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1 Phase I Report Summary

Background and Purpose

The United States Department of Transportation (USDOT) awarded the Georgia Department of Transportation (GDOT) a National Corridor Planning and Development Program grant in May 1999. The purpose of the grant is to fund an evaluation of a strategic freight corridor, designated High Priority Corridor Six, through central Georgia to more expediently connect the ports of Columbus and Savannah. GDOT broadened the study to include a thorough evaluation of transportation, commodity movement and economic development in the forty-five county study area in south central Georgia.

Anchored by Columbus in the west, Savannah/Brunswick in the east and Macon/Warner Robins in the center, central Georgia's study area encompasses forty-five rural and urban counties representing characteristics typical of the state. A mix of urban and rural counties, central Georgia is strategically situated to grow into a stronger and more influential economic engine driving the state's economy south of Atlanta.

The purposes of the evaluation are (1) to assess the study area's existing transportation infrastructure by focusing on its capability to transport goods and conduct trade in the future, (2) to define infrastructure and technology that fosters freight movement, and (3) to negate adverse environmental and social consequences of potential improvements.

The Phase 1 report represents a compilation of all activities associated with the corridor evaluation elements of the scope of work. The intent of the Phase 1 report is to provide a baseline assessment of the economies and infrastructure of central Georgia. This work will act as the foundation for all subsequent activities that will identify short and long-term transportation infrastructure needs and potential solutions within the defined study area. The study team has paid particular attention to understanding the interrelated nature of transportation infrastructure and the economic status of central Georgia, along with each county within the study area.

This section provides a summary of key Phase 1 findings and next steps. The subsequent sections provide a detailed summary of all work activities that include:

- Definition of the study area
- Collection and presentation of demographic, economic and natural resources profile
- Collection and analysis of data to generate appropriate baseline of economic conditions.
- Identification and interviews with major shippers and carriers in the Central Georgia Corridor.
- Using a variety of economic development system tools/programs, development of a commodity flow analysis



- Military research
- Infrastructure inventory and performance evaluation
- Summary, conclusion and next steps leading to implementation

Summary of Key Findings

1. *Status of Corridor*

The Corridor features a diverse, stagnant population characterized by low income, high poverty and high unemployment. The Georgia Rural Development Council (GRDC) and Power Alley Initiative in 2000 both concluded that coordinated and customized investment strategy in Central Georgia is necessary to maximize return on investment.

The studies revealed that one of the twelve keys to sustained community growth that would maximize investment return is transportation infrastructure improvement. The other eleven factors are presented to remind policy makers and other users that transportation improvements alone will not bring desired results. Strong and active leadership is essential, as well as other non-transportation infrastructure, for success.

The study area contains 45 counties, 24 (53%) of which are classified as developing or existing/emerging growth centers, which GRDC says represent the greatest potential to stimulate growth in rural Georgia. Efforts to stimulate counties that have fallen far behind may not be as fruitful as trying to build upon recent sustained success.

Not only does GRDC encourage investment in the Corridor, but the Power Alley Initiative, prepared by the University of Georgia's Carl Vinson Institute, recommended heavy investment in the study area to create a "corridor of essential infrastructure" between Columbus and Savannah. The Power Alley Initiative recommended specific projects in the Corridor including:

- widen US 280 to four lanes
- improve quality of the Georgia Southwestern Rail Line
- install natural gas pipeline
- install fiber optic cable.

The GRDC found that all rural counties are not condemned to lag behind metropolitan counties. The Corridor's Laurens and Sumter Counties were specifically cited as successful rural counties as a result of their strong local leadership and other human capital assets.

2. *Evaluation of Regional Economy*

This section describes the current status of the Corridor's economy, identifies industry clusters and estimates dependence of industries on freight transportation infrastructure.



The population in the Corridor grew less than the state or the nation between 1980 and 1990. Between 1991 and 2000 the Corridor population mirrored the United States as a whole but fell behind the rest of Georgia, the fastest growing state east of the Rocky Mountain region.

The Corridor's fastest growing counties are along the east coast-Effingham, Bryan and Long. Four of the eight Georgia counties that lost population are in the Corridor. The Corridor's employment rate outpaced the nation between 1990 and 2000. Private non-farm employment grew significantly more than the U.S. during that decade. The largest job generating industries were services, durable goods manufacturing, and construction. A detailed employment statistical breakdown is provided in this chapter.

Despite the growth in jobs, Corridor unemployment rates were higher than national and state averages. The MSAs, Columbus, Savannah and Macon, managed lower unemployment rates than the Corridor as a whole, but were still higher than national and statewide averages.

At \$21,823, the Corridor's per capita income is significantly lower than the national, \$27,203, and statewide averages, \$25,839. A detailed statistical breakdown of per capita income is provided.

3. Industry Clusters

Location Quotients and Shift-Share analysis help identify industry clusters in the Corridor that use and are dependent upon freight transportation.

Location Quotients (LQ) measure the concentration of particular industries in a region relative to the nation. The Corridor's industry mix generally mirrors the national averages except for high concentrations of government and non-durable manufacturing (textile products, food, apparel, tobacco) and low concentrations in mining, wholesale trade, and finance, insurance and real estate.

Statistical information on industries in the Corridor as they compare to the state and nation is provided. Of 172 industry sectors analyzed, the top three are manufacturing industries (led by tobacco product manufacturing). The next two are weaving, finishing, yarn and thread; and pulp, paper and paperboard. Number four is federal military. Because the Corridor encompasses bases in Columbus, Savannah and Warner-Robins, it is considered a major national defense center.

Shift Share Analysis measures the shift (movement) of the Corridor's economy into faster or slower growth sectors. It also measures the Corridor's share of growth in industrial sectors.

Nationwide trends show that services, construction, transportation, retail and agriculture industries are growing and manufacturing, mining, finance, farm



employment and government are weakening at the national level. Within the Corridor, shift share analysis shows movement in the opposite direction; services, retail, and agriculture-forestry-fishing are growing faster than national trends.

The presented methodology highlights industries that, because of local factors, are exceeding national performance. It attempts to identify growth at a specific industry level to gain understanding of which industries enjoy a competitive advantage so that investment can be strategically targeted as recommended by the GRDC. The industries with a competitive advantage in the Corridor are production of transportation equipment, agriculture, forestry and fishing, electric equipment, fabricated metals, stone, clay, glass and concrete, tobacco manufacturing, machine and computers, printing, and primary metals manufacturing

Using LQ and Shift share analysis, the industry clusters that are judged key in the Corridor include tobacco manufacturing, federal military, transportation equipment, stone, clay, etc., and food.

4. Freight Transportation Demand

A methodology is offered to compute key industries' freight transportation demand. The agriculture, forestry, food and tobacco industry boasts the highest demand. Only agriculture is among the top ten employers in central Georgia. Other industries with high freight transportation demands are government and military, transportation and aerospace equipment, apparel textiles and floor coverings, basic materials, and wood and paper products.

5. Growth Rates

How is the economy expected to change in the next twenty-five years? Employment is expected to increase 50% in agriculture, forestry and fishing employment, 33% in services, 10% in government and 5% in construction. Per capita income and population are forecast to lag behind the national average over the next 25 years.

In order to offer conclusions about the demand for freight movement we must fully comprehend the Corridor's economic structure, commodity flow patterns and transportation system performance. Once the Corridor's features are modeled alternatives can be tested using the baseline internal, external, import and through demand.

6. Major Users of the Corridor

The major users of the Corridor are identified from a comprehensive list of various sources. Users are listed and mapped by industry. The 76 shippers/receivers and carriers interviewed are mapped to show the geographic distribution represented.



Interviewees list transportation problems and potential solutions as well as their thoughts on the climate in their business.

The interviewees generally agreed that business attraction efforts are essential to the economic health of central Georgia.

7. *Commodity Flow Analysis*

The economic vitality of central Georgia region may be lagging but the Corridor accommodates considerable freight traffic. Inbound and outbound domestic tonnage in the Corridor totaled 122 million, worth \$319 billion in 1998, with trucks accounting for 77% of the tonnage, rail 22% and water 1%. The Corridor accounted for 7.5 million loaded truck moves and 550,000 loaded rail car moves. Through tonnage totaled an additional 133 million. The chapter includes specific data by destination and origin states, tonnage by commodity type, and a profile of each county's tonnage and modal share. International commodity flow is exclusively handled by the Ports of Savannah and Brunswick. Columbus processes only domestic flow, merely 175,000 tons of domestic commodities.

Savannah ranks 39th in the nation in total tonnage, 7th in container traffic, and 4th among U.S. Atlantic ports in international tonnage. Brunswick ranks 112th in the country in total port tonnage.

8. *Existing system performance*

The existing highway system description includes an analysis of traffic volume, levels of service, truck volumes, and accident rates/safety needs. The rail network in the Corridor comprises 1360 miles of track. Chatham County (Savannah) features an extraordinary amount of intermodal operations (container traffic). The aviation system including commercial and general aviation airports in Central Georgia is mapped within the report. Georgia's most active ports, Savannah, Brunswick and Columbus, are all within the study area.

A combination of GRDC's economic vitality index and an accessibility index is analyzed to categorize counties and ultimately form a basis for a targeted and coordinated investment strategy. Dublin, Thomaston, and Vidalia/Lyons would benefit significantly from investments to improve access.

Generally the Corridor's infrastructure needs are capacity improvements in metro areas, safety improvements Corridor wide, and specific, localized operational improvements throughout the Corridor.



Conclusions

Demographically, the central Georgia Corridor is in crisis. Below national and state averages for population and economic growth, per capita income, unemployment and poverty, the Corridor struggles under a desperate necessity for augmented economic development. Study after study recommends immediate action to engage the depressed, rural counties in Central Georgia.

An analysis of the performance of the existing system reveals that the Corridor claims a strong intermodal transportation system utilized at a high percentage by not only trucks but also railroads and ports to move 122 million tons of cargo per year valued at \$319 billion.

To encourage additional growth some projects were identified that may have a positive effect on the economic vitality of industries dependent on freight transportation infrastructure in the Corridor counties. The methodology and the analytical results identified and listed Corridor industry clusters that have distinct and measurable competitive advantages.

With the assistance of the detailed data collection (including source data from interviews with shippers and carriers) and thorough analysis of commodity flows and transportation infrastructure, this report can offer a baseline from which an infrastructure investment strategy that meets the criteria established by the Georgia Rural Development Council may be developed.



2

Definition of the Study Area and Area of Influence

Background and Purpose

In May 1999, GDOT was awarded a National Corridor Development Program (NCDP) grant from the U.S Department of Transportation (USDOT) to study the federally designated High Priority Corridor Six (HPC6), a strategic freight corridor connecting the barge river Port of Columbus and the Port of Savannah. As stated in Section 1118 of TEA-21, the NCPD is a federal discretionary grant program that provides “allocations to states and metropolitan planning organizations for coordinated planning, design and construction of corridors of national significance, economic growth and international or interregional trade”.

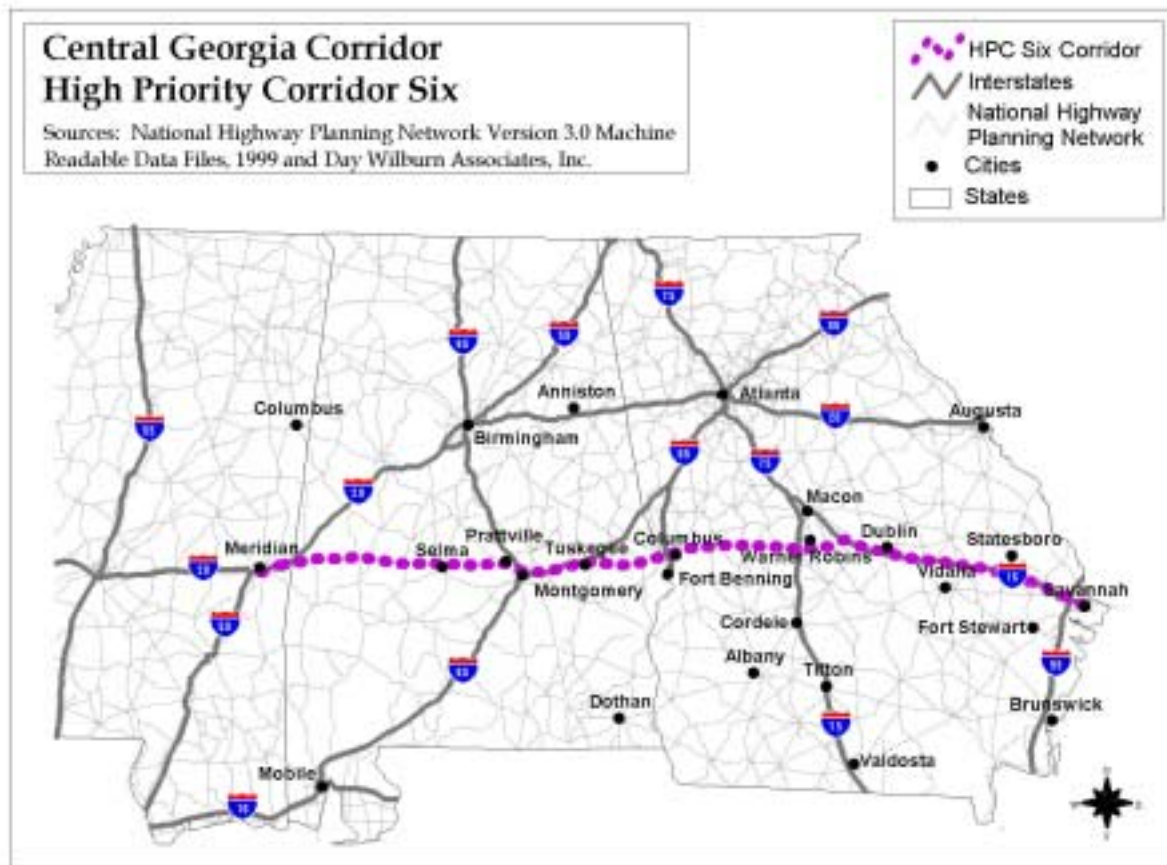
Although many international trade agreements opened the world’s markets to American goods, these same agreements also opened American markets to a flood of foreign products. While some economic sectors have increased sales, others particularly labor-intensive markets have found it difficult to compete. Regardless of the technical nature of the industry, without an adequate transportation network to import materials, distribute products and provide access to a broad labor market, industrial expansion, especially in rural areas, will not occur. The assessment of the Governor’s Road Improvement Program (GRIP) highlights the benefits of providing adequate transportation infrastructure to foster economic competitiveness¹. This GDOT sponsored study highlighted the positive impact that transportation infrastructure investments can have, particularly on rural economies.

