

Technical Memorandum

CORE MPO Freight Study – Final Report

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1. INTRODUCTION

The Coastal Region Metropolitan Planning Organization (CORE MPO) Freight Transportation Plan will provide a road map for enhancing freight mobility within and outside of its boundaries in an effort to improve the Savannah region's economic competitiveness. This 2nd Phase of the Plan builds on the analysis from the Phase 1 Study and expands the study area to include Bryan County and Effingham County because they are economically integrated into the Savannah metropolitan area.

The CORE MPO Freight Transportation Plan is developed to represent the freight needs and issues for the Savannah region, and shall be integrated with other CORE MPO and State plans. Specifically, the Freight Transportation Plan shall be consistent with:

- Moving Ahead for Progress in the 21st Century Act (MAP-21);
- CORE MPO 2035 LRTP Framework Mobility Plan;
- FY2013-2016 Transportation Improvement Program;
- Chatham County-Savannah Tricentennial Comprehensive Plan;
- 2013 Georgia Statewide Strategic Transportation Plan; and,
- Georgia Statewide Freight and Logistics Plan, 2010-2050.

During the course of the Freight Transportation Plan, the CORE MPO Freight Advisory Committee (FAC) was established to provide guidance for the plan and to review the technical memorandums. The composition of the FAC consisted of private, freight-related businesses and public partners from local, state, and federal agencies.

A series of technical memorandums were developed to provide a thorough assessment and analysis of the issues and needs impacting the Savannah region's freight transportation network. The technical memorandums developed during Phase II of the CORE MPO Freight Transportation Plan included:

- Existing and Future Freight Assessment;
- Freight Performance Measures;
- Forecasting Future Freight Growth;
- Regional Network Profiles;
- Freight Network Bottleneck and Safety Issues;
- Freight-Related Land Use Assessment and Analysis
- Economic Assessment;
- Environmental and Community Impact Scan and Analysis;
- Freight-Related Land Use Recommendations; and,
- Freight Infrastructure Recommendations.

2. REGIONAL MULTIMODAL FREIGHT OVERVIEW

2.1 Highway System Profile

2.1.1 Roadway Network

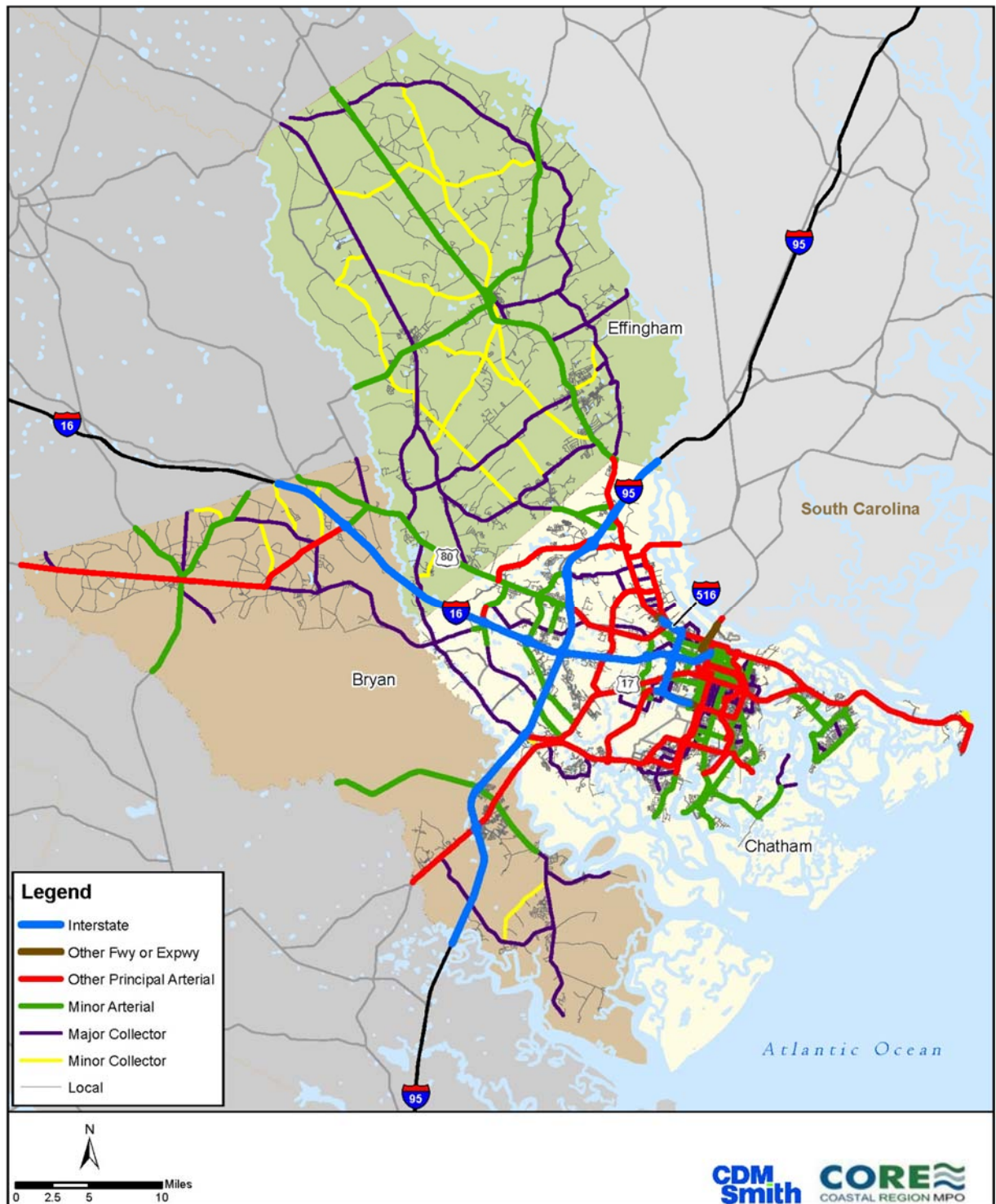
Highway functional classification and associated characteristics may be used as a predictor of truck usage. As a whole, the intended use and vehicle design will guide features that may induce commercial operator usage. **Figure 2-1** depicts the functional classification in the CORE MPO Freight Transportation Plan Phase II study area, which consists of over 1,600 total miles of roadways across all functional classes on state and county routes. On state routes, rural minor arterials and urbanized principal arterials have the highest mileage. For county routes, rural local and urbanized local are the top two in mileage. The small urban roadways are only located in Bryan County. Rural areas have 1,144 total miles across all functional classes. Urbanized areas have 483 total miles while small urban miles comprised the smallest segment with 33 miles.

Table 2-1 shows the total state- and county-maintained roadway miles within the study area by functional class.

As shown in **Figure 2-2**, 68.9 percent of roads in the study area are located in rural areas, while 29.1 percent are located in urbanized areas and the remaining 2 percent are located in small urban areas.

Figure 2-3 shows the percent of roadway miles by functional class across all area types. Local roads make up over half of the miles in the study area at 58.0 percent (964 miles). Therefore, the majority of truck traffic in the area is concentrated on less than half of the road miles in the area. Most trucks will travel on the 71 miles of interstate and 312 miles of arterial roads in the area, which represent 4.3 percent and 18.8 percent of the total system, respectively. Collector roads total 314 miles, or 18.9 percent.

Figure 2-1: Functional Classification



Source: CDM Smith

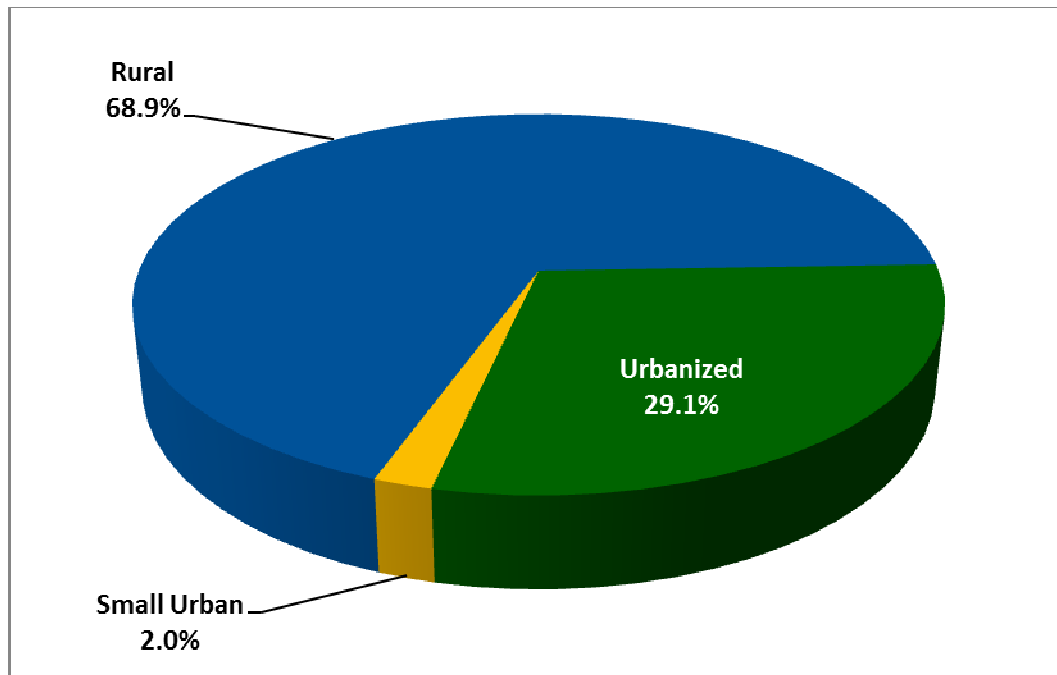
Table 2-1: Miles by Functional Class in the Study Area, 2012

Functional Class	Miles				Total		
	State Route		County Route		Miles	Percent	
Rural Interstates	25.18	228.70	-	915.74	25.18	1,144.44	68.9%
Rural Principal Arterials	34.51		-		34.51		
Rural Minor Arterials	89.41		-		89.41		
Rural Major Collectors	79.60		104.08		183.68		
Rural Minor Collectors	-		103.09		103.09		
Rural Local	-		708.57		708.57		
Urbanized Interstate	37.51	141.43	-	342.01	37.51	483.44	29.1%
Urbanized Freeway	3.44		-		3.44		
Urbanized Principal Arterial	81.55		34.16		115.71		
Urbanized Minor Arterial	16.54		47.02		63.56		
Urbanized Collector	2.39		22.89		25.28		
Urbanized Local	-		237.94		237.94		
Small Urban Interstate	4.70	13.71	-	19.57	4.70	33.28	2.0%
Small Urban Freeway	-		-		-		
Small Urban Principal Arterial	3.94		-		3.94		
Small Urban Minor Arterial	5.07		-		5.07		
Small Urban Collector	-		2.49		2.49		
Small Urban Local	-		17.08		17.08		
Total		383.84		1,277.32		1,661.16	100.0%

Source: Office of Transportation Data, Georgia Department of Transportation, 445 Series Report, 2012

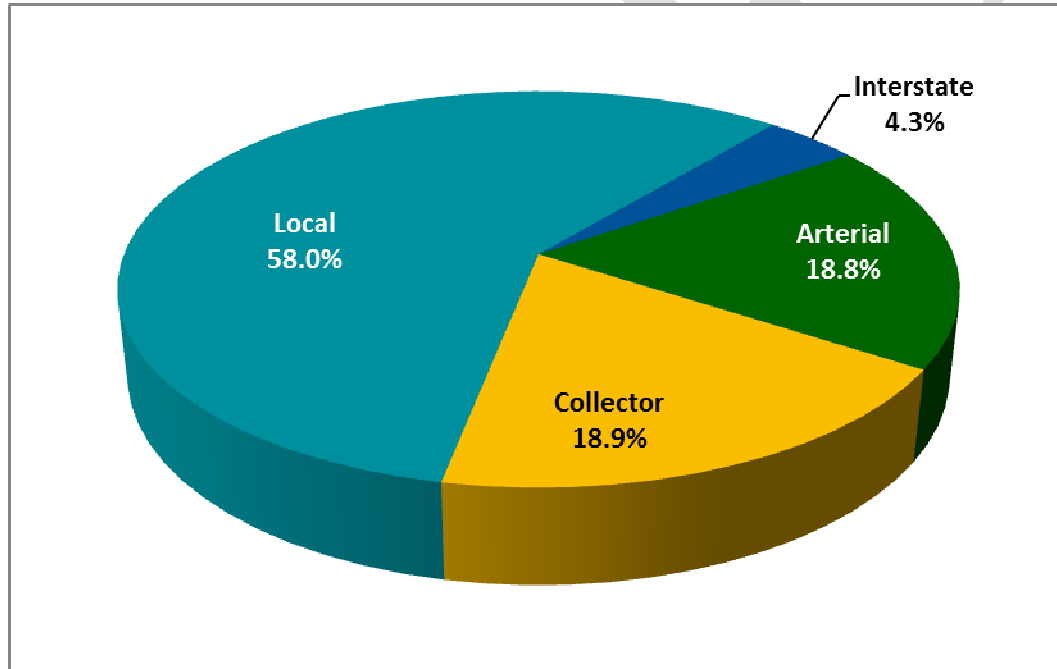
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Figure 2-2: Percent of Roadway Miles by Area Type in the Study Area



Source: Office of Transportation Data, Georgia Department of Transportation, 445 Series Report, 2012

Figure 2-3: Percent of Roadway Miles by Functional Class in the Study Area



Source: Office of Transportation Data, Georgia Department of Transportation, 445 Series Report, 2012

The posted speed limit for interstates and other limited access roads in the state is noted in **Table 2-2**. The average truck percentage and AADT for the top 20 roadways in the study area are stated in **Table 2-3**. Truck percentages range from 2 to 22 percent in the study area. There are no continuous count stations in Effingham County; thus, no data was available for truck traffic in this county. The highest truck volume occurred on I-95 in Chatham County.

Table 2-2: Speed Limits in Georgia

State	Rural Interstates		Urban Interstates		Other Limited Access Roads	
	Cars (mph)	Trucks (mph)	Cars (mph)	Trucks (mph)	Cars (mph)	Trucks (mph)
Georgia	70	70	55	55	65	65

Source: GHSA, http://www.ghsa.org/html/stateinfo/laws/speedlimit_laws.html, February 12, 2013

Table 2-3: Average Truck Percentages and AADT for Top 20 Roadways in the Study Area

County	Location	Avg. Truck %	AADT (all)	AADTT (truck)
Chatham	I-95 near SR26 & I-16	15.9	67,810	10,782
Chatham	I-95 at SR21 at the SC state line SB	20.3	45,740	9,285
Bryan	I-16 at MP 141.2 West of SR 30 (Exit 143)	21	23,020	4,834
Chatham	I-16 near SR17 & I-95	12.4	37,620	4,665
Chatham	I-16 at SR307/ Dean Forest Rd	7.9	57,080	4,509
Chatham	I-16: at CR781 & SR21/Lynes Memorial Pkwy (I-516)	7	57,170	4,002
Chatham	I-516 at SR21	8.2	32,320	2,650
Chatham	SR21 at US80 at MP 16.9	7.6	29,800	2,265
Chatham	I-516 at US17	4.2	53,850	2,262
Chatham	I-516 at SR25 ALT	6.6	33,350	2,201
Chatham	I-516 at SR21	3.4	56,000	1,904
Bryan	SR 25 near Daniel Siding Rd CR85 & I-95	8	23,460	1,877
Chatham	I-16 near Gwinnett St/CS1504 & Montgomery Av/CS1505	4	20,130	805
Chatham	Abercorn St at SR204	2.2	36,010	792
Chatham	CR787/Island Expwy near Runaway Pt Rd & Victory Dr	3.3	20,920	690
Bryan	SR 144 at MP 8.9	4.7	12,660	595
Chatham	SR204 at MP 7.8	7.1	6,460	459
Chatham	CR680/Louisville near Lathrop & Telfair	13.3	2,860	380
Chatham	Garden City at SR21 Spur	33.3	1,030	343
Chatham	CS091807/Habersham near Stevenson & DeRenne	1.6	9,310	149

Source: GDOT,

http://www.dot.ga.gov/informationcenter/statistics/TrafficData/Documents/ATRTrafficDataReports/2011_TruckPercByLocation.pdf

2.1.2 Pavement Condition

Pavement conditions directly translate into the speeds at which trucks can operate, influence driver fatigue, and affect levels of cargo damage related to vibration and jarring motions. It is therefore critical that this study consider existing pavement conditions. Currently, the Georgia Department of Transportation (GDOT) uses the Pavement Condition Evaluation System (PACES) to evaluate pavement conditions and roadway deficiencies on the state highway system.

As shown in **Table 2-4**, acceptable pavement conditions are rated greater than 70. The roadways within the study area are generally acceptable. Roadway sections with ratings of 75 and below get referred back to the district and general office for a local consideration and conditions check/verification.

Table 2-4: PACES Scale

Scale	Result
Above 70	Acceptable. May warrant minor treatment types.
70 and below	Resurface Roadway
50 and below	Reconstruct Roadway
75 and below*	<i>Rated by District and General Office</i>

Source: GDOT, <http://www.pavementpreservation.org/wp-content/uploads/presentations/Georgia%20Pavement%20Preservation.pdf>

As shown in **Table 2-5**, the majority of the study area's roadways in their respective functional class have acceptable pavement conditions. For instance, although 66.3 percent of interstate roadways are acceptable, 33.3 percent require resurfacing. In addition, some state-maintained roadways (minor arterial and major collector) require resurfacing maintenance. Complete road reconstruction is also needed for approximately 40.6 percent of local roadways because the pavement condition has deteriorated beyond a certain point that resurfacing will not solve the issues alone.

Table 2-5: PACES Results by Functional Class

Functional Class	Pavement Condition		
	Acceptable	Resurface	Reconstruct
Interstate	66.3%	33.3%	0.4%
Principal Arterial	83.9%	12.2%	4.0%
Minor Arterial	49.9%	40.8%	9.3%
Major Collector	44.9%	37.9%	17.2%
Urban/Minor Collector	47.8%	32.7%	19.4%
Local	43.3%	16.1%	40.6%

Source: GDOT, 2014

As shown in **Table 2-6**, approximately half of the roads in the study area are in acceptable condition. Effingham County has 51.9 percent of roadways in acceptable condition, followed by Chatham County with 47.2 percent and Bryan County with 41.6 percent. Over 20 percent of the road miles in the study area need some resurfacing, led by Chatham County with 23.3 percent. If current trends continue, it is anticipated that more roads will need reconstruction as the PACES

rating drops below 50. Currently, almost 31 percent of roads in the area need reconstructive projects to improve pavement conditions, led by Bryan County with 39.6 percent. The study area requires some attention to pavement, but most of this is at the county level as state-maintained roads are in better overall condition. Most of the reconstruction need is for local roads (40.6 percent in the study area).

Table 2-6: PACES Results by County

County	Pavement Condition		
	Acceptable	Resurface	Reconstruct
Bryan	41.6%	18.8%	39.6%
Chatham	47.2%	23.3%	29.5%
Effingham	51.9%	20.1%	28.0%

Source: GDOT, 2014

When GDOT establishes the annual Roadway Rehabilitation Program, the following would occur:

- Each district submits priorities to state maintenance office. The priorities are based on PACES Rating, AADT, Safety History and Skid Test. District Maintenance Assistant and State Maintenance Liaison establish the District's Priorities that are advanced.
- State maintenance office reviews each district's list and establishes a state wide priority listing. The priorities are based on available funding as well as the criteria used at the district level.

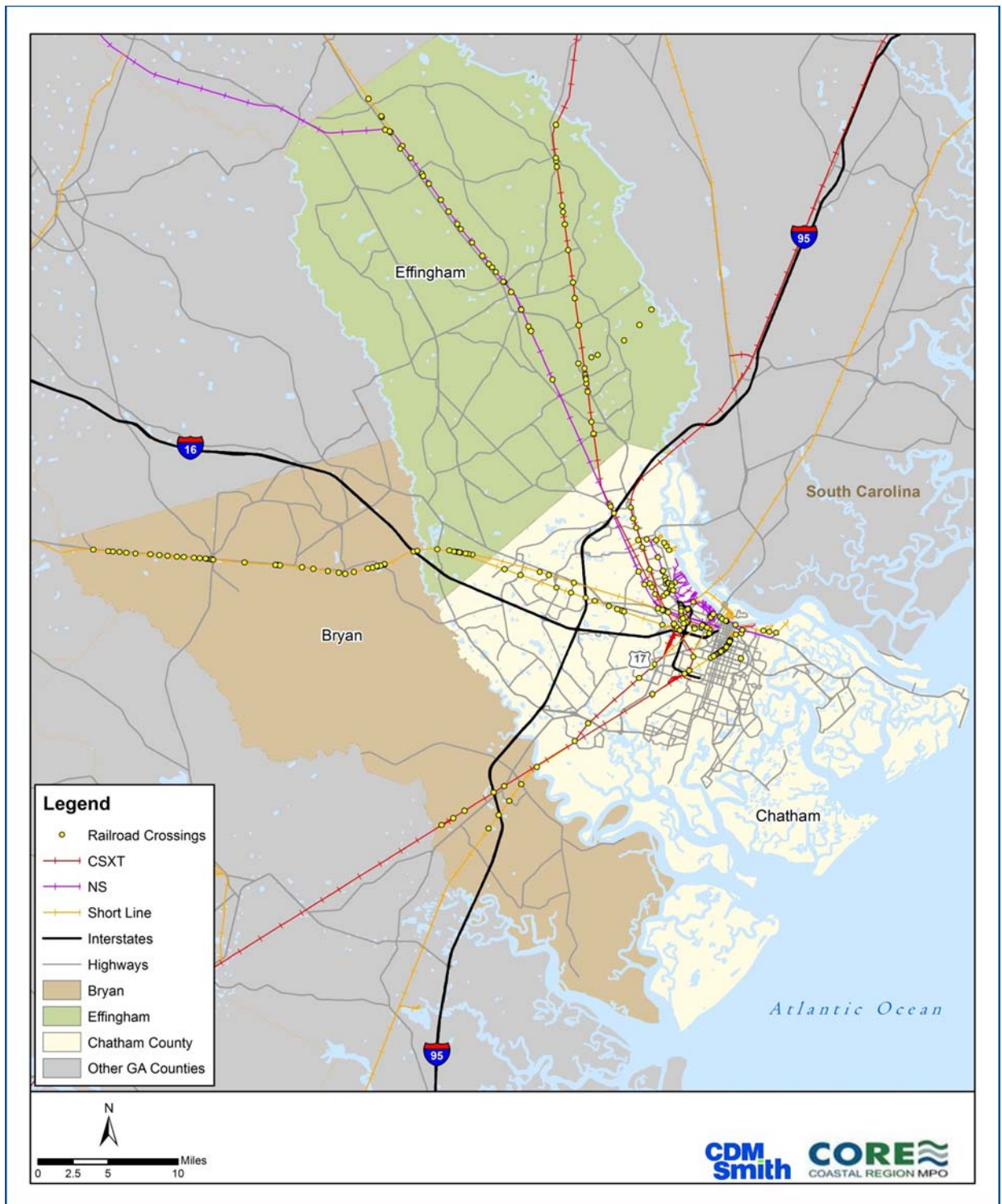
For interstates or other state routes with major distresses, the state maintenance office requests detailed pavement and/or base evaluation from the Office of Materials and Research, Pavement Design Section.

2.1.3 Railroad Crossings

The presence of railroad crossings (i.e., at-grade) on roadways presents potential safety and/or operational concerns to commercial motor vehicles (CMVs) utilizing such roadways. Grade separation refers to a crossing in which the roadway and rail are at different elevations. It poses a concern of clearance versus an actual interaction between the train and CMVs. The ability for CMVs to travel across a raised track, to fully exit the path of a potential train before reaching a stop bar, or have the line of sight to identify warning signalizations are three leading causes of CMV and train related accidents. CMV operators, resulting from the types of cargo being transported, may be required to come to a complete stop before proceeding across an at-grade crossing. This has the potential to adversely affect the flow of CMV and passenger vehicles.

There are a total of 317 at-grade crossings located within the study area. According to the Federal Railroad Association (FRA) and National Transportation Atlas Database (NTAD) there are 49 at-grade crossings in Bryan County, 199 in Chatham County and 69 in Effingham County. These crossings occur for both Class I and Class III railroads. **Figure 2-4** displays the location of railroad crossings in the study area.

Figure 2-4: Rail Crossings in the Study Area



Source: NTAD (National Transportation Atlas Database) 2012

2.1.4 Bridges

There are two physical characteristics of bridges located on or spanning the roadway that impact a CMV operator's route: Vertical Minimum Clearance and Weight-Load Restrictions. Vertical Minimum Clearance is the distance from the road surface to the lowest point on the overhead obstruction [bridge] within the confines of the travel lane. The larger class 8 CMV, which includes interstate tractor-trailer combinations used for pick-up and delivery, has an operating height of 13 feet and 6 inches. Interstate design standards have a minimum vertical clearance standard of 15 feet. Other functional classes may not define clearance standards or include structures built prior to standards being introduced. This same consideration will be necessary when reviewing the potential for restrictions to rail operations.

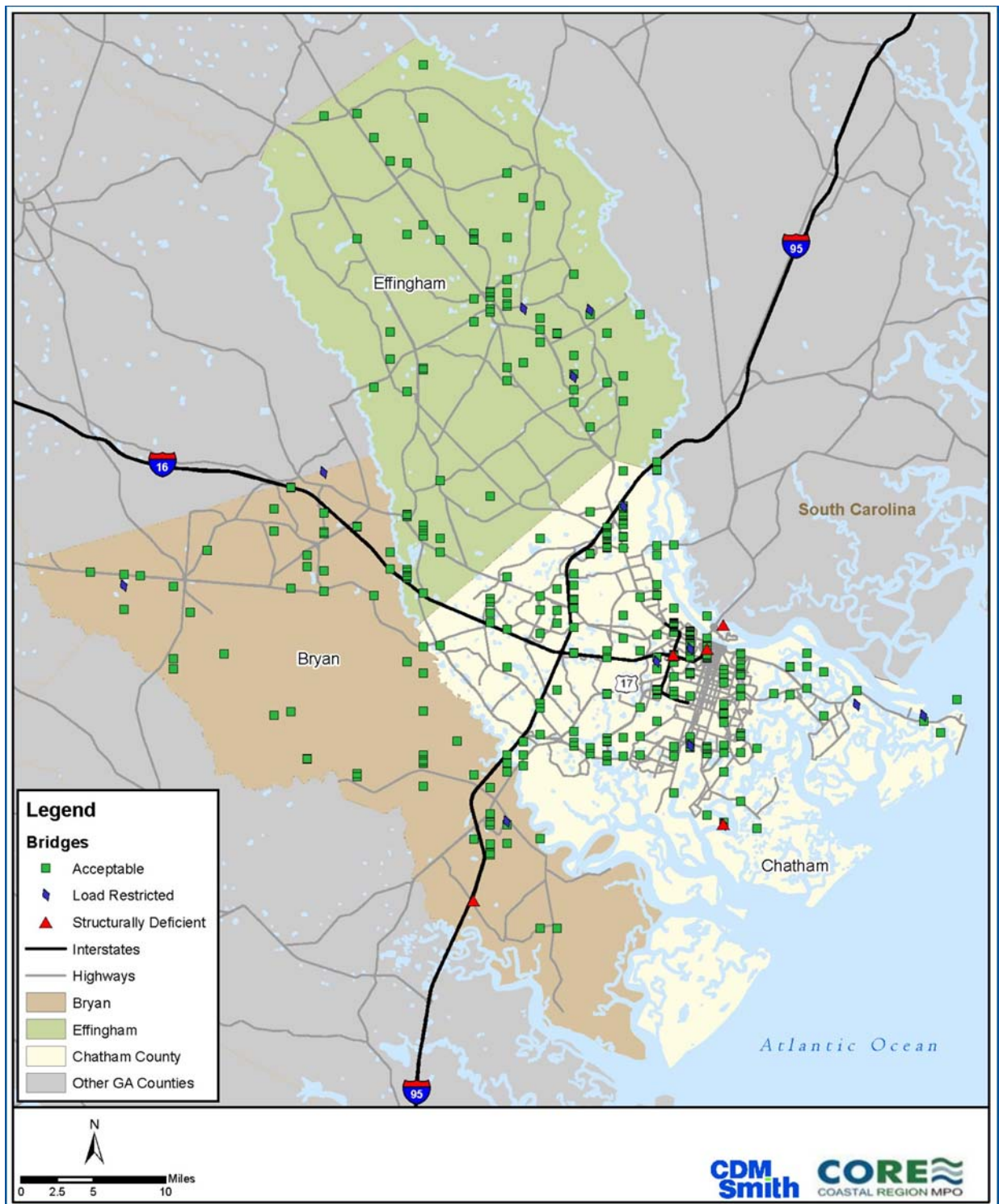
A bridge with fatigue damage may restrict what vehicle types and weights may cross it safely. A bridge is "load posted" when its capacity to carry heavy loads is diminished. **Table 2-7** lists all bridges in the study area by count, deck area, and status across counties. There are 377 bridges which have over 6,596,000 square feet of deck area in the three-county area. The status of these bridges are described as structurally deficient (SD) or functionally obsolete (FO). A bridge with a "posted for load" posting has a weight limit capacity. All SD bridges are posted, but not all posted structures are SD. Overall, there are five SD bridges in the area. The GDOT is primarily focusing on improving the SD bridges. **Figure 2-5** shows the placement of all bridges, along with the load restricted structures.

Table 2-7: Bridges Status

Name	State	Count	Area (sq ft)	Status	Posting
Bryan	Georgia	65	803,704.2	-	Open
Bryan	Georgia	3	11,240.1	-	Posted for Load
Bryan	Georgia	1	13,181.8	SD	Posted for Load
Bryan	Georgia	5	88,343.5	FO	Open
Chatham	Georgia	197	4,456,976.3	-	Open
Chatham	Georgia	1	1,489.4	-	Load Recommendation (not legal)
Chatham	Georgia	5	78,083.9	-	Posted for Load
Chatham	Georgia	3	122,416.3	SD	Open
Chatham	Georgia	1	3,025.2	SD	Posted for Load
Chatham	Georgia	22	552,997.1	FO	Open
Chatham	Georgia	1	3,347.1	FO	Posted for Load
Effingham	Georgia	68	433,258.9	-	Open
Effingham	Georgia	2	12,308.5	FO	Open
Effingham	Georgia	3	16,062.1	FO	Posted for Load

Source: Georgia NBI File Submittal, bridge data as of Dec 31, 2012

Figure 2-5: Bridge Inventory in the Study Area



Source: Georgia NBI File Submittal

2.2 Air Cargo System Profile

Air cargo consists of mail products and freight commodities. There are numerous entities which are participants in this mode (e.g., freight forwarders, deferred air carriers, etc.). The physical carriage of goods in this mode occurs on dedicated, cargo configured aircraft or in the “belly” or luggage compartments of passenger aircraft. With the transition to regional jets to service smaller markets such as Savannah, major airlines and their regional partners have reduced the overall available space for air cargo. Increased requirements to satisfy elevated security for this cargo type has also decreased the amount of cargo by limiting the number of acceptable shippers at smaller airports. This reduction has shifted cargo to other modes or to consolidators or freight forwarders who transport these shipments to larger airports via ground transportation. A third factor in the reduction of air cargo volumes are economic conditions. As the asset costs such as aircraft, fuel, and terminals outweigh those of other modes, the cost to shippers is extremely high. As economic pressures influence transportation budgets, many former air customers shift to less costly but slower transportation modes by modifying the needs of their individual supply chains.

According to data from the Freight Analysis Framework Version 3 (FAF3), which will be discussed in Section 3, in 2011 there were over five Ktons of freight traveling to and from the study area by air which totaled over \$1.5 Billion in market value.

While many airports in Georgia can accommodate air cargo activity to a certain degree, there is one airport in the Savannah metropolitan area that has significant air cargo, the Savannah / Hilton Head International Airport. The other airports are military (Hunter) and/or privately owned.

Figure 2-9 shows the location of the airports in the study area.

2.2.1 Facilities

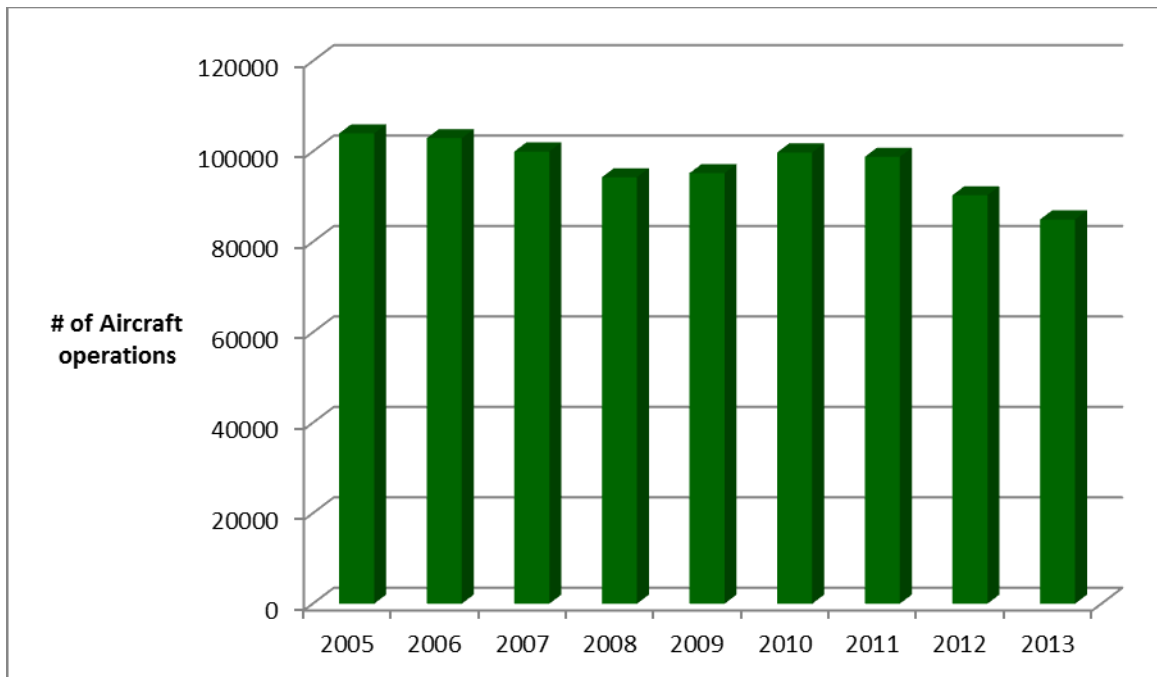
The Savannah / Hilton Head International Airport (SAV) services a growing number of passenger and cargo interests for individuals in Georgia and South Carolina. One of six identified airports within the study area, SAV handles measureable air cargo. However, SAV has experienced a decrease in aircraft traffic. The use of the airport for cargo transport has leveled off the last few years following the economic downturn of 2009, as shown in **Figure 2-6** and **Figure 2-7**.

SAV operates with two active runways, four designations, at 7,002 feet and at 9,351 feet in length. Designating air cargo capacities, based on runway lengths, does not provide sufficient information to identify aircraft types and cargo volumes. These are subject to additional factors of mean air temperature, altitude, aircraft weight (empty and loaded), and other performance based metrics. The intent of this project is to focus on air cargo tonnage (e.g., freight volume and value), not aircraft operations.

A private U.S. Army Air Field in Chatham County, the Hunter Army Airfield (AAF) has one asphalt runway of 11,375 feet in length. This is a restricted field with no commercial air service.

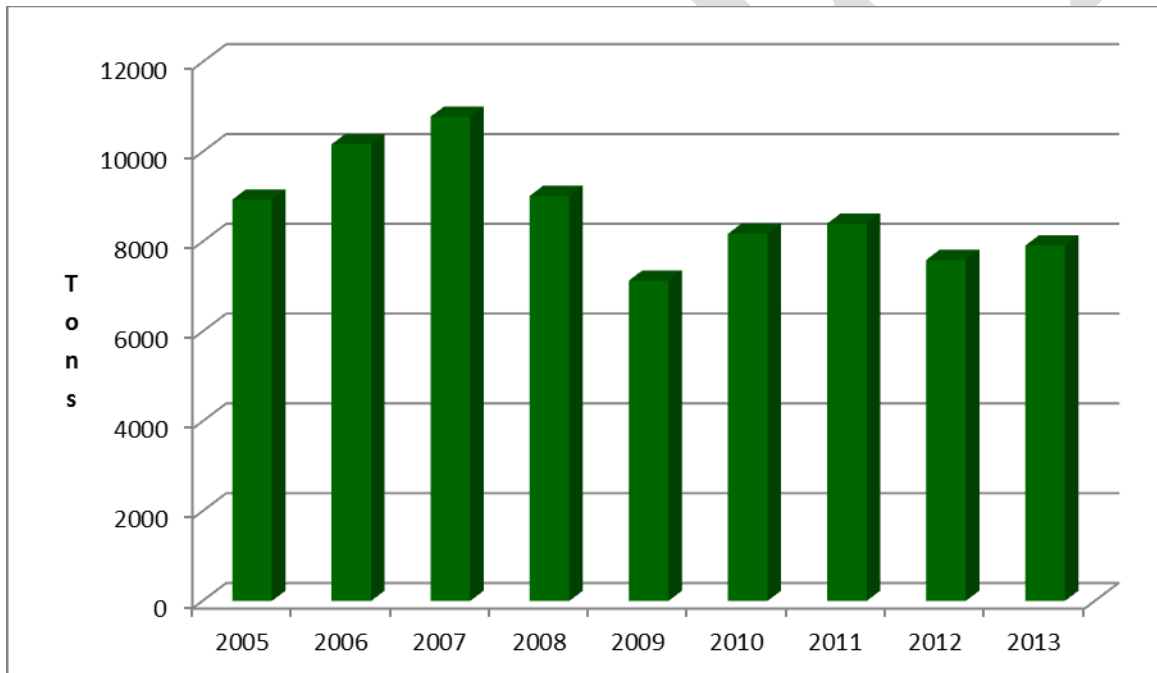
A privately owned airfield in Chatham County, Hodges Air Park has one turf surfaced at 2,640 feet in length. There are no tower, repair or service facilities. There is no commercial service available.

Figure 2-6: Aircraft Operations



Source: <http://savannahairport.com/>

Figure 2-7: Air Cargo



Source: <http://savannahairport.com/>

A privately owned airfield in Effingham County, Swaids Field has one turf surfaced at 3,000 feet in length. There is no commercial service available.

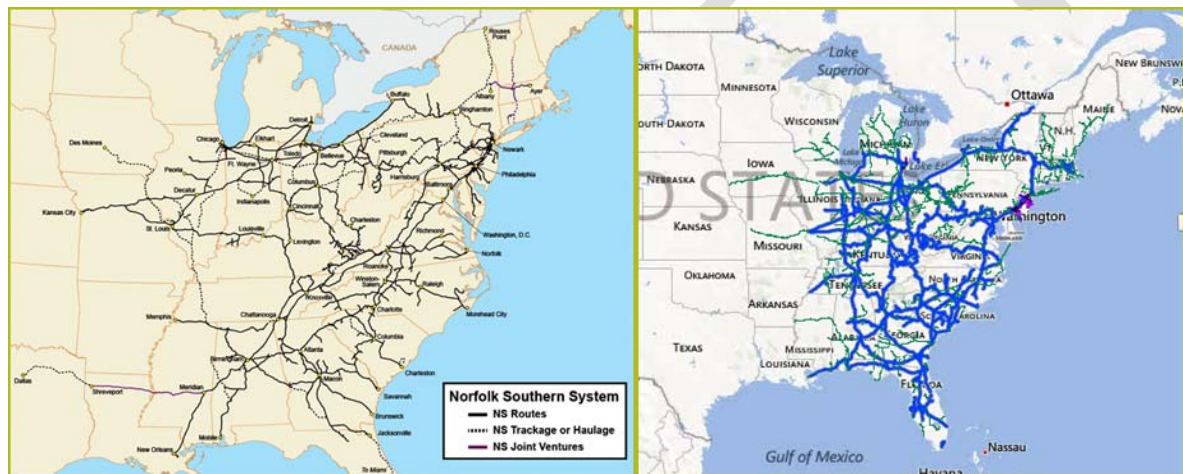
A privately owned airfield in Effingham County, Briggs Field has one turf surfaced at 2,300 feet in length. There is no commercial service available.

A privately owned airfield in Effingham County, Briar Patch has one turf surfaced at 2,600 feet in length. There is no commercial service available.

2.3 Rail System Profile

Rail is a major component of freight movement in Georgia. According to the Freight Analysis Framework (FAF) data, 11,300 Ktons moved in and out of the Savannah metropolitan area, almost 8 percent of all freight movements in the area for 2011. Railroad systems are classified as Class I, II, or III based on the operating revenues of the rail line. There are two Class I railroads in operation in Georgia, CSX and Norfolk Southern (NS), and they have over 2000 miles of rail track way in the state. Each operates exclusively east of the Mississippi River. Illustrations of the individual coverage or service areas are presented in **Figure 2-8**. The CSX line provides north and south directional access to the study area. NS only offers direct access to the north.

Figure 2-8: Coverage Areas for NS and CSX



Source: www.nscorp.com, www.csx.com, February 27, 2013

There are 220 miles of Class I track in the Savannah metropolitan region. CSX has approximately 130 miles of track in the three-county area while NS owns almost 90 miles. The main concentration of track occurs in the north side and west side of Savannah within Chatham County. This occurs because the rail providers have rail spurs and yards in the area primarily to accommodate the loading and unloading of freight from the port terminals.

Additionally, there are three Class III, or short line, railroads in the area totaling nearly 196 miles of track. The three Class III railroads in operation include Savannah Port Terminal Railroad (SAPT), Golden Isles Terminal Railroad (GITM), and Georgia Central Railway, LP (GC). These short line railroads connect the Class I railroads to commodity shippers and receivers and each plays a vital role in moving freight throughout the state. **Figure 2-9** is a visual display of all rail activity in the study area.

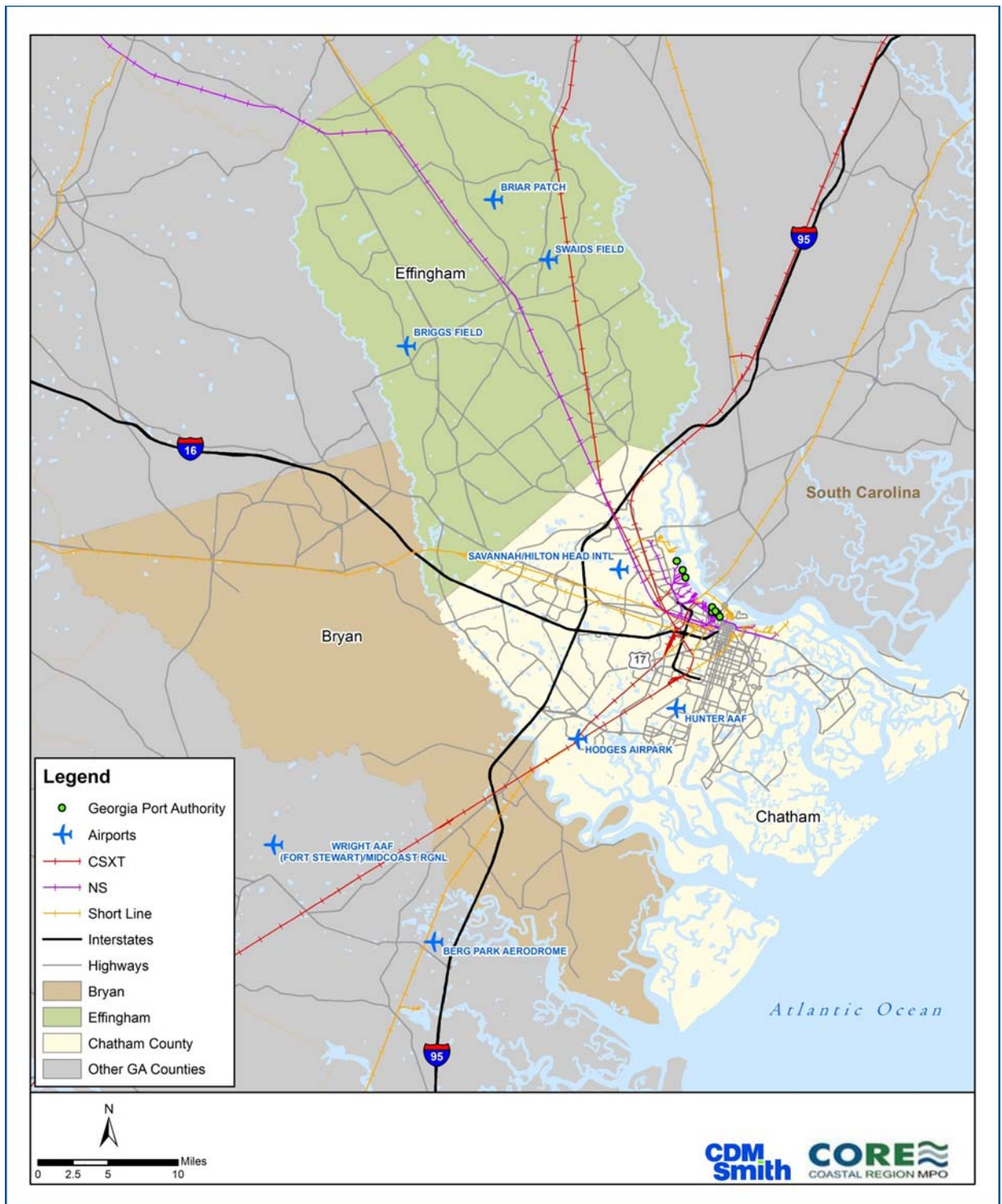
Each of the short lines provides a valuable service to the Class I network and overall freight network. The 18 miles of the Savannah Port Terminal Railroad handles 26,000 annual carloads of freight and operates in the Georgia Ports Authority's Garden City terminal. The 13 miles of the Golden Isles Terminal Railroad handles 10,000 annual carloads of freight and operates in the Colonel Island Bulk and Auto Processing terminal. The 171 miles of the Georgia Central Railway handles 1.3 million tons of freight and 15,000 carloads of freight and interchanges with NS and CSX. **Table 2-8** shows the different commodities that each of the railroads handle.

Table 2-8: Short Line Commodities

Commodity	Georgia Central	Golden Isles	Savannah Port
Automobiles		X	
Coal	X		
Chemicals	X	X	X
Farm & Food Products	X	X	
Forest	X		
Stone	X		
Plastics	X		
Paper	X		X
Intermodal			X
Machinery			X

Source: Genesee & Wyoming, Inc., <http://www.qwrr.com>

Figure 2-9: Airport, Rail and Port Locations in the Study Area



2.4 Maritime Transport System Profile

Ocean and inland water transport provide access to markets overseas and is a low cost solution via barge and short sea shipping around the state and the continent. With the globalization of the supply chain over the previous decades, the ability to transport materials and goods between continents has increased. This movement is characterized by the increasing utilization of containerization. With this method as a standard, intermodal connectivity between ocean and landside transport decreases cost and increases speed across the entire supply chain. The use of inland waterway and short sea shipping, a transport method having been in decline within the U.S., has experienced a minor renaissance with recent innovations and capital investment. Although continuing declines in investment in maintenance occur (e.g., Savannah River depths from Savannah to Augusta), other regions have experienced an increasing use of waterways, once the sole means of goods transport (e.g., Mississippi, Alabama).

The Federal Navigation Channel provides deep draft vessel passage from the ocean trade routes to the Port of Savannah. Current navigable depths provide 42 feet at mean low tide.

The Port of Savannah handles multiple commodity types through employment of Ro-Ro (roll-on, roll-off), break-bulk, container, and reefer (refrigerated) operations. This port is ranked four nationally as one of the top container ports by port calls and vessel types. **Table 2-9** shows the vessel calls and the capacity of these calls. Two terminal locations perform these services, both of which are owned and operated by the Georgia Ports Authority: Garden City Terminal and Ocean Terminal.

