Georgia Department of Transportation
Office of Planning

Georgia Statewide Freight and Logistics Plan

Truck
Modal Profile



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1.0 Introduction

This report performs an in-depth analysis of goods movement by trucks in Georgia. It describes the framework in which freight operates in Georgia along with describing the freight transportation system in terms of supply and demand. It also documents various needs and emerging issues that impact the trucking industry in Georgia. The structure of the report is as follows:

- **Chapter 1, Introduction –** Describes the structure of the report.
- **Chapter 2, Institutional Perspective –** Describes the regulatory and policy framework of the logistics industry from the trucking industry's perspective.
- **Chapter 3, Trucking-Related Infrastructure (Supply) –** Provides information on the current supply of trucking-related infrastructure in Georgia, including road infrastructure, establishments that utilize/operate trucks, and truck parking/rest facilities.
- **Chapter 4, Economic Forecasts –** Identifies sources of economic and freight forecasts related to the trucking industry. Sources are described and compared to provide insight on potential industry growth trajectories.
- **Chapter 5, Trucking Demand –** Assembles data from several sources to understand where trucks are, where they are going, what they are carrying, and how these patterns may change over time.
- **Chapter 6, Needs and Issues – Bottlenecks –** Identifies and analyzes current and potential future truck-related bottlenecks on Georgia's highway system using the statewide travel demand model and truck-equipped GPS data.
- **Chapter 7, Needs and Issues: Safety –** Discusses national truck-involved crash trends and Georgia-specific strategies and programs to improve safety.
- **Chapter 8, Needs and Issues: Parking –** Provides information on earlier analysis of truck parking needs in the state, as well as national and most-recent Georgia-specific study in metro Atlanta.
- **Chapter 9, Needs and Issues: Truck Size and Weight Issues –** Describes briefly touches on Georgia truck size and weight issues, as well as laws, relatively recent national studies and trends.
- **Chapter 10, Needs and Issues: Alternative Fuels –** This section discusses alternative fuel options for the trucking industry in Georgia.
- **Chapter 11, Summary of Key Findings, Needs and Issues –** Summarizes key findings, needs, and issues related to the trucking industry. This chapter is based on the summary information provided in other paragraphs. It will also be used as the starting point for identifying freight solutions in the State.

2.0 Institutional Perspective on Trucking Industry

2.1 STRUCTURE OF TRUCKING INDUSTRY

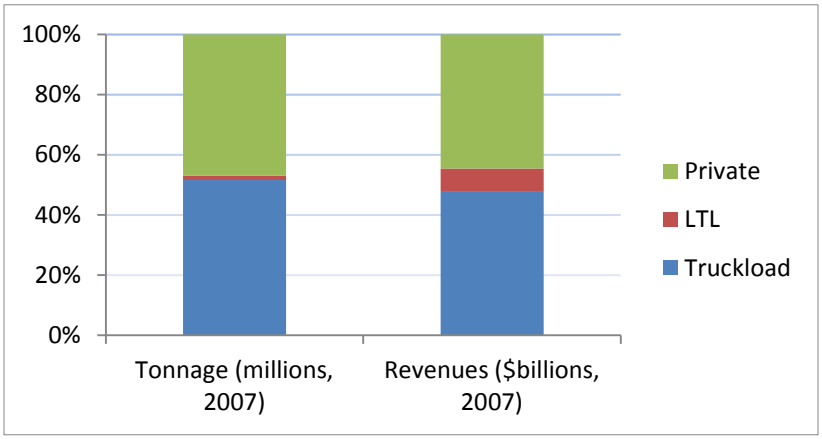
The trucking industry is comprised of three key segments: truckload, less than truckload ("LTL"), and private fleets. Truckload companies and LTL companies are both considered "for-hire carriers," because they both haul freight that is owned by other businesses. As the names suggest, truckload carriers ship only a single customer's goods in a single truck, while LTL carriers ship multiple customers' goods in a single truck. Private truck fleets are owned by companies, such as manufacturers, retailers, and other businesses, that operate their own fleet of trucks to support their primary business.

According to the 2007-2008 American Trucking Association (ATA) "Trucking and the Economy Report," tonnage from truckload companies was estimated at roughly 5.5 billion tons, or 35 percent of total freight tonnage and 50 percent of truck tonnage. National truckload revenue is about $310 billion per year. This translates into roughly 40 percent of total transportation revenue and close to 50 percent of truck revenue.

The ATA reports that the LTL component of the industry is smaller: just over 155 million tons, or about 1 percent of total tonnage and nearly 1.5 percent of truck tonnage. The higher value of most LTL shipments generates revenue of about $50 billion annually to account for approximately 6 percent of total revenue and 7 percent of truck revenue.

Private trucking firms handle more than 5 billion tons of cargo each year, representing 48 percent of total truck tonnage. Private carrier revenue is estimated at about $290 billion, nearly 45 percent of truck revenue. Figure 2.1 shows the tonnage and revenue of each of the three trucking segments.

Figure 2.1 Percent of Tonnage and Revenues by Trucking Segment, U.S.



Source: ATA Trucking and The Economy Report, 2007-2008

The Federal Highway Administration (FHWA) Highway estimates that of the 15.5 million trucks operating in the United States, 1.9 million are tractor trailers. Georgia has the fifth-highest number of tractor-trailer registrations at roughly 100,000 as of 2007. The four states with higher truck-tractor registrations are Florida, California, Texas, and Alabama.

The ATA report states that there are approximately 360,000 companies with truck fleets in the United States; 82 percent of these companies operate six or fewer trucks. Ninety-six percent of these companies operate 28 or fewer trucks. Four percent of these companies (or 14,000) have 29 trucks or more. According to the 2010 Georgia Logistics Report, there are approximately 35,000 trucking companies currently located in Georgia; most are small, locally-owned businesses. Therefore, at the state and national levels, the majority of trucking companies are small firms each operating a handful of trucks.

Of the nearly 9 million jobs supported by the trucking industry, about 30 percent are employed in the wholesale and retail industries with another 30 percent in the transportation and public utility industries. The U.S. Department of Labor reports that there are 3.5 million truck drivers in the United States, and that 1 in 10 are independent -- a majority of which are owner-operators. Many in the trucking industry are concerned about the aging of the truck driver workforce and the impact of truck driver availability.

2.2 TOP 10 TRUCKING INDUSTRY ISSUES IN GEORGIA

The American Transportation Research Institute (ATRI) conducts an annual survey of trucking firms to determine the top issues facing the industry. As the research arm of the ATA, ATRI is a member of the project team and a coauthor of this report. This section describes the result of their annual national survey at for 2008-2010 and 2016, as well as information specific to Georgia for 2010.

Survey Description

The ATA "Top Industry Issues" survey of the trucking industry identifies the most pressing current issues facing the industry, and then recommends strategies to address those issues. The survey is conducted in two phases; the initial "Phase One Survey" is designed to identify and categorize key issue areas and strategies from a representative sample of for-hire and private motor carriers. This survey population represents a cross-section of fleet sizes, industry sectors and geographic regions.

Results of the National Top Industry Issues Survey

Three of the most critical industry issues identified by the national-level respondent population during 2008, 2009, and 2010 were the economy, government regulations and fuel issues as shown in Table 2.1. In 2010 the three most important issues facing the national trucking industry were the economy, the Comprehensive Safety Accountability (CSA) 2010 regulations, and general government regulation. By 2016, the issues have changed:

Table 2.1 Top 10 National Issues for the Trucking Industry

Rank	2008	2009	2010	2016
1	Fuel Issues	Economy	Economy	ELD mandate
2	Economy	Government Regulation	CSA 2010	Hours of Service
3	Driver Shortage	Fuel Issues	Government Regulation	Cum. Econ. Impacts to Industry
4	Government Regulations	Congestion	Hours-of-Service	Truck parking
5	Hours of Service	Hours-of-Service	Driver Shortage	Economy
6	Congestion	Commercial Driver Issues	Fuel Issues	Compliance, Safety, Acctability
7	Tolls/Highway Funding	Environmental Issues	Trans. Funding/Congestion	Driver Shortage
8	Environmental Issues	Tolls/Highway Funding	On-Board Truck Technology	Driver Retention
9	Tort Reform	Size and Weight	Environmental Issues	Trans. Funding/Congestion
10	On-Board Truck Technology	On-Board Truck Technology	Size and Weight	Driver Distraction

Source: ATRI Annual Survey.

3.0 Truck-Related Infrastructure (Supply)

Truck-related infrastructure consists of three primary components: 1) the highway infrastructure; 2) freight facilities where trucks are loaded, unloaded, and stored; and 3) truck stop facilities where truck drivers refuel, rest, and take breaks. This section describes each of these facilities in Georgia.

3.1 HIGHWAY INFRASTRUCTURE

There are 117,413 miles of roadways in Georgia.[1] Table 3.1 shows road mileage by road system type and ownership. The "workhorse" for moving trucks is the urban Interstate system. This classification of roads comprises just 460 of the total 117,413 miles of statewide road system or 0.3 percent of the statewide road mileage total.

Rural and small urban Interstates are important for carrying intercity truck traffic. These two classifications of roads comprise 783 miles, which is approximately 0.7 percent of the statewide road mileage total. The non-Interstate roadways in Atlanta are primarily used to connect to the Interstate system and for local distribution of goods. The vast majority of the truck VMT in the State is carried by the Interstate system.

Figure 3.1 shows the number of lane miles on Georgia's road network based on the information contained in the statewide travel demand model for 2006. As shown in the figure, generally the Interstate system is either four or six lanes, while the non-Interstate road system is two or four lanes. The primary exceptions is that in urbanized areas (most notably in Atlanta), there are several Interstates with seven or more lanes. There also are a few non-Interstate roads with more than four lanes.

Both I-75 and I-95 are at least six lanes for their entire alignment through Georgia. These two Interstates represent nearly 40 percent of the Interstate system in the State. The other Interstates are primarily six or more lanes only in select urbanized locations.

[1] www.dot.ga.gov/DS/Data#tab-2

Table 3.1 Mileage by Route and Road System in Georgia

Road System Type	State Route Mileage	County Road Mileage	Local Road Mileage	Total Mileage
Rural Interstate	716	–	–	716
Rural Principal Arterial	2,637	6	1	2,644
Rural Minor Arterial	5,137	57		5,195
Rural Major Collector	5,559	7,210	48	12,816
Rural Minor Collector		7,320	9	7,350
Rural Local	1	48,013	3,545	51,559
Rural Totals	**14,055**	**62,630**	**3,625**	**80,281**
Small Urban Interstate	67	–	–	67
Small Urban Freeway	8	–	–	8
Small Urban Principal Arterial	589	16	13	618
Small Urban Minor Arterial	414	386	198	997
Small Urban Collector	4	89	311	604
Small Urban Local	0	1,904	,802	4,706
Small Totals	1,087	2,597	3,324	7,001
Urbanized Interstate	460	–	–	460
Urbanized Freeway	131	7	–	138
Urbanized Principal Arterial	1,104	169	65	1,338
Urbanized Minor Arterial	1,221	1,669	397	3,287
Urbanized Collector	1	1,527	582	2,130
Urbanized Local	14	16,093	6,671	2,778
Urbanized Totals	**2,952**	**19,465**	**7,715**	**30,132**
State Totals	**18,093**	**84,692**	**14,665**	**117,413**

Source: GDOT Roadway Characteristics and Mileage Reports (Report 445) 2009.

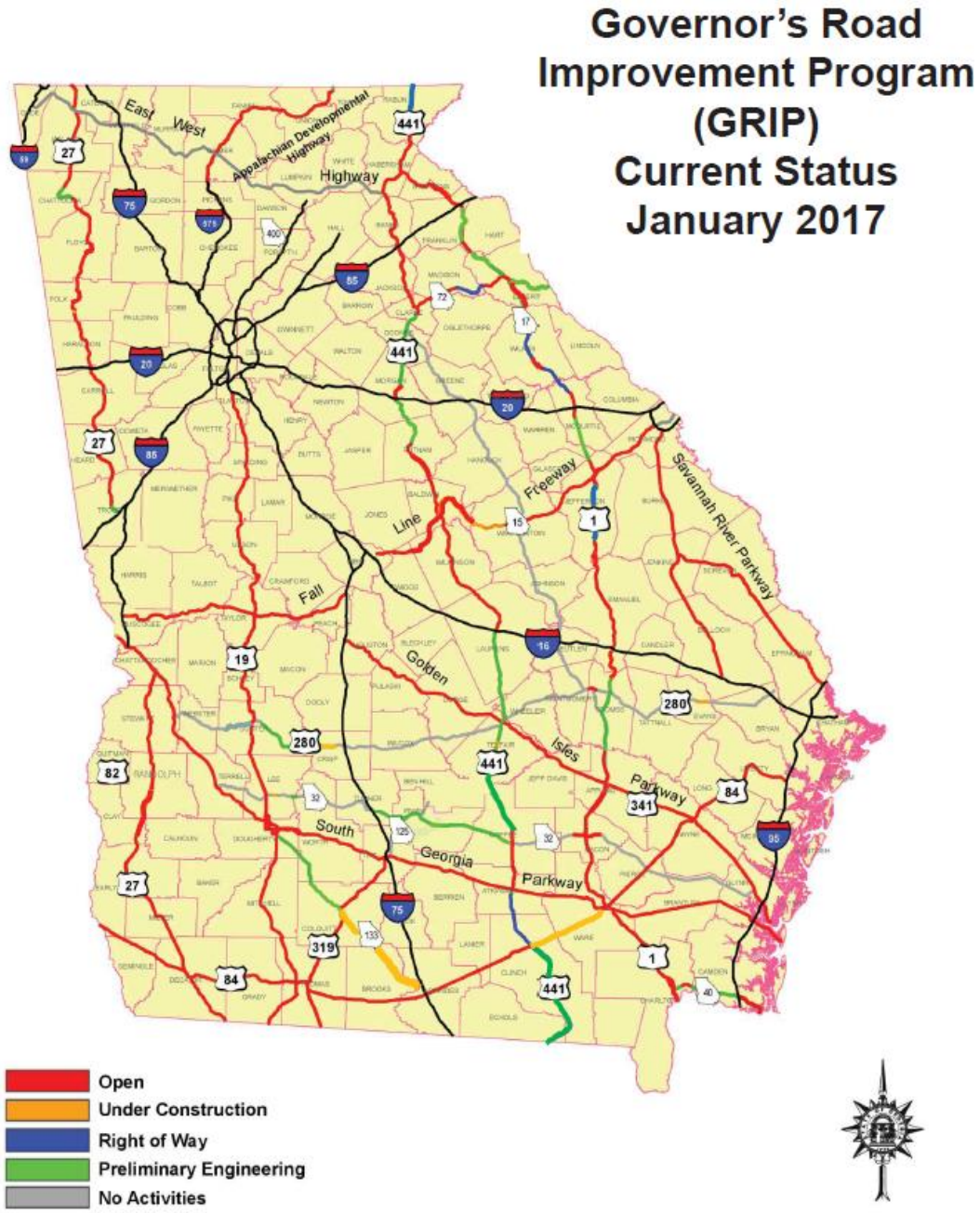
3.2 GEORGIA'S GRIP PROGRAM

The Governor's Road Improvement Program, commonly referred to as "GRIP", is a system of state highways in Georgia which have been targeted for improvement to increase economic development in the State. GRIP began in in 1989 by the Georgia General Assembly to support rural economic development through a series of routes shown in Figure 3.2. Economic analysis has shown that improving the routes on this network has had a positive impact.[2]

[2]www.dot.ga.gov/BuildSmart/Programs/Documents/GRIP/Facts/GRIPSystemSummaryFactSheet.pdf

GRIP increased connectivity throughout the State, which is beneficial for trucks that have origins or destinations in nonurban areas. GRIP roads also are beneficial for trucks with trip travel patterns not on the State's Interstate system. Section 4.0 of this report on trucking demand provides more detail on origins, destinations and routing for trucks in the State.

Figure 3.1 Status of GRIP Corridors



Source: GDOT www.dot.ga.gov/BS/Programs/GRIP

3.3 HIGHWAY DESIGNATIONS

Table 3.1 shows the roadway classification in Georgia based on the FHWA roadway functional classification system. There also are other highway designation systems that are related to truck traffic. The National Highway System (NHS) is a set of roads that are Federally-classified as important for the nation's economy, defense and mobility (Figure 3.2). The NHS also contains a Strategic Highway Network (STRANET) shown in Figure 3.2. The STRANET is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes. The data for both networks come from the National Highway Planning Network by FHWA.

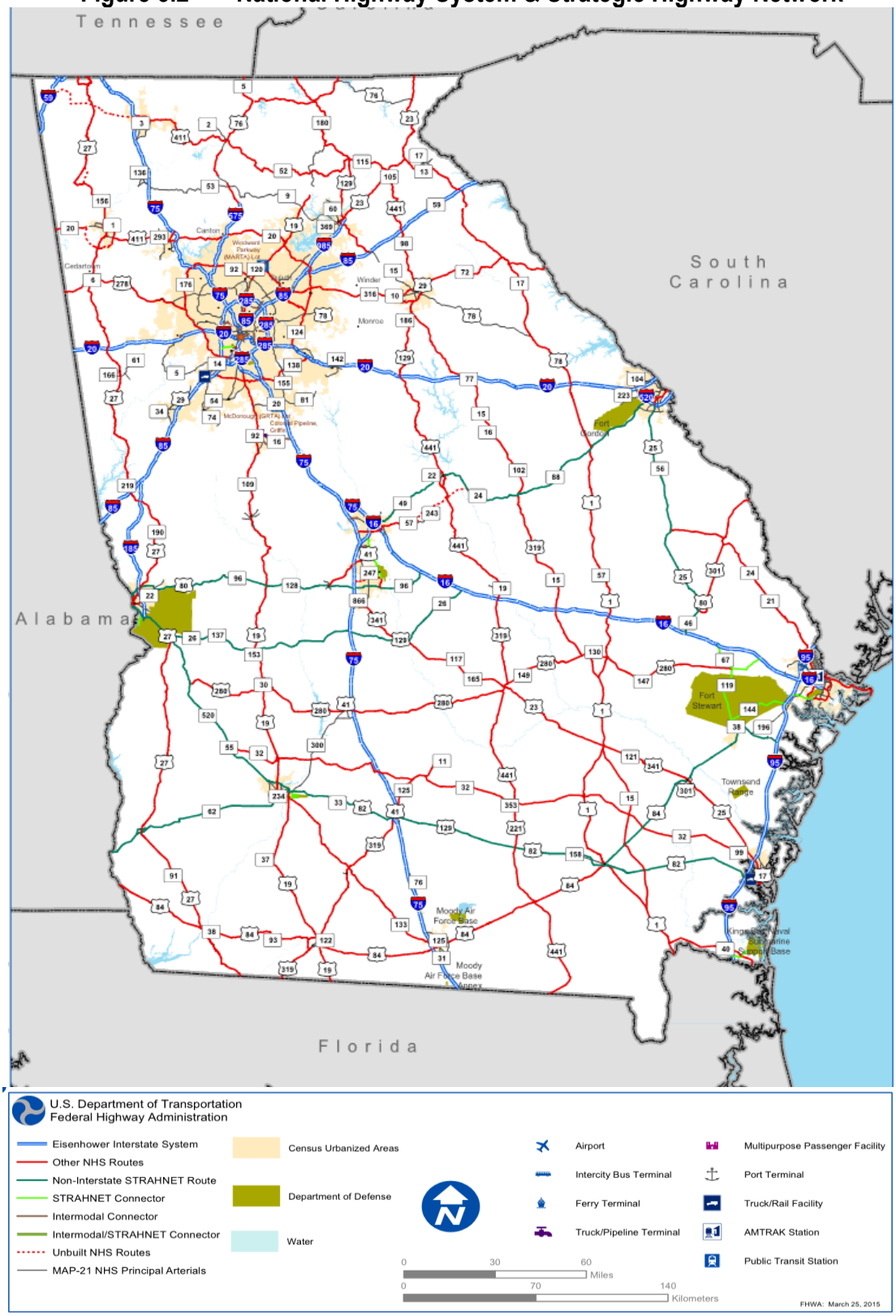
Georgia also designates specific truck routes related to oversize trucks. Oversize trucks are those that either have longer dimensions or heavier weights than those allowable by the five-axle, 80,000-pound Federal truck weight limit. Figure 3.4 shows the truck route network in Georgia. The truck route network follows the following three coding scheme from as per GDOT's "System Inventory Data Collection Coding and Procedures Manual":

- **A** stands for "designated access routes for oversize trucks allowing single and twin trailers."
- **C** is used for designated access routes that only allow for oversize trucks that utilize twin trailers. These are routes with sharp turns that oversize (in terms of length) single trailer trucks cannot negotiate, but shorter, articulated twin trailer combinations can use.
- **D** is used for "all Interstate routes."

There also is a small set of roads that trucks are prohibited from using. These are shown in black in Figure 3.4.

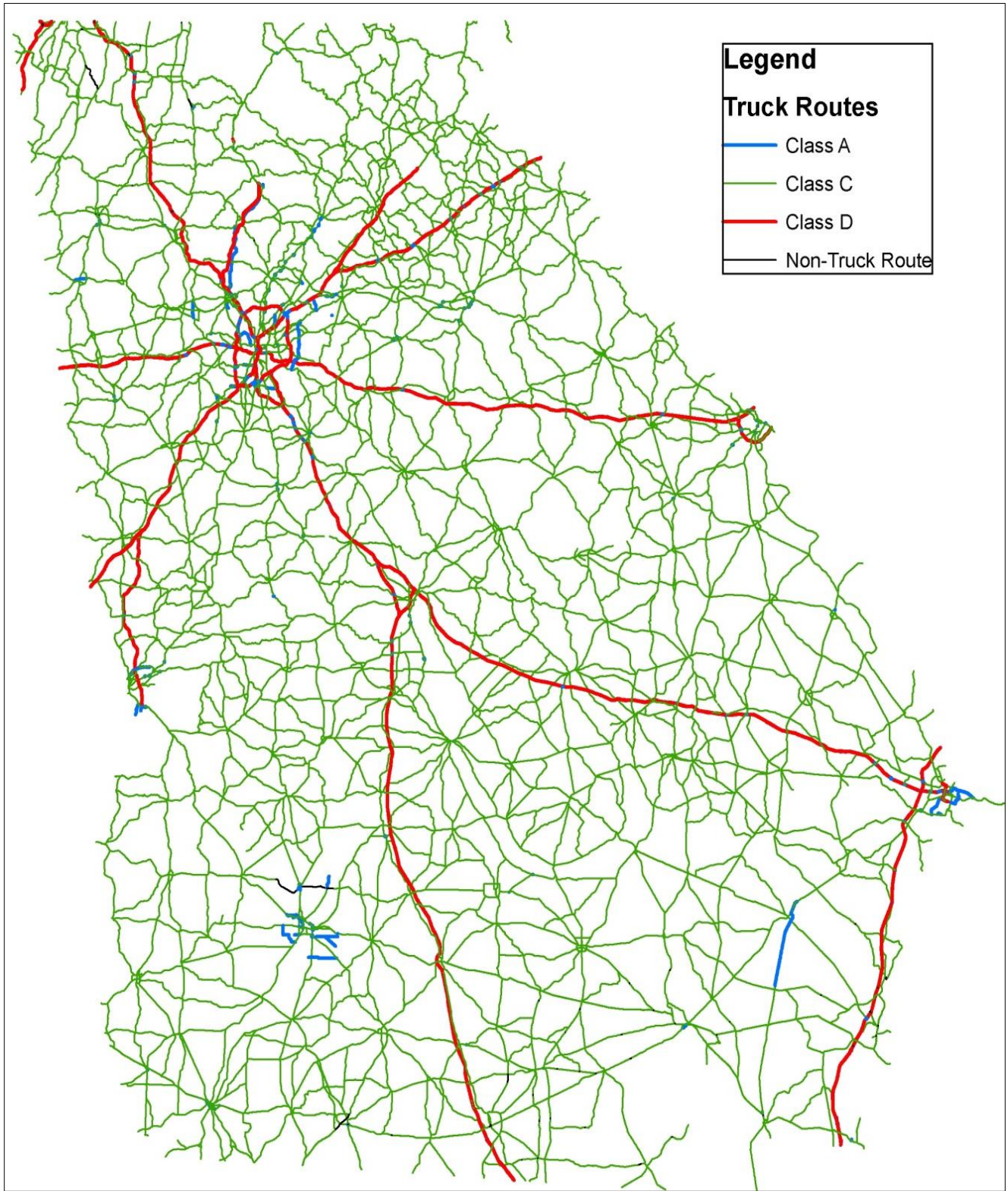
In Georgia, there is only one posted restriction for hazardous materials on the state roadway system. This restriction is for the tunnel on Georgia 400 that runs underneath an office building on Peachtree Street in Atlanta.

Figure 3.2 National Highway System & Strategic Highway Network



Source: www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/georgia/ga_georgia.pdf

Figure 3.3 Georgia Truck Routes



Source: GDOT Office of Transportation Data

3.4 TRUCK STOP AND REST FACILITIES

Truck parking facilities are an important component of the truck-related infrastructure. They ensure the safety of truck operations by providing areas where truck drivers can take necessary breaks. The location and operation of these facilities also provides information on truck points of entry and exit from the general road network and they can sometimes indicate freight-intensive locations in the State. This section shows the location of parking facilities in Georgia. Section 8.0 examines the balance of parking supply and demand in more detail for Georgia.

Truck stops are privately-owned commercial facilities that provide an opportunity to rest and fulfill many nonrest-related activities, including refueling, eating, and potentially access to the Internet. Rest areas are publicly-owned facilities that offer truck drivers with minimal services. They are primarily used for long periods of rest, typically associated with overnight stays.

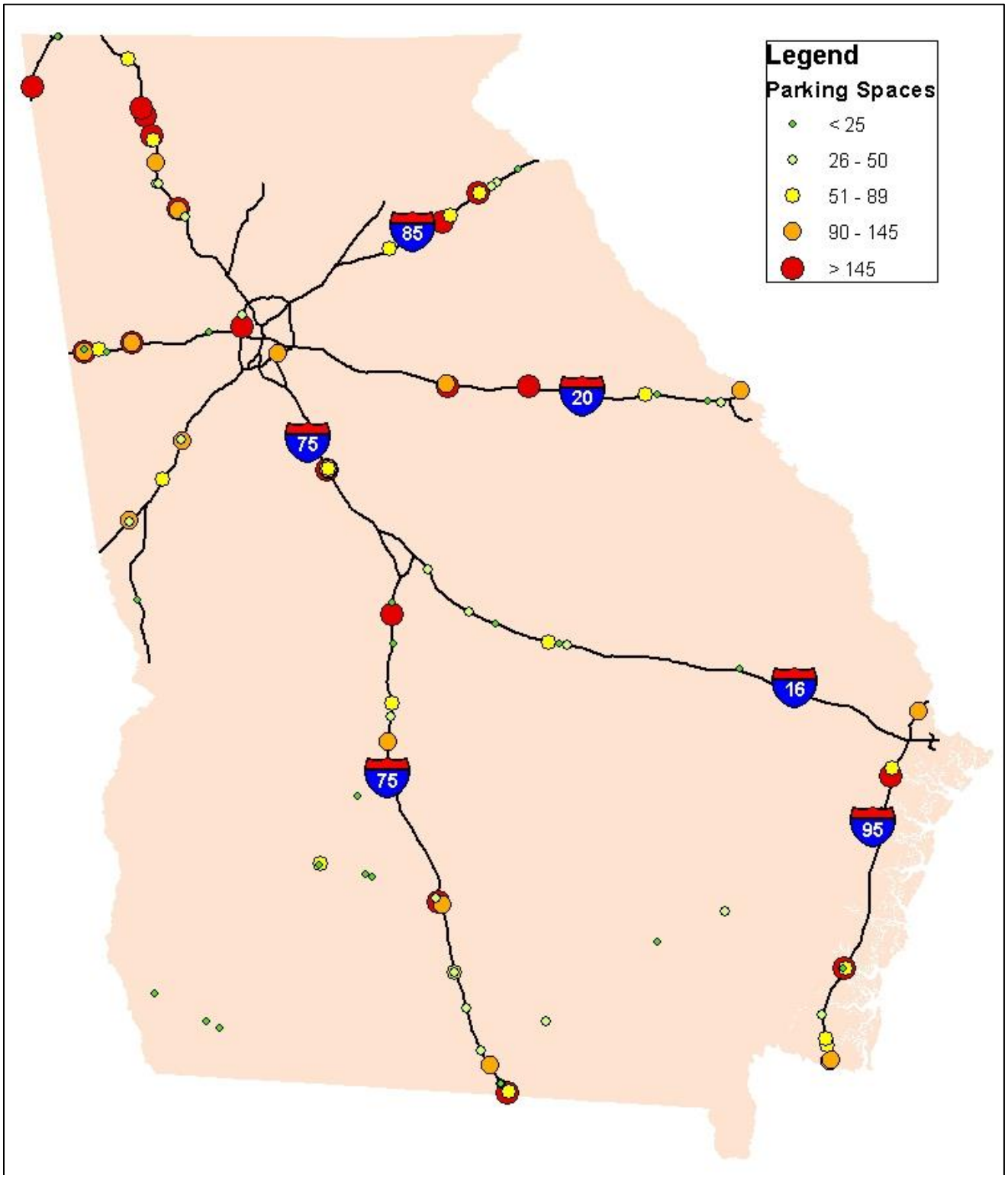
Figure 3.10 shows the location of commercial truck stops along the Interstate system in Georgia and the number of parking spaces at each truck stop. The figure shows that the vast majority of truck stops are located in rural regions. This is primarily due to the availability of relatively inexpensive land and the ability to attract intercity truck traffic at rural locations.

Figure 3.11 shows the location of rest areas and weigh stations in Georgia along with the number of parking spaces at each location. The figure shows that these facilities also are located primarily in rural regions. There also are relatively fewer of these facilities and they are much smaller in terms of their number of parking spaces.

Table 3.2 shows the number of parking spaces on each of the long-haul corridors in Georgia. Nearly half of the total truck parking spaces in the state are on I-75. The I-75 south of Macon corridor has the most truck parking spaces with over 2,000. This is followed by the I-75 north of Atlanta corridor and the I-95 corridor. Both of these corridors have over 1,500 truck parking spaces.

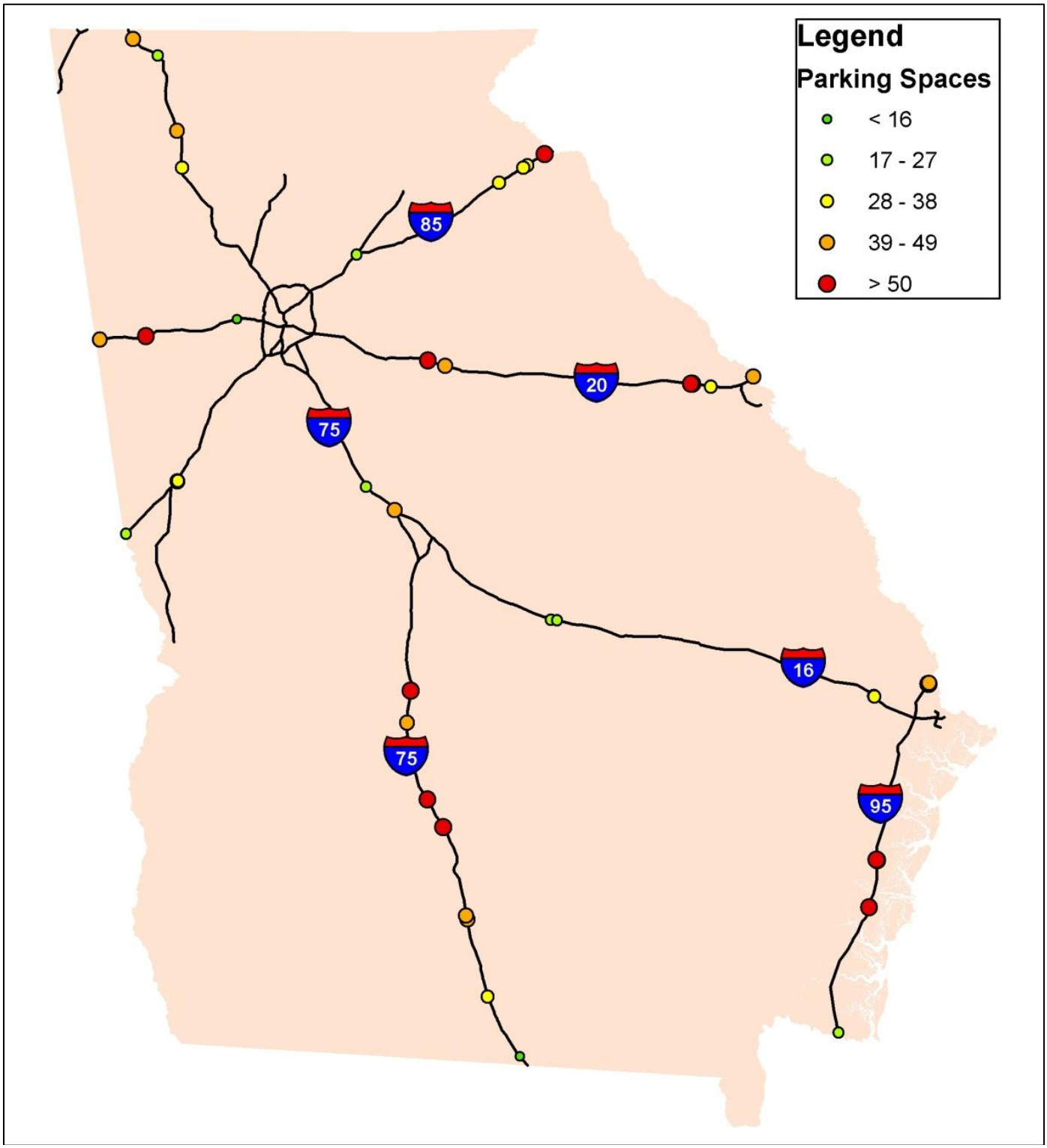
In terms of density of parking spaces per freeway mile, the I-20 west of Atlanta corridor was the highest with over 18 parking spaces per freeway mile over 50 percent more than the state average of 11 parking spaces per freeway mile. Truck parking density is lowest on I-16 with just two parking spaces per freeway mile.

Figure 3.4 Parking Spaces at Truck Stops



Source: ATRI Truck Stop Data & project team analysis.

Figure 3.5 Parking Spaces at Rest Stops and Weigh Stations



Sources: ATRI compilation of Rand McNally Atlas Data & data from "The Trucker's Friend". Rest area data from GDOT website: www.dot.ga.gov/InvestSmart/Pages/RestAreas.aspx

Table 3.2 Truck Parking Spaces per Highway Mile in Georgia

Corridor	Total Distance Miles	Total Parking Spaces	Parking Spaces per Mile
I-20 West of Atlanta to Alabama Line	50	902	18
I-75 North of Atlanta to Tennessee Line	94	1,587	17
I-75 South of Macon to Florida Line	156	2,515	16
I-95 from South Carolina Line to Florida Line	111	1,558	14
I-85 North of Atlanta to South Carolina Line	83	969	12
I-85 South of Atlanta to Alabama Line	81	628	8
I-75 South of Atlanta to Macon	67	512	8
I-20 East of Atlanta to South Carolina Line	133	978	7
I-16 Macon to Savannah	164	391	2
Total	**939**	**10,040**	**11**

Source: Project team analysis.

3.5 KEY FINDINGS ON HIGHWAY INFRASTRUCTURE

This chapter has identified the following key findings related to Georgia's highway infrastructure:

- The vast majority of trucking activity occurs on less than one percent of the State's road system mileage – the Interstate system;
- Roughly 40 percent of the Interstate system in Georgia is at least six lanes;
- The majority of freight activities in the state are focused in metro Atlanta region with Savannah being second;
- Freight facilities outside of Atlanta and Savannah are typically concentrated in urbanized areas and along rural Interstate segments; and
- Nearly half of all of the truck parking spaces in Georgia are adjacent to I-75.

4.0 Economic Forecasts

Goods movement is the result of economic activity, so understanding the performance of economic sectors is a critical component to understanding freight flows. This section examines alternative sources of economic and freight forecasts in Georgia and discusses the implications of these forecasts for freight flows across the state. The three primary sources of forecasts used are:

1. American Trucking Association's national forecasts on truck activity;
2. Data from economy.com at the state-level data, by major goods-producing industries; and
3. TRANSEARCH truck flow data by commodity.

4.1 FORECAST BASED ON AMERICAN TRUCKING ASSOCIATION

The American Trucking Association (ATA) develops short- and long-range forecasts of economic activity for the trucking sector for the entire country. They also track historical changes in national trucking activity with a monthly truck tonnage index that they provide to member companies of their organization. Unfortunately, state-level data are not available through the ATA.

According to the ATA, national truck tonnage dropped 14 percent from 2008 to 2009. At the time those statistics were announced, ATA did not expect domestic truck tonnage to return to pre-recession levels until 2015.[3]

ATA expects that by 2021, truck tonnage will increase 4.20 percent – translating to a compound annual growth rate (CAGR) of 2.2 percent. This growth rate is consistent with forecasts in other GDOT statewide studies including its GDOT Truck Lane Needs Identification Study.

According to the ATA forecast, trucking is expected to increase its market share of freight transportation relative to other freight modes (rail, marine, air, and pipeline) to 70.7 percent by 2021, up from 68 percent.

4.2 FORECAST BASED ON DATA FROM *ECONOMY.COM*

As part of the Georgia Statewide Freight and Logistics Plan, GDOT acquired economic output data for Georgia from Economy.com, which is a department

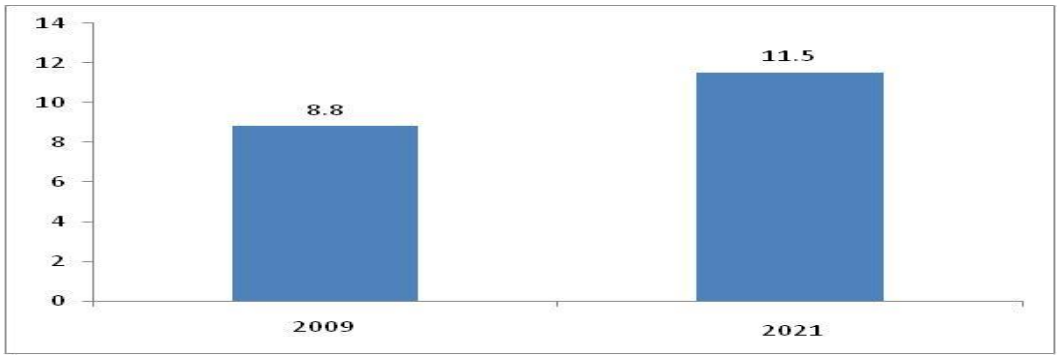
[3] American Trucking Association "*U.S. Freight Transportation Forecast to 2021*", 2010.

within Moody's Analytics Economic and Consumer Credit Analytics. Moody's provides national and subnational economic and consumer credit trends primarily to support business decisions and investment professionals.

The data acquired from Economy.com provides information on gross state product for Georgia by industry -- a direct measure of the value of economic output (as opposed to tonnage, which is a measure of goods movement activity.)

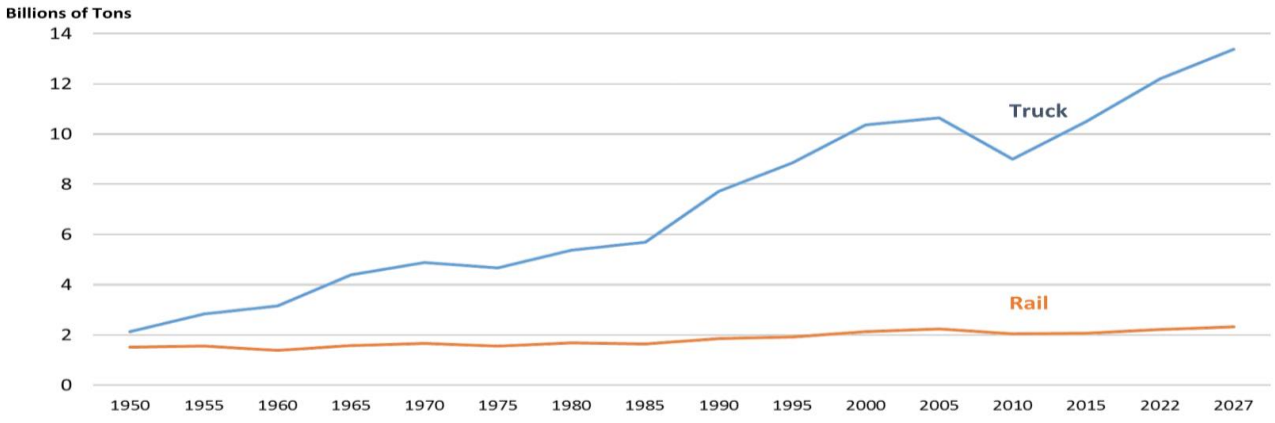
Table 4.1 shows the economy.com estimate of output by industry in Georgia in 2009 along with the economy.com forecast of output in 2050. The forecast predicts some industries growing significantly faster than others. Overall, economy.com forecasts a compound annual growth rate of 2.3 percent for Georgia's economy -- roughly equivalent to the 2.2 percent compound annual growth rate forecast for truck tonnage by ATA.

Figure 4.1 U.S. Truck Tonnage Growth
In Billion Tons



Source: American Trucking Association

U.S. Truck versus Rail Tonnage Growth



US Freight Trans. Forecast to 2027, ENO Foundation & ATA (in US EPA's presentation "*Trends Shaping the Future of Freight*" 3-29-17)

4.3 FORECAST BASED ON *TRANSEARCH* DATA

Global Insight TRANSEARCH freight flow data were analyzed to make inferences regarding economic forecasts for the trucking industry because the database provides freight flows by mode and commodity for 2013 and 2050.

TRANSEARCH estimates of truck flows by commodity for 2013 and 2050. Table 4.2 shows this information and includes inbound, outbound and internal flows ('through' truck flows are not included because trips with both the origin and destination outside of Georgia are not as strongly related to the State's economy.)

TRANSEARCH data estimates that Georgia's truck flows will grow from 450 million tons in 2013 to 846 million tons by the year 2050 -- a compound annual growth rate of 1.5 percent. This growth rate is significantly lower than the 2.2 percent growth rate forecast by the American Trucking Association. It also is significantly lower than the forecasts for most the goods-dependent industries generated by Economy.com. This indicates that the TRANSEARCH forecasts are relatively conservative compared to forecasts from other sources.

The TRANSEARCH data also indicates that there is a wide growth range for various commodities in the State of Georgia. The top three commodity categories, based on tonnage, are nonmetallic minerals, secondary traffic (goods moved to/from warehouses and distribution centers), and clay/concrete/glass/stone. These commodities have growth rates of 1.7 percent, 2.4 percent, and 0.2 percent, respectively. This implies that truck market share in future years will be dependent on both the actual growth rates achieved for specific commodities and the ability of the trucking industry to compete with other modes on a commodity-by-commodity basis.

The TRANSEARCH data also can be compared to the Economy.com forecast. Table 4.3 shows that TRANSEARCH also has a relatively conservative forecast compared to the forecast methodology of Economy.com.

Table 4.1 Georgia Gross State Products by Select Industries: 2013 & 2050
(in $ Millions)

Industry	2013	2050	CAGR
Agriculture, Forestry, Fishing and Hunting	2,864	3,449	0.43%
Mining	362	785	1.81%
Utilities	6,852	15,274	1.88%
Construction	17,225	30,874	1.37%
Wholesale Trade	28,414	80,099	2.44%
Food Manufacturing	9,264	10,543	0.30%
Beverage & Tobacco Product Manufacturing	612	563	-0.19%
Textile Mills	2,473	2,988	0.44%
Textile Product Mills	3,524	5,229	0.92%
Apparel Manufacturing	262	321	0.48%
Leather & Allied Product Manufacturing	858	1,316	1.00%
Wood Product Manufacturing	1,636	870	-1.46%
Paper Manufacturing	3,345	2,862	-0.36%
Printing & Related Support Activities	1,244	528	-1.97%
Petroleum & Coal Products Manufacturing	474	162	-2.47%
Chemical Manufacturing	3,458	8,316	2.06%
Plastics & Rubber Products Manufacturing	2,307	7,416	2.75%
Nonmetallic Mineral Product Manufacturing	1,503	3,807	2.18%
Primary Metal Manufacturing	551	1,859	2.87%
Fabricated Metal Product Manufacturing	2,241	6,697	2.58%
Machinery Manufacturing	2,398	5,386	1.90%
Computer & Electronic Product Manufacturing	2,072	5,429	2.27%
Electrical Equipment, Appliance, & Component Manufacturing	1,403	7,240	3.89%
Transportation Equipment Manufacturing	4,456	11,634	2.26%
Furniture & Related Product Manufacturing	874	1,599	1.41%
Miscellaneous Manufacturing	1,403	2,810	1.63%
Retail Trade	25,263	77,185	2.63%
Transportation and Warehousing	14,699	39,766	2.34%

Source: Economy.com data., 2005 $

Table 4.2 Tons of Commodity Flow by Trucks in Georgia

STCC	Commodity	Year 2007	Year 2013	Year 2050
14 Total	Nonmetallic Minerals; except Fuels	116,890,075	58,047,824	244,017,334
50 Total	Bulk Commodity Shipments in Boxcars	74,800,733	40,044,889	203,314,108
32 Total	Clay, Concrete, Glass or Stone Products	51,881,536	28,570,796	55,239,096
20 Total	Food or Kindred Products	49,014,583	28,153,538	49,237,249
29 Total	Petroleum or Coal Products	32,693,665	27,345,846	63,934,955
1 Total	Farm Products	20,338,843	22,331,205	21,401,879
24 Total	Lumber or Wood Products; except Furniture	17,359,508	20,333,619	33,083,884
40 Total	Waste or Scrap Materials Not Identified by Producing Industry	13,538,279	15,087,329	33,483,212
28 Total	Chemicals or Allied Products	12,459,503	10,682,152	12,528,578
26 Total	Pulp, Paper or Allied Product	9,493,413	10,084,061	11,421,219
37 Total	Transportation Equipment	8,138,347	4,754,821	9,057,907
33 Total	Primary Metal Products, including galvanizing	7,358,359	4,403,510	10,505,213
30 Total	Rubber or Miscelaneous Plastic Products	6,752,464	3,507,433	11,693,916
34 Total	Fabricated Metal Products; except Ordnance	6,341,431	2,985,338	13,235,340
35 Total	Machinery; except Electrical	4,738,473	2,781,858	12,911,161
22 Total	Textile Mill Products	4,497,702	2,554,138	10,161,079
36 Total	Electrical Machinery, Equipment or Supplies	4,315,923	2,059,112	15,459,168
27 Total	Printed Matter	2,620,856	1,333,524	10,121,092
25 Total	Furniture or Fixtures	2,169,389	1,237,234	3,600,394
39 Total	Miscellaneous Products of Manufacturing	2,143,459	806,275	5,247,488
23 Total	Apparel, Or Other Finished Textile	1,248,362	689,879	5,346,200
38 Total	Instruments, Photographic Goods, Optical Goods	579,843	457,735	9,419,460
8 Total	Forest Products	347,888	327,880	1,005,160
9 Total	Fresh Fish or Other Marine Products	284,902	189,161	833,296
31 Total	Leather or Leather Products	244,864	126,001	98,932
21 Total	Tobacco Products; except Insecticides	129,025	56,075	62,314
19 Total	Ordnance or Accessories	88,965	37,811	470,218
10 Total	Metallic Ores	3,590	26,907	19,887
11 Total	Coal		1,772	
41 Total	Miscellaneous Freight Shipments		1,723	
13 Total	Crude Petroleum, Natural Gas or Gasoline		195	
42 Total	Containers, Carriers or Devices, Shipping, Returned Empty		0	
Grand Total		**450,473,980**	**289,019,642**	**846,909,739**

Source: TRANSEARCH

Table 4.3 Comparison of Truck and Economic Forecasts

Mode and Source	Forecast Years	CAGR	Units
Truck (TRANSEARCH)	2013-2050	1.50%	Tons
Truck (ATA national forecast)	2009-2021	2.20%	Tons
Economy.com Georgia GDP	2007-2050	2.10%	Dollars

Source: Project team analysis.

