



Technical Memorandum

# ENVIRONMENTAL AND COMMUNITY IMPACT SCAN AND ANALYSIS



Prepared by CORE MPO

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## 1. INTRODUCTION

The purpose of this technical memorandum is: 1) to analyze the impacts of freight movements on communities and the environment in the CORE MPO Freight Transportation Plan study area; and 2) to suggest mitigation strategies.

Freight movement is the transportation of goods from manufacturing, warehousing and distribution locations to consumers by air, rail, truck, water or pipeline. In the CORE MPO Freight Transportation Plan study area (Savannah MSA - Bryan, Chatham and Effingham Counties), freight moving along highways accounts for 65.8 percent of all tonnage and 73.9 percent of the freight value; intermodal and mixed mode movements account for 24.5 percent of all tonnage and 20.2 percent of the total freight value; Freight moving on rail accounts for 7.7 percent of all tonnage and 3.4 percent of freight value; freight moving through the port accounts for 2.1 percent of all tonnage and 1.5 percent of the freight value; and freight moving through the airport accounts for less than 1 percent of all tonnage and 1 percent of the freight value. Growth in freight transportation within the study area is increasing because of the Port of Savannah and the area's connectivity to Atlanta, which is a major hub for distribution of goods across the country.

As freight mobility and volumes increase, the study area will face various challenges and issues associated with freight movement and freight land use development. A significant amount of freight movement is by trucks that share the existing roadway network with passenger traffic, since there are no dedicated truck facilities in the region. According to the results from Task 2, Freight Mobility Needs Assessment, congestion was identified as a major issue impacting freight mobility, and infrastructure deficiencies were identified as a cause of congestion. Additionally, there are several land use conflicts that were commonly identified as challenges to freight mobility in the region, including trucks moving through the heart of the historic district, concerns for the noise of the rail transportation, residential encroachment on traditionally industrial corridors, and operational issues such as the need for improved network management.

## 2. 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.

### 2.1 Environmental Justice Analysis

#### 2.1.1 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 2-1** 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 2-1: 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%
<b>Population by Race</b>								
White alone	140,010	52.81%	24,254	80.22%	43,182	82.64%	207,446	59.68%
American Indian and Alaska native alone	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 American alone	106,392	40.13%	4,286	14.18%	7,048	13.49%	117,726	33.87%
Native Hawaiian and Other Pacific native alone	254	0.10%	25	0.08%	26	0.05%	305	0.09%
Some other race alone	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%
<b>Population by Hispanic or Latino Origin (of any race)</b>								
Persons of Hispanic or Latino Origin	14,370	5.42%	1,336	4.42%	1,501	2.87%	17,207	4.95%
Persons Not of Hispanic or Latino Origin	250,758	94.58%	28,897	95.58%	50,749	97.13%	330,404	95.05%
<b>Population by Age</b>								
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 Community Survey	Chatham		Bryan		Effingham		Savannah MSA	
	Counts	Pct	Counts	Pct	Count	Pct	Count	Pct
<b>Persons Below Poverty Level (2008 – 2012 ACS)</b>								
Total Estimated Persons	257,301	100.00%	30,433	100.00%	51,767	100.00%	339,501	100.00%
Total Estimated Persons Below Poverty	48,591	18.88%	3,686	12.11%	5,472	10.57%	57,749	17.01%

Source: US Census Bureau

## 2.1.2 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 2-2** 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 (under 10 or over 65) larger than 25.28%.

**Table 2-2: 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	<b>42.68%</b>
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	<b>25.28%</b>
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	<b>17.01%</b>