HPC 6 traverses central Georgia, connecting the deepwater port of Savannah with the river barge terminal port in Columbus (Figure 2.1). Approximately one-half of the corridor follows I-16, a major component of the interstate highway system in Georgia. The corridor follows the alignment of roadways on the state system: U.S. 80, SR 96 and SR 358 connecting to the inland barge facility of Columbus. The Port Columbus specializes in transporting liquid bulk cargo throughout the central U.S. via the Gulf and tri-rivers waterway. HPC 6 continues west from Columbus along US 80, eventually connecting with Interstate 20 in Meridian, Mississippi. Improving the HPC 6 corridor will provide a direct connection from the Atlantic to the Pacific Oceans.

¹ Douglas C. Bachtel, Mick Ragsdale and Kelly Eamon Dowd. An Analysis of the Governor’s Road Improvement Program (GRIP) for the Georgia Department of Transportation. University of Georgia, Department of Housing and Consumer Economics.



Figure 2.1 - HPC 6



The primary purpose of the study is to provide a detailed assessment of how well transportation infrastructure is supporting the existing and future need to move goods and support the economies of central Georgia. To fully engage in addressing central Georgia transportation needs, GDOT added U.S. 280 to the study so that both major east-west routes in central Georgia were included in the study. Information developed during the study will be used to identify potential transportation infrastructure and technology that will support the economy of central Georgia, allow GDOT to address the transportation work program and to compete for the NCPD discretionary federal grant program.

The study team developed four specific project objectives in conjunction with GDOT staff, following initial discussions with key project stakeholders²:

- Focus on the economic competitiveness of central Georgia;

² The study team conducted project kickoff meetings in October 2000 involving nearly 100 project stakeholders. The study team also conducted limited one-on-one meetings with specific stakeholders.



- Ensure that the transportation system can accommodate continued and future growth;
- Define transportation system infrastructure and technological improvements that foster freight movement; and
- Address environmental and social consequences of additional freight movement.

As a direct result of the objectives, linking transportation infrastructure needs with the overall economic health and stability of a substantial portion of central Georgia became a very important component of the study. The importance of this linkage was driven home during the project kickoff meetings and all subsequent discussions with project stakeholders.

Corridor studies can be often carried out by simply analyzing the physical and operational deficiencies of the transportation facilities. While this study must ultimately address those issues, understanding the interrelated nature of transportation infrastructure and regional economies is critical to successfully addressing the project objectives. As a practical matter, study area definition is critical to assembling data and information at the precise geographic level to conduct the study successfully. The HPC6 and US 280 study area and associated data must be defined in a much broader sense than a traditional corridor study and at a sufficient detail to:

- Understand how the economies of central Georgia rely on transportation infrastructure;
- Define current transportation system performance;
- Develop forecasts of future levels of demand;
- Identify existing and future transportation system deficiencies; and
- Develop full intermodal solutions to address the deficiencies.

Overview of the Approach / Methodology

Approximately one-half of the HPC 6 follows I-16, a major component of the interstate highway system in Georgia. The corridor follows the alignment of roadways on the state system: U.S. 80, SR 96 and SR 358 connecting to the inland barge facility of Columbus. The Port of Columbus specializes in transporting liquid bulk cargo throughout the central U.S. via the Gulf and tri-rivers waterway. HPC 6 continues west along US 80, eventually connecting with Interstate 20 in Meridian Mississippi.

Several key facilities are located along the HPC 6 corridor in Georgia. The Port of Savannah is a major economic engine for the state, employing over 18,000 people statewide. The port handles iron, steel, clay, linerboard, woodpulp, machinery and foodstuffs. Exports account for approximately 56 percent of the total port tonnage, providing competitive transportation costs for the state's kaolin clay and forest products. The Savannah port provides major service for a wide variety of international markets, including the east coast of South America, Mediterranean countries, the Far East, the Persian Gulf and North Europe.

Along with Savannah, the HPC 6 corridor also connects Warner Robins and Columbus. With the exception of the Atlanta metropolitan area, Warner Robins represents the fastest growing



area in Georgia. Taken together, these three metropolitan areas represent significant employment centers in central Georgia.

Central Georgia also includes several important military installations requiring access to national and international deployment routes. These facilities include US Army bases at Fort Benning and Fort Stewart, Hunter Army Air Field, Robins Air Force Base and a Marine logistics base in Albany, Georgia. These facilities require sufficient transportation infrastructure to guarantee delivery of goods and services to the installations. Fort Benning, Fort Stewart and the Marine logistics base also rely on transportation infrastructure to move and deploy troops and equipment, both nationally and internationally. Access to the Port of Savannah is critical for these facilities.

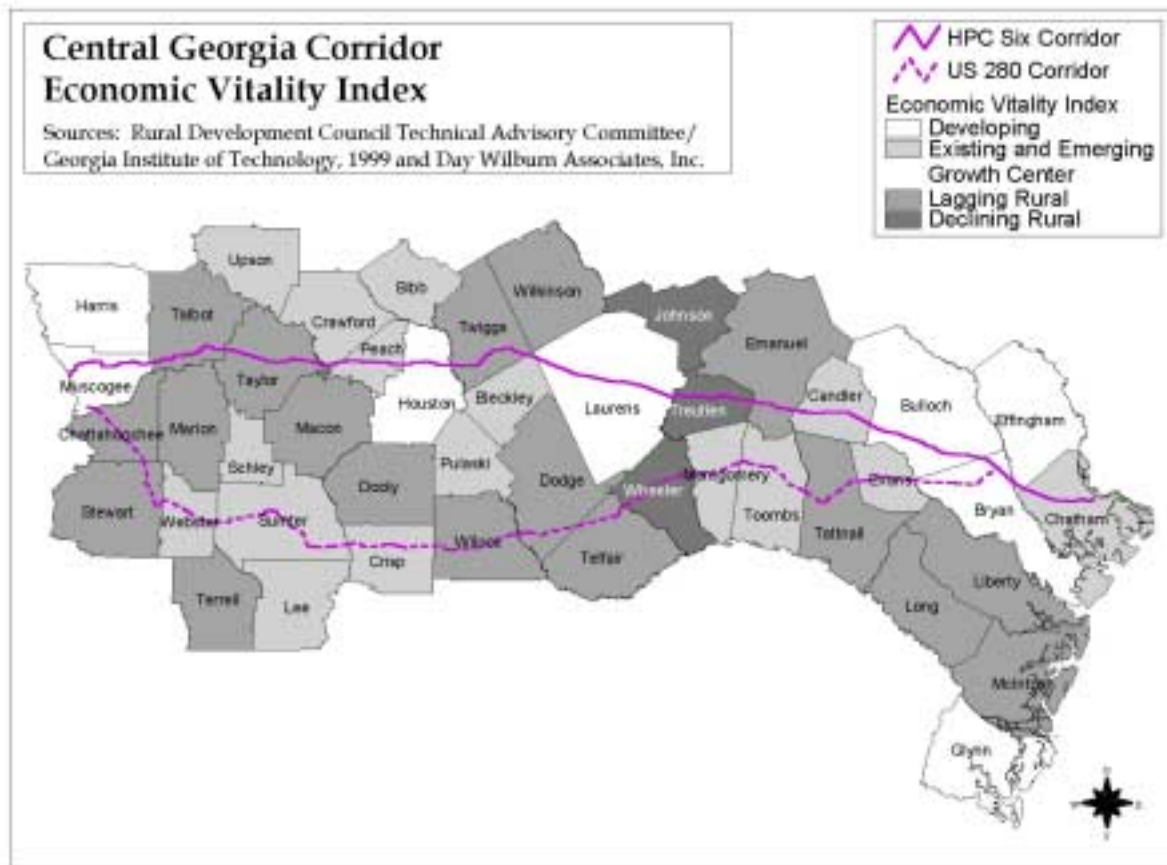
Both HPC 6 and U.S. 280 are located in central and south Georgia. Together, the two corridors traverse over forty counties and provide east-west access across south central Georgia. However, central Georgia has traditionally lagged behind the rest of the state in terms of economic development. The “Two Georgias” controversy that emerged in the mid-1980s brought about a state-led initiative to address the significant economic and social gap between the rapidly growing Atlanta metropolitan area and the economic stagnation of rural Georgia. While the gap still exists, the challenges facing rural Georgia have changed.

In 1998, Georgia created the Rural Development Council to develop the first comprehensive assessment of economic conditions for the entire state. The focus of the Rural Development Council is to help improve the quality of life and economic health of the rural portions of Georgia. As part of the Council’s first report³, counties within Georgia were organized into five economic categories. The five general categories, reflected in the Economic Vitality Index, allow policymakers to better understand the dynamics of economic conditions in rural Georgia (Figure 2.2). The data developed as part of this study provides an excellent starting point to understand the condition of the local economies in central Georgia along with defining the potential development strategies to improve the overall economic health and quality of life. The study is particularly important in capturing the role of transportation infrastructure in supporting the economic health of central Georgia.

³ Georgia Rural Development Council, The State of Rural Georgia, “Surviving, not thriving”, Report to the Technical Advisory Committee, Adopted by the State Rural Development Council, January 20, 2000.



Figure 2.2 Economic Vitality Index



In conjunction with GDOT staff, the study team developed an initial assessment of the study area using several different data sources, including preliminary economic and goods movement data, economic studies and system operational data to define the initial study area^{4,5,6}. The study team defined a 42 county study area that incorporated all major urban centers, military installations and other economic generators that could be directly affected by transportation infrastructure issues along the HPC 6 and US 280 corridors. County geography was used because it represents the most practical unit of geography for data acquisition and can be organized into other logical geographical units.

⁴ Cambridge Systematics, Georgia Statewide Plan and Process, Task 4 Economic Evaluation. Prepared for the Georgia Department of Transportation. November 2000.

⁵ Georgia Department of Transportation, Road Characteristics File

⁶ Georgia Rural Development Council, *The State of Rural Georgia, "Surviving, not thriving"*, Report to the Technical Advisory Committee, Adopted by the State Rural Development Council, January 20, 2000.



county in the study area, with regional, statewide and national statistics used as points of comparison. The commodity data will be organized in the following fashion:

- **Within 45-County Study Area** – Moves from one study area county to another (counted at both their origin and their destination in the county frame of reference, but only once in the study area frame of reference);
- **Rest of Georgia** – Moves between study area counties and any other county in Georgia;
- **Other Corridor States (AL, MS)** – Moves between study area counties and the other two states where the HPC 6 Corridor is designated;
- **West of Corridor (LA, TX, AK, OK, NM, AZ, CA)** – Moves between study area counties and the states directly west of the HPC 6 Corridor;
- **Other Southeast States (FL, SC, NC, TN)** – Moves between study area counties and these states; and
- **All Other States** – Moves between study area counties and all other states.

Transportation infrastructure assessment will include all facilities within the study area and will focus only on the study area. Any potential deficiencies identified outside the study area will be summarized and included in a report or technical documentation. Environmental and cultural data will be organized for each county within the study area.



3 Demographic, Economic, and Natural Resources Profile

Background and Purpose

The United States Department of Transportation (USDOT) awarded the Georgia Department of Transportation (GDOT) a National Corridor Planning and Development Program grant in May 1999. The purpose of the grant is to fund an evaluation of a strategic freight corridor, designated High Priority Corridor Six, through Central Georgia to more expediently connect the ports of Columbus and Savannah. GDOT broadened the study to include a thorough evaluation of transportation, commodity movement and economic development in the forty-five county study area in south central Georgia.

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Research Overview

Anchored by Columbus in the west, Savannah/Brunswick in the east and Macon/Warner Robins in the center, Central Georgia's study area encompasses forty-five rural and urban counties representing characteristics typical of the state. A mix of urban and rural counties, Central Georgia is strategically situated to grow into a stronger and more influential economic engine driving the state's economy south of Atlanta.

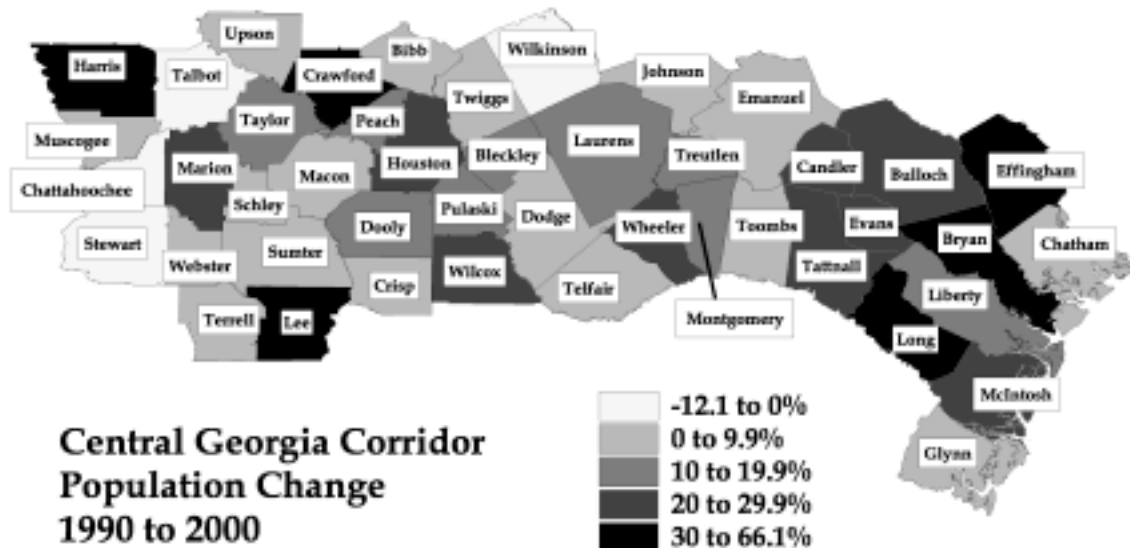
- **Population**

The study area's population is stagnant in comparison to statewide statistics. In 1990 the population of Central Georgia's counties totaled 1,291,700, 43% of which (556,165) resided in rural counties. After a ten-year 12.2% population increase (40% less than the statewide 20.2% increase), the study area's population grew to 1,449,573 in 2000, 45% (650,589) in rural counties (Figure 3.1).

Five (11%) of the study area's forty-five counties grew in population above the state average (20.2%) in the past decade. Forty (89%) grew less than the state average.



Figure 3.1 Change in Population 1999-2000



Source: U.S. Census and Cambridge Systematics, Inc.

- Other demographics

- The study area’s population is diverse when compared statewide.

