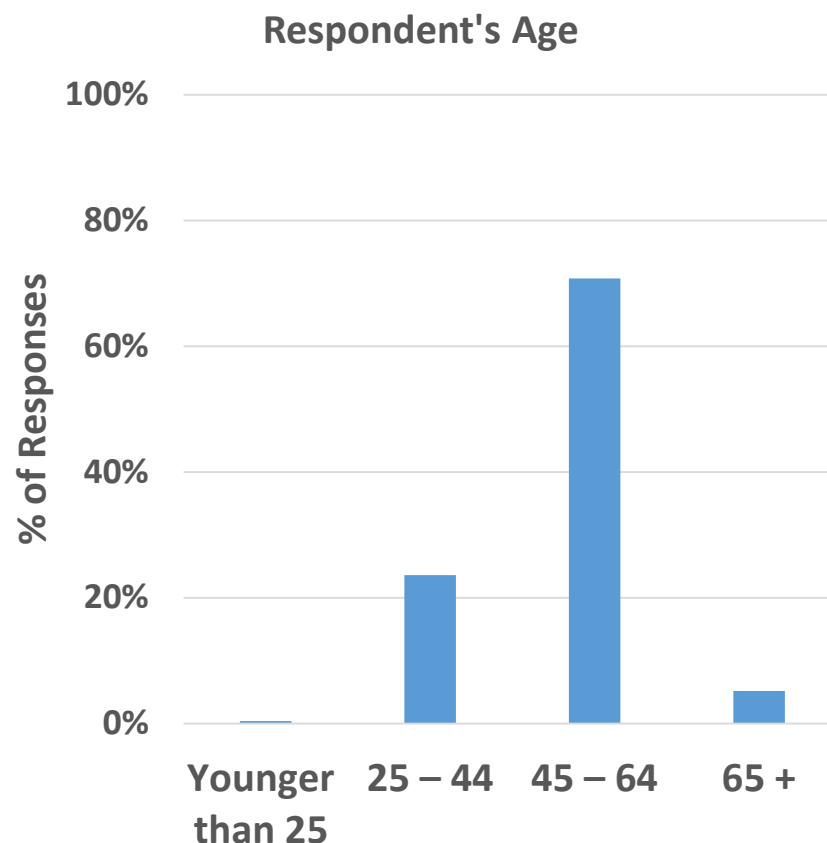
# Atlanta Regional Truck Parking Assessment Study



Outreach Update  
Truck Driver Surveys

# Truck Driver Survey Results

- 277 respondents
- 88.4% truck drivers / 11.6% non-drivers
- 79.2% male / 20.8% female



# Truck Driver Survey Results

- Average Length of Haul

| Length of Haul                          | Response |
|---|----------|
| Local (less than 100 miles)             | 0.0%     |
| Regional (100-499 miles per trip)       | 22.3%    |
| Inter-Regional (500-999 miles per trip) | 49.3%    |
| Long-Haul (1,000+ miles per trip)       | 28.4%    |

- How often do you need to temporarily park in the Atlanta Region for staging before a scheduled pick-up and/or drop-off time?
  - **84% of respondents**

# Truck Driver Survey Results

- How long does it usually take you to find truck parking in the Atlanta region?

| Length of time       | Response |
|----------------------|----------|
| Less than 15 minutes | 1.3%     |
| 15 – 30 minutes      | 6.5%     |
| 30 minutes – 1 hour  | 41.3%    |
| More than 1 hour     | 51.0%    |

- When parking in the Atlanta region, where is it more difficult to find available truck parking?

| Location            | Response |
|---------------------|----------|
| Public rest stops   | 80.8%    |
| Private truck stops | 88.5%    |
| Shipper / Receiver  | 71.8%    |

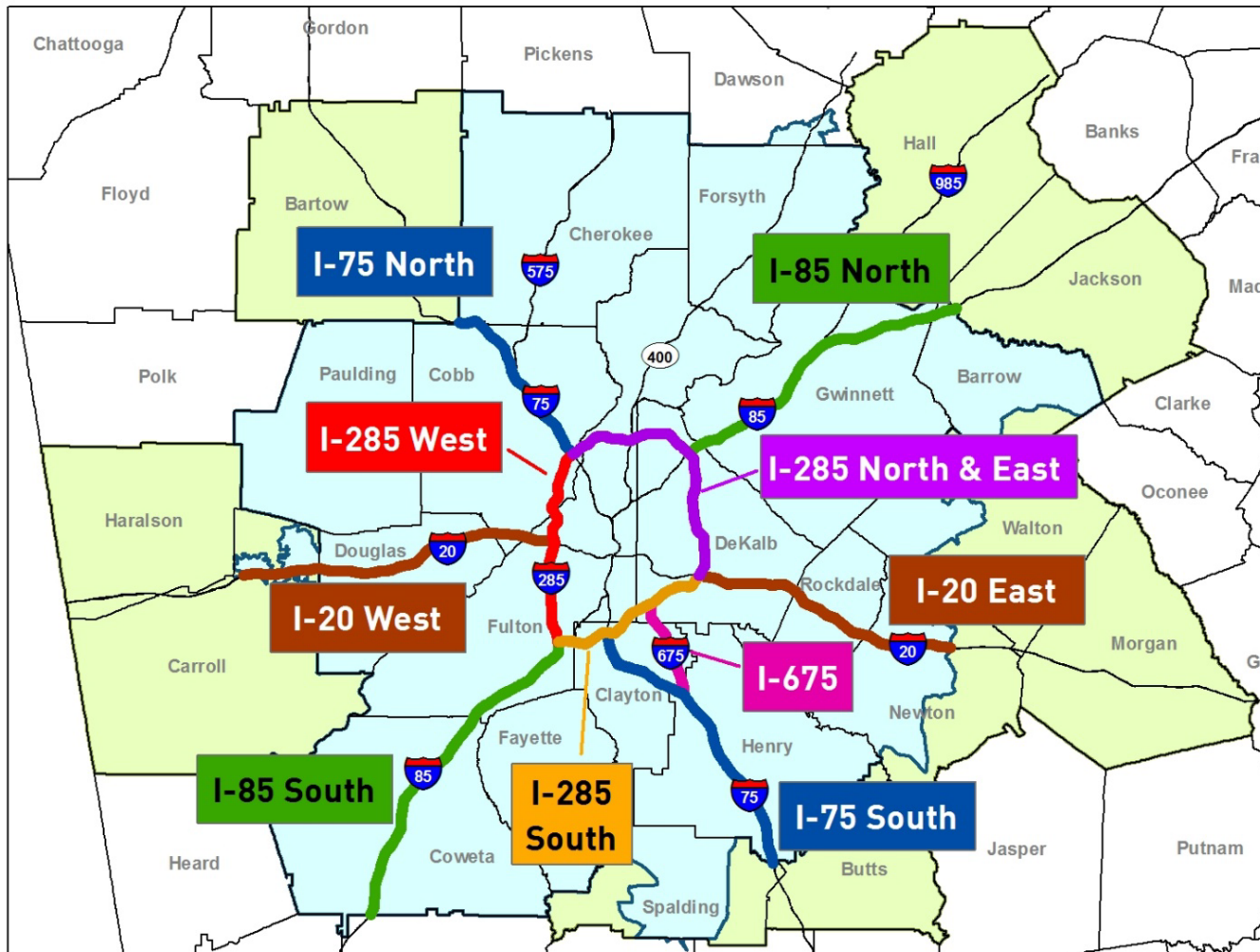
# Truck Driver Survey Results

- What method do you utilize to find truck parking when traveling within or around the Atlanta region?

| Method  | Response |
|---|----------|
| Continue driving until a safe parking location is found | 68.8%    |
| Smartphone Application                                  | 55.4%    |
| I am aware of my destination in advance                 | 47.1%    |
| Internet / Website Information                          | 38.2%    |
| Onboard Communications / Computer System                | 14.6%    |
| Roadside Changeable Message Signs                       | 4.5%     |
| Dispatcher Contact                                      | 3.8%     |
| 511 System  | 0.6%     |



# Corridor Designations



## Percentage of Respondents Who Consider Truck Parking to be Limited/Rarely Available or Not Available

| Corridor                                       | Truck Drivers | Stakeholders |
|--|---------------|--------------|
| I-285 North and East (I-75 north to I-20 east) | 91%           | 62%          |
| I-285 West (I-85 south to I-75 north)          | 90%           | 62%          |
| I-285 South (I-20 east to I-85 south)          | 89%           | 64%          |
| I-85 North                                     | 79%           | 29%          |
| I-20 East                                      | 76%           | 36%          |
| I-85 South                                     | 74%           | 29%          |
| I-75 South                                     | 73%           | 50%          |
| I-20 West                                      | 73%           | 36%          |
| I-75 North                                     | 69%           | 46%          |
| I-675  | 68%           | 69%          |

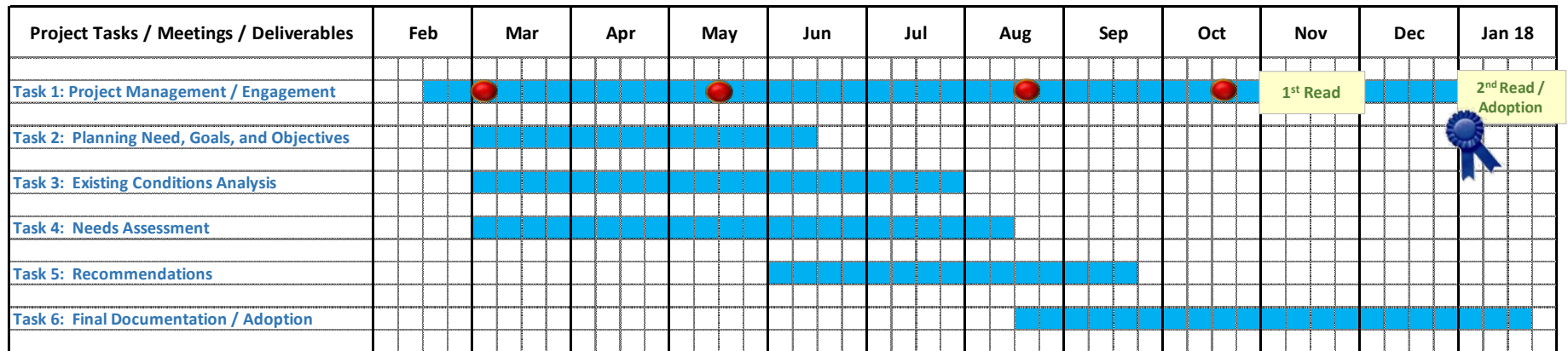
# Summary of Needs

- Current moderate challenges will worsen
- Corridor and area specific supply/demand
- Common views on challenges
- Proposed solutions vary based upon perspective
- Solutions must:
  - Include coordination
  - Maximize use of technology
  - Be adaptable / flexible
  - Leverage existing assets



# Next Steps

## Proposed Project Schedule Atlanta Regional Truck Parking Assessment Study (2017-2018)



Potential FATF Meeting

Revised: 05-15-17

# Atlanta Regional Truck Parking Assessment Study



## Questions?



## TCC MEETING RECAP

**Date:** 08-04-17  
**Subject:** **ARC Transportation Coordinating Committee (08-04-17)**  
**ARC Truck Parking Assessment Study**  
**Attendees:** Steve Cote, Kai Zuehlke and Caroline Evans  
**Cc:** Dan Murray, Alexandra Shirk, Jeff Short

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### TCC Notes

1. Questions asked during Truck Parking Study presentation
  - a. Does the data show that more long-haul or local drivers are parking in truck stops? (Fayette Co representative)
  - b. Do most drivers park in authorized or unauthorized locations? (Fayette Co representative)
  - c. How will you reconcile the disparity with the parking model and what we know will be the impacts over the next 30 years? (Spalding Co representative)
  - d. Have you thought about alternatives to offering truck parking, such as additional bypass routes and making the metro area less hospitable to trucks so they miss us altogether? (Spalding Co representative)
  - e. Can you give some examples of public sector initiatives that would aid with truck parking?
2. Other comments made during presentation
  - a. It seems like the study really needs to look at 2 separate needs, one is truck staging while they wait for deliveries, and one is overnight parking, which may require more services.
3. Conversation after presentation with Marquitrice Mangham, ARC
  - a. Did we consider the overnight parking demand from local truckers? Many zoning ordinances do not allow trucks to park in residential zones overnight. Therefore long-haul truckers that are finished with their shifts but live in the area are competing for legal/authorized truck parking spaces. When she was at DeKalb County, she heard many instances where the truck stop would rent a guaranteed space by the month to those truckers, almost like a time-share idea. The trucker would have a place to park for the 5 nights their truck happened to be in their home neighborhood, and the space could be rented out to an overnight stop during the remainder of the month. The County would not allow a driver to obtain a business license for their truck if they were an independent owner/operator unless they had a parking space lease agreement they could produce to prove they would not be parking their truck in a residential zone.
  - b. Would also like to see a recommendation about all DRI projects requiring a certain number or percent of the project for onsite and overnight truck parking spaces. This could be done through the local government that approves rezoning and the developments. The zoning codes would need to be updated to require warehouses and distribution centers to provide the parking.

## **Appendix 2-H**

### **Transportation Coordinating Committee Meeting 3**

# Atlanta Regional Truck Parking Assessment Study



## Recommendations

Technical Coordinating Committee (TCC)

*November 3, 2017*

# Today's Discussion

- Study Recap
- Recommendations & Group Discussion
- Next Steps





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# Atlanta Regional Truck Parking Assessment Study



## Study Recap



# Regulatory “Perfect Storm”

**Hours of  
Service (HOS)  
Requirements**

**Electronic  
Logging Devices  
(ELDs) Dec. 2017**



# Goals & Objectives

| Goals  | Objectives  |
|--|---|
| <b>Safety</b>  | <ul style="list-style-type: none"><li>▪ Assist truck drivers with meeting federal Hours-of-Service requirements</li><li>▪ Assist truck drivers with exercising risk management</li></ul>  |
| <b>Quality of Life</b>                               | <ul style="list-style-type: none"><li>▪ Provide for truck driver well being</li><li>▪ Assist with 24 hour delivery</li></ul>  |
| <b>Efficient Operation</b>                           | <ul style="list-style-type: none"><li>▪ Minimize wasted travel time and costs</li><li>▪ Reduce early or late breaks</li></ul>   |
| <b>Economic Development / Logistics and Commerce</b> | <ul style="list-style-type: none"><li>▪ Support a competitive operating environment for regional freight transportation</li><li>▪ Advance public policies that make metro Atlanta and the State of Georgia more attractive and competitive places to do business</li><li>▪ Invest in physical and social infrastructure that supports economic competitiveness</li></ul>  |
| <b>Coordinated Planning and Development</b>          | <ul style="list-style-type: none"><li>▪ Encourage expansion or development of new truck stops in strategic locations</li><li>▪ Preserve communities / areas with incompatible land uses (e.g., residential)</li><li>▪ Improve land use planning and the siting/development of freight-logistics industries</li><li>▪ Plan and preserve industrial land uses to support job creation and provide needed goods and services</li></ul> |

# Truck Driver Survey Results

- **277 Responses**
- How long does it usually take you to find truck parking in the Atlanta region?

| Length of time       | Response |
|----------------------|----------|
| Less than 15 minutes | 1.3%     |
| 15 – 30 minutes      | 6.5%     |
| 30 minutes – 1 hour  | 41.3%    |
| More than 1 hour     | 51.0%    |

# Summary of Needs

- Lack of parking supply throughout region
- I-285 is particularly challenging
- ELDs will increase demand
- Proposed solutions vary based upon perspective
- Solutions must:
  - Include coordination
  - Maximize use of technology
  - Be adaptable / flexible
  - Leverage existing assets





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# Atlanta Regional Truck Parking Assessment Study



## Draft Recommendations & Group Discussion



# Today's Discussion Questions

- 1) Have we captured all recommendations, or are we missing anything ?
- 2) Are any strategies / recommendations unlikely or not feasible?
- 3) Which strategy / recommendation group do you think is most important? Most feasible?

# Draft Strategies

1. *Add / Expand* Truck Parking **Supply**
2. *Develop* Truck Parking **Policies**
3. *Develop* Truck Parking **Partnerships**
4. *Improve Sharing* of Truck Parking **Information**
5. *Monitor/Incorporate* Future Use of **Technology**



# Strategy 1: Add/Expand Supply



## 1.1 - *Comprehensive Transportation Plans (CTPs)*

- Authorized truck parking
- Unauthorized truck parking locations

## 1.2 - *Freight Cluster Plans*

- Inventory authorized & unauthorized parking
- Identify potential solutions
  - Addition of new spaces
  - Allowing parking at existing industrial facilities
  - Improved technology or other strategies

# Strategy 1: Add/Expand Supply (con't)



## 1.3 - *Local Government / Community Improvement District (CID) Solutions (as needed)*

- New truck stops
- Expand existing truck stops
- Shippers / receiver agreements
- Vacant industrial spaces / brownfield sites
- Existing / closed rest areas
- Park-and-ride lots (PM only)
- Shopping centers

Add / Expand Supply

# Example: Pilot Parking Program



## ■ *Drivers Requirements:*

- Wear safety vests at all times
- Carry a flashlight at night
- Follow safety rules
- De-couple tractor from trailer
- May not move tractor
- Preferential treatment for no-idle cabs

truck news.com

News

### Kriska partners with Unilever to create safe haven parking program

December 15, 2015

How one shipper took a challenging run and made it a driver favourite

PRESCOTT, Ont. — A successful pilot project that allows Kriska Transportation Group drivers to park overnight at a major customer's facility is proving that collaboration between shippers and carriers can be more than just a buzzword.



# Add / Expand Supply

## Example: Creative Local Solutions



## QT Store Truck Parking

### Jonesboro Road at Foster Place, Henry County

# Strategy 2: Policy Development



## 2.1 – *Share Warehouse/Distribution Costs/Benefits*

- Require/incentivize shippers/receivers to provide parking
  - Promote new truck parking
    - Industrial areas / freight clusters
    - CIDs

## 2.2 – *Review Development of Regional Impact (DRI) Requirements*

- Truck stops
- Warehouse / distribution centers

# Strategy 2: Policy Development (con't)



## 2.3 - *Incentivize Off-Peak Freight Operations*

- Allow truck drivers to get closer to shippers / receivers
- Reduce miles driven and air emissions,

## 2.4 - *Develop Template Zoning Language*

- Restrictions, permitted uses, design/aesthetic controls
- Examples: Buffers, plantings, lighting, electrification systems, and/or security

## 2.5 – *Promote Local Government Actions*

- Review zoning codes
- Address any truck parking deficits, as needed

# Example: SW Thornton Master Plan



- Key Findings:

- "...participants were not necessarily against industry/industrial uses, as long as it is well-designed and does not take away from the area's desirability."

- Land Use "Guiding Policies"

- "...special attention should be paid to recommended buffers and landscaping elements in review phase..."



# Strategy 3: Partnerships



- 3.1 – *Provide ongoing updates to the Freight Advisory Task Force (FATF)*
- 3.2 - *Provide truck parking information and resources to stakeholders and planning partners*
- 3.3 - *Attend relevant meetings and participate in speaking opportunities*



# Strategy 3: Partnerships (con't)

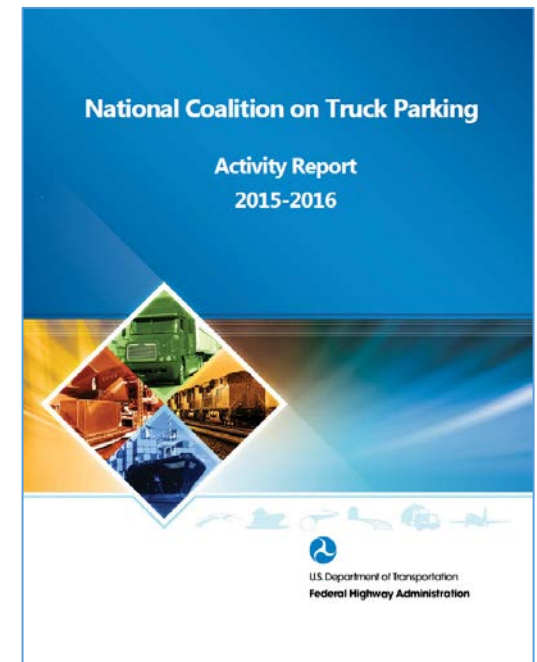


- 3.4 - *Participate in FHWA National Coalition on Truck Parking / FHWA coordination*
- 3.5 – *Continue to discuss truck parking policy priorities, initiatives. and projects*

# FHWA National Coalition on Truck Parking



- June 2017 "Activity Report"
- Four (4) Working Groups to Assess:
  - Parking Capacity
  - Technology and Data
  - Funding, Finance and Regulations
  - State, Regional and Local Government Coordination



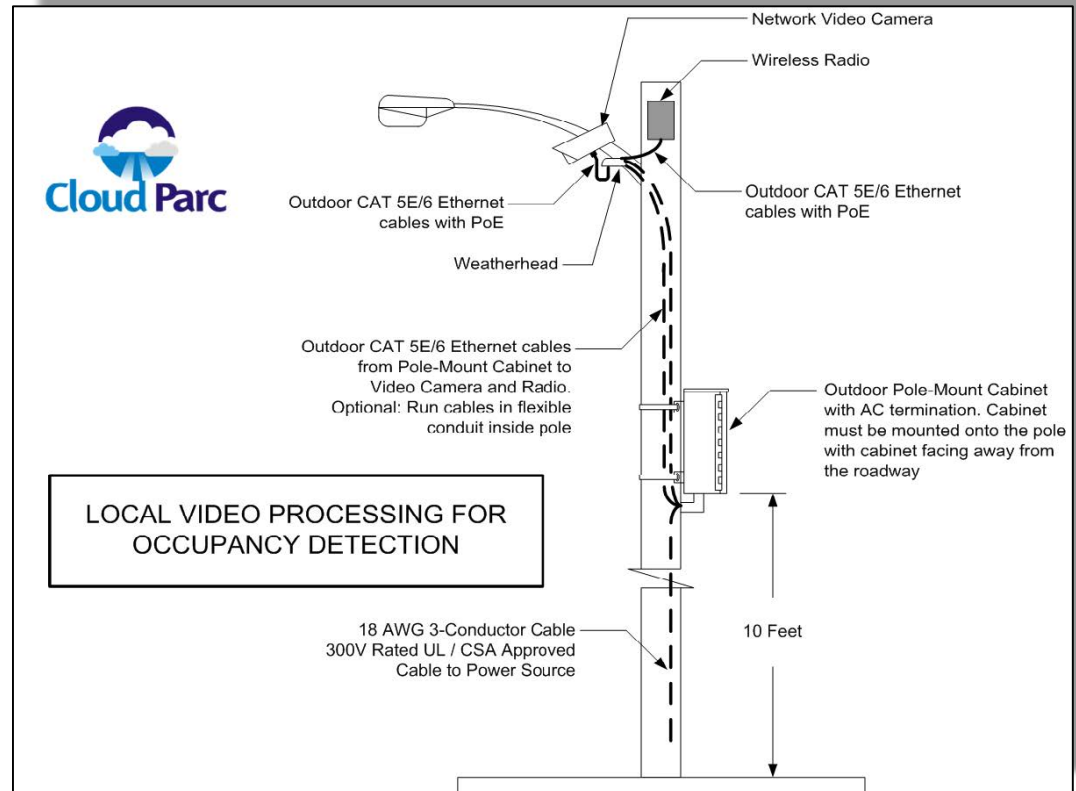
# Strategy 4: Information Sharing



- 4.1 – *Monitor opportunities to implement real-time truck parking availability systems or implement other technology solutions*
- 4.2 – *Serve as regional clearinghouse for truck parking information*

# Information Sharing

## Example: Parking Detection Devices



# Strategy 5: Monitor / Incorporate Future Technology



5.1 – *Connected /Autonomous Vehicles  
(CVs/AVs)*

5.2 – *Internet of Things (IoT)-Logistics/Freight*

5.3 – *Physical Internet*



# Monitor / Incorporate Technology

## Example: Autonomous Trucks



### Volvo Trucks Planning Chief Talks Tesla, Autonomous Vehicles and Platooning

CLARISSA HAWES || SEPTEMBER 28, 2017

|| SELF-DRIVING TRUCKS - AUTONOMOUS VEHICLES, TRUCKING TECHNOLOGY



Keith Brandis, director of product planning at Volvo Trucks North America. (Photo: Clarissa Hawes/Tr

DAILY NEWS 8 May 2015

### Autonomous truck cleared to drive on US roads for the first time



Now on Nevada highways  
Daimler AG

### Here's how Tesla, Uber, and Google are trying to revolutionize the trucking industry



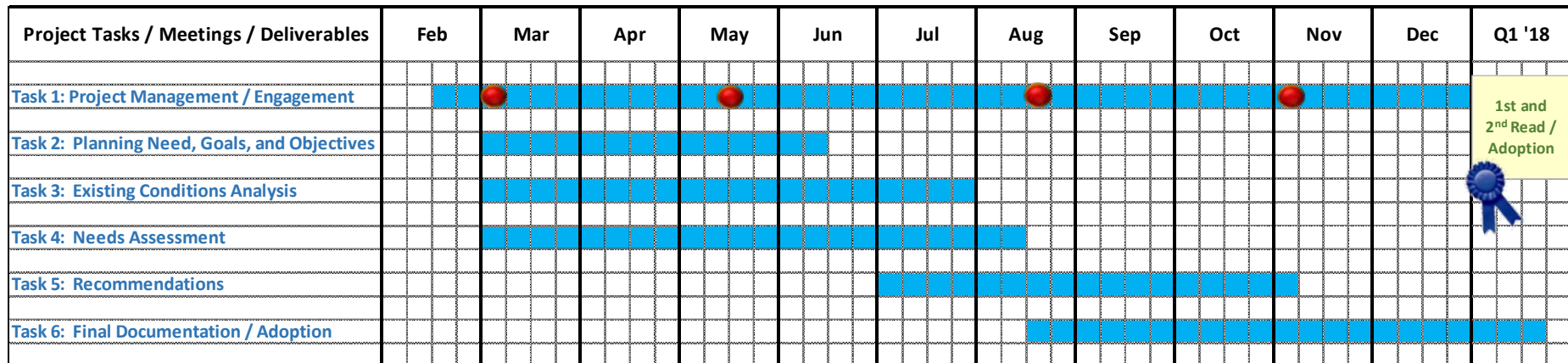
Danielle Muoio



Jun. 20, 2017, 9:07 AM 93,126

# Next Steps

## Project Schedule Atlanta Regional Truck Parking Assessment Study (2017-2018)



 FATF Meeting

Revised: 10-31-17



ATLANTA REGIONAL COMMISSION

# Atlanta Regional Truck Parking Assessment Study



# Thank You!

## TCC MEETING RECAP

**Date:** November 3, 2017  
**Subject:** **ARC TCC Meeting (11-03-2017)**  
**ARC Truck Parking Assessment Study**  
**Attendees:** Steve Cote, Caroline Evans

- 
1. Steve gave overview of study to date
  2. White Board Suggestions:
    - a. CTP and Land Use Plan must be connected
      - i. Use inventory data of current locations and compare to future locations
      - ii. Tie to industrial growth and economic development
    - b. The Freight Section of the CTP should include truck parking analysis
    - c. Decision-makers and general public may come to realize that truck parking is better than truck parking in unauthorized locations
    - d. A penalty for unauthorized parking may be needed
    - e. Truck parking locations need to be strategic
      - i. Near thoroughfares
      - ii. In/near industrial clusters
    - f. Designate a portion of large, vacant lots (i.e. Doraville) for truck parking during future development
    - g. Provide real-time truck parking data
    - h. One take-away from the SW Thornton – Douglas County study was that the residents didn't mind the industrial uses as long as the industrial traffic was separated from passenger traffic
    - i. It may be appropriate to implement requirements at a regional level, as was done with stormwater regulations

## **Appendix 2-I**

### **Land Use Coordinating Committee Meeting 1**



# Atlanta Regional Truck Parking Assessment Study



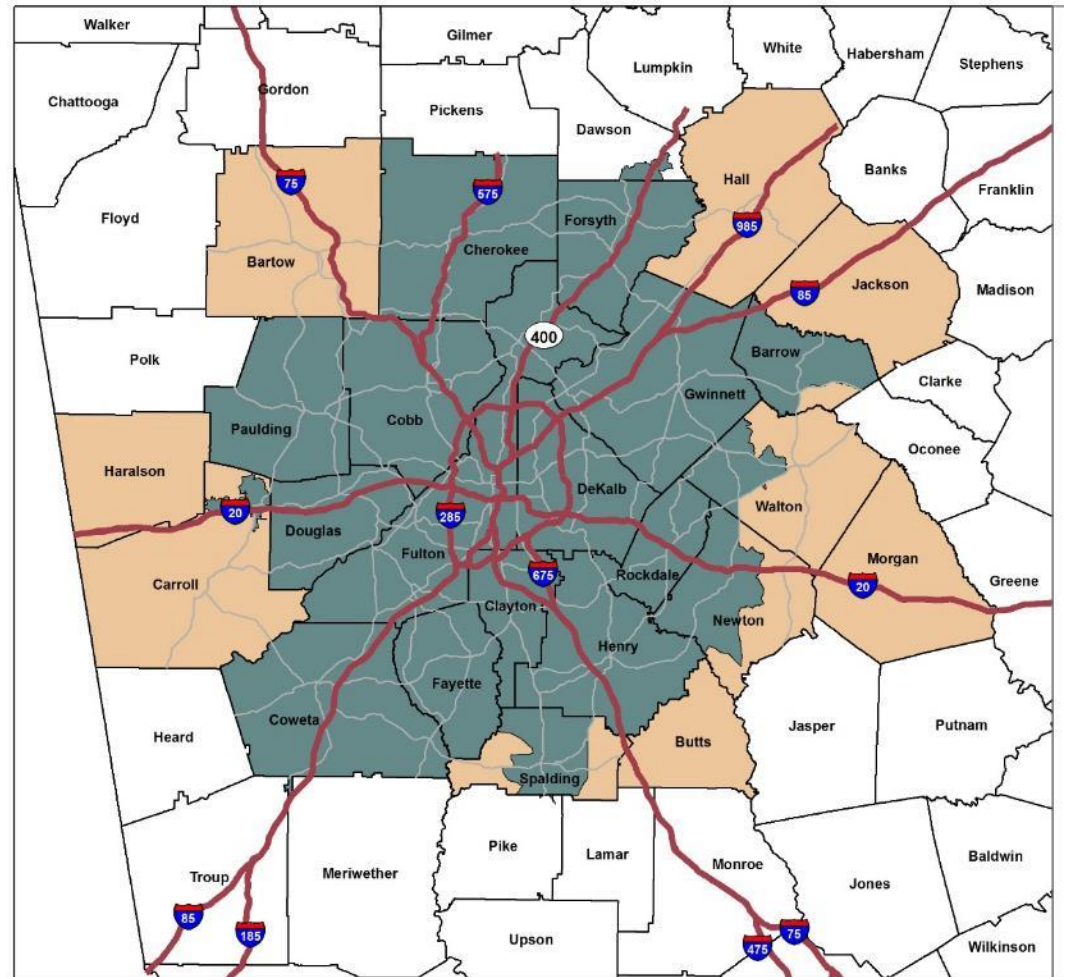
## Land Use Coordinating Committee

### Daniel Studdard, AICP, ARC Principal Planner

May 25, 2017

# Background

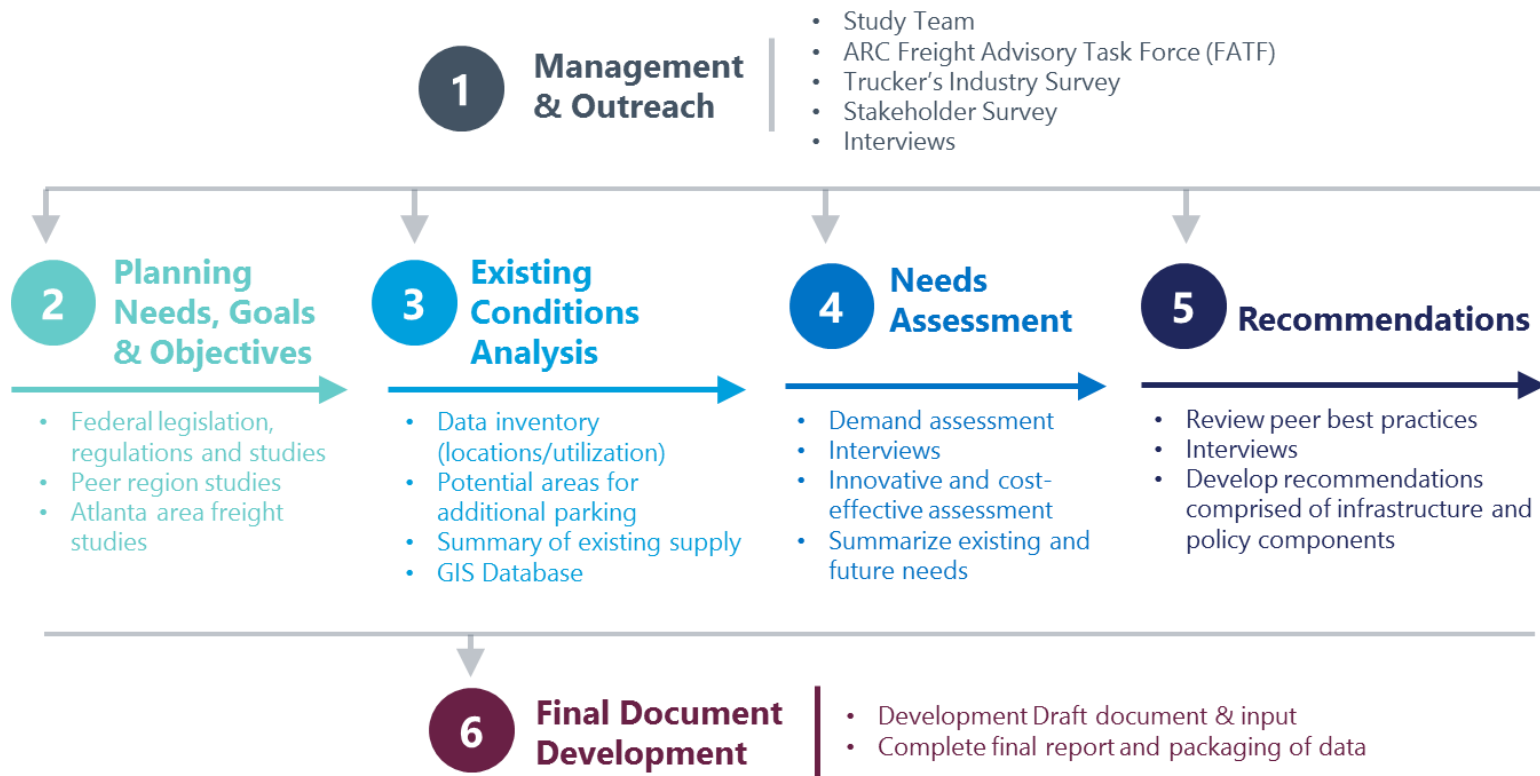
- Existing and Future Truck Parking Needs
- Study Completion: Dec. 2017
- Study Area:
  - ARC MPO
  - Key Adjacent Counties



# Study Approach



## Atlanta Regional Truck Parking Assessment Study



# Atlanta Regional Freight Mobility Plan Update – June 2016

## Recommended Completion of a Regional Truck Parking Assessment Study

- **Purpose:**

- Identify and address truck parking needs in the Atlanta Region

- **Objectives:**

- Consider short-haul and long-haul truck parking needs
- Consider needs of emerging mixed use facilities.

- **Factors:**

- Cities and counties must be considered due to the relevance of local codes and zoning ordinances that [may] regulate where trucks can operate, times of operation, and the design of mixed use facilities.

*ARC, Atlanta Regional Freight Mobility Plan Update (May 2016)*

# Federal Regulations

*Albany, NY Times Union (3/10/2009)*

- Section 1401 of MAP-21  
"Jason's Law" (10/1/2012)
- "National priority on addressing the shortage of long-term parking for commercial motor vehicles on the National Highway System to improve the safety of motorized and non-motorized users and for commercial motor vehicle operators."

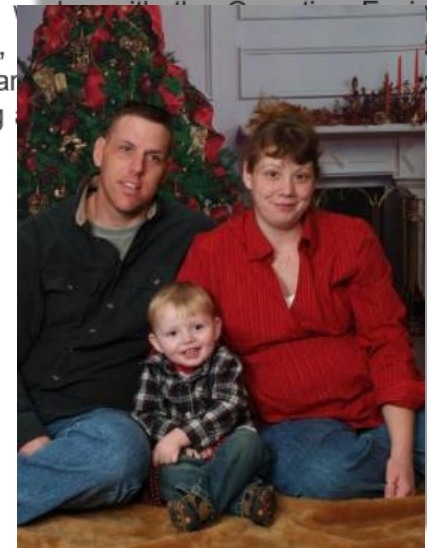
## Jason H. Rivenburg

### Obituary



Rivenburg, Jason H. FULTONHAM Jason H. Rivenburg, 35, of Tetterbark Rd., died unexpectedly Thursday, March 5, 2009 in Orangeburg, S.C. Jason was born in Cobleskill, N.Y. on October 28, 1973 the son of Dawn (Cater) and Hezekiah Rivenburg Jr.

Jason was a 1991 graduate of Schoharie Central School. He was a construction worker for years. He was a member of Local 106 in Albany, where he worked as a tractor trailers for many years. He also had his own vehicle cleaning business.

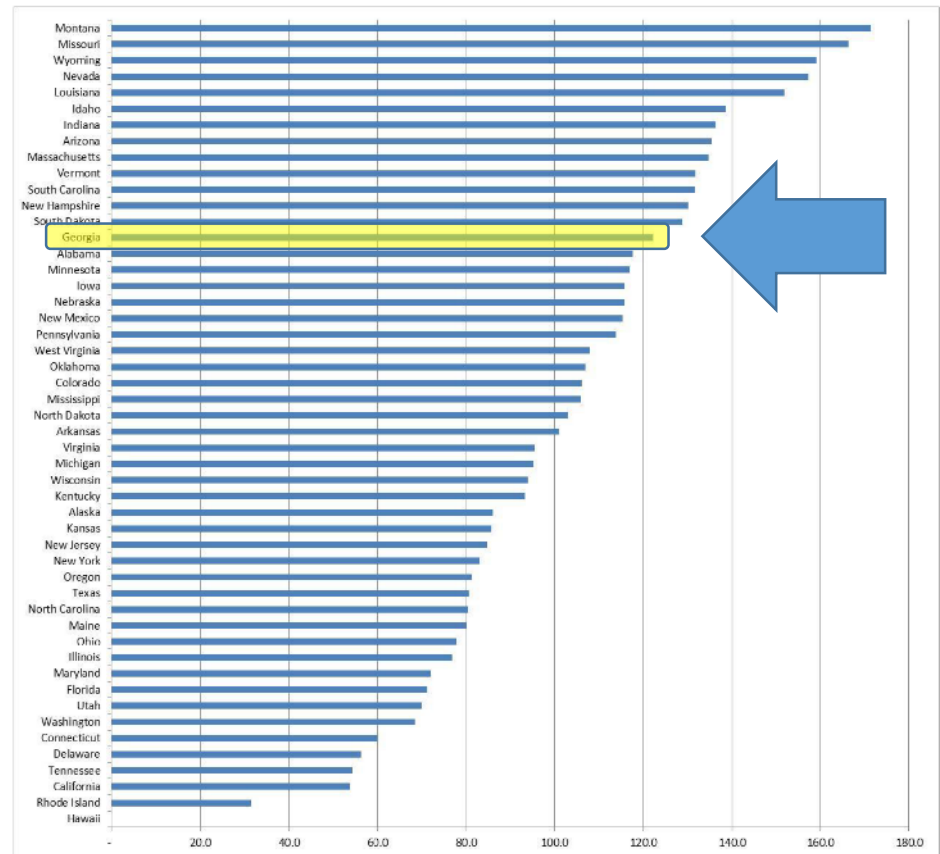




# Survey Findings: GA Infrastructure

## Federal Regulations - Jason's Law

- **Georgia Truck Parking**
  - Truck Spaces Per Daily 100K Miles of Truck VMT
  - Ranked #14
  - 265 Private Truck Stops / 12,017 spaces
  - 47 Public Facilities / 1,701 spaces
  - Private-to-Public: 7.1 spaces



Source: 2015 Trucker's Friend

FHWA, Jason's Law Truck Parking Survey Results and Comparative Analysis (August 2015)

# Hours-of-Service (HOS)

## Federal Regulations

- **Effective since 07/01/13**
- **Requirements vary for Property-Carrying versus Passenger-Carrying CMV Drivers**
- **Property-Carrying CMV Drivers**
  - **Daily Driving Limit / 11-hour Driving Limit:** may drive a maximum of 11 hours after 10 consecutive hours off duty
  - **14-Hour Driving Window / 14-Hour Limit:** may not drive beyond the 14<sup>th</sup> consecutive hours after coming on duty, following 10 consecutive hours off-duty. Off-duty time does not extend the 14-hour period.
  - **Rest Breaks / 30-Minute Break:** may drive only if eight (8) hours or less have passed since end of driver's last off-duty or sleeper berth period of at least 30 minutes [49 CFR 397.5 mandatory "in attendance" time may be included in break if no other duties performed]
  - **60/70-Hour On-Duty Limit:** may not drive after 60/70 hours on-duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.
  - **Sleeper Berth Provision / Team Driving:** drivers using this provision must take at least 8 consecutive hours in the sleeper berth, plus a separate two (2) consecutive hours in the sleeper berth, off duty, or any combination of the two (2).

# Electronic Logging Devices (ELDs)

## Federal Regulations

- **ELD**

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### **Bottom-Line:**

**Demand for truck parking  
will likely increase after  
December 2017 when ELDs  
are MANDATED**

filed

AOBRD – Automatic Onboard Recording Device (Less than 20% of existing trucks have AOBRDs per 3/2016 survey by TruckStop.com)

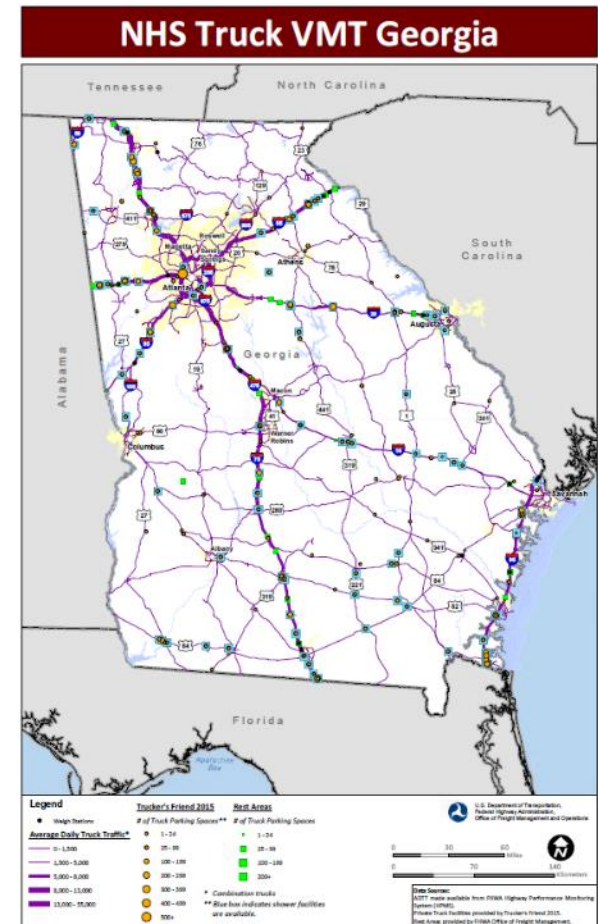
# Draft Goals and Objectives

***Purpose/Vision:*** To ensure a well-planned regional truck parking network that meets existing and future needs/demand by facilitating:

| Goals   | Objectives  |
|---|---|
| Safety  | Provide adequate truck parking supply within the Atlanta region for truck drivers to meet federal Hours-of-Service requirements |
|   | Enable truck drivers to exercise risk management  |
| Quality of Life                               | Provide for truck driver well being   |
|   | Enable 24 hour delivery   |
| Efficient Operation                           | Minimize travel time and costs  |
|   | Reduce early or late breaks   |
|   | Minimize queuing (for fueling, waiting for truck parking, and staging)  |
| Economic Development / Logistics and Commerce | Ensure a competitive operating environment for regional freight transportation  |
|   | Advance public policies that make metro Atlanta and the state of Georgia more attractive and competitive places to do business  |
|   | Invest in physical and social infrastructure that supports economic competitiveness   |
| Coordinated Planning and Development          | Enable expansion or development of new truck stops in strategic locations   |
|   | Preserve communities / areas with incompatible land uses (e.g., residential)  |
|   | Improve land use planning and the siting/development of freight-logistics industries  |
|   | Plan and preserve industrial land uses to support job creation and provided needed goods and services                           |

# Truck Parking Inventory

- ARC Data
- GDOT Data
- Jason's Law Survey Results
- Truck Stop Owners/Operators
- Truck Driver Apps
- GA Environmental Protection Division (EPD)





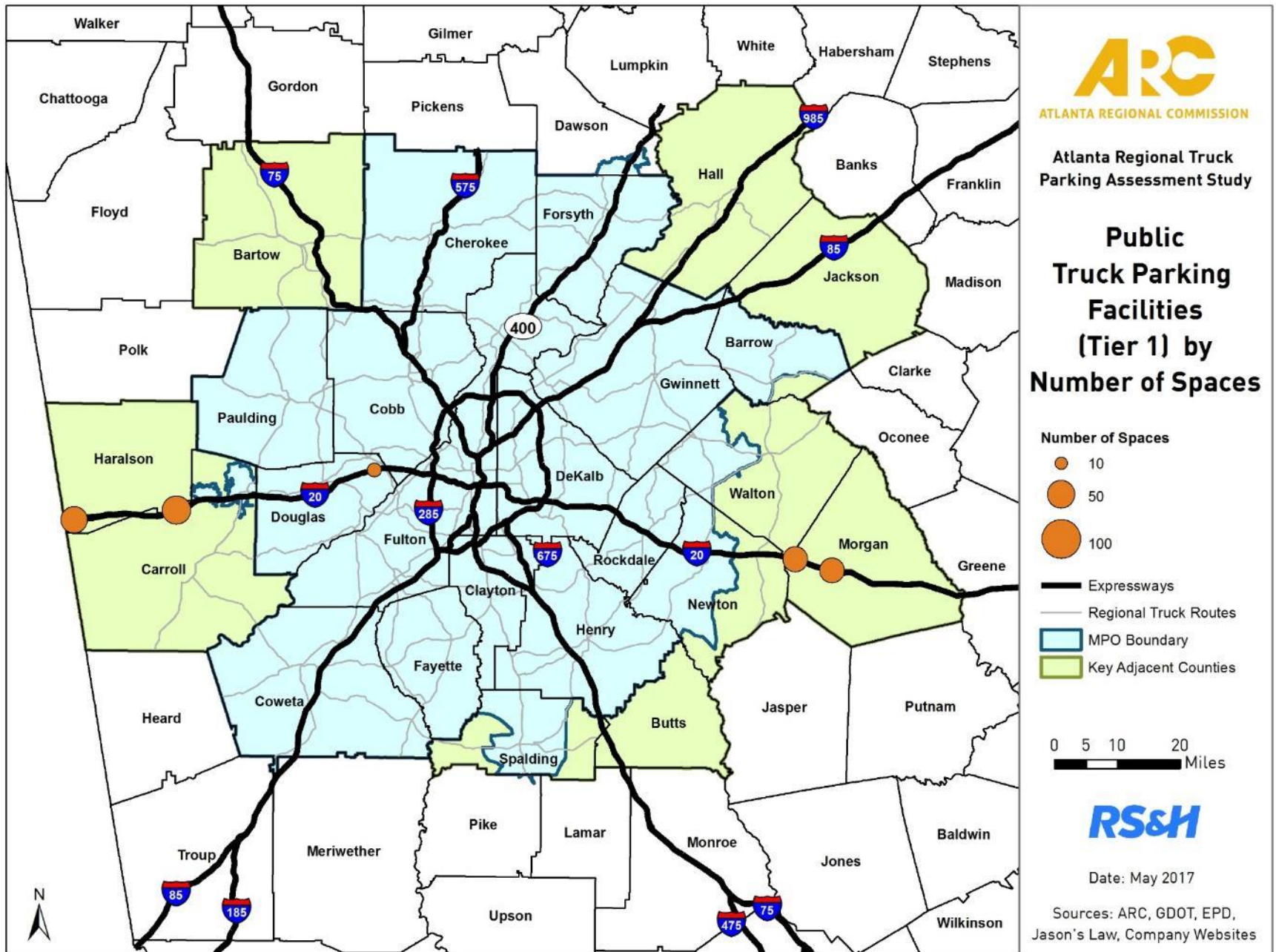
# Truck Parking Inventory Data

- Name & Store No.
- Source
- Location / Lat-Long
- Exit Number
- No. of Spaces
- Amenities
- Restaurants
- Utilization (TBD)

| Table 1: Summary of the 2019-2020 Season |              |          |            |         |          |          |      |           |            |           |           |          |           |          |           |          |  |  |
|--|--------------|----------|------------|---------|----------|----------|------|-----------|------------|-----------|-----------|----------|-----------|----------|-----------|----------|--|--|
| Date                                     | Location     | Event    | Attendance |         | Genre    | Status   | Type | Manager   | Box Office | Gross     | Revenue   |          |           |          | Profit    |          |  |  |
|  |              |          | Local      | Foreign |          |          |      |           |            |           | Local     | Foreign  | Local     | Foreign  | Local     | Foreign  |  |  |
| 2019-01-01                               | Los Angeles  | Movie A  | 1000       | 500     | Comedy   | Released | 1    | \$100,000 | \$150,000  | \$100,000 | \$150,000 | \$50,000 | \$100,000 | \$50,000 | \$100,000 | \$50,000 |  |  |
| 2019-01-05                               | New York     | Movie B  | 800        | 400     | Drama    | Released | 2    | \$80,000  | \$120,000  | \$80,000  | \$120,000 | \$40,000 | \$80,000  | \$40,000 | \$80,000  | \$40,000 |  |  |
| 2019-01-10                               | Chicago      | Movie C  | 600        | 300     | Action   | Released | 3    | \$60,000  | \$90,000   | \$60,000  | \$90,000  | \$30,000 | \$60,000  | \$30,000 | \$60,000  | \$30,000 |  |  |
| 2019-01-15                               | London       | Movie D  | 500        | 250     | Thriller | Released | 4    | \$50,000  | \$75,000   | \$50,000  | \$75,000  | \$25,000 | \$50,000  | \$25,000 | \$50,000  | \$25,000 |  |  |
| 2019-01-20                               | Paris        | Movie E  | 400        | 200     | Comedy   | Released | 5    | \$40,000  | \$60,000   | \$40,000  | \$60,000  | \$20,000 | \$40,000  | \$20,000 | \$40,000  | \$20,000 |  |  |
| 2019-01-25                               | Madrid       | Movie F  | 300        | 150     | Drama    | Released | 6    | \$30,000  | \$45,000   | \$30,000  | \$45,000  | \$15,000 | \$30,000  | \$15,000 | \$30,000  | \$15,000 |  |  |
| 2019-02-01                               | Rome         | Movie G  | 200        | 100     | Action   | Released | 7    | \$20,000  | \$30,000   | \$20,000  | \$30,000  | \$10,000 | \$20,000  | \$10,000 | \$20,000  | \$10,000 |  |  |
| 2019-02-05                               | Berlin       | Movie H  | 150        | 75      | Thriller | Released | 8    | \$15,000  | \$22,500   | \$15,000  | \$22,500  | \$7,500  | \$15,000  | \$7,500  | \$15,000  | \$7,500  |  |  |
| 2019-02-10                               | Moscow       | Movie I  | 100        | 50      | Comedy   | Released | 9    | \$10,000  | \$15,000   | \$10,000  | \$15,000  | \$5,000  | \$10,000  | \$5,000  | \$10,000  | \$5,000  |  |  |
| 2019-02-15                               | Beijing      | Movie J  | 80         | 40      | Drama    | Released | 10   | \$8,000   | \$12,000   | \$8,000   | \$12,000  | \$4,000  | \$8,000   | \$4,000  | \$8,000   | \$4,000  |  |  |
| 2019-02-20                               | Tokyo        | Movie K  | 60         | 30      | Action   | Released | 11   | \$6,000   | \$9,000    | \$6,000   | \$9,000   | \$3,000  | \$6,000   | \$3,000  | \$6,000   | \$3,000  |  |  |
| 2019-02-25                               | Sydney       | Movie L  | 40         | 20      | Thriller | Released | 12   | \$4,000   | \$6,000    | \$4,000   | \$6,000   | \$2,000  | \$4,000   | \$2,000  | \$4,000   | \$2,000  |  |  |
| 2019-03-01                               | Melbourne    | Movie M  | 30         | 15      | Comedy   | Released | 13   | \$3,000   | \$4,500    | \$3,000   | \$4,500   | \$1,500  | \$3,000   | \$1,500  | \$3,000   | \$1,500  |  |  |
| 2019-03-05                               | Auckland     | Movie N  | 20         | 10      | Drama    | Released | 14   | \$2,000   | \$3,000    | \$2,000   | \$3,000   | \$1,000  | \$2,000   | \$1,000  | \$2,000   | \$1,000  |  |  |
| 2019-03-10                               | Wellington   | Movie O  | 15         | 7.5     | Action   | Released | 15   | \$1,500   | \$2,250    | \$1,500   | \$2,250   | \$750    | \$1,500   | \$750    | \$1,500   | \$750    |  |  |
| 2019-03-15                               | Christchurch | Movie P  | 10         | 5       | Thriller | Released | 16   | \$1,000   | \$1,500    | \$1,000   | \$1,500   | \$500    | \$1,000   | \$500    | \$1,000   | \$500    |  |  |
| 2019-03-20                               | Dunedin      | Movie Q  | 8          | 4       | Comedy   | Released | 17   | \$800     | \$1,200    | \$800     | \$1,200   | \$400    | \$800     | \$400    | \$800     | \$400    |  |  |
| 2019-03-25                               | Invercargill | Movie R  | 5          | 2.5     | Drama    | Released | 18   | \$500     | \$750      | \$500     | \$750     | \$250    | \$500     | \$250    | \$500     | \$250    |  |  |
| 2019-04-01                               | Hamilton     | Movie S  | 3          | 1.5     | Action   | Released | 19   | \$300     | \$450      | \$300     | \$450     | \$150    | \$300     | \$150    | \$300     | \$150    |  |  |
| 2019-04-05                               | Tauranga     | Movie T  | 2          | 1       | Thriller | Released | 20   | \$200     | \$300      | \$200     | \$300     | \$100    | \$200     | \$100    | \$200     | \$100    |  |  |
| 2019-04-10                               | Whangarei    | Movie U  | 1          | 0.5     | Comedy   | Released | 21   | \$100     | \$150      | \$100     | \$150     | \$50     | \$100     | \$50     | \$100     | \$50     |  |  |
| 2019-04-15                               | Whakatane    | Movie V  | 0.5        | 0.25    | Drama    | Released | 22   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-04-20                               | Whangarei    | Movie W  | 0.5        | 0.25    | Action   | Released | 23   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-04-25                               | Whangarei    | Movie X  | 0.5        | 0.25    | Thriller | Released | 24   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-05-01                               | Whangarei    | Movie Y  | 0.5        | 0.25    | Comedy   | Released | 25   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-05-05                               | Whangarei    | Movie Z  | 0.5        | 0.25    | Drama    | Released | 26   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-05-10                               | Whangarei    | Movie AA | 0.5        | 0.25    | Action   | Released | 27   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-05-15                               | Whangarei    | Movie AB | 0.5        | 0.25    | Thriller | Released | 28   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-05-20                               | Whangarei    | Movie AC | 0.5        | 0.25    | Comedy   | Released | 29   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-05-25                               | Whangarei    | Movie AD | 0.5        | 0.25    | Drama    | Released | 30   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-06-01                               | Whangarei    | Movie AE | 0.5        | 0.25    | Action   | Released | 31   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-06-05                               | Whangarei    | Movie AF | 0.5        | 0.25    | Thriller | Released | 32   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-06-10                               | Whangarei    | Movie AG | 0.5        | 0.25    | Comedy   | Released | 33   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-06-15                               | Whangarei    | Movie AH | 0.5        | 0.25    | Drama    | Released | 34   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-06-20                               | Whangarei    | Movie AI | 0.5        | 0.25    | Action   | Released | 35   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-06-25                               | Whangarei    | Movie AJ | 0.5        | 0.25    | Thriller | Released | 36   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-07-01                               | Whangarei    | Movie AK | 0.5        | 0.25    | Comedy   | Released | 37   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-07-05                               | Whangarei    | Movie AL | 0.5        | 0.25    | Drama    | Released | 38   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-07-10                               | Whangarei    | Movie AM | 0.5        | 0.25    | Action   | Released | 39   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-07-15                               | Whangarei    | Movie AN | 0.5        | 0.25    | Thriller | Released | 40   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-07-20                               | Whangarei    | Movie AO | 0.5        | 0.25    | Comedy   | Released | 41   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-07-25                               | Whangarei    | Movie AP | 0.5        | 0.25    | Drama    | Released | 42   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-08-01                               | Whangarei    | Movie AQ | 0.5        | 0.25    | Action   | Released | 43   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-08-05                               | Whangarei    | Movie AR | 0.5        | 0.25    | Thriller | Released | 44   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-08-10                               | Whangarei    | Movie AS | 0.5        | 0.25    | Comedy   | Released | 45   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-08-15                               | Whangarei    | Movie AT | 0.5        | 0.25    | Drama    | Released | 46   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-08-20                               | Whangarei    | Movie AU | 0.5        | 0.25    | Action   | Released | 47   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-08-25                               | Whangarei    | Movie AV | 0.5        | 0.25    | Thriller | Released | 48   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-09-01                               | Whangarei    | Movie AW | 0.5        | 0.25    | Comedy   | Released | 49   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-09-05                               | Whangarei    | Movie AX | 0.5        | 0.25    | Drama    | Released | 50   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-09-10                               | Whangarei    | Movie AY | 0.5        | 0.25    | Action   | Released | 51   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-09-15                               | Whangarei    | Movie AZ | 0.5        | 0.25    | Thriller | Released | 52   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-09-20                               | Whangarei    | Movie BA | 0.5        | 0.25    | Comedy   | Released | 53   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-09-25                               | Whangarei    | Movie BB | 0.5        | 0.25    | Drama    | Released | 54   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-10-01                               | Whangarei    | Movie BC | 0.5        | 0.25    | Action   | Released | 55   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-10-05                               | Whangarei    | Movie BD | 0.5        | 0.25    | Thriller | Released | 56   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-10-10                               | Whangarei    | Movie BE | 0.5        | 0.25    | Comedy   | Released | 57   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-10-15                               | Whangarei    | Movie BF | 0.5        | 0.25    | Drama    | Released | 58   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-10-20                               | Whangarei    | Movie BG | 0.5        | 0.25    | Action   | Released | 59   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-10-25                               | Whangarei    | Movie BH | 0.5        | 0.25    | Thriller | Released | 60   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-11-01                               | Whangarei    | Movie BI | 0.5        | 0.25    | Comedy   | Released | 61   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-11-05                               | Whangarei    | Movie BJ | 0.5        | 0.25    | Drama    | Released | 62   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-11-10                               | Whangarei    | Movie BK | 0.5        | 0.25    | Action   | Released | 63   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-11-15                               | Whangarei    | Movie BL | 0.5        | 0.25    | Thriller | Released | 64   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-11-20                               | Whangarei    | Movie BM | 0.5        | 0.25    | Comedy   | Released | 65   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-11-25                               | Whangarei    | Movie BN | 0.5        | 0.25    | Drama    | Released | 66   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-01                               | Whangarei    | Movie BO | 0.5        | 0.25    | Action   | Released | 67   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-05                               | Whangarei    | Movie BP | 0.5        | 0.25    | Thriller | Released | 68   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-10                               | Whangarei    | Movie BQ | 0.5        | 0.25    | Comedy   | Released | 69   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-15                               | Whangarei    | Movie BR | 0.5        | 0.25    | Drama    | Released | 70   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-20                               | Whangarei    | Movie BS | 0.5        | 0.25    | Action   | Released | 71   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-25                               | Whangarei    | Movie BT | 0.5        | 0.25    | Thriller | Released | 72   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-30                               | Whangarei    | Movie BU | 0.5        | 0.25    | Comedy   | Released | 73   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |
| 2019-12-31                               | Whangarei    | Movie BV | 0.5        | 0.25    | Drama    | Released | 74   | \$50      | \$75       | \$50      | \$75      | \$25     | \$50      | \$25     | \$50      | \$25     |  |  |

STUDY AREA PUBLIC TRUCK PARKING FACILITIES

| Parking spaces & Ter location source |                                |                |         |           |            |         |    |       |             |
|--------------------------------------|--------------------------------|----------------|---------|-----------|------------|---------|----|-------|-------------|
| Source                               | Rest Stop                      | City           | County  | Latitude  | Longitude  | PARKING |    |       |             |
|                                      |                                |                |         |           |            | EPD     | JL | Hours | Utilization |
| EPD                                  | I-20 WB (MM 108)               | Rutledge       | Morgan  | 33.346646 | -83.343880 | 41      |    |       |             |
| EPD                                  | I 20 FB (MM 143)               | Rutledge       | Morgan  | 33.361027 | -83.394163 |         |    |       |             |
| EPD01                                | I-20 Ga Via Victor's Cr (MM 1) | Parisboro      | Parson  | 33.577721 | -85.320966 | 55      | 47 | 21    |             |
| EPD01                                | I-20 WB (MM 15)                | Bremen         | Carroll | 33.696    | -85.045    | 30      | 52 | 24    |             |
| Jason's Law                          | GA Weigh Station on EB (MM 43) | Lithia Springs | Douglas | 33.772    | -84.393    |         | 13 | 20    |             |



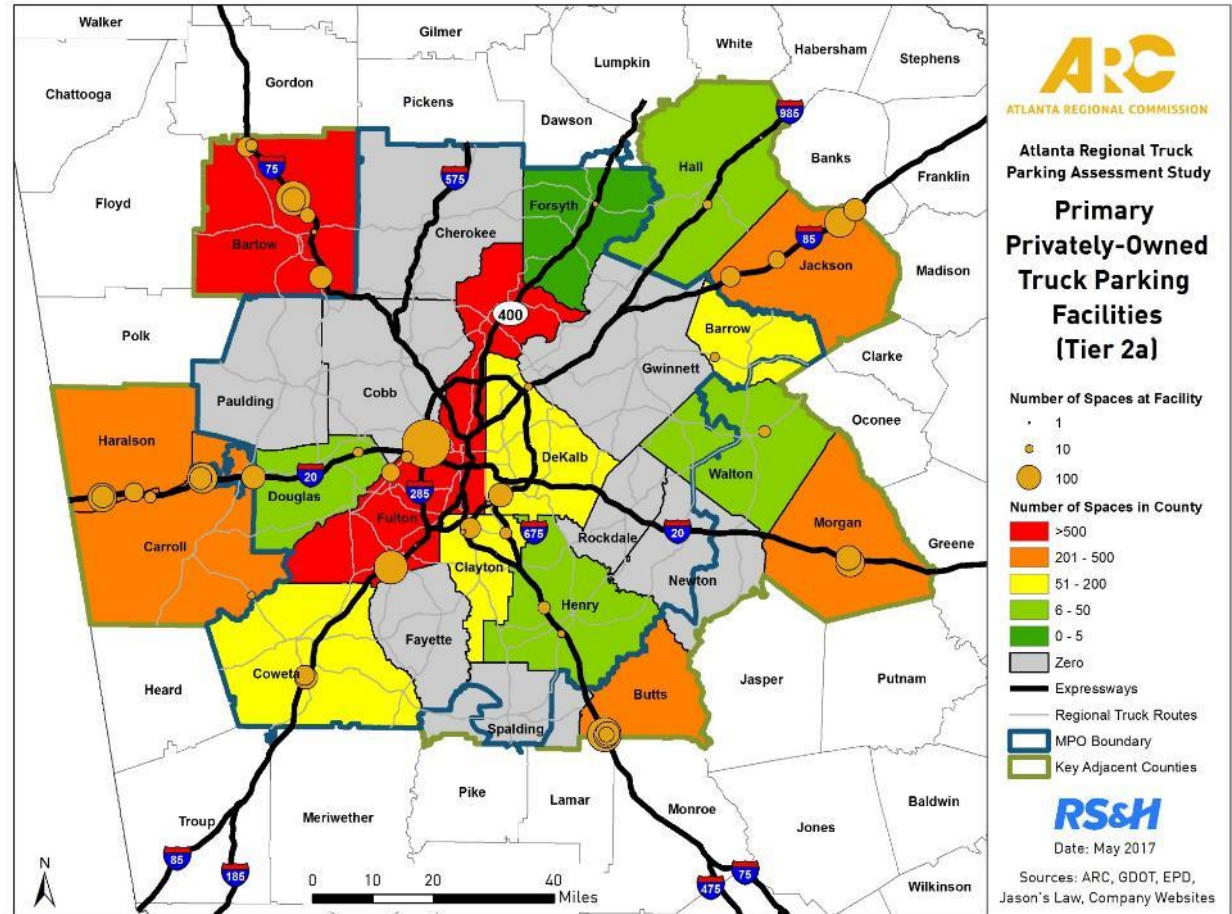






# Private Spaces by County

| County   | Spaces |
|----------|--------|
| Fulton   | 698    |
| Bartow   | 575    |
| Butts    | 450    |
| Carroll  | 360    |
| Haralson | 332    |
| Jackson  | 309    |
| Morgan   | 259    |
| Coweta   | 165    |
| DeKalb   | 114    |
| Clayton  | 105    |
| Barrow   | 85     |
| Henry    | 40     |
| Walton   | 25     |
| Douglas  | 20     |
| Hall     | 19     |
| Forsyth  | 5      |
| Total    | 3,561  |





# Outreach Activities

## ■ Surveys

- Truck Drivers
- Stakeholders
  - Local Jurisdictions & CIDs
  - Law Enforcement Officials
  - Truck Stop Owners/Operators
  - Shippers/Receivers & Private Fleets



## ■ Stakeholder Interviews

## ■ Meetings

- Freight Advisory Task Force (FATF)
- ARC Committees

# Truck Driver Survey

- Background / Demographic Data
- Rating of Regional Corridors by Truck Parking Availability
- Other Qualitative Information About Truck Parking

| Regional Routes                                 | Availability of Existing Truck Parking<br>(5 = Sufficient Parking; 1 = Parking Not Available) |   |   |   |   | Route Not Used |
|---|---|---|---|---|---|----------------|
|   | 5   | 4 | 3 | 2 | 1 |                |
| I-75 North                                      |   |   |   |   |   |                |
| I-85 North                                      |   |   |   |   |   |                |
| I-20 East                                       |   |   |   |   |   |                |
| I-675   |   |   |   |   |   |                |
| I-75 South                                      |   |   |   |   |   |                |
| I-85 South                                      |   |   |   |   |   |                |
| I-20 West                                       |   |   |   |   |   |                |
| I-285 North & East<br>(I-75 north to I-20 east) |   |   |   |   |   |                |
| I-285 South (I-20 east to I-85 south)           |   |   |   |   |   |                |
| I-285 West (I-85 south to I-75 north)           |   |   |   |   |   |                |



# Stakeholder Survey

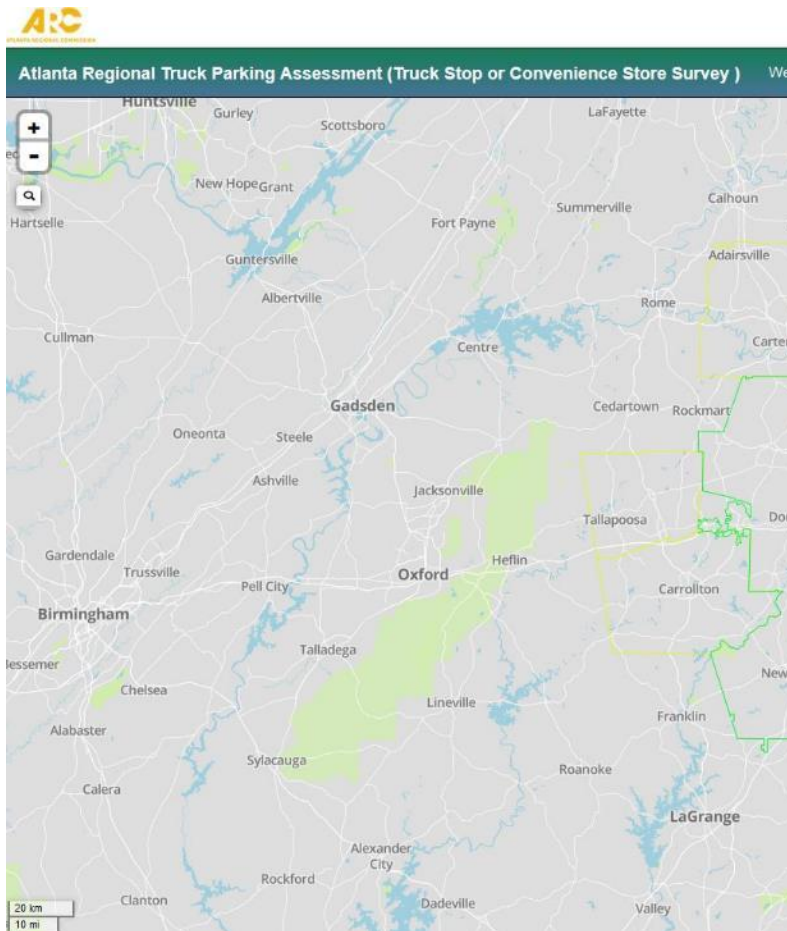
## 5. What industry do you work in?