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

**Figure 2-1** 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.

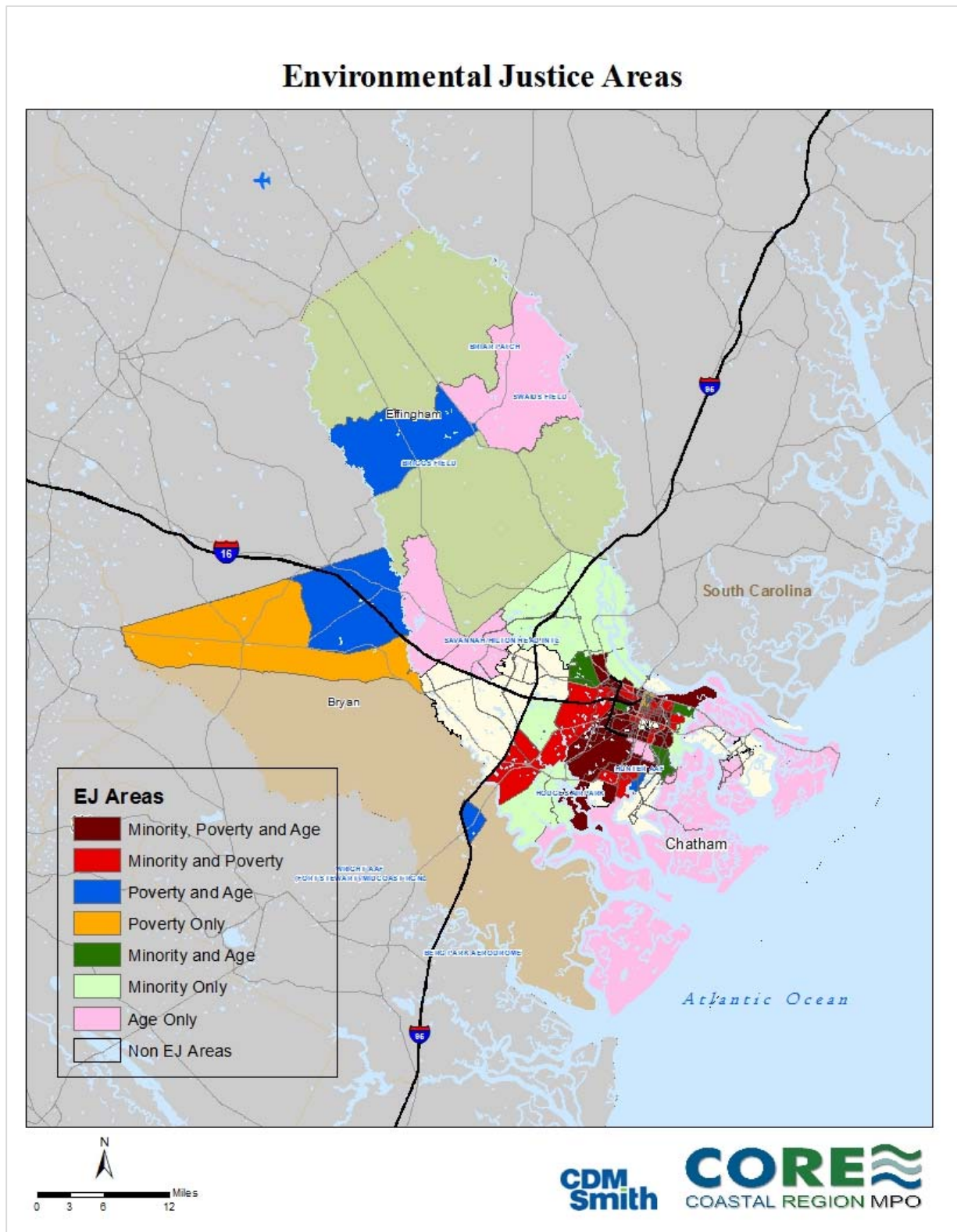
The minority concentrated areas are located mostly in Chatham County. Bryan County and Effingham County are more homogenous in race and ethnicity, so their minority concentrations have not reached the threshold. The minority populations are concentrated in the Savannah urban cores except the downtown 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 seems 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 2-1: Environmental Justice Area



Source: US Census Bureau 2010 Redistricting Data SF (PL 94-171) and 2012 ACS 5-year Estimates

### 2.1.3 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 2-1 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.

## 2.2 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 2-2**. 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.

