Georgia Department of Transportation
Office of Planning

Georgia Statewide Freight & Logistics Plan, 2010-2050

Task 3 Report

Modal Profile-
Multimodal Summary



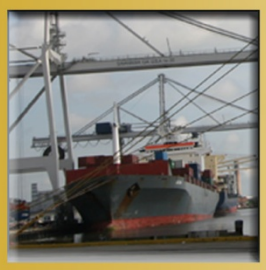

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Table of Contents

List of Tables

List of Figures

1.0 Summary

The modal profiles are designed to provide information on each of the freight modes in Georgia. Each mode was discussed separately; this document serves as the summary for all modal profiles. Each modal profile includes an analysis of supply and demand, forecasts of future freight flows, and a discussion of issues and needs.

The modal profiles assemble the key sources of available data for each freight mode in the state. Due to the unique dynamics of each mode, these topics are addressed somewhat differently for each. However, the topics are covered in detail based on available data, as well as information collected directly from modal stakeholders. The modal profiles are also designed to provide a set of issues and needs for each mode that can be utilized as a source for identifying potential freight improvement solutions to be analyzed in later tasks.

It is important to note that the primary freight forecasts analyzed in each modal profile are considered to be a base forecast. For each mode, the actual freight volumes realized will depend on several factors, including the extent to which Georgia continues to build its freight infrastructure; Georgia's success in attracting freight-related businesses; and overall national and international economic conditions.

While freight forecasts are discussed briefly for each mode in the profiles, in a separate economics analysis task, analysis of a range of potential economic and freight forecasts will occur in greater detail. Additionally, this economics analysis task will include a discussion of factors that will influence freight demand in the State.

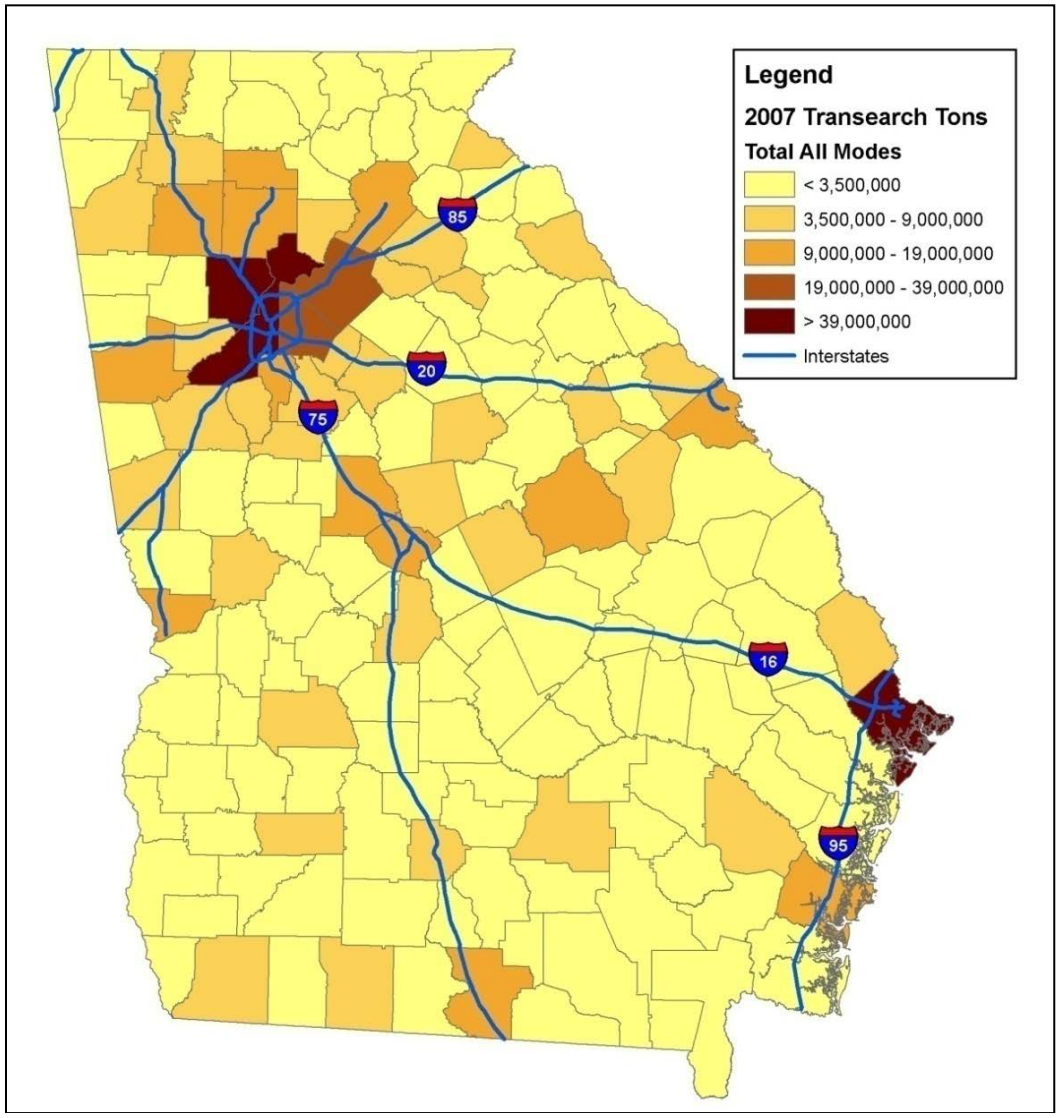
This document is comprised of four sections as follows:

- **Summary and Overview of Key Findings**
- **Georgia's Freight and Logistics Infrastructure and Flows.** This is a summary of the key infrastructure elements for each mode and some of the primary freight flows for each mode;
- **Freight Forecasts.** A synopsis of the forecasts of freight volumes for Georgia and a brief description of the implications of the forecasts for each mode; and
- **Issues and Needs.** A summary of the key issues and needs for each freight mode based on the categories of capability, capacity, and connectivity.

1.1 Overview of Key Findings

Overall. there are several specific areas of the state with very intensive freight volume flows. They experience high levels of freight entering and/or exiting

their boundaries. The map on the next page reflects this information based on TRANSEARCH data and describes total freight moved via all modes. The two most freight-intensive areas of the state are metro Atlanta and Savannah.



Mode-Specific Analysis of Freight Moving in Georgia

The truck mode carries 75 percent of the total 853 million tons of freight flowing in Georgia. The rail share of the total tonnage in Georgia is roughly 25 percent. The water and air modes each carry less than one percent. In terms of freight value, the truck mode moves nearly 88 percent of the total flows and rail carries 10 percent. The rail value percentage is lower than the rail tonnage percent because rail carries many lower-value, high-tonnage goods such as coal and lumber. The air cargo mode carries high-value, low tonnage and time-sensitive

goods and therefore has a higher value percentage relative to its tonnage percentage which is less than one percent.

Figures 1.1 and 1.2 show the mode share by tonnage and value for Georgia.

Figure 1.1 Freight Tonnage by Mode, 2007

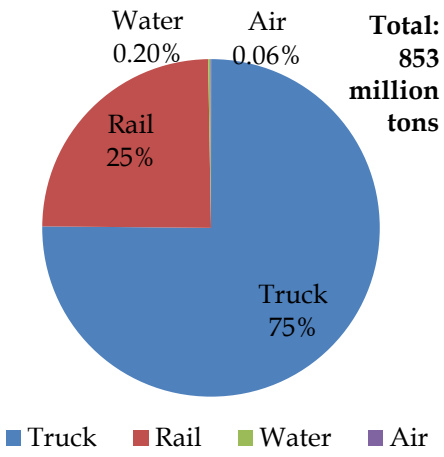
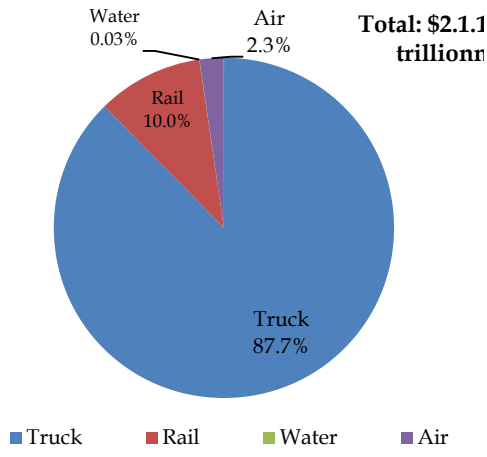


Figure 1.2 Freight Value by Mode, 2007



Additional key findings are as follows:

- The Port of Savannah is the key distinguishing feature of the freight infrastructure in Georgia. It has been extremely successful over the last 20 years in capturing discretionary container traffic along the East Coast and boosting Georgia's economy. To maintain this distinction, the Savannah Harbor and channel will need to be deepened to accommodate the larger ships that are scheduled to start coming through the Panama Canal upon its completion in 2015. Currently, the port can handle these larger "post-panamax" ships, but only during high tide events.

  To maximize Georgia's full potential to move marine cargo in the longer term, an additional port in Jasper County, South Carolina will be needed along with expansion of the rail and road connections to both the Port of Savannah and the Jasper Port.

- The Port of Savannah is unique in that it has a relatively even balance of imports and exports. This makes it relatively more critical to U.S. exporters than other major U.S. ports. This is very different from other major container ports in the U.S. which are generally dominated by import flows. On the import side, the Asian trade lanes account for 77 percent of Savannah's container volumes. This reinforces the importance of the expansion of the

Panama Canal to future trade through the Port of Savannah and the need for increased port capabilities and capacity in Savannah.

- Georgia is the southeast hub of operations for two Class I railroads in the eastern half of the U.S.: CSX and Norfolk Southern. However, due to increasing volumes along these rail lines combined with the dominance of single track rail infrastructure in Georgia, rail congestion will increasingly affect rail operations. This has the potential to impact freight moving between the state's most significant freight hubs – Atlanta and Savannah.
- The Atlanta-Savannah rail connection is currently one of the most successful shorter-haul intermodal rail operations in the country due to the density of freight moved. These cities are separated by roughly 250 miles -- shorter than the roughly typical 500 miles needed for rail intermodal to be competitive with trucks – however there are currently two Norfolk Southern trains per day moving containers between the two cities. Increasing traffic along this rail line could provide an alternative to the heavily utilized I-75 corridor between Macon and metro Atlanta.
- Trucking is, and will continue to be, the dominant mode of moving freight in Georgia. It has some advantages in terms of its ability to deliver goods quickly, provide door-to-door service, allow flexibility in shipment times and size, and support highly-competitive operations. Trucking is also the primary connecting mode for marine, rail, and air cargo to final destinations in Georgia. The trucking industry experiences a significant amount of congestion in the Atlanta region where both long-haul and local/distribution truck traffic are the highest. This congestion is forecast to get more severe (in terms of delay per vehicle), longer (in terms of the duration of peak periods), and more prevalent on the interstate corridors that connect Atlanta with its neighboring states and key trading partners.
- Georgia air cargo is dominated by traffic moving through the Atlanta airport – the 10th largest air cargo airport in the U.S. The extensive operations of Delta airlines provide direct service between Atlanta and international destinations as belly cargo in passenger airplanes. Southwest Airlines' acquisition of Airtran will also change the freight environment at the Atlanta airport because Southwest handles freight (Airtran did not.)

  Atlanta also has significant operations of air cargo airlines that only carry freight. The airport's location at the intersection of I-75, I-85, and I-285 provides for easy access from locations in Georgia and throughout the southeast. However, there is significant competition to attract air cargo traffic from major airports across the country and the potential for Atlanta's peak period congestion to restrict access to the air cargo facilities.
- The Atlanta metropolitan region is the second largest "inland port region" in the U.S. In other words, of all the non-coastal metropolitan regions in the country, it moves the second highest tonnage of freight. The Atlanta region is responsible for over one-third of all the freight traffic in Georgia. This

large volume of freight is due to Atlanta's dual role of being the primary distribution hub in the south and also having a very significant consumer base as the most populous metropolitan region in the south.

- The Savannah region contributes roughly ten percent of all freight traffic in Georgia. The vast majority of this traffic is due to goods moving through the Port of Savannah, which is closely tied to Georgia's economy. Most of the truck traffic generated at the Port is bound for warehouses and distribution centers in the Savannah region and southeast Georgia for later distribution around the rest of the state, Southeastern U.S., and rest of the country. Nearly one-third of Savannah's rail intermodal flows are coming from or heading to Atlanta. Nearly one-half of Savannah's rail carload (non-intermodal) flows are bound for within Georgia.
- Last-mile connectors are a critical component of Georgia's freight infrastructure. Nearby the Port of Savannah, over 60 percent of trucks that access the Port are coming from or going to a warehouse or distribution center within a several miles of the port. Last-mile connectors are also needed to connect Georgia's intermodal rail yards to the interstate system already heavily utilized by trucks. Last-mile connectors are also used to connect the interstate system to warehouses and distribution centers throughout the State.

2.0 Georgia's Freight and Logistics Infrastructure and Flows

Georgia has a multifaceted freight and logistics infrastructure with many nationally and internationally significant features. The Port of Savannah is the fourth largest container port in the U.S. and the fastest growing port in the country. The Atlanta airport is the 10th largest in the country in terms of air cargo. Georgia serves as the southeast hub of operations for both of the Class I railroads in the eastern half of the U.S. (Norfolk Southern and CSX). There are also several shortline railroads that operate in Georgia. The Georgia interstate system consists of 1,243 miles of interstate, making it the ninth largest in the U.S. The state highway and local road network are extensive and connect all of the State's major metropolitan areas. The road network also serves as the last-mile connector for the State's major freight facilities throughout the State. Georgia's freight infrastructure is currently performing at a very high level and poised for future success. Figure 2.1 shows a map of the key components of the freight infrastructure in the State. Figure 2.2 shows the key freight infrastructure components for the Atlanta region.

Freight Distribution by Mode

The truck mode carries the vast majority of goods in Georgia. It accounts for 75 percent of the total 853 million tons of freight flowing in the State. The dominance of truck is due to its flexibility in terms of being able to handle varying shipment sizes and its ability to achieve door-to-door delivery virtually anywhere without making any modal transfers. Truck also is a relatively high speed mode with relatively competitive total trip costs.

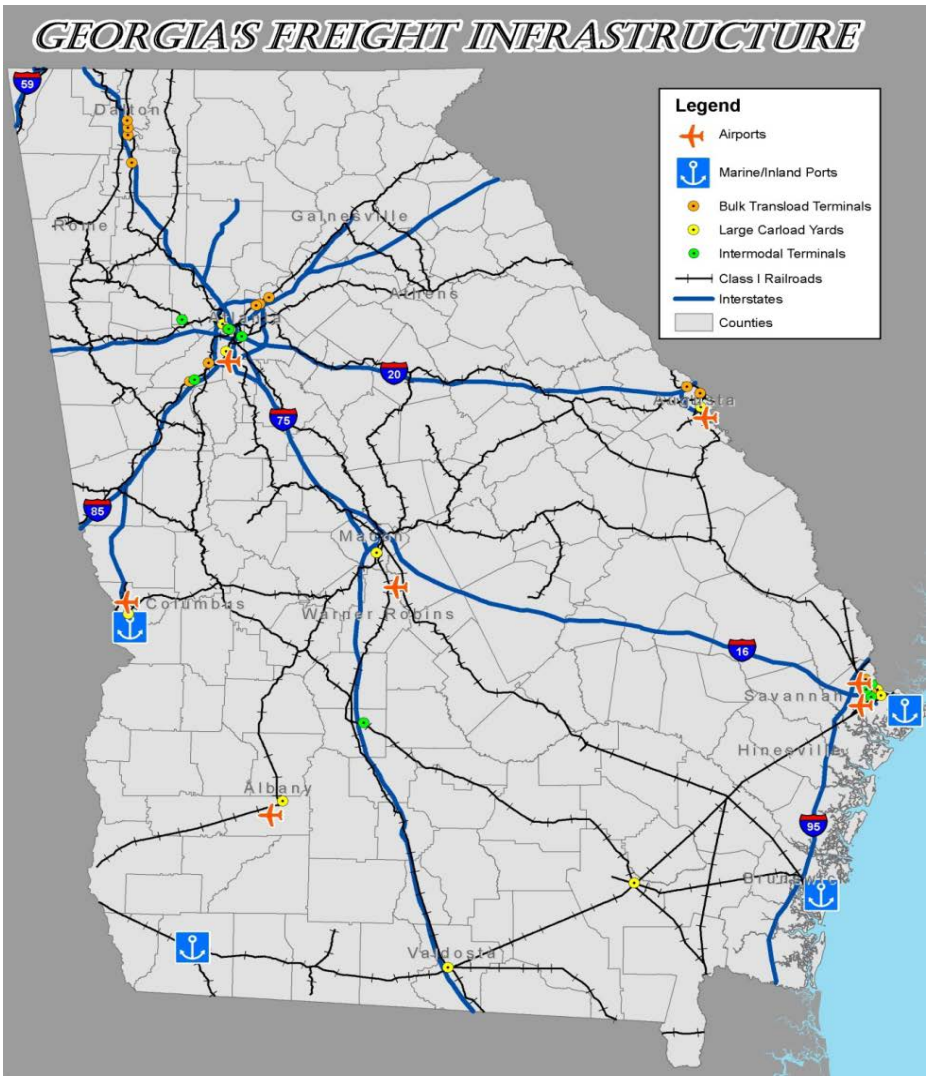
Depending on fuel prices, the rail mode is typically much more efficient at carrying bulk loads and intermodal freight distances of approximately 500 miles or more. The rail share of the total tonnage in Georgia is roughly 25 percent. This is slightly higher than other states in the U.S., due in part to Atlanta's rail hub status in the southeast, and also in part to the lack of significant inland waterway tonnage in Georgia.

The Port of Savannah terminals operated by the Georgia Ports Authority specializes in intermodal traffic and shipped a total of 27.2 million tons of freight during the fiscal year ending in June 2013. This was the vast majority of the total tons that moved by the water mode.