Table 2-9: Vessel Calls and Capacity, 2011

Port	Number of Vessel Calls	Capacity of Calls
Savannah	2,219	112,557

Source: <http://www.navigatordatacenter.us/>

Physical aspects of the port's main channels are summarized in **Table 2-10**. Both of the port's terminals have the same dimensions and even with expansions will still be relatively the same in depth. The Port of Savannah has direct access to cities throughout the Southeast and Midwest of the U.S. and is a key transportation link for Georgia's waterborne freight.

Table 2-10: Terminal Physical Aspects

Terminal	Depth (feet)	Width (feet)
Garden City	42	500
Ocean	42	500

Source: Georgia Ports Authority

There is warehousing space available in both of the terminals. As a result of investing in refrigerated container units by the Georgia Ports Authority, approximately 38 percent of the poultry in the U.S. moves through this port.

2.4.1 Facilities

Garden City Terminal

The Garden City Terminal is the newer of the two facilities offering container services across 486 hectares. This is the fourth largest container port in the U.S. by size.

Channel width is 500 feet with a depth of 42 feet. Future dredging operations are planned to deepen the channel to 48 feet. Specific characteristics of the terminal include:

- Warehousing space is 4 million square feet
- Outdoor, paved container storage space is 175 hectares
- 37 interchange lanes with 25 pre-check lanes at three gates
 - Specific lanes are equipped with scales, over-height sensing devices
 - Gate Operations :
 - Operating Hours of Gate 3:
0700 -1800 Monday, Tuesday, Wednesday and Thursday
0700 – 1700 Friday
 - Operating Hours of Gate 4:
0700 -1800 Monday through Friday
0800 – 1200 x 1300 - 1700 Saturday
 - Operating Rules:
Gates 3 and 4 are for containerized transactions only
Commercial vans and loose freight should be directed to Gates 1 or 5
Bob-tail trucks should enter through Gate 1 or Gate 5 and proceed to the internal kiosk for pick-up ticket processing
Bob-tail trucks should exit through Gate 1 or Gate 5
- Container crane equipment
 - Five have 16 container reach lengths and 48.1 metric ton lift capacity
 - Six have 18 container reach and 71 metric ton lift
 - 11 have 22 container reach and 71 metric ton lift
- Current capacity for the terminal is 2.6 million twenty foot equivalencies (TEUs)
- Intermodal Container Facility has unrestricted double stack
- Serviced by NS and CSX
- Immediate access to I-95 and I-16

Ocean Terminal

The Ocean Terminal provides break bulk as an alternative to ship non-containerized goods and Ro-Ro services, handles wood products, steel, farm equipment, heavy-lift cargo, and automobiles.

Operational highlights include:

- 10 berths
- 139,000 square meters of covered storage
 - Side warehouse rail sidings
- 34 hectares of open storage and 26.7 hectares of paved storage
- Crane equipment
 - Two gantry cranes
 - One container crane
- Two intermodal container transfer facilities
 - Mason ICTF has six working rail tracks and three storage tracks
 - Chatham ICTF has three working and one storage
- Provides access to I-95 and I-16

2.5 Connectivity to Intermodal System Profile

The Savannah metropolitan region is able to transport goods throughout the Midwest and Northeast via truck, rail and port. There is direct access to I-95 and I-16 where major cities can be reached within two days. The Port of Savannah has intermodal connections through truck and rail access, such as rail connections with CSX and NS transporting freight to Atlanta, Birmingham, Charlotte, Memphis and Orlando.

Cordele Intermodal Services located near I-75 provides rail access to the Port of Savannah. Using intermodal services reduces total costs and CO₂ emissions, and allows quick delivery by avoiding highway delays. Cordele offers a private fleet of trucks and chassis as well as a 40-acre container yard with expansion planned in the future. Tax credits are available if the Cordele uses the Port of Savannah.

CenterPoint Intermodal Center in Savannah, Georgia is located within five miles of the Port of Savannah. CenterPoint offers rail access to NS, as well as NS Dillard Yard, an intermodal center that has storage capabilities.

3. FREIGHT GROWTH

3.1 Forecasting Freight Growth

3.1.1 Methodology

The Freight Need Assessment is not meant to be a detailed project-level analysis but more of a system-level summary. The analysis considers available data to understand and evaluate the freight movement conditions and needs in the Savannah region. Qualitative and quantitative analysis is based on existing conditions, including but not limited to:

- Commodity flow (i.e., directional flow, volume, and value);
- Traffic operations of roadway network (i.e., level of service and volume to capacity ratio);
- Safety (i.e., accident locations and crash rate at rail crossings and intersections);
- Land use designations;
- Linkage between freight activities and economic activities; and,
- Average shipment distance by mode on the multimodal network systems.

Other plans, studies, and databases from state, local and regional sources were also used in this analysis, including:

- Georgia Freight and Logistics Plan, GDOT (2011);
- Georgia in Perspective, Governor's Office of Budget and Planning (2013);
- World Port Source, www.worldportsource.com;
- Georgia Ports Authority, www.gaports.com;
- FltPlan, www.fltplan.com; and,
- Savannah / Hilton Head International Airport website, www.savannahairport.com.

A freight growth forecast was also derived to estimate future volume flows of freight, demands, trends, and characteristics. These forecasts by mode were used to identify freight deficiencies, which are locations where the freight system is in need of improvement based on the forecasted freight demand. The freight growth is based on local information via establishment surveys and the disaggregation of FAF data, as described in the following sub-section.

3.1.2 Data Sources for FAF Disaggregation

The lack of locally available data makes necessary the consideration of other data sources such as the Freight Analysis Framework (FAF). However, the FAF is not reflective of movements at a county level. In FAF's existing format, the study area is part of a greater zone consisting of Bryan, Chatham, Effingham, Liberty, and Long Counties. To draw meaningful conclusions using FAF, it is necessary to disaggregate the FAF from Savannah FAF zone to freight districts. These districts are a collection of Traffic Analysis Zones (TAZs) from the CORE MPO travel demand model.

Disaggregation is based on the relationships between commodity flow (i.e., quantity of goods

produced and consumed in an industry) and employment by industry. Industry-specific employment was used as an indicator variable for consumption or production within an industry. The following subsections describe the primary inputs to this process.

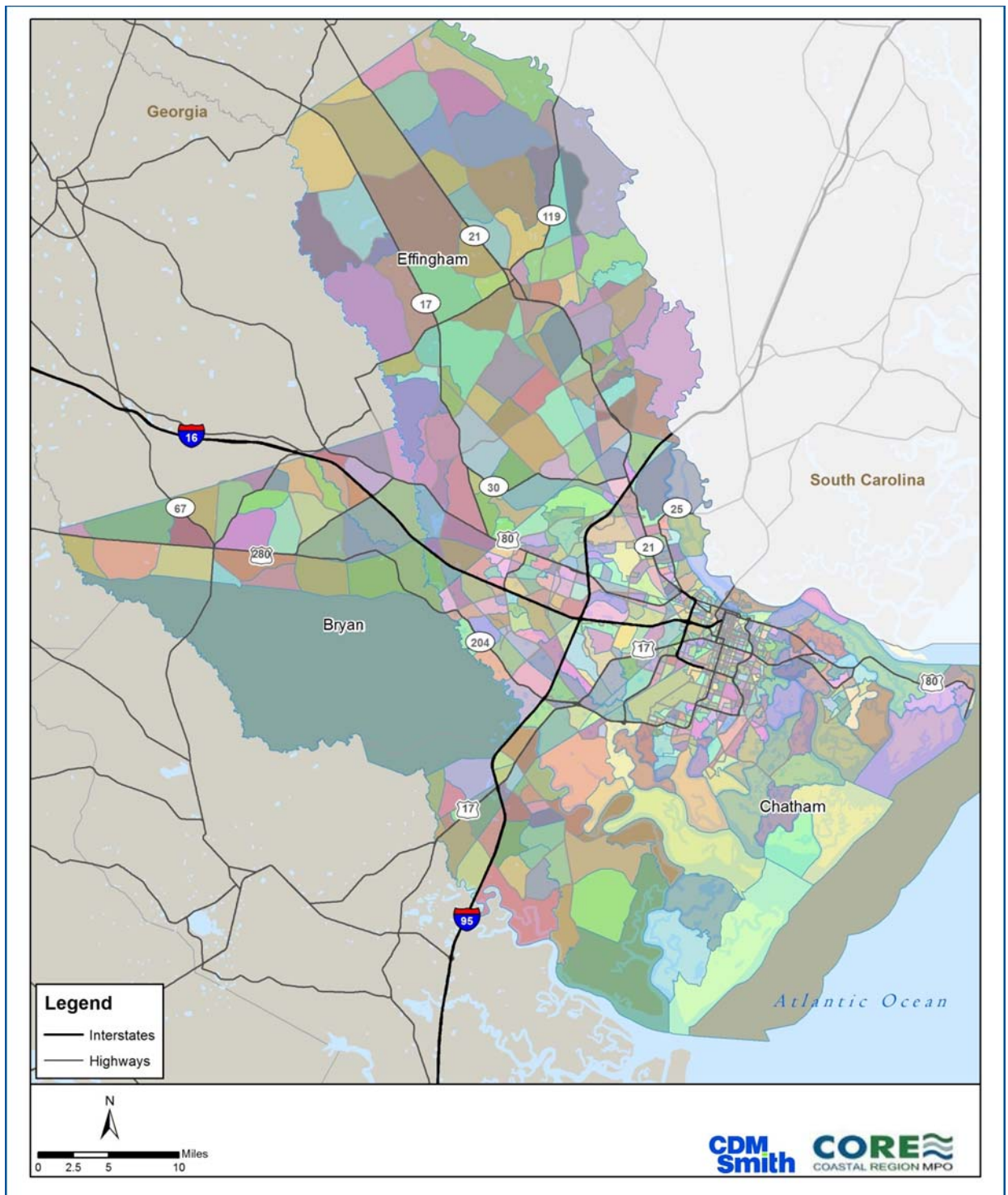
Zonal Data

As previously mentioned, the geographic portion of the FAF disaggregation used TAZs from the travel demand model. The TAZs have employment data as part of the socioeconomic attributes of the model. These TAZs were aggregated into common areas, which were referred to as freight districts. The freight districts have common industry types and employment characteristics, as well as some geographic boundaries. The freight districts were limited by a political boundary, major roadways such as interstates, or physical features such as rivers. Clustering smaller TAZs would increase the reliability of the disaggregation and its eventual results.

The CORE MPO travel demand model has 796 internal TAZs populated by the 2010 base year socioeconomic data. The model area includes Chatham, Effingham, and Bryan Counties. **Figure 3-1** illustrates the model TAZs.

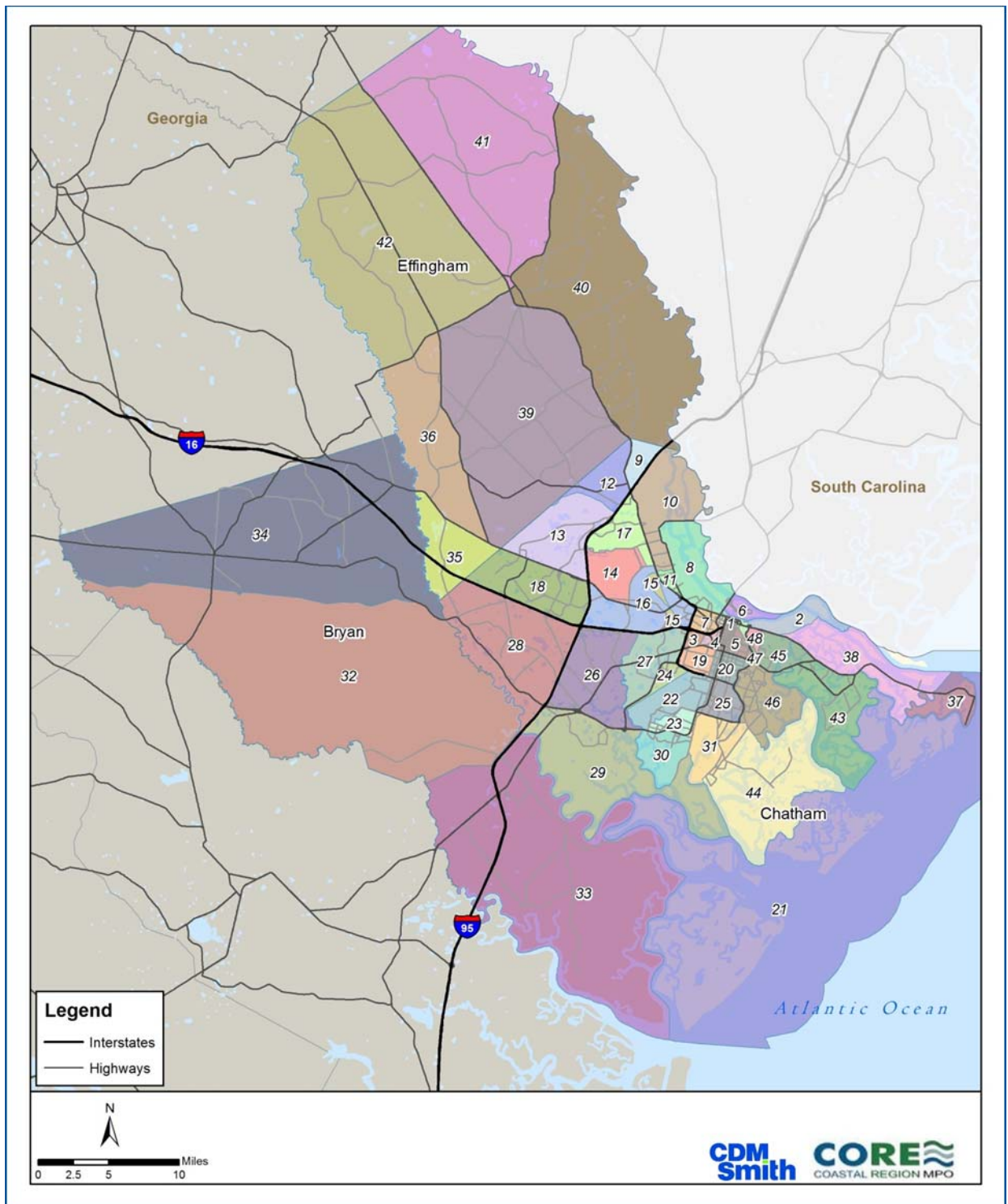
After aggregating the TAZs, the FAF disaggregation used 42 freight districts in the analysis. **Figure 3-2** illustrates the freight districts. After aggregating the TAZs with input from the CORE MPO staff, the FAF disaggregation will have 48 freight districts in the study area. However, the federal CSA Boundary for Savannah contains all of Bryan, Chatham, and Effingham Counties, along with small portions of Liberty and Long Counties. **Figure 3-3** shows the freight districts of the study area as well as the portions of Long and Liberty Counties in the Savannah CSA. These districts—the 48 freight districts for the three-county study area and the two additional counties—will be used in the analysis and reflected in Section 4.

Figure 3-1: CORE MPO Travel Demand Model Traffic Analysis Zones



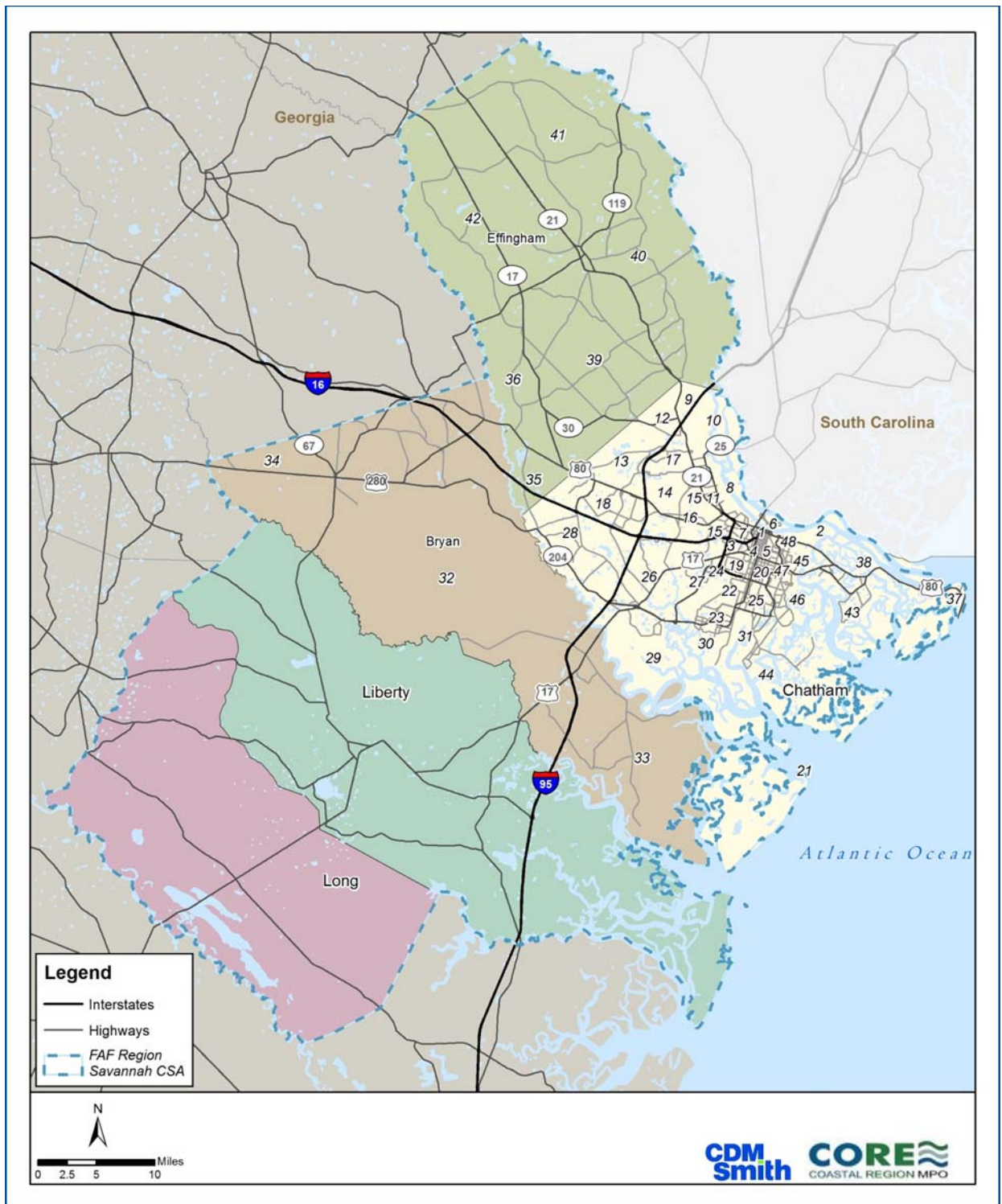
Source: CORE MPO

Figure 3-2: Freight Districts of the Study Area



Source: CDM Smith

Figure 3-3: FAF Disaggregated CSA Analysis Zones

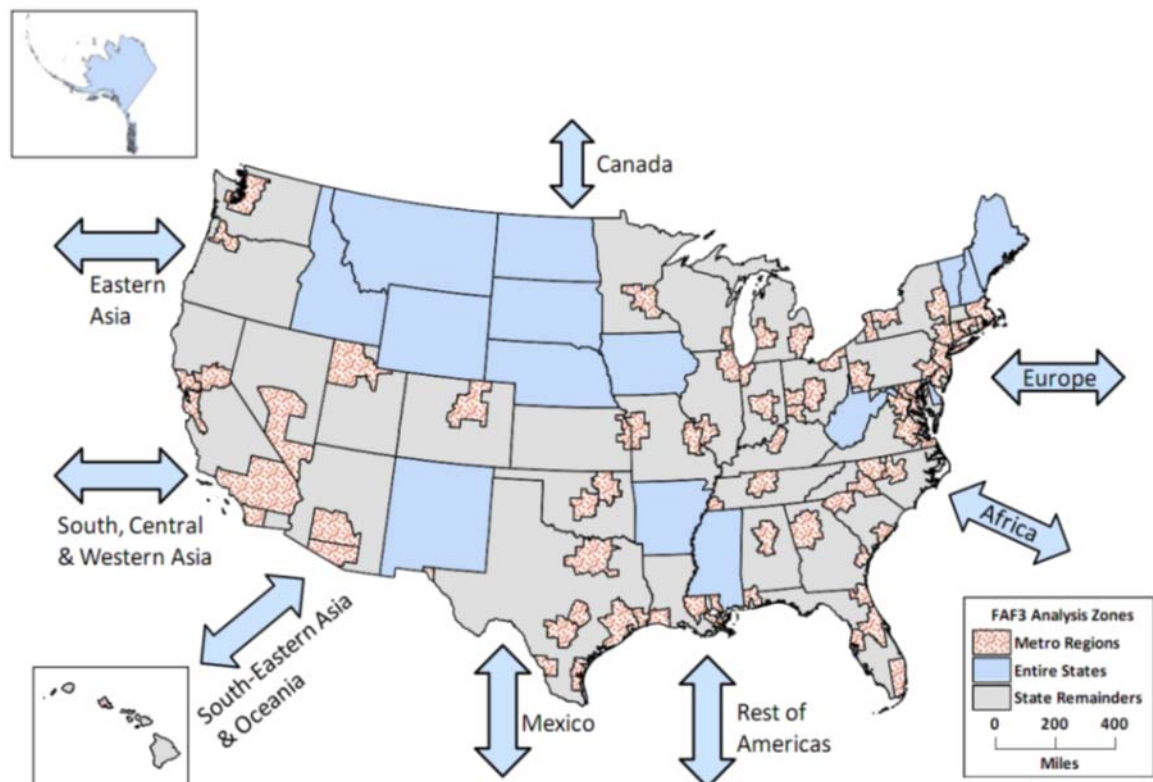


Source: CDM Smith

FAF Data

The FAF is a Federal Highway Administration (FHWA) database to help users understand how the movement of freight affects the transportation system and where problems with the transportation system could affect the flow of freight. The FAF Version 3 (FAF3) provides freight flow information for tonnage, value, and domestic ton-miles by region of origin and destination, commodity type, and mode for 2007 (baseline year), 2011, and forecast through 2040 in five-year increments. The analysis zones consist of 123 domestic areas that are divided into metro regions, state remainders and entire states. Metro regions consist of 74 metropolitan areas. The state remainders represent each of the state's territory outside of the metropolitan areas. Entire states are the 16 regions that do not have a metropolitan region. **Figure 3-4** shows the analysis zones used in the FAF3.

Figure 3-4: Analysis Zones Used in FAF3



Source: Freight Analysis Framework, <http://faf.ornl.gov/fafweb/Default.aspx>

One of the FAF3 metro regions is Savannah CSA, which will be used in the disaggregation process and relate to all other regions throughout the nation. The FAF3 data currently shows a heavy truck influence in the Savannah metro area for 2011. The imports from 2011 data included coal not-elsewhere-classified (n.e.c.), crude petroleum and fuel oils. In contrast, exports included nonmetallic minerals, newsprint/paper and meat/seafood. Truck transportation was the heaviest used mode for both imports and exports. **Table 3-1** and **Table 3-2** show the kilotons (KTons) and millions of dollars (in the 2007 base year) for each domestic mode as the freight enters, exits, and stays within the Savannah metro region for the various years. **Table 3-3** shows the percent change between the previous two tables by mode for tonnage and value.

Table 3-1: 2011 Mode Values

2011	Into Savannah FAF Region		Out Of Savannah FAF Region		Internal	
	KTons	\$M	KTons	\$M	KTons	\$M
Truck	37,663.7	38,794.5	42,243.3	64,684.1	16,691.6	15,878.6
Rail	7,731.6	3,110.3	2,926.4	2,025.4	646.2	289.4
Water	3,008.8	2,396.5	7.0	4.0	5.2	0.7
Air	2.2	489.9	3.8	1,090.7	-	2.0
Multiple modes & other	15,504.8	15,313.3	11,421.9	12,883.4	9,016.3	4,478.1

Source: Freight Analysis Framework, <http://faf.ornl.gov/fafweb/Default.aspx>

Table 3-2: 2040 Mode Values

2040	Into Savannah FAF Region		Out Of Savannah FAF Region		Internal	
	KTons	\$M	KTons	\$M	KTons	\$M
Truck	85,123.1	103,822.2	89,371.6	170,871.0	31,256.2	36,468.0
Rail	11,516.8	6,042.2	5,866.8	5,866.5	1,426.5	613.3
Water	2,354.5	1,868.1	20.8	4.5	15.4	2.2
Air	6.5	1,335.3	11.8	3,416.7	5,054.8	5,305.0
Multiple modes & other	35,883.6	46,514.0	26,936.9	38,534.2	15,679.2	6,132.0

Source: Freight Analysis Framework, <http://faf.ornl.gov/fafweb/Default.aspx>

Table 3-3: Percent Change between 2011 and 2040

2040	Into Savannah FAF Region		Out Of Savannah FAF Region		Internal	
	KTons	\$M	KTons	\$M	KTons	\$M
Truck	126.0%	167.6%	111.6%	164.2%	87.3%	129.7%
Rail	49.0%	94.3%	100.5%	189.6%	120.8%	111.9%
Water	-21.7%	-22.0%	197.1%	12.5%	196.2%	214.3%
Air	195.5%	172.6%	210.5%	213.3%	-	-
Multiple modes & other	131.4%	203.7%	135.8%	199.1%	73.9%	36.9%

LEHD and CBP Data

The Longitudinal Employer Household Dynamics (LEHD) database is the result of a partnership between the U.S. Census Bureau and States to provide high quality local labor market information and to improve the Census Bureau's economic and demographic data programs. The LEHD summarizes employment for specific industry types by race, gender, and age; however, it is only available at the census block and the 2 digit North American Incorporation Census State (NAICS) code level.

The County Business Patterns (CBP) is a publicly available database that provides employment data by county by NAICS industry. The CBP is available at 3 digit NAICS but does not go below the county level. Therefore, given the need to disaggregate the FAF database to the Freight District level (which is smaller than the county level), it was necessary to obtain the 3 digit NAICS at the FAF district level.

Essentially, employment data by industry was used to estimate the commodity flows (i.e., freight tonnage) to and from a FAF3 region.

DRAFT

4. FUTURE FREIGHT DEMAND

4.1 Projected Commodity Flow

The results of the disaggregation are a series of tables showing the commodity flow into and out of each FAF freight district by truck, rail, water, and air by commodity for 2011 and 2040.

4.1.1 Truck Imports/Exports

Truck transportation represents the largest mode share for freight to and from the FAF Disaggregated CSA boundary area. **Table 4-1** and **Table 4-2** examine the study area's economy, showing the top 10 commodities for imports and exports that occur within the area boundary via truck movement. Total import tons increase from 37,663.7 Ktons to 85,123.1 Ktons using truck as the domestic mode choice. Nonmetallic Minerals remains the largest import (by tonnage) to use truck. From 2011 to 2040, it increases in its share of total import from 12.0 percent to 23.8 percent. It may suggest for developing industries since other commodities continue to grow in total tonnage as well.

Total export tons increase from 42,243.3 Ktons in 2011 to 89,371.6 Ktons in 2040 using truck as the domestic mode choice. Coal and petroleum products are the largest export (by tonnage) to use truck in 2011, as shown in **Table 4-1**. However it only increases from 5,059.9 Ktons to 8,824.9 Ktons between 2011 and 2040. This commodity is outpaced by the rise of "other foodstuffs" (such as dairy products, sugar, oils, and coffee), which increases from 1,244.8 to 9,656.9 Ktons, and "nonmetal mineral products" (such as ceramic and glass products) which increases from 1,835.4 to 9,312.0 Ktons between 2011 and 2040.

Table 4-1: Top 10 Commodity by Tonnage by Truck (2011)

Import			Export		
Commodity	Ktons	% of total	Commodity	Ktons	% of total
Nonmetallic minerals	4,489.8	12.0%	Coal-n.e.c.	5,059.9	20.7%
Logs	3,678.5	9.8%	Mixed freight	3,238.9	13.2%
Nonmetal min. prods.	3,525.2	9.4%	Nonmetal min. prods.	1,835.4	7.5%
Waste/scrap	2,981.8	8.0%	Other foodstuffs	1,244.8	5.1%
Newsprint/paper	2,631.6	7.0%	Machinery	1,098.1	4.5%
Fertilizers	2,393.5	6.4%	Waste/scrap	1,077.6	4.4%
Gasoline	2,280.6	6.1%	Fuel oils	959.3	3.9%
Fuel oils	1,543.4	4.1%	Nonmetallic minerals	932.1	3.8%
Basic chemicals	1,275.1	3.4%	Newsprint/paper	919.2	3.8%
Coal-N.E.C.	1,158.0	3.1%	Base metals	804.9	3.3%

Table 4-2: Top 10 Commodity by Tonnage by Truck (2040)

Import			Export		
Commodity	KTons	% of total	Commodity	KTons	% of total
Nonmetallic minerals	20,032.4	23.8%	Other foodstuffs	9,656.9	10.9%
Nonmetal min. prods.	7,854.3	9.3%	Nonmetal min. prods.	9,312.0	10.5%
Newsprint/paper	6,998.0	8.3%	Coal-n.e.c.	8,824.9	10.0%
Waste/scrap	6,109.0	7.3%	Mixed freight	8,603.4	9.7%
Logs	3,932.8	4.7%	Nonmetallic minerals	5,578.0	6.3%
Meat/seafood	3,393.8	4.0%	Machinery	5,044.1	5.7%
Plastics/rubber	3,228.9	3.8%	Newsprint/paper	4,539.7	5.1%
Gasoline	3,075.8	3.7%	Waste/scrap	3,891.1	4.4%
Basic chemicals	2,852.3	3.4%	Chemical prods.	3,399.1	3.8%
Fertilizers	2,386.2	2.8%	Furniture	3,390.7	3.8%

Table 4-3 and **Table 4-4** show tonnage of the goods by origin and destination. Exports travel from the study area and imports travel to the study area. The freight districts are shown as origin and destination pairings to allow for a finer level of detail within the study area. Refer back to **Figure 2-2** for an illustration of the freight districts.

Table 4-3: Top 10 Export Trade Partners by Tonnage by Truck (2011)

Origin	Destination	KTons
Freight District 08	Atlanta, GA	801.7
Freight District 16	Houston, TX	491.3
Freight District 16	Atlanta, GA	432.9
Freight District 16	State of Georgia	397.0
Freight District 08	State of Georgia	391.7
Freight District 14	Houston, TX	385.6
Freight District 10	Atlanta, GA	362.4
Freight District 10	Houston, TX	351.9
Liberty County	State of Georgia	350.6
Freight District 10	State of Georgia	338.0

Table 4-4: Top 10 Import Trade Partners by Tonnage by Truck (2011)

Origin	Destination	KTons
Atlanta, GA	Liberty County	577.6
State of Georgia	Liberty County	488.0
Newark, NJ (New York)	Liberty County	417.4
State of Georgia	Freight District 10	369.4
State of Georgia	Freight District 16	344.7
State of South Carolina	Liberty County	297.4
State of South Carolina	Freight District 18	249.9
State of Georgia	Freight District 14	225.9
Atlanta, GA	Freight District 16	206.8
Newark, NJ (New York)	Freight District 14	183.7

Perhaps most notable in **Table 4-3** is the common origin of Districts 08, 10, and 16 along with the common destinations of Atlanta and the rest of Georgia as major freight destinations for trucks. As we will discuss later, Freight District 08 is home to the port activities in the study area. This pairing likely reflects the offloading of freight through the port onto truck for domestic delivery. This table begins to highlight a heavy movement from the Savannah region via I-16 WB and potentially I-95 SB.

Liberty County, part of the original FAF Savannah CSA metropolitan region, was disaggregated as part of the process to make sure tonnages were properly associated with the county and not the freight districts. As shown in **Table 4-5**, Liberty County is a major destination for some truck movements from Atlanta, the rest of Georgia, South Carolina, and Newark.

Table 4-5: Top 10 Internal Trade Partners by Tonnage by Truck (2011)

Origin	Destination	KTons
Liberty County	Liberty County	277.8
Freight District 08	Liberty County	237.7
Freight District 16	Freight District 10	183.7
Freight District 16	Freight District 16	175.4
Freight District 08	Freight District 16	165.2
Freight District 08	Freight District 10	156.7
Freight District 10	Freight District 10	147.2
Freight District 18	Liberty County	146.9
Freight District 10	Freight District 16	145.1
Freight District 14	Freight District 10	139.1

Part of this freight equation includes internal movements for the study area. **Table 4-5** reflects the freight carried by trucks that originates in the study area, but is also delivered in the study area. There are some intra-county and even intra-district pairings in this table. Some will originate from Freight District 08, home to the port activities in the study area, and terminate within the area as well.

Tables 4-6 through **Table 4-8** show the growth and change in trade partners in 2040. Perhaps most notable in **Table 4-6** is the common origin of Districts 08, 10, and 16 (as mentioned in 2011 also) along with the common destinations of Atlanta and the rest of Georgia as major freight destinations for trucks. Important items to note here are:

- 1) The increase of port movement to Atlanta, from 801.7 KTons in 2011 to 2,413.2 KTons in 2040, and
- 2) The rise of Houston, TX as an export trade partner in future years.

The major imports for the study area will increasingly originate from the north in Newark, NJ metropolitan region (**Table 4-7**). Trucks will take I-95 into the study area. This could reflect not only a potential need on the roadway aspect of this movement, but also an opportunity for the Port of Savannah as much of this freight may be originating from the Port of New York/New Jersey and be trucked down the coast.

Table 4-6: Top 10 Export Trade Partners by Tonnage by Truck (2040)

Origin	Destination	KTons
Freight District 08	Atlanta, GA	2,413.2
Freight District 16	Houston, TX	942.6
Freight District 16	Atlanta, GA	801.8
Freight District 14	Houston, TX	746.2
Freight District 08	State of Georgia	695.0
Freight District 10	Atlanta, GA	687.7
Freight District 10	Houston, TX	681.7
Liberty County	Atlanta, GA	623.6
Liberty County	State of Georgia	611.4
Freight District 14	Atlanta, GA	593.7

Table 4-7: Top 10 Import Trade Partners by Tonnage by Truck (2040)

Origin	Destination	KTons
Newark, NJ (New York)	Liberty County	3,654.8
Newark, NJ (New York)	Freight District 14	1,557.2
Newark, NJ (New York)	Freight District 16	1,467.3
Newark, NJ (New York)	Freight District 10	1,169.7
Atlanta, GA	Liberty County	937.5
Newark, NJ (New York)	Freight District 22	866.8
Newark, NJ (New York)	Freight District 08	864.8
Newark, NJ (New York)	Freight District 40	790.1
State of Georgia	Liberty County	748.2
State of Georgia	Freight District 10	680.3

Table 4-8: Top 10 Internal Trade Partners by Tonnage by Truck (2040)

Origin	Destination	KTons
Liberty County	Liberty County	566.2
Freight District 08	Liberty County	535.4
Freight District 08	Freight District 16	338.6
Freight District 16	Freight District 10	313.0
Freight District 16	Freight District 16	312.8
Freight District 08	Freight District 10	307.3
Freight District 18	Liberty County	299.8
Freight District 16	Liberty County	269.3
Freight District 10	Liberty County	259.7
Freight District 10	Freight District 16	259.4

Table 4-8 reflects the freight carried by trucks that originates in the study area, but is also delivered in the study area. Pairings for 2040 is similar to 2011. This table does reflect the potential growth of Liberty County in the region as it becomes a destination for five of the top 10 locations, including the top pairing originating from Liberty County and ending in Liberty County also. The top commodities (by tonnage) that originate or end up in Liberty County mainly include nonmetallic minerals, chemicals, fertilizers, and waste and scrap.

Figure 4-1 and **Figure 4-2** show the truck tons into and out of the study area for 2011.

4.1.2 Rail Imports/Exports

Truck transportation represents the largest mode share for freight to and from the study area. However, rail transportation provides another important mode. **Table 4-9** and **Table 4-10** examine the study area's economy by showing the top five commodities for imports and exports that occur via rail movement. Total import tons increase from 7,731.6 Ktons (2011) to 11,516.8 Ktons (2040) using rail as the domestic mode choice. Fertilizers and Newsprint/paper supplies are the top two commodities imported in both years. **Table 4-9** shows 2,681.8 Ktons of Fertilizers were moved in 2011, accounting for 34.7 percent of the total. While the 2040 tonnage for Fertilizers remains similar (2,787.0 Ktons), the share decreases to 24.3 percent. From 2011 to 2040, newsprint and paper supplies doubled in tonnage from 1,464.5 Ktons in 2011 to 2,861.7 Ktons in 2040. This increased the mode share to 24.9 percent.

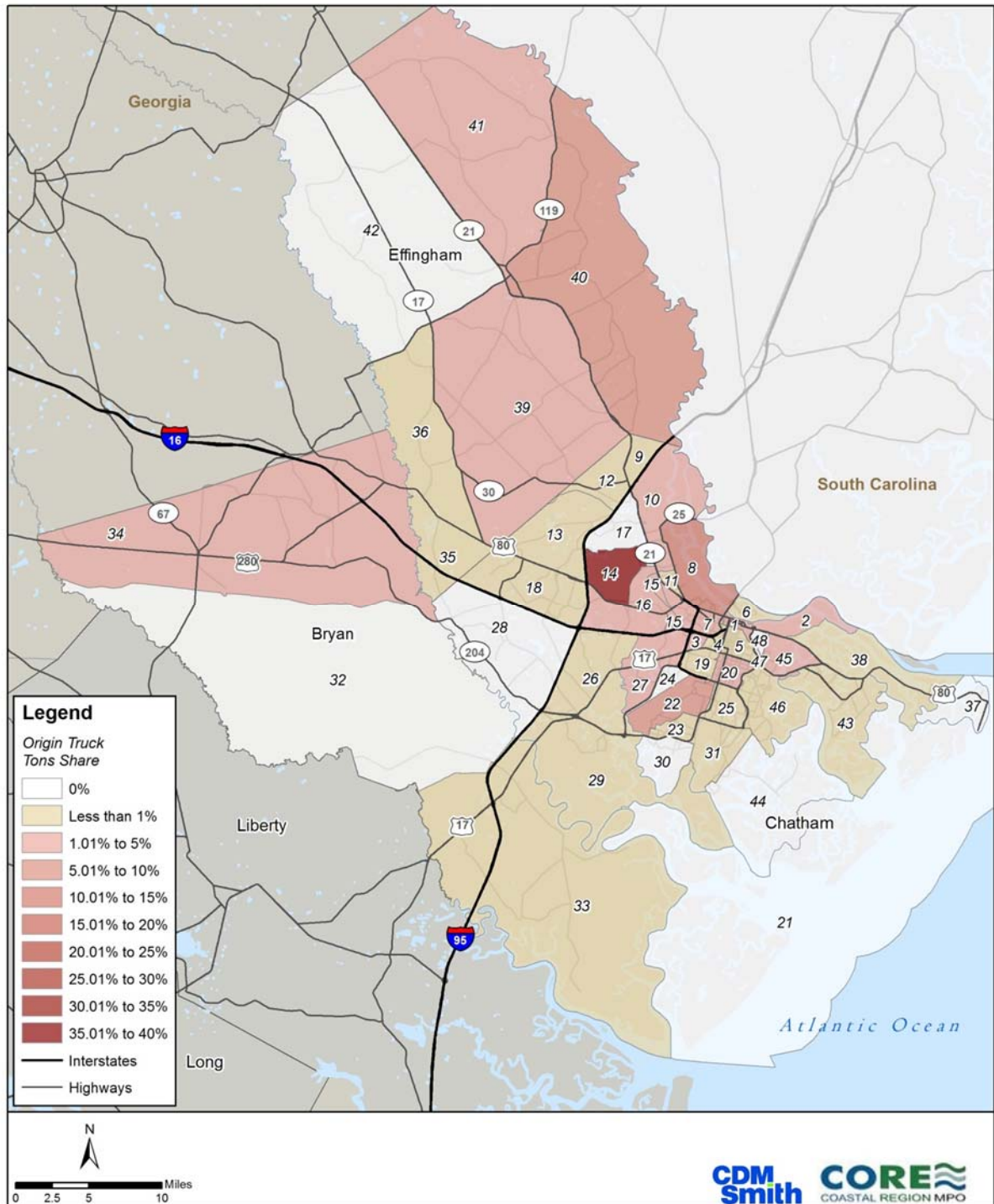
Table 4-9: Top 5 Commodity by Tonnage by Rail (2011)

Import			Export		
Commodity	Ktons	% of total	Commodity	Ktons	% of total
Fertilizers	2,681.8	34.7%	Newsprint/paper	796.7	27.3%
Newsprint/paper	1,464.5	19.0%	Coal-n.e.c.	581.7	19.9%
Nonmetallic minerals	814.9	10.6%	Basic chemicals	362.3	12.4%
Gravel	723.2	9.4%	Other foodstuffs	305.4	10.5%
Basic chemicals	557.5	7.2%	Nonmetallic minerals	239.9	8.2%

Table 4-10: Top 5 Commodity by Tonnage by Rail (2040)

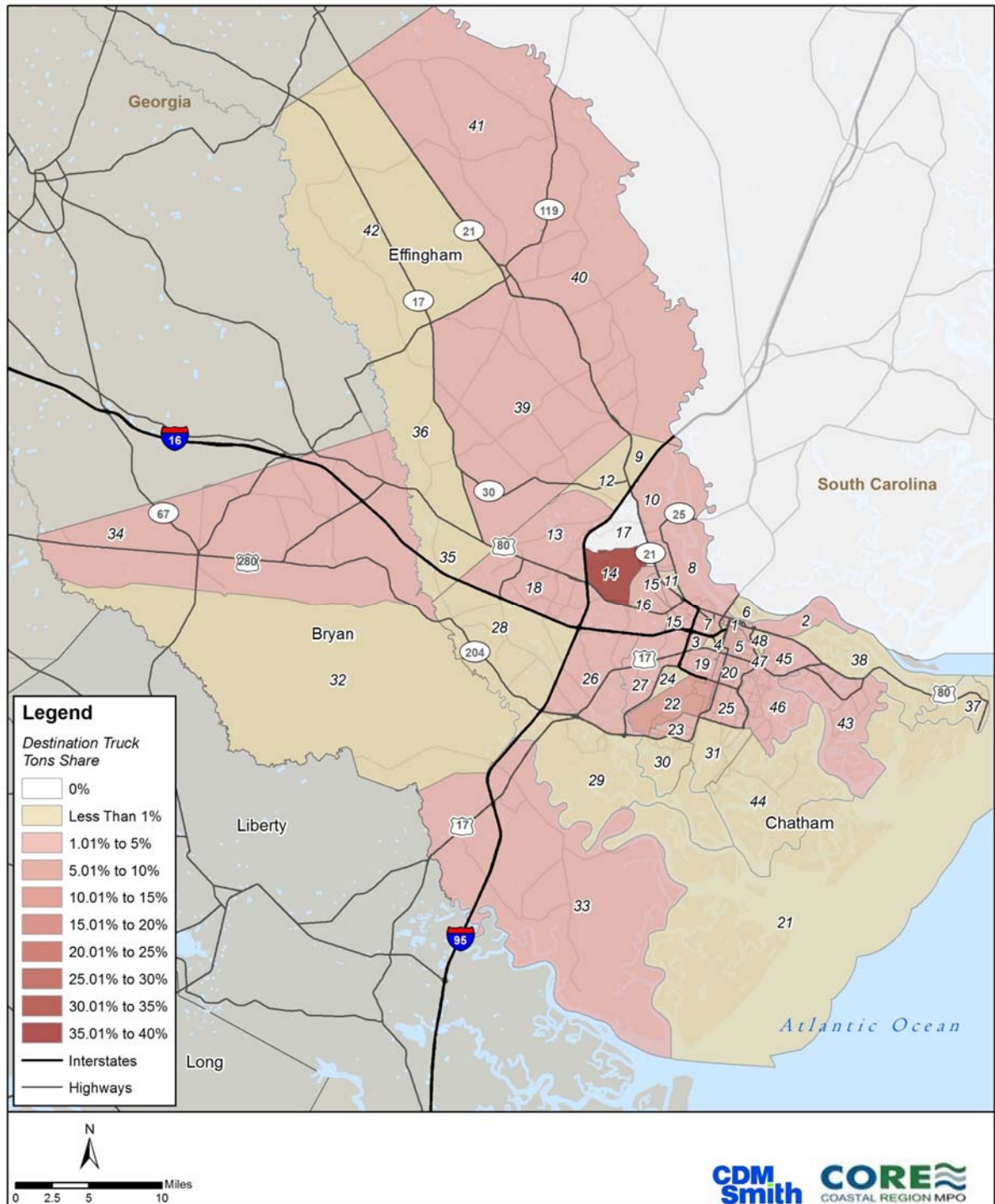
Import			Export		
Commodity	Ktons	% of total	Commodity	Ktons	% of total
Newsprint/paper	2,861.7	24.9%	Other foodstuffs	1,574.1	26.9%
Fertilizers	2,787.0	24.3%	Newsprint/paper	1,293.0	22.1%
Gravel	1,239.0	10.8%	Basic chemicals	734.7	12.5%
Nonmetallic minerals	1,229.4	10.7%	Nonmetallic minerals	704.4	12.0%
Basic chemicals	715.5	6.2%	Chemical prods.	242.8	4.1%

Figure 4-1: Truck Tons from the Study Area (2011)



Source: CDM Smith

Figure 4-2: Truck Tons to the Study Area (2011)



Source: CDM Smith

Total export tons increase from 2,926.4 Ktons in 2011 to 5,866.8 Ktons in 2040 using rail as the domestic mode choice. Newsprint/paper is the largest export commodity (by tonnage) to use rail in 2011. However it only increases from 796.7 Ktons to 1,293.0 Ktons between 2011 and 2040. This commodity is outpaced by the rise of “other foodstuffs” (such as dairy products, sugar, oils, and coffee), which increases from 305.4 to 1,574.1 Ktons between 2011 and 2040. This is a similar occurrence to projected exports for truck in **Table 4-2**.

Table 4-11 and **Table 4-12** show tonnage of goods by origin and destination. Exports travel from the study area and imports travel to the study area. The freight districts are shown as origin and destination pairings to allow for a finer level of detail within the study area. Refer back to **Figure 2-2** for an illustration of the freight districts.

Table 4-11: Top 10 Export Trade Partners by Tonnage by Rail (2011)

Origin	Destination	Ktons
Freight District 08	Atlanta, GA	211.1
Freight District 22	Atlanta, GA	183.1
Freight District 16	Atlanta, GA	124.7
Freight District 08	Houston, TX	81.3
Freight District 22	Houston, TX	80.3
Freight District 08	Minneapolis, MN	80.1
Freight District 22	Minneapolis, MN	74.2
Freight District 08	State of Georgia	54.7
Freight District 16	Houston, TX	54.1
Freight District 27	Atlanta, GA	51.3

Table 4-12: Top 10 Import Trade Partners by Tonnage by Rail (2011)

Origin	Destination	Ktons
Baton Rouge, LA	Freight District 16	653.0
Baton Rouge, LA	Freight District 22	651.5
Baton Rouge, LA	Freight District 08	619.2
New Orleans, LA	Freight District 22	325.2
State of Virginia	Freight District 16	320.3
New Orleans, LA	Freight District 16	314.5
New Orleans, LA	Freight District 08	310.4
State of Georgia	Freight District 22	289.6
State of Georgia	Freight District 08	285.5
State of Florida	Freight District 22	259.5

Perhaps most notable in **Table 4-11** is the common origin of Districts 08, 16, and 22 along with the common destinations of Atlanta and Houston as freight destinations for rail. As mentioned previously, Freight District 08 is home to the port activities in the study area. This pairing likely reflects the offloading of freight through the port onto rail for domestic delivery. Likewise, **Table 4-12** shows similar origins of Baton Rouge, New Orleans, and Georgia (non-Atlanta) that are

moving freight to the study area via rail. Many of these imported goods are going to the same Freight Districts of 08, 16, and 22.