4.4 KEY FINDINGS ON TRUCKING FORECASTS

This chapter described three sources of economic and freight forecast data and generated the following key findings:

- The trucking industry does not expect to achieve pre-recession tonnage volumes until 2015.
- However, the trucking industry expects to grow at a 2.2 percent compounded annual growth rate through 2021.
- The TRANSEARCH forecast has the lowest estimates of future growth of the three sources. Its forecast is roughly one-third lower than that of the trucking industry and economy.com. This indicates that the TRANSEARCH data is likely a good lower bound for freight forecasts, but that other sources will need to be used to generate upper bounds on freight flows. A more detailed economic analysis will be conducted as part of Task 4 of this project.

5.0 Trucking Demand

This section contains a large amount of detailed information regarding truck activity in Georgia. However, the analysis is based on answering four basic questions regarding truck activity:

1. Where are the trucks?
2. What locations are trucks going to and from?
3. What are the trucks carrying?
4. How will the answers to these three questions change in the future?

No single data source provides the answer to all of these questions, however this section assembles data from a wide range of sources to provide as comprehensive an answer to these questions as the data allows. The sections are structured to match the questions using the following format:

1. *Where are the trucks?*
    a. Section 5.1 identifies the location of trucks using truck count data.
2. *What locations are trucks going to and from?*
    a. Section 5.2 provides origin-destination analysis using TRANSEARCH data.
    b. Section 5.3 describes origin-destination patterns using the Georgia statewide travel demand model.
    c. Section 5.4 describes origin-destination data from roadside truck surveys.
    d. Section 5.5 provides data on truck trip ends using truck-equipped GPS data.
    e. Section 5.6 provides information on truck movements over short and medium durations using truck-equipped GPS data.
3. *What are the trucks carrying?*
    a. Section 5.7 provides a commodity analysis using TRANSEARCH data.
    b. Section 5.8 provides commodity information from the roadside truck surveys.
4. *How will the answers to these three questions change in the future?*
    a. Section 5.9 provides truck forecast data from TRANSEARCH.
    b. Section 5.10 provides perspectives on future truck volumes using the statewide travel demand model.

This section concludes with Section 5.11, which describes the key findings related to trucking demand in Georgia.

5.1 Truck Count Data

Truck count data can be used to identify the amount of trucks throughout the state. GDOT's Office of Traffic Data maintains an ongoing vehicle classification

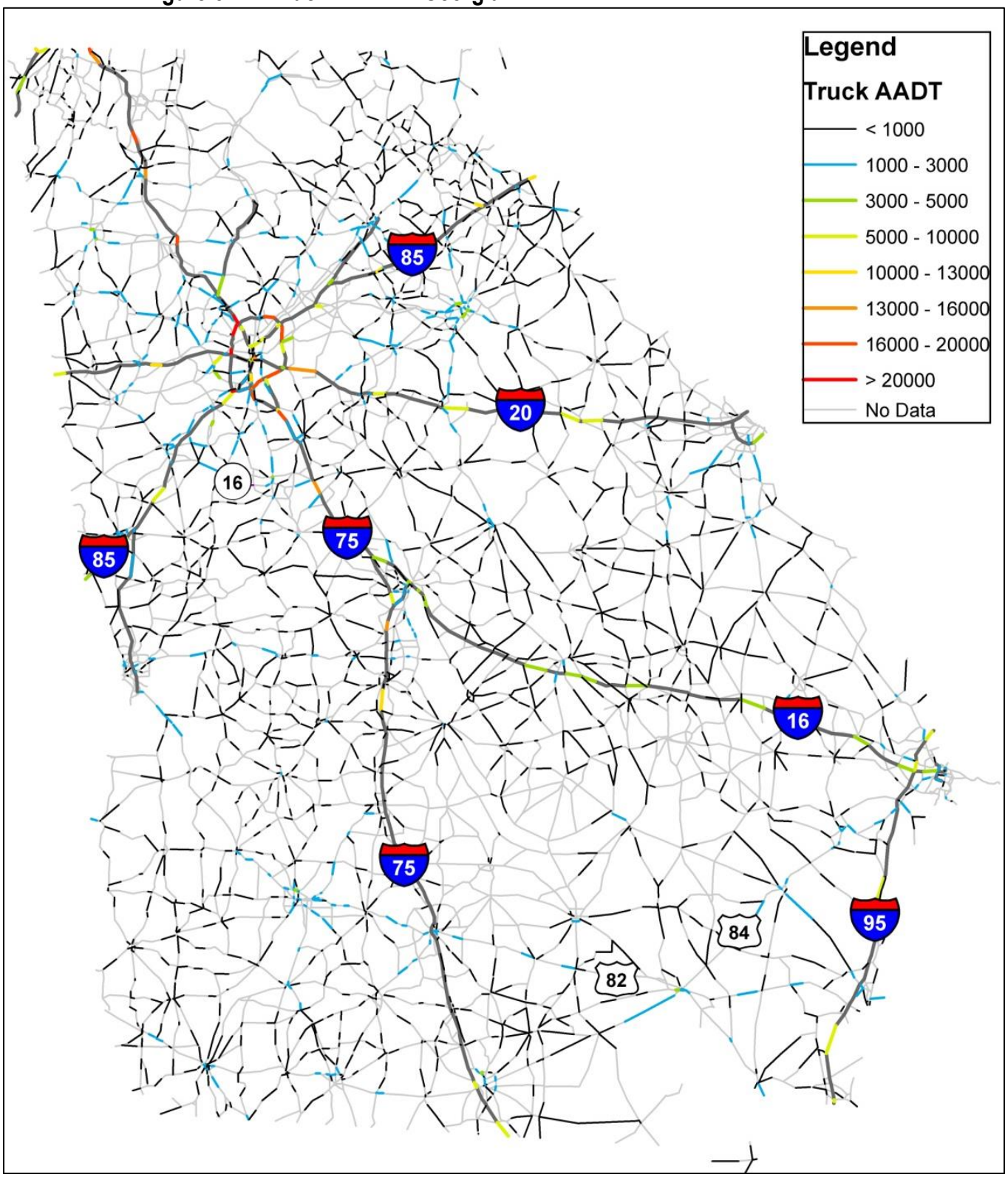
count database. The database is a mix of actual continuous count data and estimates based on extrapolating shorter duration counts (typically 48 hours). These data can be used to generate average annual daily traffic (AADT) for trucks on hundreds of road segments in the state. Data takes into account the 16-vehicle classification definitions used by the Federal Highway Administration.

Figure 5.1 provides a map with GDOT truck AADT. It indicates that the highest truck volume locations are on the Interstate system. Several locations on the Interstate system have more than 16,000 trucks per day as indicated by the red and orange lines. At the other end of the spectrum, truck volumes on non-Interstates are not as robust; there are very few road segments off the Interstate system that are not colored blue or black, meaning there are very few non-Interstate segments with more than 3,000 trucks per day. There appears to be few locations where large volumes of trucks are diverting off the Interstate system before they are close to their final destination.

Figure 5.2 shows truck counts in the Atlanta metropolitan region – a region with the highest truck volume locations in the state. The map shows that I-285 and I-75 have the highest volumes in the region and the state. Truck volumes inside I-285 are notably lower which is consistent with the ban on "through" trucks on I-75 and I-85.

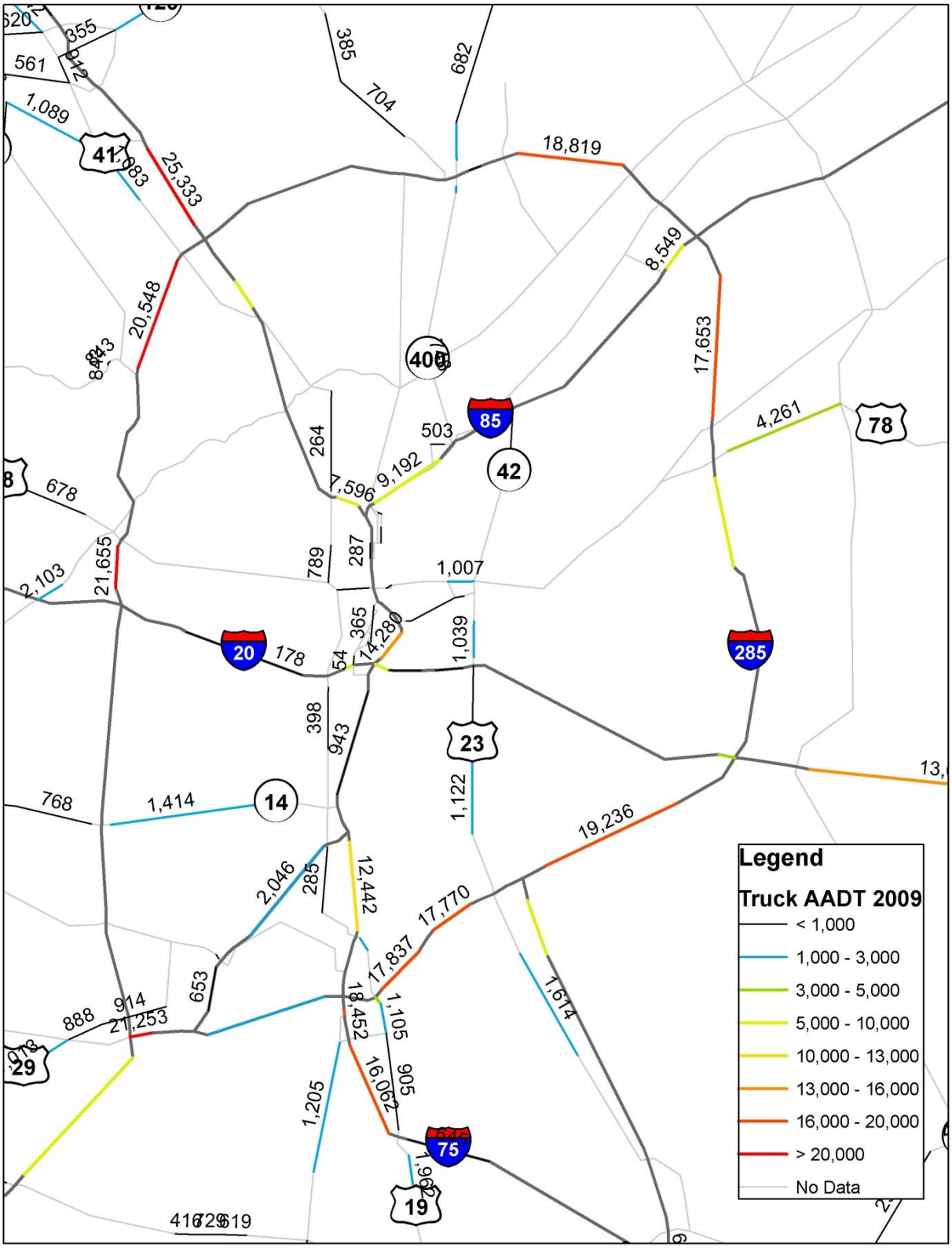
NOTE: When looking at Figure 5.2, there is not a vehicle classification location on I-85 north of I-285 until well past the split with I-985; this appears to be a data gap.

Figure 5.1 Truck AADT in Georgia



Source: GDOT Classification Count Data, 2009.

Figure 5.2 Truck AADT in Metro Atlanta



Source: GDOT Classification Count Data, 2009.

Figure 5.3 shows truck count data based on classification counts that were conducted as part of the GDOT "Radial Freeways" microsimulation study. For this study, vehicle count and length data were collected for purposes of developing a microsimulation model of activity on I-75, I-85, and I-20 in the Atlanta region. For this data collection effort, trucks were defined as all vehicles longer than 40 feet. This count data is not directly comparable to the GDOT OTD count data due to the different methodologies and technologies that are utilized. However, the important note is that it indicates that truck volumes on I-85 just north of I-285 have truck volumes that are roughly comparable with the highest truck volumes on the State, which are on I-75 north of I-285. This reinforces the notion that this location should be included in the State's classification count database. Similarly, there are locations on I-20 west of I-285 that appear to have amongst the highest volumes in the State that are not covered in the OTD count program.

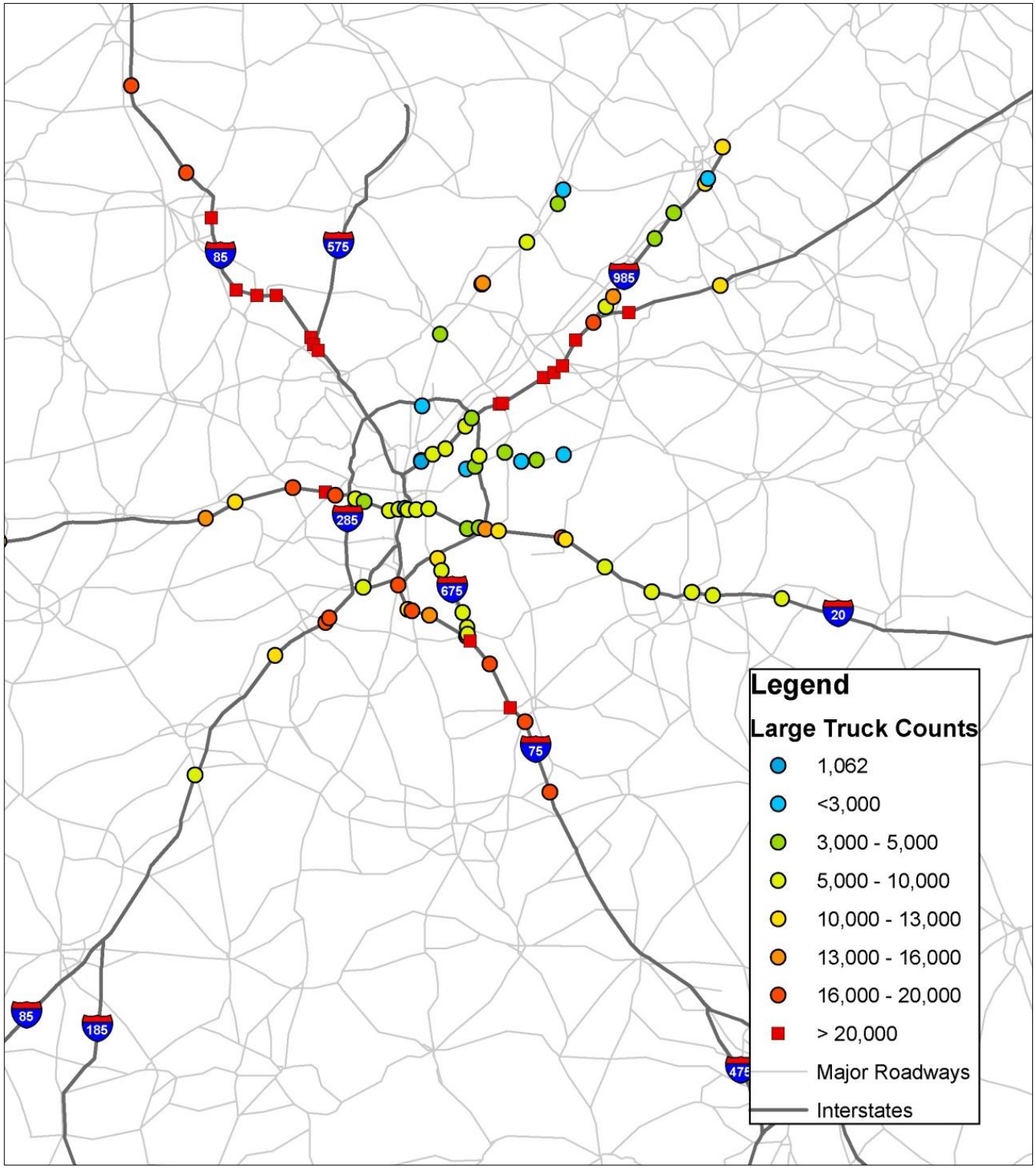
Table 5.1 lists the top 50 truck count locations in the State. It confirms that the highest truck count locations in the State are in the Atlanta region. The top 12 locations are all in the Atlanta metropolitan region – including locations in Cobb, Fulton, Henry, DeKalb, and Clayton Counties. The next highest locations are all on I-75 in North Georgia (Whitfield, Bartow, and Catoosa Counties). All of the top 50 locations are on the Interstate system.

Figure 5.4 shows only the top 50 locations using labels from 1-50 to indicate the highest to the lowest truck count locations. This graphic is particularly useful for indicating locations that do not have high truck volumes. In particular, I-16 does not have any top 50 truck volume locations. I-16 connects to the Port of Savannah, which generates over 5,000 trucks per day as discussed in the Marine Modal Profile. However, some of these trucks travel along I-16 and others travel on I-95 which results in relatively low truck volumes on I-16. Similarly, relatively low truck volumes are evident on I-85 south of the Atlanta metropolitan area and I-20 east of Newton County.

Table 5.2 shows the top 10 non-Interstate locations for truck counts. The top four locations are in the Atlanta region, including one on State Route 316, one on State Route 70 (Fulton Industrial Boulevard), and two on Georgia 400. Other notable non-Interstate locations with high truck volumes include U.S. 19 in the Albany region, , U.S. 78 in DeKalb County, State Route 3 (Tara Boulevard) in Spalding County, and State Route 6 (Thornton Road) in Fulton and Cobb Counties.

Table 5.3 shows the top locations by truck percentages. All of these locations are off the Interstate system where auto volumes are relatively low. There are three locations with high truck percentages and over 1,000 trucks per day. These locations are on State Route 19 in Laurens County, on U.S. 82 in Atkinson County, and on State Route 96 in Taylor County.

Figure 5.3 Radial Counts of Large Trucks in Atlanta



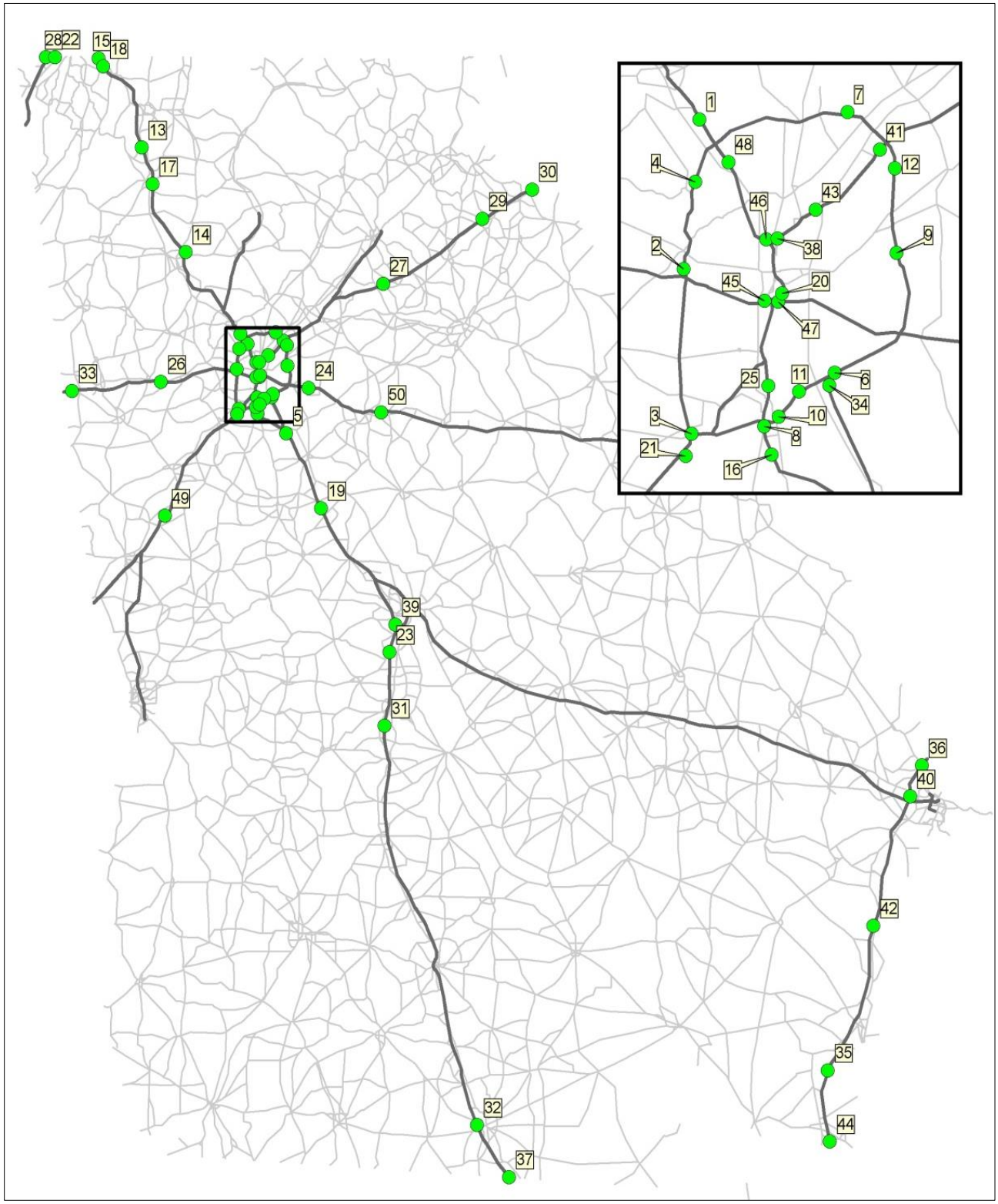
Source: GDOT's "Radial Freeways Microsimulation Study", 2007.

Table 5.1 Top 50 Truck Count Locations in Georgia

Rank	County	Route	Beginning Mile	End Mile	AADT	Truck Percentage	Truck AADT
1	Cobb	I-75	2.38	3.96	281,480	9	25,333
2	Fulton	I-285	9.87	11.46	154,680	14	21,655
3	Fulton	I-285	0	0.81	132,830	16	21,253
4	Cobb	I-285	2.57	4.09	158,060	13	20,548
5	Henry	I-75	16.26	19.75	141,840	14	19,858
6	DeKalb	I-285	23.61	24.91	147,970	13	19,236
7	DeKalb	I-285	1.96	2.98	209,100	9	18,819
8	Clayton	I-75	8.66	9.71	205,020	9	18,452
9	DeKalb	I-285	12.45	14.12	180,360	10	18,036
10	Clayton	I-285	0	2.29	127,410	14	17,837
11	Fulton	I-285	53.03	54.32	126,930	14	17,770
12	DeKalb	I-285	6.72	8.91	196,140	9	17,653
13	Whitfield	I-75	0	2.84	61,430	27	16,586
14	Bartow	I-75	12.82	16.28	66,000	25	16,500
15	Catoosa	I-75	12.03	13.44	86,350	19	16,407
16	Clayton	I-75	6.23	8.65	178,470	9	16,062
17	Gordon	I-75	4.96	7.75	63,610	25	15,903
18	Catoosa	I-75	8.4	12.02	67,030	23	15,417
19	Butts	I-75	0.33	4.58	71,310	21	14,975
20	Fulton	I-75	7.31	7.96	285,590	5	14,280
21	Fulton	I-85	8.63	11.78	136,380	10	13,638
22	Dade	I-24	3.53	4.13	61,740	22	13,583
23	Peach	I-75	8.81	11.12	73,120	18	13,162
24	DeKalb	I-20	11.86	14.96	130,910	10	13,091
25	Fulton	I-75	0.53	1.73	155,520	8	12,442
26	Douglas	I-20	0.64	4.63	72,350	17	12,300
27	Jackson	I-85	0	2.09	56,490	21	11,863
28	Dade	I-24	0	0.94	42,990	26	11,177
29	Franklin	I-85	4.38	8.43	39,070	28	10,940
30	Hart	I-85	0.29	2.14	39,540	27	10,676
31	Houston	I-75	3.21	10.06	44,180	24	10,603
32	Lowndes	I-75	16.01	18.04	43,050	23	9,902
33	Haralson	I-20	0	4.66	31,390	31	9,731
34	DeKalb	I-675	0	2.71	74,510	13	9,686
35	Camden	I-95	14.19	26.36	45,450	21	9,545
36	Chatham	I-95	16.63	20.2	47,070	20	9,414
37	Lowndes	I-75	0	1.55	36,030	26	9,368
38	Fulton	I-85	27.81	29.09	229,810	4	9,192
39	Bibb	I-475	0	3.99	50,990	18	9,178
40	Chatham	I-95	7.4	10.14	66,670	13	8,667
41	DeKalb	I-85	5.94	7.14	213,720	4	8,549
42	McIntosh	I-95	13.66	21.92	42,180	20	8,436
43	DeKalb	I-85	0	0.9	210,330	4	8,413
44	Camden	I-95	0	1.15	54,320	15	8,148
45	Fulton	I-20	8.47	8.78	157,790	5	7,890
46	Fulton	I-75	11.2	12.13	189,900	4	7,596
47	Fulton	I-20	9.26	10.05	179,980	4	7,199
48	Fulton	I-75	17.13	18.06	172,020	4	6,881
49	Meriwether	I-85	0	4.43	41,920	16	6,707
50	Newton	I-20	7.89	12.22	41,600	16	6,656

Source: GDOT Classification Data, 2009.

Figure 5.4 Top 50 Highest Truck Count Locations in Georgia



Source: GDOT Classification Data, 2009.

Table 5.2 Top 10 Truck Count Non-Interstate Locations in Georgia

County	Route	Beginning Mile	End Mile	AADT	Truck Percent	Truck AADT
Gwinnett	SR 316	0.00	2.44	87,220	7	6,105
Fulton	SR 70	28.65	29.65	27,870	20	5,574
Fulton	GA 400	6.97	8.43	181,960	3	5,459
Fulton	GA 400	16.32	18.15	129,790	4	5,192
Spalding	SR 3	5.58	6.22	34,890	14	4,885
Dougherty	U.S. 19	3.51	4.99	39,440	11	4,338
DeKalb	U.S. 78	1.55	2.79	106,530	4	4,261
Dougherty	U.S. 19	7.18	8.14	39,510	10	3,951
Fulton	SR 6	4.29	5.81	31,560	12	3,787
Laurens	SR 19	19.55	19.94	6,370	58	3,695

Source: GDOT Classification Data, 2009.

Table 5.3 Top 20 Locations with High Truck Percent and Volumes, *2009*

County	Route	Beginning Mile	End Mile	AADT	Truck Percent	Truck AADT
Ben Hill	U.S. 129	14.22	14.85	1,300	74	962
Taylor	SR 90	6.53	11.35	240	63	151
Laurens	SR 19	19.55	19.94	6,370	58	3,695
Screven	SR 17	0	4.86	1,020	39	398
Atkinson	U.S. 82	0	2.86	3,350	38	1,273
Houston	SR 26	11.61	14.62	920	38	350
Screven	SR 24	35.92	41.29	1,630	37	603
McDuffie	SR 80	1.61	1.76	280	37	104
Jefferson	U.S. 319	1.65	3.96	1,610	36	580
Monroe	U.S. 341	0	2.09	1,340	36	482
Burke	U.S. 17W	5.87	9.6	910	36	328
Warren	SR 80	24.2	25.06	300	36	108
Taylor	SR 96	8.39	9.31	3,030	35	1,061
Floyd	U.S. 411	1.77	2.05	2,350	35	823
Houston	SR 26	0	3.41	1,740	35	609
Houston	SR 26	4.73	7.91	1,580	35	553
Turner	SR 32	16.27	21.11	920	35	322
Schley	U.S. 19	12.56	16.12	880	35	308
Walker	SR 157	3.67	8.2	440	35	154
Wilkinson	SR 96	1.96	9.36	280	35	98

Source: GDOT Classification Data, 2009.

5.2 ORIGIN-DESTINATION ANALYSIS USING TRANSEARCH DATA

GDOT acquired Global Insight TRANSEARCH freight flow data to assist with their freight planning efforts, including the Statewide Freight and Logistics Plan. TRANSEARCH provides county-level, origin-destination tonnage data for over 20 commodities and for each of the primary freight modes – truck, rail, water, and air. The data was purchased for a base year of 2007 and for a forecast year of 2027. The project team extended this forecast to 2050 using FHWA FAF3 data. This section will examine the origin-destination characteristics of the trucking mode in the TRANSEARCH database in 2007.

Table 5.4 shows the truck tonnages for inbound, outbound, internal and through truck trips for Georgia in 2007 and 2013. Internal truck trips have the highest percentage with 35 percent of the total tonnage followed by 30 percent for through truck trips. Inbound and outbound truck trips combined are another 35 percent of the total. Therefore, 70 percent of the truck tonnage moved in the State is directly related to Georgia's economy.

In terms of through truck trips, the project team generated an estimate of approximately 10-15 percent of the through truck trips are trucks that travel along I-95 between South Carolina and Florida. The remainder of through truck trips (85 to 90 percent) go through the Atlanta metro. This is because the State's three main Interstates (I-75, I-85, and I-20) all intersect in the Atlanta region. These Interstates provide excellent connectivity for the State, but they also are used by vehicles that are simply traveling through the State and are not at all related to the State's economy. These through truck trips place an additional burden on the physical condition of the State's Interstate system, and they add to congestion in the urbanized areas in the State that are located on the Interstate, particularly in Atlanta. Development of options that bypass Atlanta would assist in removing a significant portion of truck activity from the region.

Table 5.5 shows the origins and destinations of truck traffic for inbound and outbound trips for the years 2007 and 2013. It shows that in 2007, Florida was Georgia's top trading partner in terms of goods that move by truck. Florida generated about 26 percent of Georgia's inbound truck tonnage, and it received about 15 percent of Georgia's outbound truck tonnage. This is primarily based on the fact that Florida is the largest economy in the Southeast U.S., and the fact that Florida and Georgia are neighboring states. The Florida economy is actually larger than all of Georgia's other neighboring states combined. California and Texas also are top 10 trading partners with Georgia due to the size of their economies. The year 2013 data some states changed rank, but it is worth noting that most major trading partners for Georgia are neighboring states (Alabama, South Carolina, North Carolina, and Tennessee) reflecting Georgia's economic ties to the Southeast U.S. as well as major state economies throughout the U.S.

Figure 5.5 shows the truck tonnage trade between all states in the United States.

Table 5.4 Summary of Truck Flows by Type of Movement for Georgia

Type of Movement	Year 2007 Tons	Percent of Total (2007)	Year 2013 Tons	Percent of Total (2013)
Within	226,021,926	35%	110,396,772	26%
Through	190,325,118	30%	137,420,075	32%
Inbound	106,380,868	17%	86,011,715	20%
Outbound	118,071,185	18%	92,611,155	22%
Total	**640,799,096**	**100%**	**426,439,717**	**100%**

Source: TRANSEARCH.

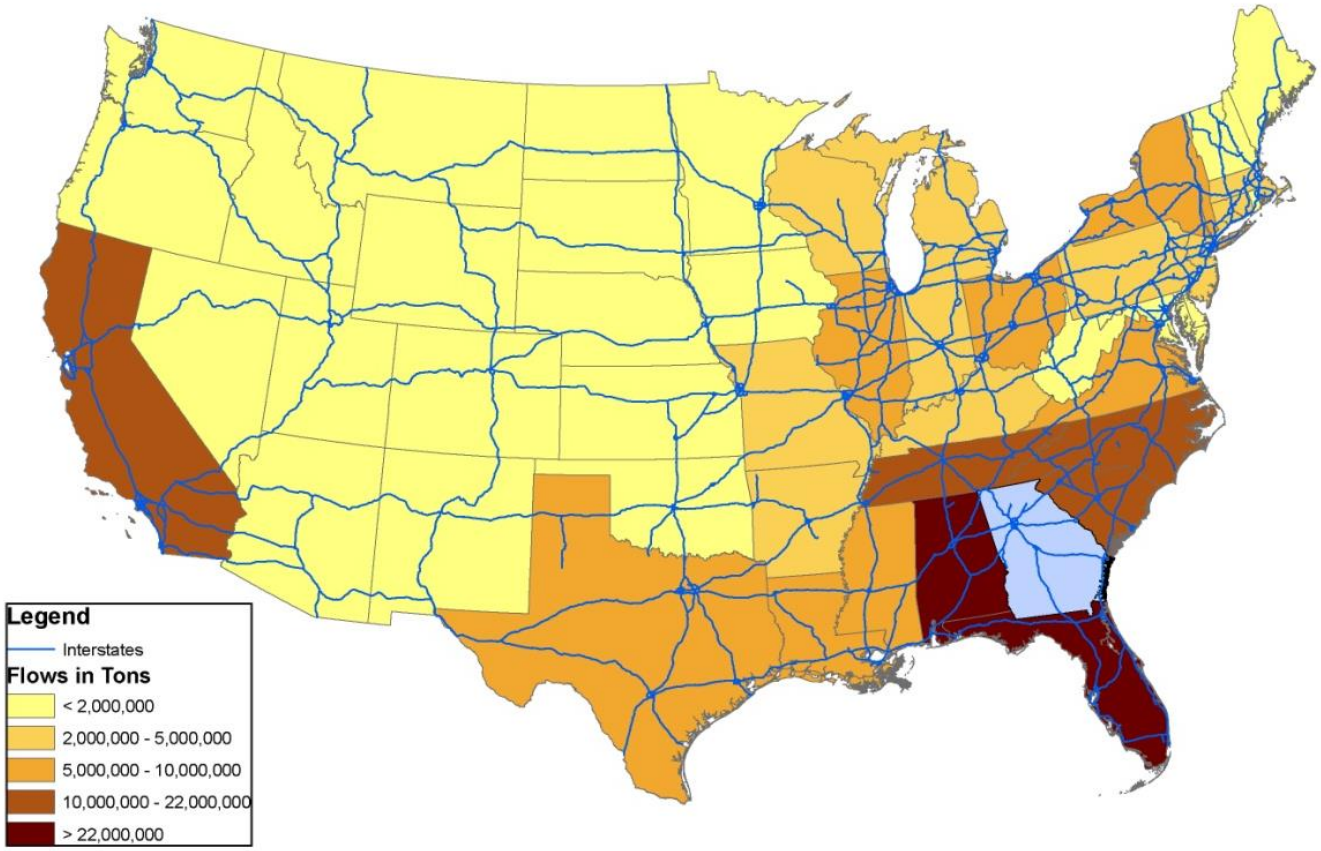
Table 5.5 Top 10 Origin States of Georgia Truck Traffic, 2007 & 2013

Rank	State	Truck Tons	Percent Total Inbound	Rank	State	Truck Tons	Percent Total Outbound
1	FL	27,691,377	26%	1	FL	18,173,961	15%
2	AL	14,977,863	14%	2	NC	12,345,276	10%
3	SC	9,387,293	9%	3	SC	11,537,086	10%
4	CA	6,202,533	6%	4	TN	8,640,026	7%
5	TN	5,235,017	5%	5	AL	7,451,813	6%
6	TX	5,213,746	5%	6	VA	6,070,102	5%
7	MS	4,124,912	4%	7	NY	5,255,603	4%
8	IL	3,457,363	3%	8	TX	4,206,503	4%
9	NC	3,343,678	3%	9	LA	4,039,827	3%
10	LA	3,018,633	3%	10	CA	3,904,694	3%

Rank	State	Truck Tons	Percent Total Inbound	Rank	State	Truck Tons	Percent Total Outbound
1	SC	12,924,924	15%	1	FL	17,299,217	19%
2	AL	12,169,416	14%	2	AL	13,795,257	15%
3	FL	11,630,303	14%	3	SC	11,613,138	13%
4	TN	10,796,240	13%	4	NC	8,695,981	10%
5	NC	7,563,409	9%	5	TN	7,823,190	9%
6	TX	3,095,054	4%	6	TX	2,733,683	3%
7	OH	2,235,419	3%	7	VA	2,595,924	3%
8	KY	2,162,700	3%	8	KY	2,159,459	2%
9	MS	2,135,928	3%	9	NY	2,086,449	2%
10	LA	1,588,493	2%	10	PA	2,062,201	2%

Source: TRANSEARCH Data.

Figure 5.5 Georgia's "Trading Partners" for Truck-Moved Tonnage, Inbound and Outbound Flows



Source: TRANSEARCH Data.

Georgia's "Trading Partners" for Truck-Moved Tonnage

Inbound and Outbound Truck Flows for Georgia, 2013

Rank 2013	State	Inbound Sum Of Tons	State	Outbound Sum Of Tons	Inbound and Outbound Flows 2013	% of Total Truck Flows 2013
1	FL	11,630,303	FL	17,299,217	28,929,520	16.20%
2	AL	12,169,416	AL	13,795,257	25,964,672	14.54%
3	SC	12,924,924	SC	11,613,138	24,538,062	13.74%
4	TN	10,796,240	TN	7,823,190	18,619,430	10.42%
5	NC	7,563,409	NC	8,695,981	16,259,390	9.10%
6	TX	3,095,054	TX	2,733,683	5,828,737	3.26%
7	KY	2,162,700	KY	2,159,459	4,322,159	2.42%
8	OH	2,235,419	OH	1,984,587	4,220,005	2.36%
9	VA	1,481,801	VA	2,595,924	4,077,725	2.28%
10	PA	1,528,862	PA	2,062,201	3,591,063	2.01%
11	MS	2,135,928	MS	1,168,388	3,304,316	1.85%
12	LA	1,588,493	LA	1,571,121	3,159,614	1.77%
13	IN	1,464,716	IN	1,535,380	3,000,096	1.68%
14	NY	778,828	NY	2,086,449	2,865,277	1.60%
15	MI	1,006,314	MI	1,574,326	2,580,640	1.44%
16	IL	1,207,204	IL	1,138,278	2,345,482	1.31%
17	NJ	1,051,874	NJ	1,093,693	2,145,567	1.20%
18	WI	882,832	WI	1,106,299	1,989,131	1.11%
19	CA	1,100,087	CA	888,202	1,988,290	1.11%
20	MO	996,139	MO	809,203	1,805,342	1.01%
21	AR	1,004,466	AR	630,087	1,634,553	0.92%
22	MD	413,440	MD	1,013,498	1,426,938	0.80%
23	ON	359,488	ON	957,775	1,317,263	0.74%
24	MA	314,386	MA	855,811	1,170,197	0.66%
25	WV	638,934	WV	445,214	1,084,148	0.61%
26	OK	438,731	OK	431,195	869,926	0.49%
27	IA	436,338	IA	396,174	832,512	0.47%
28	MN	383,408	MN	355,865	739,273	0.41%
29	CT	153,396	CT	549,336	702,732	0.39%
30	KS	393,681	KS	262,921	656,602	0.37%
31	CO	274,840	CO	306,333	581,173	0.33%
32	WA	358,326	WA	216,037	574,363	0.32%
33	AZ	184,119	AZ	217,326	401,445	0.22%
34	NE	211,012	NE	167,769	378,780	0.21%
35	ME	218,879	ME	144,190	363,069	0.20%
36	MT	229,625	MT	68,475	298,101	0.17%
37	QC	173,471	QC	106,864	280,334	0.16%
38	DE	132,219	DE	145,876	278,095	0.16%
39	EM	157,505	EM	95,831	253,336	0.14%
40	NH	77,977	NH	151,705	229,682	0.13%
41	SD	144,321	SD	76,660	220,982	0.12%
42	UT	143,829	UT	70,333	214,163	0.12%
43	ID	149,355	ID	44,904	194,259	0.11%
44	WY	156,275	WY	37,141	193,416	0.11%
45	ND	119,829	ND	69,479	189,308	0.11%
46	OR	110,999	OR	75,259	186,258	0.10%
47	NM	111,525	NM	61,915	173,441	0.10%
48	DF	84,225	DF	87,136	171,361	0.10%
49	DC	10,094	DC	158,581	168,675	0.09%
50	VT	65,639	VT	94,329	159,968	0.09%
51	RI	45,913	RI	86,268	132,181	0.07%
52	BJ	78,737	BJ	47,762	126,498	0.07%
53	NV	30,776	NV	65,186	95,962	0.05%

Note: Red color indicates Mexican or Canadian states

Source: Transearch 2013

Inbound Truck Flows for Georgia, 2013

Rank 2013	State	Inbound Sum Of Tons	% of Total Inbound 2013
1	SC	12,924,924	15.03%
2	AL	12,169,416	14.15%
3	FL	11,630,303	13.52%
4	TN	10,796,240	12.55%
5	NC	7,563,409	8.79%
6	TX	3,095,054	3.60%
7	OH	2,235,419	2.60%
8	KY	2,162,700	2.51%
9	MS	2,135,928	2.48%
10	LA	1,588,493	1.85%
11	PA	1,528,862	1.78%
12	VA	1,481,801	1.72%
13	IN	1,464,716	1.70%
14	IL	1,207,204	1.40%
15	CA	1,100,087	1.28%
16	NJ	1,051,874	1.22%
17	MI	1,006,314	1.17%
18	AR	1,004,466	1.17%
19	MO	996,139	1.16%
20	WI	882,832	1.03%
21	NY	778,828	0.91%
22	WV	638,934	0.74%
23	OK	438,731	0.51%
24	IA	436,338	0.51%
25	MD	413,440	0.48%
26	KS	393,681	0.46%
27	MN	383,408	0.45%
28	ON	359,488	0.42%
29	WA	358,326	0.42%
30	MA	314,386	0.37%
31	CO	274,840	0.32%
32	MT	229,625	0.27%
33	ME	218,879	0.25%
34	NE	211,012	0.25%
35	AZ	184,119	0.21%
36	QC	173,471	0.20%
37	EM	157,505	0.18%
38	WY	156,275	0.18%
39	CT	153,396	0.18%
40	ID	149,355	0.17%
41	SD	144,321	0.17%
42	UT	143,829	0.17%
43	DE	132,219	0.15%
44	ND	119,829	0.14%
45	NM	111,525	0.13%
46	OR	110,999	0.13%
47	DF	84,225	0.10%
48	BJ	78,737	0.09%
49	NH	77,977	0.09%
50	VT	65,639	0.08%
51	MX	56,712	0.07%
52	RI	45,913	0.05%
53	JA	45,723	0.05%
54	GJ	37,913	0.04%
55	NL	35,140	0.04%
56	NV	30,776	0.04%

Outbound Truck Flows for Georgia, 2013

Rank 2013	State	Outbound Sum Of Tons	% of Total Outbound 2013
1	FL	17,299,217	18.68%
2	AL	13,795,257	14.90%
3	SC	11,613,138	12.54%
4	NC	8,695,981	9.39%
5	TN	7,823,190	8.45%
6	TX	2,733,683	2.95%
7	VA	2,595,924	2.80%
8	KY	2,159,459	2.33%
9	NY	2,086,449	2.25%
10	PA	2,062,201	2.23%
11	OH	1,984,587	2.14%
12	MI	1,574,326	1.70%
13	LA	1,571,121	1.70%
14	IN	1,535,380	1.66%
15	MS	1,168,388	1.26%
16	IL	1,138,278	1.23%
17	WI	1,106,299	1.19%
18	NJ	1,093,693	1.18%
19	MD	1,013,498	1.09%
20	ON	957,775	1.03%
21	CA	888,202	0.96%
22	MA	855,811	0.92%
23	MO	809,203	0.87%
24	AR	630,087	0.68%
25	CT	549,336	0.59%
26	WV	445,214	0.48%
27	OK	431,195	0.47%
28	IA	396,174	0.43%
29	MN	355,865	0.38%
30	CO	306,333	0.33%
31	KS	262,921	0.28%
32	AZ	217,326	0.23%
33	WA	216,037	0.23%
34	NE	167,769	0.18%
35	DC	158,581	0.17%
36	NH	151,705	0.16%
37	DE	145,876	0.16%
38	ME	144,190	0.16%
39	QC	106,864	0.12%
40	EM	95,831	0.10%
41	VT	94,329	0.10%
42	DF	87,136	0.09%
43	RI	86,268	0.09%
44	SD	76,660	0.08%
45	OR	75,259	0.08%
46	UT	70,333	0.08%
47	ND	69,479	0.08%
48	MT	68,475	0.07%
49	NV	65,186	0.07%
50	NM	61,915	0.07%
51	MB	60,973	0.07%
52	BJ	47,762	0.05%
53	ID	44,904	0.05%
54	NB	37,219	0.04%
55	WY	37,141	0.04%
56	JA	33,414	0.04%

Note: Red color indicates Mexican or Canadian states

Source: Transearch 2013

County-Level Truck Flows in Georgia

County-level truck flows were examined to determine locations within Georgia with relatively high or low truck volumes. Table 5.6 shows the top 20 counties for inbound and outbound truck tonnage; it is apparent that metro Atlanta is home to the largest percentage of the truck flows in the state. Fulton, Gwinnett, DeKalb, and Cobb Counties accounted for about 38 percent of Georgia's inbound truck tons and 21 percent of Georgia's outbound truck tons. This high percentage is primarily based on the freight demand that accompanies large population (consumption) centers such as metro Atlanta.

Chatham County is the largest single county generator of truck tons, generating over 21 percent of the outbound truck tonnage in the state -- roughly the same amount of Fulton, Gwinnett, DeKalb and Cobb Counties combined. This high volume of outbound trucks in Chatham County is primarily due to the large number of imported containers from the Port of Savannah.

Export volumes at the port make Chatham County second in terms of inbound truck tonnage. Similarly, shipments through the Port of Brunswick make Glynn County the fifth largest county in Georgia in terms of outbound truck tonnage.

Table 5.6 Top 20 Counties with Highest Truck Tons

Outbound				Inbound			
County	Truck Tons (2007)	Truck Tons (2013)	% of Total	County	Truck Tons (2007)	Truck Tons (2013)	% of Total
Fulton County, GA	14,315,413	25,305,708	12%	Fulton County, GA	28,354,215	28,741,899	15%
Chatham County, GA	24,747,960	17,049,256	8%	Chatham County, GA	8,677,489	19,445,910	10%
Cobb County, GA	2,789,090	10,271,111	5%	Cobb County, GA	3,574,647	18,358,001	9%
Gwinnett County, GA	4,315,205	8,044,889	4%	Gwinnett County, GA	4,315,205	12,825,765	7%
Hall County, GA	2,180,890	7,459,725	4%	DeKalb County, GA	4,248,574	10,109,629	5%
DeKalb County, GA	n/a	5,826,095	3%	Muscogee County, GA	2,630,894	5,768,440	3%
Elbert County, GA	1,280,639	4,334,219	2%	Richmond County, GA	3,033,269	5,518,352	3%
Richmond County, GA	3,497,863	4,219,166	2%	Hall County, GA	n/a	4,573,840	2%
Bibb County, GA	2,341,544	3,704,540	2%	Forsyth County, GA	n/a	3,407,383	2%
Muscogee County, GA	n/a	3,607,825	2%	Houston County, GA	n/a	3,288,517	2%
Jones County, GA	n/a	3,224,378	2%	Lowndes County, GA	2,461,220	3,206,959	2%
Houston County, GA	n/a	3,210,906	2%	Bibb County, GA	1,719,290	3,037,758	2%
Whitfield County, GA	2,138,084	3,032,536	1%	Clayton County, GA	2,748,225	2,662,757	1%
Clayton County, GA	n/a	2,793,609	1%	Troup County, GA	1,276,050	2,575,205	1%
Bartow County, GA	1,324,244	2,652,403	1%	Cherokee County, GA	n/a	2,332,444	1%
Glynn County, GA	3,632,475	2,412,050	1%	Glynn County, GA	n/a	2,287,383	1%
Crawford County, GA	n/a	2,287,569	1%	Dougherty County, GA	2,306,558	2,275,640	1%
Henry County, GA	n/a	2,262,821	1%	Whitfield County, GA	n/a	2,221,792	1%
Forsyth County, GA	n/a	2,124,548	1%	Rockdale County, GA	n/a	2,208,486	1%
Pickens County, GA	n/a	2,015,098	1%	Henry County, GA	n/a	2,139,078	1%

Source: TRANSEARCH Data.