Air cargo tends to carry time-sensitive, higher-value cargo. The vast majority of this freight is lightweight, and most of it is shipped through Atlanta's Hartsfield-Jackson Atlanta International Airport. Both the water and air mode comprised well less than one percent of Georgia's freight on a tonnage basis.

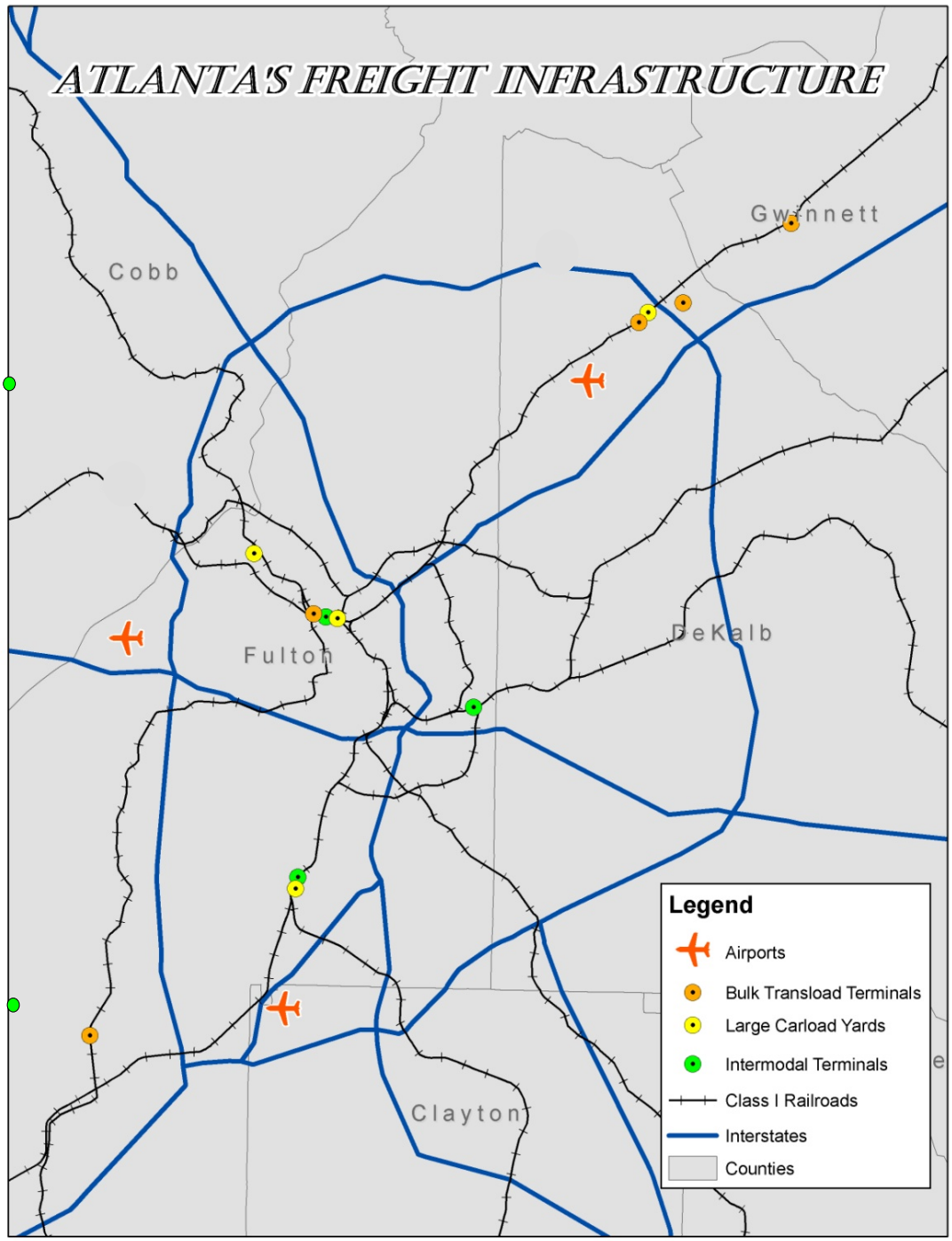
In terms of freight value, the truck mode moves nearly 88 percent of the total flows and rail carries 10 percent. The flexibility of the trucking industry allows it to carry virtually all types of commodities. The rail value percentage is lower than the rail tonnage percent because rail carries many lower-value, high-tonnage goods such as coal and lumber. The air cargo mode carries high-value, low tonnage goods and therefore has a higher value percentage of 2.3 percent relative to its tonnage percentage which is less than one percent. Figures 2.3 and 2.4 show the mode share by tonnage and value for Georgia.

Figure 2.1 Key Elements of Georgia's Freight Infrastructure



Note: the airports shown above are the state's top air cargo airports, by tonnage

Figure 2.2 Key Elements of Georgia's Freight Infrastructure: Atlanta area



Note: Hartsfield Jackson is the top Georgia air cargo airport.

Figure 2.3 Freight Tonnage by Mode, 2007

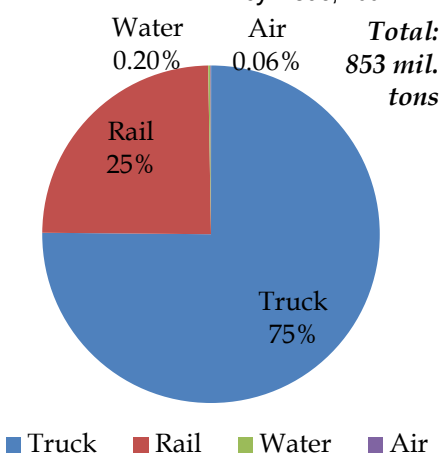
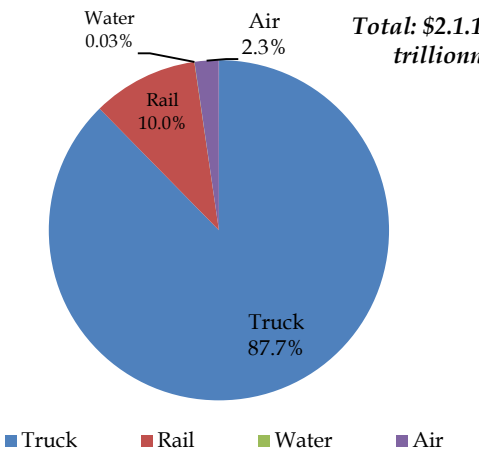


Figure 2.4 Freight Value by Mode, 2007



Source: TRANSEARCH data.

The following four subsections describe the key findings for flows from each of the four freight modes: truck, rail, port, and air cargo.

2.1 KEY FINDINGS ON TRUCK FLOWS

Truck flows are generated throughout Georgia, but the highest concentration of tonnage generated is in two regions – the Atlanta metropolitan region and the Savannah metropolitan region. Table 2.1 shows inbound and outbound flows from counties in Georgia. Counties in the Atlanta metropolitan region account for 46 percent of the State's inbound flows and seven of the top eight inbound flows. Chatham County in the Savannah metropolitan region is the eighth county. Similarly, seven of the top 10 outbound flows are in the Atlanta and Savannah metropolitan regions. This accounts for 29 percent of all outbound flows.

The high levels of Atlanta metropolitan truck tonnage is a large part of the reason that the region is the second largest "inland port" in the U.S. (after Chicago) based on the 2007 Bureau of Transportation Statistics Commodity Flow Survey. This means that of all of the non-coastal metropolitan regions in the country, it handles the second highest tonnage of freight. This large volume of freight is due to Atlanta's dual role of being the primary distribution hub in the south and also being the most populous metropolitan region in the south. When coastal metropolitan regions are also included, Atlanta is the fifth largest region in terms of total tonnage moved in the country (Houston, Los Angeles, Chicago, and San Francisco are the top four.)

Georgia counties outside of metro Atlanta and Savannah having large *inbound* flows include Richmond County (Augusta) and Muscogee County (Columbus), partially due to being significant population/consumption centers. Counties

outside of the Atlanta and Savannah regions that have large *outbound* flows are Pickens, Elbert, and Hall. Pickens County has one of the largest marble repositories in the world; its outbound shipments consist mainly of broken stone and riprap which is mined in its marble quarries.[1] The high outbound truck tonnages in Elbert County are attributed to over 3 million tons of broken stone or riprap and 1.5 million tons of ready-mix concrete, along with another half million tons of other non-metallic minerals and concrete. The county seat, Elberton, is known as "The Granite Capital of the World" produces more granite monuments than any other city in the world.[2] Hall County outbound flows are primarily due to live chicken farming that is shipped to others areas for processing.

Table 2.1 Top Counties for Inbound and Outbound Truck Tonnage, 2007

Inbound			Outbound		
County	Truck Tons	Percent of Total	County	Truck Tons	Percent of Total
Fulton	66,665,525	22%	Fulton	39,263,963	12%
Cobb	20,073,530	7%	Chatham	39,263,460	12%
Chatham	18,281,929	6%	Gwinnett	15,566,397	5%
DeKalb	16,244,796	5%	DeKalb	12,569,444	4%
Gwinnett	12,979,167	4%	Cobb	11,752,374	4%
Cherokee	11,035,166	4%	Pickens	8,745,010	3%
Carroll	6,747,882	2%	Clayton	6,522,028	2%
Clayton	5,961,328	2%	Elbert	6,458,481	2%
Richmond	5,471,106	2%	Hall	6,225,193	2%
Muscogee	5,159,165	2%	Forsyth	6,209,033	2%
Other	135,417,273	45%	Other	163,151,800	52%
Total County-Level Inbound Flows	304,036,867	100%	Total County-Level Outbound Flows	315,727,183	100%

Source: TRANSEARCH data.

In Georgia, the vast majority of truck travel occurs on the state's Interstate system routes. The high use of the interstate is due to two primary factors: 1) the efficient connectivity provided by Georgia's interstate system in the north-south direction, the east-west direction and along the coast; and 2) the higher speeds and ease of travel of the interstate system relative to other types of roads.

GDOT has several hundred truck count locations on all road classification types in Georgia. As shown in Figure 2.5, the 50 highest truck count locations in the

[1] Source: http://nelson.georgia.gov/05/home/0,2230,9021097,00.html

[2] Source: www.cityofelberton.net

State are all on the interstate system with truck volumes ranging from 6,500 per day up to more than 25,000 per day based on the 2009 GDOT vehicle classification data. The highest truck volumes in the State are found on I-75 just north and south of I-285 and the "western wall" of I-285 that connects I-75 on both sides of Atlanta. High truck count locations are found throughout I-285 and on all of Georgia's radial highways just outside of I-285. These are the locations where Georgia's long-haul truck traffic and Atlanta's local distribution truck traffic intersect. The long-haul corridor with the highest truck volumes is the I-75 Atlanta-Chattanooga corridor.

Figure 2.6 shows the truck count data for all roadways for the entire state, in AADT which stands for 'average annual daily traffic' of total trucks per day. Figure 2.7 shows truck counts in the Atlanta metropolitan region. It reinforces the notion from Figure 2.5 that there are very few non-interstate roads with high truck volumes.

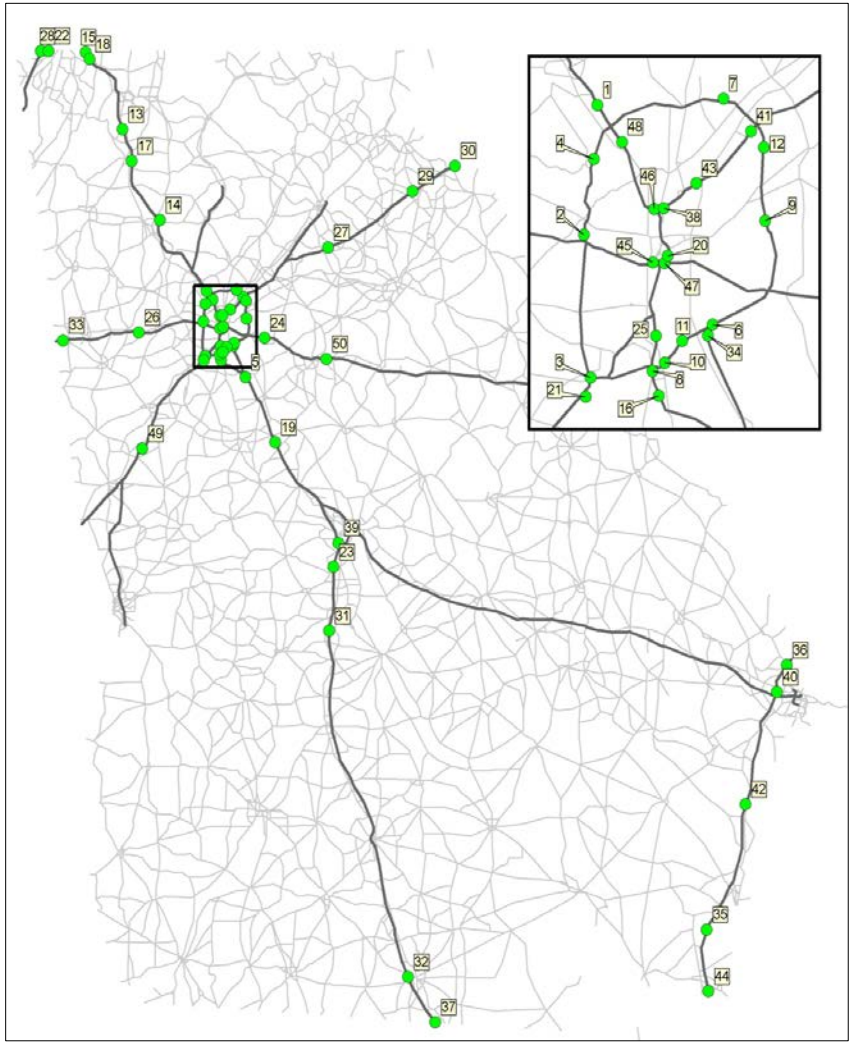
The highest Georgia truck volume on a non-interstate metro Atlanta route is the 6,105 trucks per day on State Route 316 in Gwinnett County, which serves significant retail, warehouse and a Publix supermarket distribution center.

The highest Georgia truck volumes on a non-interstate route outside the metro Atlanta is on U.S. 19 around Albany and on State Route 19 in Laurens County/Dublin area just north of I-16. These locations have just more than 3,000 trucks per day. Albany is the home to several major manufacturing plants such as Georgia Pacific, Proctor & Gamble and MillerCoors as well as the Marine Corps Logistics Base that employs 3,000 who repair ground combat equipment that is regularly moved in and out via truck. Dublin is the location for several major warehouse/distribution centers including Best Buy and Fred's supermarkets, as well as a new German-owned autoparts plant that makes metal parts and subassemblies for such automakers as BMW, Mercedes and Volkswagen.

Trucks are also used as the primary mode for trade between Georgia and other states. Table 2.2 shows Georgia's top "trading partners" by state for goods moved by truck. Due to its status as the fourth largest economy in the U.S., Florida is Georgia's top trading partner in terms of truck tonnage. Georgia's other neighboring states – Alabama, North Carolina, South Carolina, and Tennessee – are the other top trading partners by truck tonnage. Figure 2.8 shows the distribution of truck traffic to top trading partners across the country.

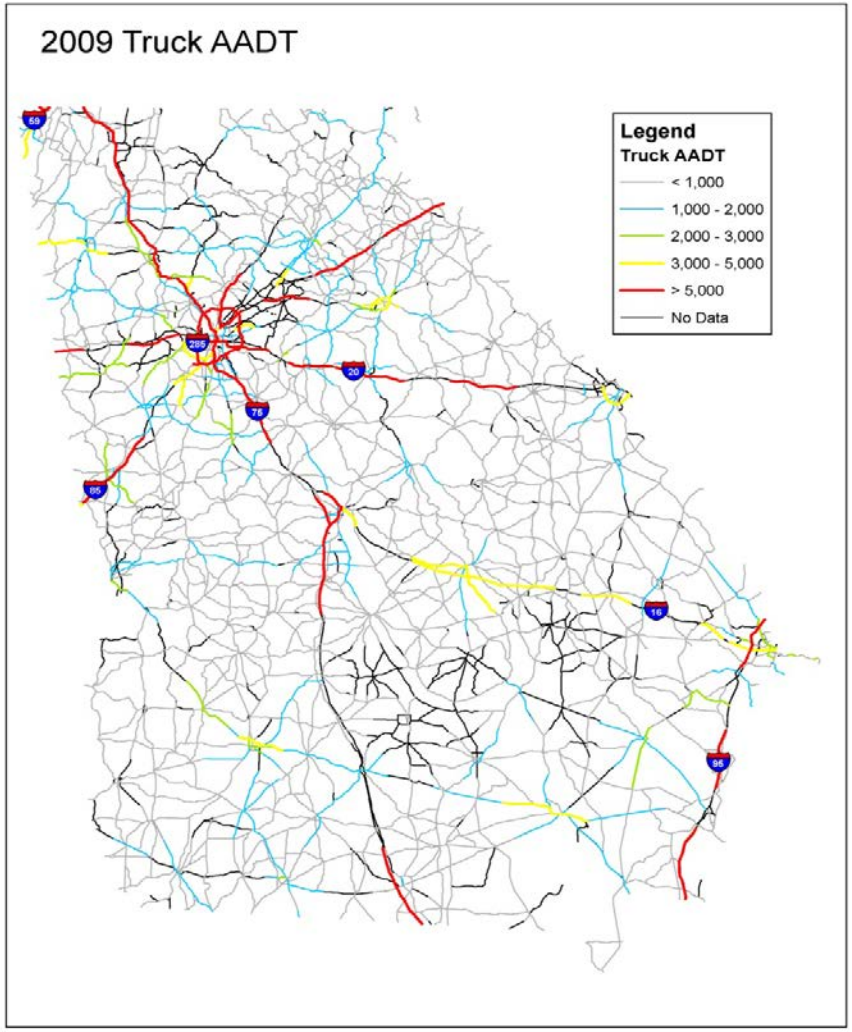
There is also a significant amount of through truck traffic that does not start or stop in Georgia. Roughly 30 percent of the trucks entering the State travel through without making any drop-offs or pickups. This number is higher on I-95 where over one-half of the truck traffic on I-95 is through truck traffic. The vast majority of the through truck traffic on Georgia's interstates 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 Midwestern states.