Table 4-13 shows only the top five pairings from freight district to freight district since the distance within the region is not great enough to make rail a viable mode for intra-study area movements. Most of the internal movements are between the yard areas of Freight District 02, 16, and 22, along with the port-based Freight District 08. District 02 contains warehouse and industry plants, such as BASF and Conoco-Phillips, which produce tons of freight for distribution, mainly by rail.

Table 4-13: Top 5 Internal Trade Partners by Tonnage by Rail (2011)

Origin	Destination	KTons
Freight District 02	Freight District 08	111.7
Freight District 02	Freight District 22	110.6
Freight District 08	Freight District 22	80.0
Freight District 08	Freight District 08	78.4
Freight District 02	Freight District 16	76.4

Table 4-14 shows the projected 2040 top export pairings for rail freight movements. While the origins are similar to 2011, as shown in **Table 4-11**, the destinations change slightly with the rise of Tennessee as a top destination for the study area's freight. The overall export growth in all pairings is reflected evenly.

Table 4-14: Top 10 Export Trade Partners by Tonnage by Rail (2040)

Origin	Destination	KTons
Freight District 08	Atlanta, GA	288.9
Freight District 22	Atlanta, GA	193.1
Freight District 08	Houston, TX	186.8
Freight District 22	Houston, TX	185.2
Freight District 08	State of Tennessee	166.6
Freight District 22	State of Tennessee	165.2
Freight District 08	Minneapolis, MN	139.0
Freight District 16	Atlanta, GA	132.7
Freight District 22	Minneapolis, MN	131.6
Freight District 16	Houston, TX	125.0

Table 4-15 shows the projected 2040 top import pairings for rail freight movements. This table is very similar to **Table 4-12** in both pairings and tonnage. Most notable here though is the growth of rail freight out of Virginia and moving into the study area, specifically to Freight District 16. In 2040, 602.0 KTons will move by rail from Virginia to the study area. This almost doubles the 320.3 KTons in 2011.

Table 4-15: Top 10 Import Trade Partners by Tonnage by Rail (2040)

Origin	Destination	KTons
Baton Rouge, LA	Freight District 16	672.6
Baton Rouge, LA	Freight District 22	667.6
Baton Rouge, LA	Freight District 08	633.5
State of Virginia	Freight District 16	602.0
State of Georgia	Freight District 22	399.5
State of Georgia	Freight District 08	391.5
New Orleans, LA	Freight District 22	348.6
New Orleans, LA	Freight District 16	335.7
New Orleans, LA	Freight District 08	331.9
State of Georgia	Freight District 16	283.3

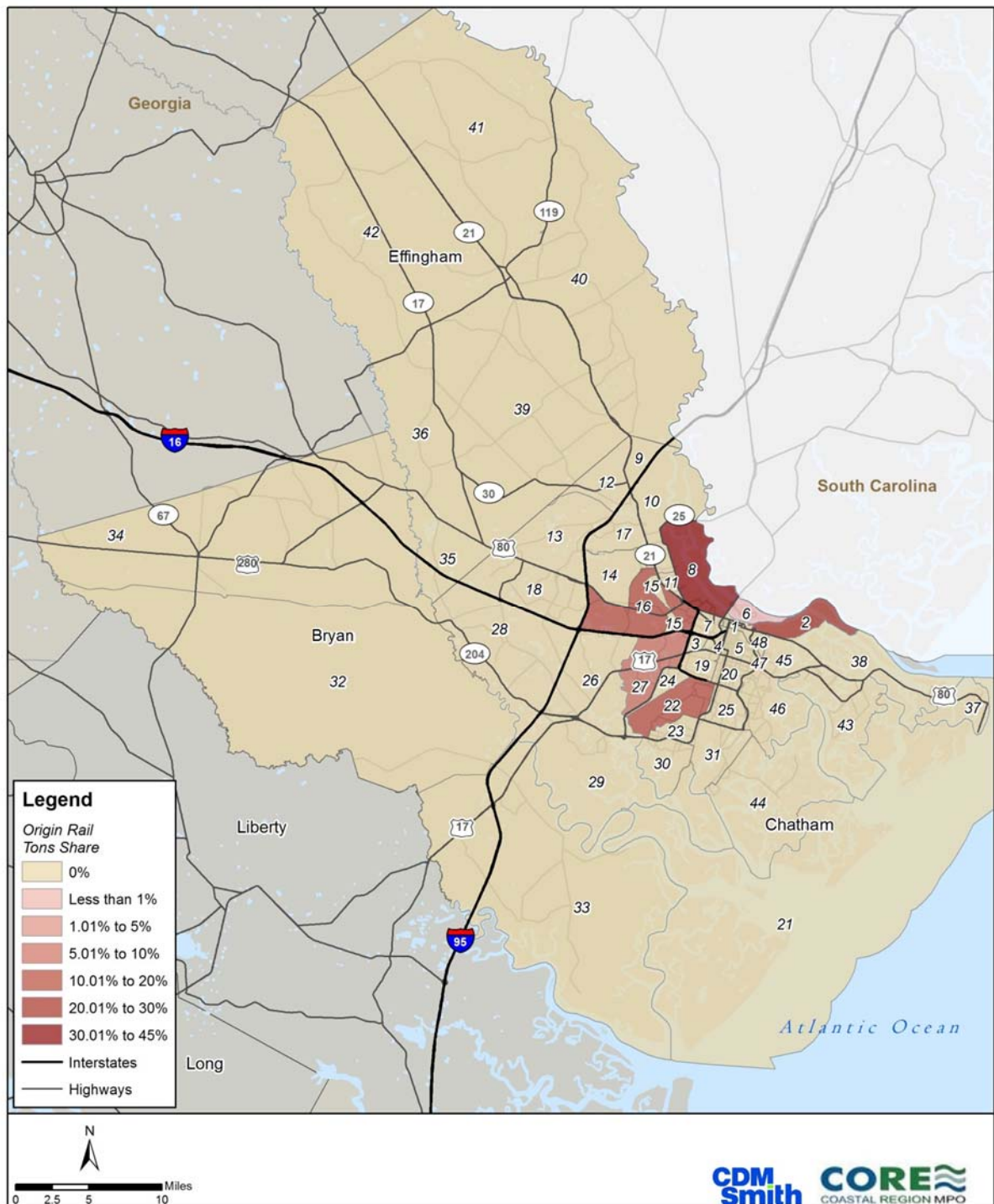
Table 4-16 shows only the top 5 pairings of rail freight movements for 2040 between freight districts.

Figure 4-3 and **Figure 4-4** show the rail tons into and out of the study area for 2011.

Table 4-16: Top 5 Internal Trade Partners by Tonnage by Rail (2040)

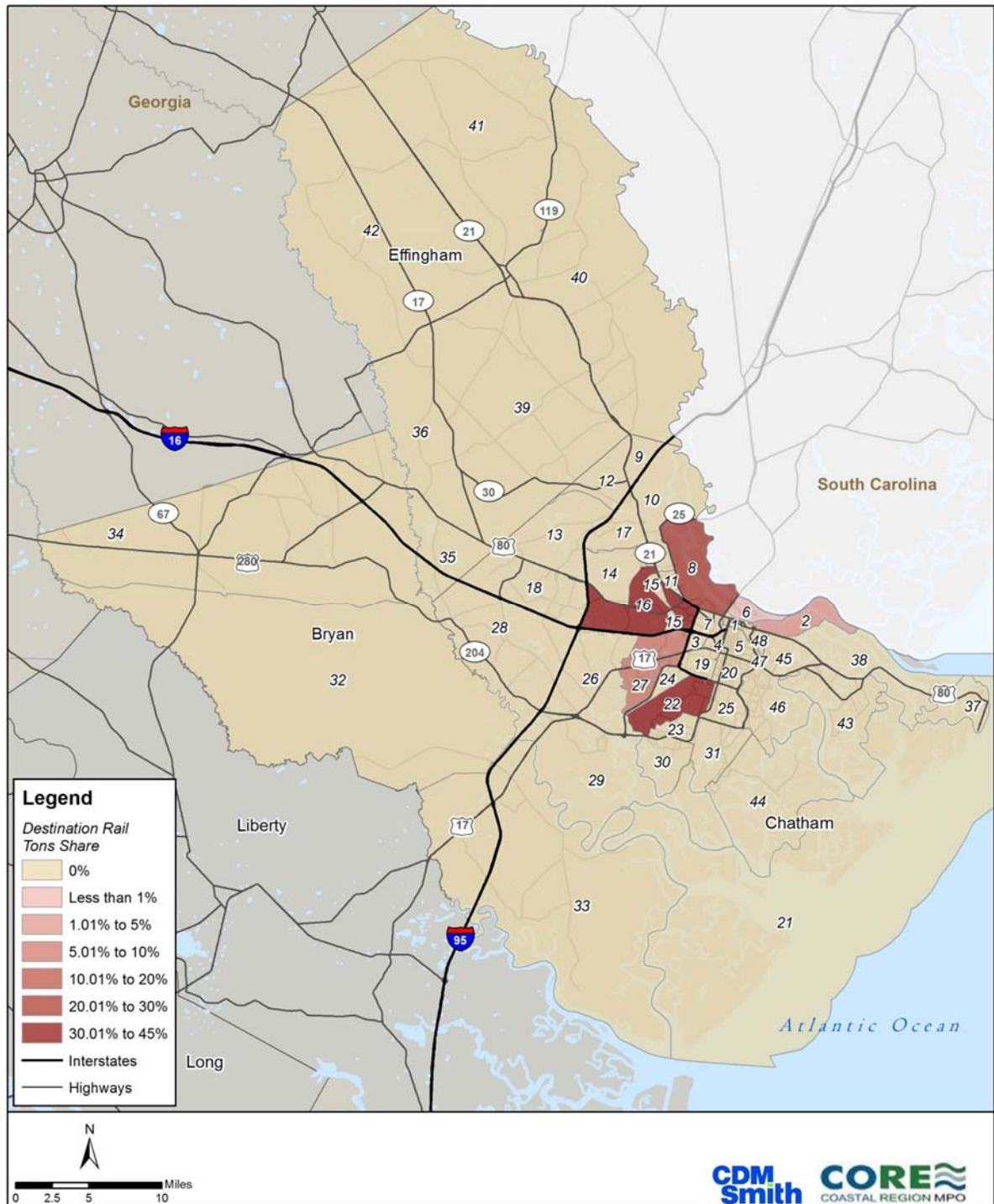
Origin	Destination	KTons
Freight District 02	Freight District 08	222.5
Freight District 02	Freight District 22	220.7
Freight District 08	Freight District 22	194.7
Freight District 08	Freight District 08	188.1
Freight District 02	Freight District 16	152.8

Figure 4-3: Rail Tons from the Study Area (2011)



Source: CDM Smith

Figure 4-4: Rail Tons to the Study Area (2011)



Source: CDM Smith

4.1.3 Water Imports/Exports

Waterborne freight in Savannah is a major economic engine for not only the study area, but also the State of Georgia. Savannah's port is a top five port nationally for capacity and freight movement. For this study, all water activity is located within Freight District 8, which is the location of all port terminals.

For 2011, 31,561.6 Ktons of freight came into the Port of Savannah while 19,238.6 Ktons shipped out of the port to other destinations, as shown in **Table 4-17**. The major import (approximately 40 percent) is Coal (SCTG #19) via North and South American markets, as well as Africa. The principal exports from Savannah are nonmetallic materials and Newsprint/paper at 33 and 24 percent respectively of all exports. In 2040, the international imports are expected to be surpassed by the exports in the study area. Total import tons are expected to be 70,097.0 Ktons while exports are projected to reach 67,997.5 Ktons. Principal commodities are the same, but Furniture is an emerging import while waste/scrap is a growing export commodity group.

Table 4-17 : Total Water movement by tonnage, 2011 and 2040

Freight Movement		2011	2040	Total Change	Annual Growth
International	Import	28,560.8	67,742.5	137.19%	3.02%
	Export	19,231.7	67,976.7	253.46%	4.45%
Domestic	Import	3,000.8	2,354.5	-21.54%	-0.83%
	Export	7.0	20.8	197.14%	3.85%
Total	Import	31,561.6	70,097.0	122.10%	2.79%
	Export	19,238.6	67,997.5	253.44%	4.45%

The vast majority of this tonnage was international freight movements coming into the port and moving out via other modes once it is off loaded domestically. For this study, these international tons are captured in the truck and rail movements domestically. Domestic water movements are actual pairings between two U.S. locations of the origins and destinations.

Overall, the port growth is projected to increase three percent annually on imports and approximately 4.5 percent on exports. This is driven by the port's international movements to foreign markets, but it is important to note the decrease in domestic imports to the port.

Domestic imports to the Port of Savannah's terminal locations in the study area totaled slightly over 3,000 Ktons in 2011. The largest domestic imports include coal shipments from Beaumont, TX (Port of Beaumont) and Delaware (likely the Port of Wilmington). However, each of these origin-destination pairings is projected to decrease out to 2040, as shown in **Table 4-18**. The port does project a small increase in domestic imports of paper products from Florida (12 Ktons).

Table 4-18 : Top Domestic Port Origins

Origin	Top Commodities Shipped	2011	2040
Beaumont, TX	Coal and petroleum products	2,350.9	2,083.2
State of Delaware	Coal and petroleum products	585.6	172.8
State of Florida	Pulp, newsprint, paper, and paperboard	48.1	60.1

Domestic exports from the port are smaller in scale. Freight is primarily moved out of the port to other local areas (via barge perhaps). The major export destination is Honolulu, HI. Coal and petroleum products are shipped out of the port and carried west. In 2011, this movement totaled only 0.12 KTons. This shows that the vast majority of exports are staying in the Georgia area. Most of these exports are nonmetallic minerals (at an estimate 5.3 KTons in 2011) and nonmetallic mineral products (1.3 KTons in 2011).

These commodity groups and trade partners are projected to continue through 2040. Exports of nonmetallic minerals are projected to increase to 17.5 KTons, more than triple the tonnage amount of 2011. Nonmetallic mineral products will double in export amount to 2.6 KTons by 2040.

4.1.4 Air Imports/Exports

The Savannah/Hilton Head International Airport (SAV) is the center for commuter air travel in the Coastal Empire of Georgia, the Golden Isles and South Carolina's Low Country. It is also a major air freight destination for the study area. The physical carriage of goods in this mode occurs on dedicated, cargo configured aircraft or in the "belly" or luggage compartments of passenger aircraft. Aside from the five commuter carriers that service the airport, the SAV has small firms and major industry providers (such as FedEx and DHL) who serve the airport too. For this study, all air cargo activity is located within Freight District 14, which is the location of the airport.

For 2011, 4.1 KTons of air cargo came into the study area while 5.8 KTons flew out of the airport to other destinations, as shown in **Table 4-19**. Compared to other modes, air products are typically time sensitive, smaller, lighter and more expensive than the "bulk" items. This explains the small tonnages and the commodity mix.

Table 4-19 : Total Air Movement by Tonnage, 2011 and 2040

Freight Movement		2011	2040	Total Change	annual growth
International	Import	1.9	6.0	215.79%	4.08%
	Export	2.0	8.2	310.00%	4.91%
Domestic	Import	2.2	6.5	195.45%	3.81%
	Export	3.8	11.8	210.53%	3.98%
Total	Import	4.1	12.5	204.88%	3.93%
	Export	5.8	20.0	244.83%	4.34%

Domestic air cargo has many pairings between the other U.S. airports. The large import region for air freight is Pennsylvania, while the greatest export partner in 2011 was Massachusetts. This commodity to Massachusetts was Base Metal in Primary or Semi-Finished Forms and in Finished Basic Shapes and accounted for one-third of the export tonnage.

The principal international import is other agricultural products, which are items such as vegetables and nuts and fresh cut flowers, at 0.8 KTons. The international export is machinery, such as pumps and refrigeration units, at 0.6 KTons.

At the Savannah / Hilton Head International Airport, cargo transport is mixed between FedEx who handles 95 percent of the cargo using Boeing 727's five days a week to the FedEx hub in Memphis, TN. The remaining five percent is carried by Delta in the belly of passenger aircraft. The Savannah / Hilton Head International Airport staff reported that there is also limited feeder service on smaller general aviation aircraft contracted by UPS and ABX.

For 2040, 12.5 KTons of air cargo came into the study area while 20.0 KTons flew out of the airport to other destinations. This is an annual growth rate of 3.9 percent for imports and 4.3 percent for exports. This pace is similar to the port and other modes.

Domestic air cargo grew at a slower pace (both import and export below four percent). However, 6.5 KTons in imported air freight and 11.8 export KTons in 2040 reflect a growing importance of SAV in the marketplace. The large import region for air freight is still projected to be Pennsylvania. The export partner projected for savannah in 2040 will be Massachusetts as Base Metal freight is projected to increase to 4.8 KTons.

The international market has a promising future growth potential in SAV. Growth rates for imports and exports will increase annually above four percent with agricultural products and machinery projected to remain the top commodities.

5. ECONOMIC DEVELOPMENT MARKET ASSESSMENT

5.1 Regional Population Growth

Population growth within the counties which make up the CORE MPO region is almost double than the national growth rate and slightly higher than the state of Georgia at 18.6 percent from 2000 to 2010. Of the three counties, Effingham County experienced the highest rate of growth at 39.2 percent with Chatham County experiencing the highest actual number increase with 33,080 new residents. This is due to the fact out of all three counties; Chatham is the most urbanized and populous. By 2030, Effingham County will still lead the pack in terms of growth rate, but Chatham County will continue to be more populous as shown in **Table 5-1** below. Overall, the rate of growth within the region is forecasted to double by 2030.

Table 5-1 Population Growth (2000 – 2030)

Population Area	2000	2010	2030	Projected Population Growth (2000 – 2010)	Projected Population Growth (2010 – 2030)
Bryan County	23,417	30,233	44,465	29.1%	47.1%
Chatham County	232,048	265,128	354,945	14.2%	33.9%
Effingham County	37,535	52,250	78,507	39.2%	50.3%
Total	293,000	347,611	477,917	18.6%	37.5%

5.2 Economic Role of Freight

Chatham County is the center of a diverse and robust economy of the Savannah region, taking advantage of many local and regional resources. For 2013, the overall general industry mix in Chatham County can be broken down into three major categories as illustrated in **Figure 5-1**.

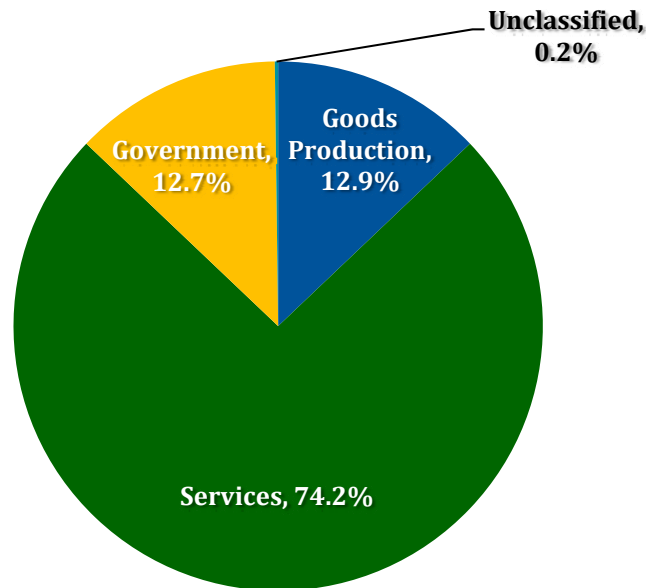
The services industry category is the largest with 6,835 companies and 102,137 individuals employed. As reported by the Georgia Department of Labor, the five largest industries comprising this category include:

- 1) Accommodations and Food Services,
- 2) Health Care and Social Assistance,
- 3) Retail Trade,
- 4) Administrative and Support and Waste Management and Remediation Services, and
- 5) Transportation and Warehousing.

Second to the services industry is goods production, of which the manufacturing industry makes up 74 percent of the category, followed by construction and agriculture. Government and

unclassified industry categories include local, state, and federal government employment such as the military presence in the CORE MPO freight transportation plan study area. Hunter Army

Figure 5-1: Chatham County Industry Mix for 2013 (by Employment Share)



Source: Georgia Department of Labor. 2014. Chatham County Area Labor Profile.

Airfield is located in Chatham County with Fort Stewart located nearby by in Bryan and Liberty Counties. Fort Stewart serves as the headquarters of the U.S. Army's Third Infantry Division.

Table 5-2 below describes the industry mixes for Bryan and Effingham Counties. Compared to the industry mixes of Bryan and Chatham Counties, the goods production industry has a higher share in Effingham County. However, unlike Chatham County, this area is behind services and government industries. This is a similar share for Bryan County.

Table 5-2: 2013 Industry Mix for Bryan and Effingham Counties

Industry Categories	Bryan County	Effingham County
Goods Production	10.8%	22.4%
Government	25.2%	31.0%
Services	63.3%	46.2%
Unclassified	0.7%	0.4%

Source: Georgia Department of Labor. 2014. Bryan and Effingham County Area Labor Profiles.

The following subsections review major freight industry users, the available labor force in Chatham County and surrounding areas, and economic relationships with other regions.

5.3 Major Freight Industries and Associated Commodities

Freight touches all areas of the economy. For the state of Georgia, the four main freight-related industry sectors are transportation and warehousing, manufacturing, wholesale trade, and retail trade.¹ As identified for Chatham County, retail trade, transportation and warehousing, and manufacturing make up a significant portion of the industry mix within the county. The retail trade industry sector consists of store retailers and non-store retailers which function as a final step in the distribution of merchandise to a customer.

5.3.1 Manufacturing

The manufacturing industry within the Savannah MSA consists of 209 manufacturing companies who employ more than 12,000 people with a payroll of more than \$1.1 billion for 2014.^{2,3} The largest companies and their associated commodities are listed in **Table 5-3**.

Table 5-3: Top Fifteen Manufacturing Companies and Commodities

Company	Commodity/Service
Gulfstream Aerospace Corporation	Jet aircraft, Aerospace equipment
International Paper	Paper products, Chemicals, Corrugated containers and packaging
JCB Americas, Inc.	Agricultural equipment, Construction equipment
Imperial Sugar	Refined sugar
Brasseler USA, Inc.	Dental instruments
Mitsubishi Power Systems Americas, Inc.	Power plant gas and steam turbines
Weyerhaeuser	Bleached pulp
Derst Baking Company	Bread, rolls, cakes
Diamond Crystal Brand	Salt, Pepper, Sugar packaging
Roger Wood Foods	Smoked sausages, Smoked meats
Kerry Ingredients and Flavours	Formulation, manufacture, and containerization of technological-based flavors, ingredients, and integrated solutions
Savannah Morning News	Information company
Arizona Chemical	Specialty resins, Pine-based chemicals
EMD Chemical	Industrial pigments
Orafol	Adhesive film

Source: Savannah Economic Development Authority, April 2014

The manufacturing industry in the Savannah region is incredibly diverse offering products from the global aerospace industry, equipment for energy production, to food products. Gulfstream Aerospace Corporation is a world premier business jet manufacturer. The company has grown

¹ Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

² Savannah Economic Development Authority. April 2014. <http://www.seda.org/savannah/39/manufacturing.html>

³ Georgia Department of Labor. 2014. Chatham County Area Labor Profile.

since 1967 and chose the Savannah area to be the headquarters for development of the company's civilian business aircraft division. Another significant manufacturing company is JCB, Inc. Their headquarters for the North and South American region, known as JCB Americas, Inc., is located in Pooler, Georgia, just west of the Savannah/Hilton Head International Airport.

Georgia's agricultural and agribusiness industry has a major impact on the statewide economy. Critical aspects for this industry include the production and processing of the food and fiber sector and forestry. Forestry alone contributes almost \$20 billion to the state's economy with the state being home to the largest acreage of commercial forest land in the nation at 23.8 million acres.⁴ The Savannah area is home to International Paper, Weyerhaeuser, Imperial Sugar, Arizona Chemical and other similar companies which benefit from the proximity of agriculture production and raw materials.

International Paper is a major global company with multiple company locations within the Savannah region including the Savannah Container Plant, Savannah Containerboard Mill, and the Savannah Fiber Supply Procurement Office.⁵ Imperial Sugar is one of the largest sugar refiners in the world with a presence in 16 commodity trading centers. The company's major refinery is located in Port Wentworth, Georgia.

The Savannah region is also home to smaller, but still significant manufacturers such as Benedetto Guitars and the Gretsch Company which provide industry diversification. Benedetto Guitars includes its only manufacturing facility, is located in Savannah, while Gretsch Company, located in Pooler, is a 130-year old world famous manufacturer of guitars and drums.⁶

5.3.2 Transportation and Warehousing

The Port of Savannah is a powerhouse in ocean container shipping. A large deepwater seaport, the Port of Savannah is the fastest growing container port in the nation and the second largest volume container port on the Atlantic Coast. The port was ranked fourth in the nation in waterborne container traffic in 2012 and 2013. The Port of Savannah serves as a major distribution hub for a 26-state region, which includes about 75 percent of the nation's population. In 2013, Chatham County's retail and wholesale trade industry consisted of 1,630 companies and employed almost 21,300 individuals. These, along with other factors, provide a strong incentive for companies associated to transportation and distribution to locate to Chatham County. The transportation and warehousing industry in Chatham County consists of 391 companies with 9,030 employees. The top ten largest companies in the CORE MPO freight transportation plan study area that directly utilize the port and their associated commodities are listed in **Table 5-4**.

⁴ World Trade Center Savannah. 2014. Key Industries. <http://www.wtcsavannah.org/invest-here/key-industries/>

⁵ International Paper. 2014. <http://www.internationalpaper.com/US/EN/index.html>

⁶ Gretsch Company. 2014. <http://www.gretsch.com/home>

Table 5-4: Top Ten Transportation and Warehousing Companies

Company	Commodity/Service
CSX Transportation	Freight Railroad
Home Depot	Home improvement supplies
Dollar Tree Stores	Sundry retail product distribution
Coca-Cola Bottling Company United	Soft drink/water bottling warehouse
Target	Sundry retail import center
Pier 1 Imports	Household goods
Schneider	Warehousing, Distribution, Export Packaging
CalCartage	Warehousing for K-Mart
Chatham Steel Corporation	Steel service center
IKEA Wholesale Inc.	Furniture distribution

NOTE: As determined by number of employees. Additional employment information to be found under Section 2.2.
Source: Savannah Economic Development Authority, April 2014

In addition, Chatham County is home to over 45 million square feet of warehousing and distribution with a vacancy rate of 11.5 percent, equating to 5,275,887 square feet available to existing business expansions or new companies. Average rental rate is \$3.72 per square foot per year, which is lower than other metropolitan areas such as Seattle (Washington), Philadelphia (Pennsylvania), Charleston (South Carolina), and Norfolk (Virginia).⁷

5.3.3 Labor Force and Employment

Due to the growth in population and industry, the labor force in the Savannah MSA is growing as well. The Savannah MSA had a combined labor force of 181,861 with an unemployment rate of 8.2 percent in 2013. By April 2014, the overall Savannah MSA labor force was reported to be 183,611 with an unemployment rate down to 6.2 percent. For both years, the Savannah MSA's unemployment rate was lower than that of the state of Georgia as a whole. Chatham County provides a significant portion of this labor force. In 2013, Chatham County had a labor force of 137,793 with an unemployment rate of 7.7 percent.

For all industries, between 2010 and 2012, employment has increased by 5.1 percent.⁸

Table 5-5 lists the top ten distribution company employers in the Savannah area. The majority of companies listed are manufacturing-focused with a few representing transportation and warehousing. Georgia Ports Authority employment relates to the Port of Savannah employees. However, the number doesn't capture the total local and regional impacts in regards to employment because it does not include individuals employed by private tenants, stevedoring services, and other jobs associated with the port. The total economic impacts from the Port of Savannah's operations support the employment of 37,319 individuals in Chatham County. For the entire Savannah MSA, this number increases to 42,856.⁹

⁷ Savannah Economic Development Agency. 2013. Real Estate Market Data. <http://www.seda.org/savannah/128/real-estate/market-data.html>

⁸ This includes all non-agricultural employment. <http://www.seda.org/savannah/93/labor-force/labor-force-characteristics.html>

⁹ Georgia Ports Authority. 2013 State of the Port.

Table 5-5: Distribution Company Employment

Company	Employment Numbers
Gulfstream Aerospace Corporation	9,382
Georgia Ports Authority*	988
International Paper	600
JCB Americas, Inc.	558
Imperial Sugar	450
Brasseler USA, Inc.	420
Mitsubishi Power Systems Americas, Inc.	420
CSX Transportation	308
Derst Baking Company	273
Dollar Tree Stores	271

*Georgia Port Authority is classified as under the government industry because it is not a private company.

Source: Savannah Economic Development Agency, 2014.

Gulfstream Aerospace Corporation is the largest single employer in the Savannah region. The presence of this company and other manufacturing and distribution companies has had a profound impact on educational opportunities in the Savannah region. For example, Embry-Riddle Aeronautical University, the world's largest, fully accredited school in aviation and aerospace with 150 locations worldwide which has earned several number one and other top ten rankings from U.S. News and World Report¹⁰, opened a campus in Savannah in 2010. The Savannah Technical College broke ground in spring 2012 to be an aviation training center.¹¹ There are 11 other colleges and universities within the Savannah MSA which provide educational opportunities in these and other fields.

In regards to education, the Savannah MSA has a significantly educated labor force as detailed in Table 5-6.

Table 5-6: Highest Level of Education of the Labor Force in the Savannah MSA

Education Level	Percentage Share
Elementary	3.5%
Some High School	10.5%
High School/GED	31.6%
Some College	23.5%
College Grad 2 year	7.1%
College Grad 4 year	15.9%
Post Grad Studies	7.9%
Total	100%

Source: Georgia Department of Labor. 2013. Savannah, GA Metropolitan Statistical Area Labor Profile

¹⁰ U.S. News and World Report. Embry-Riddle Aeronautical University. <http://colleges.usnews.rankingsandreviews.com/best-colleges/embry-riddle-aeronautical-university-133553/overall-rankings>

¹¹ World Trade Center Savannah. 2014. Key Industries. <http://www.wtcsavannah.org/invest-here/key-industries/>

5.3.4 Relationships with Other Regions

The CORE MPO freight transportation plan study area has a significant and substantial impact on local, regional, and state economies. **Error! Reference source not found.** illustrates where the employed residents within the Savannah MSA travel to for work. Of the 116,228 Chatham County residents that are employed, almost 94 percent were employed in Chatham County. About 58 percent of Effingham County residents and around 52 percent of Bryan County residents were also employed within Chatham County, with 22,710 and 13,904 employed residents respectively. The majority of those who are employed in the Savannah MSA also work within the area. However, there are significant percentage shares of those who are employed within the Savannah MSA but are located outside the MSA including outside of the state.

Table 5-7: Employment Location by County in 2010

Employed Residents of:					
Bryan County		Chatham County		Effingham County	
County Where Employed	Percentage of Share	County Where Employed	Percentage of Share	County Where Employed	Percentage of Share
Chatham, GA	51.6%	Chatham, GA	93.6%	Chatham, GA	57.9%
Bryan, GA	29.7%	Liberty, GA	1.3%	Effingham, GA	34.2%
Liberty, GA	9.6%	Effingham, GA	1.3%	Beaufort, SC	1.4%
Effingham, GA	2.6%	Beaufort, SC	1.2%	Jasper, SC	1.4%
Bulloch, GA	1.2%	Bryan, GA	0.7%	Bryan, GA	1.1%
Beaufort, SC	0.9%	Bulloch, GA	0.2%	Bulloch, GA	1.0%
Jasper, SC	0.6%	Jasper, SC	0.2%	Screven, GA	0.5%
Mecklenburg, NC	0.5%	Glynn, GA	0.1%	Liberty, GA	0.4%
Other	3.3%	Other	1.3%	Other	2.0%
Total	100%	Total	100%	Total	100%

Source: Georgia Department of Labor, 2013.

In regards to the origins of the workforce within each county of the Savannah MSA, **Table 5-8** illustrates that the origins of the workforce within the area are located within Bryan, Chatham, and Effingham Counties. Of the three counties in the CORE MPO freight transportation plan study area, Chatham County had the largest total workforce in 2010 at 145,867 followed by Effingham County with 10,765 individuals and Bryan County with 7,419 individuals. This illustrates that Chatham County is not only a hub for the Savannah MSA, but also serves as a hub for the Coastal Workforce Investment Area (WIA). The Coastal WIA covers Bulloch, Bryan, Chatham, Effingham, Glynn, Liberty, and Long Counties. The significance of the region goes even beyond this, touching a total of 11 counties with a labor pool of nearly 350,000 which crosses into South Carolina.

Table 5-8: Employee Origin by County in 2010

Persons Working In:					
Bryan County		Chatham County		Effingham County	
County of Residence	Percentage of Share	County of Residence	Percentage of Share	County of Residence	Percentage of Share
Bryan, GA	55.7%	Chatham, GA	74.6%	Effingham, GA	72.2%
Liberty, GA	12.6%	Effingham, GA	9.0%	Chatham, GA	13.7%
Chatham, GA	11.5%	Bryan, GA	4.9%	Bulloch, GA	3.7%
Bulloch, GA	6.6%	Liberty, GA	2.8%	Bryan, GA	3.4%
Effingham, GA	3.5%	Bulloch, GA	2.5%	Screven, GA	2.1%
Long, GA	3.1%	Beaufort, SC	1.1%	Hampton, GA	1.4%
Tattnall, GA	1.9%	Jasper, SC	0.7%	Liberty, GA	0.8%
McIntosh, GA	1.0%	Long, GA	0.3%	Hampton City, VA	0.4%
Other	4.2%	Other	4.1%	Other	2.5%
Total	100%	Total	100%	Total	100%

Source: Georgia Department of Labor, 2013.

Beyond employment, the Savannah region has significant trade partners which are discussed in more detail in Section 3. One such trade partner is the Atlanta area. There are several direct routes via road and freight rail which connect the Atlanta area to the Savannah region. The two areas even complement each other, with the Savannah region being home to the Port of Savannah while Atlanta being home to the Hartsfield-Jackson Atlanta International Airport. The Port of Savannah is a primary deepwater seaport for Atlanta's exports and imports, which travel either by intermodal rail or truck.¹² The freight rail connections between Atlanta and Savannah are considered to be one of the most successful in the country due to the amount of freight rail tonnage moved between the municipalities every day.¹³

5.4 Supply Chain and Transportation

Supply chains can be complex and dynamic frameworks for organizations which transport products from suppliers to customers. Supply chain activities transform natural resources, raw materials, and components into final products that are delivered to the end customers. Participants include suppliers, manufacturers, intermediaries, third-party service providers, and customers. Export, import, and domestic movements of raw materials, intermediate goods and final products are dependent upon the availability and efficiency of a freight transportation network. Logistics costs influence the decisions of which mode of transportation to use, which can account for up to 12 percent of a company's sales and revenues.¹⁴

¹² Atlanta Regional Commission. 2008. Atlanta Regional Freight Mobility Plan.

¹³ Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

¹⁴ Georgia Center of Innovation for Logistics. 2013. 2013 Georgia Logistics Report: A Global Perspective.

Overall, the state of Georgia is home to 121,459 centerline miles of roadways, 4,976 miles of active mainline and short line rail tracks, 22 million square yards of pavement surrounding 104 publicly-owned, public-use airports, and two deep water seaports which are supported by 20,800 acres of dredged material containment areas for waterway maintenance.^{15,16} Each of these modes of transport is available within the CORE MPO freight transportation plan study area.

5.4.1 Supply Chain Overview

Supply chain management encompasses planning and coordination of sourcing and procurement, conversion, and logistics. In essence, supply chains are used to manage supply and demand within and across companies. A case study of supply chain operations for Home Depot in Georgia will provide an example. Home Depot was founded in 1978 in Atlanta with a significant presence in the Savannah region.

Supply chain operations for Home Depot revolve around its five distribution centers. The Savannah stocking distribution center (SDC) is significant for the company with the Port of Savannah handling 15 to 20 percent of all of Home Depot imported goods, the vast majority of which come from Asia and Europe. The Port of Savannah is one of four key ports for Home Depot with the other ports being Seattle-Tacoma, Los Angeles-Long Beach, and New York-New Jersey. Containers of finished goods are transferred to the Savannah SDC from the Port which is later shipped to Florida or to other distribution centers in Georgia by rail or truck.

For Home Depot, the interstate system is critical for trucking, specifically I-16 and I-75 for shipments between Atlanta and Savannah. Roadway congestion can impact logistics costs for Home Depot. To battle the potential for rising costs, Home Depot takes advantage of intermodal rail options at Port of Savannah and domestic rail to ship between distribution centers.

The subsections below provide details of each freight transportation mode and facility located within the Savannah region and its significance in terms of supply chain operations.

5.4.2 Roadway

The trucking industry moves over 70 percent of all freight worldwide, measured in weight terms, with a significantly higher percentage share when measured in value. For example, export and import trade between the US and Canada in 2011 generated \$195 billion and \$136 billion, respectively¹⁷. The state of Georgia ranks 8th nationally in regards to its extensive roadway network connecting all of its major metropolitan areas with each other and beyond. The state is also fortunate to have about 450,000 commercially licensed truck drivers, ranking the state 9th in the nation. This combination allows for 80 percent of the nation's consumer market to be reachable by truck from Georgia in less than 48 hours.¹⁸ **Table 5-9** illustrates the impact of this winning combination in terms of freight flows and cargo value for Georgia.

¹⁵ Georgia Department of Transportation. 2014.

¹⁶ Georgia Department of Transportation. 2013. Fact Book.

¹⁷ Georgia Center of Innovation and Logistics. 2013 Georgia Logistics Report.

¹⁸ Georgia Department of Labor. 2014. Chatham County Area Labor Profile.

Table 5-9: Georgia Domestic Truck Volumes (in 2012)

Freight Movement Direction	Freight Weight (in Tons)	Cargo Value	Number of Truck Freight Movements
Inbound to Georgia	97,490,043	\$363.82 Billion	8,213,232
Outbound from Georgia	111,713,106	\$338.12 Billion	8,687,179
Moved Inside Georgia	203,312,198	\$325.90 Billion	21,340,695
Passed Through Georgia	185,345,836	\$765.50 Billion	10,403,516
Total	597,861,184	\$1.79 Trillion	48,644,621

Source: Georgia Center of Innovation for Logistics. 2013 Georgia Logistics Report.

Moving from a statewide level to a regional level, a significant portion of that truck freight traffic travels into, through, and out of the Savannah MSA as shown in **Table 5-10**. Of the three general flows, out-bound truck freight flows are higher in tonnage and value compared to either in-bound or internal movements which is the likely result of the industries within the Savannah MSA including operations at the Port of Savannah.

Table 5-10: Savannah MSA Truck Volumes (in 2011)

Freight Movement Direction	Freight Weight (in Tons)	Cargo Value
Inbound to Savannah MSA	37,663,700	\$38.79 Billion
Outbound from Savannah MSA	42,243,300	\$64.68 Billion
Moved Inside Savannah MSA	16,691,600	\$15.87 Billion
Total	96,598,600	\$119.34 Billion

Source: Freight Analysis Framework, <http://faf.ornl.gov/fafweb/Default.aspx>

Chatham County contains 543 centerline miles of roadways designated on Georgia's State Highway System and the County's Road system. Bryan and Effingham Counties contain 391 and 726 centerline miles of state and county roadways, respectively. For both counties, the majority of mileage exists on the respective County Road system.¹⁹ **Table 5-11** describes the major roadway facilities located within the Savannah MSA. In addition, centerline mileages for the municipalities within the Savannah region total to about 840 centerline miles with the majority located within the Savannah municipal jurisdiction.²⁰ Combined, this system of roadways provides access to all of the Savannah region's rail, seaport, and airport facilities.

Florida is Georgia's top state trading partner in terms of truck flows. By road, the Savannah area has ready access to six major metropolitan areas located within and outside of the state, including Florida, as identified in **Table 5-12**.

¹⁹ Georgia Department of Transportation. 2012.
http://www.dot.ga.gov/informationcenter/statistics/RoadData/Documents/437/DPP437_2012.pdf

²⁰ Georgia Department of Transportation. 2009.
http://www.dot.ga.gov/informationcenter/statistics/RoadData/Documents/449/DPP449_2009.pdf

Table 5-11: Major Roadway Facilities in Savannah MSA

Highway Type	Lane Number Range	Highway Name
Interstates	4 to 6	<ul style="list-style-type: none"> Interstate 95 (I-95) Interstate 16 (I-16) Interstate 516 (I-516)
U.S. Highways	2 to 4	<ul style="list-style-type: none"> US Highway 17 US Highway 17A US Highway 80
State (Georgia) Highways	2 to 4	<ul style="list-style-type: none"> State Road 21 State Road 25 State Road 204 State Road 307

Source: 2014 Savannah Economic Development Agency

Table 5-12: Distance to Major Metropolitan Areas from Savannah

Metropolitan Area	State	Distance from Savannah (miles)
Atlanta/Sandy Springs/Marietta	Georgia	248
Charlotte/Gastonia/Concord	North Carolina South Carolina	252
Charleston/North Charleston	South Carolina	107
Hinesville/Fort Stewart	Georgia	40
Jacksonville	Florida	140
Macon	Georgia	166

Source: 2014 Savannah Economic Development Agency

The most significant metropolitan area in terms of freight flows for Savannah is the Atlanta area. According to the Federal Highway Administration, intercity travel time reliability is an important freight performance measure used to judge the impacts of the unexpected delays on travel time. Significant travel time delays can negatively impact logistics costs for companies and may dissuade future use of congested routes in response. Travel time maximums between Savannah and Atlanta are 4 hours 45 minutes for north/east travel and 4 hours 37 minutes for south/west travel. Respectively, the travel time reliability percentages for both travel directions are 17.2 and 14.1^{21,22}. The data illustrates that travelers utilizing the Savannah to Atlanta route are less likely to encounter unexpected delays compared to other routes such as Los Angeles to San Francisco, Miami to Tampa, and Tampa to Orlando.

²¹ FHWA. 2014. Freight Facts and Figures 2013.

http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/13factsfigures/table3_18.htm

²² As described, travel time reliability measures the extent of unexpected delays a traveler experiences on the transportation network either day-to-day or across different times of the day. This illustrates constraints including congestion experienced along a route. The percent change is the difference between observed minimum and maximum times by direction. For example, the minimum travel time for Savannah and Atlanta for north/east travel is 4 hours with a maximum of 4 hours and 45 minutes. Thus, the calculated difference between the two times is 17.2 percent to reflect the increase of 45 minutes. The FHWA encourages the use of travel time reliability as a measure and additional information can be found here:

http://ops.fhwa.dot.gov/publications/tt_reliability/

As shown in **Table 5-13**, Chatham County receives a significant amount of freight via road with in-bound truck freight flows with goods originating from outside of Georgia, terminating in the County, accounting for over \$18 billion. Truck freight flows with origins and destinations within the state accounts for over \$34 billion. Out-bound freight leaving the County for areas outside of Georgia account for more than double the value compared to in-bound alone. Chatham County is the largest single-county generator of truck freight flows compared to other counties in the state with over 21 percent of the outbound trucks.²³ This illustrates the strong influence of the manufacturing industry and imported containers from the Port of Savannah within the Savannah region. In addition, the County is second to Fulton County in regards to in-bound freight flows.

For Bryan and Effingham Counties, in-bound, internal and out-bound truck volumes are substantially smaller in terms of tonnage and value when compared to Chatham County. However, as shown in **Table 5-13**, in-bound and out-bound truck volumes are generally higher valued in Bryan and Effingham Counties.

Table 5-13: Truck Volumes in Savannah MSA (in 2013)

Truck Freight	Inbound	Outbound	Within the State
Bryan County			
Weight (In Tons)	65,995	99,609	221,569
Value	\$191,607,426	\$266,594,457	\$36,360,562
Number of Truck Freight Movements	6,771	5,865	18,027
Chatham County			
Weight (In Tons)	8,115,841	23,030,519	19,734,679
Value	\$18,148,574,000	\$43,320,545,645	\$34,234,326,006
Number of Truck Freight Movements	1,125,243	1,253,618	1,867,368
Effingham County			
Weight (In Tons)	378,372	617,230	2,059,265
Value	\$2,691,110,670	\$2,151,289,002	\$239,035,949
Number of Truck Freight Movements	55,104	34,654	129,682

Source: Georgia Center of Innovation for Logistics. 2014. Bryan County, Chatham County, and Effingham County Logistics Spotlights.

The commodities that comprise these truck freight movements are varied. **Table 5-14** provides an example of the percentage share distribution of goods by commodity category.

²³ Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

Table 5-14: Truck Commodity Distribution on I-95 and I-16 (in 2005)

Commodities	Percentage of Share	
	I-95 (Chatham Co.)	I-16 (Pembroke)
Food and Farm Products	25%	14%
Textiles	8%	4%
Chemicals	7%	10%
Clay/Concrete/Glass/Stone	5%	5%
Transportation Equipment	4%	10%
Lumber/Wood/Logs	4%	2%
Warehousing (Secondary Traffic)	<1%	4%
Sand and Gravel (Non-Metallic Minerals)	<1%	<1%
Others	48%	49%

Source: Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan

5.4.3 Rail

Georgia ranks 5th in the nation in rail tonnage terminating (ending) within the state.²⁴ The CORE MPO freight transportation plan study area is serviced by three main rail carriers:

- 1) CSX Transportation (CSXT),
- 2) Genesee & Wyoming, Inc. (G&W), and
- 3) Norfolk Southern (NS).

These carriers are also illustrated on the following page in **Figure 5-2**.

CSX Transportation and Norfolk Southern are classified as Class I Railroads. There are seven large railroads in the United States which qualify for this distinction. These railroads function as the main regional rail freight carriers with operating revenues of greater than \$433.2 million in 2011.²⁵ In Georgia, CSX Transportation and Norfolk South own and operate 71 percent of the entire active rail track in the state. These rail carriers as well as 25 short line rail carriers transport more than 80 million gross tons of freight annually; these rail lines are among the heaviest used in the nation.²⁶ Chatham County is also home to three intermodal rail terminals, three bulk transload terminals, and two large carload yards; most of which are associated with the Port of Savannah. There are no rail terminals or yards other than rail lines which run through Bryan County. The CSX Transportation rail line runs directly through Bryan County to connect to the Norfolk Southern's line in Chatham County. Effingham County also does not contain any rail terminals or yards²⁷. However, industrial sites within Effingham County have rail access for both CSX Transportation and Norfolk Southern lines as well as one of the three short line railroads which service the county²⁸.

²⁴ Georgia Center of Innovation and Logistics. 2013 Georgia Logistics Report.