- ☒ Local jurisdiction Community Improvement District (CID) (staff or elected official)
- ☐ Law enforcement
- ☐ Own or operate a private truck stop or convenience store (or something related)
- ☐ Trucking company, shipper, or company with a private fleet


Next


<https://www.surveymonkey.com/r/ARCTruckParking>

# WikiMapping



Welcome

  
Atlanta  
Regional  
Truck  
Parking  
Assessment  
Study



Thank you for taking the time to give us your valuable input on truck parking in the Atlanta Region. We are asking you to indicate locations on the map by dropping a pin in the following locations:

1. Where your truck stop is located.
2. Where you think there is a need for an additional private truck stop(s).
3. Where you think there is a need for expansion to an existing private truck stop(s).

You may add as many points per category as you wish, by clicking on the "Points" tab. Detailed instructions on how to do this can be found under the "About & Help" tab located in the blue header at the top of the map. Once you click on the tab a menu will drop down allowing you to then click on instructions.

Use your email address to login and make comments, and to receive project notifications.

Email Address

Continue To Map



# Next Steps

- Distribute Surveys to Stakeholder and ATRI contact databases
- Initiate Stakeholder Interviews
- Complete peer and literature review
- Begin parking demand analysis
- Complete truck GPS analysis
- Prepare for next Freight Task Force Meeting – August 2017





# Atlanta Regional Truck Parking Assessment Study



## Questions?

Daniel Studdard, AICP, ARC Principal Planner

[dstuddard@atlantaregional.com](mailto:dstuddard@atlantaregional.com)

## **Appendix 2-J**

### **Land Use Coordinating Committee Meeting 2**

# Atlanta Regional Truck Parking Assessment Study



## Land Use Coordinating Committee

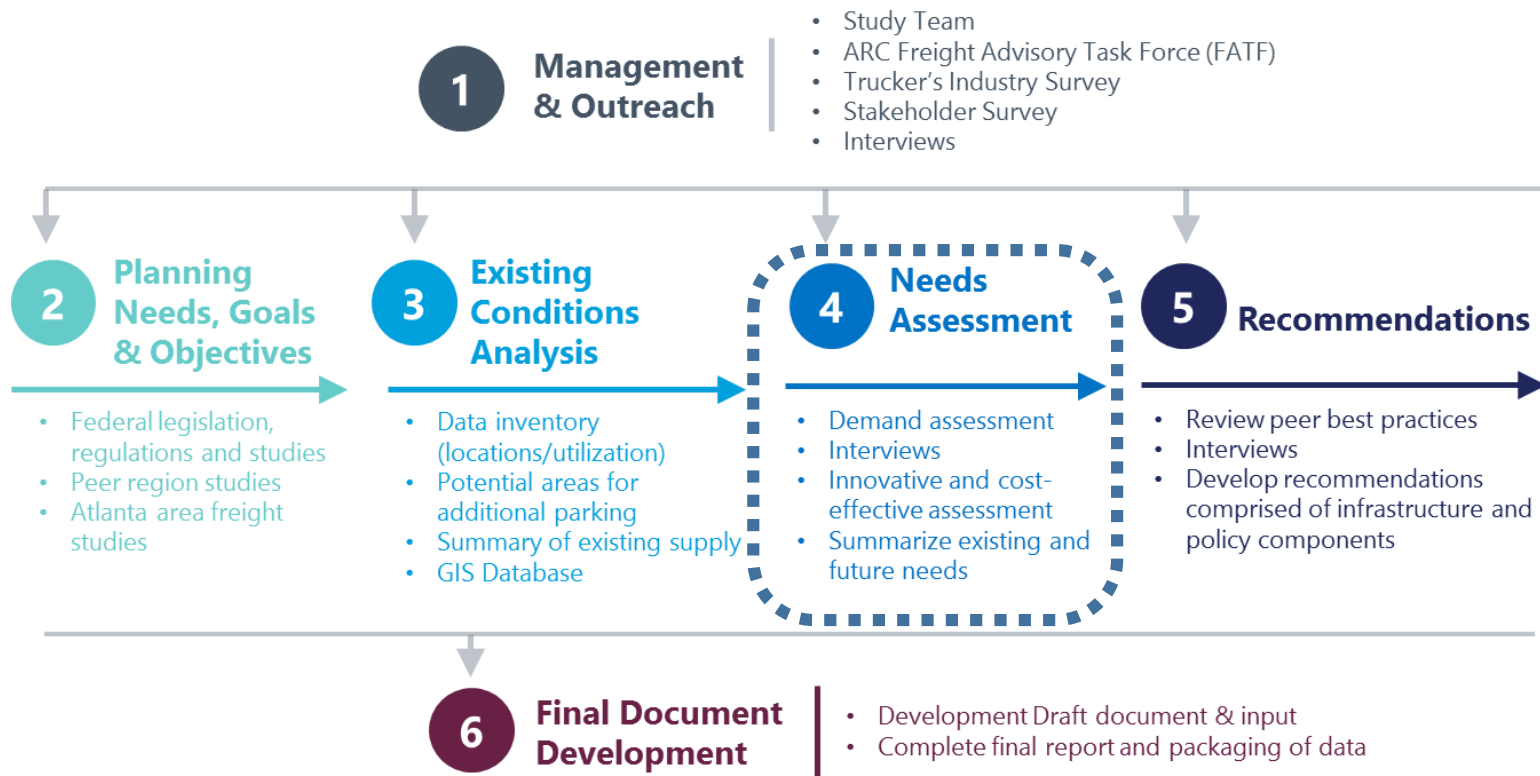
Daniel Studdard, AICP, Atlanta Regional Commission

*August 31, 2017*

# Study Approach

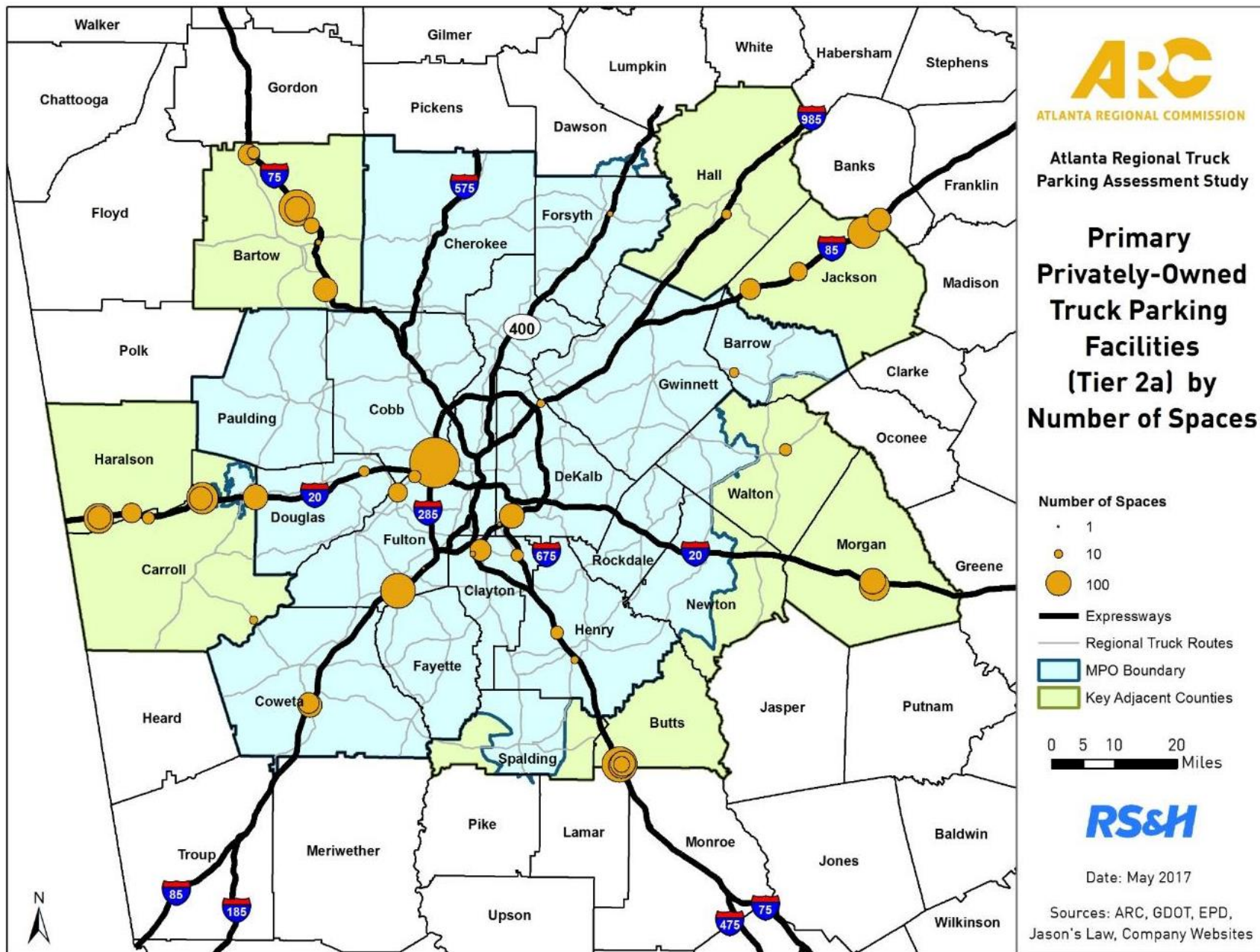


## Atlanta Regional Truck Parking Assessment Study



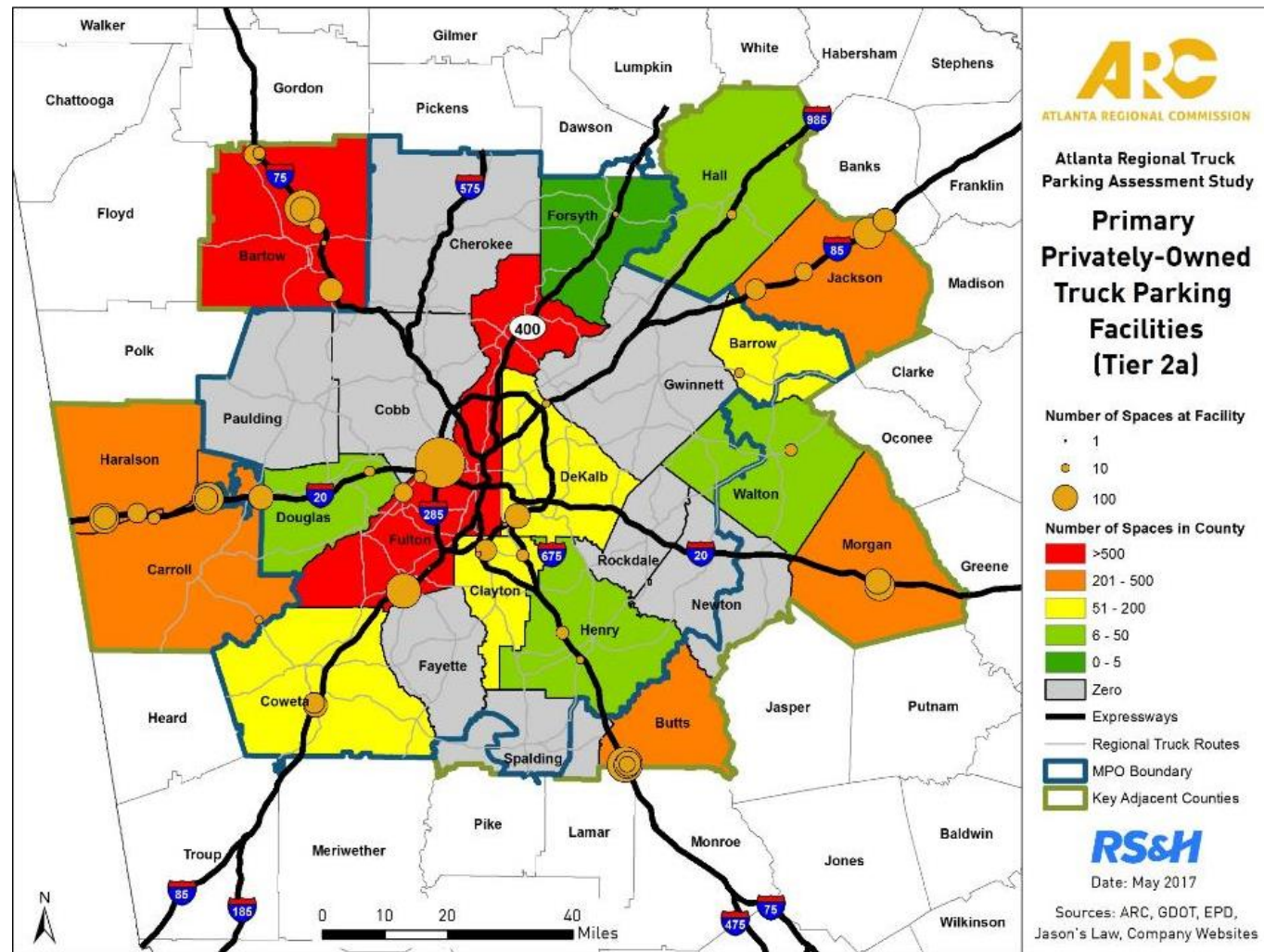






# Private Spaces by County

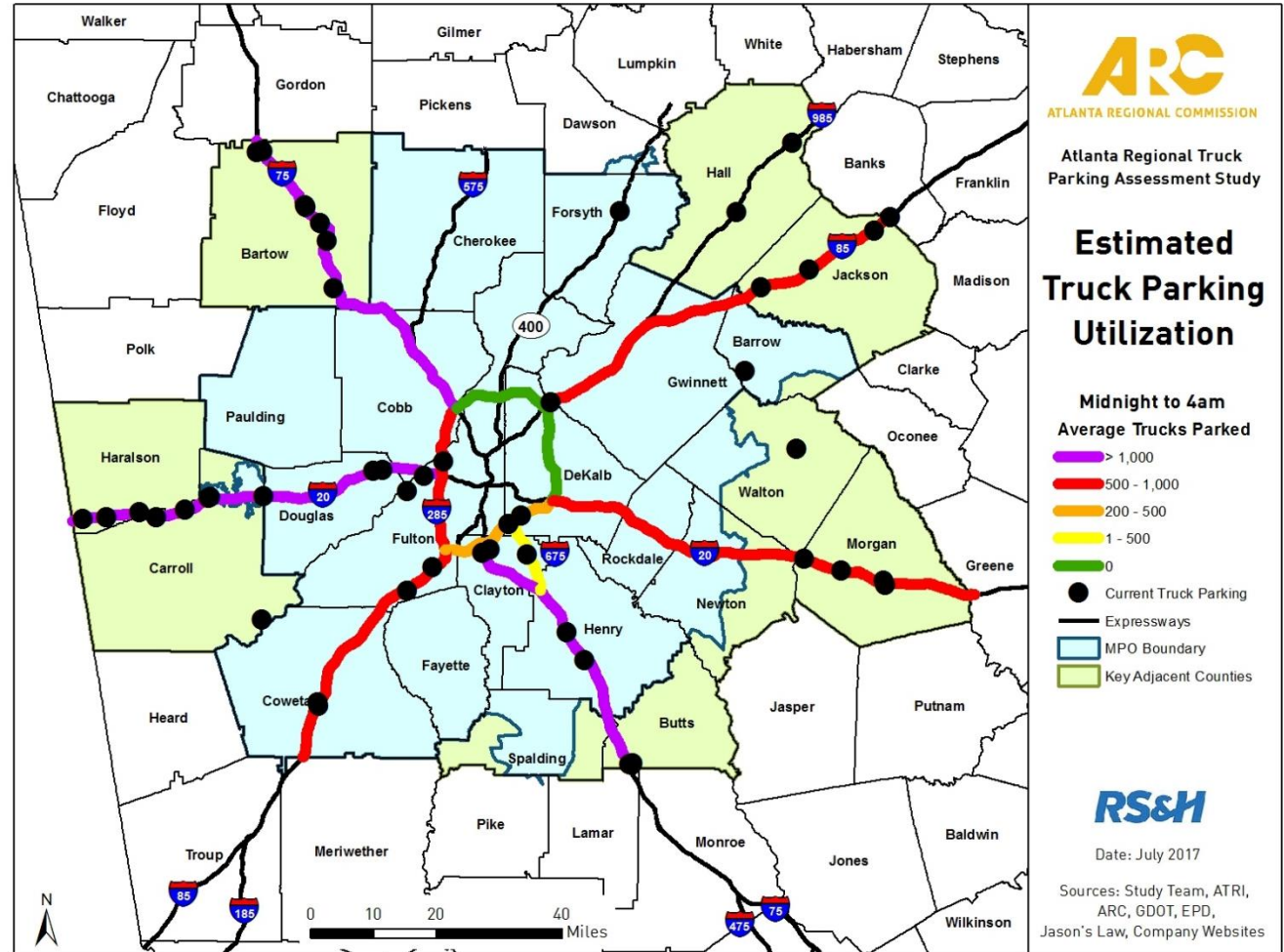
| County   | Spaces |
|----------|--------|
| Fulton   | 698    |
| Bartow   | 575    |
| Butts    | 450    |
| Carroll  | 360    |
| Haralson | 332    |
| Jackson  | 309    |
| Morgan   | 259    |
| Coweta   | 165    |
| DeKalb   | 114    |
| Clayton  | 105    |
| Barrow   | 85     |
| Henry    | 40     |
| Walton   | 25     |
| Douglas  | 20     |
| Hall     | 19     |
| Forsyth  | 5      |
| Total    | 3,561  |





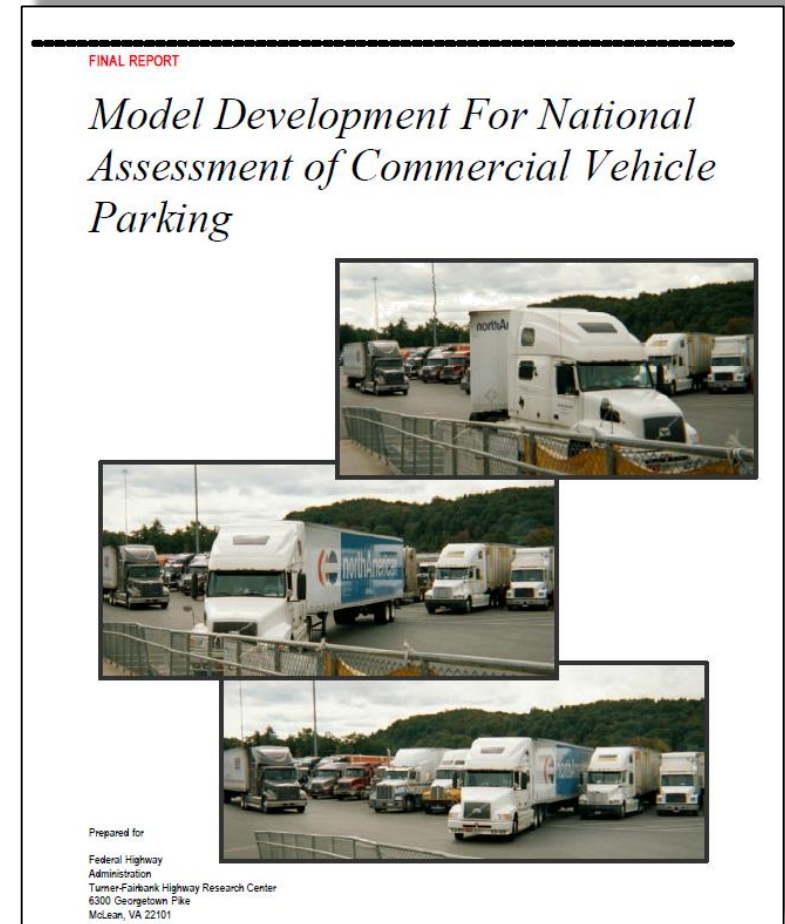
# Estimated Truck Parking Utilization

| Corridor | Estimated Utilization |
|----------|-----------------------|
| I-20 W   | 2,290                 |
| I-75 S   | 1,710                 |
| I-75 N   | 1,800                 |
| I-285 W  | 990                   |
| I-85 S   | 860                   |
| I-20 E   | 880                   |
| I-85 N   | 850                   |
| I-285 S  | 420                   |
| I-675    | 170                   |
| I-985    | 50                    |
| Total    | 10,020                |



# FHWA Truck Parking Demand Model

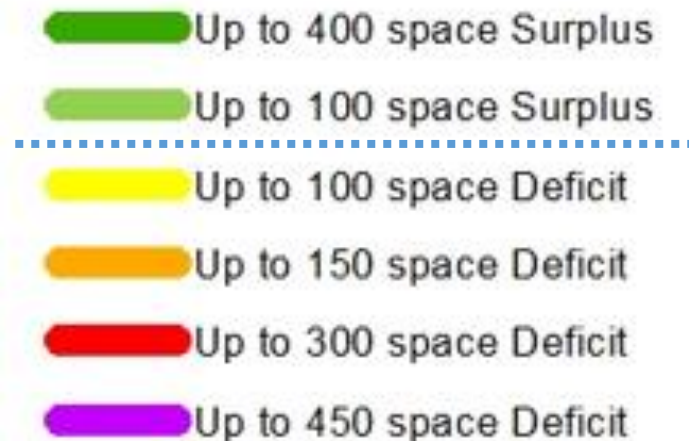
- Estimates corridor-level truck parking demand
- Input
  - Volumes
  - Corridor segment length
  - Speed
- Parameters
  - Truck driver service hour limits
  - Long haul parameters



# FHWA Truck Parking Demand Model

Result: Between 2012 and 2045 truck parking demand is estimated to increase by approximately **76%**.

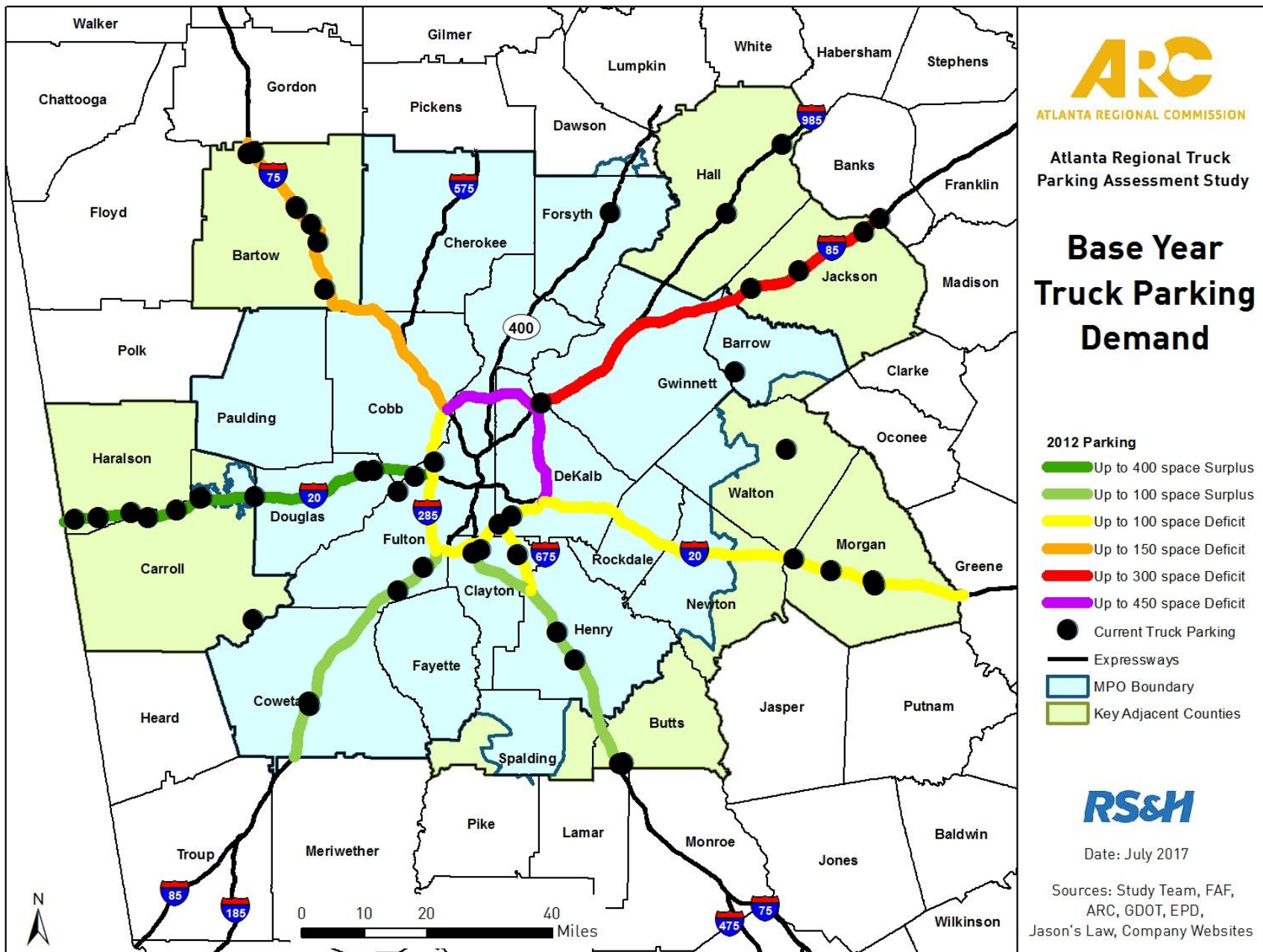
## Legend - Corridor Level Results

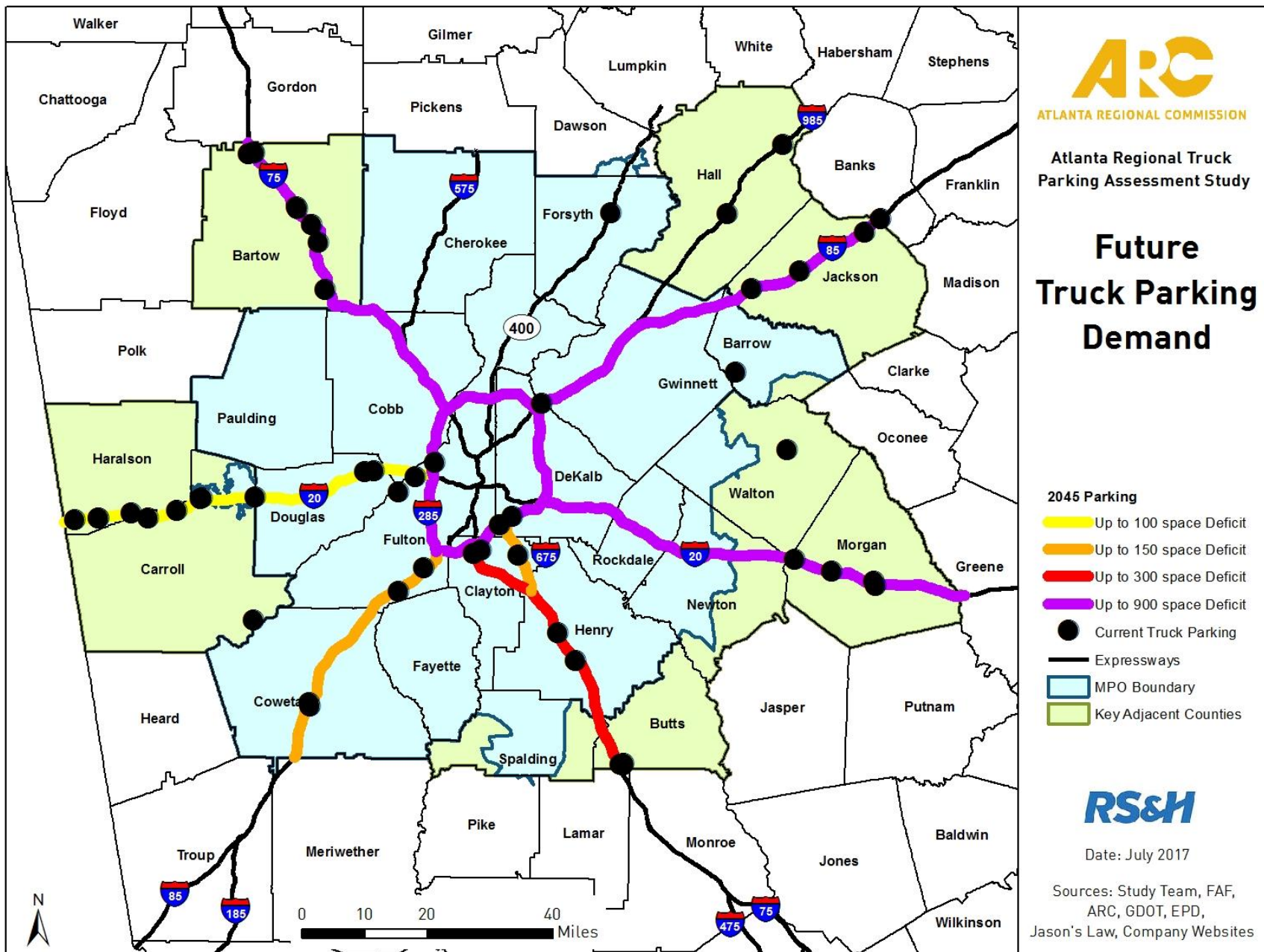


## Parking Surplus or Deficit

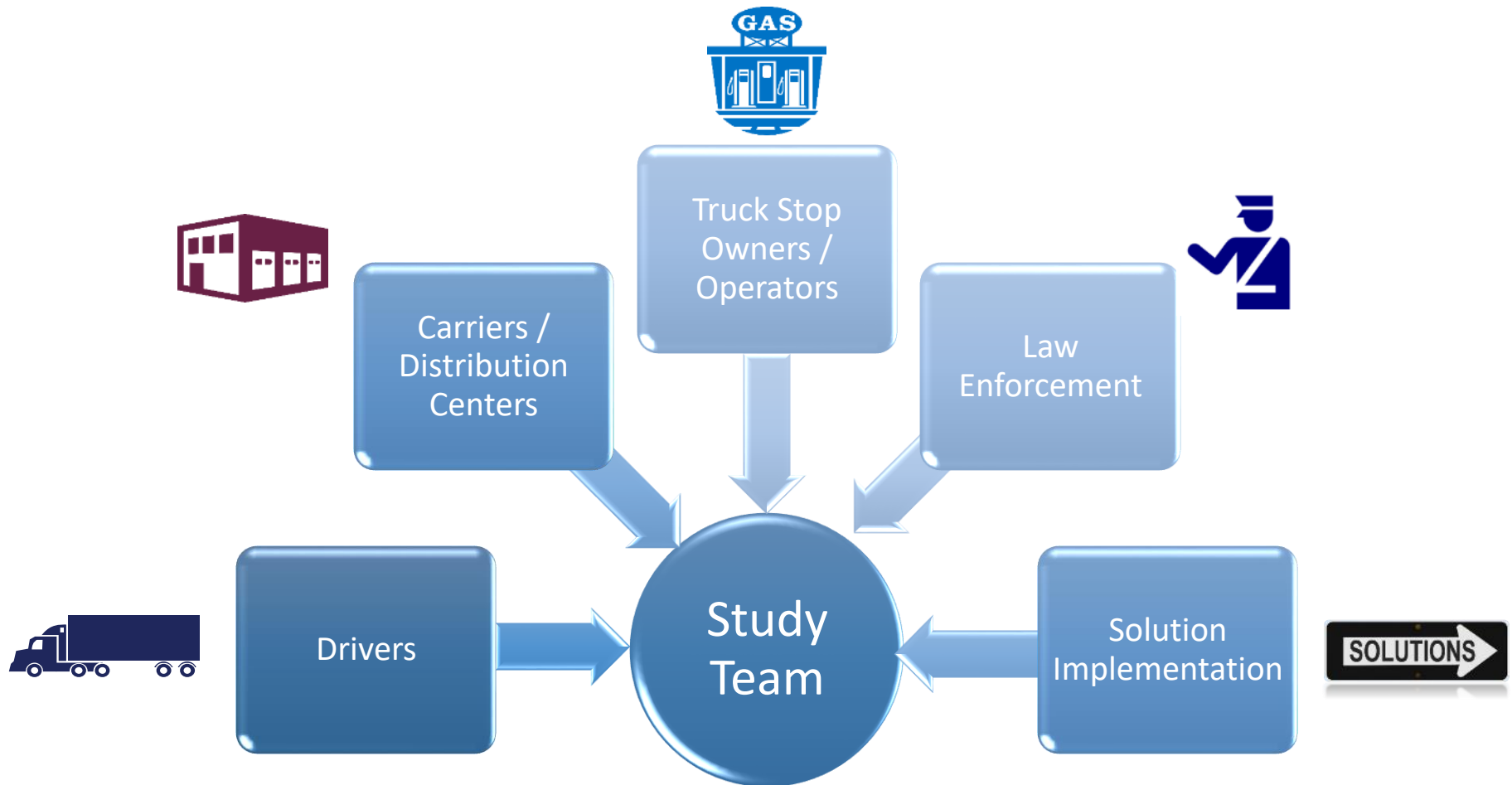
| Corridor    | 2012  | 2045 |
|-------------|-------|------|
| I-20 West   | (368) | 37   |
| I-85 South  | (96)  | 110  |
| I-75 South  | (87)  | 223  |
| I-285 West  | 21    | 349  |
| I-675       | 50    | 106  |
| I-20 East   | 88    | 413  |
| I-285 South | 97    | 307  |
| I-75 North  | 147   | 695  |
| I-85 North  | 303   | 830  |
| I-285 NE    | 456   | 802  |









# Stakeholder Groups







# Stakeholders Interviewed

| Affiliation / Agency  | <br>Drivers | <br>Carriers /<br>Distribution<br>Centers | <br>Truck Stop<br>Owners /<br>Operators | <br>Law<br>Enforcement | <br>Solution<br>Implementation |
|---|--|---|--|---|---|
| Owner-Operator Independent Drivers Association (OOIDA)                        | X  |   |  |   |   |
| Truck Driver - America's Road Team Captain, American Trucking Association     | X  |   |  |   |   |
| National Association of Truck Stop Operators (NATSO)                          |  |   | X  |   |   |
| Geo. H. Green Oil, Inc.   |  |   | X  |   |   |
| Southeastern Freight Lines  |  | X   |  |   |   |
| Walmart – Driver (FHWA Webinar)   | X  |   |  |   |   |
| Walmart - Distribution Center   |  | X   |  |   |   |
| Air Cargo Industry Liaison (Mullins International Solutions)                  |  | X   |  |   |   |
| Georgia Motor Trucking Association  | X  |   |  |   |   |
| Cisco - Global Logistics  |  |   |  |   | X   |
| Georgia Department of Public Safety, Motor Carrier Compliance Division (MCCD) |  |   |  | X   |   |
| Georgia Department of Transportation  |  |   |  |   | X   |
| FHWA  |  |   |  |   | X   |
| FDOT (adjacent State DOT Peer)  |  |   |  |   | X   |
| Mid-America Freight Coalition (MAFC)  |  |   |  |   | X   |

# Stakeholder Interviews





## Common Issues

| Issues   |  |  |  |  |
|--|--|---|---|---|
|  | Drivers  | Carriers /<br>Distribution<br>Centers   | Truck Stop<br>Owners /<br>Operators   | Law<br>Enforcement  |
| Finding Safe and Authorized Parking is a Challenge   | X  | X   | X   |   |
| Zoning, Land Use, and Noise Ordinances are an impediment to finding and siting truck parking   | X  | X   | X   |   |
| Truck parking demand is greater than supply of parking spaces, which creates issues with traffic and staging for delivery                    | X  | X   | X   | X   |
| Lack of parking results in less driving time and impacts to bottom-line as substantial time is spent searching for safe, authorized parking. | X  | X   |   |   |



# Stakeholder Interviews

## Common Findings

| Issues  |  |  |  |  |
|---|--|---|---|---|
|   | Drivers  | Carriers /<br>Distribution<br>Centers   | Truck Stop<br>Owners /<br>Operators   | Law<br>Enforcement  |
| Most truckers just need a clean restroom, and well-lit, safe, parking area - most carry their own food and supplies.                | X  | X   | X   |   |
| Finding parking is mostly handled by drivers through GPS, apps, and local knowledge   | X  | X   | X   |   |
| The most common truck parking violations are those parking on interstate ramps and in emergency lanes                               |  |   |   | X   |
| Industrial areas bring increased truck traffic; many communities want the increased tax revenue, but don't realize the side effects | X  | X   | X   |   |
| Electronic Logging Device (ELD) requirements will increase truck parking challenges   | X  | X   | X   | X   |

# Recommendations from Interviews

## Solutions Implementation

- Multi-level agency collaboration
- Public-private collaboration
- Educational component
- Importance of technology

**FHWA**

- Rapid technology advances challenge investment level
- Sharing culture / WAZE effect
- Innovative solutions using existing assets
- Data availability: public vs private
- Small investments by many versus large investments by few

**Mid-America Freight  
Coalition / FDOT / CISCO**

# Stakeholder Surveys



## ■ Distribution

- ARC Committees: TCC, TAQC, LUCC
- Freight Advisory Task Force (FATF)
- Interviewees and their networks
- Georgia Tech Supply Chain & Logistics Institute

*Survey open from 5/15/2017 to 7/17/2017*

## ■ 97 Responses

- |                                 |              |
|---------------------------------|--------------|
| ■ Local Jurisdictions/CIDs      | 45 responses |
| ■ Trucking Companies / Shippers | 27 responses |
| ■ Law Enforcement               | 19 responses |
| ■ Truck Stop Owner / Operators  | 6 responses  |



# Truck Driver Survey Results

- 277 Survey Respondents
- Average Length of Haul:

| Length of Haul                          | Response |
|---|----------|
| Local (less than 100 miles)             | 0.0%     |
| Regional (100-499 miles per trip)       | 22.3%    |
| Inter-Regional (500-999 miles per trip) | 49.3%    |
| Long-Haul (1,000+ miles per trip)       | 28.4%    |



# Truck Driver Survey Results

- **84% of respondents** often need to temporarily park in the Atlanta Region for staging
- How long does it usually take you to find truck parking in the Atlanta region?

| Length of Time       | Response |
|----------------------|----------|
| Less than 15 minutes | 1.3%     |
| 15 – 30 minutes      | 6.5%     |
| 30 minutes – 1 hour  | 41.3%    |
| More than 1 hour     | 51.0%    |

# Survey Respondents Who Consider Truck Parking to be Limited/Rarely Available or Not Available

| Corridor                                       | Driver Response |
|--|-----------------|
| I-285 North and East (I-75 north to I-20 east) | 91%             |
| I-285 West (I-85 south to I-75 north)          | 90%             |
| I-285 South (I-20 east to I-85 south)          | 89%             |
| I-85 North                                     | 79%             |
| I-20 East                                      | 76%             |
| I-85 South                                     | 74%             |
| I-75 South                                     | 73%             |
| I-20 West                                      | 73%             |
| I-75 North                                     | 69%             |
| I-675  | 68%             |

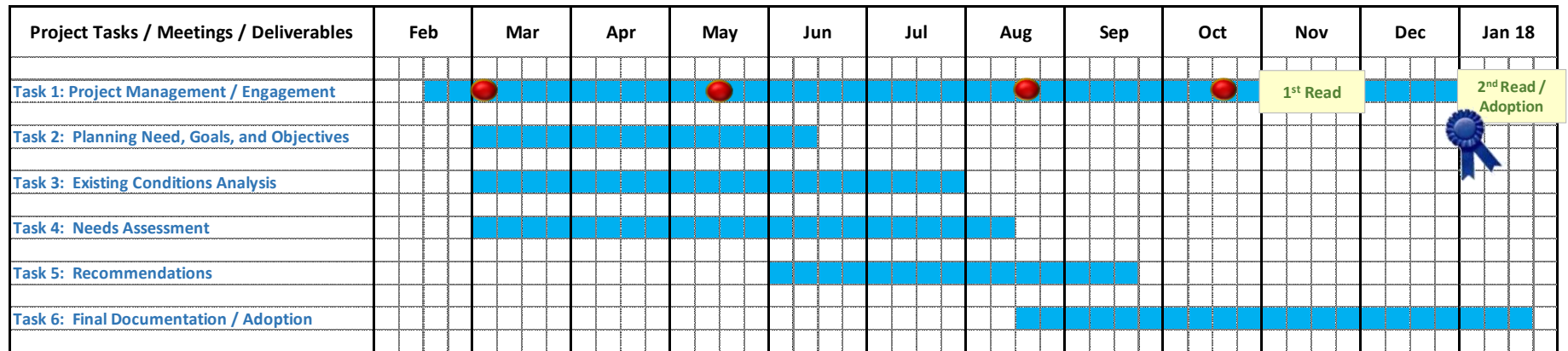
# Summary of Needs


- Lack of parking supply throughout region
- ELDs, industrial growth will increase demand
- Zoning constrains expansion of parking supply
- Proposed solutions vary based upon perspective
- Solutions must:
  - Include coordination
  - Maximize use of technology
  - Be adaptable / flexible
  - Leverage existing assets



# Next Steps

## Proposed Project Schedule Atlanta Regional Truck Parking Assessment Study (2017-2018)



 Potential FATF Meeting

*Revised: 05-15-17*

# Questions/Comments?

- Are any regional truck parking needs missing?
- How can we best address truck parking as a region?
- Can zoning changes help address supply?
- Can existing lots be used for truck parking, with improvements (lighting, security, restrooms)?
  - Park and Ride lots
  - Shopping Centers
  - Vacant Property
- **Next Steps: Develop Recommendations**



## **Appendix 2-K**

### **Stakeholder Questions**

## Contact Information

**The Atlanta Regional Commission (ARC) is conducting this survey to assess the current and future truck parking needs within the Atlanta Region. We are requesting your name and contact information for informational purposes only for ARC and the Study Team; it will not be shared or sold to any third parties.**

1. Name:

2. Organization:

3. Email Address:

4. Phone number (optional)

5. What industry do you work in?

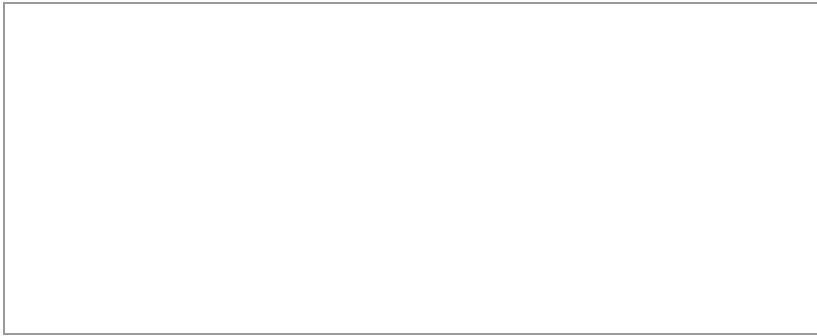
- ☐ Local jurisdiction Community Improvement District (CID) (staff or elected official)
- ☐ Law enforcement
- ☐ Own or operate a private truck stop or convenience store (or something related)
- ☐ Trucking company, shipper, or company with a private fleet

Local Jurisdiction or Community Improvement District (CID):

**Thank you for taking this survey. The first portion contains questions, and then you'll be linked to a map where you'll have the opportunity to place points to communicate locations. This survey considers that the trucking industry is a vital part of the local economy, and that truck parking is a necessary function of that industry.**

6. How do you facilitate truck parking in your locality?

- ☐ My jurisdiction or CID does not have an active role in facilitating truck parking
- ☐ Our locality facilitates truck parking by:



7. Does your jurisdiction have any programs, policies, or strategies in place to address truck parking?

- ☐ Yes
- ☐ No

Local Jurisdiction or Community Improvement District (CID) pg 2:

8. What are the programs, policies, and/or strategies?

Local Jurisdiction or Community Improvement District (CID) pg3:

9. What are some devices, tools, or technologies your jurisdiction employs or could employ to communicate with truckers?

10. What are your top 3 issues with truck parking in your jurisdiction?

Issue 1:

Issue 2:

Issue 3:

11. What are your top 3 strategies for addressing the issues with truck parking in your jurisdiction?

Strategy 1:

Strategy 2:

Strategy 3:

**Please follow this link to finish the survey in Wikimapping:**  
**Wikimapping Local Jurisdiction Survey**



Law Enforcement:

**Thank you for taking this survey. The first portion contains questions, and then you'll be linked to a map where you'll have the opportunity to place points to communicate locations. This survey considers that the trucking industry is a vital part of the local economy, and that truck parking is a necessary function of that industry.**

12. What programs, policies, and strategies do you employ to address truck parking?

13. What do you do to enforce illegal truck parking?

14. What suggestions do you have to increase truck parking and/or help to address illegal truck parking?

Please follow this link to finish the survey in WikiMapping:  
[Law Enforcement Wikimapping Survey](#)

If Private Truck Stop or Convenience Store Owner or Operator:

**Thank you for taking this survey. The first portion contains questions, and then you'll be linked to a map where you'll have the opportunity to place points to communicate locations. We are seeking an understanding of the current and potential truck parking locations and amenities in the Atlanta region.**

15. What is the name and/or store number of your store? (this question is voluntary)

16. What are the primary amenities at your truck stop? (select all that apply)

- ☐ Restrooms
- ☐ Fueling Services
- ☐ Restaurant
- ☐ Vending Machines
- ☐ Showers
- ☐ Retail Stores
- ☐ Lighting
- ☐ Security
- ☐ Internet Access/Wi-Fi
- ☐ Access to the Interstate
- ☐ Hotel/Motel

Other

17. Do you take truck parking reservations?

☐ Yes

☐ No

Private Truck Stop or Convenience Store Owner or Operator (pg 2):

18. What percentage of truck spaces are set aside for reservations?

19. How much does a reserved space cost?

Private Truck Stop or Convenience Store Owner or Operator (pg 3):

20. What time of day does your lot fill up? (select all that apply)

- ☐ Midnight to 5 am
- ☐ 5 am to 9 am
- ☐ 9 am to Noon
- ☐ Noon to 4 pm
- ☐ 4 pm to 8 pm
- ☐ 8 pm to Midnight
- ☐ Lot is full around the clock

21. What are the top 3 complaints you hear from truckers regarding parking in the Metro Atlanta region?

Please follow this link to finish the survey in WikiMapping:  
[Truck Stop or Convenience Store Wikimapping Survey](#)



Trucking Company, Shipper or Company with Private Fleet:

**Thank you for taking this survey. We are seeking to better understand existing and future truck parking conditions and potential needs within the Atlanta Region. As a trucking company or company that owns/operates a trucking fleet, we would like to learn more about how you handle truck parking from a corporate perspective.**

22. Is truck parking considered a significant issue for your company?

☐ Yes

☐ No

Trucking Company, Shipper or Company with Private Fleet (pg2):

23. Please explain how truck parking is negatively impacting your company and recommendations you may have to mitigate those impacts.

Trucking Company, Shipper or Company with Private Fleet (pg 3):

24. Do you expect demand for truck parking to increase over the next decade, particularly with the requirement to use Electronic Logging Devices (ELDs)?

☐ Yes

☐ No

25. Does your dispatch assist drivers with finding parking, or are drivers on their own?

☐ Yes, Dispatch assists drivers

☐ No, Drivers find parking on their own

26. Do your drivers pay for truck parking?

☐ Yes

☐ No

Trucking Company, Shipper or Company with Private Fleet (pg 4):

27. Do the drivers pay for parking out of pocket or does the corporation reimburse them?

- ☐ Out of drivers' pocket
- ☐ Corporate reimbursement

Trucking Company, Shipper or Company with Private Fleet (pg 5):

28. Do you consider the Atlanta Region to have adequate truck parking?

☐ Yes

☐ No



## Trucking Company, Shipper or Company with Private Fleet (pg 6):

29. Using the above map, please indicate the rating you could give to each corridor listed.

|  | Parking not<br>available | Limited parking<br>/ Rarely<br>available | Limited parking /<br>Sometimes available | Sufficient parking<br>/ Sometimes<br>available | Sufficient<br>Parking /<br>Always<br>available | Unfamiliar with<br>this route |
|--|--------------------------|--|--|--|--|-------------------------------|
| I-75 North                                       | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-85 North                                       | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-20 East  | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-675  | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-75 South                                       | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-85 South                                       | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-20 West  | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-285 North & East (I-<br>75 north to I-20 east) | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-285 South (I-20 east<br>to I-85 south)         | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |
| I-285 West (I-85 south<br>to I-75 north)         | <input type="radio"/>    | <input type="radio"/>                    | <input type="radio"/>                    | <input type="radio"/>                          | <input type="radio"/>                          | <input type="radio"/>         |

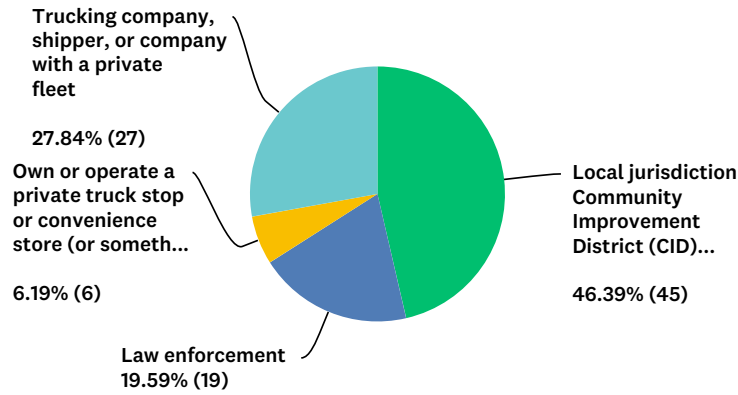
Other regional routes (please specify major ones)

## **Appendix 2-L**

### **Stakeholder Survey Results**

## Q5 What industry do you work in?

Answered: 97 Skipped: 6

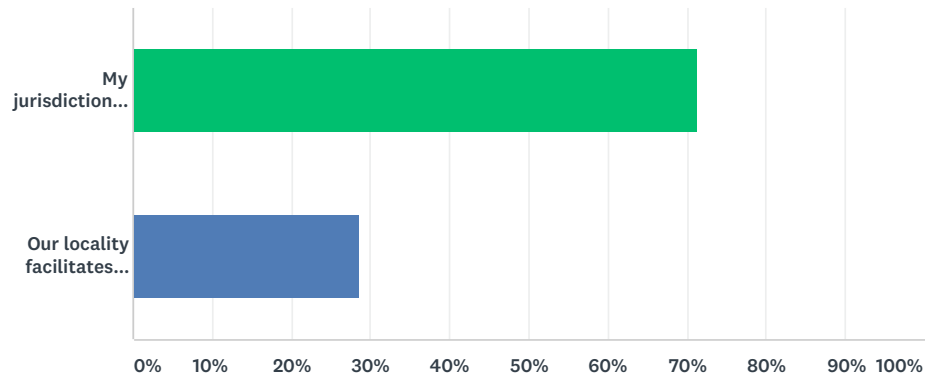


| ANSWER CHOICES  | RESPONSES |           |
|---|-----------|-----------|
| Local jurisdiction Community Improvement District (CID) (staff or elected official) (1) | 46.39%    | 45        |
| Law enforcement (2)   | 19.59%    | 19        |
| Own or operate a private truck stop or convenience store (or something related) (3)     | 6.19%     | 6         |
| Trucking company, shipper, or company with a private fleet (4)                          | 27.84%    | 27        |
| <b>TOTAL</b>  |           | <b>97</b> |

| BASIC STATISTICS |         |        |      |                    |
|------------------|---------|--------|------|--------------------|
| Minimum          | Maximum | Median | Mean | Standard Deviation |
| 1.00             | 4.00    | 2.00   | 2.15 | 1.27               |

## Q6 How do you facilitate truck parking in your locality?

Answered: 42 Skipped: 61

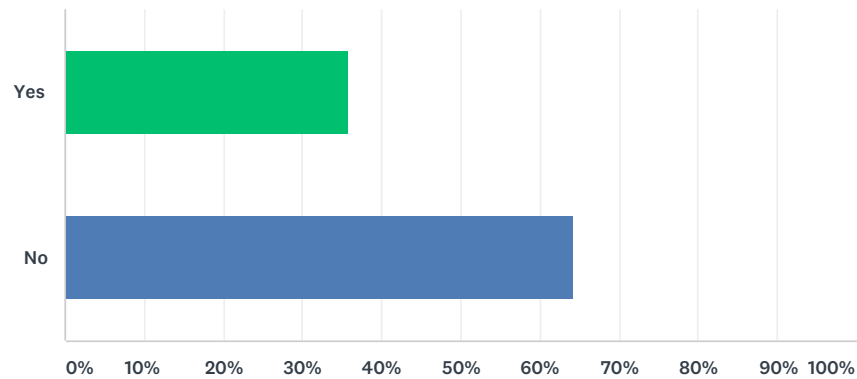


| ANSWER CHOICES  | RESPONSES |           |
|---|-----------|-----------|
| My jurisdiction or CID does not have an active role in facilitating truck parking | 71.43%    | 30        |
| Our locality facilitates truck parking by:  | 28.57%    | 12        |
| <b>TOTAL</b>  |           | <b>42</b> |

| #  | OUR LOCALITY FACILITATES TRUCK PARKING BY:   | DATE               |
|----|--|--------------------|
| 1  | L  | 7/11/2017 9:20 AM  |
| 2  | following the city's zoning ordinance as it relates to tractor truck parking.  | 7/7/2017 9:10 AM   |
| 3  | Allowing truck parking lots in industrial zoning districts subject to screening/landscaping requirements.  | 6/23/2017 4:21 PM  |
| 4  | Any new truck stops would have to be approved through the local zoning/permitting process.   | 6/7/2017 4:53 PM   |
| 5  | Permitting Truck and freight transportation services in our Highway Commercial, Interchange Activity Center, Light Industrial, and Heavy Industrial zoning districts per our Unified Land Development Code (ULDC).   | 6/7/2017 1:32 PM   |
| 6  | Regulations for truck parking specified in Zoning Ordinance.   | 6/7/2017 1:14 PM   |
| 7  | Ordinances   | 6/7/2017 12:32 PM  |
| 8  | We have very limited truck parking in Morrow, and for good reason. Trucks are very destructive to the city's infrastructure. They often drive through parking lots knocking over signs and lights or park illegally in various places. We recently had a truck knock down a street light in a hotel parking lot and drive off leaving a \$20,000 repair job necessary. | 6/7/2017 12:17 PM  |
| 9  | Gwinnett County Police Department Quality of Life Unit minimum standards policies.   | 6/6/2017 4:30 PM   |
| 10 | Our zoning ordinance specifically calls out overnight and/or long-term parking of commercial vehicles and heavy equipment by prohibiting it in various zoning districts. There is no "catch all" ordinance in Cobb County that directly addresses commercial truck parking.  | 6/2/2017 1:05 PM   |
| 11 | Local ordinance that provides for fleet parking at the point of business or special use permit for other off site parking.   | 5/31/2017 1:10 PM  |
| 12 | Require a Special Use Permit in M-1 zoning.  | 5/25/2017 10:01 AM |

Q7 Does your jurisdiction have any programs, policies, or strategies in place to address truck parking?

Answered: 42    Skipped: 61



| ANSWER CHOICES |  | RESPONSES |    |
|----------------|--|-----------|----|
| Yes            |  | 35.71%    | 15 |
| No             |  | 64.29%    | 27 |
| TOTAL          |  |           | 42 |

## Q8 What are the programs, policies, and/or strategies?

Answered: 14 Skipped: 89

| #  | RESPONSES  | DATE              |
|----|--|-------------------|
| 1  | <b>Signage and Enforcement</b> ADDITIONAL NO PARKING SIGNS ON OFF-RAMPS; ACTIVE ENFORCEMENT FROM LAW ENFORCEMENT; ADDITIONAL INFORMATIONAL SIGNAGE AT LOCAL TRUCK STOP   | 7/11/2017 8:03 AM |
| 2  | <b>Zoning</b> Ordinances addressing no truck parking in residential areas.   | 7/10/2017 5:24 PM |
| 3  | <b>Zoning</b> We currently follow the city's zoning ordinance that regulates where tractor trucks can or cannot park in the city for time specific, in most cases a permit by the city is needed as well as proof of tractor truck ownership and residency in the City is required. The city has not had an issue with truck parking, often times trucks usually pass through the city, if trucks are noticed in an area for a period of time public safety usually speaks to the driver and they leave.   | 7/7/2017 9:23 AM  |
| 4  | <b>Zoning</b> It varies, based on the local zoning laws and private property restrictions.   | 7/5/2017 10:30 AM |
| 5  | <b>Private Property</b> Trucks are not allowed to park overnight in commercial/industrial parking lots (unless associated with the business on site) or residential districts,   | 6/23/2017 4:24 PM |
| 6  | <b>Signage and Enforcement</b> The Gwinnett Place CID gets written permission from local property owners to trespass trucks parking or using private property without the owners permission. We also actively tag trucks with a bright orange "warning" sticker that alerts the truck driver that his/her truck may be towed if it is not moved.   | 6/12/2017 1:07 PM |
| 7  | <b>Zoning</b> The related policy is per our Land Use table in Section 2.03.00 of our ULDC.   | 6/7/2017 1:33 PM  |
| 8  | <b>Private Property</b> No truck parking allowed on public right-of-way. Truck parking only allowed on private property.   | 6/7/2017 1:16 PM  |
| 9  | <b>Zoning</b> The City considers vehicles parked outdoors for more than 24 hours to be outdoor storage. Outdoor storage is limited to our M-1 Zoning District and must be done in appropriately enclosed area. Vehicles must be parked on an appropriately treated surface. We have also worked with property owners around the interchange that have unused property. They let us know that trucks do not have permission to park on the property, so we can have the trucks move. The City does have one truck terminal that allows for truck parking.   | 6/7/2017 12:34 PM |
| 10 | <b>Signage and Enforcement</b> Truck parking only - no truck stops Commercial parking lots   | 6/7/2017 12:33 PM |
| 11 | <b>Zoning</b> Strict regulations for parking to prevent the destruction of our right of ways and commercial corridors.   | 6/7/2017 12:18 PM |
| 12 | <b>Zoning</b> Commercial Vehicle Parking (ZR1007) In all residential zoning districts, the parking of the following commercial vehicles are prohibited: Limousines, flat bed trucks, dump trucks, tow trucks, transport wreckers, tandem axle trucks, cab-on-chassis trucks, tractor trailers, wheeled attachments or trailers, buses, earthmoving machinery, semi-trailers, and any vehicle over 20 feet long, 7 feet high, or 7 feet wide. Vehicles or equipment used for agricultural purposes on RA-200 or R-100 zoned property with five acres or more are permitted if parked outside the required front yard setback. In all residential zoning districts, the parking of the following commercial vehicles is permitted: 1) An automobile, pick-up truck, van, or SUV used to provide daily transportation to and from work, 2) A commercial vehicle that is parked temporarily in conjunction with a commercial service, sale, or delivery, and 3) School buses used for the primary purpose of transporting children to and from state licensed or accredited elementary, middle, or high schools, provided such vehicle is parked off any public thoroughfare, on a hard-surfaced area, and in the side or rear yard. | 6/6/2017 4:31 PM  |
| 13 | <b>Zoning</b> Rockdale County Code 222-11  | 5/31/2017 4:24 PM |
| 14 | <b>Zoning</b> the policies in place are to discourage truck parking in commercial and residential areas. No positive policies in place.  | 5/31/2017 6:18 AM |



## Q9 What are some devices, tools, or technologies your jurisdiction employs or could employ to communicate with truckers?

Answered: 25 Skipped: 78

| #  | RESPONSES   | DATE              |
|----|---|-------------------|
| 1  | <b>Signage</b> (1) ADDITIONAL SIGNAGE ON ALL INTERSTATE RAMPS, WHICH ARE TORN DOWN BY TRUCKERS (2) ENCOUNTERS WITH LAW ENFORCEMENT (3) ADDITIONAL SIGNAGE AT LOCAL TRUCK STOP   | 7/11/2017 8:06 AM |
| 2  | <b>None</b> None  | 7/11/2017 8:04 AM |
| 3  | <b>Social Media</b> facebook, twitter   | 7/10/2017 5:29 PM |
| 4  | <b>Social Media</b> We currently have not had an issue with trucks or truckers in the jurisdiction due to our location, that of not being close to interstate exits. If we should ever need to communicate with truckers, we could use the city's website to post information and the city's Facebook and Twitter pages. The city's public safety departments can also place information on their pages to communicate with truckers if needed. | 7/7/2017 9:25 AM  |
| 5  | <b>Phone Application</b> Phone apps   | 7/5/2017 10:32 AM |
| 6  | <b>Police</b> Typically code enforcement. Occasionally police.  | 6/23/2017 4:32 PM |
| 7  | <b>None</b> Directions to distribution facilities or truck parking lots nearby. Not in use, but would be useful.  | 6/19/2017 5:02 PM |
| 8  | <b>GIS</b> identify parking spots on-line (GIS)   | 6/19/2017 8:45 AM |
| 9  | <b>Police</b> Local law enforcement; providing information to distribution/warehouse centers; provide info to employers   | 6/16/2017 2:59 PM |
| 10 | <b>None</b> At this time parking is not permitted.  | 6/15/2017 4:53 PM |
| 11 | <b>Police</b> As previously stated we use a bright orange "warning" sticker and we place that on the driver's side window for any truck we suspect is parked illegally.   | 6/12/2017 1:14 PM |
| 12 | <b>None</b> We do not employ anything currently. The voluntary GPS app for semi drivers would be helpful in determining high volume areas for truck idling and parking.   | 6/8/2017 11:29 AM |
| 13 | <b>None</b> Henry County's development authority may have some suggestions.   | 6/7/2017 1:29 PM  |
| 14 | <b>Police</b> Police Department assist Code Enforcement to communicate with truckers related to illegal parking.  | 6/7/2017 1:25 PM  |
| 15 | <b>Direct Communication</b> <b>Signage</b> Signage at key locations; direct communications with property owners/business owners (eblasts and newsletters); we are getting ready to form a stakeholders group  | 6/7/2017 12:44 PM |
| 16 | <b>Signage</b> <b>Social Media</b> I'm not sure I'm clear on what we mean by communicate? Maybe there should be a symbol for "trucks welcome" and one for "trucks restricted" and jurisdictions can display on signs, websites, social media etc - - to communicate that beyond deliveries trucks should or should not come here.   | 6/7/2017 12:21 PM |
| 17 | <b>Social Media</b> County's official Website.  | 6/6/2017 4:37 PM  |
| 18 | <b>None</b> None at this time.  | 6/2/2017 1:06 PM  |
| 19 | <b>Social Media</b> CID website newsletter, social media, relationships with industrial property owners and airport staff.  | 6/1/2017 1:20 PM  |
| 20 | <b>None</b> We are not aware of any concerns with truck parking   | 6/1/2017 12:57 PM |
| 21 | <b>Police</b> We call the major truck lines and inform them of the illegally parked vehicle and vehicle number. We will have the Sheriffs Department run the tag so we can issue Magistrate Court citations.  | 5/31/2017 4:27 PM |
| 22 | <b>None</b> We have no real tools at the moment but are open to using any available method  | 5/31/2017 1:32 PM |
| 23 | <b>None</b> don't know.   | 5/31/2017 6:21 AM |
| 24 | <b>Police</b> <b>Signage</b> Signage & law enforcement  | 5/30/2017 4:55 PM |
| 25 | <b>None</b> None  | 5/30/2017 4:30 PM |

## Q10 What are your top 3 issues with truck parking in your jurisdiction?

Answered: 29 Skipped: 74

| ANSWER CHOICES |  | RESPONSES  |
|----------------|--|------------|
| Issue 1:       |  | 100.00% 29 |
| Issue 2:       |  | 82.76% 24  |
| Issue 3:       |  | 48.28% 14  |

| #  | ISSUE 1:   | DATE              |
|----|--|-------------------|
| 1  | <b>Parking on Ramp/ S R</b> PARKING IN NO PARKING ZONES ON OFF RAMPS   | 7/11/2017 8:06 AM |
| 2  | <b>Res/ROW/Private</b> Parking on vacant private lots  | 7/11/2017 8:04 AM |
| 3  | <b>Res/ROW/Private</b> Illegal parking in residential areas  | 7/10/2017 5:29 PM |
| 4  | <b>Parking on Ramp/ S R</b> Parking on exit/entrance ramps at I-75 exits 283 and 296   | 7/10/2017 4:02 PM |
| 5  | <b>N/A</b> n/a   | 7/7/2017 9:25 AM  |
| 6  | <b>Res/ROW/Private</b> Parking in restricted areas   | 7/5/2017 10:32 AM |
| 7  | <b>Res/ROW/Private</b> parking on abandoned property   | 6/23/2017 4:32 PM |
| 8  | <b>Parking on Ramp/ S R</b> Parking on the freeway on/off ramps.   | 6/19/2017 5:02 PM |
| 9  | <b>Res/ROW/Private</b> truck owners parking in residential subdivisions  | 6/19/2017 8:45 AM |
| 10 | <b>Safety</b> Safety   | 6/16/2017 2:59 PM |
| 11 | <b>Safety</b> Sight Distance issues  | 6/15/2017 4:53 PM |
| 12 | <b>Res/ROW/Private</b> Trucks that load and unload cars that are being hauled between states. Example, a person will ship a car from Florida to Duluth Ga. The truck driver often uses private property where there is a big parking lot to load and unload these cars, and then drive the car to the location of the person that shipped the car. Huge issue in our area. | 6/12/2017 1:14 PM |
| 13 | <b>Lack of Available Parking</b> There are no designated areas for truck parking.  | 6/8/2017 11:29 AM |
| 14 | <b>Aesthetics</b> visual aesthetics  | 6/7/2017 1:42 PM  |
| 15 | The lack of a strategy.  | 6/7/2017 1:29 PM  |
| 16 | <b>Res/ROW/Private</b> Parking on public rights-of-way   | 6/7/2017 1:25 PM  |
| 17 | <b>Res/ROW/Private</b> Off street parking on gravel lots   | 6/7/2017 12:44 PM |
| 18 | <b>Res/ROW/Private</b> illegal parking   | 6/7/2017 12:21 PM |
| 19 | <b>Safety</b> safety   | 6/6/2017 4:37 PM  |
| 20 | <b>Res/ROW/Private</b> Parking in public parking areas of commercial shopping centers, which can present a danger to the public.   | 6/2/2017 1:06 PM  |
| 21 | <b>Infrastructure Damage</b> Erosion of road, sidewalk, and bridge facilities  | 6/1/2017 1:20 PM  |
| 22 | <b>N/A</b> N/A   | 6/1/2017 12:57 PM |
| 23 | <b>Res/ROW/Private</b> Illegally parking in residential zoning.  | 5/31/2017 4:27 PM |
| 24 | <b>Safety</b> safety   | 5/31/2017 2:30 PM |
| 25 | <b>Res/ROW/Private</b> parking within public right-of-way  | 5/31/2017 2:21 PM |
| 26 | <b>Res/ROW/Private</b> Parking on dead ends/cul de sacs  | 5/31/2017 1:32 PM |
| 27 | <b>Lack of Available Parking</b> none in the area  | 5/31/2017 6:21 AM |
| 28 | <b>Infrastructure Damage</b> Trucks parking off pavement thus destroying shoulders   | 5/30/2017 4:55 PM |
| 29 | <b>Res/ROW/Private</b> Complaints from property owners   | 5/30/2017 4:30 PM |

## Stakeholder's Survey with WikiMapping®/Atlanta Regional Truck Parking Assessment Study

| #  | ISSUE 2:   | DATE              |
|----|--|-------------------|
| 1  | <b>Parking on Ramp/ S R</b> PARKING IN NO PARKING ZONES ON ON RAMPS  | 7/11/2017 8:06 AM |
| 2  | <b>Aesthetics</b> Leaving trash behind.  | 7/11/2017 8:04 AM |
| 3  | <b>Res/ROW/Private</b> random overnight parking in retail commercial areas   | 7/10/2017 5:29 PM |
| 4  | <b>N/A</b> n/a   | 7/7/2017 9:25 AM  |
| 5  | <b>Lack of Available Parking</b> Lack of permissible parking areas   | 7/5/2017 10:32 AM |
| 6  | <b>Res/ROW/Private</b> unauthorized parking  | 6/23/2017 4:32 PM |
| 7  | <b>Res/ROW/Private</b> Parking in commercial shopping centers overnight.   | 6/19/2017 5:02 PM |
| 8  | <b>Parking on Ramp/ S R</b> trucks parking along state routes  | 6/19/2017 8:45 AM |
| 9  | <b>Res/ROW/Private</b> Trucks in areas they aren't supposed to be  | 6/16/2017 2:59 PM |
| 10 | <b>Safety</b> safety and security  | 6/15/2017 4:53 PM |
| 11 | <b>Res/ROW/Private</b> Many trucks are parked illegally in commercial lots near apartment buildings where the drivers or their families live.  | 6/12/2017 1:14 PM |
| 12 | <b>Parking on Ramp/ S R</b> Trucks park at larger businesses and in areas not designated for parking such as on and off ramps.   | 6/8/2017 11:29 AM |
| 13 | <b>Safety</b> increase in crime  | 6/7/2017 1:42 PM  |
| 14 | <b>Noise</b> Noise from engine idling in the early morning hours   | 6/7/2017 1:25 PM  |
| 15 | <b>Lack of Available Parking</b> Secure parking areas  | 6/7/2017 12:44 PM |
| 16 | <b>Infrastructure Damage</b> damage to infrastructure  | 6/7/2017 12:21 PM |
| 17 | <b>Lack of Available Parking</b> lack of suitable locations  | 6/6/2017 4:37 PM  |
| 18 | <b>Res/ROW/Private</b> Congestion along secondary arterials  | 6/1/2017 1:20 PM  |
| 19 | <b>N/A</b> N/A   | 6/1/2017 12:57 PM |
| 20 | <b>Res/ROW/Private</b> Illegally parked on random rights of ways.  | 5/31/2017 4:27 PM |
| 21 | <b>Res/ROW/Private</b> obstructing access  | 5/31/2017 2:21 PM |
| 22 | <b>Res/ROW/Private</b> Parking on residential property   | 5/31/2017 1:32 PM |
| 23 | <b>Res/ROW/Private</b> Trucks parking in areas designated 'no parking zones'   | 5/30/2017 4:55 PM |
| 24 | <b>Infrastructure Damage</b> Damage to signage and landscape   | 5/30/2017 4:30 PM |
| #  | ISSUE 3:   | DATE              |
| 1  | <b>Res/ROW/Private</b> USING PRIVATE PARKING LOTS FOR PARKING WITHOUT PERMISSION / DAMAGING PROPERTY   | 7/11/2017 8:06 AM |
| 2  | <b>Infrastructure Damage</b> Damage of pavement in areas where trucks are not supposed to be.  | 7/10/2017 5:29 PM |
| 3  | <b>N/A</b> n/a   | 7/7/2017 9:25 AM  |
| 4  | <b>Res/ROW/Private</b> parking in residential areas  | 6/23/2017 4:32 PM |
| 5  | <b>Res/ROW/Private</b> Parking along sides of streets or vacant unimproved lots.   | 6/19/2017 5:02 PM |
| 6  | <b>Safety</b> illegal activities   | 6/15/2017 4:53 PM |
| 7  | <b>Res/ROW/Private</b> Truck drivers tend to think because a parking lot is big and spacious that they have the "right" to park a truck on that property. They are often very ugly about the situation and frankly we have decided that it is simply best to call local law enforcement to deal with them. | 6/12/2017 1:14 PM |
| 8  | <b>Aesthetics</b> maintenance of site  | 6/7/2017 1:42 PM  |
| 9  | <b>Aesthetics</b> creates an industrial appearance   | 6/7/2017 12:21 PM |
| 10 | <b>Safety</b> logistics (pick up and delivery schedules)   | 6/6/2017 4:37 PM  |
| 11 | <b>N/A</b> N/A   | 6/1/2017 12:57 PM |
| 12 | <b>Res/ROW/Private</b> Illegally parked in shopping areas  | 5/31/2017 4:27 PM |
| 13 | <b>Safety</b> Truckers being approached by panhandlers, prostitutes etc.   | 5/30/2017 4:55 PM |

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|    |  |                   |
|----|--|-------------------|
| 14 | Res/ROW/Private Trucks left for extended periods on private property | 5/30/2017 4:30 PM |
|----|--|-------------------|

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## Q11 What are your top 3 strategies for addressing the issues with truck parking in your jurisdiction?