Figure 2.5 Top 50 Highest Truck Count Locations, 2009



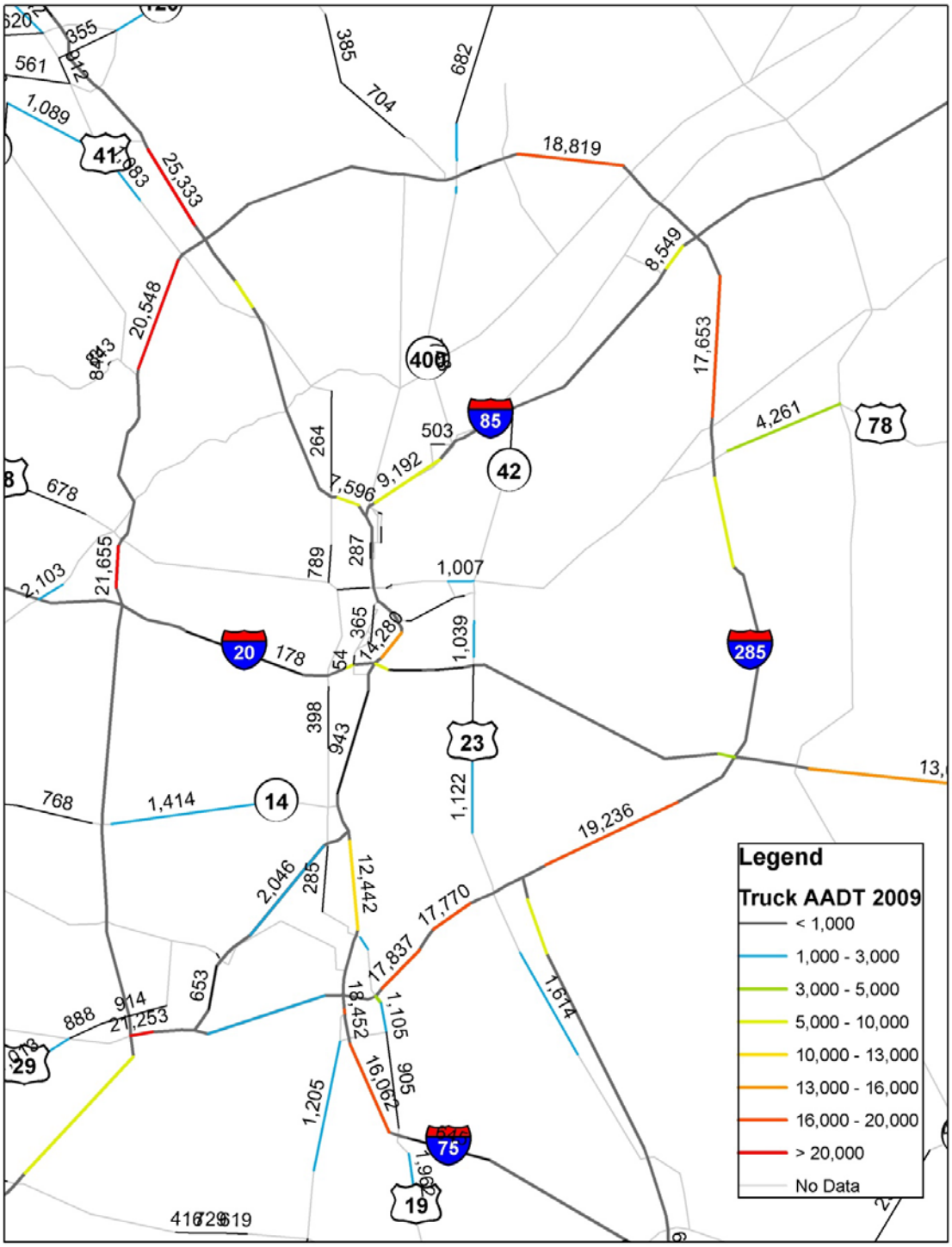
Source: GDOT Classification Count Data, 2009.

Figure 2.6 Truck Volumes (AADT), 2009



Source: GDOT Classification Count Data, 2009.

Figure 2.7 Truck Volumes (average number per day, AADT) select locations in metro Atlanta



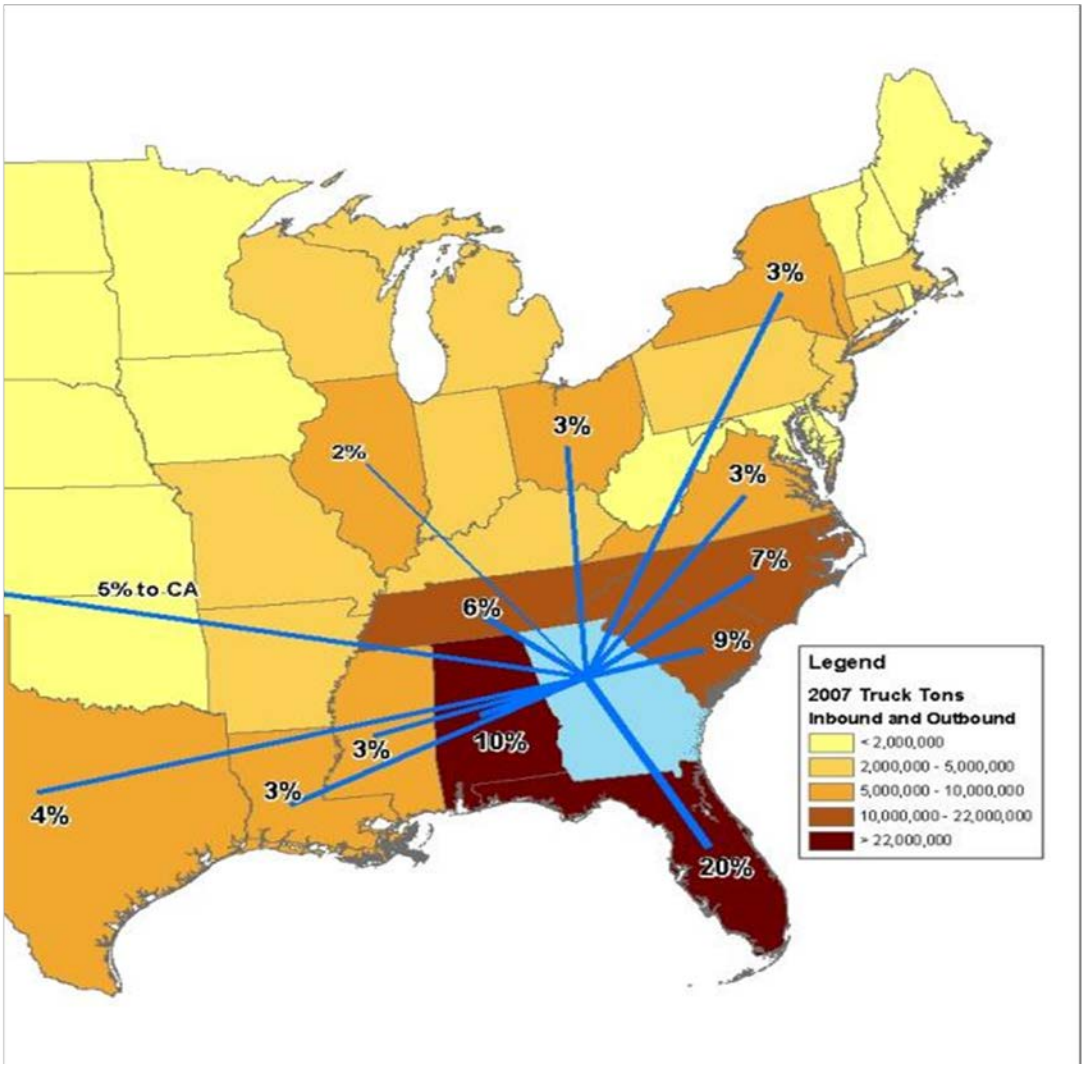
Source: GDOT Classification Count Data, 2009.

Table 2.2 Top 10 "Trading Partners" for Georgia Truck Traffic, 2007

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%
Other 40 states		23,728452	22%	Other 40 states		36,446,294	31%
Total		106,380,867	100%	Total		118,071,185	100%

Source: TRANSEARCH Data.

Figure 2.8 Top Trading Partners for Georgia Truck Traffic, 2007
(Inbound and Outbound Combined)



Source: TRANSEARCH Data.

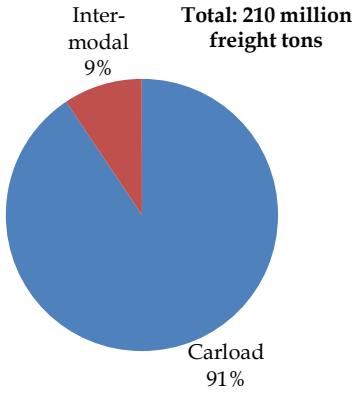
2.2 KEY FINDINGS ON RAIL FLOWS

There are two primary types of rail equipment used by the railroads: 1) carload (non-intermodal) to handle bulk, break-bulk, and liquid products; and 2) intermodal containers to haul a range of goods that fit into a standard sized 40-foot (international) or 53-foot (domestic) container. By type of rail equipment, the 2007 TRANSEARCH data show that 91 percent of rail tonnage is carried in railcars and 9 percent in intermodal containers. However, intermodal containers (which include containers and truck trailers on flat cars) account for 44 percent of

all rail equipment units moved in Georgia. The shares are illustrated in Figures 2.9 and 2.10.

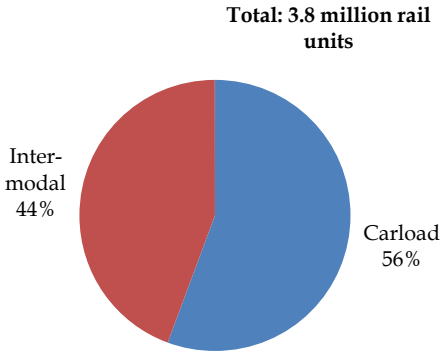
The difference between the equipment shares is due to the fact that intermodal shipments tend to be higher-value and lower-weight freight, such as consumer goods, that require more packaging and have a low weight-to-volume ratio. Carload shipments tend to be heavier and lower value freight, such as coal and nonmetallic minerals that have a high weight-to-volume ratio.

Figure 2.9 Georgia Rail *Tonnage* by Carload and Intermodal Equipment, 2007



Source: TRANSEARCH data.

Figure 2.10 Georgia Rail *Units* by Carload and Intermodal Equipment, 2007

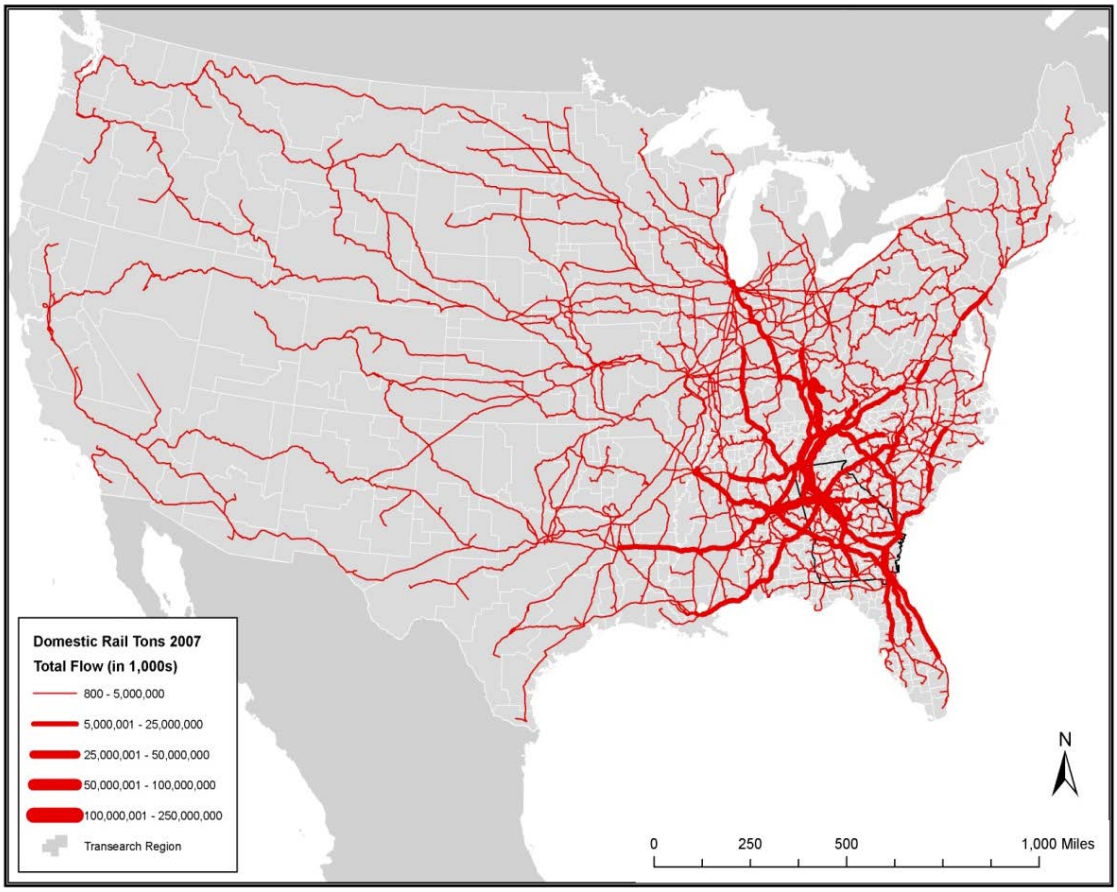


Source: TRANSEARCH data.

Georgia's major trading partners for outbound and inbound rail tonnage include locations where the state's Class I railroads (Norfolk Southern and CSX) interchange with the western U.S. Class I railroads (Burlington Northern Santa Fe, Kansas City Southern, and Union Pacific). Some of these interchange locations are among Georgia's largest trading partners, including Memphis, Chicago, Meridian (Mississippi), and New Orleans.

Freight passing through these interchange locations include inbound intermodal shipments of international cargo from West Coast ports, food and kindred products from California and Washington, and minerals and coal from the Rocky Mountain states. Kentucky and Virginia are sources of coal that represent large volumes of rail tonnage traveling into Georgia. Indiana is a source of coal bound for Georgia, and a growing intermodal lane between Indianapolis and Atlanta. Georgia also hosts a considerable volume of through traffic that originates or terminates in Florida, passing through Georgia along the I-75 corridor. Figure 2.11 shows rail flows originating and terminating in Georgia and how they are distributed across the U.S.

Figure 2.11 Georgia Rail Flows, 2007



Source: Consultant team analysis, using the I-95 Corridor Coalition's "Integrated Corridor Analysis Tool" (ICAT), and TRANSEARCH data.

Table 2.3 shows the flow of goods between Atlanta, Savannah, the rest of Georgia, and the rest of the U.S. for intermodal and carload rail. Virtually all of the intermodal rail flows in the State go through the Atlanta or Savannah regions. Nearly one-third of the Savannah intermodal flows are coming from or going to Atlanta, and another 30 percent of Savannah's intermodal rail flows are trade with Memphis, Tennessee. The remainder is spread between several different states. Atlanta's top intermodal trading partners are spread among 10 states/regions: Alabama, Illinois, Savannah, Louisiana, Tennessee, Texas, Pennsylvania, North Carolina, South Carolina, and California. These states/regions make up 90 percent of Atlanta's intermodal flows. Figures 2.12 and 2.13 show the top trading partners for intermodal rail from Atlanta and Savannah respectively.

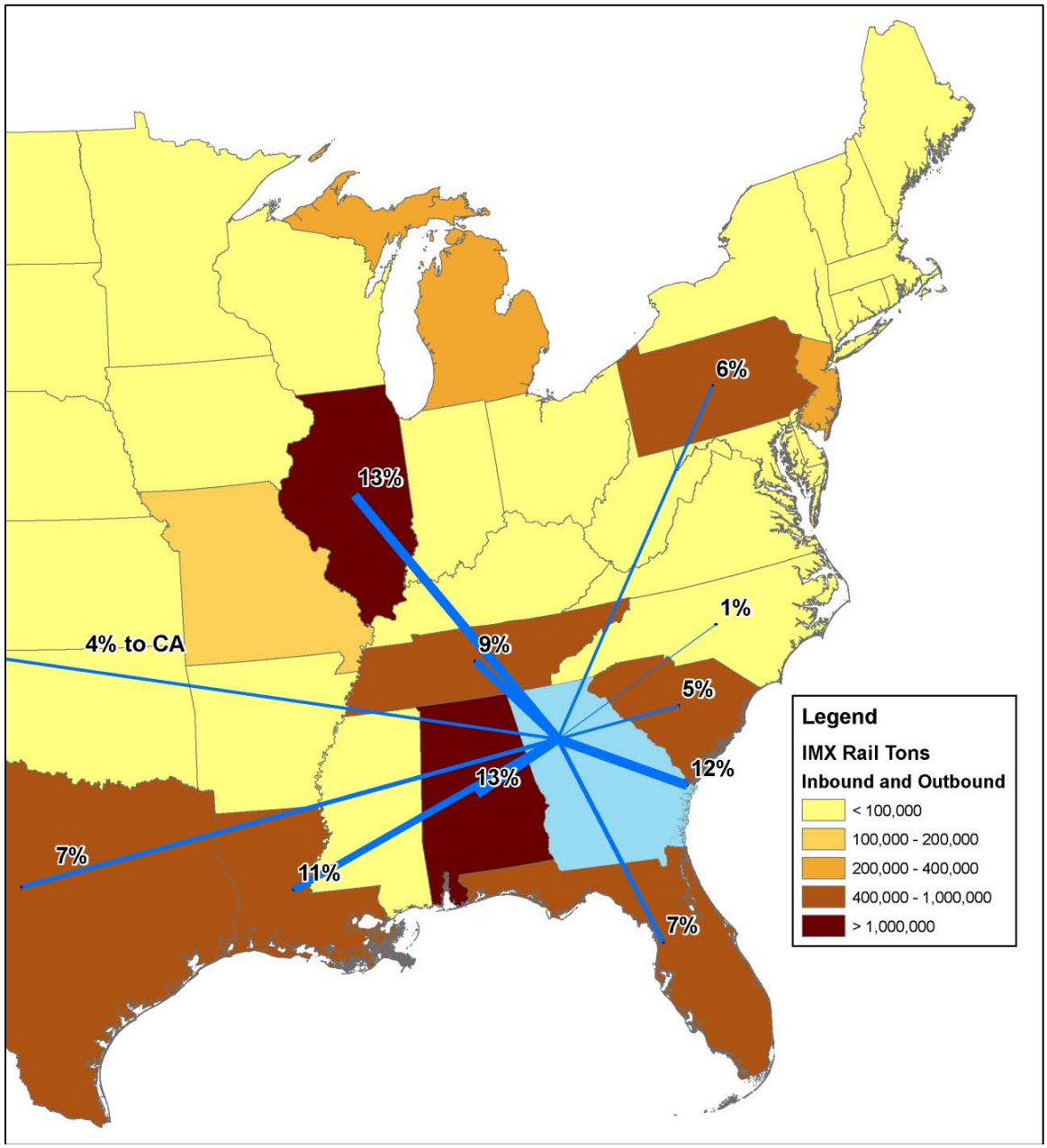
Most of Georgia's 191 million tons of carload flows do not originate or terminate in the Atlanta or Savannah regions. However, it is interesting to note that the nature of the carload flows to each of these regions is very different. More than

95 percent of Atlanta's carload tons are to and from other states, while nearly one-half of Savannah's carload flows is from locations within Georgia. A significant portion of this flow is kaolin clay from middle Georgia area being shipped to the Port of Savannah for export.