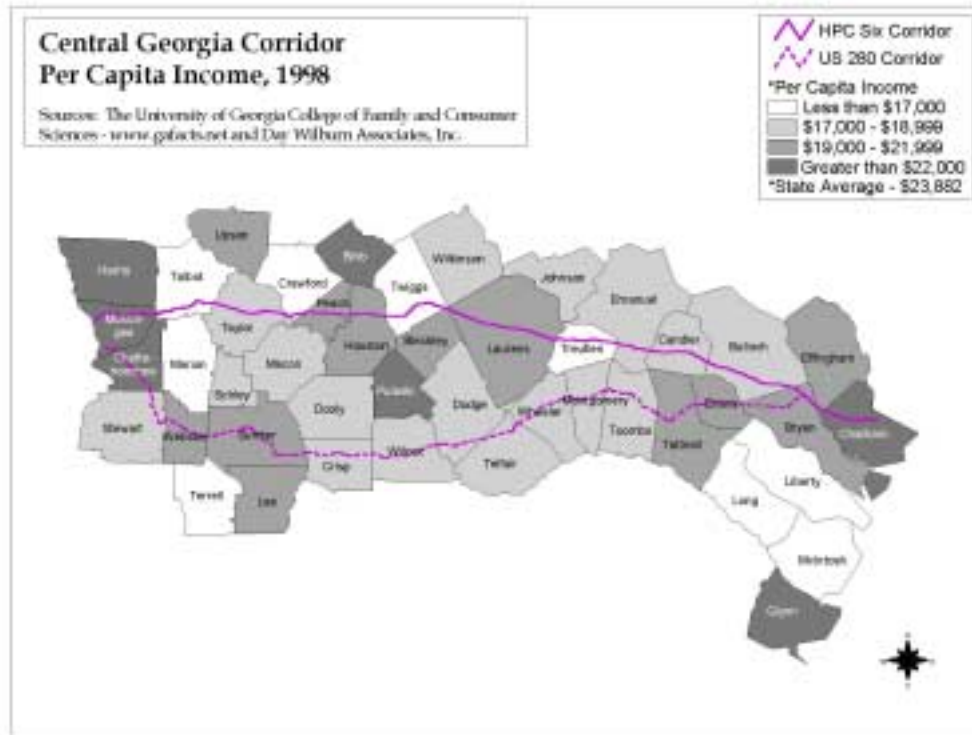
Seven (16%) of the study area’s forty-five counties have a percentage of minority population below the state average (31.4% of population). Thirty-eight (84%) have a greater minority population than the state average.

- The study area’s per capita income falls well short of the statewide average.

Four (9%) reveal a per capita income greater than the state average (\$23,882) while forty-one (91%) counties’ per capita income is less than the state average (Figure 3.2).



Figure 3.2 Per Capita Income 1998



- The study area’s population is more impoverished in comparison to statewide figures.

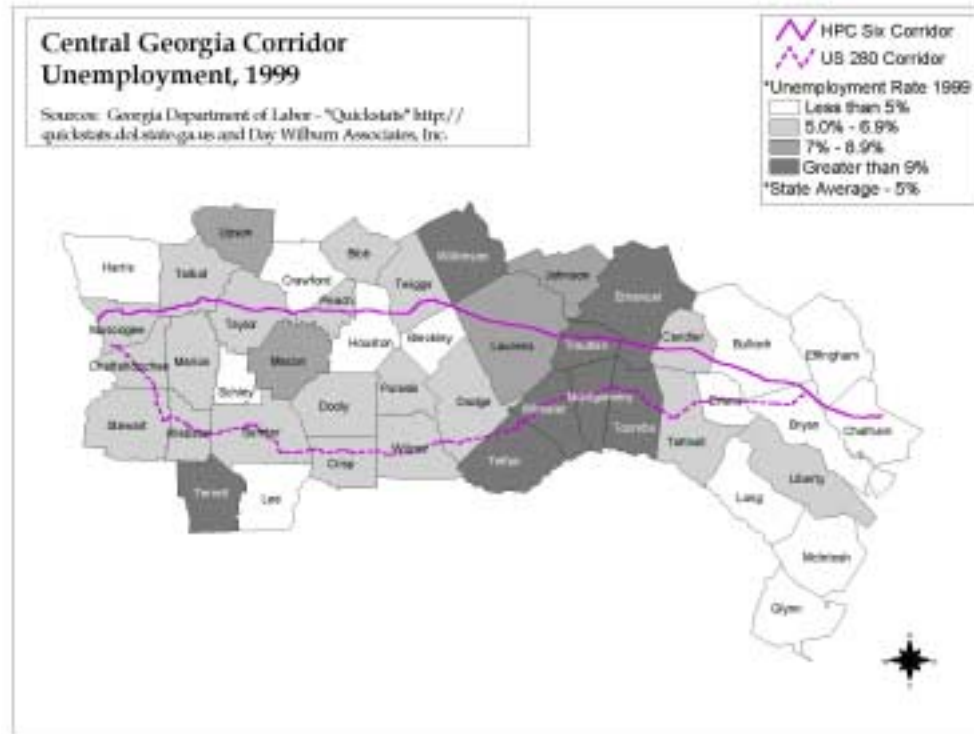
Seven (16%) of the counties’ poverty rates are below the state average (15.6%) but the other thirty-eight (84%) have a higher percentage of population under the poverty level than the state average.

- The study area’s unemployment rates are consistently higher than the rest of the state.

Nine counties, 20% of the study area, enjoyed unemployment rates less than the state average (4.2%) while thirty-six (80%) suffer higher than average unemployment rates (Figure 3.3).



Figure 3.3 Unemployment 1999



Rural Development Council and Power Alley Initiative

Despite some increase in population, the thirty-eight rural counties in the study area are not realizing the economic growth that Georgia has experienced over the past decade. Two recent studies addressed economic vitality issues in Georgia, the Rural Development Council's final report and the Power Alley Initiative.

- **Rural Development Council**

In August 1999 Governor Roy Barnes created the Rural Development Council to evaluate opportunities for rural Georgia to strengthen its economic position and realize its share of benefit from the booming Georgia economy. As part of its work the Rural Development Council, chaired by Lt. Governor Mark Taylor, created a Technical Advisory Committee to take a "fresh look" at rural Georgia's lethargy and offer advice to inject prosperity into rural Georgia. Chaired and staffed by professionals in the state's Department of Community Affairs, the committee consisted of staff representatives from GDOT, RDC's, GMA, ACCG, Georgia's University System, utility companies, and Georgia's Economic Developers Association.

The Rural Development Council's findings follow.



- The rural/urban controversy in the mid-eighties identified two Georgias.
- A decade and a half later the Council discovered five Georgias: rapidly developing, developing, existing and emerging growth centers, lagging rural, and declining.
- Not all rural counties are declining or lagging. Rural county success stories are recounted, specifically Rabun, Pickens, Putnam, Laurens, Sumter, and Appling. Two of the five reported successful counties, Laurens and Sumter, are in the High Priority Corridor Six study area. Regrettably, twenty-one of the forty-five counties are either lagging or declining.
- The Council also listed the major components of growth in successful Georgia counties.
 - Active, informed leadership
 - Trained workforce
 - Transportation infrastructure
 - Technology and innovation
 - Telecommunications
 - Targeted/coordinated investment
 - Private sector engagement
 - Support of existing industry
 - Support of entrepreneurship
 - Quality education
 - Quality health care
 - Regionalism/cooperation

The Council recommends that the state move toward “OneGeorgia” characterized by coordinated, strategic practices that benefit the entire state. To accomplish the goal of ensuring maximum statewide benefits from a growth economy, several specific recommendations were offered by the Council.

- State fiscal policy should be launched to coordinate an investment strategy among all state agencies and development partners, private and public.
- State, regional and local development policy should be sufficiently flexible to anticipate and react to changes in the regulatory climate and the expanding global marketplace.
- The investment strategy should:
 - Emphasize actions that are coordinated and long term
 - Generate maximum and measured returns
 - Partner with local and regional leadership
 - Leverage private sector coinvestment
 - Establish regional objectives and empower regional entities
 - Pursue growth components referenced previously
 - Customize investment based on the communities’ readiness
 - Excel in the New Economy (information technology)



- Coordinate with state, local, and regional agencies
- Target unique challenges in each community and enhance its distinctive assets

To ensure targeted and coordinated investment, the Council established an Economic Vitality Index that classifies Georgia's counties as rapidly developing, developing, existing and emerging growth centers, lagging rural, and declining rural (Figure 3.4). The Index uses seven key indicators to assess economic vitality compared with other Georgia counties: per capita income, unemployment, bank deposits per 1,000 population, labor force participation, average manufacturing weekly wages, annual growth in total population, and percentage of population below the poverty line. The Index also identifies centers of economic activity that, if properly stimulated, could serve as a catalyst for regional growth.

Rapidly developing

Eight counties statewide are characterized by heavy development, high per capita incomes, low unemployment, and lower than average drop out rates.

Developing

Forty-two Georgia counties are experiencing growing development and poverty rates that are under the state average.

Existing and emerging growth centers

Fifty-eight counties are performing near the statewide average of economic indicators. They are experiencing marginal to moderate gains in industrial and commercial development and represent the greatest potential to improve growth variables in rural Georgia.

Lagging rural

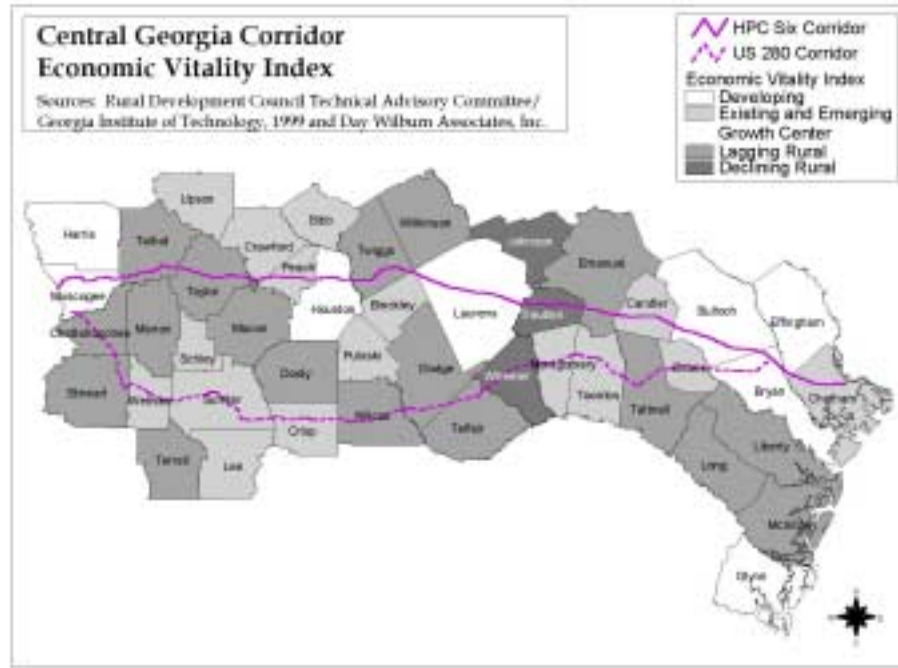
Forty-three "distressed" Georgia counties are performing at or below statewide economic indicator averages. They have no industrial or commercial center as well as higher than average poverty rates.

Declining rural

Eight counties statewide suffer high poverty rates, substantially lower per capita incomes, much higher unemployment rates, and higher percentages of children and senior citizens.



Figure 3.4 Economic Vitality Index



- Power Alley Initiative

In December 2000 the Carl Vinson Institute at the University of Georgia prepared “an assessment of the economic development potential of state infrastructure investment in South Georgia” for the Georgia General Assembly. The Power Alley Initiative studied forty-three central Georgia counties, thirty-four common to the study area. The counties incorporated by the Initiative that are not part of the High Priority Corridor Six study area included Appling, Ben Hill, Coffee, Jeff Davis, Quitman, Randolph, Turner, Wayne, and Worth. The Initiative did not include ten counties in the High Priority Corridor Six study area, Bibb, Crawford, Glynn, Houston, Johnson, McIntosh, Peach, Twiggs, Upson, and Wilkinson.

The original purpose of the Power Alley Initiative was to study the economic impacts of a proposed natural gas pipeline from Columbus to Savannah. It was expanded to include the economic impact of infrastructure investment in highways, railroads, fiber optic cable, and natural gas.

Similar to the High Priority Corridor Six project, the Initiative’s forty-three county target area is also characterized by economic stagnation in stark contrast to the strong statewide economy. The Institute of Government found that the area relies upon a declining agricultural industry and fails to attract investment in the growing service economy.



The proposed Power Alley Initiative recommends substantial investment in transportation, telecommunications, and the generation and distribution of electricity creating a “corridor of essential infrastructure” between Columbus and Savannah. The Power Alley Initiative also envisions significant private sector investment subsequent to initial public sector investments. For example, if the public sector invests in roads, the private sector may take advantage of available right of way and follow with a strong investment in fiber optic cable essential for future development and further investment.

Similar to the Rural Development Council’s findings, the Power Alley Initiative recognizes that constructing public infrastructure alone does not consistently stimulate growth. Investments in human capital accompanying infrastructure investments are crucial. The Initiative reinforces the Council’s human components of growth: active/informed leadership, trained workforce and quality education.

The Initiative’s specific infrastructure recommendations and the Institute’s estimated costs follow.

- Widen US 280 to four lanes (\$28 million)
- Enhance quality of Georgia Southwestern Rail Line (\$26 million)
- Install new natural gas pipeline (\$225 million)
- Install new fiber optic cable (\$15 million)

Summary of Key Findings

An economic vitality picture of the High Priority Corridor Six study area can be quickly visualized by classifying the counties into the Rural Development Council’s five categories.

- Of the study area’s forty-five counties, none are cataloged as rapidly developing.
- Eight (18%) are developing counties: Harris, Muscogee, Houston, Laurens, Bryan, Effingham, Bulloch, and Glynn.
- Sixteen counties (36%) are existing/emerging growth centers: Lee, Sumter, Schley, Webster, Upson, Crawford, Bibb, Peach, Bleckley, Pulaski, Montgomery, Toombs, Evans, Candler, Chatham, and Crisp.
- Eighteen (40%) are lagging: Terrell, Stewart, Chattahoochee, Marion, Talbot, Taylor, Macon, Dooly, Twiggs, Wilkinson, Wilcox, Dodge, Telfair, Tatnall, Liberty, Long, Emanuel, and McIntosh.
- Three (7%) are classified as declining rural: Johnson, Truetlen, and Wheeler.



According to the Rural Development Council, not all rural economies are condemned to lag or decline. In fact six counties are specifically cited in the Council's final report as successful rural counties, two, Laurens and Sumter, in the study area.

Laurens County is acknowledged as economically successful because:

- Its per capita income rose 171% between 1980 and 1997 (\$7,012 to \$18,985)
- Its unemployment rate dropped from 8.8% in 1980 to 7.3% in 1998
- Its labor force participation increased from 58.7% in 1980 to 72.9% in 1998
- Its annual population grew by 0.9% from 1980 to 1998

Sumter County is recognized because:

- Its per capita income rose 181% between 1980 and 1997 (\$6,721 to \$18,858)
- Its unemployment rate dropped from 8.4% in 1980 to 7.7% in 1998
- Its annual population grew 0.3% from 1980 to 1998

These communities are acclaimed because they epitomize how locals can successfully overcome challenges and resist prevalent rural decline. Key development components and strong investment strategies allowed Laurens and Sumter to flourish while neighboring rural communities in Central Georgia lagged and declined.