Answered: 27 Skipped: 76

| ANSWER CHOICES | RESPONSES |    |
|----------------|-----------|----|
| Strategy 1:    | 100.00%   | 27 |
| Strategy 2:    | 59.26%    | 16 |
| Strategy 3:    | 44.44%    | 12 |

| #  | STRATEGY 1:  | DATE              |
|----|--|-------------------|
| 1  | KEEP TRUCKS FROM USING PUBLIC RIGHT OF WAY / EMERGENCY AREAS FOR PARKING   | 7/11/2017 8:06 AM |
| 2  | Communicating with drivers   | 7/11/2017 8:04 AM |
| 3  | Police and code enforcement in violation areas   | 7/10/2017 5:29 PM |
| 4  | n/a  | 7/7/2017 9:25 AM  |
| 5  | updating local zoning regulations where applicable   | 7/5/2017 10:32 AM |
| 6  | enforcement  | 6/23/2017 4:32 PM |
| 7  | Code Enforcement.  | 6/19/2017 5:02 PM |
| 8  | na   | 6/19/2017 8:45 AM |
| 9  | Law enforcement  | 6/16/2017 2:59 PM |
| 10 | Prohibition of parking   | 6/15/2017 4:53 PM |
| 11 | Tagging vehicles with a warning sticker.   | 6/12/2017 1:14 PM |
| 12 | We have none that I am currently aware.  | 6/8/2017 11:29 AM |
| 13 | identifying proper locations   | 6/7/2017 1:42 PM  |
| 14 | Create a strategy.   | 6/7/2017 1:29 PM  |
| 15 | City of Conyers adopted current regulations as stated in the fall of 2016 to address truck parking.  | 6/7/2017 1:25 PM  |
| 16 | working with code compliance and the county re:zoning  | 6/7/2017 12:44 PM |
| 17 | restrictive codes  | 6/7/2017 12:21 PM |
| 18 | Provide suitable parking lots with amenities.  | 6/6/2017 4:37 PM  |
| 19 | Enforce existing ordinances, as alluded to in question #6. This is primarily a function of the Code Enforcement Division of Cobb Community Development, not the Cobb County Police Department. | 6/2/2017 1:06 PM  |
| 20 | Communication with industrial property owners and law enforcement  | 6/1/2017 1:20 PM  |
| 21 | N/A  | 6/1/2017 12:57 PM |
| 22 | Citations  | 5/31/2017 4:27 PM |
| 23 | code enforcement   | 5/31/2017 2:21 PM |
| 24 | Code Enforcement conversations with companies and drivers  | 5/31/2017 1:32 PM |
| 25 | agai we have none from a positive perspective  | 5/31/2017 6:21 AM |
| 26 | Law enforcement  | 5/30/2017 4:55 PM |
| 27 | Have designated areas to accommodate parking   | 5/30/2017 4:30 PM |
| #  | STRATEGY 2:  | DATE              |
| 1  | KEEP TRUCKS OUT OF NO PARKING ZONES  | 7/11/2017 8:06 AM |
| 2  | Contacting home offices  | 7/11/2017 8:04 AM |
| 3  | Development codes that require adequate truck facilities   | 7/10/2017 5:29 PM |
| 4  | n/a  | 7/7/2017 9:25 AM  |
| 5  | developing a local truck parking ordinance   | 7/5/2017 10:32 AM |

## Stakeholder's Survey with WikiMapping®/Atlanta Regional Truck Parking Assessment Study

|    |   |                   |
|----|---|-------------------|
| 6  | private development of truck parking lots                                   | 6/23/2017 4:32 PM |
| 7  | On-Street Parking regulations.  | 6/19/2017 5:02 PM |
| 8  | Getting trespass authorization from property owners.                        | 6/12/2017 1:14 PM |
| 9  | supplemental standards  | 6/7/2017 1:42 PM  |
| 10 | providing extra security on top of County police                            | 6/7/2017 12:44 PM |
| 11 | responsive enforcement  | 6/7/2017 12:21 PM |
| 12 | Improve infrastructure, , i.e, wider turn radii, improved access points     | 6/6/2017 4:37 PM  |
| 13 | Wayfinding and signage program  | 6/1/2017 1:20 PM  |
| 14 | N/A   | 6/1/2017 12:57 PM |
| 15 | Contact the main trucking company   | 5/31/2017 4:27 PM |
| 16 | Employ a communication campaign that lets them know where to park safely    | 5/30/2017 4:30 PM |
| #  | STRATEGY 3:   | DATE              |
| 1  | ACTIVE AND AGGRESSIVE LOCAL LAW ENFORCEMENT                                 | 7/11/2017 8:06 AM |
| 2  | code enforcement  | 7/11/2017 8:04 AM |
| 3  | Zoning ordinances   | 7/10/2017 5:29 PM |
| 4  | n/a   | 7/7/2017 9:25 AM  |
| 5  | coordinating with private property owners                                   | 7/5/2017 10:32 AM |
| 6  | Working with businesses when opportunities present.                         | 6/19/2017 5:02 PM |
| 7  | Communicating with property owners/managers about illegally parked trucks.  | 6/12/2017 1:14 PM |
| 8  | communication with the industry   | 6/7/2017 1:42 PM  |
| 9  | education   | 6/7/2017 12:21 PM |
| 10 | Better communicaton between public sector and trucking industry.            | 6/6/2017 4:37 PM  |
| 11 | N/A   | 6/1/2017 12:57 PM |
| 12 | Understand the range for truckers from different points in the service area | 5/30/2017 4:30 PM |



## Q12 What programs, policies, and strategies do you employ to address truck parking?

Answered: 13 Skipped: 90

| #  | RESPONSES  | DATE               |
|----|--|--------------------|
| 1  | <b>Ordinances</b> State Law and County Ordinance   | 6/20/2017 9:45 AM  |
| 2  | <b>Enforcement</b> <b>Ordinances</b> <b>Signage</b> Local ordinances, signage, enforcement   | 6/13/2017 12:30 PM |
| 3  | <b>Ordinances</b> Local ordinance  | 6/13/2017 3:45 AM  |
| 4  | <b>Enforcement</b> We encourage all drivers to utilize the truck stop on Hwy. 74 / Senoia Road. Illegal parking is enforced through verbal and written warnings as well as citations.                          | 6/9/2017 1:38 PM   |
| 5  | <b>Ordinances</b> city ordinance against truck parking in city. Implement towing if not moved within a certain time frame.   | 6/8/2017 4:22 PM   |
| 6  | <b>No Action</b> As long as they are parked legally, it is fine. If they park on private property and the property owner OK's it, then we take no action   | 6/8/2017 1:46 PM   |
| 7  | <b>Ordinances</b> The county has local ordinances under zoning that address where trucks can / cannot park.  | 6/7/2017 1:57 PM   |
| 8  | <b>Ordinances</b> Local Ordinances to manage where they can park   | 6/6/2017 9:53 AM   |
| 9  | <b>Ordinances</b> City Ordinance restrictions  | 6/2/2017 10:07 AM  |
| 10 | <b>Ordinances</b> We've pinpointed problematic areas (mostly where trucks were being parked on city right of way on side streets) and enacted ordinances prohibiting such actions.                             | 6/1/2017 3:52 PM   |
| 11 | <b>Enforcement</b> directed patrols for illegally parked commercial vehicles enforcing City Ordinances and state law regarding illegally parked commercial vehicles or vehicles that are blocking the roadway. | 6/1/2017 3:16 PM   |
| 12 | <b>Enforcement</b> Parking violations are usually not enforced unless the truck is a safety hazard or is partially in the roadway.   | 6/1/2017 1:54 AM   |
| 13 | <b>Signage</b> Signage   | 5/31/2017 6:29 PM  |

## Q13 What do you do to enforce illegal truck parking?

Answered: 14 Skipped: 89

| #  | RESPONSES   | DATE               |
|----|---|--------------------|
| 1  | <b>Citation</b> <b>Warning</b> Cite or warn   | 6/20/2017 9:45 AM  |
| 2  | <b>Citation</b> ticketing   | 6/13/2017 12:30 PM |
| 3  | <b>Verbal</b> Advise driver of the ordinance.   | 6/13/2017 3:45 AM  |
| 4  | <b>Citation</b> <b>impound</b> <b>Verbal</b> <b>Warning</b> Verbals warnings, window decal warnings, parking citations, and vehicle impound for abandoned vehicles that pose a hazard.  | 6/9/2017 1:38 PM   |
| 5  | <b>impound</b> <b>Verbal</b> phone calls as warnings, or towing truck   | 6/8/2017 4:22 PM   |
| 6  | <b>Have them Move</b> <b>impound</b> Have them to move the truck or if need be, impound them.   | 6/8/2017 1:46 PM   |
| 7  | <b>Citation</b> <b>impound</b> <b>Warning</b> through patrol and observation and also calls from the public we respond to possible illegal truck parking. If found to be in violation we can warn, we can cite and tow  | 6/8/2017 9:59 AM   |
| 8  | Our unit, Quality of Life, issues notices of violation first to allow the driver to remove the vehicle. If compliance is not achieved a sworn officer is contacted to impound the vehicle. If one of our Code Enforcement officers can get contact with the driver he/she will be cited for "non-permitted use" and ordered to appear before a Records Court Judge. | 6/7/2017 1:57 PM   |
| 9  | Citations to those who violate the ordinance  | 6/6/2017 9:53 AM   |
| 10 | Tickets   | 6/2/2017 10:07 AM  |
| 11 | <b>impound</b> <b>Warning</b> We issue a warning and then tow. We have towed two tractor trailers since December.   | 6/1/2017 3:52 PM   |
| 12 | <b>Citation</b> <b>Verbal</b> written citations, verbal warnings, notify the owners of the businesses so they can let drivers know not to park in certain areas.  | 6/1/2017 3:16 PM   |
| 13 | <b>Have them Move</b> We make contact with the trucking company if the driver is not in the truck or speak to the driver directly to move the truck.  | 6/1/2017 1:54 AM   |
| 14 | <b>Citation</b> <b>Warning</b> Warnings and Citations   | 5/31/2017 6:29 PM  |

## Q14 What suggestions do you have to increase truck parking and/or help to address illegal truck parking?

Answered: 12 Skipped: 91

| #  | RESPONSES   | DATE               |
|----|---|--------------------|
| 1  | truck parking lots  | 6/13/2017 12:30 PM |
| 2  | The jurisdiction should have designated areas for the trucks to park while waiting to make the deliveries.  | 6/13/2017 3:45 AM  |
| 3  | Create incentives for property owners and local governments to create new truck parking spaces.   | 6/9/2017 1:38 PM   |
| 4  | provide a location for owners to legally park trucks while off duty. We issue citations and contact the company.  | 6/8/2017 4:22 PM   |
| 5  | Private lots that charge a fee for them to use exclusively.   | 6/8/2017 1:46 PM   |
| 6  | Have the local jurisdictions allow for easier rezoning for these type uses and allow them more frequently throughout the areas not in just one or two localized zoning districts.   | 6/7/2017 1:57 PM   |
| 7  | Regional sites need to be created so they will not simply pull off any interstate exit and park in illegal areas  | 6/6/2017 9:53 AM   |
| 8  | Build more rest areas for Truck Drivers to park in a safe area and rest.  | 6/2/2017 10:07 AM  |
| 9  | Local governments need to enact stronger ordinances that address illegal parking AND ensure that their zoning ordinances provide appropriate areas for such parking on commercial property - Drivers need more options for paying to park their trucks. | 6/1/2017 3:52 PM   |
| 10 | more signage, letting business owners know about the local ordinance and state laws.  | 6/1/2017 3:16 PM   |
| 11 | Truck driver often state that there are not enough parking lots and therefore park along the interstate and grocery stores. This happens mainly over night.   | 6/1/2017 1:54 AM   |
| 12 | N/A   | 5/31/2017 6:29 PM  |

Q15 What is the name and/or store number of your store? (this question is voluntary)

Answered: 3   Skipped: 100

| # | RESPONSES  | DATE               |
|---|--|--------------------|
| 1 | Fairburn Family Travel Center                    | 6/1/2017 11:40 AM  |
| 2 | Fairburn Family Travel Center Greenway Store 614 | 5/31/2017 11:09 AM |
| 3 | Fairburn Family Travel Center                    | 5/31/2017 10:21 AM |

## Q16 What are the primary amenities at your truck stop? (select all that apply)

Answered: 3 Skipped: 100



| ANSWER CHOICES           | RESPONSES |   |
|--------------------------|-----------|---|
| Restrooms                | 100.00%   | 3 |
| Fueling Services         | 100.00%   | 3 |
| Restaurant               | 100.00%   | 3 |
| Vending Machines         | 0.00%     | 0 |
| Showers                  | 100.00%   | 3 |
| Retail Stores            | 100.00%   | 3 |
| Lighting                 | 66.67%    | 2 |
| Security                 | 100.00%   | 3 |
| Internet Access/Wi-Fi    | 100.00%   | 3 |
| Access to the Interstate | 100.00%   | 3 |
| Hotel/Motel              | 66.67%    | 2 |
| Total Respondents: 3     |           |   |

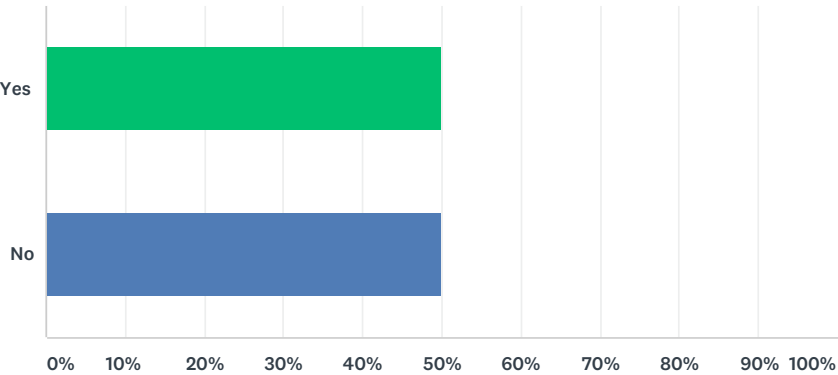
## Stakeholder's Survey with WikiMapping®/Atlanta Regional Truck Parking Assessment Study

| # | OTHER   | DATE               |
|---|---|--------------------|
| 1 | Laundry, Truck wash, Truck repair shop, lounge, barber shop,    | 6/1/2017 11:40 AM  |
| 2 | Used Truck Sales  | 6/1/2017 11:20 AM  |
| 3 | 200 truck parking spaces 5 bay truck repair and truck wash shop | 5/31/2017 11:09 AM |
| 4 | Hotel near by Truck Wash Truck Shop Truck Parking               | 5/31/2017 10:21 AM |



Q17 Do you take truck parking reservations?

Answered: 4    Skipped: 99



| ANSWER CHOICES |  | RESPONSES |   |
|----------------|--|-----------|---|
| Yes            |  | 50.00%    | 2 |
| No             |  | 50.00%    | 2 |
| TOTAL          |  |           | 4 |

## Q18 What percentage of truck spaces are set aside for reservations?

Answered: 0   Skipped: 103

| # | RESPONSES               | DATE |
|---|-------------------------|------|
|   | There are no responses. |      |

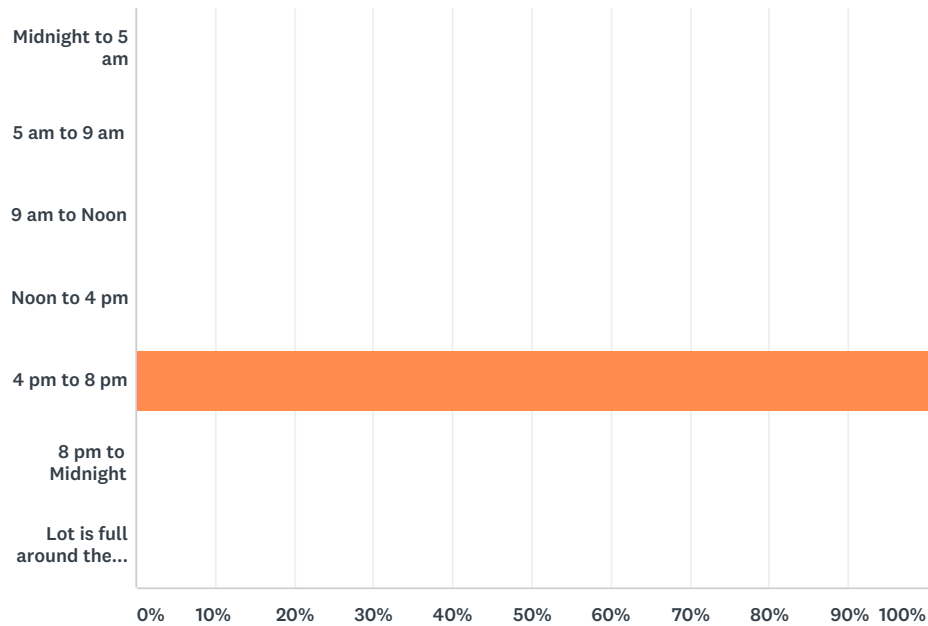
Q19 How much does a reserved space cost?

Answered: 0    Skipped: 103

| # | RESPONSES               | DATE |
|---|-------------------------|------|
|   | There are no responses. |      |

## Q20 What time of day does your lot fill up? (select all that apply)

Answered: 1 Skipped: 102



| ANSWER CHOICES               | RESPONSES |   |
|------------------------------|-----------|---|
| Midnight to 5 am             | 0.00%     | 0 |
| 5 am to 9 am                 | 0.00%     | 0 |
| 9 am to Noon                 | 0.00%     | 0 |
| Noon to 4 pm                 | 0.00%     | 0 |
| 4 pm to 8 pm                 | 100.00%   | 1 |
| 8 pm to Midnight             | 0.00%     | 0 |
| Lot is full around the clock | 0.00%     | 0 |
| Total Respondents: 1         |           |   |

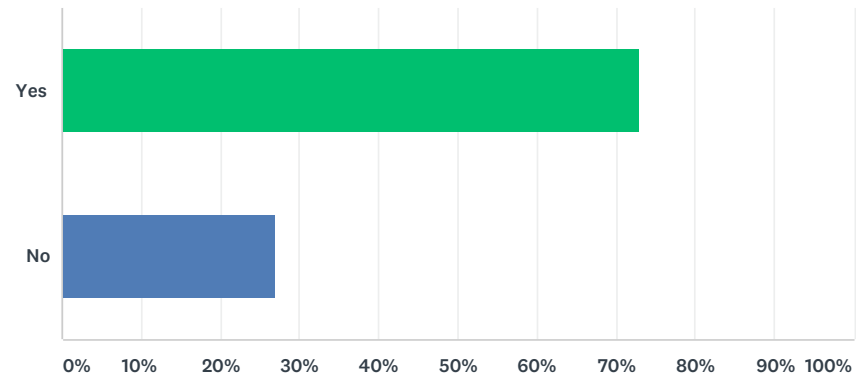
## Q21 What are the top 3 complaints you hear from truckers regarding parking in the Metro Atlanta region?

Answered: 2   Skipped: 101

| # | RESPONSES  | DATE               |
|---|--|--------------------|
| 1 | not enough parking, forced to park on street, truck gets towed | 6/1/2017 11:42 AM  |
| 2 | Not enough.  | 5/31/2017 10:23 AM |

Q22 Is truck parking considered a significant issue for your company?

Answered: 26 Skipped: 77



| ANSWER CHOICES |  | RESPONSES |    |
|----------------|--|-----------|----|
| Yes            |  | 73.08%    | 19 |
| No             |  | 26.92%    | 7  |
| TOTAL          |  |           | 26 |



## Q23 Please explain how truck parking is negatively impacting your company and recommendations you may have to mitigate those impacts.

Answered: 18 Skipped: 85

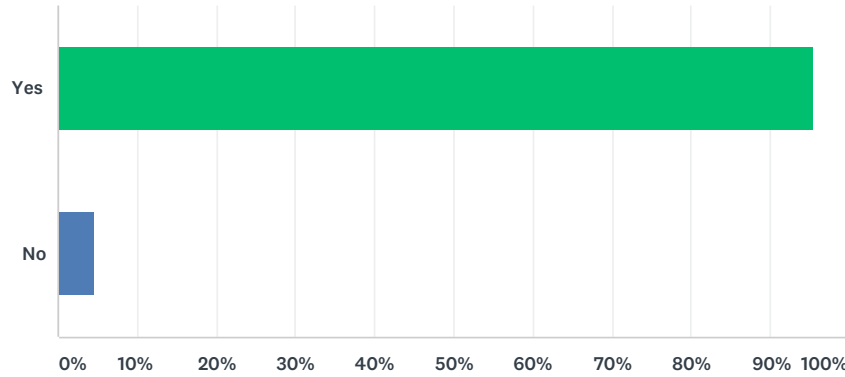
| #  | RESPONSES   | DATE               |
|----|---|--------------------|
| 1  | <b>Safety</b> In general, buildings around the Atlanta Airport are built without considering the space that is required to turn tractor-trailers around safely. As far as place to park, we have our own trailer yard so it is a big help. Otherwise, we would have a real issue.   | 7/4/2017 11:09 PM  |
| 2  | <b>Hours of Service</b> With the usage of ELD's it's important for the driver to have parking as soon as his/her driving hours are completed. Often time the driver has to drive from point to point to find parking which puts them in violations. Parking at the customer is not always available, which again force the driver to move the truck violating Hours of Service.   | 7/3/2017 8:06 AM   |
| 3  | <b>Staging Area</b> a staging area is a good idea, wait times at Alliance have not improved, just moved the traffic congestion off the road. Some cases at Swissport drivers have been given the same door assignment by the staging area, when driver tries to get in that door another trucker is already in the door, assigned to the same door. Causes confusion and delays   | 6/30/2017 6:20 PM  |
| 4  | <b>N/A</b> .  | 6/29/2017 5:29 PM  |
| 5  | <b>Staging Area</b> a Dwell has not improved with the new staging center and specific days of the week Forward Air has seen an increase. Average times to get to a door are 1-2 hours and then getting processed at the GHA is another 2-3 hours. Ideas include set reservation times Sunday - Saturday for larger carriers like Forward Air that are delivering and picking up truckloads worth of freight for these airlines. For instance in the morning reserve a door at Swissport for delivery of China Airlines, Cathay, Qatar and then allow the same truck to recover all imports for that day. Points of contact if truck is at staging center for periods of time. Many of our loads going to S Cargo will have multiple stops to maximize truck utilization. If we have deliveries for AGI, Swissport 2 and LH allow truck to stay at the GHAs versus returning to staging center especially when open doors are present. | 6/29/2017 4:49 PM  |
| 6  | <b>Staging Area</b> a Staging center has certainly brought structure and organization to the flow of trucks in / out of LH, AGI, SWP 1&2. The challenge is that the dwell is  | 6/29/2017 4:36 PM  |
| 7  | <b>Early Stops</b> At time drivers are stopping earlier than needed because truck stop parking fills up early and they want to make sure they find safe parking   | 6/29/2017 12:55 PM |
| 8  | <b>Hours of Service</b> Truck parking doesn't only have a negative impact on Walpole Inc. but the entire trucking industry is faced with an a grave parking issue; based on the lack of interest and neglect by all states local and federal governments. Not only does it but a burden on the trucking industry but all also creates a major safety issue for all motorist. Personally I think the federal governments mandate of Elogs for the trucking will create a great issue with parking than anyone had anticipated.   | 6/28/2017 9:48 PM  |
| 9  | <b>Hours of Service</b> Based on the new Elog and customer needs throughout the Country; the truck parking doesn't  | 6/28/2017 4:57 PM  |
| 10 | <b>Hours of Service</b> HOS considerations and driver fitness concerns  | 6/28/2017 4:48 PM  |
| 11 | <b>Close Parking Unavailable</b> trying to have places for my drivers to park at night to rest and sleep and be close enough for early next morning delivery is becoming a big problem especially in big cities   | 6/28/2017 4:27 PM  |
| 12 | <b>Close Parking Unavailable</b> Lack of truck parking in major distribution points: Miami, Orlando, Tampa, Jacksonville, Atlanta, Philadelphia, Newark, onward on the East Coast and same issues heading west towards Los Angeles. Major cities are the worst actors as they don't want to see trucks but our drivers and assets need well-lit and safe options for truck parking and mandated rest periods.   | 6/27/2017 4:08 PM  |
| 13 | <b>Close Parking Unavailable</b> <b>Hours of Service</b> HOURS OF SERVICE ISSUES. DRIVERS NOT COMFORTABLE. MAKE SHIPPERS AND RECEIVERS OF OTR ITEMS PROVIDE AND OR ALLOW TRUCKS TO PARK ONSITE.   | 6/27/2017 3:46 PM  |
| 14 | <b>Hours of Service</b> Affecting hours of service and miles traveled each day. More parking and split sleeper berth time i.e. 7-3 8-2 6-4  | 6/13/2017 2:17 PM  |

## Stakeholder's Survey with WikiMapping®/Atlanta Regional Truck Parking Assessment Study

|    |   |                   |
|----|---|-------------------|
| 15 | <b>N/A</b> It is not negatively impacting my company, we have many retail store locations where we can park when necessary and available.   | 6/7/2017 3:17 PM  |
| 16 | <b>N/A</b> Not a big problem in Atlanta because we have our terminal here. It is an issue at time in other big cities. Due to lack of truck stops with enough space   | 6/6/2017 9:35 AM  |
| 17 | <b>Hours of Service</b> There is not enough parking for capacity. The lack of parking is effecting my drivers safety and hours of service compliance. The main recommendation that I have is to create more parking and accommodations for trucks in areas where warehouses are clustered. There are plenty of warehouses being constructed but no where for the trucks that deliver to them to park. | 6/1/2017 10:51 AM |
| 18 | <b>Hours of Service</b> with federal DOT standards, once drivers are out of time then they need a place to take a 10 hour break. Not all folks want big trucks around, thus the need in this area for safe truck parking.   | 5/30/2017 4:02 PM |

## Q24 Do you expect demand for truck parking to increase over the next decade, particularly with the requirement to use Electronic Logging Devices (ELDs)?

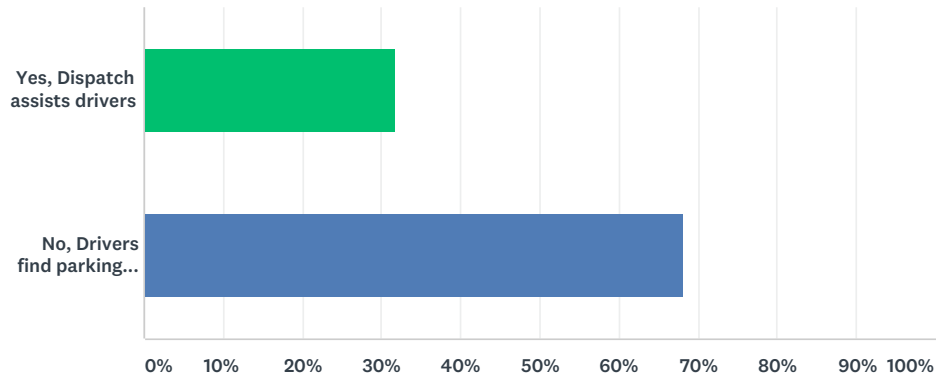
Answered: 22 Skipped: 81



| ANSWER CHOICES |  | RESPONSES |    |
|----------------|--|-----------|----|
| Yes            |  | 95.45%    | 21 |
| No             |  | 4.55%     | 1  |
| TOTAL          |  |           | 22 |

## Q25 Does your dispatch assist drivers with finding parking, or are drivers on their own?

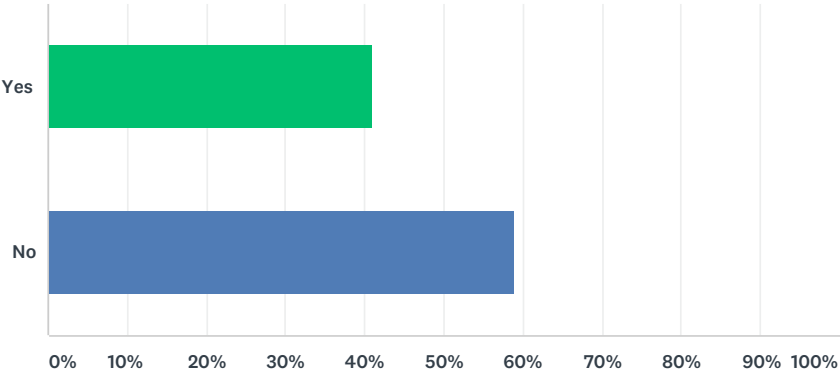
Answered: 22 Skipped: 81



| ANSWER CHOICES                        |  | RESPONSES |    |
|---------------------------------------|--|-----------|----|
| Yes, Dispatch assists drivers         |  | 31.82%    | 7  |
| No, Drivers find parking on their own |  | 68.18%    | 15 |
| TOTAL                                 |  |           | 22 |

Q26 Do your drivers pay for truck parking?

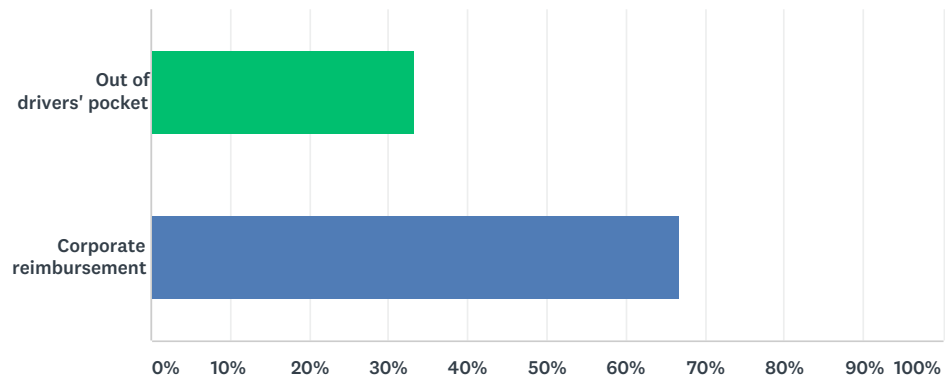
Answered: 22    Skipped: 81



| ANSWER CHOICES |  | RESPONSES |    |
|----------------|--|-----------|----|
| Yes            |  | 40.91%    | 9  |
| No             |  | 59.09%    | 13 |
| TOTAL          |  |           | 22 |

Q27 Do the drivers pay for parking out of pocket or does the corporation reimburse them?

Answered: 9    Skipped: 94

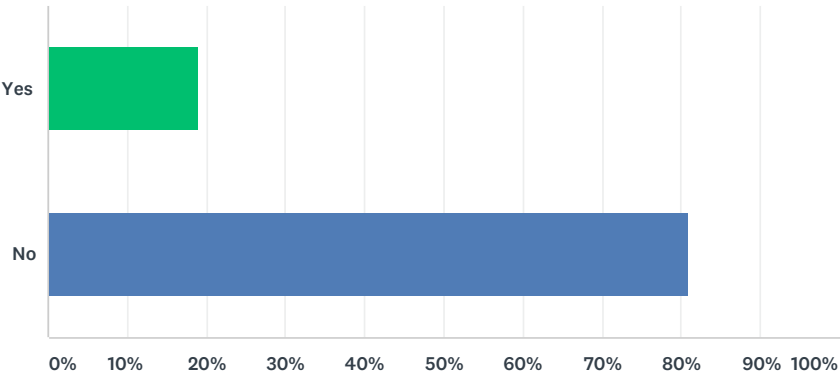


| ANSWER CHOICES          |  | RESPONSES |   |
|-------------------------|--|-----------|---|
| Out of drivers' pocket  |  | 33.33%    | 3 |
| Corporate reimbursement |  | 66.67%    | 6 |
| TOTAL                   |  |           | 9 |



Q28 Do you consider the Atlanta Region to have adequate truck parking?

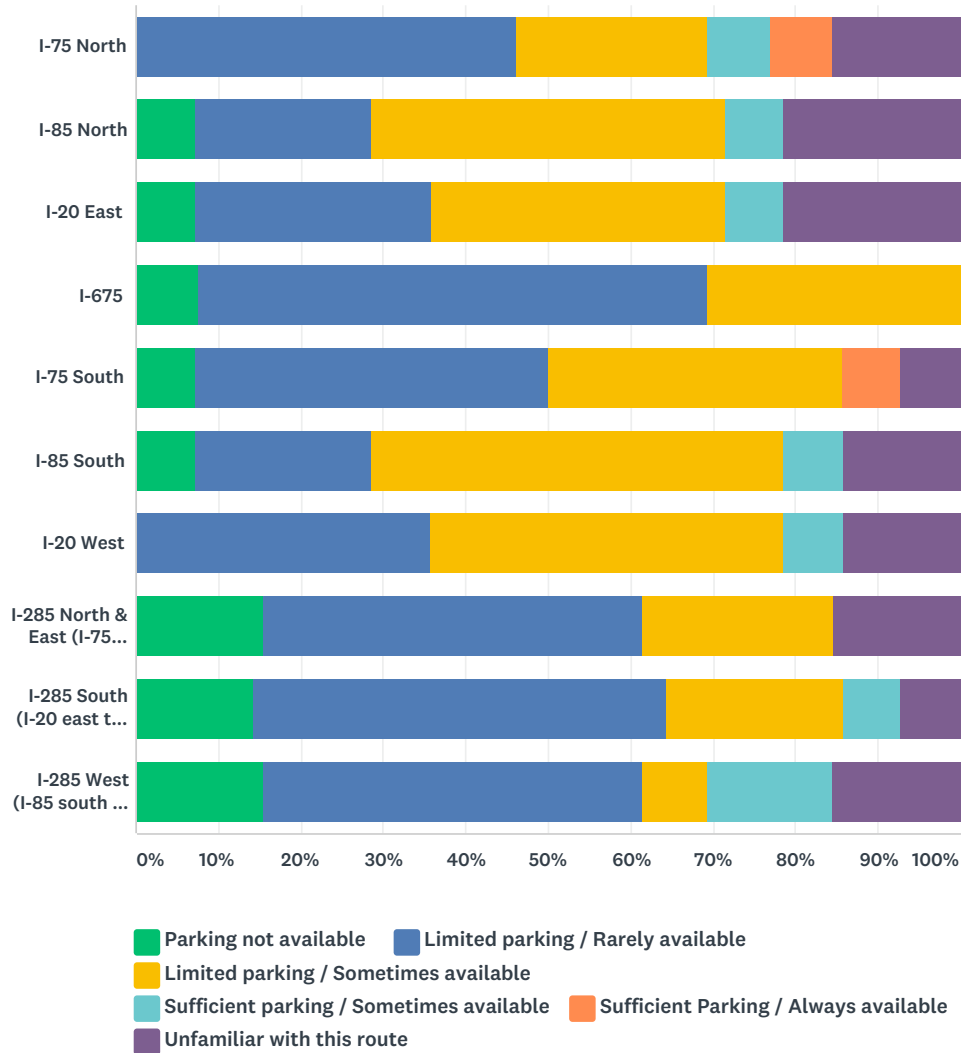
Answered: 21    Skipped: 82



| ANSWER CHOICES |  | RESPONSES |    |
|----------------|--|-----------|----|
| Yes            |  | 19.05%    | 4  |
| No             |  | 80.95%    | 17 |
| TOTAL          |  |           | 21 |

## Q29 Using the above map, please indicate the rating you could give to each corridor listed.

Answered: 14 Skipped: 89



|            | PARKING NOT AVAILABLE | LIMITED PARKING / RARELY AVAILABLE | LIMITED PARKING / SOMETIMES AVAILABLE | SUFFICIENT PARKING / SOMETIMES AVAILABLE | SUFFICIENT PARKING / ALWAYS AVAILABLE | UNFAMILIAR WITH THIS ROUTE | TOTAL | WEIGHT AVERAGE |
|------------|-----------------------|------------------------------------|---------------------------------------|--|---------------------------------------|----------------------------|-------|----------------|
| I-75 North | 0.00%<br>0            | 46.15%<br>6                        | 23.08%<br>3                           | 7.69%<br>1                               | 7.69%<br>1                            | 15.38%<br>2                | 13    |                |
| I-85 North | 7.14%<br>1            | 21.43%<br>3                        | 42.86%<br>6                           | 7.14%<br>1                               | 0.00%<br>0                            | 21.43%<br>3                | 14    |                |
| I-20 East  | 7.14%<br>1            | 28.57%<br>4                        | 35.71%<br>5                           | 7.14%<br>1                               | 0.00%<br>0                            | 21.43%<br>3                | 14    |                |
| I-675      | 7.69%<br>1            | 61.54%<br>8                        | 30.77%<br>4                           | 0.00%<br>0                               | 0.00%<br>0                            | 0.00%<br>0                 | 13    |                |
| I-75 South | 7.14%<br>1            | 42.86%<br>6                        | 35.71%<br>5                           | 0.00%<br>0                               | 7.14%<br>1                            | 7.14%<br>1                 | 14    |                |
| I-85 South | 7.14%<br>1            | 21.43%<br>3                        | 50.00%<br>7                           | 7.14%<br>1                               | 0.00%<br>0                            | 14.29%<br>2                | 14    |                |
| I-20 West  | 0.00%<br>0            | 35.71%<br>5                        | 42.86%<br>6                           | 7.14%<br>1                               | 0.00%<br>0                            | 14.29%<br>2                | 14    |                |

# Stakeholder's Survey with WikiMapping®/Atlanta Regional Truck Parking Assessment Study

|   |             |             |             |             |            |             |    |
|---|-------------|-------------|-------------|-------------|------------|-------------|----|
| I-285<br>North<br>&<br>East<br>(I-75<br>north<br>to I-<br>20<br>east) | 15.38%<br>2 | 46.15%<br>6 | 23.08%<br>3 | 0.00%<br>0  | 0.00%<br>0 | 15.38%<br>2 | 13 |
| I-285<br>South<br>(I-20<br>east<br>to I-<br>85<br>south)              | 14.29%<br>2 | 50.00%<br>7 | 21.43%<br>3 | 7.14%<br>1  | 0.00%<br>0 | 7.14%<br>1  | 14 |
| I-285<br>West<br>(I-85<br>south<br>to I-<br>75<br>north)              | 15.38%<br>2 | 46.15%<br>6 | 7.69%<br>1  | 15.38%<br>2 | 0.00%<br>0 | 15.38%<br>2 | 13 |

| # | OTHER REGIONAL ROUTES (PLEASE SPECIFY MAJOR ONES) | DATE |
|---|---|------|
|   | There are no responses.                           |      |

## **Appendix 2-M**

### **Wikimapping© Questions and Results**

# Stakeholder's Survey with WikiMapping®

## Atlanta Regional Truck Parking Assessment Study

Revised 5-9-17

### If Local Jurisdiction or Community Improvement District (CID):

Please follow this link to finish the survey in WikiMapping: [Local Jurisdiction](http://wikimapping.com/wikimap/Atlanta-Regional-Truck-Parking-Assessment-Local-Jurisdiction-Survey-.html)



<http://wikimapping.com/wikimap/Atlanta-Regional-Truck-Parking-Assessment-Local-Jurisdiction-Survey-.html>

**"Thank you for taking the time to give us your valuable input on truck parking in the Atlanta Region. We are asking you to indicate locations on the map by dropping a pin where you have observed the following:**

- 1. Trucks parked in unauthorized locations (i.e. highway on/off ramps, alongside the road, in vacant lots, etc.).**
- 2. Location(s) that could potentially address the unauthorized parking issues and serve as authorized parking locations for truck drivers.**

**You may add as many points per category as you wish. Detailed instructions on how to do this can be found under the "About & Help" tab located in the blue header at the top of the map. Once you click on the tab a menu will drop down allowing you to then click on instructions."**

1. Trucks parked in unauthorized locations
  - How often have you observed unauthorized truck parking in this location?
    - 1-2 times per week
    - 3-5 times per week
    - Daily
    - A few times a month
    - Seasonally
  - When do you observe unauthorized truck parking in this location?
    - Morning
    - Afternoon
    - Evening
    - Overnight
    - Throughout the day
  - Can you identify a strategy to solve this issue?
    - Open form
2. Potential truck parking
  - How would this resolve the issue?

- Open form
- What is the current use of the location?
  - Vacant lot/building
  - Underutilized parking lot
  - Current truck stop
  - Other: open form?

DRAFT



## If Law Enforcement:

Please follow this link to finish the survey in WikiMapping: [Law Enforcement](http://wikimapping.com/wikimap/Atlanta-Regional-Truck-Parking-Assessment-Law-Enforcement-Survey-.html)



<http://wikimapping.com/wikimap/Atlanta-Regional-Truck-Parking-Assessment-Law-Enforcement-Survey-.html>

**“Thank you for taking the time to give us your valuable input on truck parking in the Atlanta Region. We are asking you to indicate locations on the map by dropping a pin where you have observed the following:**

- 1. Trucks parked illegally**
- 2. Trucks parking legally**
- 3. Potential location(s) that could resolve the illegal truck parking you’ve identified**

**You may add as many points per category as you wish. Detailed instructions on how to do this can be found under the "About & Help" tab located in the blue header at the top of the map. Once you click on the tab a menu will drop down allowing you to then click on instructions.”**

3. Trucks parked illegally
  - How often have you observed this?
    - 1-2 times per week
    - 3-5 times per week
    - Daily
    - A few times a month
    - Seasonally
  - When do you observe this?
    - Morning
    - Afternoon
    - Evening
    - Overnight
    - Throughout the day
  - What is this location?
    - Highway on/off ramp
    - Side of road
    - Vacant lot/building
    - Parking lot that does not allow truck parking
    - Other:
4. Trucks parked legally
  - How often have you observed this?
    - 1-2 times per week
    - 3-5 times per week
    - Daily
    - A few times a month
    - Seasonally
  - When do you observe this?

- Morning
  - Afternoon
  - Evening
  - Overnight
  - Throughout the day
  - What is this location?
    - Truck stop/convenience store
    - Rest area or weigh station
    - Warehouse or manufacturing facility that allows truck parking
    - Retail/Commercial parking lot that allows truck parking
    - Other:
5. Potential truck parking
- What is the current use of the location?
    - Vacant lot/building
    - Underutilized parking lot
    - Current truck stop
    - Other: \_\_\_\_\_

## If Private Truck Stop or Convenience Store Owner or Operator:

Please follow this link to finish the survey in WikiMapping: [Private Truck Stop and Convenience Store Owners or Operators or Related](http://wikimapping.com/wikimap/Atlanta-Regional-Truck-Parking-Assessment-Truck-Stop-or-Convenience-Store-Survey-.html)



<http://wikimapping.com/wikimap/Atlanta-Regional-Truck-Parking-Assessment-Truck-Stop-or-Convenience-Store-Survey-.html>

**“Thank you for taking the time to give us your valuable input on truck parking in the Atlanta Region. We are asking you to indicate locations on the map by dropping a pin in the following locations:**

**1 – Where your truck stop is located**

**2 – Where you think there is a need for an additional private truck stop**

**3 – Where you think there is a need for expansion to existing private truck stop(s)**

**You may add as many points per category as you wish. Detailed instructions on how to do this can be found under the "About & Help" tab located in the blue header at the top of the map. Once you click on the tab a menu will drop down allowing you to then click on instructions.”**

6. Location of your truck stop

- Fill in the store name/store number
  - Open answer
- Fill in the address
  - Open answer

7. Additional private truck stop(s) needed

- What makes this location ideal?
  - Open Answer
- What challenges would you foresee in trying to locate a private truck stop in this location?
  - Open Answer

8. Expansion to existing private truck stop(s) needed

- What makes this location ideal for expansions?
  - Open Answer
- What challenges would you foresee in trying to expand the private truck stop in this location?
  - Open Answer

| Wikimapping Survey Results from Local Jurisdiction Survey |            |            |              |              |             |   |                           |   |  |
|---|------------|------------|--------------|--------------|-------------|---|---------------------------|---|--|
| lat   | Ing        | Feature ID | Feature Type | Created Date | Inputter ID | How often have you observed trucks illegally parked in this location? | When do you observe this? | What is this location?                        | Please specify for other   |
| 33.830783   | -84.190464 | 243699     | point        | 5/30/2017    | 150286      | Daily   | Throughout the day        | Side of road                                  |  |
| 33.859226   | -84.183168 | 243700     | point        | 5/30/2017    | 150286      | 3-5 times per week  | Throughout the day        | Side of road                                  |  |
| 33.763558   | -84.606196 | 243790     | point        | 5/31/2017    | 150409      | 1-2 times per week  | Morning                   | Vacant lot/building                           |  |
| 33.771219   | -84.652265 | 243791     | point        | 5/31/2017    | 150409      | Daily   | Throughout the day        | Vacant lot/building                           |  |
| 33.783463   | -84.637095 | 243792     | point        | 5/31/2017    | 150409      | 1-2 times per week  | Morning                   | Side of road                                  |  |
| 33.480351   | -84.21896  | 243797     | point        | 5/31/2017    | 150418      | Seasonally  | Throughout the day        | Vacant lot/building                           |  |
| 33.627413   | -84.419975 | 243882     | point        | 6/1/2017     | 150580      | Seasonally  | Throughout the day        | Highway on/off ramp                           |  |
| 33.630379   | -84.310198 | 243883     | point        | 6/1/2017     | 150580      | 1-2 times per week  | Throughout the day        | Side of road                                  |  |
| 33.654352   | -84.521513 | 243885     | point        | 6/1/2017     | 150580      | 1-2 times per week  | Afternoon                 | Side of road                                  |  |
| 33.768909   | -84.653885 | 245143     | point        | 6/15/2017    | 152994      | Daily   | Morning                   | Highway on/off ramp                           |  |
| 33.768445   | -84.650173 | 245144     | point        | 6/15/2017    | 152994      | Daily   | Morning                   | Highway on/off ramp                           |  |
| 33.765609   | -84.651375 | 245146     | point        | 6/15/2017    | 152994      | 3-5 times per week  | Throughout the day        | Side of road                                  |  |
| 33.772031   | -84.650924 | 245147     | point        | 6/15/2017    | 152994      | Daily   | Throughout the day        | Vacant lot/building                           |  |
| 33.782946   | -84.63614  | 245148     | point        | 6/15/2017    | 152994      | A few times a month   | Throughout the day        | Vacant lot/building                           |  |
| 33.728212   | -84.763427 | 245149     | point        | 6/15/2017    | 152994      | Daily   | Morning                   | Highway on/off ramp                           |  |
| 33.720074   | -84.833357 | 245151     | point        | 6/15/2017    | 152994      | Daily   | Morning                   | Highway on/off ramp                           |  |
| 33.549673   | -84.442334 | 245299     | point        | 6/19/2017    | 153388      | A few times a month   | Evening                   | Side of road                                  |  |
| 33.459936   | -84.421874 | 245300     | point        | 6/19/2017    | 153388      | A few times a month   | Overnight                 | Side of road                                  |  |
| 33.452285   | -84.430089 | 245301     | point        | 6/19/2017    | 153388      | A few times a month   | Morning                   | Side of road                                  |  |
| 33.409609   | -84.16567  | 245303     | point        | 6/19/2017    | 153454      | 1-2 times per week  | Throughout the day        | Side of road                                  |  |
| 33.481151   | -84.219469 | 245304     | point        | 6/19/2017    | 153454      | A few times a month   | Overnight                 | Other   | end of public street (old Jodeco Road, roadbed)  |
| 33.478659   | -84.099183 | 245305     | point        | 6/19/2017    | 153454      | A few times a month   | Throughout the day        | Side of road                                  | wide shoulder on SR20, from SR20 realignment. Trucks sometimes pull over in this area. |
| 33.351717   | -84.125619 | 245306     | point        | 6/19/2017    | 153457      | 1-2 times per week  | Morning                   | Highway on/off ramp                           |  |
| 33.354154   | -84.124675 | 245307     | point        | 6/19/2017    | 153457      | 1-2 times per week  | Evening                   | Highway on/off ramp                           |  |
| 33.352272   | -84.119031 | 245308     | point        | 6/19/2017    | 153457      | Daily   | Throughout the day        | Other   | Rear of Shopping Center  |
| 33.356233   | -84.12078  | 245309     | point        | 6/19/2017    | 153457      | 3-5 times per week  | Throughout the day        | Other   | Shopping Center  |
| 33.335306   | -84.107884 | 245310     | point        | 6/19/2017    | 153457      | Seasonally  | Morning                   | Vacant lot/building                           |  |
| 33.333433   | -84.087381 | 245311     | point        | 6/19/2017    | 153457      | Seasonally  | Morning                   | Vacant lot/building                           |  |
| 33.917438   | -84.115791 | 245683     | point        | 6/23/2017    | 154198      | A few times a month   | Morning                   | Vacant lot/building                           |  |
| 33.903191   | -84.109612 | 245684     | point        | 6/23/2017    | 154198      | A few times a month   | Morning                   | Parking lot that does not allow truck parking |  |
| 33.801974   | -84.182739 | 249740     | point        | 7/11/2017    | 147828      | 1-2 times per week  | Morning                   | Highway on/off ramp                           |  |
| 33.91969  | -84.300488 | 253856     | point        | 9/21/2017    | 169390      | 1-2 times per week  | Throughout the day        | Vacant lot/building                           | Former Steak & Ale, Indian restaurant location   |

**Wikimapping Survey Results from Law Enforcement Survey**

| <b>lat</b> | <b>lng</b> | <b>Feature ID</b> | <b>Feature Type</b> | <b>Created(DD/MM/YYYY)</b> | <b>Inputter ID</b> | <b>How often have you<br/>observed trucks illegally<br/>parked in this location?</b> | <b>When do you<br/>observe this?</b> | <b>What is this<br/>location?</b> | <b>Please specify<br/>for other</b> |
|------------|------------|-------------------|---------------------|----------------------------|--------------------|--|--------------------------------------|-----------------------------------|-------------------------------------|
| 33.477487  | -84.584534 | 243897            | point               | 6/1/2017                   | 150611             | 1-2 times per week   | Throughout the day                   | Side of road                      |                                     |
| 33.493003  | -84.581798 | 243898            | point               | 6/1/2017                   | 150611             | 1-2 times per week   | Throughout the day                   | Side of road                      |                                     |
| 33.488082  | -84.584169 | 243899            | point               | 6/1/2017                   | 150611             | 1-2 times per week   | Throughout the day                   | Side of road                      |                                     |
| 33.486042  | -84.595799 | 243900            | point               | 6/1/2017                   | 150611             | A few times a month  | Overnight                            | Vacant lot/building               |                                     |
| 33.468529  | -84.61436  | 243902            | point               | 6/1/2017                   | 150611             | A few times a month  | Overnight                            | Other                             | Residence                           |
| 33.412905  | -84.164586 | 244645            | point               | 6/7/2017                   | 151730             | Daily  | Overnight                            | Highway on/off ramp               |                                     |
| 33.461413  | -84.208574 | 244656            | point               | 6/7/2017                   | 151730             | 1-2 times per week   | Overnight                            | Highway on/off ramp               |                                     |
| 33.864714  | -84.613953 | 244773            | point               | 6/8/2017                   | 151928             | Seasonally   | Morning                              | Vacant lot/building               |                                     |

| Wikimapping Survey Results from Local Jurisdiction Survey |            |            |              |              |             |   |                           |                        |                          |
|---|------------|------------|--------------|--------------|-------------|---|---------------------------|------------------------|--------------------------|
| lat   | lng        | Feature ID | Feature Type | Created Date | Inputter ID | How often have you observed trucks illegally parked in this location? | When do you observe this? | What is this location? | Please specify for other |
| 33.927821   | -84.312308 | 253858     | point        | 9/21/2017    | 169390      | A few times a month   | Morning                   | Vacant lot/building    | DeKalb "Shallowford ES"  |
| 33.929213   | -84.378955 | 253859     | point        | 9/21/2017    | 169390      | A few times a month   | Morning                   | Vacant lot/building    | "Marshalls Plaza"        |
| 33.969945   | -84.348532 | 253864     | point        | 9/21/2017    | 169390      | A few times a month   | Evening                   | Side of road           |                          |



## **Appendix 2-N**

### **Truck Driver Survey Questions**

# Truck Driver Survey

## Atlanta Regional Truck Parking Assessment Study

The American Transportation Research Institute (ATRI), the not-for-profit research arm of the trucking industry, is assisting the Atlanta Regional Commission (ARC) in better understanding new or improved truck parking solutions that better serve trucking stakeholders traveling in, through and around the Atlanta, Georgia region. ATRI is now seeking truck driver input on the attached survey.

All responses to this survey will be kept strictly confidential and will only be reported in aggregate form. Due to the sensitivity of this research, under NO circumstances will we release any of your personal or organizational information.

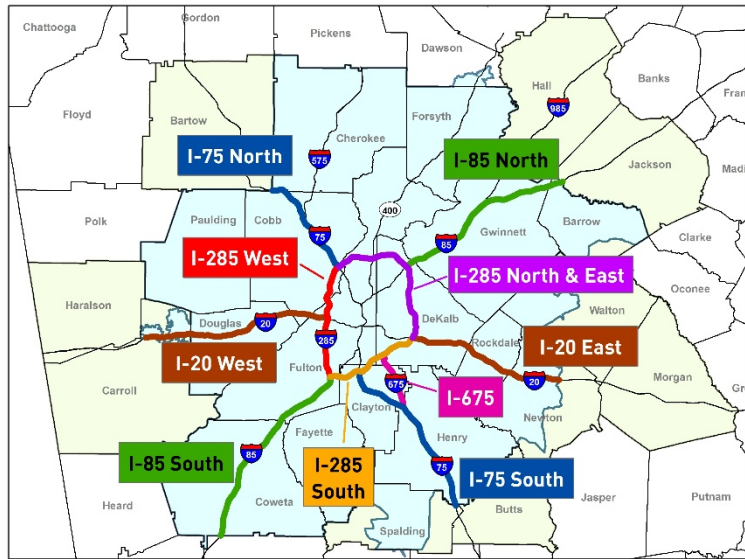
### *Background Information*

- 1. Do you operate a truck in, through or around the Atlanta region?**
  - Yes
  - Never (survey would be complete)
- 2. What is your gender?**
  - Male
  - Female
- 3. What is your age?**
  - Younger than 25
  - 25 – 44
  - 45 – 64
  - 65+
- 4. How many years of professional truck driving experience do you have?**
  - Less than 1 year
  - 1 – 5 years
  - 6 – 10 years
  - 11+ years

### *Truck Parking within the Atlanta Region*

5. Referencing the map to the right, please indicate the route(s) that you generally use (check as many routes as needed)

- I-75 North
- I-85 North
- I-20 East
- I-675
- I-75 South
- I-85 South
- I-20 West
- I-285 North & East (I-75 north to I-20 east)
- I-285 South (I-20 east to I-85 south)
- I-285 West (I-85 south to I-75 north)
- Other regional routes (please specify major ones) \_\_\_\_\_



6. Within the Atlanta region, (see map) have you experienced a shortage of truck parking on specific routes?

- Yes, please place an “X” under the rating based on routes where additional truck parking is needed: (check as many routes as needed)
- No (skip to question 7)

| Regional Routes                                 | Availability of Existing Truck Parking<br>(5 = Sufficient Parking; 1 = Parking Not Available) |   |   |   |   |                |
|---|---|---|---|---|---|----------------|
|   | 5   | 4 | 3 | 2 | 1 | Route Not Used |
| I-75 North                                      |   |   |   |   |   |                |
| I-85 North                                      |   |   |   |   |   |                |
| I-20 East                                       |   |   |   |   |   |                |
| I-675   |   |   |   |   |   |                |
| I-75 South                                      |   |   |   |   |   |                |
| I-85 South                                      |   |   |   |   |   |                |
| I-20 West                                       |   |   |   |   |   |                |
| I-285 North & East<br>(I-75 north to I-20 east) |   |   |   |   |   |                |
| I-285 South (I-20 east to I-85 south)           |   |   |   |   |   |                |
| I-285 West (I-85 south to I-75 north)           |   |   |   |   |   |                |

- 7. Do you pick up or drop off shipments within the Atlanta region?**
- Yes
  - No (skip to question 10)
- 8. For deliveries starting or ending within the Atlanta region, do you often need to temporarily park in the Atlanta Region for staging/queuing before your scheduled pick-up and/or drop-off time?**
- Yes
  - No (skip to question 10)
- 9. If yes, please choose all the temporary parking / staging locations that typically apply to you:**
- Within Facility's property fence
  - Outside of Facility's property fence, on adjacent roadway near entrance
  - Outside of Facility's property fence at retail / commercial location
  - Other? (please specify \_\_\_\_\_)
  - I park / stage outside of the Atlanta Region for pick-ups and drop-offs in the region
- 10. How frequently do you need to find truck parking in the Atlanta region? (check one)**
- Monthly
  - Once a week
  - 2-4 times a week
  - 5-6 times a week
  - Everyday
- 11. If/when you need truck parking in the Atlanta region, how long does it usually take you to find truck parking? (check one)**
- Less than 15 minutes
  - 15 – 30 minutes
  - 30 minutes – 1 hour
  - More than 1 hour
- 12. When parking in the Atlanta region, where is it more difficult to find available truck parking? (check all that apply)**
- Public rest stops
  - Private truck stops
  - Shipper/Receiver

**13. During what time of day is it most difficult to find truck parking in the Atlanta region?**

- Midnight - 5:00 AM
- 5:00 AM - 9:00 AM
- 9:00 AM - Noon
- Noon – 4:00 PM
- 4:00 PM – 7:00 PM
- 7:00 PM – Midnight

**14. What method do you utilize to find truck parking when traveling within, through or around the Atlanta region? (check up to 3)**

- Onboard Communications / Computer System
- Internet / Website Information
- Roadside Changeable Message Signs
- Dispatcher Contact
- 511 System
- Smartphone Application
- Continue driving until a safe parking location is found
- I am aware of my destination in advance

**15. Please rank order (1-12), with 1 being the MOST frequent reason why you seek truck parking in the Atlanta region. (If an answer is provided for “other,” please include in ranking.)**

| <b>Truck Parking Reasons</b>                 | <b>Rank (1-12)</b> |
|--|--------------------|
| Hours of Service 10 hour break               |                    |
| Hours of Service 30 minute break             |                    |
| Awaiting Dispatch                            |                    |
| Avoiding Congestion                          |                    |
| Mechanical Issues / Failures                 |                    |
| Restaurant / Eating                          |                    |
| Showering / Restroom                         |                    |
| Staging / Waiting for Loads                  |                    |
| Customer Delays / Detention                  |                    |
| Obtaining Directions                         |                    |
| Safety Checks / Load Securement              |                    |
| Personal Communication (e.g. cell, internet) |                    |
| Weather-related                              |                    |
| Other:                                       |                    |

**16. Please rank order (1-11), with 1 being the MOST important, truck parking amenities you desire when stopping to park.**

| Truck Parking Amenities  | Rank (1-11) |
|--------------------------|-------------|
| Restrooms                |             |
| Fueling Services         |             |
| Restaurant               |             |
| Vending Machines         |             |
| Showers                  |             |
| Retail Store             |             |
| Adequate Lighting        |             |
| Adequate Security        |             |
| Internet Access/Wi-Fi    |             |
| Access to the Interstate |             |
| Hotel / Motel            |             |
| Other:                   |             |

**17. When traveling within, through or around the Atlanta region, would you like the ability to reserve a parking spot?**

- No
- Yes
- a. If yes, how much, if any would you be willing to pay to have a guaranteed reservation? \_\_\_\_\_

**18. Who should be responsible for paying any fees related to the truck parking reservations system? (check one)**

- Driver
- Carrier
- Both the carrier and the driver
- Not sure / no opinion
- Other (please specify): \_\_\_\_\_

**19. Do you have any additional thoughts on finding safe and legal truck parking in the Atlanta region?**



## *Driver Background Information*

**20. In what segment of the trucking industry do you primarily operate? (check one)**

- For-hire
- Private
- Don't Know

**21. If for-hire, which sector best describes your operation? (check one)**

- Truckload
- Less-than-truckload
- Specialized, flatbed
- Specialized, tanker
- Express / Parcel Service
- Intermodal Drayage
- Don't know
- Other (please specify)

**22. Which of the following best describes your employment: (check one)**

- Employee driver
- Owner-operator (O-O) with own authority
- O-O/Independent Contractor leased to a motor carrier
- Don't Know

**23. What is your average length of haul? (check one)**

- Local (less than 100 miles per trip)
- Regional (100-499 miles per trip)
- Inter-Regional (500-999 miles per trip)
- Long-Haul (1,000+ miles per trip)
- Don't Know

**24. What is the primary vehicle configuration that you typically operate? (check one)**

- 5-axle Dry Van
- 5-axle Refrigerated Trailer
- 5-axle Flatbed
- 5-axle Tanker
- Straight Truck
- Longer Combination Vehicles (Doubles, Triples, etc.)
- Don't Know
- Other (please specify)