Table 2.3 Intermodal and Carload Tons from Atlanta and Savannah, 2007

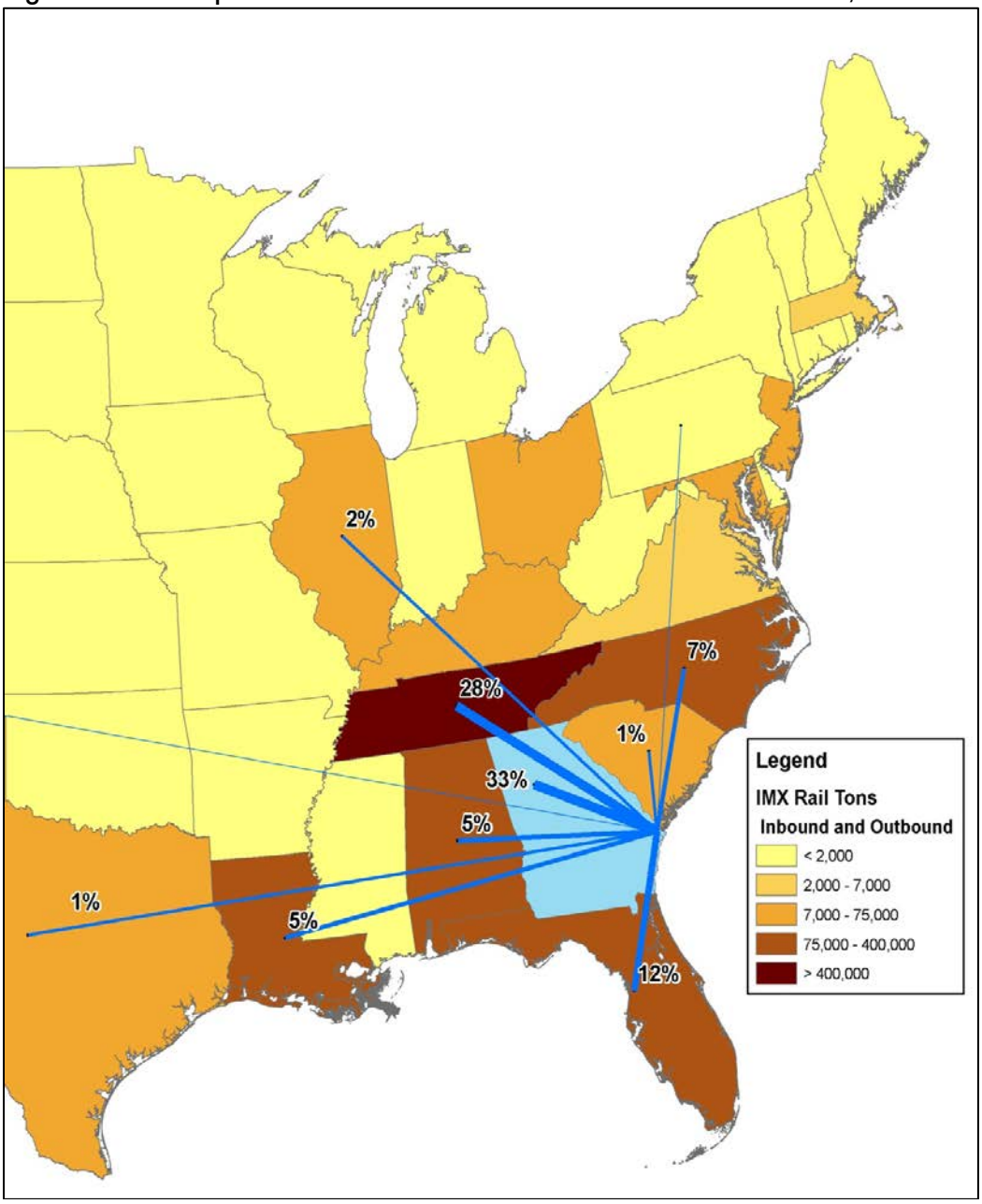
Intermodal Tons				Carload Tons			
From	To Atlanta	To Savannah	Total	From	To Atlanta	To Savannah	Total
Atlanta	–	1,056,240	1,056,240	Atlanta	29,720	305,872	335,592
Savannah	1,056,240	–	1,056,240	Savannah	305,872	8,140	314,012
Rest of GA	–	–	–	Rest of GA	626,040	5,181,072	5,807,112
TN	818,560	889,600	1,708,160	AL	3,789,178	460,128	4,249,306
AL	1,159,640	159,840	1,319,480	KY	1,989,623	151,165	2,140,788
IL	1,129,560	59,280	1,188,840	VA	1,495,970	583,613	2,079,583
LA	969,320	153,800	1,123,120	IL	1,158,458	339,860	1,498,318
FL	613,320	375,240	988,560	NC	369,428	775,212	1,144,640
TX	641,280	27,760	669,040	LA	841,480	269,920	1,111,400
SC	462,320	33,600	495,920	TN	703,034	400,396	1,103,430
PA	483,680	–	483,680	FL	267,424	731,932	999,356
CA	376,200	4,640	380,840	SC	567,932	371,560	939,492
NC	67,640	234,800	302,440	OH	455,968	68,864	524,832
Rest of U.S.	839,880	186,640	1,026,520	Rest of U.S.	3,078,776	861,728	3,940,504
Total	8,617,640	3,181,440		Total	15,678,903	10,509,462	

Figure 2.12 Trip Ends for Intermodal Rail Tons to/from Atlanta, 2007



Source: 2007 Transearch data, Project team analysis.

Figure 2.13 Trip Ends for Intermodal Rail Tons to/from Savannah, 2007



Source: 2007 Transearch data, Project team analysis

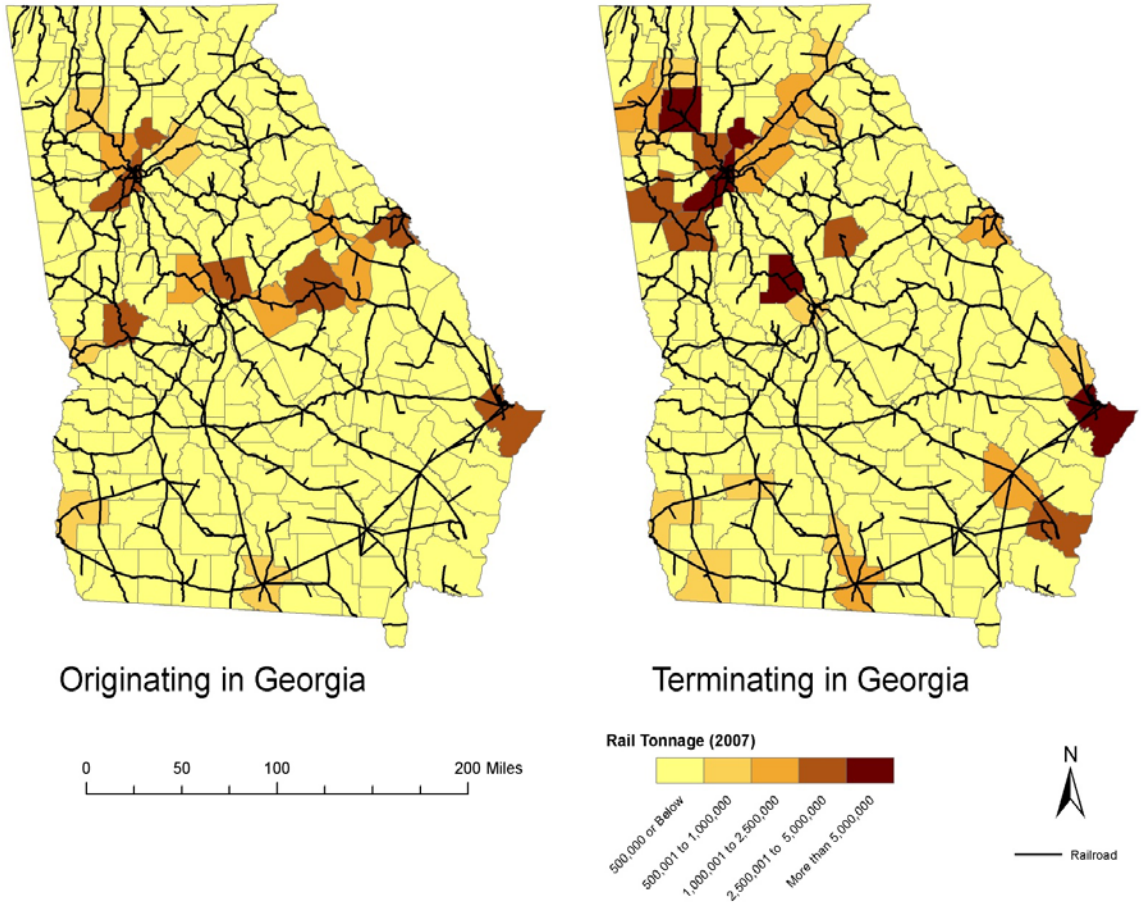
Freight rail originations and destinations within Georgia are even more concentrated than they are for the truck mode. Figure 2.14 shows county-level rail flows for the State. Rail shipments are primarily generated in the Atlanta

region, the Savannah region, and a string of counties from Augusta to Columbus. Shipments from the Atlanta region are primarily intermodal goods. Approximately 12 percent of these intermodal goods go to Savannah and the remainder goes to locations outside of Georgia. Shipments from Chatham County exceed 3.8 million tons annually and are mostly chemicals, intermodal goods, pulp and paper, and food products. A majority of the freight rail produced in the region between Augusta and Macon is kaolin clay.

The two top rail tonnage destination counties in Georgia are Monroe County and Bartow County, attracting 16.6 million and 10.6 million tons, respectively. These flows are mostly coal from Tennessee used to supply large coal-fired powerplants (Plant Scherer in Monroe County and Plant Bowen in Bartow County).

The Atlanta metropolitan region and the Savannah metropolitan regions are the other primary attractors of freight rail traffic in the State.

Figure 2.14 Rail Tonnage Originating and Terminating in Ga. Counties, 2007



Source: Project team analysis, using the I-95 Corridor Coalition's "Integrated Corridor Analysis Tool" (ICAT), and TRANSEARCH data.

Cordele Intermodal Facility

A significant recent addition to Georgia's freight asset portfolio is the Cordele Intermodal Facility located approximately 140 miles south of Atlanta near exit 101. Situated on 40 acres, with the ability to expand up to 1,200, the facility has access to U.S. 280, a north-south CSX rail line, and an east-west leg of the Heart of Georgia Railroad. The Heart of Georgia rail line, in conjunction with a Georgia Central rail line and a CSX line in Savannah, provides it with a comprehensive rail connection to the Port of Savannah 180 miles to the east. It also has rail access to Georgia's Port of Brunswick and is near State Route 300 (a.k.a. "Georgia Florida Parkway") a multi-lane connection to Albany with continued multi-lane connection south to I-10 and Tallahassee, Florida.

This facility can serve as a bridge between shippers in southwest Georgia and the importing and exporting capability of the Ports. The Cordele Intermodal Facility has several benefits that may include:

- Ability for Port of Savannah to serve new customers in southwest Georgia, the panhandle of Florida, Alabama and Mississippi.
- Increased diversion from truck to rail of shipping services already served by the Port of Savannah
- Increased business attraction opportunities for the southwest Georgia region.

According to the 2011 edition of Georgia Ports Authority's (GPA) Anchor Age magazine, the Port of Savannah handles approximately 300,000 containers annually from the Cordele Intermodal Facility target market; 50,000 of these originate or terminate within a 50 mile radius of Cordele. The relationship of these two facilities is recognized; on July 10, 2013 the Cordele Intermodal Facility and Governor Deal with the Georgia Ports Authority signed an agreement to partner on creating and expanding regional business with focus on expansion of international markets.

The Cordele Intermodal Facility is planned to grow to a capacity of up to 230,000 containers per year.[3] Cordele Intermodal handled via rail 18 containers in 2011, 1,400 containers in 2012, 3,500 containers in 2013, and close to 5,000 containers in 2014. A capital investment project to construct a 6,500 foot double-track rail spur connecting the Heart of Georgia railroad and the CSX mainline in Cordele is currently in progress as of January, 2015. This investment is expected to support continued growth of the number of containers the facility handles annually.[4] GDOT has also helped to further the growth of the facility by making

[3]http://www.albanyherald.com/news/2011/may/18/officials-inland-port-brings-benefits/

[4]http://www.cordeleintermodal.com/wp-content/uploads/2015/02/Marketing-Award-2014-ASLRRA.pdf

improvements to the Heart of Georgia railroad, and will construct a widening of US 280 from the current two lanes to four lanes from I-75 to Midway Road as a "last mile" improvement to the Cordele Intermodal Facility in 2017.

Appalachian Regional Port

A second inland port intermodal facility similar to the Cordele Intermodal Facility is planned for Murray County near Chatsworth, in North Georgia, to be known as the Appalachian Regional Port. This facility will expand the planned network of terminals that will be developed to enhance the movement of goods by rail from across the state under the Georgia Ports Authority's "Network Georgia" initiative (see **Figure 2.15**).[5] The intended market for this facility includes parts of Alabama, Tennessee, and Kentucky.

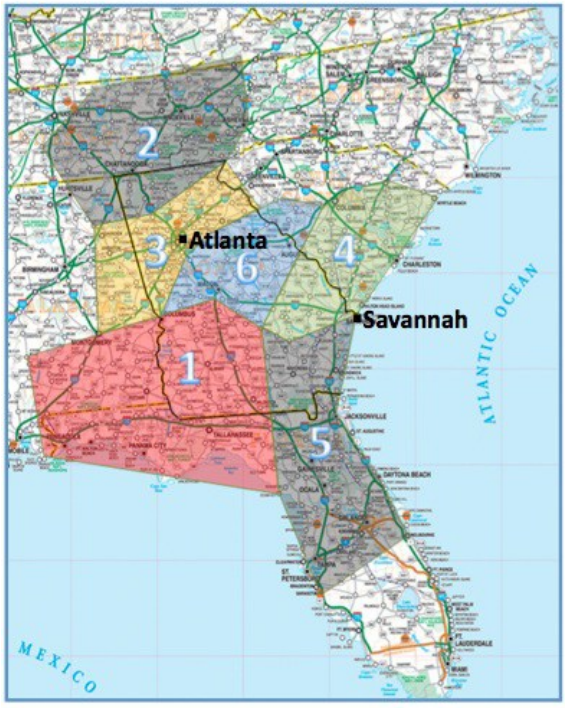
Appalachian Regional Port will be located on a 42 acre site adjacent to US 411, and less than twenty miles from I-75. The facility will feature on-terminal rail access for ease of transferring containers between trucks and trains, and it will be equipped to handle import, export, and domestic cargo.

The facility is intended to open in 2018, and will feature an initial annual capacity of 50,000 containers. A development plan will increase the capacity to 100,000 containers over the course of a decade.[6] The diversion of containers from trucks to rail between north Georgia and Savannah that will result from the operation of the Appalachian Regional Port is expected to divert up to 40,000 trucks from Atlanta area roads annually.

[5] http://www.porttechnology.org/news/gpa_unveil_network_georgia_concept

[6] http://www.gaports.com/Media/PressReleases/tabid/379/xmmid/1097/xmid/10652/xmview/2/Default.aspx

Figure 2.15 Georgia Ports Authority Network Georgia Proposal



Georgia Ports Authority
WE DO MORE

NETWORK GEORGIA

Zones:

1. SW Georgia - Cordele
2. NW Georgia
3. Port Atlanta
4. I-95 Corridor - North
5. I-95 Corridor - South
6. Middle Georgia

Truck-Rail Mode Split Characteristics

The freight rail mode has higher fixed costs than trucks primarily due to the high cost of the rail equipment, but generally lowers per-mile operating costs. The lower per-mile costs can be attributed to the fuel efficiency of the railroads and higher labor productivity of a train relative to a truck (i.e. each truck requires a driver, but a large freight train can operate with a small crew). These lower per-mile costs make travel distance a key determinant of the truck-rail mode split.