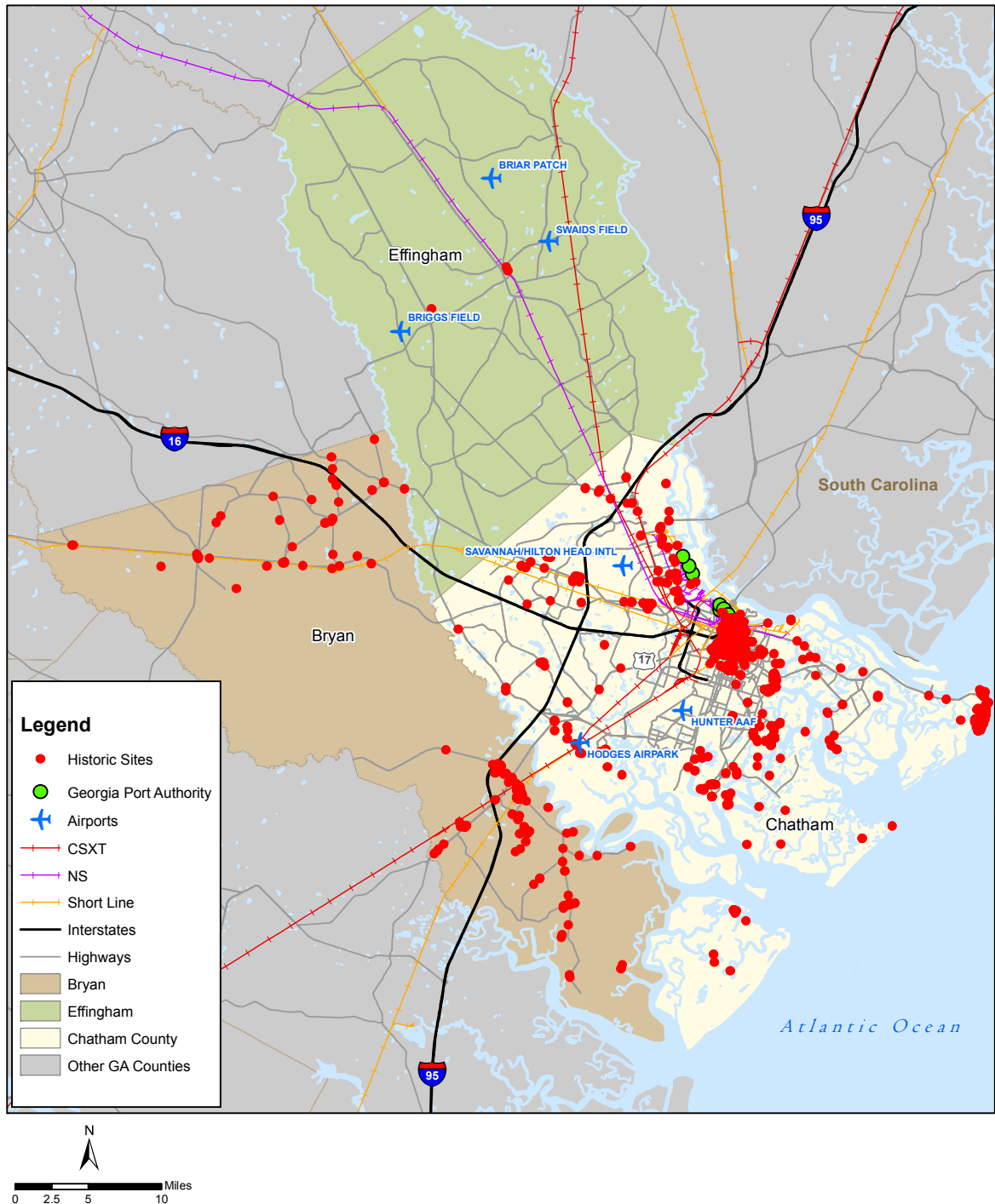
Freight movements and freight facilities have potential impacts on historic and cultural resources.