***Thank you for your time and input!!***

## **Appendix 4-A**

### **Detailed Truck Parking Inventory**

Primary Privately-Owned Truck Parking Locations within the Atlanta Region and Key Adjacent Counties

| Truck Stop              | Store # | LOCATION       |          |                                 |  |           |            |                            | Truck Parking Spaces | AMENITIES    |            |               |         |         |                |   | Source                  |
|-------------------------|---------|----------------|----------|---------------------------------|--|-----------|------------|----------------------------|----------------------|--------------|------------|---------------|---------|---------|----------------|---|-------------------------|
|                         |         | City           | County   | Address                         | Within Atlanta Regional Commission (ARC) Boundary or a Key Adjacent County (KAC) | Latitude  | Longitude  | Corridor                   |                      | Travel Store | CAT Scales | Hotel / Motel | Laundry | Showers | Idle Reduction | Restaurants   |                         |
| Pilot                   | 66      | Braselton      | Barrow   | 5888 Highway 53                 | KAC  | 34.119723 | -83.761654 | I-85 N                     | 70                   | Yes          | Yes        | No            | No      | Yes     |                | Subway; McDonald's  | Website/EPD/Jason's Law |
| Exxon                   | N/A     | Winder         | Barrow   | 529 Patrick Mill Rd             | ARC  | 33.960901 | -83.798400 | Off-Interstate             | 15                   |              |            |               |         |         |                |   | Jason's Law             |
| Pattys Truck Stop       | N/A     | Adairsville    | Bartow   | 950 Highway 140                 | KAC  | 34.378583 | -84.906856 | I-75 N                     | 25                   | Yes          | Yes        | No            | No      | Yes     | Yes            | None  | Website/EPD             |
| All American Truck Stop | N/A     | Adairsville    | Bartow   | 7740 GA 140                     | KAC  | 34.376434 | -84.919380 | I-75 N                     | 70                   | Yes          | Yes        | No            | No      | Yes     | No             | Full Service Restaurant                                   | EPD                     |
| Quik Trip               | 757     | Adairsville    | Bartow   | 961 Hwy 140                     | KAC  | 34.378342 | -84.907639 | I-75 N                     | 25                   | Yes          | Yes        | No            | No      | No      | No             | Full Service Restaurant                                   | Website/EPD/Jason's Law |
| Circle K                | N/A     | Cartersville   | Bartow   | 5646 Highway 20 SE              | KAC  | 34.208851 | -84.759071 | I-75 N                     | 6                    |              |            |               |         |         |                | And Marathon Gas  | Jason's Law             |
| Marathon                | N/A     | Cartersville   | Bartow   | 2320 Highway 411                | KAC  | 34.241061 | -84.774073 | I-75 N                     | 40                   | Yes          | No         | No            | No      | No      |                | Waffle House  | Website/EPD/Jason's Law |
| Pilot                   | 67      | Cartersville   | Bartow   | 968 Cassville White Rd          | KAC  | 33.273006 | -84.808159 | I-75 N                     | 100                  | Yes          | Yes        | No            | No      | Yes     |                | McDonald's  | Website/EPD/Jason's Law |
| TA                      | 146     | Cartersville   | Bartow   | 981 Cassville-White Road        | KAC  | 34.274288 | -84.806190 | I-75 N                     | 212                  | Yes          | Yes        | No            | Yes     | Yes     |                | Country Pride; Pizza Hut; Burger King; Popeyes; Taco Bell | Website/EPD/Jason's Law |
| Loves                   | 359     | Emerson        | Bartow   | I-75 Exit 283 at Allatoona Road | KAC  | 34.118835 | -84.742592 | I-75 N                     | 97                   | Yes          | Yes        | Yes           | No      | Yes     |                | McDonalds; Subway   | Website/EPD/Jason's Law |
| TA                      | 100     | Jackson        | Butts    | 122 Truckstop Way               | KAC  | 33.206500 | -84.058500 | I-75 S                     | 108                  | Yes          | Yes        | No            | Yes     | Yes     |                | Atlanta's Family Restaurant; Subway; A&W                  | Website/EPD/Jason's Law |
| Flying J                | 630     | Jackson        | Butts    | 1125 Bucksnot Road              | KAC  | 33.208006 | -84.064004 | I-75 S                     | 200                  | Yes          | Yes        | No            | No      | Yes     |                | Denny's; Breakfast/Soup Bar                               | Website/EPD/Jason's Law |
| Loves                   | 307     | Jackson        | Butts    | 115 Truckstop Way               | KAC  | 33.208091 | -84.058520 | I-75 S                     | 40                   | Yes          | Yes        | No            | No      | Yes     |                | McDonalds   | Website/EPD/Jason's Law |
| Wilco-Hess              | N/A     | Jackson        | Butts    | 2995 Highway 36 W               | KAC  | 33.210444 | -84.056316 | I-75 S                     | 102                  | Yes          | Yes        | No            | Yes     | Yes     |                | Wendys; DQ; Dunkin Donuts                                 | Website/EPD             |
| Whitesburg BP           | N/A     | Whitesburg     | Carroll  | 356 Main St                     | KAC  | 33.486135 | -84.907971 | Off-Interstate             | 10                   | Yes          | No         | No            | No      | No      | No             | None  | EPD/JL                  |
| Pilot                   | 4559    | Villa Rica     | Carroll  | 95 Liberty Road                 | KAC  | 33.721688 | -84.903623 | I-20 W                     | 100                  | Yes          | Yes        | No            | No      | Yes     |                | Subway; Godfather's Pizza                                 | Website/EPD/Jason's Law |
| Pilot                   | 417     | Temple         | Carroll  | 625 Carrollton Street           | ARC  | 33.719364 | -85.029832 | I-20 W                     | 86                   | Yes          | Yes        | No            | No      | Yes     |                | Subway; Cinnabon; Wendy's                                 | Website/EPD/Jason's Law |
| Flying J                | 634     | Temple         | Carroll  | 650 Carrollton Street           | ARC  | 33.719612 | -85.025684 | I-20 W                     | 164                  | Yes          | Yes        | No            | No      | Yes     |                | Hot Food and Pizza  | Website/EPD/Jason's Law |
| BP                      | N/A     | Forest Park    | Clayton  | 5198 Hwy 85                     | ARC  | 33.612597 | -84.402597 | I-75 S                     | 5                    | Yes          | No         | No            | No      | No      |                | None  | EPD                     |
| Sun/Petro               | N/A     | Forest Park    | Clayton  | 132 Forest Parkway              | ARC  | 33.619633 | -84.384956 | I-285 S                    | 75                   | Yes          | Yes        | Yes           | Yes     | Yes     |                | Deli/Restaurant   | Website/EPD             |
| Quik Trip               | 787     | Ellenwood      | Clayton  | 2881 Forest Parkway             | ARC  | 33.611505 | -84.299133 | I-675                      | 25                   | Yes          | Yes        | No            | No      | No      | No             | Deli/Restaurant   | Website/EPD             |
| BP                      | N/A     | Newnan         | Coweta   | 1389 Highway 29 S               | ARC  | 33.326442 | -84.780413 | I-85 S                     | 70                   | Yes          | Yes        | No            | No      | Yes     |                | Deli; McDonalds; Mexican                                  | Website/EPD             |
| Pilot                   | 422     | Newnan         | Coweta   | 1645 South Highway 29           | ARC  | 33.321115 | -84.777822 | I-85 S                     | 95                   | Yes          | Yes        | No            | No      | Yes     |                | Subway  | Website/EPD/Jason's Law |
| Pilot                   | 331     | Atlanta        | DeKalb   | 2605 Bouldercrest Road SE       | ARC  | 33.685437 | -84.312174 | I-285 S                    | 100                  | Yes          | Yes        | No            | No      | Yes     |                | Wendy's   | Website/EPD/Jason's Law |
| Citgo                   | N/A     | Conley         | DeKalb   | 3097 Moreland Avenue            | ARC  | 33.669151 | -84.340736 | I-285 S                    | 4                    |              |            |               |         |         |                |   | Jason's Law             |
| Quik Trip               | 707     | Doraville      | DeKalb   | 4086 Pleasantdale Rd            | ARC  | 33.901382 | -84.245010 | I-85 N                     | 10                   | Yes          | No         | No            | No      | No      | No             | Deli/Restaurant   | Website/Jason's Law     |
| Marathon                | N/A     | Lithia Springs | Douglas  | 7512 Lee Rd                     | ARC  | 33.771025 | -84.652681 | I-20 W                     | 20                   | Yes          | No         | No            | No      | No      |                | None  | EPD                     |
| Sunoco                  | N/A     | Coal Mountain  | Forsyth  | 3845 Browns Bridge Road         | ARC  | 34.263615 | -84.085281 | GA 400                     | 5                    |              |            |               |         |         |                |   | Jason's Law             |
| Quik Trip               | 729     | Atlanta        | Fulton   | 5705 Fulton Industrial Blvd     | ARC  | 33.730865 | -84.574821 | I-20 W / Fulton Industrial | 60                   | Yes          | Yes        | No            | No      | No      | No             | Restaurant  | Website/EPD/Jason's Law |
| Citgo                   | N/A     | Atlanta        | Fulton   | 4590 Fulton Industrial Blvd     | ARC  | 33.760918 | -84.536415 | I-20 W / Fulton Industrial | 25                   | Yes          | No         | No            | No      | Yes     |                | Deli/Restaurant   | Website/EPD/Jason's Law |
| Petro                   | 322     | Atlanta        | Fulton   | 3181 Donald Lee Hollowell Pkwy  | ARC  | 33.785744 | -84.489975 | I-285 W                    | 411                  | Yes          | Yes        | No            | Yes     | Yes     |                | Iron Skillet; Burger King                                 | Website/EPD/Jason's Law |
| BP                      | N/A     | Fairburn       | Fulton   | 7860 Senoia Rd                  | ARC  | 33.542458 | -84.574600 | I-85 S                     | 200                  | Yes          | Yes        | No            | Yes     | Yes     |                | Deli/Huddle House   | Website/EPD/Jason's Law |
| Chevron                 | 212984  | Union City     | Fulton   | 3850 Flat Shoals Road           | ARC  | 33.586128 | -84.516129 | I-85 S                     | 2                    |              |            |               |         |         |                |   | Jason's Law             |
| Circle K                | N/A     | Gainesville    | Hall     | 1260 Candler Rd                 | KAC  | 34.262832 | -83.816438 | I-985                      | 16                   | Yes          | No         | No            | No      | No      |                | Restaurant  | Website/EPD/Jason's Law |
| Exxon                   | N/A     | Lula           | Hall     | 4504 Cornelia Highway           | KAC  | 34.394567 | -83.689553 | I-985                      | 3                    |              |            |               |         |         |                | Subway  | Jason's Law             |
| Circle K/Exxon          | N/A     | Bremen         | Haralson | 3008 Alabama Ave                | KAC  | 33.681973 | -85.150757 | I-20 W                     | 25                   |              |            |               |         |         |                |   | Jason's Law             |
| Newborn Truck Stop      | N/A     | Tallapoosa     | Haralson | 840 Georgia Highway 100         | KAC  | 33.681116 | -85.264747 | I-20 W                     | 151                  | Yes          | Yes        | No            | Yes     | Yes     |                | Full Service Restaurant; DQ                               | Website/EPD             |
| Pilot                   | 312     | Tallapoosa     | Haralson | 882 Georgia Highway 100         | KAC  | 33.682548 | -85.263639 | I-20 W                     | 90                   | Yes          | Yes        | No            | No      | Yes     |                | Taco Bell; KFC  | Website/EPD/Jason's Law |
| Loves                   | 311     | Waco           | Haralson | 523 Atlanta Ave.                | KAC  | 33.691297 | -85.189547 | I-20 W                     | 66                   | Yes          | Yes        | No            | No      | Yes     |                | Chesters; Subway  | Website/EPD/Jason's Law |
| Shell                   | N/A     | McDonough      | Henry    | 1599 Jonesboro Rd               | ARC  | 33.461883 | -84.207582 | I-75 S                     | 30                   | Yes          | No         | No            | No      | No      |                | Deli/Restaurant   | Website/EPD/Jason's Law |
| Kangaroo                | N/A     | McDonough      | Henry    | 978 Highway 155 S               | ARC  | 33.408630 | -84.165428 | I-75 S                     | 10                   |              |            |               |         |         |                |   | Jason's Law             |
| AM Best                 | N/A     | Commerce       | Jackson  | I-85 and Exit 147               | KAC  | 34.227848 | -83.499237 | I-85 N                     | 165                  | Yes          | Yes        | No            | Yes     | Yes     |                | Georgia's Grill; Dunkin Donuts                            | Website/EPD/Jason's Law |
| TA                      | 156     | Commerce       | Jackson  | 30732 Hwy 441 South             | KAC  | 34.252800 | -83.463200 | I-85 N                     | 89                   | Yes          | Yes        | No            | Yes     | Yes     |                | Fuddruckers   | Website/EPD             |
| Quik Trip               | 737     | Jefferson      | Jackson  | 5240 Hwy 129                    | KAC  | 34.152679 | -83.649086 | I-85 N                     | 55                   | Yes          | Yes        | No            | No      | No      | No             | Wedys; Waffle House; Burger King                          | Website/EPD/Jason's Law |
| TA                      | 045     | Madison        | Morgan   | 2021 Eatonton Rd.               | KAC  | 33.552400 | -83.474800 | I-20 E                     | 149                  | Yes          | Yes        | No            | Yes     | Yes     |                | Popeyes   | Website/EPD/Jason's Law |
| Pilot                   | 420     | Madison        | Morgan   | 1881 Eatonton Road              | KAC  | 33.560277 | -83.479265 | I-20 E                     | 110                  | Yes          | Yes        | No            | No      | Yes     |                | Café; Huddle House  | Website/EPD/Jason's Law |
| Marathon                | N/A     | Monroe         | Walton   | 1490 Highway 78                 | KAC  | 33.812931 | -83.680271 | Off-Interstate             | 25                   | Yes          | No         | Yes           | Yes     | Yes     |                | PJs; Katies; Waffle House                                 | Website/EPD             |

**Publicly-Owned** Truck Parking Locations **within** the Atlanta Region and Key Adjacent Counties

| Source      | Type             | Location               | City           | County   | Within Atlanta Regional<br>Commission (ARC) Boundary or a<br>Key Adjacent County (KAC) | Latitude  | Longitude  | Number of<br>Spaces |
|-------------|------------------|------------------------|----------------|----------|--|-----------|------------|---------------------|
| EPD/JL      | Weigh Station    | I-20 WB (MM 15)        | Bremen         | Carroll  | KAC  | 33.696000 | -85.085000 | 42                  |
| Jason's Law | Weigh Station    | I-20 EB (MM 43)        | Lithia Springs | Douglas  | ARC  | 33.772000 | -84.630000 | 13                  |
| GDOT        | Closed Rest Area | I-85 SB North of I-985 | Suwanee        | Gwinnett | ARC  | 34.049042 | -84.024104 | --                  |
| GDOT        | Closed Rest Area | I-85 NB South of I-985 | Suwanee        | Gwinnett | ARC  | 34.048973 | -84.024594 | --                  |
| EPD/JL      | Welcome Center   | I-20 EB (MM 1)         | Tallapoosa     | Haralson | KAC  | 33.677721 | -85.320366 | 52                  |
| EPD         | Rest Area        | I-20 WB (MM 108)       | Rutledge       | Morgan   | KAC  | 33.580327 | -83.577100 | 41                  |
| EPD         | Rest Area        | I-20 EB (MM 103)       | Rutledge       | Morgan   | KAC  | 33.601782 | -83.662249 | 41                  |

## **Appendix 4-B**

### **FHWA Truck Parking Demand Model Equations**

## APPENDIX B-1

### FHWA Truck Parking Demand Model Equations

#### Equation 1: Daily Truck Traffic Volume

$$\begin{aligned} \text{AADTT12b} &= \text{AADTT} * f, \\ &\text{where } f = 0.79 \text{ on I-75 south of I-675} \\ &\text{and } f = 0.65 \text{ on I-285 between I-675 and I-75. "b" for adjusted second version.} \\ \text{AADTT45\_f} &= \text{AADTT12b} * 1.76 \text{ to represent a 76\% increase. "f" for forecast.} \end{aligned}$$

#### Equation 2: Short-Haul Truck Volume

$$\begin{aligned} \text{Vt\_SH12b} &= 1.15 * 0.36 * [\text{AADTT12b}] \\ \text{Vt\_SH45\_f} &= 1.15 * 0.36 * [\text{AADTT45\_f}] \end{aligned}$$

#### Equation 3: Long-Haul Truck Volume

$$\begin{aligned} \text{Vt\_LH12b} &= 1.15 * 0.64 * [\text{AADTT12b}] \\ \text{Vt\_LH45\_f} &= 1.15 * 0.64 * [\text{AADTT45\_f}] \end{aligned}$$

#### Equation 4: Short-Haul Truck-Hours of Travel

$$\begin{aligned} \text{THT\_SH12b} &= [\text{TRAV\_HRS}] * [\text{Vt\_SH12b}] \\ \text{THT\_SH45\_f} &= [\text{TRAV\_HRS}] * [\text{Vt\_SH45\_f}] \end{aligned}$$

#### Equation 5: Long-Haul Truck-Hours of Travel

$$\begin{aligned} \text{THT\_LH12b} &= [\text{TRAV\_HRS}] * [\text{Vt\_LH12b}] \\ \text{THT\_LH45\_f} &= [\text{TRAV\_HRS}] * [\text{Vt\_LH45\_f}] \end{aligned}$$

#### Equation 6: Short-Haul Truck-Hours of Parking Demand

$$\begin{aligned} \text{THP\_SH12b} &= 5/60 * [\text{THT\_SH12b}] \\ \text{THP\_SH45\_f} &= 5/60 * [\text{THT\_SH45\_f}] \end{aligned}$$

#### Equation 7: Long-Haul Truck-Hours of Parking Demand

$$\begin{aligned} \text{THP\_LH12b} &= 0.7 * [\text{THT\_LH12b}] + (5 * [\text{THT\_LH12b}]) / 60 \\ \text{THP\_LH45\_f} &= 0.7 * [\text{THT\_LH45\_f}] + (5 * [\text{THT\_LH45\_f}]) / 60 \end{aligned}$$

#### Equation 8: Short-Haul Peak Hour Parking Demand

$$\begin{aligned} \text{PHP\_SH12b} &= 0.02 * [\text{THP\_SH12b}] \\ \text{PHP\_SH45\_f} &= 0.02 * [\text{THP\_SH45\_f}] \end{aligned}$$

#### Equation 9: Long-Haul Peak Hour Parking Demand

$$\begin{aligned} \text{PHP\_LH12b} &= 0.09 * [\text{THP\_LH12b}] \\ \text{PHP\_LH45\_f} &= 0.09 * [\text{THP\_LH45\_f}] \end{aligned}$$

#### Equation 10: Peak Public Truck Parking Demand

$$\begin{aligned} \text{DemPub\_12b} &= 0.23 * ([\text{PHP\_SH12b}] + [\text{PHP\_LH12b}]) \\ \text{DemPub45\_f} &= 0.23 * ([\text{PHP\_SH45\_f}] + [\text{PHP\_LH45\_f}]) \end{aligned}$$

#### Equation 11: Peak Private Truck Parking Demand

$$\begin{aligned} \text{DemPri\_12b} &= 0.77 * ([\text{PHP\_SH12b}] + [\text{PHP\_LH12b}]) \\ \text{DemPri45} &= 0.77 * ([\text{PHP\_SH45\_f}] + [\text{PHP\_LH45\_f}]) \end{aligned}$$



| Corridor,C,254       | Links | Sum_DemPri12b | Sum_DemPub12b | Sum_DemPri45f | Sum_DemPub45f |
|----------------------|-------|---------------|---------------|---------------|---------------|
| Corridor             |       | sDemPri12b    | sDemPub12b    | sDemPri45f    | sDemPub45f    |
| I-85 North, MPO      | 84    | 381           | 114           | 670           | 200           |
| I-85 North, Adjacent | 26    | 153           | 46            | 269           | 80            |
| I-285 North & East   | 115   | 351           | 105           | 618           | 184           |
| I-20 East, MPO       | 66    | 213           | 64            | 375           | 112           |
| I-20 East, Adjacent  | 33    | 117           | 35            | 206           | 62            |
| I-675                | 30    | 57            | 17            | 101           | 30            |
| I-75 South, MPO      | 84    | 266           | 79            | 468           | 140           |
| I-75 South, Adjacent | 14    | 48            | 14            | 85            | 25            |
| I-85 South, MPO      | 62    | 209           | 62            | 367           | 110           |
| I-285 South          | 67    | 213           | 63            | 374           | 112           |
| I-20 West, MPO       | 78    | 310           | 93            | 546           | 163           |
| I-20 West, Adjacent  | 25    | 100           | 30            | 176           | 52            |
| I-285 West           | 78    | 333           | 99            | 585           | 175           |
| I-75 North, MPO      | 59    | 288           | 86            | 507           | 151           |
| I-75 North, Adjacent | 57    | 268           | 80            | 471           | 141           |

|           |
|-----------|
| I-85 N    |
| I-285 N&E |
| I-20 E    |
| I-675     |
| I-75 S    |
| I-85 S    |
| I-285 S   |
| I-20 W    |
| I-285 W   |
| I-75 N    |

| Corridor,C,254       |
|----------------------|
| I-85 North, MPO      |
| I-85 North, Adjacent |
| I-285 North & East   |
| I-20 East, MPO       |
| I-20 East, Adjacent  |
| I-675                |
| I-75 South, MPO      |
| I-75 South, Adjacent |
| I-85 South, MPO      |
| I-285 South          |
| I-20 West, MPO       |
| I-20 West, Adjacent  |
| I-285 West           |
| I-75 North, MPO      |
| I-75 North, Adjacent |

| Sum_DemPri12b | Adjacent | TOT |
|---------------|----------|-----|
| MPO           |          |     |
| I-85 N        | 381      | 153 |
| I-285 N&E     | 351      | 0   |
| I-20 E        | 213      | 117 |
| I-675         | 57       | 0   |
| I-75 S        | 266      | 48  |
| I-85 S        | 209      | 0   |
| I-285 S       | 213      | 0   |
| I-20 W        | 310      | 100 |
| I-285 W       | 333      | 0   |
| I-75 N        | 288      | 268 |

| Sum_DemPub12b | Adjacent | TOT |
|---------------|----------|-----|
| MPO           |          |     |
| I-85 N        | 114      | 46  |
| I-285 N&E     | 105      | 0   |
| I-20 E        | 64       | 35  |
| I-675         | 17       | 0   |
| I-75 S        | 79       | 14  |
| I-85 S        | 62       | 0   |
| I-285 S       | 63       | 0   |
| I-20 W        | 93       | 30  |
| I-285 W       | 99       | 0   |
| I-75 N        | 86       | 80  |

| Priv+Pub  | TOT |
|-----------|-----|
| I-85 N    | 692 |
| I-285 N&E | 456 |
| I-20 E    | 429 |
| I-675     | 75  |
| I-75 S    | 408 |
| I-85 S    | 271 |
| I-285 S   | 276 |
| I-20 W    | 532 |
| I-285 W   | 432 |
| I-75 N    | 722 |

| Corridor,C,254       |
|----------------------|
| I-85 North, MPO      |
| I-85 North, Adjacent |
| I-285 North & East   |
| I-20 East, MPO       |
| I-20 East, Adjacent  |
| I-675                |
| I-75 South, MPO      |
| I-75 South, Adjacent |
| I-85 South, MPO      |
| I-285 South          |
| I-20 West, MPO       |
| I-20 West, Adjacent  |
| I-285 West           |
| I-75 North, MPO      |
| I-75 North, Adjacent |

| Sum_DemPub45f | Adjacent | TOT |
|---------------|----------|-----|
| MPO           |          |     |
| I-85 N        | 200      | 80  |
| I-285 N&E     | 184      | 0   |
| I-20 E        | 112      | 62  |
| I-675         | 30       | 0   |
| I-75 S        | 140      | 25  |
| I-85 S        | 110      | 0   |
| I-285 S       | 112      | -   |
| I-20 W        | 163      | 52  |
| I-285 W       | 175      | -   |
| I-75 N        | 151      | 141 |

| Priv+Pub  | TOT   |
|-----------|-------|
| I-85 N    | 1,219 |
| I-285 N&E | 802   |
| I-20 E    | 754   |
| I-675     | 131   |
| I-75 S    | 718   |
| I-85 S    | 477   |
| I-285 S   | 486   |
| I-20 W    | 937   |
| I-285 W   | 760   |
| I-75 N    | 1,270 |

| Public  | Supply         |       |          |       |
|---------|----------------|-------|----------|-------|
|         | Public Supply  |       |          |       |
|         | Corridor       | MPO   | Adjacent | Total |
|         | I-85 N         | 0     | 0        | 0     |
|         | I-285 N&E      | 0     | 0        | 0     |
|         | I-20 E         | 0     | 82       | 82    |
|         | I-675          | 0     | 0        | 0     |
|         | I-75 S         | 0     | 0        | 0     |
|         | I-85 S         | 0     | 0        | 0     |
|         | I-285 S        | 0     | 0        | 0     |
|         | I-20 W         | 100   | 13       | 113   |
|         | I-285 W        | 0     | 0        | 0     |
|         | I-75 N         | 0     | 0        | 0     |
|         | Total          | 100   | 95       | 195   |
| Private | Private Supply |       |          |       |
|         | Corridor       | MPO   | Adjacent | Total |
|         | I-85 N         | 10    | 379      | 389   |
|         | I-285 N&E      | 0     | 0        | 0     |
|         | I-20 E         | 0     | 259      | 259   |
|         | I-675          | 25    | 0        | 25    |
|         | I-75 S         | 45    | 450      | 495   |
|         | I-85 S         | 367   | 0        | 367   |
|         | I-285 S        | 179   | 0        | 179   |
|         | I-20 W         | 355   | 432      | 787   |
|         | I-285 W        | 411   | 0        | 411   |
|         | I-75 N         | 0     | 575      | 575   |
|         | Total          | 1,392 | 2,095    | 3,487 |

|           |
|-----------|
| NP_Supply |
| 389       |
| 0         |
| 341       |
| 25        |
| 495       |
| 367       |
| 179       |
| 900       |
| 411       |
| 575       |

| Corridor             | NP_ID       | NP_Supply | NP_Dem12 | NP_Def12 | NP_Dem45 | NP_Def45 |
|----------------------|-------------|-----------|----------|----------|----------|----------|
| I-85 North, MPO      | I-85 North  | 389       | 692      | 303      | 1,219    | 830      |
| I-85 North, Adjacent | I-85 North  | 389       | 692      | 303      | 1,219    | 830      |
| I-285 North & East   | I-285 NE    | 0         | 456      | 456      | 802      | 802      |
| I-20 East, MPO       | I-20 East   | 341       | 429      | 88       | 754      | 413      |
| I-20 East, Adjacent  | I-20 East   | 341       | 429      | 88       | 754      | 413      |
| I-675                | I-675       | 25        | 75       | 50       | 131      | 106      |
| I-75 South, MPO      | I-75 South  | 495       | 408      | (87)     | 718      | 223      |
| I-75 South, Adjacent | I-75 South  | 495       | 408      | (87)     | 718      | 223      |
| I-85 South, MPO      | I-85 South  | 367       | 271      | (96)     | 477      | 110      |
| I-285 South          | I-285 South | 179       | 276      | 97       | 486      | 307      |
| I-20 West, MPO       | I-20 West   | 900       | 532      | (368)    | 937      | 37       |
| I-20 West, Adjacent  | I-20 West   | 900       | 532      | (368)    | 937      | 37       |
| I-285 West           | I-285 West  | 411       | 432      | 21       | 760      | 349      |
| I-75 North, MPO      | I-75 North  | 575       | 722      | 147      | 1,270    | 695      |
| I-75 North, Adjacent | I-75 North  | 575       | 722      | 147      | 1,270    | 695      |

## **Appendix 4-C**

### **Truck Count Comparison Analysis**

## Appendix C Truck Count Comparison

This appendix compares truck counts. Sources include GDOT Geocounts, GDOT Geoportal, GDOT data previously obtained for the ARC Freight Plan Update, and the Freight Analysis Framework (FAF). FAF truck volumes were used for the truck parking demand model. GDOT recommends use of the Geocounts data. Given the available comparisons, FAF volumes on two corridor segments were adjusted to more closely resemble Geocounts volumes.

### **Base Year Adjustment**

Based on comparison of Geocounts and FAF, both 2012 volumes, two corridors had FAF base year volumes adjusted. The first is I-75 South from I-675 to the edge of the study area (southern border of Butts County). See the table below. Between Jodeco Road and Hudson Bridge Road, Geocounts had a value 79% of the FAF volume (18,760 Geocounts compared to 23,770 FAF). The last column in the table below shows base year FAF volumes adjusted by the 79% factor. The adjusted volumes south of I-675 are more in line with expected values based on geocounts and extend south from the center of the metro region. However, the unadjusted volumes north of I-675 were retained to avoid causing the volumes to drop to far below the next available Geocounts location (north of Tara Boulevard). The segments that received the 79% adjustment from I-675 to the southern boundary of Butts County are comprised of 50 FAF links.

#### **I-75 South Base Year Adjustment**

| <b>Location</b>                        | <b>FAF12</b>  | <b>Geocounts</b> | <b>FAF12_Adjusted</b> |
|--|---------------|------------------|-----------------------|
| North of Tara Blvd                     |               | 15,559           |                       |
| North of Southalke Mall                | <b>14,715</b> |                  | 11,614                |
| At Lake Spivey Pkwy Interchange        | <b>8,660</b>  |                  | 6,835                 |
| Between Lake Spivey Pkwy and I-675     | <b>8,470</b>  |                  | 6,685                 |
| Between Jodeco Rd and Hudson Bridge Rd | 23,770        | 18,760           | <b>18,760</b>         |
| North of Jonesboro Rd                  | 23,850        |                  | <b>18,823</b>         |
| Between SR 20 and Jonesboro Rd         | 21,120        |                  | <b>16,669</b>         |
| Between SR 155 and SR 20               | 17,770        |                  | <b>14,025</b>         |
| Between Bill Gardner Pkwy and SR 155   | 15,018        |                  | <b>11,853</b>         |
| South of Bill Gardner Pkwy             | 12,620        |                  | <b>9,960</b>          |
| North of SR 16                         | 12,620        |                  | <b>9,960</b>          |

The second corridor where an adjustment was applied on I-285 South. From east to west, segments along this corridor spanned the following facilities: I-20, Flat Shoals Parkway, Bouldercrest Rd, I-675, Moreland Avenue, Jonesboro Road, Old Dixie Road, and I-75. The table below shows the FAF and Geocounts comparison by segment. Direct comparisons are possible on three segments. Geocounts comprise 97%, 55%, and 75% of FAF counts on the respective segments. The first segment in the table inherits the adjustment factor from the adjacent segment, due to lack of Geocounts data. However, the 97% adjustment factor was not applied because it would be a relatively small adjustment. The respective adjustment factor was applied to the last two segments, which lie between Moreland Ave (and I-675 to the east) and Old Dixie Road (and I-75 to the west), which are comprised of 25 FAF links. Actually, because

Geocounts GIS data are not available for each segment, a blanket average adjustment factor of 65% is applied to I-285 between I-675 and I-75.

**I-285 South Base Year Adjustment**

| <b>Location</b>                       | <b>FAF12</b>  | <b>Geocounts</b> | <b>Adj.</b> | <b>FAF12_Adjusted</b> |
|---------------------------------------|---------------|------------------|-------------|-----------------------|
| Between Flat Shoals and Bouldercrest  | <b>20,919</b> |                  | <b>97%</b>  | <del>20,373</del>     |
| Between Bouldercrest and I-675        | <b>18,166</b> | 17,692           | <b>97%</b>  | <del>17,692</del>     |
| Between Moreland Ave and Jonesboro Rd | 27,270        | 14,984           | 55%         | <b>14,984</b>         |
| Between Jonesboro Rd and Old Dixie Rd | 24,465        | 18,419           | 75%         | <b>18,419</b>         |

**Comparison Charts**

The remainder of this appendix contains the detailed comparison of truck counts on the various interstate corridors within the study area.

# Truck Count Comparison

Atlanta Regional Truck Parking Assessment Study

# Geocounts-FAF Adjustment Factor Summary

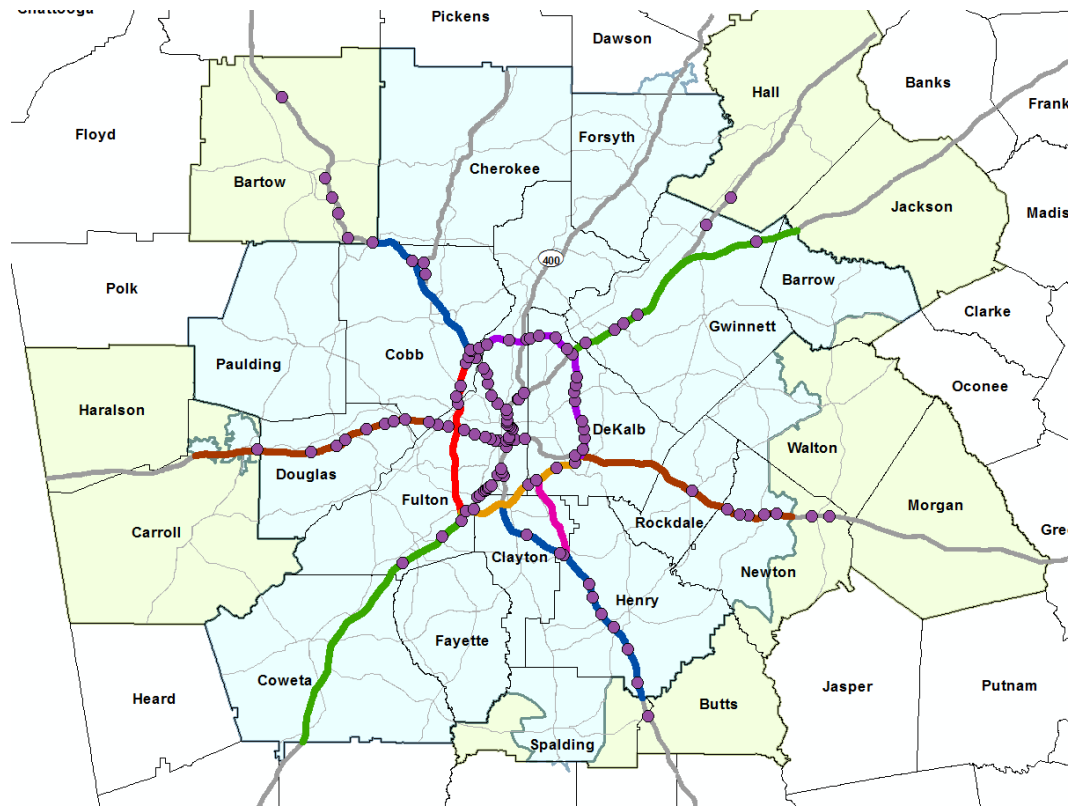
- Not needed/possible
  - I-75 North
  - I-85 North
  - I-20 West
  - I-20 East
  - I-85 South
  - I-285 West
  - I-285 North & East
- Adjustment Possible
  - I-75 South
    - Demand model status based on FAF 2012: Supply on par with demand
    - Adjustment: Reduce truck volume
    - Potential Implication: Reveal surplus
  - I-285 South
    - Demand model status based on FAF 2012: Parking deficit
    - Adjustment: Reduce truck volume
    - Potential Implication: Reduce deficit



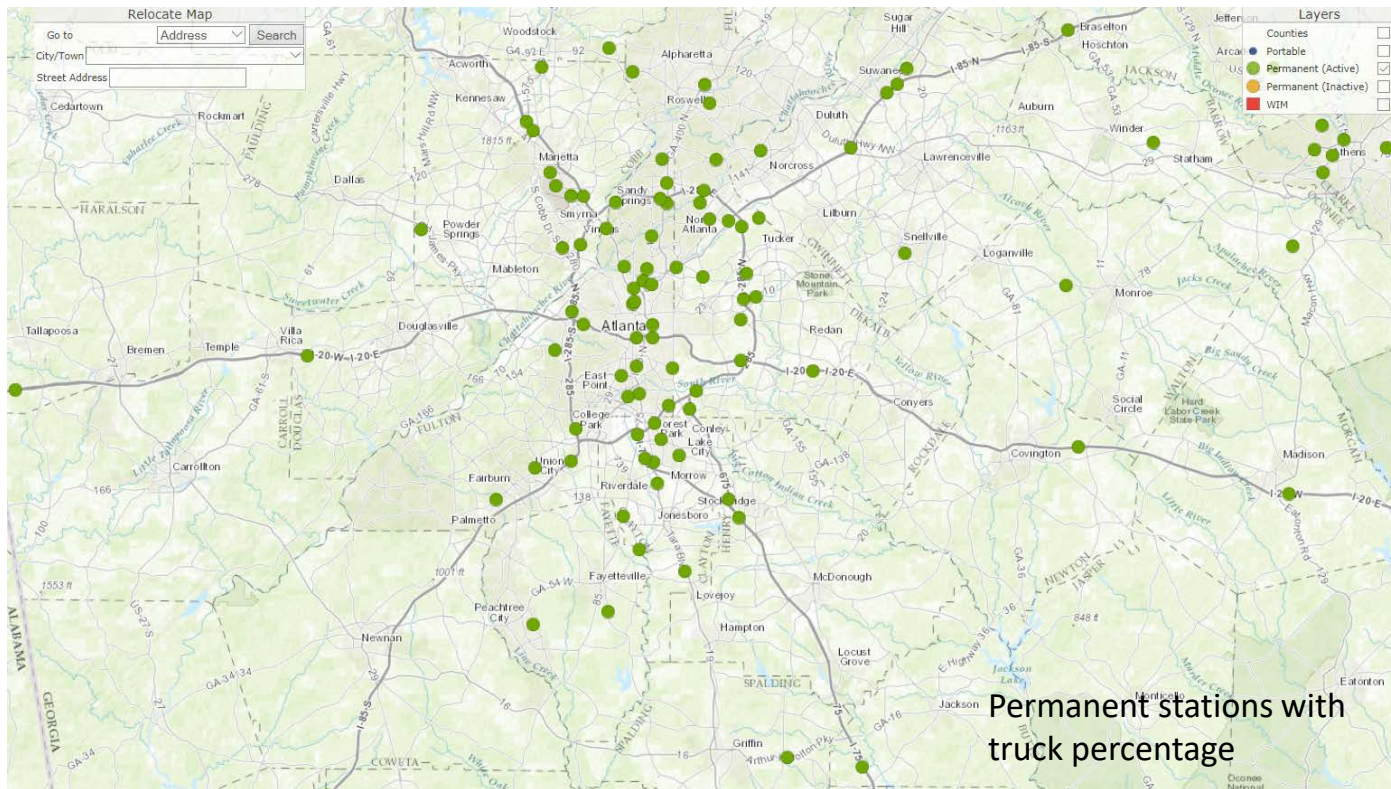
# Truck Count Data Sources

- Geoportal
  - “Traffic Count Stations – 2011”
  - Year: 2013
  - Format: Point
- FAF
  - Year: 2012 base year truck volumes.
  - Format: Linear segment
- ARC
  - From the ARC Regional Freight Mobility Plan Update figure 3-1. Sourced as Georgia DOT Geocounts Database.
  - Year: 2014 (specified in reference for Table 3-5)
  - Format: Linear segment
- Geocounts
  - Data from Geocounts website. Permanent stations only (for truck AADT).
  - Year: 2013 to approximate other sources. 2016 available
  - Format: Points

# Geoportal Traffic Count Stations



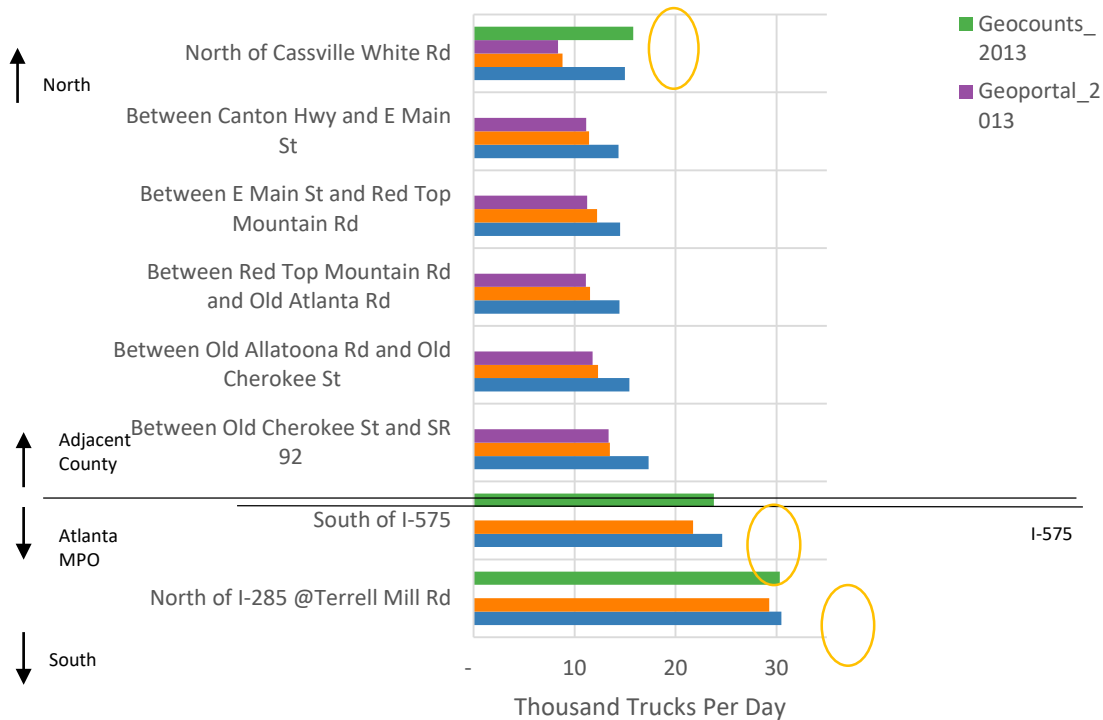
# Geocounts



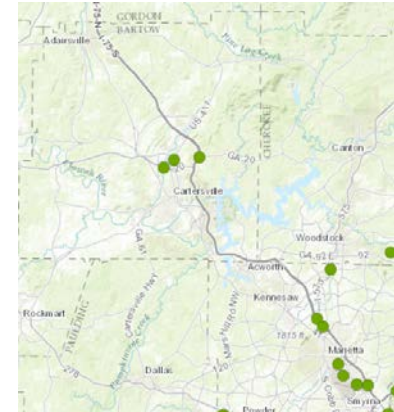
# Count Comparison Summary

| Corridor  |     | Geoportal | FAF    | ARC    | Geocounts |
|-----------|-----|-----------|--------|--------|-----------|
| I-85 N    | Min | 22,202    | 11,630 | 11,914 | 12,348    |
|           | Max | 42,900    | 30,290 | 41,882 | 18,525    |
| I-285 N&E | Min | 12,180    | 13,710 | 12,668 | 13,730    |
|           | Max | 23,782    | 23,510 | 21,645 | 18,512    |
| I-20 E    | Min | 6,880     | 6,068  | 7,885  | 5,891     |
|           | Max | 10,352    | 8,790  | 10,764 | 13,089    |
| I-675     | Min |           |        |        |           |
|           | Max |           |        |        |           |
| I-75 S    | Min | 5,138     | 8,470  | 6,195  | 15,559    |
|           | Max | 15,840    | 23,850 | 15,549 | 18,760    |
| I-85 S    | Min | 3,900     | 10,080 | 4,845  | 13,913    |
|           | Max | 11,856    | 15,470 | 11,803 | 13,913    |
| I-285 S   | Min | 8,764     | 20,919 | 9,762  | 14,984    |
|           | Max | 9,240     | 27,270 | 10,618 | 18,419    |
| I-20 W    | Min | 2,440     | 11,295 | 3,200  | 8,725     |
|           | Max | 21,900    | 20,580 | 20,275 | 12,002    |
| I-285 W   | Min | 12,960    | 17,980 | 13,511 | 22,027    |
|           | Max | 15,030    | 19,300 | 19,514 | 22,916    |
| I-75 N    | Min | 8,358     | 14,360 | 8,821  | 15,821    |
|           | Max | 13,370    | 30,480 | 29,283 | 30,326    |

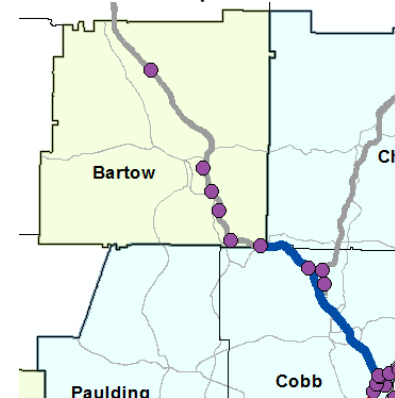
# I-75 North Corridor



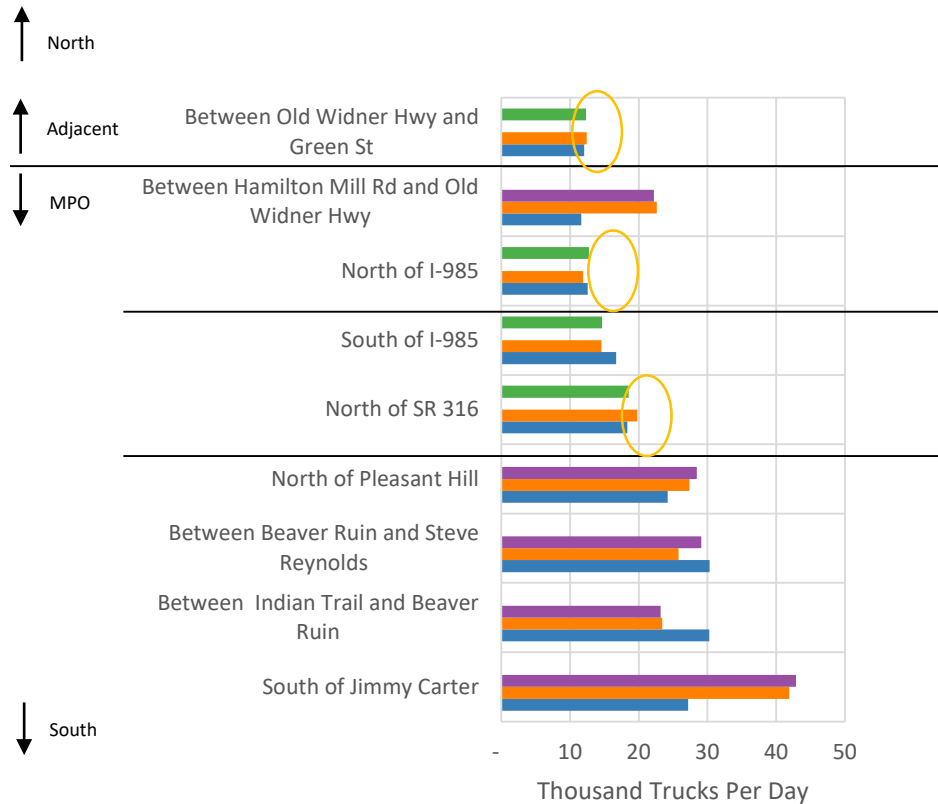
Geocounts



Geoportal



# I-85 North Corridor



I-985

SR 316

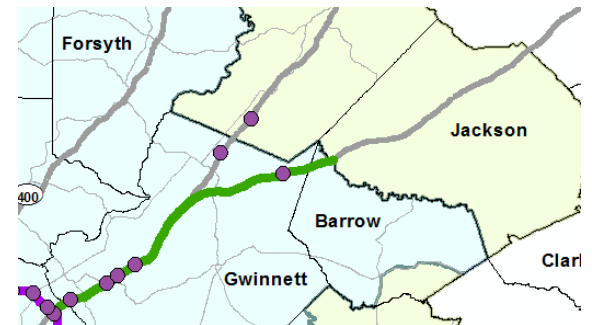
■ Geocounts\_2013

■ Geoportal\_2013

## Geocounts

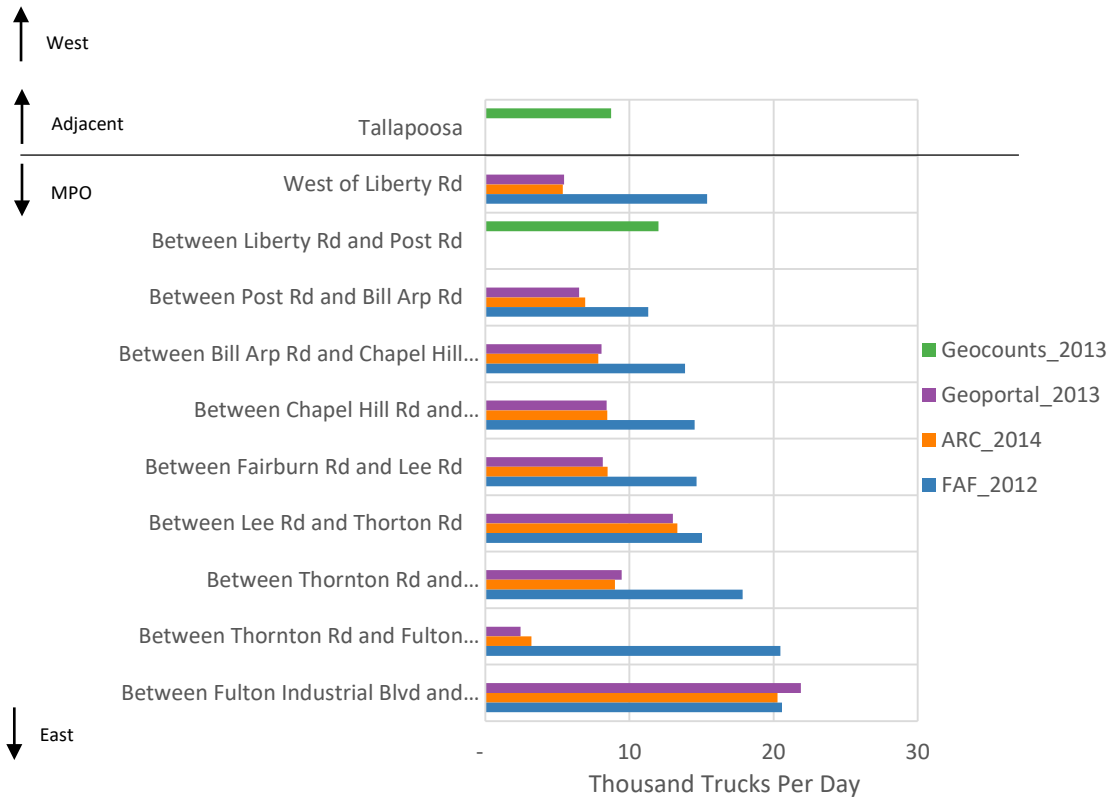


## Geoportal





# I-20 West Corridor



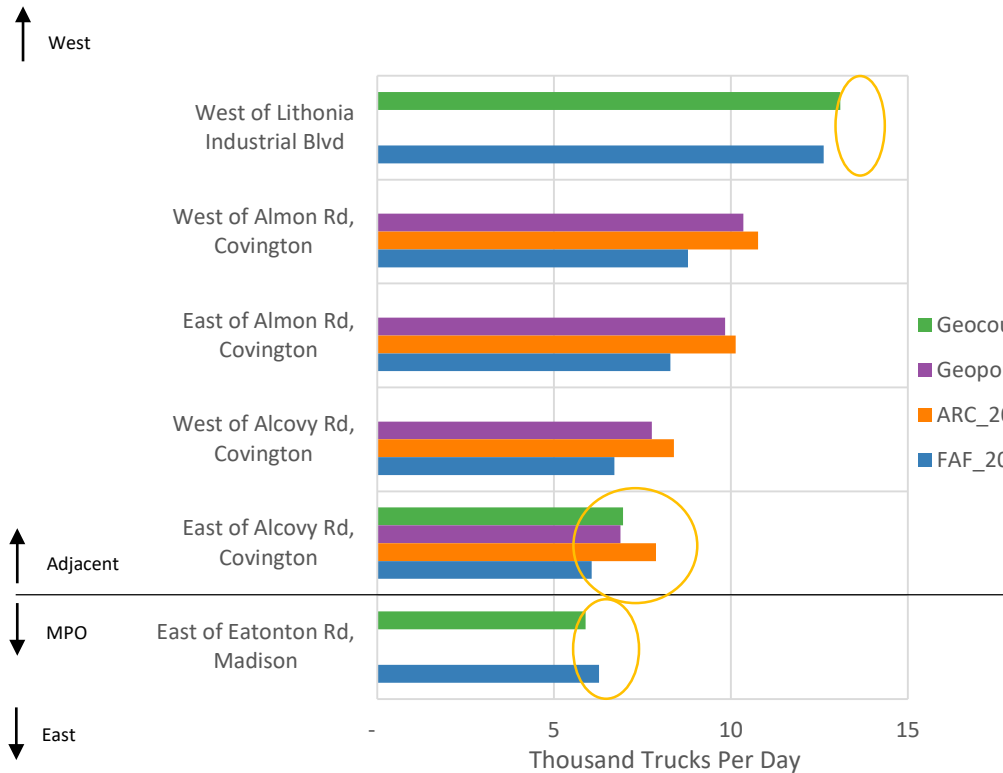
Geocounts



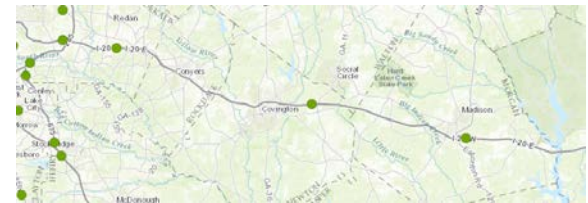
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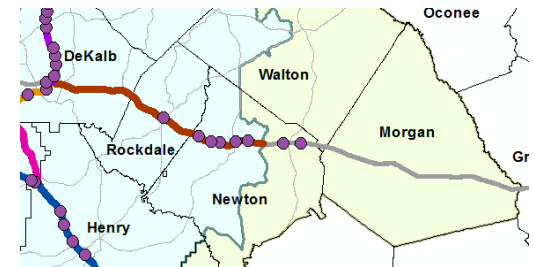
# I-20 East Corridor



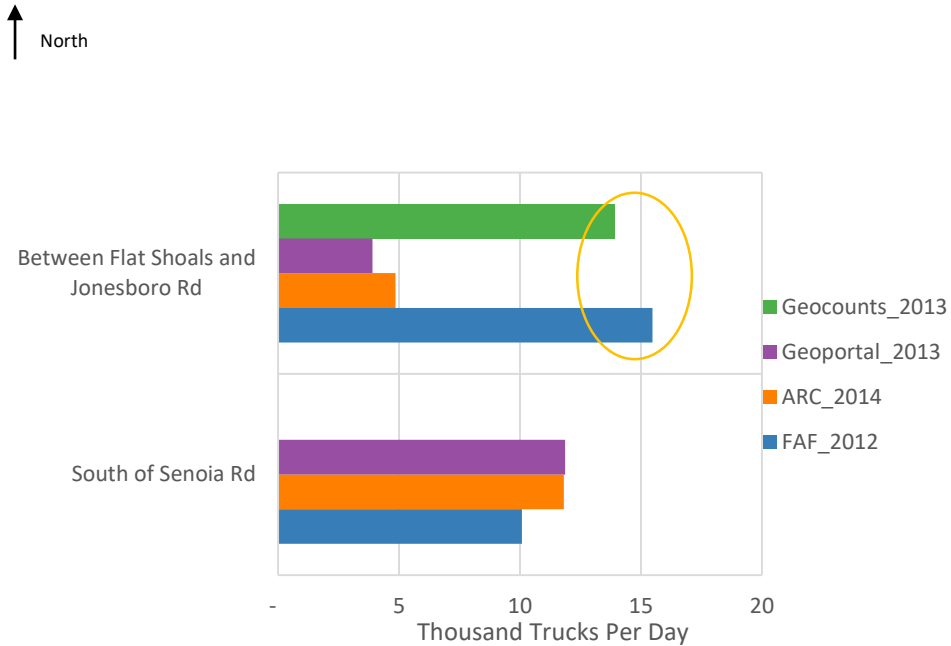
Geocounts



Geoportal

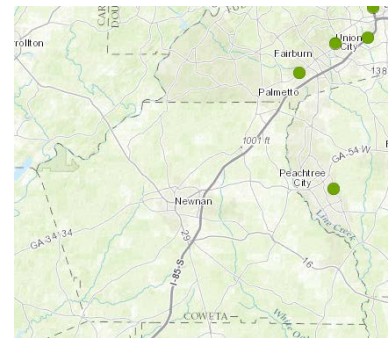


# I-85 South Corridor

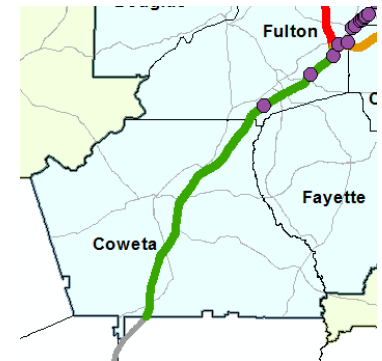


↓ South

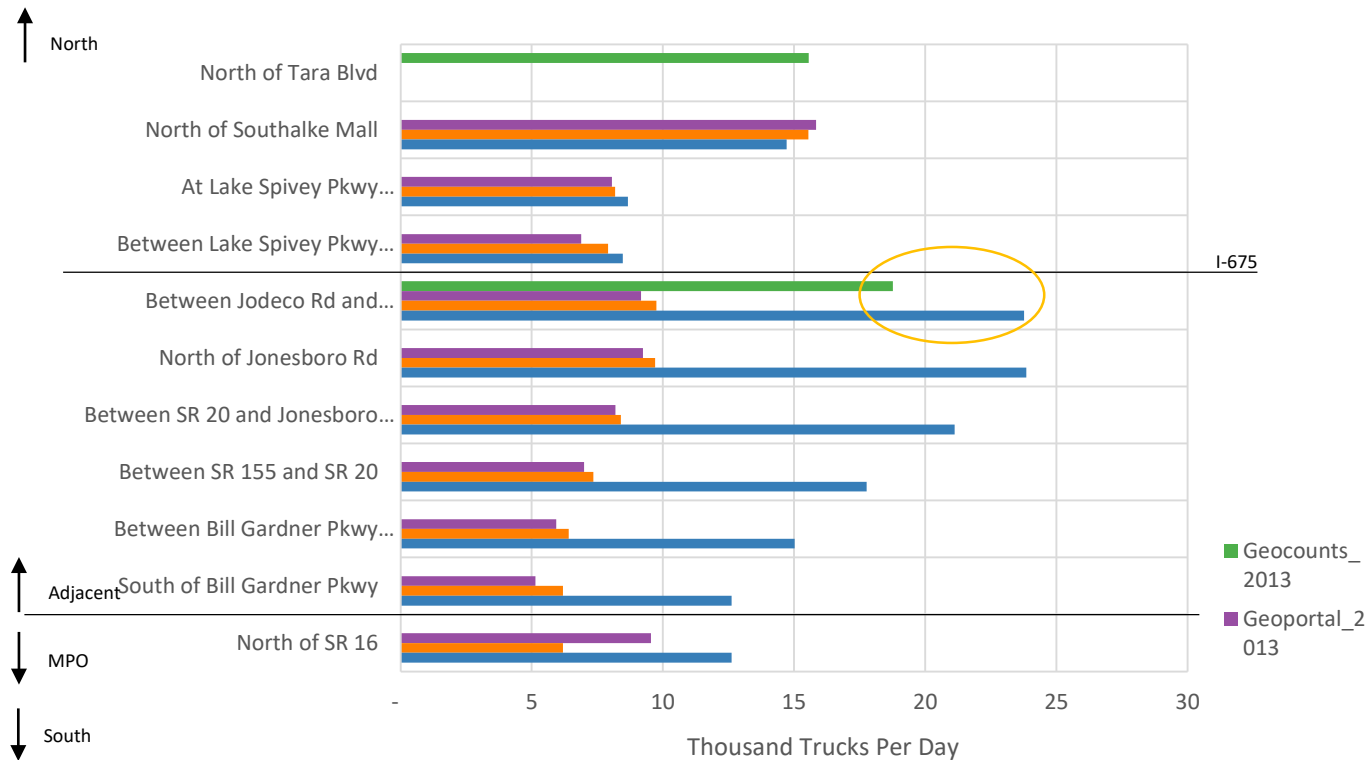
Geocounts



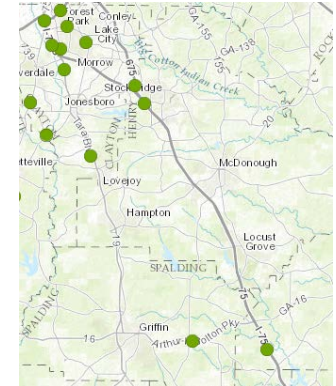
Geoportal



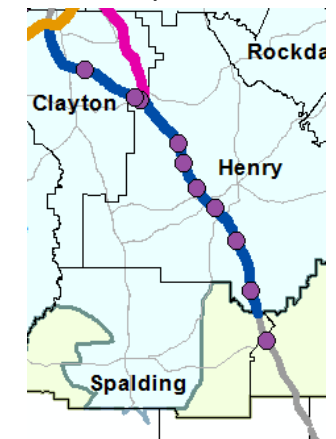
# I-75 South Corridor



Geocounts



Geoportal

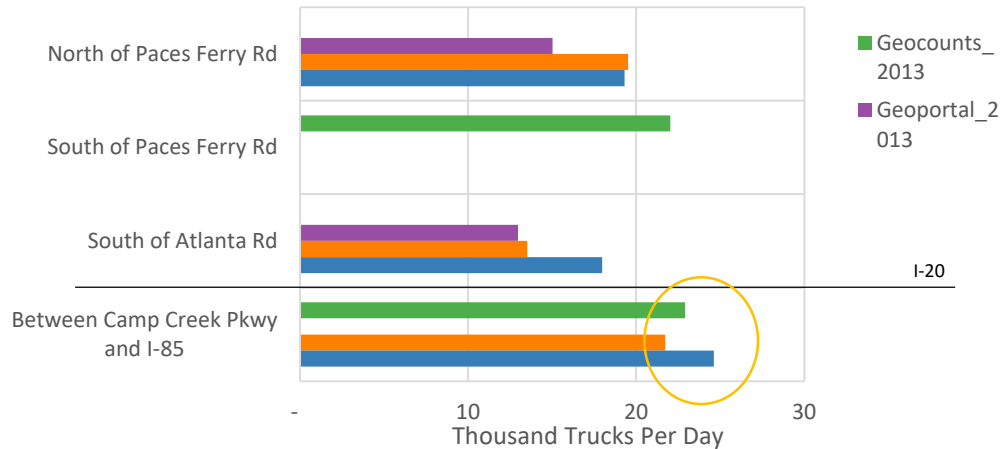


# I-285 West Corridor



North

Truck Count Comparison: I-285 West



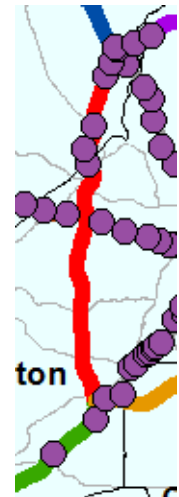
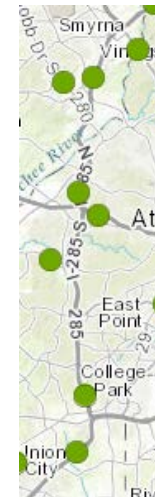
I-20