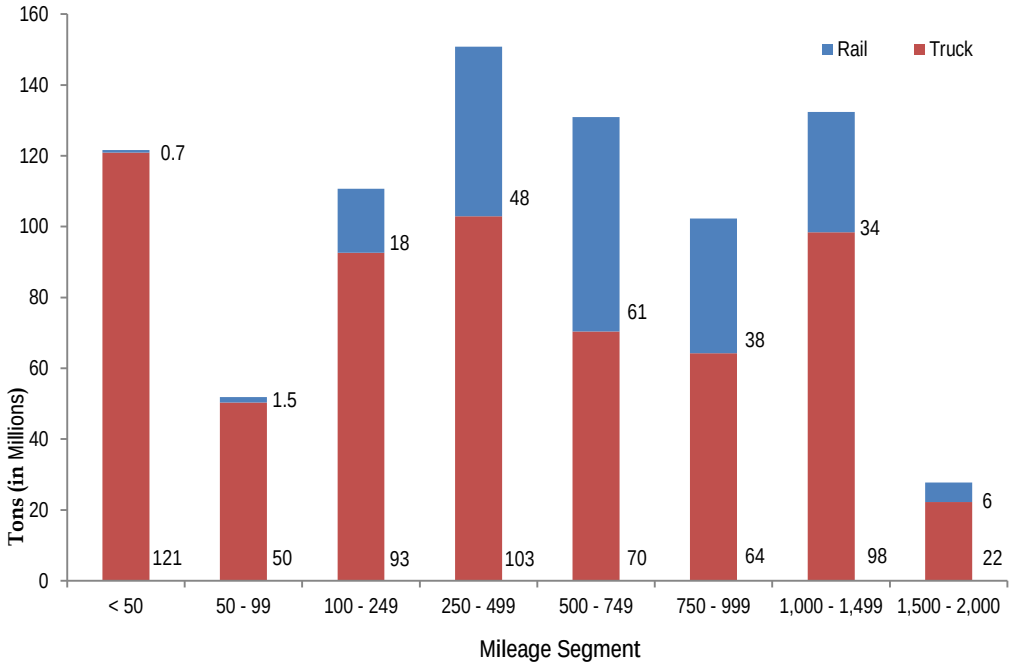
According to senior management within Norfolk Southern, it has been estimated that the intermodal trains of 8,000 to 10,000 feet in length that the company uses to service the Port of Savannah are equivalent roughly 280 to 300 trucks.[7] These trains would typically represent a diversion of freight from trucks on I-16 and I-20 moving between Savannah and Atlanta.

Figure 2.15 shows the freight choice of mode between truck and rail at different travel distances. Trucks mostly dominate travel within relatively shorter distances. However, as trips reach the 250-mile threshold, roughly one-third goes by rail. The rail mode share is even higher for trips of longer distances. For

[7] http://businessinsavannah.com/bis/2015-01-24/rail-still-rules-logistics-landscape

intermodal rail traffic, about 500 miles is generally the break point before rail receives a significant share of the overall freight traffic.

Figure 2.16 Georgia Freight Rail and Truck Mode Share by Distance, 2007



Source: TRANSEARCH data and Oak Ridge National Laboratory (ORNL) Center for Transportation Analysis (CTA) Distance Matrix and Project team analysis

2.3 KEY FINDINGS ON PORT ACTIVITY

There is a mix of publicly-owned and privately-owned port terminals across the State. The private terminals are generally owned and operated by companies that exclusively ship their own products. This includes terminals owned by Southern LNG (liquefied natural gas facility on Elba Island 5 miles downstream from Savannah), GP Gypsum Corporation (Savannah Wharf Port facility), and Savannah Sugar Refinery. However, the vast majority of the marine tonnage moves through publicly-owned terminals, which are operated by the GPA; their facilities include:

- **The Port of Savannah.** The terminals at this GPA owned/operated Port specialize in the handling of container, refrigerated, break-bulk, and roll-on/roll-off ("RoRo") cargoes[8]. Their Garden City Terminal is located on the

[8] Break-bulk is non-containerized cargo shipped as a unit such as barrels, boxes, cartons, drums and pallets. Roll-on/roll-off cargo are items that can be driven onto/off ships such as automobiles and other transportation equipment.

Savannah River upstream from downtown Savannah and is the largest of all of the GPA facilities. Ocean Terminal is the GPA's break-bulk activity center just upstream from downtown Savannah; it has 96 acres of outside storage and 1.4 million square feet of warehousing. It also includes transit shed space that back up 10 berths for cargoes like linerboard, lumber, and steel.

- **The Port of Brunswick.** This GPA-owned/operated Port specializes in the handling of break-bulk, agri-bulk, and RoRo cargoes. As well as service for importers and exporters of forest products, paper products, bulk commodities, and automobiles. The terminals at this Port include Colonel's Island Terminal RoRo Facility and Agri-bulk Facility, Mayor's Point Terminal, and the Marine Port Terminal.
- **Two Inland Ports.** GPA operates inland ports at Port Bainbridge located on the Apalachicola-Chattahoochee-Flint Waterway and Port Columbus located on the Chattahoochee River. Both of these ports are on the Chattahoochee Intra-Coastal Waterway. Port Bainbridge primarily handles bulk commodities that are shipped by barge such as gypsum, cottonseed, and cypress bark mulch. Port Columbus has been inoperable for several years due to lower water levels on its inland waterway system of the Chattahoochee River.
- **Deepwater Port at St. Marys**. Proposed for the site of a former paper mill near downtown St. Marys in Camden County is the third deepwater port in Georgia. Plans include a barge dock and ship berths, cargo handling and rail intermodal facilities, as well as infrastructure. Initial plans indicate that approximately 3,000 linear feet of barge and vessel berthing is attainable on the North River. A Development of Regional Impact determination was made on the project in November of 2015.

Table 2.4 shows the volumes at each of GPA's ports. The Port of Savannah carries the vast majority of the marine freight flows in Georgia. In 2007, the Port of Savannah became the fourth largest container port in the U.S., and it has been the fastest growing container port in the U.S. over the past 30 years. Table 2.5 shows the twenty-foot equivalent units (TEUs) at the Port of Savannah relative to the other large ports over the last 30 years.

A "TEU", or twenty-foot equivalent unit, is the basic container metric used in the shipping industry, representing a container 20 feet long and 8 feet wide and high.

Table 2.4 Port Volumes in Georgia, FY 2011

Port	Containers	Tons	Dollar Value
Port of Savannah	2,927,371	23,758,563	$9,100,985,875
Port of Brunswick	0	2,180,334	$287,325,556
Port of Bainbridge	0	82,521	n/a
Port of Columbus	0	0	0

Total	2,927,371	26,021,428	$9,388,311,430

Source: Georgia Ports Authority

The Port of Savannah is responsible for moving 7.9 percent of the U.S. containerized cargo volume and more than 18.5 percent of all East Coast container trade. In 2012, it handled 10.2% of all U.S. containerized exports -- a total of 1.23 million loaded TEUs. The Port serves approximately 21,000 companies in all 50 states, more than 75% of which are headquartered outside of Georgia.

Table 2.5 TEUs at Largest U.S. Container Ports

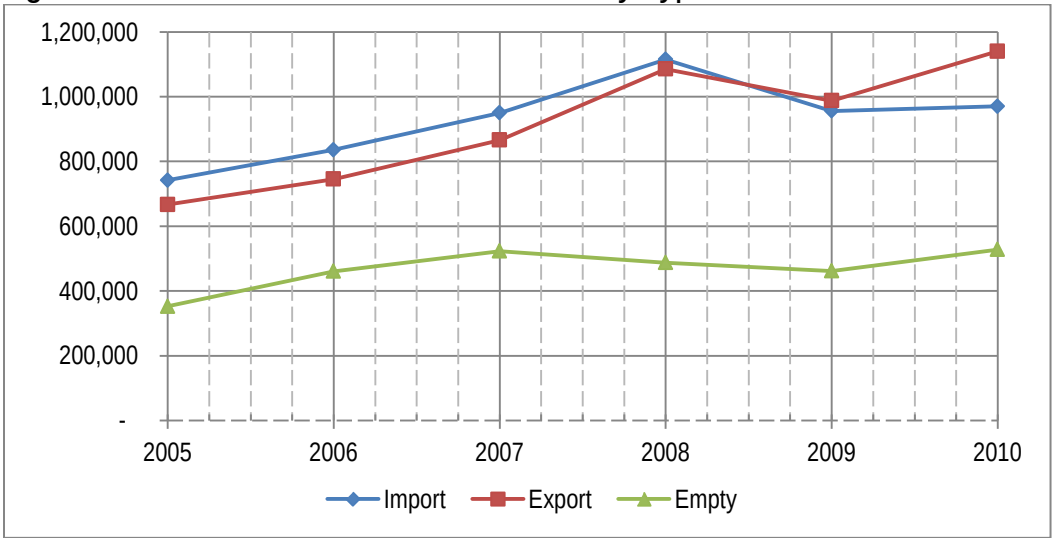
							Growth	
Port	1980	1990	2000	2008	2009	2010	1980-2010	2008-2010
Los Angeles	0.6	2.1	4.9	7.9	6.7	7.8	1,200%	-1%
Long Beach	0.8	1.6	4.6	6.4	5.1	6.2	675%	-3%
PANYNJ	1.9	1.9	3.1	5.3	4.5	5.3	179%	0%
Savannah	0.2	0.4	0.9	2.6	2.4	2.8	1,300%	8%
Oakland	0.8	1.1	1.8	2.2	2.1	2.3	188%	5%
Seattle	0.8	1.2	1.5	1.7	1.6	2.1	163%	24%
Hampton Roads (Virginia)	0.4	0.8	1.3	2.1	1.7	1.9	375%	-10%
Houston	0.3	0.5	1.1	1.8	1.8	1.8	500%	0%
Tacoma	N/A[a]	0.9	1.4	1.9	1.5	1.5	N/A[a]	-21%
Charleston	0.2	0.8	1.6	1.6	1.2	1.4	600%	-13%
Total U.S. (Mainland)	7.4	14.4	27.5	39.7	34.3	42.3	436%	6%

Source: American Association of Port Officials, Project team analysis.
[a] Tacoma did not track container traffic in 1980.

As noted, Savannah is also the largest port in the U.S. that does not have a relatively large local population of consumers nearby the port location. Therefore, virtually all of the freight that moves through the Port of Savannah is destined for locations hundreds or thousands of miles away from the Port. This makes Savannah a discretionary port; in that, the ships that call at this Port could call at any number of ports on the East Coast. This is in contrast to the Ports of Los Angeles, Long Beach, and New York/New Jersey that have a large local population of consumers that is significantly easier to reach through the nearby port complexes. These ports will retain much of their ship traffic regardless of competitive forces in the marketplace.

The Port of Savannah is also unique relative to the top container ports, because it has a balanced import-export profile in terms of TEUs. Figure 2.16 shows the trend of imports and exports at the Port of Savannah, and that they have stayed relatively close to each other over the past seven years. This can be contrasted with the other major container ports, which rely primarily on imports for their volumes. Note that empty containers in this figure refers to containers being returned to their owner after shipping goods. These can be either export or import containers.

Figure 2.17 Savannah Container Volumes by Type 2005 to 2010



Source: GPA/Moffatt and Nichol.

Exports to the Asian trade lanes accounted for 50 percent of Savannah's container volumes in FY 2010, as Table 2.6 shows. On the import side, the Asian trade lanes account for 77 percent of Savannah's container volumes. This dominance of Asian trade underscores the importance of the expansion of the Panama Canal to future trade through the Port of Savannah.

It also highlights the importance of the Savannah Harbor Expansion Project (SHEP) to maintaining and increasing the competitive advantage of the Port of Savannah relative to other ports on the East Coast of the U.S. and in the Caribbean. This is discussed in greater detail in the "Capability" portion of Section ES.4.

Table 2.6 Top Trade Lanes for the Port of Savannah, FY 2010, in TEUs

Trade Lane	Export	Import	Total
Northeast Asia	400,974	603,271	1,004,245
Mediterranean	166,220	71,499	237,719
Southeast Asia	101,353	108,502	209,855
North Europe	110,519	64,046	174,565
Southern Asia/India	44,162	43,997	88,159
Middle East	69,490	12,388	81,878
Oceania	52,844	11,552	64,396
East Coast South America	44,003	18,574	62,577
West Coast South America	25,314	n/a*	25,314
Africa	21,806	n/a*	21,806
Central America	n/a*	15,557	15,557
Eastern Europe	n/a*	12,054	12,054
Other	59,748	20,714	80,462
Total	1,096,433	982,154	2,078,587

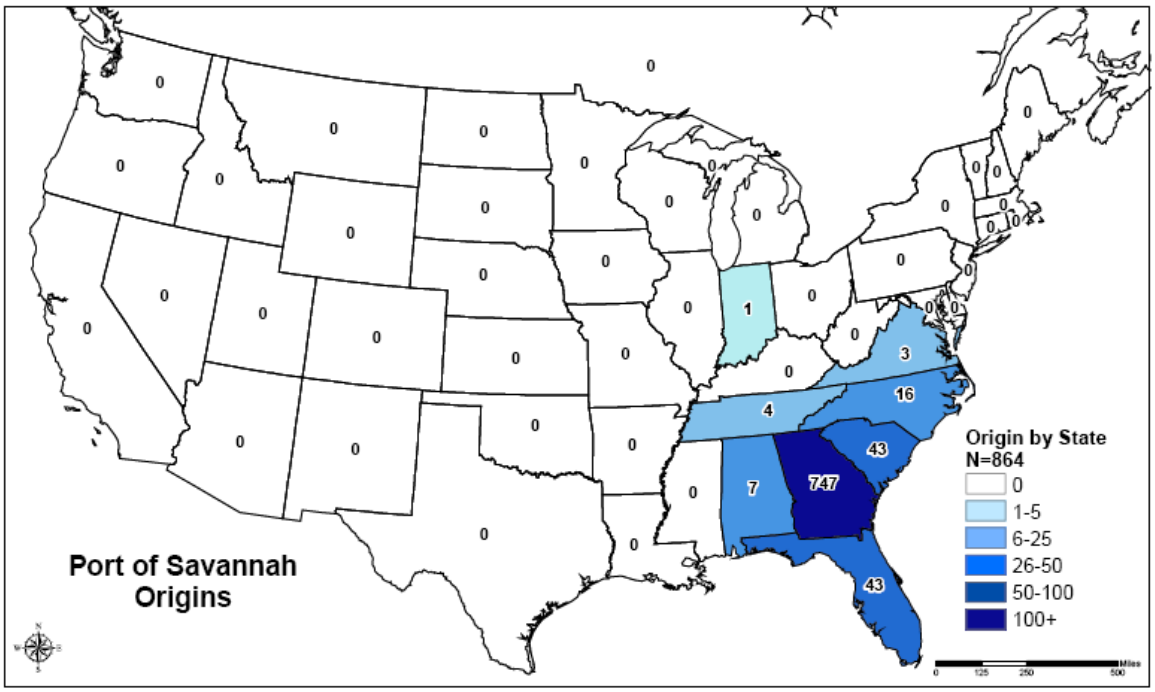
Source: Port Import-Export Reporting System
*Included in "Other" category due to small or no volumes.

Road Access to the Port of Savannah

Truck origin-destination (O-D) surveys were conducted in the spring and summer of 2006 as part of GDOT Office of Planning's "Truck-Only Lane Needs Identification Study" to collect real-world information on truck movements and O-D pairs throughout the State. Of most relevance for marine transportation in Georgia is that there were 411 surveys conducted at Gate 3 at the Port of Savannah and 476 surveys conducted at Gate 4. These are the most heavily trafficked gates at the Port of Savannah, representing roughly 80 percent of the total truck moves in and out of the port gates.

As shown in Figure 2.17, the survey found that 86 percent (747 of 864 respondents) of the trucks moving through the Port of Savannah are from locations within the State of Georgia. The largest external states capturing Port of Savannah truck trip traffic were South Carolina and Florida. These states each represented roughly 5 percent of the total truck trip ends from the survey. Only one truck in the survey had a trip end outside the southeastern United States.

Figure 2.18 Distribution of Port of Savannah Truck Trip Ends within the United States

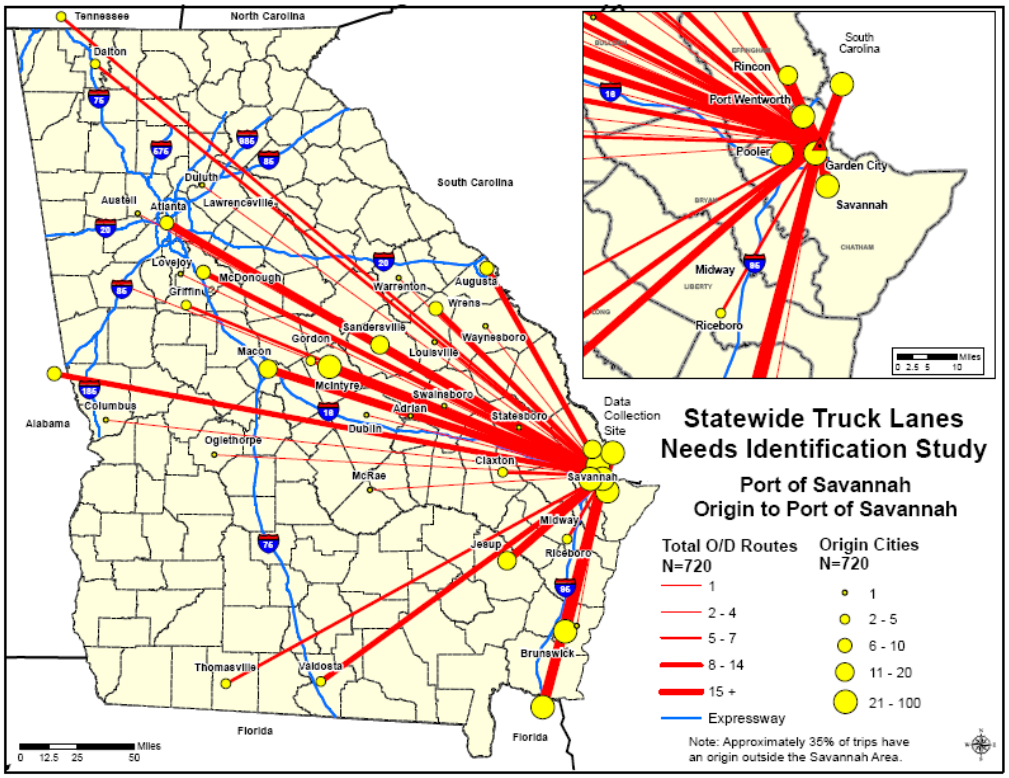


Source: GDOT Office of Planning's "Truck-Only Lane Needs Identification Study", 2006.