A common thread between Laurens and Sumter is the strength of their human capital. Specifically Laurens succeeds due to effective local leadership that propelled the community beyond plant closures related to NAFTA into a New Economy prosperity. Sumter flourishes because of successful downtown revitalization and historic preservation initiatives driven by strong local leadership.

Overall the forty-five county study area currently fails to meet its economic potential, does not contribute positively to the state and national economy, and suffers from a malaise prompted by a bleak future. However, with the proper mix of human capital investments, as suggested by the Rural Development Council, and strategic public infrastructure installations resembling those recommended in the Power Alley Initiative and the High Priority Corridor Six project, the demographics of the Central Georgia region could match and eventually exceed the statewide economy.

County Economic and Demographic Profiles

Attached are documents profiling each of the forty-five counties along the Central Georgia Corridor. The Demographic Profile is a concise one-page charted summary of each county's population estimates, growth, birth rates, death rates, net migration, racial composition, and senior population. A county map, a corridor map showing the location of the profiled county, and some narrative is also included to offer concise, valuable and up-to-date demographic information designed to capture the past demographic performance and anticipate the future of the profiled county.



The Economic Profile is a one-page summary of the profiled county's pertinent economic information. It includes county and statewide economic vitality indicators such as per capita income, average weekly wages, average annual unemployment rate, poverty rate, labor force, and deposits in financial institutions. Within the same page is a corridor map, county map, narrative, and charts comparing the county's wages and unemployment to statewide figures. A pie chart showing the county's employment distribution is also included to provide concise, valuable and current economic information necessary to evaluate the economic development potential of the corridor's forty-five counties.

Natural Resources

In order to properly evaluate and plan improvements to meet the needs of the counties along the corridor and to meet state and national expectations regarding the transport of freight through central Georgia, efforts are required to identify natural and historic resources in the corridor.

According to the Georgia Natural Heritage Program¹ website, "The Georgia Natural Heritage Program Database System (GNHPDS) is provided as a public service and contains information on the location of rare animals, plants and natural communities in Georgia to the precision of one quarter of a USGS 7.5 minute quadrangle map (quarter quad)." The data collected by the GNHP comes from a variety of sources and should not be considered a final statement on the species or area under consideration. A listing of these protected species is included in within the appendices.

Conclusions

A review of demographic and economic vitality data available on the Central Georgia Corridor suggests that the economic development that should accompany studied improvement of High Priority Corridor 6 and U.S. 280 is desperately needed. With only isolated exceptions the forty-five counties within the corridor lag well behind expectations and performance of the northern half of the state. Data collected in the Corridor and scrutinized by concerned academics, practitioners and policy makers consistently points to a need to stimulate quality development and assist the counties in efforts to meet their economic vitality potential.

A sustained effort to plan and implement social and physical infrastructure in the Corridor is necessary. Costs estimated by the Carl Vinson Institute in its Power Alley Initiative are too low. The \$28 million estimated to widen U.S. 280 might only be enough to widen the bridges. The \$26 million to enhance the Georgia Southwestern Rail Line is also too low but a strategic and coordinated effort by all involved parties to invest in appropriate, cost effective infrastructure is necessary to reach the full potential of the Central Georgia Corridor.

¹ Georgia Natural Heritage Program. October 24, 2000. The Georgia Natural Heritage Program Database System Element Occurrences by Quarter 7.5 Minute USGS Quadrangle and County. Georgia Department of Natural Resources, Social Circle.





4 Evaluation of the Regional Economy

Purpose

This section presents a baseline economic profile of the study area economy. This profile helps us to understand the types of industries that generate freight movement within the study area, the degree to which the study area economy is dependent on efficient freight movement, and the extent to which growth in the study area economy will create additional pressures on the freight transportation system within the corridor.

Methodology

The primary source of data for this analysis comes from a regional economic model created by Regional Economic Models, Inc. (REMI). The REMI model provides detailed industry-level data on several key variables, including employment, per capita income, population, and production (sales). The team obtained data for the period 1990-2025 for the aggregated 45-county study area. The data was analyzed in a variety of ways – including the calculation of location quotients and “shift share” analysis -- to highlight key trends, identify important industry clusters, and derive growth rates for the movement of specific commodity types. Other data sources were used to supplement the REMI data, including data from the U.S. Census Bureau, the U.S. Bureau of Economic Analysis, and a socioeconomic forecast from Woods & Poole .

The findings of this economic evaluation are presented in four subsections, which address the following issues:

- What are the key demographic issues – in terms of population, income, unemployment and employment – underlying the corridor economy?
- What are the major industries in the study area? Are they growing or declining? Which industries are represented in higher concentrations (or “clusters”) than others?
- What industries are most dependent on efficient freight movement? and
- How will changes in population and industry employment affect the demand for freight movement in the future?



Findings

Demographic Drivers

Population

One of the most telling economic indicators is population. Strong population growth is often indicative of strong economic growth, as people move to (and remain in) areas where jobs and economic opportunities are readily available. Looking at U.S. Census Bureau data for the period 1990 to 2000, we see that the study area is extremely diverse in terms of the population characteristics of its 45 counties. It includes more heavily-populated counties like Chatham, Muscogee, Bibb, Houston and Glynn – which taken together represent half the study area population -- along with less-populated counties like Stewart, Schley and Webster.

Table 4-1
Population of Study Area Counties, Year 2000

	Population	Share		Population	Share
Chatham	232,048	16.0%	Telfair	11,794	0.8%
Muscogee	186,291	12.9%	Bleckley	11,666	0.8%
Bibb	153,887	10.6%	Dooly	11,525	0.8%
Houston	110,765	7.6%	Terrell	10,970	0.8%
Glynn	67,568	4.7%	McIntosh	10,847	0.7%
Liberty	61,610	4.3%	Twiggs	10,590	0.7%
Bulloch	55,983	3.9%	Evans	10,495	0.7%
Laurens	44,874	3.1%	Long	10,304	0.7%
Effingham	37,535	2.6%	Wilkinson	10,220	0.7%
Sumter	33,200	2.3%	Pulaski	9,588	0.7%
Upson	27,597	1.9%	Candler	9,577	0.7%
Toombs	26,067	1.8%	Taylor	8,815	0.6%
Lee	24,757	1.7%	Wilcox	8,577	0.6%
Harris	23,695	1.6%	Johnson	8,560	0.6%
Peach	23,668	1.6%	Montgomery	8,270	0.6%
Bryan	23,417	1.6%	Marion	7,144	0.5%
Tattnall	22,305	1.5%	Treutlen	6,854	0.5%
Crisp	21,996	1.5%	Talbot	6,498	0.4%
Emanuel	21,837	1.5%	Wheeler	6,179	0.4%
Dodge	19,171	1.3%	Stewart	5,252	0.4%
Chattahoochee	14,882	1.0%	Schley	3,766	0.3%
Macon	14,074	1.0%	Webster	2,390	0.2%
Crawford	12,495	0.9%	TOTAL	1,449,603	100.0%

Source: U.S. Census Bureau and Cambridge Systematics, Inc.



Overall, the study area population grew by 157,896 between 1990 and 2000, which corresponds to an increase of 12.2%, or to a compound annual growth rate of 1.2%. If we rank the study area counties by population growth, we see that Houston, Chatham, Bulloch and Effingham counties made the highest overall gains in population, while several moderately-sized counties – Long, Lee, Bryan, Effingham, Crawford, Harris and Bulloch – made the greatest gains on a percentage basis.

**Table 4-2
Percentage Change in Population of Study Area Counties, 1990 to 2000**

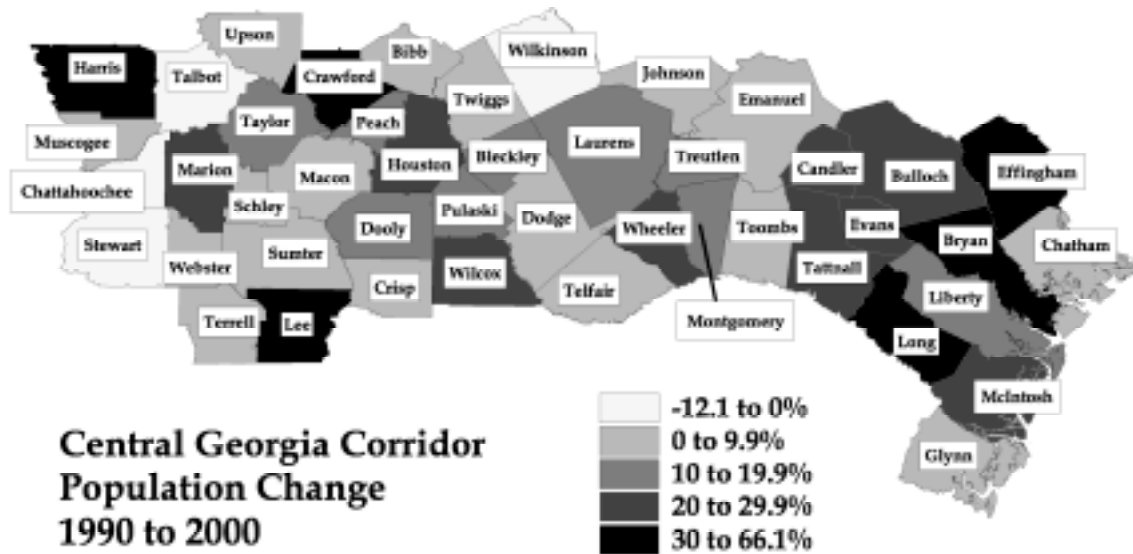
County	1990	2000	Numeric Change	Percent Change	County	1990	2000	Numeric Change	Percent Change
Long	6,202	10,304	4,102	66.1	Peach	21,189	23,668	2,479	11.7
Lee	16,250	24,757	8,507	52.4	Crisp	20,011	21,996	1,985	9.9
Bryan	15,438	23,417	7,979	51.7	Sumter	30,228	33,200	2,972	9.8
Effingham	25,687	37,535	11,848	46.1	Dodge	17,607	19,171	1,564	8.9
Crawford	8,991	12,495	3,504	39.0	Toombs	24,072	26,067	1,995	8.3
Harris	17,788	23,695	5,907	33.2	Glynn	62,496	67,568	5,072	8.1
Bulloch	43,125	55,983	12,858	29.8	Twiggs	9,806	10,590	784	8.0
Marion	5,590	7,144	1,554	27.8	Macon	13,114	14,074	960	7.3
Wheeler	4,903	6,179	1,276	26.0	Telfair	11,000	11,794	794	7.2
Tattnall	17,722	22,305	4,583	25.9	Chatham	216,935	232,048	15,113	7.0
McIntosh	8,634	10,847	2,213	25.6	Emanuel	20,546	21,837	1,291	6.3
Houston	89,208	110,765	21,557	24.2	Webster	2,263	2,390	127	5.6
Candler	7,744	9,577	1,833	23.7	Schley	3,588	3,766	178	5.0
Wilcox	7,008	8,577	1,569	22.4	Upson	26,300	27,597	1,297	4.9
Evans	8,724	10,495	1,771	20.3	Muscogee	179,278	186,291	7,013	3.9
Pulaski	8,108	9,588	1,480	18.3	Terrell	10,653	10,970	317	3.0
Liberty	52,745	61,610	8,865	16.8	Johnson	8,329	8,560	231	2.8
Dooley	9,901	11,525	1,624	16.4	Bibb	149,967	153,887	3,920	2.6
Montgomery	7,163	8,270	1,107	15.5	Wilkinson	10,228	10,220	-8	-0.1
Taylor	7,642	8,815	1,173	15.3	Talbot	6,524	6,498	-26	-0.4
Treutlen	5,994	6,854	860	14.3	Stewart	5,654	5,252	-402	-7.1
Laurens	39,988	44,874	4,886	12.2	Chattahoochee	16,934	14,882	-2,052	-12.1
Bleckley	10,430	11,666	1,236	11.9	TOTAL	1,291,707	1,449,603	157,896	12.2

Source: U.S. Census Bureau and Cambridge Systematics, Inc.

Several of the fastest growing counties in the Corridor are along the Atlantic Coast: Effingham, Bryan, and Long. These are generally clustered around the existing economic activity in Chatham County. Others tend to be clustered along or near the I-75 corridor. Exceptions include Harris County and Lee County on the western end of the Corridor. The implication is for increasing freight activity to be concentrated in these high-growth counties. The geographic distribution of population growth patterns is illustrated in Figure 4-1 on the following page.



Figure 4-1
Study Area Population Growth by County

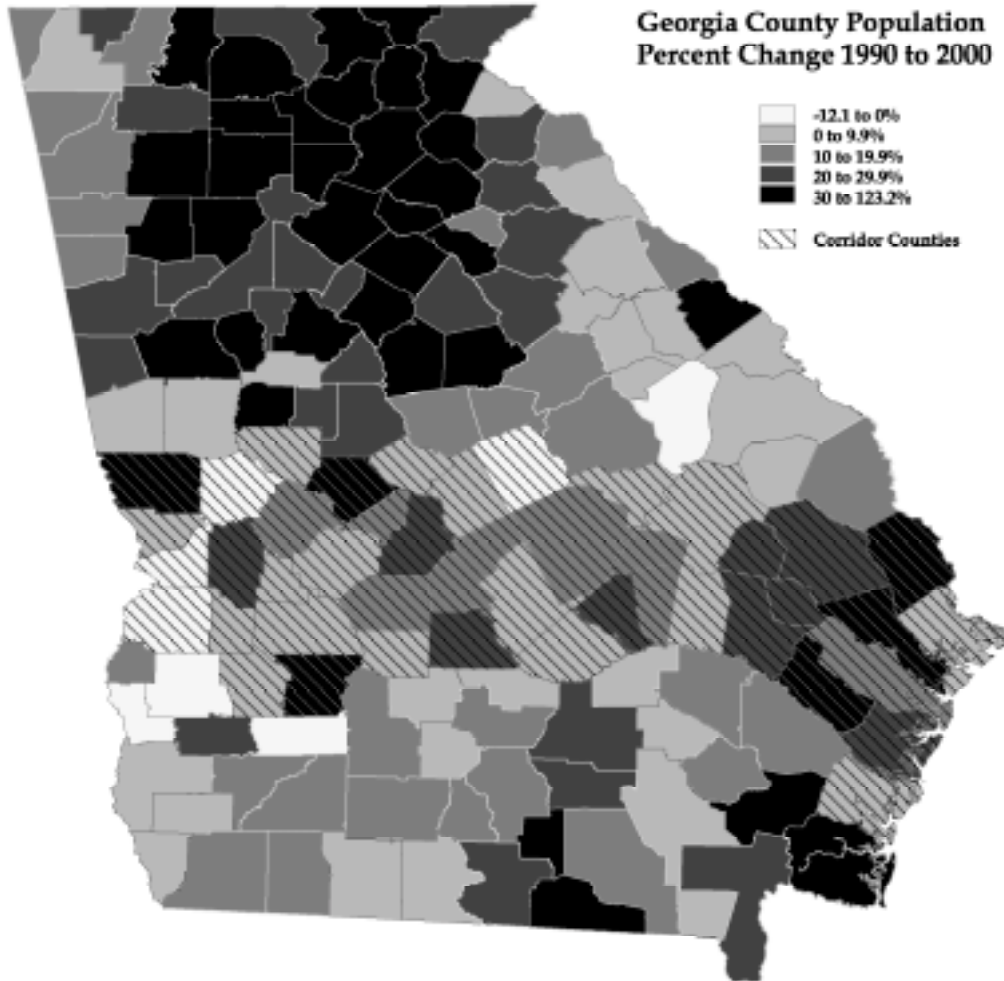


If we compare the study area to the state of Georgia as a whole, we see that four of the eight counties in Georgia with population loss between 1990 and 2000 are in the Corridor. Those counties are Talbot, Stewart, and Chattahoochee on the western end of the study area, and Wilkinson County in the north center. Chattahoochee, with a 12.1 percent decrease in population, led the state in percent population loss.