South

Geocounts

Geoportal

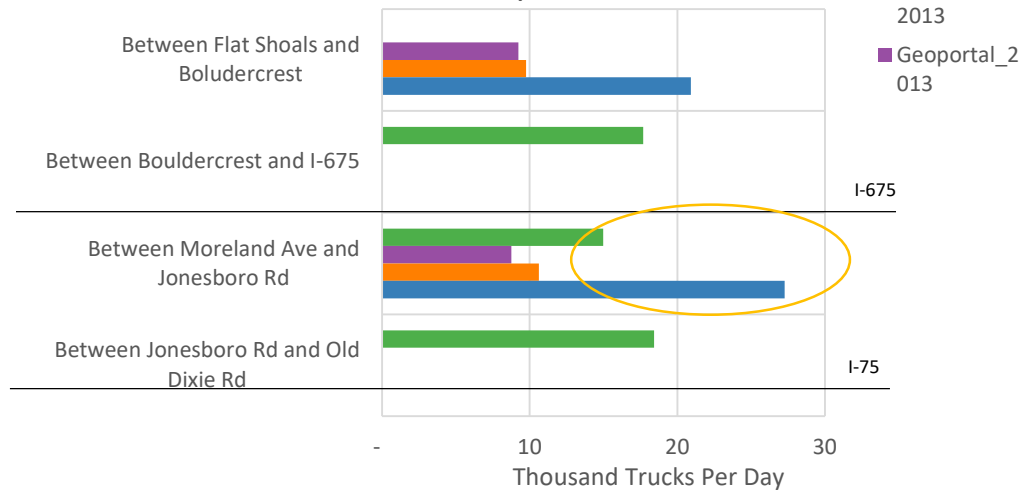


# I-285 South Corridor



East

Truck Count Comparison: I-285 South



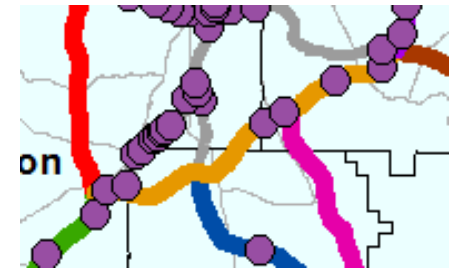
I-675

I-75

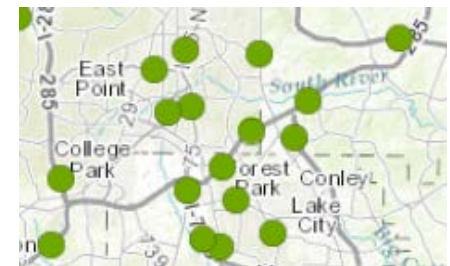


West

Geocounts

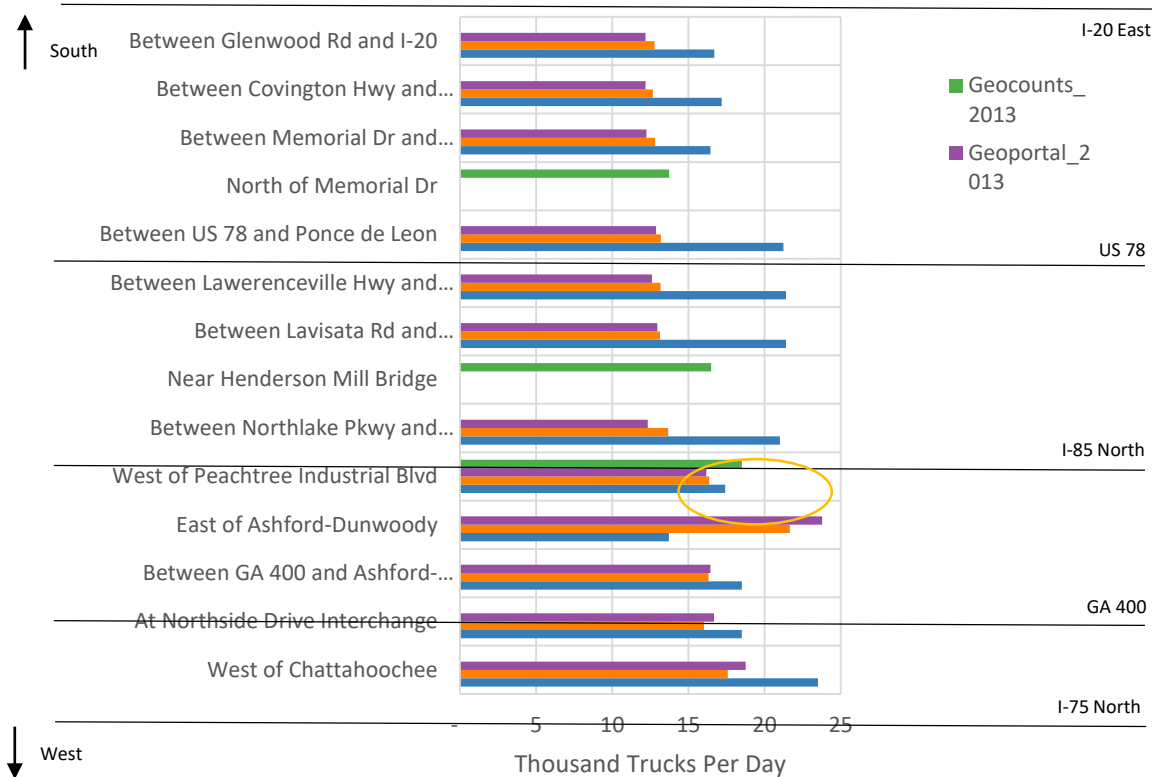


Geoportal

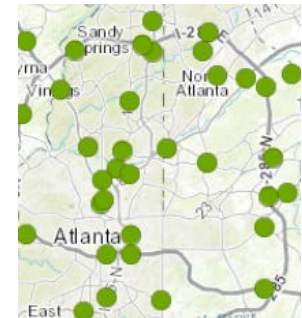




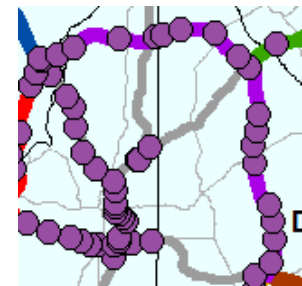
# I-285 North & East Corridor



Geocounts

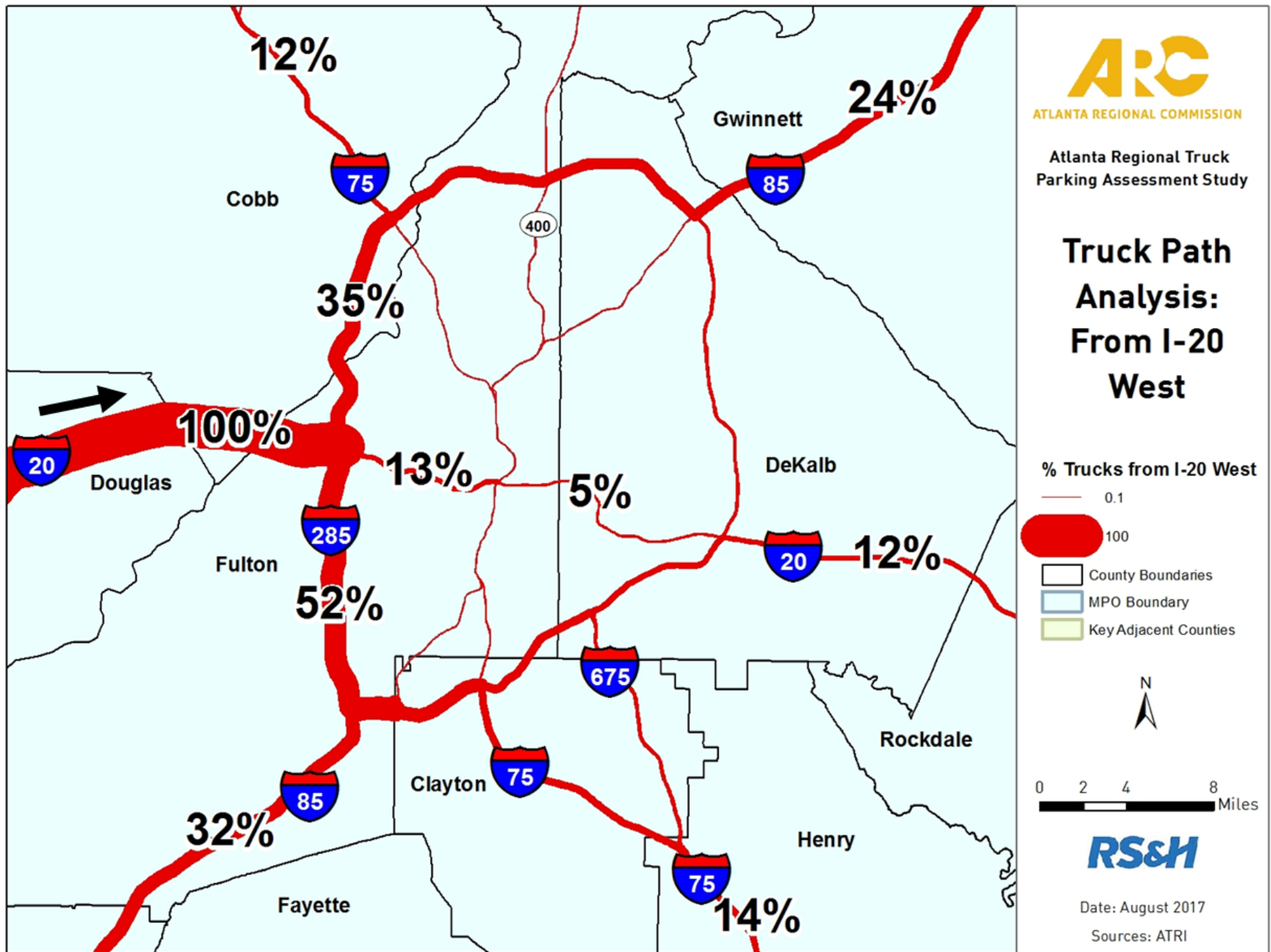


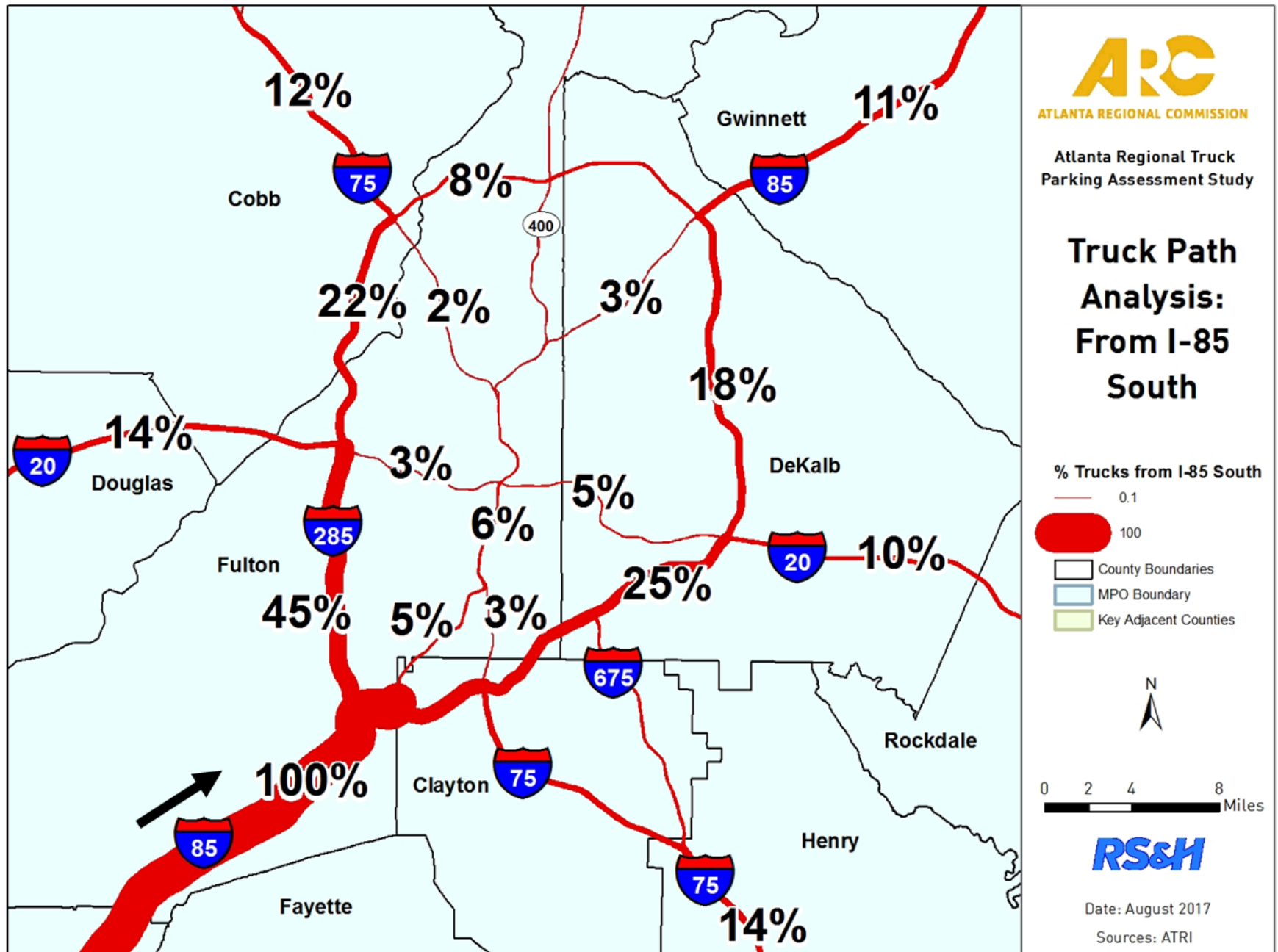
Geoportal

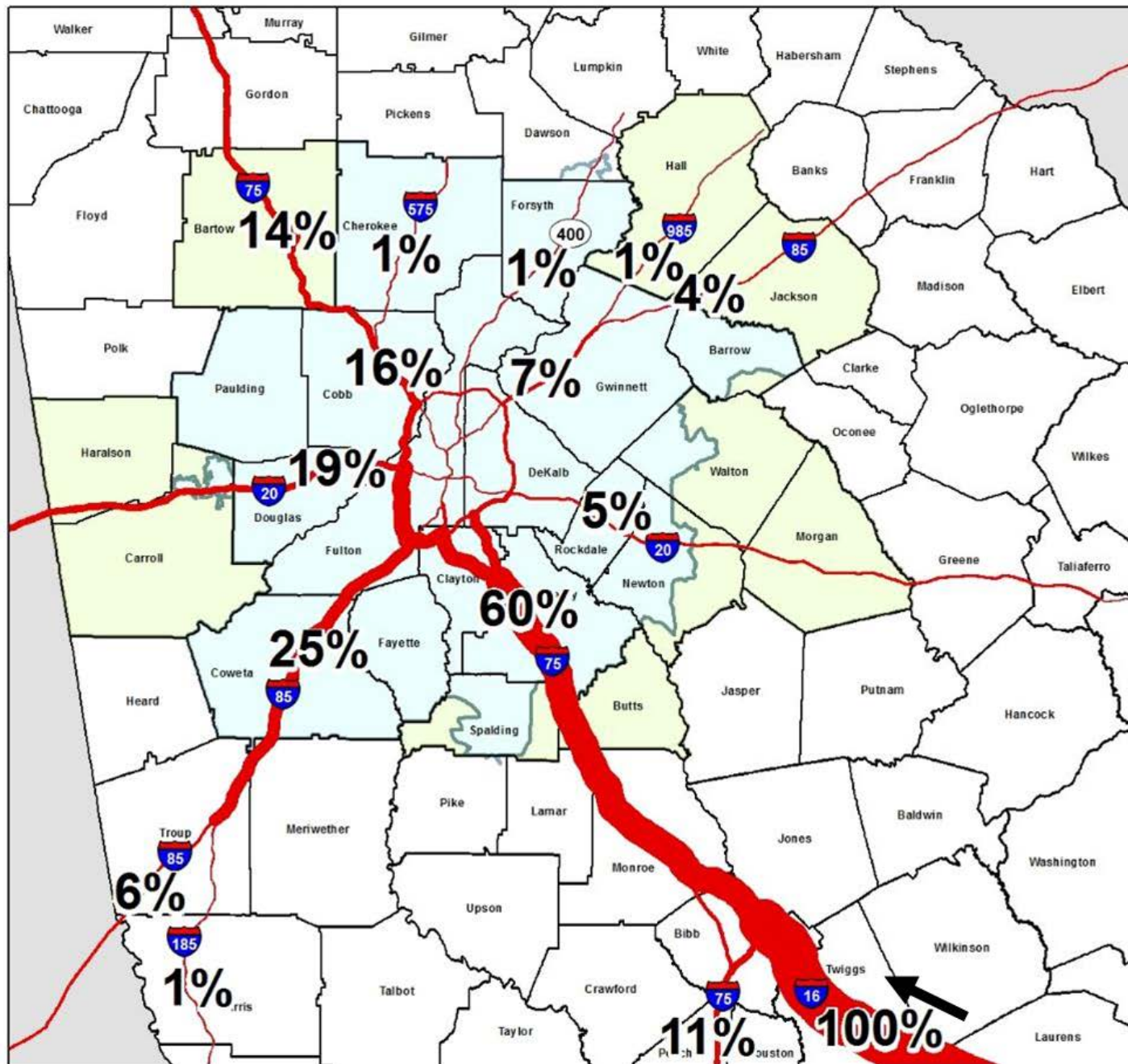


## **Appendix 4-D**

### **Regional Truck Flow Diagrams**







## Atlanta Regional Truck Parking Assessment Study

### Truck Path Analysis: From I-16

% Trucks from I-16



- County Boundaries
- MPO Boundary
- Key Adjacent Counties



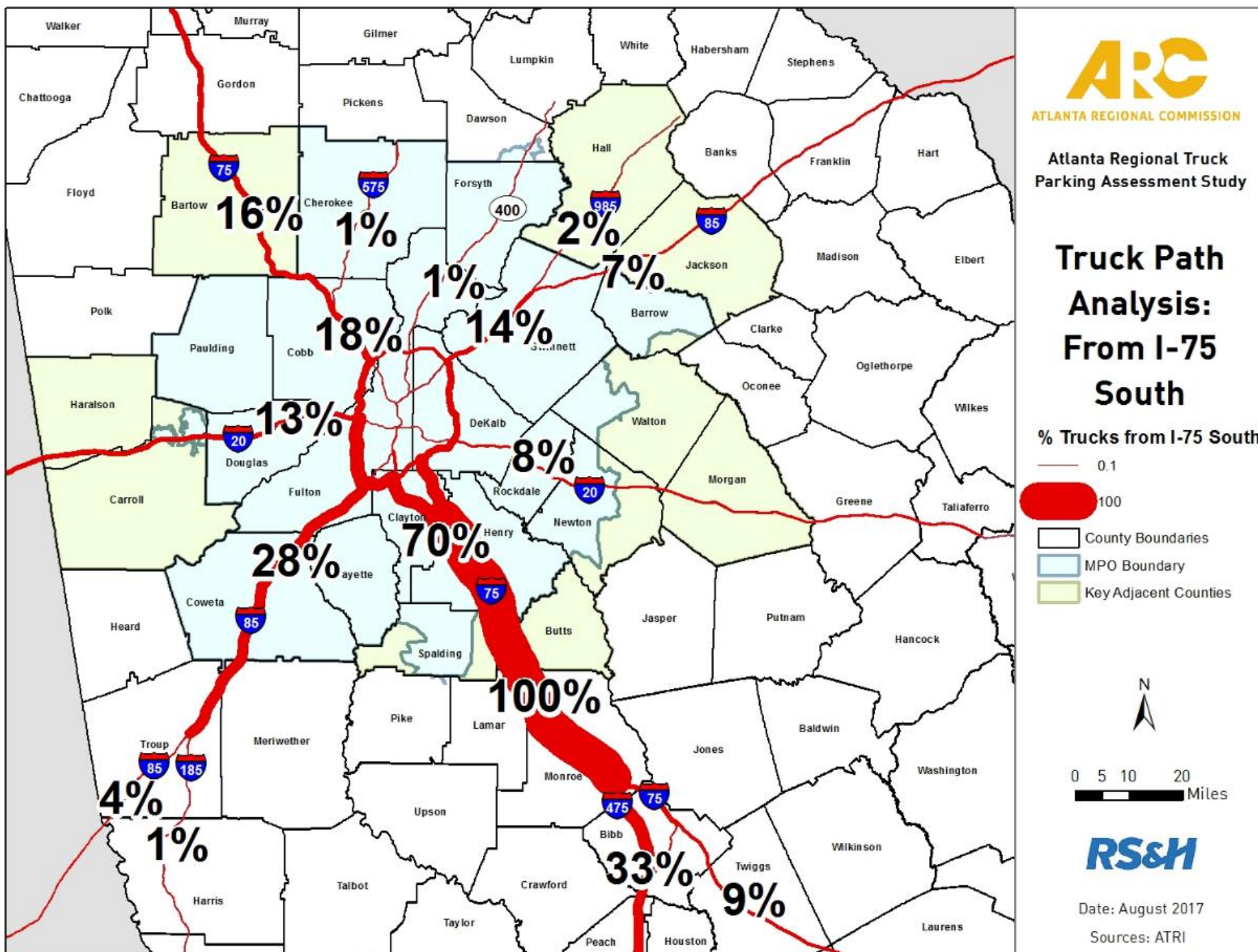
0 5 10 20  
Miles



Date: August 2017

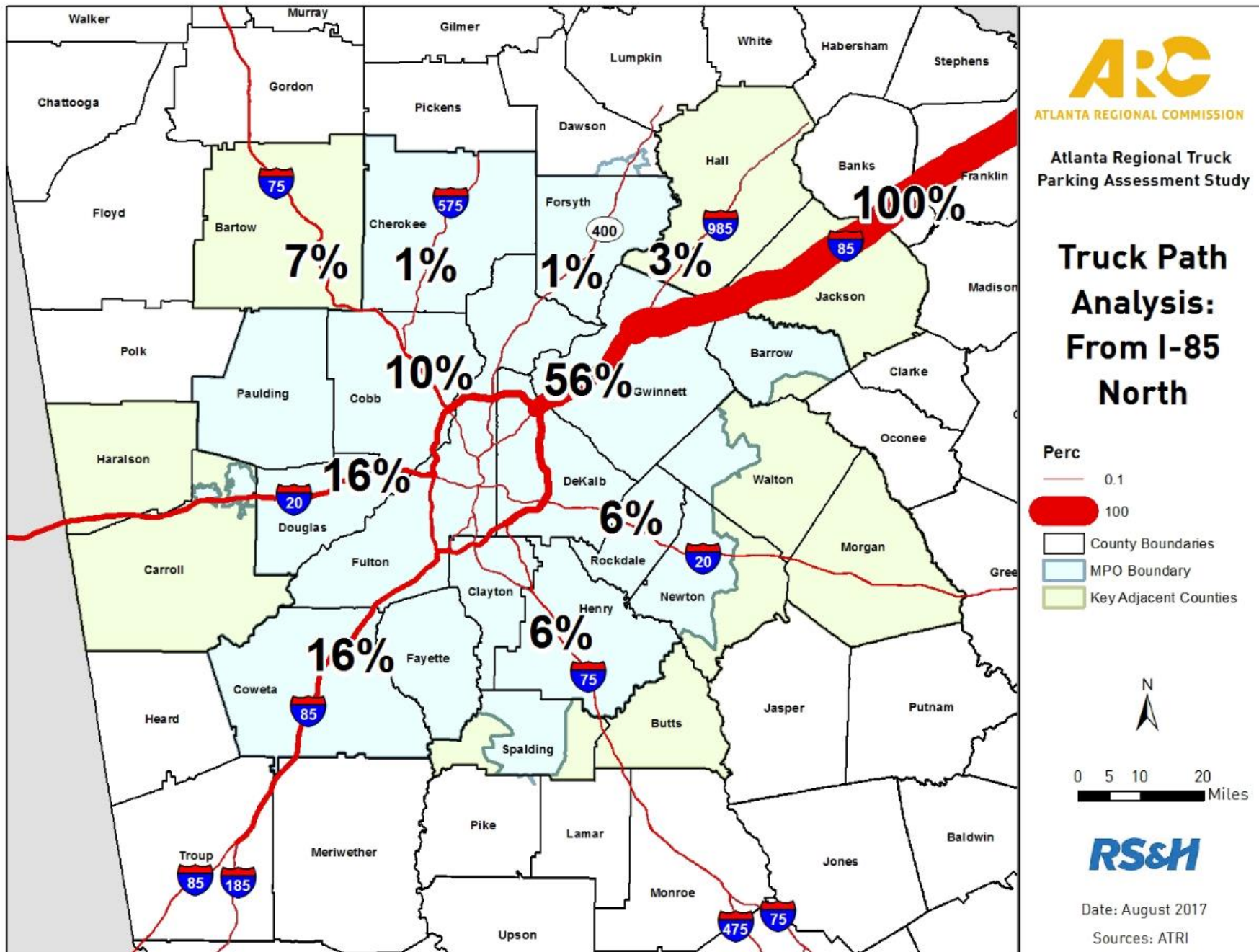
Sources: ATRI

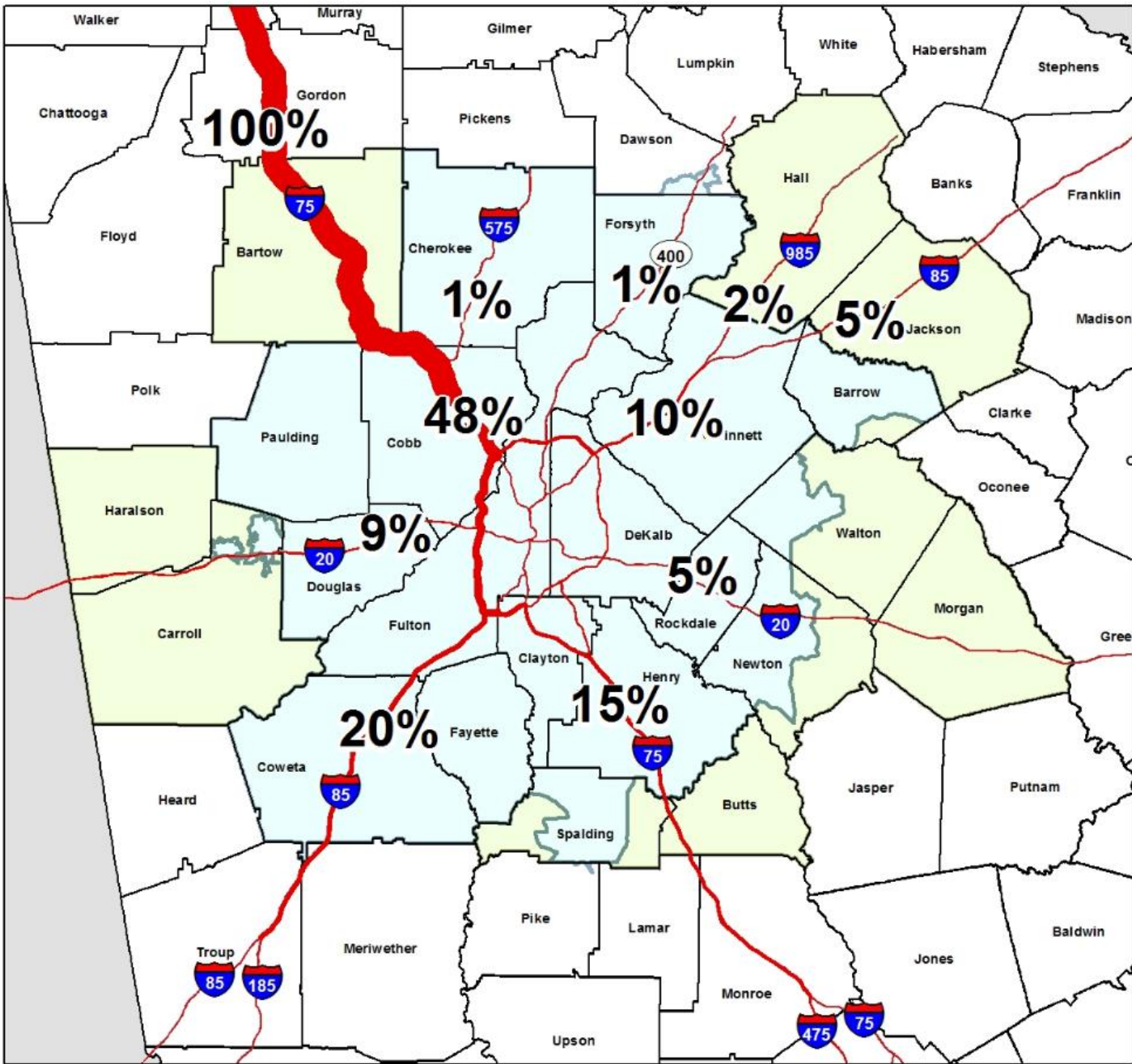










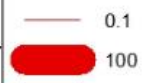


ATLANTA REGIONAL COMMISSION

Atlanta Regional Truck  
Parking Assessment Study

## Truck Path Analysis: From I-75 North

% Trucks from I-75 North



- County Boundaries
- MPO Boundary
- Key Adjacent Counties



Date: August 2017

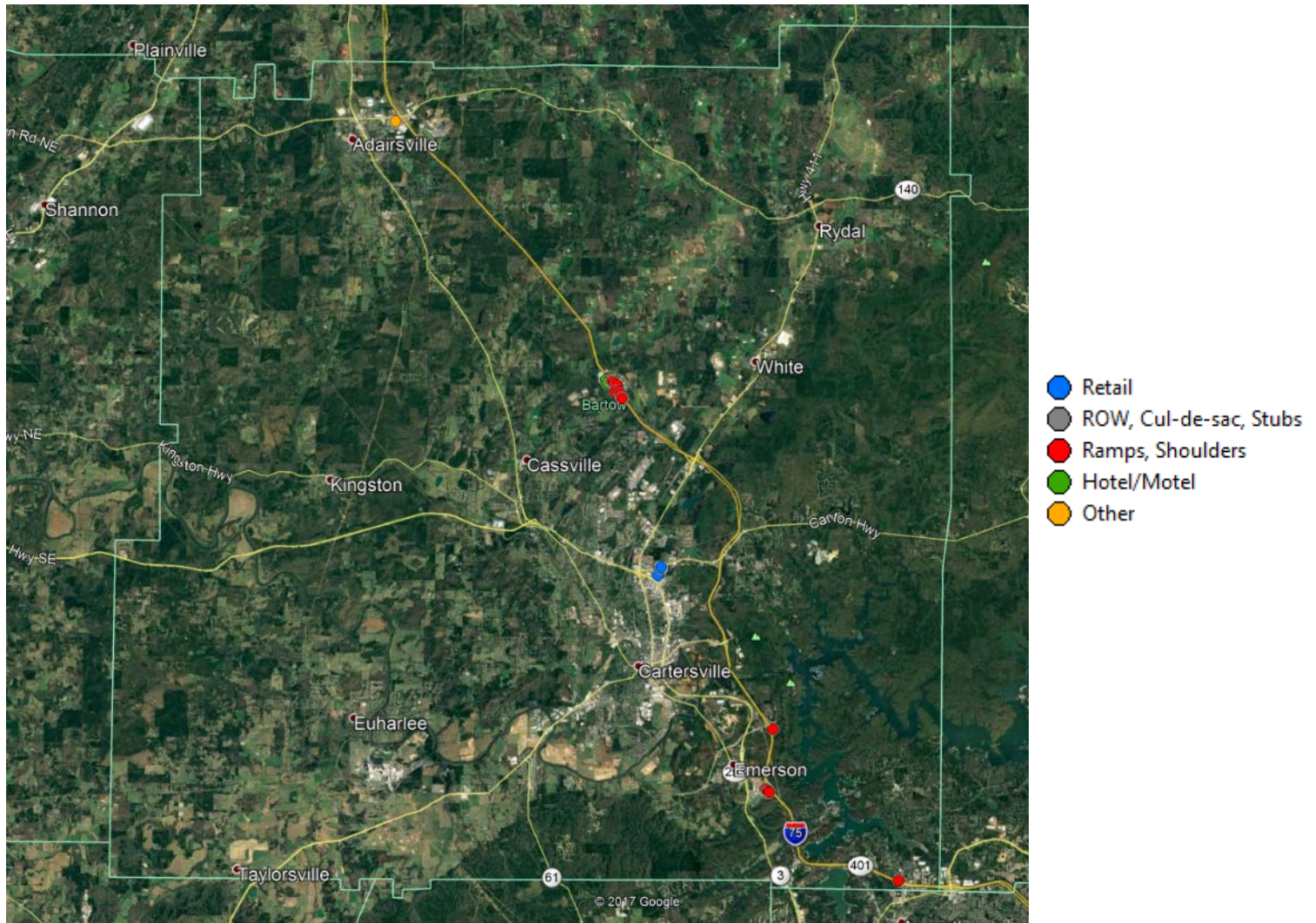
Sources: ATRI

## **Appendix 4-E**

### **Observed Locations of Unauthorized and Other Truck Parking**



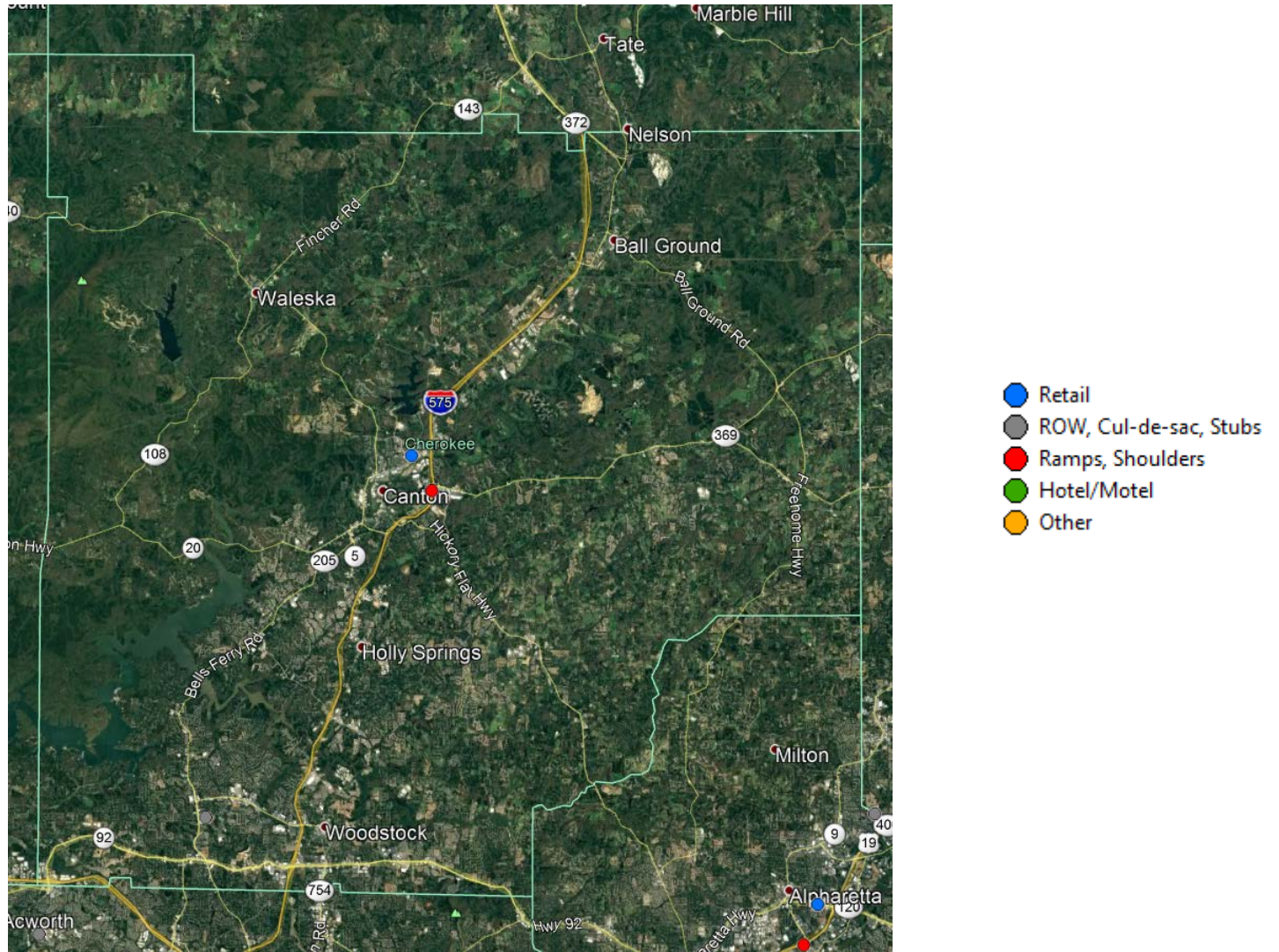
# Bartow County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



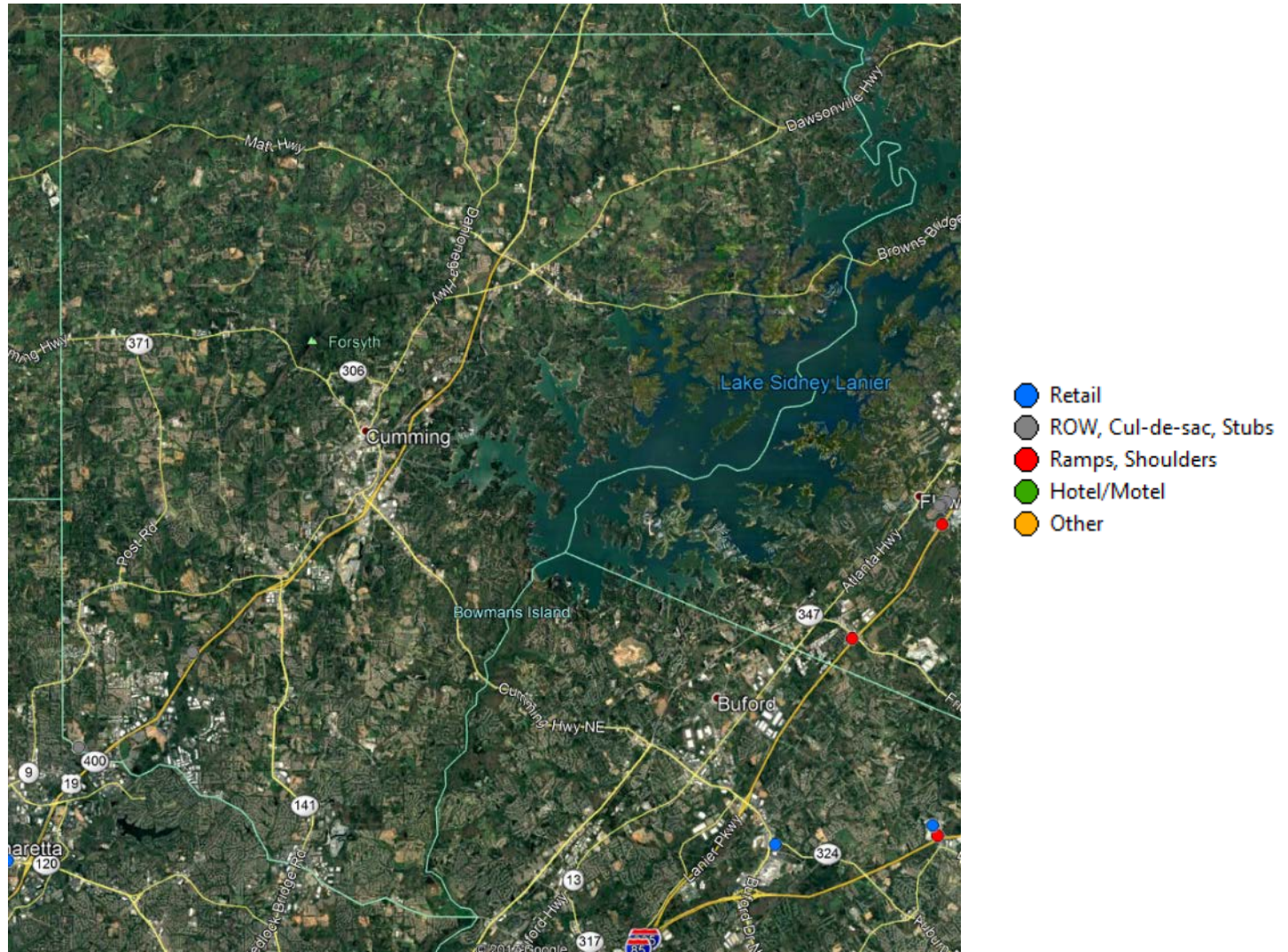
# Cherokee County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



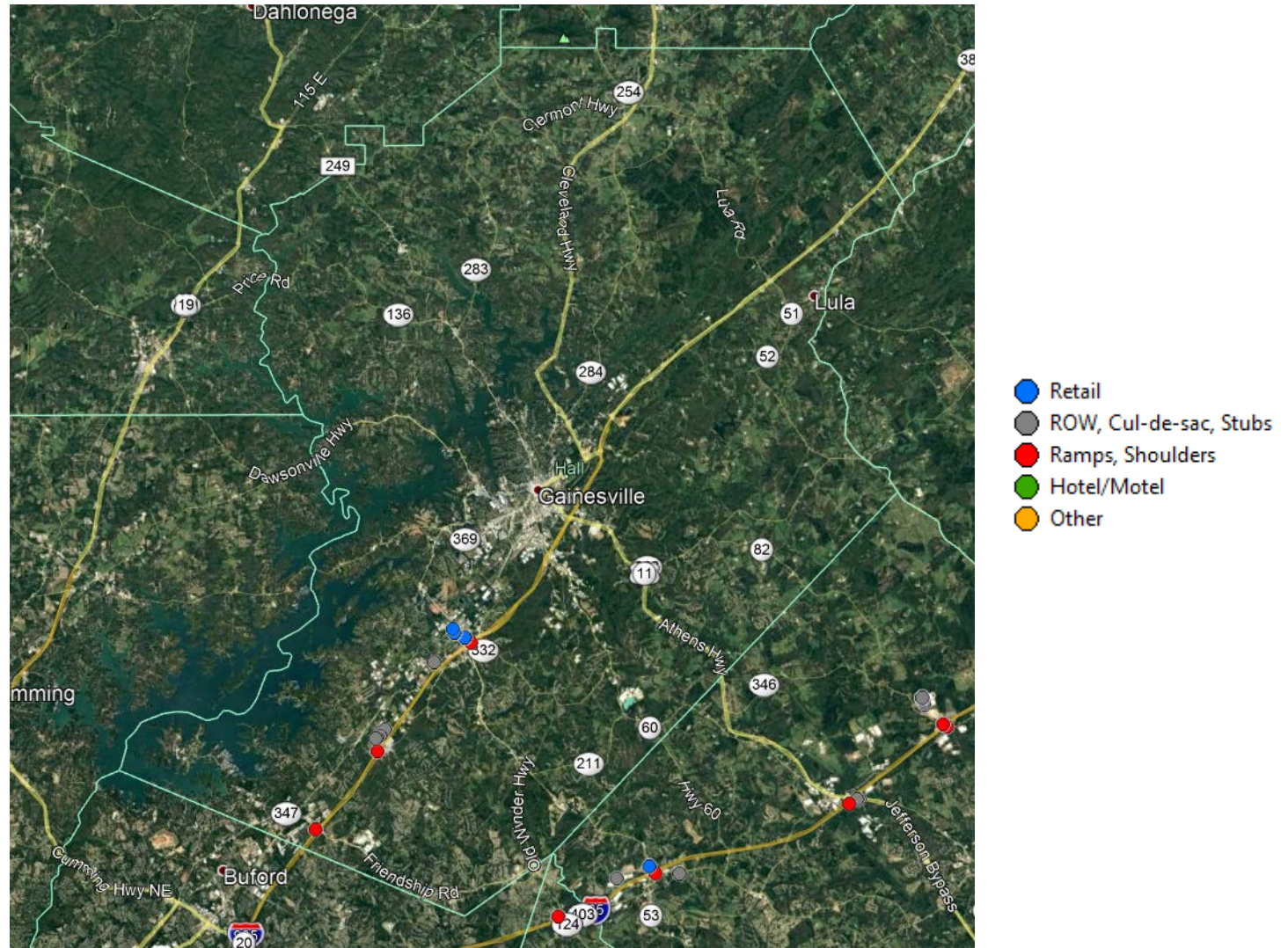
# Forsyth County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



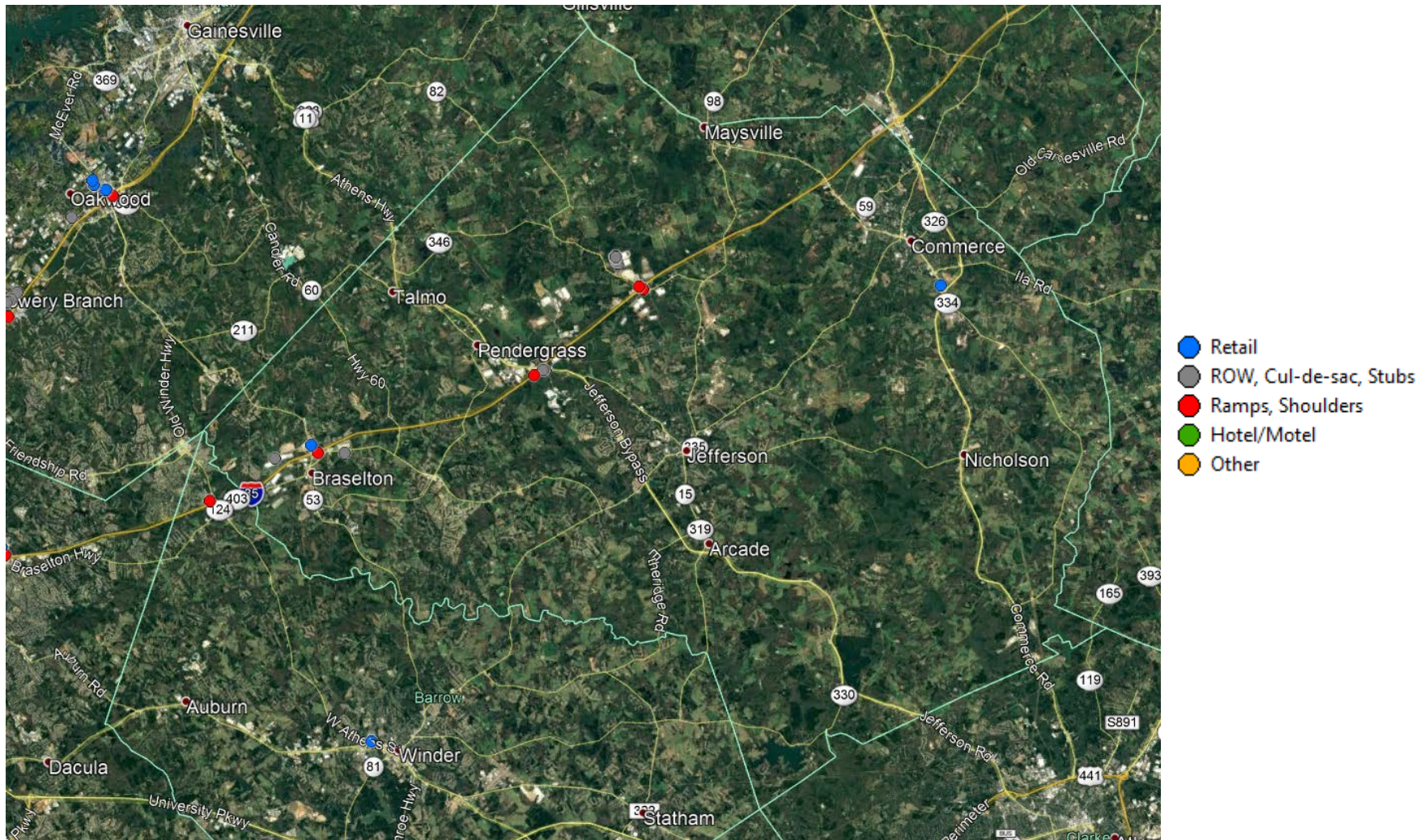
# Hall County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



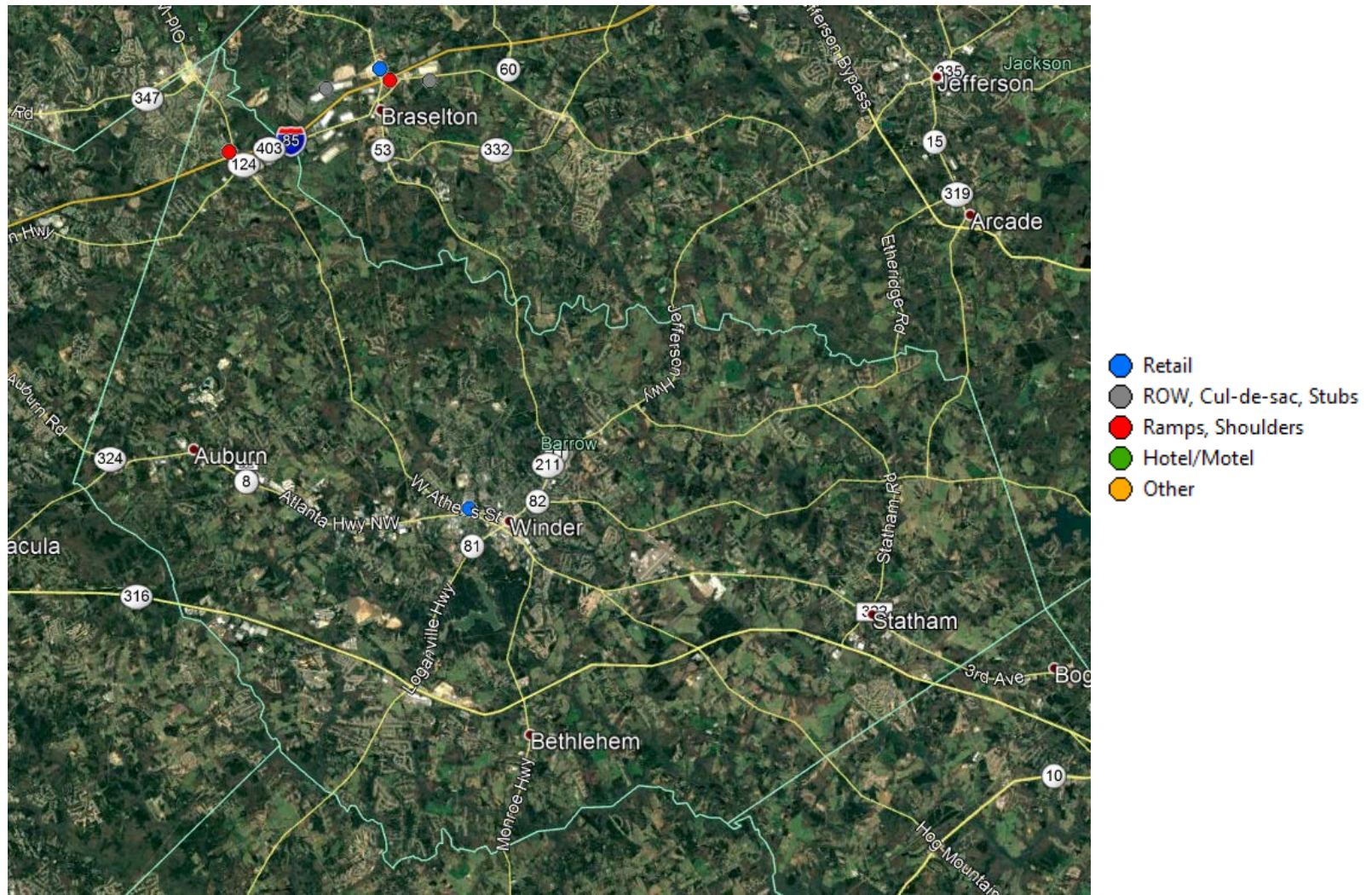
# Jackson County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



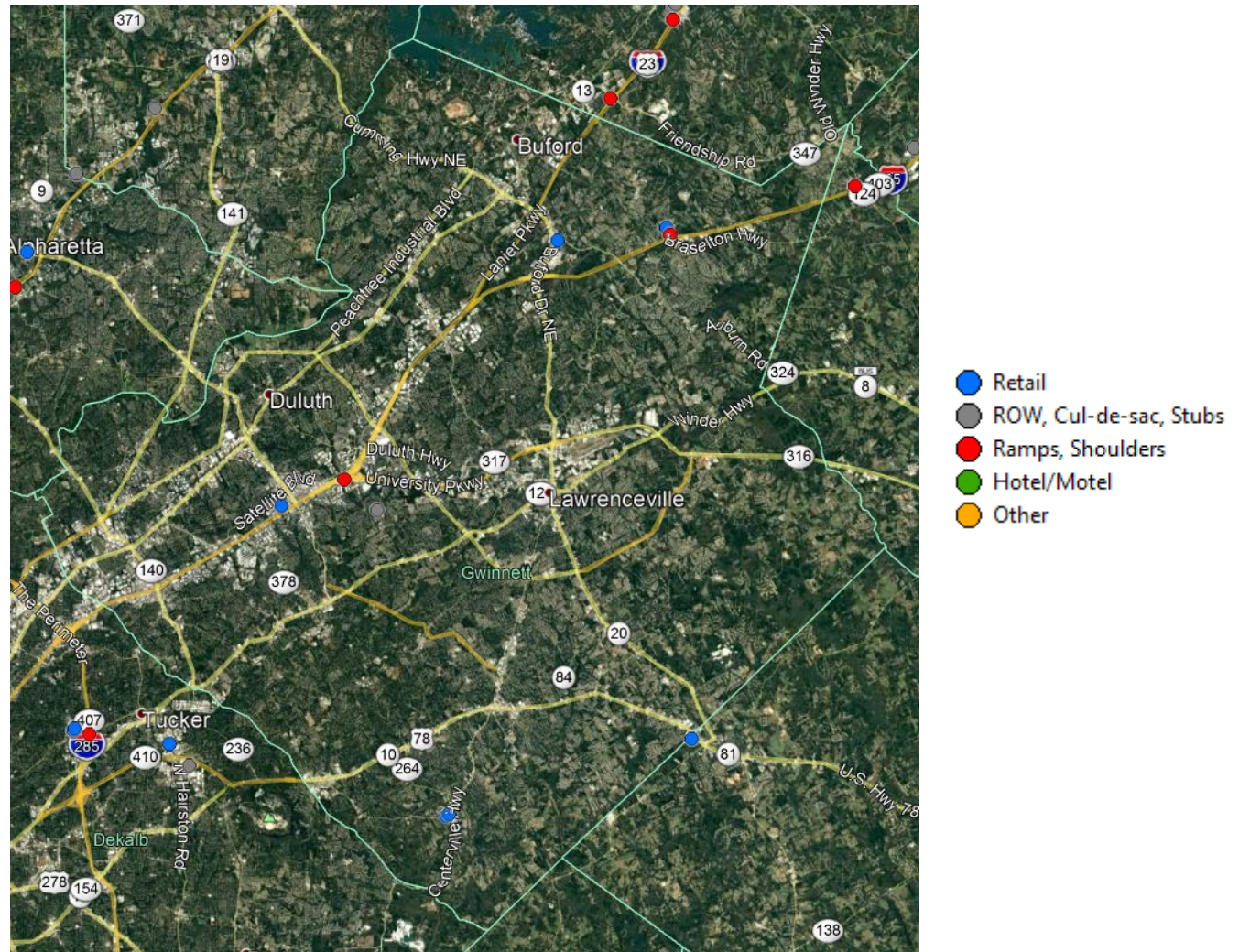
# Barrow County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16–11/20/16)



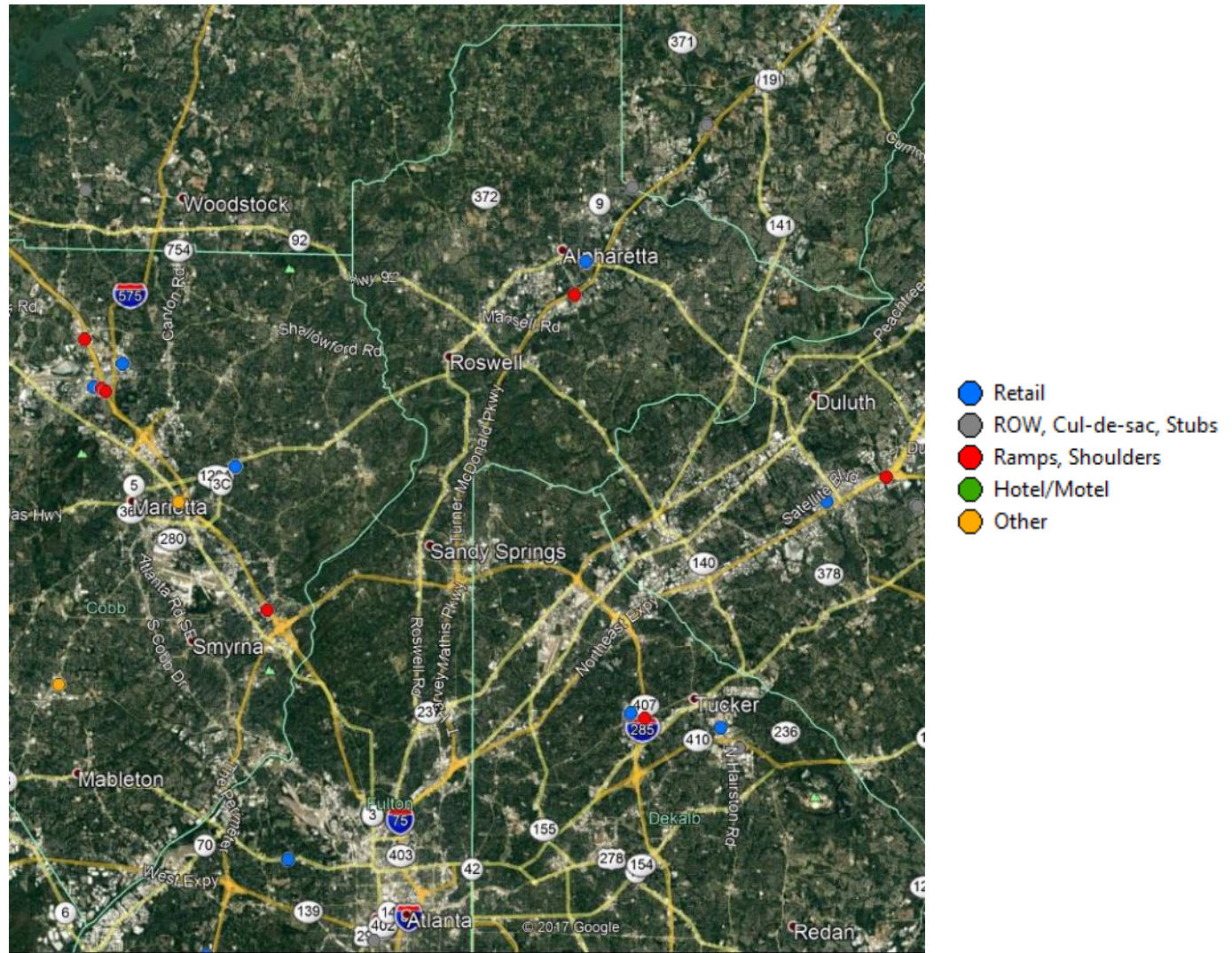
# Gwinnett County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



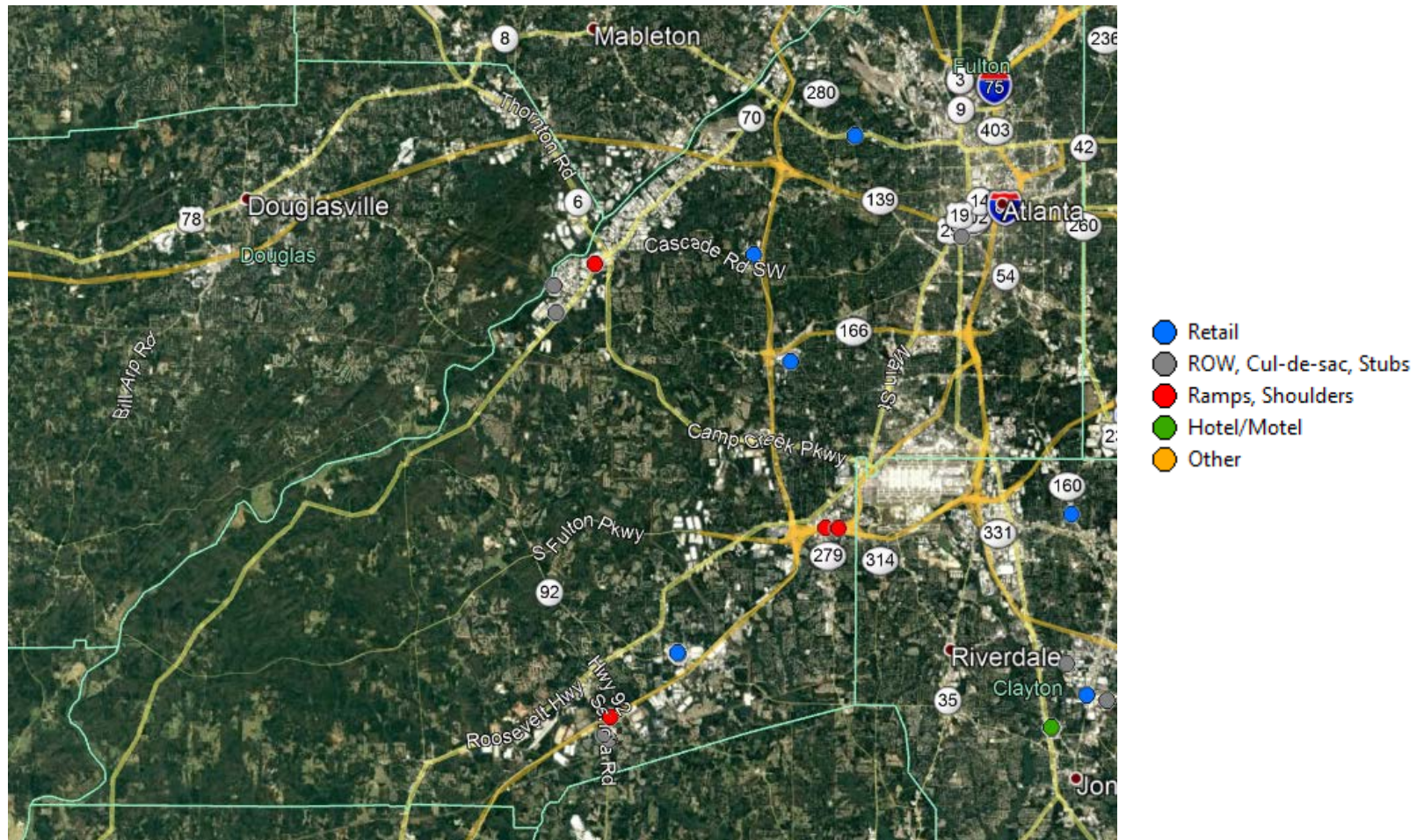
# N. Fulton County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



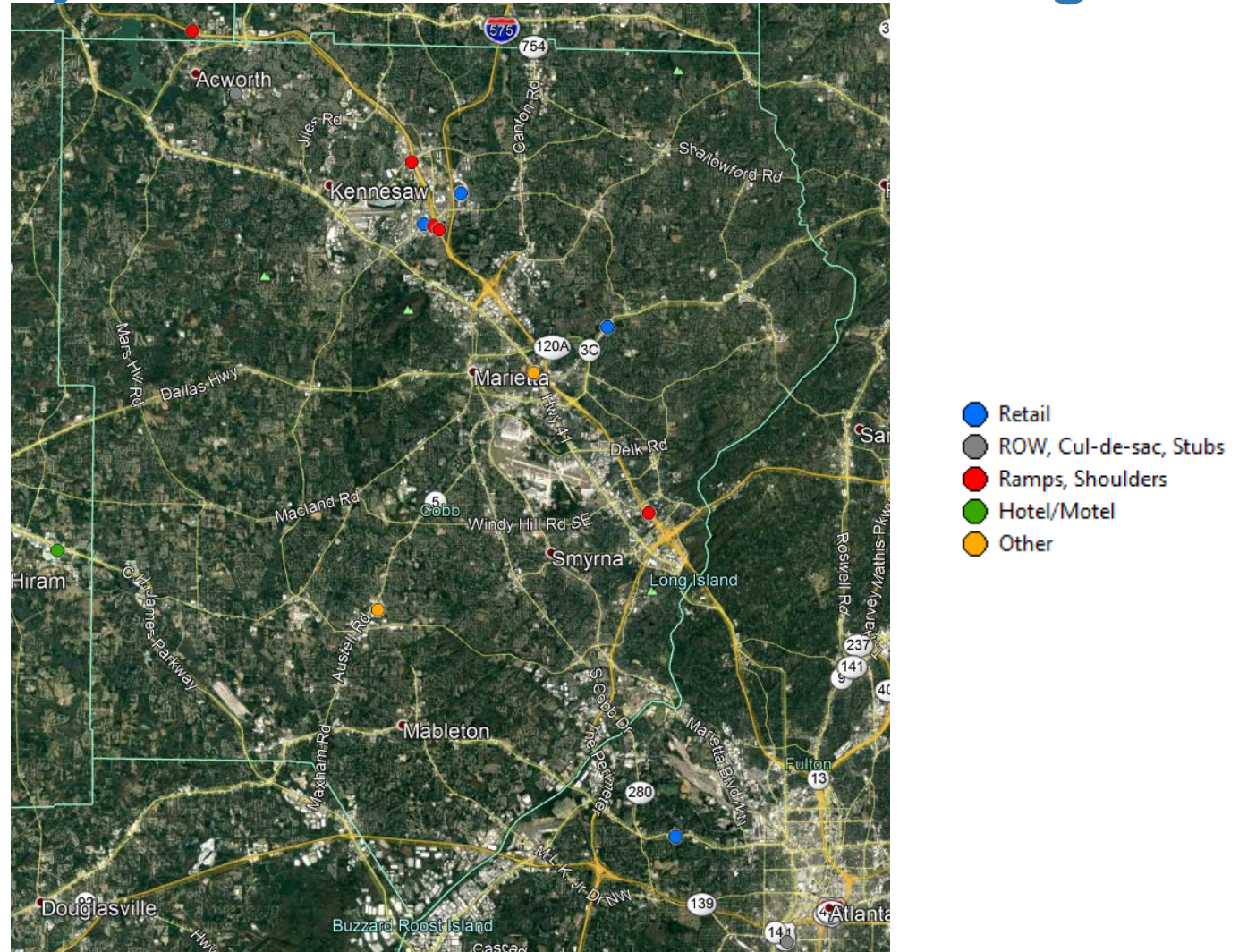
# S. Fulton County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)

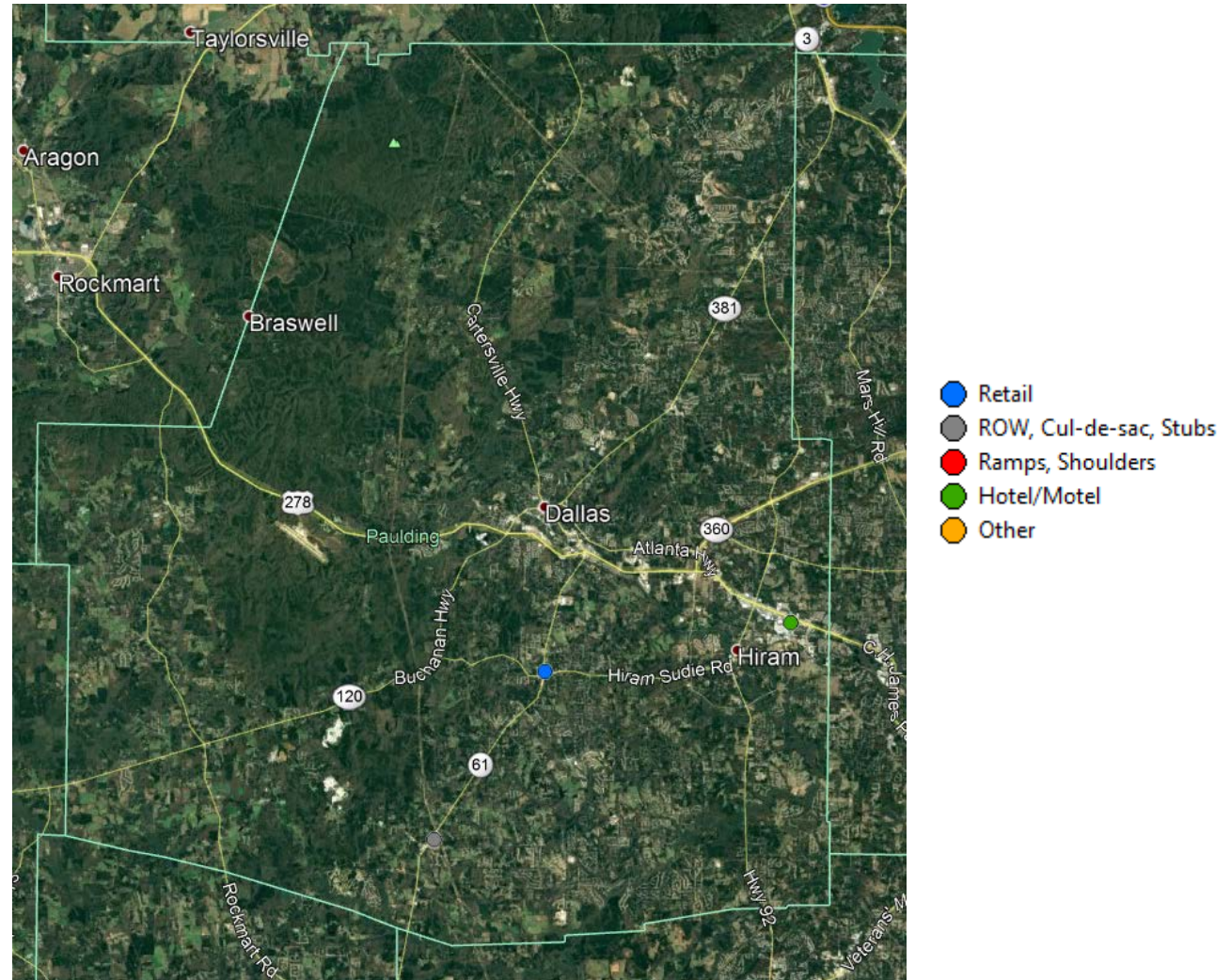


# Cobb County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)

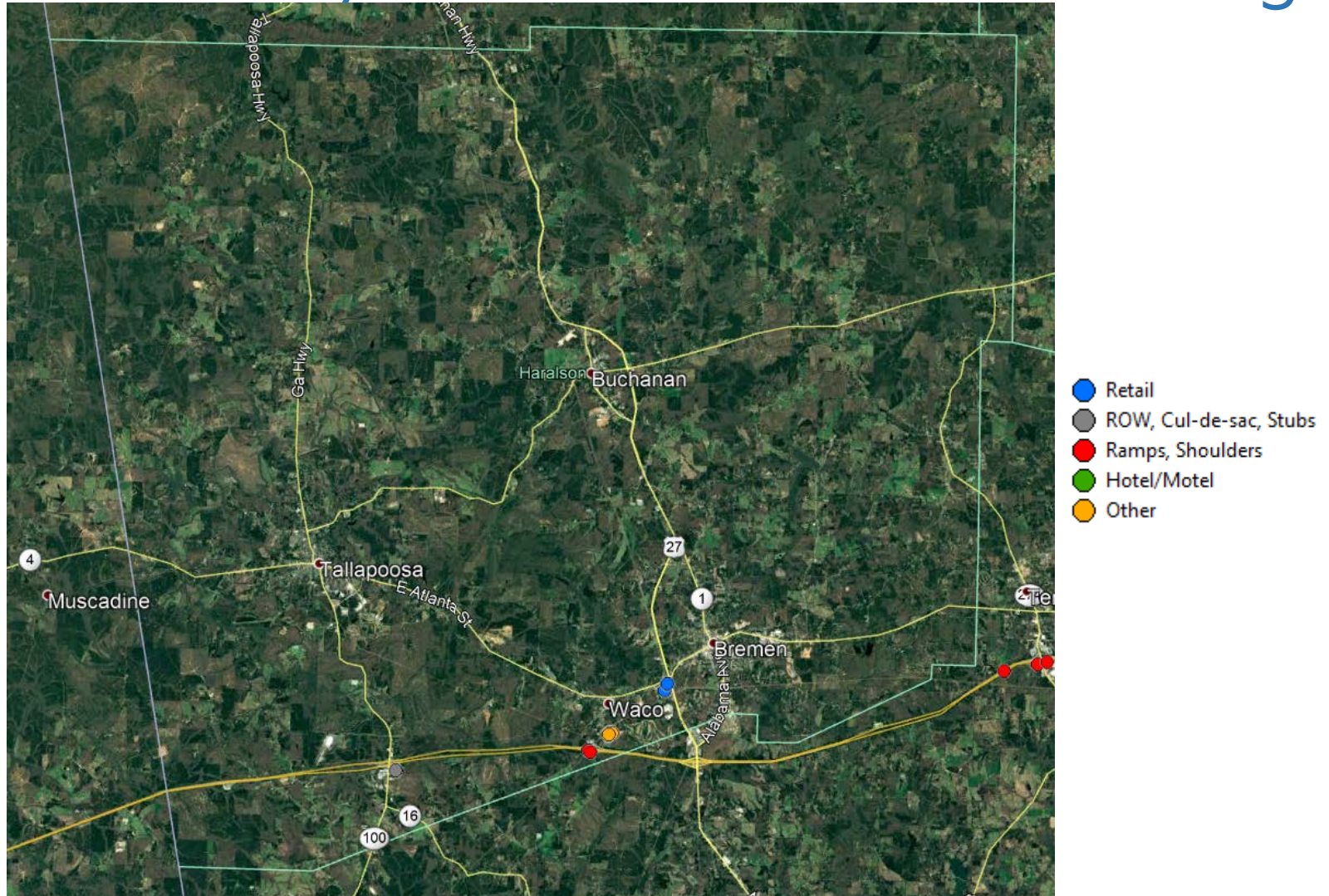
# Paulding County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



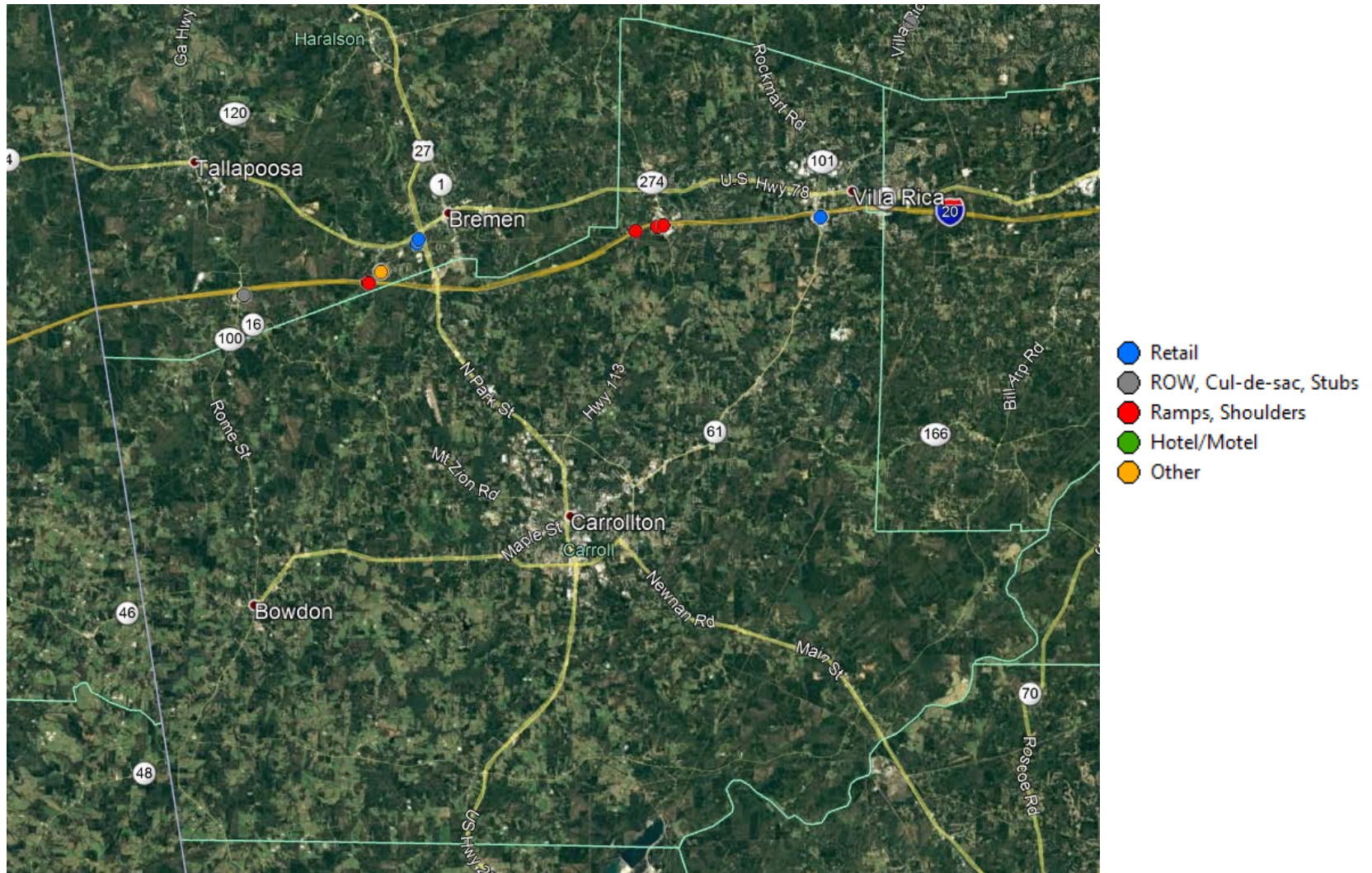
# Haralson County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