Top 20 Counties with Highest Truck Tons
EXCLUDING INTRA-STATE FLOWS

	Outbound				Inbound		
County	Truck Tons (2007)	Truck Tons (2013)	% of Total	County	Truck Tons (2007)	Truck Tons (2013)	% of Total
Chatham County, GA	24,747,960	11,429,181	12%	Chatham County, GA	8,677,489	11,538,938	13%
Fulton County, GA	14,315,413	7,389,352	8%	Fulton County, GA	28,354,215	9,023,222	10%
Gwinnett County, GA	3,762,409	2,611,196	3%	Cobb County, GA	3,574,647	5,552,426	6%
Hall County, GA	2,180,890	2,381,075	3%	Gwinnett County, GA	4,315,205	5,301,571	6%
DeKalb County, GA	4,510,309	2,287,404	2%	Muscogee County, GA	2,630,894	3,697,979	4%
Elbert County, GA	1,280,639	2,253,036	2%	DeKalb County, GA	4,248,574	3,565,779	4%
Cobb County, GA	2,789,090	2,220,157	2%	Richmond County, GA	3,033,269	3,220,710	4%
Muscogee County, GA	n/a	2,176,947	2%	Hall County, GA	n/a	2,411,589	3%
Richmond County, GA	3,497,863	2,026,057	2%	Lowndes County, GA	2,461,220	1,808,605	2%
Whitfield County, GA	2,138,084	1,996,345	2%	Glynn County, GA	n/a	1,559,821	2%
Houston County, GA	n/a	1,865,282	2%	Troup County, GA	1,276,050	1,484,043	2%
Bibb County, GA	2,341,544	1,830,297	2%	Whitfield County, GA	n/a	1,472,173	2%
Glynn County, GA	3,632,475	1,638,055	2%	Forsyth County, GA	n/a	1,458,944	2%
Troup County, GA	1,474,861	1,348,855	1%	Houston County, GA	n/a	1,395,724	2%
Lowndes County, GA	1,370,231	1,344,230	1%	Bibb County, GA	1,719,290	1,392,581	2%
Bartow County, GA	1,324,244	1,341,543	1%	Floyd County, GA	n/a	1,270,356	1%
Floyd County, GA	1,354,432	1,276,178	1%	Cherokee County, GA	n/a	1,099,586	1%
Decatur County, GA	n/a	1,274,423	1%	Dougherty County, GA	2,306,558	985,931	1%
Dougherty County, GA	1,261,408	1,253,746	1%	Clayton County, GA	2,748,225	968,425	1%
Clayton County, GA	n/a	1,239,272	1%	Gordon County, GA	n/a	919,548	1%

Source: TRANSEARCH Data.

Top 20 Counties with Highest Freight Tonnage (***ALL MODES***)

County	Total
Fulton County, GA	83,103,650
Chatham County, GA	62,798,359
Cobb County, GA	35,266,261
Monroe County, GA	27,194,107
Gwinnett County, GA	23,538,199
DeKalb County, GA	19,501,202
Richmond County, GA	16,695,976
Bartow County, GA	15,765,786
Hall County, GA	14,814,654
Muscogee County, GA	10,503,254
Lowndes County, GA	9,635,812
Glynn County, GA	9,360,878
Bibb County, GA	8,485,965
Houston County, GA	7,672,511
Jones County, GA	7,306,117
Carroll County, GA	6,848,355
Floyd County, GA	6,575,999
Clayton County, GA	6,397,724
Whitfield County, GA	6,214,340
Washington County, GA	5,768,358

Source: TRANSEARCH Data.

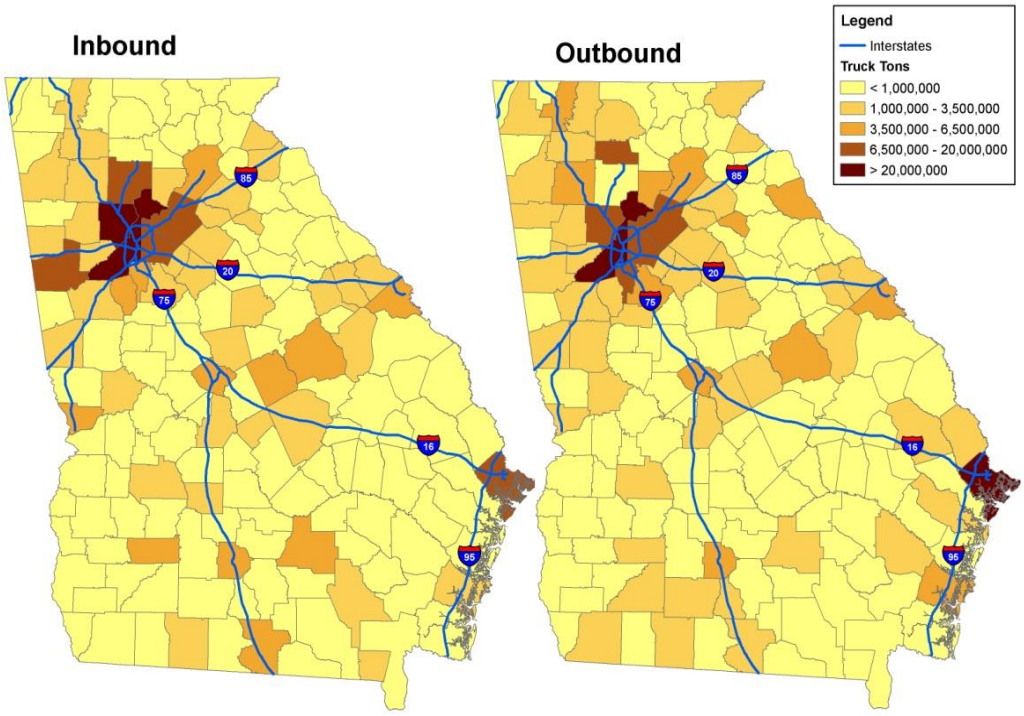
Midsized metropolitan regions generate and attract a fair share of truck tonnage as well. Richmond County (Augusta), Dougherty County (Albany), Bibb County (Macon), Hall County (Gainesville), Lowndes County (Valdosta), and Muscogee County (Columbus) are in the state's top 20 counties in terms of truck tonnage.

There are some notable smaller population counties that have high truck tonnages. Tift County is the sixth largest county in terms of truck tons generated and eighth largest in terms of truck tons attracted. Most of this tonnage is outbound flows of food products and inbound flows of metal products, paper products, and goods from warehouses and distribution center such as Target. Washington and Floyd Counties (Rome) are the other two counties that are in the top 20 in terms of inbound and outbound tonnages. Washington and Floyd Counties have large volumes of nonmetallic minerals; for example, Washington County is on the list due to kaolin clay production.

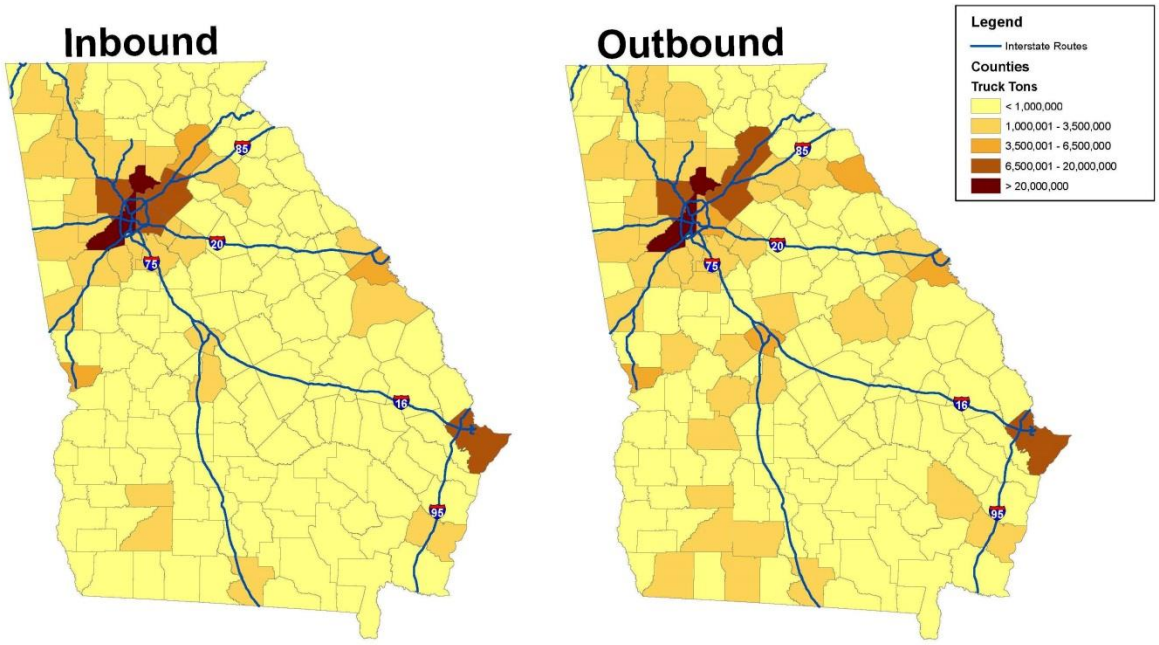
In northern Georgia, Whitfield County (Dalton) and Gordon County (Calhoun) are notable as significant in terms of outbound truck tonnage. Whitfield has large outbound and inbound flows of textile mill products associated with carpet production. Gordon County has large outbound shipments of textile mill products (carpet production), chemicals or allied products, and clay/concrete/glass/stone. Coffee County in south Georgia appears with significant truck tonnage also -- largely due to the presence of a Walmart distribution center.

Figure 5.6 on the next page is the analysis of two different years of TRANSEARCH data. These timeframes represent general pre-recession economic conditions (2007) and during the recession (2013). In both instances, two areas of the state consistently stand out as Georgia's highest freight volume handling regions: metro Atlanta and Savannah/Chatham County.

Figure 5.6 Inbound & Outbound Truck Tons by County, *2007*



Inbound & Outbound Truck Tons by County, *2013*



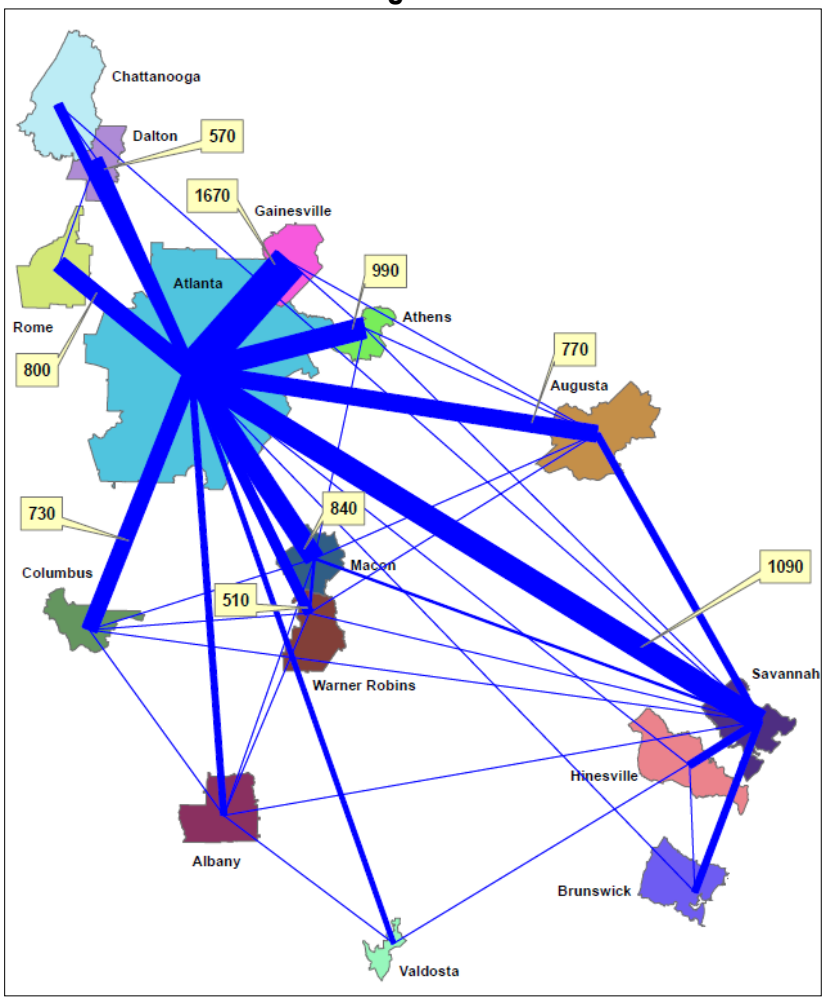
Source: TRANSEARCH Data.

5.3 ORIGIN-DESTINATION ANALYSIS USING STATEWIDE TRAVEL DEMAND MODEL

Truck origin-destination analysis also can be conducted using the GDOT statewide travel demand model. This section examines 'internal' state truck flows between Georgia census-designated urbanized areas and also estimates Georgia's "through" truck trips (with neither an origin or destination in state.)

Figure 5.7 maps the truck flows between Georgia's urbanized areas based on the travel demand model. It shows that the largest truck flows are between metro Atlanta other census-designated urbanized areas of the state. The three largest truck flows are: metro Atlanta to metro Gainesville (1,670 daily trucks), metro Atlanta to metro Savannah (1,090 daily trucks), and metro Atlanta to metro Athens (990 daily trucks.) The largest non-Atlanta truck volumes are between metro Savannah and metro Augusta (311 daily trucks.)

Figure 5.7 Estimated Daily Truck Volumes Between <Census-Designated> Urbanized Areas in Georgia



Source: GDOT Statewide Travel Demand Model

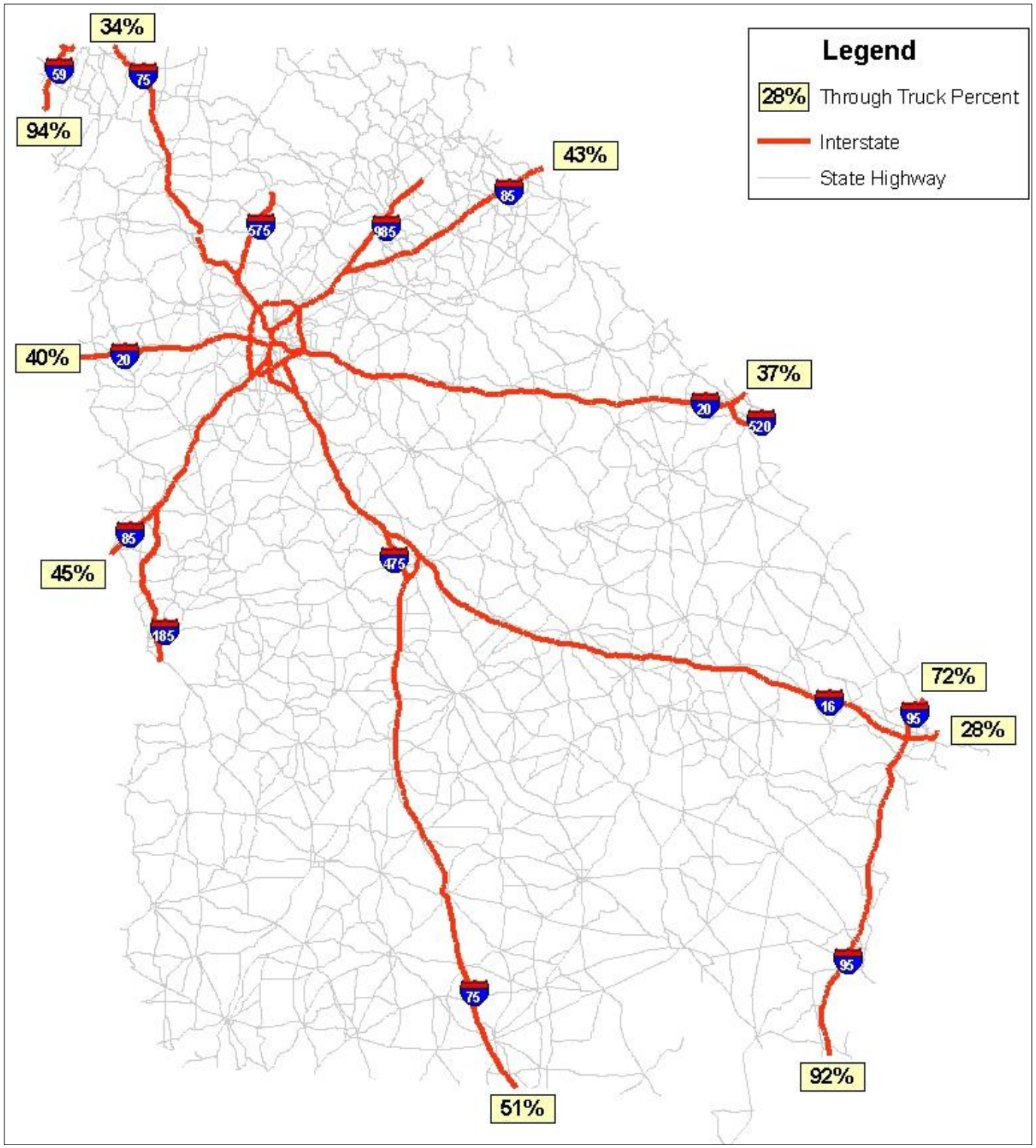
Table 5.7 Estimated Daily Truck Volume Between Census-Designated Urbanized Areas in Georgia

Area	Albany	Athens	Atlanta	Augusta	Brunswick	Chattanooga	Columbus	Dalton	Gainesville	Hinesville	Macon	Rome	Savannah	Valdosta	Warner Robins
Albany	–	3	101	6	4	2	22	1	2	2	15	2	25	22	13
Athens	3	–	447	31	1	4	5	4	33	1	15	6	26	2	7
Atlanta	129	543	–	436	27	258	391	361	982	16	461	467	820	82	209
Augusta	6	28	338	–	9	5	6	5	20	7	25	6	178	7	12
Brunswick	6	1	23	10	–	1	2	0	1	18	3	0	143	13	3
Chattanooga	1	4	181	4	0	–	3	29	9	0	3	13	23	1	2
Columbus	29	5	339	7	2	4	–	5	9	1	23	7	37	8	17
Dalton	1	4	206	3	0	17	3	–	9	0	3	14	8	1	2
Gainesville	2	29	687	18	1	8	7	10	–	0	8	8	15	2	4
Hinesville	3	1	28	12	21	1	2	0	1	–	4	0	167	6	3
Macon	15	15	377	25	2	4	22	4	10	2	–	6	51	9	48
Rome	2	5	333	5	0	12	6	17	9	0	5	–	8	1	3
Savannah	25	15	272	133	149	11	24	7	8	114	49	4	–	25	23
Valdosta	21	2	52	6	10	1	6	1	2	3	7	1	32	–	5
Warner Robins	17	10	297	17	3	3	24	3	6	2	62	4	45	9	–

Source: GDOT Statewide Travel Demand Model

Figure 5.8 on the next page shows the estimated percent of trucks entering Georgia that are 'through' truck trips. For example, of the trucks that enter the state on I-20 from South Carolina, 37 percent travel through the state without stopping at any location in the state. Therefore, the numbers on this figure can be used as a proxy for how important each of the Interstate corridors is for Georgia's economy. Just south of the Tennessee border, I-75 has the lowest percent of truck through trips: 34%. This contrasts with 72 percent of the trucks entering the state on I-95 from South Carolina, and 92 percent of the trucks from Florida, are "through" truck trips.

Figure 5.8 Model "Through" Truck Percentages on Georgia Interstates: At state border locations



Source: GDOT Statewide Travel Demand Model

5.4 ORIGIN-DESTINATION ANALYSIS USING ROADSIDE TRUCK SURVEY DATA

Another perspective on truck origins and destinations can be considered using data collected from roadside truck origin-destination surveys. In 2005, the Atlanta Regional Commission ("ARC") conducted roadside truck surveys primarily at weigh stations in/around metro Atlanta as part of their regional freight mobility plan. GDOT supplemented these around the rest of the state in 2006 as part of the GDOT Truck Lane Needs Identification Study. (At the time this report was first written, the I-20 westbound station west of Augusta was closed for reconstruction and not available for data collection…after its reconstruction completed, data was collected at this site through GDOT Office of Planning's *Connect Central Georgia Study*; this last piece made the dataset complete and robust for use in supplementing this report.)

Tables 5.8 and 5.9 provide the number of trucks by origination and destination states for each of Georgia's neighbor states at each origin-destination survey location. Tables 5.10 and 5.11 provide percentage of trucks by origination and destination states for each of Georgia's neighbor states at each survey location; a sample of findings are as follows:

- **Florida is the top 'trading partner' for Georgia in terms of truck freight.** It is by far the largest recipient of Georgia's goods on I-75, the highest volume truck corridor in the State. At the Forsyth, Georgia survey location (weigh station) in central Georgia, over half the southbound truck traffic was destined for Florida, while the other half had destinations within Georgia. The finding of Florida's status as Georgia's top trading partner was mirrored in the TRANSEARCH analysis conducted in the previous section.
- **Florida is the largest generator of "through" truck traffic for Georgia.** Even as far north as the survey location on I-75 in Ringgold, just south of the Tennessee border, approximately 20 percent of trucks are destined for Florida. On I-95, virtually all "through" truck traffic has a trip end in Florida.
- **South Carolina and North Carolina are the state's 2nd and 3rd top trading partners in terms of truck freight, respectively.** South Carolina receives a significant fraction of Georgia truck traffic from both I-20 and I-85. North Carolina and South Carolina combined are responsible for over half of the goods that arrive in the State via I-85. Alabama is the 4th largest trading partner for Georgia in terms of truck freight.
- **I-16 is used as a truck "expressway" for traffic connecting the Port of Savannah to other locations within Georgia.** Roughly 80 percent of the trucks surveyed on I-16 in Pembroke (west of Savannah) have both their origin and destination in Georgia. Trip ends east of Pembroke are mostly likely to be the Port of Savannah as it is by far the largest freight generator in that region. This indicates that trucks from the Port that have interior trip ends outside of Georgia primarily utilize I-95.

Table 5.8 Origin States of Trucks at Georgia Survey Stations

Survey Location	Dir	Georgia	Florida	South Carolina	North Carolina	Alabama	Tennessee	Other	Total
I-75 at Valdosta	NB	38	279	–	–	–	–	–	317
	SB	133	1	1	–	7	23	106	271
I-75 at Forsyth	NB	72	37	2	2	–	–	6	119
	SB	134	4	1	3	6	15	37	200
I-75 at Ringgold	SB	22	–	4	4	5	41	62	138
I-85 at LaGrange	NB	37	4	–	–	37	4	26	108
	SB	90	2	11	8	11	–	15	137
I-85 at Lavonia	SB	12	1	27	29	2	2	30	103
I-20 at Bremen	WB	88	1	7	3	5	4	9	117
I-20 at Lithia Springs	EB	47	1	1	6	31	5	35	126
I-20 at Augusta	EB	149	2	14	3	17	14	42	241
I-95 at Chatham	SB	5	1	152	67	–	4	113	342
I-95 at Eulonia	NB	99	354	–	–	1	–	5	459
	SB	164	1	103	63	–	5	87	423
I-16 at Pembroke	EB	245	22	29	6	–	–	11	313
	WB	271	31	26	8	–	–	3	339
Totals		**1,606**	**741**	**378**	**202**	**122**	**117**	**587**	**3,753**

Source: GDOT Truck Lane Needs Identification Study Data, ARC Regional Freight Mobility Plan.

Table 5.9 Destination States of Trucks at Georgia Survey Locations

Survey Location	Dir	Georgia	Florida	South Carolina	North Carolina	Alabama	Tennessee	Other	Total
I-75 at Valdosta	NB	229	1	2	9	3	22	51	317
	SB	32	237	–	–	–	–	2	271
I-75 at Forsyth	NB	69	2	4	2	1	12	29	119
	SB	100	97	–	–	–	–	2	199
I-75 at Ringgold	SB	96	28	2	–	2	7	3	138
I-85 at LaGrange	NB	60	2	12	7	14	–	13	108
	SB	43	8	–	63	–	–	23	137
I-85 at Lavonia	SB	67	8	–	11	1	2	14	103
I-20 at Bremen	WB	23	1	1	3	–	5	47	80
I-20 at Lithia Springs	EB	88	8	8	3	10	2	7	126
I-20 at Augusta	EB	73	1	115	1	28	–	23	241
I-95 at Chatham	SB	105	215	3	2	1	1	10	337
I-95 at Eulonia	NB	191	1	89	–	56	3	119	459
	SB	75	344	–	1	–	–	3	423
I-16 at Pembroke	EB	245	22	29	–	6	–	11	313
	WB	264	3	5	17	1	15	34	339
Totals		**1,760**	**978**	**270**	**119**	**123**	**69**	**391**	**3,710**

Source: GDOT Truck Lane Needs Identification Study Data, ARC Regional Freight Mobility Plan.

Table 5.10 Origin State Percentages of Trucks at Georgia Survey Locations

Survey Location	Dir	Georgia	Florida	South Carolina	North Carolina	Alabama	Tennessee	Other	Total
I-75 at Valdosta	NB	12%	88%	0%	0%	0%	0%	0%	**100%**
	SB	49%	0%	0%	0%	3%	8%	39%	**100%**
I-75 at Forsyth	NB	61%	31%	2%	2%	0%	0%	5%	**100%**
	SB	67%	2%	1%	2%	3%	8%	19%	**100%**
I-75 at Ringgold	SB	16%	0%	3%	3%	4%	30%	45%	**100%**
I-85 at LaGrange	NB	34%	4%	0%	0%	34%	4%	24%	**100%**
	SB	66%	1%	8%	6%	8%	0%	11%	**100%**
I-85 at Lavonia	SB	12%	1%	26%	28%	2%	2%	29%	**100%**
I-20 at Bremen	WB	75%	1%	6%	3%	4%	3%	8%	**100%**
I-20 at Lithia Springs	EB	37%	1%	1%	5%	25%	4%	28%	**100%**
I-20 at Augusta	EB	62%	1%	6%	1%	7%	6%	17%	**100%**
I-95 at Chatham	SB	1%	0%	44%	20%	0%	1%	33%	**100%**
I-95 at Eulonia	NB	22%	77%	0%	0%	0%	0%	1%	**100%**
	SB	39%	0%	24%	15%	0%	1%	21%	**100%**
I-16 at Pembroke	EB	78%	7%	9%	2%	0%	0%	4%	**100%**
	WB	80%	9%	8%	2%	0%	0%	1%	**100%**

Source: GDOT Truck Lane Needs Identification Study Data, ARC Regional Freight Mobility Plan.

Table 5.11 Destination State Percentages of Trucks at Georgia Survey Locations

Survey Location	Dir	Georgia	Florida	South Carolina	Alabama	North Carolina	Tennessee	Other	Total
I-75 at Valdosta	NB	72%	0%	1%	3%	1%	7%	16%	**100%**
	SB	12%	87%	0%	0%	0%	0%	1%	**100%**
I-75 at Forsyth	NB	58%	2%	3%	2%	1%	10%	24%	**100%**
	SB	50%	49%	0%	0%	0%	0%	1%	**100%**
I-75 at Ringgold	SB	70%	20%	1%	0%	1%	5%	2%	**100%**
I-85 at LaGrange	NB	56%	2%	11%	6%	13%	0%	12%	**100%**
	SB	31%	6%	0%	46%	0%	0%	17%	**100%**
I-85 at Lavonia	SB	65%	8%	0%	11%	1%	2%	14%	**100%**
I-20 at Bremen	WB	29%	1%	1%	4%	0%	6%	59%	**100%**
I-20 at Lithia Springs	EB	70%	6%	6%	2%	8%	2%	6%	**100%**
I-20 at Augusta	EB	30%	0%	48%	0%	12%	0%	10%	**100%**
I-95 at Chatham	SB	31%	64%	1%	1%	0%	0%	3%	**100%**
I-95 at Eulonia	NB	42%	0%	19%	0%	12%	1%	26%	**100%**
	SB	18%	81%	0%	0%	0%	0%	1%	**100%**
I-16 at Pembroke	EB	78%	7%	9%	0%	2%	0%	4%	**100%**
	WB	78%	1%	1%	5%	0%	4%	10%	**100%**

Source: GDOT Truck Lane Needs Identification Study Data, ARC Regional Freight Mobility Plan.

- **The Georgia portion of I-95 is primarily used to move goods between the Carolinas and Florida.** At the I-95 Eulonia southbound weigh station survey location (approximately halfway between Savannah and Jacksonville, Florida), the percentage of trucks generated from the Carolinas is as high as the number of trucks generated in Georgia. At the I-95 Chatham southbound survey location, there are twice as many trucks originating in the Carolinas relative to the number generated in Georgia.
- **Tennessee serves as a 'pass-through' state for Georgia's trucks.** Over 45 percent of the trucks surveyed on I-75 at Ringgold, just south of the Tennessee border, had origination states that were north of Tennessee. Only 30 percent report Tennessee as an origination. Similarly, at the I-75 survey location near Forsyth, Georgia there were more than twice as many trucks from non-neighbor Georgia states (i.e., north of Tennessee) than trucks from Tennessee. This implies that improvements in Tennessee's Interstate system also will benefit Georgia truck traffic and Georgia's economy.

The roadside surveys also requested information regarding specific cities for originating and terminating traffic. Table 5.12 lists the specific cities (not metro areas) in descending order in terms of their frequency of being captured in the survey. It shows that Savannah was the single most often cited city in the origin-destination ("O-D") surveys with 387 trucks either going to or from this city. Atlanta was second with 227 responses and Augusta was a distant third with 72 responses, but is particularly noteworthy given that there was no available survey location on westbound I-20 at that time. The Georgia cities of Brunswick; Macon; Valdosta; LaGrange; Forest Park; and Statesboro round out the top nine city locations mentioned in the survey.

Note: This is not a direct estimate of the number of trucks generated in each city, because survey locations were not evenly spread across the state and some locations only surveyed in one direction. However, it does provide some indication of cities that are key generators and attractors of Georgia truck traffic.

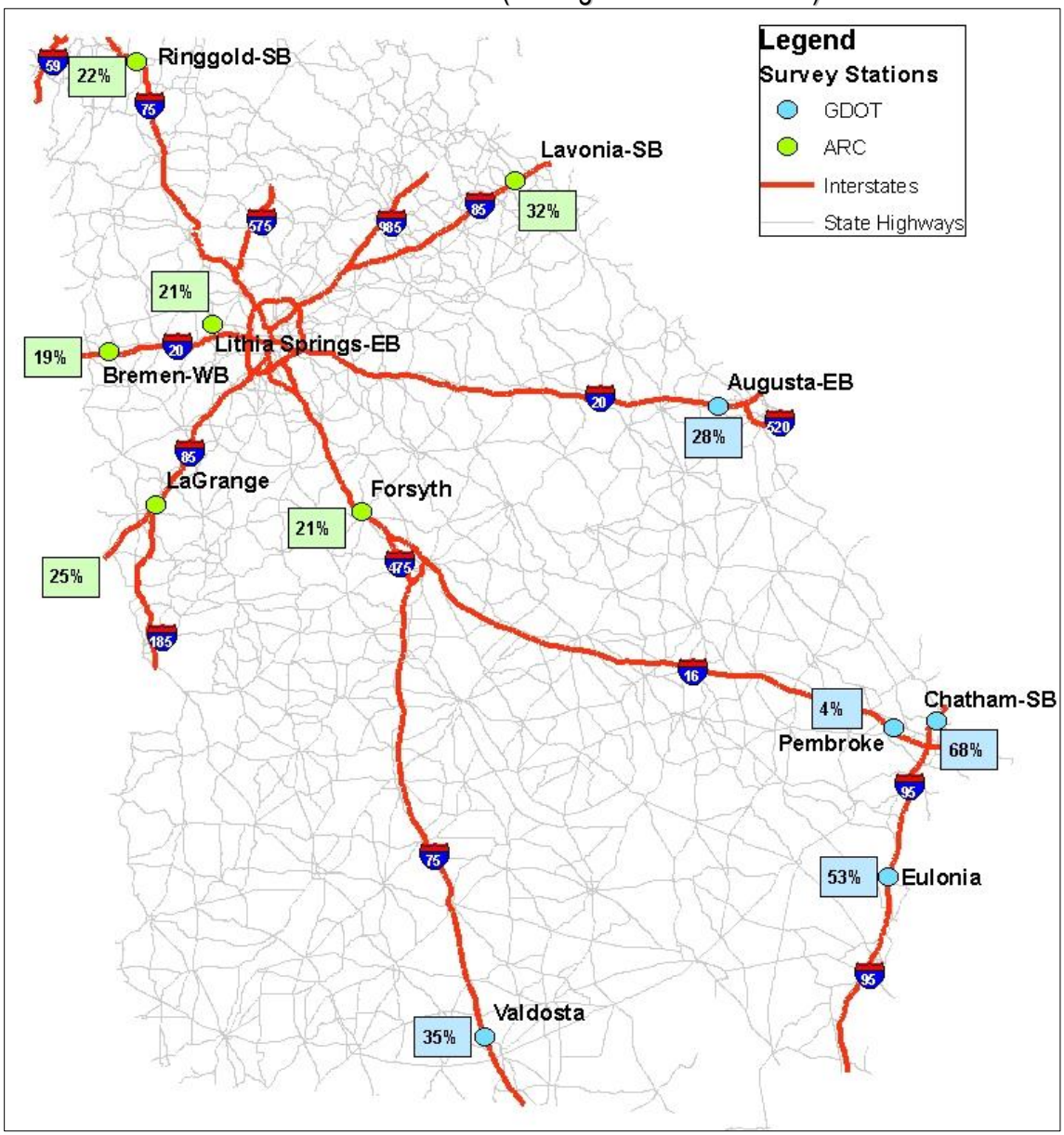
Table 5.12 Top Origin and Destination Cities Cited in O-D Surveys

Rank	O-D	Count	Rank	O-D	Count
1	Savannah	387	11	Norcross	29
2	Metro Atlanta	227	12	Dublin	28
3	Augusta	72	13	Columbus	26
4	Brunswick	61	14	Richmond	24
5	Macon	46	15	McDonough	22
6	Valdosta	40	16	Albany	21
7	LaGrange	38	17	Dalton	20
8	Forest Park	33	18	Savannah	20
9	Statesboro	31	19	Rincon	19
10	South Fulton Co.	30	20	Garden City	19

The surveys also can be used similar to the travel demand model in terms of estimating the importance of each corridor to Georgia's economy. Figure 5.9 shows the percent of trucks surveyed at each location with both an origin and destination outside the state.

The results mirror trends predicted by the state travel demand model that the I-75 Ringgold location has one of the lowest percentages and the locations on I-95 have the highest percentages of "through" traffic. I-16 has the lowest percentage of through truck traffic in the state (four percent), which means virtually all trucks on this corridor are directly related to Georgia's economy.

Figure 5.9 O-D Survey "Through" Truck Percent on Ga. Interstates
(at weight station locations)



Source: GDOT Truck Lane Needs Identification Study Data & ARC Regional Freight Mobility Plan.

5.5 TRUCK TRIP END ANALYSIS USING TRUCK-EQUIPPED GPS DATA

Commercial trucks are increasingly incorporating GPS technology to assist in truck fleet tracking and management. A third-party vendor typically manages the GPS data and technology. These third-party vendors often make their GPS data available to non-trucking entities in a way that the data is aggregated with identifying truck company information removed to assure the privacy of the vendor's customers. Recently, the Federal Highway Administration (FHWA) negotiated rights to a wide sample of GPS data from some of the largest truck GPS data providers for use in studies such as this report.

As one of the team members working on the Georgia Statewide Freight and Logistics Plan, ATRI's analysis of the GPS data was utilized in a number of different sections in this report and is referred to as the FHWA/ATRI Freight Performance Measurement ("FPM") Database. The following information describes an analysis done identifying truck trip ends within the state.

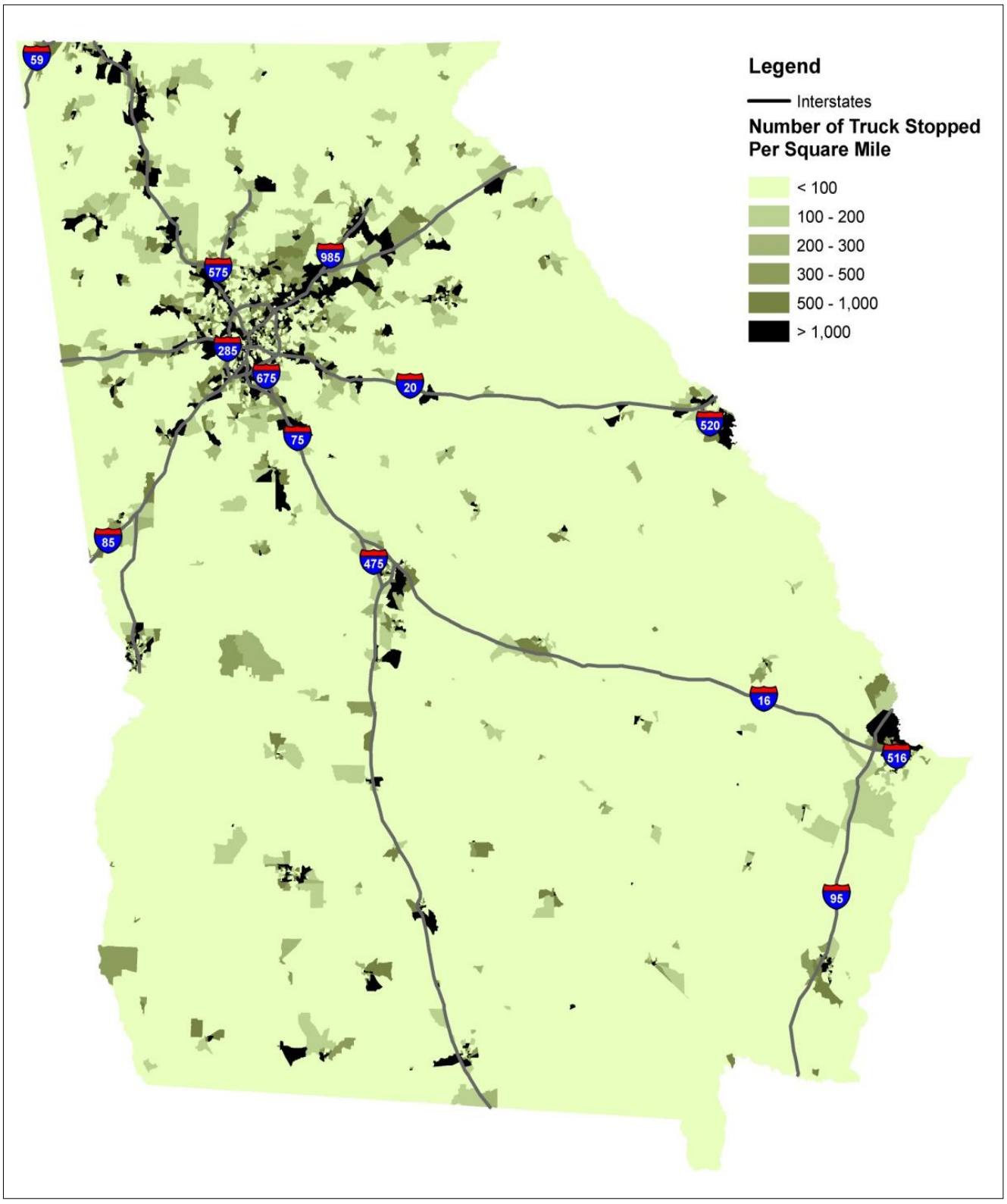
Note: GPS-equipped trucks are not perfectly representative of the entire trucking population in Georgia; in particular, trucks with smaller fleets and owner-operators are less likely to use this technology. These smaller operations are more common for truck drays at ports and railyards as well as for bulk/commodity operations that handle forest products, wood products, and sand/gravel. Additionally, truck trips at truck stops are removed from this analysis to avoid simply identifying truck stop locations.

Figure 5.10 shows a map of truck trip ends in Georgia using the FPM database for each census block groups. Not too surprisingly, the figure shows that the bulk of the truck trip ends are located in the urbanized areas; this is consistent with the county-level analysis that was conducted using the TRANSEARCH analysis.

Figure 5.10 also displays the truck intensity of various corridors in the state. The I-75 corridor between metro Atlanta and Tennessee appears to be the most intensive due to many truck-focused locations adjacent to the corridor. On I-85 north of metro Atlanta, it appears more truck-intensive than I-75 approaching metro Atlanta from the north; however, for the last 50 miles on I-85 before South Carolina the freight intensity drops off significantly. The freight intensity on I-20 also drops off significantly east of metro Atlanta, as does I-75 south of metro Atlanta and I-85 south of metro Atlanta. There are also discrete areas of truck intensity on I-75 between Macon and Florida; this appears to be the most truck intensive corridor in southern Georgia.

Detailed county-level data is shown in Table 5.13; it lists the top Georgia counties for truck 'trip ends'. Not surprisingly, counties in metro Atlanta area are some of the highest: Fulton, DeKalb, Gwinnett, and Clayton counties are the top four. Chatham County, the location of the Port of Savannah, is fifth. Mapped versions of 'zoomed in' areas of the state were also created as part of this report.

Figure 5.10 Number of Trucks Stopped per Square Mile



Source: Project team analysis of FHWA/ATRI Freight Performance Measurement ("FPM") Database. *(Oct. 1, 2008 – Sept. 30, 2009)*

Table 5.13 Top 50 Counties with Highest Number of Trucks Stopped

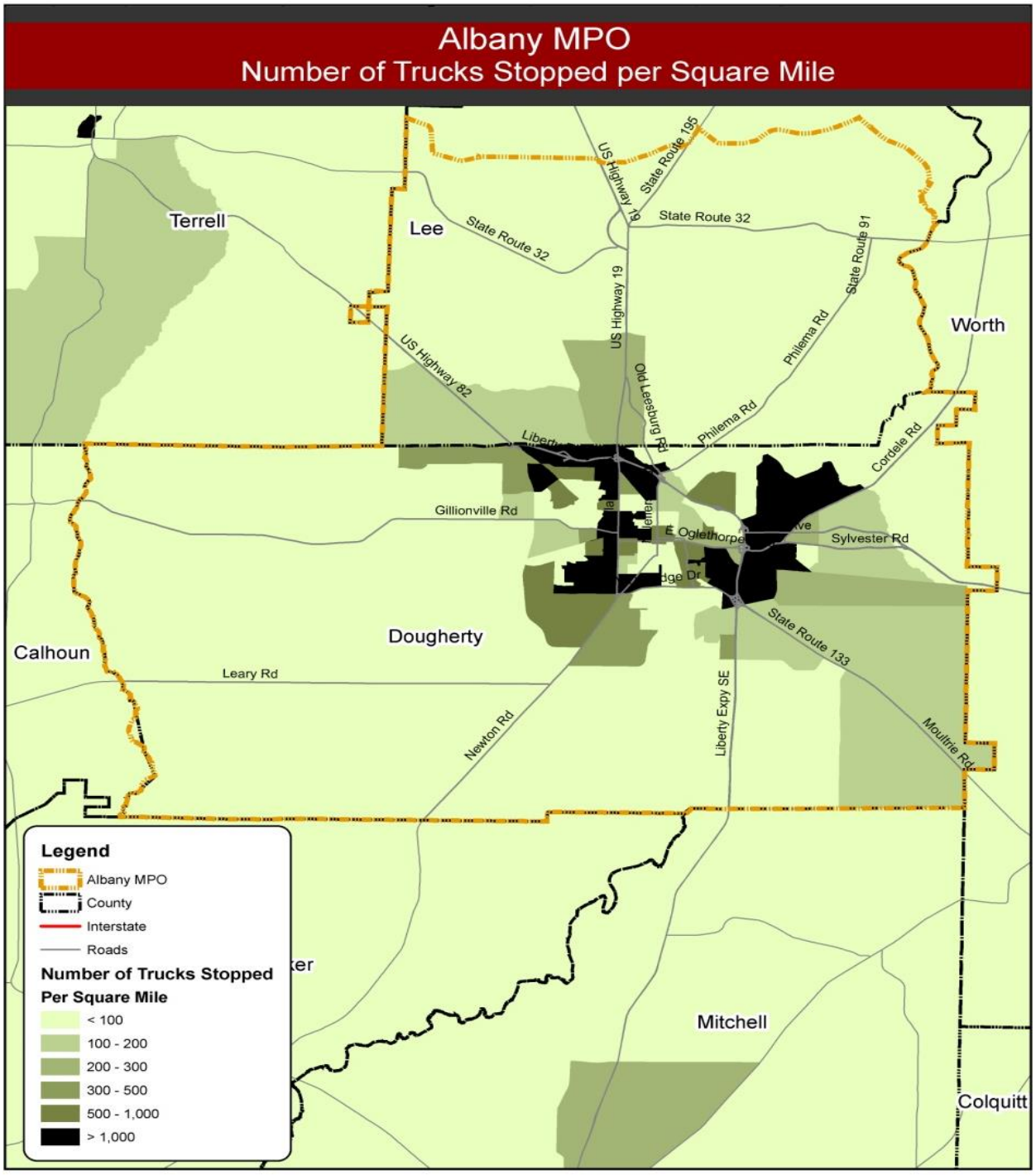
Rank	County	Truck Stops	Rank	County	Truck Stops
1	Fulton	819,560	26	Floyd	73,602
2	De Kalb	685,425	27	Barrow	73,191
3	Gwinnett	591,194	28	Lowndes	71,902
4	Clayton	436,842	29	Cherokee	69,221
5	Chatham	419,830	30	Walker	68,808
6	Hall	407,671	31	Newton	68,448
7	Cobb	351,383	32	Spalding	66,431
8	Bartow	293,476	33	Troup	60,977
9	Henry	252,806	34	Colquitt	59,178
10	Richmond	236,164	35	Murray	57,927
11	Dougherty	208,425	36	Lamar	56,805
12	Gordon	195,558	37	Carroll	53,543
13	Rockdale	166,446	38	Tift	52,805
14	Clarke	146,751	39	Walton	50,168
15	Bibb	140,790	40	Grady	42,418
16	Douglas	139,090	41	Paulding	41,914
17	Jackson	133,065	42	Columbia	39,710
18	Franklin	113,391	43	Early	37,541
19	Coweta	112,146	44	Fayette	36,670
20	Catoosa	108,989	45	Laurens	36,535
21	Muscogee	91,904	46	Decatur	35,597
22	Forsyth	90,710	47	Effingham	33,926
23	Houston	85,276	48	Taylor	31,535
24	Pickens	79,579	49	Morgan	30,163
25	Glynn	76,740	50	Thomas	27,819

Source: FHWA/ATRI Freight Performance Measurement ("FPM") Database. *(Oct. 1, 2008 – Sept. 30, 2009)*

An example of a 'zoomed in' area of Georgia is shown in Figure 5.11, which displays truck trip ends at the census block group level for the Albany region. (***Note**: Appendix A of this report contains individual maps of each Ga. urbanized area*)

Figure 5.11 shows that truck activity identified through the FPM focus at specific locations around Albany -- many of which closely correlate with land uses designated in Comprehensive Plans as industrial, commercial, etc. Combining these planning activities and resources reinforce the need for freight planning activities by Metropolitan Planning Organizations in each urbanized area, because high truck locations often have unique transportation needs.