Figure 4-2 on the following page shows Georgia population growth by county. Within the state, high-growth areas include Northern Georgia, especially metropolitan counties surrounding Atlanta, and several counties in Southeastern Georgia along the Atlantic coast and within the Corridor. Of the 10 fastest growing Georgia counties, eight are located in the greater Atlanta area. Four study area counties fall within Georgia's 20 fastest growing counties: Long (66.1%); Lee (52.4 percent); Bryan (51.7 percent); and Effingham (46.1 percent).



Figure 4-2
Georgia Population Growth Rates by County



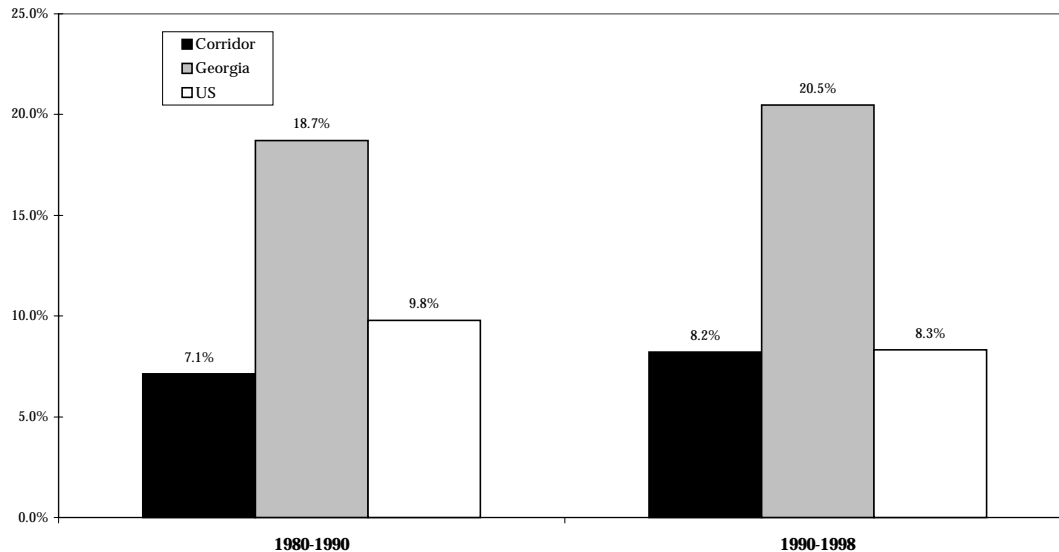
Source: U.S. Census and Cambridge Systematics, Inc.

If we compare the study area growth rate with the growth rates for both the state of Georgia as a whole and the U.S. as a whole, we see that:

- From 1980 to 1990, the population growth rate of the Corridor study area was less than both the state of Georgia and the nation as a whole.
- In the last decade, however, the study area population increased at the same rate as the U.S. as a whole. However, the state's population continued to grow at nearly twice the rate of the corridor, due largely to rapid growth in the Atlanta region.



Figure 4-3
Population Growth in Study Area, Georgia and US (Percentage Change)



Source: REMI, Woods & Poole, and Cambridge Systematics, Inc.

The REMI forecast suggests that the study area population will grow from 1998 to 2025, but at a rate less than that of the rest of the nation. The forecast shows Corridor population will grow at a slower rate than the national average between 1998 and 2025. The Corridor will add more than 150,000 people (11.2 percent) while the nation’s population will expand by more than 65 million (24.3 percent.) This indicates that, absent successful efforts to retain and attract business activity within the study area, it may experience a weakening economy relative to other regions in the nation. It should also be noted that this forecast may be conservative, as the Bureau of the Census estimates place the study area population at 1,449,603 in year 2000 – well above the REMI figure for year 1998.

Table 4-3
Population Forecast, Study Area and United States, 1998 to 2025

	1998	2025	Growth	Annual Rate
Study Area	1,401,581	1,559,188	11.2%	0.4%
United States	270,251,000	335,985,000	24.3%	0.8%

Source: REMI and Cambridge Systematics, Inc.



Per Capita Income

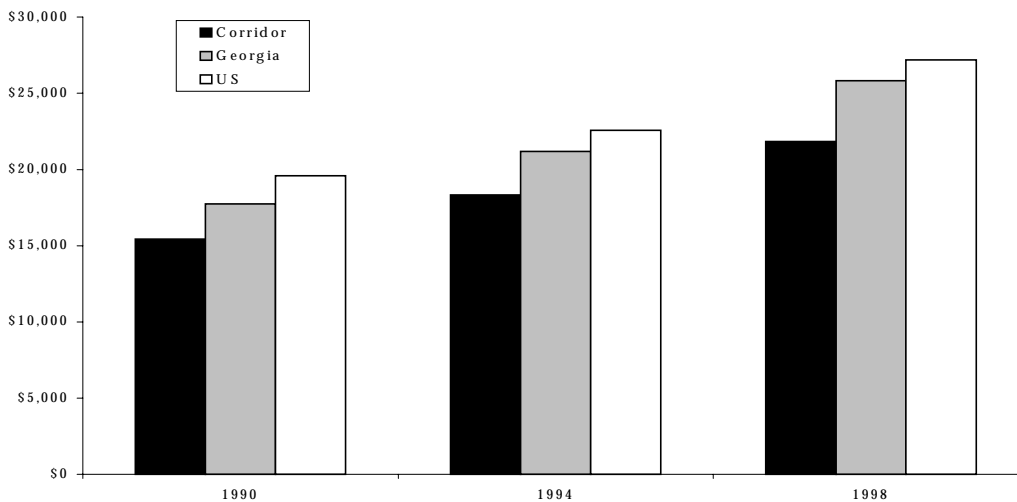
Another important indicator of regional economic well-being is per capita personal income. For the study area, per capita personal income in 1998 was \$21,823. This is over \$4,000 less than the Georgia average and over \$5,000 less than the U.S. average. Although the study area income grew at slightly faster rate (in percentage terms) than the national average between 1990 and 1998, the study area actually fell further behind in dollar terms.

**Table 4-4
Per Capita Personal Income, 1990 to 1998**

	1990	1994	1998	Growth	Annual Rate
Study Area	\$15,431	\$18,327	\$21,823	41.4%	4.4%
Georgia	\$17,738	\$21,170	\$25,839	45.7%	4.8%
United States	\$19,584	\$22,581	\$27,203	38.9%	4.2%

Source: REMI, Cambridge Systematics, Inc., and U.S. Bureau of Economic Analysis

**Figure 4-4
Comparison of Study Area, Georgia and U.S. Per Capita Personal Income, 1990-1998**



Source: REMI, Cambridge Systematics, Inc., and U.S. Bureau of Economic Analysis



Table 4-5
Per Capita Personal Income Forecast, 1998 to 2025, Current Year Dollars¹

	1998	2025	Growth	Annual Rate
Georgia Central Corridor	\$21,823	\$56,318	158.1%	3.6%
United States	\$27,203	\$71,516	162.9%	3.6%

Source: REMI and Cambridge Systematics, Inc.

By the year 2025, per capita income in the study area is forecast to be two and one-half times greater than in 1998. This growth rate closely tracks with the national average. However, the income disparity between the study area and the nation as a whole will almost triple, increasing from \$5380 to \$15,198. Clearly, income growth that simply matches the national average will not overcome this disadvantage – the corridor must exceed that rate, or risk falling further behind.

Unemployment

Unemployment within the study area is higher than the surrounding region and nation. Specifically, the 1998 unemployment rate in the study area counties is 6.18% -- more than 1.5 percentage points higher than the national average and nearly 2.0 percentage points higher than the state of Georgia.

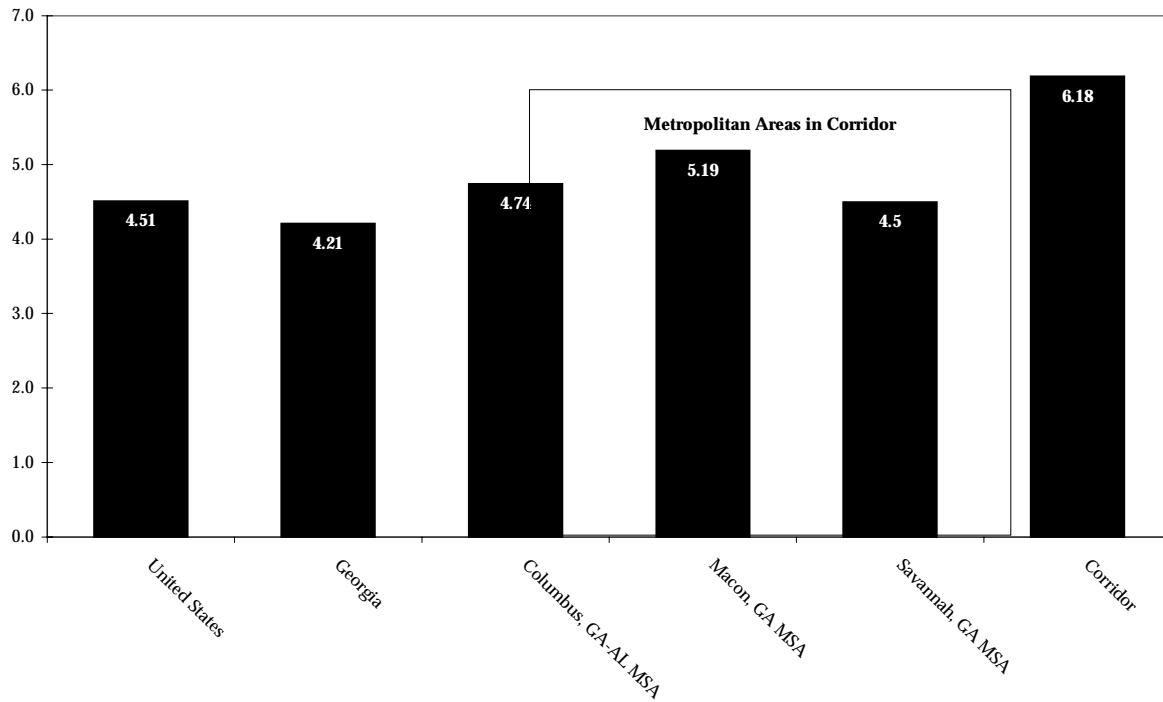
Figure 4-5 on the following page shows that within the study area, unemployment rates tend to be lower in the more urbanized Metropolitan Statistical Areas, or MSAs.² The three MSAs -- Columbus, Macon and Savannah -- each had unemployment rates close to the national average, and between 1.0 and 1.65 percentage points lower than the study area as a whole. Of the three MSAs in the Corridor, Savannah has the lowest unemployment rate.

¹Values in nominal dollars (or current-year dollars) are the actual dollar values for the representative year. This is in contrast to real or constant dollars that are defined for a particular year, say 2000, which put dollar values from various years into an inflation-adjusted base year.

²Metro areas are defined as those counties that lie within a Metropolitan Statistical Area (MSA) as specified by the U.S. Census. The Census uses multiple criteria to define metropolitan areas; the primary criteria is that the center of the area includes a city of 50,000 population or greater.



**Figure 4-5
Unemployment Rates, 1998**



Source: REMI, Woods & Poole, and Cambridge Systematics, Inc.

Employment

Employment growth is generally considered in two broad categories: Total Employment and Private Non-Farm Employment. “Total Employment” counts all jobs including farm (agricultural) and government (federal, state, and local) employment, while private employment growth focuses on the business sector.

**Table 4-6
Total Employment in the Study Area and United States, 1990 to 1998**

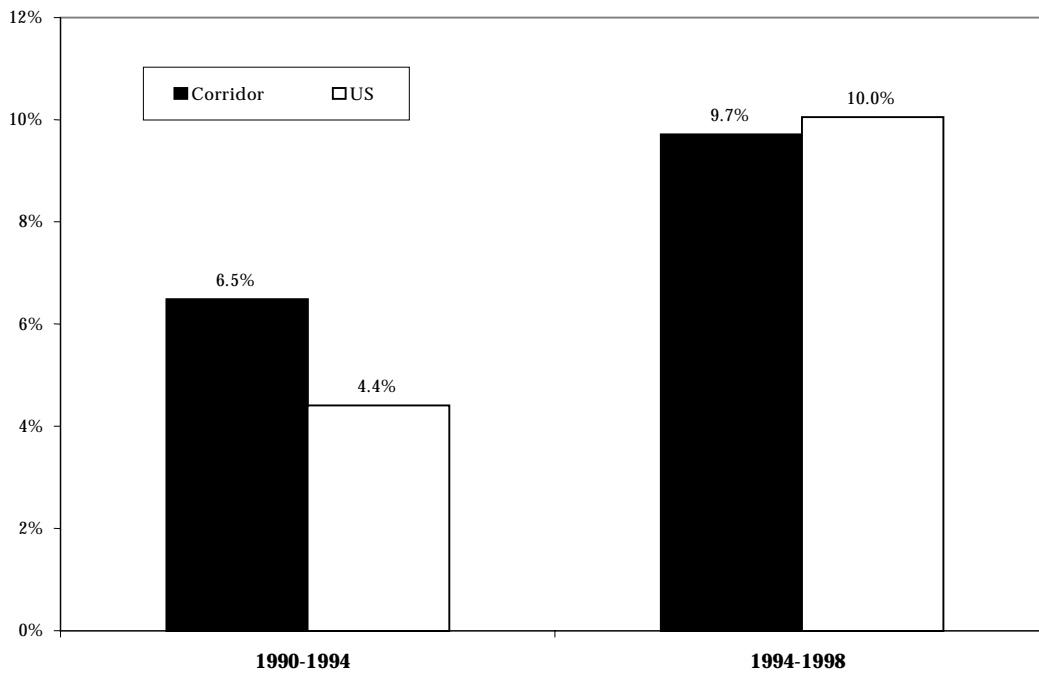
	1990	1994	1998	Growth	Annual Rate
Study Area	670,522	713,999	783,364	16.8%	2.0%
United States	139,426,900	145,571,600	160,198,700	14.9%	1.8%

Source: REMI and Cambridge Systematics, Inc.