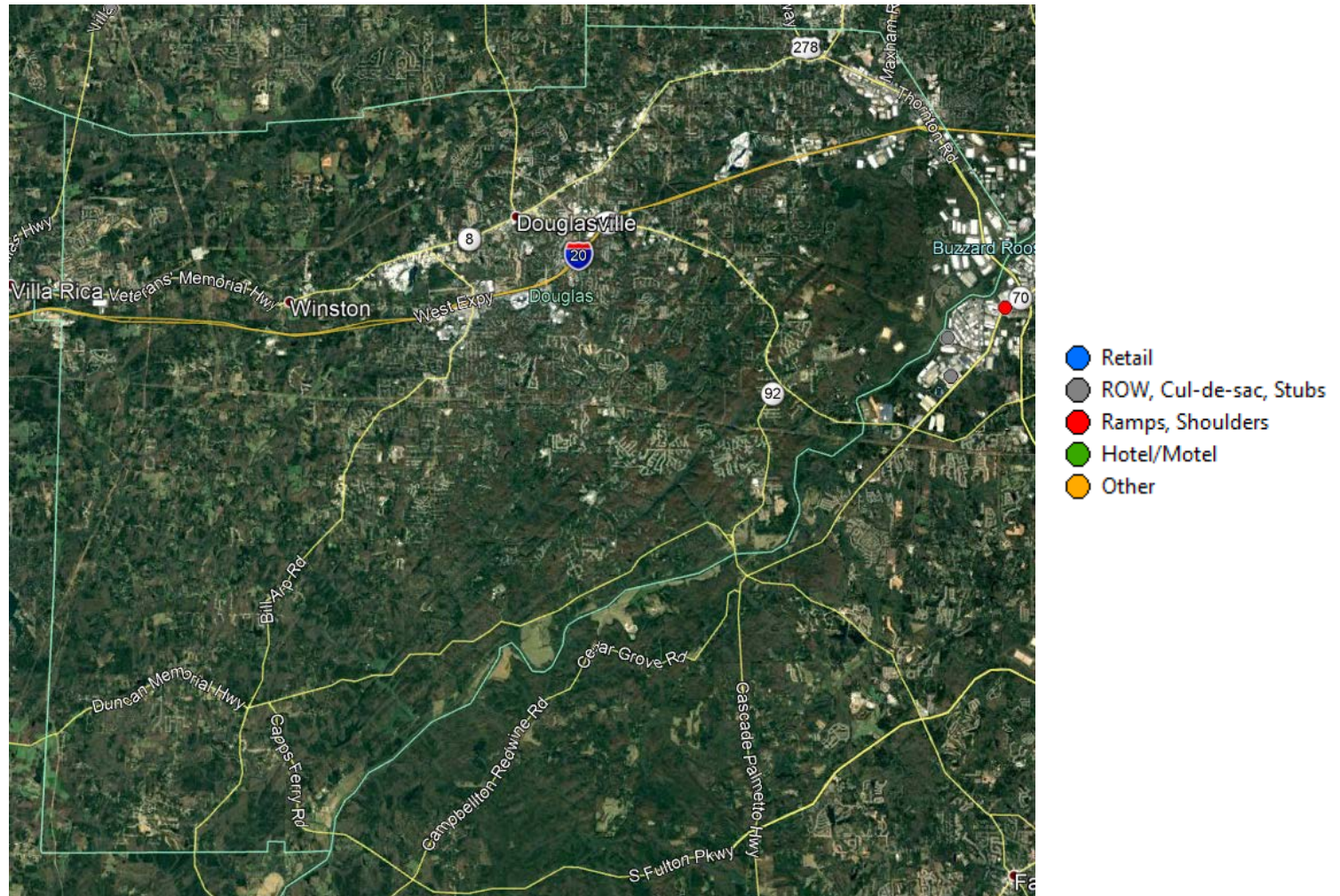
# Carroll County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



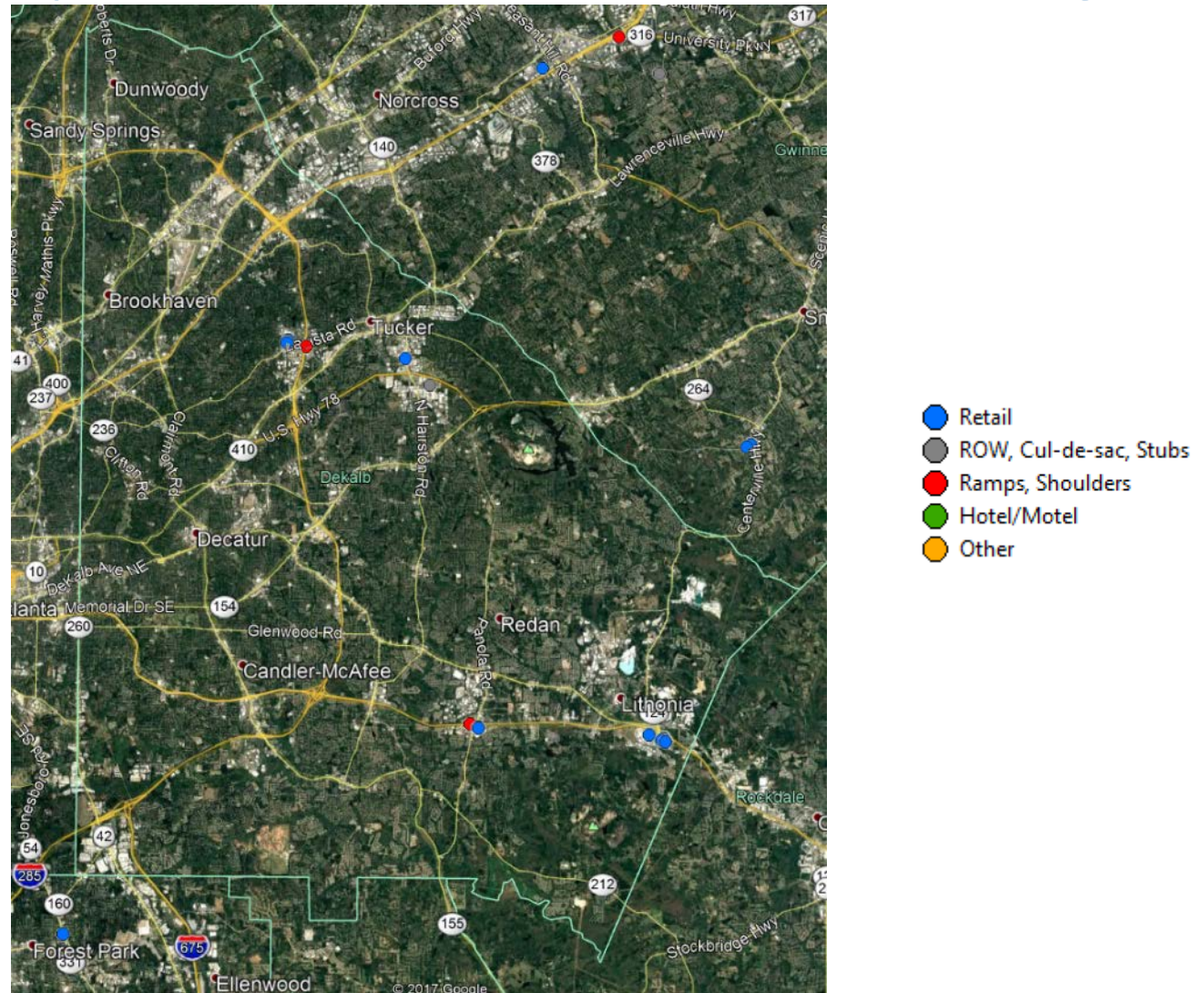
# Douglas County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



# DeKalb County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



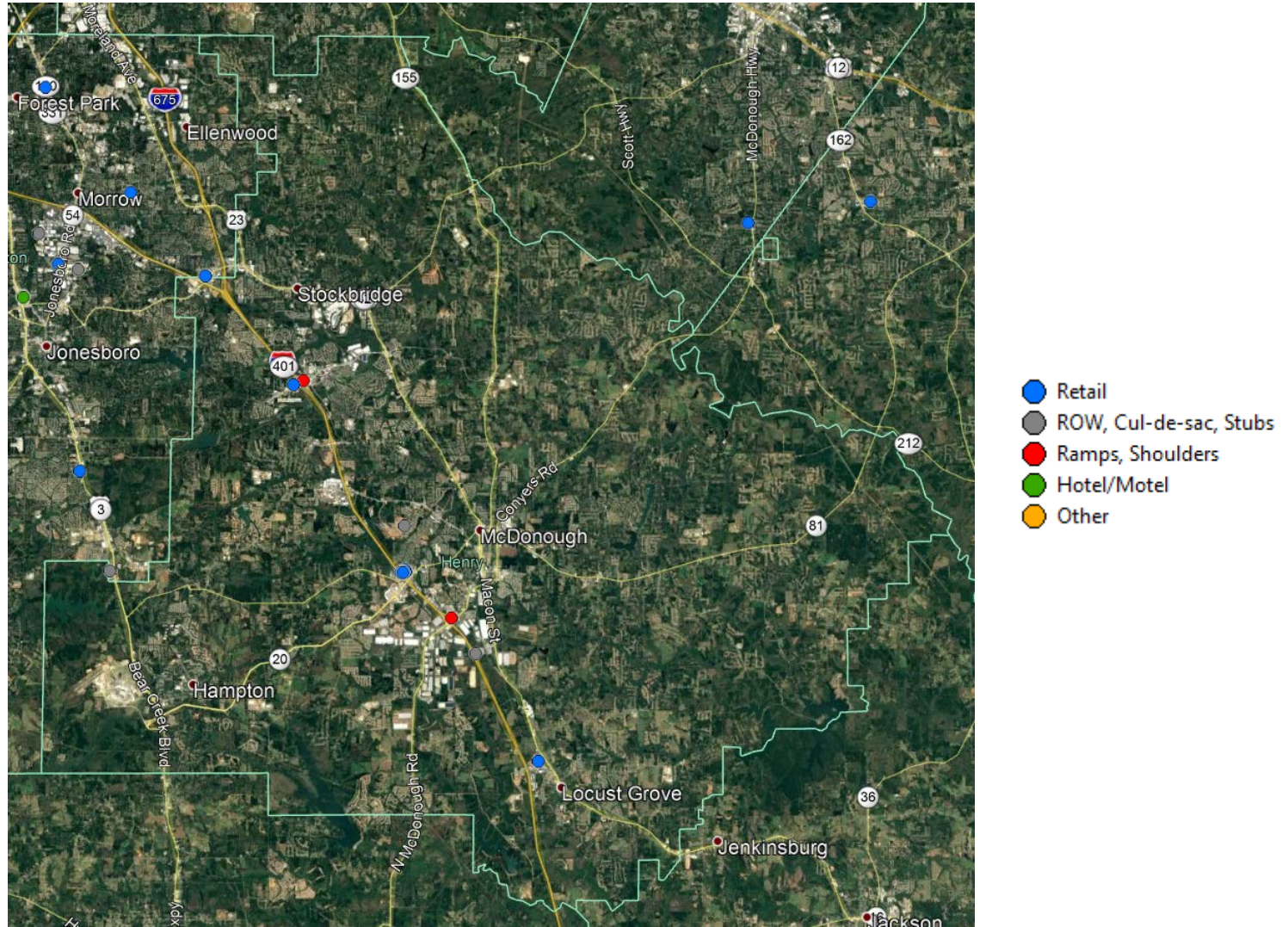
# Rockdale County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



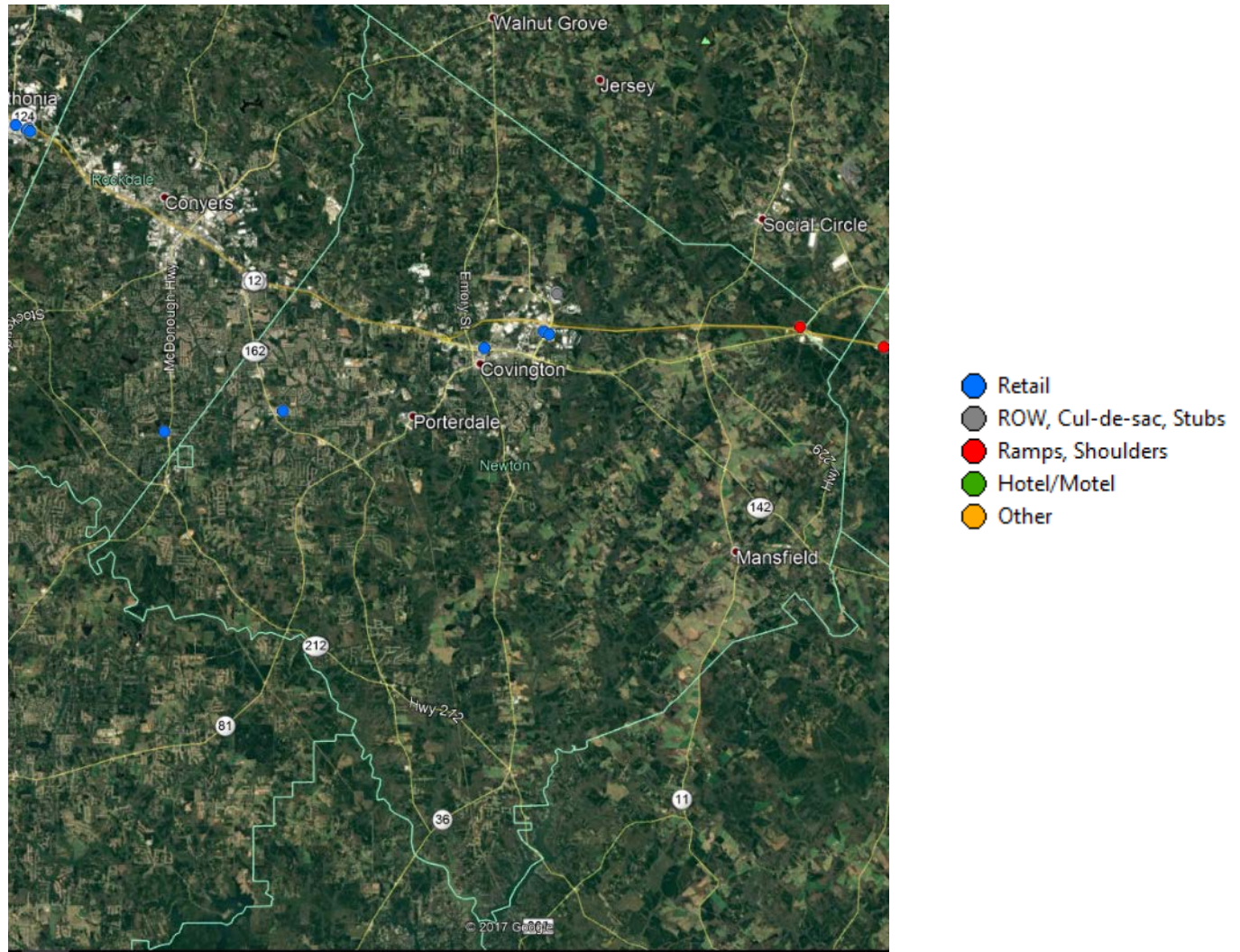
# Henry County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



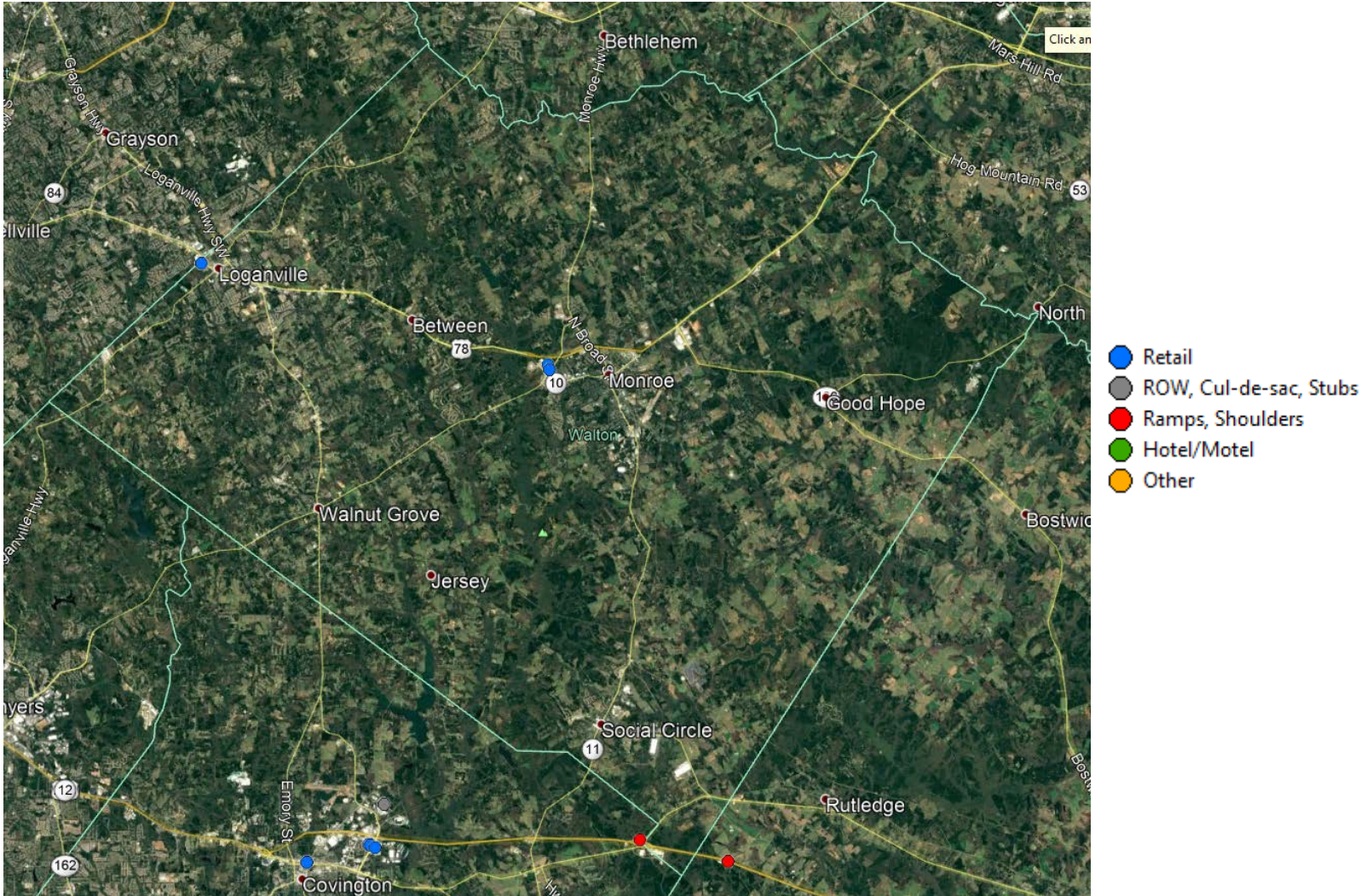
# Newton County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



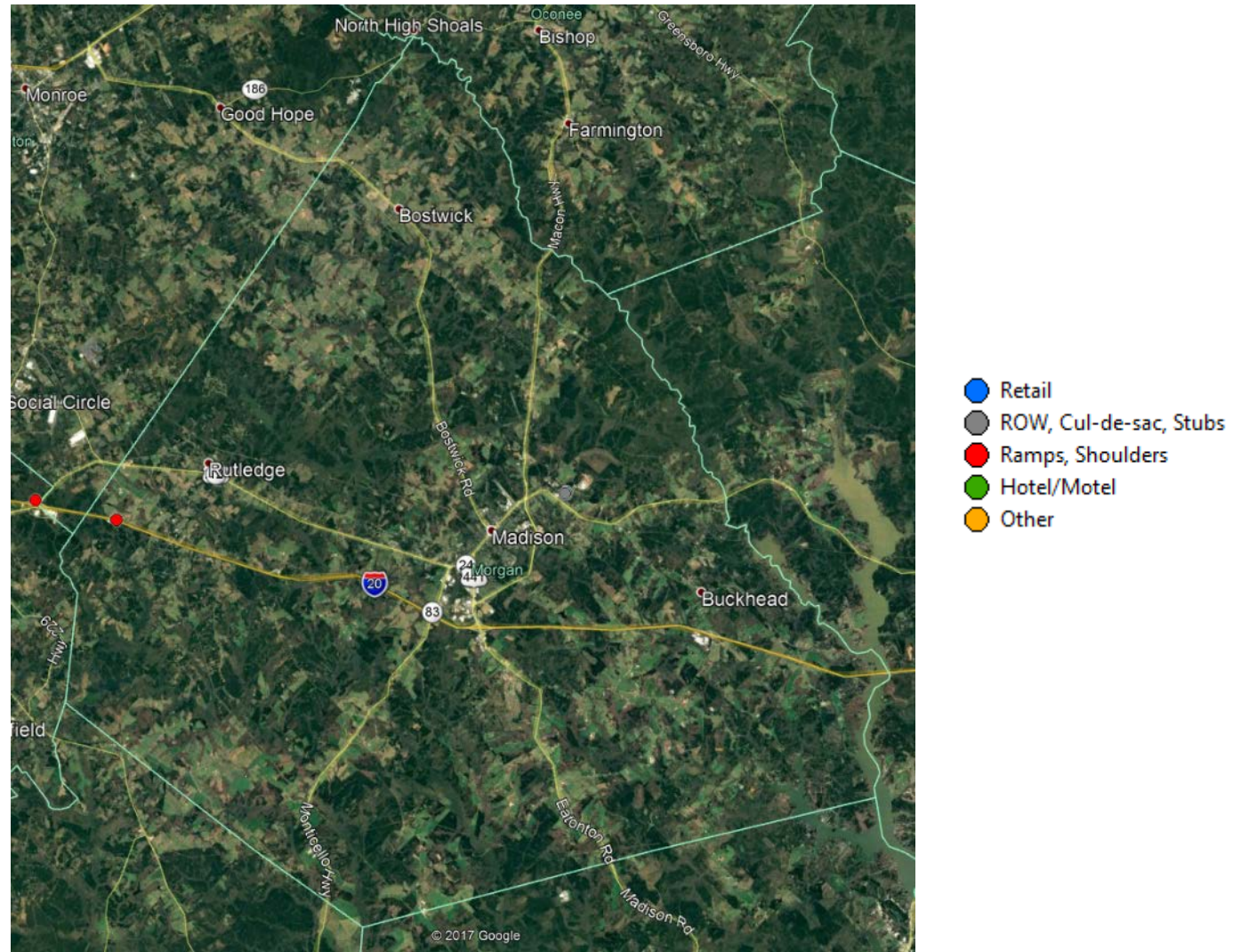
# Walton County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



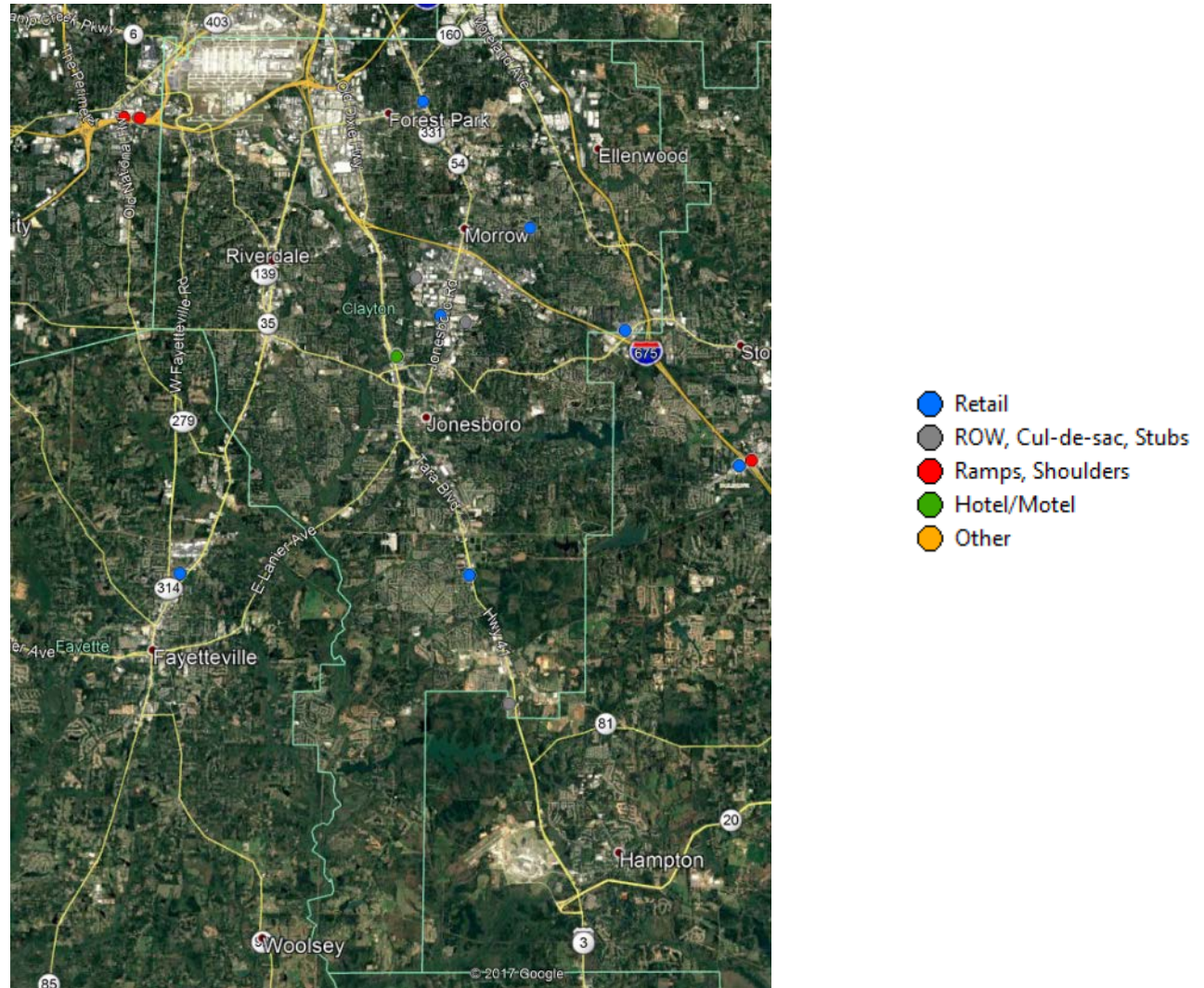
# Morgan County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)

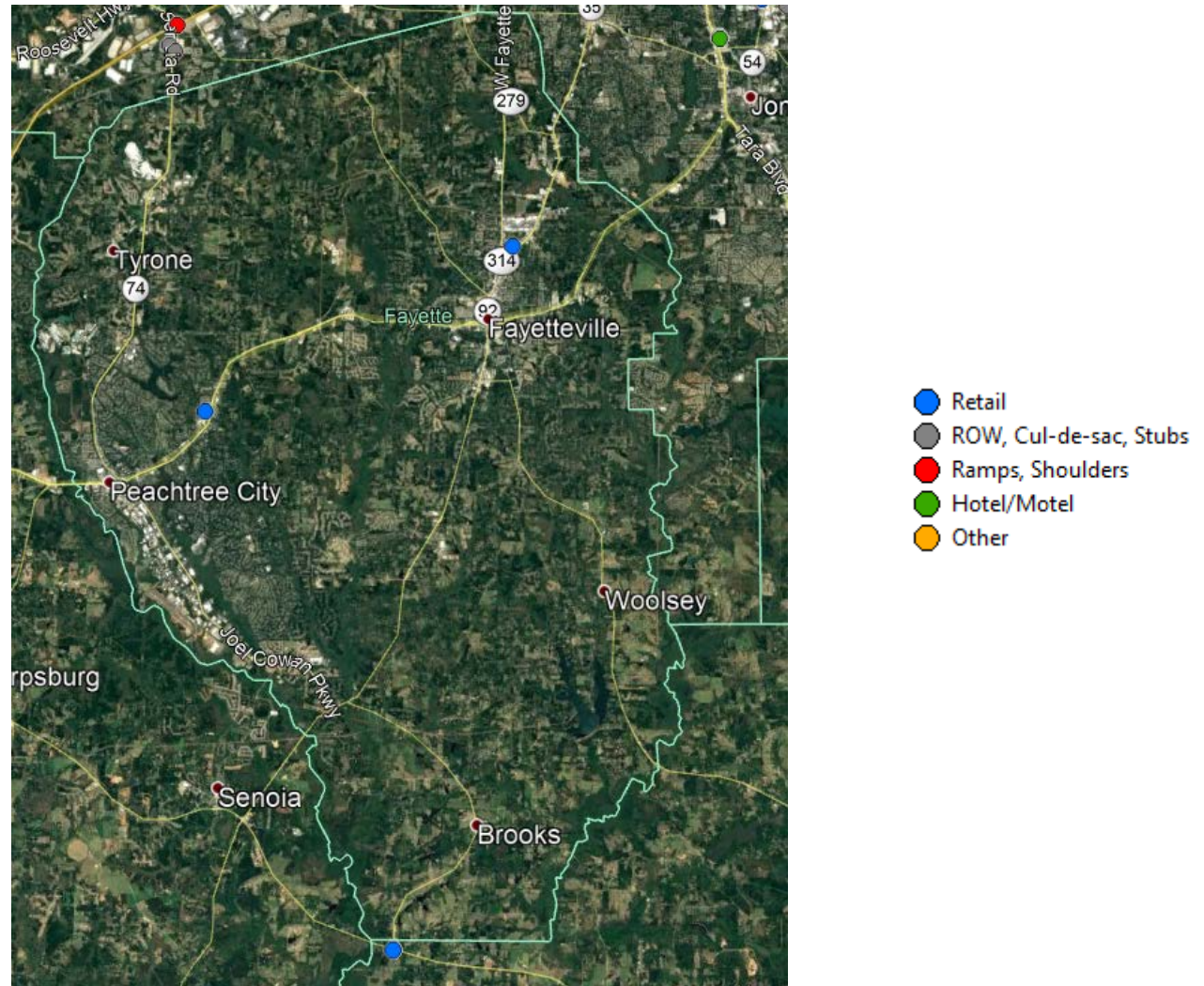


# Clayton County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)

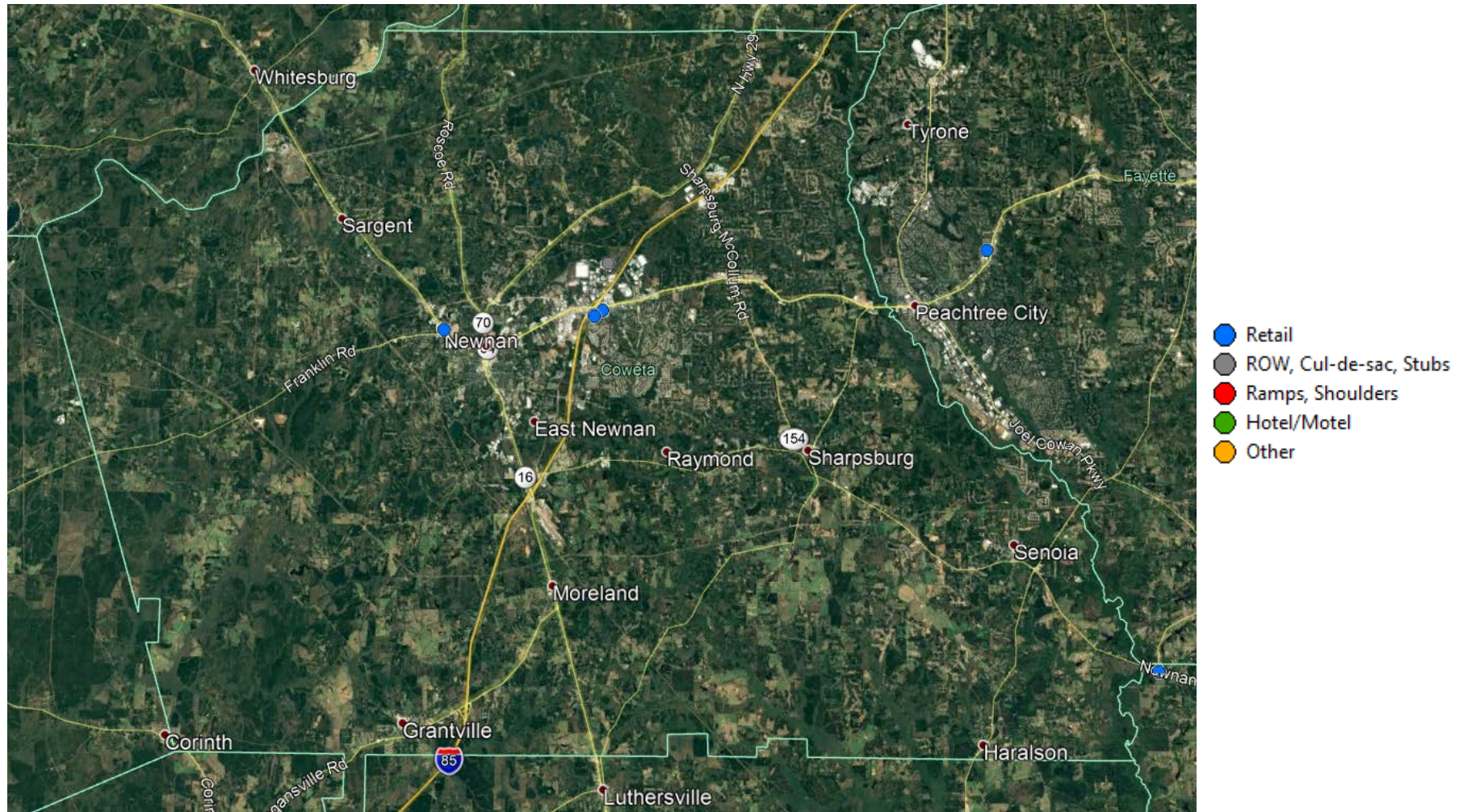
# Fayette County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



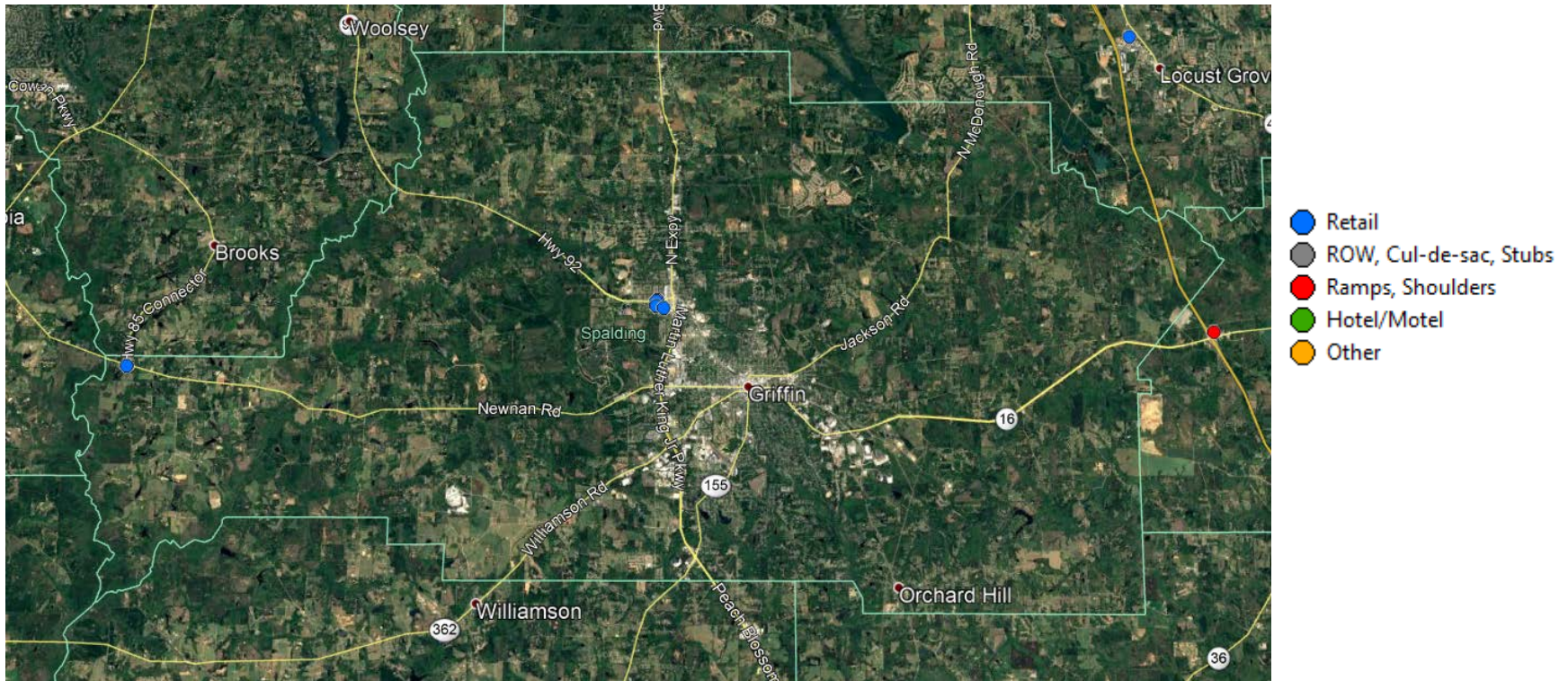
# Coweta County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



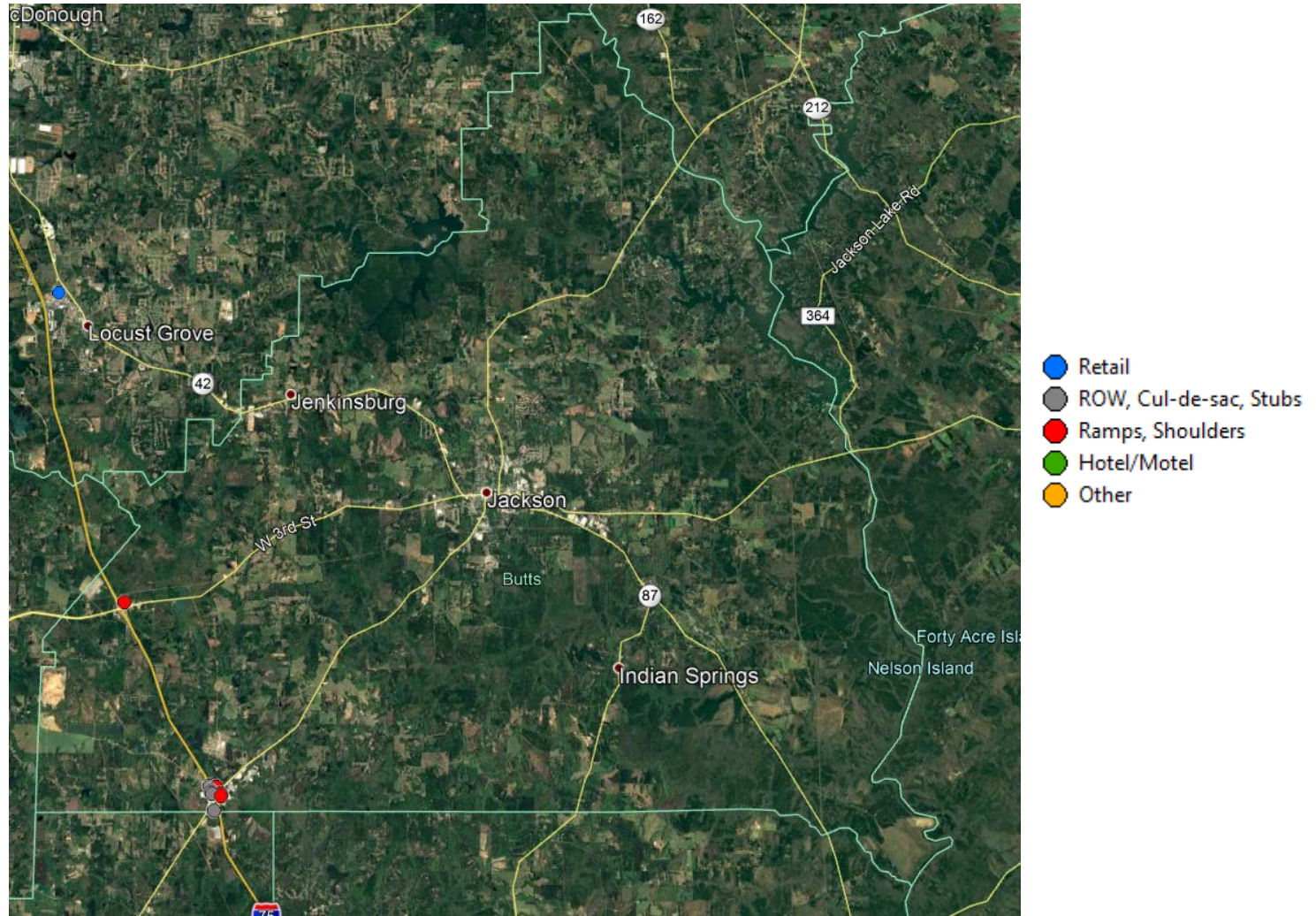
# Spalding County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)



# Butts County - Unauthorized Truck Parking



Source: ATRI GPS Truck Speed Data (11/5/16 – 11/20/16)

## **Appendix 5-A**

### **National Coalition on Truck Parking - Topic Areas for Further Review**



## FHWA – National Coalition on Truck Parking: Activity Report 2015-2016

### Summary of Initial List of Potential Recommendation for Further Assessment/Review by Coalition

| Topic Areas and Initial Findings for Further Review   | Incorporated into Atlanta Regional Truck Parking Assessment Study Recommendations |
|---|---|
| <b>Parking Capacity</b> <ul style="list-style-type: none"> <li>Develop additional truck parking capacity through the creative use of public land within highway rights-of-way.</li> <li>Develop an updated national design standard for parking facilities, considering the needs of oversized trucks, security, and lighting needs while also maximizing the capacity of a truck parking area within the highway right-of-way.</li> <li>Integrate shippers/receivers into the conversation to address truck parking needs at industrial sites.</li> <li>Address truck parking needs in the context of improving the efficiency of the entire supply chain.</li> </ul>  | <b>Strategy 1</b>   |
| <b>Technology and Data</b> <ul style="list-style-type: none"> <li>Develop interoperable tools to disseminate real-time information about parking availability at highway rest areas and private truck stops.</li> <li>Incorporate truck parking technology into trip planning and reservation services using existing fleet/vehicle management software.</li> <li>Build parking availability and reservation capabilities into connected vehicle and vehicle-to-infrastructure (V2I) technology.</li> </ul>   | <b>Strategies 4 and 5</b>   |
| <b>Funding, Finance, and Regulations</b> <ul style="list-style-type: none"> <li>Establish a dedicated funding source to support capital projects and maintenance for public rest areas and truck parking facilities on the national highway network.</li> <li>Promote innovative local land-use controls and funding mechanisms such as industrial park co-operatives or industrial tax districts for pooled parking in industrial areas.</li> <li>Promote and support public-private partnerships for new or expanded parking facilities.</li> <li>Study financial models for truck parking fees to provide a source of capital and operating revenue for truck parking facilities.</li> </ul>   | <b>Strategy 2</b>   |
| <b>State, Regional, and Local Government Coordination</b> <ul style="list-style-type: none"> <li>Encourage States and metropolitan planning organizations (MPO) to address truck parking and similar issues in State and regional freight plans.</li> <li>Conduct outreach on truck parking and other important trucking industry issues through MPOs, regional councils, economic development authorities, and national industry organizations.</li> <li>Involve trucking and truck stop industries in State and MPO freight or transportation advisory committees to address truck parking needs.</li> <li>Develop a public relations campaign to educate the public and elected officials about the importance of truck parking in freight transportation and industrial development.</li> </ul> | <b>Strategies 2 and 3</b>   |

## **Appendix 5-B**

### **FDOT Truck Parking Availability System (TPAS) Information**

# TRUCK PARKING AVAILABILITY SYSTEM (TPAS)



REST AREA  
TRUCK PARKING

21  
SPACES  
AVAILABLE

Florida's transportation system has seen an increase in commercial vehicle traffic over the years. The high percentage of freight transported by trucks illustrates the significance and importance of the Florida roadway network as it relates to just-in-time deliveries. With the increase in commercial vehicle traffic, additional issues arise; one of the issues deals with commercial vehicle operators and the Federal Motor Carrier Safety Administrations (FMCSA) hours-of-service (HOS) rules.

FMCSA put HOS rules in place to ensure that commercial vehicle operators receive adequate rest; the rules were designed to prevent commercial vehicle related crashes and fatalities by prescribing on-duty and off-duty rest periods for drivers. However, truck drivers face two main issues in meeting these requirements:

- Lack of safe and convenient parking options.
- Lack of real-time parking availability information.

Florida's truck stops experience overflow parking at some locations while others remain underutilized, demonstrating a need for stronger parking information management. Truck drivers facing this ongoing challenge often resort to unsafe and illegal methods of parking on the interstate mainline and ramp shoulders or in vacant lots.

## FIU RESEARCH

In a proactive approach to address the issue of truck parking shortage, the Florida Department of Transportation (FDOT) initiated a research project in 2011 with Florida International University (FIU) to determine the supply and demand characteristics for commercial truck parking in Florida. The research determined that a technology solution could be used to improve parking management.

## PILOT PROJECT

As part of the research, a test project was deployed to review rest area parking data and to test the technology and determine the feasibility of providing real-time parking availability information. The project tested in-pavement wireless detection sensors (WDS) at the I-10 rest area in Leon County, west of Tallahassee, and utilized closed circuit television (CCTV) cameras for verification of the availability data.

A second test project deployment in a rest area in St. Johns County on I-95 south of Jacksonville tested the use of microwave vehicle detection sensors (MVDS) to count the vehicles as they entered and exited the rest area. An embedded dynamic message sign (DMS) approximately one mile ahead of the rest area notified commercial vehicle operators of the availability of parking spaces.

## AID GRANT

Based on the FIU study and test deployment projects, the FDOT applied for and in June 2015 received a \$1 million Accelerated Innovation Deployment (AID) grant for a demonstration project on a Truck Parking Availability System (TPAS). The AID grant will supplement FDOT funding to deploy the TPAS at seven public parking sites located along I-4 and I-95 in FDOT District 5.

## RESEARCH

As the AID project was being developed, in 2016 the FDOT tested the performance of available technology through a research project with the University of Florida (UF) at two rest areas in Columbia County to further define the parameters of the new WDS deployment. The study resulted in the establishment of a Developmental Specification outlining the requirements of the WDS.

## FAST LANE GRANT

Additionally, as part of the initial AID project, the FDOT undertook project development to deploy TPAS throughout the entire Florida interstate system public parking areas: welcome centers, rest areas and weigh stations. The effort included concept plan development, cost estimates, environmental evaluation, utility coordination and right-of-way requirements. Leveraging the exhaustive efforts and the level of preparedness, an application for the inaugural Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) grant application was submitted. The FDOT was notified in September 2016 of the intent to award an additional \$10.7 million in Federal Funding for the full deployment of TPAS throughout Florida's interstate system, to supplement state funding.

The Florida Department of Transportation (FDOT) is currently developing a Truck Parking Availability System (TPAS) to address the need for parking information management. The TPAS program will be delivered in three stages:

## STAGE

# 1

Implementation of technology to accurately assess and disseminate the availability of truck parking

Stage 1 is currently underway through a series of design-build projects. The system will provide real-time information on the availability of parking spaces along the interstates and will be deployed in state-owned welcome centers, rest areas and weigh stations. TPAS will detect parking availability through sensors embedded in the parking areas as well as through vehicle detection counters. The information will be aggregated through the existing Intelligent Transportation Systems fiber optic network at each of the District Regional Transportation Management Centers (RTMC). The truck parking availability will be disseminated to the public through roadside signs, the FL511 application as well as third-party data feeds. It is anticipated that statewide implementation will be completed in 2019.

## STAGE

# 2

Development of predictive analysis for future parking availability

Stage 2 will follow once sufficient stabilization of parking occurs and adequate data is available. As statistically sufficient data is aggregated, algorithms will predict parking availability based on trends in parking utilization. This information will be made available through data feeds and allow motor carrier operators to make educated trip logistics planning to optimize safe and efficient freight movement throughout Florida. It is anticipated that this stage will begin immediately upon completion of Stage 1.

## STAGE

# 3

Incorporation of private parking locations for systemwide resource utilization

Stage 3 will require ongoing coordination with third-party vendors to integrate private parking facilities into TPAS. Public-private partnerships may be leveraged to deploy technology at private system parking facilities. Private parking data will then be aggregated and disseminated along with public parking information to provide full system availability and predictive analysis to commercial vehicle operators and dispatchers, maximizing use of the parking network.

The information that will be provided by TPAS will assist truck drivers in identifying available parking locations where the technology is deployed. While this provides a great resource for trip planning and increasing safety, it only assists in alleviating a part of the issue. There is still a need for additional parking areas for commercial vehicle operators. The TPAS will address full utilization of existing parking resources through efficient technology application.

## VEHICLE DETECTION SYSTEM.

(REV 12-20-16)

ARTICLE 660-2 is expanded by the following:

**660-2.5 Truck Parking Detection System:** Furnish and install a truck parking detection system in accordance with the details shown in the Plans. The detection system must be capable of the following:

1. Detecting vehicle occupancy, including partial occupancy, for each parking space.
2. Detecting FHWA Vehicle Class 2 and above vehicles.
3. Vehicle detection in all weather conditions including heavy rain, fog, snow, ice, and high winds.

All materials furnished, assembled, fabricated, or installed must be new products.

**660-2.5.1 Technology Type – Wireless Magnetometer:** Meet the requirements of 660-2.1.2.4.

**660-2.5.2 Mechanical Requirements:** Meet the requirements of 660-2.1.3.

**660-2.5.3 Environmental Requirements:** Meet the requirements of 660-2.1.4.

**660-2.5.4 Performance Requirements:** Turnover accuracy is defined as the detector's ability to identify parking events correctly (ingress and egress). Occupancy accuracy is defined as the percentage of time the detector reports the status of the parking spaces correctly (vacant or occupied).

Each detection system must be tested to meet the following minimum performance requirements, conducted over two 15-hour (6:00p.m. to 9:00 a.m.) sessions:

Turnover Accuracy – 90%

Occupancy Accuracy – 95%

**660-2.5.6 Installation Requirements:** All components must be installed in accordance with the manufacturer's requirements.

Wireless detection must be activated and communicating with the repeaters/relay nodes and access point/data collector/data aggregator before installing them into the ground. Provide evidence of functionality to the Engineer prior to installation. Loop sealant used must be listed on the Approved Product List (APL).

All above ground components must be placed on new poles and have a minimum mounting height of 15 feet above ground level.

Cabinets provided must be listed on the APL.

**660-2.5.7 Security Requirements:** Provide a Cyber Security Plan to the Engineer that includes security for all interfaces within the Department's communications network, as well as all Department server vulnerabilities introduced by the proposed system.

**660-2.5.8 Warranty:** Meet the requirements of 660-4. All wireless magnetometer batteries must include a five year warranty.

**660-2.5.9 Method of Measurement:** The Contract unit price for each wireless magnetometer detection system will include furnishing, placement, and testing of all components, materials and equipment, and for all tools, labor, equipment, hardware, operational software packages and firmware, supplies, support, personnel training, shop drawings, warranty documentation, and incidentals necessary for a complete and accepted installation.



**660-2.5.10 Basis of Payment:** Price and payment will be full compensation for all work specified in this Section. Payment will be made under:

|                |  |
|----------------|--|
| Item No. 660-5 | Vehicle Detection System – Wireless Magnetometer – each. |
|----------------|--|

Deliverable #3 (Final Report)

to the

Florida Department of Transportation  
Research Office

on Project

**Commercial Truck Parking Detection Technology Evaluation for  
Columbia County Rest Areas**

**Contract #: BDV31-977-56**

University of Florida  
Department of Civil and Coastal Engineering



November 2016

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## **DISCLAIMER**

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data published herein. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

## SI (MODERN METRIC) CONVERSION FACTORS

| SI* (MODERN METRIC) CONVERSION FACTORS                             |                             |                             |                             |                     |
|--|-----------------------------|-----------------------------|-----------------------------|---------------------|
| APPROXIMATE CONVERSIONS TO SI UNITS                                |                             |                             |                             |                     |
| Symbol   | When You Know               | Multiply By                 | To Find                     | Symbol              |
| <b>LENGTH</b>  |                             |                             |                             |                     |
| in   | inches                      | 25.4                        | millimeters                 | mm                  |
| ft   | feet                        | 0.305                       | meters                      | m                   |
| yd   | yards                       | 0.914                       | meters                      | m                   |
| mi   | miles                       | 1.61                        | kilometers                  | km                  |
| <b>AREA</b>  |                             |                             |                             |                     |
| in <sup>2</sup>  | square inches               | 645.2                       | square millimeters          | mm <sup>2</sup>     |
| ft <sup>2</sup>  | square feet                 | 0.093                       | square meters               | m <sup>2</sup>      |
| yd <sup>2</sup>  | square yard                 | 0.836                       | square meters               | m <sup>2</sup>      |
| ac   | acres                       | 0.405                       | hectares                    | ha                  |
| mi <sup>2</sup>  | square miles                | 2.59                        | square kilometers           | km <sup>2</sup>     |
| <b>VOLUME</b>  |                             |                             |                             |                     |
| fl oz  | fluid ounces                | 29.57                       | milliliters                 | mL                  |
| gal  | gallons                     | 3.785                       | liters                      | L                   |
| ft <sup>3</sup>  | cubic feet                  | 0.028                       | cubic meters                | m <sup>3</sup>      |
| yd <sup>3</sup>  | cubic yards                 | 0.765                       | cubic meters                | m <sup>3</sup>      |
| NOTE: volumes greater than 1000 L shall be shown in m <sup>3</sup> |                             |                             |                             |                     |
| <b>MASS</b>  |                             |                             |                             |                     |
| oz   | ounces                      | 28.35                       | grams                       | g                   |
| lb   | pounds                      | 0.454                       | kilograms                   | kg                  |
| T  | short tons (2000 lb)        | 0.907                       | megagrams (or "metric ton") | Mg (or "t")         |
| <b>TEMPERATURE (exact degrees)</b>                                 |                             |                             |                             |                     |
| °F   | Fahrenheit                  | 5 (F-32)/9<br>or (F-32)/1.8 | Celsius                     | °C                  |
| <b>ILLUMINATION</b>  |                             |                             |                             |                     |
| fc   | foot-candles                | 10.76                       | lux                         | lx                  |
| fl   | foot-Lamberts               | 3.426                       | candela/m <sup>2</sup>      | cd/m <sup>2</sup>   |
| <b>FORCE and PRESSURE or STRESS</b>                                |                             |                             |                             |                     |
| lbf  | poundforce                  | 4.45                        | newtons                     | N                   |
| lbf/in <sup>2</sup>  | poundforce per square inch  | 6.89                        | kilopascals                 | kPa                 |
| APPROXIMATE CONVERSIONS FROM SI UNITS                              |                             |                             |                             |                     |
| Symbol   | When You Know               | Multiply By                 | To Find                     | Symbol              |
| <b>LENGTH</b>  |                             |                             |                             |                     |
| mm   | millimeters                 | 0.039                       | inches                      | in                  |
| m  | meters                      | 3.28                        | feet                        | ft                  |
| m  | meters                      | 1.09                        | yards                       | yd                  |
| km   | kilometers                  | 0.621                       | miles                       | mi                  |
| <b>AREA</b>  |                             |                             |                             |                     |
| mm <sup>2</sup>  | square millimeters          | 0.0016                      | square inches               | in <sup>2</sup>     |
| m <sup>2</sup>   | square meters               | 10.764                      | square feet                 | ft <sup>2</sup>     |
| m <sup>2</sup>   | square meters               | 1.195                       | square yards                | yd <sup>2</sup>     |
| ha   | hectares                    | 2.47                        | acres                       | ac                  |
| km <sup>2</sup>  | square kilometers           | 0.386                       | square miles                | mi <sup>2</sup>     |
| <b>VOLUME</b>  |                             |                             |                             |                     |
| mL   | milliliters                 | 0.034                       | fluid ounces                | fl oz               |
| L  | liters                      | 0.264                       | gallons                     | gal                 |
| m <sup>3</sup>   | cubic meters                | 35.314                      | cubic feet                  | ft <sup>3</sup>     |
| m <sup>3</sup>   | cubic meters                | 1.307                       | cubic yards                 | yd <sup>3</sup>     |
| <b>MASS</b>  |                             |                             |                             |                     |
| g  | grams                       | 0.035                       | ounces                      | oz                  |
| kg   | kilograms                   | 2.202                       | pounds                      | lb                  |
| Mg (or "t")  | megagrams (or "metric ton") | 1.103                       | short tons (2000 lb)        | T                   |
| <b>TEMPERATURE (exact degrees)</b>                                 |                             |                             |                             |                     |
| °C   | Celsius                     | 1.8C+32                     | Fahrenheit                  | °F                  |
| <b>ILLUMINATION</b>  |                             |                             |                             |                     |
| lx   | lux                         | 0.0929                      | foot-candles                | fc                  |
| cd/m <sup>2</sup>  | candela/m <sup>2</sup>      | 0.2919                      | foot-Lamberts               | fl                  |
| <b>FORCE and PRESSURE or STRESS</b>                                |                             |                             |                             |                     |
| N  | newtons                     | 0.225                       | poundforce                  | lbf                 |
| kPa  | kilopascals                 | 0.145                       | poundforce per square inch  | lbf/in <sup>2</sup> |

\*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.  
(Revised March 2003)

## TECHNICAL REPORT DOCUMENTATION PAGE

|   |  |  |          |
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| 16. Abstract<br>Rest areas along Florida's interstate routes are heavily utilized by commercial trucks for overnight parking. Many of the rest areas regularly experience 100% utilization of the commercial truck parking spaces during the evening and early morning hours.<br><br>The objective of this project was to evaluate three different vehicle detection technologies (SENSIT, Sensys, and CivicSmart) as applied to commercial truck parking areas of interstate rest areas. This evaluation addresses several aspects: (1) the accuracy of the vehicle detection in parking spaces, (2) cost of the technology (not included in this report for confidentiality reasons), (3) installation, setup, and maintenance of technology, (4) sensor output integration with SunGuide® software, and (5) sensor durability (to the extent this was possible over the relatively short duration of this project).<br><br>The research team recorded video of the rest areas as the ground-truth data and compared the video data with the parking sensor data. Two accuracy tests (event accuracy and occupancy accuracy) were conducted to evaluate each sensor's ability to correctly reflect the status of each parking space. Overall, it was found that all three technologies performed well, with accuracy rates of 95% or better for both tests. |  |  |          |
| 17. Key Words<br>Commercial truck parking, parking detection technology   |  | 18. Distribution Statement<br>No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA, 22161 |          |
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## EXECUTIVE SUMMARY

Rest areas along Florida's interstate routes are heavily utilized by commercial trucks for overnight parking. Being able to communicate commercial truck parking space availability to drivers in advance of arriving at a rest area would reduce unnecessary stops at full rest areas as well as driver anxiety. In order to do this, it is critical to implement a vehicle detection technology to correctly reflect the parking status of the rest area. The objective of this project was to evaluate available in-pavement different vehicle detection technologies to apply commercial truck parking areas of interstate rest areas.

The vehicle parking detection technologies evaluated in this project were SENSIT, Sensys, and CivicSmart. The technologies employed by each vendor are given in the following table.

### Vehicle detection technologies

| Vendor              | SENSIT                | Sensys          | CivicSmart              |
|---------------------|-----------------------|-----------------|-------------------------|
| Technologies        | Magnetic and Infrared | Microwave Radar | Microwave Radar         |
| Operating frequency | 902-928 MHz           | 2400-2483.5 MHz | 2.4 GHz (2405-2480 MHz) |

The vehicle parking technology was tested at two rest areas within FDOT District 2. The sites are located in FDOT rest area facilities 20161 (I-75 northbound) and 20162 (I-75 southbound) in Columbia County at milepost 413 of I-75 (GPS coordinates: 29.978335, -82.57862).

IPsens installed the Nedap SENSIT detectors in 10 spaces on the southern end of the northbound rest area. CivicSmart installed their sensors in 10 spaces on the northern end of the northbound rest area. Sensys installed their sensors in 10 spaces on the southern end of the southbound rest area.

Video data were collected by the research team to use as the ground-truth data. Each of the detector technology vendors provided access to the data collected by their sensors to the research team. The detector data were compared to the video data in two different tests to determine their accuracy for classifying parking ingress/egress events as well as continuous parking occupancy status. Overall, it was found that all three technologies performed well, with accuracy rates of

95% or better for both tests.

While the project was of relatively short duration, no visual damage of the various detectors was observed during this time. One vendor encountered a failure of one sensor, but this appears to have been due to a faulty sensor rather than physical damage. The sensor was replaced in field by CivicSmart maintenance personnel.

Each of the technology vendors can work with FDOT to integrate their parking sensor data into the SunGuide® software system. The main report should be consulted for further details. Pricing information was provided in a supplemental document for confidentiality reasons. Additionally, due to the number of variables involved and rapidly evolving industry, pricing is very time sensitive. Thus, the vendors should be consulted for precise pricing information for any given application.

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## Chapter 1: Introduction

### Background Statement

Rest areas along Florida's interstate routes are heavily utilized by commercial trucks for overnight parking. Many of the rest areas regularly experience over-capacity utilization of the commercial truck parking spaces during the evening and early morning hours [1]. Currently, information on the number of available commercial truck parking spaces at Florida rest areas is not available remotely. Thus, aside from obtaining this information through direct communication with someone already on site, a truck driver's only sure way of determining if parking is available at a rest area is to stop at the rest area. Being able to communicate commercial truck parking space availability to drivers in advance of arriving at a rest area would reduce unnecessary stops at full rest areas as well as driver anxiety.

### Project Objective and Tasks

The objective of this project is to evaluate available vehicle detection technologies as applied to commercial truck parking areas of interstate rest areas in the state of Florida. This evaluation addresses several aspects: (1) the accuracy of the vehicle detection in parking spaces, (2) cost of the technology, (3) installation, setup, and maintenance of technology, (4) sensor output integration with SunGuide® software, and (5) sensor durability (to the extent this was possible over the relatively short duration of this project).

The specific tasks performed as part of this project are as follows.

1. Identify vehicle detection technologies for use in project — In this task, the research team reviewed the literature and vehicle sensor technology vendor web sites to identify potential vehicle parking detection technologies available for this application.
2. Site visit for ground-truth data collection equipment installation — The vehicle parking technologies were tested at two rest areas within FDOT District 2, located in FDOT rest area facilities 20161 (I-75 northbound) and 20162 (I-75 southbound) in Columbia County at milepost 413 of I-75 (GPS coordinates: 29.978335, -82.57862). Video equipment was installed at the rest areas to record video as the ground-truth data.

3. Collect ground-truth data — After the installation of the video equipment, the data collection commenced. Since the start dates of the vendors were different, the amount of data collected for each vendor was different, but at least one month of video data for each vendor was collected. The amount of data used for accuracy tests was a function of several factors: the truck parking demand, the accuracy rate of the parking detection equipment, and the desired statistical confidence range of the measured accuracy rate. For accuracy tests, the research team obtained the raw data collected from the vehicle sensors and compared with the ground-truth data.
4. Parking data analysis — The following were conducted in this task:
  - reduced the ground-truth data
  - analyzed the ground-truth data
  - compared the ground-truth results to the data obtained from the parking detection technology, and evaluated the accuracy of the vehicle detection technology with respect to parking space utilization
  - gathered information on other aspects of each parking detection technology from participating vendors; for example: installation, SunGuide® integration, cost, durability/maintenance, etc.

## Chapter 2: Vehicle Detection Technologies

There are several vendors that sell a product, or products, that are designed solely for the purpose of vehicle parking detection or a multi-purpose detector that they claim can be applied to parking situations. After reviewing the literature and vehicle sensor technology vendor web sites, five vendors were identified that had previous experience in this area or were moving into this area. These five vendors were contacted and given the opportunity to participate in this project. Two of the vendors decided that they were not ready for a test deployment. The three vendors/products that did participate in the project are:

1. NEDAP/IPsens/SENSIT<sup>1</sup> (<http://www.nedapidentification.com/products/sensit/>)
2. Sensys (<http://www.sensysnetworks.com/products/microradar>)
3. CivicSmart (<http://www.civicsmart.com/>)

The vehicle detection technologies above feature wireless in-pavement sensors, which detect the presence of a vehicle as it parks within a boundary around them. The specific technologies used in each sensor are given in Table 1.

**Table 1. Vehicle detection technologies**

| Vendors             | SENSIT                | Sensys          | CivicSmart              |
|---------------------|-----------------------|-----------------|-------------------------|
| Technologies        | Magnetic and Infrared | Microwave Radar | Microwave Radar         |
| Operating frequency | 902-928 MHz           | 2400-2483.5 MHz | 2.4 GHz (2405-2480 MHz) |

The following descriptions of each of the technologies is largely copied or paraphrased from the manufacturer literature, the references for which are contained at the end of the report.

---

<sup>1</sup> Also used in study “Commercial Motor Vehicle Parking Trends at Rest Areas and Weigh Stations”, FDOT report BDK80 977-14, December 2012.

## SENSIT

The manufacturer of SENSIT products is Nedap Identification Systems of the Netherlands. In this project, the vehicle detection technology system was provided, integrated and installed by IPsens, LLC (<http://ipsens.net/>).

According to IPsens personnel, IPsens has been involved in enterprise software development and systems implementation for 41 years and continues to serve in this capacity with large enterprise customers such as NYCPD and NYCDOT. The Nedap SENSIT sensor is currently installed in several countries around the world and has a demonstrated continuous operations record of 5+ years with no sensor replacements required due to battery depletion. The SENSIT system is also installed in several other Truck Parking Installations around the world.

The following description of SENSIT vehicle detection system components were based on the product sheets obtained from the company's website [2].

Nedap's wireless vehicle detection sensors, which are mounted in the pavement of individual parking spots, detect vehicle presence and send that information to a central server. The SENSIT IR is a vehicle detection sensor featuring dual detection technology. The sensors feature earth magnetic field and infrared detection. According to the vendor, the combined detection effectively detects vehicles using a sophisticated algorithm to ensure detection is invulnerable to snow, dirt, and leaves. According to the vendor, the sensors are designed to be vandalism resistant.

The actual status (occupancy) of the sensor is transmitted to the Relay Node, which is part of the wireless mesh network. The Relay Node 2G is a wireless communication unit for on-street applications and is used to relay the messages to a Data Collector. The Relay Node 2G is a fully wireless unit, ensuring easy installation onto nearby posts/poles. According to the vendor, once installed, no maintenance is required for years.

The Data Collector IP65 GPRS is the interface between the vehicle detection sensors, the Relay Node and the IPsens software. The Data Collector IP65 GPRS collects actual status data from the



individual sensors via the Relay Node through the wireless mesh network. Offering a variety of communication options, the Data Collector IP65 GPRS automatically inserts all the collected data in the database. Integration with parking guidance, traffic guidance, and enforcement systems can be realized on a server level. The Data Collector IP65 GPRS allows users to operate, maintain, or configure the equipment in the wireless mesh network using bidirectional communication with the systems components. The Data Collector features a back-up battery to ensure the wireless mesh network will remain operational even in case of power failure. Additionally, the Data Collector can be connected to the power source of a light pole or solar power panel. Detailed product specifications are included in Appendix A.



**Figure 1. SENSIT vehicle detection technology components**

Note: From left to right is SENSIT IR, Relay Node 2G and Data Collector IP65 GPRS.

(Source: <http://www.nedapidentification.com/products/sensit/>)

## Sensys

The MicroRadar sensor from Sensys Networks is an ultra-low power, in-pavement, patented radar sensor, compatible with the entire Sensys Networks' product suite. MicroRadar can detect the onset of parking events and the clearance of cars/trucks from spaces. MicroRadar installs seamlessly as a supplement to existing wireless detection systems, lowering costs by leveraging existing infrastructure and communications. The following description of the Sensys vehicle detection system components were based on the product sheets obtained from the company's website [3].

Sensys Networks VSN240-MP-2 MicroRadar sensor incorporates an extremely low power, wide-band, fixed-position radar with a Sensys NanoPower (SNP) Protocol radio. This compact in-pavement sensor works on the same principle as any other radar. High frequency radio frequency (RF) pulses are transmitted, reflected off a target object, and measured by a time-gated return RF mixer. The MP-2 version incorporates a higher sensitivity radar design and a modified case with tabs to aid installation flush with the road surface—allowing the installation to avoid issues with snowplows and ADA compliance/pedestrian tripping hazards. The MP-2 has specific stability tracking algorithms optimized for parking.