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 2-2: Historic and Cultural Resources

## Historic and Cultural Resources



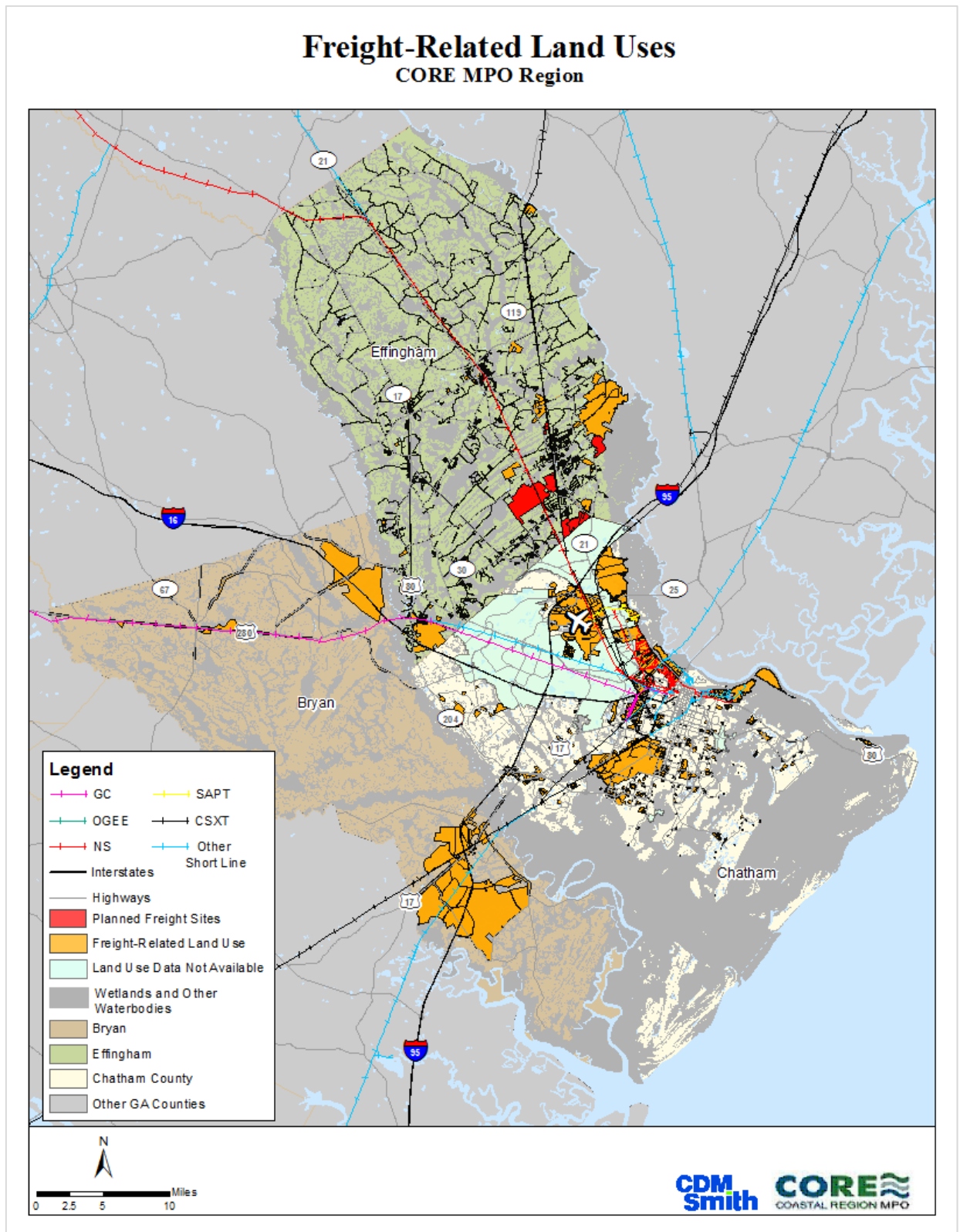
## 2.3 Natural Resource Analysis

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 2-3**) 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.

Figure 2-3: Natural Resources



## 3. 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.

### 3.1 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.

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.

## 3.2 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 equipments 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.

## 4. NEXT STEPS

This technical memorandum examines the freight impacts on environmental justice, the natural resources and cultural resources in the CORE MPO Freight Transportation Plan study area. The memo also explores potential mitigation methods to reduce the freight impacts.

Review of the findings of this analysis is helpful to ensure that freight impacts will be considered in the development of the CORE MPO Freight Transportation Plan. This analysis along with other tasks of this project will assist decision makers in the assessment and prioritization of recommended projects for the Savannah region in terms of land use planning and infrastructure improvements.