²⁵ <https://www.aar.org/StatisticsAndPublications/Documents/AAR-Stats-2013-07-09.pdf>

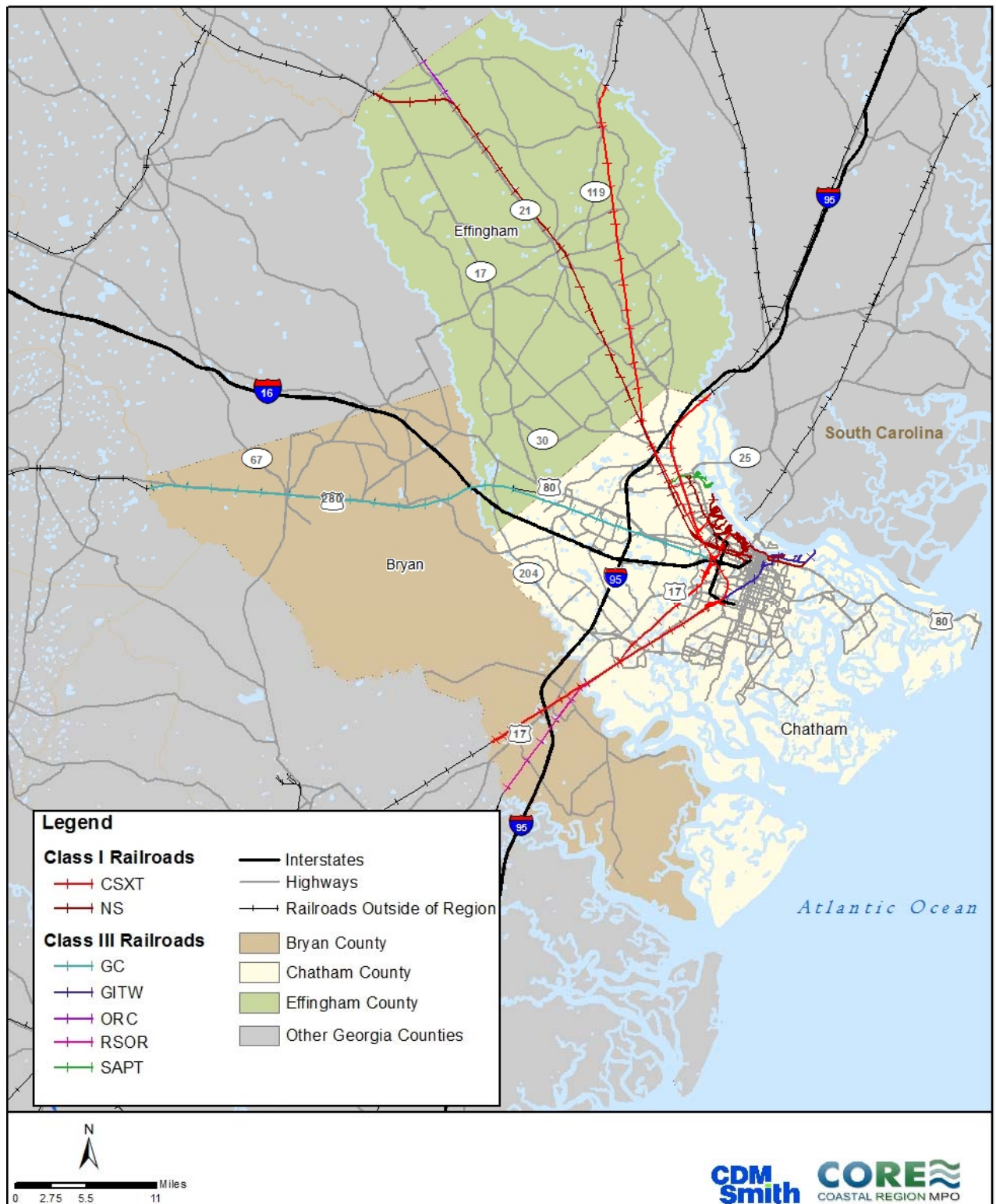
²⁶ Georgia Department of Transportation. 2013. Fact Book.

<http://www.dot.ga.gov/informationcenter/pressroom/Documents/publications/FactBook/GeorgiaDOT-FactBook.pdf>

²⁷ Georgia Center for Innovation of Logistics. 2014. Bryan County and Effingham County Logistics Spotlights.

²⁸ Effingham County Industrial Development Authority. 2014. <http://www.effinghamindustry.com/community-data/>

Figure 5-2: Class I and Class III Railroads in Savannah MSA



CSX Transportation's freight rail network reaches almost 67 percent of the nation's population in 23 states as well as the Canadian provinces of Ontario and Quebec. CSX Transportation has 1,626 miles of rail lines within Georgia of which a yard is located within Savannah.²⁹ 22 states as well as the nation's capital are served by Norfolk Southern's extensive freight rail network which consists of 20,000 miles.³⁰ Of this amount, Norfolk Southern owns and operates 1,912 miles of rail lines within Georgia which includes the portion within the Savannah region.³¹ Of the portion within the Savannah region, Norfolk Southern operates a "straight-line" rail alignment between Atlanta and Savannah which spans about 250 miles. This rail alignment aids in alleviating congestion along roadway routes between Atlanta and Savannah and providing a lower cost alternative to trucking.

Genesee & Wyoming, Inc., is the owner of 112 short line, or Class III, and regional freight rail lines in Australia, Europe, and North America. This includes the Georgia Central Railway (GC), on-port Savannah Port Terminal Railroad (SAPT), Riceboro Southern Railway (RSOR) and Golden Isle Terminal Wharf (GITW), which are four Class III railroads within the Savannah MSA region. These lines are operated by one of Genesee & Wyoming, Inc.'s subsidiaries, Rail Link, which primarily operates port-related railroads³². The Georgia Central Railway is a 171-mile freight short line which runs between Savannah and Macon, Georgia, similar to Norfolk Southern's line to Atlanta. The rail line connects with CSX Transportation, Heart of Georgia Railroad, and Norfolk Southern lines. Several industrial developments lie along the track length with five transload locations in Macon. Generally, commodities transported along this line include coal, chemicals, farm and food products, forest products, minerals and stone, plastics, and pulp and paper products.³³ The Savannah Port Terminal Railroad is an 18-mile short line freight rail line at the Port of Savannah which connects with rail lines and intermodal facilities for CSX Transportation and Norfolk Southern. The rail line's commodity flows consist of chemicals, food products, intermodal containers, and pulp and paper products.³⁴

Riceboro Southern Railway is an 18-mile freight short line which runs between Riceboro and Georgetown, Georgia. The rail line connects with a CSX Transportation line. There are two transload locations along the line; one outside and one within Bryan County at the Belfast Commerce Park industrial site. Commodities typically carried include chemicals and pulp and paper products³⁵. Finally, Golden Isle Terminal Wharf is a 7-mile short line which serves the Savannah Wharf customers and connects with a CSX Transportation rail line. Commodity flows for

²⁹ <http://www.intermodal.com/index.cfm/intermodal-maps/>

³⁰ Norfolk Southern. 2013. Annual Report.

³¹ Georgia Department of Transportation. 2013. Fact Book.

³² Genesee & Wyoming, Inc., 2014. Rail Link Overview.

http://www.gwrr.com/operations/industrial_switching/rail_link_overview

³³ Genesee & Wyoming, Inc. 2014. Georgia Central Railroad.

http://www.gwrr.com/operations/railroads/north_america/georgia_central_railway

³⁴ Genesee & Wyoming, Inc. 2014. Savannah Port Terminal Railroad.

http://www.gwrr.com/operations/railroads/north_america/savannah_port_terminal_railroad

³⁵ Genesee & Wyoming, Inc. 2014. Riceboro Southern Railway.

http://www.gwrr.com/operations/railroads/north_america/riceboro_southern_railway

this rail line consist of chemicals, food/feed products, metals, minerals, petroleum products, pulp and paper products, wood pellets, and bulk freight³⁶.

Another short line railroad which was listed above but is located in Effingham County as shown in **Figure 5-2** is Ogeechee Railway (ORC), which is owned by the state of Georgia and operated and maintained by GDOT³⁷. The rail line runs between Effingham and Screven Counties. The rail line connects with the Norfolk Southern's line in Ardmore, located within Effingham County.

Table 5-15 describes inbound, outbound, and within freight movements by rail for the Savannah MSA. The highest volumes in terms of weight and value are associated with freight rail volume moved within the state, followed by in-bound and out-bound rail freight.

Table 5-15: Rail Volumes in Savannah MSA (in 2013)

Rail Freight	Inbound	Outbound	Within the State
Bryan County			
Weight (In Tons)	N/A*	3,005	N/A*
Value		\$922,580	
Number of Rail Freight Movements		32	
Chatham County			
Weight (In Tons)	2,958,165	1,709,255	4,664,517
Value	\$6,447,396,538	\$4,078,182,862	\$4,707,837,793
Number of Rail Freight Movements	37,961	20,878	52,350
Effingham County			
Weight (In Tons)	643,299	17,397	147,675
Value	\$146,921,496	\$16,297,674	\$4,623,868
Number of Rail Freight Movements	6,471	181	4,771

Source: Georgia Center of Innovation for Logistics. 2013. Chatham County Logistics Spotlight

*N/A – There is no recorded in-bound or intra-rail freight volumes for Bryan County.

5.4.4 Water

The Port of Savannah is one of the two deep water ports located within Georgia. The Port of Savannah has a substantial fiscal impact from its distribution operations on local, state, and federal governments. In fiscal year 2011, the deepwater seaport has contributed:

- \$66.9 billion in sales
- \$32.4 billion in state GDP
- \$18.5 billion in income
- 352,146 full- and part-time jobs
- \$4.5 billion in federal taxes
- \$1.4 billion in state taxes
- \$1.1 billion in local taxes

³⁶ Genesee & Wyoming, Inc. 2014. Golden Isles Terminal Wharf.

http://www.gwrr.com/operations/railroads/north_america/golden_isles_terminal_wharf

³⁷ Georgia Department of Transportation. 2014. <https://www.dot.ga.gov/travelingingeorgia/rail/Pages/default.aspx>

The Port of Savannah's revenues account for 9.5 percent of the entire state of Georgia's total sales. Employment at the port accounts for 8.3 percent of the total employment in the state³⁸. The seaport hosts several tenants, some of which were previously identified in Section 2. Below identifies the non-public companies that operate at the seaport³⁹:

- | | | | |
|------------------|-----------------------|---------------------|-------------------|
| • Colonial Group | • Imperial Sugar | • Southern LNG | • Vopak |
| • Conoco Philips | • International Paper | • Standard Concrete | • Metro Ports |
| • Georgia Kaolin | • NuStar Refinery | • Weyerhaeuser | • Georgia Pacific |
| • Hercules | • Epic Midstream | • Wood Chip | • National Gypsum |
| • Valero | • Dulany Industries | • Exporting Corp | • GAF Materials |

The seaport is equipped with a substantial yet diverse set of capabilities for handling varying types of commodities. The seaport has two main terminals, Garden City and Ocean, which combined provide 15,461 feet of contiguous berth space for waterborne vessels.⁴⁰ In general, the channel widths for these terminals are 500 feet with a current depth of 42 feet. Future dredging plans, to a depth of 47 feet, will allow the Garden City Terminal, with a throughput capacity of 6.5 million TEUs, to increase the volume of containers through the facility.⁴¹

The seaport has access to the largest concentration of import distribution centers on the eastern coast with direct roadway and rail connections. The seaport has immediate access to I-16, running east- west, and I-95, running north- south. This allows for four-hour commuting for truckers for major markets such as Atlanta, Orlando (Florida), and Charlotte (North Carolina). As discussed in the previous section, Genesee & Wyoming, Inc., operates a short line rail line on the seaport itself which connects with CSX Transportation and Norfolk Southern main line rail lines. The seaport is also in close proximity to the Savannah/Hilton Head International Airport. A trip between the two facilities' gates is less than 6 miles.

The Port of Savannah is unique in that it has an almost even balance of exports and imports, which is different from most other U.S. container ports that are dominated by import flows.⁴²

³⁸ Georgia Ports Authority. 2013. Fiscal Year 2011 Economic Impacts of Georgia's Deepwater Ports.

³⁹ Georgia Center of Innovation for Logistics. 2013 Georgia Logistics Report.

⁴⁰ Georgia Port Authority.

⁴¹ US Army Corps of Engineers. 2012. Final General Re-Evaluation Report for Savannah Harbor Expansion Project.

⁴² Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

Table 5-16 describes the top ten imports and exports in 2012 for the Port of Savannah. Ranked number one in exports is wood pulp. As described earlier, Georgia has a significant forestry industry. Weyerhaeuser is a company with a pulp mill location within Chatham County near Savannah. Another of the top exports for the seaport is kaolin clay, a resource found in Georgia. Kaolin clay, or “china clay”, is commonly used for paper, plastics, rubber, paints and other products⁴³. Over 66 percent of Savannah’s clay products are exported to Northeast Asia, followed by North Europe, Southeast Asia, the Mediterranean, and East Coast of South America.

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⁴³ Georgia Mining Association. 2014. Georgia’s Kaolin Industry. <http://www.georgiamining.org/GMA-georgia-kaolin-industry.php>

Table 5-16: Top Ten Exports and Imports (in 2012)

Rank	Exports		Imports	
	Commodity	Amount (in TEUs)	Commodity	Amount (in TEUs)
1	Wood pulp	178,654	Furniture	143,412
2	Food	157,531	Retail and consumer goods	132,244
3	Paper and paperboard	144,710	Machinery, appliances, and electronics	121,482
4	Clay	97,054	Hardware and housewares	98,877
5	Automotive	87,778	Automotive	96,576
6	Machinery, appliances, and electronics	80,760	Food	80,078
7	Fabrics/raw cotton	74,877	Apparel	55,800
8	Chemicals	73,871	Toys	49,666
9	Retail and consumer goods	63,299	Minerals	49,373
10	Resins and rubber	61,021	Chemicals	36,436
	Other	214,324	Other	220,900
	Total	1,233,877	Total	1,084,844

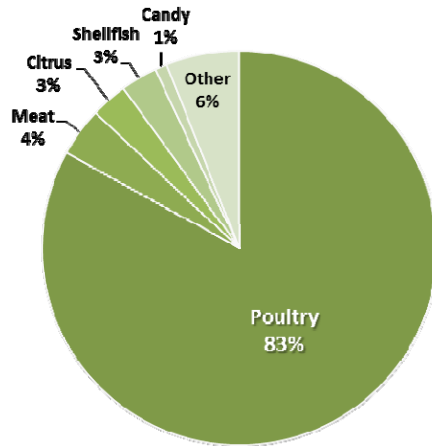
Source: Georgia Center of Innovation and Logistics. 2013 Georgia Logistics Report

Figure 5-3 shows the breakdown of the top refrigerated commodities. The Garden City Terminal handles 40 percent of the nation's poultry exports which total 3 billion pounds a year. In terms of markets, Mexico is a top market for poultry products from Georgia. For other forms of refrigerated cargo products, the top five exporters and importers are identified in

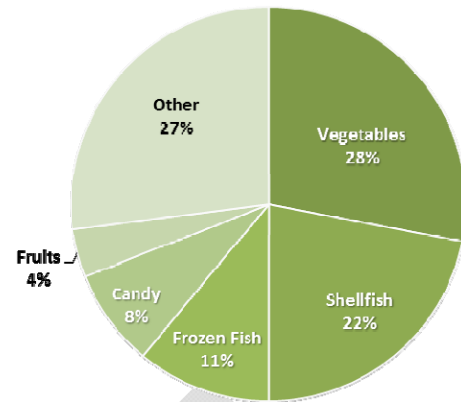
Table 5-17.

Figure 5-3: Top Reefer Exports and Imports (in 2012)

Top Savannah Refrigerated Ocean Exports



Top Savannah Refrigerated Ocean Imports



Source: Georgia Center of Innovation and Logistics. 2013 Georgia Logistics Report

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Table 5-17: Top Five Refrigerated Export and Import Markets

Rank	Import Markets	Export Markets
1	West Coast South America	Northeast Asia
2	Southeast Asia	Eastern Europe
3	Northeast Asia	Africa
4	Mediterranean	Southeast Asia
5	North Europe	Mediterranean

Source: Georgia Center of Innovation and Logistics. 2013 Georgia Logistics Report

5.4.5 Air

Ten of Georgia's airports provide significant air cargo operations for the state. Statewide, air cargo and passenger operations contribute \$62.6 billion to the state and federal economy with 471,000 employees and \$17.8 billion payroll.⁴⁴ The Savannah/Hilton Head International Airport provides local air cargo options within Chatham County, located seven miles northwest of Savannah and in proximity to the Port of Savannah. The airport has two runways and direct flights to 17 major US markets. The Savannah Airport Commission also owns and operates Foreign Trade Zone 104, allowing domestic and international freight movements to be processed without formal customs entry and duties and tax payments.⁴⁵

The airport is a general aviation and commercial airport which provides both passenger and freight services. Air cargo companies which utilize this airport include Delta Airlines, DHL, FedEx, and American Airlines and allows Gulfstream Aerospace use of their facilities in conjunction with their recent \$500 million expansion mentioned in Section 2.1.1.⁴⁶ In 2013, the airport moved 7,914.8 tons of air cargo. Although air freight tonnage increased in 2013, **Figure 5-4** illustrates that the air cargo tonnage at the airport has decreased from 2008 to 2012.

In addition to the Savannah/Hilton Head International Airport is the military's Hunter Army Air Field, which receives air cargo for the Savannah area's military operations and personnel, and Hodges Air Park, a privately owned airfield. Neither Hunter Army Air Field nor Hodges Air Park offers commercial services.

Beyond Savannah/Hilton Head International Airport, companies in the Savannah region also have access to Atlanta's Hartsfield-Jackson International Airport. This airport handles 98 percent of the state's annual air cargo volumes and is the 10th and 31st largest in the nation and the world for air cargo, respectively. In 2012,⁴⁷ the state's top ten air cargo commodities were:

- | | |
|---------------------------------|---------------------------------|
| 1) Miscellaneous mixed | 6) Electrical equipment |
| 2) Mail or contract traffic | 7) Printed matter |
| 3) Machinery | 8) Precision instruments |
| 4) Chemicals or allied products | 9) Apparel and related products |
| 5) Transportation equipment | 10) Fabricated metal products |

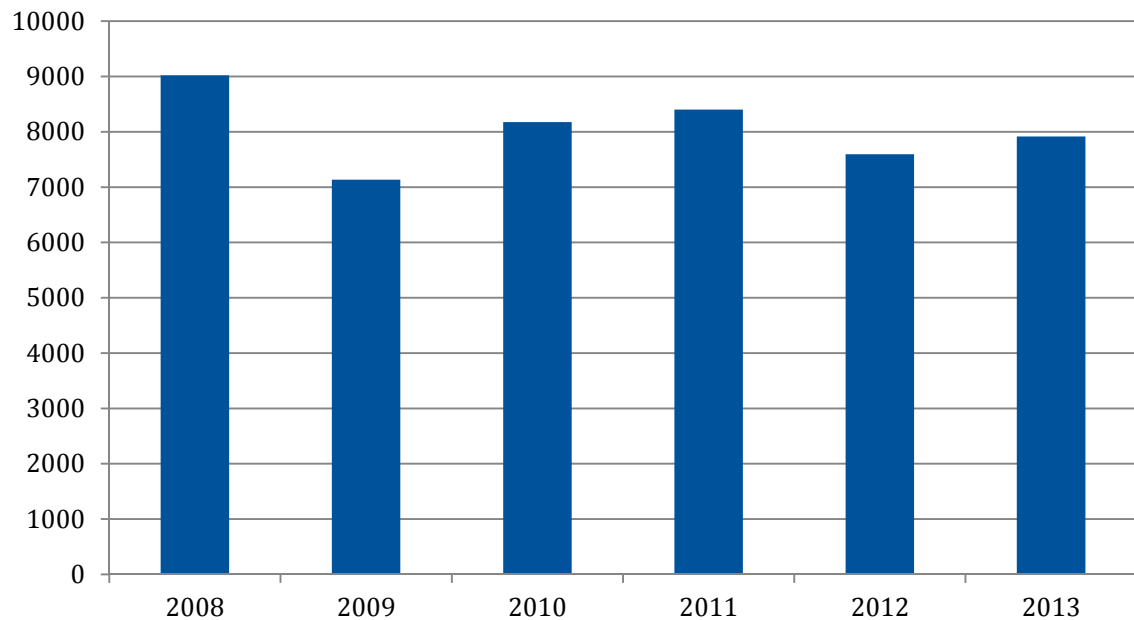
⁴⁴ Georgia Center of Innovation for Logistics. 2013. Chatham County Logistics Spotlight.

⁴⁵ Savannah Economic Development Agency, 2014. <http://www.seda.org/savannah/20/infrastructure.html>

⁴⁶ Savannah Economic Development Agency, 2014. <http://www.seda.org/savannah/106/airport.html>

⁴⁷ Georgia Center of Innovation for Logistics. 2013 Georgia Logistics Report.

Figure 5-4: Air Cargo (Freight/Express Mail in Tons)



Source: Savannah/ Hilton Head International Airport. 2014. Statistics.

5.4.6 Other Freight Facilities

Warehousing and distribution and intermodal facilities are critical to freight movements via roadway, water, rail or air. There are 230 retail distribution centers located throughout the state operated by over 170 retailers. 28 of these centers are more than 1 million square feet in size. Another 28 pharmaceutical distribution warehouses call the state home, which are certified through the Drug Enforcement Administration under the US Department of Justice. Lastly, Georgia is home to 216 million square feet of warehousing and distribution facility space for over 920 facilities. More than 20 million square feet of these facilities are located within a 2.5 hour traveling radius of the Port of Savannah.

Associated with the Port of Savannah cargo services, Chatham County is home to 125 warehousing and distribution facilities with a total of 26,471,243 square feet.⁴⁸ The largest of these facilities are identified in

⁴⁸ Georgia Center of Innovation for Logistics. 2014. Chatham County Logistics Spotlight

Table 5-18 and are located in Chatham County. Chatham County is home to five cold storage warehousing and distribution facilities which are essential to food, pharmaceutical, and other temperature-sensitive supply chains.

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Table 5-18: Largest Warehousing and Distribution Facilities in Savannah MSA

Rank	Facility Name	Size (in Square Feet)
1	Target Import Warehouse	2,000,000
2	Home Depot	1,364,000
3	Schneider Logistics	1,200,000
4	Dollar Tree Stores	1,000,000

Source: Georgia Center of Innovation for Logistics. 2014. Chatham County Logistics Spotlight

Bryan County is home to seven warehousing and distribution facilities with a total capacity of 1,386,000 square feet with the Oneida facility being the largest at 499,000 square feet. The county also has one cold storage facility⁴⁹. Effingham County has seven warehousing and distribution facilities with a total capacity of 1,745,600 square feet. The largest of these facilities is the Bonded Service Warehouse at 700,000 square feet. In addition, the county has one cold storage facility⁵⁰.

Intermodal facilities are generally concentrated within the Atlanta and Savannah areas.

Table 5-19: Intermodal Terminals in Savannah, GA

Terminal Name	Annual Volume (Lifts)	Length of Loading Cars (in Feet)	Storage/Stack Capacity
Chatham Intermodal Container Transfer Facility	20,000 initial capacity with future growth to 100,000	6,435	12,406 feet of storage rail tracks
Dillard Yard	15,000	1,246	210 wheeled spaces
James D. Mason Intermodal Container Transfer Facility	230,000 +	12,500	7,500 feet of storage rail tracks
Savannah Yard	50,000 +	4,800	650 wheeled spaces

Source: Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

identifies the intermodal facilities located in the Savannah area.

Table 5-19: Intermodal Terminals in Savannah, GA

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Savannah Yard	50,000 +	4,800	650 wheeled spaces

Source: Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

⁴⁹ Georgia Center of Innovation for Logistics. 2014. Bryan County Logistics Spotlight

⁵⁰ Georgia Center of Innovation for Logistics. 2014. Effingham County Logistics Spotlight

All of these intermodal facilities are associated with the Port of Savannah and either CSX Transportation or Norfolk Southern for rail service. The Savannah Yard, operated by CSX Transportation, serves domestic and international intermodal freight products such as UMAX (domestic interline container service), private containers, and door-to-door deliveries.⁵¹ The yard provides service Monday through Saturday.

Chatham Intermodal Container Transfer Facility (ICTF) is located on-terminal in the Garden City Terminal at the Port of Savannah, and includes 3 working tracks totaling over 6,400 feet, and an additional 12,406 feet of storage track. The ICTF calls to CSX Transportation and provides unrestricted double-stack service and two- to three-day transit times to major hubs throughout the Midwest, Gulf Coast and Southeast, including overnight service to Atlanta. The other ICTF, James D. Mason, is served by Norfolk Southern. Dillard Yard, an intermodal facility, which specializes in domestic containers and is served by Norfolk Southern, is located in close proximity to the Port of Savannah⁵².

In addition to these intermodal facilities are rail/highway bulk terminals. Rail/highway bulk terminals are where out-bound rail freight of dry or liquid bulk arrives by truck and transferred to specialized rail cars for transport. There are several of these facilities throughout Georgia with three located in the Savannah region as described in **Table 5-20**, which are in proximity to the Port of Savannah.

Table 5-20: Rail/Highway Bulk Terminals in Savannah, GA

Terminal Name	Rail Carrier Served	Loading/Unloading Spots	Commodities Handled
Colonial Terminals	CSX Transportation Norfolk Southern	N/A	Acids, chemicals (liquid), petroleum products
CSXT Transflo	CSX Transportation	45	Acids, chemicals (liquid)
Paktank	CSX Transportation Norfolk Southern Savannah State Docks	18	Acids, chemicals (liquid), foods (liquid), petroleum products, clay slurry

Source: Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

5.5 Areas of Future Growth

The ability for the Savannah region to take advantage of the growth in freight flows moving domestically and internationally depends on the growth of industry and the availability and quality of the freight transportation network. The following subsections review areas of industry change in the past and look forward to how future global and national trends impact freight flows in the Savannah region.

⁵¹ <http://www.intermodal.com/index.cfm/intermodal-maps/>

⁵² Norfolk Southern. <http://www.nscorp.com/content/nscorp/en/ship-with-norfolk-southern/shipping-options/intermodal/terminals-and-schedules/savannah-ga-portwentworthdillardyard.html>

5.5.1 Industry Growth Forecast

The nation's economy has been going through changes for the last several years which have impacted many industries. According to the US Census Bureau, between 1997 and 2012, there has been drastic increase in employment demand from service industries such as accommodation and food services, health care and social assistance, and administrative and support and waste management and remediation services. These are strong industries identified currently in the Savannah region, particularly Chatham County. Transportation and warehousing nationally has seen increases between 1997 and 2007 after which it has leveled off. Employment for the retail trade industry increased as well, up 5.3 percent from 1997 to 2007. During the 2008-2009 recession, the industry saw a decrease in employment despite retail trade companies still having the most establishments in the US of all industry sectors. However, the industry sector impacted the most heavily nationally was manufacturing. The manufacturing industry had the largest decrease in employment amongst all industry sectors, declining 32.9 percent or 5.5 million since 1997. However, annual payroll per employee has increased by 55.4 percent during this time period.⁵³ The broad decrease in manufacturing has also led to concentration in manufacturing geographically in enclaves around the nation including in Chatham County.

In Chatham County, there was a decrease in the number of manufacturing companies between 2010 and 2013. However, there was a dramatic increase in the number of employees as described in **Table 5-21**.

Table 5-21: Changes in Manufacturing Industry in Chatham County (2010 to 2013)

Industry Name	Number of Companies (Percent Change)	Number of Employees (Percent Change)
Manufacturing (Overall)	-66.3%	160.7%
Apparel	-99.5%	N/A*
Beverage and Tobacco Product	0.0%	N/A
Chemical	21.43%	-4.5%
Computer and Electronic Product	0%	14.8%
Electrical Equipment, Appliance, and Component	0%	36.4%
Fabricated Metal Product	-3.5%	24.5%
Food	-9.5%	-49.4%
Furniture and Related Product	-15.4%	-31.6%
Leather and Allied Product	0.0%	N/A
Machinery	-14.3%	-15.8%
Miscellaneous	0.0%	16.7%
Nonmetallic Mineral Product	0.0%	4.3%
Paper	0.0%	4.6%
Petroleum and Coal Products	-25.0%	-8.0%
Plastics and Rubber Products	0.0%	N/A
Primary Metal	50.0%	N/A
Printing and Related Support Activities	-21.1%	0.0%
Textile Mills	100%	N/A

⁵³ US Census Bureau. Measuring America. http://www.census.gov/how/infographics/changing_us_economy.html

Textile Product Mills	16.6%	54.0%
Transportation Equipment	10.0%	N/A
Wood Product	-16.7%	24.4%

**Note: N/A denotes incomplete data because of confidential data relating to individual employees that cannot be released.*

Source: Georgia Department of Labor

Several manufacturing industry sectors listed above saw decreases in the number of companies active within the County such as apparel, fabricated metal product, and machinery. Although some of these projected decreases in employment as well, others have shown no change or increased employment, suggesting consolidation or company acquisition such as with Chatham Steel and Reliance.⁵⁴ A company acquisition allows regional, national, or international companies to establish footholds in markets with existing local experience. If successful, acquired locations may even increase employment opportunities in response to market demand. This is a possible explanation for how, despite the decrease in the number of companies from 847 in 2010 to 794 in 2013, there was an increase in employment from 16,661 to 17,535 during the same time period. Industry sectors that increased the most include textile products mills and wood product. SEDA has indicated that three new companies will be locating to the Savannah region: Coby Electronics, Dorel Juvenile, and Diageo-Guinness Brands.⁵⁵

During the same time period and shown in **Table 5-22**, Bryan County's overall manufacturing sector has seen a decrease in the number of firms from 17 to 11 with a resulting decrease of 9.3 percent in the number of employees. Industry sectors which saw a loss in firms were chemical, fabricated metal products, food, and nonmetallic mineral product. Other industry sectors, such as machinery, paper, and plastics and rubber products, stayed the same. In addition, there were firms in the industry sectors of primary metal, transportation equipment, and wood product. As of 2013, those firms are no longer located in Bryan County which is why those sectors are not represented in the above table.

Table 5-22: Changes in Manufacturing Industry in Bryan County (2010 to 2013)

Industry Name	Number of Companies (Percent Change)
Manufacturing (Overall)	-35.3%
Chemical	-66.7%
Fabricated Metal Product	50.0%
Food	-50.0%
Machinery	0.0%
Nonmetallic Mineral Product	-25.0%
Paper	0.0%
Plastics and Rubber Products	0.0%

Source: Georgia Department of Labor

**Please note that the employment data for majority of areas identified under manufacturing in Bryan County is designated confidential.*

For Effingham County, the overall manufacturing sector has increased the number of firms from 25 to 27 with new firms being added in the fabricated metal product, nonmetallic mineral product,

⁵⁴ This acquisition happened outside of the time period, but it is here to provide a local example.

⁵⁵ <http://www.seda.org/savannah/4/industries-companies.html>

and miscellaneous areas as shown in **Table 5-23**. These additions appear to lessen the impact of losses in firms in sectors including, but not limited to, chemical, electrical equipment, machinery, and paper.

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Table 5-23: Changes in Manufacturing Industry in Effingham County (2010 to 2013)

Industry Name	Number of Companies (Percent Change)
Manufacturing (Overall)	8.0%
Beverage and Tobacco Product	0.0%
Chemical	-75.0%
Electrical Equipment, Appliance, and Component	-50.0%
Fabricated Metal Product	66.7%
Furniture and Related Product	-66.7%
Machinery	-33.3%
Miscellaneous	33.3%
Nonmetallic Mineral Product	400%
Paper	-80.0%
Printing and Related Support Activities	0.0%
Wood Product	0.0%

Source: Georgia Department of Labor

*Please note that the employment data for majority of areas identified under manufacturing in Effingham County is designated confidential.

For industry sectors identified under the service industry, the trend is different with overall company and employee numbers increasing during the same time period for Chatham County as shown in **Table 5-24**.

Table 5-24: Changes in Service Industry in Chatham County (2010 to 2013)

Industry Name	Number of Companies (Percent Change)	Number of Employees (Percent Change)
Service (Overall)	7.4%	8.6%
Utilities	8.3%	9.2%
Wholesale Trade	12.0%	1.6%
Retail Trade	4.9%	9.0%
Transportation and Warehousing	8.0%	5.4%
Information	-14.1%	-11.5%
Finance and Insurance	36.9%	14.5%
Real Estate and Rental and Leasing	-1.7%	-2.2%
Professional, Scientific & Technical Svc	6.9%	17.5%
Management of Companies and Enterprises	42.9%	-10.9%
Admin., Support, Waste Mgmt, Remediation	1.5%	14.3%
Education Services	14.8%	4.6%
Health Care and Social Assistance	8.4%	5.9%
Arts, Entertainment, and Recreation	16.0%	12.0%
Accommodation and Food Services	6.0%	14.2%
Other Services (except Public Admin.)	-1.3%	6.2%

*Note: N/A denotes incomplete data because of confidential data relating to individual employees that cannot be released.

Source: Georgia Department of Labor

Among service industry subsections, information, real estate and company management decreased the most during the 2010 to 2013 time period. All other industry subsections have fared moderately or even significantly well. The industry subsectors with the highest growth

during this period include finance and insurance, professional services, accommodation and food services, arts and entertainment, health care, and transportation and warehousing.

As displayed in **Table 5-25**, the service industry in Bryan County saw a significant decline between 2010 and 2013, particularly in areas of wholesale trade, retail trade, transportation and warehousing, finance and insurance, professional services, and the arts. However, the services which saw growth during this period included health and tourism, information, as well as real estate.

Table 5-25: Changes in Service Industry in Bryan County (2010 to 2013)

Industry Name	Number of Companies (Percent Change)	Number of Employees (Percent Change)
Service (Overall)	-81.0%	-71.1%
Utilities	2700%	N/A*
Wholesale Trade	-57.9%	-82.1%
Retail Trade	-64.0%	-72.1%
Transportation and Warehousing	-26.7%	-64.4295
Information	833.3%	785%
Finance and Insurance	-96.2%	N/A*
Real Estate and Rental and Leasing	82.6%	308.3%
Professional, Scientific & Technical Svc	-94.6%	-93.7%
Management of Companies and Enterprises	32.4%	203.6%
Admin., Support, Waste Mgmt, Remediation	100%	N/A*
Education Services	63.0%	91.9%
Health Care and Social Assistance	771.4%	438.0%
Arts, Entertainment, and Recreation	-50.0%	-97.0%
Accommodation and Food Services	1236.2%	1955.8%
Other Services (except Public Admin.)	53.3%	7029.2%

*Note: N/A denotes incomplete data because of confidential data relating to individual employees that cannot be released.

Source: Georgia Department of Labor

As reflected in **Table 5-26**, during the 2010 to 2013 period, there was a slight increase in overall service-related firms and employees for Effingham County. The industry areas that contained growth included wholesale trade, finance and insurance, real estate, waste management, health, and accommodations.

The subsectors of industry growth and decline provide a general picture on how these subsectors are currently operating within the Savannah MSA. The Georgia Department of Labor has developed a series of 10-year long-term industry outlook projections within Workforce Investment Areas (WIAs). As identified briefly in Section 2.3, the Savannah MSA is within the Coastal WIA which includes nine counties.

Table 5-27 identifies those industries that are projected to decline or increase from 2010 to 2020.

Table 5-26: Changes in Service Industry in Effingham County (2010 to 2013)

Industry Name	Number of Companies (Percent Change)	Number of Employees (Percent Change)
Service (Overall)	0.6%	1.1%
Utilities	-20.0%	N/A*
Wholesale Trade	33.3%	18.6%
Retail Trade	-1.0%	4.9%
Transportation and Warehousing	-17.0%	-9.8%
Information	-14.3%	-17.9%
Finance and Insurance	12.1%	5.5%
Real Estate and Rental and Leasing	6.9%	-14.1%
Professional, Scientific & Technical Svc	-1.6%	17.1%
Management of Companies and Enterprises	-89.2%	N/A*
Admin., Support, Waste Mgmt, Remediation	850.0%	3612.5%
Education Services	-96.2%	N/A*
Health Care and Social Assistance	2600.0%	N/A*
Arts, Entertainment, and Recreation	-98.3%	N/A*
Accommodation and Food Services	18.4%	132.3%
Other Services (except Public Admin.)	0.6%	1.1%

*Note: N/A denotes incomplete data because of confidential data relating to individual employees that cannot be released.
Source: Georgia Department of Labor

Table 5-27: 10-Year Industry Projections for Coastal WIA (2010 to 2020)

Rank	Growing Industries	Declining Industries
1	Educational Services	Total Federal Government Employment
2	Food Services and Drinking Places	Food Manufacturing
3	Administrative and Support Services	State, Excluding Education and Hospitals
4	Ambulatory Health Care Services	Chemical Manufacturing
5	Hospitals	Agriculture, Crop and Animal Production
6	Professional, Scientific, and Technical Services	Support Activities for Transportation
7	Warehousing and Storage	Personal and Laundry Services
8	Nursing and Residential Care Facilities	Telecommunications
9	Accommodation	Wholesale Electronic Markets and Agents and Brokers
10	Social Assistance	Forestry and Logging
11	Amusement, Gambling, and Recreation Industries	Sporting Goods, Hobby, Book, and Music Stores
12	Specialty Trade Contractors	Printing and Related Support Activities
13	Local, Excluding Education and Hospitals	Petroleum and Coal Products Manufacturing
14	Religious, Grantmaking, Civic, Professional, and Similar Org	Food and Beverage Stores
15	Transportation Equipment Manufacturing	Fabricated Metal Product Manufacturing
16	Credit Intermediation and Related Activities	Water Transportation
17	General Merchandise Stores	Postal Service
18	Motor Vehicle and Parts Dealers	Publishing Industries
19	Repair and Maintenance	Broadcasting (except Internet)
20	Building Material and Garden Equipment and Supplies Dealers	Rental and Leasing Services

Source: Georgia Department of Labor. <http://explorer.dol.state.ga.us/qsipub/index.asp?docid=386>

In general, several of these sectors and subsectors that grew during the 2010 to 2013 period include health care, accommodations, warehousing and storage (transportation and warehousing), and transportation equipment manufacturing. However, these projections show that “support activities for transportation” and water transportation declining over the 10-year period. Both subsectors are part of the transportation and warehousing sector and may indicate either that the Port of Savannah deepening was not factored in or a consolidation of services was expected.

5.5.2 Impacts on Freight Transportation

As discussed throughout this chapter, the freight transportation system in the Savannah region has a strong relationship to the Port of Savannah along with its extensive system of roadways and freight rail interconnected by intermodal facilities and warehousing that provide access to major markets. For the past twenty years, the port has been successful at capturing U.S. East Coast containerized cargo traffic market share with the consequential positive impacts on Chatham County, the Savannah region, and the state’s economies.⁵⁶ There are two main factors that may impact the Savannah region’s industries and freight network: changes in business practices and the expansion of the Panama Canal.

In terms of business, two significant trends which impact freight flows globally are near-sourcing and sustainability. Near-sourcing is a variant on the out-sourcing which became popular in 1980s and 1990s, and is the trend to move production closer to consumer markets to reduce logistics costs, especially for small- and medium-sized businesses. Sustainability is the trend that company’s practices and production incorporate sustainable raw materials, greener best practices, responsible use of conflict minerals, and attention to environmental impacts and human rights. This impacts location and expansion projects for companies.⁵⁷

Near-sourcing would impact both the industry growth in the Savannah region and the network. This may encourage growth of manufacturing industries such as the transportation equipment manufacturing sector identified in Section 4.1.

With the rise of importance of use of renewable resources, there is growth in demand for products of the Georgia forest products industry, which will likely impact companies such as International Paper and Weyerhaeuser who have wood pulp mills located in Chatham County. Growth of manufacturing and service industries in locations closer to consumer markets will have significant impacts on modes of freight transportation. The use of the highway and freight rail system may increase while there may be less use of air and water modes of freight transportation for certain industry subsectors.

Another major impact on the Savannah region will come from the expansion of the Panama Canal. The expansion of the Panama Canal includes the construction and completion of the third set of locks that will allow container ships that are 250 percent larger than the current ships to transit the Canal. Current lock container vessel’s maximum capacity is 4,400 TEUs which will increase to 12,600 TEUs with the completion of the new locks. Any significant increase of freight movements

⁵⁶ Georgia Department of Transportation. 2013. Georgia Statewide Freight Plan.

⁵⁷ Georgia Center of Innovation for Logistics. 2013 Georgia Logistics Report.

through the Panama Canal will be of significance to the Savannah region with its strong reliance on the Port of Savannah as a gateway for trade.

In March 2014, the Georgia Port Authority (GPA) announced that waterborne cargo movements through the state's deep water ports has increased by 7.6 percent between July 2013 and February 2014, as compared to fiscal year 2013, with all major cargo sectors contributing to the growth. This includes an increase in roll on/roll off (ro/ro) cargo (5.6 percent) and bulk cargo which includes agricultural products (up 6.6 percent). GPA identified that seaports handled the highest volume of containerized cargo for February, an increase of 2.6 percent. Break bulk cargo also saw an increase of 8.8 percent.⁵⁸ These increases are supported by the GPA's investment in port infrastructure. Ahead of the expansion of the Panama Canal, the Port of Savannah has already acquired several Post- and Super Post-Panamax cranes to handle the larger size of the new container ships. In addition, the Savannah Harbor Expansion Project will increase channels depths for the seaport by five feet, from 42 to 47. Improvements to port infrastructure and the deepening of channels are critical to take advantage of the Panama Canal expansion. Carriers and their shipper customers will use the larger ships to help decrease logistics costs, a focus also found in the trend towards near-sourcing today.

To keep the Savannah region and the Port of Savannah competitive, a focus must be maintained on providing needed improvements to the roadway and freight rail system connecting the Port to its markets.

⁵⁸ Georgia Port Authority. March 24, 2014. Press Release: GPA Achieves 6 Percent Container Growth.

6. FREIGHT TRENDS, NEEDS, ISSUES, AND DEFICIENCIES

6.1 Freight Infrastructure

6.1.1 Rail System

Deficiencies exist in the rail infrastructure, such as substandard weight limits and vertical clearances. Through research for the area, needs were determined and validated in the Georgia Statewide Freight & Logistics Plan. One of the short lines needs to be upgraded in order to carry 286,000 pounds, the same as the Class I rail lines. Jointly with improving the weight limits, increasing the vertical clearances to current standards - 22 feet and 6 inches - would allow the rail system to accommodate stacked containers. The vertical improvement projects include both Class I and short lines but pose challenges with roadway obstructions such as bridges. Improvements could be made to the actual track in order to accommodate additional rail traffic. Double tracking allows for increased traffic, shorter delays, and mixes of types of rail to work together.

6.1.2 Air Cargo

Congestion has been the leading issues in air cargo service, according to the Georgia Statewide Freight and Logistics Plan and Savannah / Hilton Head International Airport Commission reports. Therefore, infrastructure in and around the airport needs to be improved to help this effort. The roadway from the Savannah / Hilton Head International Airport to the Port of Savannah experiences traffic congestion, such as those on SR 307. This will be a continuing problem with truck traffic projected to increase from the port to the airport. The Port of Savannah has aided congestion relief in this area by completing the “Last Mile Project” or Jimmy DeLoach Extension that connects the port to the interstate system. Although the capacity at the airport is sufficient to handle additional cargo increases, there is a need to lengthen the runways.

6.1.3 Maritime Transport System

As capacity is expected to increase, the Georgia Ports Authority is planning for growth through port expansions. For example, the Savannah Harbor Expansion Project (SHEP) involves the deepening of 32 miles of the Savannah channel to 47 and 48 feet for both of the terminals. This project also includes new infrastructure and equipment such as enlarging the Kings Island Turning Basin or additional super post-panamax cranes. The Georgia Ports Authority has begun implementing this project. This project would allow the Port of Savannah to accommodate the larger ships that may pass through the new Panama Canal.

Existing infrastructure needs to be improved for both rail and truck. Rail connectivity is vital to the success of the Port of Savannah since two major Class I railroads are connected to the port. For trucking services, as stacked containers continue to get larger, the port will have to find a way to deal with their storage and have them ready for transport.

The relationship between transportation connections to port needs to be improved. State and federal funding can improve linkages with highways and rail. In general, the Port of Savannah is underutilized. Some contributing factors could be that the port has a constrained schedule for trucks to pick up containers and loads, and that the dedicated overland routes to move heavy loads from the port are limited. Investments to the port can lead to an inclusive freight strategy. Overall, maintaining and improving the communication between all agencies will aide in gaining further perspectives and improving agency response time to ongoing port issues.

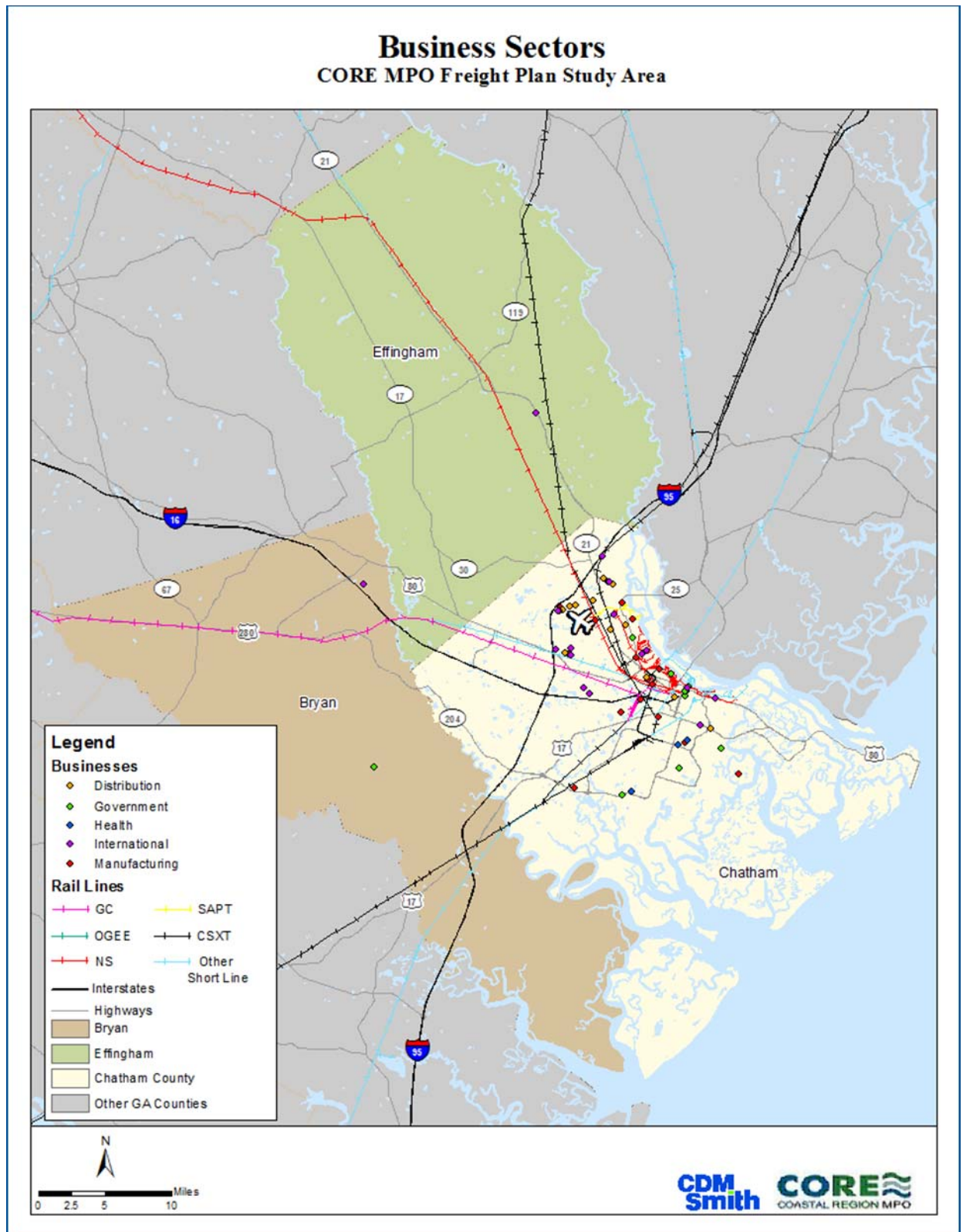
6.2 Freight Generators

The need for modal availability and access are determined by the presence of local freight generators and driven by their specific supply chain needs. These generators are comprised of the various types of businesses which could be present in a region. These businesses in turn can be categorized within business sectors, each reflecting a particular commodity, production volume, customer designated service or coverage area, and cost structure. All of these considerations contribute to the modal preference present in their supply chains.