Figure 5.11 EXAMPLE: Albany, Georgia MPO area -- Number of Truck Stopped per Square Mile



Source: Project team analysis of FHWA/ATRI Freight Performance Measurement (FPM) Database *(Oct.1, 2008 - Sep.30,2009)*

5.6 TRUCK MOVEMENT ANALYSIS USING TRUCK-EQUIPPED GPS DATA

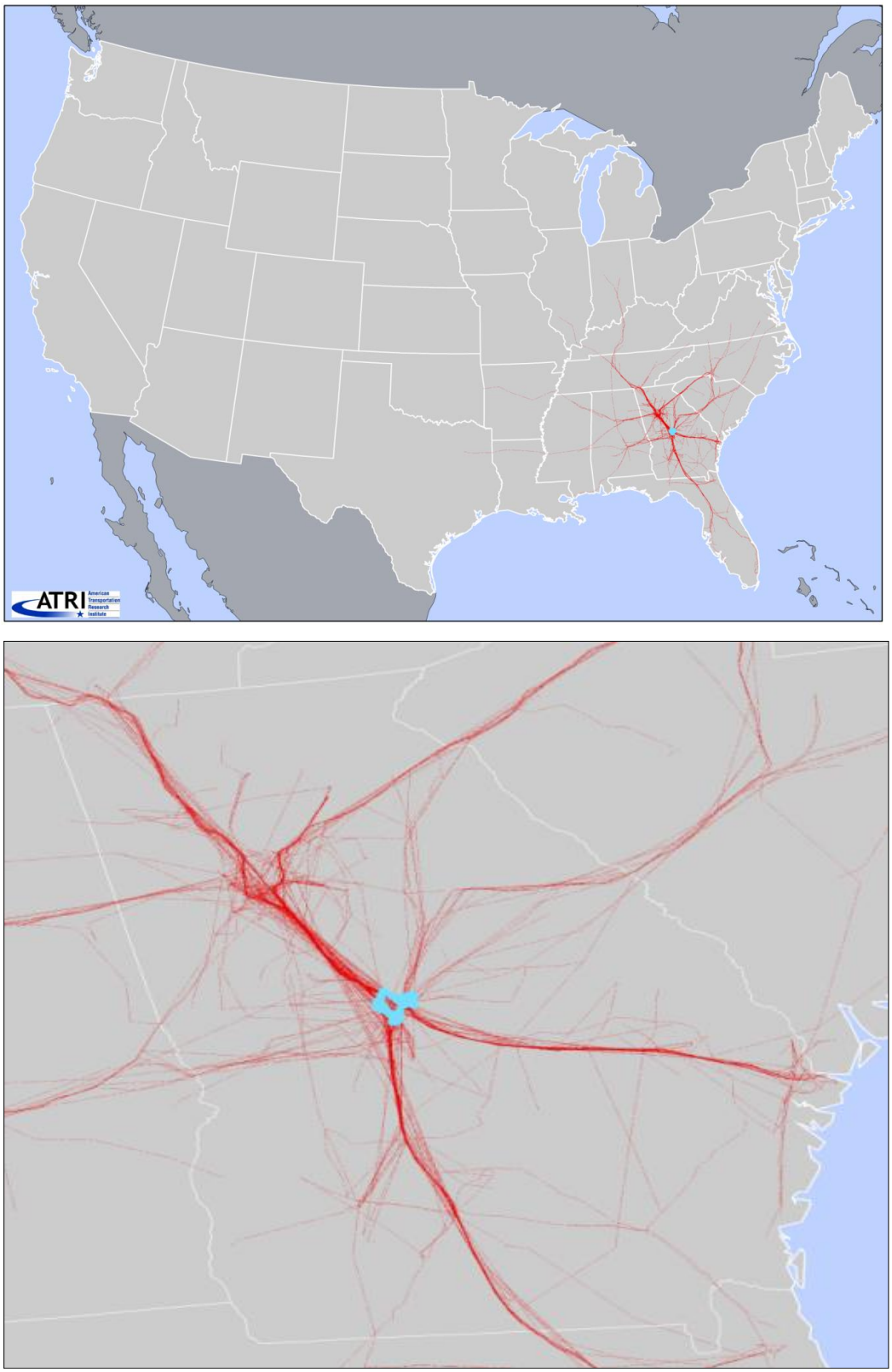
The FPM data can also be used to track truck movement over periods of time. This provides an understanding of how far trucks travel from Georgia and give insight into Georgia's relationship with other states in the Southeast U.S.

Figures 5.12, 5.13, and 5.14 are example travel paths of roughly 500 trucks leaving Macon, Georgia and tracked at their locations 12 hours, 24 hours, and 72 hours later. The figures show the majority of trucks captured in this analysis generally stayed in the Southeast U.S.; this is particularly notable on Figure 5.14, which shows trucks after 24 hours of tracking. Very few of the trucks had left the Southeast U.S. -- even after this extended period of time.

These types of 500-sample truck flow maps were also developed for the example areas of Albany and Savannah for similar time periods; their maps follow the Macon maps.

Tables 5.14, 5.15, and 5.16 show the percentage of trucks in Georgia, the Southeast U.S., and metro Atlanta, respectively. Most notably, Table 5.15 shows that 90 percent of trucks from these metro regions remain in the Southeast U.S. after 24 hours; after 72 hours, roughly half remain. This means trucking tends to be a regional activity -- Georgia's most significant trading partners are states that are closest to it.

Figure 5.12 Truck Flow Paths from Macon example: 12 Hours After Departure



Source: ATRI, Project Team Analysis

Figure 5.13 Truck Flow Paths from Macon example: 24 Hours After Departure

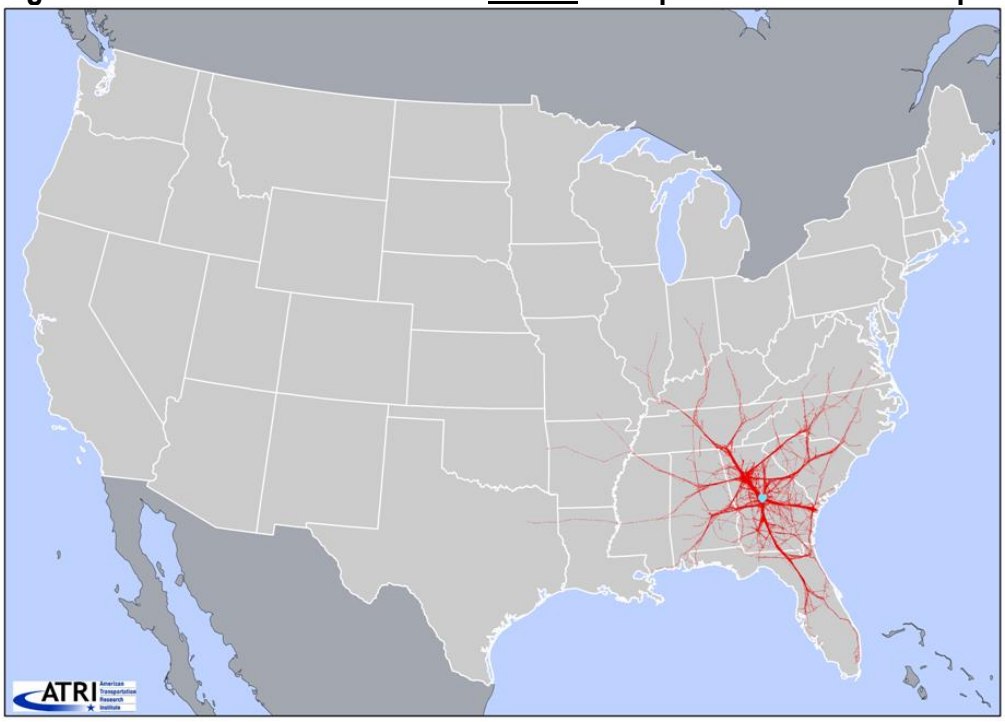
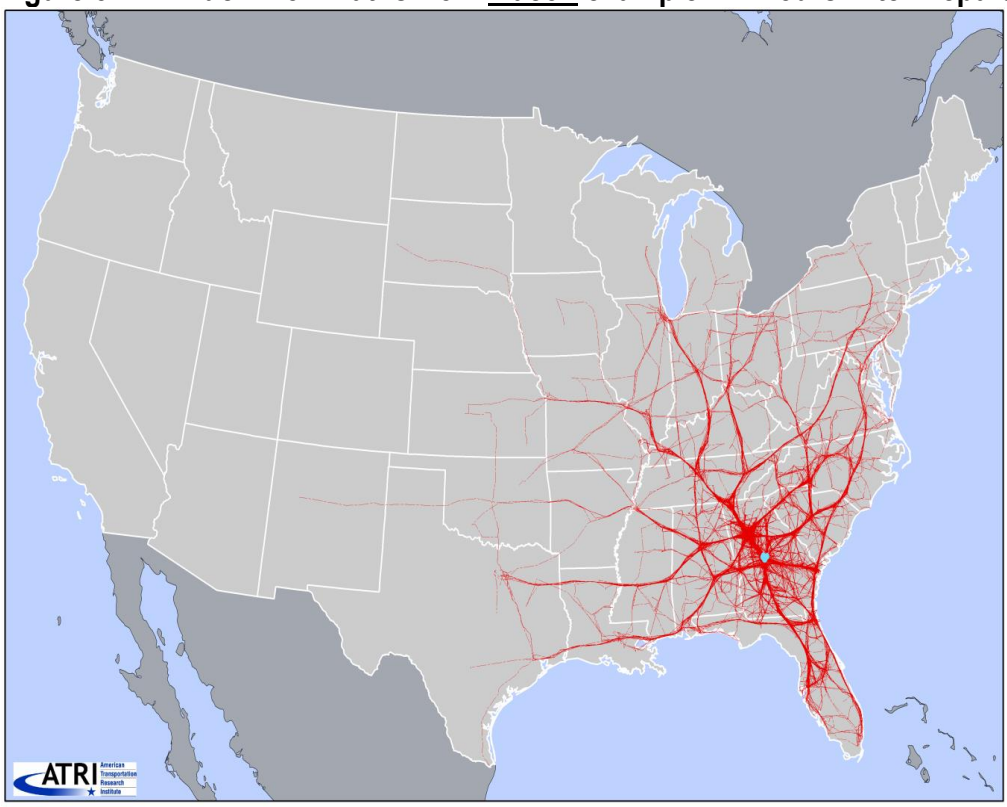
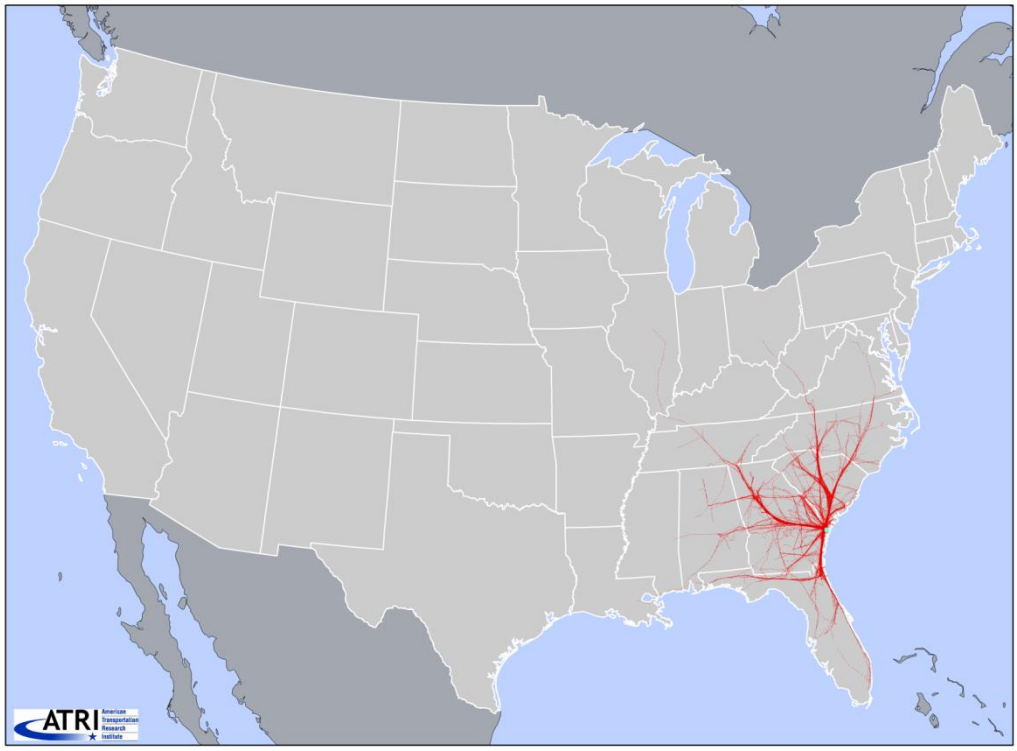
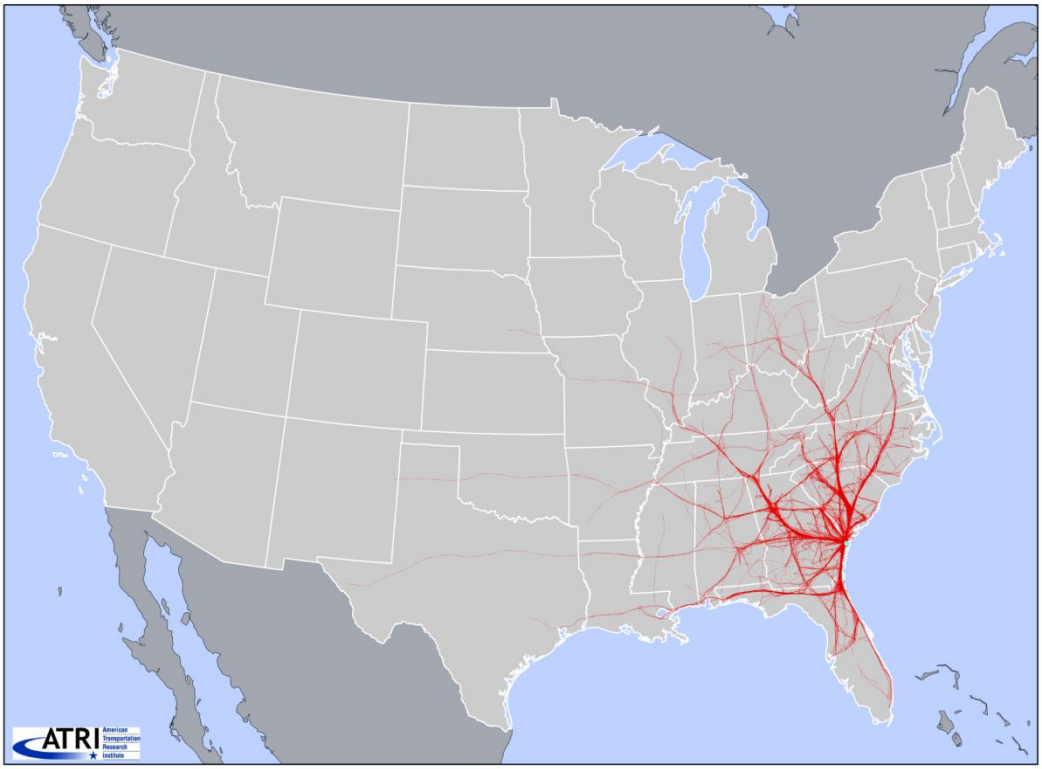


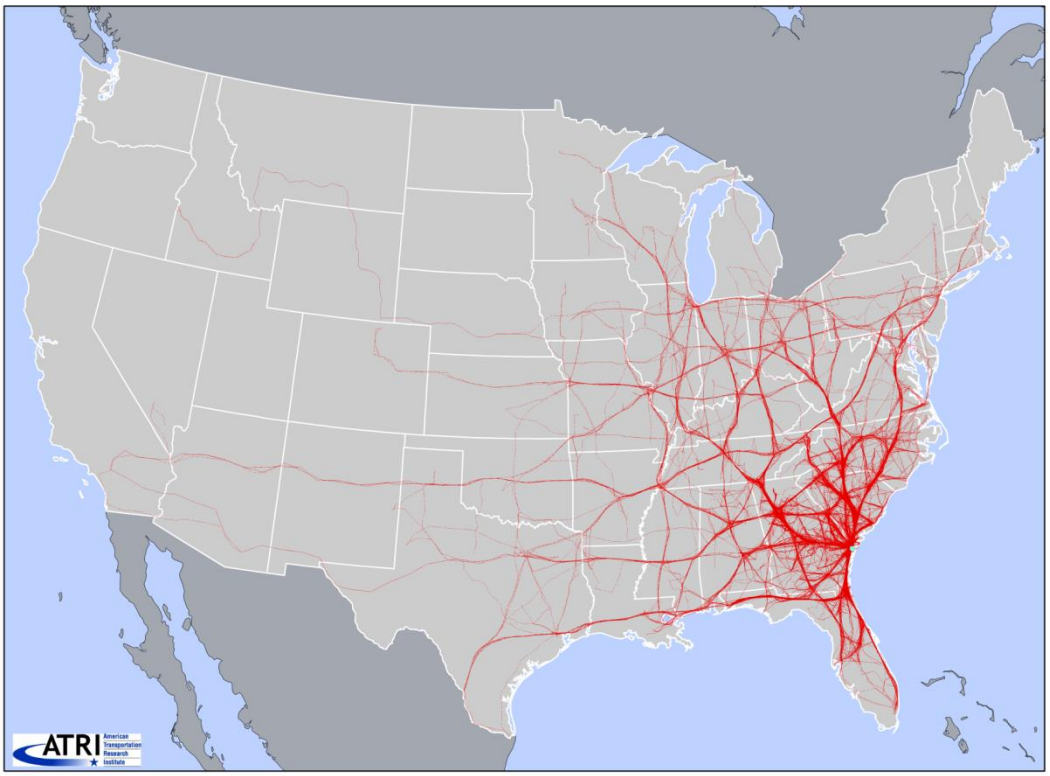
Figure 5.14 Truck Flow Paths from Macon example: 72 Hours After Departure



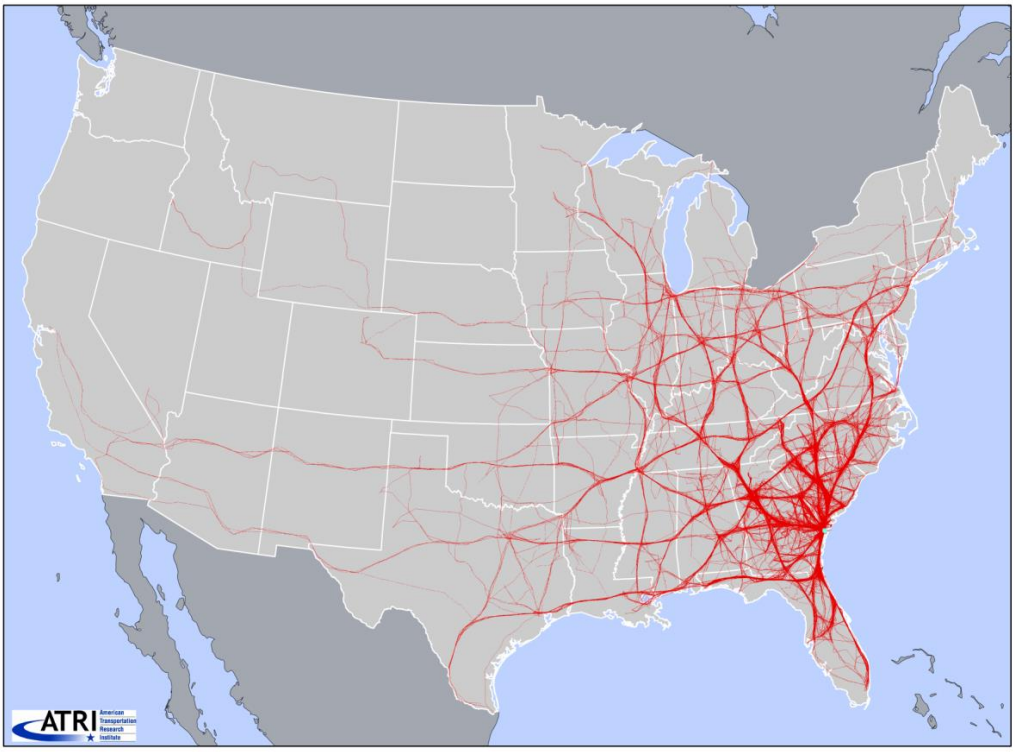
Savannah area Truck Flow Maps


ATRI
American Transportation Research Institute


ATRI
American Transportation Research Institute

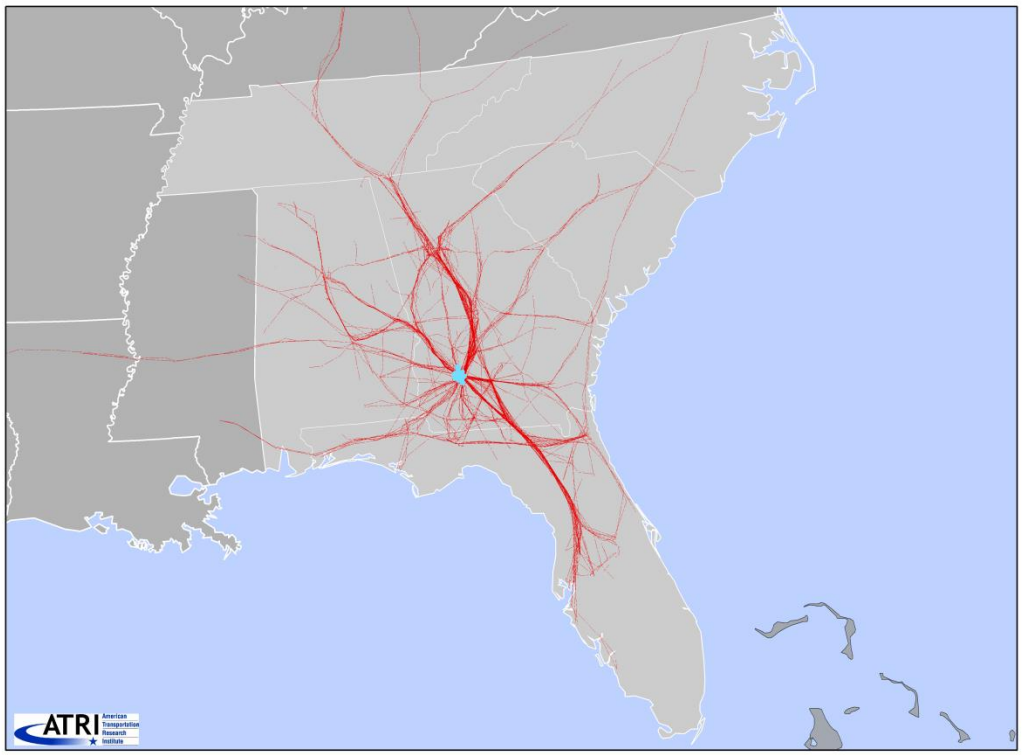


Truck Flow Paths from Savannah example: 7 Days After Departure



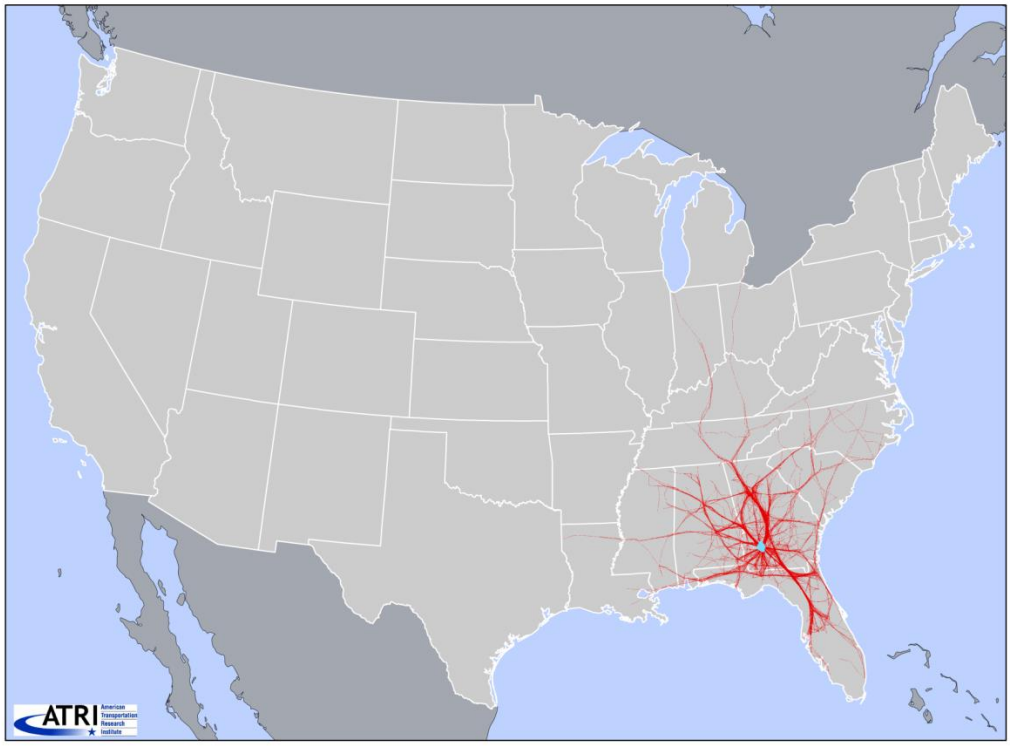
Albany area Truck Flow Maps

Truck Flow Paths from Albany example: 12 Hours After Departure



Source: ATRI, Project Team Analysis

Truck Flow Paths from Albany example: 24 Hours After Departure Truck



Truck Flow Paths from Albany example: 48 Hours After Departure Truck

Truck Flow Paths from Albany example: 72 Hours After Departure Truck

Truck Flow Paths from Albany example: 7 Days After Departure Truck

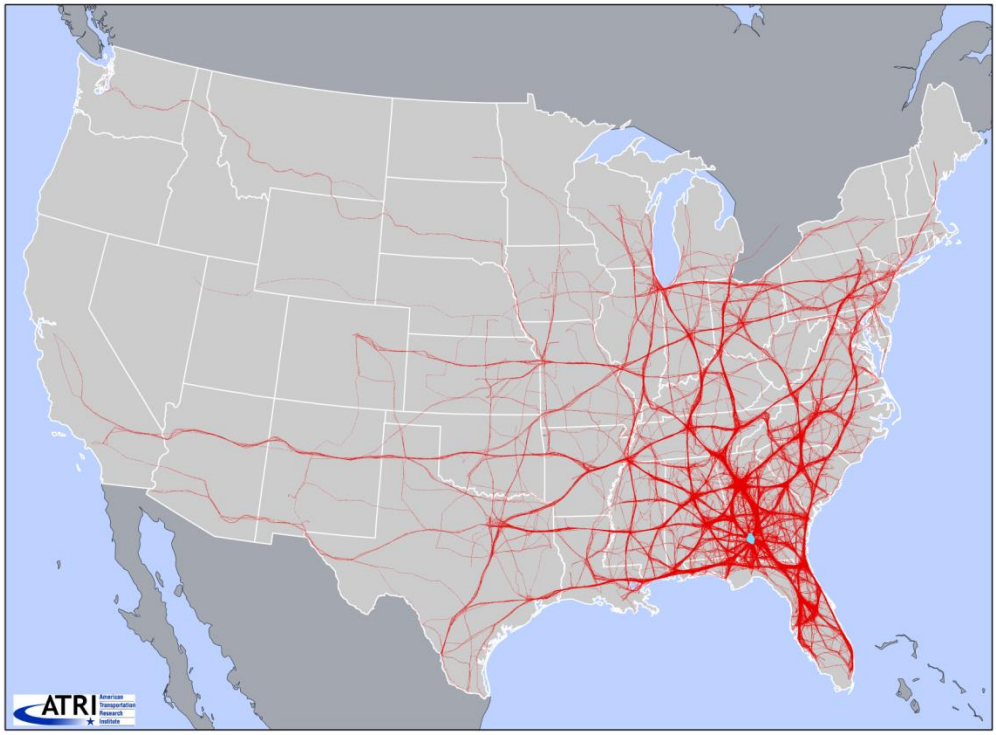


Table 5.14 Percent of Trucks Staying in Georgia over Time

Trucks Starting In…	Percent of Trucks Staying In…	Sample Size	After 12 Hours	After 24 Hours	After 48 Hours	After 72 Hours	After 1 Week
Albany	Georgia	622	47%	30%	14%	11%	6%
Savannah	Georgia	495	51%	32%	16%	12%	8%
Macon	Georgia	497	58%	46%	25%	19%	11%
Atlanta metro	Georgia	1,986	77%	53%	27%	21%	15%

Source: Project team analysis, FHWA/ATRI Freight Performance Measurement ("FPM") Data.

Table 5.15 Percent of Trucks Staying in Southeast U.S. over Time

Trucks Starting In…	Percent of Trucks Staying In…	Sample Size	After 12 Hours	After 24 Hours	After 48 Hours	After 72 Hours	After 1 Week
Albany	Southeast U.S.	622	89%	88%	68%	52%	36%
Savannah	Southeast U.S.	495	83%	72%	51%	39%	29%
Macon	Southeast U.S.	497	87%	90%	66%	53%	40%
Atlanta metro	Southeast U.S.	1,986	91%	91%	64%	51%	40%

Source: Project team analysis, FHWA/ATRI Freight Performance Measurement ("FPM") Data.

Table 5.16 Percent of Trucks Staying in Metro Atlanta over Time

Trucks Starting In…	Percent of Trucks Staying In…	Sample Size	After 12 Hours	After 24 Hours	After 48 Hours	After 72 Hours	After 1 Week
Atlanta metro	Atlanta metro	1,986	56%	32%	12%	9%	4%

Source: Project team analysis, FHWA/ATRI Freight Performance Measurement ("FPM") Data.

5.7 COMMODITY ANALYSIS USING ROADSIDE TRUCK SURVEY DATA

Conducting a commodity analysis provides insight on the relationship of trucks to the broader Georgia economy. The commodities identified in roadside surveys conducted through the GDOT Truck Lane Needs Identification study indicate which industries rely on Georgia's infrastructure to move their supplies and end products. This analysis was conducted only at truck survey locations which were part of the GDOT study, because the ARC survey locations noted in Section 5.4 of this report did not request commodity information.

Table 5.17 shows the commodity distribution for the GDOT truck survey locations. It showed that food and farm products were the largest single sector in the survey, representing between 12 and 30 percent of the truck movements at the locations shown in the table. Transportation equipment and chemicals were the only other commodities that exceeded 10 percent of the trucks surveyed at the Augusta and Chatham County/Savannah survey locations, respectively.

Table 5.17 Commodities Distribution at GDOT Survey Stations

Commodities	I-75 Valdosta	I-95 Eulonia	I-95 Chatham Co.	I-20 Augusta	I-16 Pembroke
Food and Farm Products	30%	27%	25%	12%	14%
Transportation Equipment	8%	10%	4%	14%	10%
Chemicals	5%	2%	7%	10%	10%
Textiles	1%	4%	8%	3%	4%
Clay/Concrete/Glass/Stone	0%	3%	5%	5%	5%
Lumber/Wood/Logs	1%	3%	4%	0%	2%
Warehousing (Secondary Traffic)	0%	3%	0%	2%	4%
Sand and Gravel (Nonmetallic Minerals)	0%	1%	0%	2%	0%
Other Commodities	54%	47%	48%	52%	49%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: GDOT Truck Lane Needs and Identification Study

5.8 COMMODITY ANALYSIS USING TRANSEARCH DATA

Table 5.18 shows commodity data extracted from the 2007 & 2013 TRANSEARCH databases that represents all goods moved by truck in the state. This table has a high percentage of nonmetallic minerals, which is a commodity category that includes materials used in cement and concrete commonly used in road and building construction. These goods are typically delivered by truck over relatively short distances due to their abundance and use across the state. The category also includes kaolin, which is found in abundance in Georgia and is used to make ceramics (e.g., porcelain) and paper.

The term "secondary traffic" refers to commodities in the database representing the short 'dray' truck trips (i.e. from warehouses and distribution centers to final destinations.) This category includes any type of goods typically moved between warehouses and distribution centers.

Clay/concrete/glass/stone is a commodity category used for construction purposes similar to nonmetallic mineral. This commodity, along with lumber and wood products, totals over 10 percent in the state.

Table 5.18 Georgia Truck Tonnage by Commodity, *2007*

Commodity	Inbound	Outbound	Within	Through	Total Tons	Percent Total
Nonmetallic Minerals	19,113,030	8,662,976	89,114,069	2,494,403	119,384,478	18.6%
Secondary Traffic	23,928,245	13,079,992	37,792,496	28,270,706	103,071,439	16.1%
Chemicals or Allied Products	2,386,962	14,111,912	860,634	44,324,229	61,683,737	9.6%
Food or Kindred Products	8,781,281	16,302,225	7,610,159	27,863,475	60,557,141	9.5%
Clay, Concrete, Glass, or Stone	4,751,403	10,185,748	36,944,385	7,772,121	59,653,657	9.3%
Lumber or Wood Products	9,681,918	13,773,559	25,559,106	8,751,860	57,766,443	9.0%
Farm Products	7,563,212	3,439,293	2,535,774	10,644,741	24,183,020	3.8%
Primary Metal Products	6,673,497	1,121,628	1,698,288	13,624,626	23,118,040	3.6%
Petroleum or Coal Products	6,019,830	7,730,158	6,588,855	1,856,055	22,194,898	3.5%
Pulp, Paper, or Allied Products	2,547,986	4,343,009	5,568,508	5,929,428	18,388,931	2.9%
Fabricated Metal Products	3,527,438	2,778,410	1,052,511	7,707,803	15,066,162	2.4%
Rubber or Misc Plastics	2,331,353	3,725,229	284,849	6,600,745	12,942,176	2.0%
Transportation Equipment	581,340	3,487,013	429,349	4,722,847	9,220,549	1.4%
Machinery	1,246,337	2,167,155	1,324,981	4,292,331	9,030,804	1.4%
Textile Mill Products	333,980	5,320,665	1,097,819	1,864,752	8,617,216	1.3%
Metallic Ores	1,114,347	2,569,260	4,454,740	11,876	8,150,222	1.3%
Electrical Equipment	1,416,199	2,199,412	700,312	3,247,999	7,563,921	1.2%
Apparel or Related Products	1,468,962	383,955	290,542	3,834,778	5,978,236	0.9%
Furniture or Fixtures	872,347	1,217,103	531,406	2,017,872	4,638,728	0.7%
Printed Matter	866,791	625,816	676,782	2,367,822	4,537,211	0.7%
Miscellaneous Manufacturing Products	424,608	506,200	317,554	942,462	2,190,824	0.3%
Instrument, Photo Equipment, Optical Equipment	261,417	222,591	95,835	607,658	1,187,501	0.2%
Leather or Leather Products	200,573	57,790	89,525	391,213	739,101	0.1%
Forest Products	–	–	284,902	–	284,902	<0.1%
Coal	244,864	–	–	29,647	274,512	<0.1%
Tobacco Products	40,609	60,088	28,328	132,615	261,639	<0.1%
Fresh Fish or Marine Products	–	–	88,965	–	88,965	<0.1%
Ordnance or Accessories	2,340	–	1,250	21,054	24,645	<0.1%
Total	**106,380,868**	**118,071,185**	**226,021,926**	**190,325,118**	**640,799,096**	**100.0%**

Source: TRANSEARCH data & Project team analysis

Georgia Truck Tonnage by Commodity, *2013*

Commodity	Inbound	Outbound	Within	Through	Total Tons	Percent Total
Nonmetallic Minerals	13,758,367	10,226,796	34,062,661	6,001,703	64,049,527	15.0%
Secondary Traffic	9,606,064	6,947,832	23,490,993	11,926,487	51,971,376	12.2%
Petroleum or Coal Products	5,691,070	7,089,911	14,565,060	21,422,580	48,768,621	11.4%
Food or Kindred Products	10,615,365	12,199,869	5,338,304	18,684,985	46,838,523	11.0%
Clay, Concrete, Glass, or Stone	6,080,124	10,141,592	12,349,079	8,615,937	37,186,733	8.7%
Farm Products	9,666,787	6,623,297	6,041,121	12,668,630	34,999,836	8.2%
Lumber or Wood Products	5,787,395	9,241,281	5,304,943	6,610,977	26,944,595	6.3%
Chemicals or Allied Products	6,095,929	3,542,656	1,043,567	13,500,634	24,182,786	5.7%
Waste or Scrap	4,055,664	8,014,514	3,017,151	8,414,701	23,502,031	5.5%
Pulp, Paper, or Allied Products	3,611,648	4,752,775	1,719,638	5,061,191	15,145,253	3.6%
Primary Metal Products	2,642,410	1,357,108	403,991	4,593,694	8,997,203	2.1%
Transportation Equipment	1,708,915	2,118,180	927,725	2,914,779	7,669,599	1.8%
Rubber or Misc Plastics	1,449,446	1,779,963	278,025	3,308,702	6,816,135	1.6%
Fabricated Metal Products	1,058,647	1,486,407	440,284	2,320,423	5,305,761	1.2%
Machinery	940,851	1,475,192	365,815	2,436,392	5,218,250	1.2%
Electrical Equipment	953,638	976,365	129,109	2,405,616	4,464,728	1.0%
Textile Mill Products	478,392	1,797,138	278,608	1,193,225	3,747,363	0.9%
Furniture or Fixtures	355,814	779,997	101,423	1,152,382	2,389,616	0.6%
Printed Matter Total	510,984	580,014	242,526	1,043,615	2,377,139	0.6%
Miscellaneous Manufacturing Products	195,975	526,065	84,235	23,998	1,430,273	0.3%
Apparel or Related Products	148,017	469,208	72,654	685,313	1,375,191	0.3%
Instrument, Photo Equipment, Optical	249,563	149,882	58,289	471,689	929,424	0.2%
Forest Products	92,466	203,617	31,796	228,812	556,692	0.1%
Metallic Ores	26,205	703	-	503,180	530,087	0.1%
Fresh Fish or Marine Products	125,968	44,478	18,716	279,074	468,235	0.1%
Leather or Leather Products	62,792	52,155	11,054	115,757	241,758	0.1%
Tobacco Products	31,283	9,402	15,389	182,344	238,419	0.1%
Ordnance or Accessories	10,113	23,084	4,613	42,905	80,715	<0.1%
Coal	1,772		-	61,652	63,424	<0.1%
Miscellaneous Freight	50	1,673	-	4,087	5,811	<0.1%
Total	**86,011,715**	**92,611,155**	**110,396,772**	**137,420,075**	**426,439,717**	

Source: TRANSEARCH data & Project team analysis

5.9 TRUCK FORECAST USING TRANSEARCH DATA

TRANSEARCH data obtained for this project included a forecast of freight flows for the year 2027, which was extrapolated to 2050 by the project team using factors calculated from the FHWA Freight Analysis Framework3 database. Interim year 2013 data was also analyzed and included.

Table 5.19 shows the TRANSEARCH forecast at the commodity level for Georgia. Overall, truck tonnage is forecast to grow at a 1.4 percent compounded annual rate. This is considered a relatively conservative forecast, as many forecasts project truck tonnage growth between 2 and 3 percent.

Table 5.19 also shows that commodities are projected to grow at very different rates; of most importance is the growth of the largest commodities. "Secondary traffic" (drayage and truck moves from warehouses and distribution centers) is forecast to grow at a 2.4 percent annual rate -- much higher than the 1.4 percent annual growth projected for the entire state. Several of the bulk commodities forecasted to grow as significantly over the long term include clay, concrete, glass, or stone; lumber or wood products; and petroleum or coal products. Future tasks of this project will examine the sensitivity of the forecast to growth rates of specific commodities.

Table 5.20 shows the truck forecast by the four general movement types: 'inbound', 'outbound', 'internal', and 'through' trips. The TRANSEARCH forecast indicates that *inbound* truck movements are forecast to grow faster than *outbound* truck movements, reflecting Georgia's consumption portion of the economy expected to grow faster than the production portion of the economy. 'Through' truck tonnage is forecast to grow much faster than internal truck tonnage; this indicates that truck trips will generally get longer, because 'through' truck trips are generally much longer than internal truck trips.

Table 5.21 and 5.22 show the anticipated growth in truck tonnage for the top 10 state trading partners for Georgia. Florida is clearly expected to remain the top trading partner for Georgia.

Alabama is forecast to be the fastest-growing neighboring state *origin* in terms of truck tonnage, while South Carolina is forecast to be the fastest-growing neighboring state *destination*. This put more focus on I-85 as an important corridor; truck traffic on it is expected to grow faster than other Georgia interstates.

Figure 5.15 maps the tonnage for truck tonnage to each state in the United States. It illustrates the rapid growth projected for truck tons to California and Texas.

Table 5.23 shows inbound truck tonnage by county within Georgia for the years 2007 and 2013. Fulton County is forecast to remain the largest county for inbound truck tonnage by the year 2050. However, the fastest-growing counties based on truck tonnage are forecast to be *outside* metro Atlanta; these include Tift County which is expected to grow 201 percent between 2007 and 2050 and become the 4th-largest in the state for inbound truck tonnage. Muscogee

(Columbus), Lowndes (Valdosta), and Dougherty (Albany) Counties are the other top counties forecast to grow over 200 percent between 2007 and 2050.

Table 5.19 Georgia Truck Tonnage by Commodity, *years 2007, 2013 & 2050*

Commodity	Rank 2007	2007	2007 (%)	Rank 2013	2013	2013 (%)	Rank 2050	2050	2050 (%)
Nonmetallic Minerals	1	116,890,075	25.95%	1	58,047,824	20.08%	1	244,017,334	28.81%
Secondary Traffic	2	74,800,733	16.60%	2	40,044,889	13.86%	2	203,314,108	24.01%
Clay, Concrete, Glass, or Stone	3	51,881,536	11.52%	3	28,570,795	9.89%	4	55,239,096	6.52%
Lumber or Wood Products	4	49,014,583	10.88%	7	20,333,619	7.04%	5	49,237,249	5.81%
Food or Kindred Products	5	32,693,665	7.26%	4	28,153,538	9.74%	3	63,934,955	7.55%
Petroleum or Coal Products	6	20,338,843	4.51%	5	27,346,041	9.46%	8	21,401,879	2.53%
Chemicals or Allied Products	7	17,359,508	3.85%	9	10,682,152	3.70%	7	33,083,884	3.91%
Farm Products	8	13,538,279	3.01%	6	22,331,205	7.73%	6	33,483,212	3.95%
Pulp, Paper, or Allied Products	9	12,459,503	2.77%	10	10,084,061	3.49%	12	12,528,578	1.48%
Primary Metal Products	10	9,493,413	2.11%	12	4,403,509	1.52%	14	11,421,219	1.35%
Metallic Ores	11	8,138,347	1.81%	28	26,908	0.01%	19	9,057,907	1.07%
Fabricated Metal Products	12	7,358,359	1.63%	14	2,985,338	1.03%	15	10,505,213	1.24%
Textile Mill Products	13	6,752,464	1.50%	16	2,554,138	0.88%	13	11,693,916	1.38%
Rubber or Misc Plastics	14	6,341,431	1.41%	13	3,507,434	1.21%	10	13,235,340	1.56%
Machinery	15	4,738,473	1.05%	15	2,781,858	0.96%	11	12,911,161	1.52%
Transportation Equipment	16	4,497,702	1.00%	11	4,754,820	1.65%	16	10,161,079	1.20%
Electrical Equipment	17	4,315,923	0.96%	17	2,059,112	0.71%	9	15,459,168	1.83%
Furniture or Fixtures	18	2,620,856	0.58%	19	1,237,234	0.43%	17	10,121,092	1.20%
Printed Matter	19	2,169,389	0.48%	18	1,333,524	0.46%	21	3,600,394	0.43%
Apparel or Related Products	20	2,143,459	0.48%	21	689,879	0.24%	20	5,247,488	0.62%
Misc Manufacturing Products	21	1,248,362	0.28%	20	806,275	0.28%	19	5,346,200	0.63%
Instruments, Photo Equipment,	22	579,843	0.13%	22	457,734	0.16%	18	9,419,460	1.11%
Leather or Leather Products	23	347,888	0.08%	25	126,001	0.04%	22	1,005,160	0.12%
Forest Products	24	284,902	0.06%	23	327,879	0.11%	23	833,296	0.10%
Coal	25	244,864	0.05%	29	1,772	0.00%	25	98,932	0.01%
Tobacco Products	26	129,025	0.03%	26	56,074	0.02%	26	62,314	0.01%
Fresh Fish or Marine Products	27	88,965	0.02%	24	189,162	0.07%	24	470,218	0.06%
Ordnance or Accessories	28	3,590	0.00%	27	37,810	0.01%	27	19,887	0.00%
Miscellaneous Freight	-	-		30	1,723	0.00%		-	
Crude Petroleum, Natural Gas	-	-		31	195	0.00%		-	
Waste or Scrap	-	-		8	15,087,329	5.22%		-	
Grand Total		**450,473,980**	**100.00%**		**289,019,832**	**100.00%**		**846,909,739**	**100.00%**

Source: TRANSEARCH and Project team analysis.

Table 5.20 Summary of Ga. Truck Flows, by Type of Movement, *years 2007, 2013 & 2050*

Type of Movement	Year 2007	Year 2013	Year 2050
Inbound	106,380,868	86,011,715	277,419,550
Outbound	118,071,185	92,611,155	205,411,846
Within	226,021,926	110,396,772	364,078,347
Through	190,325,118	137,420,075	482,753,521
Total	**640,799,096**	**426,439,717**	**1,329,663,264**

Source: TRANSEARCH and Project team analysis.

Table 5.21 Top 10 Origin States of Georgia Truck Traffic, *years 2007, 2013 & 2050*

	Sum Of Tons					
State	Rank 2007	Year 2 7 (*)	Rank 2013	Year 2013	Rank 2050	ar 2050 (*)
Florida	1	27,691,377	3	11,630,303.26	1	76,191,944
Alabama	2	14,977,863	2	12,169,415.73	2	44,483,441
South Carolina	3	9,387,293	1	12,924,923.91	4	20,537,966
California	4	6,202,533		n/a	3	25,037,194
Tenneessee	5	5,235,017	4	10,796,240.44	6	12,853,287
Texas	6	5,213,746	6	3,095,054.09	5	16,347,875
Mississippi	7	4,124,912	9	2,135,928.01	8	7,465,352
Illinois	8	3,457,363		n/a	10	6,594,275
North Carolina	9	3,343,678	5	7,563,408.93	7	9,352,374
Louisiana	10	3,018,633	10	1,588,492.58	9	7,227,819
Ohio		n/a	7	2,235,418.86		n/a
Kentucky		n/a	8	2,162,700.42		n/a

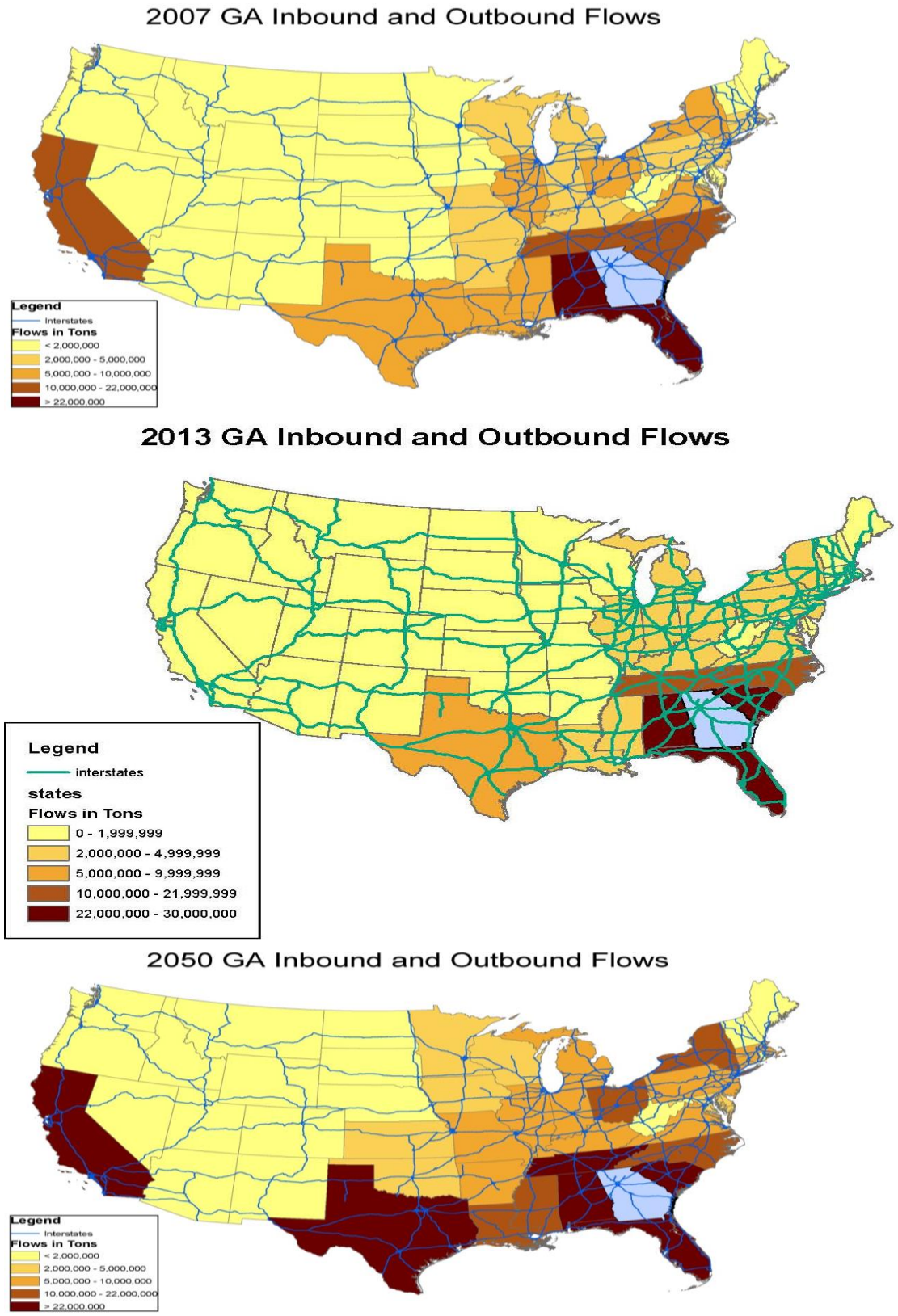
Source: TRANSEARCH and Project team analysis.