As shown in Table 4-6 above and Figure 4-6 below, total employment growth in the study area has actually outpaced the national average between 1990 and 1998. Growth was greater between 1994 and 1998 than the earlier part of the 1990s in the Corridor and the United States, which is consistent with the recession in the early 1990s and the subsequent economic expansion. In the early 1990s, the Corridor’s growth rate outpaced the national growth rate. Corridor employment grew at roughly the same rate as the nation during the period from 1994 to 1998. Overall, this is encouraging news.

Figure 4-6
Total Employment Growth, 1990 to 1998



Source: REMI and Cambridge Systematics, Inc.



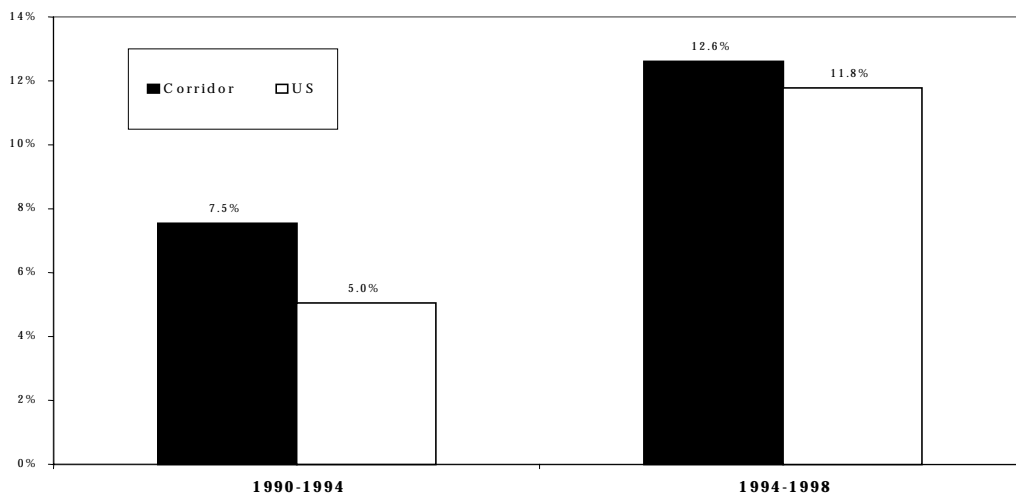
As shown in Table 4-7 and Figure 4-7, private non-farm employment in the Corridor grew at a faster pace than total employment and outpaced U.S. growth rates during both periods (see Figure 2). Private non-farm employment in the Corridor during the recessionary years of the early 1990's 1.5 times faster than the United States. Moreover, during the boom years of the later 1990s, the Corridor's private employment continued to outpace very strong U.S. employment growth. This is encouraging for the region because it implies an active private sector, rather than a reliance on government job creation.

**Table 4-7
Total Private Non-Farm Employment, 1990 to 1998**

	1990	1994	1998	Growth	Annual Rate
Study Area	493,307	530,548	597,422	21.1%	2.4%
United States	115,077,900	120,885,600	135,123,700	17.4%	2.0%

Source: REMI and Cambridge Systematics, Inc.

**Figure 4-7
Private Non-Farm Employment Growth, 1990 to 1998**



Source: REMI and Cambridge Systematics, Inc.

Table 4-8 presents the REMI forecast for total employment to 2025 in the Corridor and the United States. While the forecast anticipates that the study area will add 80,000 new jobs, it also suggests that employment growth in the study area will fall behind the overall national rate between 1998 and 2025. The forecasted growth rate for study area employment (0.3%) also lags the forecasted growth rate for study area employment (0.4%).



**Table 4-8
Total Employment Growth Forecast, 1998 to 2025**

	1998	2025	Growth	Annual Rate
Study Area	783,364	852,464	8.8%	0.3%
United States	160,198,700	194,577,400	21.5%	0.7%

Source: REMI and Cambridge Systematics, Inc.

The difference in study area and national growth rates is largely due to the “industry mix” within the study area – that is, the study area is characterized by higher concentrations of the types of industries that REMI forecasts lower growth rates for, and lower concentrations of faster-growing industries. The challenge for the study area is to maximize its growth potential by supporting its existing industries and by attracting new high-growth industries, in part through the provision of cost-effective transportation and communications infrastructure.

Profile of Major Industries – Employment, Output and Industry Clusters

Employment

Table 4-9 presents a summary of study area employment for 1998. The greatest share of employment (25.9%) was in services, followed by government (21.6%) and retail (17.6%).

**Table 4-9
Study Area Employment by Sector, 1998**

	1998	Share
Services	203,095	25.9%
Government	168,875	21.6%
Retail Trade	138,014	17.6%
Non-Durable Manufacturing	54,031	6.9%
Durable Manufacturing	49,740	6.3%
Finance, Insurance, & Real Estate	44,050	5.6%
Construction	40,902	5.2%
Transportation & Public Utilities	30,656	3.9%
Wholesale Trade	24,154	3.1%
Farm	17,067	2.2%
Agricultural Services, Forestry, Fisheries, and Other	10,502	1.3%
Mining	2,278	0.3%
TOTAL EMPLOYMENT	783,364	100.0%

Source: REMI and Cambridge Systematics, Inc.



Table 4-10
Study Area Employment, Durable and Non-Durable Manufacturing, 1998

	1998	Share
Food	14,287	13.8%
Textiles	10,246	9.9%
Paper	8,956	8.6%
Lumber	8,737	8.4%
Transportation equipment excluding motor vehicles	8,469	8.2%
Machinery & computers	6,305	6.1%
Apparel	6,107	5.9%
Electrical Equipment	5,760	5.6%
Printing	5,496	5.3%
Stone, clay, glass, concrete	5,219	5.0%
Fabricated metals	4,450	4.3%
Motor Vehicles	3,956	3.8%
Chemicals	3,504	3.4%
Tobacco manufacturing	2,962	2.9%
Primary metals	2,516	2.4%
Rubber	2,114	2.0%
Furniture	1,956	1.9%
Miscellaneous manufacturing	1,918	1.8%
Instruments	452	0.4%
Petroleum products	358	0.3%
Leather	1	0.0%
TOTAL MANUFACTURING	103,771	100.0%

Source: REMI and Cambridge Systematics, Inc.

Durable and non-durable manufacturing represent 13.2% of the study area employment, and the majority of its freight movement in terms of tonnage. Among manufacturing categories, the leading employers in the study area are food, textiles, paper, lumber and transportation equipment.

The overall picture is of a highly diversified economy anchored by – but not dependent on – services, government and retail trade. The freight-moving sectors of the study area economy – non-durable manufacturing, durable manufacturing, construction, transportation, wholesale trade, farm, agricultural/forest/fisheries services, and mining – account for a substantial share of the study area economy.

Table 4-11 on the following page summarizes employment gains and losses in the study area between 1990 and 1998. The largest gain (60,497 employees) has been in services, and the next largest (26,050) in retail. Other sectors added a smaller number of employees, with the exception of mining (which has declined by 17.5% overall) and non-durable manufacturing (which has declined by 12.8% overall). On a percentage basis, the fastest growth was achieved by Agriculture, Forest and Fisheries services (growth of 64.4% overall). The freight-dependent industries in the study area generally grew at a moderate rate, with the notable exception of non-durable manufacturing.



Table 4-11
Study Area Employment Growth, 1990 to 1998

	1990	1998	Gain/Loss	Growth	Annual Rate
Services	142,598	203,095	60,497	42.4%	4.5%
Retail Trade	111,964	138,014	26,050	23.3%	2.6%
Finance, Insurance, & Real Estate	35,507	44,050	8,543	24.1%	2.7%
Government	160,513	168,875	8,362	5.2%	0.6%
Durable Manufacturing	41,668	49,740	8,072	19.4%	2.2%
Agricultural Services, Forestry, Fisheries, and Other	6,387	10,502	4,115	64.4%	6.4%
Transportation & Public Utilities	27,719	30,656	2,937	10.6%	1.3%
Construction	39,129	40,902	1,773	4.5%	0.6%
Wholesale Trade	23,611	24,154	543	2.3%	0.3%
Farm	16,702	17,067	365	2.2%	0.3%
Mining	2,762	2,278	-484	-17.5%	-2.4%
Non-Durable Manufacturing	61,962	54,031	-7,931	-12.8%	-1.7%
TOTAL EMPLOYMENT	670,522	783,364	112,842	16.8%	2.0%

Source: REMI and Cambridge Systematics, Inc.

Table 4-12
Study Area Durable and Non-Durable Employment Growth, 1990 to 1998

	1990	1998	Gain/Loss	Growth	Annual Rate
Fabricated metals	3,027	4,450	1,423	47.0%	4.9%
Transportation equipment excluding motor vehicles	7,096	8,469	1,373	19.3%	2.2%
Electrical Equipment	4,474	5,760	1,286	28.7%	3.2%
Machinery & computers	5,161	6,305	1,144	22.2%	2.5%
Stone, clay, glass, concrete	4,222	5,219	997	23.6%	2.7%
Food	13,492	14,287	795	5.9%	0.7%
Printing	4,768	5,496	728	15.3%	1.8%
Motor Vehicles	3,239	3,956	717	22.1%	2.5%
Lumber	8,088	8,737	649	8.0%	1.0%
Tobacco manufacturing	2,413	2,962	549	22.8%	2.6%
Furniture	1,524	1,956	432	28.3%	3.2%
Primary metals	2,103	2,516	413	19.6%	2.3%
Rubber	1,840	2,114	274	14.9%	1.8%
Chemicals	3,446	3,504	58	1.7%	0.2%
Petroleum products	350	358	8	2.3%	0.3%
Miscellaneous manufacturing	1,933	1,918	-15	-0.8%	-0.1%
Instruments	802	452	-350	-43.6%	-6.9%
Leather	476	1	-475	-99.8%	-53.7%
Paper	9,540	8,956	-584	-6.1%	-0.8%
Textiles	12,741	10,246	-2,495	-19.6%	-2.7%
Apparel	12,895	6,107	-6,788	-52.6%	-8.9%
TOTAL MANUFACTURING	103,630	103,771	141	0.1%	0.0%

Source: REMI and Cambridge Systematics, Inc.



Looking more closely at the manufacturing sectors, we see that the highest employment gains between 1990 and 1998 were made in fabricated metals, transportation equipment, electrical equipment, machinery and computers, and stone/clay/glass/concrete. Moderate gains were seen in food, printing, lumber, motor vehicles, tobacco, furniture, primary metals and rubber. Substantial losses were seen in: apparel (which lost 6,788 employees, or 52.6%); textiles (which lost 2,495 employees, or 19.6%); paper (which lost 584 employees, or 6.1%); and leather (which lost 475 employees, its entire workforce). The significant declines in apparel and textiles are largely responsible for the overall decline within the non-durable manufacturing sector.

The REMI growth forecasts for the period 1998-2025 suggest that the year 2025 economy will continue to be anchored by services, government and retail trade, but there will continue to be a diverse range of freight-generating industries as well. The overall forecast is for a modest increase of 69,100 jobs in the study area (an increase of 8.8% overall). Gains are forecast primarily in the service industries and in government. A number of freight-dependent industries are expected to grow as well, including agricultural/forest/fisheries services and construction. However, most freight-dependent industries are actually forecast to lose employment. The loss is forecast to be greatest in non-durable manufacturing, farm employment, wholesale trade, and mining.

Table 4-13
Study Area Employment Forecast, 1998 to 2025

	1998	2025	Gain/Loss	Growth Annual Rate	
Services	203,095	270,584	67,489	33.2%	1.1%
Government	168,875	185,477	16,602	9.8%	0.3%
Retail Trade	138,014	139,336	1,322	1.0%	0.0%
Durable Manufacturing	49,740	48,526	-1,214	-2.4%	-0.1%
Non-Durable Manufacturing	54,031	44,890	-9,141	-16.9%	-0.7%
Construction	40,902	43,024	2,122	5.2%	0.2%
Finance, Insurance, & Real Estate	44,050	41,966	-2,084	-4.7%	-0.2%
Transportation & Public Utilities	30,656	30,424	-232	-0.8%	0.0%
Wholesale Trade	24,154	19,195	-4,959	-20.5%	-0.8%
Agricultural Services, Forestry, Fisheries, and Other	10,502	15,660	5,158	49.1%	1.5%
Farm	17,067	11,810	-5,257	-30.8%	-1.4%
Mining	2,278	1,573	-705	-30.9%	-1.4%
TOTAL EMPLOYMENT	783,364	852,464	69,100	8.8%	0.3%

Source: REMI and Cambridge Systematics, Inc.



Within the durable and non-durable manufacturing sectors, the year 2025 forecast suggests that food, transportation equipment, lumber, paper and textiles will continue to lead in terms of job creation; these are the same top five as in 1998, with transportation equipment moving up to second position and textiles dropping from second to fifth position. Overall, manufacturing employment in the study area is forecast to decline by 10,355 jobs (a 10.0% loss) between 1998 and 2025. Some industries – including transportation equipment, fabricated metals, food, furniture, lumber and printing – are expected to add jobs during this period, but most manufacturing industries are forecast to lose jobs. The most significant declines are forecast for apparel (loss of 3,895 jobs), textiles (loss of 3,312 jobs), electrical equipment (loss of 1,820 jobs), tobacco (loss of 1,699 jobs) and paper (loss of 1,212 jobs).

Table 4-14
Study Area Durable and Non-Durable Employment Forecast, 1998 to 2025

	1998	2025	Gain/Loss	Growth	Annual Rate
Food	14,287	15,154	867	6.1%	0.2%
Transportation equipment excluding motor vehicles	8,469	9,629	1,160	13.7%	0.5%
Lumber	8,737	8,996	259	3.0%	0.1%
Paper	8,956	7,744	-1,212	-13.5%	-0.5%
Textiles	10,246	6,934	-3,312	-32.3%	-1.4%
Machinery & computers	6,305	6,100	-205	-3.3%	-0.1%
Printing	5,496	5,621	125	2.3%	0.1%
Fabricated metals	4,450	5,233	783	17.6%	0.6%
Stone, clay, glass, concrete	5,219	4,495	-724	-13.9%	-0.6%
Electrical Equipment	5,760	3,940	-1,820	-31.6%	-1.4%
Motor Vehicles	3,956	3,740	-216	-5.5%	-0.2%
Chemicals	3,504	3,474	-30	-0.9%	0.0%
Furniture	1,956	2,532	576	29.4%	1.0%
Apparel	6,107	2,212	-3,895	-63.8%	-3.7%
Rubber	2,114	2,173	59	2.8%	0.1%
Primary metals	2,516	1,785	-731	-29.1%	-1.3%
Miscellaneous manufacturing	1,918	1,668	-250	-13.0%	-0.5%
Tobacco manufacturing	2,962	1,263	-1,699	-57.4%	-3.1%
Instruments	452	408	-44	-9.7%	-0.4%
Petroleum products	358	315	-43	-12.0%	-0.5%
Leather	1	0	-1	-100.0%	-100.0%
TOTAL MANUFACTURING	103,771	93,416	-10,355	-10.0%	-0.4%

Source: REMI and Cambridge Systematics, Inc.