Supply chain modal needs vary with the commodity type. In illustration, a business sector catering to the high technology field, e.g. computers, medical devices, will be influenced by the high value of their inbound parts and outbound finished goods. Since all or part of these have very high carrying costs or have the capacity to capture a large percentage of a company's cash holdings until the product is sold, speed and reliability of transportation becomes a dominant concern. The servicing transportation mode in this instance may be air cargo, where high levels of reliability and speed are the dominant characteristics, when compared to other modes.

Recognizing the need to associate modal availability and access with business sector supply chain needs, this section will identify the significant freight generators within the study area. These generators are categorized within five business sectors: Distribution, Government, Healthcare, Manufacturing, and International. **Figure 6-1** illustrates those identified generators across all five sectors. Each sector will be discussed in detail in subsequent sections.

Figure 6-1: Business Sectors



6.2.1 Distribution

Inclusive of several distinct categories, the distribution sector is generally defined as including finished goods warehouses, parts or sub-assembly distribution centers, and transload facilities. This latter category exists to transfer goods between ocean going containers and the other modes equipment, e.g. trailers, aircraft cargo containers. Transloading capacity will continue to increase in coastal areas as container owners restrict inland transport of the physical container to locations immediately adjacent to the port.

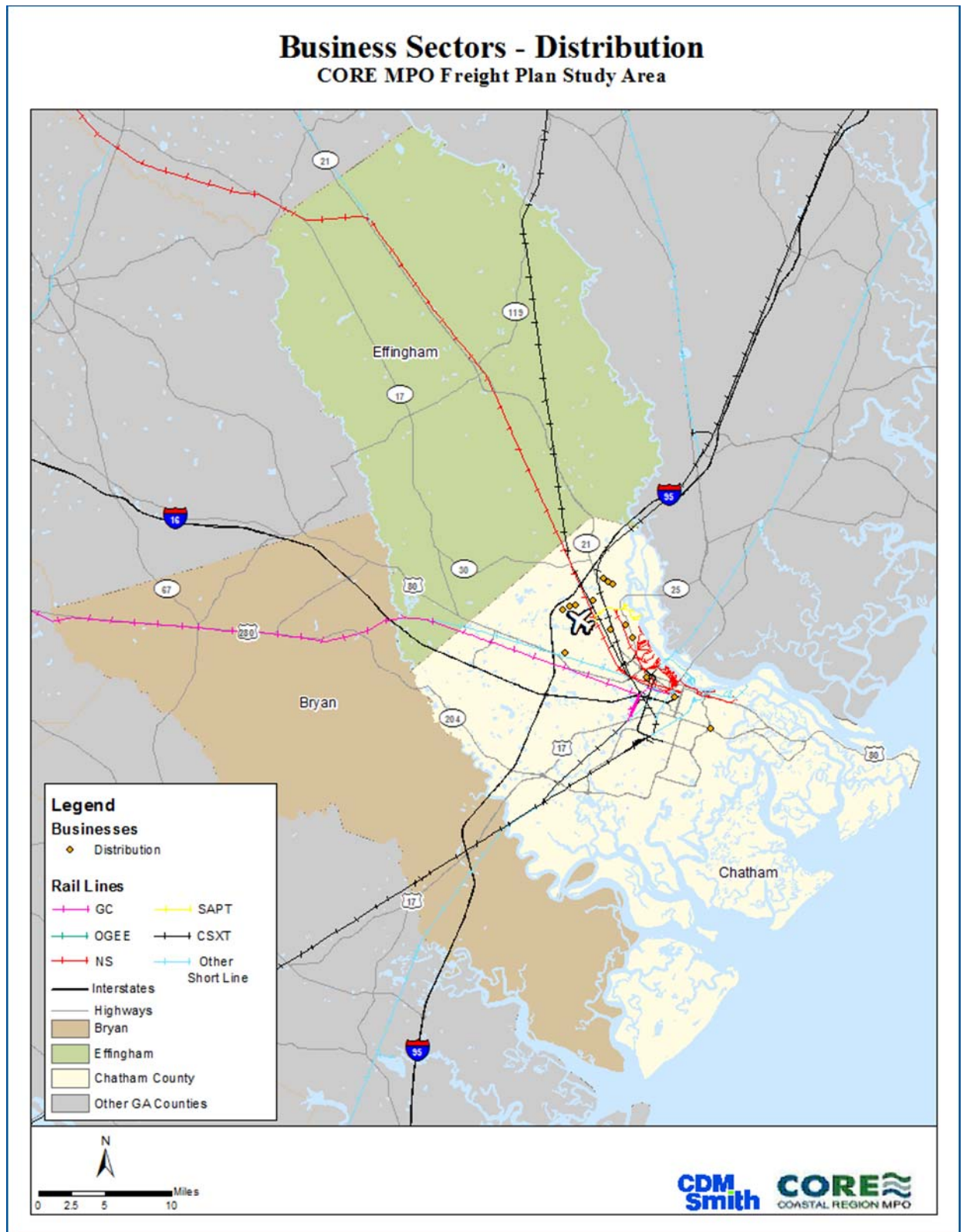
There are nine companies operating distribution facilities in the study area with employee counts of over 100 as reported in October 2011. These companies are listed in **Table 6-1** and their locations are shown in **Figure 6-2**. Many of these locations are between the port and the interstate facilitating access to other markets.

Table 6-1: Distribution Companies with 100+ Employees

Company	Product/Service	Employment
The Home Depot	Home improvement supplies	440
Dollar Tree Stores	Assundry product distribution	229
Coca-Cola Bottling Company United	Soft drink/water bottling warehouse	211
Target	Assundry import center	160
Pier 1 Imports	Household goods	150
Schneider	Warehousing, distribution, export packaging	150
CalCartage	Warehousing for K-Mart	140

Source: CDM Smith, www.seda.org, February 27, 2013

Figure 6-2: Business Sector Distribution



6.2.2 Government and Military

Government, more specifically educational facilities, and military installations generate a significant volume of goods at an inbound and outbound level. Text books, general supplies for schools and the variety of goods, e.g. food products to military hardware, are necessary to sustain operations on a daily and annual basis.

Significant employers, with employment counts of 500 or more, are listed in **Table 6-2** and identified by specific or “central office” locations in **Figure 6-3**.

Table 6-2: Government/Military Organizations with More than 500 employees

Company	Product/Service	Employment
Ft. Stewart/Hunter Army Airfield	Civilian personnel	4,719
Savannah-Chatham County Board of Education	Public schools	4,600
City of Savannah	Government	2,500
Savannah College of Art & Design	Education	1,750
Chatham County	Government	1,500
Georgia Ports Authority	Ship terminal operation	973
Armstrong Atlantic State University	Education	613
US Army Corp of Engineers	Civil Engineering	600
Savannah State University	Education	527

6.2.3 Healthcare

Large healthcare centers require a small to medium volumes of goods on a continuous and regular basis. These generators do not generally employ large vehicles or transport methods. Though this is the case, the continuous flow of goods and the immediate need of many of those trips require consideration in a discussion of freight transportation systems.

The significant healthcare employers are listed in **Table 6-3** and identified by specific location in **Figure 6-4**.

Table 6-3: Significant Healthcare Employers

Company
Memorial Health University Medical Center
St Joseph Hospital Campus
Candler Hospital Campus

Source: CDM Smith, www.seda.org, February 27, 2013

Figure 6-3: Government /Military

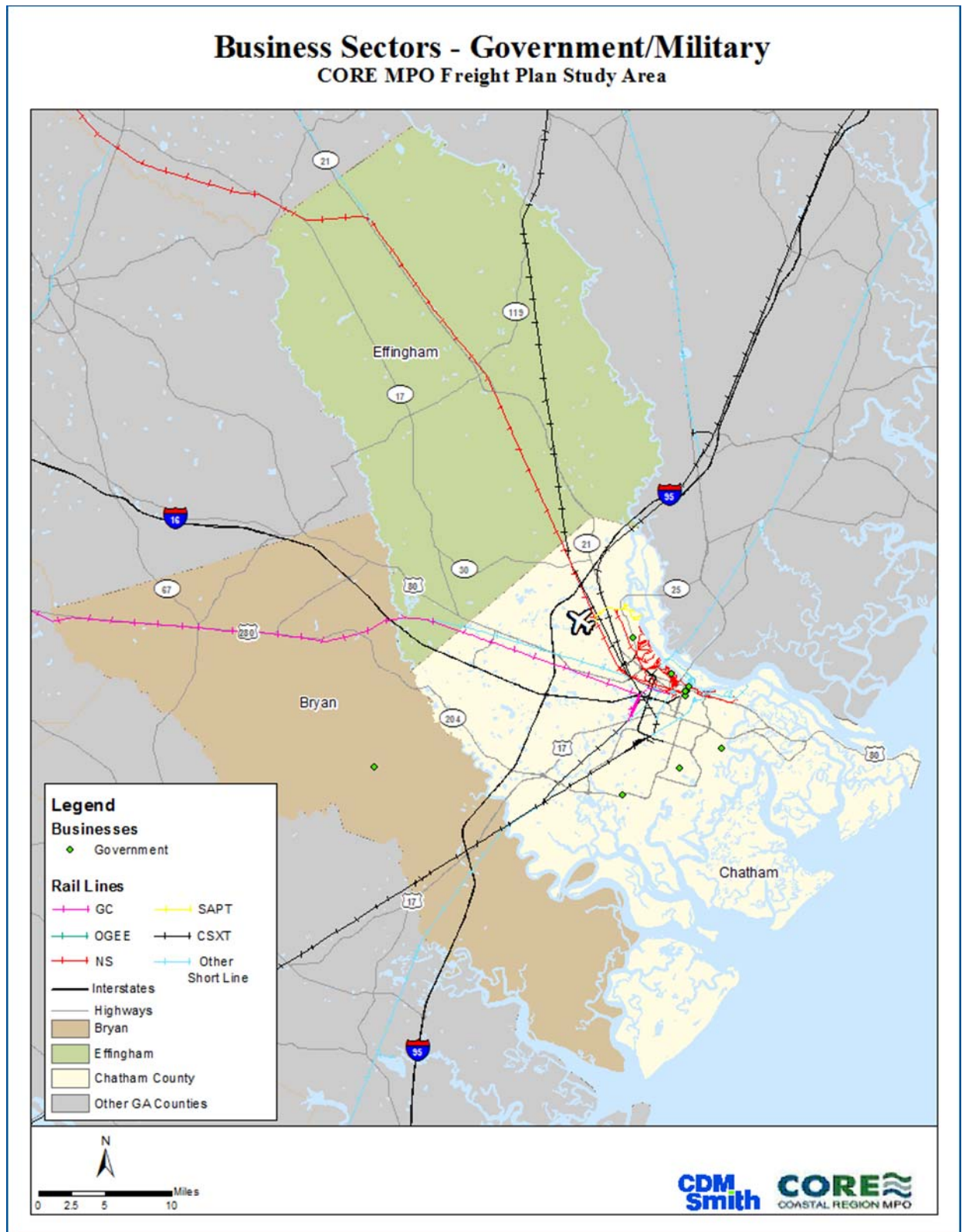
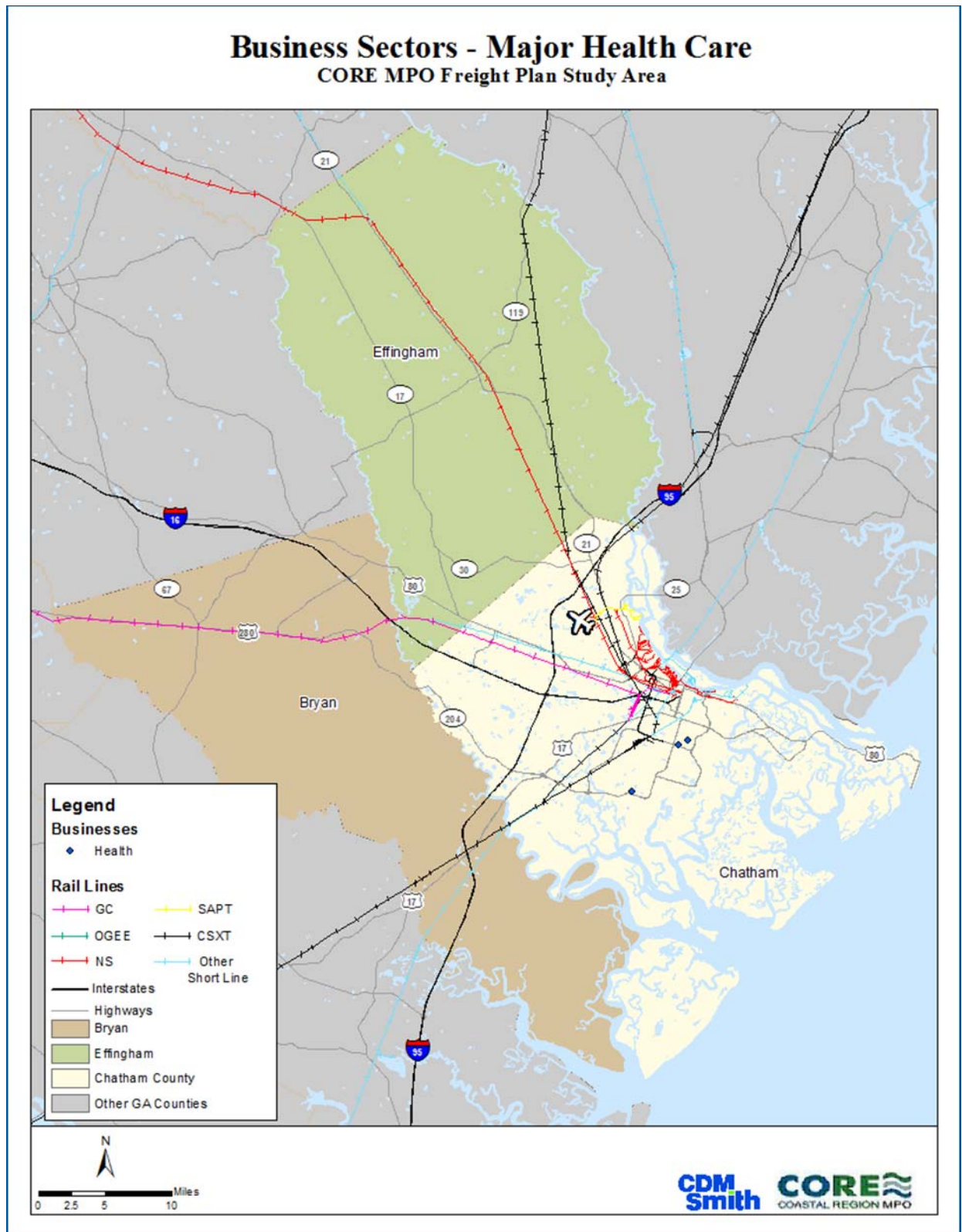


Figure 6-4: Healthcare Locations



6.2.4 International

The increasing importance of international business in the local economy generates the need for goods from professional sustainment, e.g. office supplies, to the potential for import-export activities. As this sector continues to increase, identification of those freight generators is germane to a continuing effort of analysis.

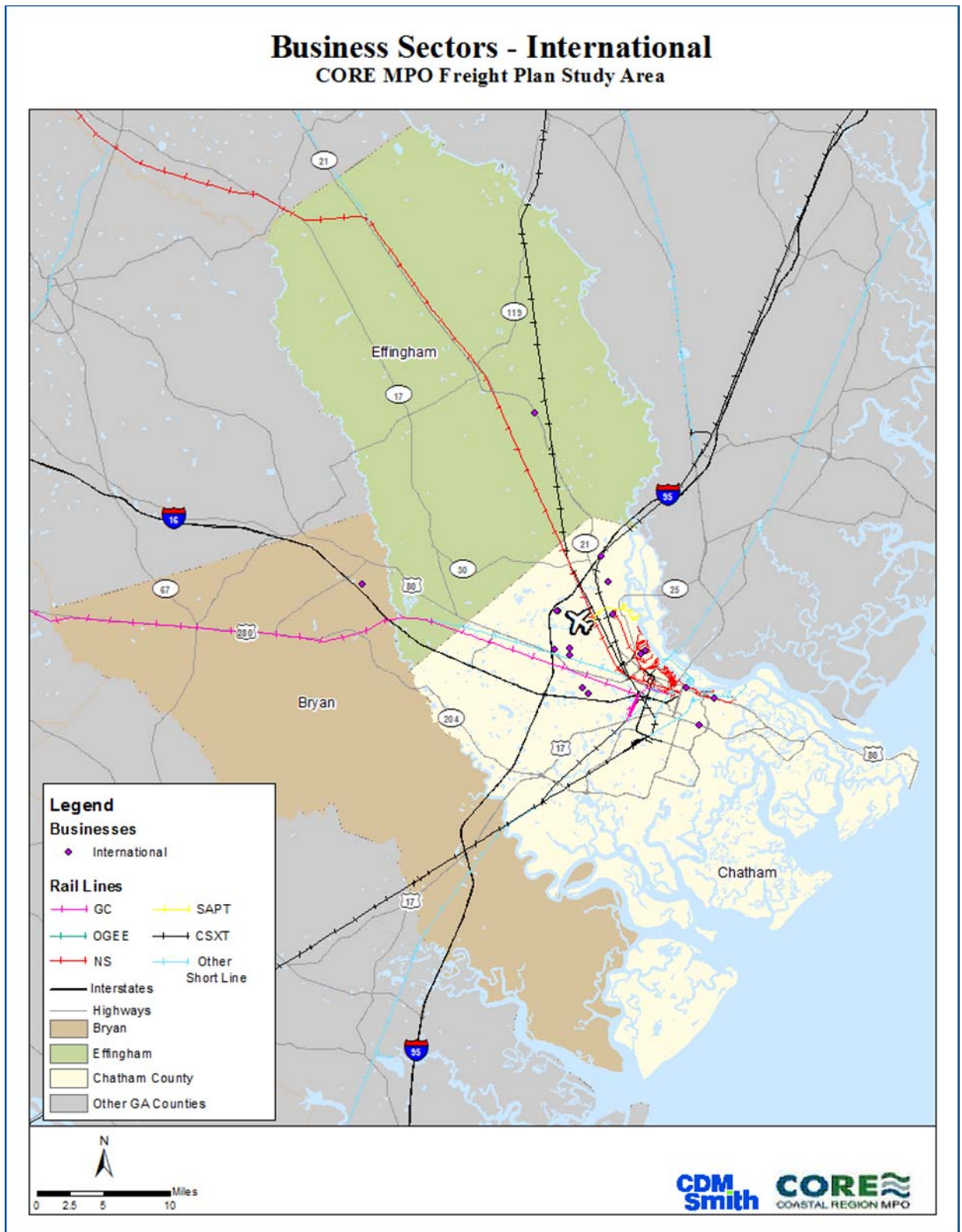
Significant international employers are listed in **Table 6-4** and identified by specific location in **Figure 6-5**.

Table 6-4: Significant International Employers

COMPANY	Country	Description
BASF	Germany	Chemical- Manufacturer
Coby Electronics	China	Electronics - Warehousing
DIRTT	Canada	Movable internal walls- Manufacturer
Douglas Brothers of Georgia	Canada	Fabricated Structural Metal Manufacturer
EFACEC	Portugal	Power Transformer - Manufacturer
EMD Chemicals	Germany	Chemical- Manufacturer
Fuji Vegetable Oil Co.	Japan	Vegetable Oil Manufacturer
IKEA	Sweden	Commodity & Merchandise- Warehousing
JCB, Inc.	UK	Excavating Equipment- Manufacturer
Kerry Ingredients & Flavours	Ireland	Food Processing
Lummus Corporation	Switzerland	Cotton Ginning Equipment- Manufacturer
Maersk Sealand	Denmark	Public Finance Activities
Mitsubishi Power Systems	Japan	Gas Turbine Manufacturer
Mitsui-Soko	Japan	Electronics - Warehousing
Nippon Express USA, Inc.	Japan	Freight Forwarding
Noritake Co., Inc.	Japan	Warehousing & Storage
Oracal USA	Germany	Adhesive Film - Manufacturer
Vopak	Netherlands	Public warehousing
Wallenius Wilhelmsen Logistics	Norway	Transportation and Logistics

Source: CDM Smith, www.seda.org, February 27, 2013

Figure 6-5: International Business Locations



6.2.5 Manufacturing

From light to heavy industrial and manufacturing activities, this sector represents the traditional freight generator. This sector has the potential to span the entire supply chain from raw materials, through sub-assembly, to final assembly or product manufacturing. There are twenty identified organizations in this sector with an employee count exceeding 100, as reported in October 2011.

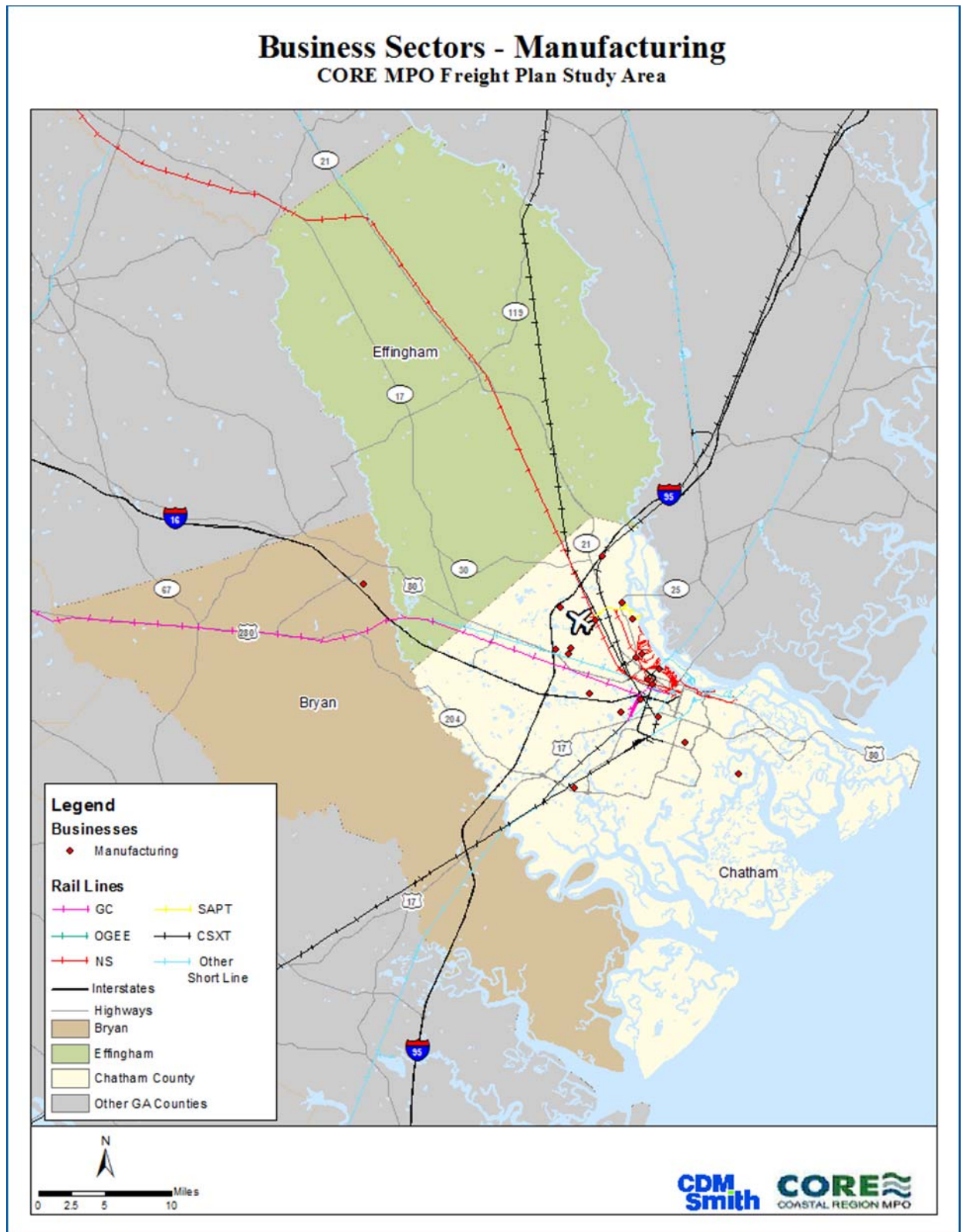
Significant employers are listed in **Table 6-5** and identified by specific location in **Figure 6-6**.

Table 6-5: Manufacturing Employers with Greater than 100 Employees

COMPANY	Product/Service	Employment
Gulfstream Aerospace Corporation (Direct & Contract Workers)	Jet aircraft, aerospace equipment	8,406
International Paper	Paper products, chemicals, corrugated containers	650
JCB Americas, Inc.	Construction equipment	558
Imperial Sugar	Refined Sugar	450
Brasseler USA, Inc.	Dental Instruments	400
Mitsubishi Power Systems Americas, Inc.	Gas turbines and steam turbines used by power plant	315
Weyerhaeuser	Bleached pulp	300
Derst Baking Company	Bread, rolls, cakes	275
Diamond Crystal Brand	Salt, Pepper, Sugar Packaging	250
Roger Wood Foods	Smoked sausage and meats	220
Kerry Ingredients & Flavours	Formulation, manufacture, & containerization of technology-based ingredients, flavors & integrated solutions	200
Savannah Morning News	Information company - paper and pixels	200
Arizona Chemical	Specialty Resins & pine-based chemicals	175
EMD Chemical	Industrial Pigments	154
Oracal, USA	Adhesive film	137
Coastal Concrete SE, LLC	Ready mix concrete	125
Intercat	Catalyst production	120
GAF Materials Corporation	Residential and commercial rolled roof manufacturer	113
Fuji Vegetable Oil, Inc.	Cooking Oils	105
DIRTT Environmental Solutions	Modular internal walls for residential, commercial and industrial buildings	100

Source: CDM Smith, www.seda.org, February 27, 2013

Figure 6-6: Manufacturing Locations



6.3 Safety and Security

6.3.1 Crash Hot Spots Analysis

Safety “hot spots” are locations with high truck crashes or rail related accidents such as rail-roadway at-grade crossings, roadways having design deficiencies, and roadways having operational issues. The GDOT statewide crash data from GEARS (Georgia Electronic Accident Reporting System) was retrieved from 2008 through 2012 in order to identify crash density and hot spot segments in the study area. The dataset specifically pertains to crash accidents involving commercial and non-commercial vehicles, and contains relative information (e.g., location of accident, accident type and severity). Data from the Federal Railroad Administration (FRA) Office of Railroad Safety was also obtained for accident information on national railroad lines and highway-rail crossings. **Table 6-6** shows the totals for fatalities, injuries, and total incidents recorded in this database for each year.

Table 6-6: Incidents Involving Trucks in the Study Area – 5 Year Totals

County	2008			2009			2010			2011			2012		
	Fatalities	Injuries	Total Incidents	Fatalities	Injuries	Total Incidents	Fatalities	Injuries	Total Incidents	Fatalities	Injuries	Total Incidents	Fatalities	Injuries	Total Incidents
Bryan	-	14	50	1	17	52	1	25	55	4	27	64	2	17	43
Chatham	5	16	62	2	14	49	9	12	43	2	12	55	5	12	53
Effingham	1	40	51	1	8	23	2	26	31	2	27	42	-	12	26
Study Area Total	6	21	72	4	16	57	12	17	52	8	17	65	7	15	60

Source: GDOT

The identification of hot spot locations was derived from an understanding of the overall crash density and a ranking of the individual roadway segments based on crash characteristics. The ranking of roadway segments was derived from the average of two categorical scores—the first score is based on type and count thresholds for accidents occurring on the segment, and the second score is based on the facility type of the given segment. Each of these categorical scores ranges from 1 to 4, with 4 being the most severe situation. For example, a roadway segment that is classified as a U.S. highway may have experienced one injury accident during the time period under study. Using the crash severity index criteria shown in **Table 6-7**, the ranking for this segment would be 2.5 (e.g., $[2+3]/2$), which is moderate. The highest crash totals among the highest severity index scores assisted in determining the top ten hot spot segments. **Table 6-8** shows the top ten hot spot segments. As shown in **Figure 6-7**, the hot spot segments fall within areas of high accident density and thus, are considered excessively unsafe locations along the freight network.

Table 6-7: Crash Severity Index Criteria Chart

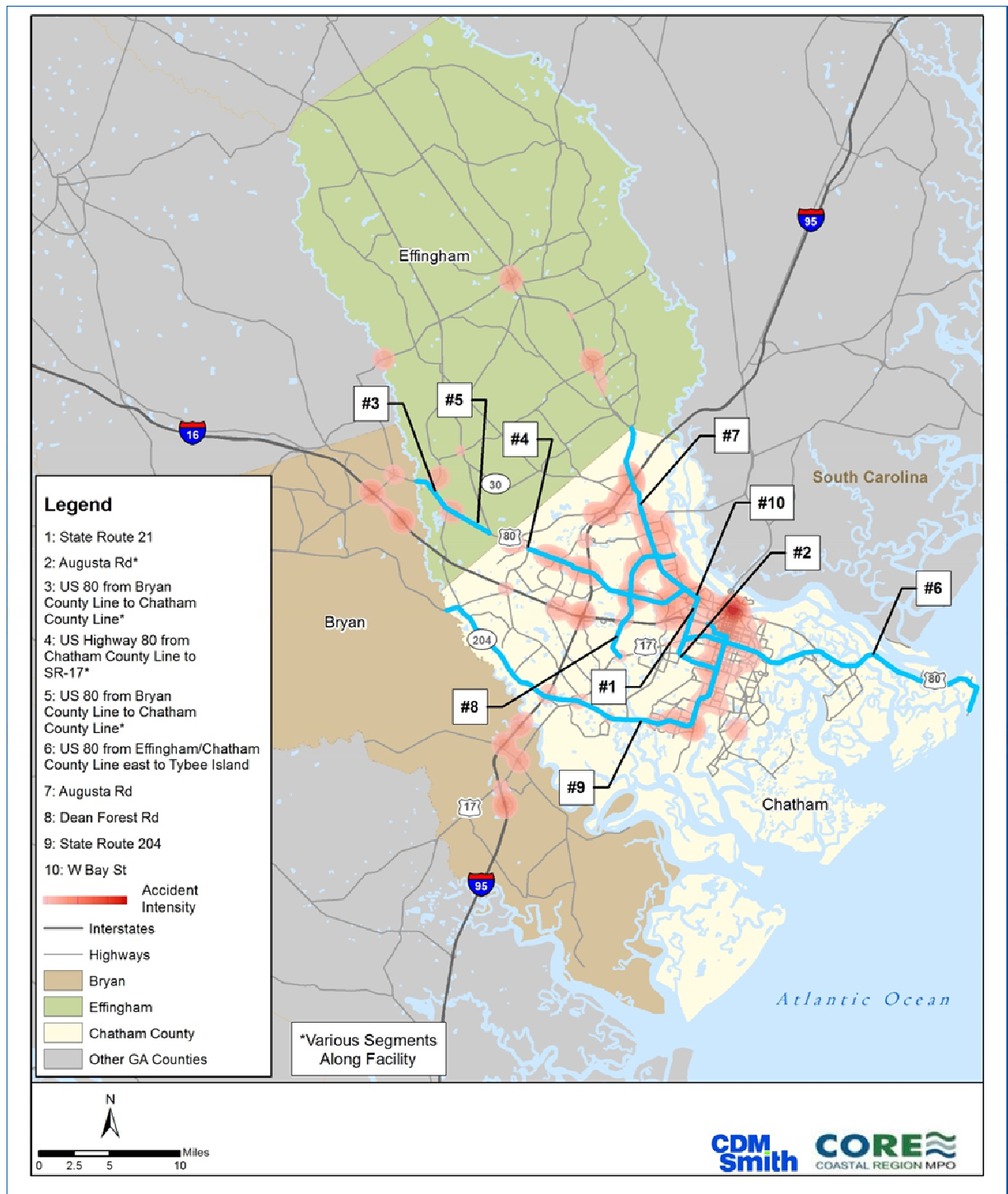
Rating	Crash Severity	Facility Type (FC)
1	PDO, 0 Fatalities, 0 Injuries	FC Lower than State Highway
2	0 Fatalities, 1 Injury	State Highway
3	0 Fatalities, >= 2 Injuries	US Highway
4	>= 1 Fatality	Interstate

Table 6-8: Top Ten Hot Spot Locations

Rank	Segment Name	Scoring	Notes
1	Augusta Rd/GA-21	3.5, 184 crashes on-segment. See *Note	Burnseed Blvd to Mildred St
2	Augusta Rd/GA-21	3.5, 184 crashes on-segment. See *Note	Burnseed Blvd, east to GA-17 Intersection
3	US 80	3.5, 10 crashes on-segment	US 80 from Bryan County Line to Chatham County Line
4	US 80	3.5, 5 crashes on-segment See *Note	US 80 from Chatham County Line to SR-17
5	US 80	3.5, 2 crashes on-segment	US 80 from Bryan County Line to Chatham County Line
6	US 80	3.0, 184 crashes on-segment	US 80 from Effingham/Chatham County Line east to Tybee Island
7	Augusta Rd/GA-21	3.0, 184 crashes on-segment	From Chatham County Line to intersection with Main St (GA-25)
8	SR 307/Dean Forest Rd	3.0, 109 crashes on-segment	From Ogeechee Rd (US-17) to Main St (GA-25)
9	State Route 204	3.0, 64 crashes on-segment	From Bryan/Chatham County Line to intersection with Ogeechee Rd (GA-25)
10	West Bay St	3.5, 184 crashes on-segment. See *Note	W Bay Street at the I-516/GA-25 Intersection

**Note – The crash dataset reported 184 crashes at a single location on the LRS network. Upon discussion this anomaly was attributed to data entry routines on the part of police/first responders. Since S Coastal Highway and Augusta Rd share an identical RCLINK segment identifier in the GDOT LRS, both segments inherited an identical crash count. Ranking between these particular segments was determined on the basis of shortest segment length; the theory being that if equal portions of 184 crashes were applied to each segment, S Coastal highway would have a higher crashes-per-mile. However, this distinction is tenuous and is essentially a means to avoid a perpetual tie for first place.*

Figure 6-7: Crash Location Density and Top Ten Hotspot Segments



6.3.2 Potential Crash Hot Spot Locations from Freight Advisory Committee

At the first Freight Advisory Committee (FAC) Meeting in May 2014, meeting participants were shown the Crash Intensity map illustrated in **Figure 6-7** and asked to comment if this map was accurate and what other crash locations should be added as potentially hazardous locations for freight movements. The participants identified additional locations for consideration as identified in **Table 6-9**.

Table 6-9: Freight Advisory Committee (FAC) Identified Crash Locations

Locations	Comments
I-16 at Chatham Parkway	Crashes during the PM period
US 80 and SR 307	
I-95 at Jimmy DeLoach Parkway	Speed and geometric configuration of the segment
Rail Crossings along SR 21	Need roadway/rail grade separation
I-16 at SR 307	Geometry issues and congestion leading up to the intersection
Telfair and SR 307/Dean Forest Road	School zone with young drivers crossing traffic on Dean Forest Road, and speed and light issues from I-16 interchange
SR 21 Corridor	Multiple locations along the corridor are a concern

6.4 System Capacity

6.4.1 Traffic Count Data

Traffic count data is collected at numerous locations around the state by GDOT and is accessed through a web portal on GDOT's website. There are three types of count stations: continuous, short, and Weigh-In-Motion (WIM). The continuous count stations can supply hourly counts for a 24-hour continual loop. The short count station can also provide hourly counts, but for a short duration. Both count station types are used to calculate average annual daily traffic (AADT). Some of the count locations are capable of collecting more detailed information such as vehicle classification. WIM (weigh-in-motion) device can electronically detect vehicle types along with count data; however, there are no WIM stations located within the study area. **Table 6-10** displays the traffic counter information for the study area.

Table 6-10: Study Area Count Stations

County	Continuous	Short	WIM
Chatham	19	594	0
Effingham	0	94	0
Bryan	3	75	0

Source: GDOT

The traffic count data (accessed through the GDOT web portal) will be used to validate the hot spots and the FAF disaggregation results, where applicable.

Real-time traffic reports are available on the GDOT website. The mapping technology allows for the identification and assessment of count locations and bridges on specific routes. While there is

some information available in the identification display tool, more detailed information will be accessible through the other tools or the National Bridge Inventory (NBI) database.

6.4.2 Network Bottlenecks

A bottleneck is a roadway segment with particular and significant negative impacts on freight network performance. Bottlenecks are generally locations where capacities are inadequate to handle traffic flows, which impact the performance of freight network segments. Congestion, or the queuing/delay of freight movements, reduces the performance and dependability of the freight network in terms of serving freight traffic flows. The most critical bottlenecks were identified along the network. Information describing the performance and dependability of existing infrastructure along the freight network assists decision-makers in identifying problem areas where delays in freight movement originate. Positive identification of delay-prone network segments promotes better prioritization of freight investment.

It should be understood that the current method for identifying bottlenecks will be modified in the future. Moving Ahead for Progress in the 21st Century (MAP-21) contains several directives for the federal government to establish for the national transportation network. A primary directive of MAP-21 is the establishment of a performance-based and outcome-oriented program to assess transportation efficiency and effectiveness which would provide solutions consistent with achieving federal goals to improve the national transportation network. This includes the development of performance measures for freight transportation. The measures and targets used to identify bottlenecks for freight transportation must be consistent with federal freight performance measures. As MAP-21 guidance in regards to freight transportation performance was not available at the time this study was completed, they were not included in our methodology. Future iterations of this bottleneck identification analysis should incorporate available MAP-21 guidance.

In order to determine bottlenecks in the study area, congested segments were ranked in terms of its potential to disturb efficient operation of the network. This selection methodology was based on the following:

- Available GDOT time-congestion grades;
- Three-hour assessment timeframe for each AM and PM peak hour period;
- Traffic direction;
- Level of service (LOS) grade to determine quality of roadway traffic conditions; and,
- Weighted values according to the Average Annual Daily Traffic (AADT) on the roadway segment over the course of a 24-hour period.

Four categorical values for measuring congestion were associated with segments following application of the bottleneck analysis. The congestion intensity categories include: AM Congestion, AM Marginal Congestion, PM Congestion, and PM Marginal Congestion. For the purposes of this study, the highest severity segments were classified as “Congested” with lesser but still significant segments classified as “Marginally Congested.”

As shown in **Tables 6-11, 6-12, 6-13 and 6-14**, the Congestion categories can occur in any combination of Congested/Marginal with respect to AM/PM travel periods. Following this logic, the worst possible situation for a bottleneck segment is Congestion occurring in both the AM and PM timeframes, shown in **Table 6-11**, which amounts to significant congestion experienced throughout the entire day along the segment.

Table 6-11: AM Congestion with PM Marginal Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	Fort Argyle Rd/Abercorn St	"F" for both Eastbound and Westbound Segments	From Sweetwater Station Drive to King George Blvd. This is the only facility showing AM Congestion and PM Marginal Congestion in study area.

Table 6-12: AM and PM Marginal Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	US 80	"D" for Eastbound and "E" for Westbound	From Dean Forest Rd to Griffin Ave. This is the only facility showing AM and PM Marginal congestion in the study area.

Table 6-13: AM Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	Diamond Cswy	"F" for Northbound and "D" for Southbound	From Ferguson Ave to Pin Point Ave
2	Ferguson Ave	None Available	From Pin Point Ave to Diamond Cswy
3	Fort Argyle Rd	"F" for Eastbound and Westbound	From Ford Ave to Sweetwater Station Drive
4	I-16 Eastbound	"F" and "E" for Eastbound Segments	12 Segments included; From Pooler Parkway to I-95
5	I-16 Eastbound Ramp	"F" and "E" for Eastbound Segment	Ramp to Eastbound I-16 at Dean Forest Road

Table 6-14: PM Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	Abercorn St	"E" Eastbound and Westbound	From Janet Dr to East DeRenne Ave
2	Augusta Rd	"F" Northbound and Southbound	From Hendley Rd to I-95 NB Onramp
3	I-95 Offramp	"A" and "B" for ramp segments	At Exit #109 to Augusta Rd
4	Ogeechee Rd	"D" and "F" for Eastbound and Westbound segments	Chatham Parkway to Red Gate Farms Rd
5	Waters Drive	"E" for Northbound and "C" for Southbound	From Althea Pkwy to E DeRenne Ave

The lowest performing segment in the study area, Fort Argyle Road from Sweetwater Station Drive to King George Blvd, showed AM Congestion with PM Marginal Congestion. The second lowest performing segment, US 80 between Dean Forest Rd and Griffin Ave, showed both AM and PM Marginal Congestion (Marginally Congested all day).

To provide a simple bottleneck severity ranking, segments analyzed considered AM/PM congestion and marginal congestion characteristics, and were grouped into the output classification of the roadway segments is displayed in **Figure 6-8**.

6.4.3 Potential Bottleneck Locations from Freight Advisory Committee

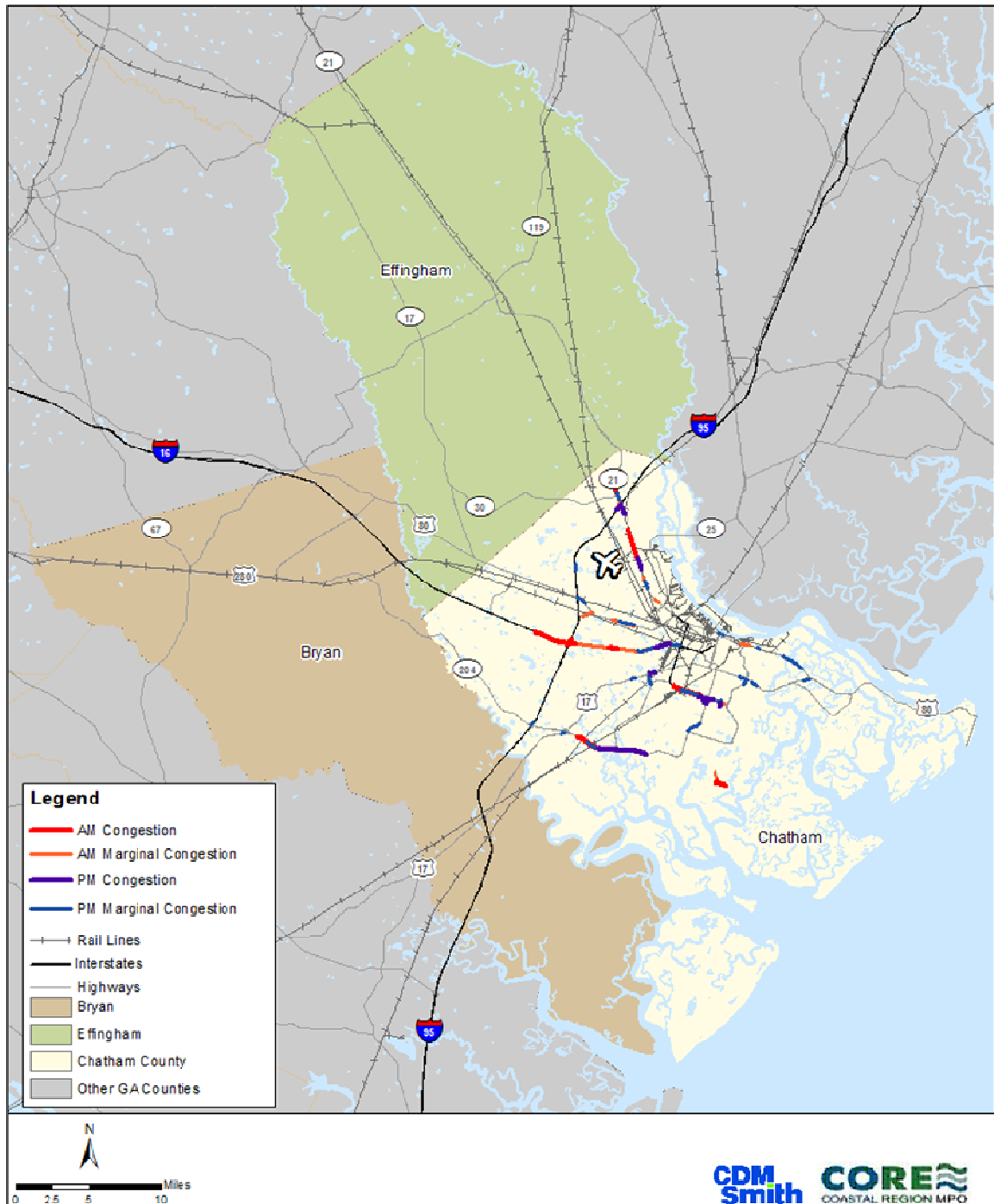
At the first Freight Advisory Committee (FAC) Meeting in August 2014, meeting participants were shown the Bottleneck map illustrated in **Figure 6-8** and asked to comment if this map was accurate and what other segments with congestion should be added as potential bottleneck locations for freight movements. The participants identified the following additional locations for consideration which are shown in **Table 6-15**.

Table 6-15: Freight Advisory Committee (FAC) Identified Bottleneck Locations

Location	FAC Comments
SR 307 to I-16	Main Port Authority Route
SR 307 to SR 21 to Jimmy DeLoach Pkwy to I-95	Main Port Authority Route
Brampton Road route to I-516	Main Port Authority Route
US 17 through Richmond Hill	
I-516 Corridor	Obsolete Design Standards
Pooler Pkwy/Airways Ave @ I-95	Potential Outlet Mall Development
	Mix between retail and freight traffic near Gulfstream Road
	Signal timing issue along Service Road (I-95 is city boundary for signal ownership)

Figure 6-8: Bottleneck Locations throughout the Study Area

Bottleneck Locations CORE MPO Freight Plan Study Area



7. FREIGHT PERFORMANCE MEASURES

7.1 Next Planning Steps

There is a growing national focus on using performance measures to inform decision making, improve accountability, and respond to stakeholder demands for transparency. The development of freight performance measures is the next critical step in achieving the tools necessary to effectively identify private sectors trends, needs, and challenges.

Freight performance measurements serve the following three functions:

- 1) Plan Development – Provide a means to quantify the performance of the transportation system in accommodating safe and efficient freight movements, and guide decisions on freight-related investment strategies during the planning process.
- 2) Plan Implementation – Emphasizing agency goals and objectives and integrating them into budgeting, program structure, project evaluation/prioritization, and program implementation policies.
- 3) Accountability – Facilitate tracking and reporting on system performance relative to plan goals and objectives to support accountability for effective plan implementation and results.

The freight performance measures will be developed within the context of the goals established in the Chatham County-Savannah Tricentennial Comprehensive Plan and the CORE MPO 2035 Long Range Transportation Plan (LRTP) Framework Mobility Plan.

7.2 Existing Measures

Performance measures are indicators that quantify progress toward attaining the goals and objectives set by a transportation agency. Many transportation agencies have established performance measure systems to track overall system performance, but efforts to look specifically at freight performance are often still under development. Freight performance measurement is improving, however, as state and national efforts to define freight measurement evolve. The following section summarizes some of these national and state-level efforts to establish and measure freight transportation performance.

7.2.1 National

MAP-21 requires the U.S. DOT to establish national measures for the performance categories shown in **Table 7-1** through a series of rulemakings that will have a single effective date. As identified previously, state DOTs and MPOs will be required to develop performance targets for these measures within one year of the final rulemaking.

Table 7-1: National Performance Measures Required under MAP-21

Program	Measure Category	States to Establish Targets:
National Highway Performance Program	Interstate Pavement Condition on the NHS	Within 1 year of final rule on national performance measures
	Non-Interstate Pavement Condition on the NHS	
	Bridge Condition on NHS (focus on SD)	
	Performance of Interstate System	
	Performance of Non-Interstate NHS	
Highway Safety Improvement Program	Serious Injuries per VMT	Within 1 year of final rule on national performance measures
	Fatalities per VMT	
	Number of Serious Injuries	
	Number of Fatalities	
Congestion Mitigation and Air Quality	Traffic Congestion	Within 1 year of final rule on national performance measures
	On-road mobile source emissions	
Freight Policy	Freight Movement on the Interstate	Periodically

Performance measures for freight developed by state DOTs and MPOs are required under MAP-21 to be consistent with established federal freight performance measures. This is important to consider federal guidance for freight to ensure future coordination and funding opportunities.