Figure 2.18 shows truck trip ends within the State of Georgia based on the port O-D surveys. Sixty-three percent of surveyed trucks had trip ends within Chatham County with the vast majority of those trip origins occurring within a few mile radius of the Port of Savannah, as shown in Figure 2.19.

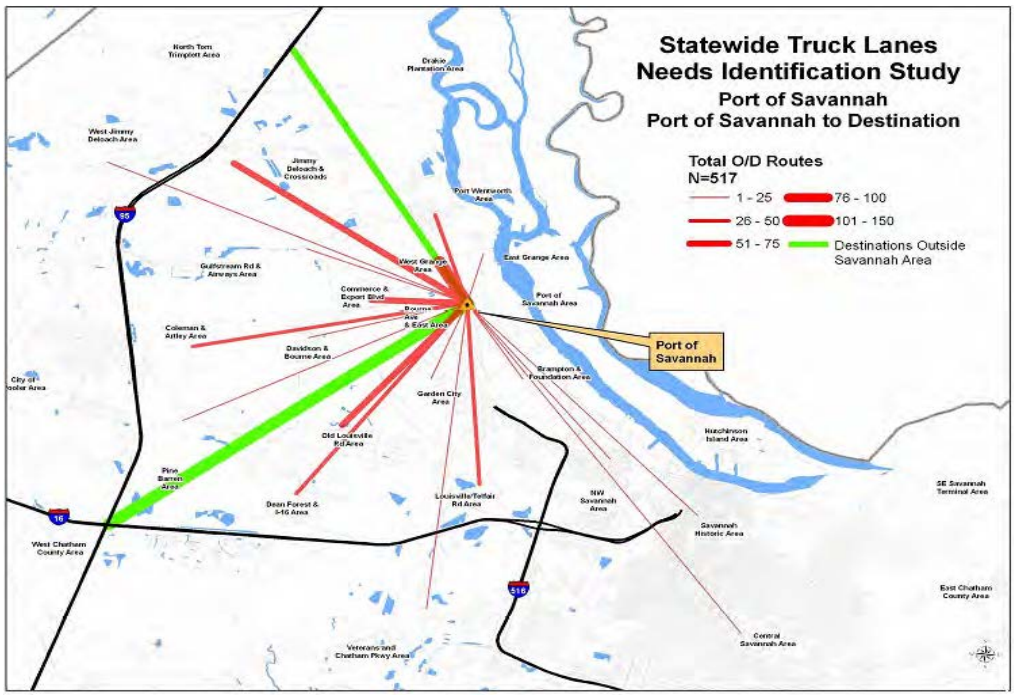
These survey results demonstrate that the vast majority of truck trips to and from the Port are short distance truck trips to and from the warehouses relatively close to the Port. From these warehouse locations, the trucks distribute their goods throughout Georgia and the rest of the U.S.

Figure 2.19 Distribution of Port Truck Trip Ends within Georgia



Source: GDOT Office of Planning's "Truck-Only Lane Needs Identification Study", 2006.

Figure 2.20 Distribution of Chatham County Port Truck Trip Ends



Source: GDOT Office of Planning's "Truck-Only Lane Needs Identification Study", 2006.

2.4 KEY FINDINGS ON AIRPORT ACTIVITY

Georgia has more than 100 public access airports. Ten of these airports are currently providing significant air cargo operations (Figure 2.20). The volume of air cargo handled is listed on Table 2.7, demonstrating that three Georgia airports had air cargo volumes above 1,000 annual tons in 2009: Hartsfield-Jackson Atlanta International Airport, the Southwest Georgia Regional Airport (in Albany), and the Savannah International Airport. The Hartsfield-Jackson represents more than 95 percent of the total air cargo volume in Georgia.

For Georgia airports, air cargo typically travels in the 'belly' of commercial passenger airliners, on dedicated freight carriers such as UPS and FedEx, or on all-cargo air carriers. These types of cargo are all represented at Hartsfield-Jackson airport. Due to the high number of passenger flights, 'belly cargo' has ample opportunity to move through this airport.

Figure 2.21 Top Georgia Air Cargo Airports

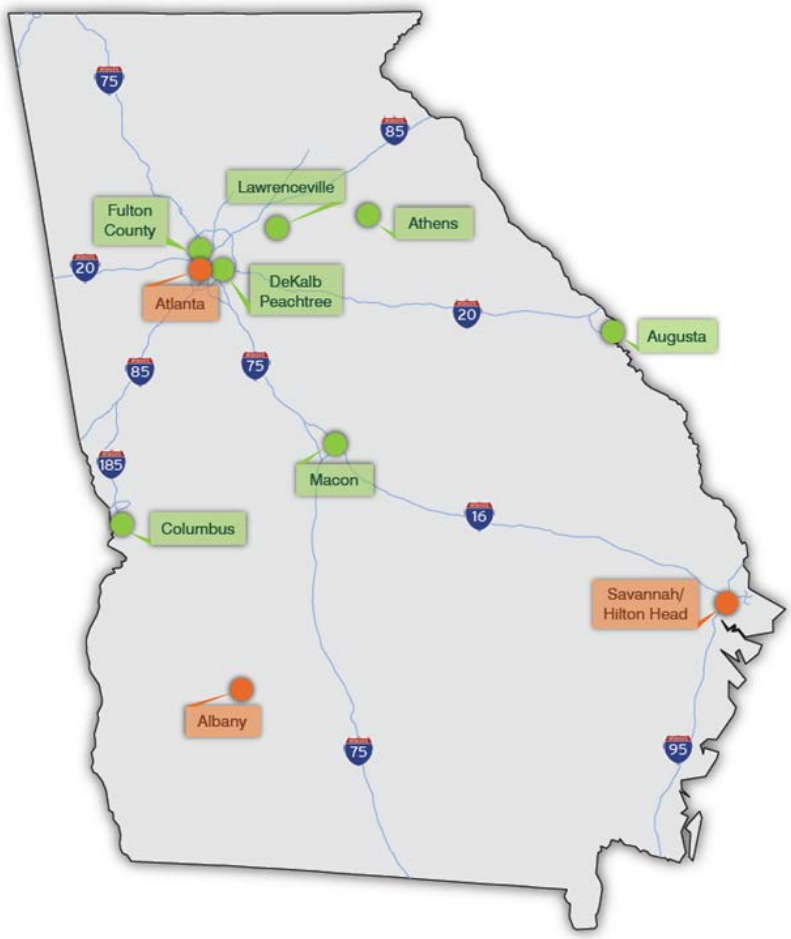


Table 2.7 Georgia Annual Air Cargo Volumes

Airport Name	Airport Location	Tonnage (2009)	Percent of Tonnage Total
Hartsfield-Jackson Atlanta International Airport	Atlanta	663,724	95.3%
Southwest Georgia Regional Airport	Albany	26,076	3.7%
Savannah/Hilton Head International	Savannah	5,666	0.8%
Hunter Army Air Field	Savannah	521	< 0.1%
Columbus Metropolitan	Columbus	175	< 0.1%
Robins Air Force Base	Warner Robins	141	< 0.1%
Bush Field	Augusta	19	< 0.1%
Others (14 included)	Various Locations	8	< 0.1%
Total		696,330	100.0%

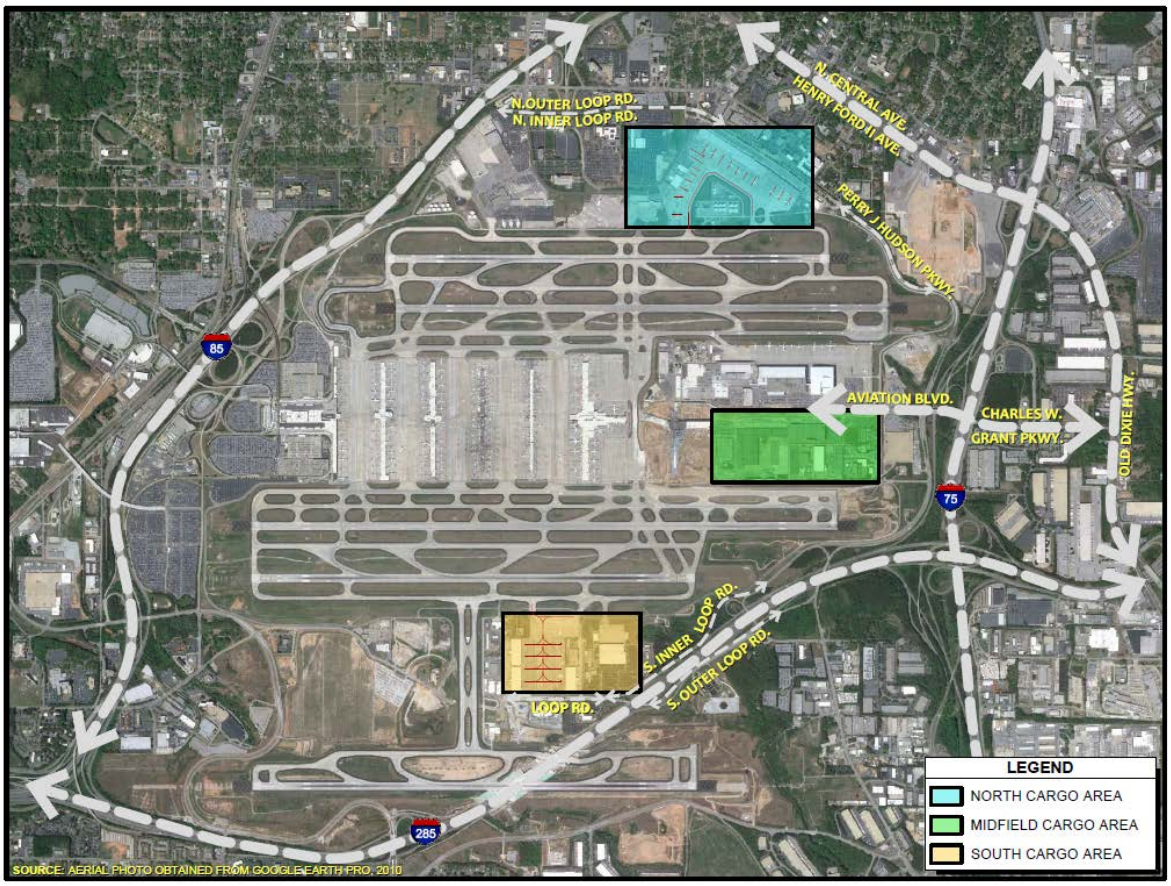
Source: U.S. DOT, Schedule T-100

Figure 2.21 shows the location of Hartsfield-Jackson airport and its cargo facilities. The airport is located approximately 11 miles south of downtown Atlanta and with immediate access to Interstates 75, 85, and 285. Therefore, each of these interstates is important in terms of air cargo access for the Atlanta airport.

The main circulation road at Hartsfield-Jackson is Loop Road. This is the artery that provides primary access to the individual cargo areas. North Loop Road provides access to the North Cargo Area from Interstate 85. South Inner Loop Road provides access to the South Cargo Area from Interstate 285. Aviation Road provides access to the Midfield Cargo Area from Interstate 75. This network of local access roads and interstate access locations provides a significant amount of capacity to connect the Atlanta airport air cargo traffic to other locations in the Atlanta metropolitan region and the southeast as a whole. Passenger vehicular traffic dominates the airport, and in satisfying this demand the airport will also need to ensure that air cargo access is provided.

The cargo area at the Atlanta airport consists of a North Cargo Complex, a Midfield Cargo Complex, and a South Cargo Complex. The North Cargo Complex is the largest in terms of office square footage and ramp square footage. It also has the most parking positions for aircraft and truck bays of the facilities. The North Cargo Terminal building contains 378,000 square feet of floor space plus additional space on a mezzanine level. The North Cargo Complex also includes a 600,000-square foot aircraft ramp, a building leased by UPS, another building leased by DHL/Airborne, a perishable goods facility that is refrigerated, and an equine center.

Figure 2.22 Location of Atlanta Airport's Air Cargo Complexes



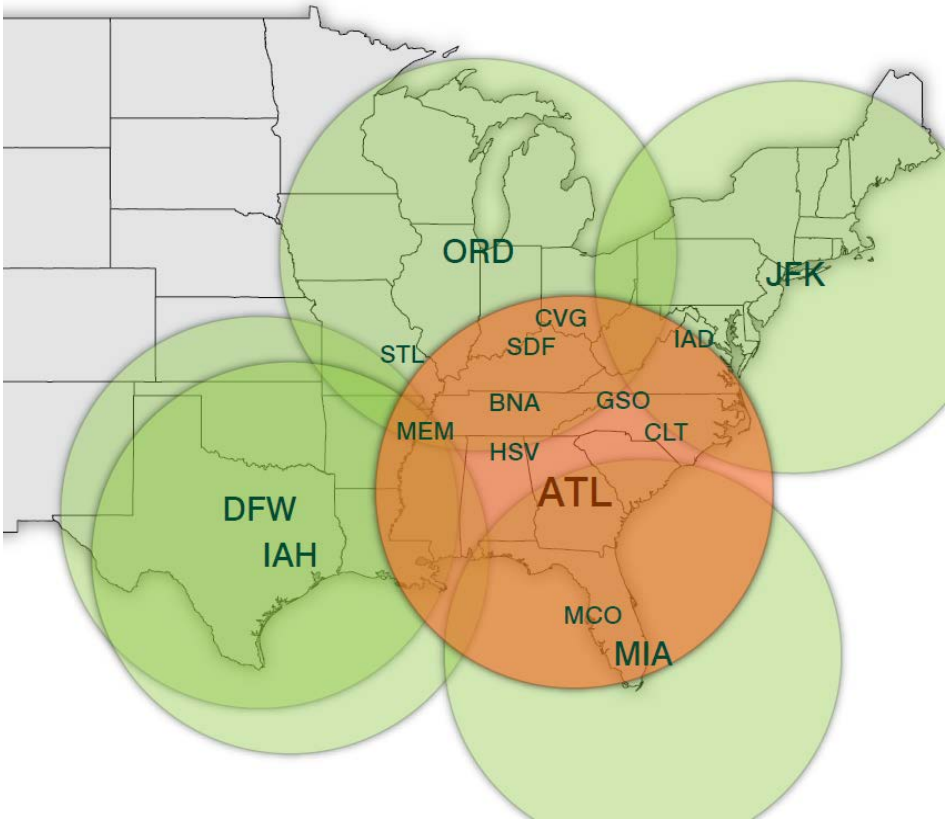
The Midfield Cargo Complex is the largest in terms of warehouse square footage with more than 500,000 square feet available to store goods. However, it does not include any ramps. The South Cargo Complex is the airport's newest air cargo facility. It was completed in 1999 and added roughly 300,000 square feet of warehousing space. This complex includes three buildings of roughly equal size and includes 8 aircraft parking spots, 126 truck bays, and a 700,000 square foot ramp. The latest update to the airport master plan, due to be complete in late 2014, proposes to expand the cargo facilities at the airport.[9] Given that the plan is currently in draft form, exact recommendations as to the location and amount of additional cargo capacity are as yet unavailable.

Hartsfield-Jackson airport serves 250 destinations and is the number one passenger airport in the world in terms of volume and operations. In 2009, the airport handled more than 88 million domestic and international passengers.

[9] Source: http://www.bizjournals.com/atlanta/blog/capitol_vision/2014/08/new-atlanta-airport-master-plan-eyes-new-gates.html?page=all

The enormous volume of passengers is carried on more than 2,600 daily aircraft operations. Even though many of these have limited belly capacity, the sheer numbers provide a wide range of options to shippers. Several years ago, the fifth runway added capacity and reduced delays, making the airport even more attractive to the industry. Nevertheless, there are challenges to growing the cargo operations. John F. Kennedy International Airport in New York has a geographic advantage to service air cargo markets in the heavily populated northeast U.S. while Miami has a geographic advantage to service Florida. Chicago's O'Hare airport has a geographic advantage to service the Midwest markets, and the airports in Texas have a geographic advantage to capture flights from Asia. The catchment area of airports typically tends to be roughly one day's truck drive or about 500 miles. The catchment areas of these competing airports are shown in Figure 2.22; it shows how stiff the competition is for major airports in capturing air cargo traffic business.

Figure 2.23 International Air Cargo Catchment Areas



Another important recent and ongoing development for Georgia air cargo was the Airtran Airlines' acquisition by Southwest Airlines. Airtran did not carry air cargo, while Southwest Airlines does. In 2010, Southwest Airlines reported $125 million of revenue from air cargo compared to $850 million by Delta Airlines. The growth of Southwest Airlines at Hartsfield-Jackson will provide more options and flexibility for shippers and forwarders that utilize air cargo. This

will be particularly noteworthy for domestic air cargo, because the vast majority of Southwest Airlines flights are domestic.

Overall, the economic benefit of the airport is quite significant. According to their 2009 Economic Impact study, Hartsfield-Jackson's air cargo operations generated 31,385 direct, indirect and induced jobs for the Atlanta region. This economic activity amounts to $7.4 billion in additional business revenue and $1.8 billion in additional personal income in the Atlanta region.