The Sensys Networks Access Point Controller Card (APCC) is a second-generation controller card that maintains low power consumption, supports multiple radios, and allows for additional communication and processing power. The APCC, which is compatible with all of the Sensys Networks VDS240 Wireless Vehicle Detection System products, receives and processes data from the sensors. The APCC then relays the sensor detection data to a roadside traffic controller or remote server traffic management system. Detailed product specifications are included in Appendix B.



**Figure 2. Sensys vehicle detection technology components**

Note: From left to right is Sensys MicroRadar and Access Point Controller Card (APCC).  
(Source: <http://www.sensysnetworks.com/products/flexradar#parkingdetection>)

## CivicSmart

CivicSmart is a technology services and engineering company that specializes in the development and delivery of innovative parking and transportation offerings. CivicSmart is an innovator of “Smart City” parking products, technologies, and services, including vehicle

detection sensors, smart parking meters, wireless handheld enforcement devices, and comprehensive data management systems. CivicSmart delivers these Smart City solutions through their wholly owned subsidiary, Duncan Parking Technologies, Inc., which has provided innovative parking equipment, services, and systems to municipalities around the world for nearly 80 years. Today, 2,000 jurisdictions manage their parking programs with the help of a million of their parking devices. These clients include Miami-Dade County, FL; Jacksonville, FL; New Orleans, LA; Atlanta, GA; Chicago, IL; Detroit, MI; North Sydney, Australia; and Harare, Zimbabwe. The following description of CivicSmart vehicle detection system components were based on the information obtained from the company's website [4], as well as product sheets provided by CivicSmart personnel.

For Florida's truck parking occupancy program, CivicSmart proposed the use of in-pavement vehicle detection sensors. The patented vehicle detection sensors use microwave radar-based technology to detect a vehicle entering or leaving a space. According to CivicSmart, the accuracy of the sensors is immune to environmental conditions, passing or adjacent vehicles, and electromagnetic interference. The sensors feature directional radar, which means that they can be installed anywhere near a parking space. Additionally, the sensors use radio waves to transmit data, which means that they are not affected by conditions that plague other sensor technologies (ambient light, color, weather, night/low light, etc.).

The sensors communicate through solar-powered gateways that transmit sensor data to a backend management system for action and analysis. Diagnostic data is sent to CivicSmart so it can monitor the health and "heartbeat" of each node in the State's truck parking system. In-pavement sensors will completely self-configure and communicate directly via a gateway to the server system (either directly to SunGuide® or to their Parking Enterprise Management System). These gateways will be located within a few hundred feet of the sensor, and are typically installed on light poles, parking signs, or traffic signal poles.

The solar-powered gateways feature proprietary low latency, noise-tolerant communications technology, which receives sensor data and can send it to the traffic management center either wirelessly or via a fiber connection. Detailed product specifications are included in Appendix C.



**Figure 3. CivicSmart vehicle detection technology components**

Note: From left to right is in-pavement sensor and solar-powered gateway.  
(Source: <http://www.civicsmart.com/>)

The main points of contact for each of the vendors are listed in Table 2.

**Table 2. Contact information of vendors**

| Vendor     | Name            | Email  | Phone          |
|------------|-----------------|--|----------------|
| IPsens     | Gorm Tuxen      | <a href="mailto:gorm.tuxen@ipsens.net">gorm.tuxen@ipsens.net</a>                   | (888) 705-1196 |
| Sensys     | Sheldon Pafford | <a href="mailto:Sheldon.pafford@temple-inc.com">Sheldon.pafford@temple-inc.com</a> | (386) 615-4866 |
| CivicSmart | Bradley Magee   | <a href="mailto:BMagee@civicsmart.com">BMagee@civicsmart.com</a>                   | (480) 510-1557 |

## Chapter 3: Test Site

The vehicle parking technology was tested at two rest areas within FDOT District 2. The sites are located in FDOT rest area facilities 20161 (I-75 northbound) and 20162 (I-75 southbound) in Columbia County at milepost 413 of I-75 (GPS coordinates: 29.978335, -82.57862). An aerial view of this site is shown in Figures 4-6. The Columbia county site has two truck parking areas, as listed in Table 3.



**Figure 4. Location and aerial view of Columbia County rest area**

**Table 3. Columbia County rest area information**

| Facility Name             | Rest area northbound | Rest area southbound |
|---------------------------|----------------------|----------------------|
| Interstate Number         | I-75                 |                      |
| Milepost                  | MP 413               |                      |
| FDOT Facility Number      | 20161                | 20162                |
| Prior Exit Number         | Exit 404             | Exit 414             |
| # of Truck Parking Spaces | 49                   | 49                   |





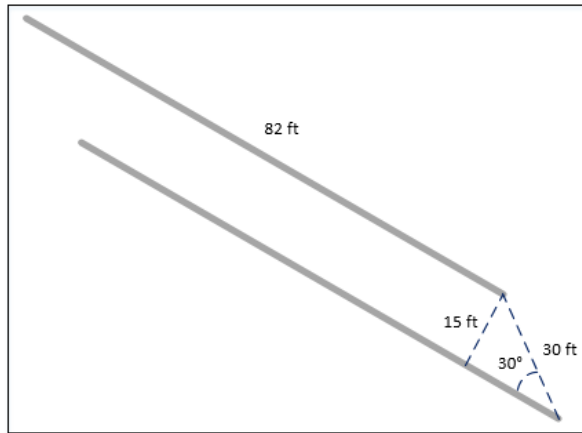
**Figure 5. Southbound rest area**



**Figure 6. Northbound rest area**

The commercial truck parking space in the rest area has the following approximate dimensions:

- length = 82 feet,
- width = 15 feet, and
- angle = 30 degrees.



**Figure 7. Parking space specifications**

## Chapter 4: Installation of Technologies

### SENSIT

The sensors are placed in a 3-inch-deep core-drilled hole in the pavement. The sensor is designed for use of non-toxic standard mortar mix to hold it in place. The research team observed that the installation was easy, and the water-based mortar makes for easy clean-up after installation.

The process of installing the SENSIT sensor into the road includes the following steps:

1. Find and mark the desired sensor location.
2. Core a hole 3 inches (7.6 cm) deep into the pavement.



**Figure 8. Core a hole into the pavement**

3. Vacuum or brush the hole clear of dust and debris.



**Figure 9. Vacuum the hole**

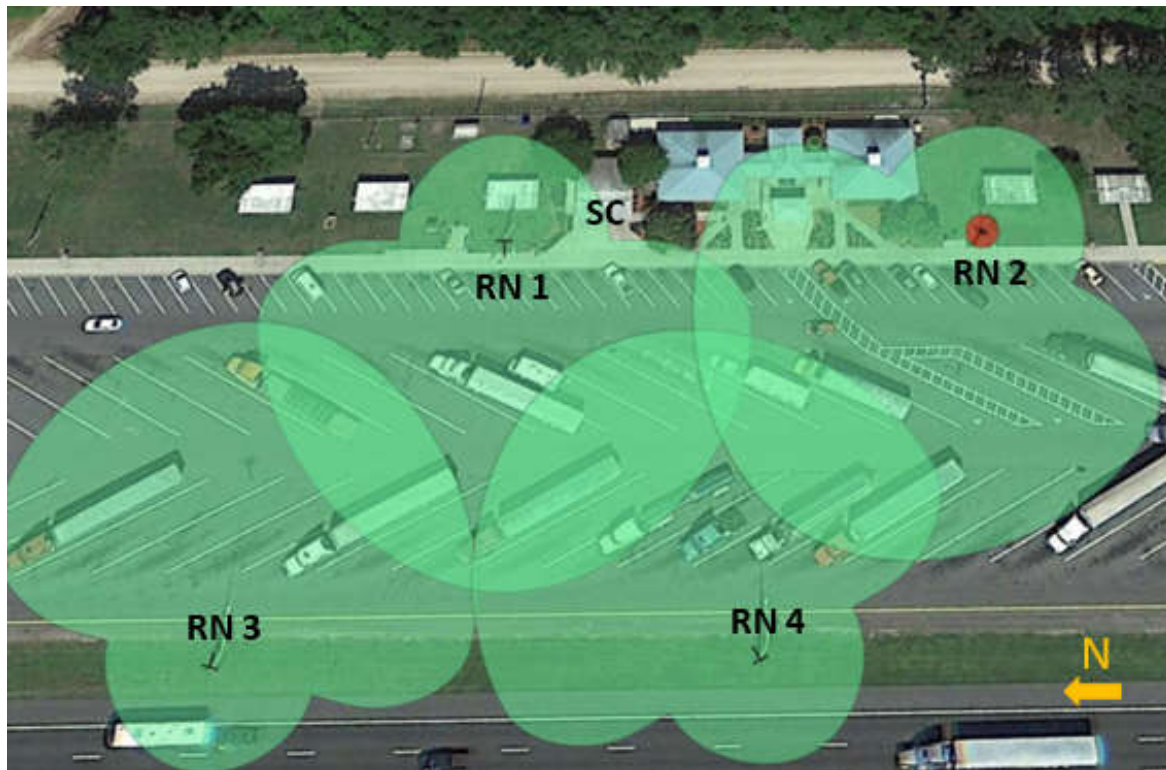
4. Place sensor until the ring sits flush against the pavement and apply the non-toxic standard mortar mix to hold it in place.



**Figure 10. Place sensor to the hole**

Relay Node 2G should be preferably mounted at about 3-6 meters [10-20 ft] from the floor/ground (e.g., onto a light pole) to allow for line-of-sight with the sensors. The relay node shall visually see the sensors at an angle. The relay nodes are mounted on four light poles in the rest area to receive signal from the sensors.





**Figure 11. Installed relay nodes**

Note: 'SC' is site controller, 'RN' is relay node.

(Source: provided by IPsens personnel)

The Site Controller is mounted on the wall of a building of the rest area. The Site Controller is the main interface point connecting all sensors in its service area with the Cloud Host Server through a cellular modem to the internet or alternative hardline TCP/IP, fiber connection to Host Server. The Site Controller incorporates the Data Collector IP65 GPRS, which is the end data termination point for the local sensor network. If the Site Controller is configured for direct TCP/IP connection, cellular modem can be offered as a backup connectivity option.

The Site Collector is equipped with UPS power supply, which offers additional redundancy to the system's ability to store information on the Sensors in case of loss of connectivity to the site. Site Controller also includes surge protection and power supply to convert from 120V AC to 5V DC to power all internal components.





**Figure 12. Installed site controller**

## Sensys

Again, the research team observed that the installation process for the Sensys detectors was simple. The process of installing the MicroRadar sensor into the road included the following steps:

1. Find and mark the center of the desired sensor location.



**Figure 13. Find and mark the sensor location**

2. Core a hole approximately 4 inches (10.2 cm) in diameter, and 3 inches (7.6 cm) deep into the pavement. Check depth as you drill, remove debris periodically.



**Figure 14. Core a hole into the pavement**

3. Vacuum or brush the hole clear of dust and debris. Ensure that the hole is dry as moisture may impede the curing of the epoxy. If moisture is observed, use the heat-gun or torch to dry the inside of the hole completely.
4. Apply epoxy to the bottom of the hole to half of the sensor height.
5. Place sensor until the ring sits flush against the pavement.



**Figure 15. Place sensor in the hole**

6. Fill hole with epoxy until level to road surface.



**Figure 16. Fill hole with epoxy**

## CivicSmart

Again, the research team observed that the installation process for the CivicSmart detectors was simple. The in-pavement sensor installation requires the following tools:

1. core drill bit (diamond-embedded recommended)
2. drill motor or coring stand with cooling source (e.g., water)
3. wet vacuum (water trap recommended)
4. marking paint or chalk
5. digging/chipping tool
6. tape measure
7. sensor node assemblies.

The detector installation includes the following steps:

1. Ensure the pavement is solid and stable for each sensor that is to be installed. Mark the drilling point for each parking space, and place drilling equipment over mark. Using a 140-mm core drill bit, drill to a depth of 80 mm into the concrete or asphalt surface. Remove plug.



**Figure 17. Mark the drilling point and drill a hole**

2. Align the orientation of the sensor on the node (as shown above) to the corresponding type of parking space.
3. Place the sensor node into the hole. Confirm that the top of the sensor enclosure is 6 mm above the ground surface. Then apply epoxy glue around the sensor node.



**Figure 18. Put sensor into the hole**

The gateway installation requires the following tools:

- ladder (tie down cinch, if needed)
- hammer drill
- hose clamps: Qty. 3 (size dependent on mounting pole diameter)
- Allen bolts: Qty. 2 (M5 x 40 mm)
- Allen wrench and gateway assembly.

The gateway installation includes the following steps:

1. Choose a hose clamp respective of the mounting pole diameter. Slide the hose clamp into the slots provided in the solar mount bracket.
2. Tighten the adjustable hose clamp. For the top bracket only, use a 0.5 to 7 N-m torque capacity and 7-mm socket nut driver.
3. Mark the height from the top pole mount clamp edge to adjust the angle required using a measuring tape and marker. Separation between clamps for different elevation angles are as follows:
  - 25° – 850 mm
  - 50° – 575 mm
  - 75° – 175 mm
4. Using a 7-mm socket nut drive, tighten the hose clamp bolt on the bottom pole mount bracket.
5. Slide the hose clamp into the slots of the gateway mounting brackets.
6. Affix the gateway assembly onto the gateway mounting brackets using an M5x25 mm Allen bolt and tighten using 4-mm Allen key. Affix the gateway mount below the solar mount bracket to the pole.

## Installation Time

For this project, all three vendors installed the sensors and other relevant equipment that covered the 10 parking spaces within 2-3 days. After the installation of the parking sensors and related equipment, each vendor spent 1-2 weeks tuning and calibrating their system. It should also be noted that while all the detectors were installed in asphalt pavement at this site, all of the vendors noted that their detectors are also easily installed in concrete pavement.

## Chapter 5: Data Collection

### Vendor Parking Spaces Assignment

Each of the three vendors was assigned to a 10-space section on either the northbound side or southbound side of the rest area. To avoid possible interference among the signals of the different vendors, vendors with similar operating frequencies were not located on the same side. The parking space assignment plan for the vendors is shown in the Table 4.

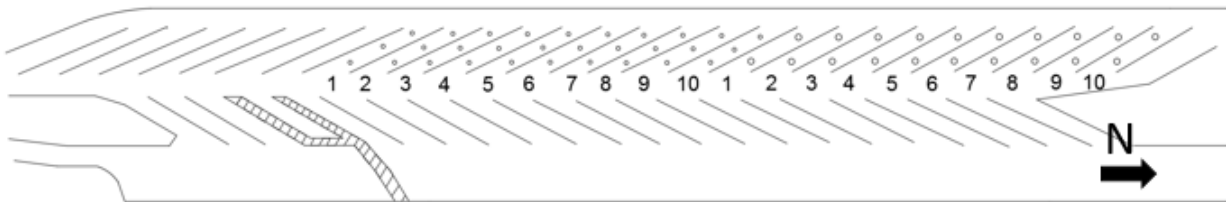
**Table 4. Vendors allocation plan**

| Vendor            | SENSIT        | Sensys            | CivicSmart      |
|-------------------|---------------|-------------------|-----------------|
| Frequency         | 902 – 928 MHz | 2400 – 2483.5 MHz | 2405 – 2480 MHz |
| Placement         | Northbound    | Southbound        | Northbound      |
| Sensors per space | 3             | 3                 | 2               |

The parking space assignment for the vendors is illustrated in Figures 19 and 20. CivicSmart was the second vendor that installed their sensors at the northbound rest area, so there were constraints about their equipment locations in order to avoid possible interference with the SENSIT equipment that had already been installed. However, it is not known whether this had any impact on the performance of the CivicSmart system.



**Figure 19. Southbound rest area vendor parking space distribution (Sensys)**

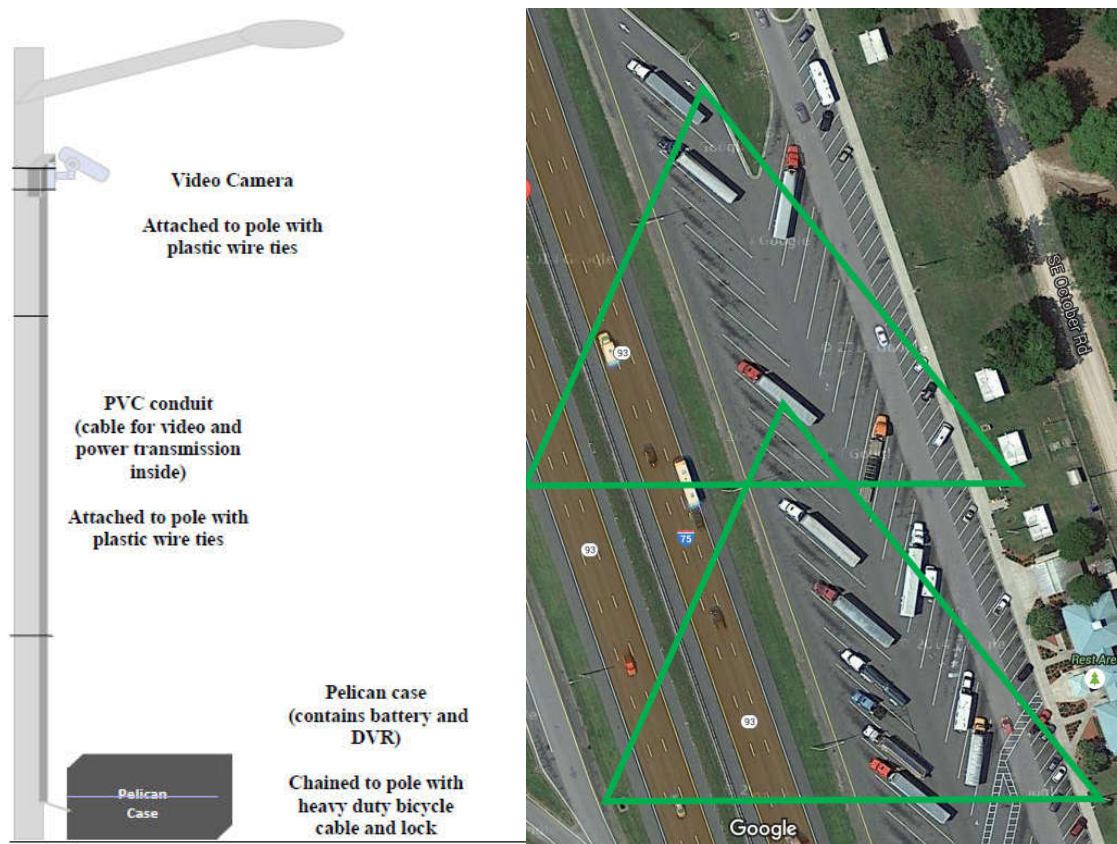


**Figure 20. Northbound rest area vendor parking space distribution (left: SENSIT, right: CivicSmart)**



## Video Installation

The project used video cameras to record the truck parking area as the ground-truth data—two cameras for the northbound rest area and one camera for the southbound rest area. The cameras were mounted to the top of light poles in the rest area. Figure 21 illustrates the video camera installation set up and approximate fields-of-view for the two northbound side camera installations. Figure 22 shows a picture of one of the camera installations—camera mounted to the top of the light pole (35 ft), which is connected with video and power transmission cables running through PVC conduit, which connect to a battery and digital video recorder (DVR) inside a Pelican case that is chained to the light pole. Figure 23 shows the fields-of-view from the three cameras.



**Figure 21. Camera installation schematic and camera range**



**Figure 22. Installed camera, PVC conduit, and Pelican case**



Figure 23. Camera view (From top to bottom: SENSIT, Sensys, and CivicSmart)

## Collect Video Ground-Truth Data

Once the video equipment was installed, and the vendors were finishing with calibrating their sensors, the data collection commenced. Video was recorded at the parking rest area for several weeks:

- SENSIT and CivicSmart: 8/10/2016 - 10/05/2016
- Sensys: 8/24/2016 - 10/05/2016

## **Chapter 6: Tests and Evaluation of the Parking Detection Technologies**

### **Video Data Reduction**

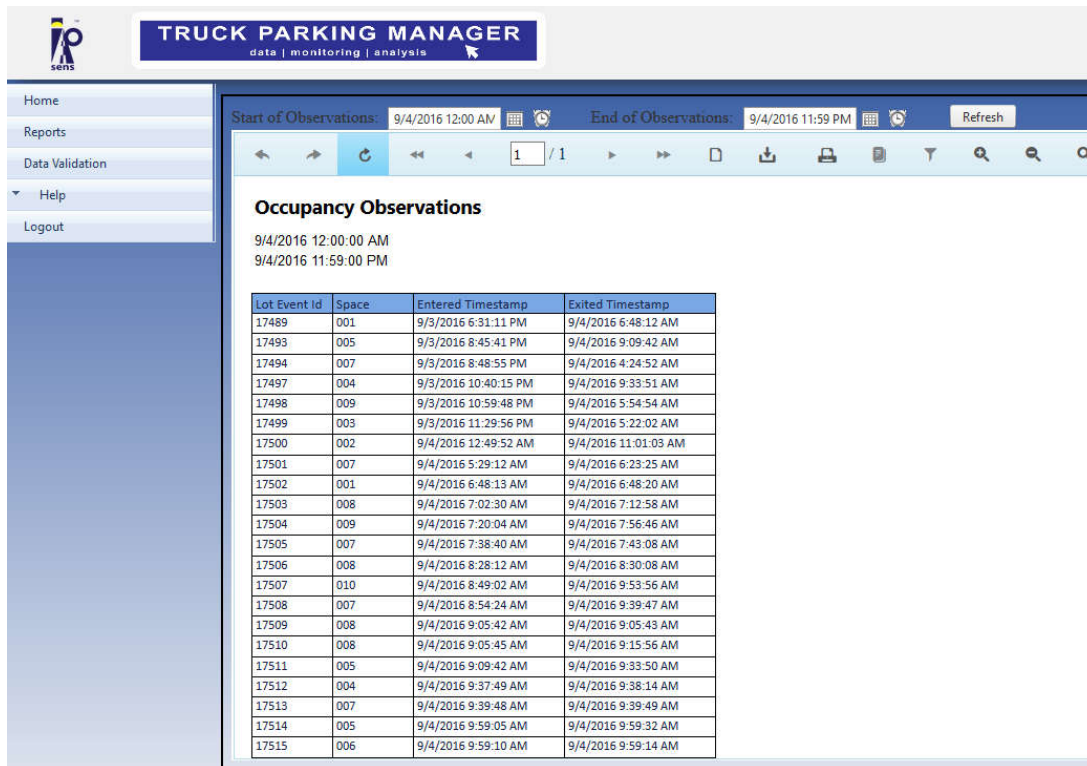
The ingress and egress movements of each vehicle were recorded manually. The manually recorded data included the following information for each entering/exiting truck:

1. parking space number
2. time entered space
3. time exited space
4. vehicle type (such as truck with no trailer, truck with vehicle trailer, truck with flatbed trailer, truck with closed trailer, truck with double closed trailer, truck with tanker trailer, single unit truck, RV, other: personal car, etc.).

The research team developed a data analysis software tool to process and analyze the data. The manually recorded video data are saved into CSV-formatted files to be loaded into the software tool for further analysis.

The research team obtained the raw data collected by the vehicle sensors and compared them with the ground-truth data for the accuracy tests. The raw data of SENSIT sensors were collected from the company's backend system, the Truck Parking Manager, as shown in Figure 24. The raw data of Sensys sensors were collected from the company's backend system, the Sensys Networks Archive Proxy and Statistics (SNAPS) system, as shown in Figure 25. The raw data of CivicSmart were provided by their personnel in CSV-formatted files, as shown in Figure 26. The CSV-formatted files of the raw data from the sensors can be loaded into the data analysis software tool developed by the research team for accuracy tests. A brief introduction of the software tool is included in Appendix E.





**TRUCK PARKING MANAGER**  
data | monitoring | analysis

Start of Observations: 9/4/2016 12:00 AM End of Observations: 9/4/2016 11:59 PM Refresh

Occupancy Observations

9/4/2016 12:00:00 AM  
9/4/2016 11:59:00 PM

| Lot Event Id | Space | Entered Timestamp    | Exited Timestamp     |
|--------------|-------|----------------------|----------------------|
| 17489        | 001   | 9/3/2016 6:31:11 PM  | 9/4/2016 6:48:12 AM  |
| 17493        | 005   | 9/3/2016 8:45:41 PM  | 9/4/2016 9:09:42 AM  |
| 17494        | 007   | 9/3/2016 8:48:55 PM  | 9/4/2016 4:24:52 AM  |
| 17497        | 004   | 9/3/2016 10:40:15 PM | 9/4/2016 9:33:51 AM  |
| 17498        | 009   | 9/3/2016 10:59:48 PM | 9/4/2016 5:54:54 AM  |
| 17499        | 003   | 9/3/2016 11:29:56 PM | 9/4/2016 5:22:02 AM  |
| 17500        | 002   | 9/4/2016 12:49:52 AM | 9/4/2016 11:01:03 AM |
| 17501        | 007   | 9/4/2016 5:29:12 AM  | 9/4/2016 6:23:25 AM  |
| 17502        | 001   | 9/4/2016 6:48:13 AM  | 9/4/2016 6:48:20 AM  |
| 17503        | 008   | 9/4/2016 7:02:30 AM  | 9/4/2016 7:12:58 AM  |
| 17504        | 009   | 9/4/2016 7:20:04 AM  | 9/4/2016 7:56:46 AM  |
| 17505        | 007   | 9/4/2016 7:38:40 AM  | 9/4/2016 7:43:08 AM  |
| 17506        | 008   | 9/4/2016 8:28:12 AM  | 9/4/2016 8:30:08 AM  |
| 17507        | 010   | 9/4/2016 8:49:02 AM  | 9/4/2016 9:53:56 AM  |
| 17508        | 007   | 9/4/2016 8:54:24 AM  | 9/4/2016 9:39:47 AM  |
| 17509        | 008   | 9/4/2016 9:05:42 AM  | 9/4/2016 9:05:43 AM  |
| 17510        | 008   | 9/4/2016 9:05:45 AM  | 9/4/2016 9:15:56 AM  |
| 17511        | 005   | 9/4/2016 9:09:42 AM  | 9/4/2016 9:33:50 AM  |
| 17512        | 004   | 9/4/2016 9:37:49 AM  | 9/4/2016 9:38:14 AM  |
| 17513        | 007   | 9/4/2016 9:39:48 AM  | 9/4/2016 9:39:49 AM  |
| 17514        | 005   | 9/4/2016 9:59:05 AM  | 9/4/2016 9:59:32 AM  |
| 17515        | 006   | 9/4/2016 9:59:10 AM  | 9/4/2016 9:59:14 AM  |

Figure 24. Raw data of SENSIT sensors

## Index of /fdot/snc2csv\_reports

| Name   | Last modified     | Size | Description |
|--|-------------------|------|-------------|
| <a href="#">Parent Directory</a>   |                   |      |             |
| <a href="#">snc2csv fdot-pb3r2 2016-0801-1470009600 2016-0829-1472515200 md0.csv</a> | 30-Aug-2016 15:13 | 155K |             |
| <a href="#">snc2csv fdot-pb3r2 2016-0830-1472529901 2016-0830-1472616301 md0.csv</a> | 30-Aug-2016 21:05 | 25K  |             |
| <a href="#">snc2csv fdot-pb3r2 2016-0831-1472616302 2016-0831-1472702702 md0.csv</a> | 31-Aug-2016 21:05 | 29K  |             |
| <a href="#">snc2csv fdot-pb3r2 2016-0901-1472702701 2016-0901-1472789101 md0.csv</a> | 01-Sep-2016 21:05 | 31K  |             |
| <a href="#">snc2csv fdot-pb3r2 2016-0902-1472789101 2016-0902-1472875501 md0.csv</a> | 02-Sep-2016 21:05 | 29K  |             |
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| <a href="#">snc2csv fdot-pb3r2 2016-0915-1473912301 2016-0915-1473998701 md0.csv</a> | 15-Sep-2016 21:05 | 31K  |             |

Figure 25. Raw data of Sensys sensors



|    | A              | B                 | C                    | D               | E | F |
|----|----------------|-------------------|----------------------|-----------------|---|---|
| 1  | <b>AuditID</b> | <b>LastStatus</b> | <b>LastUpdatedTS</b> | <b>GMeterId</b> |   |   |
| 2  | 28684827       | Vacant            | 20/08/2016 09:16:20  | 32001           |   |   |
| 3  | 28691105       | Occupied          | 20/08/2016 14:10:56  | 32001           |   |   |
| 4  | 28695390       | Vacant            | 20/08/2016 16:58:35  | 32001           |   |   |
| 5  | 28697062       | Occupied          | 20/08/2016 17:59:25  | 32001           |   |   |
| 6  | 28697113       | Vacant            | 20/08/2016 18:01:19  | 32001           |   |   |
| 7  | 28697787       | Occupied          | 20/08/2016 18:26:34  | 32001           |   |   |
| 8  | 28708956       | Vacant            | 21/08/2016 09:28:56  | 32001           |   |   |
| 9  | 28708962       | Occupied          | 21/08/2016 09:33:39  | 32001           |   |   |
| 10 | 28709113       | Vacant            | 21/08/2016 09:46:15  | 32001           |   |   |
| 11 | 28712029       | Occupied          | 21/08/2016 12:54:35  | 32001           |   |   |
| 12 | 28712035       | Vacant            | 21/08/2016 12:54:46  | 32001           |   |   |
| 13 | 28715613       | Occupied          | 21/08/2016 15:41:16  | 32001           |   |   |
| 14 | 28715584       | Vacant            | 21/08/2016 15:43:02  | 32001           |   |   |
| 15 | 28745149       | Occupied          | 22/08/2016 18:24:06  | 32001           |   |   |
| 16 | 28745402       | Vacant            | 22/08/2016 18:35:03  | 32001           |   |   |
| 17 | 28753782       | Vacant            | 23/08/2016 07:37:26  | 32001           |   |   |
| 18 | 28754057       | Occupied          | 23/08/2016 08:00:39  | 32001           |   |   |
| 19 | 28754249       | Vacant            | 23/08/2016 08:11:50  | 32001           |   |   |
| 20 | 28759935       | Occupied          | 23/08/2016 11:59:54  | 32001           |   |   |
| 21 | 28760000       | Vacant            | 23/08/2016 12:01:59  | 32001           |   |   |
| 22 | 28762915       | Occupied          | 23/08/2016 13:36:12  | 32001           |   |   |
| 23 | 28763073       | Vacant            | 23/08/2016 13:41:55  | 32001           |   |   |
| 24 | 28766608       | Occupied          | 23/08/2016 15:28:00  | 32001           |   |   |

**Figure 26. Raw data of CivicSmart sensors**

Although the parking detection technologies should be insensitive to lighting conditions, Table 5 provides the number of daylight and nighttime hours used in the data analysis for each vendor.

**Table 5. Number of daytime and nighttime data for each vendor**

|               | SENSIT | Sensys | CivicSmart |
|---------------|--------|--------|------------|
| Daytime (h)   | 70     | 84     | 96         |
| Nighttime (h) | 64     | 84     | 16         |

The overall weather condition during the data collection period was warm and humid, with frequent rains. The research team conducted a brief analysis of the ground-truth data regarding the day of week parking space occupation, parking hours, and parking vehicle types, detailed figures and statistics are provided in Appendix G.

## Accuracy Tests

Two accuracy tests were applied for evaluation of the parking detection technologies in this preliminary analysis: turnover accuracy and occupancy accuracy. The turnover accuracy test evaluates the sensor's ability to identify parking events (parking ingress or egress) correctly. The occupancy accuracy test evaluates the percentage of time in which the sensors report the status of the parking spaces (vacant or occupied) correctly. Table 6 provides the accuracy test results of the three technologies. More detailed results of the accuracy test are included in Appendix D.

**Table 6. Accuracy tests results**

| <b>Technology</b> | <b>Number of parking events</b> | <b>Turnover accuracy (%)</b> | <b>Turnover ratio (parking events/h)</b> | <b>Number of hours</b> | <b>Occupancy accuracy (%)</b> |
|-------------------|---------------------------------|------------------------------|--|------------------------|-------------------------------|
| SENSIT            | 1073                            | 95.25                        | 8.01                                     | 134                    | 97.36                         |
| Sensys            | 776                             | 97.94                        | 4.62                                     | 168                    | 99.15                         |
| CivicSmart        | 488                             | 96.11                        | 4.45                                     | 112                    | 97.20                         |

In this project, each parking space has two or three sensors (depending on the vendor). For all vendors, the method used to identify an occupied parking space is that at least one of the detectors needs to be in the 'on' status (vehicle over or near the detector). Conversely, if all the sensors in the space are in the 'off' position, the parking space is considered to not be occupied. Then, the parking space status obtained from the sensor is compared to the ground-truth data for accuracy tests. In this case, the accuracy includes turnover/occupancy by any type of vehicle.

The turnover ratio (average number of parking events per hour) is also shown for each vendor, as an informational item to give an indication of the amount of parking activity in each vendor's set of assigned spaces. This measure should not be interpreted as necessarily being correlated with the accuracy of the respective systems. Given that truck drivers typically park in the closest available space to the entrance of the rest area, these turnover ratio values match our expectations. That is, since the SENSIT detectors were closer to the entrance of the rest area than the Sensys and CivicSmart detectors, we would expect a higher turnover ratio for the SENSIT spaces.

Table 7 shows the 95% confidence interval of the turnover accuracy for each detection technology. The confidence interval is calculated based on the number of events ( $n$ ) and the turnover accuracy ( $p$ ), assuming a binomial distribution, as shown in Equation 1.

$$\text{Confidence Interval} = \hat{p} \pm z_{\alpha/2} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}, \alpha = 5\% \quad (1)$$

Where:

- $\alpha$  is the statistical significance level
- $n$  is the number of parking events for a specific vendor
- $p$  is the turnover accuracy for a specific vendor

**Table 7. Turnover accuracy confidence interval**

|                                  | <b>SENSIT</b> | <b>Sensys</b> | <b>CivicSmart</b> |
|----------------------------------|---------------|---------------|-------------------|
| Number of parking Events ( $n$ ) | 1073          | 776           | 488               |
| Turnover Accuracy ( $p$ )        | 95.25%        | 97.94%        | 96.11%            |
| 95% Conf. Interval               | 94%-97%       | 97%-99%       | 94%-98%           |

With respect to the difference in the number of events between the vendors, the following should be noted:

- The confidence interval values would not change for Sensys if it had the same number of parking events as SENSIT, and assuming the  $p$  value remained unchanged.
- The confidence interval for CivicSmart would change to 95%-97% if it had the same number of parking events as SENSIT, and the  $p$  value remained unchanged. Because of the issues described earlier, the sample size for CivicSmart was smaller than the sample size for the other vendors.

Despite the different number of parking events across vendors, the relatively narrow range of the 95<sup>th</sup> percentile confidence interval values for each vendor shows that the accuracy results are fairly stable.

## Observations

This section describes the issues, if applicable, that were observed in the data analysis process that may explain particular results.

*SENSIT*

- One issue is that the sensors sometimes generate more events than the ground-truth data. For example, the video showed that a truck had been parked continuously in a space for 2 hours, but the sensors might report several ‘on’/’off’ events during that same period. However, the time intervals corresponding to these events might be between only 10-40 seconds. In this case, the SENSIT algorithm for reporting parking events is properly accounting for these short duration changes in sensor status, as the sensors normally have certain lag time to change status, so that the occupancy status would not be affected. Further testing may identify situations where the parking status is incorrectly reported because of longer duration incorrect readings of the sensor(s).

*Sensys*

- During one analysis period (9/3/16) of the Sensys detector data, there was a period (16:20 – 17:10) of very heavy rain. Nearly all of the incorrect readings of the Sensys detectors happened during this heavy-rain period. During non-rain periods, the accuracy of the Sensys detectors was very high. However, this was a one-time observation, no similar observations were found by the research team among other observations under raining conditions. The accuracy results under raining conditions, for all vendors, can be found in Table 17 in Appendix D.
- According to information provided by Sensys personnel: Some preliminary results indicate that small amounts of ice and sheeting water will not degrade performance, although the manufacturer is cautious to make this claim for all icing and sheeting/standing water conditions as testing has been limited.

*CivicSmart*

- The CivicSmart sensors also have the same issue of multiple events of several seconds duration described above, but the parking occupancy status should not be affected if the interval of events is small, as the sensors normally have a certain lag time before they change status.

- CivicSmart inadvertently activated the sleep mode of their sensors, which means that events from 8 PM to 6 AM were not detected. In this case, the accuracy analysis for CivicSmart only focused on the time period of 6 AM to 8 PM.
- According to CivicSmart personnel, there was a server outage in the staging server on their data center, which may have caused latency in the data.
- CivicSmart lost readings from one sensor for three weeks (8/19 – 9/7). They fixed it on 9/12.
- During 9/16 and 9/17, CivicSmart personnel went to the site for calibration of their sensors and ended up having problems with their sensor IDs. A CivicSmart representative said the data from 9/16 – 10/03 could not be used because of the issue, and correct data from the sensors was provided after 10/03.
- The CivicSmart sensor data and the ground-truth data (video) used to have a 2-minute offset (i.e., time-stamp difference). However, on September 1<sup>st</sup>, between 6 AM to 8 PM, the offset changed to 6 minutes. From September 1<sup>st</sup>, the offset between CivicSmart sensor data and ground-truth data has remained 6 minutes. This issue was raised with CivicSmart representatives, and they said it is because their domain controller was off by six minutes for two weeks in September.
- Again, another issue is that the sensors sometimes generate more events than the ground-truth data; for example, the video might show a truck that had been parked continuously in a space for 2 hours, but the sensors might report several events during that same time period. However, the time intervals corresponding to these events might be between only 10-40 seconds. Further testing may identify situations where the parking status is incorrectly reported because of longer duration incorrect readings of the sensor(s).

Appendix F contains additional information from the vendors about the inaccurate parking detection events.

## Integration with SunGuide® System

The following information has largely been provided by the vendors and has not been independently verified by the research team, as a full integration and testing exercise was beyond the scope of the project.

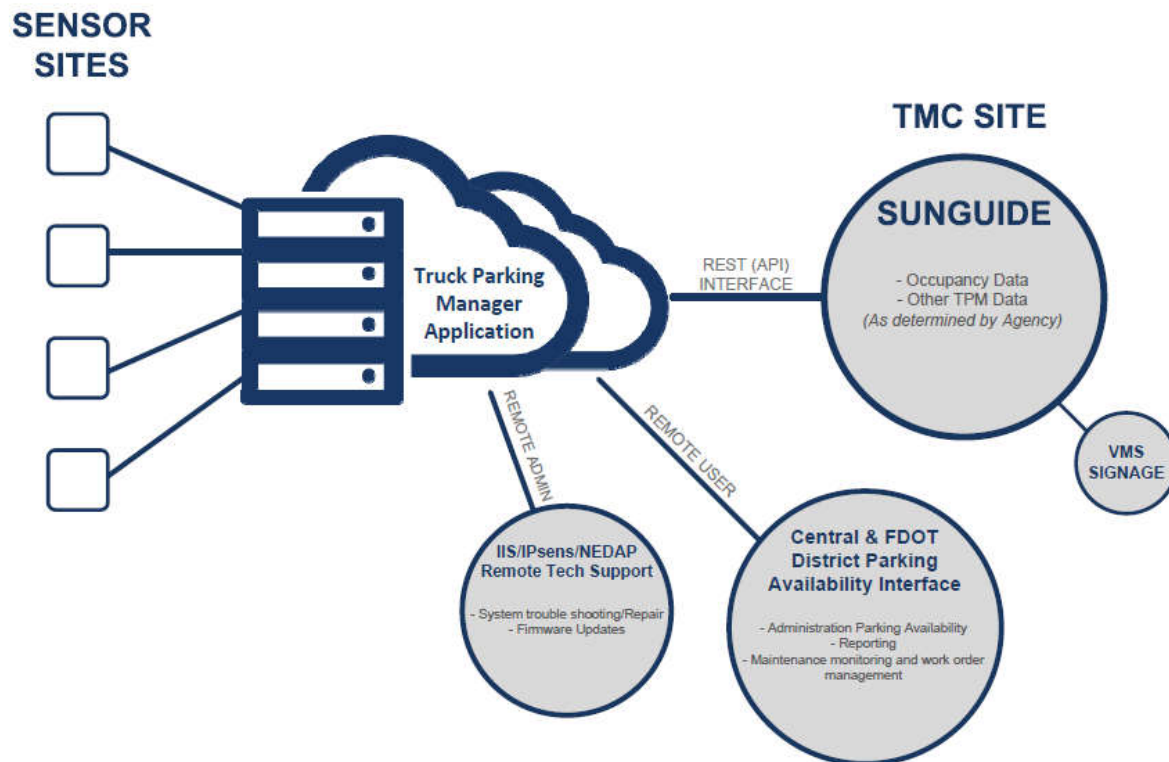
### *SENSIT*

IPsens can use its Truck Parking Manager Application to integrate with the SunGuide system, as illustrated in Figure 27, but again, was not tested by the research team. The Truck Parking Manager (TPM) application is the central data system for the IPsens solution. According to the vendor, for the system components capacity, each data collector can support up to 15 relay nodes max and 500 SENSIT nodes max (ground sensors) per Data Collector. Theoretically the maximum number of sensors in one network is about 65,000 but in general the above scale is applied for optimal system performance. This cloud hosted, or centrally served and controlled, application connects all information from every sensor at every site to support the following key operations:

1. Import, analyze, and compile all raw data from the field-deployed sensor systems.
2. Function as the central management interface for all operational data collected through field-deployed devices such as sensors. Compiles final data output for every space through an algorithm monitoring the combined status of all sensors in a space.
3. Advanced Maintenance Monitoring conducts automated analysis of the status and of individual systems components while also running algorithms to alert of unusual behavior of the systems as a whole. Tracks pending maintenance alert status and work orders while compiling a historical record of system operability and issues reported.
4. Consolidated data monitoring of all operational data from every monitored parking availability site.
5. Parking availability centric reporting capabilities, with a multitude of pre-designed and custom reporting options.
6. Open IP data exchange through a secure REST web service for further data integration into other 3rd party enterprise type systems.



## FDOT HOST SENSOR SYSTEM SERVER



**Figure 27. IPsens integration with SunGuide®**

(Source: provided by IPsens personnel)

Additional information provided by SENSIT was included in a supplemental document.

### *Sensys*

In conjunction with the Sensys Networks Access Points (AP) and Parking Session servers the system can manage thousands of deployed sensors, archive data and monitor the health of the system. According to the vendor, the SNAPS (Sensys Networks Archive Proxy and Statistics) software can handle up to 200 Access Points (AP), and each access point can handle hundreds of MicroRadar units. Sensys suggests that each remote parking site could utilize a single AP, allowing up to 200 sites with a single server license. SNAPS can be cloud or network based.

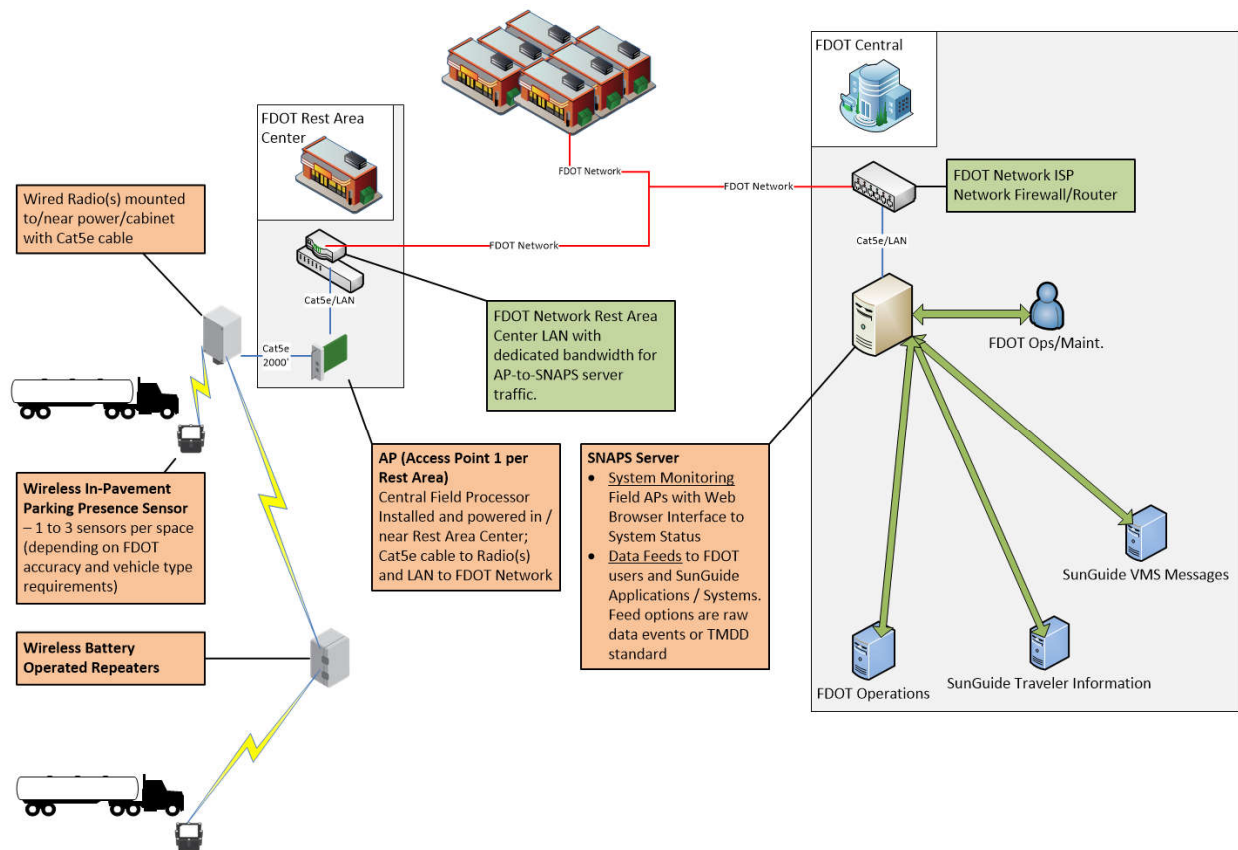
There are two SNAPS-based Parking APIs for server-to-server data interchange of Parking data. A REST API (XML feed) that uses simple web based calls. And a Traffic Management Data

Dictionary (TMDD) implementation that uses TMDD over SOAP. Both offer the same functionality. Both are fully documented in the SNAPS 2.16 Setup and Operating Guide Appendices (available on Sensys Networks' website).

Sensys has several large-scale deployments utilizing the SNAPS server architecture and data exchanged via XML interfaces, such as the Parkopedia and Parkme websites and smart phone applications.

The Institute of Transportation Engineers (ITE) Traffic Management Data Dictionary (TMDD) is an open standard set that anyone can use, and is recommended for use by agencies if they want to develop their central system to be open standard for vendor's data. Sensys Networks is working with the ITE TMDD Steering Committee, which is including parking occupancy and inventory data in its released standards.

Sensys Networks offers products with data feeds supporting the latest TMDD Standard for the Center to Center Communications (currently Version 03.03a), including "Parking Information" datasets that define lot/space inventory and space status/occupancy schema. Sensys Networks server software products implement the Owner Center side of the C2C interface.



Another option exists for interfacing between SunGuide® and directly from the Sensys system in the field, called Event Proxy. Event Proxy is a real-time system that would run on each AP and delivery a “push” or “pull” timestamped for each unique sensor ID event. However, use of the direct field-to-FDOT SunGuide® server architecture (without use of SNAPS) would not allow for field equipment diagnostics/monitoring and buffered data transmit logic if communication is lost and restored. It could, however, be deployed on an AP in unison with a SNAPS server on the same network as FDOT SunGuide®.

### *CivicSmart*

The PEMS system comes with a set of default RESTful Web service APIs to facilitate system integrations and interoperability between PEMS and DOT’s SunGuide® software systems. The API is designed to “PUSH” or “PULL” sensor data (or events) in real time for space occupancy information. The sensors/gateways post the sensor data (occupied and unoccupied) to an external server over HTTP/S from the PEMS servers. Sensor transactions will be posted to various

systems or will be available to be pulled in real time – typically within a few seconds, no more than 30 seconds after the transaction time. According to the vendor, one gateway can handle 21 to 25 sensors, and the PEMS system has no specific limitation on the number of sensors to handle.

The services include “Get Space Inventory”, “PULL Sensor Data”, and “PUSH Sensor Data”. The API specification document is included as part of our interface control document in the Appendices. The web services will use HTTP or HTTPS protocol to communicate. HTTPS protocol provides for end-point security and encryption/integrity of data during transmission. An SSL (Secure Sockets Layer) certificate helps validate end points and ensure the systems are communicating with each other. Additional Data transmission security is provided via Token bases authentication and IP Filtering. Any required interfaces will be configured as part of the PEMS systems installation.

The CivicSmart sensor system is designed to be flexible to adapt to a variety of solution architectures. The parking detector data can be sent directly to customer systems from the gateways. The system is capable of supporting custom APIs for this integration if required by the customer. CivicSmart’s gateways can also be embedded in other products (such as message signs, parking meters, etc.). CivicSmart can also provide a light weight field device manager which will be a front end component that can be hosted within SunGuide systems. The below examples describe some of the ways the systems are currently deployed and illustrate the flexibility of the system:

1. In a city-wide deployment of sensors, the sensor data is being collected by CivicSmart gateways. CivicSmart gateways are integrated directly to the customer’s backend and are transmitted via customer’s own private APN. CivicSmart has access to diagnostic data and other information required for maintenance functions.
2. In a city-wide deployment of sensors, CivicSmart gateways are integrated into customer owned field equipment and the data is transmitted via a private network that is managed by the customer.

According to CivicSmart, they understand and support FDOT's need to be independent of vendor-owned backend and networks and they feel that they would have no problem meeting those requirements.

### Durability/Maintenance

During the course of numerous site visits to exchange batteries and download video data, some brief observations were made of the parking sensors (where convenient). No visual damage was observed of the various detectors. While CivicSmart encountered a failure of one sensor, this appears to have been due to a faulty sensor rather than physical damage. The sensor was replaced in the field by CivicSmart maintenance personnel. It should be kept in mind, however, that the duration of this project was relatively short and observations of the detector conditions should be made by FDOT personnel in another several months.

The rest of the material in this section was provided by the vendors.

### *SENSIT*

IPsens has developed its Advanced Maintenance Monitoring Application and services based on decades of experience in providing parking management applications and connecting various field data devices, such as hand held terminals and parking meters, to a centralized database.

This IPSens Application is comprised of the following key modules:

1. Diagnostics Engine

The diagnostics engine has been developed to identify systems and component failures. In the case of parking sensors, this is based in part on the connected device's ability to communicate certain diagnostic codes such as battery status, battery failure, sensing status, battery consumption, loss of communication with system, etc.

Secondly algorithms have been and will continue to be developed based on observed historical system performance and component behavior, to help anticipate and

provide early notification of impending system problems.

## 2. Alert Notification

Based on the continuous diagnostics monitoring of the system automated first level troubleshooting alerts are generated based on a pre-established priority hierarchy of the diagnosed problem.

The diagnosed problems are sorted by severity based on its immediate impact on systems' data accuracy. For example, a lost communication failure to an entire parking site will be prioritized higher than the outage of a single attached device, such as an individual parking sensor. Based on the level and type of priority of the issue the system will generate an electronic message (email, sms) to the individual/entity designated as the first level maintenance provider.

## 3. Work Order Issuance

Starting with the first notification of a problem, the system generates a first level troubleshooting work order to the designated service provider. First level troubleshooting will be undertaken by the maintenance provider, supported by IPSens technical staff for actual deep level diagnostics and remedial action.

In the event first level troubleshooting and remote maintenance actions prove unsuccessful, the system provides the maintenance provider with the ability to generate a field maintenance order identifying the expected problem with a call for specific maintenance action to be undertaken.

Severity status of the problem and requested time for completion in addition to the identification of specific components required on site will be issued as part of the work order.

## 4. Work Order Processing

Work orders are issued directly on the Advanced Maintenance Monitoring Application and can be accessed through remote interface using a secure web browser



interface. This allows the field maintenance operator the ability to use an internet enabled mobile device to access the work order and notate completion status and/or a call for further action required; in the field or in the back office.

#### 5. Work Order History

The system automatically tracks the status of all work orders issued by the system. A historical record is automatically generated that can provide information such as failure types by type of equipment, communication, site, space, frequency etc. It also tracks individual and compiled times for problem resolution by several different levels of detail. This feature provides a transparent record to the operator of the performance of equipment, system, and maintenance services.

#### 6. Real Time Outage Map

The Maintenance Monitoring Application provides a GIS based map of every deployed field device in every location. When a device and or location report a problem it will automatically be posted as a graphic presentation on a real time map in the application. The posted outage/problem identifier will be continued to be posted on the map until a work order has been closed out and the problem has been resolved.

#### 7. Secure Support Interface Layer

The Maintenance Monitoring Application runs as a secured module within the parking availability application. As such, the maintenance provider of the system can be completely isolated from all access to operational systems data, should the end user wish to do so.

#### 8. Optional, 3rd Party API

An optional 3rd party API can be provided allowing certain data contained in the Maintenance Monitoring Application to be shared with other data management systems that comply with an open data systems protocol.

## 9. Maintenance Monitoring Services

IPsens provides several services as part of their Maintenance Monitoring Application offering. These services are key to the systems maintenance-monitoring concept as it allows them to address and monitor problems at a very high level, which can ordinarily not be trained for with an operator of “IOT” devices as it is a constantly changing environment.

Their service offering includes the following components:

**Application Maintenance and Updates.** The operation of the system requires manned monitoring to generate and analyze the required historical performance; They undertake the task of monitoring systems behavior and identifying the patterns or events that form the basis for development of new or updated automated monitoring algorithms; They undertake all first level troubleshooting and remote repair actions. These can include things from a simple reset and device recalibration; to much more complicated actions such as remotely deploying new firmware upgrades to all devices.

**Hardware Support Services.** They work closely with all the hardware manufacturers to closely monitor performance and troubleshoot any items that reside outside our ability to address them; Services include reviewing and addressing the on-going performance of the manufactures devices; Additional services address the updating and issuance of new firmware, developed to address particular problems observed and/or the release of new firmware to address issues such as prolonging battery life of connected devices or special operator requirements. Having the hardware manufacturer involved, in cases where this is possible, is a definite advantage to the operator as it allows for problem resolution to include the on-going involvement of the engineers who designed the system [5].

*Sensys*

According to the Sensys personnel: “There is no required preventative maintenance for our products. They are self-calibrating and self-tuning. Expected parking sensor battery life is 8 years. Expected repeater battery life is 7 years. Only recommended maintenance is firmware updates for access points, radios, repeaters, and sensors. The system will record and report status of all batteries and stability (wireless signal strength, line quality, detection status, etc.), and provide maintenance alerts to user account emails if diagnostic values are exceeded.”

*CivicSmart*

Parking Enterprise Management System (PEMS) comes packed with a full suite of real time and historic reporting, allowing the DOT to look at their truck parking program from multiple angles, from the performance of all sensors to the performance of a single sensor. This data may also be displayed on a tablet or handheld device/smartphone for increased efficiency among field staff.

Designated DOT personnel will have access to real-time alarms and status reporting for system monitoring and maintenance. In addition to these alarms being available through PEMS, they can also be sent via email or text to selected personnel, facilitating even faster maintenance and increasing system uptime.

All management reports are available through our web-based PEMS and can be accessed by authorized users from any computer with an internet connection and standard web browser.

Our PEMS system has a robust reporting mechanism that allows clients real-time and historic access to the data needed to effectively manage their program. The data presented in these reports can be segmented in myriad ways, including date and time, sensor location, and sensor activity. Essentially, this provides the DOT with unlimited report and data capabilities [6].

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## Appendix A

### Technical Specifications for IPsens Truck Parking Detection Network Components

**Table 8. Technical specifications for SENSIT IR**

| <b>SENSIT IR</b>               | <b>9898620</b>  |
|--------------------------------|---|
| <b>Operating frequency</b>     | 902-928 MHz   |
| <b>Detection</b>               | Magnetic and IR   |
| <b>Detection height</b>        | 0 ... 90 cm [0 ... 35.5 in]   |
| <b>Mounting</b>                | Into the floor  |
| <b>Mounting Dimensions</b>     | Total: 78 mm [3.07 in] and 73 mm [2.87 in]<br>Above the floor: 20 mm [0.79 in]<br>In the floor: 53 mm [2.09 in] |
| <b>Weight</b>                  | 365 gram [12.87 oz]   |
| <b>Protection</b>              | IP67, completely sealed Housing PE  |
| <b>Material</b>                | Black Ployethylene  |
| <b>Operational temperature</b> | -40 ... +85°C [-40 ...+ 185°F]  |
| <b>Storage temperature</b>     | -40 ... +85°C [-40 ...+ 185°F]  |
| <b>Power supply</b>            | Built in lithium battery  |
| <b>Expected lifetime</b>       | 5-10 years  |

**Table 9. Technical specifications for Relay Node 2G**

| <b>Relay Node 2G</b>             | <b>9212892</b>  |
|----------------------------------|---|
| <b>Operating frequency</b>       | 902-928 MHz   |
| <b>Mounting</b>                  | Onto a pole or wall, metal mounting bracket included  |
| <b>Suggested mounting height</b> | 3-6 meters [ 10-20 ft] from the floor onto a lamppost or pole   |
| <b>Pole dimensions</b>           | Min. 40 mm [1.57 in]; Max. 150 mm [6 in]  |
| <b>Wall mounting</b>             | With bracket using 4 screws   |
| <b>Weight</b>                    | 365 gram [12.87 oz]   |
| <b>Protection</b>                | IP65, completely sealed Housing ASA and Alu   |
| <b>Operational temperature</b>   | -40 ... +85°C [-40 ...+ 185°F]  |
| <b>Storage temperature</b>       | -40 ... +85°C [-40 ...+ 185°F]  |
| <b>Communication range</b>       | Relay Node 2G – SENSIT max. 35 m [135 ft] omnidirectional, 50 m [164 ft] directional<br>Relay Node 2G – Relay Node 2G max. 100m [328 ft]<br>Data Collector IP65 GPRS – Relay Node 2G max. 10m [33 ft] |
| <b>Power supply</b>              | Replaceable lithium batteries with expected lifetime of 5-7 years   |

**Table 10. Technical specifications for Data Collector IP65 GPRS**

| <b>Data Collector IP65 GPRS</b> | <b>9966498</b>   |
|---------------------------------|--|
| <b>Operating frequency</b>      | 868.2 MHz  |
| <b>Housing dimensions L×W×H</b> | 250 × 90 × 250 mm [9.9 × 3.5 × 9.9 in]   |
| <b>Weight</b>                   | 2200 gram [77 oz]  |
| <b>Protection</b>               | IP65   |
| <b>Operational temperature</b>  | -40 ... +65°C [-40 ...+ 149°F]   |
| <b>Storage temperature</b>      | -40 ... +65°C [-40 ...+ 149°F]   |
| <b>Communication range</b>      | The nearest node should be positioned within 10 m [33 ft] of the Data Collector IP65 GPRS. |
| <b>Power supply</b>             | 100-240Vac, 50-60 Hz, 15 VAC   |



## Appendix B

### Technical Specifications for Sensys Truck Parking Detection Network Components

Table 11. Technical specifications for MicroRadar

| Sensys MicroRadar       | VSN240-MP-2  |
|-------------------------|--|
| Operating frequency     | 2400-2483.5 MHz  |
| Detection               | Micro radar  |
| Mounting                | Into the floor   |
| Dimensions              | 2.9" × 2.9" × 2.3" [7.4 cm × 7.4 cm × 5.8 cm]  |
| Weight                  | 0.6 pounds / 0.3 kg  |
| Protection              | IP67 ingress protection  |
| Operational temperature | -40 ... +85°C [-40 ... + 176°F]  |
| Power supply            | Non-replaceable primary Li-SOCl <sub>2</sub> 3.6V battery pack<br>7.2 Ah (normal capacity) |
| Expected lifetime       | 8 years  |

Table 12. Technical specifications for Access Point Controller Card

| Access Point Controller Card |  |
|------------------------------|--|
| Operating frequency          | 2400-2483.5 MHz  |
| Mounting                     | Any roadside location that provides adequate signal coverage to sensors/repeaters<br>1. No special requirements regarding setback, relative angle of the sun, or mounting stability  |
| Dimensions                   | Single-slot: 7" × 4.5" × 1.1" (18 cm × 11.4 cm × 3 cm)<br>Double-slot: 7" × 4.5" × 2.3" (18 cm × 11.4 cm × 6 cm)<br>APCC-SPP: 4.7" × 3.5" × 2.4" (12 cm × 9 cm × 6 cm)<br>Isolator: 6.5" × 3" × 1.3" (17 cm × 8 cm × 3 cm) |
| Weight                       | Single-slot: 7.9 oz (224 g)<br>Double-slot: 10.5 oz (298 g)<br>APCC-SPP: 14.1 oz (400 g)<br>Isolator: 5.6 oz (159 g)   |
| SPP enclosure rating         | NEMA 4X  |
| Operational temperature      | Industrial -40 ... +80°C   |
| Input voltage                | 22-26 VDC (24VDC nominal)<br>9-15 VDC (12 VDC nominal)   |

## Appendix C

### Technical Specifications for CivicSmart Truck Parking Detection Network Components

**Table 13. Technical specifications for In-pavement Vehicle Detection Sensor**

| In-pavement Vehicle Detection Sensor |  |
|--------------------------------------|--|
| <b>Operating frequency</b>           | 2405-2480 MHz  |
| <b>Detection</b>                     | Microwave radar  |
| <b>Mounting</b>                      | Into the floor   |
| <b>Dimensions</b>                    | 144 mm × 89 mm   |
| <b>Weight</b>                        | 940 g  |
| <b>Protection</b>                    | ASTM B117, ISO 9227 Salt Spray<br>ASTM D1735 Humidity Testing<br>IP67 environmental rating<br>GMW 14872 Cyclic Corrosion |
| <b>Operational temperature</b>       | -20 ... +80°C  |
| <b>Power supply</b>                  | 3.6 V, 24 Ah Lithium Thionyl Chloride sealed unit  |
| <b>Expected lifetime</b>             | 8 years  |

**Table 14. Technical specifications for Solar-Powered Gateway**

| Solar-Powered Gateway          |   |
|--------------------------------|---|
| <b>Operating frequency</b>     | 2405 - 2480 MHz   |
| <b>Dimensions</b>              | Enclosure: 110 mm × 75 mm × 75 mm   |
| <b>Weight</b>                  | 6 kg (including mount)  |
| <b>Protection</b>              | RoHS<br>Compatible with FCC Part 15<br>Compatible with EN 300 440-1<br>IP54 environmental rating<br>Compatible with ASTM B117, ISO 9227 Salt Spray<br>Compatible with ASTM D1735 Humidity Testing |
| <b>Operational temperature</b> | -20 °C to 85°C  |
| <b>Power supply</b>            | Main power: 8.2 V rechargeable battery pack<br>External power: 12 V, 10 Watt Solar Panel  |

## Appendix D

### Detailed Accuracy Test Results

**Table 15. Accuracy test results**

| Technologies | Analysis period      | Number of parking events | Turnover accuracy (%) | Number of hours | Occupancy accuracy (%) | General weather condition |
|--------------|----------------------|--------------------------|-----------------------|-----------------|------------------------|---------------------------|
| IPsens       | 8/18/16: 8:00-23:59  | 208                      | 93.27                 | 16              | 97.89                  | Dry                       |
|              | 8/19/16: 0:00-23:59  | 218                      | 97.71                 | 24              | 97.88                  | Rain, Thunderstorm        |
|              | 8/20/16: 0:00-17:00  | 158                      | 100                   | 24              | 98.99                  | Dry                       |
|              | 8/31/16: 0:00-22:00  | 206                      | 95.15                 | 22              | 98.27                  | Rain                      |
|              | 9/05/16: 0:00-23:59  | 131                      | 93.13                 | 24              | 96.24                  | Rain                      |
|              | 9/11/16: 0:00-23:59  | 152                      | 91.45                 | 24              | 95.12                  | Thunderstorm              |
|              | Sum                  | 1073                     | <b>95.25</b>          | 134             | <b>97.36</b>           |                           |
| Sensys       | 9/01/16: 0:00-23:59  | 114                      | 97.37                 | 24              | 98.63                  | Rain, Thunderstorm        |
|              | 9/03/16: 0:00-23:59  | 110                      | 93.64                 | 24              | 98.01                  | Rain, Thunderstorm        |
|              | 9/05/16: 0:00-23:59  | 104                      | 99.04                 | 24              | 99.20                  | Rain                      |
|              | 9/06/16: 0:00-23:59  | 105                      | 100.00                | 24              | 99.72                  | Dry                       |
|              | 9/09/16: 0:00-23:59  | 109                      | 96.33                 | 24              | 99.52                  | Dry                       |
|              | 9/11/16: 0:00-23:59  | 106                      | 100.00                | 24              | 99.49                  | Thunderstorm              |
|              | 9/14/16: 0:00-23:59  | 128                      | 99.22                 | 24              | 99.49                  | Rain, Thunderstorm        |
|              | Sum                  | 776                      | <b>97.94</b>          | 168             | <b>99.15</b>           |                           |
| CivicSmart   | 8/20/16: 6:00-20:00  | 63                       | 98.41                 | 14              | 99.19                  | Dry                       |
|              | 8/24/16: 16:00-20:00 | 23                       | 91.3                  | 4               | 89.95                  | Dry                       |
|              | 8/25/16: 6:00-13:00  | 38                       | 100                   | 7               | 99.14                  | Dry                       |
|              | 8/26/16: 16:00-20:00 | 18                       | 100                   | 4               | 99.41                  | Dry                       |
|              | 8/27/16: 6:00-20:00  | 41                       | 95.12                 | 14              | 89.99                  | Dry                       |
|              | 8/28/16: 6:00-15:00  | 24                       | 100                   | 9               | 96.97                  | Dry                       |
|              | 8/31/16: 6:00-15:00  | 84                       | 97.62                 | 9               | 98.5                   | Rain                      |
|              | 9/01/16: 6:00-20:00  | 57                       | 89.47                 | 14              | 96.31                  | Rain, Thunderstorm        |
|              | 9/04/16: 11:00-20:00 | 27                       | 85.19                 | 9               | 99.61                  | Rain, Thunderstorm        |
|              | 9/05/16: 6:00-20:00  | 33                       | 100                   | 14              | 99.87                  | Rain                      |
|              | 9/09/16: 6:00-20:00  | 80                       | 97.5                  | 14              | 98.91                  | Dry                       |
|              | Sum                  | 488                      | <b>96.11</b>          | 112             | <b>97.20</b>           |                           |

**Table 16. Accuracy test results under raining conditions**

| Technologies | Analysis period      | Number of parking events | Turnover accuracy (%) | Number of hours | Occupancy accuracy (%) | General weather condition |
|--------------|----------------------|--------------------------|-----------------------|-----------------|------------------------|---------------------------|
| IPsens       | 8/19/16: 0:00-23:59  | 218                      | 97.71                 | 24              | 97.88                  | Rain, Thunderstorm        |
|              | 8/31/16: 0:00-22:00  | 206                      | 95.15                 | 22              | 98.27                  | Rain                      |
|              | 9/05/16: 0:00-23:59  | 131                      | 93.13                 | 24              | 96.24                  | Rain                      |
|              | 9/11/16: 0:00-23:59  | 152                      | 91.45                 | 24              | 95.12                  | Thunderstorm              |
|              | Sum                  | 707                      | <b>94.77</b>          | 94              | <b>96.85</b>           |                           |
| Sensys       | 9/01/16: 0:00-23:59  | 114                      | 97.37                 | 24              | 98.63                  | Rain, Thunderstorm        |
|              | 9/03/16: 0:00-23:59  | 110                      | 93.64                 | 24              | 98.01                  | Rain, Thunderstorm        |
|              | 9/05/16: 0:00-23:59  | 104                      | 99.04                 | 24              | 99.20                  | Rain                      |
|              | 9/11/16: 0:00-23:59  | 106                      | 100.00                | 24              | 99.49                  | Thunderstorm              |
|              | 9/14/16: 0:00-23:59  | 128                      | 99.22                 | 24              | 99.49                  | Rain, Thunderstorm        |
|              | Sum                  | 562                      | <b>97.87</b>          | 120             | <b>98.96</b>           |                           |
| CivicSmart   | 8/31/16: 6:00-15:00  | 84                       | 97.62                 | 9               | 98.5                   | Rain                      |
|              | 9/01/16: 6:00-20:00  | 57                       | 89.47                 | 14              | 96.31                  | Rain, Thunderstorm        |
|              | 9/04/16: 11:00-20:00 | 27                       | 85.19                 | 9               | 99.61                  | Rain, Thunderstorm        |
|              | 9/05/16: 6:00-20:00  | 33                       | 100                   | 14              | 99.87                  | Rain                      |
|              | Sum                  | 201                      | <b>94.03</b>          | 46              | <b>98.47</b>           |                           |

## Appendix E

### Overview of the Data Analysis Software Tool

The following is a brief overview of the data analysis software tool developed for this project.