Output

From an employment perspective, the overall employment picture is one of a diversified economy, growing at a relatively slow rate, and consolidating its freight-related employment away from historic industries in apparent decline (farm, mining, apparel and textile, etc.). As a means of testing these findings, we can examine another measure of economic vitality – output. Output is defined as the total value of goods and services produced.



**Table 4-15
Study Area Output Forecast, 1998 to 2025**

(in billions of fixed 1992 dollars)	1998	2025	Gain/Loss	Growth	Annual Rate
Non-Durable Manufacturing	\$ 14.9	\$ 20.6	\$ 5.7	38.2%	1.2%
Durable Manufacturing	\$ 10.6	\$ 19.4	\$ 8.8	82.5%	2.3%
Services	\$ 9.2	\$ 14.4	\$ 5.3	57.4%	1.7%
Transportation & Public Utilities	\$ 4.3	\$ 8.1	\$ 3.8	89.5%	2.4%
Finance, Insurance, & Real Estate	\$ 5.6	\$ 7.8	\$ 2.2	38.9%	1.2%
Retail Trade	\$ 5.2	\$ 7.6	\$ 2.3	44.5%	1.4%
Wholesale Trade	\$ 2.4	\$ 4.2	\$ 1.8	72.9%	2.0%
Construction	\$ 3.5	\$ 4.0	\$ 0.5	14.7%	0.5%
Mining	\$ 0.6	\$ 0.3	\$ (0.2)	-38.5%	-1.8%
Agricultural Services, Forestry, Fisheries	\$ 0.2	\$ 0.3	\$ 0.1	52.7%	1.6%
TOTAL	\$ 56.5	\$ 86.7	\$ 30.2	53.5%	1.6%

Source: REMI and Cambridge Systematics, Inc.

The output data presents a brighter picture than the employment data in many respects. For one thing, the total growth in output – measured in constant 1992 dollars – increases by 1.6% annually between 1998 and 2025, compared with an increase of only 0.3% in employment. The higher output reflects increasing productivity per employee. The data confirms that the employment decline in mining represents a real decline, as output is also forecast to drop in that sector; output forecasts for the farm sector, which is also forecast to lose substantial employment, are not available. But perhaps the most interesting finding is that certain industries in apparent decline based on the employment data – particularly durable manufacturing, non-durable manufacturing and wholesale trade, all of which are forecast to lose jobs – will actually increase their output substantially over the next 25 years. In fact, the two largest increases in output are associated with durable and non-durable manufacturing. This means that these industries will actually increase their need for, and dependence on, transportation and communications infrastructure within the study area.

Table 4-16 on the following page provides additional details on durable and non-durable manufacturing. The highest growth in terms of dollars is associated with transportation equipment, tobacco manufacturing, paper, motor vehicles, food, primary metals and chemicals. Even textiles, which is forecast to reduce its workforce by 32%, actually increases its output by 31%. In fact, the only manufacturing industries forecasted to suffer declining output are apparel and petroleum products. The overall message is that the corridor’s diversified manufacturing sectors, despite undergoing significant shifts in workforce structure, will for the most part continue to increase their output.



Table 4-16
Study Area Durable and Non-Durable Output Forecast, 1998 to 2025

(in billions of fixed 1992 dollars)	1998	2025	Gain/Loss	Growth	Annual Rate
Transportation equipment excluding motor vehicles	\$ 2.6	\$ 7.2	\$ 4.6	179.8%	3.9%
Tobacco manufacturing	\$ 4.5	\$ 6.1	\$ 1.6	35.3%	1.1%
Food	\$ 4.0	\$ 5.3	\$ 1.3	32.1%	1.0%
Paper	\$ 2.0	\$ 3.5	\$ 1.5	78.0%	2.2%
Motor vehicles	\$ 1.6	\$ 3.1	\$ 1.5	90.8%	2.4%
Machinery & computers	\$ 1.9	\$ 2.2	\$ 0.3	16.5%	0.6%
Textiles	\$ 1.6	\$ 2.1	\$ 0.5	30.9%	1.0%
Chemicals	\$ 1.2	\$ 2.0	\$ 0.8	72.5%	2.0%
Lumber	\$ 1.1	\$ 1.6	\$ 0.5	41.7%	1.3%
Primary metals	\$ 0.6	\$ 1.5	\$ 0.9	149.3%	3.4%
Electric equipment	\$ 1.0	\$ 1.1	\$ 0.1	6.8%	0.2%
Stone, clay, glass, concrete	\$ 0.7	\$ 1.0	\$ 0.2	34.1%	1.1%
Fabricated metals	\$ 0.6	\$ 0.9	\$ 0.3	59.3%	1.7%
Rubber	\$ 0.3	\$ 0.7	\$ 0.3	111.7%	2.8%
Printing	\$ 0.4	\$ 0.5	\$ 0.1	18.3%	0.6%
Furniture	\$ 0.2	\$ 0.4	\$ 0.1	49.4%	1.5%
Apparel	\$ 0.5	\$ 0.3	\$ (0.2)	-44.9%	-2.2%
Miscellaneous manufacturing	\$ 0.2	\$ 0.3	\$ 0.1	70.1%	2.0%
Instruments	\$ 0.1	\$ 0.2	\$ 0.1	156.5%	3.5%
Petroleum products	\$ 0.4	\$ 0.2	\$ (0.2)	-60.5%	-3.4%
TOTAL	\$ 25.5	\$ 40.0	\$ 14.4	56.6%	1.7%

Source: REMI and Cambridge Systematics, Inc.

The overall message is that the corridor’s diversified economy – and particularly its durable and non-durable manufacturing sectors – will, despite undergoing significant shifts in workforce structure, for the most part continue to increase their output, requiring increased levels of service from the study area’s transportation and communications infrastructure.

Industry Clusters

To more clearly identify the industries that use the freight transportation system in the study area – those that either depend on it today, or whose growth and vitality depends on future improvements – this section presents a more detailed industry-level analysis. Specifically, this section identifies several important industry “clusters” by using two major forms of regional economic analysis: location quotients and shift-share analysis. This analysis defines a “cluster” as a group of interrelated industries that are characterized by a common supplier and/or buyer relationships and similar competitive requirements. Examples of clusters in the United States include the Silicon Valley high-technology cluster in Northern California and the automotive industry in Michigan.

The first form of analysis, Location Quotients (LQ), measures the concentration of a particular industry in a region relative to the United States. Mathematically, a location quotient is derived in three steps. First, looking at the study area, we calculate the relative share of total employment within each sector. Second, looking at the U.S. as a whole, we make the same determination. Third, we divide the study area share for a given industry by the national share



for that industry; a resulting figure greater than one means that the study area has a higher share of that industry than the nation as a whole, while a figure less than one means the study area has a lower share. In cases where the location quotient is greater than one, and especially in cases where the quotient is significantly greater than one, the location quotient may be indicative of an industrial cluster. Location quotients can also be interpreted to indicate goods and services that are “imported” to or “exported” from the study area. For example, if a location quotient is less than one for a specific industry sector, then the region is likely a net importer because it does not produce a sufficient self-supply of these goods.

Table 4-17 below presents location quotients for major industry categories for both 1990 and 1998. For year 1998, the region’s industrial mix generally follows the national average, with the exceptions of high location quotients in government, non-durable manufacturing (textile mill products, food and kindred products, apparel, and tobacco products etc.) and farming, and low concentrations in mining, wholesale trade, and finance/insurance/real estate.

**Table 4-17
Location Quotients for Study Area, Major Industries, 1990 and 1998**

Industry	1990	1998	1998 Tends to Be
Government (including military)	1.57	1.57	Export
Non-durable manufacturing	1.57	1.40	Export
Farming	1.10	1.12	Export
Retail Trade	1.02	1.06	
Agriculture, Forestry, and Fishing Services	0.91	1.05	
Construction	1.12	0.95	
Durable goods	0.75	0.87	Import
Services	0.77	0.83	Import
Transportation and public utilities	0.88	0.82	Import
Finance, insurance, and real estate	0.69	0.74	Import
Wholesale trade	0.73	0.67	Import
Mining	0.55	0.54	Import

Source: REMI 45-County Georgia Model and Cambridge Systematics, Inc.



To further define specific industry clusters, location quotients were calculated from detailed industry-level data for 172 industry groups. Of these, the top three are manufacturing industries. Tobacco product manufacturing is the most concentrated industry sector in comparison to the U.S., with a location quotient more than 14. The next two strongest industry clusters are weaving, finishing, yarn, and thread mills; and pulp, paper, and paperboard mills. The fourth highest LQ is federal military; with military bases in Columbus, Warner Robbins, and Savannah, the Corridor is a major national defense center. Interestingly, the analysis picks up employment at the ports of Savannah, Brunswick and Columbus – water transportation has a location quotient of 3.55.

**Table 4-18
Top 25 Industry Location Quotients**

Industry	1998 LQ	Industry	1998 LQ
Tobacco products	14.81	Electric lighting and wiring equipment	2.56
Weaving, finishing, yarn, and thread mills	5.48	Aerospace	2.45
Pulp, paper, and paperboard mills	5.42	Miscellaneous food and kindred products	2.39
Federal Military	4.59	Meat products	2.36
Carpets and rugs	4.55	Sawmills and planing mills	2.10
Logging	3.82	Federal Civilian	2.06
Water transportation	3.55	Hydraulic cement	1.95
Greeting cards	3.29	Converted paper products except containers	1.81
Household appliances	3.09	Sugar and confectionery products	1.75
Farm and garden machinery and equipment	2.97	Iron and steel foundries	1.74
Nonmetallic minerals, except fuels	2.95	Engines and turbines	1.68
Bakery products	2.77	Wood buildings and mobile homes	1.63
Stone, clay, and misc. mineral products	2.59		

Source: REMI 45-County Georgia Model and Cambridge Systematics.

The use of location quotients helps define the types of industries that require freight transportation infrastructure within the study area. The other type of analysis used to determine and understand industrial trends and clusters in the Corridor is shift-share analysis. Simply stated, shift-share analysis measures the degree to which corridor industries are growing (or declining) as a response to national or local factors, and whether the study area economy is “shifting” towards a mix of faster-growing or slower-growing industries. Shift-share analysis looks at employment in terms of four specific components:

- **Total** is the actual number of jobs created in a given industrial sector between 1990 and 1998 in the study area. It is the sum of the other three components (national share, industry mix and local factors).
- **National Share** is a theoretical figure indicating how many jobs would have been created in a study area industry if it had grown at the national average for all industries.



- Industry Mix** is a theoretical figure that, when combined with the national share, indicates how many jobs would have been created in a study area industry if it had grown at the national average for that particular industry. This is a benchmark for determining if a particular industry is growing faster or slower than the overall economy at the national level. A positive number for any industry means that it is growing faster than the national average; a negative number means it is growing slower. A region that has more industries with positive numbers than negative numbers has a positive “industry mix,” in that it contains more industries growing at better than average rates.
- Local Factors** is the difference between the actual total jobs created and the theoretical share of these jobs attributable to national share and industry mix. It measures whether a particular study area industry grew faster or slower than the national average for that particular industry, presumably based on specific local competitive advantages or disadvantages. A positive local factor indicates that a region has added jobs on top of those it could be expected to add based on national growth in that industry.

Table 4-19
Aggregate-Level Shift-Share Analysis, Study Area Job Creation 1990 to 1998

Industry	National Share	Industry Mix	Local Factors	Total
Manufacturing: Durable Goods	6,208	-5,507 -	7,371 +	8,072
Manufacturing: Non-Durable Goods	9,231	-11,664 --	-5,498 -	-7,931
Mining	411	-910 -	15 +	-484
Construction	5,829	2,461 +	-6,571 -	1,719
Transportation and Public Utilities	4,130	511 +	-1,704 -	2,937
Finance, Insurance, and Real Estate	5,290	-261 -	3,514 +	8,543
Retail Trade	16,680	1,832 +	7,538 +	26,050
Wholesale Trade	3,518	-1,265 -	-1,710 -	543
Services	21,244	19,970 ++	19,282 ++	60,496
Agriculture, Forestry & Fishing Services	952	1,640 +	1,523 +	4,115
Farm Employment	2,488	-2,626 -	503 +	365
Government and Government Enterprises	23,913	-18,218 --	2,667 +	8,362
TOTAL	99,894	-14,037	26,984	112,841

Source: REMI 45-County Georgia Model and Cambridge Systematics.

Legend: ++ (very positive), + (positive), - (negative), -- (very negative)

We can make the following general interpretations of these findings:

- If the study area had grown at the national average for all industries between 1990 and 1998 (the National Share), it would have added only 99,894 jobs. The fact that it added 112,842



jobs means that it grew at a faster rate than the national average (consistent with the findings presented in Table 4-6 previously).

- If the study area had grown at the national average for the specific industries represented in the study area (National Share plus Industry Mix), it would have added only 85,857 jobs. The fact that it added 112,842 jobs means that it outperformed the nation in these industries by a total of 26,984 jobs – which represents the study area’s Local Factor.
- The negative industry mix means that the study area is characterized by a larger-than-average share of slower-growing industries – particularly government, non-durable manufacturing, durable manufacturing, farming and mining. The fact that the study area managed to create a higher than expected share of jobs within these industries is attributable to local competitive advantages in terms of labor, land and transportation and other business costs, and other factors.
- The study area outperformed the nation (high positive Local Factor) in services, retail trade, durable goods manufacturing and government. It failed to outperform the nation (low negative Local Factor) in construction, non-durable goods, wholesale and transportation. Interestingly, despite the study area’s losses in farming and mining, it actually outperformed the nation over the period 1990-1998 (slightly positive Local Factor).
- Industries that are faster growing at the national level (positive industry mix) but slower growing in the corridor (negative local mix) can be thought of as healthy industries that are not being fully captured by the corridor economy, and that represent key opportunities for future economic development. These include construction and transportation.

Industry Need for Freight Transportation Infrastructure and Services

The preceding analyses identified several key industries in the Corridor. The following discussion analyzes the transportation demand from these most important industry groups in Central Georgia as a means of creating a bridge between regional economic activity and transportation activity. This discussion is useful in policy analysis because it identifies the transportation demands of industry clusters. This discussion draws from the Transportation Satellite Accounts³ (TSAs) published by the U.S. Bureau of Transportation Statistics to provide estimates of transportation demand by industry group. While the TSAs provide insight into transportation demand by industry, they are based on national aggregate statistics. Therefore,

³ Transportation Satellite Account data provide estimates, by industry, of the transportation demand per dollar of output. This means, for example, that a transportation-intensive industry (like agriculture) spends a higher portion of each output dollar on transportation costs than does a less transportation-intensive industry.



this analysis assumes that industry transportation demand at the national level is roughly equal to industry transportation demand in Central Georgia.