Table 5.22 Top 10 Destination States for Georgia Truck Traffic, *years 2007, 2013 & 2050*

	Sum Of Tons					
State	Rank 2007	Year 2007 (*)	Rank 2013	Year 2013	Rank 2050	Year 2050 (*)
Florida	1	18,173,961	1	17,299,217	1	30,725,096
North Carolina	2	12,345,276	4	8,695,981	4	12,646,634
South Carolina	3	11,537,086	3	11,613,138	2	23,395,650
Tenneessee	4	8,640,026	5	7,823,190	5	11,354,854
Alabama	5	7,451,813	2	13,795,257	3	14,528,991
Virginia	6	6,070,102	7	2,595,924	8	7,044,677
New York	7	5,255,603	9	2,086,449	6	10,605,055
Texas	8	4,206,503	6	2,733,683	7	8,730,343
Louisiana	9	4,039,827		n/a	9	6,907,223
California	10	3,904,694		n/a	10	6,891,587
Kentucky		n/a	8	2,159,459		n/a
Pennsylvania			10	2,062,201		n/a

Source: TRANSEARCH Data and Project team analysis.

Figure 5.15 Inbound & Outbound Truck Flows for Georgia



Source: TRANSEARCH and Project team analysis.

Table 5.23 Top 20 Ga. Counties with Highest Inbound Truck Tons, *2007 & 2050*

Rank	County	Truck Tons		Percent Growth
		2007	2050	
1	Fulton	28,354,215	62,791,449	121%
2	Chatham	8,677,489	22,101,174	155%
3	Gwinnett	4,315,205	10,743,881	149%
4	DeKalb	4,248,574	9,707,059	128%
5	Cobb	3,574,647	7,823,460	119%
6	Tift	3,427,215	10,305,222	201%
7	Richmond	3,033,269	4,890,219	61%
8	Carroll	2,956,327	6,903,019	133%
9	Clayton	2,748,225	7,413,172	170%
10	Muscogee	2,630,894	8,725,196	232%
11	Coffee	2,473,136	6,428,414	160%
12	Lowndes	2,461,220	10,147,109	312%
13	Dougherty	2,306,558	9,912,196	330%
14	Bibb	1,791,290	3,645,275	103%

Source: TRANSEARCH and Project team analysis.

Top 20 Ga. Counties with Highest Inbound Truck Tons, *2013 & 2050*

Rank	County	Truck Tons		Percent Growth
		2013	2050	
1	Fulton County, GA	28,741,899	62,791,449	**118%**
2	Chatham County, GA	19,445,910	22,101,174	**14%**
3	Cobb County, GA	18,358,001	7,823,460	**-57%**
4	Gwinnett County, GA	12,825,765	10,743,881	**-16%**
5	DeKalb County, GA	10,109,629	9,707,059	**-4%**
6	Muscogee County, GA	5,768,440	8,725,196	**51%**
7	Richmond County, GA	5,518,352	4,890,219	**-11%**
8	Hall County, GA	4,573,840	*n/a*	*n/a*
9	Forsyth County, GA	3,407,383	*n/a*	*n/a*
10	Houston County, GA	3,288,517	*n/a*	*n/a*
11	Lowndes County, GA	3,206,959	10,147,109	**216%**
12	Bibb County, GA	3,037,758	3,645,275	**20%**
13	Clayton County, GA	2,662,757	7,413,172	**178%**
14	Troup County, GA	2,575,205	*n/a*	*n/a*
15	Cherokee County, GA	2,332,444	*n/a*	*n/a*
16	Glynn County, GA	2,287,383	*n/a*	*n/a*
17	Dougherty County, GA	2,275,640	9,912,196	**336%**
18	Whitfield County, GA	2,221,792	*n/a*	*n/a*
19	Rockdale County, GA	2,208,486	*n/a*	*n/a*
20	Henry County, GA	2,139,078	*n/a*	*n/a*

Source: TRANSEARCH and Project team analysis.

Similarly, Table 5.24 shows Chatham and Fulton Counties remain the top two for outbound tonnage in the years 2007 and 2013. Gwinnett County is forecast to have the fastest growth of top counties with 133-percent growth between 2007 and 2050, making it 3rd largest in terms of truck tonnage in the state. Figures 5.16 and 5.17 show inbound and outbound truck tonnage by county in 2007 and 2050.

Table 5.24 Top 20 Ga. Counties w/Highest Outbound Truck Tons, *2007 & 2050*

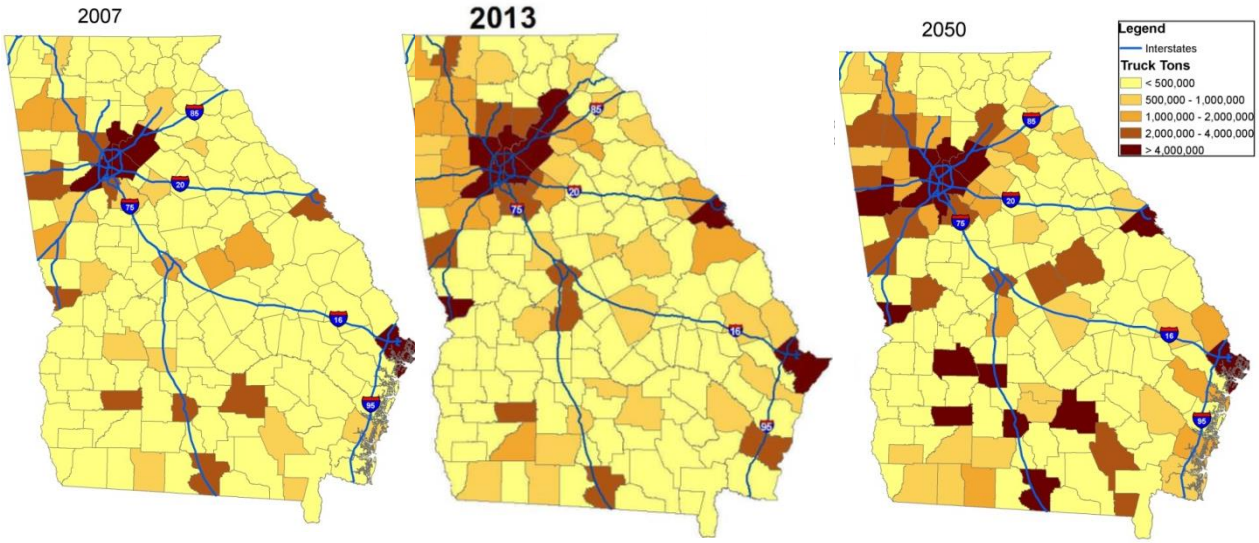
	Truck Tons		
County	2007	2050	Percent Growth
Chatham	24,747,960	49,343,003	99%
Fulton	14,315,413	26,946,245	88%
DeKalb	4,510,309	7,888,082	75%
Gwinnett	3,762,409	8,763,530	133%
Glynn	3,632,475	3,718,477	2%
Richmond	3,497,863	4,810,641	38%
Cobb	2,789,090	5,181,244	86%
Tift	2,687,926	4,133,175	54%
Bibb	2,341,544	3,407,901	46%
Hall	2,180,890	4,287,933	97%
Whitfield	2,138,084	2,952,818	38%
Gordon	1,730,203	2,696,733	56%
Washington	1,501,080	2,466,688	64%

Source: TRANSEARCH and Project team analysis.

Top 20 Ga. Counties w/Highest Outbound Truck Tons, *2013 & 2050*

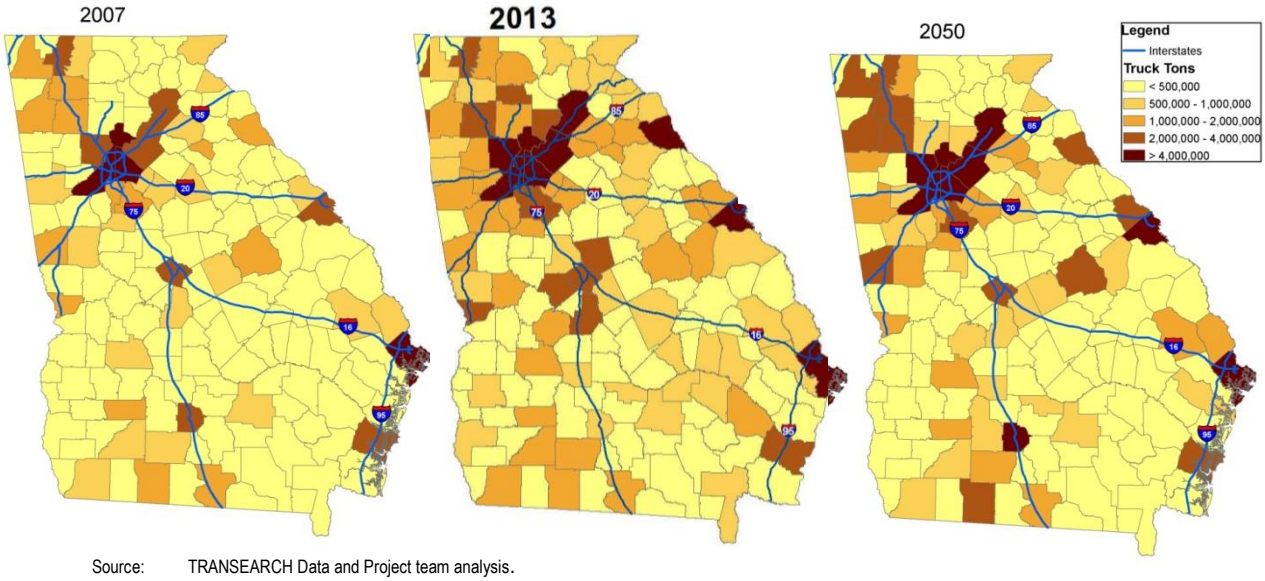
		Truck Tons		
Rank	County	2013	2050	Percent Growth
1	Fulton County, GA	25,305,708	26,946,245	**6%**
2	Chatham County, GA	17,049,256	49,343,003	**189%**
3	Cobb County, GA	10,271,111	5,181,244	**-50%**
4	Gwinnett County, GA	8,044,889	8,763,530	**9%**
5	Hall County, GA	7,459,725	4,287,933	**-43%**
6	DeKalb County, GA	5,826,095	7,888,082	**35%**
7	Elbert County, GA	4,334,219	n/a	n/a
8	Richmond County, GA	4,219,166	4,810,641	**14%**
9	Bibb County, GA	3,704,540	3,407,901	**-8%**
10	Muscogee County, GA	3,607,825	*n/a*	*n/a*
11	Jones County, GA	3,224,378	*n/a*	*n/a*
12	Houston County, GA	3,210,906	*n/a*	*n/a*
13	Whitfield County, GA	3,032,536	2,952,818	**-3%**
14	Clayton County, GA	2,793,609	*n/a*	*n/a*
15	Bartow County, GA	2,652,403	*n/a*	*n/a*
16	Glynn County, GA	2,412,050	3,718,477	**54%**
17	Crawford County, GA	2,287,569	*n/a*	*n/a*
18	Henry County, GA	2,262,821	*n/a*	*n/a*
19	Forsyth County, GA	2,124,548	*n/a*	*n/a*
20	Pickens County, GA	2,015,098	*n/a*	*n/a*

Figure 5.16 Inbound Truck Tons by County in Georgia, years 2007, 2013 & 2050



Source: TRANSEARCH Data and project team analysis.

Figure 5.17 Outbound Truck Tons by County, years 2007, 2013 & 2050



Source: TRANSEARCH Data and Project team analysis.

5.10 TRUCK FORECASTS USING STATEWIDE TRAVEL DEMAND MODEL

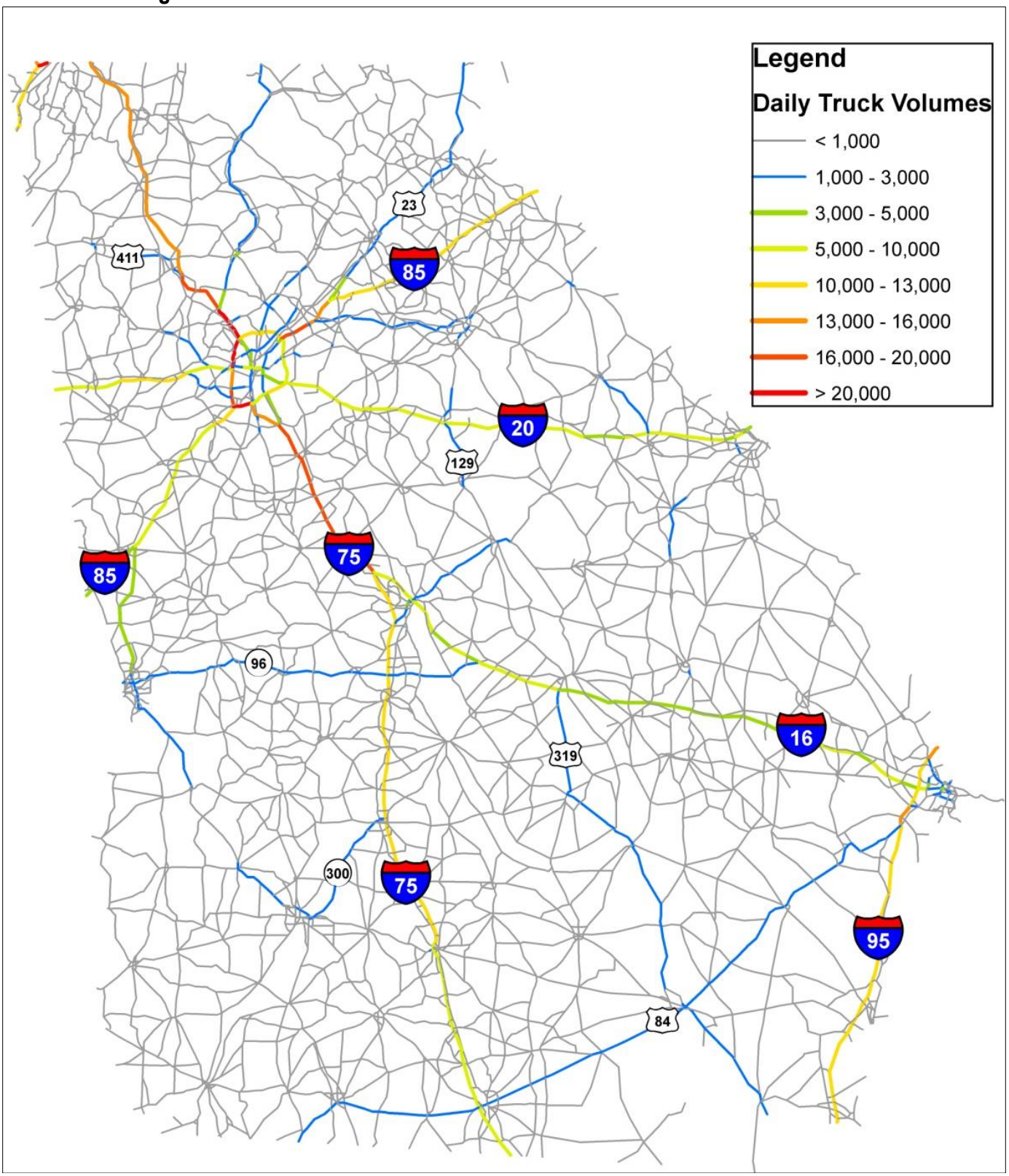
Another perspective on freight forecasting can be found from utilizing the GDOT statewide travel demand model. The model provides information on truck volumes in the base year of 2006, in the forecast year of 2050, and for several years in between.

Figure 5.18 shows the truck volumes in the base year. Figure 5.19 shows truck volumes forecast to 2050, and Figure 5.20 shows the difference between volumes in the two different models. As shown in Figure 5.20, the travel demand model predicts that the fastest growing corridors in terms of total number of trucks in this time period are several Interstate segments in the Atlanta metropolitan region and the northern portion of I-95.

Secondarily, slightly slower growth is anticipated for I-20 between Atlanta and Augusta; and on Interstate legs of I-75 and I-85 approximately 10 to 20 miles outside of the perimeter. This indicates that the current version of the model is anticipating slow growth for the trucking sector.

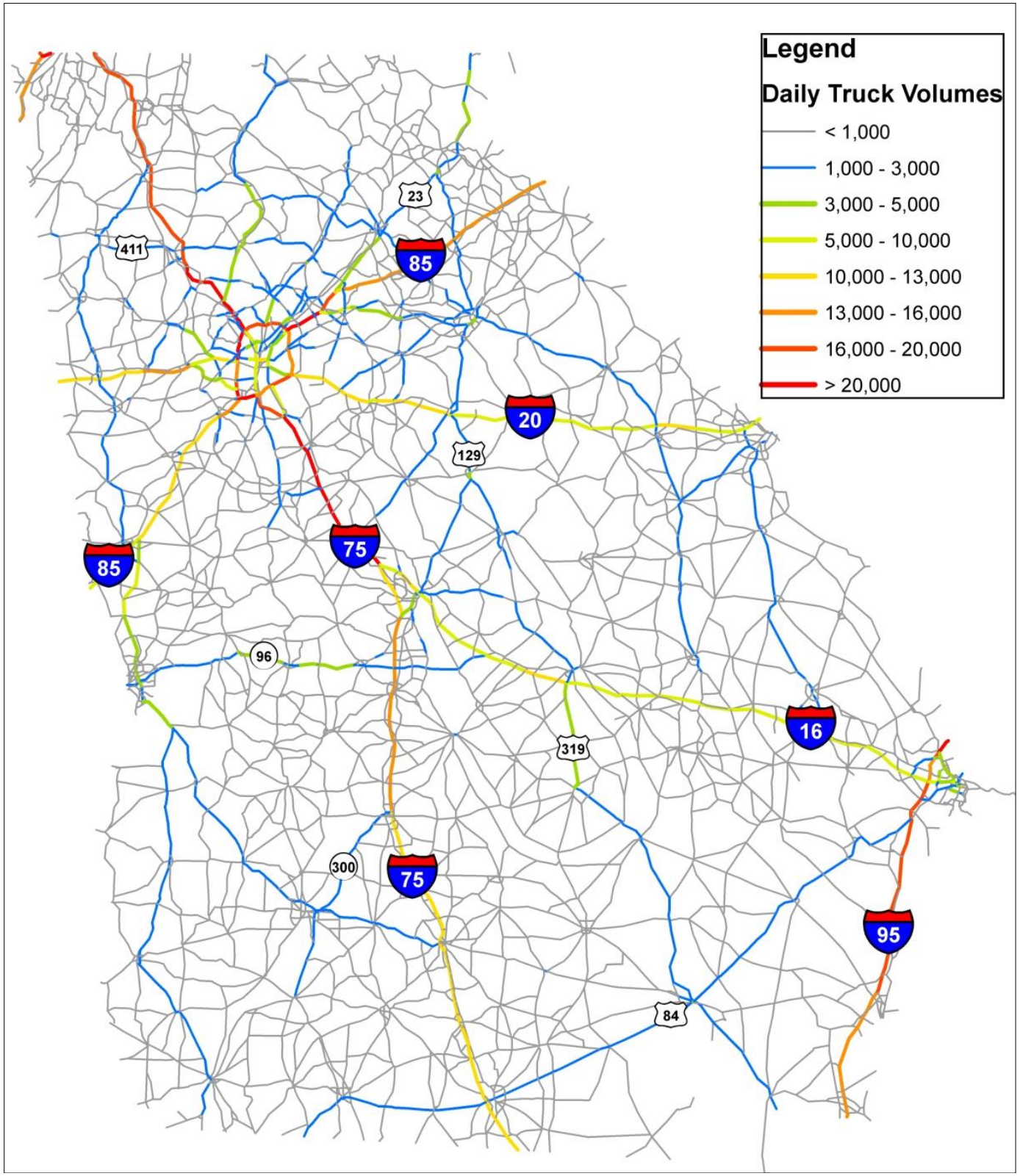
A subsequent task in this project will conduct more robust alternative freight forecasts in greater detail, including comparing the TRANSEARCH and truck model forecasts to those derived from other sources.

Figure 5.18 Statewide Travel Demand Model: Current Truck AADT Volumes



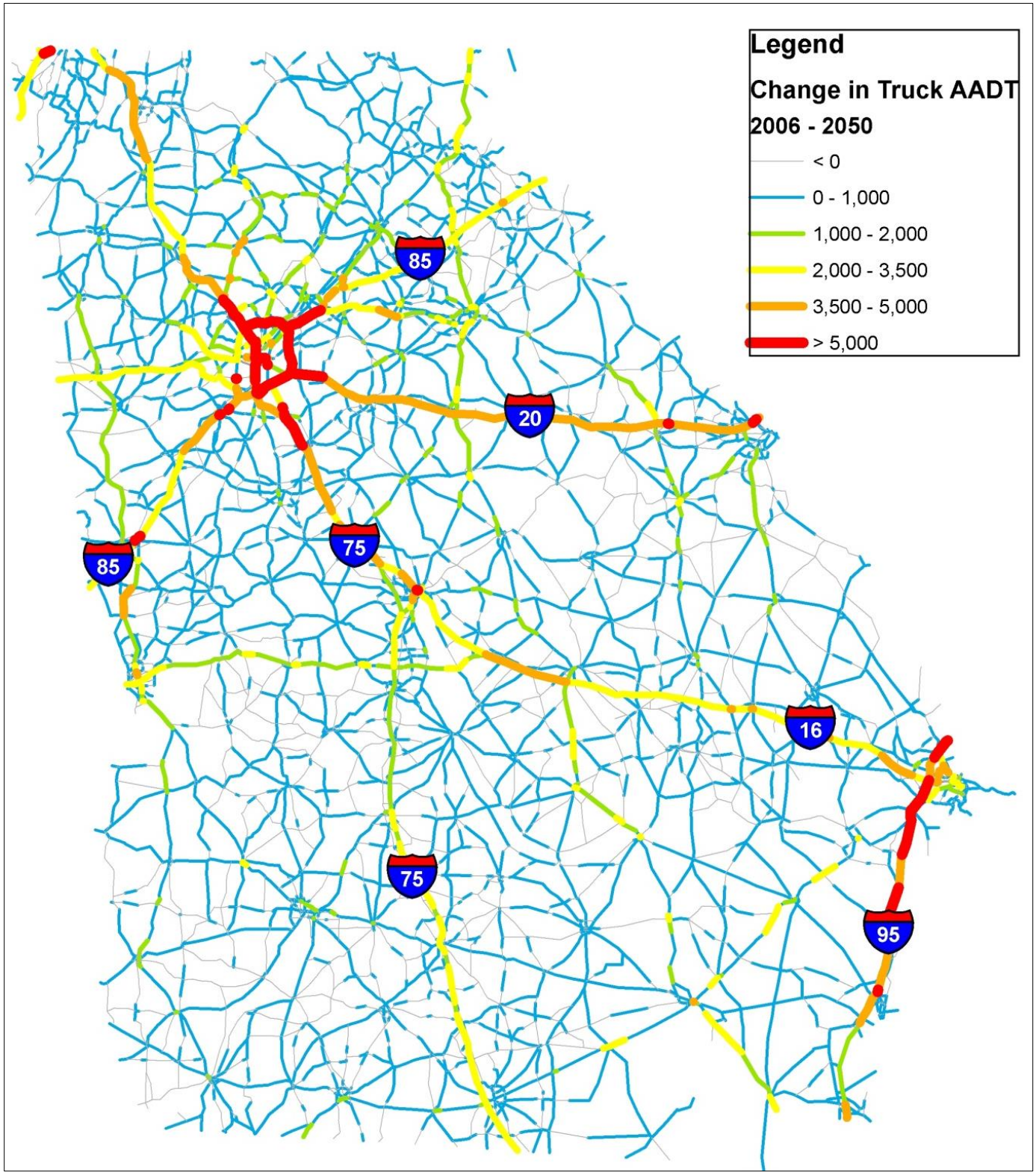
Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version), 2006 base data

Figure 5.19 Statewide Travel Demand Model: Future Truck AADT Volumes, *2050*



Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

Figure 5.20 Difference in Truck Volumes Between Base and Future Model Outputs



Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

5.11 KEY FINDINGS ON TRUCK DEMAND

This chapter has provided a large amount of data and information related to trucking demand. The following are key findings related to where the trucks are and where they are going on Georgia's Highway Infrastructure:

- The most freight-intensive long-haul corridor in Georgia is I-75 between Atlanta and Chattanooga. This corridor carries freight traffic between both Georgia and Florida to locations throughout the Midwest. Closer in to the Atlanta region are the highest truck volumes in the State (over 25,000 trucks per day) as this long-haul truck traffic overlaps with local distribution traffic serving the Atlanta metropolitan region. The truck counts on I-75 in Whitfield, Catoosa, Bartow, and Gordon counties are the highest non-Atlanta truck counts in the State. Most of the long-haul truck traffic on this corridor goes through Tennessee and Kentucky on its way to states further north.
- I-75 between Atlanta and Macon is the second most significant freight corridor in Georgia. It captures traffic between the Atlanta metropolitan region and Georgia's top trading partner, Florida. It also is used by trucks moving goods coming through the Port of Savannah to get to Atlanta and points further west and north. I-75 in Henry and Clayton Counties are fast growing freight centers and also drive a significant portion of the truck volume close in to the Atlanta region.
- The "western wall" of I-285 which runs between I-75 north and south of Atlanta is a critical truck link in the State as it connects the two highest truck volume corridors and also is used by large industrial stakeholders on the historically freight-intensive southwest side of the Atlanta area. The top 11 truck count locations in the State are either on I-75 or the "western wall."
- The I-85 corridor north of Atlanta is the third highest in terms of truck volumes. High truck volumes extend out from the Atlanta region to Gainesville. They do appear to decrease significantly prior to the South Carolina state line. This corridor is different from I-75 in that the demand is only served by four lanes of Interstate rather than six lanes, which is the minimum throughout I-75. This impacts both congestion and mobility on the I-85 corridor. I-85 north of Atlanta also does not have truck count data close to I-285, which will limit the ability to track truck activity on the corridor.
- There are relatively high truck volumes on I-20 at Fulton Industrial Boulevard however, the I-20 and I-85 (south of Atlanta) corridors have less volumes than the other interstate connecting to metro Atlanta.
- The primary truck use for I-16 is to move goods to/from the Port of Savannah subarea to the rest of Georgia. Roughly 80 percent of trucks surveyed on I-16 at Pembroke had both an origin and destination in Georgia. Truck volumes on this corridor track closely to growth of Port traffic.
- I-95 is a key corridor to get goods into, and out of, the Port of Savannah. However, truck volumes on this corridor that come from the port are dwarfed by the large numbers of "through Georgia" truck traffic that

dominate the corridor. Most of the trucks on I-95 have origins and destinations in Florida and the Carolinas with well over half of the trucks on I-95 being through truck trips servicing economies outside of Georgia.

- I-475 is a critical truck bypass route in Macon serving 10,000+ trucks per day.
- The Interstate network is extensive enough to capture the majority of the State's intercity truck travel patterns. Comparatively, state highways have lower truck volumes; none of Georgia's top 50 truck counts is off Interstate. There are only 10 count locations on state highways over 3,000 trucks/day.
- Due to truck ban on "through Atlanta" trucks for I-75, I-85, and I-20 inside I-285, there are relatively low truck volumes on interstates inside 285.

Key findings for truck destinations, from a southeastern regional perspective:

- Nearly two-thirds of truck tonnage in Georgia was found to be either internal Georgia trips or through Georgia trips. The remaining one-third was found to be either inbound or outbound truck trips.
- Florida is Georgia's top trading partner for truck flows. This is consistent with Florida being the largest economy in the Southeast and fourth largest economy in U.S. It is twice as large as Georgia – the second largest economy in the Southeast. Florida is largest generator of "through" trucks in Georgia.
- South Carolina and North Carolina are the State's second and third top trading partners for truck flows, respectively. South Carolina receives a significant fraction of Georgia truck traffic from both I-20 and I-85. North Carolina and South Carolina combined are responsible for over half of goods arriving in the state via I-85. South Carolina currently has no financially constrained plans to widen I-85 from the current four lanes up to six where it connects to the Georgia border.[4]
- Alabama is fourth largest trading partner in terms of truck freight; I-20 from just west of the Georgia border was widened to six lanes (from four) in 2014.[5]
- Tennessee serves as a pass-through State for Georgia's trucks. Over 45 percent of the trucks surveyed at Ringgold, had origination states that were north of Tennessee. Only 30 percent had Tennessee as an origination State. Similarly, at the Forsyth survey location, more than twice as many trucks from states north of Tennessee than from Tennessee. This implies that improvements in Tennessee's Interstate system also will benefit Georgia truck traffic and Georgia's economy. Recently, TDOT announced design work to improve the I-24/I-59 interchange just north of the Georgia border[6].

[4] www.scdot.org/Multimodal/pdf/SC_MTP_Interstate_Plan_FINAL.pdf

[5] www.annistonstar.com/news/aldot-widening-of-i--lanes-in-cleburne-county-should/article_e9c0936f-28b0-5265-9acc-a87e60622db0.html

[6] www.wrcbtv.com/story/36565719/tdot-planning-redesign-for-i-75i-24-split-to-alleviate-traffic-congestion

- Atlanta metro is the primary regional generator of truck traffic in Georgia, with the top 12 truck count locations all in the metro area. Fulton County is the largest generator of combined inbound and outbound truck tonnage in the state. Metro Atlanta is home to 8 of the top 9 counties in terms of the number of truck trip ends.
- Chatham County is Georgia's largest county-level generator of outbound truck traffic and second largest of inbound truck traffic. Savannah was the most commonly cited city as a truck trip end in the roadside truck surveys -- it was mentioned nearly twice as much as the #2 response of Atlanta.
- There are several smaller counties from a population perspective that have relatively large portions of truck tonnage based on the TRANSEARCH data. These include Tift County due to a combination of manufactured and food products and Target warehouse, Coffee County due to nonmetallic minerals and Walmart warehouse, Glynn County due to the Port of Brunswick, Floyd County due to nonmetallic minerals/stone, Whitfield County due to textile/carpet mill products, and Washington County due to kaolin.

The following are key findings related to what trucks are carrying:

- Origin-destination surveys indicate that on long-haul corridors, a large proportion of the trucks are carrying farm and food-related products. This total amount was over 20% in Chatham, Eulonia, and Valdosta and 12% in Augusta. Secondarily, transportation equipment (including cars and car parts) was found to be a significant commodity at most locations. The remaining goods were distributed across several different commodities. There were no other locations with more than 10% of any single commodity.
- The TRANSEARCH data estimates truck trips on all roads in the State. It shows a very different commodity distribution. The top three commodities in TRANSEARCH are nonmetallic minerals, secondary traffic, and clay/ concrete/glass/stone. These three commodities tend to travel short distances and, therefore, would not be picked up at the roadside O-D survey locations. Across Georgia, food and farm products combined are estimated at 10%.

The following are key findings related to trends over time:

- Year 2050 freight flow forecast estimates truck tonnage to grow 1.4 percent annually. This is modest relative to other freight flow forecasts.
- Year 2050 freight flow forecast indicates a wide range of growth rates for specific commodities across Georgia. This indicates different industries are predicted to grow at differing rates over the long term.
- The forecast predicts that inbound shipments are growing significantly faster than outbound and "through" shipments; this indicates the consumption portion of Georgia's economy will grow faster than the production portion, and average truck trip lengths will increase over time.
- The forecast also predicts that Florida will remain the top trading partner.

6.0 Needs and Issues – Bottlenecks

This chapter describes two types of freight-related bottlenecks in the state: bottleneck **segments** and bottleneck **hotspots**.

Section 6.1 describes *corridor-level* bottleneck segments throughout the entire system for a base- and future-year scenario, and describes how this is likely to impact truck travel. This analysis was conducted primarily utilizing the statewide travel demand model. Section 6.2 describes recent GPS-based *corridor-level* freight bottlenecks; this data allows for an understanding of the impact of system reliability on trucks. Section 6.3 shows *site-specific* "hot spot" bottleneck points identified in national studies that highlighted several locations in Georgia -- typically at/around major interchanges. Section 6.4 summarizes the key findings from this chapter.

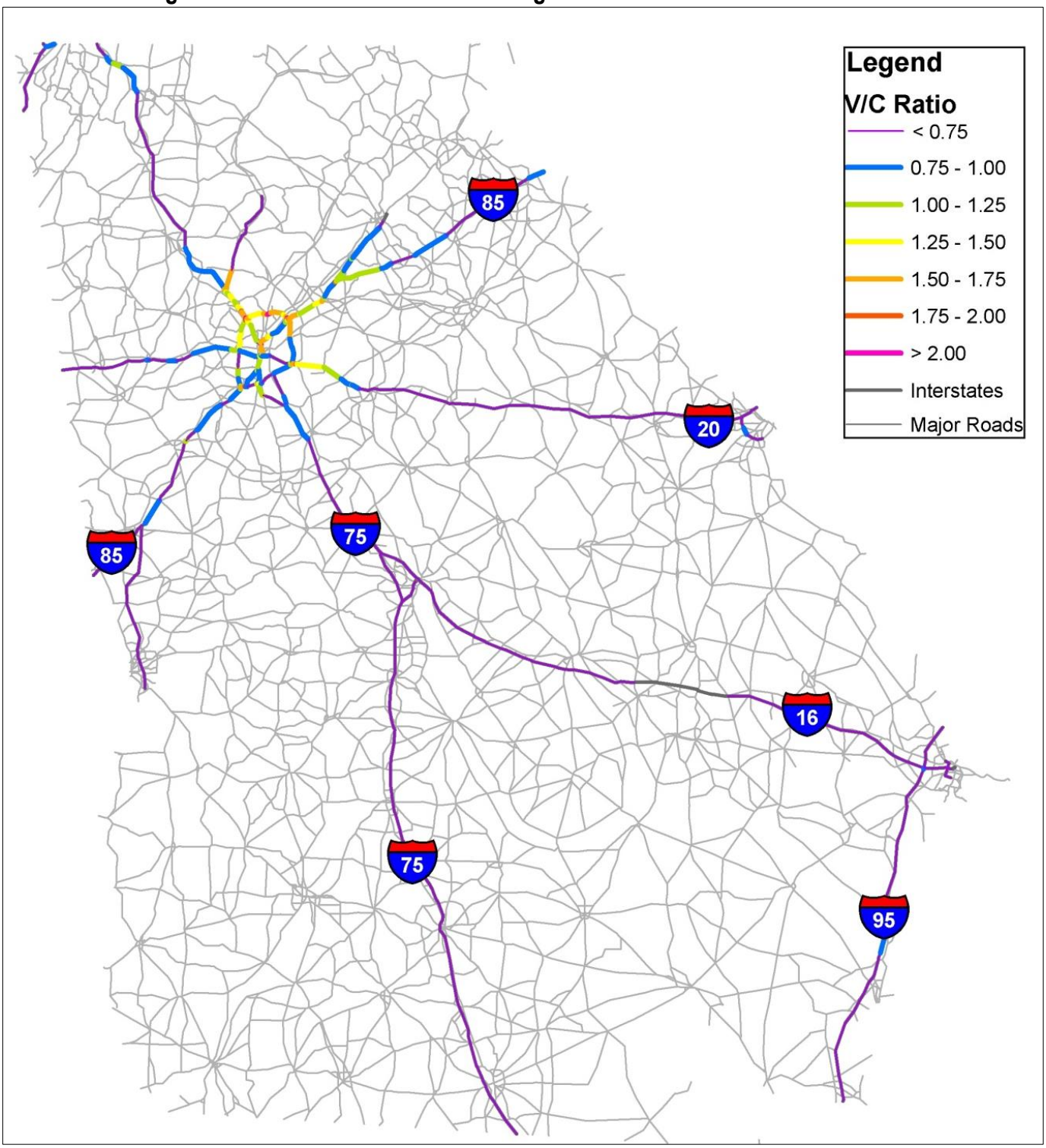
6.1 BOTTLENECK SEGMENTS: *CORRIDOR-LEVEL CONGESTION IN THE BASE- AND FUTURE-YEAR (PER GDOT STATEWIDE TRAVEL DEMAND MODEL)*

The Georgia statewide travel demand model estimates congestion using a Volume-to-Capacity ratio ("V/C") based on 24-hour volumes and 24-hour capacities. A road segment with a V/C ratio of one is operating at capacity. A V/C ratio above one indicates a road segment that is impacted by congestion, while a V/C ratio below one is operating below capacity. In this analysis, volumes include all vehicles on the roadway not just trucks. Capacity is the number of vehicles that can be handled on the roadway, which is primarily a supply-versus-demand function of the number of lanes. (NOTE: *This methodology does not identify operational or capacity deficiencies at interchanges*.)

Figure 6.1 shows the estimated V/C ratios on Georgia's interstate system in the base year of 2006. As expected, the highest V/C ratios are present in the Atlanta metropolitan region. I-285 has high V/C ratios on its entire alignment; I-75, I-85 and I-20 tend to have their highest levels of congestion near I-285, with congestion decreasing moving further away from Atlanta.

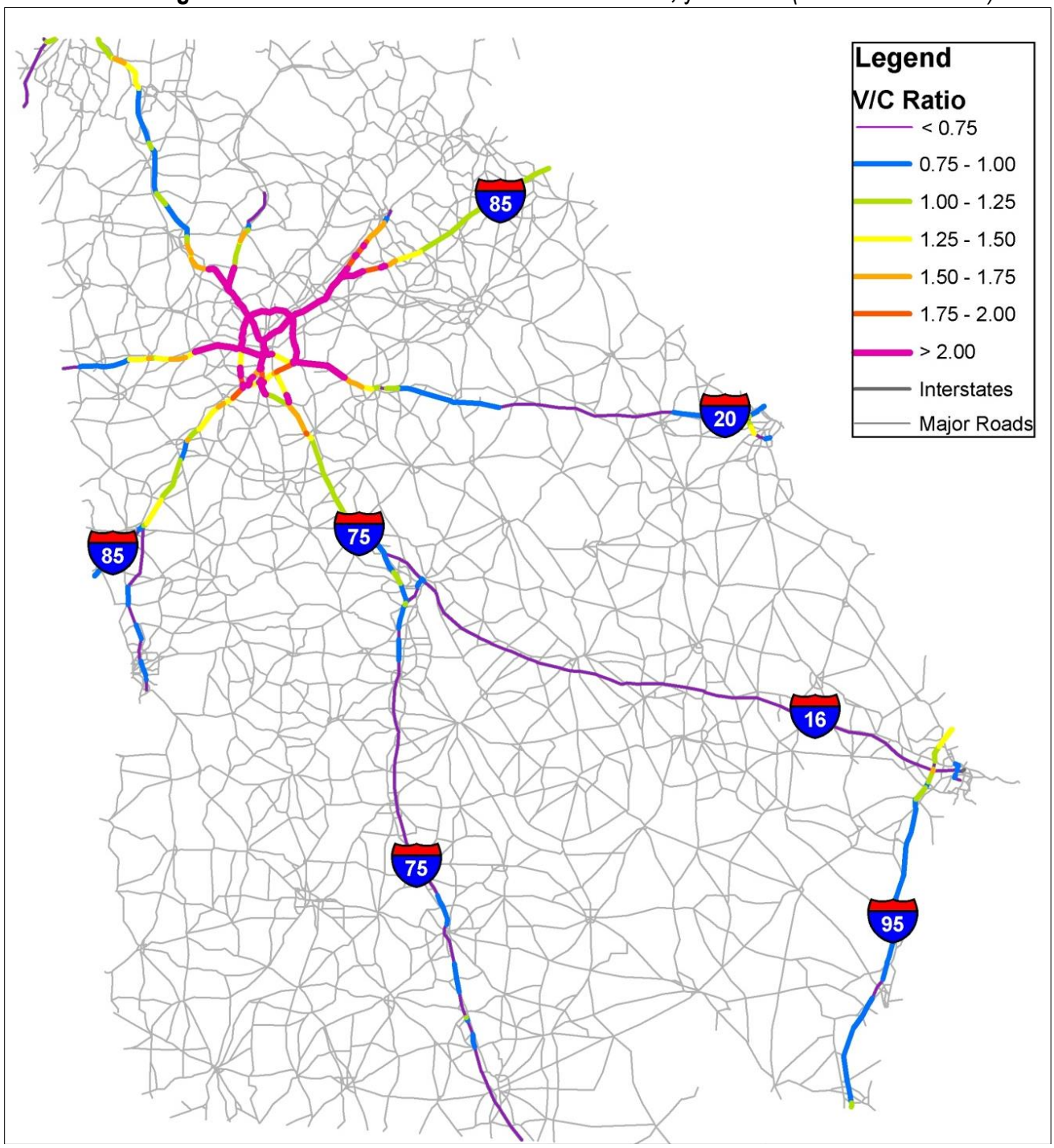
Of particular note is that I-85 north of Atlanta appears to have the longest stretch of congestion with a V/C ratio higher than one several miles north of the I-85 split with I-985. By comparison, congestion on I-75 north of Atlanta drops to below a V/C of 1.0 at the I-75/I-575 split.

Figure 6.1 Model V/C Ratio for Georgia Interstates



Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

Figure 6.2 Model V/C Ratio for Ga. Interstates, year *2050 ("no-build" scenario)*



Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

Figure 6.2 shows the forecasted V/C ratios on Georgia's interstate system in the year 2050. It assumes the existing number of lanes and routes as today with future levels of traffic on them (it is a "what if" scenario to see how today's

routes/lanes would be able to handle future year traffic demands -- sometimes known as a "no build" scenario).

Atlanta remains the region with the highest levels of congestion. This figure allows us to draw the following general conclusions about future congestion levels on the State's key interstate corridors:

- I-85 north of Atlanta would appear to be the most congested corridor in Georgia by the year 2050. The V/C ratio is over 1.0 for its entire alignment.
- I-85 south of Atlanta would have a V/C ratio above 1.0 for a considerable amount of the corridor until the I-85 split with I-185.
- I-75 between Atlanta and Macon would have a V/C ratio above 1.0 until just north of Macon
- I-75 between Atlanta and Tennessee has high levels of congestion in the Atlanta metropolitan region and the Chattanooga region, but several locations below 1.0 in the rural areas.
- I-20 has limited congestion outside of the Atlanta metropolitan region
- I-95 has sufficient capacity, except for a few shorter segments in the Savannah metropolitan region
- I-16 will operate well below capacity into the long-term future.

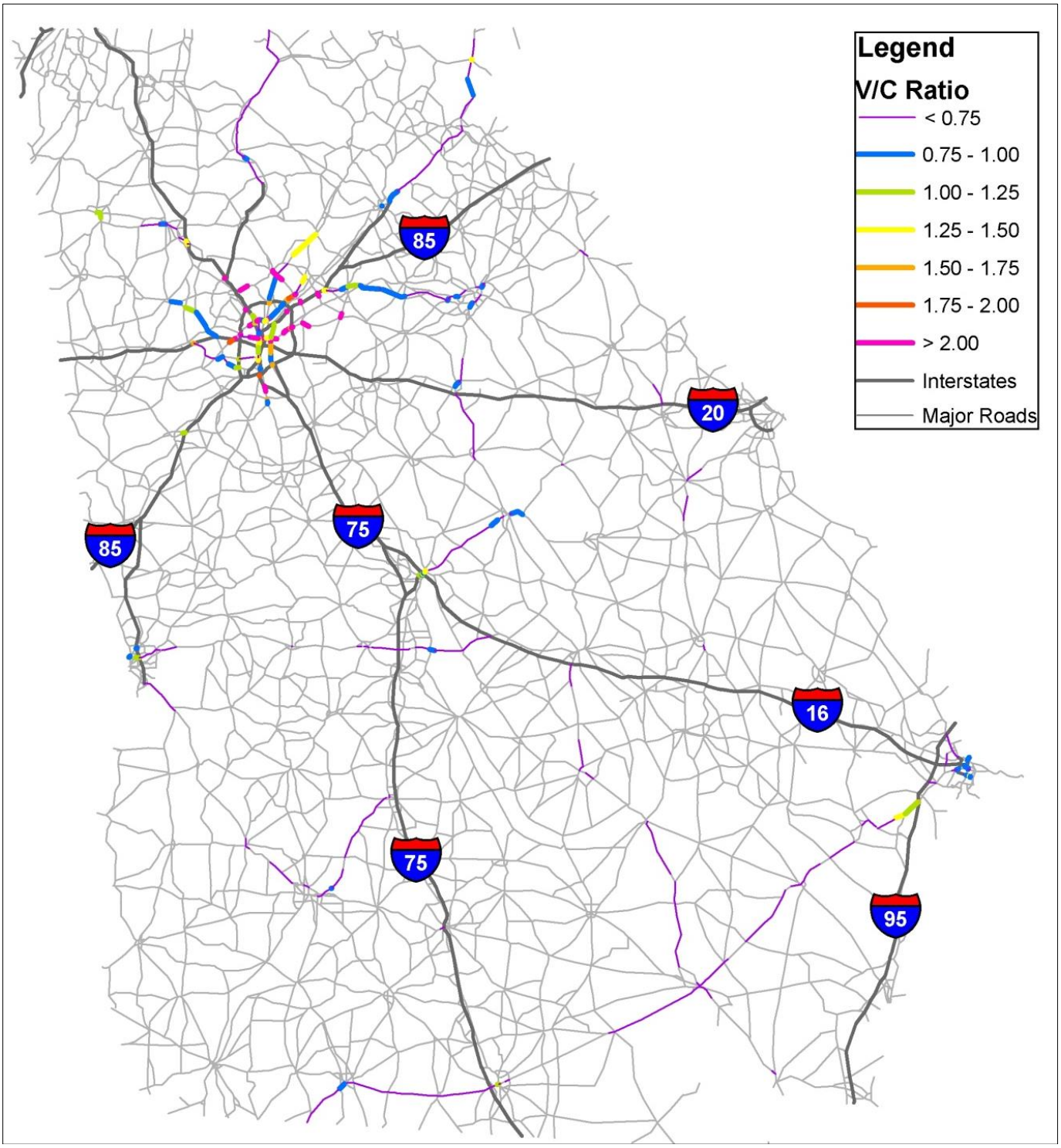
Generally, I-75 performs better than I-85 in terms of its ability to handle traffic demands in the future. This is largely due to the fact that I-75 is already a total of six lanes throughout the State, as opposed to I-85, which is a total four lanes at most rural locations.