#### Main screen:

In the main screen, CSV-formatted files of video data and parking sensor data from each vendor can be loaded into the software for analysis. Detailed specifications (record interval, space numbers, the range of accepted error in seconds, etc.) can also be specified accordingly.

After loading the video data and sensor data files and specified the necessary information, click the “Events Compare” and “Occupancy Compare” buttons in the “Accuracy Tests” section, the number of events in the record, event accuracy (%) and the duration in hours, occupancy accuracy (%) will be calculated and displayed in the screen.

**Truck Parking Data**

Video Data Folder:

IPsens Data Folder:

Sensys Data Folder:   TimeDifference

CivicSmart Data Folder:   Offset

Record Interval  
Start (M/D/h/m/s)       
End (M/D/h/m/s)

Space Numbers  
Start #   
End #

(Specify the start and end time of the studied parking interval, will be used in the development of charts and calculation of statistics.)

Accuracy Tests

Range (s)   # of Events  Event Accuracy (%)

Duration (h)  Occupancy Accuracy (%)

### Parking records screen:

The software can also display the records from the loaded file and various kinds of charts by clicking the “Display Parking Records and Charts” button in the main screen.

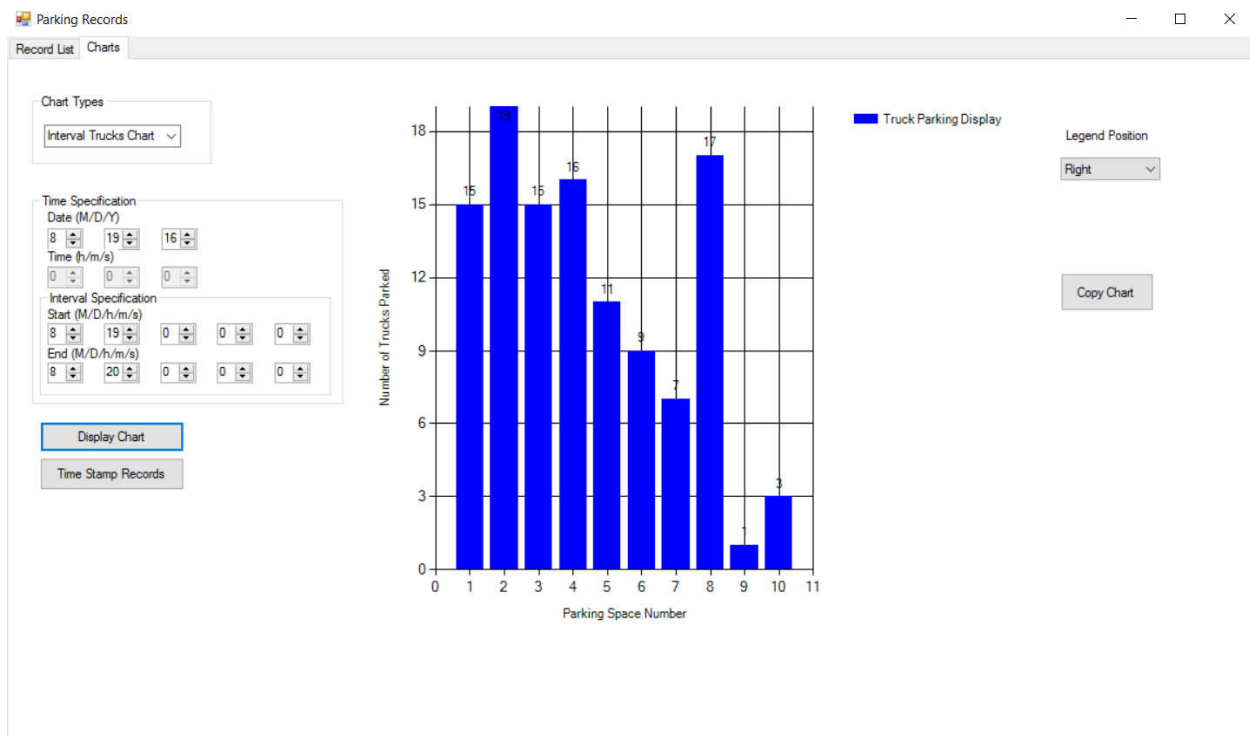
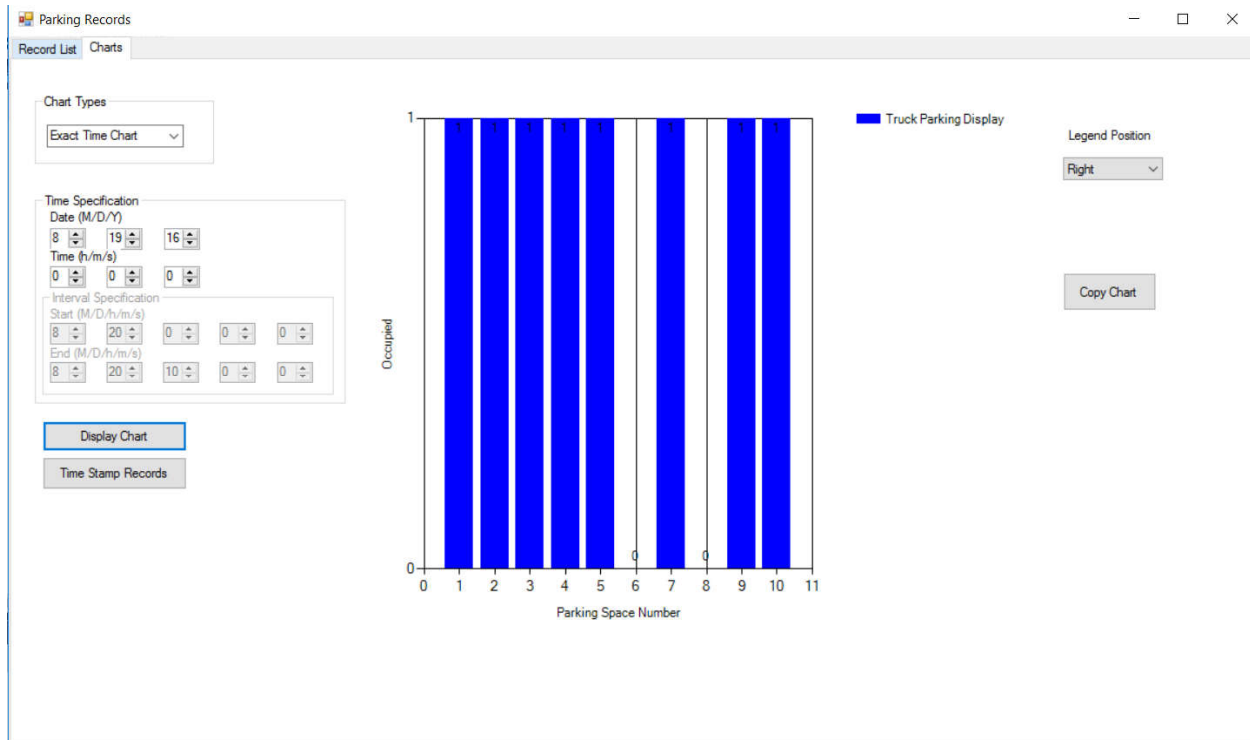
**Parking Records**

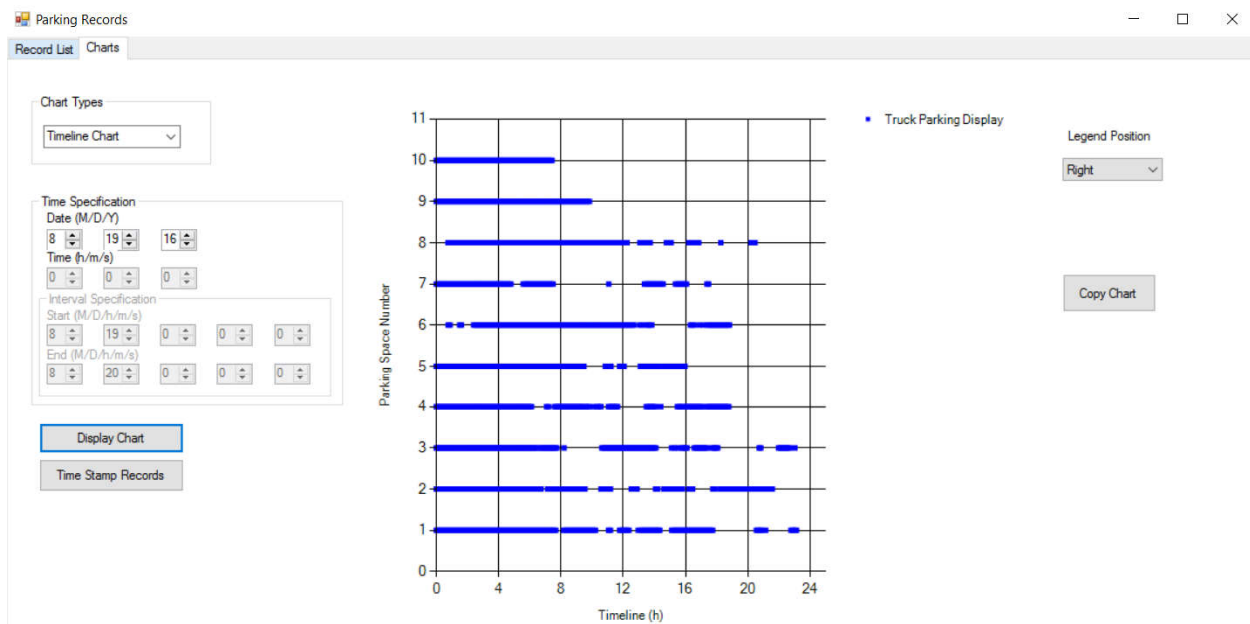
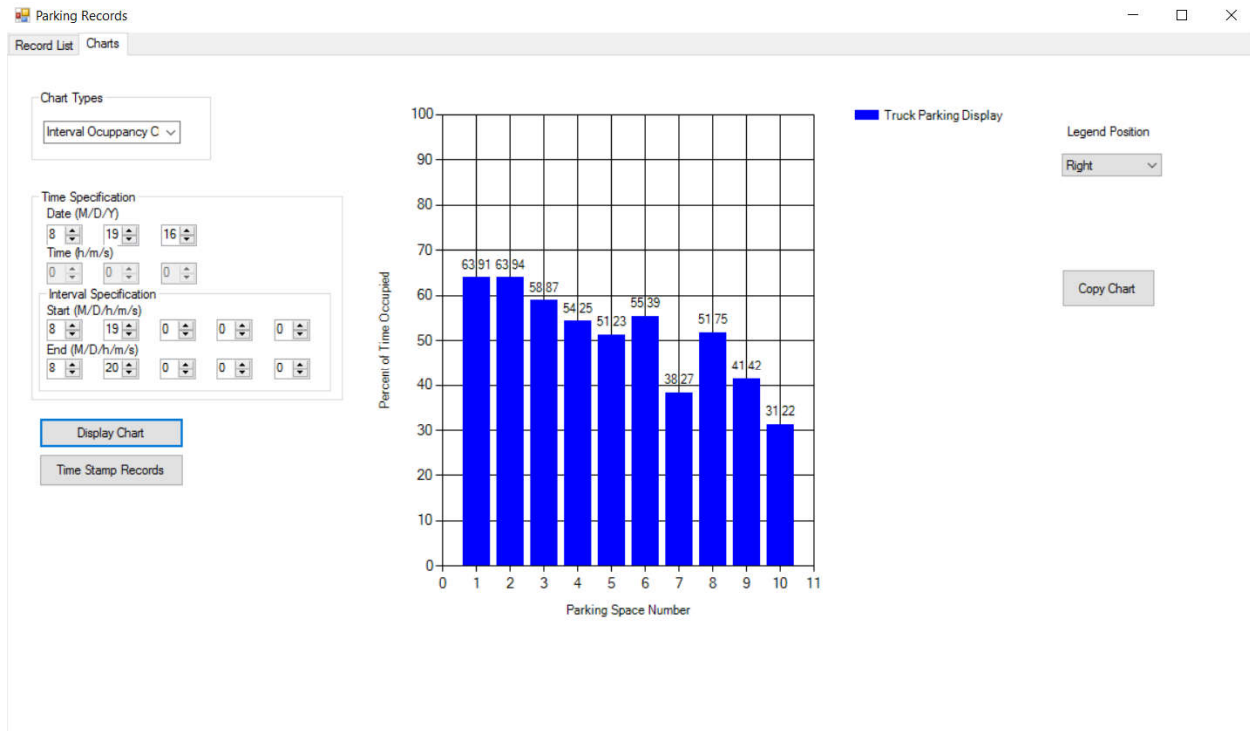
Record List

| Record ID | Truck ID | Space # | In/Out | Date      | Year | Month | Day | Time    | Hour | Minute | Second | Veh Type       | Alignment              | Truck Label |
|-----------|----------|---------|--------|-----------|------|-------|-----|---------|------|--------|--------|----------------|------------------------|-------------|
| 1         | 1        | 1       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 2         | 2        | 2       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 3         | 3        | 3       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 4         | 4        | 4       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 5         | 5        | 5       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 6         | 6        | 7       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Other          | Semi towing other cabs |             |
| 7         | 7        | 9       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 8         | 8        | 10      | In     | 8/19/2016 | 2016 | 8     | 19  | 0:00:00 | 0    | 0      | 0      | Truck with ... |                        |             |
| 9         | 9        | 8       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:45:30 | 0    | 45     | 30     | Truck with ... |                        |             |
| 10        | 10       | 6       | In     | 8/19/2016 | 2016 | 8     | 19  | 0:46:00 | 0    | 46     | 0      | Other          |                        |             |
| 11        | 10       | 6       | Out    | 8/19/2016 | 2016 | 8     | 19  | 1:00:00 | 1    | 0      | 0      | Other          |                        |             |
| 12        | 11       | 6       | In     | 8/19/2016 | 2016 | 8     | 19  | 1:30:00 | 1    | 30     | 0      | Other          |                        |             |
| 13        | 11       | 6       | Out    | 8/19/2016 | 2016 | 8     | 19  | 1:39:00 | 1    | 39     | 0      | Other          |                        |             |
| 14        | 12       | 6       | In     | 8/19/2016 | 2016 | 8     | 19  | 2:24:00 | 2    | 24     | 0      | Truck with ... |                        |             |
| 15        | 6        | 7       | Out    | 8/19/2016 | 2016 | 8     | 19  | 4:49:30 | 4    | 49     | 30     | Other          | Semi towing other cabs |             |
| 16        | 13       | 7       | In     | 8/19/2016 | 2016 | 8     | 19  | 5:34:30 | 5    | 34     | 30     | Truck with ... |                        |             |
| 17        | 4        | 4       | Out    | 8/19/2016 | 2016 | 8     | 19  | 6:10:30 | 6    | 10     | 30     | Truck with ... |                        |             |
| 18        | 3        | 3       | Out    | 8/19/2016 | 2016 | 8     | 19  | 6:28:30 | 6    | 28     | 30     | Truck with ... |                        |             |
| 19        | 14       | 3       | In     | 8/19/2016 | 2016 | 8     | 19  | 6:40:00 | 6    | 40     | 0      | Truck with ... |                        |             |
| 20        | 2        | 2       | Out    | 8/19/2016 | 2016 | 8     | 19  | 6:49:00 | 6    | 49     | 0      | Truck with ... |                        |             |
| 21        | 15       | 4       | In     | 8/19/2016 | 2016 | 8     | 19  | 7:05:00 | 7    | 5      | 0      | Truck with ... |                        |             |
| 22        | 16       | 2       | In     | 8/19/2016 | 2016 | 8     | 19  | 7:09:00 | 7    | 9      | 0      | Truck with ... |                        |             |
| 23        | 15       | 4       | Out    | 8/19/2016 | 2016 | 8     | 19  | 7:17:00 | 7    | 17     | 0      | Truck with ... |                        |             |
| 24        | 8        | 10      | Out    | 8/19/2016 | 2016 | 8     | 19  | 7:22:00 | 7    | 22     | 0      | Truck with ... |                        |             |
| 25        | 17       | 10      | In     | 8/19/2016 | 2016 | 8     | 19  | 7:23:30 | 7    | 23     | 30     | Truck with ... |                        |             |

Four kinds of charts could be displayed in the software: exact time chart, interval trucks chart, interval occupancy chart, and timeline chart.







## **Appendix F**

### **Vendors' Explanation of Incorrect Test Results**

#### **IPsens**

After the research team conducted the accuracy tests and shared the results with IPSens, IPSens personnel requested the comparison data and ground-truth data for further examination.

According to IPSens personnel, they were able to identify a filter issue that affected their results for 9/5 and 9/11. The following information is provided by the IPSens personnel.

#### **Background:**

The sensors can be set to report an event in a number of different modes as follow: Magnetic Only, IR Only, or Automatic. For purposes of this Automatic mode was chosen for all sensors. When in automatic mode the sensor will look primarily at the status of the IR, if the IR gets blocked, while the magnetic sensor sees additional events, a factory set filter will monitor this and reset the sensor to magnetic only sensing based on the threshold setting of the filter. Until the filter settings have been reached the unit will show occupied.

The IPSens sensor array for Truck Parking uses an algorithm which among other things contain the logic for how a space is deemed to be occupied as follow: The algorithm will sort by the automatic occupancy status from the sensor system, which in auto setting is IR first. If one or more sensors in an array shows occupied the space will be deemed occupied by the system for the duration, any changed input from remaining sensors in the space will be ignored for the duration until all occupied inputs have been cleared.

During the test on 9/05/16 this caused the following data anomalies:

In space 4, a small truck enters at 14:09 and departs at 14:29. (Line 86 & 91 in the attached sheet) It parks squarely between the front and middle sensor in the array and does not activate the IR to show occupied. Due to the auto setting on the sensors the event is missed by IR. However, when looking at the input data from the system the event was shown correctly when looking at the magnetic input only. We are currently looking to improve this in the future as a

part of the completion of our vehicle classification algorithm, in such a way that the magnetic input would be considered in parallel with the IR input. For now, we consider these events missed.

In space 5, a truck enters at 15:17 and the IPSens algorithm shows the event continuing 11:56 the following day. Upon closer examination we have learned that one of the sensors in the array in space 5 experienced an IR blockage during this occupancy. With the auto sensor filter set in factory default settings this had the unintended consequence of locking the space in an occupied state until an automatic reset took place. This blockage caused the algorithm to ignore the following 7 observed events, which were all correctly identified by other sensors in the array. This can be very easily fixed by remotely changing the filter settings on the individual sensor in the manufacturers firmware settings to a level which takes the redundancy of the additional sensors into account. The filter was set for single sensor discrimination and not an array. We would like to request that these events be changed from missed to correct or be eliminated from the data file as we made an obvious error in correctly configuring the sensor filter settings for an array.

We reviewed the data for 9/11/16 and found issues similar to the ones found in the 9/05/16 files. It is reasonable to assume that taking the actions discussed below for 9/05/16 would yield similar improvements to the on-going data accuracy results going forward.

### **CivicSmart**

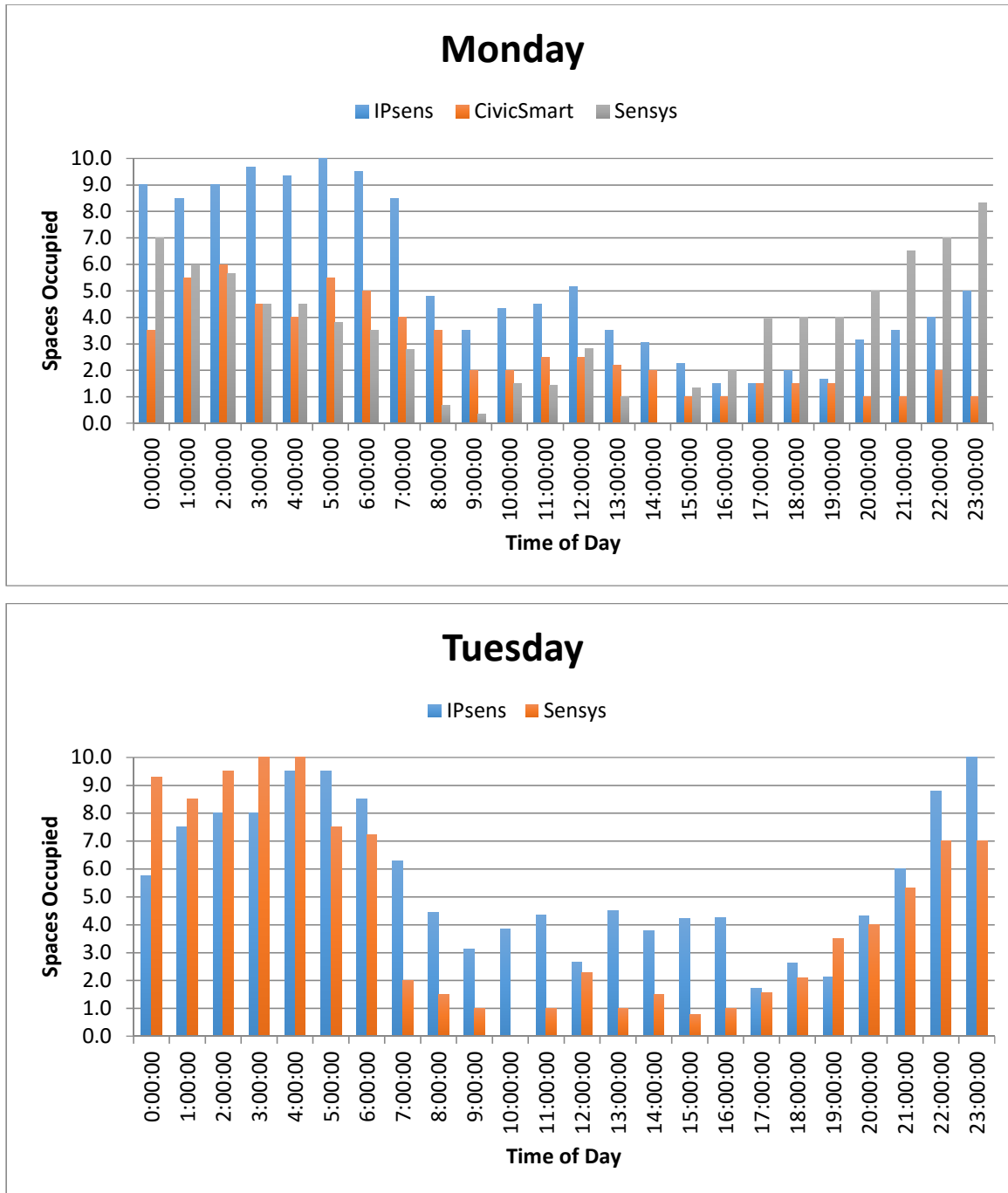
It should be noted that CivicSmart's performance was achieved using only 2 sensors per truck space instead of 3 sensors for the other two solutions. All the misses in CivicSmart's system were due to either 1) data reported by sensor, but ignored for the purposes of this analysis as the event time was off by more than 90 seconds on September 1st due to the sensor domain controller clock offset issue that CivicSmart experienced or 2) short vehicles that pulled up to the head of the space and missed the sensor. CivicSmart has stated that they have since corrected the sensor domain controller time using a network time standard and video analysis shows that moving the sensors by 5 feet within the space will capture short and long vehicles with just 2 CivicSmart sensors.

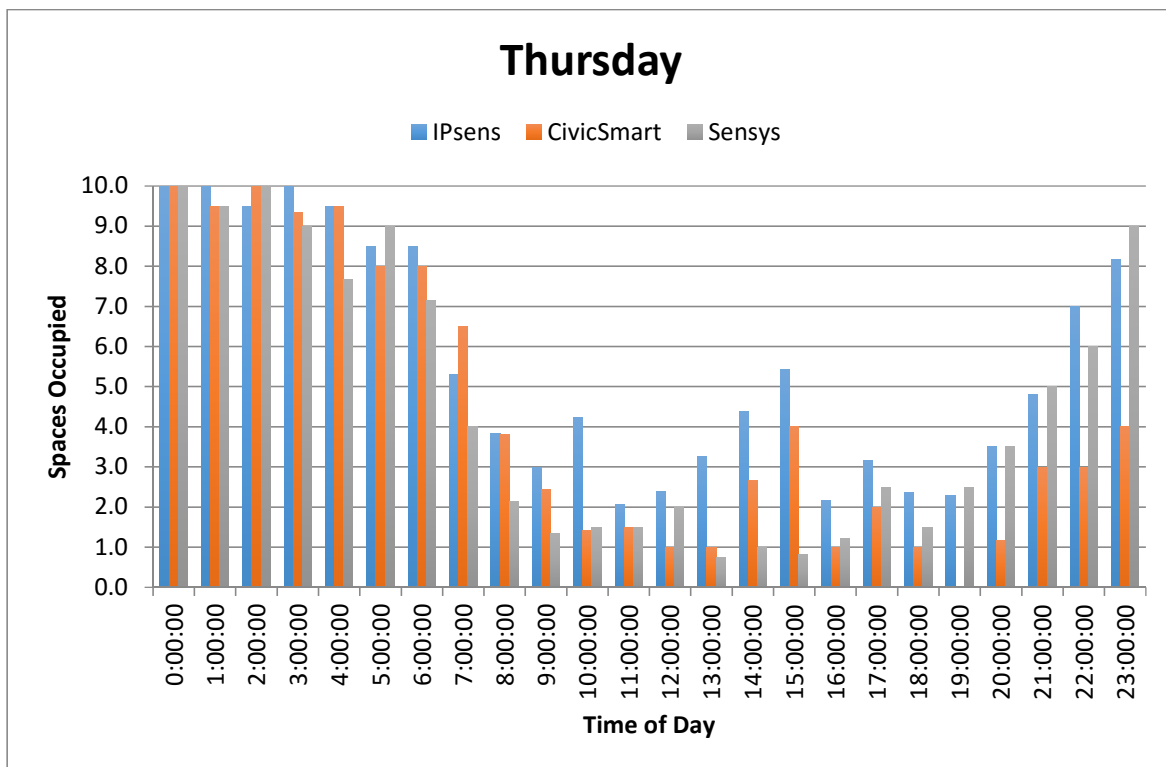
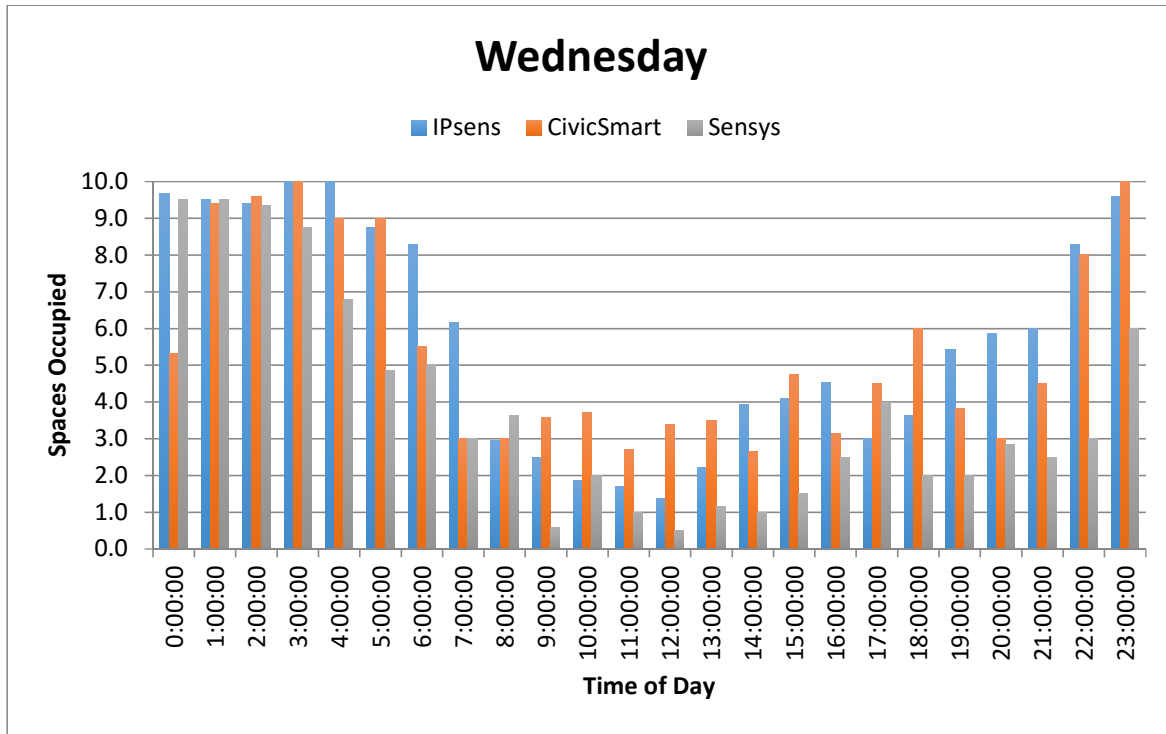
## Appendix G

### Supplemental Parking Statistics from Video Data Analysis

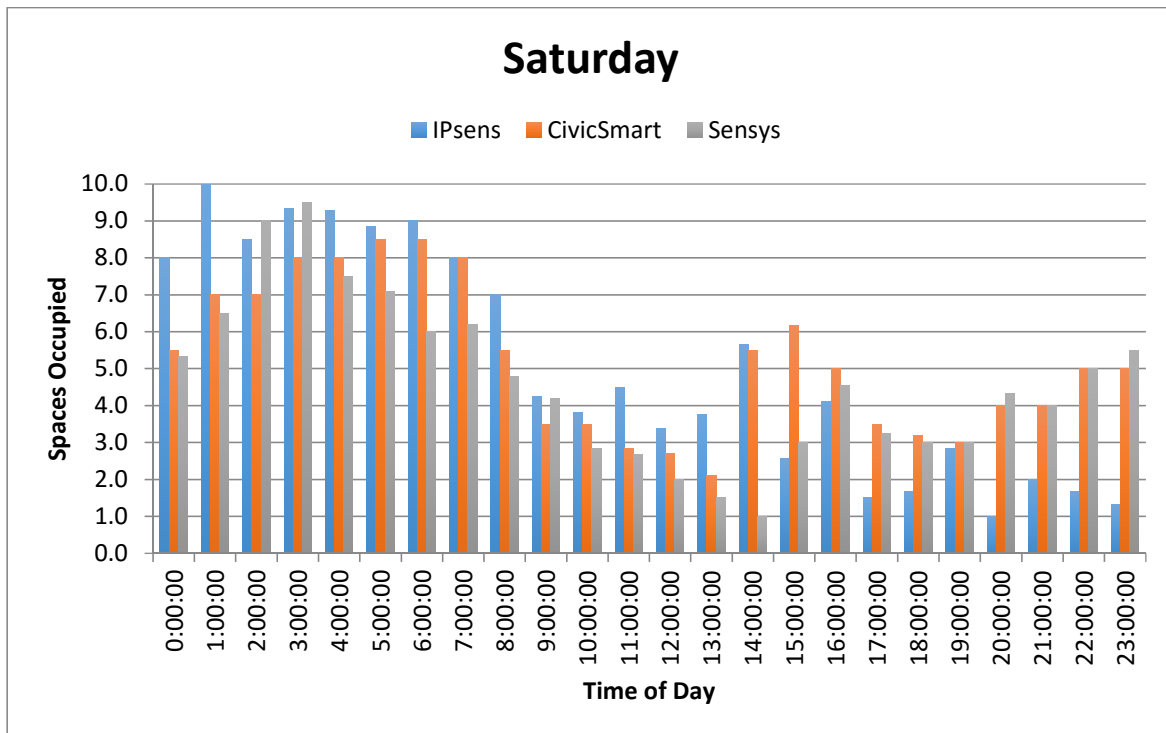
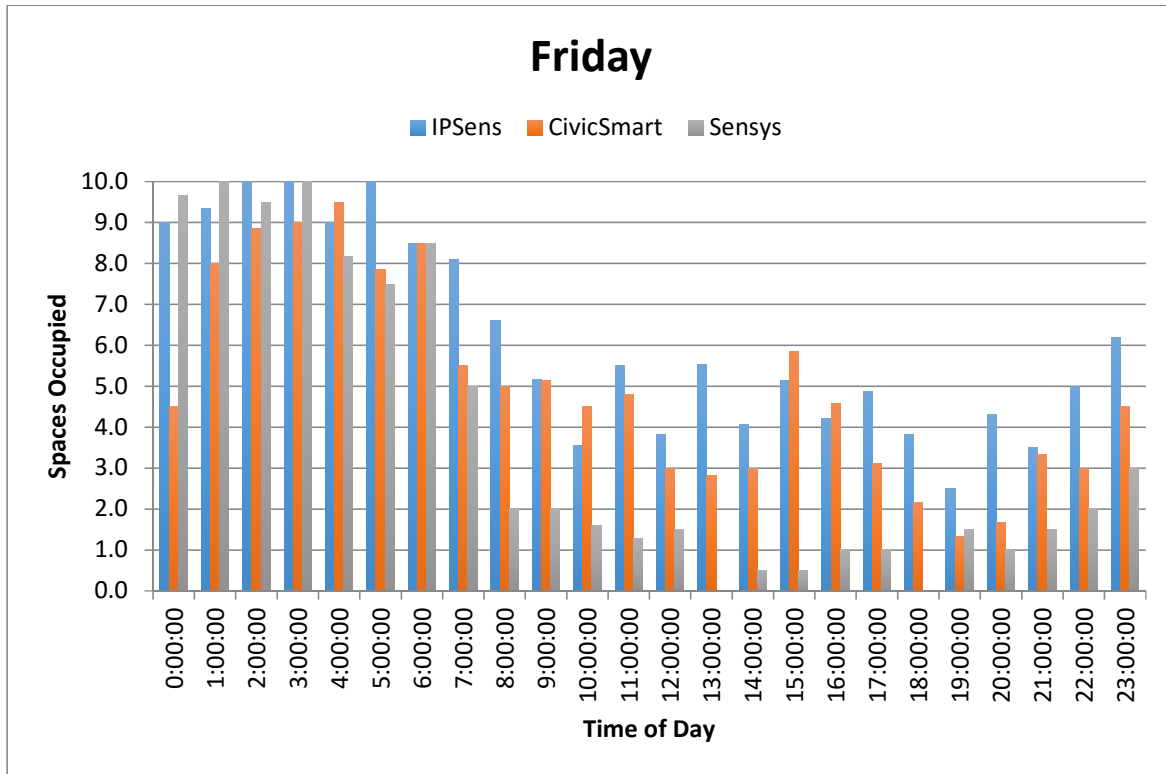
The data in this section were sampled from 8/18/2016 – 9/14/2016.

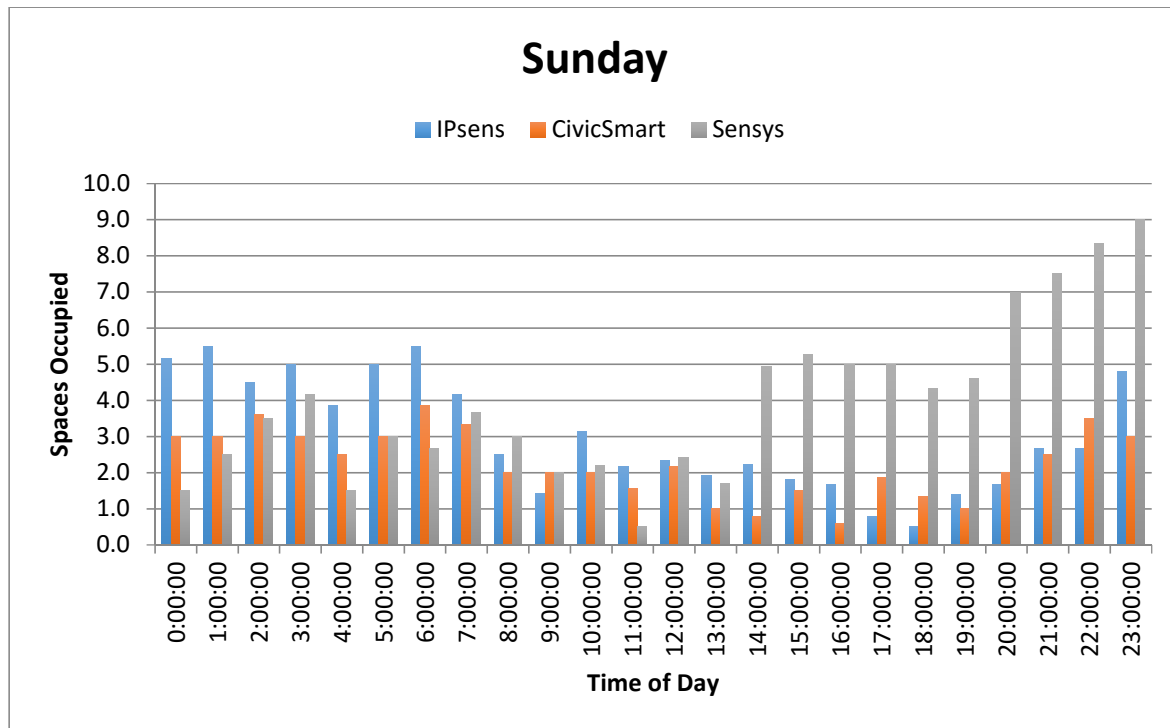
#### Time of day parking space utilization, by day of the week:

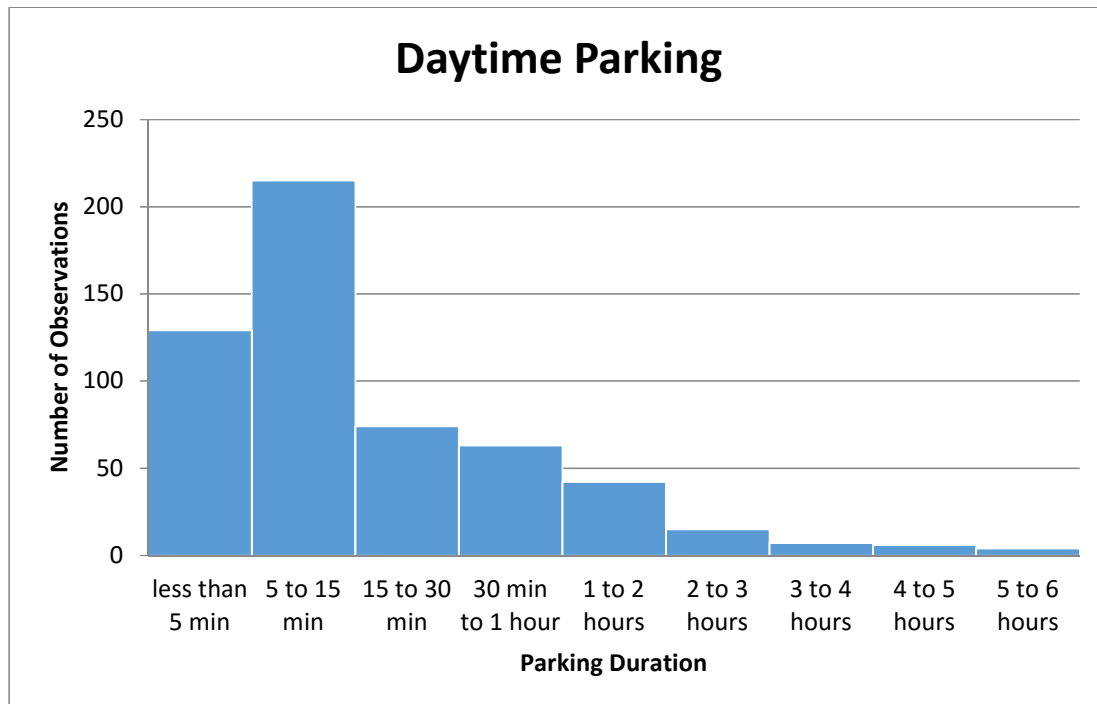




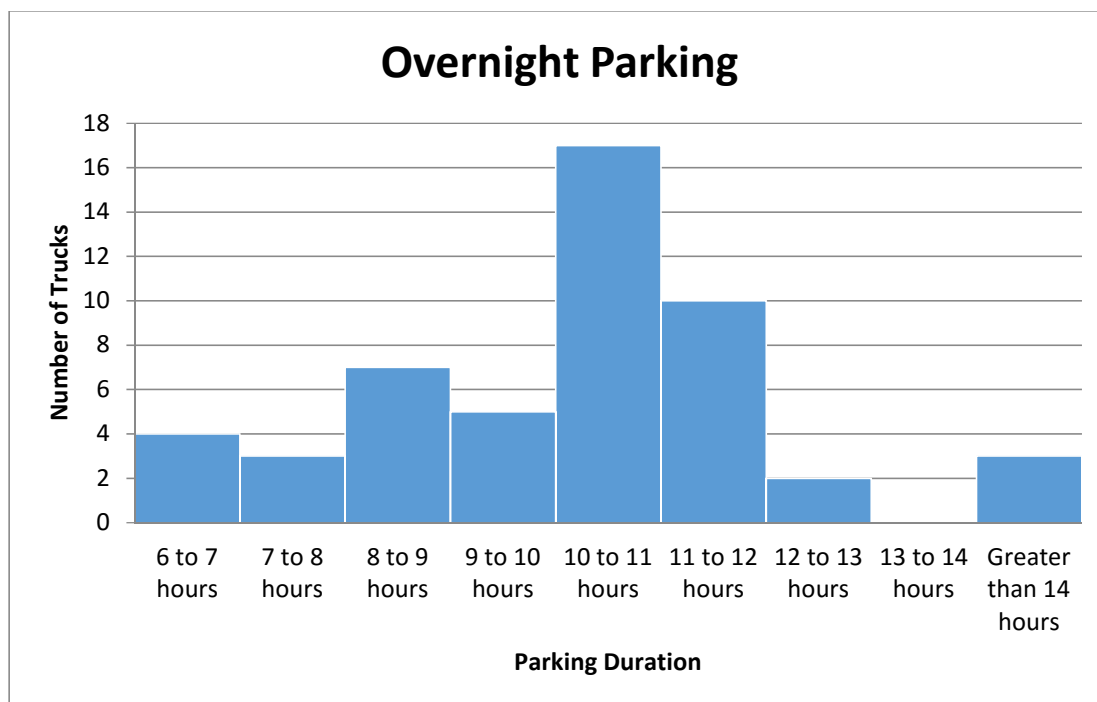






**Truck parking hours (8/18/16 to 8/20/16 and 9/4/16 to 9/8/16):**

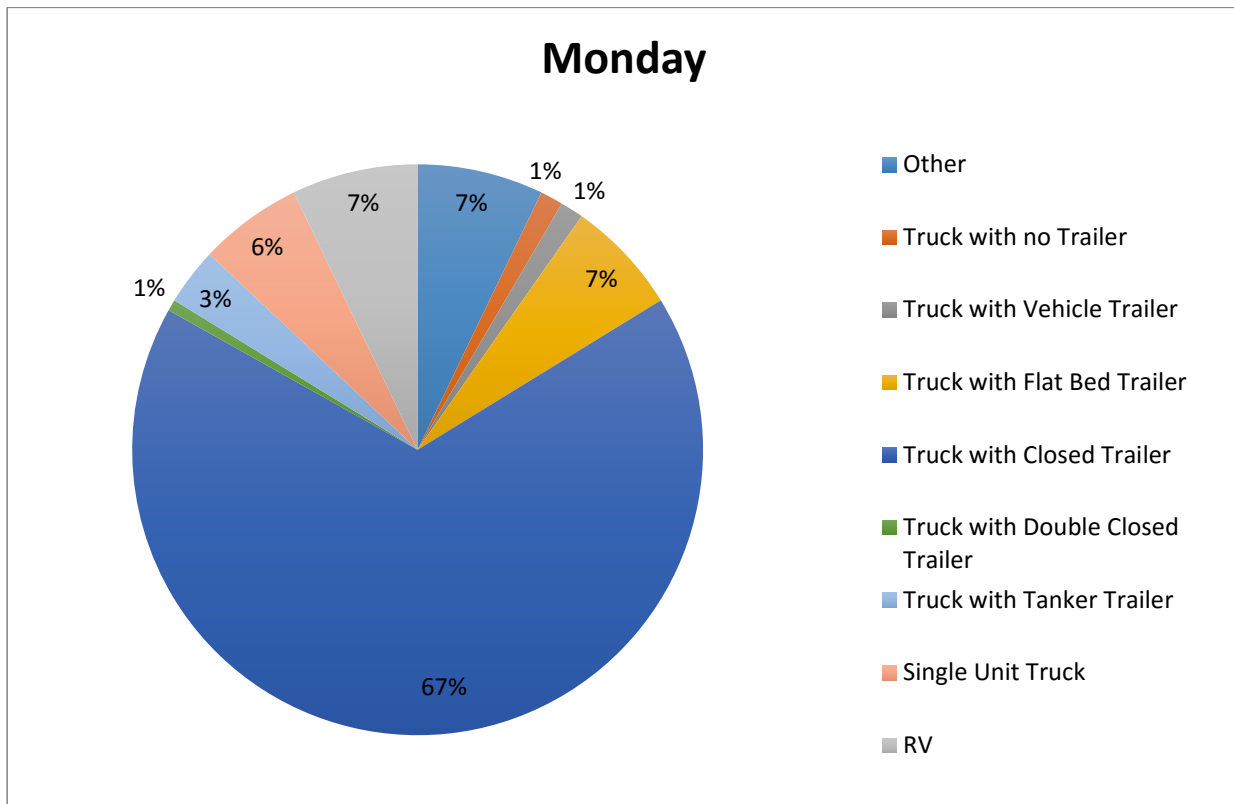
| Average       | Standard Deviation | Number of Observations |
|---------------|--------------------|------------------------|
| 30 min 10 sec | 3.63%              | 555                    |



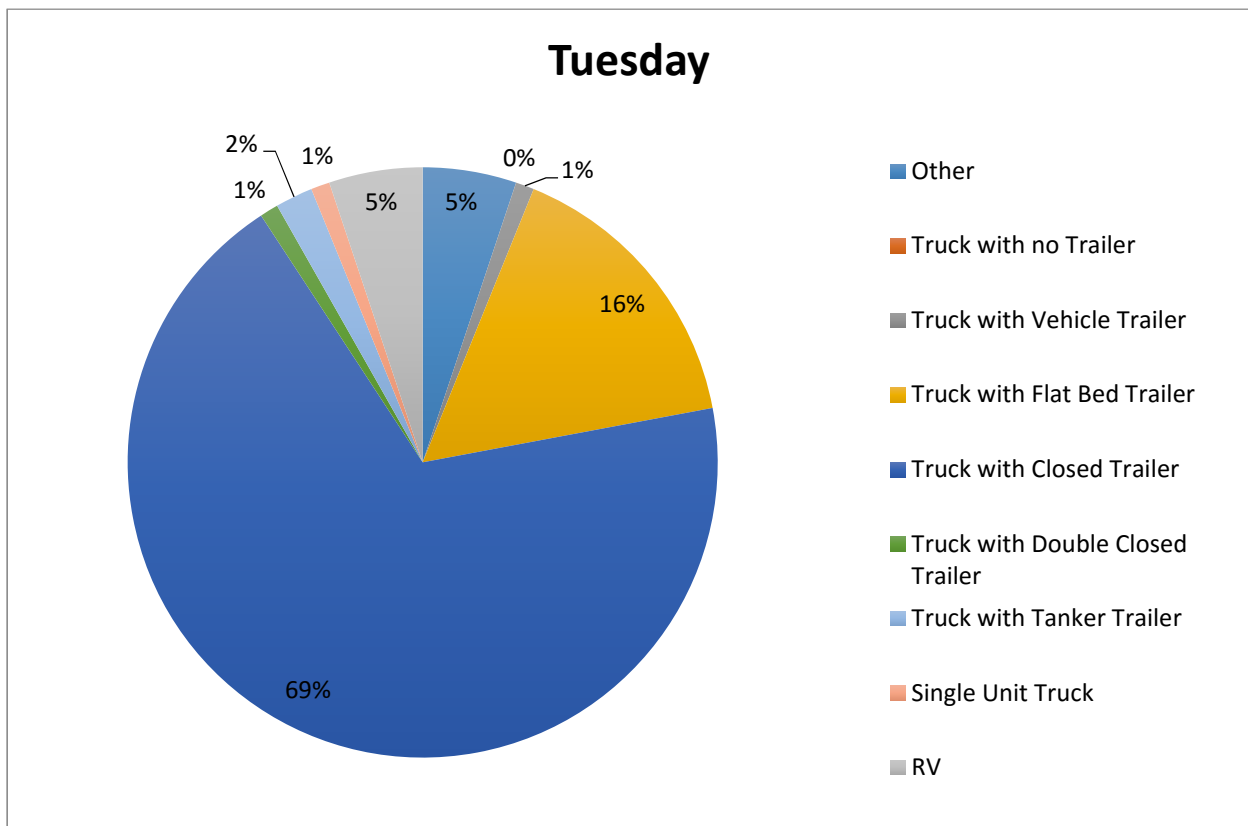
| Average              | Standard Deviation | Number of Observations |
|----------------------|--------------------|------------------------|
| 10 hrs 12 min 17 sec | 9.32%              | 51                     |

**Parking vehicle type:**

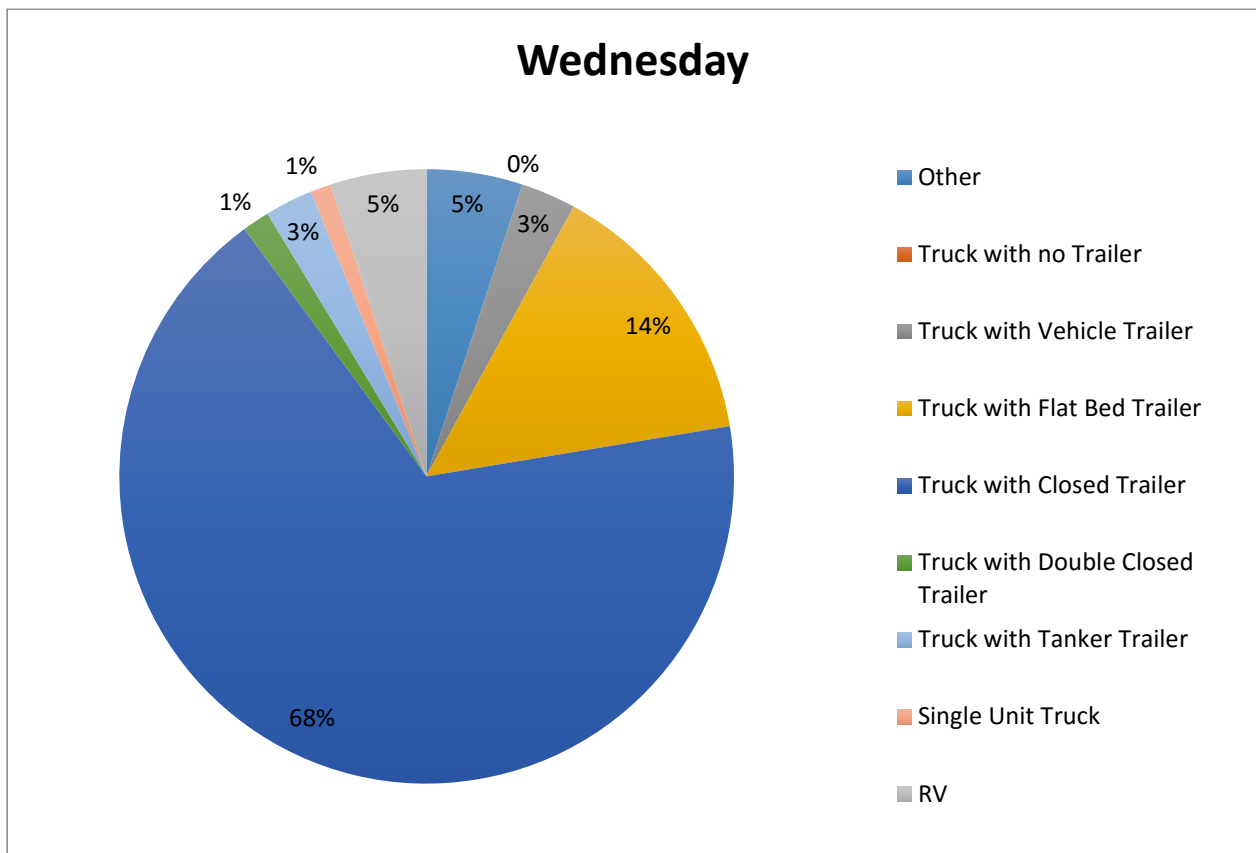
| <b>Monday</b>                    | <b>IPsens</b> | <b>CivicSmart</b> | <b>Sensys</b> |
|----------------------------------|---------------|-------------------|---------------|
| Other                            | 4             | 2                 | 5             |
| Truck with no Trailer            | 2             | 0                 | 0             |
| Truck with Vehicle Trailer       | 2             | 0                 | 0             |
| Truck with Flat Bed Trailer      | 4             | 1                 | 5             |
| Truck with Closed Trailer        | 42            | 20                | 41            |
| Truck with Double Closed Trailer | 0             | 0                 | 1             |
| Truck with Tanker Trailer        | 4             | 0                 | 1             |
| Single Unit Truck                | 8             | 0                 | 1             |
| RV                               | 7             | 2                 | 2             |
| <b>Total Number of Vehicles</b>  | <b>73</b>     | <b>25</b>         | <b>56</b>     |



| Tuesday                          | IPsens | CivicSmart | Sensys |
|----------------------------------|--------|------------|--------|
| Other                            | 6      |            | 4      |
| Truck with no Trailer            | 0      |            | 0      |
| Truck with Vehicle Trailer       | 1      |            | 1      |
| Truck with Flat Bed Trailer      | 19     |            | 12     |
| Truck with Closed Trailer        | 99     |            | 35     |
| Truck with Double Closed Trailer | 1      |            | 1      |
| Truck with Tanker Trailer        | 4      |            | 0      |
| Single Unit Truck                | 2      |            | 0      |
| RV                               | 7      |            | 3      |
| Total Number of Vehicles         | 139    |            | 56     |

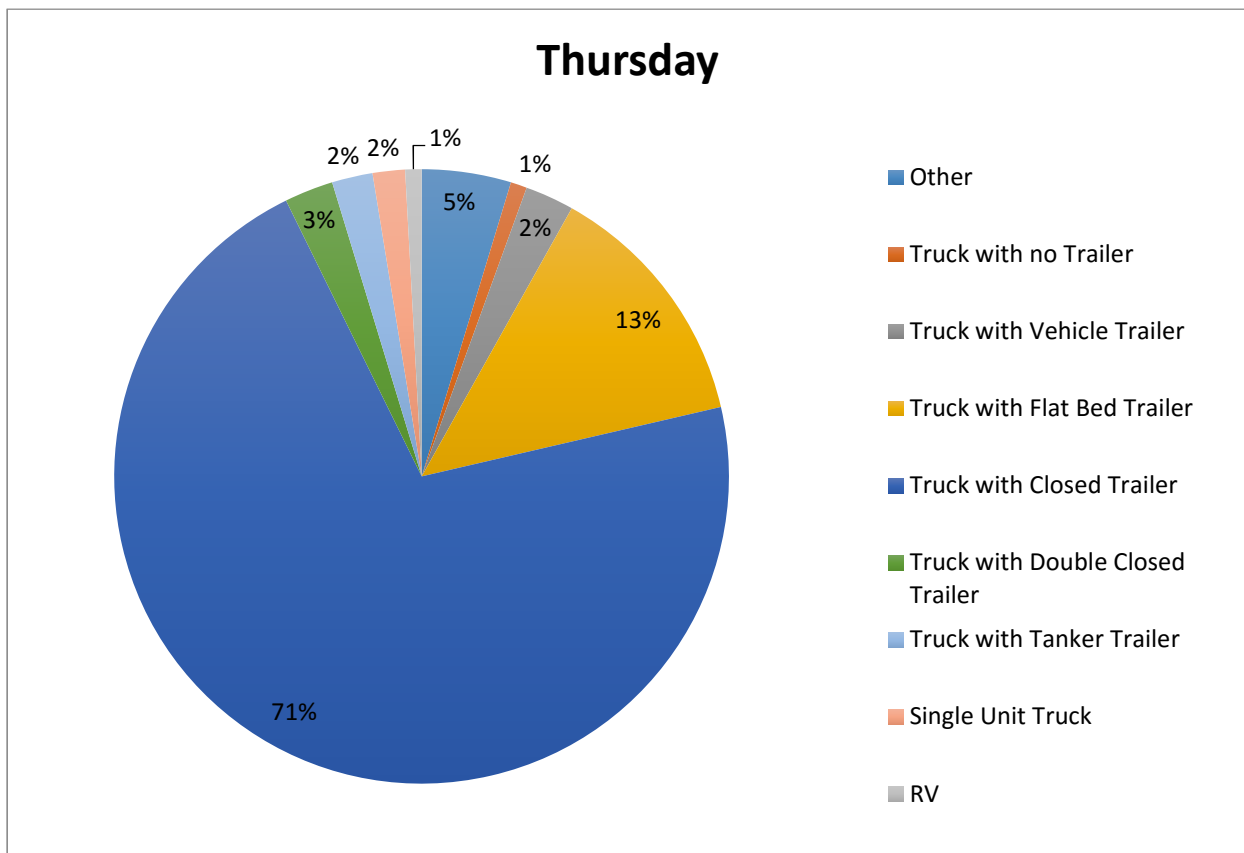


| Wednesday                        | IPsens     | CivicSmart | Sensys    |
|----------------------------------|------------|------------|-----------|
| Other                            | 6          | 4          | 4         |
| Truck with no Trailer            | 0          | 0          | 0         |
| Truck with Vehicle Trailer       | 4          | 4          | 0         |
| Truck with Flat Bed Trailer      | 16         | 12         | 12        |
| Truck with Closed Trailer        | 91         | 54         | 42        |
| Truck with Double Closed Trailer | 1          | 2          | 1         |
| Truck with Tanker Trailer        | 3          | 2          | 2         |
| Single Unit Truck                | 2          | 0          | 1         |
| RV                               | 5          | 3          | 6         |
| <b>Total Number of Vehicles</b>  | <b>128</b> | <b>81</b>  | <b>68</b> |

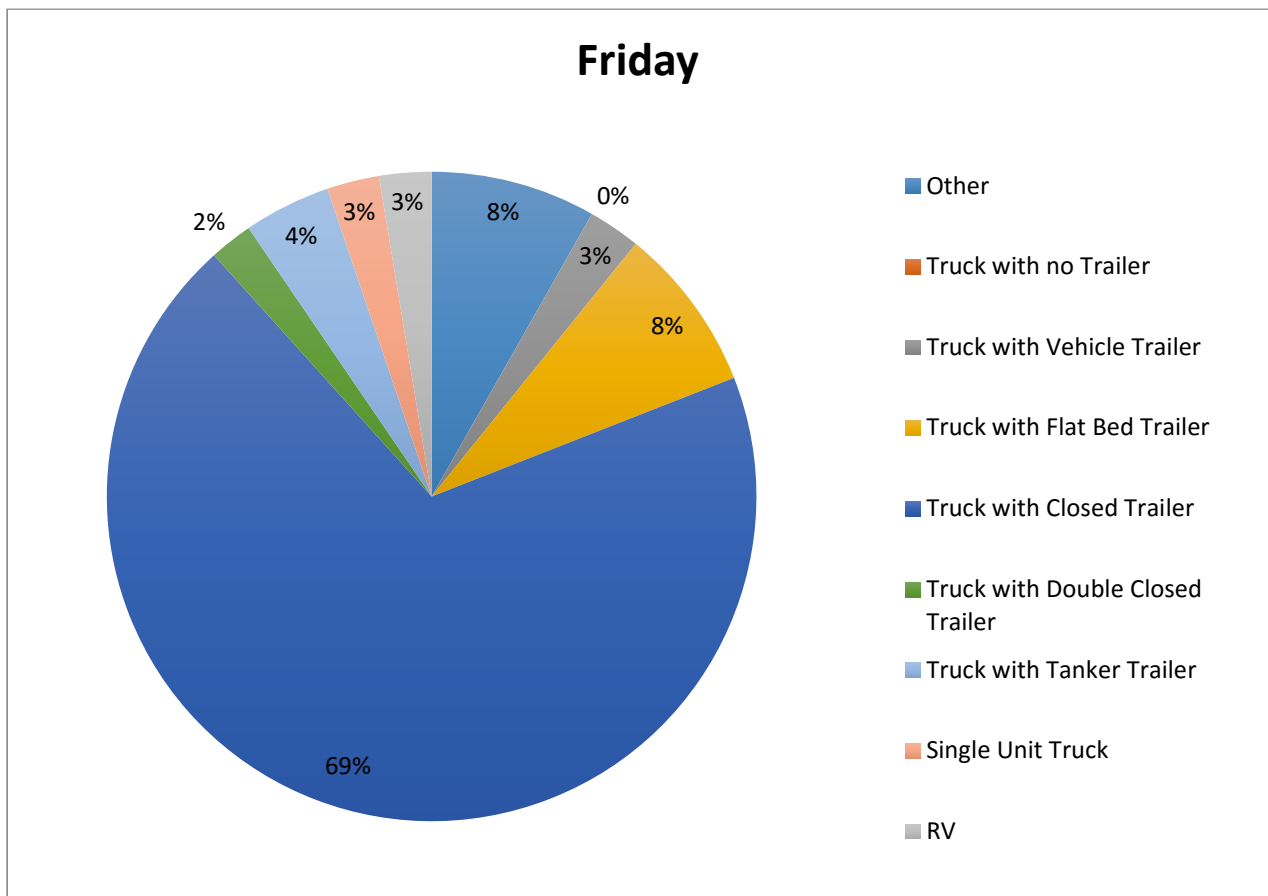




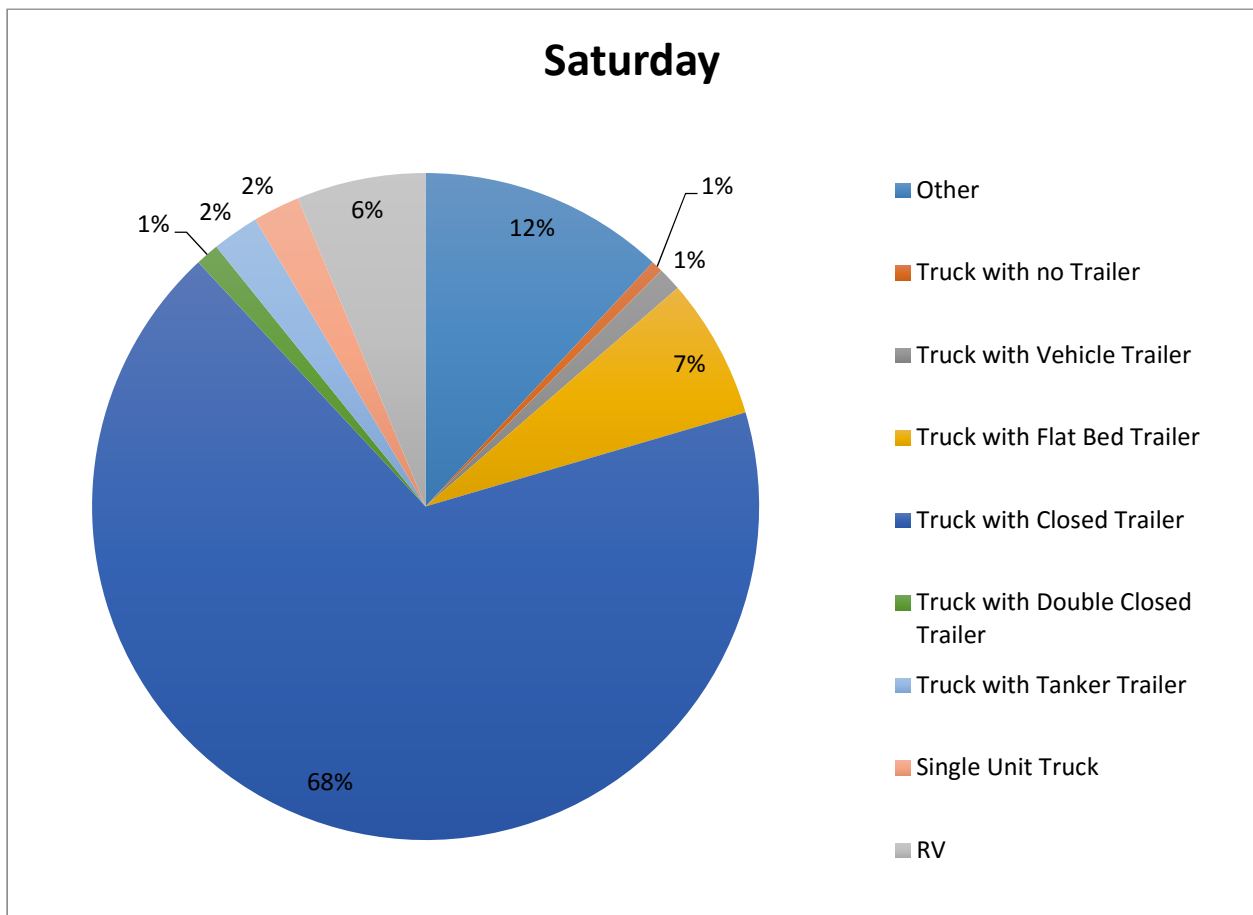
| Thursday                         | IPsens     | CivicSmart | Sensys    |
|----------------------------------|------------|------------|-----------|
| Other                            | 6          | 4          | 1         |
| Truck with no Trailer            | 2          | 0          | 0         |
| Truck with Vehicle Trailer       | 4          | 2          | 0         |
| Truck with Flat Bed Trailer      | 14         | 8          | 9         |
| Truck with Closed Trailer        | 83         | 36         | 48        |
| Truck with Double Closed Trailer | 5          | 0          | 1         |
| Truck with Tanker Trailer        | 4          | 0          | 1         |
| Single Unit Truck                | 2          | 0          | 2         |
| RV                               | 2          | 0          | 0         |
| <b>Total Number of Vehicles</b>  | <b>122</b> | <b>50</b>  | <b>62</b> |



| Friday                           | IPsens     | CivicSmart | Sensys    |
|----------------------------------|------------|------------|-----------|
| Other                            | 13         | 1          | 5         |
| Truck with no Trailer            | 0          | 0          | 0         |
| Truck with Vehicle Trailer       | 4          | 1          | 1         |
| Truck with Flat Bed Trailer      | 9          | 6          | 4         |
| Truck with Closed Trailer        | 78         | 48         | 34        |
| Truck with Double Closed Trailer | 2          | 1          | 2         |
| Truck with Tanker Trailer        | 3          | 1          | 6         |
| Single Unit Truck                | 3          | 2          | 1         |
| RV                               | 1          | 2          | 3         |
| <b>Total Number of Vehicles</b>  | <b>113</b> | <b>62</b>  | <b>56</b> |



| Saturday                         | IPsens    | CivicSmart | Sensys    |
|----------------------------------|-----------|------------|-----------|
| Other                            | 5         | 2          | 14        |
| Truck with no Trailer            | 1         | 0          | 0         |
| Truck with Vehicle Trailer       | 0         | 2          | 0         |
| Truck with Flat Bed Trailer      | 3         | 2          | 7         |
| Truck with Closed Trailer        | 57        | 30         | 32        |
| Truck with Double Closed Trailer | 2         | 0          | 0         |
| Truck with Tanker Trailer        | 4         | 0          | 0         |
| Single Unit Truck                | 3         | 0          | 1         |
| RV                               | 4         | 4          | 3         |
| <b>Total Number of Vehicles</b>  | <b>79</b> | <b>40</b>  | <b>57</b> |



| Sunday                           | IPsens    | CivicSmart | Sensys    |
|----------------------------------|-----------|------------|-----------|
| Other                            | 10        | 2          | 5         |
| Truck with no Trailer            | 1         | 0          | 0         |
| Truck with Vehicle Trailer       | 2         | 0          | 3         |
| Truck with Flat Bed Trailer      | 4         | 5          | 3         |
| Truck with Closed Trailer        | 48        | 28         | 40        |
| Truck with Double Closed Trailer | 3         | 0          | 0         |
| Truck with Tanker Trailer        | 0         | 2          | 1         |
| Single Unit Truck                | 1         | 1          | 2         |
| RV                               | 10        | 1          | 4         |
| <b>Total Number of Vehicles</b>  | <b>79</b> | <b>39</b>  | <b>58</b> |