3.0 Freight Forecasts

Freight and Economic Forecasts

The consultant team developed year 2050 forecasts for this study by utilizing the TRANSEARCH base year 2007 freight flow data and applying growth rates from the Federal Highway Administration's Freight Analysis Framework (FAF) data.[10] The FAF data has a 2007 baseyear and forecasts freight flows through 2040. Additionally, the FAF forecast was developed after the recent economic downturn had officially ended[11] and, therefore, provides the most recent perspective on freight growth for Georgia.

Table 3.1 displays the growth rate from this freight forecast and a forecasted growth rate for Georgia's entire economy from Moody's Analytics Economic & Consumer Credit Analytics. Using these two forecasts as 'bookends' for a low and high forecast freight growth rate for the State, it indicates that the amount of freight is forecast to grow between 244 percent and 289 percent between the years 2007 and 2050.

Table 3.1 Freight and Economic Forecasts

Source	Time Period	Tonnage Annual Growth Rate	Value Annual Growth Rate
GDOT Freight and Logistics Plan base forecast (*TRANSEARCH Base Year Data w/FHWA FAF3 growth rates*)	2007-2050	1.5%	2.5%
Economy.com Georgia GDP	2007-2050	–	2.1%

Mode-Specific Forecasts

Freight stakeholders have developed mode-specific forecasts for the trucking, marine port, and air cargo modes, but not for the freight rail mode. These mode-specific forecasts are compared to the mode-specific forecast developed for the Georgia Freight and Logistics Plan in Table 3.2. The table shows that the Plan's forecast is somewhat more conservative than the forecast developed by industry.

[10] http://ops.fhwa.dot.gov/freight/freight_analysis/faf/

[11] National Bureau of Econ. Research, Business Cycle Dating Committee, September 2010.

Table 3.2 Mode-Specific Forecasts

Mode / Source	Time Period	CAGR	Units
Port of Savannah Container Growth / GPA	2010-2050	4.5%	TEUs
Georgia Air Cargo / GDOT F&L Plan	2007-2050	3.1%	Tons
National Air Cargo / Federal Aviation Authority	2010-2030	5.0%	Revenue ton-miles
Georgia Truck / GDOT F&L Plan	2007-2050	1.5%	Tons
National Truck / American Trucking Assoc.	2009-2021	2.2%	Tons
Georgia Rail / GDOT F&L Plan	2007-2050	1.0%	Tons

The American Trucking Association (ATA) develops forecasts of trucking growth nationally. ATA expects that by 2021, truck tonnage will increase 30 percent relative to 2009 levels; this would result in an increase nationally from 8.8 billion tons in 2009 to 11.5 billion tons in 2021. It translates to a compound annual growth rate (CAGR) of 2.2 percent between 2009 and 2021. This is higher than the more conservative 1.5 percent forecast developed for the Georgia Statewide Freight and Logistics Plan.

The Georgia Ports Authority developed an unconstrained forecast for container growth at the Port of Savannah which translates to a 4.5-percent annual growth rate. This is more conservative that the than the 12 percent growth rate observed since 2000.

The Federal Aviation Authority (FAA) developed a national air cargo forecast with a CAGR of 5.0 percent between 2010 and 2030. This is somewhat higher than the 3.1 percent forecast developed in the air cargo forecast for this Plan.

Overall, the forecast growth rates developed for the Georgia Statewide Freight and Logistics Plan are lower and, thereby, more conservative relative to industry forecasts. This may be in part due to the natural tendency of industry associations to be optimistic regarding the performance of their industry. It also likely reflects the fact that many of the industry forecasts have not yet fully incorporated the full impact of the recent recession.

4.0 Issues and Needs

This section describes the Georgia freight transportation systems issues in terms of capacity, capability, and connectivity. Other types of issues such as hours of service, environmental concerns and fuel consumption are not addressed in this section.

4.1 CAPACITY

The lack of sufficient infrastructure capacity relative to demand, which typically results in congestion, is a significant issue across all of the freight modes. For the freight and logistics industries, congestion increases the direct and indirect costs of moving goods through increased driver needs, increased fuel consumption, increased emissions generation, increased vehicle fleet requirements and concerns for reliability.

Several of Georgia's most congested highway corridors have high volumes of trucks. This is particularly true in the Atlanta region, where highway congestion is the most pronounced and truck volumes are the highest in the State. Nevertheless, the vast majority of the State's long-haul corridors currently operate in free-flow conditions when considered through *total* daily (24 hour) traffic volumes.

However, by 2050 these long-haul corridors are projected to become more and more affected by congestion as well due to the growth of truck activity to support Georgia's expanding economy. Figure 4.1 shows volume-to-capacity (V/C) ratios for the long-haul corridors in the State based on future volumes and existing capacity conditions as provided in the Georgia statewide travel demand model. The V/C ratios are calculated over a single total 24-hour period, so *peak hour* V/C ratios would be much higher than what is shown. A V/C ratio above one indicates severely congested conditions. Based on the figure, the most congested long-haul corridors by 2050 will be I-75 from Atlanta to Macon and I-85 from Atlanta to the Georgia/South Carolina border.

The railroad industry is also susceptible to capacity constraints both on rail mainlines and at rail terminals. This congestion has the potential to increase rail shipment times by days. Interviews with representatives of Norfolk Southern and CSX were utilized to identify current bottlenecks on Georgia's rail network. This information was combined with rail growth forecasts from TRANSEARCH that indicated the growth rates for origin-destination pairs based on their commodity mix. The congestion dynamic is discussed in Figure 4.2; it shows that the rail line carrying the most traffic and running roughly parallel to I-75 throughout Georgia also will experience significant growth that will exacerbate the currently congested conditions. Additionally, rail congestion will be a concern along both Class I rail lines from the Port of Savannah and the primary east-west rail line in the State.

Figure 4.1 Model V/C Ratio for Georgia Interstates, 2050

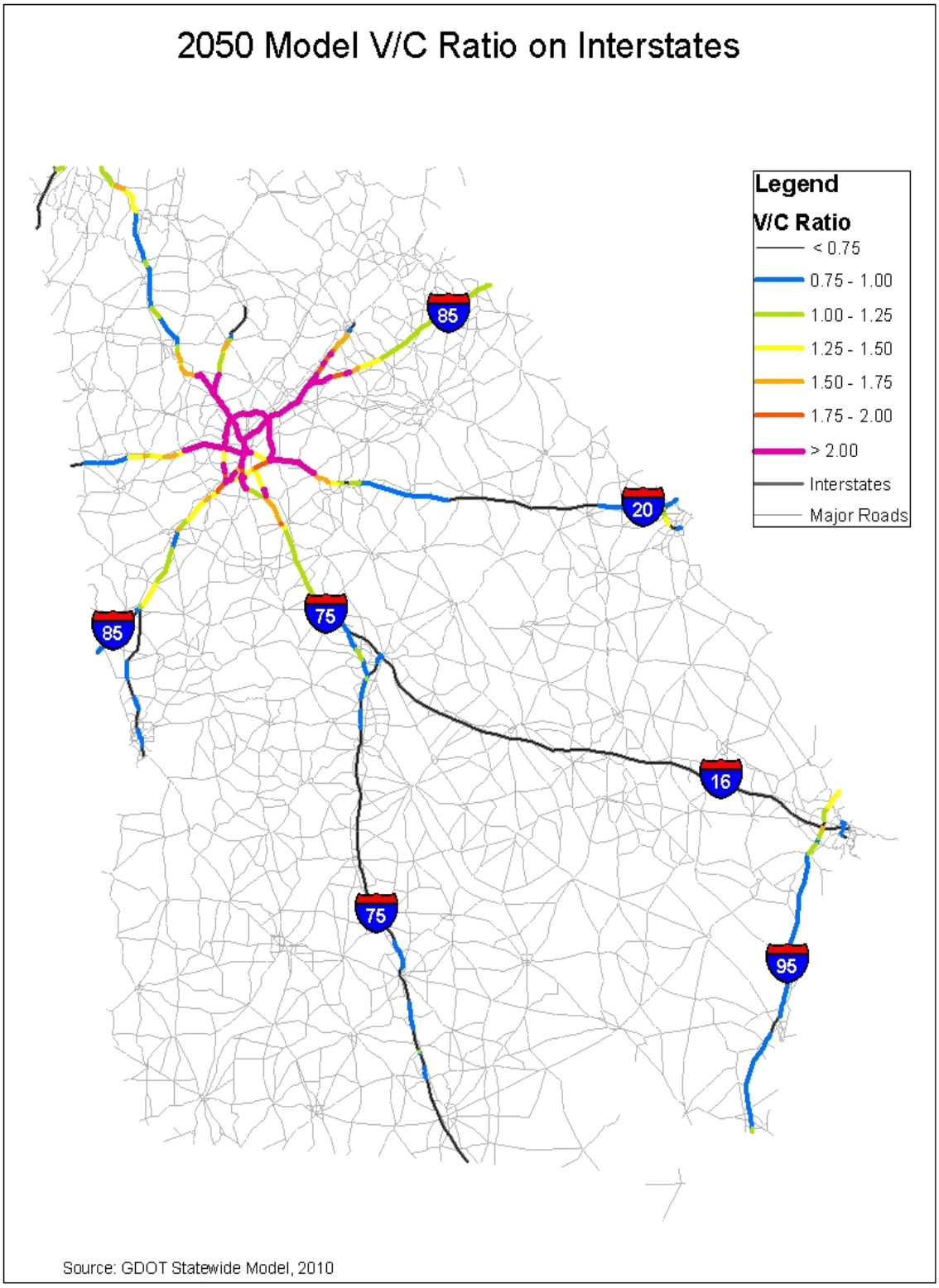
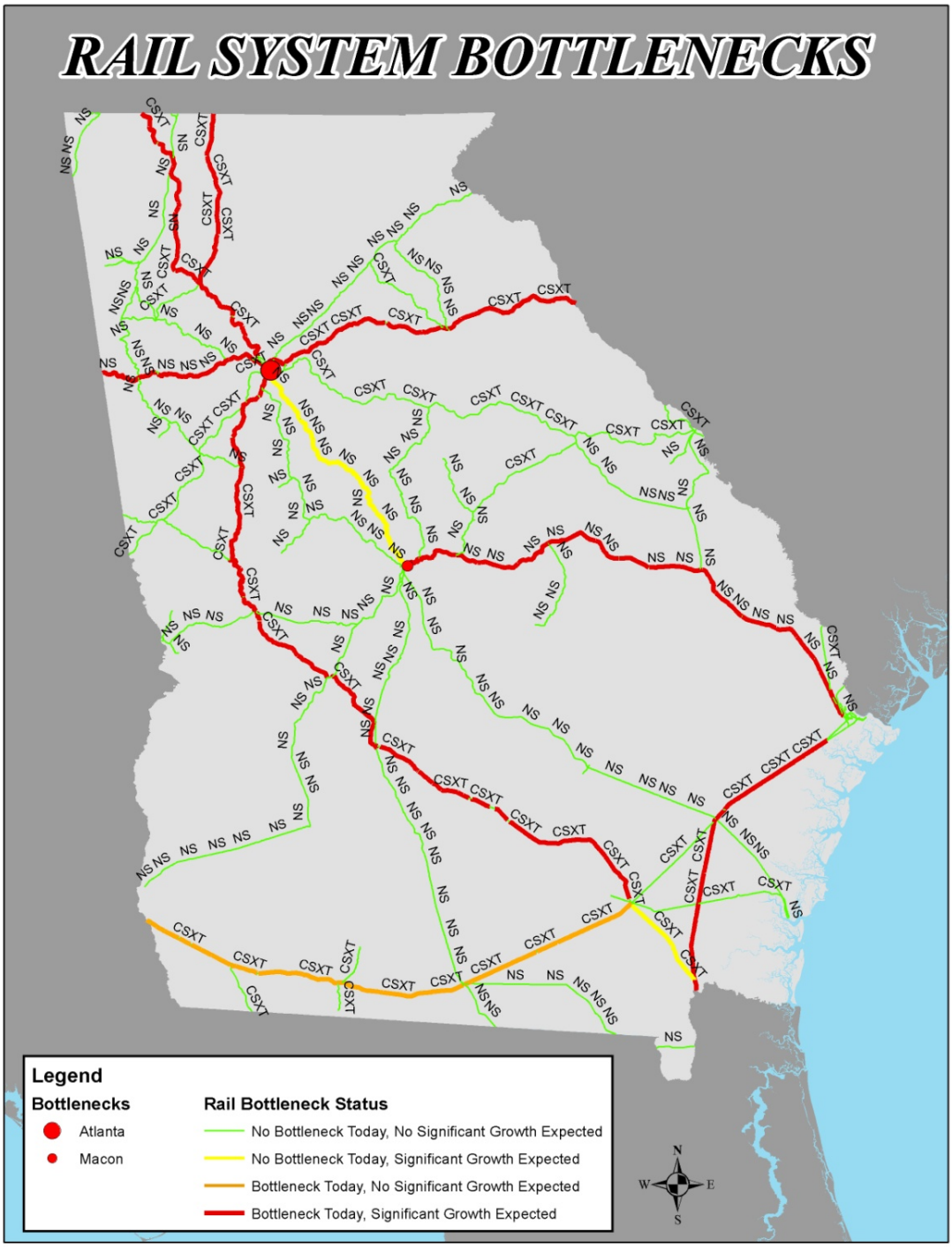


Figure 4.2 Current Rail Bottlenecks and Forecast Growth on Georgia's Rail Network



Source: Current congestion identified through interviews with Class 1 railroad representatives. Project team analysis of Transearch forecast data determined rail lines expecting longer-term significant growth.

Significant capacity issues were not a focus of current conditions at Georgia's marine ports and airports. However, based on the forecast growth of these modes, there is the potential for congestion during typical peak hour periods on access roads to the largest of these facilities – the Port of Savannah and Hartsfield-Jackson airport. This is also discussed later in the section on connectivity. Additionally, the forecast growth at the Port of Savannah has led to discussions of developing a new port in Jasper County, South Carolina that is jointly being coordinated by the states of Georgia and South Carolina.

4.2 CAPABILITY

The most significant capability shortfall in Georgia is at the Port of Savannah, where the current channel depth is 42 feet at mean low water -- well short of what is needed to consistently service the larger ships that will start traveling through the Panama Canal after its completion in 2015. Currently the Port can handle the larger "Post-Panamax" ships but only during high tides.

The Port of Savannah plays a critical role in Georgia's economy. According to a University of Georgia Terry College of Business study, the economic impact of the port on the state is equivalent to 295,443 full and part-time jobs. Additionally, the port adds $26.8 billion to Georgia's GSP. Not being able to readily handle larger ships could detrimentally affect the cost of handling cargo at the Port of Savannah. There are several ports on the East Coast already having deeper channels and berths than the Port of Savannah, as shown in Table 4.1; therefore the competitive pressure to deepen the Savannah harbor is particularly noteworthy.

Table 4.1 Current Atlantic Channel and Berth Depths for Major East Coast Container Ports (as of 3rd Quarter 2010)

Port	Terminal	Channel Depth Range (Feet)	Berth Depth Range (Feet)
Savannah	Garden City	42	42-48
Baltimore	Seagirt	36-50	45
	Dundalk	36-50	34-46
	North Locust Point	36-50	34
	South Locust Point	36-50	30-36
Boston	Conley Container Terminal	35-40	35-45
Charleston	Columbus Street	47	40
	North Charleston	47	40
	Wando Welch	47	45
Jacksonville	Blount Island	38	38
	Talleyrand	38	38

Port	Terminal	Channel Depth Range (Feet)	Berth Depth Range (Feet)
Miami	Lummus Island	36-44	42
	Seaboard Marine Terminal	36-44	50
NY/NJ	Maher Terminals	40	45
	APMT	40	45
	Port Newark	40	40-50
	Red Hook Marine	45	42
	Global Terminal	45	42
	NY Container Terminal	45	35-42
Philadelphia	Packer Avenue	40	40
	Tioga Marine Terminal	40	36
	Tioga Cont. (ro-ro berth)	40	36
Port Everglades	Midport/Northport	45	38
	Southport Container Terminal	45	44
Virginia	APM Terminals (Portsmouth)	50	49-56
	Newport News	40	36-40
	Norfolk International Terminal	50	50-55
	Portsmouth	43	40
Wilmington DE	Port of Wilmington	38-40	38
Wilmington NC	Wilmington, NC	42	38

Source: Moffat and Nichol.

Feasibility of an Additional Port in the region

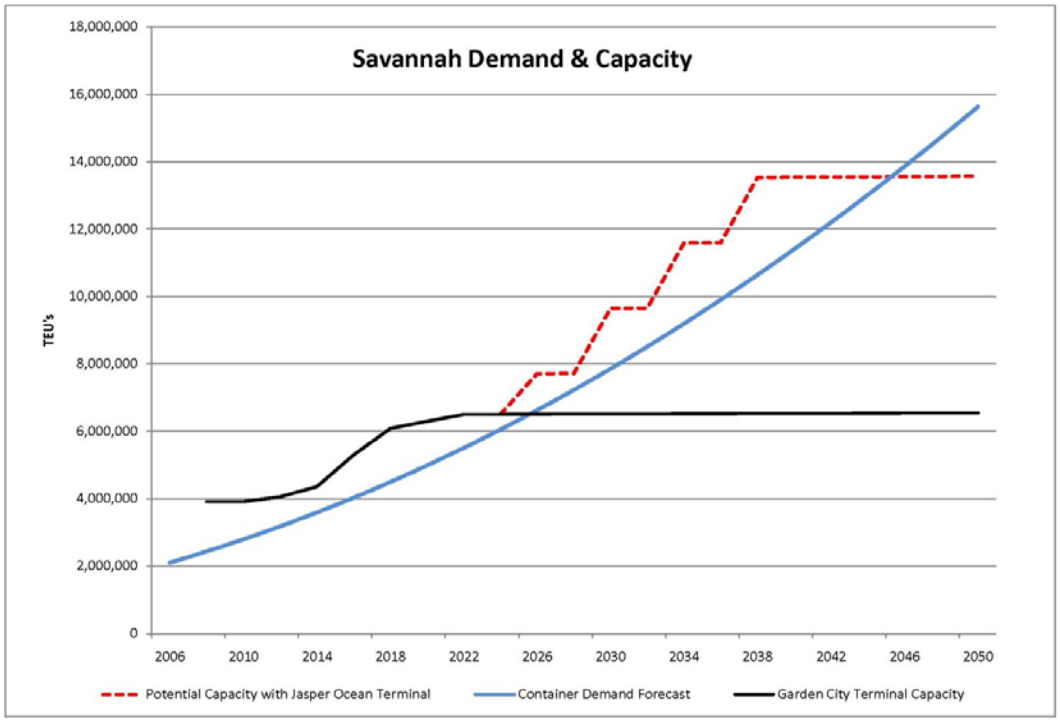
For Georgia, and particularly Savannah, containerized trade is a significant percentage of the total volume of imports and exports – a trend that is expected to increase. In fact, by the year 2050 it is anticipated that there will be a demand of approximately 15 million TEUs. (The blue line on Figure 4.3 shown on the next page indicates solid economic projections of continued demand in the region to send and receive cargo.)