Pursuant to the federal surface transportation law, Moving Ahead for Progress in the 21st Century Act, or MAP-21, state DOTs and MPOs are required to set performance targets consistent with the established national performance measures for freight. Those targets are to be integrated within their planning processes to include long range transportation plans. These transportation agencies are also required to report their measured progress to the U.S. DOT. This federal requirement is connected to eligibility requirements under MAP-21 for increased federal funding shares for qualifying freight projects.

7.2.2 State

GDOT has identified performance measures for the goals and objectives within Georgia's SSTP, which are listed in **Table 7-2**.

Table 7-2: GDOT Performance Measures

Goal		Objective	Performance Measures
1	Supporting Georgia's economic growth and competitiveness	Improved access to jobs, encouraging growth in private-sector employment, workforce	Average number of workers that can reach a major employment center by auto in 45 minutes in the AM peak period*
			Average number of workers that can reach a major employment center by transit in 45 minutes in the AM peak period*
		Reduction in traffic congestion	Annual congestion cost per peak auto commuter*
		Improved efficiency, reliability of commutes in major metropolitan areas	Average work commute time*
			Daily average number of people traveling in HOT/express lanes during the weekday AM and PM peak periods*
			Daily average number of people taking rail trips during the weekday AM and PM peak periods*
		Efficiency and reliability of freight, cargo, and goods movement	Daily hours of truck delay on Georgia Interstates
		Border to border and interregional connectivity	Percent of population within 10 miles of a 4-lanes state or US route
		Support for local connectivity to statewide transportation network	Percent of state and federal transportation funds spent on local roads
2	Ensuring safety and security	Reduction in crashes resulting in injury and loss of life	Reduction in annual highway fatalities
3	Maximizing the value of Georgia's assets, getting the most out of the existing network	Optimized capital asset management	Percent of Interstates meeting maintenance standards
			Percent of state-owned non-Interstate roads meeting maintenance standards
			Percent of state-owned bridges meeting GDOT standards
		Optimized throughput of people and goods through network assets throughout the day	Metro Atlanta highway morning peak hour speeds*
			Metro Atlanta highway evening peak hour speeds*
			Average HERO response time*
			Percent of commute trips to major employment centers on transit*
4	Minimize impact on the environment	Reduce emissions, improve air quality statewide, limit footprint	Undetermined

*This measure is obtained only from the metropolitan Atlanta area.

7.2.3 CORE MPO

The transportation component of the Tricentennial Plan was based on the CORE MPO Framework Mobility Plan. The CORE MPO has identified performance measures associated with the goals and objectives within the CORE MPO 2035 LRTP Framework Mobility Plan, as well as the CORE MPO's Congestion Management Process (CMP). These goals and objectives and associated performance measures, as described in **Table 7-3**, were approved by the CORE MPO's Citizens Advisory Committee and Technical Coordinating Committee in 2009. The goals and objectives are consistent and further those of the Tricentennial Plan.

Table 7-3: CORE MPO Framework Mobility Plan

GOAL 1	Economic Activity: Support the economic vitality of the region, matching the community's goals, especially by enabling local, regional and global competitiveness, productivity and efficiency.	
	Objectives: <ul style="list-style-type: none"> Minimize work trip congestion Promote projects which provide the maximum travel benefit per cost 	Performance Measures: <ul style="list-style-type: none"> Project cost/vehicle miles of travel (VMT) Reductions in VMT Work trip vehicle hours of travel (VHT) Sustained or increased funding status Increased Sustainable development incorporating mixed-use, pedestrian-oriented design
GOAL 2	Safety: Ensure and increase the safety of the transportation system for all users, including motorized vehicles, bicyclists and pedestrians.	
	Objectives: <ul style="list-style-type: none"> Eliminate at-grade railroad crossings Minimize frequency and severity of vehicular accidents Minimize conflicts and increase safety for non- motorized users 	Performance Measures: <ul style="list-style-type: none"> Total accidents per million miles traveled, involving all user types Injury accidents per million miles traveled, involving all user types Fatal accidents per million miles traveled, involving all user types Implementation of transit and other safety projects Number of increased bike and pedestrian facilities Number of at-grade crossings reduced
GOAL 3	Security: Ensure and increase the security of the transportation system for all users, including motorized vehicles, bicyclists and pedestrians.	
	Objectives: <ul style="list-style-type: none"> Promote projects which aid in hurricane evacuation Adequately prepare for coordinated responses to incidents Monitor vulnerable infrastructure through visual and other inspection methods 	Performance Measures: <ul style="list-style-type: none"> Hurricane evacuation route status Improved emergency responses (e.g., ambulance travel times to hospitals) Maximize transportation system mobility during disruptive events (such as reductions in time to clear major crashes from through lanes) Reduction in vulnerability of the transportation system (such as implementation of monitoring infrastructure for major transportation system)

GOAL 4	Accessibility, Mobility and Connectivity: Ensure and increase the accessibility, mobility and connectivity options available to people and freight, and ensure the integration of modes, where appropriate.	
	Objectives: <ul style="list-style-type: none"> Minimize congestion delays Maximize regional population and employment accessibility Provide efficient and reliable freight corridors Minimize delays in corridors served by transit Encourage use of transit and non-motorized modes, focusing on areas with low rates of automobile ownership or high population of elderly and/or disabled populations Expand transit service area and 	Performance Measures: <ul style="list-style-type: none"> Base year vs. future year volume/capacity ratios for various modes Percent of population within ½ mile of transit route or facility connecting to regional activity center(s) Daily freight truck use/lane Operational performance of transit system (buses arriving/departing on schedule) Percent of population within ½ mile of bicycle facility connecting to regional activity center(s)
GOAL 5	Environment and Quality of Life: Protect, enhance and sustain the environment and quality of life, promote energy conservation and address climate change.	
	Objectives: <ul style="list-style-type: none"> Protect wetlands, historic resources, neighborhoods, recreational facilities and other important resources Support infill development Implement green infrastructure to reduce region's impact on storm water pollution and address potential impacts from a changing climate 	Performance Measures: <ul style="list-style-type: none"> Impacts to natural environment (such as rate of development of green space compared to the rate of green space preservation) Impacts to historic and cultural resources (such as the strengthening of regulations to protect historic and cultural resources) Strengthening of regulations promoting infill and brownfield development Project utilization of green infrastructure Vehicle miles of travel
GOAL 6	System Management and Maintenance: Assess the transportation system to determine what works well, what does not work well, and potential improvement options.	
	Objectives: <ul style="list-style-type: none"> Maximize efficiency of signalized intersections Expand use of Intelligent Transportation Systems (ITS) Continue existing levels of maintenance for highways and bridges 	Performance Measures: <ul style="list-style-type: none"> Average Daily Traffic (ADT) per lane Congestion Index (CI) Level of Service (LOS) ITS coverage of region Roadway pavement ratings and bridge sufficiency ratings Bicycle and pedestrian facility surface conditions Transit user satisfaction (such as reliability)
GOAL 7	Intergovernmental Coordination: Ensure coordination in the transportation planning process between intra- and inter-regional partners, including both state and local agencies.	
	Objectives: <ul style="list-style-type: none"> Enhance coordination between CORE MPO, Georgia Department of Transportation, County departments and City governments 	Performance Measures: <ul style="list-style-type: none"> CORE MPO represented at all project development meetings Establishment of coordination policies to promote communications between various agencies

Source: CORE MPO 2035 LRTP Framework Mobility Plan

The CORE MPO's CMP has two main goals which include: 1) identifying problem areas through the use of travel-time studies, and 2) presenting recommendations to improve the traffic flow on the transportation system as whole, as well as on specific corridors. To further these goals, the CMP also contains a set of identified performance measures, as listed below:

- Congestion Index;
- Approach Level of Service;
- Preservation of regional mobility through the implementation of alternative access improvements to enhance local mobility;
- Implementation of sustainable development through the incorporation of mixed-use, pedestrian-oriented design that helps to minimize trip length; and,
- Promotion of multimodal connectivity through the implementation of transit, bicycle, and pedestrian enhancements.

7.2.4 Other States

A number of states have already established freight performance measures, including Florida, Iowa, Minnesota, and Oregon. The performance measures specific to each of these states are listed in **Table 7-4**.

Table 7-4: Freight Performance Measure Examples from Other States

Florida	Iowa	Minnesota	Oregon
Truck miles traveled	Truck crash rates	Miles below 45 MPH during peak hour	Distance from CBD to international container port
Seaport truck equivalent units	Railroad crossing crashes	Hours of daily truck delay	Truck travel time index
Average truck travel speed	Derailments	Cost of truck delay	Percent of peak time aviation capacity use
Hours of truck delay	Percent of 40 mph track miles	Travel time reliability index	Number of rail safety incidents
Highway adequacy (Level of Service (LOS))	Percent of 286K lb track miles		Average lock delay per tow
Quality rail access	Rail ton miles/gallon of fuel		Rail ton-miles per track mile
Vehicles per lane mile congested	Travel times to major markets		Freight facilities/population
Travel time reliability index			
Tonnage			

7.3 Recommended Measures

7.3.1 Framework

The establishment of freight performance measures by the CORE MPO will assist with the planning processes including the CORE MPO 2035 LRTP Framework Mobility Plan updates and the CMP, by providing the link from the policies, programs, plans, and projects back to the goals and objectives used for the LRTP and CMP. Performance measures will allow the CORE MPO to actively track the performance of their area's freight network which will be critical for the identification of freight specific trends and challenges. Performance measures may allow the CORE MPO more flexibility while addressing the needs of its freight stakeholders and assist in communicating freight performance to external partners, e.g. GDOT. The measures will be most useful if they are appropriately tailored to the CORE MPO area. The considerations used for development of performance measures include:

- **Data availability** – the data and analysis tools needed for the measure should be readily available or easy to obtain. The data should be reliable, accurate, and timely.
- **Strategic alignment** – the measures should align well with the goals and objectives of the Chatham County-Savannah Tricentennial Comprehensive Plan, Georgia's SSTP, and the National Freight Policy.
- **Understandable and explainable** – the measures should be easy to understand and useful when communicating to external partners.
- **Causality** – the measures should focus on the items under the CORE MPO's span of control.
- **Decision-making value** – The measures should provide predictive, diagnostic and reporting value to agency decision makers.

It is recommended that the CORE MPO develop supplementary freight performance measures from existing performance measures identified within the CORE MPO 2035 LRTP Framework Mobility Plan and Congestion Management Plan. These performance measures are already in use with for the LRTP and CMP planning processes. **Table 7-5** provides an example of this as compared to the goals and objectives identified to further freight mobility under the Tricentennial Plan.

Table 7-5: Example Freight Performance Measures

Goals, Objectives, and Strategies		Example Freight Performance Measures from Existing MPO Measures	Example Freight Performance Measures from Other States
A	Objective 2, Strategy b	Increased sustainable development incorporating mixed-use, pedestrian oriented design Sustained or increased funding status	
	Objective 3, Strategy a	Operational performance of transit system Percent of population within ½ mile of transit route or facility connecting to regional activity center(s)	Freight facilities/population (Oregon)
B	Objective 1, Strategy a	Establishment of coordination policies to promote communications between various agencies and the public	
	Objective 1, Strategy c	Level of Service ADT per lane Congestion Index Project cost/vehicle miles of travel	Freight facilities/population (Oregon)
C	Objective 1, Strategy d	Increased sustainable development incorporating mixed-use, pedestrian oriented design Strengthening of regulations promoting infill and brownfield development Base year vs. future year volume/capacity ratios for various modes Level of Service Congestion Index	Travel time reliability index (Florida, Minnesota)
D		Percent of population within ½ mile of transit route or facility connecting to regional activity center(s) Operational performance of transit system Transit ridership	
E	Objective 1, Strategy a	Daily freight truck use/lane Level of Service ADT per lane Congestion Index Project cost/vehicle miles of travel	Seaport truck equivalent units (Florida)
	Objective 1, Strategy b	Base year vs. future year volume/capacity ratios for various modes Congestion Index	Truck miles traveled (Florida) Freight facilities/population (Oregon) Travel time reliability index (Florida, Minnesota)
	Objective 1, Strategy c	Total accidents per million miles traveled, involving all user types Implementation of transit and other safety projects Number of at-grade crossings reduced	Derailments (Iowa)
	Objective 1, Strategy d	Base year vs. future year volume/capacity ratios for various modes	Percent of peak time aviation capacity use (Oregon)
	Objective 1, Strategy e	Base year vs. future year volume/capacity ratios for various modes Congestion Index Daily freight truck use/lane ITS coverage of region Roadway pavement ratings and bridge sufficiency ratings	Hours of truck delay (Florida) Tonnage (Florida)
	Objective 1, Strategy f	Project cost/vehicle miles of travel Reductions in VMT Energy consumption trends	Quality rail access (Florida)
	Objective 2, Strategy a	Establishment of coordination policies to promote communications between various agencies and the public	
	Objective 2, Strategy b	Sustained or increased funding status	

This table contains a significant number of freight performance measures that the CORE MPO may choose from. Several states that have or are currently establishing freight performance measures may use as few as five or greater than ten. This is related to the previously mentioned considerations such as data availability and level of complexity. Understanding the parameters of a measure in relation to freight planning for the CORE MPO area is important. **Table 7-6** illustrates specific freight performance measures with their associated parameters by freight transportation mode.

Table 7-6: Example Freight Performance Measure Parameters

Mode	Example Freight Performance Measures	Parameters
Highway	Combination Truck Miles Travelled	Determined using combination truck traffic volume and segment length. Combination truck is defined as FHWA Classification 8-13.
	Truck Miles Traveled	Determined using truck traffic volume and segment length.
	Travel Time Reliability	Freight travel time reliability is defined as the percentage of travel that is greater than 45 mph on freeways.
	Combination Truck Average Travel Speed	The calculation of combination truck average travel speed is identical to the methodology for (passenger) vehicle's average travel speed, except that combination trucks are assumed to have a lower free-flow speed. The free flow truck speed is assumed to be equal to the speed limit.
	Vehicles Per Lane Mile	Vehicles per lane mile (freight) is calculated as the summation of each roadway segment's peak hour vehicle miles traveled divided by the number of lane miles.
Aviation	Tonnage	All air cargo landed at public airports.
Rail	Tonnage	Tons of freight carried by rail mode originated or terminated for a specific area.
Seaport	Truck Equivalent Units	Includes international and domestic waterborne cargo handled at both public and private terminals in port areas for a specific area.

Developing freight performance measures from existing measures as well as other documented measures will also ensure that tools used to analyze these measures are familiar and understandable to MPO staff. Examples of tools that can be used to analyze freight performance measures include benefit and cost analysis, scorecards, performance dashboards, data monitoring reports, and models. For example, for the Georgia Statewide Freight and Logistics Plan, GDOT utilized benefit and cost analysis, GDOT statewide travel demand model, and "off-model" analytical techniques as some of the tools for analyzing potential freight projects. The Florida Department of Transportation uses a combination of tools include a scorecard, quarterly performance reports, and customer satisfaction surveys.

7.3.2 Application and Implementation

Development and use of freight performance measures will identify areas of focus for planning and project purposes. Often, improvement needs are greater than available funding. The CORE MPO can use these performance measures to set performance targets which will be used to define acceptable levels of performance from the perspective of the decision maker and can be adjusted over time to reflect reasonable performance expectations in light of funding constraints. In

addition, these performance measures and their associated targets can then monitor the efficiency and effectiveness of the projects that have been prioritized.

Freight performance measures and their targets can be used in the CORE MPO's Framework Mobility Plan Needs Assessment process, which updates the LRTP. The needs assessment consists of a performance-based analysis of the existing CORE MPO area's transportation system to identify needs and deficiencies by mode. For example, the Georgia Statewide Freight and Logistics Plan has identified the deepening of the shipping channel for the Port of Savannah to increase utilization of the port and diversify its freight commodity flows to overall improve economic competitiveness. This can lead to impacts to the MPO's transportation system.

The CORE MPO can use performance measures such as Tonnage, Base year versus future year volume/capacity ratios, Congestion Index, and Level of Service to identify:

- the significant roadway segments for freight flows from the port;
- the growth of vehicles along these segments in response to growth at the port;
- what levels of congestion will be created; and,
- whether deficiencies will arise from the increase in use.

This will help identify whether a project is necessary to correct a deficiency and its level of importance. Development of freight performance measures can be complex. Most importantly, the performance measures must be specific, measurable, attainable, realistic and timely. They are only valuable if they can be re-produced and sustained over a sufficient period of time in order to identify trends and impacts of changes to the system. Performance measures for freight need to be tested, refined, and perhaps replaced on a regular cycle, both to keep up with changing issues as well as to take advantage of new technologies for collecting, processing, and displaying data. Like the freight system itself, performance measures cannot be static. Next steps should include refining the MPO's freight performance measures for ease of use during planning and project prioritization.

8. ENVIRONMENTAL AND COMMUNITY IMPACT SCAN AND ANALYSIS

8.1 Community And Environmental Justice Analysis

Freight movement and freight facility locations have potential impacts on communities because of concerns for noise, air quality, traffic, safety, and land use conflicts. In order to meet both the freight needs and the community goals, it is necessary to identify the potential freight impacts on community and environmental assets in the CORE MPO Freight Transportation Plan study area so that mitigation measures can be explored. This section conducts three areas of analysis regarding the impacts of freight: environmental justice analysis, cultural resources analysis, and natural resources analysis.

8.1.1 Environmental Justice Analysis

Environmental Justice

One of the most pressing social concerns when examining large-scale infrastructure impacts is environmental justice (EJ). The U.S. EPA Office of Environmental Justice defines EJ as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including racial, ethnic, or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies.”

Since 1994, federal agencies have been required to identify and address potential or actual disproportional adverse environmental effects on minority and low-income populations. Thus it is appropriate to conduct a demographic analysis of the study area, with a special emphasis on locating concentrations of minority and populations in poverty, in order to address environmental justice issues concerning existing and potential future freight traffic impacts. What constitutes low income and minority populations are defined by the Environmental Justice Guidelines of the Georgia Department of Transportation (GDOT) as follows:

- Minority means a person who is: (1) Black (a person having origins in any of the black racial groups of Africa); (2) Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); (3) Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); (4) American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition); and (5) Native Hawaiian or Other Pacific Islanders (a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands). Additionally, any person who

responded to the US Census as being either solely or a mix of one of these minority groups qualifies as being in the minority population.

- Minority Population means any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons who will be similarly affected by a proposed USDOT program, policy or activity.
- Low-Income means a person whose median household income is at or below the Department of Health and Human Services poverty guidelines.
- Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons who will be similarly affected by a proposed USDOT program, policy or activity.
- Besides the minority and low-income populations, elderly people and children are particularly vulnerable to potential health impacts brought by freight. In this analysis, these populations are defined as below:
- The Elderly Population refers to the people that are 65 years and older.
- Children refers to the people who are under 10 years of age.

An environmental justice (EJ) community is defined as a community that has populations that exceed regional averages for certain population groups that are adversely or disproportionately affected by negative impacts in the area. **Table 8-1** shows the demographic profile of the Savannah metropolitan area. It should be noted that federal standards mandate that race and ethnicity (Hispanic Origin) are separate and distinct concepts; therefore the population by race in the table might include some people with Hispanic origin.

In the CORE MPO Freight Transportation Plan study area, Chatham County is the population center. It has a more diverse population composition than Bryan and Effingham Counties. The African Americans compose most of the minority populations in the study area. The populations of Hispanic origins increased mostly rapidly in the study area by comparison to the 2000 census data. There is a much larger African American concentration in Chatham County. Bryan County and Effingham County are dominated by white population. Percentagewise, Bryan County is more diverse than Effingham County in race and ethnicity.

Chatham County is the employment center of the study area. However, it has the highest poverty rate among the three counties. Effingham County has the lowest poverty rate.

Bryan County has the highest concentration of children under Age 10, followed by Effingham County and Chatham County. On the other hand, Chatham County has the highest concentration of seniors over 65 years of age and Bryan County has the lowest concentration of senior citizens.

Table 8-1: Demographic Profile of the Savannah MSA

2010 Census Population	Chatham		Bryan		Effingham		Savannah MSA	
	Counts	Pct	Counts	Pct	Count	Pct	Count	Pct
Total Population	265,128	100.00%	30,233	100.00%	52,250	100.00%	347,611	100.00%
Population by Race								
White alone	140,010	52.81%	24,254	80.22%	43,182	82.64%	207,446	59.68%
American Indian and	691	0.26%	98	0.32%	156	0.30%	945	0.27%
Asian alone	6,311	2.38%	486	1.61%	427	0.82%	7,224	2.08%
Black or African	106,392	40.13%	4,286	14.18%	7,048	13.49%	117,726	33.87%
Native Hawaiian and	254	0.10%	25	0.08%	26	0.05%	305	0.09%
Some other race	5,771	2.18%	326	1.08%	431	0.82%	6,528	1.88%
Two or more races	5,699	2.15%	758	2.51%	980	1.88%	7,437	2.14%
Population by Hispanic or Latino Origin (of any race)								
Persons of Hispanic	14,370	5.42%	1,336	4.42%	1,501	2.87%	17,207	4.95%
Persons Not of	250,758	94.58%	28,897	95.58%	50,749	97.13%	330,404	95.05%
Population by Age								
Persons under Age 10	35,001	13.20%	4,702	15.55%	7,821	14.97%	47,524	13.67%
Persons over Age 65	32,864	12.40%	2,715	8.98%	4,763	9.12%	40,342	11.61%
2008 – 2012 American	Chatham		Bryan		Effingham		Savannah MSA	
	Counts	Pct	Counts	Pct	Count	Pct	Count	Pct
Persons Below Poverty Level (2008 – 2012 ACS)								
Total Estimated	257,301	100.00%	30,433	100.00%	51,767	100.00%	339,501	100.00%
Total Estimated	48,591	18.88%	3,686	12.11%	5,472	10.57%	57,749	17.01%

Source: US Census Bureau

Environmental Justice Analysis

For the CORE MPO Freight Transportation Plan, the delineation of EJ populations and EJ areas are based on the geography of 2010 census tracts. Though the race and ethnicity information is available at the smaller census block group level by the decennial census, the poverty information is only available at the census tract level by the American Community Survey (ACS). The ACS data has large margins of error (MOE), so using larger geography (census tract) and multi-year (5-year) data might help reduce the MOE.

The 2010 Census data divide people into more than 70 categories based on the combinations of various race and ethnicity. For this study, the minority persons are defined as those that are not “non-Hispanic white”. People with two or more races are included in the minority category. **Table 8-2** lists the thresholds for the EJ analysis. The EJ areas are defined as those census tracts that have a minority concentration larger than 42.68%, or a poverty concentration larger than 17.01%, or a concentration of vulnerable population (aged under 10 or over 65) larger than 25.28%.

Table 8-2: Thresholds of CORE MPO Freight Plan EJ Target Populations and EJ Areas

Census Population	Chatham	Bryan	Effingham	Savannah MSA	Threshold
2010 Total Population	265,128	30,233	52,250	347,611	
Not Hispanic or Latino – White Alone	133,492	23,446	42,311	199,249	
Minority – All Others	131,636	6,787	9,939	148,362	42.68%
Persons under Age 10	35,001	4,702	7,821	47,524	
Persons over Age 65	32,864	2,715	4,763	40,342	
Under 10 or Over 65	67,865	7,417	12,584	87,866	25.28%
2008-2012 ACS Total Estimated Persons for Poverty	257,301	30,433	51,767	339,501	
2008-2012 Estimated Persons Below Poverty Level	48,591	3,686	5,472	57,749	17.01%

Source: US Census Bureau 2010 Decennial Census and 2012 ACS 5-year Estimates

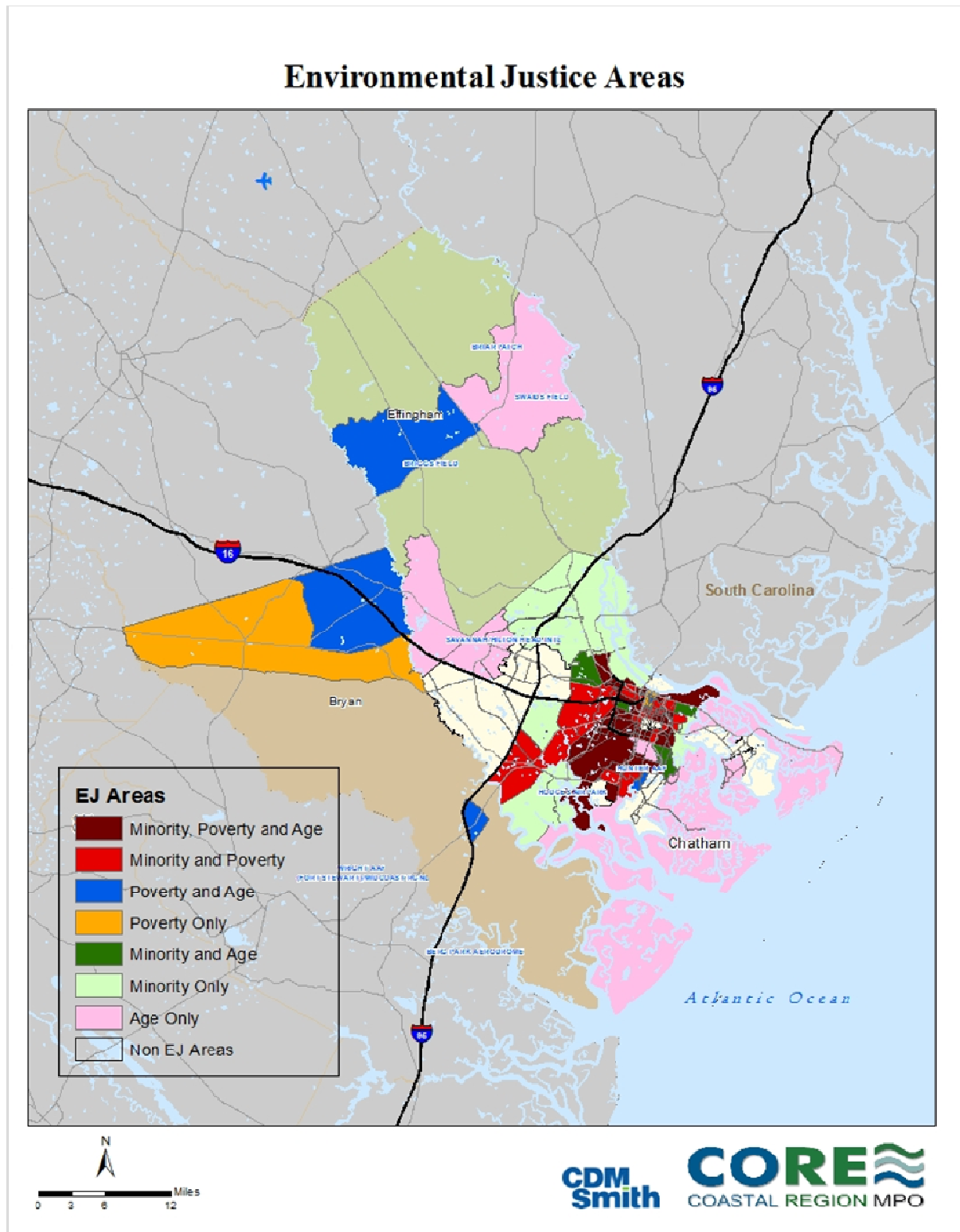
Figure 8-1 displays the EJ areas. Most of Bryan County and Effingham County are non-EJ areas. In Chatham County, the non-EJ areas are located in West and Southwest of the county, in Ardsley Park, and in some isolated island areas.

The minority concentrated areas are located mostly in Chatham County. Bryan County and Effingham County are more homogenous in race and ethnicity, so their minority concentrations have not reached the threshold. The minority populations are concentrated in the Savannah urban cores except the downtown area, the north side of Ardsley Park, and several neighborhoods just south of DeRenne Avenue. Some other minority concentrated areas include Garden City south of Smith Avenue along SR 21 and SR 25, areas along Veterans Parkway, Hunter Army Airfield, and areas south of Montgomery Cross Road that is along SR 204. Due to the rapid development in the Westside of Chatham County, the minority concentrated areas also expand into Port Wentworth, Pooler and West Savannah along the SR 21 corridor.

Some of the low-income areas are consistent with the minority concentrated census tracts – in the Savannah urban core, in Garden City, in areas around the Savannah Mall and around the US 17/SR 204 interchange area, but there are some differences. Downtown Savannah is identified as a low-income area but not a minority area. This might be due to the concentration of the Savannah College of Art and Design (SCAD) students in this area. The areas around the City of Richmond Hill in Bryan County and those census tracts north of Fort Steward are identified as low-income areas. In Effingham County, the areas around the City of Guyton are identified as low-income areas.

Some of the minority areas and poverty concentrated areas also coincide with areas where young children and senior citizens live – in the Savannah urban core and the Hunter Army Field area, for example. In other urban centers such as Richmond Hill and Pembroke in Bryan County and Guyton area in Effingham County, both poverty and age-related populations are concentrated. However, it appears that the age-related EJ population is more widely disbursed. The Island areas and Bloomingdale in Chatham County, as well as the southwest corner and Springfield in Effingham County all have concentrations of these populations.

Figure 8-1: Environmental Justice Area



Impact of Freight Movement and Freight Facilities on Environmental Justice Areas

In the case of this report, negative impacts refer to freight-based operations and facilities. As the map in **Figure 8-1** shows, the majority of the rail lines are located in the identified EJ areas, as well as with many at-grade rail crossings. The Port of Savannah and the Savannah – Hilton Head International Airport are located in minority concentrated areas. The Hunter Army Airfield is located in the EJ area. The EJ areas also experience a lot of truck traffic, such as those along SR 21, I-516 and I-16. The freight movements and developments in these areas impact the EJ populations in terms of air pollution, noise pollution, aesthetic pollution, as well as safety concerns.

8.1.2 Cultural Resource Analysis

The most significant cultural resources in the Savannah MSA are historic properties and historic sites, which are spread within the three-county area, but are particularly concentrated in Downtown Savannah as demonstrated in **Figure 8-2**. There are over 8,000 historic and cultural resources that have been identified in Savannah and Chatham County alone.

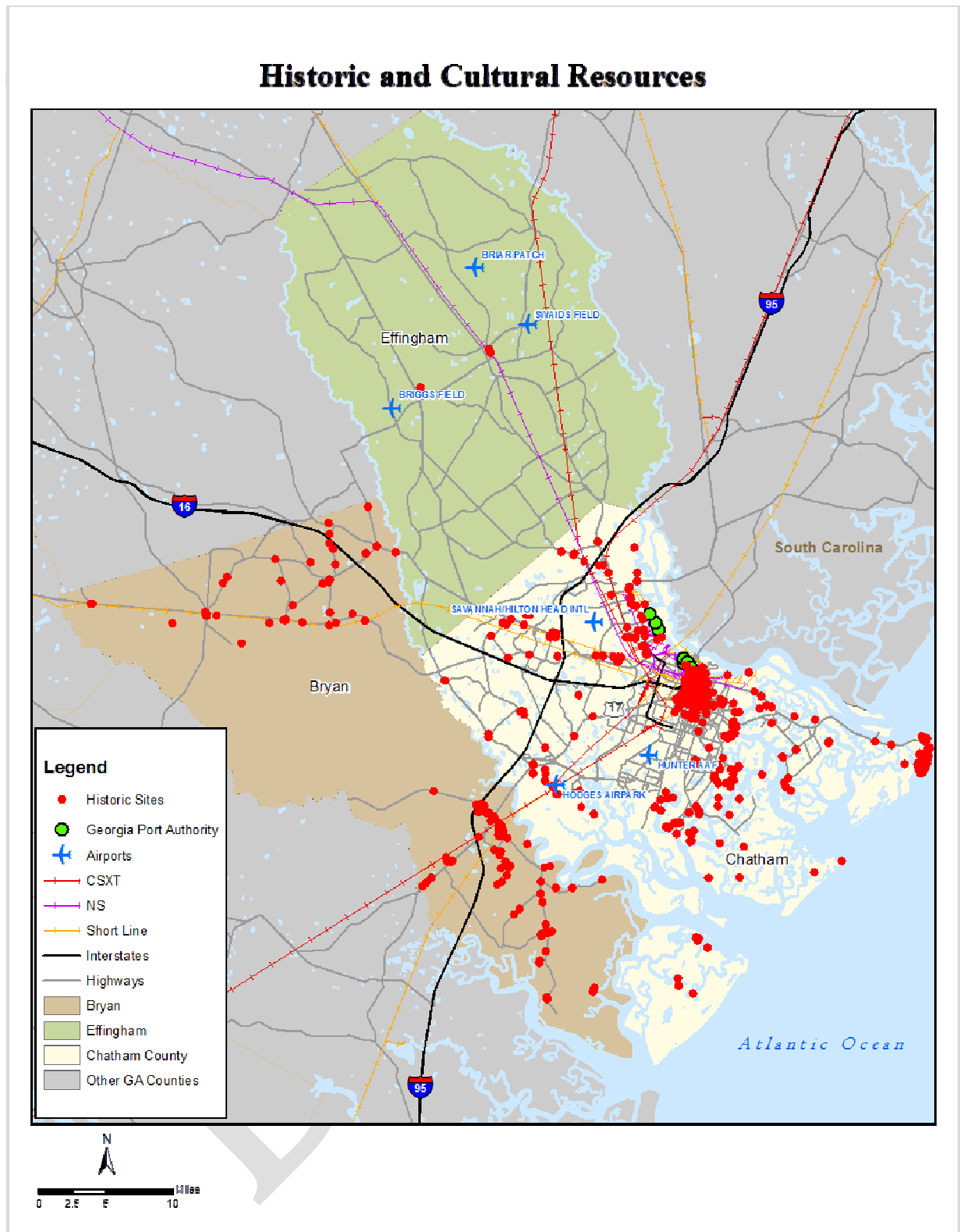
These cultural resources contribute to the character of the community's neighborhoods and are the basis of the area's robust tourism economy. The preservation and revitalization of these historic areas/sites is a primary goal of the local jurisdictions.

Freight movements and freight facilities have potential impacts on historic and cultural resources.

A significant amount of freight movement is by trucks that move through the heart of the Savannah Landmark Historic District, which produce concerns for noise and air pollution, vibration as well as pedestrian safety. A great example to demonstrate this impact is Bay Street, which passes in front of the Savannah City Hall and connects River Street in the north to the larger part of the historic district in the south. As a major connecting road in the historic district, Bay Street sees large percentages of truck traffic on a daily basis. The truck traffic - historic resource conflict has been identified as a major land use conflict in the historic district, causing air pollution and safety problems to tourists and residents alike. Another example is Victory Drive (US 80) which has been designated by CORE MPO as a palm-lined causeway and canopied roadway; both features are considered a part of the area's cultural heritage. Large trucks need higher clearance and wider lanes, which conflict with the canopy trees and narrow lane width of Victory Drive, causing damage to this historically characteristic roadway.

Rail development and traffic also have impacts on the cultural resources. Many of the rail lines and rail yards are located in the older parts of the Savannah area due to the area's history and development patterns, causing quality of life issues. Lack of grade-separated rail crossings and noise have been identified as major impacts to the study area in term of safety, congestion and quality of life.

Figure 8-2: Historic and Cultural Resources



8.1.3 Natural Resource Analysis

The Savannah MSA contains exceptional natural resources vitally important to its economy and development potential. The area therefore has an interest in promoting, developing, sustaining, and protecting its natural resources for future generations. One of the most significant natural resources in the Savannah MSA is wetland (shown in **Figure 8-3**) since the area is located in coastal Georgia. The natural resources should be protected and should not be impacted by future freight development.

Freight, particularly diesel-emitting freight, has a significant impact on air quality. The construction and operation of freight facilities can disrupt the functionality of natural habitats, and freight is a significant contributor to point- and non-point source water pollution. Freight movement has increasingly invoked “not in my backyard” reactions from communities concerned about noise, air quality, traffic, safety, and land use issues leading to concerns about the location of freight facilities and the movement of cargo.

The freight land use analysis in Task 3 determines if incompatible land use adjacencies between freight-based facilities and residential development currently exist, if current zoning ordinances allow or discourage such adjacencies, and if the Future Land Use Map continues these trends. The freight impact on natural resources is a part of the land use analysis (Task 3). The result of the analysis will help develop freight land use recommendations in Task 6.

8.2 FREIGHT IMPACT MITIGATION

This Freight Mitigation section is based on the previous analysis, looks at general freight impacts, evaluates possible factors that exacerbate or contribute to these impacts and how the impacts manifest themselves, and develops potential prevention and mitigation methods. Specific impacts and mitigation methods on specific projects are not discussed here. These will be identified and analyzed on a more detailed level in the project development process and in keeping up with the requirements of the National Environmental Policy Act (NEPA). As specific freight improvement projects move further into the stages of development, they will be assessed more closely. A determination can then be made as to any specific negative impacts and a specific approach will be developed in mitigating these impacts.

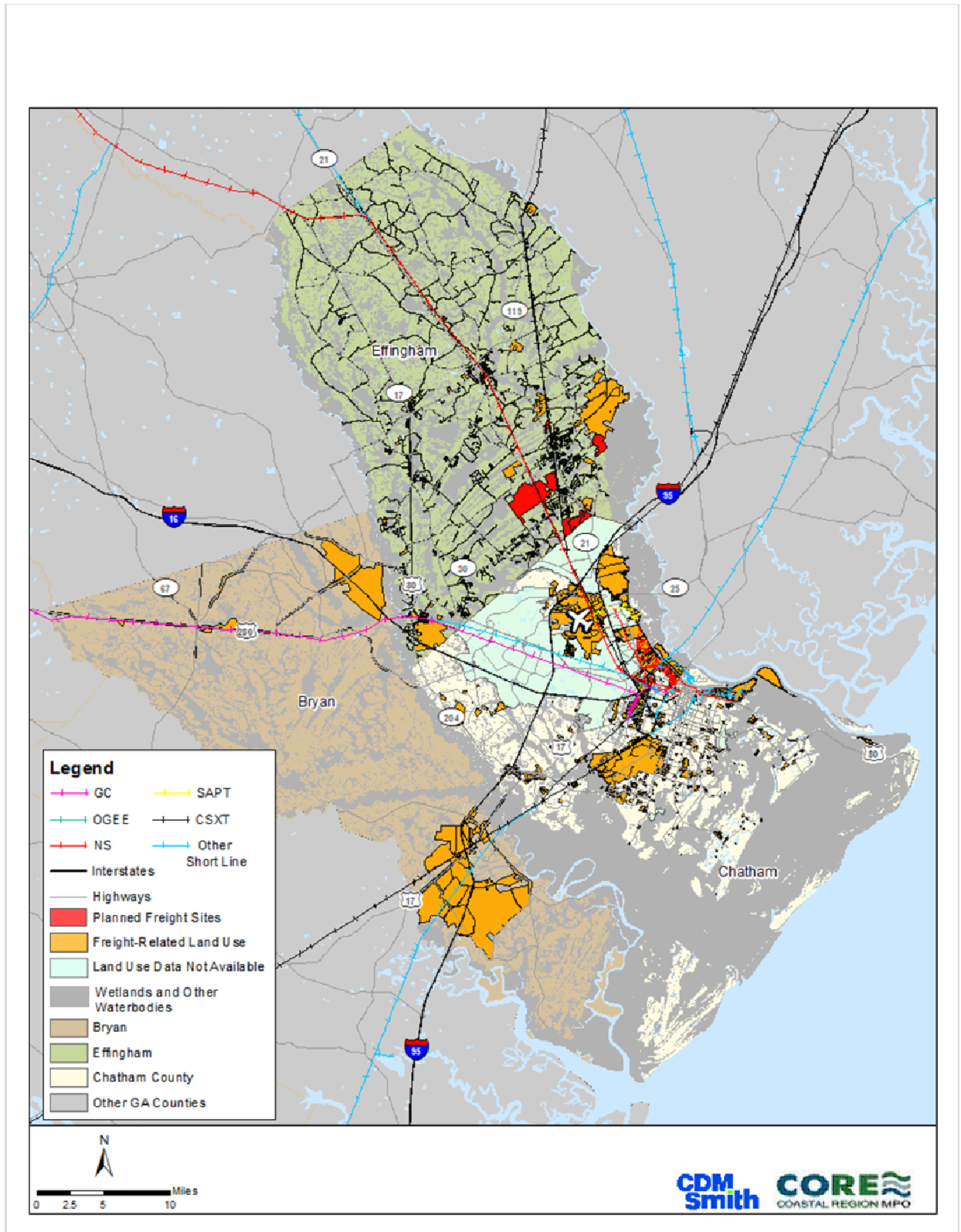
8.2.1 General Freight Impacts

The freight impacts can be grouped into four general categories: health, quality of life, environmental, and economic.

Health impacts range from direct causal links such as exposure to ozone and diesel particulate matter having an effect on respiratory illnesses such as asthma, and less directly related effects such as traffic congestion causing stress which then can have consequences related to hypertension and a weakened immune system.

The quality of life impacts might include diminished enjoyment of the public environment when freight destroys or compromises the beauty of a viewshed.

Figure 8-3: Natural Resources



Environmental impacts include impacts to air, soil, water, flora, and fauna. Impacts on air quality stem from ozone and diesel particulate matter. Surface and ground water are impacted by point- and nonpoint-source pollution. Stormwater runoff can contain sedimentation from construction sites or contaminants from the operation of freight including oil changes and chemicals related to cleaning, for example. Such contaminants can disrupt the natural habitats of aquatic species and can be detrimental to humans. Also freight can disrupt habitats by fragmenting ecosystems altering feeding and migration patterns. Historic, cultural, and archaeological resources are also at risk of impacts from freight particularly when not protected by zoning from incompatible land uses or when disrupted by poor construction or management practices.

Freight movement can have significant economic ramifications, both positive and negative. Businesses are concerned with both the health and well-being of their employees and their own bottom line. Loss of productivity can result from absenteeism and from physical and mental health issues which, while not solely caused by freight, can be exacerbated by the industry. Rising health care costs and the ability to provide quality care are of concern to both state and local governments. While freight can be an economic boom for a city if done well, it can also be disastrous for economic development if done poorly, such as when the character of a place is compromised or there are extensive negative health impacts.

Associated with the potential impacts of freight on health, quality of life, environmental, and economic as listed above, there are also some freight related issues. Concerns for traffic flow and congestion, cut-through traffic, road and pavement conditions, and connectivity and access are some of the issues identified. Noise pollution and vibration address impacts on noise sensitive communities. Light pollution looks at impacts on people, animals, and ecosystems. Community safety-related impacts include injury, accidents, and crashes, the transport of hazardous materials, and security concerns. Environmental impacts examine the effects of freight on ecosystems, water, soil, air, and historic, cultural, and archaeological resources. Finally, visual and aesthetic concerns look at the effects of this issue on communities.

Some populations are particularly vulnerable or sensitive to the impacts of freight. Sensitive receptor locations include: residential communities, schools, day care centers, playgrounds, parks, youth centers, nursing homes, hospitals, and other public spaces where people are likely to spend time. These sensitive locations are, for the most part, places where the young, the elderly, and people of compromised health spend large portions of their day. Such groups are identified as vulnerable populations and include but are not limited to: children and babies, pregnant women, people with existing illness or compromised immune systems, the elderly, people recovering from illnesses, persons with disabilities, people living in poverty, and minorities. Ecosystems, composed of plants, animals, soil, and water, should also be included in a list of vulnerable populations.

8.2.2 Prevention and Mitigation of Freight Impacts

The methods to prevent and/or mitigation freight impacts are varied based on freight modes, impact types, impact contribution factors, impacted populations, and others. These methods can be generally divided into various categories – technological, operational, planning and design, policy, and regulations.

Technology – The latest technology can be utilized to reduce freight impacts. Some options might include integrating Intelligent Transportation System (ITS) technologies to improve the freight transportation system efficiency; upgrading equipment where feasible to reduce air pollution, light pollution and noise pollution, etc.

Operational – All modes of freight transportation can make operational improvements to reduce impacts on human and natural environment. Examples might include reducing idling time by making more efficient scheduling arrangements; adopting more efficient cargo handling strategies to reduce emissions; reducing speeds; switching from truck to rail use where appropriate; restricting trucks to certain routes; modifying hours of freight operations where feasible, etc.

Planning & Design – All modes of freight transportation can benefit from better planning and design in addressing environmental impacts. Some measures include clustering industrial uses; separating non-compatible and sensitive land uses to decrease exposure to pollutants; creating/maintaining buffer zones (vegetation, compatible land uses, open space, etc.) between polluting freight and sensitive receptors (housing, schools, day cares, playgrounds, hospitals, nursing homes, etc.); replacing at-grade rail crossings with grade separated crossings; developing and integrating an efficient and effective wayfinding signage program for more efficient freight movements; developing rail spurs or connections to provide direct service to freight facilities, etc.

Regulations – As mentioned in previous sections, regulations of land uses are important to reduce /mitigate freight impacts on the natural and cultural resources. Examples of regulatory methods include developing and maintaining truck-only access routes; retaining and building-upon existing industrial areas; requiring that developers use building techniques and materials that mitigate impacts of pollution in homes being built proximate to freight facilities; requiring developers to make necessary highway access improvements as a condition for project approval; establishing a transportation enhancement district through which property owners and developers contribute to transportation improvements; requiring staging areas for trucks at buildings, etc.

Policy – Some good policies for freight might help reduce impacts, such as encouraging the use of alternatively fueled vehicles; encouraging re-use of brownfields; providing incentives to encourage the acquisition of cleaner technologies; instituting quiet zones for horn blowing by trains at grade crossings, etc.

Environmental Justice - Environmental justice (EJ) remains a relatively new concern in planning and policy, and strategies to mitigate disproportionate environmental impacts on low-income or minority populations are still evolving. Mitigation strategies for EJ include: ensuring that affected communities have a say in future freight developments; ensuring significant and ongoing public involvement in decision-making throughout the life of the freight project; addressing specific community issues and responding to community preferences; the provision of environmental benefits to the community such as infrastructure upgrades or landscaping and buffering; and providing economic benefits to the community such as the creation of job opportunities, guaranteed participation in construction projects, and grants or loans for small business start-ups.

The goal of environmental justice mitigation is to ensure that vulnerable populations that have been receiving an undue share of the burdens of, in the case of this report, the freight industry, no longer are unfairly burdened. In addition these populations should receive a proportionate share of the benefits of a freight project.

DRAFT

9. FREIGHT LAND USE ASSESSMENT AND ANALYSIS

Freight generating land uses include warehousing, manufacturing, logistics, industrial activities, port and harbor operations, and related activities. These land uses provide a number of benefits to CORE MPO's regional economy by providing employment opportunities, substantial fiscal impact from tax benefits, and other benefits. However, there are a few drawbacks from freight generating land uses including air quality, greenhouse gas emissions, and potential environmental justice issues.

As part of the development of the CORE MPO Freight Transportation Plan, staff conducted a freight land use assessment of the CORE MPO's freight transportation plan study area. The freight land use assessment completed for this plan focused on three key areas: regional growth, land use analysis, and freight-related land use and zoning. Each of these areas is summarized in the sections below. Overall, the assessment identified existing freight generating land uses and supporting infrastructure as well as areas for future expansion of these uses.

9.1 Land Use Analysis

Taking into account significant increases in regional population, the presence of an extensive freight transportation network, and the future expansion of freight-related industries, it is critical to get an understanding of the existing land use patterns within the CORE MPO region and how to incentivize and plan the expansion of freight-related industries. To do this, staff had to develop a methodology to identify existing areas which allow for freight-related activities as well as areas of undeveloped lands within the CORE MPO's freight plan study area.

The methodological framework developed for the CORE MPO region included the review of future land use categories and zoning districts within each county and their municipalities, as available, which allow for freight-related activities and those that prohibit such activities. Freight-related activities are generally defined for the CORE MPO's freight plan study area as activities related to:

- 1) Warehousing,
- 2) Transportation-related facilities and infrastructure such as aviation, seaports, highway corridors, freight terminals and intermodal facilities,
- 3) Distribution centers and wholesale trade facilities,
- 4) Manufacturing, and
- 5) Industrial activities.