Figures 6.3 and 6.4 show the V/C ratios on non-interstate segments with truck volumes greater than 1,000 per day. These figures indicate that the non-interstate road network in rural portions of the State generally has adequate capacity to handle truck and auto volumes well into the distant future, however Atlanta metro has the most non-interstate routes with high congestion levels. Secondarily, small congested segments are evident in other urban areas such as Albany, Athens, Macon, Savannah, Augusta, and Columbus.

> (***Note**: Details about how interstate and non-interstate routes perform within MPO areas in the current and future years are handled through the MPO's ongoing planning process, respective regional travel demand modeling exercises, Long Range Transportation Plan updates, etc.;* ***those seeking that detailed level of information should reference those documents***.)

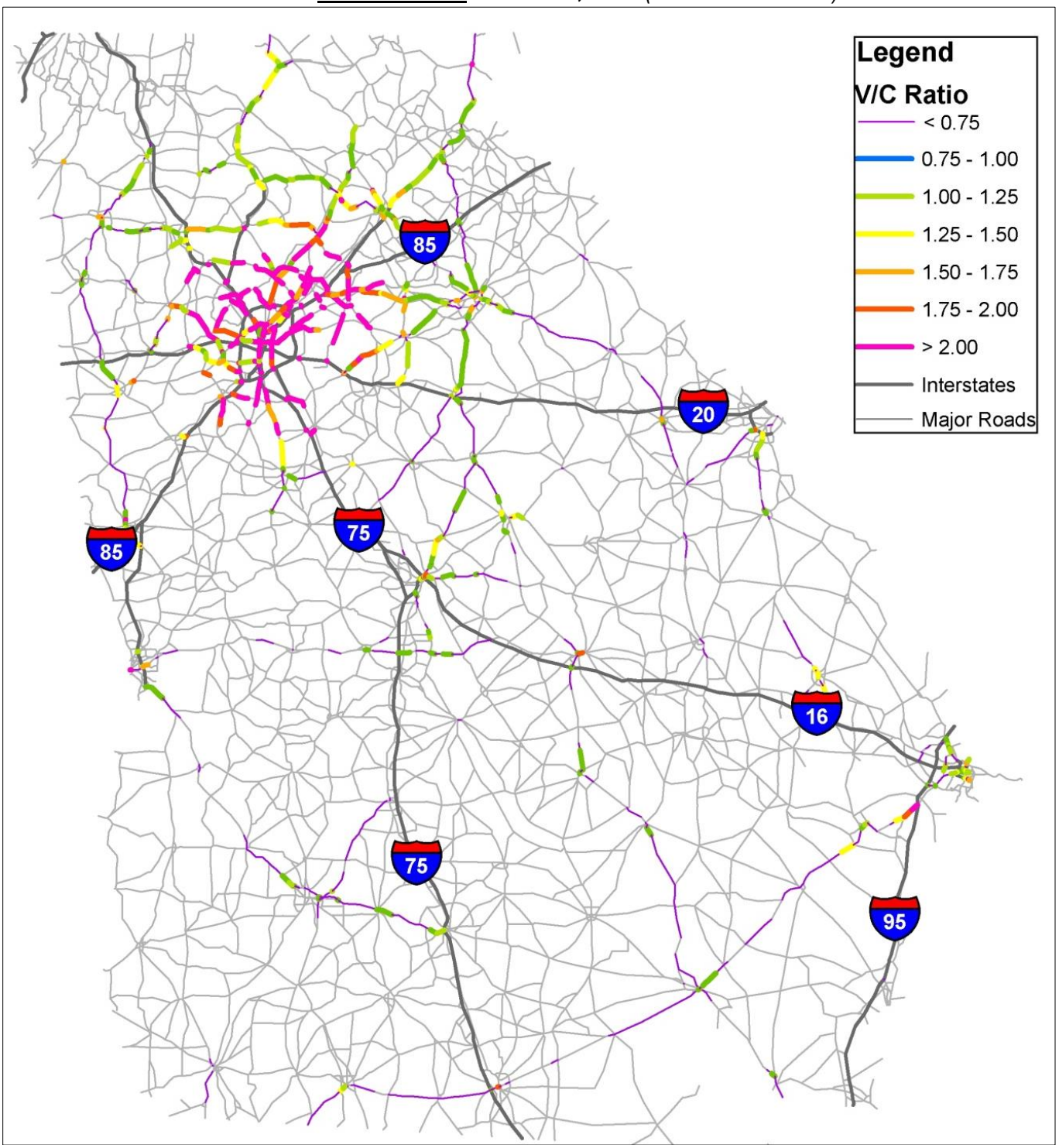
Figure 6.5 shows the change in truck AADT by 2050, as forecasted by the GDOT statewide travel demand model. The model forecasts that truck volume growth will be the highest on a collection of interstates in the Atlanta metropolitan region. From the "long haul" corridor perspective, I-20 east of Atlanta and I-75 between Chattanooga and Macon expect signficant truck volume growth.

Figure 6.3 Model V/C Ratio for Non-Interstate Locations with Truck Volume Greater than 1,000



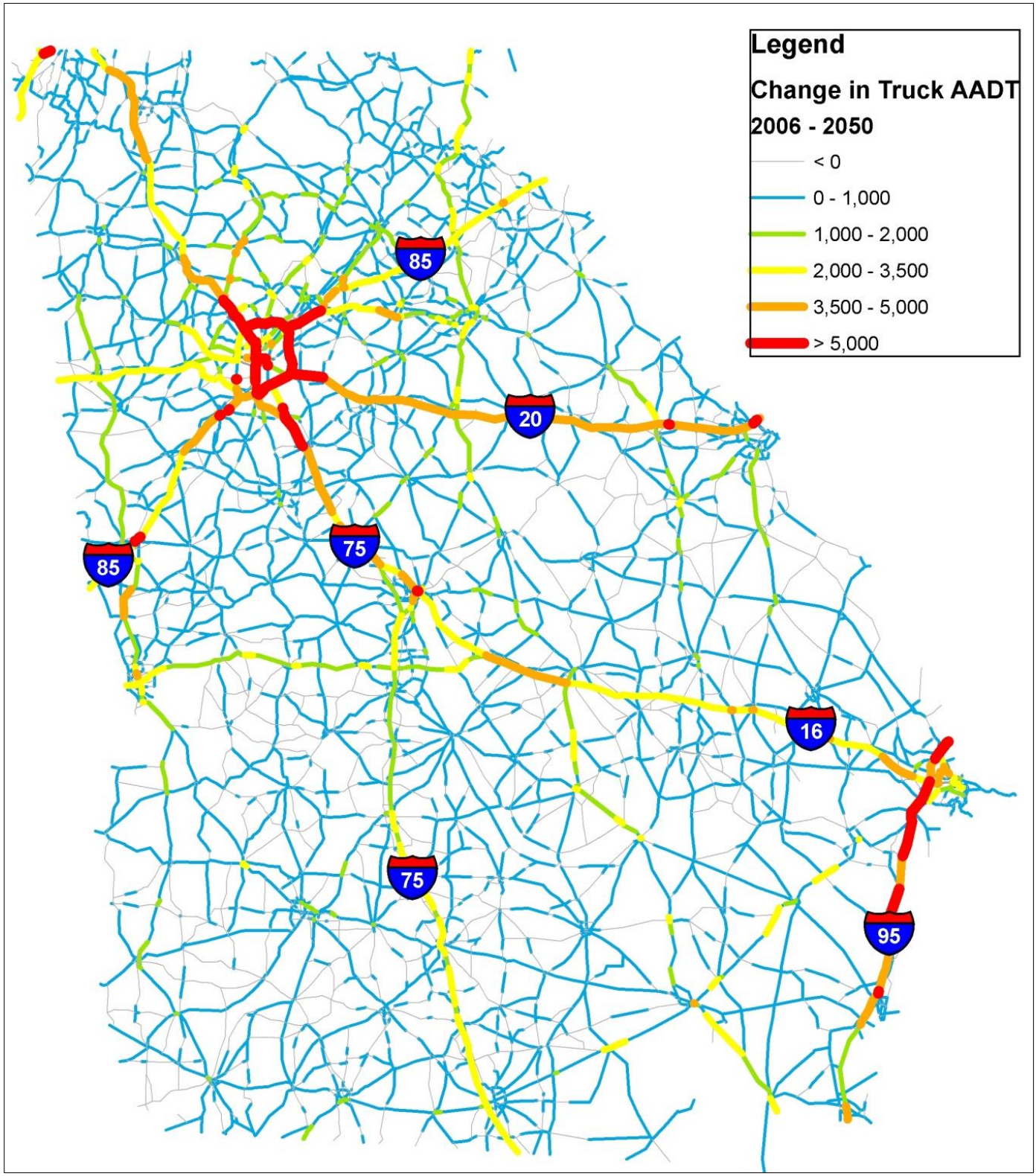
Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

Figure 6.4 Model V/C Ratio for Truck Volume Greater than 1,000 for Non-Interstate Locations, *2050 ("no build" scenario)*



Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

Figure 6.5 Change in Truck AADT *(by 2050, "no build" scenario)*



Source: GDOT Statewide Travel Demand Model output (Jan. 2011 Model Version)

6.2 BOTTLENECK SEGMENTS:

CORRIDOR-LEVEL FOR THE CURRENT YEAR (PER ATRI GPS DATA)

FHWA/ATRI Freight Performance Measurement GPS data were utilized to gain an additional perspective on current corridor-level bottlenecks in Georgia. The analysis consisted on the following elements:

- A statewide analysis of truck speeds on the interstate system during four time periods;
- A corridor-level comparative analysis of the most congested interstate segments in the State; and
- A detailed analysis of each of the most congested corridors.

The GPS data were assembled over a 12-month period between October 1, 2009 and September 30, 2010.

Statewide Truck Speed Analysis

The first set of analyses examines the annual average speeds for the entire State, as well as the Atlanta metro area. The analysis is conducted by showing average speeds for the entire State, and then showing directional speeds within the Atlanta metropolitan region. The analysis was conducted for the following four weekday time periods:

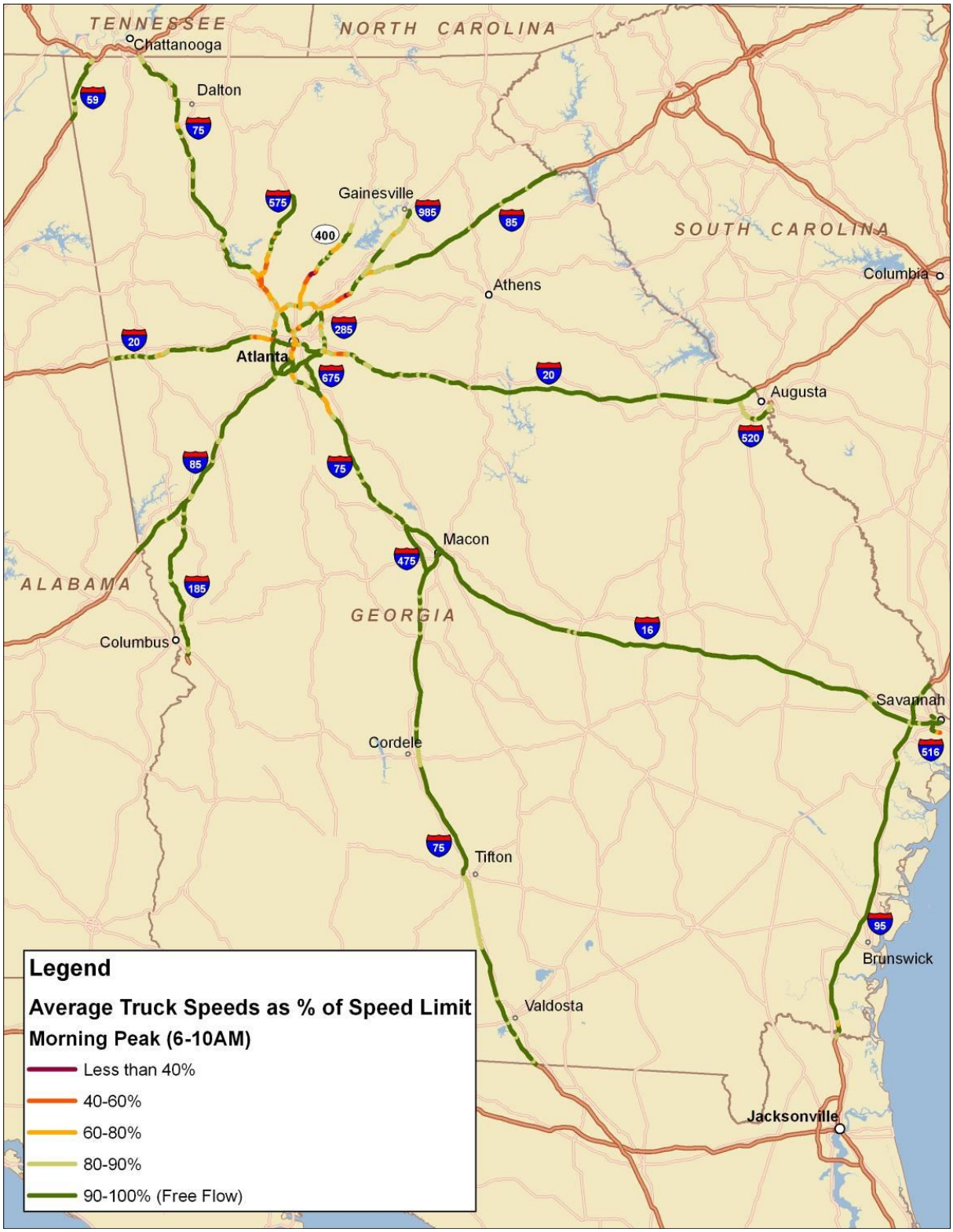
1. Morning Peak – 6:00 a.m. to 10:00 a.m. (Figures 6.6 and 6.7);
2. Mid-day – 10:00 a.m. to 3:00 p.m. (Figures 6.8 and 6.9);
3. Afternoon Peak – 3:00 p.m. to 7:00 p.m. (Figures 6.10 and 6.11); and
4. Off-Peak – 7:00 p.m. to 6:00 a.m. (Figures 6.12 – statewide only).

The data analysis shown in the figures reinforce many commonly held understandings about traffic in Georgia. Average speeds were very close to the speed limit throughout most of the State during all time periods. Overall, the system appears to be operating at a very high level. The exceptions to this general rule were the Atlanta metropolitan region which has several congested segments and a few sections on I-75 in south Georgia where there was ongoing construction throughout the data assembly time period.

Additionally, within the Atlanta metropolitan region, the lowest truck speeds were for trucks that were traveling in the direction of peak period traffic during the morning and afternoon time periods. There was little congestion during the mid-day period, except on the Downtown Connector (I-75/85) and a few interstate interchanges. It is also notable that the afternoon congestion is significantly worse than the morning congestion.

Figures 6.6 through 6.12 demonstrate that key truck corridors in the State are all significantly impacted by the urban congestion that is experienced in the Atlanta region. Therefore, efforts to decrease urbanized congestion in Atlanta will benefit the trucking industry and freight-related sectors of Georgia's economy.

Figure 6.6 Average Truck Speeds as a % of Speed Limit
Morning Peak

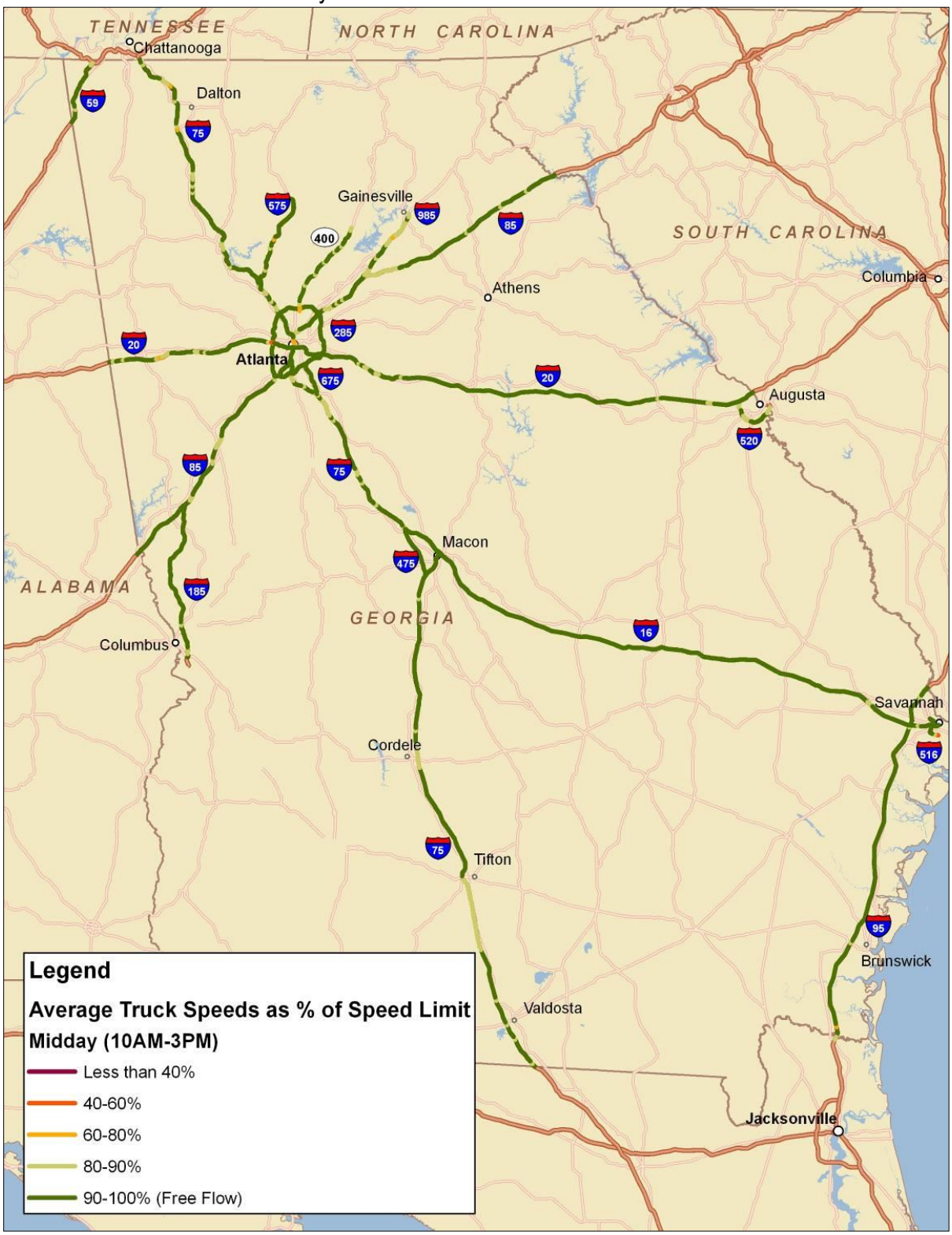


Source: Project team analysis & FHWA/ATRI FPM Data. (Data from 10/01/2009 - 9/30/2010)

Figure 6.7 Metro Atlanta Average Truck Speeds as a Percent of Speed Limit
Morning Peak

Source: Project team analysis, FHWA/ATRI FPM Data. (Data from1 0/01/2009 - 9/30/2010)

Figure 6.8 Average Truck Speeds as a Percent of Speed Limit
Mid-day

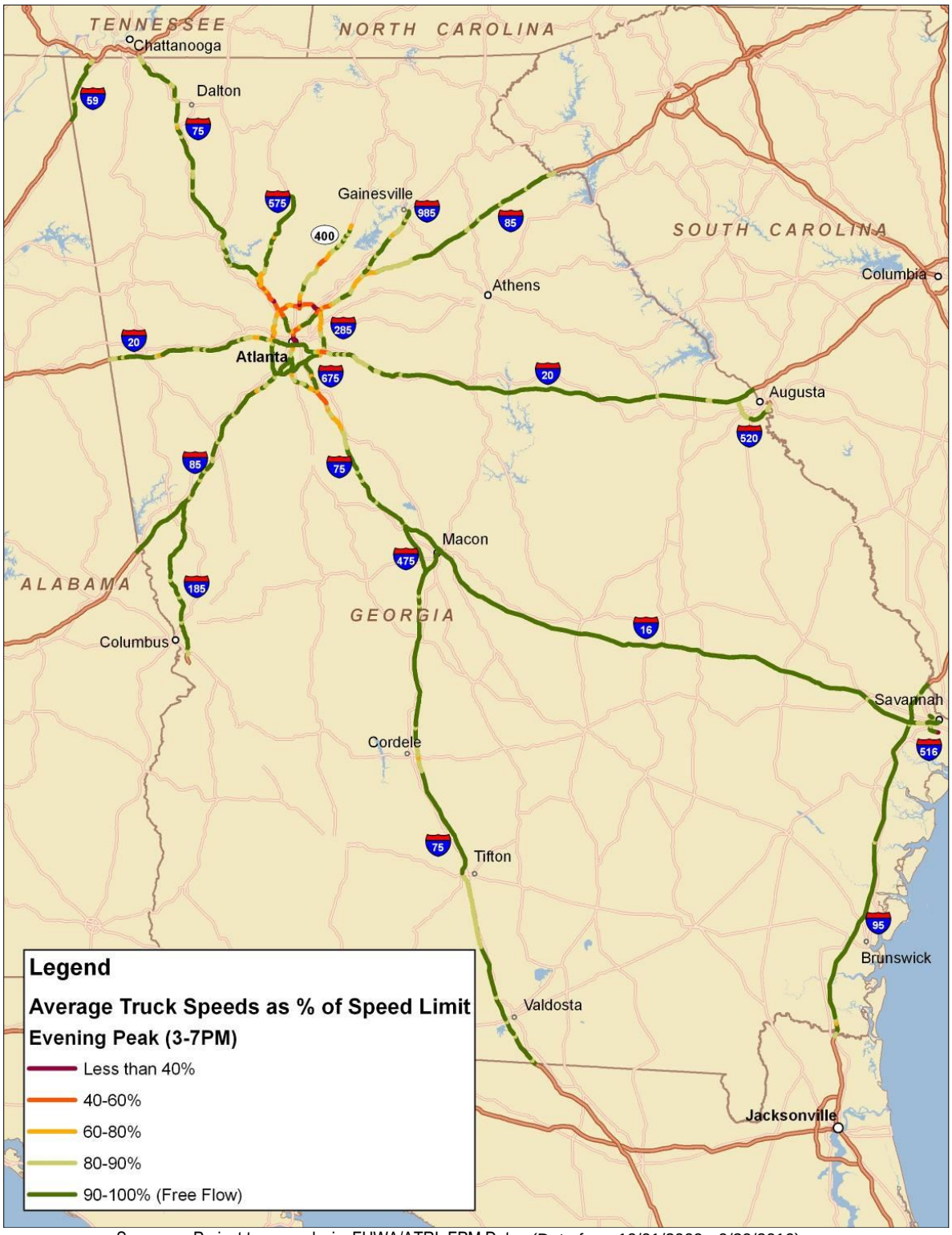


Source: Project team analysis, FHWA/ATRI FPM Data. (Data from 10/01/2009 - 9/30/2010)

Figure 6.9 Metro Atlanta Average Truck Speeds as a Percent of Speed Limit
Mid-day

Source: Project team analysis, FHWA/ATRI FPM Data. (Data from 10/01/2009 - 9/30/2010)

Figure 6.10 Average Truck Speeds as a Percent of Speed Limit, *Afternoon Peak*

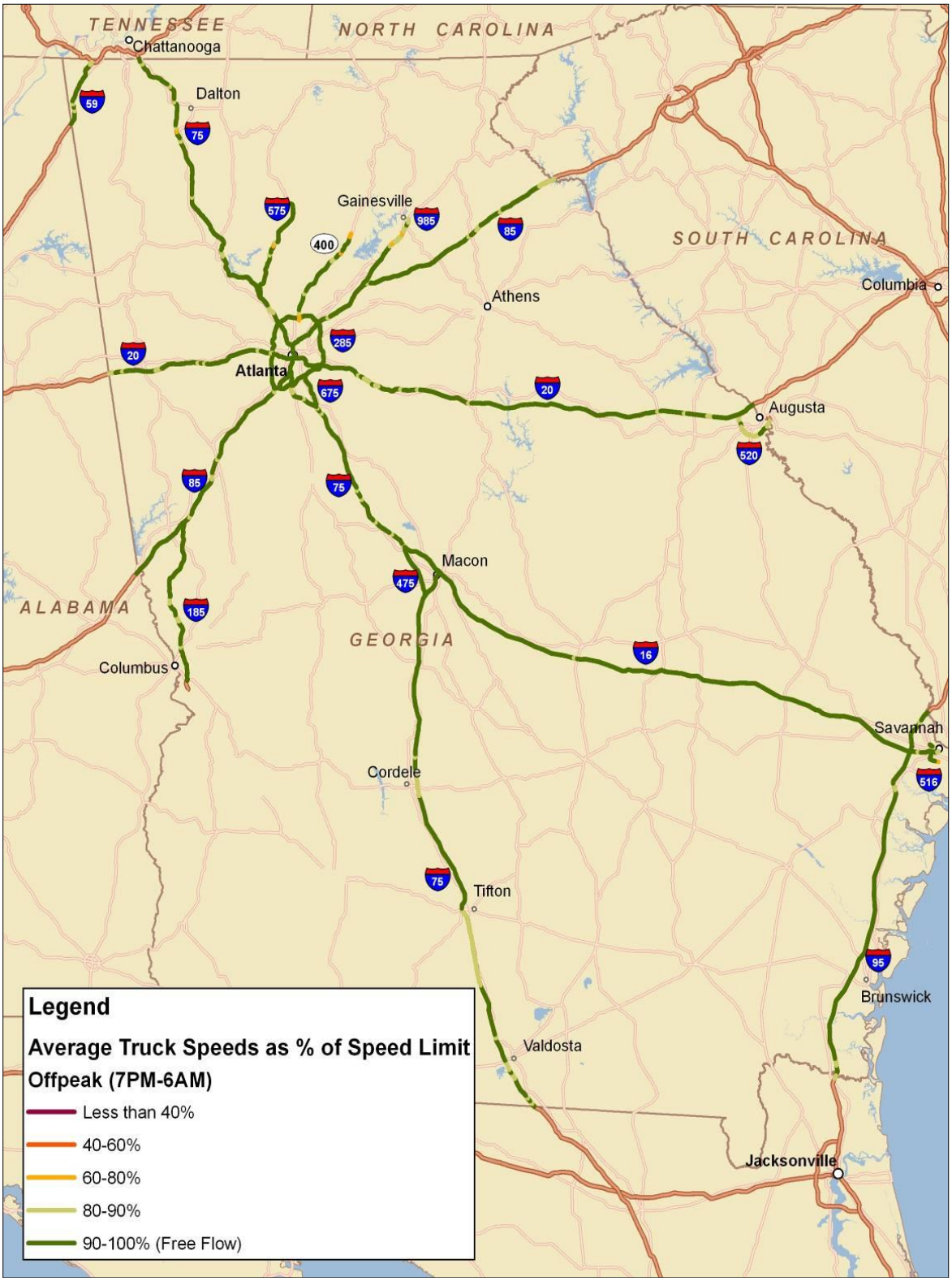


Source: Project team analysis, FHWA/ATRI FPM Data. (Data from 10/01/2009 - 9/30/2010)

Figure 6.11 Metro Atlanta Average Truck Speeds as a Percent of Speed Limit
Afternoon Peak

Source: Project team analysis, FHWA/ATRI FPM Data. (Data from 10/01/2009 - 9/30/2010)

Figure 6.12 Average Truck Speeds as a Percent of Speed Limit
Off-Peak



Source: Project team analysis, FHWA/ATRI FPM Data. (Data from 10/01/2009 - 9/30/2010)

Comparison of Most Congested Corridors

Using the GPS data, the 10 most congested corridors were analyzed based on average speed data across the entire 24-hour time period. These corridors are shown in Figure 6.13. Comparing this figure to the top 50 truck locations provided in Table 5.1, it is evident that the top 12 highest truck volume locations are all on the most congested corridors in the State. This indicates that trucks exacerbate already congested conditions in the Atlanta metropolitan region. It also means that trucks are part of the vehicle population that is negatively impacted by congestion. This creates additional costs for the trucking industry and may contribute to the cost of shipping and doing business in metro Atlanta.

Table 6.1 shows average speeds for each of the 10 most congested corridors during each time period. It shows that all of the 10 most congested corridors have significant variation in speeds by time of day and direction. This indicates that it is commute traffic that is generating the majority of this congestion.

Table 6.2 shows the lowest travel speeds in the State by location and time period. It shows that I-75 has the most severe congestion in terms of average speeds. Three of the four most congested locations/times in the State are on I-75. Interestingly, the second most congested corridor is I-20 on the west side of I-285. This is also a heavily truck trafficked corridor connecting Fulton Industrial Boulevard to I-20 and to I-285 on the west side of metro Atlanta.

Figure 6.13 Map of Highway Bottleneck Segments, Metro Atlanta

Source: Project team analysis, FHWA/ATRI FPM Data.

Table 6.1 Summary for 10 Georgia Corridor Bottleneck Segments, By Direction

		Average Speed			
Corridor	Direction	AM Peak	Mid-day	PM Peak	Off-Peak
I-20: Milepoints 47-52	EB	38.2	52.6	54.6	58.7
I-20: Milepoints 47-52	WB	56.8	56.7	51.0	56.8
I-20: Milepoints 66-72	EB	59.5	58.2	39.9	56.9
I-20: Milepoints 66-72	WB	47.0	55.5	54.0	57.0
I-75: Milepoints 217-231	NB	55.9	59.5	55.0	61.7
I-75: Milepoints 217-231	SB	62.9	60.4	47.1	62.2
I-75: Milepoints 243-251	NB	40.1	52.5	39.7	55.7
I-75: Milepoints 243-251	SB	51.9	51.5	38.0	56.2
I-75: Milepoints 257-275	NB	61.7	60.2	39.3	60.1
I-75: Milepoints 257-275	SB	45.7	58.6	58.8	62.0
I-85: Milepoints 95-110	NB	60.6	59.9	48.3	60.4
I-85: Milepoints 95-110	SB	43.5	57.7	57.0	61.8
I-285: Milepoints 8-15	Inner Loop	54.5	58.9	55.7	59.5
I-285: Milepoints 8-15	Outer Loop	58.6	56.5	42.8	58.3
I-285: Milepoints 21-35	Inner Loop	50.9	56.6	37.0	57.5
I-285: Milepoints 21-35	Outer Loop	50.9	56.1	40.0	58.1
I-285: Milepoints 46-50	Inner Loop	60.5	60.5	58.0	61.6
I-285: Milepoints 46-50	Outer Loop	54.2	57.7	46.3	58.1
GA 400: Milepoints 7-20	NB	58.3	59.8	52.7	60.0
GA 400: Milepoints 7-20	SB	40.1	57.7	50.4	60.4

Source: Project team analysis, FHWA/ATRI FPM Data.

Table 6.2 Top 10 Congested Bottleneck Segments in Georgia

Rank	Corridor	Time Period	Direction	Average Speed
1	I-75: Milepoints 243-251	PM Peak	SB	38.0
2	I-20: Milepoints 47-52	AM Peak	EB	38.2
3	I-75: Milepoints 257-275	PM Peak	NB	39.3
4	I-75: Milepoints 243-251	PM Peak	NB	39.7
5	I-20: Milepoints 66-72	PM Peak	EB	39.9
6	I-285: Milepoints 21-35	PM Peak	Outer Loop	40.0
7	I-75: Milepoints 243-251	AM Peak	NB	40.1
8	GA 400: Milepoints 7-20	AM Peak	SB	40.1
9	I-285: Milepoints 8-15	PM Peak	Outer Loop	42.8
10	I-85: Milepoints 95-110	AM Peak	SB	43.5

Source: Project team analysis, FHWA/ATRI FPM Data.

Detailed Corridor Analysis – I-75 Example (north of Atlanta)

Each of the top 10 corridors was analyzed in detail to gain an understanding of the specific *existing* delay characteristics at each location.

For illustrative purposes, one corridor is discussed in the following pages -- the I-75 corridor between milepoints 257 and 275. The specific segment studied is shown in Figure 6.14 assume the current number of lanes & alignment as it exists today (i.e. does not reflect the proposed Northwest Corridor project.)

Figure 6.14 I-75: Milepoints 257 to 275

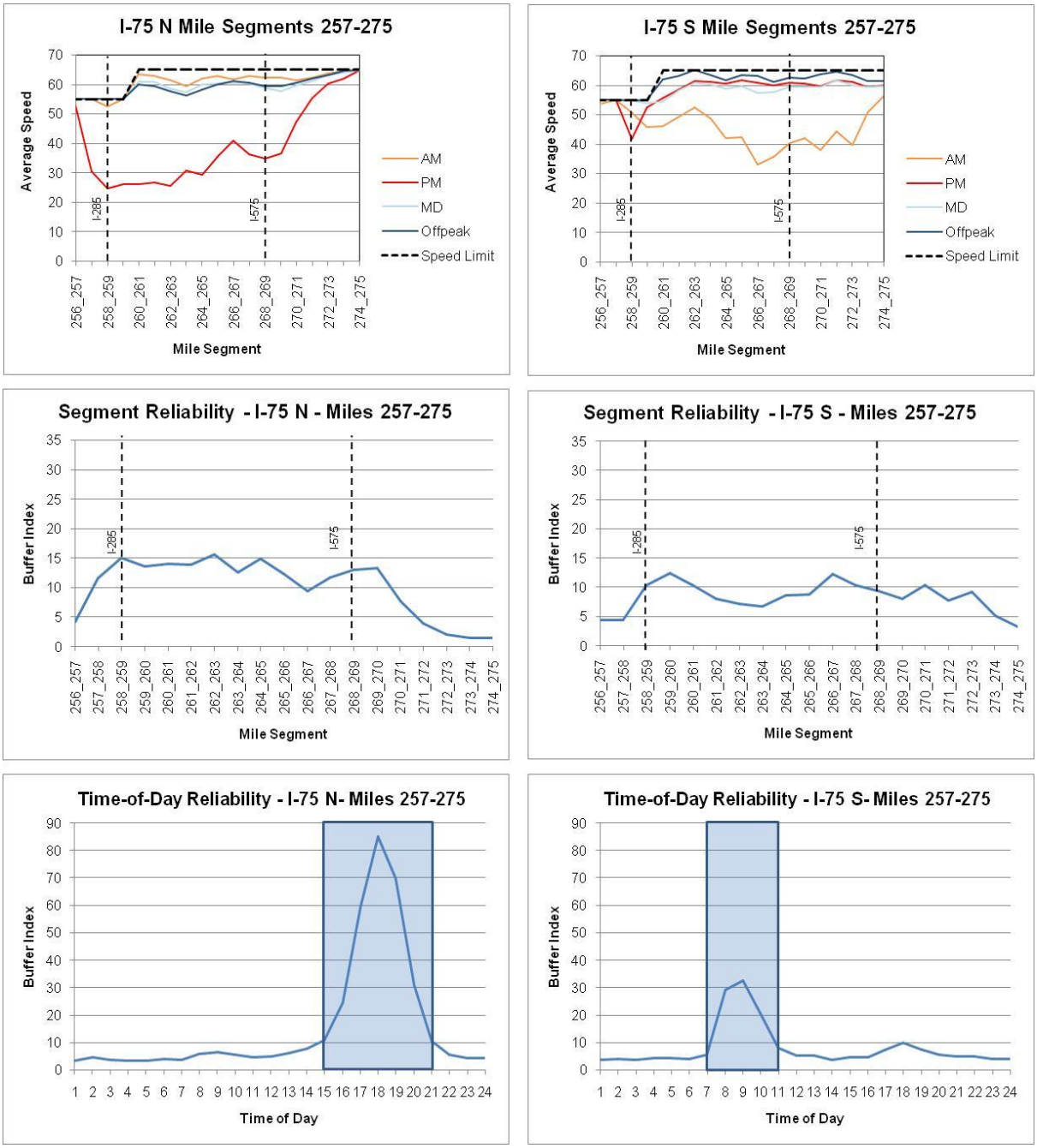
Source: Project team analysis, FHWA/ATRI FPM Data.

On the next page, figure 6.15 displays six graphs describing the delay characteristics at this location. The top left graph shows the average speed by time period over the 20-mile segment in the northbound direction. The top right graph shows the same information in the southbound direction.

In the northbound direction during the PM peak period, the speed is roughly 25 mph on the segment of I-75 intersecting I-285. The speed gradually increases to roughly 35 mph at I-75 and does not reach free-flow speeds until 6 miles north of I-575.

In the southbound direction during the AM peak period, the speed is slowest just south of I-575 with average speeds of roughly 35 mph slowly increasing to free-flow speeds inside of I-285.

Figure 6.15 I-75: Milepoints 257-275…Avg. Speed, Segment &Time-of-Day Reliability



Source: Project team analysis, FHWA/ATRI FPM Data.

The middle two graphs in Figure 6.15 show the buffer index in each direction. The buffer index is the percent of travel time that needs to be added to the free-flow trip time to be 95% confident that the traveler arrives on time. For I-75 northbound at I-285, the buffer index of 15 indicates that a truck driver would

need 15% more travel time relative to free-flow time to be 95% confident they could travel that one-mile segment.

The buffer index is more relevant to specific corridors over time. This is shown in the bottom two graphs in Figure 6.15. These bottom left graph shows that the buffer index peaks at 6:00 p.m. in the northbound direction with a buffer index of roughly 80. At that time, a truck driver would need to plan on a trip along this 20-mile corridor taking 36 minutes to give the driver a 95% probability of traveling the corridor on time. This translates to an extra 16 minutes of travel time that needs to be built into every trip on this corridor.

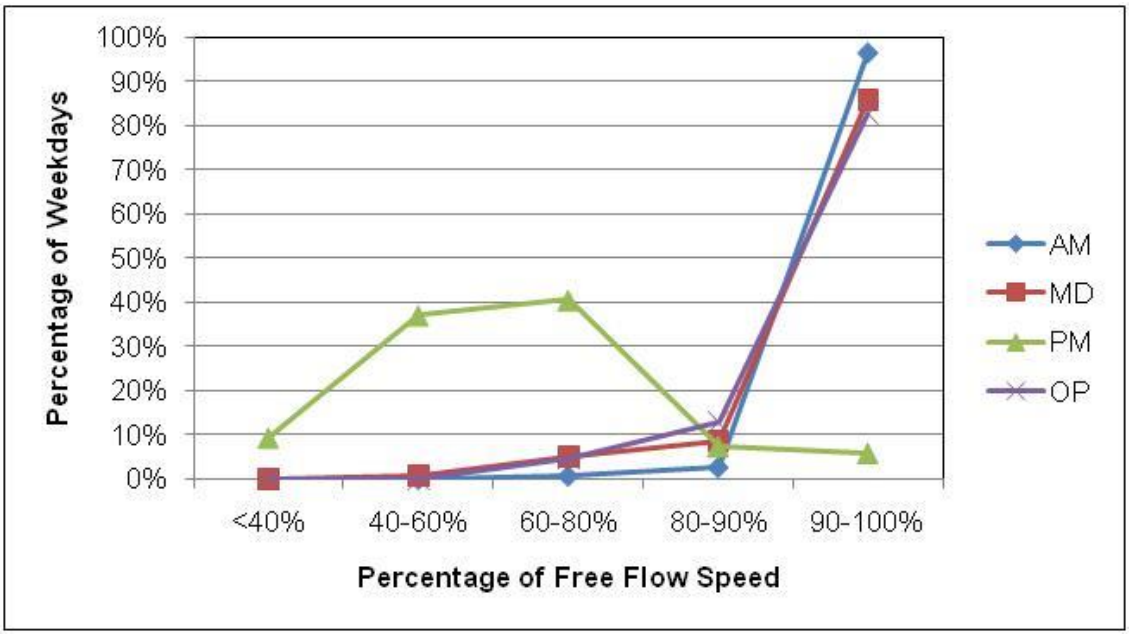
Similarly, in the southbound direction, the peak buffer index of 30 at roughly 9:00 a.m. indicates that a truck driver would need to build in additional 6 minutes of travel time to ensure being on time 95% of the time.

Figures 6.16 and 6.17 on the next page shows the distribution of truck speeds on this corridor in the northbound and southbound direction. The figure shows that in the northbound direction during the p.m. peak period, nearly 50% of trucks are traveling at less than one-half of the free-flow speed, and roughly 90% of the trucks are traveling at less than 50 mph.

In the southbound direction during the a.m. peak period, roughly 70% of trucks are traveling at less than 50 mph. These graphs also highlight the wide variability in potential travel times along the corridor.

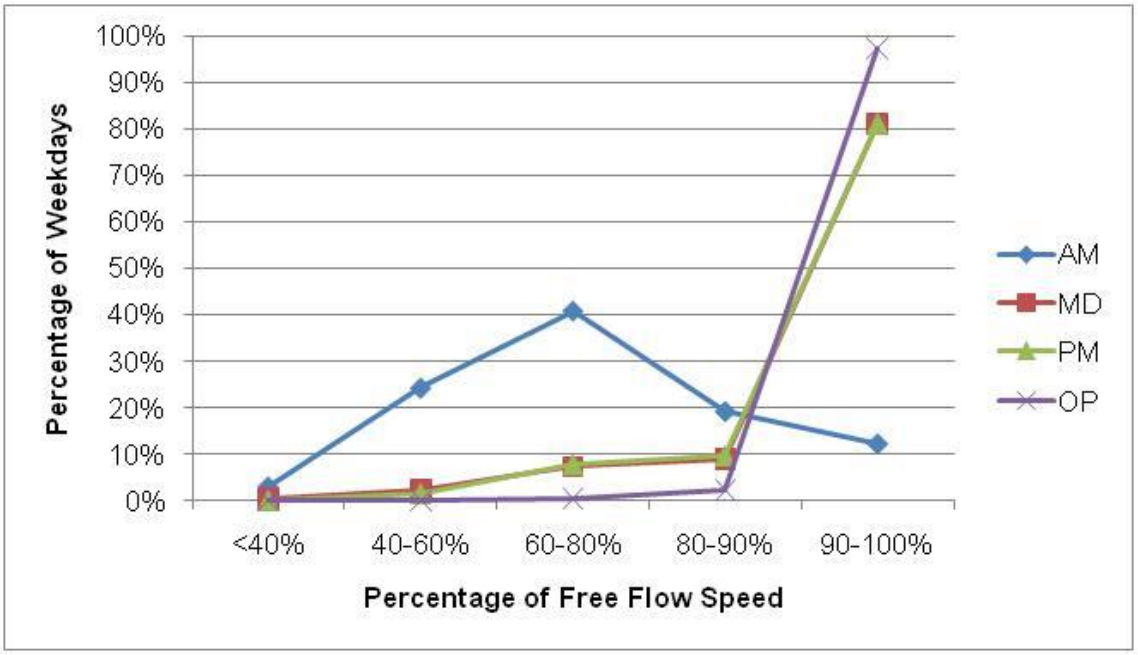
This variability complicates the truck routing and facility planning process for motor carriers. Most are forced to build in significant redundancies into their logistics systems to ensure that on-time delivery is possible for the products that they are moving.

Figure 6.16 Distribution of Average Speeds by Time Period: I-75 North of metro Atlanta between Milepoints 256-275



Source: FHWA/ATRI FPM Data, Project team analysis

Figure 6.17 Distribution of Average Speeds by Time Period: I-75 South of metro Atlanta between Milepoints 256-275



Source: FHWA/ATRI FPM Data, Project team analysis

TABLE 6.3 BOTTLENECK HOT-SPOTS IN GEORGIA

As shown in the following table, numerous national-level truck bottleneck studies have been completed over the past several years. Methodologies varied, as did the data source that was used. The results indicate several Georgia locations that are consistently mentioned. Most of these studies were led by ATRI (the American Transportation Research Institute, an affiliate of the American Trucking Association.)

The following is a summary of Georgia locations cited in the studies; the lower the number means higher ranked in terms of more congestion, comparatively:

ATRI-FHWA National Truck Freight Congestion ***Georgia Locations***	FHWA study 2005 **Initial Assessment of 227 U.S. Freight Bottlenecks on Highways**	FHWA study, 2008 **Estimated Cost of Freight Involved in Highway Bottlenecks**	ATRI study 2009 **Freight Performance Measures Analysis of 30 Freight Bottlenecks**	ATRI study 2009 **Bottleneck Analysis of 100 Freight Significant Highway Locations**	ATRI study 2010 **Congestion Monitoring at 250 U.S. Freight Significant Highway Locations**	ATRI study 2012 **Congestion Monitoring at 125 U.S. Freight Significant Highway Locations**	ATRI study 2013 **Congestion Analysis of 100 U.S. Freight Significant Highway Locations**	ATRI study 2014 **Congestion Impact Analysis of (top 250) Freight Significant Highway Locations**	ATRI study 2015 **Congestion Impact Analysis of (top 250) Freight Significant Highway Locations**	ATRI study 2017 **Top 100 Truck Bottleneck List**	ATRI study 2018 **Top 100 Truck Bottleneck List**
Atl., GA: I-285 @ I-85 (North metro)	**2nd**	**3rd**	**4th**	**5th**	**9th**	**5th**	**14th**	**3rd**	**1st**	**1st**	**1st**
Atl., GA: I-285 @ I-75 (North metro)	**7th**	**18th**	**23rd**	**15th**	**20th**	**13th**	**24th**	**14th**	**12th**	**9th**	**4th**
Atl., GA: I-285 @ I-20 (West metro)	**11th**	-	-	**22nd**	**42nd**	**33rd**	**46th**	**25th**	**26th**	**14th**	**17th**
Atl., GA: I-75 @ I-85 (North metro)	**15th**	**12th**	**17th**	**62nd**	-	**96th**	-	**88th**	**81st**	**73rd**	**90th**
Atl., GA: I-20 @ Fulton Industrial Blvd.	**21st**	-	-	-	-	-	-	-	-		
Atl., GA: I-285 @ SR 400 (southbound 400)	**95th**	-	-	-	-	-	-	-	-		
Atl., GA: I-285 @ SR 400 (northbound 400)	**206th**	-	-	-	-	-	-	-	-		
Atl., GA: I-285 @ I-20 (East metro)	-	**32nd**	-	**37th**	**58th**	**32nd**	**64th**	**23rd**	**52nd**	**43rd**	**46th**
Atl., GA: I-20 @ I-75/85 (Downtown)	-	**4th**	**11th**	**57th**	**79th**	**68th**	-	**61st**	**65th**	**62nd**	**79th**
Atl., GA: I-75 @ I-675	-	-	-	**66th**	**105th**	**101st**	-	**95th**	**86th**	**66th**	**95th**
Macon, GA: I-75 @ I-16	-	-	-	-	**180th**	-	-	**174th**	-		
Savannah, GA: I-95 @ I-16	-	-	-	-	**194th**	-	-	-	**190th**		
Macon, GA: I-75 @ I-475 (South of city)	-	-	-	-	**198th**	-	-	-	-		

6.3 KEY FINDINGS ON TRUCK BOTTLENECKS

Key findings regarding bottleneck *segments* include:

- The highest V/C ratios in Georgia are in metro Atlanta. I-285 has high V/C ratios on its entire alignment. I-75, I-85, I-20, and State Route 400 tend to have their highest levels of congestion around interchanges at I-285, with congestion decreasing moving further away from Atlanta.
- I-85 north of Atlanta is most routinely congested corridor; it has the longest stretch of congestion with V/C ratio higher than 1.0 several miles north of the I-85 interchange with I-985. If no improvements were made, by year 2050 the entire Georgia section of I-85 north of Atlanta would have a V/C ratio 1.0+.
- I-75 is the 2nd most congested corridor in the State. Historic data indicate several segments of congestion between Macon and Chattanooga; ATRI's GPS analysis indicated that three of the four more severely congested interstate segments are along I-75.
  - If no improvements, by the year 2050 the vast majority of the interstate between Atlanta and Macon would have a V/C greater > 1.0.
  - I-75 north of Atlanta performs better than I-85 north of Atlanta (I-75 has a minimum of six lanes throughout Georgia, as opposed to I-85 which has a total of four lanes at most rural locations.)
- I-20 has some regularly-occurring congestion outside of the Atlanta metropolitan region, both today and forecasted for the year 2050.
- I-95 and I-16 are generally forecasted to operate at acceptable travel conditions (volume well below capacity) through the year 2050, except for localized segments in metro Savannah.
- From a statewide look, rural *non*-interstate roads are very *generally* forecasted to have adequate capacity to handle truck and auto traffic by the year 2050.