However, the figure also shows that the maximum capacity limit for the Port of Savannah's Garden City Terminal is approximately 6.25 million TEUs, even if you assume full-build out of current and proposed expansion plans at the Port. This means there would be unmet demand for container cargo handling at some point in the near future, unless additional capacity was developed.

In order to accommodate this future excess demand, and take advantage of the accompanying economic development opportunities, additional port capabilities

would need to be developed. For these reasons, the states of Georgia and South Carolina are currently coordinating in the conceptual planning for a so-called Jasper Ocean Terminal which could accommodate the additional container-handling demand. As shown on the red dotted line, the Jasper terminal would "raise the ceiling" and create additional container-handling capacity allowing the region to take advantage of a significant freight market opportunity.

Figure 4.3 Savannah Container Shipping: Demand versus Capacity



Source: Georgia Ports Authority

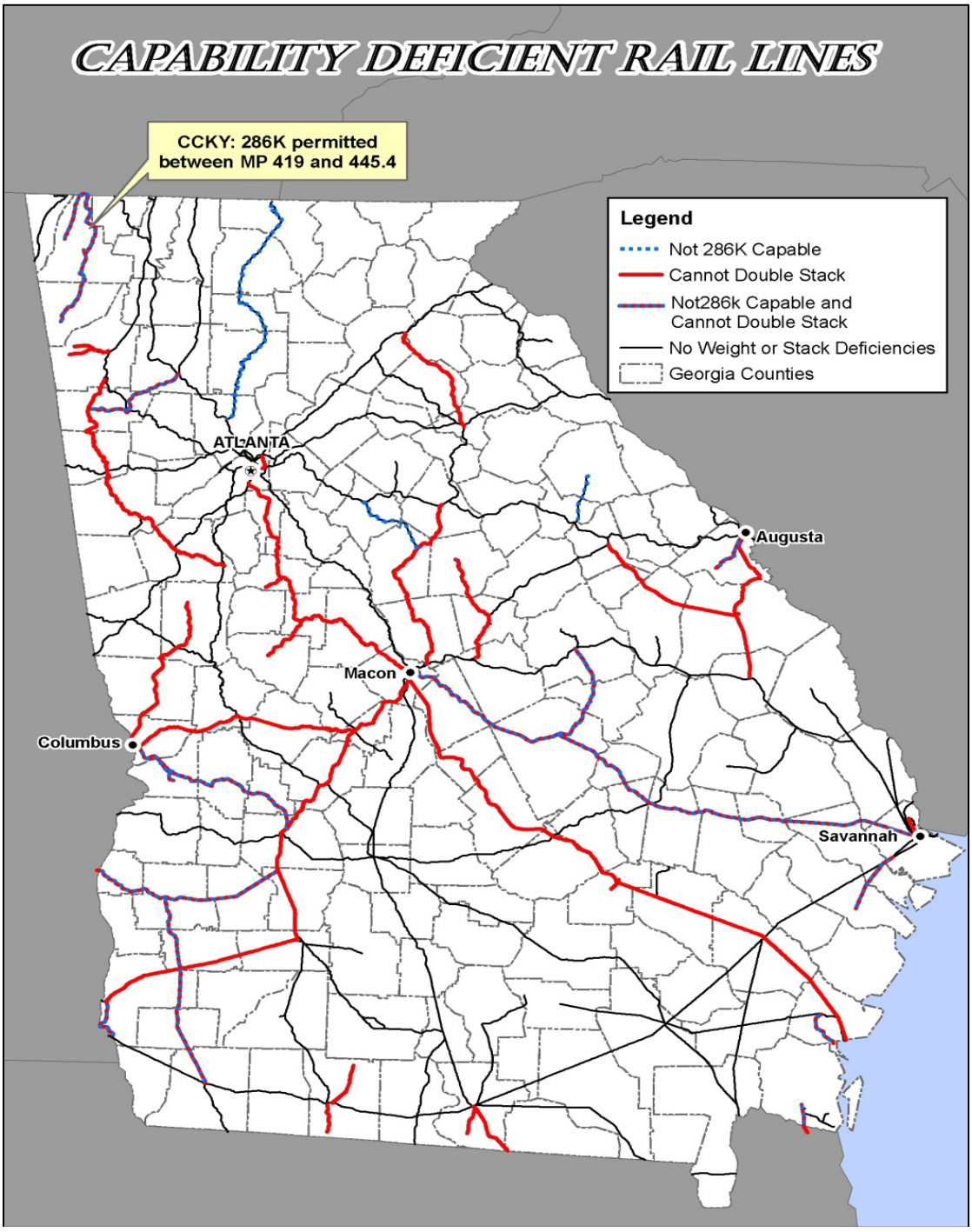
Rail

Georgia's rail assets also have capability issues. The vast majority of the rail track in the State is single track, meaning that the ability to operate trains in both directions is limited to locations where there is a rail siding. The length of the siding also affects the length of trains that can be operated. This restricts the flexibility of rail operations and the efficiency of the overall system.

Additionally, there are several sections of Georgia's rail infrastructure that cannot carry the industry-standard 286,000 pound rail cars. Most of these sections are on the shortline rail network, but a few sections of Class I rail infrastructure is also restricted in terms of weight.

In addition, there are locations in the State that cannot achieve the industry standard height clearance of 22' 6". Figure 4.4 shows the locations in Georgia of the limited rail capability as discussed.

Figure 4.4 Rail Capability Deficiencies in Georgia



Note: All rail lines in Georgia are single track -- except for small segments in Atlanta and Savannah metro with double track.

Truck

For Georgia's trucking industry, a key capability issue is predicting and managing the variability in the performance of the highway network. This variability is termed "reliability" and reflects changes in the amount, location, and severity of congestion on a day-to-day basis. Real-time traffic data is becoming increasingly available and utilized by truck fleet operators, enabling them to respond to changes in the highway performance on a real-time basis. However, quantifying highway reliability and incorporating reliability into supply chain design have not occurred. Therefore, reliability still has the potential to cause significant disruption to the movement of goods, and add costs to the logistics chain.

In metro Atlanta, GDOT's Highway Emergency Response Operators (HERO) patrol interstates in the Atlanta region. HERO units can significantly improve incident response times by moving crashed vehicles out of the traffic stream. Because crashes are the primary determinant of reliability, reducing incident delay can significantly improve the reliability of the highway infrastructure -- especially during peak hours. Supported with a robust ITS (Intelligent Transportation System), the GDOT initiatives work to keep traffic flowing and are discussed more as part of the Georgia Statewide Freight and Logistics Plan in Task 5 "Recommendations" report.

A significant capability restriction in Georgia, and all states in the U.S., is the maximum weight allowance of standard trucks of 80,000 pounds on the interstate system. Advocates for increasing truck size and weight argue that increasing the allowable weight limit has the potential to improve the productivity of the trucking industry by moving more goods with fewer vehicles. They say this would reduce costs for many supply chains, reduce congestion for all highway users, and reduce the emissions and fuel consumption of the trucking industry. Others say increasing the maximum weight allowance would increase pavement wear and tear on a per-vehicle basis, and require additional costs to build and maintain bridges. They also cite concerns regarding the severity of truck-involved crashes when heavier vehicles are involved. This issue is getting significant national attention: truck weight limits, in addition to truck size criteria, is currently the subject of a U.S. DOT study on Comprehensive Truck Size and Weight Limits. Additionally, Maine and Vermont recently received Federal authorization to conduct pilot studies of 100,000-pound trucks on their interstate highways, and they will report their results back to Congress in June of 2012. In November 2010, the American Association of State Highway and Transportation Officials (AASHTO) developed a policy resolution that their Board of Directors establish a Truck Size & Weight Working Group to coordinate the effort needed to investigate the feasibility of regional adjustments in truck size and weight in particular corridors.

Fuel is also another issue facing the trucking industry. Somewhat recently, significant investment made to broaden the capability of the truck fleet in terms of its fuel consumption. Chesapeake Energy Corporation announced that it will

invest $150 million over the next 10 years to build 150 liquid natural-gas filling stops at Pilot-Flying J Travel centers across the country.[12] In Georgia, Southern LNG Company plans to reactivate the truck loading facilities located at its natural gas import terminal on Elba Island in the Savannah region in part to capture some of the demand from trucks fueled by natural gas[13]. In early October 2013, UPS announced it will spend $50 million to build nine LNG (liquefied natural gas) fueling stations by the end of 2014; expansion will include on-site fueling stations in Florida, Illinois, Indiana, Mississippi, Missouri, Ohio, Pennsylvania and Texas which will join four stations already operating in the Tennessee cities of Knoxville, Nashville and Memphis, as well as Dallas, Texas[14].

Converting trucks from diesel to natural gas has the potential to reduce costs for the trucking industry, reduce costs for entire supply chains that utilize the trucking industry, reduce vehicle emissions, and lower the U.S. dependence on foreign sources of energy.

Air

There are no significant capability issues at the Atlanta airport, the State's largest air cargo airport. However, the Southwest Georgia Regional Airport in Albany, identified the need to extend its runway to accommodate the increased weight of the existing daily UPS Airbus300 freighters and potential Boeing 757 and Boeing 767 freight aircraft in the future; as a UPS sorting center, that airport is currently ranked second in the state for cargo volumes.

4.3 CONNECTIVITY

Connectivity is critical to the freight transportation system. Since most freight cargo moves by truck from air, marine, and rail intermodal facilities, landside access to these facilities is critical. The highway network itself needs to provide connectivity to the major population centers and freight activity centers within the State, and to/from out-of-state trading partners.

The Port of Savannah is connected to its landside customers through a road and rail network. The intermodal rail network relies on trucks for delivery to final destinations. Georgia's interstate system is connected to freight facilities through a network of state highways and local roads.

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[12] http://www.chk.com/media/news/press-releases/Chesapeake+Energy+Corporation+Unveils+Bold+Plan+to+Transform+U+S+Transportation+Fuels+Market+and+Reduce+OPEC+Oil+Imports+7+11+2011+

[13] Elba Island LNG Terminal Truck Loading Facilities, Traffic Impact Analysis, Aug. 2010.

[14] www.bizjournals.com/atlanta/news/2013/10/08/ups-expands-lng-fueling-operations.html

GDOT has worked with the Port of Savannah to develop four last-mile road projects. Most recently, GDOT recently-completed the State Route 307 highway grade separation over the GPA's Mason Intermodal Rail Yard to "cut <intermodal> rail transit time <from the Port> to Atlanta by two hours"[15] and GDOT's Jimmy DeLoach Parkway extension which is currently under construction and will provide direct access from the Port of Savannah to I-95. Complementing these are the Grange Road and Brampton Road projects that are listed in the Savannah MPO's LRTP and TIP. Looking forward, the continued growth/build-out of the Port of Savannah and pursuit of the Jasper port will generate an even larger need for landside access for cars, trucks, and trains; the landside connectivity to meet these future needs of a new port facility does not currently exist.

There are four intermodal rail yards in the Atlanta region. As these railyards continue to grow, and overall traffic in the Atlanta region also grows, there will be increasing numbers of trucks and cars utilizing limited road capacity. While needs on SR 6 and its relationship to the Norfolk Southern Austell Yard has been studied, sufficient capacity at each of Atlanta's intermodal rail yards will need to be considered through 2050. This is especially true considering Norfolk Southern's Crescent Corridor initiative announced in 2007; for Georgia this will mean expansion of their Austell Intermodal Yard which will likely affect traffic volume projections.

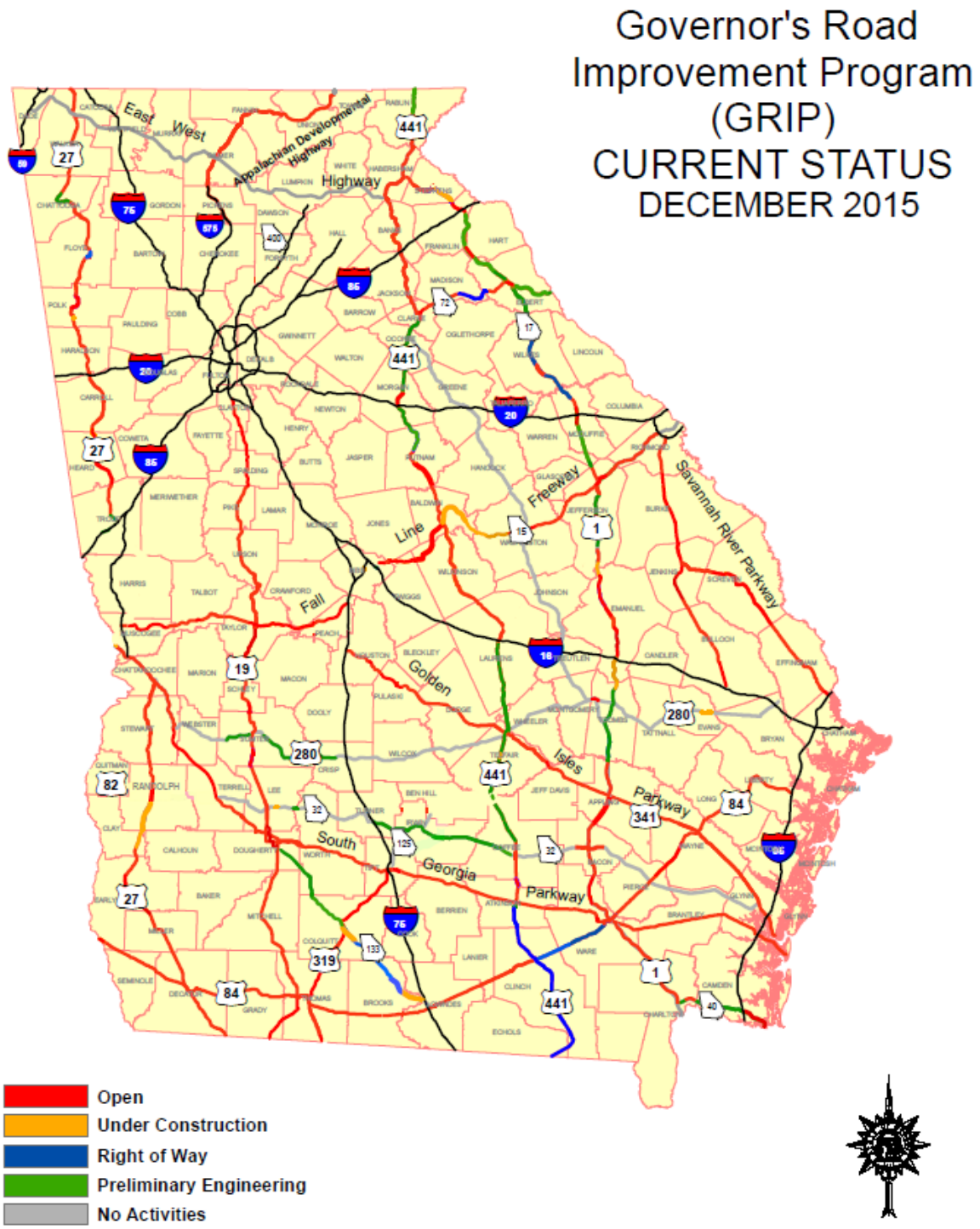
Similarly, the Atlanta airport is situated at the intersection of three high volume truck and auto interstates just south of downtown Atlanta. The need for additional capacity will be an issue as the airport grows on the passenger and air cargo sides.

On the highway side, connectivity refers to freight facilities having access to roadways of sufficient quality to support freight activity. Some have expressed concern that certain urban areas and portions of rural Georgia do not have adequate access to the larger highway network. GDOT has implemented the Governor's Road Improvement Program (GRIP) on many rural roads to improve highway connectivity, but there are portions of the GRIP network that are incomplete as shown in Figure 4.5.

However, the State Transportation Board's adoption of a statewide designated State Freight Corridor in August 2013 is already helping state policy-makers identify the most freight-strategic investments to make with limited resources. The approved Georgia State Freight Corridor is discussed in more detail in Task 5 Recommendations report.

[15] http://savannahnow.com/exchange/2012-08-01/highway-307-overpass-garden-city-terminal-divert-port-traffic

Figure 4.5 Status of the GRIP Program



Source: www.dot.ga.gov/BS/Programs/GRIP ("status map")

4.4 CONCLUSIONS

Georgia has a well-developed freight infrastructure network across each of the primary freight modes. These modes work together to provide a high level of service for shippers, carriers, and the State's economy as a whole. To ensure that the system continues functioning at a high level, it is important to identify issues related to the capability, capacity, and connectivity of the system. As the Georgia economy continues to grow, there will be additional strains felt across each of these three needs categories. Later tasks in this project will identify and analyze freight improvement solutions to address these issues.