This review formed the basis of a crosswalk. The purpose of the crosswalk was two-fold: 1) to identify land use areas which would allow for freight-related activities and 2) identify those land uses designated as undeveloped lands within a jurisdiction. This is important as future land use and zoning districts may have similar naming conventions across jurisdictions, but their intent, allowances, prohibitions, and other regulations in regards to activities vary greatly across

jurisdictions. In addition, identification of undeveloped lands was critical to find areas of opportunity to expand freight-related activities in the region.

Table 9-1 lists freight-related land uses identified for each county and their municipality as available. For Bryan County, the Cities of Pembroke and Richmond Hill had differing land use categories compared to the unincorporated County. Land use information was only received from Chatham County in which the County has a consolidated approach to land use with the City of Savannah. Thus, land use categories used within unincorporated Chatham County are the same as those used within the City of Savannah. Finally, Effingham County shares similar land use categories throughout the County itself.

Table 9-1: Freight Related Land Use by County

County	Municipality	Freight-Related Land Use
Bryan		Corridor/Gateway Regional Commercial
	Pembroke	Highway Commercial Industrial
	Richmond Hill	Commercial Corridor/Gateway Mixed Use
Chatham		Commercial – Regional Commercial – Marine Industry – Light Industry – Heavy Transportation/Communication/Utilities
Effingham		Industrial Transportation/Utilities

Zoning districts implement the overarching land use categories. By definition, there are several more zoning district classifications than land use categories as one land use category can have a number of allowable zoning districts associated with it. For Bryan County, both the County and the City of Richmond Hill have similar zoning districts which allow for freight-related activities. Zoning information was not received for the City of Pembroke. For the remaining counties and their municipalities, their zoning district information is identified in **Table 9-2**.

Table 9-2: Zoning Districts by County

County	Municipality	Freight-Related Zoning Category	
Bryan		General Commercial District General Industrial District Interchange Commercial District Light Industrial District Waterfront Commercial - Industrial	
Chatham ⁵⁹		Business Business Limited Business General Heavy Industrial Light Industrial	Manufacturing Planned Light Industrial Transition Waterfront Industry
	Bloomingtondale	General Commercial Intensive Industry Extensive Industry	
	Garden City	Industrial	
	Pooler	Industrial, light district Industrial, heavy district	
	Port Wentworth	Economic Development Zone Industrial Planned Industrial	
	Savannah	General Business General Business Transition General Business Transition 2 Highway Business	Heavy Industrial Light Industrial Light Industrial Business Manufacturing
	Thunderbolt	Light Industrial Industrial Waterfront Industry	
	Tybee Island	Maritime District	
Effingham		Highway Commercial Districts Industrial Districts	
	Guyton	Industrial	
	Rincon	General Commercial Use District Limited Industrial Use District General Industrial Use District Planned Unit Development-MXU	
	Springfield	General Commercial District Industrial District	

9.2 Freight-Related Land Uses and Zoning

9.2.1 Existing Freight-Related Zoning

In the CORE MPO's freight plan study Area, over two-thirds of the existing land zoned for freight-related uses is located in Chatham County, which is home to major freight generators such as the Port of Savannah, major freight rail terminals, and the Savannah/Hilton Head International

⁵⁹ Planned Development versions of the listed uses are also considered Freight-Related.

Airport. As shown in **Table 9-3**, over 25,000 acres of land is zoned for freight-related use in Chatham County, which is about 18 percent of the total land in the county. Displayed in **Figure 9-1**, in Chatham County, a large concentration of the freight-related zoning is bordered by I-95 to the west, I-16 to the south, I-516 to the east, and the Savannah River to the north.

Table 9-3: Existing Freight-Related Zoning in the CORE MPO's Freight Plan Study Area

County	Total Developable Acres	Existing Freight-Related Zoning Acreage	Percentage of Land Currently Zoned for Freight-Related Uses
Bryan	98,792	1,497	1.52%
Chatham	140,772	25,442	18.07%
Effingham	189,121	7,686	4.06%
Total ⁶⁰	428,685	34,625	8.08%

In Effingham County, less than 8,000 acres of land is zoned for freight-related use, a total of four percent of the county's land. These sites are located primarily in the southern half of Effingham County along the I-16 corridor, adjacent to the Class I railroads in the south central section of Effingham County, and SR 21 corridor.

Bryan County is home to less than 1,500 acres zoned for freight-related use. This land is concentrated in one area, the Interstate Centre, located along I-16 in the western section of the county. The Belfast Commerce Center, an industrial park located along I-95 in the eastern section of the county, was not listed by the county as being zoned for freight-related uses.

9.2.2 Existing Freight-Related Land Use

For the CORE MPO's Freight Plan Study Area, the total percentage of freight-related land use is over nine percent for the region of Bryan, Chatham, and Effingham counties. In shown in **Table 9-4** and illustrated in **Figure 9-2**, Chatham County and Bryan County have the two highest percentages of freight-related land use, about 25 percent and 19 percent respectively. In Chatham County, the freight-related land uses are located along the Savannah River, in the vicinity of I-95 and the Savannah/Hilton Head International Airport, and around Hunter Army Airfield. In Bryan County, the freight-related land uses are concentrated in two areas, Interstate Centre, located in western Bryan County along I-16, and Belfast Commerce Centre, located in eastern Bryan County along I-95 and the CSX rail line.

⁶⁰ Note that total developable acreages used for each land use analysis subset are dependent upon the amount of land use and zoning data available for that analysis subset for each jurisdiction. In addition, for Bryan County, any land coverage associated with Ft. Stewart was not included in any of these analyses.

Figure 9-1: Existing Freight-Related Zoning within CORE MPO's Freight Plan Study Area

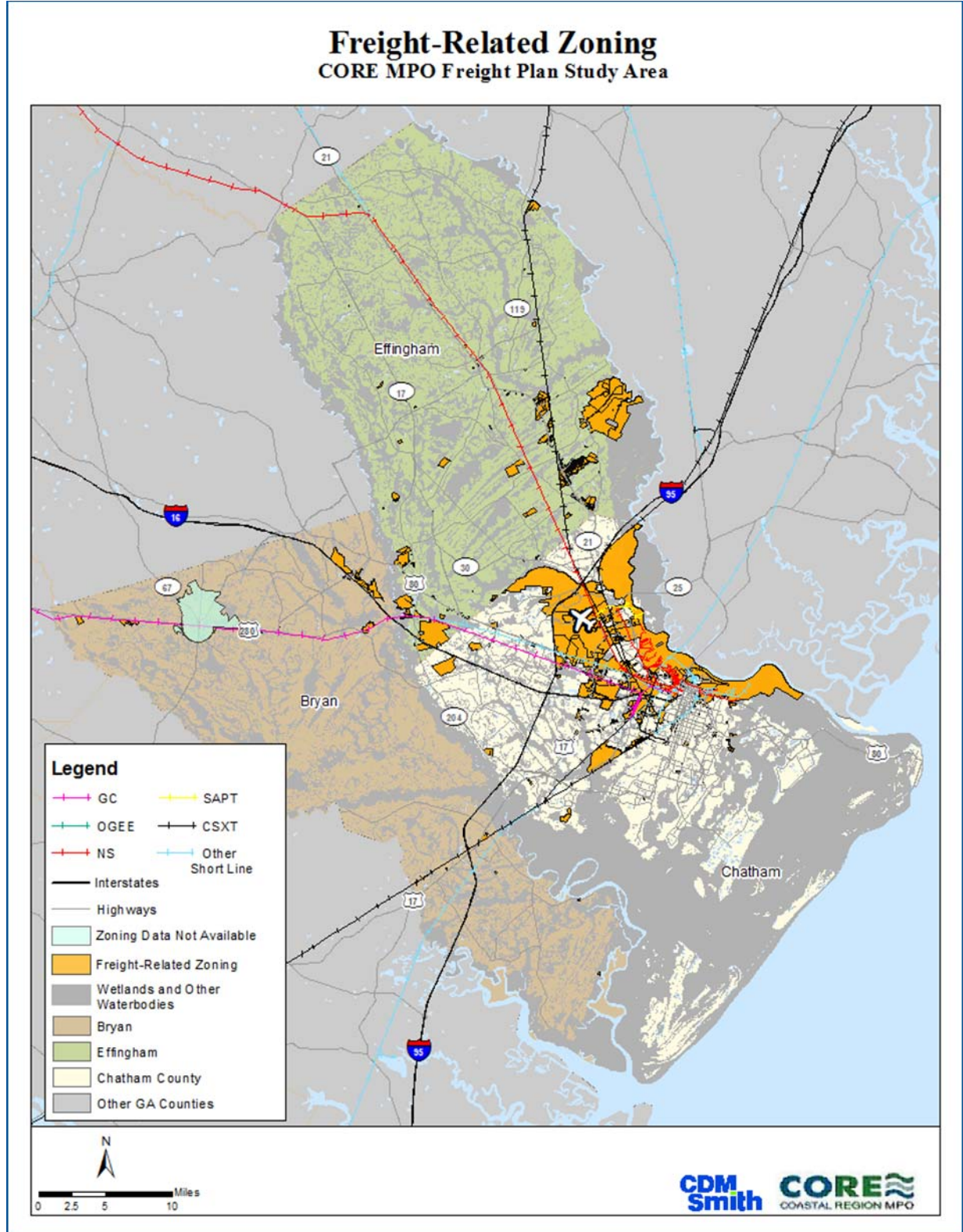


Figure 9-2: Existing Freight-Related Land Use within CORE MPO's Freight Plan Study Area

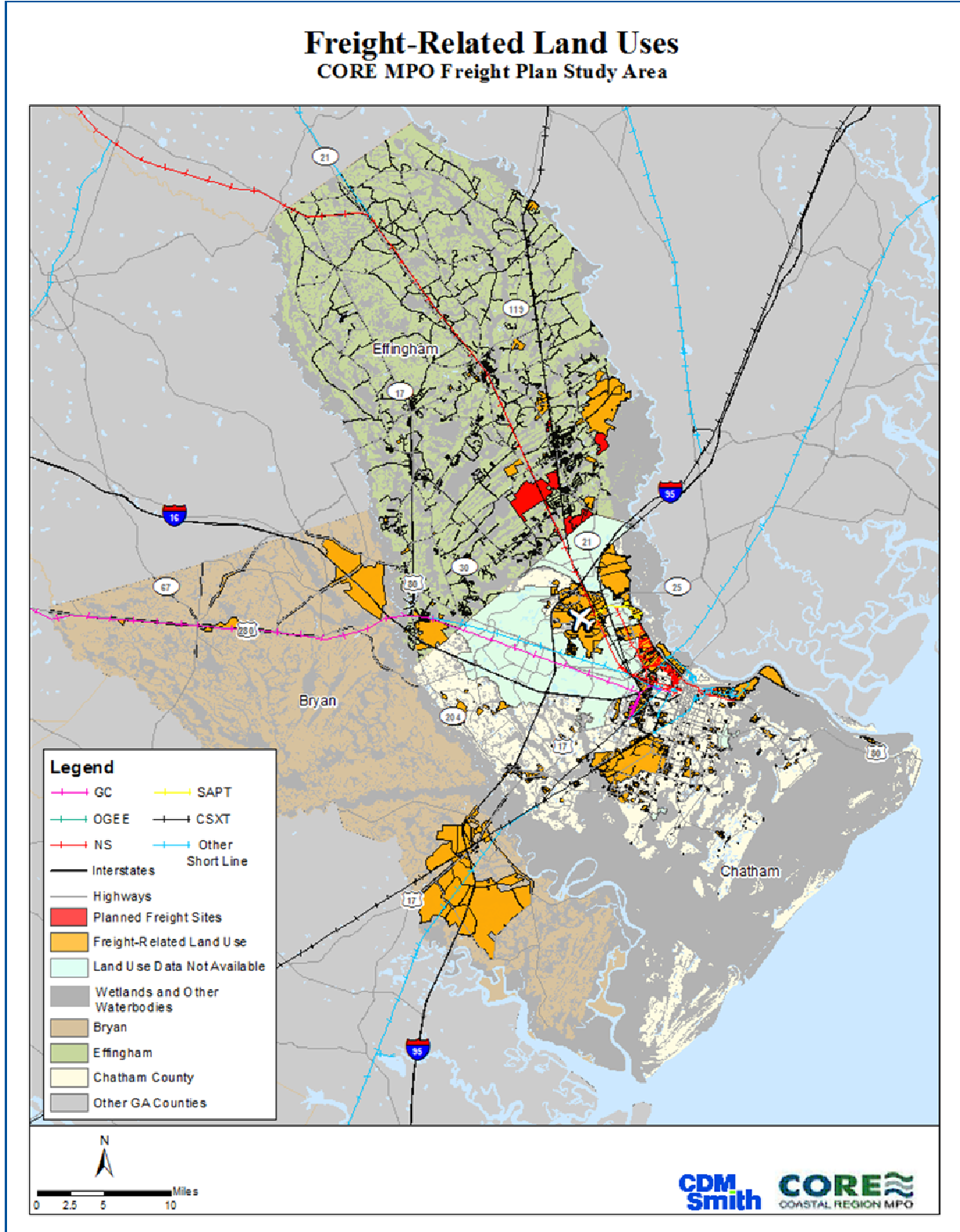


Table 9-4: Existing Freight-Related Land Use in the CORE MPO's Freight Plan Study Area

County	Total Developable Acres	Existing Freight-Related Land Use Acreage	Percentage of Land Currently Utilized for Freight-Related Uses
Bryan	118,342	22,502	19.02%
Chatham	98,343	25,344	25.76%
Effingham	192,934	13,189	6.84%
Total	409,619	61,035	14.90%

Effingham County has about 13,000 acres, or under seven percent of land used for freight-related land uses. Similar to the Effingham County freight-related zoned areas, these sites are located primarily in the southern half of Effingham County along the I-16 corridor, adjacent to the Class I railroads in the south central section of Effingham County, and SR 21 corridor.

9.2.3 Existing Vacant/Undeveloped Land

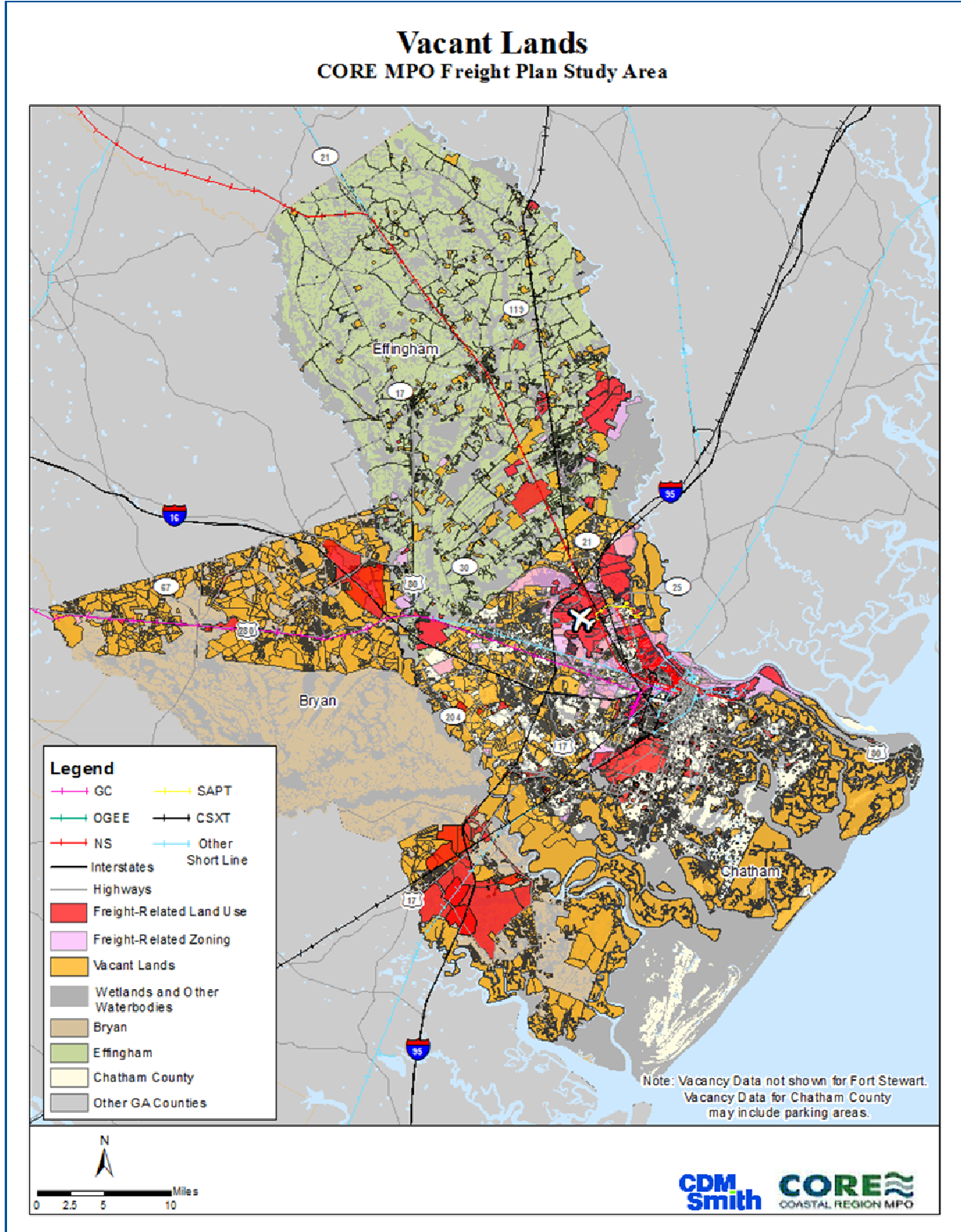
The existing vacant and undeveloped land potentially available for development for future growth in the CORE MPO's freight plan Study Area totals over 197,000 acres of land, which is just under half of the total 400,000 plus acres of developable land. (Table 9-5 and Figure 9-3.) Chatham County, the most developed county of the three, has only about 46,000 acres classified as vacant or undeveloped, which is about a third of total developable land in the county.

As the region continues to grow, developers may look outside of Chatham County and towards neighboring counties of Bryan and Effingham for future growth. Effingham County has about 92,000 acres of vacant and undeveloped land in the county. Bryan County has about 65 percent of its 92,000 acres of land vacant or undeveloped.

Table 9-5: Existing Vacant/Undeveloped Land in the CORE MPO Study Area

County	Total Developable Acres	Existing Acres of Vacant/Undeveloped Land	Percentage of Land Vacant/Undeveloped
Bryan	92,121	59,708	64.82%
Chatham	121,631	45,835	37.68%
Effingham	192,934	91,696	48.49%
Total	406,686	197,239	48.50%

Figure 9-3: Vacant/Undeveloped Land within CORE MPO's Freight Plan Study Area



10. FINAL RECOMMENDATIONS

10.1 Future Freight Land Use Recommendations

Planning for accommodating future growth and presenting a vision for the future land uses in the Savannah region requires coordination from local, regional, and state partners. As the Savannah MSA (Bryan, Chatham and Effingham Counties) continues to grow with residential, commercial, and industrial development, the supply of available land in the region is being reduced. This reduction of available land coincides with the rise in demand for goods movement services due to the increased amount of freight projected for the Port of Savannah. Regional partners need to determine opportunities on how to preserve land which is in close proximity to the port for port-related freight-related businesses and land uses instead of higher, more profitable uses like commercial or residential uses that may not be best uses for this land.

Prioritizing the type of land uses which should be allowed for freight development is crucial for the long-term economic growth of the Savannah region. Preserving land in the most advantageous locations will provide the Savannah region the opportunity to accommodate the projected freight growth and sustain the area as a center of major international port.

10.2 Land Use Strategies

Although the implementation of land use practices does not specifically dictate the location of freight activities, the requirement of land use designation influence the planning process for freight transportation, in terms of access and potential needs. The conflict of freight activities (e.g., truck trips, warehousing and rail yard noise pollution), and community activities (e.g., schools, bicycle-pedestrian, and residential needs) may be mitigated in the freight planning process by understanding and potentially segregating these activities through land use designation. For example, planning for route designations between two freight generators, for truck trips, may be influenced by the presence of parcels designated for residential use.

In the following sections the two strategies to attract and accommodate freight-related land use for the Savannah region have been developed and summarized.

10.2.1 Re-Use and Infill of Existing Freight Clusters

"Freight clusters" are concentrations of freight-generating parcels of land create which are located in close proximity to freight hubs, such as the Port of Savannah or Savannah / Hilton Head International Airport, and freight corridors, the interstate network. Due to the importance to locate near freight hubs, preserving land for freight-uses will be strategic for continued freight growth of the region.

Filling vacant and/or undeveloped sites within existing freight clusters should be considered a high priority since these locations have a major beneficial factor behind them – location. Existing

freight clusters and industrial parks are most likely developed for their desirable locations in the movement of freight.

Sites and locations identified in this Reuse and Infill category are existing industrial parks and clusters which are already developed or planned. Available sites are primarily industrial infill developments on parcels that are currently surrounded by other industrial uses.

As shown in **Figure 10-1**, existing areas of freight clusters are concentrated in close proximity to the Port of Savannah, along the Savannah River, and primarily in western Chatham County. The majority of the clusters are located in Chatham County, with a few concentrations of development in Bryan and Effingham Counties. As they get further from the Port, clusters are located along the existing freight transportation network including the I-16 corridor in Bryan, Effingham, and Chatham Counties and I-95 in Bryan County.

Chatham County

The Chatham County freight-related land use clusters are located in closest proximity to the Port of Savannah and potentially provide the most desirable locations for placing freight-related industries in the CORE MPO Freight Transportation Plan study area (Savannah MSA). Currently, Chatham County has over 25,000 acres of freight-related land uses. As shown in **Figure 10-2**, the existing freight-related clusters in Chatham County are concentrated along the Savannah River, north of I-16 and in the vicinity of I-95 and the Savannah/Hilton Head International Airport, though a large cluster of freight-related land is located west of I-95 and borders the Effingham County/Chatham County line. **Table 10-1** displays the major existing business/industrial parks and their current city locations in Chatham County⁶¹. The sites listed in **Table 10-1** total over 3,400 acres of land available for industrial development.

Table 10-1: Major Chatham County Industrial Sites

Location	City	Total Acres Available
Savannah Mega Site	Pooler*	1,560
CenterPoint Intermodal Center	Garden City	250
Westport Business Park	Garden City	35
Crossroads Site 6M	Savannah	8
Crossgate Site	Port Wentworth	90.6
6594 Highway 21	Port Wentworth	23
Northport Business Park	Savannah	69.7
Brasseler Boulevard Lot E	Savannah	2.52
Compass Business Park	Bloomingdale	614.33
Prologis Morgan Business Center	Bloomingdale	175
114 Gignillat Circle	Savannah	9.27
Blakewood Ryals Estate Tract	Pooler	115
Pine Barren Tract	Pooler	8
Nettles Industrial Lot 6	Savannah	2.96
Mega-Site Business Park	Pooler	15.85
Jimmy DeLoach Industrial Land	Pooler	6
SeaPoint Industrial Terminal Complex	Savannah	365
130 Crossgate Road	Savannah	21
Morgan Industrial Land	Pooler	31

Source: Savannah Economic Development Authority, 2015.

*The mega site is in the process of being deannexed from the City of Pooler.

⁶¹ <http://www.savannahsitesearch.com/>

Figure 10-1: Existing Freight Clusters within the Savannah MSA

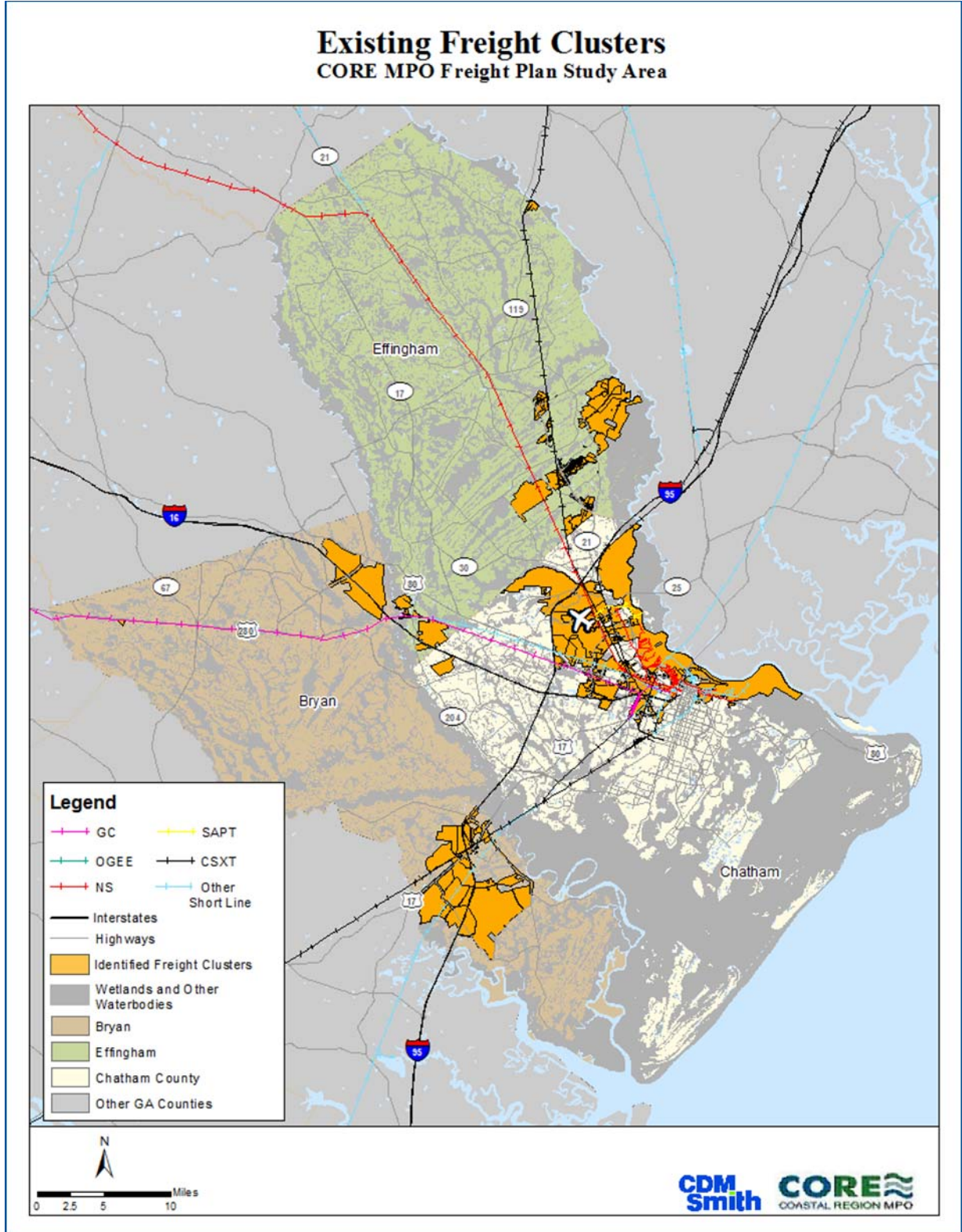
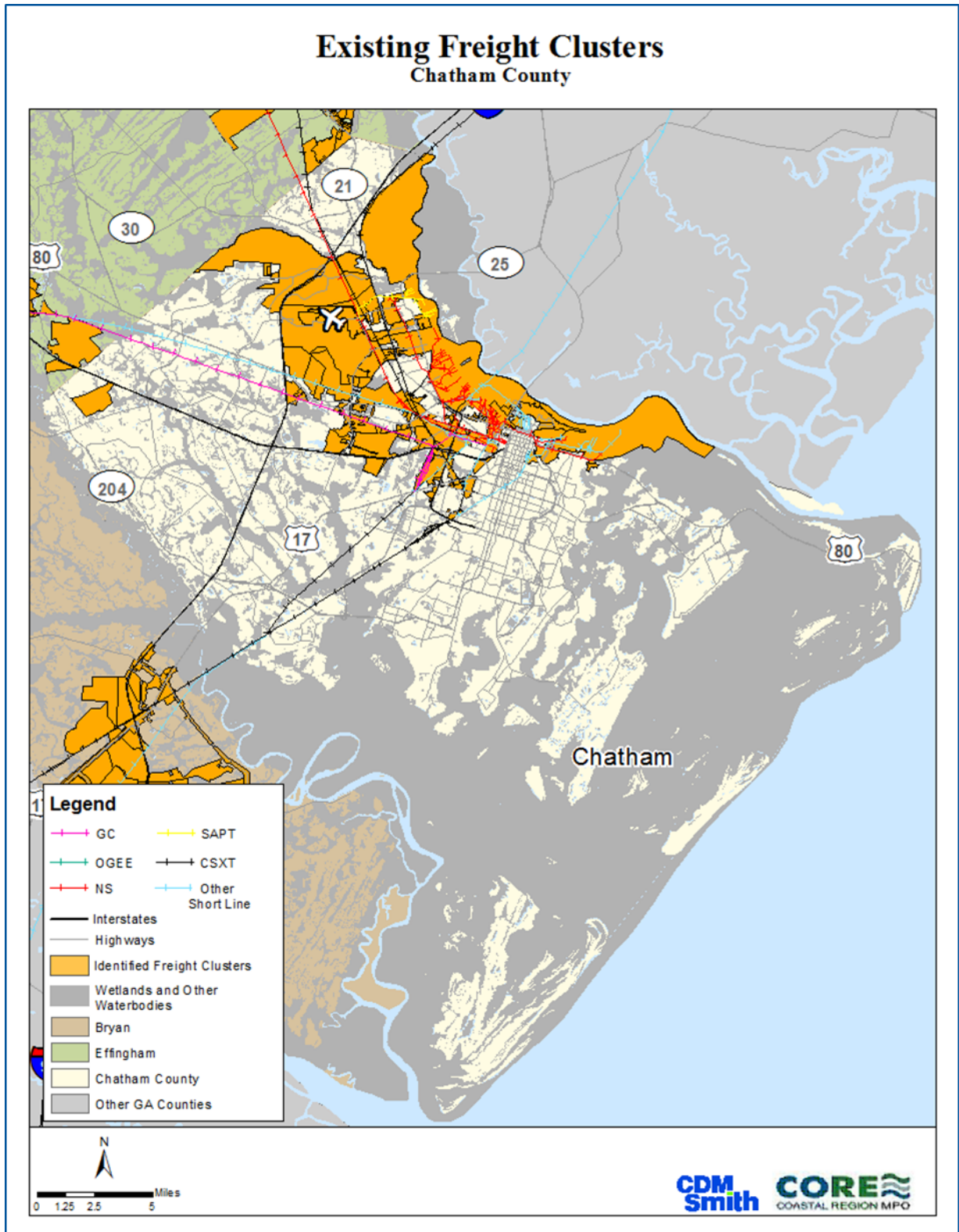


Figure 10-2: Existing Freight Clusters in Chatham County



Chatham County Brownfield Sites

Brownfields are sites or developments where industrial uses were once located and the site may contain some type of contamination in the soil or structure. Due to its impact on the surrounding environment, Brownfield properties are eligible for incentives to assist developers with the cost to clean up the site of any environmental issues. The majority of Brownfield properties identified in **Table 10-2** by the Georgia Environmental Protection Division are located within the freight clusters in Chatham County. The sites listed in **Table 10-2** are individual parcels of land.

Table 10-2: Brownfield Public Record Sites in Chatham County

Property Name	Address	City	County	Acreage
1400-1422 Dean Forest Road	1400,1404,1410,1416 ,1422 Dean Forest Rd.	Garden City	Chatham	19.94
1713 Old Dean Forest Road	1713 Old Dean Forest Rd.	Pooler	Chatham	7.06
2217 West Bay Street	2217 West Bay St.	Savannah	Chatham	0.733
400 Telfair Road	400 Telfair Rd.	Savannah	Chatham	12.9
63 Martin Luther King	63 Martin Luther King, Jr. Blvd.	Savannah	Chatham	0.8
Abercorn & Largo	12311 Largo Dr.	Savannah	Chatham	0.25
Central Georgia of Railroad Company-Battlefield Pa	Between MLK Jr Blvd, Louisville Rd, West Boundary	Savannah	Chatham	9.6
Coastal Acquisition	2333 Louisville Rd.	Savannah	Chatham	4.923
Comet Carwash Site	1901 East Victory Dr.	Savannah	Chatham	11.5
Container Land Associates	6069 Commerce Blvd.	Garden City	Chatham	18.35
CSX Feeley Avenue	Feeley Ave.	Savannah	Chatham	2.09
DryClean USA	11434 Abercorn St.	Savannah	Chatham	0.5
East River Street	601, 611 and 620 East River St.	Savannah	Chatham	4.088
Martha's Cleaner	4608 Skidaway Rd.	Savannah	Chatham	1.5
Romana Riley Lofts	1108 East Anderson St., 1402 & 1413 Waters Ave. and 1021 & 1023 E. Anderson St.	Savannah	Chatham	2
Sam's Club	3609 Ogeechee Rd.	Savannah	Chatham	19.44
Toto Distribution Site	Industry Dr.	Savannah	Chatham	18
Trustees Garden parcel C (Randolph St. Dev. LLC)	Bay St. and Randolph St.	Savannah	Chatham	3.51
Trustees Garden Subdivision- Parcel A	620 East Broughton St.	Savannah	Chatham	2.5
Trustees Garden Subdivision- Parcel B	60 East Broad St.	Savannah	Chatham	3.04
Victory Square Shopping Center	1901 East Victory Dr.	Savannah	Chatham	10.491
1400-1422 Dean Forest Road	1400,1404,1410,1416 ,1422 Dean Forest Rd.	Garden City	Chatham	19.94
1713 Old Dean Forest Road	1713 Old Dean Forest Rd.	Pooler	Chatham	7.06
2217 West Bay Street	2217 West Bay St.	Savannah	Chatham	0.733
400 Telfair Road	400 Telfair Rd.	Savannah	Chatham	12.9
63 Martin Luther King	63 Martin Luther King, Jr. Blvd.	Savannah	Chatham	0.8
Abercorn & Largo	12311 Largo Dr.	Savannah	Chatham	0.25

Property Name	Address	City	County	Acreage
Central Georgia of Railroad Company-Battlefield Pa	Between MLK Jr Blvd, Louisville Rd, West Boundary	Savannah	Chatham	9.6
Coastal Acquisition	2333 Louisville Rd.	Savannah	Chatham	4.923
Comet Carwash Site	1901 East Victory Dr.	Savannah	Chatham	11.5
Container Land Associates	6069 Commerce Blvd.	Garden City	Chatham	18.35
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Comet Carwash Site	1901 East Victory Dr.	Savannah	Chatham	11.5
Container Land Associates	6069 Commerce Blvd.	Garden City	Chatham	18.35

Source: Georgia Environmental Protection Division

Bryan County

In Bryan County, currently under 22,502 acres of land are targeted for freight-related uses. The freight-related land uses are concentrated in two areas, Interstate Centre, and Belfast Commerce Center (**Table 10-3**). Interstate Centre is located in western Bryan County and has access to I-16, while Belfast Commerce Centre is located in eastern Bryan County and has access to I-95 and the CSX rail line.

Table 10-3: Bryan County Industrial Parks

Location	City	Freight Network
Interstate Centre	Ellabell	I-16
Belfast Commerce Centre	Richmond Hill	I-95, CSX

Source: Development Authority of Bryan County

Bryan County did not have any Brownfield sites identified by the Georgia Environmental Protection Division. The county's existing freight clusters are displayed in **Figure 10-3**.

Effingham County

In Effingham County, about 13,000 acres, or under 7 percent of land in the county is currently used for freight-related land uses (**Table 10-4**). Currently, just less than 4,400 Acres of industrial land is identified as available for development by the Effingham County Industrial Development Authority. Shown in **Figure 10-4**, the Effingham County sites are located primarily in the southern half of Effingham County along the I-16 corridor, adjacent to the Class I railroads in the south central section of Effingham County, and SR 21 corridor.

Effingham County did not have any Brownfield sites identified by the Georgia Environmental Protection Division.

Table 10-4: Effingham County Industrial Sites

Location	City	Available Acres	Freight Network
Neidlinger Site (Effingham Industrial Park)	Rincon	30	SR 21, SR 119, I-95
Zipperer Park	Rincon	115	I-95, Rail
New Savannah Site	Rincon	710	SR 21, I-95
Grand View Site	Rincon	368	SR 21, I-95
McCormick-Kicklighter Site	Rincon	259	SR 21, I-95
I-16 Coastline Site – Effingham County I-16 Industrial Park	Rincon	183	I-16
Research Forest Site	Rincon	2,577	SR 21, CSX Rail, NS Rail, I-95
638 Fort Howard Road	Rincon	45	SR 21, I-95
21 Trade Park	Rincon	96	SR 21, CSX Rail, I-95

Source: Effingham County Industrial Development Authority

Figure 10-3: Existing Freight Clusters in Bryan County

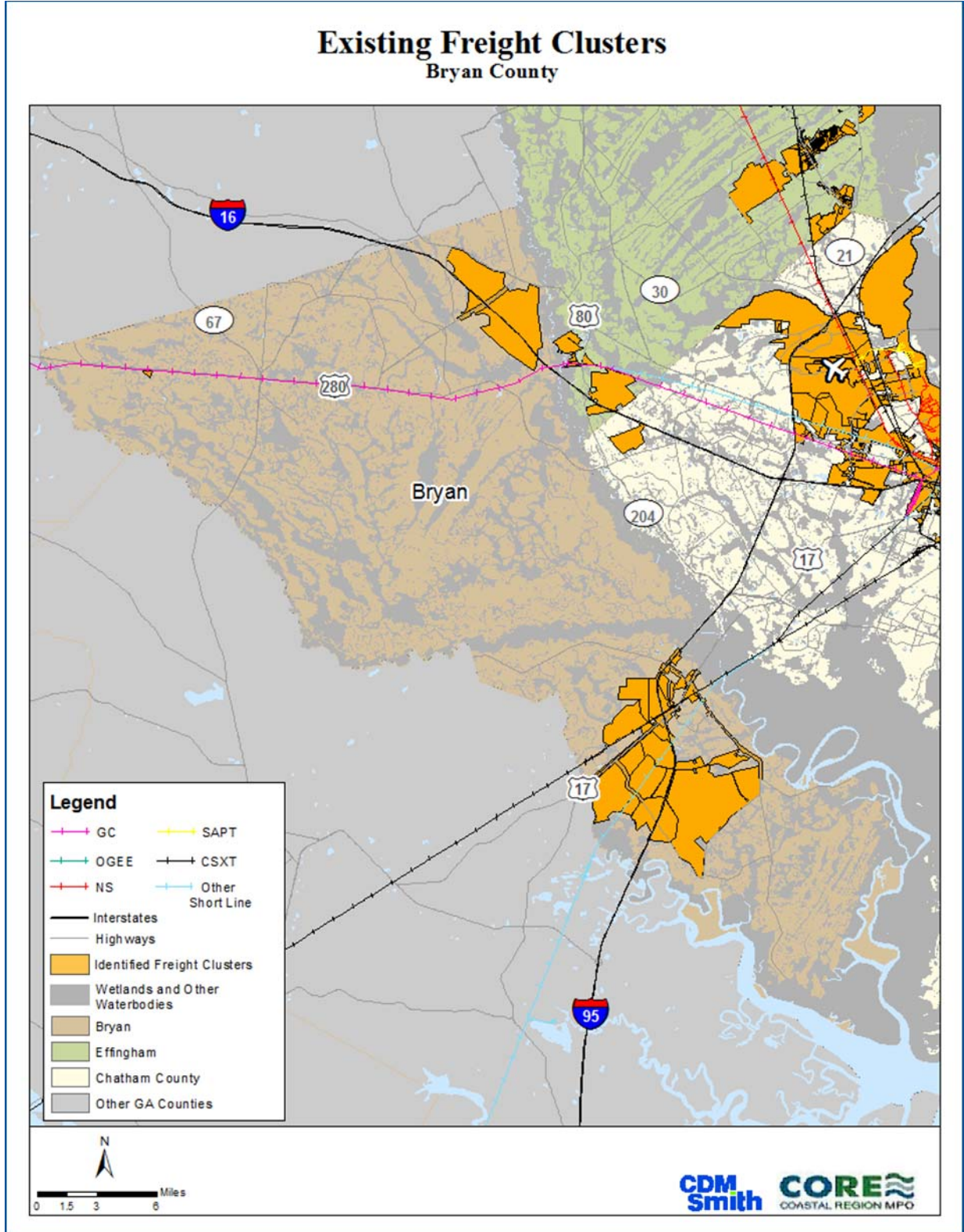
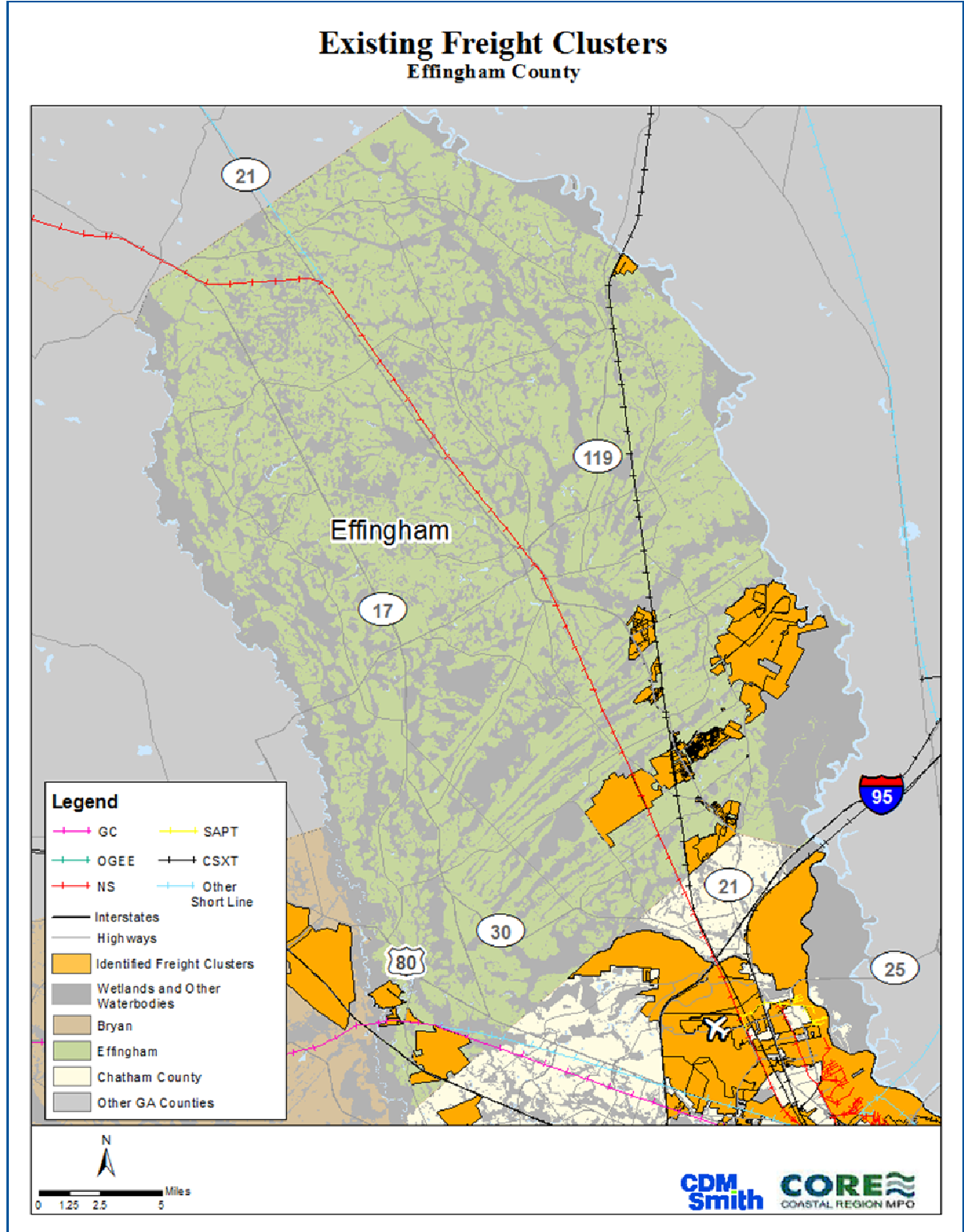


Figure 10-4: Existing Freight Clusters in Effingham County



10.2.2 Potential Greenfield Developments

As mentioned earlier, as the Savannah MSA continues to grow it is important to strategize where this future growth will occur for residential, commercial and industrial development. Targeting the best areas in the region for freight-related land use growth is crucial for the long-term economic growth. Undeveloped and vacant land located on or in close proximity to the freight transportation infrastructure will reduce the amount of conflict between freight and other uses, while also preserving other land for tax revenue generating businesses.

The methodology utilized to identify the Potential Freight Land Opportunities included parcels of land which are identified as being either vacant or undeveloped parcels of land. After identifying the vacant or undeveloped land parcels, these parcels were filtered to only include parcels located adjacent to the freight transportation network. **Figure 10-5** provides a vision of the Potential Freight Land Opportunities in Bryan, Chatham, and Effingham Counties.

Chatham County

In Chatham County, Potential Freight Land Opportunities are mainly located in Western County, similar to the Freight Cluster areas for the county. Several individual parcels were selected utilizing the criteria to identify Potential Freight Land Opportunities, though sites located within a wetland area were not included as an Opportunity. As shown in **Figure 10-6**, Chatham County has an abundant amount of access to the freight network via roadway and rail access points in Western Chatham County.

Bryan County

With strategic access to I-16 and I-95, Bryan County has two large groupings of vacant or undeveloped parcels located along both corridors. Displayed in **Figure 10-7**, the I-16 parcels are located in close proximity to the Existing Freight Cluster located at the Interstate Centre industrial park. While similar to Belfast Commerce Centre, the parcels along I-95 are located adjacent to the interstate and CSX rail line. The remainder of Bryan County has a few parcels spread out throughout the rest of the county.

Effingham County

The Potential Freight Land Opportunities in Effingham County are concentrated in Southern Effingham County, near the Chatham County border. As presented in **Figure 10-8**, two of the three larger groupings of vacant or undeveloped land are located along the CSX rail line, while the third group of parcels is located east of SR 21 in the Southeastern section of the County.

10.2.3 Combined Freight Development Recommended Areas

An overlay of both freight development recommended areas, Freight Clusters and Potential Greenfield Development Areas are highlighted in Section 10.1.2. **Figure 10-9** displays a comprehensive picture of the recommended areas shown in Sections 2.1 and 2.2 for the Savannah MSA, while **Figures 10-10, 10-11, and 10-12** covers Chatham, Bryan, and Effingham Counties respectively.