The key findings regarding bottleneck *hotspots* include:

- Various national studies indicate a significant variability of the ranking of Georgia's hotspot locations.
  - A comprehensive national research project was conducted by the Transportation Board (NCHRP project 08-98) to develop a consistent methodology for analyzing and classifying hotspot bottlenecks.
- Note: The Task 5 recommendations report repeats Georgia's bottleneck hotspots in Table 6.3, but includes information on recently-completed GDOT projects and/or projects under development to improve traffic flow.

7.0 Needs and Issues – Safety

Roadway safety is an issue that is extremely important. Led by the Governor's Office of Highway Safety, detailed crash data is analyzed and tracked. Georgia's overall crash and fatality rates for all types of crashes is shown in Figure 7.1:

Figure 7.1 Georgia and National Average Fatality Rates Compared

	2008	2009	2010	2011	2012	2013	2014	2015
Traffic Fatalities	1,495	1,292	1,247	1,226	1,192	1,180	1,164	1,430
Fatalities Rate*	1.33	1.18	1.14	1.13	1.11	1.08	1.04	1.21
Crashes	306,342	286,896	290,611	289,002	315,459	332,067	333,963	385,221
Crash Rate++	2.72	2.63	2.66	2.66	2.93	3.04	2.99	3.26
Serious Injuries	11,729	12,482	12,483	14,756	15,510	17,040	16,168	19,405
Serious injury Rate++	10.81	11.44	11.17	13.67	14.6	15.61	14.52	16.46
VMT(millions)	112,541	109,057	109,258	108,454	107,488	109,355	111,535	118,107

*Rates are calculated per 100 million Vehicle Miles Traveled
++Rates are calculated per million Vehicle Miles Traveled

Source: Ga. Governor's Office of Highway Safety www.gahighwaysafety.org/research/ga-crashes/injuries/fatalities/

7.1 National Trends

Based on information from U.S. DOT's Federal Motor Carrier Safety Administration, data on truck involvement with crashes indicate:

- *"In 2015, 4,311 large trucks and buses were involved in fatal crashes, an 8-percent increase from 2014. Although the number of large trucks and buses in fatal crashes increased 26 percent from its low of 3,432 in 2009, the 2015 number is still 18 percent lower than 21st-century peak of 5,231 in 2005. From 2014 to 2015, large truck and bus fatalities per 100 million vehicle miles traveled by all motor vehicles increased 1.7 percent, from 0.138 to 0.140.*
- *There was a 34-percent decrease in number of fatal crashes involving large trucks or buses between 2005 and 2009, followed by an increase of 20 percent between 2009 and 2015. From 2014 to 2015, the number of fatal crashes involving large trucks or buses increased 5 percent.*
- *The number of injury crashes involving large trucks or buses decreased steadily from 89,000 in 2005 to 60,000 in 2009 (a decline of 33 percent). This decline was followed by an increase of 62 percent from 2009 to 2015.*
- *Over the past year (from 2014 to 2015):*

- *The number of large trucks involved in fatal crashes increased by 8 percent, from 3,749 to 4,050, and the large truck involvement rate (large trucks involved in fatal crashes per 100 million miles traveled by large trucks) increased by 8 percent, from 1.34 to 1.45.*
- *The number of large trucks involved in injury crashes decreased by 1 percent, from 88,000 to 87,000, and the large truck involvement rate in injury crashes decreased by 2 percent.*
- *The number of large trucks involved in property damage only crashes decreased by 1 percent, from 346,000 to 342,000, and the large truck involvement rate in property damage only crashes decreased by 2 percent.*
- *Vehicle miles traveled (VMT) by large trucks increased by 0.3 percent, and bus VMT increased by 1.4 percent."*[7]

7.2 GA. LAW ENFORCEMENT CRASH RESPONSE

The Department of Public Safety is a state-led agency for the Federal Motor Carrier Safety Assistance Program. This program allows the MCCD to conduct safety inspections of commercial motor vehicles (trucks and buses), highway shipments of hazardous materials, and to perform compliance reviews (safety performance audits) on motor carriers.[8]

Historical MCCD Initiatives

The first part of the interview involves determining what the MCCD already has done in terms of identifying high truck-involved crash locations, and safety improvements. The MCCD already has been generating high-crash traffic locations each quarter, which employs a risk-based crash scoring methodology by assigning costs to different types of traffic accidents. Specifically, a crash score of 1 is assigned to a property-damage-only crash, a score of 13 is assigned to an injury crash, and a fatal crash has a score of 238. These scores are grouped into counties for each of the nine regions to determine the counties with the highest scores. Two reports are produced each quarter using this methodology, a CMV crashes by region by county, and CMV crashes by county, day, and time segment. The reports are useful in identifying counties within each region that have high crashes, but does not pinpoint specific high-crash corridors.

Each region, on the other hand, also generates a High-Crash Corridor Report each quarter. These reports, done by troopers, identify the top three counties in each region that have high-crashes corridors. The names of the corridors also are listed as well as a series of strategies and next steps to improve safety in those

[7] "*Large Truck and Bus Crash Facts, 2015*" FMCSA www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts

[8] http://dps.georgia.gov/motor-carrier-compliance-division-0

areas. This information, again, is useful for enforcement purposes, but the corridors identified are broad (e.g., I-75) and the strategies largely includes holistic enforcement initiatives.

7.3 EXISTING GEORGIA AND NATIONAL TRUCK SAFETY PROGRAMS

Highway Safety Plan

The Governor's Office of Highway Safety (GOHS) publishes a Highway Safety Plan annually, which serves as the state's guide for highway safety initiative implementation and an application for federal grant funding from the National Highway Traffic Safety Administration (NHTSA). The Highway Safety Plan is directly aligned with the priorities of the Georgia Strategic Highway Safety Plan, and is used to justify, develop, implement, monitor, and evaluate traffic safety activities for improvement throughout the federal fiscal year.

Georgia Strategic Highway Safety Plan

The Georgia Strategic Highway Safety Program[9] (SHSP) documents the highway safety progress in Georgia; during development of this document, the latest version available was for 2009. That 2009 version set its primary goal to reduce annual crash deaths to below 1,498 by 2012 through a series of measures and programs, most directly related to trucks is commercial motor vehicle safety and addressed through the Motor Carrier Safety Assistance Program[10] (MCSAP).

The MCSAP was initiated through a Federal grant[11] program managed under the Federal Motor Carrier Safety Administration (FMCSA). It provides financial assistance to states to reduce the number and severity of crashes and hazardous materials incidents involving commercial motor vehicles (CMV). In Georgia, the Department of Public Safety is the lead Georgia agency for the MCSAP, with the MCCD is responsible for the implementation of, and compliance with, the MCSAP guidelines. The state Strategic Highway Safety Plan addresses the heavy truck aspect of safety through summarizing the MCCD's Commercial Vehicle Safety Plan, which will be discussed separately in the following pages.

[9] www.gahighwaysafety.org/highway-safety/shsp

[10] http://dps.georgia.gov/motor-carrier-compliance

[11] www.fmcsa.dot.gov/grants/mcsap-basic-incentive-grant/motor-carrier-safety-assistance-program-mcsap-basic-and-incentive

Georgia Commercial Motor Vehicle Safety Plan[12] (CMVSP)

Enforcing the compliance of commercial motor vehicles is a high priority. The CMVSP is an annual report published to document the progress of MCCD in improving commercial vehicle safety in Georgia.

The goal of the CMVSP is to reduce the fatal crash rate in relation to the Federal goal. Crash reduction focused on increased inspections, compliance reviews, and enforcements. In addition, improving the quality of data is another goal stated in the CMVSP to better identify high-risk carriers, drivers, vehicles and highways within the state.

The CMVSP showed that while performance goals had been met, the determination as to whether crash reduction was met is unsure because of data reporting issues.

The MCCD states that it must continue to identify problem areas that contribute to crash causation and place increased emphasis of those problems identified. In addition, results also show that reductions in vehicles that are out of service and have violations reduced in the last year, as well as increase in traffic enforcement on speeding, failure to obey traffic control devices and seat belt usage.

The MCCD has several emphasis areas to reach the fatalities reduction goal. The MCCD plans to increase enforcements on rural roads, increase driver focused inspections, continue participate in Operation Safe Driver, sponsored by CVSA and FMCSA and obtaining more accurate data.

Georgia's "Ticketing Aggressive Cars & Trucks (GTACT)" Program

The Federal TACT program is a traffic enforcement program that uses communication, enforcement, and evaluation activities to reduce CMV-related crashes, fatalities, and injuries. In Georgia, the GTACT program was initiated to increase driver awareness of CMVs through education and enforcement. The Georgia *Ticketing Aggressive Cars and Trucks Program* is a traffic safety campaign designed to increase driver awareness of the dangers they face with risky driving behaviors around commercial motor vehicles. The program combines educational outreach with traffic enforcement to reduce the number of crashes between commercial vehicles and much-smaller passenger vehicles[13]. Data from the program has shown decrease in crashes involving CMVs and an increased awareness to the general public.

The GTACT program maintains a web site detailing efforts taken so far. In the first wave of the program,

[12] www.gahighwaysafety.org/docs/cvsp2009.pdf

[13] www.georgiatact.net

portions of I-85 and I-285 were targeted as enforcement areas since they were identified as relatively high truck-involved crash corridors based on results from the Federal Motor Carrier Safety Administration (FMCSA), who also funds the state program. Other focus areas of the state included I-75 in the southern part of the state[14]. Specific efforts include cautioning drivers to "leave more space" through enforcement by officers, informing drivers through billboards, radio, ads, and safety message signs. The web site also provides information to educate drivers on how to drive safely.

Examples of other Recent Initiatives in Georgia

The Governor's Office of Highway Safety continues to lead high-visibility safety campaigns[15] such as H.E.A.T., 100 Days of Summer Heat, Hand Across the Border, and Thunder Task Force. One of those, Operation Rolling Thunder, has implications focused on trucks: The Motor Carrier Compliance Division units target violations for large trucks and buses. Division officers focus on commercial motor vehicle operations and inspections as well as compliance reviews. There are several critical issues relating to large truck safety; are on the roadway targeting these types of accident causing violations.

Comprehensive Safety Analysis (CSA) 2010 Initiative

The CSA 2010 Initiative already was identified as the number two trucking related issue in the nation based on the ATRI survey mentioned in Chapter 2. The CSA 2010 is a Federal Motor Carrier Safety Administration (FMCSA) initiative to improve large truck and bus safety by introducing a new enforcement and compliance model that allows FMCSA and its State Partners to track and monitor a larger number of carriers in closer to real time. This process is designed to lead to earlier detection of safety problems, most notably unsafe drivers and truck fleets with disproportionately unsafe vehicles.

The CSA 2010 initiative was prompted due to a slowing of crash reductions and limitations of current compliance models. Limitations include resource intensive compliance reviews that only reach out to a small number of trucks, a lack of targeting contributors for crashes, and a lack of options regarding solutions for identified problems. As such, the CSA 2010 Operational Model is developed and is characterized by:

1. A more comprehensive measurement system that uses inspection and crash results to identify risky behaviors;
2. A proposed safety fitness determination methodology that is based on performance data; and

[14] http://dps.georgia.gov/press-releases/2009-02-26/i-75-truck-safety-campaign-underway

[15] www.gahighwaysafety.org/campaigns/high-visibility-campaigns

3. A comprehensive intervention process designed to more efficiently and effectively correct safety deficiencies.

A key component of the program is that each motor carrier will be rated in a number of compliance areas based on citation and noncompliance information collected. These ratings will then help enforcement personnel to determine which method of intervention to choose from, thus reducing enforcement costs and improving effectiveness. The program was rolled out in December 2010

The impact of this program on safety enforcement in Georgia is that each violation becomes much more important for truck drivers and truck fleet operators.

Other GDOT Safety Programs

GDOT continues its standing safety program with multiple components to identify needed safety improvements and delivering projects to improve safety.[16]

Through its *Georgia Highway Safety Improvement Program* (HSIP), GDOT conducts a continuous and systematic focus on identifying and reviewing specific traffic safety issues around the state and developing improvements. The HSIP program annually allocates funds to complete projects specifically identified in the SHSP. Projects typically pursued under HSIP include moderate-sized operational improvements such as intersection improvements, turn lanes, signage, and signal upgrades.

The GDOT *Off-System Safety Program* (OSSP) funds improvements to road facilities that are maintained by agencies other than GDOT. OSSP is an opportunity for local governments to pursue funds for safety projects from GDOT; the types of projects typically include smaller 'operational' improvements such as pavement markings, rumble strips, and guardrails. OSSP projects are initiated through the GDOT District[17] traffic engineer and coordinated through the Local Maintenance and Improvement Grant[18] process, as all OSSP projects are let locally.

The GDOT *High Risk Rural Roads* (HRRR) program funds improvements to roads functionally classified as 'rural major' or 'minor collectors' that currently or as a result of projected increases in traffic volumes experience fatalities or injuries in excess of the statewide average for that functional class of roadway. GDOT maintained and local roads are eligible for the program, and projects are let by GDOT. The GDOT Office of Traffic Operations prepares a list of eligible routes

[16] http://documents.atlantaregional.com/tcc/2014/2014-03-21/Safety_Program_Overview.pdf

[17] www.dot.ga.gov/AboutGDOT/Districts

[18] www.dot.ga.gov/PS/Local/LMIG

for each GDOT District. A variety of project types are covered by the program, which are more complex than those funded under OSSP, and include work up to the level of railroad grade-separation projects.

GDOT's *Road Safety Audits* (RSA's) are performed to examine the safety performance of existing or future roads to identify potential road safety issues. These reviews are performed proactively by a third party, and area done in the field in order to gain a more comprehensive understanding of the design features of a facility as they pertain to safety.

Additional Georgia Commercial Vehicle Enforcement Officers

In June of 2015, Governor Nathan Deal announced the addition of 60 commercial vehicle enforcement officers to the existing force of 234 at a cost of $10 million.[19] Of these 60 new officers, half will patrol the I-95 and I-16 corridors, and another 20 will be deployed in the metro Atlanta area. Officers work checkpoints to catch impact trucks as well as catch commercial vehicles operating under the influence. At a location along I-95 in Savannah in February 2017, for example, impaired drivers were identified, trucks were taken out-of-service for driving over hours and citations issues for commercial motor-vehicle violations[20].

This increase in patrol numbers is in anticipation of the increased in truck traffic that will result from the Savannah harbor deepening and is also intended as a response to a 4 percent rise in crashes involving trucks since 2012. This increase in patrol officers bolsters the efforts of the GTACT program and the goals of the CMVSP.

[19] http://gov.georgia.gov/press-releases/2015-06-11/deal-expands-highway-safety-enforcement-efforts

[20] www.wtoc.com/story/34580366/law-enforcement-checkpoint-to-catch-impaired-truckers-along-i-95-in-chatham-co

8.0 Needs and Issues: Truck Parking

This section compares truck parking supply and truck parking demand to determine the adequacy of commercial vehicle parking at various locations in 2011. Even though more recent analysis was completed by several entities (and discussed later in this section), the following pages discuss the methodology pursued in 2011.

8.1 TRUCK PARKING SUPPLY STUDY

Truck parking supply consists of the types of truck facilities: truck stops and truck rest areas. Truck stops are privately-owned commercial facilities that provide an opportunity to rest and fulfill many nonrest-related activities, including refueling, eating, and potentially access to the Internet. Rest areas are publicly-owned facilities that offer truck drivers with minimal services. They are primarily used for long periods of rest, typically associated with overnight stays. These facilities were also discussed in Section 3.4 of this report.

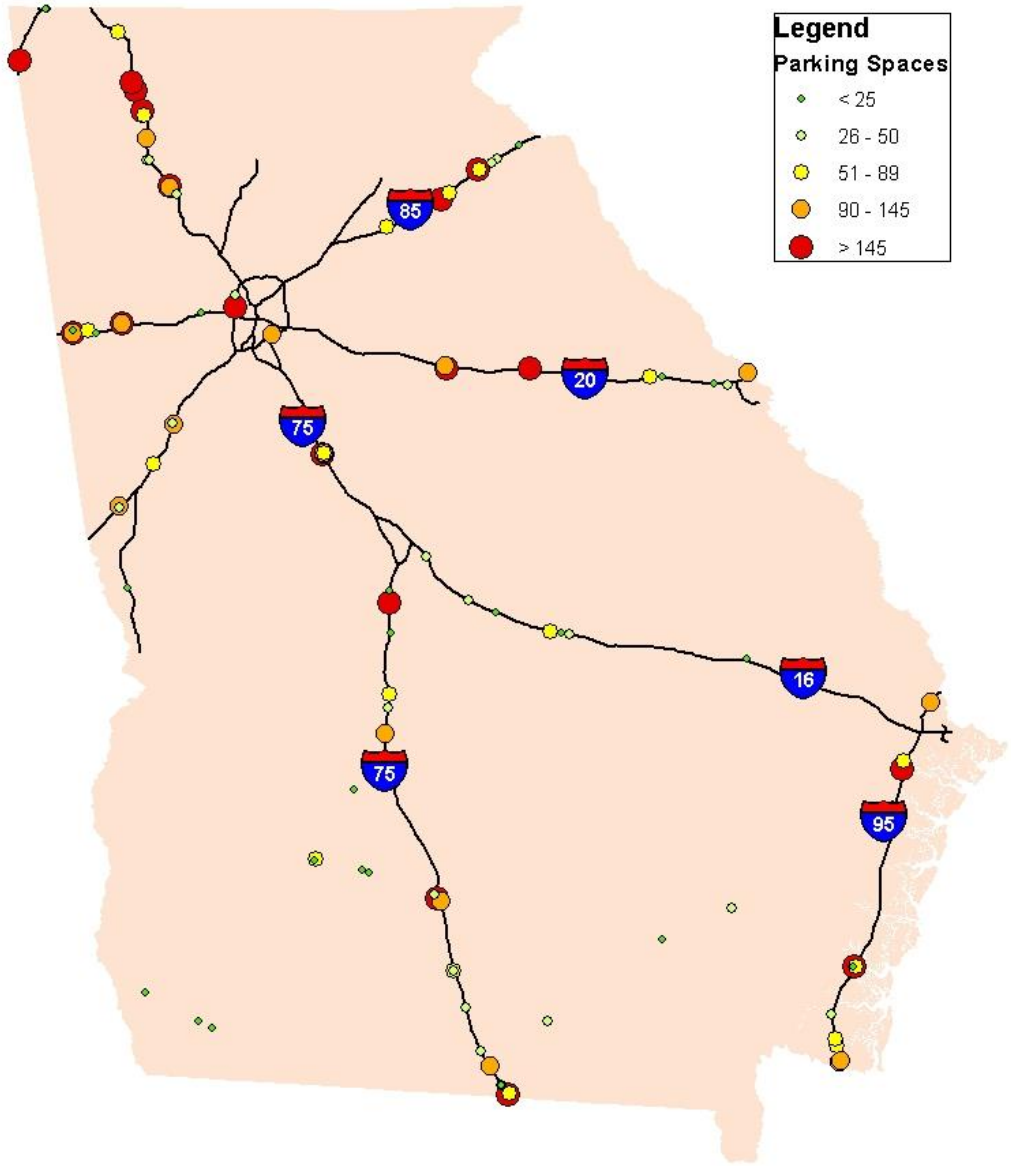
Figure 8.1 shows the location of commercial truck stops along the Interstate system in Georgia and the number of parking spaces at each truck stop, as of 2011. These maps were developed based on a combination of a pre-existing ATRI truck stop database and visual observation using Google Earth. As mentioned in Chapter 3 of this report, the figure shows that the vast majority of truck stops are located in rural regions. This is primarily due to the availability of relatively inexpensive land and the ability to attract intercity truck traffic at rural locations. Figure 3.11 shows the location of rest areas and weigh stations in Georgia along with the number of parking spaces at each location.

Each truck stop and rest area was assigned to a corridor based on its location. Most truck stops are located off of the interstate, because these are the locations with the most traffic. Table 8.1 shows the number of parking spaces on each of the long-haul corridors in Georgia. This represents truck parking supply by interstate corridor for Georgia.

As mentioned in Chapter 3, nearly half of the total truck parking spaces in the State are on I-75. In terms of density (spaces per freeway mile), the I-20 west of Atlanta corridor was the highest with over 18 parking spaces per freeway mile -- 50% more than the state average of 11 parking spaces per freeway mile. Truck parking density is lowest on I-16 with 2 parking spaces per freeway mile.

Weigh stations were also calculated as part of the truck parking supply, because Georgia allows trucking parking at weigh stations at non-operating hours.[21] The numbers of spaces are then summed up for each of the nine corridors regions as shown in Figure 8.1 below. I-285 and the Interstate segments within the I-285 bypass are not considered due to the high percentage of short haul truck traffic on these facilities.

Figure 8.1 Parking Spaces at Truck Stops, 2011



Source: ATRI Truck Stop Data and project team analysis (2011)

[21] Study of Adequacy of Commercial Truck Parking Facilities – Tech. Report, FHWA, 2002.

Table 8.1 Truck Parking Spaces per Highway Mile

Corridor	Total Distance (Miles)	Total Parking Spaces	Parking Spaces per Mile
I-20 West of Atlanta to Alabama Line	50	902	18
I-75 North of Atlanta to Tennessee Line	94	1,587	17
I-75 South of Macon to Florida Line	156	2,515 [22]	16
I-95 from South Carolina Line to Florida Line	111	1,558	14
I-85 North of Atlanta to South Carolina Line	83	969	12
I-85 South of Atlanta to Alabama Line	81	628	8
I-75 South of Atlanta to Macon	67	512	8
I-20 East of Atlanta to South Carolina Line	133	978	7
I-16 Macon to Savannah	164	391	2
Total	**939**	**10,040**	**11**

Source: Project team analysis (2011)

8.2 TRUCK PARKING DEMAND

The demand for truck parking is estimated using a methodology adopted from the FHWA Report, *Study of Adequacy of Commercial Truck Parking Facilities.* The report determined the supply and demand of parking for Georgia as a whole based on 2002 data. The analysis in this chapter extends the FHWA methodology to estimate truck parking demand for specific long-haul corridors based on current year truck travel data. Long-haul trucks are the truck types of greatest concern because they have longer rest periods, and therefore require more parking hours than short haul trucks. Short haul trucks tend to return to their home base at the end of the day.

The demand for long-haul truck parking spaces can be determined by multiplying a **peak-parking factor** for long-haul trucks with the **total parking time**. This peak-parking factor is the ratio of peak parking demand (in spaces) to total daily parking demand (in hours) for long-haul trucks. If parking demand were evenly distributed throughout the day, this value would be 1/24 or about 0.04. Because parking demand for long-haul trucks is concentrated during overnight hours, this number should exceed 0.04. A value of 0.09 was generated by FHWA based on visual observation of parking activity at truckstops.

[22] Figures do not reflect Feb. 2016 announcement of a proposed new truck stop near I-75/Sardis Church Road with 119 truck parking spots http://www.macon.com/news/business/article61847442.html

The total parking time can be determined from multiplying the **total driving time** (hours of travel per day) with the **long-haul parking ratio**. The total highway driving time (THT) can be determined from this equation:

$$THT = Truck\% * AADT * L/S$$

THT is the average truck-hours of travel per day;

Truck% is the percentage of daily volume consisting of trucks;

AADT is the annual average daily traffic;

L is the length of the roadway segment in miles; and

S is the average speed of the trucks in miles per hour.

Each of the four independent variables were estimated using outputs from the Georgia statewide travel demand model.

Next, the long-haul parking ratio needs to be determined. This is the ratio of the total parking time to the total driving time for long-haul trucks. The following equation is used by FHWA to estimate this parameter:

$$PR_{LH} = \frac{8days \times \frac{24hr}{day} - T_{DRIVING} - T_{HOME} - T_{LOAD/UNLOAD} - T_{SHIPPER/RECEIVER}}{T_{DRIVING}} + \frac{5min}{60min} = 0.7833$$

Where,

$T_{DRIVING}$ is the time driving for long-haul drivers (value = 70h/8days);

T_{HOME} is the time at home for long-haul drivers (value = 42h/8days);

$T_{LOAD/UNLOAD}$ is the loading and unloading for long-haul drivers (value = 15h/8days);

$T_{SHIPPER/RECEIVER}$ is the time at shipper/receiver for long-haul drivers (value = 16h/8days).

This equates to a long-haul parking ratio of 0.7833 for the State of Georgia.

Using the THT and long-haul parking ratio, now we can determine the total parking time for each corridor. Note that the THT also needs to be multiplied with the **seasonal peaking factor** of 1.15 to adjust the annual average daily traffic to a seasonal peak day to better estimate the maximum peak demand for truck parking. This seasonal peaking factor represents a peak truck volume of 15 percent above the average.

To eliminate short-haul truck trips in rural and urban areas from the analysis, the portion of short-haul truck trips from the THTs for both the rural and urban portions is removed. To determine how much short-haul trips there are for rural and urban corridors, ArcGIS software was used to overlay urban MPO boundaries with the corridors. The THTs for the urban and rural segments are

the calculated separately. Next, the FHWA short-haul to long-haul ratios were applied to determine the percentages of long-haul trucks. By multiplying the THTs with the percent of long-haul trucks, the appropriate short-haul truck trips were removed. The long-haul percentage was estimated to be 93 percent for rural segments, and 64 percent for urban segments based on origin-destination surveys conducted as part of the FHWA study.

The final peak-period truck parking demand for each of the corridors in Georgia is shown in Table 8.2 along with the corresponding truck parking supply, and parking adequacy calculations.

Table 8.2 Truck Parking Adequacy for Corridors in Georgia

Corridor	Peak Period Truck Parking Demand	Truck Parking Supply	Excess Parking Spaces	Percentage Difference
I-75 Middle GA	1,721	2,515	794	46
I-20 West GA	532	902	370	69
I-20 East GA	750	978	228	30
I-95	1,425	1,558	133	9
I-75 North GA	1,538	1,587	49	3
I-85 North GA	1,000	969	-31	-3
I-85 South GA	551	512	-39	-7
I-16	811	391	-420	-52
I-75South GA	1,076	628	-448	-42

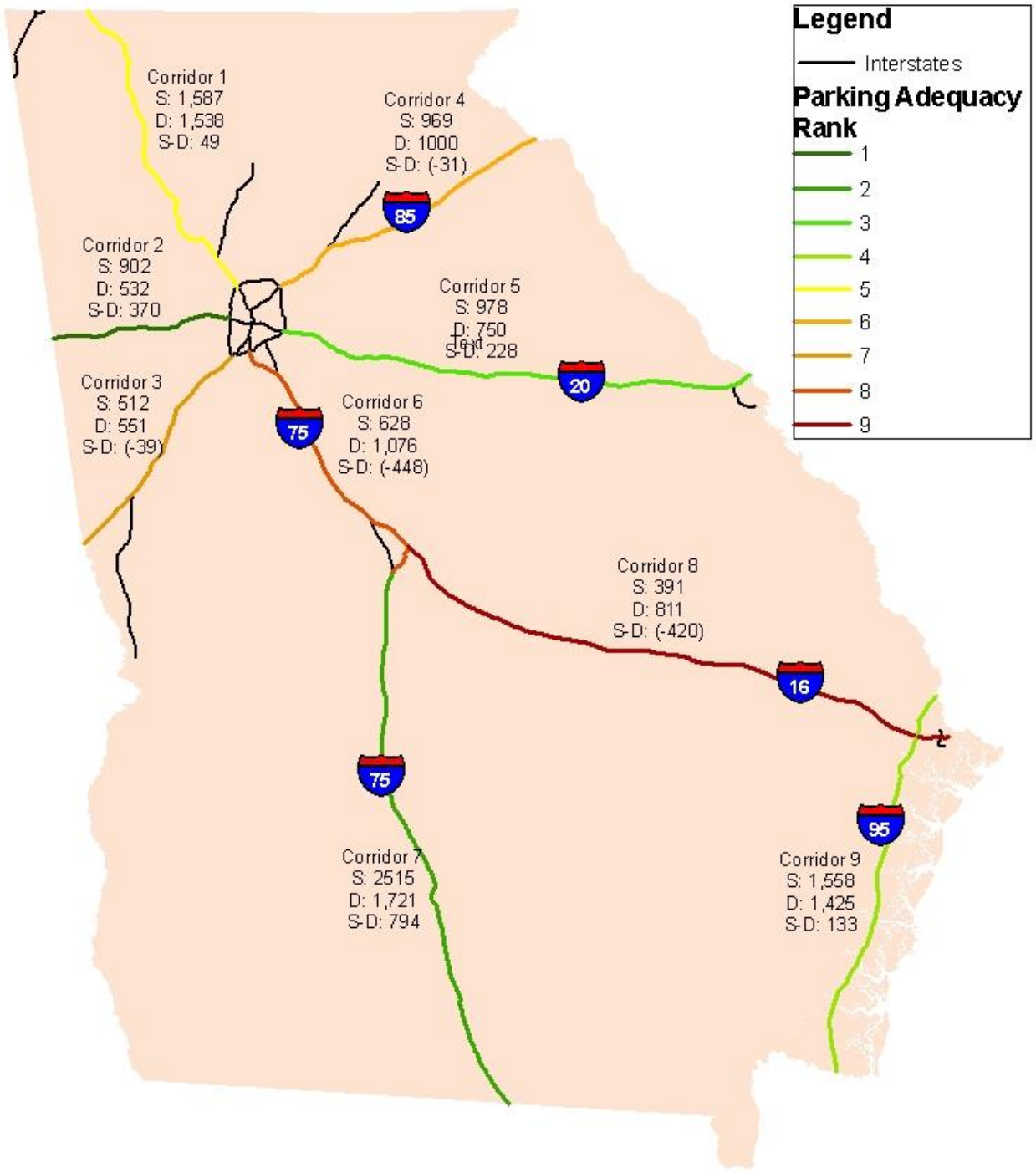
Source: Project team analysis (2011)

8.3 RESULTS

Table 8.2 shows the results of the analysis for each corridor. Based on this methodology, the most likely location of truck parking shortages are I-75 between metro Atlanta and metro Macon, I-16, I-85 south of metro Atlanta, and I-85 north of metro Atlanta.

Figure 8.2 displays the truck parking supply and demand in graphical terms. The colors on the map show the relative shortage intensities along each corridor, with red indicating the most severe shortage, green indicating adequate truck parking.

Figure 8.2 Truck Parking Adequacy for Corridors in Georgia, 2011



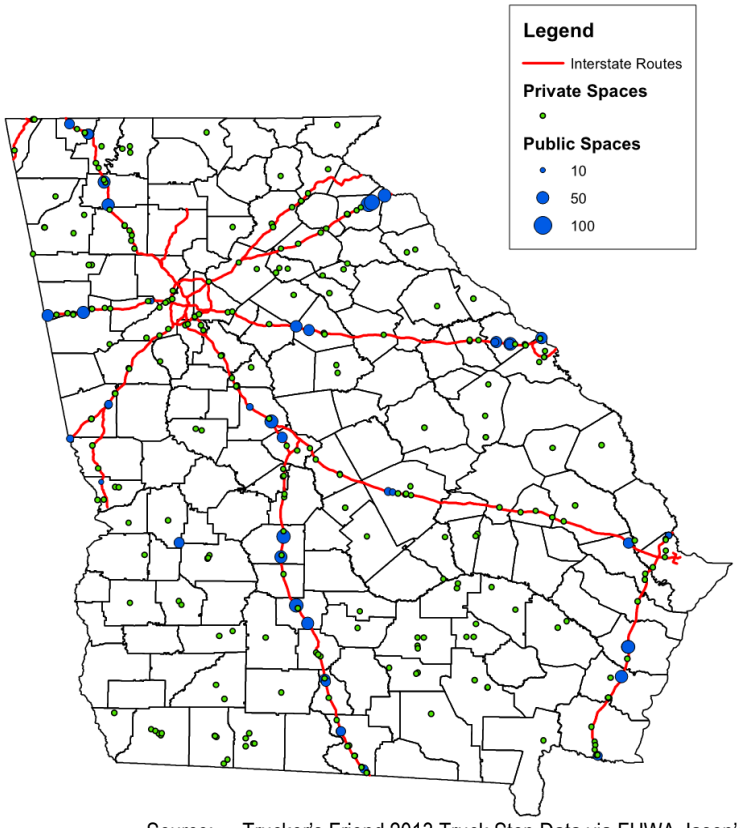
Source: Google Satellite Image Data (2011)

8.4 KEY FINDINGS ON TRUCK PARKING

- Since the truck parking analysis in this report was completed, FHWA released the results of its Jason's Law Truck Parking Survey[23] in July, 2015. The Survey was conducted as mandated by MAP-21 in order to conduct a comparative assessment of the capability of each State to provide adequate parking and rest facilities for commercial motor vehicles engaged in interstate transportation, assess the volume of commercial motor vehicle traffic in each State, and develop a system of metrics to measure the adequacy of commercial motor vehicle parking facilities in each State.

  This study identified public spaces in terms of how many truck spaces are available at these stops. Information for the number of spaces at private stops was not provided, and these locations are shown at a uniform size. The vast majority of public spaces are located along interstate routes, outside of inner-city areas.

Public and Private Truck Parking Spaces



Source: Trucker's Friend 2013 Truck Stop Data via FHWA Jason's Law Study

[23] www.ops.fhwa.dot.gov/freight/infrastructure/truck_parking/jasons_law/truckparkingsurvey/index.htm

Late 2015 was the release for a study done by *Overdrive* Magazine, a trucking industry publication. It ranked the U.S. states with the most severe parking problems, based on three elements: two from the FHWA study and the third from *Overdrive*'s reader survey. The Overdrive study focused on the 'Top 20 worst states for Truck Parking' and found that Georgia was ranked at 27.8 with only 12.4% of available spaces being publicly-controlled[24].

- The national ranking of each state is shown below. **Red** are states where problem is worst; **blue** states are where parking is most plentiful; **gray** are those in the middle:

Source: www.overdriveonline.com/parking

- In addition, a new National Coalition on Truck Parking was announced that will work to find solutions to the nation's truck parking shortage that was found to exist in the Jason's Law Truck Parking Survey[25]. The findings in the survey show most states reported having truck parking shortages occurring at all times of the day on every day of the week. The National Coalition on Truck Parking will consist of many public and private stakeholders. The Coalition was announced simultaneously with the release of the Jason's Law Survey results.

- Technology advances continue; for example more information is becoming available to truckers seeking information on parking facilities.

[24] www.overdriveonline.com/parking

[25] www.truckinginfo.com/news/story/2015/08/new-coalition-to-look-for-truck-parking-solutions.aspx

Private sector websites continue to be improved providing truckers with information on truck stops, including location, open 24 hour or not, and parking lot size.

- Examples include
  - www.truckstopinfoplus.com/show_list.asp?state=Georgia
  - www.allstays.com/c/truck-stops-georgia.htm.
- The public sector is also providing web-based information for those truckers wishing to use truck stops with electrified facilities; the US Department of Energy maintains a website listing truck stops with electrification facilities:
  - www.afdc.energy.gov/truckstop

- Since the original analysis was done, the capacity of truck parking in Georgia continues to increase as private-sector truck stops are built or expanded. Monitoring these major proposals in Georgia is accomplished through the state Department of Community Affairs' Development of Regional Impact program. Recently, several new sites have been proposed or built adjacent to I-20, I-75 and I-85 on the periphery of metro Atlanta. www.dca.ga.gov/DRI/Submissions.aspx

- As noted on the next page, most recently GDOT is coordinating with the Atlanta Regional Commission's on their Atlanta Regional Truck Parking Assessment Study[26]. With a study area that includes all of the 20-county metro Atlanta area in addition to the next 'ring of outer' counties, it is taking into account such issues as ongoing addition of private-sector truck parking capacity in the region, planned land-use changes for warehouse/logistics-based industries that may affect truck parking demand in future, and considering ongoing influences from technology/apps[27] in providing information on parking availability via a crowdsourcing paradigm[28].

[26] https://atlantaregional.org/transportation-mobility/freight/atlanta-regional-truck-parking-assessment-study

[27] www.truckinginfo.com/channel/drivers/news/story/2016/10/park-my-truck-app-helps-driver-find-available-parking.aspx

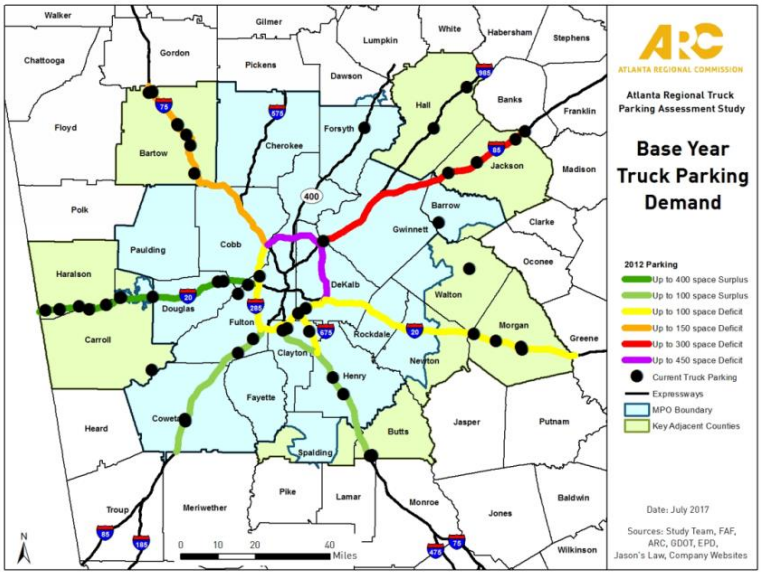
[28] www.trucks.com/2016/07/13/truck-parking-app

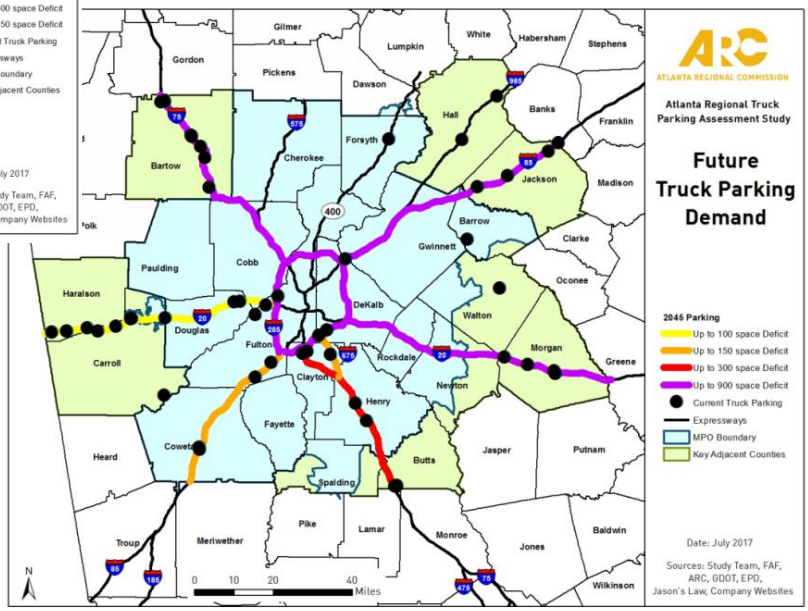
RECENT TRUCK PARKING RESEARCH IN GEORGIA

The Atlanta Regional Commission (ARC), working with GDOT, FHWA, and transportation planners/engineers; Community Improvement Districts; and members of the private sector from throughout the 20-county metro Atlanta region, initiated work on its Atlanta Regional Truck Parking Assessment Study during 2017. Prompted by the 2016 ARC Regional Freight Mobility Plan Update, study tasks included gathering truck parking demand data and inventory from local, regional and federal sources. During that process, many cities and counties in the Atlanta region identified truck parking as an issue in their jurisdiction.

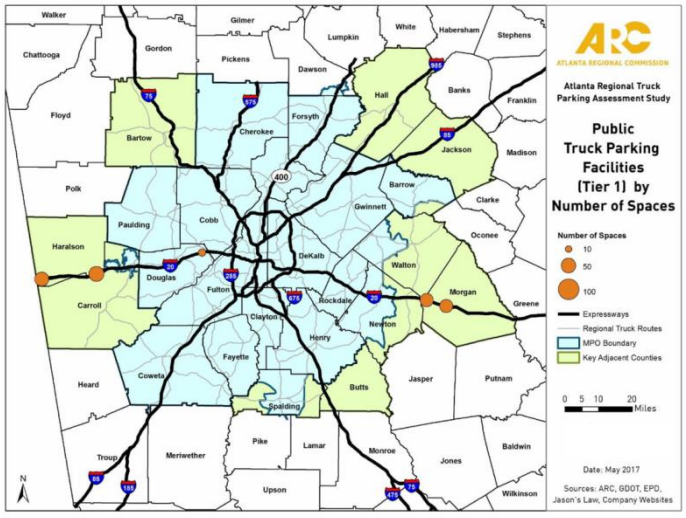
The study will culminate in early 2018 with completion of a final report containing an existing conditions analysis, needs assessment, and potential recommendations for both infrastructure and policy that could address regional truck parking needs. Full information is available on the study website:

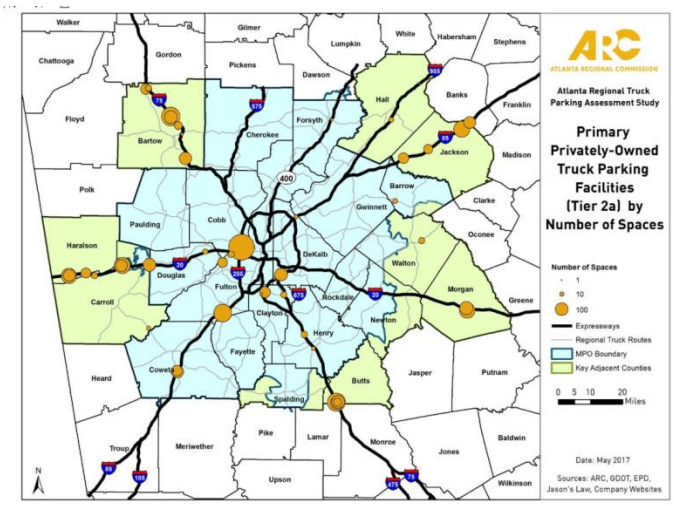
https://atlantaregional.org/transportation-mobility/freight/atlanta-regional-truck-parking-assessment-study





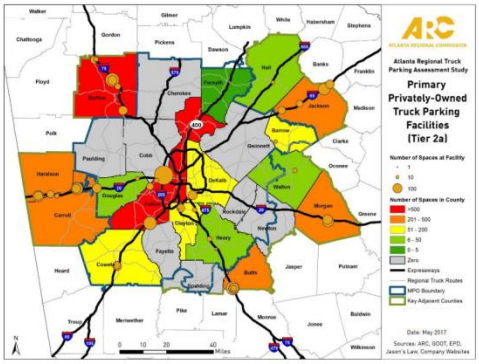
Source: https://atlantaregional.org/wp-content/uploads/08-31-17-lucc-truck-parking-study.pdf





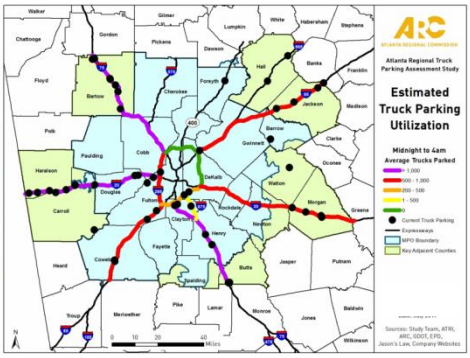
Private Spaces by County

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



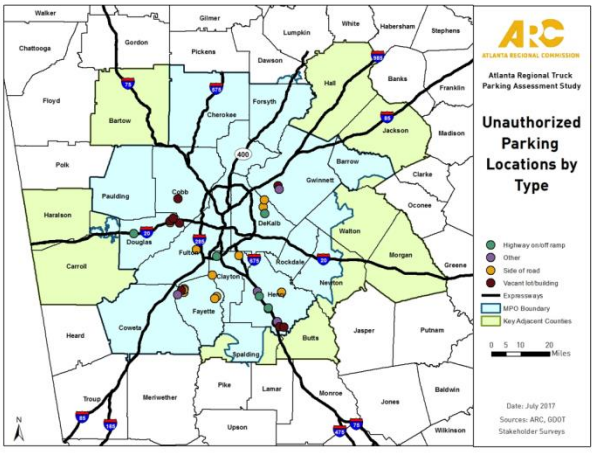
FHWA Truck Parking Demand Model

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

Legend - Corridor Level Results

- Up to 400 space Surplus
- Up to 100 space Surplus
- Up to 100 space Deficit
- Up to 150 space Deficit
- Up to 300 space Deficit
- Up to 450 space Deficit

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



Source: https://atlantaregional.org/wp-content/uploads/08-31-17-lucc-truck-parking-study.pdf

Security / Cargo Theft

Cargo security can be another aspect of truck parking considerations. Because Georgia is major logistics hub making cargo theft prevention an important priority for the state, in 2009 Georgia Governor Purdue led formation of the Major Theft Unit of the Georgia Bureau of Investigation (GBI).[29]

In that year, it was estimated that 43.5 million truckloads of cargo, valued at $1.4 trillion, traveled through Georgia's highways.[30] In 2017, Georgia was ranked #6 in the nation for cargo theft.[31]

The Unit's formation was preceded by a cargo bill law enacted in 2004, with later legislation coming in 2005 that stiffened the penalties for those convicted of cargo theft.[32]

[29] https://investigative-gbi.georgia.gov/major-theft-unit

[30] www.walb.com/story/11969710/gbi-major-theft-unit-recovers-stolen-cargo

[31] http://businessinsavannah.com/bis/2017-04-01/georgia-truckers-gbi-work-cut-cargo-theft

[32] https://gbi.georgia.gov/press-releases/2009-07-23/american-trucking-association-award-dekalb-county-police-det-keith-lewis

9.0 Needs and Issues: Truck Size and Weight

This chapter describes the laws, regulations, processes, and issues for operating oversize/overweight vehicles in Georgia. This section will provide only a *general* review of Federal and Georgia size and weight laws.

FOR LATEST GDOT INFO & REQUIRMENTS, CALL (844) 837-5500 OR VISIT WEBSITE:
www.dot.ga.gov/PS/Permits/OversizePermits

9.1 GEORGIA TRUCK SIZE AND WEIGHT LAWS

Georgia state statute defines the size and weight limits for vehicles that can operate on Georgia highways without obtaining a special permit. The majority of commercial vehicles on Georgia's highways operate within these legal limits. Above these limits, the motor carrier (or passenger driver, for a private vehicle and load, for example a boat of exceptional dimension) must purchase a permit issued by the Georgia Department of Transportation (GDOT). This concept is defined in a combination of both Federal Law and Georgia state law (Code Section 32-6-1) [33] as well as in GDOT published rules (672-2) [34].