Figure 10-5: Potential Greenfield Development Areas for Future Growth

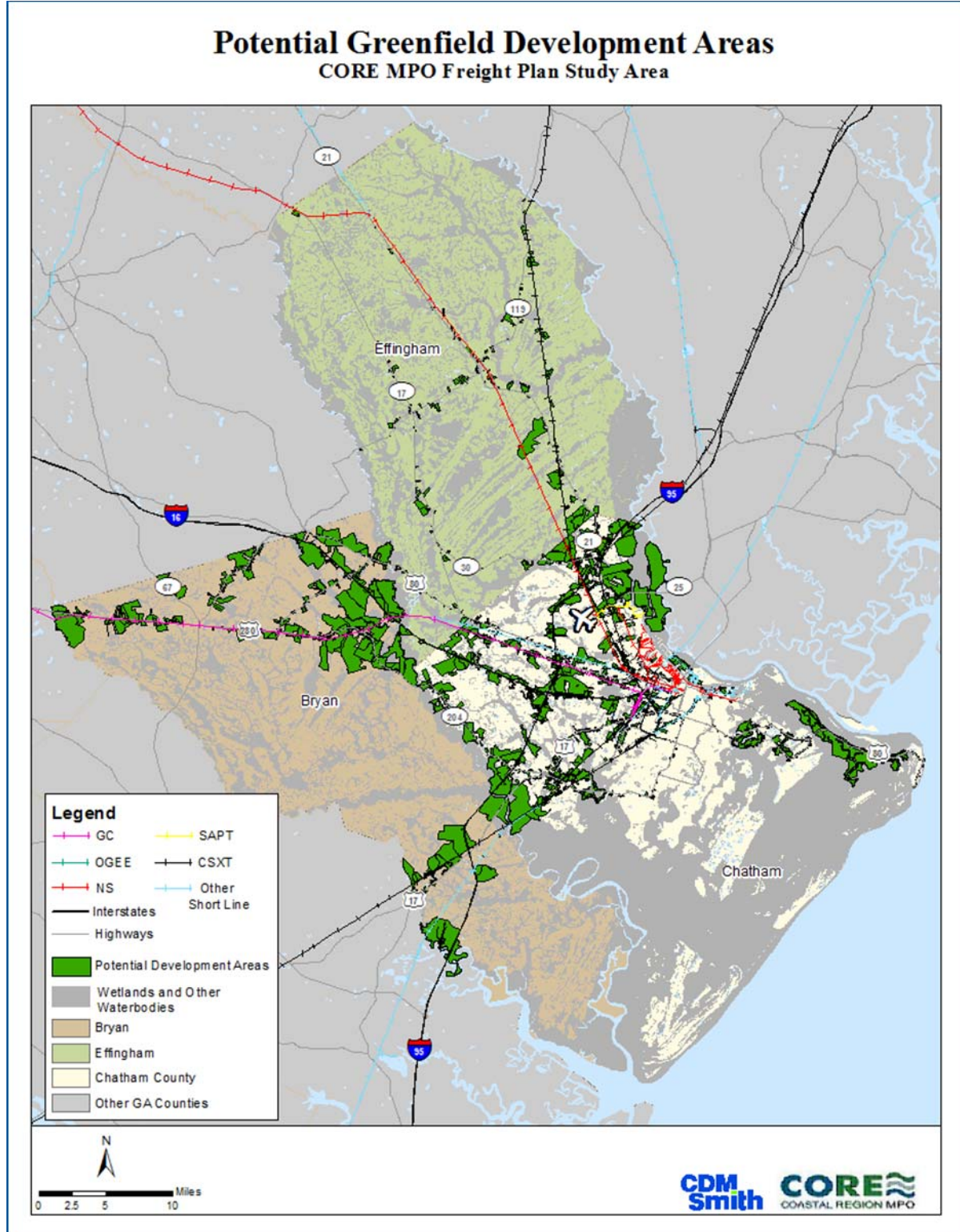


Figure 10-6: Potential Greenfield Development Areas for Future Growth in Chatham County

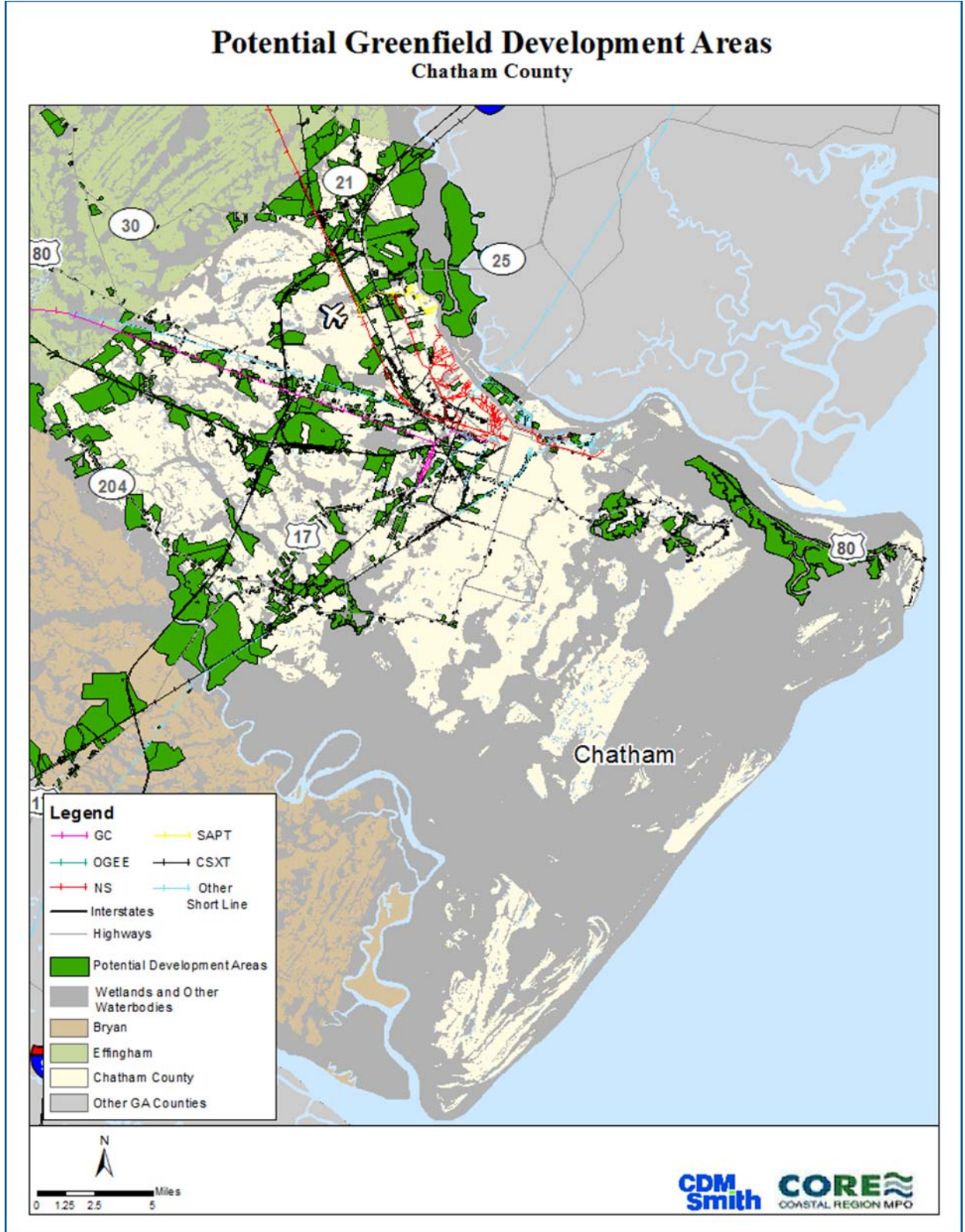


Figure 10-7: Potential Greenfield Development Areas for Future Growth in Bryan County

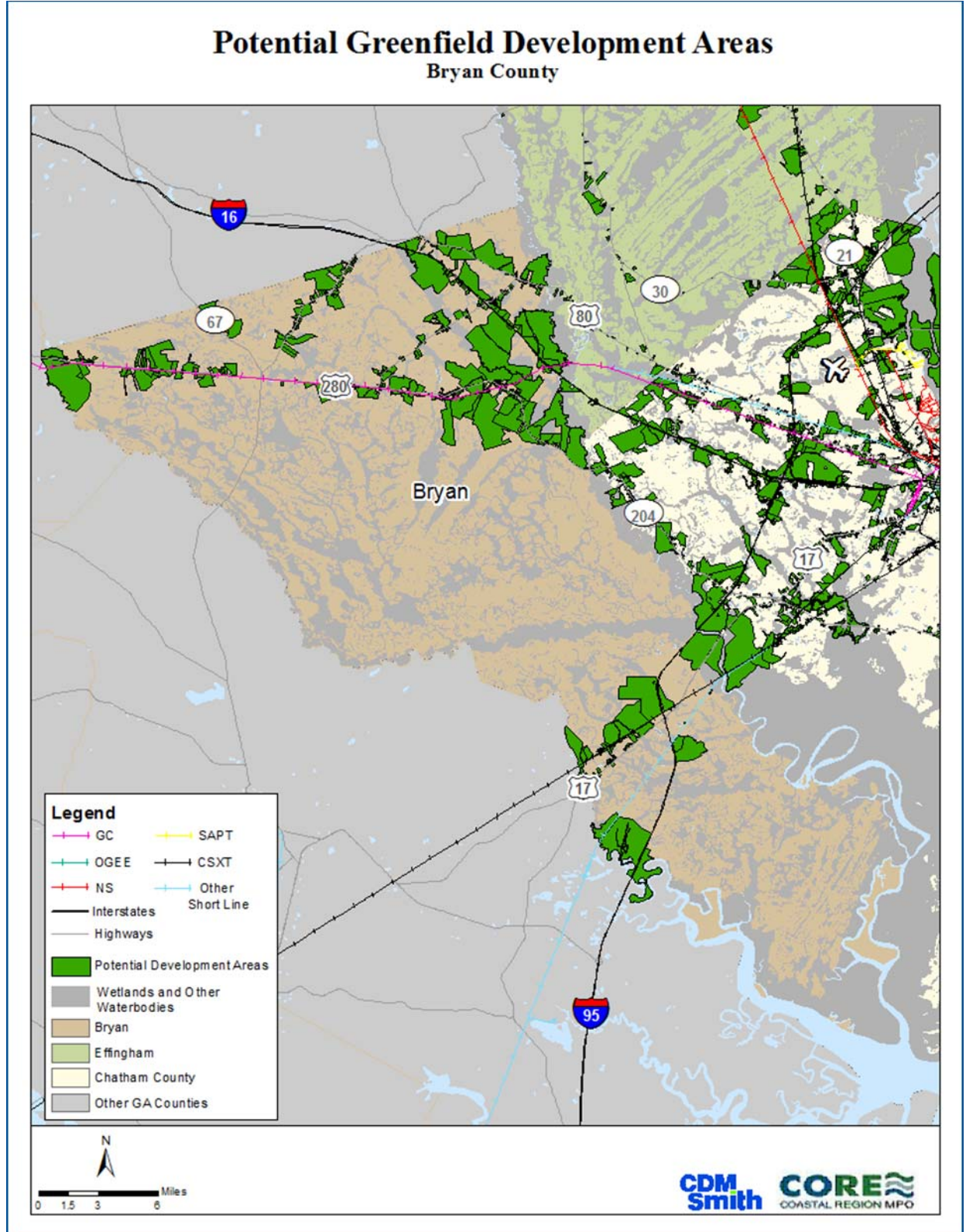


Figure 10-8: Potential Greenfield Development Areas for Future Growth in Effingham County

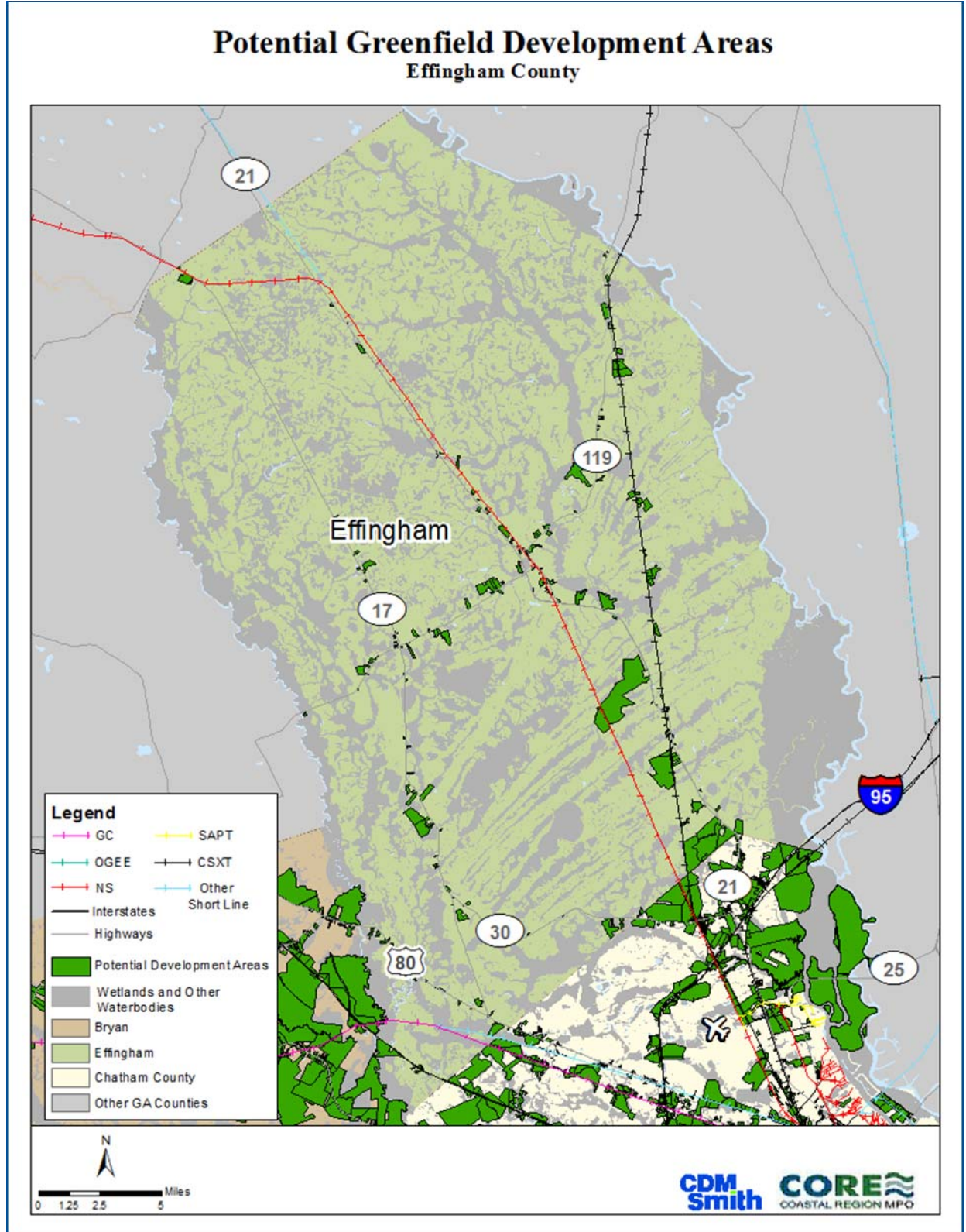


Figure 10-9: Freight Clusters and Potential Greenfield Development Areas

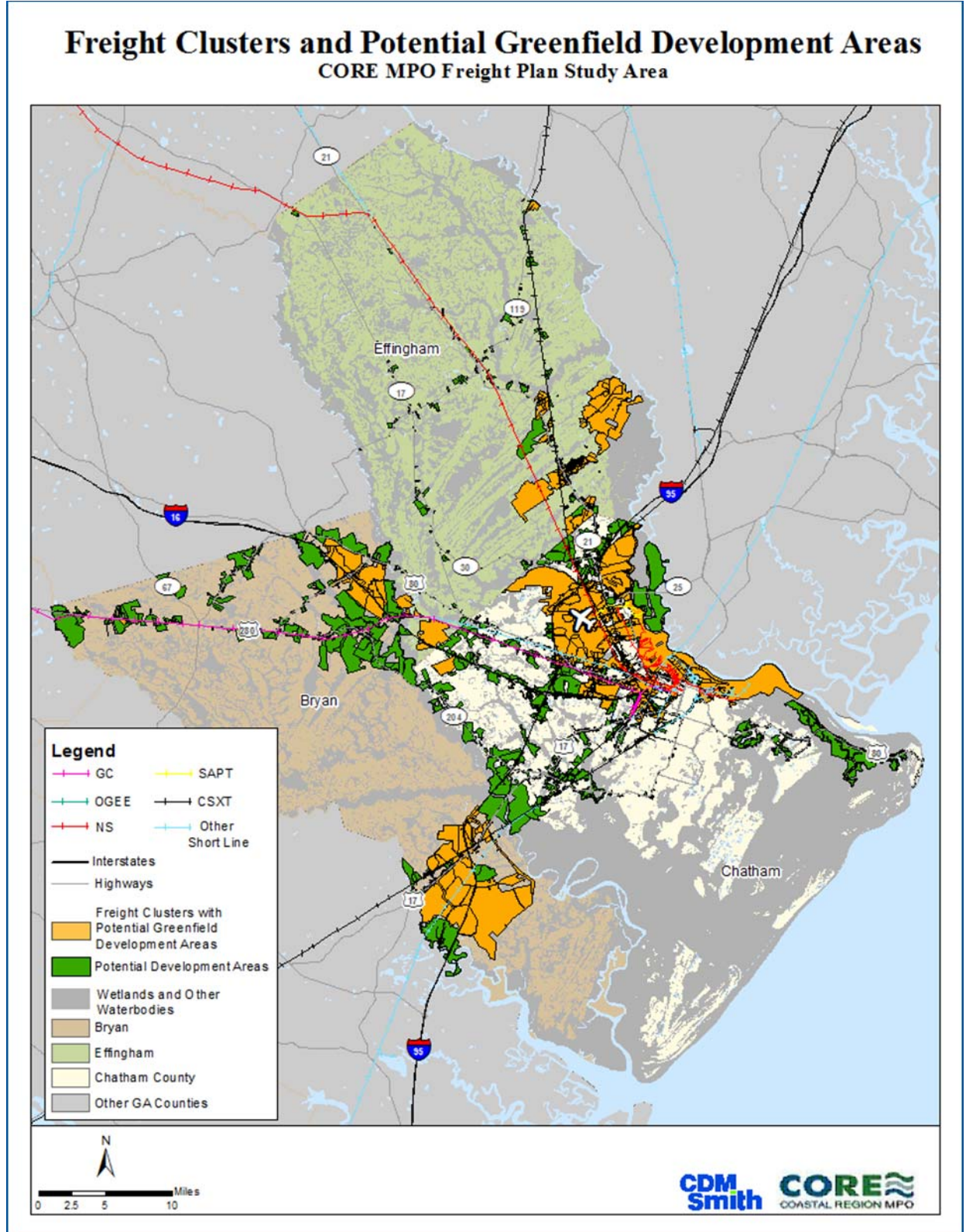


Figure 10-10: Chatham County Freight Clusters and Potential Greenfield Development Areas

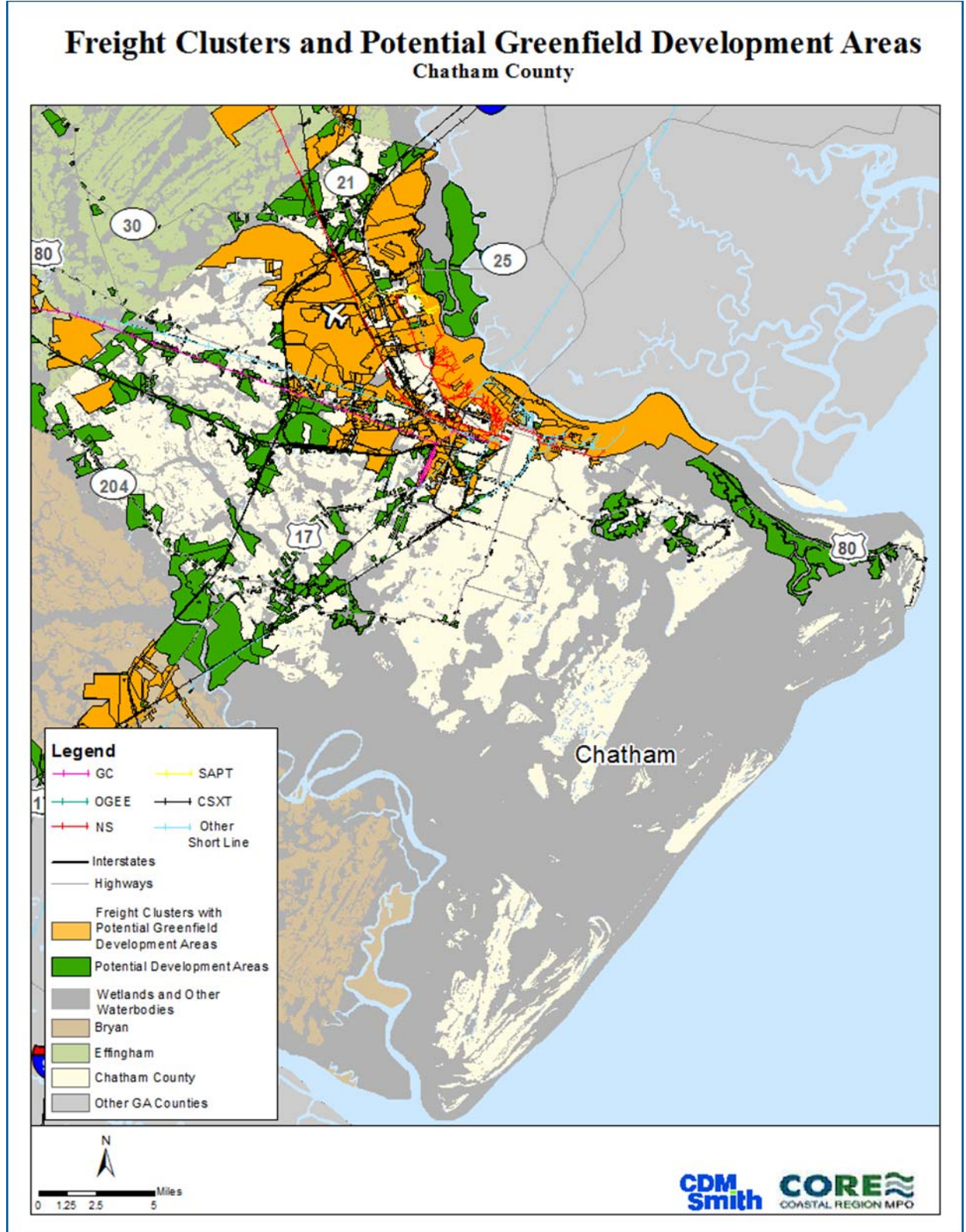


Figure 10-11: Bryan County Freight Clusters and Potential Greenfield Development Areas

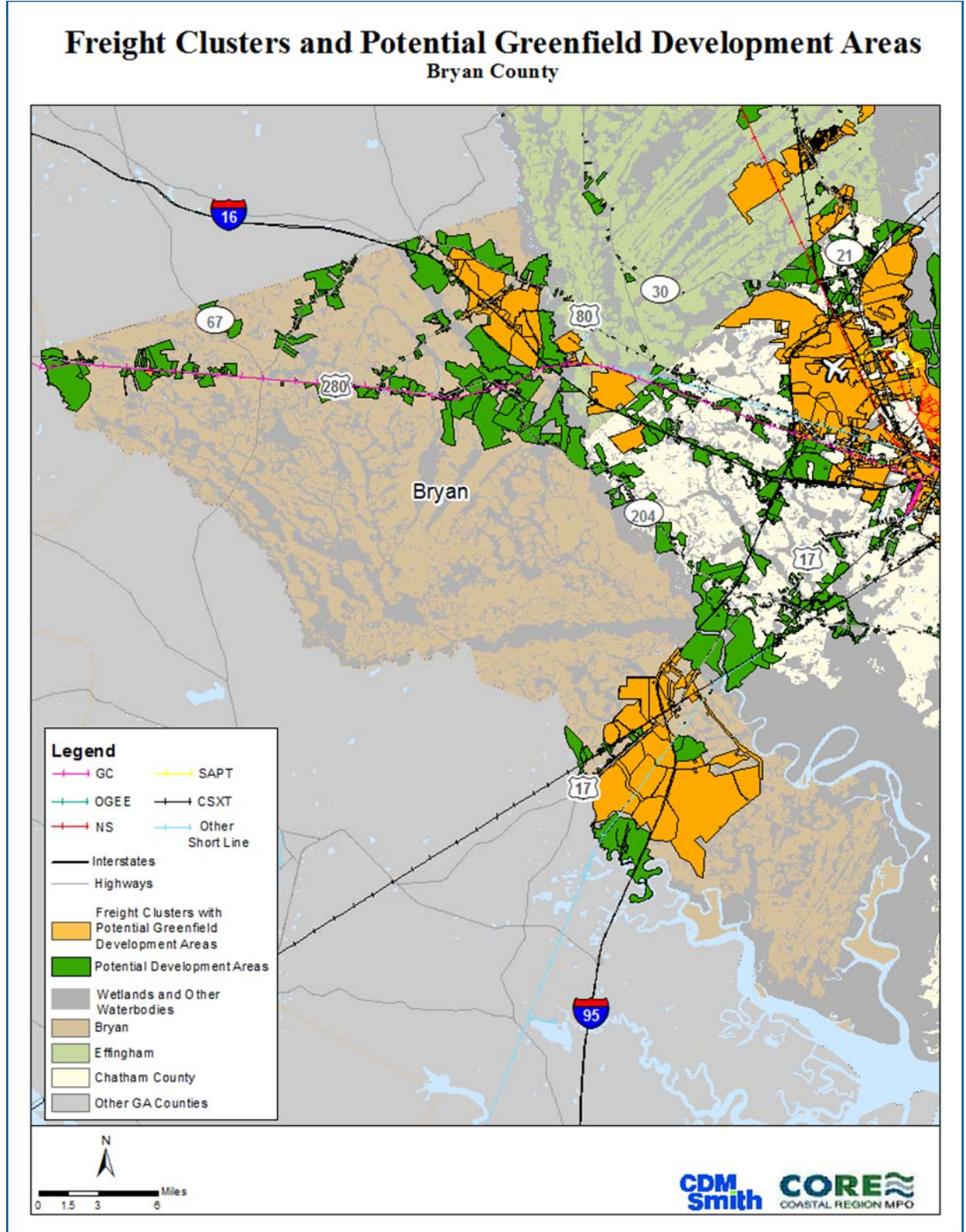
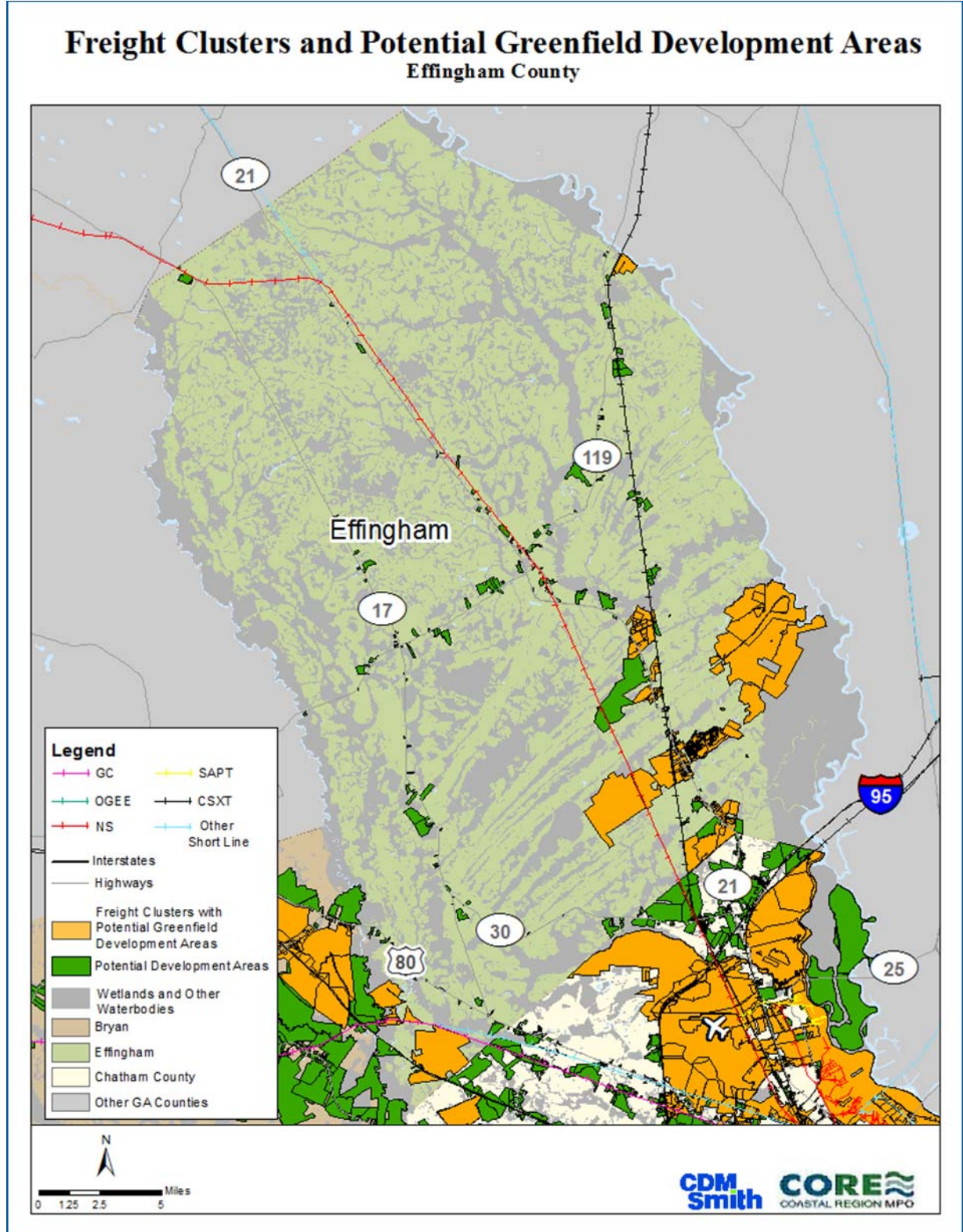


Figure 10-12: Effingham County Freight Clusters and Potential Greenfield Development Areas



10.3 Freight Land Use Policy Recommendations

Moving goods and freight is critical to the Savannah region's economy. The development of strategies to target land to provide for future freight needs will be important as the Savannah region anticipates more freight to travel through in the upcoming decades. Below are specific land use policy recommendations which will enable the Savannah region to accommodate current and future freight needs are important in order to sustain and grow freight.

- Prioritization of clustering existing designated industrial developments.
 - Infill within existing industrial clusters
 - Greenfield development located adjacent to or in close proximity to freight transportation network

First, placing a priority on developing sites located in existing industrial parks closest to major freight generators, such as the Port of Savannah and the Savannah / Hilton Head International Airport, are crucial in preserving the most strategic areas of land for freight related growth. Second, locating any new Greenfield industrial development adjacent to or close in proximity to the freight transportation network. Locating close to the freight network will minimize freight impact on the community, while also providing direct access to the network. Once these strategic sites are developed for other uses, it will be difficult to convert them to freight uses in the future.

- Counties and Municipalities Zoning and Land Use Data should be consistent and reflect their future land use plans.

Inconsistencies in zoning and land use data can have negative implications when planning for future growth for a community. Having data that is reliable and consistent can streamline processes, as data collection and analysis is typically one of the first activities in the planning process.

- Development of a Savannah Regional Economic Development Task Force which coordinates between counties and municipalities on land use and economic development information sharing and communication in the region.

Integrate into the existing CORE MPO Freight Advisory Committee (FAC), public and private economic development stakeholders and decision makers in the Savannah region. This committee can provide a forum for peer exchange of economic development information for the Savannah region.

- Increase transportation system safety by expanding the use of compatible land use practices in regard to transportation issues. Adoption of access management ordinances by Counties and Municipalities. Locate development on properties with access to rail, truck, air, and port facilities.

10.4 Freight Infrastructure Recommendations

In conjunction with the freight infrastructure improvement recommendations, the freight policy recommendations will provide guidance in the maintenance and investment of the freight infrastructure and movement of freight and goods in the Savannah MSA. As the Savannah region and the state continue to invest in the Port of Savannah, improving connections to the port on land is crucial in the process of capturing the freight growth anticipated for the region. In order to ensure this efficient movement of freight and goods, any freight project should be recognized and given a higher priority due to its benefits to the economy and the continued investment of technological and innovative improvement in the national, state, and regional freight transportation system. A series of freight policy recommendations are listed below.

- ***Maintain State of Good Repair of the existing freight system***

Freight movements cause a lot of wear and tear, thus it is important to place a high priority on preserving and maintaining the physical condition of the existing freight network, e.g. resurfacing of roadways, bridge maintenance, rail track and bridge maintenance, river dredging, etc.

- ***Encourage that safety improvements which accommodate truck traffic are included for projects on the freight transportation network***

Encourage safety practices beyond minimum compliance. Ensure signage and roadway markings on all designated truck routes, practice access management, maintain lane width minimums on truck routes, reduce the amount of at-grade crossings on truck routes, and provide full railroad crossing safety signalizations at all at-grade crossings. Safety, security and resiliency factors need to be considered and built into transportation infrastructure design and investment decisions for all CORE MPO designated truck routes.

- ***Establish a Regional Multimodal Freight Transportation Network:***

- ***Grandfather State Freight Transportation Network – interstate and state highways;***
- ***Add local freight roadways onto CORE MPO Regional Freight Network – Jimmy DeLoach Parkway, Chatham Parkway, and Airways Avenue.***

Establish a comprehensive regional multimodal freight transportation network with the region's freight facilities on the network. Establish a regional freight network emphasis area where public investments on freight system shall be focused upon for future investments to ensure the efficient movement of freight and goods in the Savannah region.

- ***Establish Truck Operational Hours along Bay Street (Downtown Savannah)***

Bay Street is a major east-west connection corridor in Downtown Savannah and serves vehicular, truck, bicycle and pedestrian traffic heavily. Identify a strategy which improves the safety and operation of Bay Street for all users of this corridor. Develop a task force which includes public and private partners who travel on Bay Street for their input on creating an environment on Bay Street that is beneficial to all parties. This task force will establish a set of daily operational hours for trucks traveling through Bay Street.

- ***Develop an ITS/Traffic Messaging System for communication with trucks to utilize alternative routes on the freight transportation network***

Establish and support technology development and deployment of integrated corridor management and the integration of intelligent transportation systems (ITS) on the freight transportation network. As more last-mile connections are constructed with the Port of Savannah, provide signage and alternative routes to truck drivers to avoid congested routes.

- ***Develop corridor signal timing on major truck routes – example GDOT Regional Traffic Operations Program (RTOP)***

With limited funds available for adding capacity to roadways through widening projects, maximizing the existing infrastructure by increasing vehicle throughput within the existing corridor is a necessity. The GDOT RTOP invests resources in improving traffic operations on major arterials by improving the signal operations for the corridor. The purpose of the GDOT RTOP is to increase travel throughput by reducing delays along congested corridors through the improvement of signal operations.

Since RTOP focuses on corridors, these sections of roadways typically cross city and county boundaries. GDOT coordinates with the local governments on the signal timing for the corridors. Currently, the RTOP is only utilized for corridors in the Metro Atlanta region, though GDOT is targeting other corridors around the state for the program. More information about the RTOP is available at www.dot.ga.gov/DS/SafetyOperation/RTOP.

RTOP candidates for the Savannah MSA would include:

- U.S. 80
- SR 21
- SR 307

- ***Develop a Wayfinding System between Port of Savannah and Interstate Corridors***

Currently in the Savannah region, sporadic signage with directional references to the Port of Savannah and the local truck route is available. As freight industry continues to grow in the region, new infrastructure improvements are being constructed to provide last-mile connections with the port. As investments are made on the freight transportation network to accommodate trucks, it's important to display to truck drivers the routes best utilized for freight movement, instead of trucks attempting to take short cuts through residential areas

- ***Continue the CORE MPO Freight Advisory Committee (FAC)***

Established during the CORE MPO Freight Transportation Plan development, the Freight Advisory Committee (FAC) is made up of private and public sector freight and economic development stakeholders and decision makers. At the conclusion of the freight plan development, the FAC will be evolved into a standing advisory committee of CORE MPO – Economic Development and Freight Advisory Committee (EDFAC). This committee allows the CORE MPO to provide a forum for peer exchange of freight information for the Savannah region. Participant outreach includes informing the EDFAC on the CORE MPO's freight

activities and allows the EDFAC to provide input and recommendations on the direction of the CORE MPO's freight planning efforts.

It is recommended that the EDFAC continue to meet regularly to share information on freight and economic development related needs and issues that exist within the Savannah Region, and oversee the implementation of recommended policies and projects from this freight transportation plan. As the CORE MPO's freight program continues to involve, the EDFAC can provide important feedback and direction for future freight developments.

10.5 Freight Infrastructure Recommendations

As the Savannah region and the state continue to invest in the Port of Savannah, improving connections to the port on land is crucial in the process of capturing the freight growth anticipated for the region. This chapter outlines the project-level freight infrastructure improvement recommendations, which combined total over \$1.18 billion in infrastructure improvements for the Savannah region. The projects are divided into three tiers for improvements based on their current development status, ease of implementation and feasibility.

10.5.1 Short – Term Freight Infrastructure Improvement Recommendations (Years 0 – 5)

The proposed short-term projects, totaling \$288,564,703, have been evaluated based upon the analysis during the CORE MPO Freight Transportation Plan development (**Table 10-5**). The short-term recommendations include strategies that can be implemented fairly quickly to provide immediate benefits to freight and goods movement in the Savannah region. The identified improvements, strategies, and recommendations are both broad-based freight policies/programs and specific infrastructure, operational, and mobility enhancement projects. Projects classified as Short-Term are anticipated on being constructed or being programmed for construction within the next five years.

The short-range grade crossing improvement projects are programmed primarily to provide active warning devices at crossing locations where they do not currently exist or are lacking updated safety infrastructure.

Some of the short-term infrastructure improvement projects identified during the early stages of the CORE MPO Freight Transportation Plan development are either already under construction or have been let for construction (see list below). These projects are no longer included in the proposed short-term project list.

- 1) Savannah Harbor Expansion Project (Deepening)
- 2) CS 602/CS 650/Grange Rd from SR 21 to E of SR 25
- 3) CS651/Crossgate Rd from SR 21 to NS#734150L in Port Wentworth
- 4) SR 21 from SR 30 to I-95; Including Interchange (Diverging Diamond Interchange)
- 5) I-95 at Airways Avenue Interim Improvements
- 6) SR 25 Conn/Bay Street from I-516 to the Bay Street Viaduct (West Bay Street Widening)

Table 10-5: Short-Term Freight Infrastructure Improvement Recommendations

Short-term (0-5 years)					
Project	Highway	Seaport	Airport	Rail	Cost*
CR 787/Islands Expressway at Wilmington River/Bascule Bridge ²	X				\$45,019,917
SR 21 Culvert Replacement at Pipemakers Canal ²	X				\$2,525,000
SR 25 Culvert Replacement at Pipemakers Canal ²	X				\$2,525,000
SR 26 from I-516 to CS 188/Victory Drive (US 80/Ogeechee Rd Widening) ²	X				\$20,823,924
I-516/Lynes Parkway Widening from I-16 to Veterans Parkway ²	X				\$95,746,503
CR 984/Jimmy DeLoach Parkway @ SR 17 – Interchange (New Interchange at US 80) ²	X				\$26,605,432
Jimmy DeLoach Parkway Extension from US 80 to I-16, including new interchange at US 80 ²	X				\$24,571,426
Intersection Operational Improvements Ogeechee Road (US 17/SR 25) at Chatham Parkway ¹	X				\$375,000
Operations and Safety Enhancements – Dean Forest Road/Bourne Road (SR 307) from Port Authority to I-16 ¹	X				\$700,000
Intersection Safety Beacon – SR 25 N Coastal Highway at Main Mill Entrance (Port Entrance) ¹	X				\$27,500
Safety Improvements – South of SR 25 at Crossgate intersection in Port Wentworth (On-street angled parking on truck route)	X				\$500,000
Safety Improvements – South of SR 25 at Aberfeldy Street intersection in Port Wentworth (On-street angled parking on truck route)	X				\$500,000
Intersection Safety Beacon – SR 17 at SR 30	X				\$27,500
Safety Improvements – North of SR 17 at 2 nd Avenue intersection in Guyton (On-street angled parking on truck route)	X				\$500,000
Wayfinding – US 280 at Strickland in Pembroke – sign to I-16 through residential street (shortcut_ need to add sign no trucks allowed) ¹	X				\$10,000
Wayfinding – US 280 at SR 67 – need truck signage to I-16 ¹	X				\$10,000

Short-term (0-5 years)					
Project	Highway	Seaport	Airport	Rail	Cost*
US 17/Ogeechee Road widening from east of Lynes Parkway to east of the Springfield Canal and the US 17/Ogeechee Road Intersection with Victory Drive ⁵	X				\$38,000,000
Airways Avenue Widening ²	X				\$5,846,375
SR 25/US 17 Bridge Replacement at Savannah River	X				\$11,258,655
SR 25/US 17 Bridge Replacement at Middle River	X				\$13,002,461

¹ List of Recommendations from the CORE MPO Regional Freight Plan

² Projects from the CORE MPO 2040 Total Mobility Plan

³ Draft Recommendation from the Georgia State Rail Plan that is currently being updated

⁴ Recommendations from the Georgia Statewide Freight and Logistics Plan, 2010-2050

⁵ GDOT PI

*The project costs are planning-level estimates.

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10.5.2 Mid – Term Freight Infrastructure Improvement Recommendations (Years 6 – 15)

The proposed mid-term projects, totaling \$165,122,913, have been evaluated based upon the analysis during the CORE MPO Freight Transportation Plan development (**Table 10-6**). The Mid-Term Infrastructure improvement recommendations include strategies that may require design and right-of-way acquisition to provide intermediate benefits to freight and goods movement in the Savannah region. The identified improvements, strategies, and recommendations are both broad-based freight policies/programs and specific infrastructure, operational, and mobility enhancement projects.

Table 10-6: Mid-Term Freight Infrastructure Improvement Recommendations

Mid-term (6-15 years)					
Project	Highway	Seaport	Airport	Rail	Cost*
I-516 @ CS/1503/DeRenne Avenue (DeRenne Blvd. Option) ²	X				\$50,322,299
East DeRenne from SR 204 to Harry S Truman Parkway (East DeRenne Avenue Improvements) ²	X				\$11,162,892
SR 21 from CS 346/Mildred Street to SR 204 (West DeRenne Avenue Improvements) ²	X				\$6,064,991
Brampton Road Connector from Foundation Drive to SR 21/SR 25/US 80 ²	X				\$25,175,226
Build additional tracks for storage, double-tracking or re-configuring storage leads at Garden City Terminal ³				X	\$10,000,000
Increase Garden City Terminal Yard capacity, track lengths, or double tracking ³				X	\$10,000,000
Operations and Safety Enhancements – SR 21 Corridor ¹	X				\$3,500,000
Operations and Safety Enhancements - US 80 Corridor ¹	X				\$3,500,000
Intersection Operational Improvements - SR 25 at SR 30 ¹	X				\$375,000
Intersection Operational Improvements - SR25 at Brampton Road ¹	X				\$375,000
Intersection Operational Improvements - SR 25 at SR 21 – Right Turn Lane ¹	X				\$200,000
Intersection Operational Improvements - SR 119 N Laurel Street at SR 119 E Madison Street – Right Turn southwest crosses over into the opposite lane ¹	X				\$200,000
Intersection Operational Improvements - SR 119 at SR 17 – Four way improvements ¹	X				\$750,000
Intersection Operational Improvements – SR 30 at SR 21 – Right hand turn from US 80 eastbound to SR 21 southbound ¹	X				\$200,000

Mid-term (6-15 years)					
Project	Highway	Seaport	Airport	Rail	Cost*
Interchange Operational Improvements – US 80 at I-95– Extend left turn lane across light for turn onto northbound I-95 ¹	X				\$350,000
Intersection Operational Improvements – SR 30 – add right hand turn lane (westbound) across from Dublin Road into Fleet Pride property entrance ¹	X				\$375,000
Intersection Operational Improvements – US 80 at SR 307 – Widen right hand turn from US 80 eastbound to SR 307 southbound ¹	X				\$375,000
Intersection Operational Improvements – US 80 at 8 th Street/Alfred Street – right hand turn from US 80 eastbound to 8 th Street/Alfred Street southbound; right hand turn from 8 th Street/Alfred Street to US 80 eastbound ¹	X				\$375,000
Intersection Operational Improvements – US 80 at West Lathrop Avenue – Right hand turn from US 80 southbound at West Lathrop Avenue ¹	X				\$375,000
Operational Improvements - Jimmy DeLoach Pkwy – add right hand turn lane westbound Jimmy DeLoach Pkwy to Expansion Blvd northbound ¹	X				\$375,000
Operational Improvements - Jimmy DeLoach Pkwy – add right hand turn lane westbound Jimmy DeLoach Pkwy to Logistics Way northbound ¹	X				\$375,000
Operational Improvements - Jimmy DeLoach Pkwy – add right hand turn lane eastbound Jimmy DeLoach Pkwy to Port Logistics Center Crossroads southbound (near SR 21) ¹	X				\$375,000
Operational Improvements - Jimmy DeLoach Pkwy – add right hand turn lane westbound Jimmy DeLoach Pkwy to Port City entrance northbound ¹	X				\$375,000
Airways Avenue Flyover to Gulfstream Road ²	X				\$15,280,653
I-95 at Airways Avenue Diverging Diamond Interchange ²	X				\$14,000,000
Benton Boulevard from Highlands Boulevard to Meinhard Road ²	X				\$8,496,852
Chatham Parkway Improvements from I-16 to US 80	X				\$2,170,000

¹ List of Recommendations from the CORE MPO Regional Freight Plan

² Projects from the CORE MPO 2040 Total Mobility Plan

³ Draft Recommendation from the Georgia State Rail Plan that is currently being updated

⁴ Recommendations from the Georgia Statewide Freight and Logistics Plan, 2010-2050

⁵ GDOT PI

*The project costs are planning level estimates.

10.5.3 Long – Term Freight Infrastructure Improvement Recommendations (Years 16 – 25)

The proposed long-term projects, totaling \$726,434,278, have been evaluated based upon the analysis during the CORE MPO Freight Transportation Plan development (**Table 10-7**). The long-term recommendations include strategies that may require design and right-of-way acquisition, additional funding and extensive coordination with community stakeholders to provide long-term benefits to freight and goods movement in the region. The identified improvements, strategies, and recommendations are both broad-based freight policies/programs and specific infrastructure, operational, and mobility enhancement projects.

Table 10-7: Long-Term Freight Infrastructure Improvement Recommendations

Long-term (16-25 years)					
Project	Highway	Seaport	Airport	Rail	Total Project Cost*
I-95 at SR 21/Augusta Rd Interchange Reconstruction ²	X				\$23,394,881
US 80/Victory Drive Improvements/Congestion Mitigation ²	X				\$39,015,752
President Street/Truman Parkway Interchange Bridge and Ramp Reconstruction ²	X				\$108,883,056
I-516/Lynes Parkway Widening from Veterans Parkway to Mildred Street ²	X				\$158,188,915
I-516/Lynes Parkway at I-16 Interchange Reconstruction ²	X				\$47,250,000
I-16 at I-95 Interchange Reconstruction ²	X				\$84,459,499
I-16 at Chatham Parkway – Interchange improvements ¹	X				\$54,250,000
New Roadway - Effingham Parkway – From SR 119/Effingham to SR 30/Chatham ²	X				\$22,992,175
Savannah Port Rail Improvements to upgrade rail infrastructure and build grade separations as necessary ³	X			X	\$30,000,000
I-95 and Airways Avenue Interchange Reconstruction ²	X				\$80,000,000
I-16 Widening – I-95 to I-516 ²	X				\$78,000,000
SR 21 Grade Separation at CSXT Rail Crossing ¹	X			X	\$33,360,000
SR 25 Grade Separation at NS/CSX Rail Crossings ¹	X			X	\$16,440,000
I-16 Interchange Reconstruction @ SR 307 ¹	X				\$25,250,000

¹ List of Recommendations from the CORE MPO Regional Freight Plan

² Projects from the CORE MPO 2040 Total Mobility Plan

³ Draft Recommendation from the Georgia State Rail Plan that is currently being updated

⁴ Recommendations from the Georgia Statewide Freight and Logistics Plan, 2010-2050

⁵ GDOT PI

*The project costs are planning level estimates.