Most vehicles are governed by the same width, height, length (including overhang), and weight limits. Some vehicles, often within a specific commodity class, are exempt from some of these limits. A summary of common exemptions from these limits are outlined later in this chapter.

Limits and Route Type When Traveling *Without* a Permit

The size and weight limits for a vehicle that does not need a permit (commonly referred to colloquially as a "legal vehicle") depend on the designation of the highway segments being traveled. Specifically, differentiation for the following:

- **Interstate Highway System –** Weights are governed by the Federal Bridge Formula, to an absolute maximum of 80,000 pounds. According to FHWA, "Congress enacted the Bridge Formula in 1975 to limit the weight-to-length

[33] www.dot.ga.gov/PS/Permits/OversizePermits#tab-4

[34] www.dot.ga.gov/PS/Permits/OversizePermits#tab-4

ratio of a vehicle crossing a bridge. This is accomplished either by spreading weight over additional axles or by increasing the distance between axles." A calculator for determining the legal weight depending on the configuration of the vehicle is available at the FHWA web site.[35] Vehicles also have different limits for vehicle length when using Interstate highways.

- **National Highway System (NHS) –** Vehicles on the national highway system have different limits for vehicle length when using NHS highways.
- **State Designated System and Other State Routes –** Vehicles on the State Designated System or other state routes have a different formula for maximum weight for vehicles with two, three, or four axles, and are subject to different rules regarding maximum legal length.
- **County Roads –** Travel on county roads limited to a lower max.gross weight.

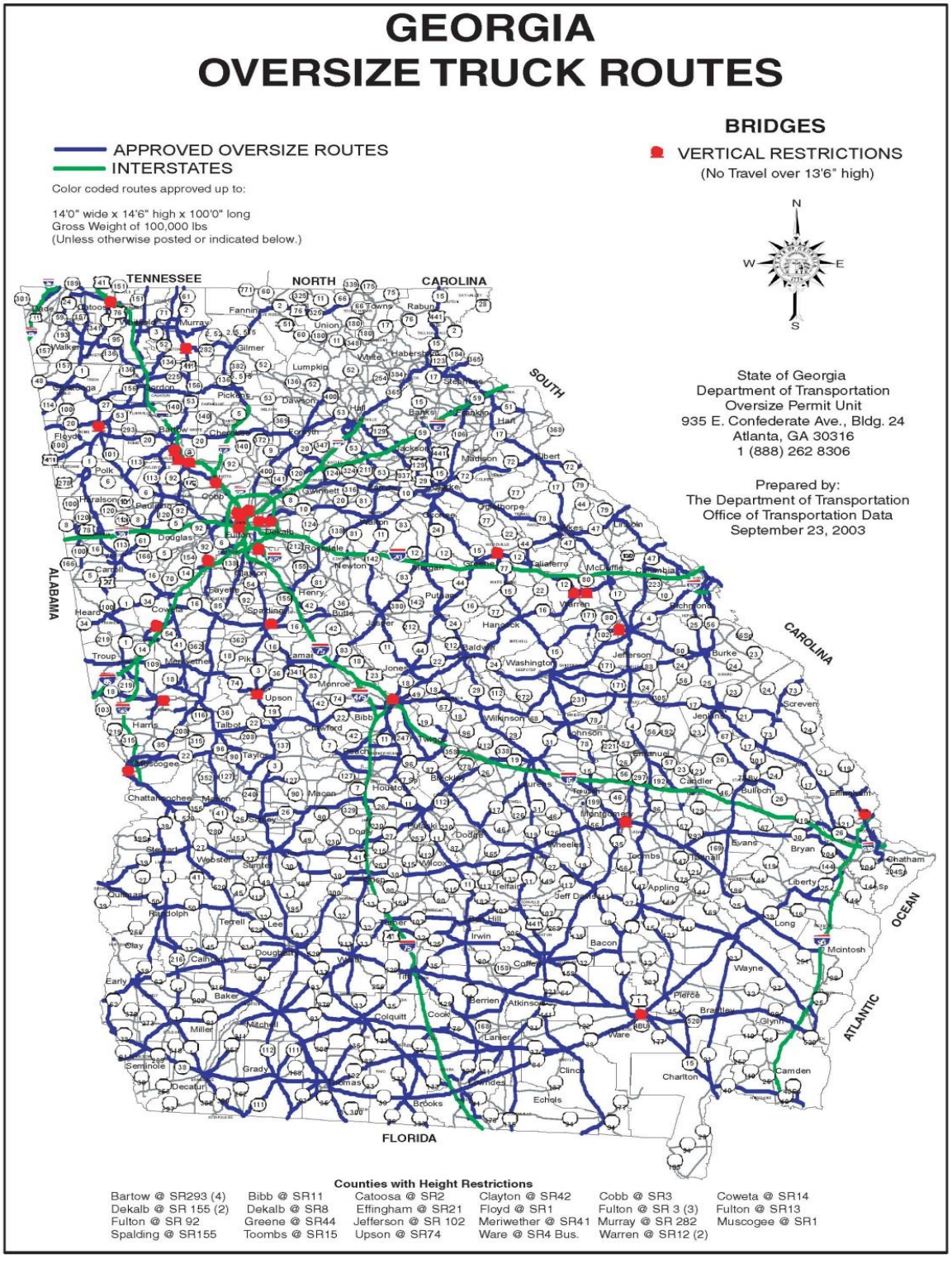
General Limits

The following limits on size and weight generally apply in Georgia.

- **Gross Weight –** Regardless of state or Interstate highway, no vehicle and load can exceed 80,000 pounds without obtaining a permit. Depending on the configuration of the vehicle and load, limits of less than 80,000 may apply. County roads are further limited to 56,000 pounds unless making a pickup or delivery with the appropriate documentation.
- **Axle Weight –** In addition to the overall gross weight of the vehicle and load, specific axles and groups of axles are subject to individual limits. A single axle is limited to 20,340 pounds, and a tandem axle is limited to anywhere between 34,000 and 40,680 pounds depending on the highway(s) being used and the overall configuration and dimensions of the vehicle.
- **Height –** Maximum allowed height in Georgia without a permit is 162 inches, or 13 feet 6 inches.
- **Width –** Maximum allowed width in Georgia without a permit is 102 inches, or 8 feet 6 inches.
- **Length**, as defined by AASHTO, is the total longitudinal dimension of a single vehicle, a trailer, or a semitrailer, including bumper and load but excluding noncargo-carrying equipment. The maximum legal length of a vehicle is based on the configuration of the vehicle and in some cases, the load being carried. In general, however, single trailers are limited to 53 feet, multiple trailer units on state routes are limited to 28 feet per trailer, and overall maximum legal length can vary up to 100 feet depending on configuration.

[35] http://ops.fhwa.dot.gov/freight/sw/brdgcalc/calc_page.htm

Figure 9.1



Source: GDOT www.dot.ga.gov/PartnerSmart/permits/Documents/GaOversizeTrkRouteMap.pdf

Legal Limit Exceptions

This section highlights some of the most common commercial vehicle exceptions to the size and weight laws listed above. In addition to exceptions to the legal limits on some commercial vehicles, there are additional exceptions to the nondivisible load permitting provisions.

The most common exception to state law is for industry-specific exceptions to the weight limits for non-Interstate routes. A limit of 23,000 pounds per axle to a total maximum gross weight of 80,000 pounds is available for the following industries:

- Hauling forest products from the forest where cut to the owner's place of business, plant, plantation, or residence;
- Hauling live poultry or cotton from a farm to a processing plant;
- Hauling feed from a feed mill to a farm;
- Hauling granite, either block or sawed for further processing, from the quarry to a processing plant located in the same or an adjoining county; or
- Hauling solid waste or recovered materials from points of generation to a solid waste handling facility or other processing facility; and
- Hauling unhardened concrete from plant to customer.

Another area where exceptions are common are in the nonpermit maximums for length. Some examples of exceptions are:

- Car and boat carriers allow a load length of 65 feet, a tractor/trailer unit of 60 feet, and overhangs of three feet to the front and 4 feet to the rear;
- Stinger steered units are limited to a maximum of 75 feet, with overhangs of 3 feet to the front and four feet to the rear; and
- Overall length is unlimited on state routes when twin trailer combinations with 28 feet trailer units are used.

9.2 GDOT PERMIT OFFICE

Permits for traveling above legal limits are issued by the GDOT' Oversize Permit Unit. The Permit Unit issues approximately 180,000 permits annually. Customers can apply for a permit either by fax or by using an on-line permit ordering application. The Oversize Permit Unit is comprised of approximately 25 staff, and will interact with the agency's structural engineers in the Bridge Maintenance Unit if a detailed analysis of bridge impacts is required for a proposed permitted vehicle.

For vehicles and loads that exceed the previously outlined sizes and weights, permits are issued by the GDOT's Oversize Permit Unit. There are two types of permits available, trip and annual, each with different limitations and fees.

Trip Permits

Trip permits comprise approximately 80 percent of the size and weight permits that the GDOT issues each year. These permits are valid for a specific number of travel days and times

Though Georgia law does not specify axle limits for their trip permits, the following table shows their published "typical allowed weights" by number of axles.

Table 9.1 Typically Allowed Weights for Overweight Permit Applications

Number of Axles	Typically Allowed Weights (Pounds)
1	23,000
2	46,000
3	60,000
4	92,000
5	100,000
6	125,000
7	148,000
8	150,000

Source: GDOT web site.

The following information is required for an overweight or oversize trip permit:

- A description of the load;
- Name of transporter;
- Origin and destination;
- Routes of travel (for loads with dimensions greater than 12 feet wide, 13 feet and 6 inches high, 125 feet in length, or 100,000 pounds); and
- Insurance provider information.

Standard single trip permits have a fee and are subject to width/height/weight limits.

Superload trip permits have a fee as well. Weights are limited, and width and height are generally considered; the issuance of a permit is based on the specific dimensions available on the requested route.

Superload plus permits have a fee and require analysis of the impact of the proposed vehicle on the bridges to be traversed, conducted by one of the Department's structural engineers. For these trip permits, contact GDOT well in advance to accommodate these requirements.

Annual Permits

Annual permits comprise approximately 20 percent of the size and weight permits that the GDOT issues each year. Annual permits are good for a period of one year from the date of purchase. These are interchangeable within the same company, as long as the original is in the transport vehicle at the time of

movement; may be used for any load type that is not divisible, and does not exceed any dimension as listed on the permit. The carrier is required to maintain liability insurance with the GDOT as the certificate holder and must be on file with the Department for the duration of the permit. Unlike trip permits, annual permits may be used on any route, although it is the responsibility of the permit holder to ensure that the route being travel does not have height or width restrictions or posted bridge weight limits. A maximum allowed axle weight is in effect pounds unless otherwise specified.

Standard annual permits have a fee and specify width, height, length and weight limits.

Annual plus permits have a fee and travel is allowed only on NHS routes. They have limits on width, height, length and weight.

Applications for permits of gross vehicle weight above a certain threshold must undergo an engineering review before a decision is made about permit issuance. This review is conducted by the bridge maintenance function at GDOT. The bridge maintenance staff considers the impacts the vehicle would have on bridges being traversed, determines if the vehicle can move safely, and imposes travel restrictions on the permit such as traveling at 5 miles per hour on certain bridges.

Depending on the size and weight of the permitted vehicle and load, a vehicle may be required to utilize its permit only when accompanied by one or more escort vehicles, following established protocols. Unlike many states, Georgia has a Certified Escort Training program, and escort vehicle drivers may be certified through a local technical college program.[36]

9.3 GEORGIA CVISN AND GDOT'S ROLE IN SUPPORTING SIZE AND WEIGHT ENFORCEMENT

Background: The National CVISN Program

The CVISN (Commercial Vehicle Information Systems and Networks) program is a nationwide information sharing and partnership effort supported by the Federal Motor Carrier Safety Administration (FMCSA). CVISN consists of the information systems and communications networks owned and operated by governments, motor carriers, and other stakeholders. Many stakeholders have data about motor carriers, their vehicles, commercial drivers, crashes, and the enforcement actions of officers, yet by and large they are not capable of sharing the data electronically. The various information systems of the stakeholders can be described as "stovepipes." Stovepiped systems prevent stakeholders from

[36] https://dps.georgia.gov/certified-escort-vehicle-program

sharing the data in the systems for purposes such as improving safety and increasing efficiency.

CVISN supports state capabilities in three areas: safety information exchange, electronic screening, and electronic credentialing. CVISN supports a framework or architecture that enables government agencies, motor carriers, and other parties to exchange information and conduct business transactions electronically. This framework is designed to address the inability of state agencies to share commercial vehicle operations data electronically with other agencies in the State and in other states. By electronically linking government agencies and motor carriers, CVISN aims to improve safety, streamline credentialing and regulatory systems and procedures, and increase the productivity of the motor carrier industry.

Georgia's Participation in CVISN

The State of Georgia has a strong history of interest and participation in ITS/Commercial Vehicle Operations (CVO), dating back to 1997. Georgia completed its required documentation to obtain Federal funding in fall 2000, and these documents were accepted by FMCSA. In the ensuing years, Georgia's CVISN structure experienced changes in organization and personnel. Advances in technology and changes in technology preferences impacted the CVISN projects described in the original documents, from the particular systems to be deployed to the interfaces between systems. Furthermore, state funding in the absence of Federal Deployment Funds was not sufficient to support deployment of the complete suite of Core CVISN capabilities. Recently, the CVISN team has reconvened and has expressed its commitment to achieving Core CVISN compliance.

Changes in Georgia's CVISN organizational structure since 2000 have affected how commercial vehicle operations are conducted in the State. Roadside inspections, previously completed by the Public Service Commission, are now performed by the Department of Public Safety (DPS), Motor Carrier Compliance Division (MCCD). Weigh stations, previously staffed by the GDOT, are now staffed by DPS-MCCD. In addition, DPS previously administered driver licensing, which is now performed by the Department of Driver Services (DDS).

The State of Georgia recently updated its required CVISN documents and affirmed Georgia's commitment to complete the implementation of all Core CVISN capabilities. In addition, Georgia intends to implement Expanded CVISN capabilities to further improve commercial vehicle safety, security, mobility, and productivity.

The Department of Revenue (DOR) is the lead agency for CVISN. The lead agency provides focused leadership for CVISN activities extending from the planning phase through deployment. DOR also is the lead agency for five of the planned CVISN projects. DOR is supported by two state agencies, GDOT and DPS, which are the co-lead agencies for the remaining planned CVISN project.

Together, these three agencies are largely responsible for the regulation and enforcement of commercial motor vehicles (CMV) in Georgia. The agencies are listed below with their high-level CVO-related responsibilities.

- **DOR –** IRP, IFTA, titling, intrastate vehicle registration, Unified Carrier Registration (UCR), intrastate operating authority, and Performance and Registration Information Systems Management (PRISM) deskside processes;
- **GDOT –** Oversize and overweight (OS/OW) permitting, mainline weigh-in-motion (WIM) systems, and memorandum of understanding (MOU) with Heavy Vehicle Electronic License Plate (HELP), Inc. (PrePass electronic screening system governing body); and
- **DPS –** Size and weight enforcement, roadside safety inspections, roadside credentials enforcement, carrier compliance reviews, electronic screening operations roadside oversight, hazardous materials permitting and enforcement, and amber lights permitting.

Current Accomplishments Related to Size and Weight

Georgia's weigh stations have historically supported Core CVISN-compliant electronic screening in the form of PrePass[37], which is a transponder-based electronic screening system owned, installed, and administered by HELP, Inc. Enrolled vehicles are screened according to safety history and credentials status; safe and legal vehicles are allowed to bypass without slowing down or stopping. The first Georgia sites were operational in January 2007; the last went on-line December 2007.

GDOT executed the MOU with HELP, Inc. that established PrePass in Georgia, and serves as the lead administrative agency for the state's participation. Weight station personnel oversee the 'e-screening' operations at the roadside. None of the facilities is equipped with mainline WIM at this time, although all support WIM on the entrance ramp.

CVISN Deployment Projects Related to Size and Weight

Commercial Vehicle Information Exchange Window ("CVIEW")

CVIEW serves as the core CVO data exchange system in Georgia[38]. Its primary focus is exchange data among multiple systems within the state. CVIEW also exchanges data with the SAFER and PRISM national systems. Like these systems, CVIEW collects data from multiple sources so that users can access the data they need from a single place. Users include roadside enforcement and

[37] http://www.prepass.com/services/prepass/Pages/WhatIsPrepass.aspx

[38] http://cvisn.fmcsa.dot.gov/default.aspx?PageID=cview

state administrative offices responsible for credentialing, licensing, and permitting systems.

Before a credential is issued, the credentialing system (e.g., IRP, IFTA, OS/OW permitting) will check the carrier's status (e.g., IRP, IFTA, UCR, title, PRISM MCSIP, OOS) in CVIEW and after the credential is issued will send updated information to CVIEW for incorporation into the carrier and vehicle snapshots. The Motor Carrier Compliance Division of the Department of Public Safety will access CVIEW snapshots at the roadside for enforcement purposes. Snapshots also will be used at virtual weigh stations and possibly at PrePass sites. Motor carriers view their own information that is stored in the CVIEW database.

This project implements the Core CVISN capability for a CVIEW (or equivalent) system for the exchange of intrastate and interstate data within the State and connection to SAFER for exchange of Interstate data through snapshots.

E-Credentialing Portal

The electronic credentialing portal provides a one-stop shopping experience for the users of Georgia CVISN systems. It has a single sign-on capability so that users need only enter their username and password once for selected applications. Once a user has been authenticated, the portal displays the appropriate links to allow access to the system(s) for which they are authorized.

The portal is accessible from the Department of Revenue's web site at www.cvisn.dor.ga.gov.

The Georgia electronic credentialing portal supports:

- On-line registration requests by users;
- Single sign-on capability that allows access to all participating applications a user is authorized for; and
- Access to on-line applications based on the user type.

At a minimum, the applications accessed through the portal include:

- Carrier portal account and demographic information; and
- IRP, IFTA licensing and fuel tax filing, UCR, and OS/OW permitting, with CVIEW also available for the carrier to view its own safety and credentials information.

Implementation of the portal is not a Core CVISN requirement; rather, it represents Expanded CVISN functionality in the expanded e-credentialing area. Nonetheless, Georgia considers it essential to its Core CVISN program by providing a single point of authentication for end users to access all CVISN credentialing applications for which the user is authorized.

Through GDOT's membership in the I-95 Corridor Coalition, the state of Georgia's portal is also available with all east coast states on the coalition's website: **http://i95coalition.org/commercial-vehicle-operations-online-portal/#Georgia**

Virtual Weigh Station

With inspection resources stretched thin due to increasing traffic volumes, staffing cuts, and expansion of roles and activities, states are deploying virtual weigh stations to enhance their weight enforcement efforts and monitor commercial vehicles on more roads without the use of on-site staff and with a smaller investment in equipment. A virtual weigh station is a roadside enforcement facility that does not require continuous staffing and is monitored from another location, and which typically includes a WIM installation, a camera system, and high-speed communications, for use in real-time truck screening.

Virtual weigh stations are intended to mimic the capabilities of a fixed weigh station. Typically, one is located where a fixed weigh station would not be feasible for environmental or cost reasons. For example, virtual sites can be located in urban areas more readily than fixed, staffed weigh stations. They also may be located where a fixed, staffed site is not needed, but where violators are likely to travel. Depending on the technologies present, virtual weigh stations provide at least the same information about a vehicle as does a traditional weigh station.

Virtual weigh station deployment is not a Core CVISN requirement; rather, it represents Expanded CVISN functionality in the Smart Roadside area. Virtual weigh stations are deemed to be a key component of Georgia's overall commercial vehicle enforcement strategy, rounding out enforcement activities conducted at fixed weigh stations and by mobile enforcement teams. Virtual weigh stations will provide Georgia with a cost-effective tool to monitor and enforce truck weights on bypass and secondary routes.

In this project, a pilot location will be equipped with WIM, automatic vehicle identification, and screening capabilities to monitor commercial vehicles that travel past the virtual weigh station. All screening capabilities may not be operational at the time of initial rollout, but they will be added as soon as they are operational (e.g., CVIEW data). In the interim, temporary interfaces may be developed to allow screening on safety in addition to weight.

A U.S. DOT number reader and a license plate reader (LPR) will provide automatic vehicle identification (AVI) capabilities. A U.S. DOT number reader uses a camera and optical character recognition (OCR) technology to capture the U.S. DOT number from the side of the vehicle and identify the carrier. A license plate reader uses a camera and OCR to automatically "read" a license plate and identify the vehicle. Both the U.S. DOT number reader and LPR can interface with CVIEW to retrieve safety and credentials information associated with the carrier and vehicle identified automatically by its U.S. DOT number and license plate, respectively, for use in automated screening. Additionally, license plates can be searched in the Georgia Crime Information Center (GCIC)/National Crime Information Center (NCIC) or other database or list, further expanding the screening factors. An overview camera also will be installed to capture a broader image of the vehicle. A WIM system will be deployed for weight screening.

Deployment of a U.S. DOT number reader and LPR at the virtual weigh station will allow screening on safety, credentials, and criminal justice information as well as weight and can considerably reduce the time required to retrieve additional information about a suspect vehicle.

9.4 SIZE AND WEIGHT TRENDS IN TRUCKING

Federal and state transportation policy-makers are considering increasing truck size and weight limits as a means of increasing the productivity of the freight system. Increasing size and weight limits would decrease the number of trucks needed to move goods, thereby decreasing congestion, emissions and the number of truck-involved crashes by reducing truck VMT. However, increasing these limits also has the potential to exacerbate damage to the nation's deteriorating bridge and pavement infrastructure. Heavier trucks also have the potential to cause more severe crashes as the physical impacts of these trucks would increase.

The rail industry has been a vocal opponent of increasing truck size and weight regulations stating that the benefits are overstated and that rail would lose mode share and many shortline railroads would cease operations. Within this debate, several specific policy actions are being discussed or implemented. This section highlights a few of these methods and provides some relevant data on them, including the prominent debate over congressional proposals for a six-axle, 97,000-pound truck limit.

The Potential Six-Axle 97,000 Pound Vehicle

In 2010, a new bill was introduced into the U.S. Senate that, if passed, would allow state departments of transportation to raise their Interstate weight limits to 97,000 pounds if a vehicle was operating with six axles. The proposal has strong support from the trucking industry, shippers, and some states – including Vermont and Maine – where heavy trucks currently pass through village and town centers on the state network. The proposed configuration was tested during a one-year congressionally-authorized pilot period on the Interstates of Vermont and I-95 in Maine. Currently, U.S. DOT is preparing a report to Congress on the impacts of the one-year pilot on bridge durability, pavements, highway safety, commerce, traffic volumes, and energy. The results of that study may provide a template for other states to analyze the potential impacts of allowing the six-axle 97,000-pound truck onto their systems. If the proposal becomes Federal law, Georgia could allow the six-axle 97-kip configuration on its Interstate system.

Until the Vermont-Maine Study is complete, states like Georgia may look to studies conducted by other states on the potential effect of the six-axle 97-kip truck. The most recent examination was completed by the Wisconsin DOT, which analyzed the impacts on state and interstate highways of a very similar six-axle 98-kip truck.

Wisconsin Truck Size and Weight Study: Six-Axle 98-Kip Truck Results

According to the Wisconsin study, if Federal law allowed the six-axle 98-kip truck on its Interstate system, the configuration would provide a significant savings to shippers and would slightly reduce truck VMT, leading to safety and congestion savings. The analysis also showed savings to the State's highway pavement budget because of the distribution of weight on six axles causing less wear on the pavement. The negative finding of the study related to bridges and found that the six-axle 98-kip truck would require additional state bridge funding in addition to the existing backlog of bridge costs. Even with the increased bridge costs, the study concluded that the six-axle truck would provide net benefits. Table 9.2 summarizes the findings of the six-axle 98-kip truck analysis.

Table 9.2 Annual Costs and Benefits for Candidate Configurations Assuming Interstate Operation is Allowable

System User Benefits			Public Agency Benefits and Impacts			Net Benefits	
Transport Savings	Safety	Congestion	Pavement	Bridge Costs for TSW Configs	Baseline Bridge Costs	With TSW Bridge Costs Only	With All Bridge Costs
127.94	9.40	11.03	10.19	(8.48)	(55.50)	150.09	94.59

Note: All values in millions (assumes Interstate highway and non-Interstate highway operation).

In addition to the metrics listed in Table 9.2, the Wisconsin study also considered the safety performance of the six-axle 98-kip truck. Using the University of Michigan Transportation Research Center (UMTRI) physical modeling capabilities, the study tested the six-axle 98,000 pound configuration against internationally accepted safety performance standards and it received passing grades in all of the tests by satisfying the target value thresholds. The results are shown for the various safety tests in Table 9.3.

Table 9.3 Performance Measures for the Six- and Seven-Axle Tractor Semitrailer

Performance Measure	Target Value	Six-Axle Semi 98,000	Performance
Static Rollover Threshold (Ideal)	0.35g (minimum)	0.40g	Satisfactory
Load Transfer Ratio	0.60 (maximum)	0.309	Satisfactory
Rearward Amplification	2.00 (maximum)	0.977	Satisfactory
High-Speed Transient Offtracking	2.62 feet (maximum)	0.36 feet	Satisfactory
High-Speed Offtracking	1.51 feet (maximum)	0.93 feet	Satisfactory
Low-Speed Offtracking	19.69 feet (maximum)	19.03 feet	Satisfactory

In addition to the Wisconsin study, it should be noted that in 2001 the United Kingdom raised its gross vehicle weight limit to 97,000 pounds for six-axle vehicles. Their data shows a 35-percent reduction in fatal truck-involved crashes and an overall decline in VMT for trucks over the past decade. Canada and other parts of Europe currently have higher weight limits than the United States as well.

Interoperability and Uniformity across States

The national themes within the heavy-haul community tend to be divided into Federal and state topics. National topics of interest to the heavy-haul community include topics common to many other carriers such as hours of service rules and electronic on-board recorders, as well as specialized topics such as general size and weight laws for the Interstate and load securement and other highway safety standards.

At the state level, concerns raised by industry leaders often involve the following three topics:

1. Regional permitting of OSOW loads. This is less of an issue in Georgia, where Georgia is one the states in the region with procedures to allow for a base regional permit and an envelope vehicle[39], than it is in other parts of the country such as New England and the Midwest.
2. Best practices in pilot car and escorts. Again, this is less of an issue in Georgia, where the DOT has established a certified escort program through local colleges.
3. Standardization of permit weight regulations, including tandem and tridem axle grouping maximum weights. This is more of an issue in Georgia; as noted earlier, Georgia has a lower maximum weight for its annual permits than its neighboring states, and the various states in the region differ when it comes to allowed weights for groupings.

The general theme of the heavy-haul industry's comments at various industry events is the need to balance the prerogative of each state to adjust laws and regulations to meet the unique needs of the State against the needs of businesses operating across states to have a more uniform operating model to provide increased operating efficiency and improved safety.

[39] http://perba.dotd.louisiana.gov/welcome.nsf

9.5 KEY FINDINGS AND ISSUES ON TRUCK SIZE AND WEIGHT

As of the time this document was first developed, the following key findings and issues were identified in this chapter on truck size and weight:

- The number of oversize and overweight permits is increasing in Georgia and most other states in the U.S.
- Georgia's maximum gross vehicle weight limit of 100,000 pounds is lower than those of some neighboring states, which utilize 150,000 pounds.
- In 2010, Federal legislation was introduced in the U.S. Senate to change the limits to a 6-axle, 97,000 pound weight limit, but the bill did not advance.
- Without special design consideration, oversize and overweight vehicles may particularly impacted by roundabouts.

9.6 U.S. DOT'S MAP-21 COMPREHENSIVE TRUCK SIZE AND WEIGHT LIMITS STUDY

US DOT completed a national truck size and weight study and sent its final report to Congress in April 2016.[40] Provisions in MAP-21, the Moving Ahead for Progress in the 21st Century Act required the USDOT to:

- Conduct a Comprehensive Truck Size and Weight Limits Study addressing differences in safety risks, infrastructure impacts, and the effect on levels of enforcement between trucks operating at or within federal truck size and weight (TSW) limits and trucks legally operating in excess of federal limits;
- Compare and contrast the potential safety and infrastructure impacts of alternative configurations (including configurations that exceed current federal TSW limits) to the current Federal TSW law and regulations; and,
- Estimate the effects of freight diversion due to these alternative configurations.

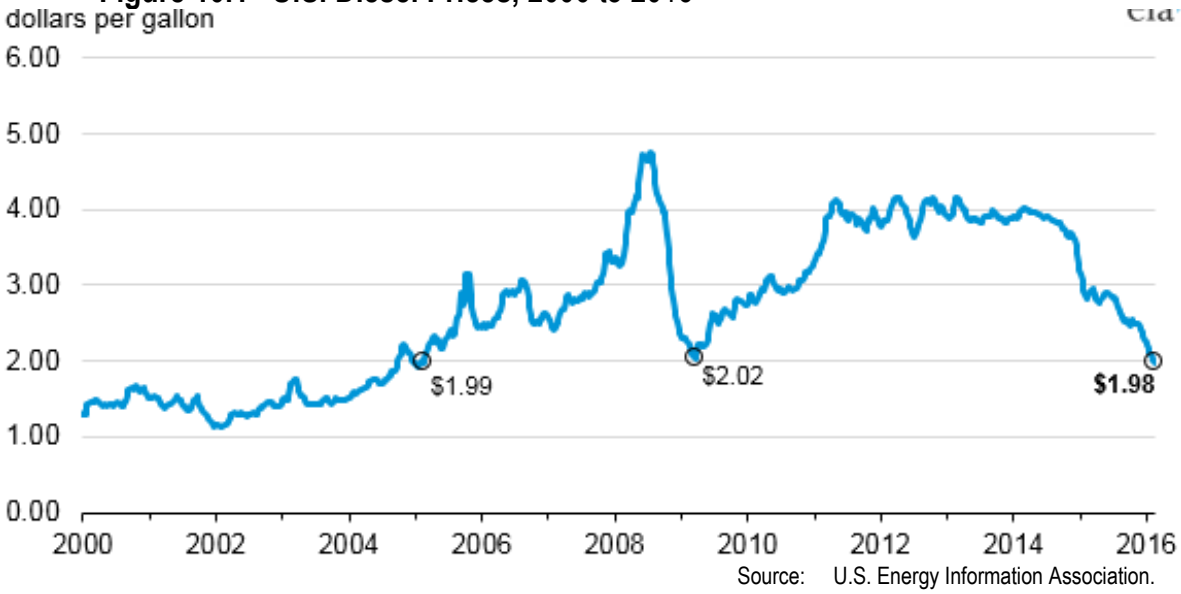
[40] http://ops.fhwa.dot.gov/freight/sw/map21tswstudy/index.htm

10.0 Needs and Issues: Alternative Fuels

10.1 Types of Fuels

Diesel has historically been the fuel of choice for truck manufacturers in the United States. This is primarily due to its fuel efficiency relative to gasoline. Diesel engines also produce higher levels of torque than gasoline engines making them even more fuel efficient as the vehicle's loaded weight increases. Diesel engines do have higher costs than gasoline engines to purchase and maintain, but these higher costs are more than offset by the fuel efficiency of diesel engines along with their higher durability. However, diesel prices have risen significantly over the last two decades along with price of gasoline (see Figure 10.1). As discussed in Chapter 2, fuel represents roughly 25 percent of the costs of the average trucking company. Therefore, diesel fuel prices going up by 400 percent in a decade has the impact of doubling the total costs of the average trucking firm. This has a significant impact on trucking profitability, costs to shippers, and final costs to consumers.

Figure 10.1 U.S. Diesel Prices, 2000 to 2016



Source: U.S. Energy Information Association.

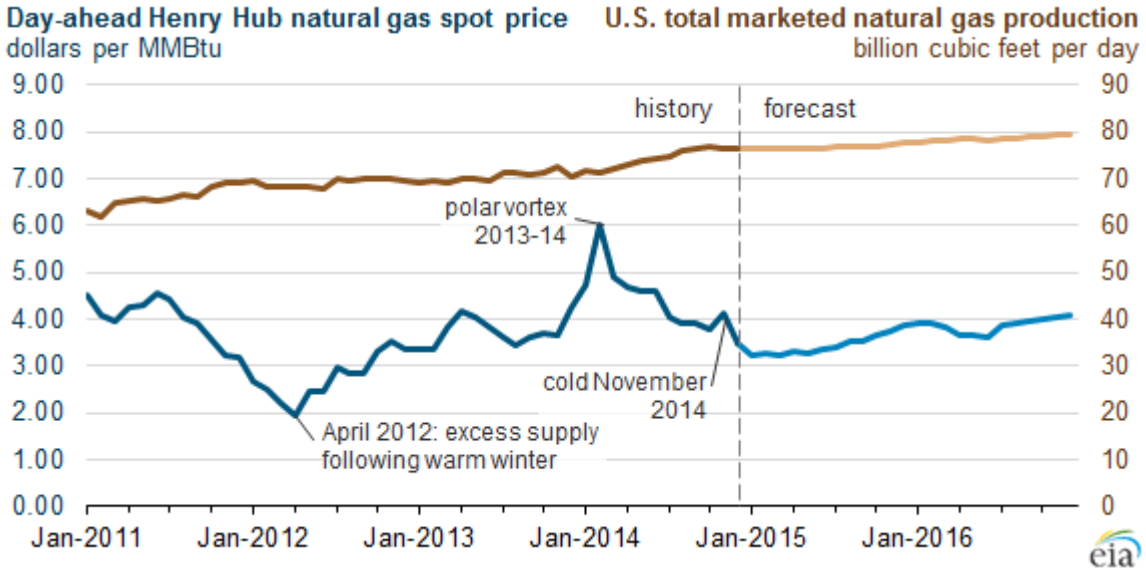
The rise in diesel prices has led to increased consideration of an alternative fuel source for the onroad trucking fleet. There are various types of alternative fuel options -- some not widely available and have issues of supply, high cost, and technological immaturity; others may not be practical for heavy truck fleets. Table 10.1 compares different fuel options in terms of fuel source, applications, fuel cost, emission reductions, refueling infrastructure and energy security.

Table 10.1 Issues Regarding Different Types of Alternative Fuels

Fuel Type	Main Fuel Source	Applications	Approximate Fuel Cost	Emission Reductions	Refueling Infrastructure	Energy Security
Biodiesel	Soybean Oil, waste cooking oil, animals fats, and rapeseed oil	Light-Duty (LD) and HD diesel vehicles.	Less than petroleum diesel. Slightly more expensive than diesel or gasoline	B20: CO – 12.6%, HC -11%, NO_x +1.2%, PM -15%; B100: CO -43.2%, HC – 56.3%, NO_x +5.8%, PM -70%	Easily blended in existing diesel pumps and tanks. Several fleets use blends higher than the common B2 blend. Available in bulk form from many suppliers, many states have stations to public. Numerous stations in Georgia.	Domestically produced, fossil fuel inputs similar to petroleum.
Diesel	Crude Oil	Many types of Vehicle classes. Main fuel for HD vehicles.	Slightly less than gasoline.	Can be reduced to varying degrees based on different retrofit technologies	Available at select fueling stations throughout the country	Not secure. Manufactured using imported oil.
E85-Ethanol	Corn, grains or agricultural waste	Many Light-Duty (LD) vehicles available as Flex Fuel Vehicles (FFV) capable of running on any blend of E85 and gasoline.	Less than gasoline or diesel. Also less BTUs/gallon.	CO – 40%, VOCs -15%, NO_x -10%, PM -20%	Use existing gasoline/diesel infrastructure with minor modifications. Numerous stations in Georgia, almost all for government use.	Domestically produced and renewable.
Electric/Hybrid Electric Vehicle (EV/HEV)	Coal; nuclear, natural gas, hydro-electric, and other renewable sources also possible.	Neighborhood EVs (NEV) for campus and planned communities, alternative fuel HEV and Electric transit and shuttle.	Less than gasoline and diesel. No Federal and state tax.	Potential zero emissions for EVs if solar charged. HEVs offer significant emission reductions over conventional models.	NEVs are charged in 110V outlets. For transit application fast charge 220V is available. May need special charging outlets for HD trucks.	Coal is a stable fuel source that is domestically produced.
Liquefied Natural Gas (LNG)	Underground reserves	HD trucks, LNG appropriate for HD long-distance vehicles.	Significantly less than gasoline and diesel.	CO – 90-97%, HC -50-75%, NO_x -35-60%, PM -90-97% (CNG/LNG combined)	For home and small-med fleets - $2,000-$90,000. Large fleet refueling $250,000. Public LNG stations limited (<40 nationally).	Domestically produced.

Source: U.S. Department of Energy, American Lung Association, and Project team analysis

Figure 10.2 Price of U.S. Natural Gas



Source: U.S. Energy Information Administration

There have been dramatic recent improvements to the technology for identifying and extracting natural gas reserves. For example, the discovery of the Marcellus Shale in the Mid-Atlantic region of the United States is estimated to contain more than 500 trillion cubic feet of natural gas, enough gas to supply the entire United States for two years. The presence of such volumes of gas in the Eastern United States has great economic significance in stabilizing the supply of natural gas and gives natural gas a distinct advantage in the marketplace.[41] Widescale adoption of natural gas/LNG trucks is still being debated.

Meanwhile, electric trucks are being developed and pursued, especially in California. In early November 2017 the Ports of Long Beach and Los Angeles approved a plan to encourage phase-out of diesel truck and favor of natural gas and zero-emission/electric truck and cargo-handling equipment[42]. Also at those ports earlier this year, investigation and discussion of hydrogen fuel cell-powered trucks continues to evolve[43].

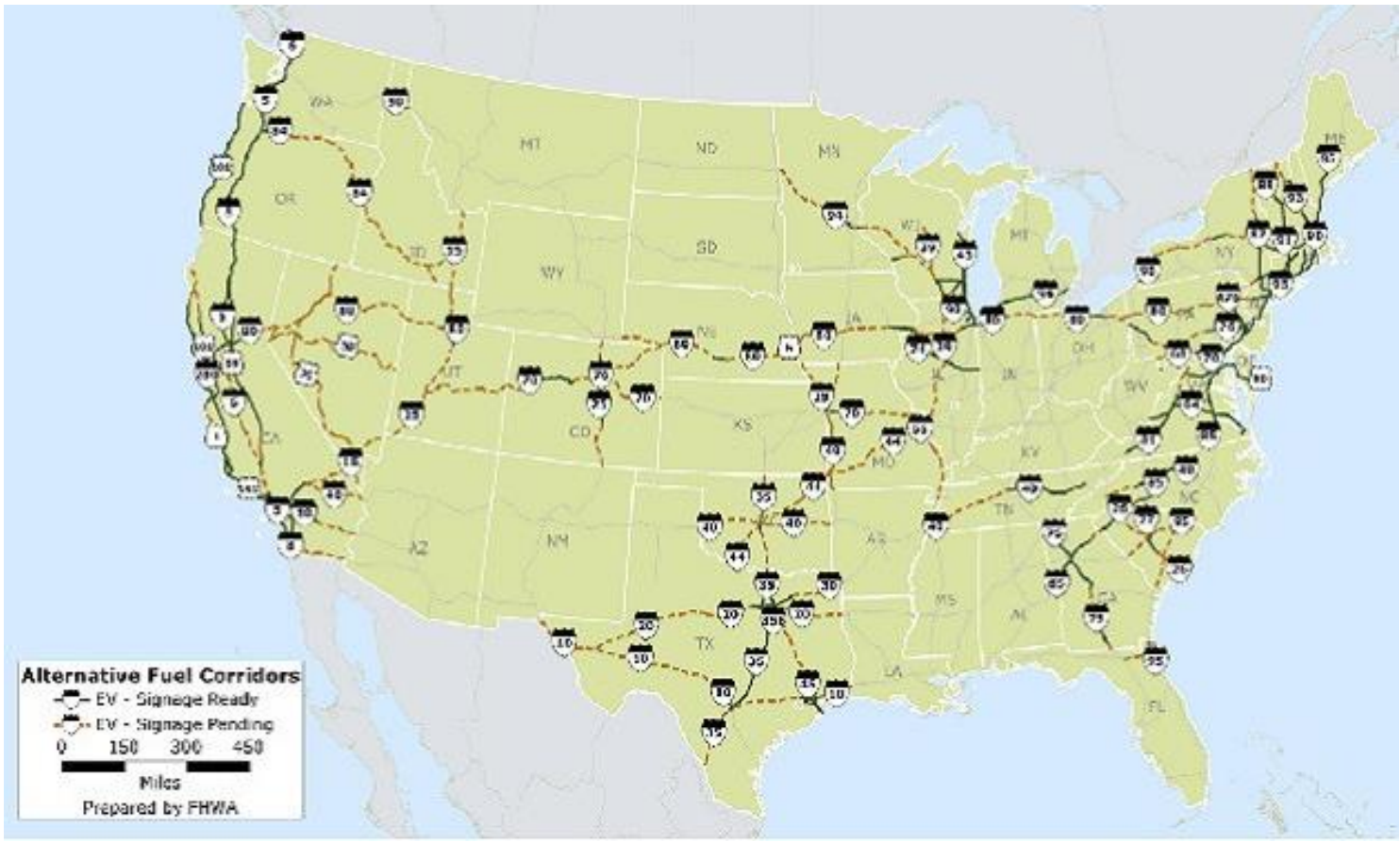
[41] http://geology.com/articles/marcellus-shale.shtml

[42] www.latimes.com/local/lanow/la-me-ports-air-quality-20171102-story.html

[43] www.ocregister.com/2017/04/19/this-hydrogen-fueled-18-wheeler-at-la-long-beach-ports-emits-only-water-from-tailpipe-4

10.2 GEORGIA ISSUES ON ALTERNATIVE FUELS

- **In late 2016, two Georgia interstates were designated by the Federal Highway Administration as Alternative Fuel Corridors**[44]:
  - I-75 is designated signage-ready for *electric vehicles* from the Tennessee border to Warner Robins, and from Tifton to Valdosta; it is signage-pending from Warner Robins to Tifton and from Valdosta to the Florida border. I-75 is CNG-designated along its entire length from Tennessee to Florida.
  - I-85 is designated signage-ready for *electric vehicles* from Commerce to the Alabama border, and signage-pending from Commerce to the South Carolina border. I-85 is CNG-ready from South Carolina to College Park (south metro Atlanta), and signage-pending from College Park to the Alabama line.



[44] www.dot.ga.gov/PartnerSmart/Public/PressReleases/Alternative%20Fuel%20Corridors-11-22-16.pdf

11.0 Summary of Key Truck Findings, Needs, and Issues

This section compiles a summary of the key findings, needs and issues identified throughout this report. These key findings summarize the state of the trucking industry and Georgia's transportation system in regards to goods movement. They also will feed into the solutions identification and prioritization activities that will occur in future tasks.

11.1 GEOGRAPHIC DISTRIBUTION OF TRUCKING ACTIVITY

Georgia has a growing logistics and distribution business, with large facilities located all around the state. As of July 2016, there were 30 facilities with 1 million ft^2, and 80 between one-half and one million ft^2.[45]

The Atlanta metropolitan region is the top generator of trucking activity in the state. Due to its large population and its geographic location, there is a significant amount of trucking activity that is moving in and out of the Atlanta region, and there is a significant fraction of trucking activity attempting to go around the Atlanta region. Fulton County alone is estimated to attract 27 percent of all of the trucking activity in the state. Four of the top five counties in terms of truck tonnage are located in the Atlanta region: Fulton, Gwinnett, DeKalb, and Cobb. The highest truck volumes on the state are found on I-75 just outside of I-285 and the "western wall" of I-285 that connects I-75 on both sides of Atlanta. These are the locations where the State's long-haul truck traffic and the local distribution truck traffic intersect. The Atlanta region is also home to the largest fraction of warehouses, distribution centers, logistics firms, and logistics users in the state.

The container traffic moving through the Port of Savannah makes the Savannah region the second highest location of truck activity in the state. Chatham County alone generates over 20 percent of the state's outbound truck traffic. Savannah also has the second highest concentration of freight facilities in Georgia. This trucking activity has turned I-16 into a truck expressway moving goods from the port to inland destinations around Georgia and throughout the U.S.

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[45] https://www.selectgeorgia.com/resources/publications/warehousing-and-logistics

Florida is the most significant neighboring state for Georgia in terms of trucking activity. Due to its status as the 4th largest economy in the U.S., Florida is Georgia's top trading partner in terms of truck tonnage. However, Florida also generates the vast majority of through truck traffic for the state. Roughly 30 percent of the trucks entering the state travel through the state without making any drop-offs or pickups. Over half of the truck traffic on I-95 is through truck traffic. The vast majority of the through truck traffic in Georgia is moving in or out of Florida. At the other end of the spectrum, Tennessee primarily serves as a pass-through state for Georgia trucks. Most of the trucks leaving Georgia on I-75 go through Tennessee on the way to states in the Midwest.

There are several smaller counties from a population perspective that have relatively large portions of truck tonnage based on the TRANSEARCH freight flow data. These include Tift County due to a combination of manufactured and food products as well as warehouse/distribution, Coffee County due to nonmetallic minerals and warehouse/distribution, Glynn County due to the Port of Brunswick, Floyd County due to nonmetallic minerals, Whitfield County due to textile mill products, and Washington County due to kaolin.

11.2 PERFORMANCE OF GEORGIA ROAD NETWORK

Similar to other growing states, Georgia's trucking industry is impacted by congestion. Not surprisingly, the most severe congestion is in the Atlanta metropolitan region. Based on the results of the GDOT statewide travel demand model, I-285 is heavily congested throughout its entire alignment. I-75, I-85 and I-20 tend to have their highest levels of congestion at I-285 with congestion decreasing moving further away from Atlanta. As of 2017, GDOT is in the process of developing and delivering major interstate capacity investments in the region under the Major Mobility Investment Program (MMIP) to strategic interstate corridors in metro Atlanta and Savannah; more information is available in the Task 5 Recommendations report.

The year 2050 TRANSEARCH freight flow forecast estimates that truck tonnage will grow by 1.4 percent annually. Even with this relatively modest growth rate forecast, truck volumes will grow by nearly 70 percent across the state by 2050.

11.3 EMERGING TOPICS: TRUCK SIZE AND WEIGHT AND ALTERNATIVE FUELS

There are two emerging topics that could affect truck productivity: 1) truck size and weight and 2) alternative fuels.

Nationally, some interests have advocated for increasing the current weight limits to make 6-axle, 97,000-lb. trucks legal. Additionally, higher weight limits may result in lower truck VMT, lower emissions, and less truck-involved crashes. Opponents of increased truck size and weight cite the negative impact on the road maintenance and safety concerns. Most recently, the US DOT completed a comprehensive truck size and weight study[46] to providing a national policy framework discussion on the issue.

Alternative Fuels-- Similar to gasoline prices, diesel fuel prices have increased 400 percent over the last decade. This alone has increased the cost of shipping by up to 50 percent. It has also spurred consideration of alternative fuels for truck fleets.

For some, such as UPS, natural gas may be a viable alternative fuel for consideration for trucking activity[47]. A major challenge to wide adoption of natural gas is the lack of a regional or national fueling infrastructure. However, in the spring of 2015 UPS announced it would "build 15 compressed natural gas (CNG) fueling stations to support the purchase and planned deployment of 1,400 new CNG vehicles over the next year"[48] and noted that two of the locations would be in Georgia: Atlanta and Doraville.[49]

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[46] www.ops.fhwa.dot.gov/freight/SW/map21tswstudy/index.htm

[47] www.bloomberg.com/news/2014-03-05/ups-expands-alternative-fuel-fleet-32-with-1-000-propane-trucks.html

[48] www.pressroom.ups.com/pressroom/ContentDetailsViewer.page?ConceptType=PressReleases&id=1429038032641-100

[49] www.bizjournals.com/atlanta/news/2015/04/01/ups-to-build-15-compressed-natural-gas-fueling.html