- **Agriculture, Forestry, Food, and Tobacco Products.** From the shift-share and location-quotient analyses, food products, farming, and tobacco appear as likely industry clusters. The production of poultry and other meat products is a growing industry in the Corridor. Tobacco manufacturing, especially in the Macon industry, is another industrial cluster. Farming and agriculture services are another strong industry in the Corridor, with products ranging from onions in the eastern portion of the Corridor to peanuts and melons in the region around Cordele. The sector of agriculture, forestry and fishing services has grown rapidly during the analysis period to become a strong industry cluster. From other analysis, and interviews, we also know the forestry industry is also important in this region. Despite their importance as clusters, only one of these industries is among the top 10 employers in the Corridor, farming, employing more than 24,000. For these industries, the TSAs indicate mixed transportation demand. The TSAs indicate that the food products industry has a slightly lower transportation demand per dollar than the average industry. For agriculture, however, the transportation demand is approximately twice the national average. The modal split between these industries is evenly distributed among trucking, rail, and water. Forestry has high transportation demand; nearly three times the national average. Forestry typically is a heavy user of own-account (in house) transportation, which in the Corridor is principally by truck.
- **Government and Military.** The state and local government sector (93,559 employees 1998) and the federal military sectors (47,070 employees in 1998) are not only highly concentrated in Central Georgia but are among the largest employment sectors. The federal civilian sector is also a major employer in the Corridor. Much of the state and local employment may be because of the many administrative units of the Corridor's 45 counties. As mentioned previously, there are numerous federal military bases in the Corridor, resulting in high numbers of federal military employment. Much of the federal civilian employment is related to support functions for the military, especially in areas surrounding bases such as Warner Robins. The TSAs do not have a separate category for federal military and federal civilian sectors. Nonetheless, the TSAs estimate federal government transportation demand at more than twice the national average, with the majority of trips split evenly between three modes: motor freight, water, and air transportation. In this region, railroad transportation is less important for federal industries. State and local government enterprises (excluding passenger transit operations) are less transportation intensive, with demand nearly half the national average.
- **Transportation and Aerospace Equipment.** From the location quotient and shift share analysis, transportation equipment emerges as an important Corridor industry. Similarly (although not so apparent in the LQ and shift share analysis), aerospace is a major employer in the Corridor. For transportation equipment, including truck and bus bodies, the TSAs indicated transportation demand slightly less than national average. For aerospace, the



TSAs estimate demand at roughly one-half the national average. These industries have similar modal splits, relying most heavily upon own-account transportation with some motor carrier reliance.

- **Apparel Textiles and Floor Coverings.** While these industries do not appear in the LQ/shift-share composite table, they are historically important industries in the Corridor and continue to be major employers. Weaving, finishing, yarn and thread mills, for example, employ nearly 9,000 in the Corridor; apparel manufacturing employs nearly 5,000. There are several carpet and floor covering manufacturers in the Corridor, but nowhere near the concentration of northern Georgia (Dalton region). The transportation demand of these industries varies. Weaving mills and apparel manufacturers have less than average transportation demand; the carpet and floor covering is just under the national average. Each of these industries is most reliant upon motor freight carriers to meet their transportation needs.
- **Basic Materials.** This sector, including stone, clay, and glass; and primary metals employs a relatively small proportion of the Corridor. However, these industries tend to be transportation intensive. Kaolin clay, for example, employs relatively few people in the Corridor, but the number of trucks generated has an important impact on the region's roads. The TSAs indicate that transportation demand by the stone, clay, and glass industry is well above the national average, mostly demanding motor freight trucking carriers. The primary metals sector has transportation demand slightly greater than the national average. All basic materials industries use rail in higher proportions than most industries.
- **Wood and Paper Products.** With corporations such as Weyerhaeuser and Georgia Pacific with sizable operations in the Corridor, this cluster is also important to mention in relation to transportation. Paper and pulp mills employed nearly 6,000 in 1998 in the Corridor. According to the TSAs, transportation demand for paper and wood product industries is slightly greater than the national average. It should be noted that the logging industry (mentioned above in 'forestry') is very transportation intensive and demands nearly three times the national average of transportation services.

How Changes in the Study Area Economy Will Affect Freight Movement

Once the underlying economic structure of the corridor is defined and understood in terms of its implications for freight movement, the key question is: how will the economy change, and how will freight movement be impacted as a result? This section develops commodity-specific economic growth rates that can be applied to base year freight activity in the corridor as a means of developing future forecasts.



There are several assumptions that were used to calculate the growth rates. First, the forecast period is 1998 (last history year of data) to 2025, based on the REMI forecast. Each growth factor was derived from annual growth rates of 168 industrial sectors; the REMI model was utilized to calculate growth rates because of the specific detail of the 168-level forecast. All economic forecast indicators were calculated using fixed 1992 dollars, to control for inflationary effects. These growth rates, because they are based on a county-aggregated regional forecast, also assume that growth rates by industry are the same for each county.

To project future commodity flows for the Central Georgia Corridor, four types of economic demand growth rates were extracted from the REMI forecast model for the region:

1. Internal demand;
2. Export demand;
3. Import demand; and
4. Pass-through demand.

Growth rates for each of the four types of demand will be used as multipliers to forecast one of four corresponding commodity flows. The following table shows the four types of demand and the corresponding type of commodity flow (O-D pairs).

Table 4-20
Relationship Between Growth Rates and Commodity Flows

Demand Type Growth Rate	Commodity Flow Type (O-D Pairs)
Internal Demand	Flows with origin and destination points within the region.
Export Demand	Flows with origin within the region and destination outside the region (outbound from study area).
Import Demand	Flows with origin outside the region and destination within the region (inbound to study area).
Pass-Through Demand	Flows with origin outside the region and destination outside the region that pass through the region.

Before presenting the growth rates that will be used to forecast commodity flows, it is important to present the methodology used to calculate the growth factors from the demand data extracted from the REMI forecast. The following paragraphs outline the methodology for extracting and calculating the growth rates for each of the commodity flow categories.



- **Internal Demand: Growth Factors for O-D Pairs within Region.** The growth rate for internal demand is represented by growth in the REMI variable “Self Supply.” Self Supply is defined by REMI as the amount of local demand supplied locally. Self Supply is derived by multiplying the REMI variable “Regional Purchase Coefficient” by the forecast growth in regional demand for goods and services. The “Regional Purchase Coefficient” (RPC) is the proportion of the regional demand for a good or service that is fulfilled by regional production as opposed to being fulfilled by imports from other regions. Thus, the growth in “Internal Demand” is a logical proxy to forecast growth in origin-destination pairs within the region because it predicts growth in demand for goods and services within the region met by providers within the region.
- **Export Demand: Growth Factors for Origins within Region to Destinations outside Region.** The growth rate for export demand is represented by growth in the REMI variable “Exports to U.S. & Rest of World.” This variable simply represents the value of exports shipped from the Corridor region to destinations in the United States and abroad (rest of world). Thus, the growth in “Exports to U.S. & Rest of World” is a logical multiplier to forecast growth in origin-destination pairs with origins in the region and destinations outside the region.
- **Import Demand: Growth Factors for Origins outside Region to Destination within Region.** The growth rate for import demand is represented by “Import Demand,” a variable created for this commodity flow forecast from variables in the REMI forecast for Central Georgia. This variable is a measure of the demand for goods and services in the region that is not met by goods and services supplied locally. Import Demand is calculated using input-output coefficients from the REMI Input-Output Matrix and the REMI variable “Regional Purchase Coefficients,” a variable explained in a preceding paragraph on internal demand. This analysis uses input-output coefficients because they explain the portion of intermediate inputs by commodity used by an industry thereby showing the interrelatedness of the region’s economy. Specifically, an input-output coefficient is the dollar cost of input (from each of 168 industries) an industry purchases in order to produce \$1.00 of output. For example, for every \$1.00 of output from the paper industry, that industry purchases \$0.20 in inputs from the logging industry, \$.30 from the chemical industry, etc. Thus, the growth rate of Import Demand (subtracting self supply determined using the RPCs) will be used as a multiplier to forecast origin-destination pairs with origins outside the region to destinations within the region.
- **Pass-Through Demand: Growth Factors for Through Trips.** The growth rate for pass-through demand is represented by the growth in the REMI variable “U.S. Output.” This variable is a measure of the value of all output (sales) in the United States by industry. The growth of U.S. output generally parallels the growth of commodity flows. Thus, the growth rate of U.S. output is a reasonable proxy for growth in origin-destination pairs with origins and destinations outside the region.



**Table 4-21
Annual Percentage Growth Factors by Commodity**

Commodity	O-D Pairs Within Study Area	Outbound from Study Area	Inbound to Study Area	Through
Logging	1.1%	1.6%	1.5%	1.4%
Sawmills and planing mills	0.3%	0.7%	0.8%	0.5%
Millwork, plywood, and structural members	0.3%	0.9%	0.5%	0.7%
Wood containers and misc. wood products	1.4%	1.7%	0.7%	1.5%
Wood buildings and mobile homes	0.3%	0.6%	0.3%	0.4%
Household furniture	1.7%	2.0%	1.3%	1.8%
Partitions and fixtures	3.0%	3.0%	2.8%	3.0%
Office and misc. furniture and fixtures	2.9%	3.1%	2.3%	2.9%
Glass and glass products	1.1%	2.1%	0.5%	2.0%
Hydraulic cement	-0.5%	-0.4%	0.5%	-0.4%
Stone, clay, and misc. mineral products	1.1%	1.5%	1.0%	1.5%
Concrete, gypsum, & plaster products	0.7%	0.9%	0.6%	0.8%
Blast furnaces and basic steel products	2.4%	2.9%	2.5%	2.7%
Iron and steel foundries	2.9%	3.2%	2.2%	3.0%
Primary non-ferrous smelting & refining	2.3%	no data	1.7%	2.8%
All other primary metals	3.0%	3.5%	2.6%	3.2%
Non-ferrous rolling and drawing	2.6%	3.2%	1.7%	3.1%
Non-ferrous foundries	2.7%	no data	2.1%	2.7%
Metal cans and shipping containers	0.5%	no data	0.4%	0.7%
Cutlery, hand tools, and hardware	1.4%	1.7%	1.5%	1.7%
Plumbing and non-electric heating equipment	0.3%	no data	0.4%	0.7%
Fabricated structural metal products	1.5%	1.7%	0.4%	1.7%
Screw machine products, bolts, rivets, etc.	2.4%	2.7%	1.3%	2.7%
Metal forgings and stampings	2.2%	2.3%	1.3%	2.3%
Metal coating, engraving, and allied services	4.1%	3.9%	1.9%	4.1%
Ordnance and ammunition	1.5%	1.1%	1.2%	1.9%
Miscellaneous fabricated metal products	2.1%	2.6%	1.5%	2.7%
Engines and turbines	0.3%	2.7%	0.3%	2.6%
Farm and garden machinery and equipment	2.6%	3.0%	2.8%	2.9%
Construction and related machinery	1.8%	3.3%	2.1%	3.1%
Metalworking machinery and equipment	2.7%	3.3%	2.6%	3.1%
Special industry machinery	3.3%	4.0%	2.8%	3.8%



Commodity	O-D Pairs Within Study Area	Outbound from Study Area	Inbound to Study Area	Through
General industrial machinery and equipment	3.0%	3.4%	2.4%	3.2%
Computer and office equipment	8.0%	8.0%	7.1%	7.5%
Refrigeration and service industry machinery	2.0%	2.5%	1.6%	2.4%
Industrial machinery, nec	2.6%	no data	1.9%	3.0%
Electric distribution equipment	2.5%	3.0%	2.1%	3.0%
Electrical industrial apparatus	3.5%	3.6%	1.6%	3.6%
Household appliances	1.0%	1.4%	1.2%	1.5%
Electric lighting and wiring equipment	1.0%	1.8%	0.7%	1.8%
Household audio and video equipment	2.3%	2.7%	4.1%	2.6%
Communications equipment	4.8%	5.1%	3.3%	4.8%
Electronic components and accessories	6.6%	no data	2.9%	6.3%
Miscellaneous electrical equipment	0.3%	2.1%	1.4%	2.1%
Motor vehicles and equipment	1.8%	2.3%	1.5%	2.1%
Aerospace	2.4%	3.2%	3.2%	3.1%
Ship and boat building and repairing	0.9%	1.8%	1.1%	1.3%
Railroad equipment	3.0%	no data	2.6%	3.1%
Miscellaneous transportation equipment	2.4%	3.1%	2.1%	2.7%
Search and navigation equipment	2.2%	2.7%	1.6%	2.4%
Measuring and controlling devices	2.9%	4.0%	1.9%	3.7%
Medical equipment, instruments and supplies	2.7%	3.5%	1.9%	3.3%
Ophthalmic goods	0.2%	no data	1.7%	2.4%
Photographic equipment and supplies	2.0%	2.7%	2.0%	2.4%
Watches, clocks, and parts	-100.0%	no data	1.0%	1.0%
Jewelry, silverware, and plated ware	-1.1%	no data	0.7%	-0.2%
Toys and sporting goods	-2.0%	-0.6%	1.6%	-0.2%
Manufactured products, nec	1.8%	2.1%	1.4%	2.1%
Meat products	0.9%	1.1%	1.4%	1.0%
Dairy products	0.3%	0.6%	1.0%	0.5%
Preserved fruits and vegetables	0.3%	0.7%	1.0%	0.6%
Grain mill products and fats and oils	0.7%	1.4%	0.8%	1.3%
Bakery products	0.2%	0.4%	0.8%	0.3%
Sugar and confectionery products	-0.2%	0.3%	0.6%	0.2%
Beverages	0.5%	0.6%	0.9%	0.6%
Miscellaneous food and kindred products	0.3%	0.7%	0.9%	0.6%
Tobacco products	0.4%	1.1%	0.8%	1.0%



Commodity	O-D Pairs Within Study Area	Outbound from Study Area	Inbound to Study Area	Through
Weaving, finishing, yarn, and thread mills	0.3%	0.8%	0.6%	0.7%
Knitting mills	-2.5%	no data	0.9%	-0.3%
Carpets and rugs	1.8%	2.1%	1.4%	2.0%
Miscellaneous textile goods	1.1%	2.0%	1.2%	1.8%
Apparel	-3.2%	-1.5%	0.7%	-1.5%
Miscellaneous fabricated textile products	1.0%	1.3%	1.6%	1.3%
Pulp, paper, and paperboard mills	1.4%	1.8%	1.3%	1.7%
Paperboard containers and boxes	1.9%	2.1%	0.6%	2.1%
Converted paper products except containers	1.1%	1.5%	0.1%	1.5%
Newspapers	0.5%	0.6%	-0.8%	0.5%
Periodicals	1.2%	1.6%	0.1%	1.3%
Books	1.3%	1.8%	1.1%	1.5%
Miscellaneous publishing	1.9%	2.0%	0.4%	2.0%
Commercial printing and business forms	1.5%	1.6%	-0.1%	1.6%
Greeting cards	1.1%	1.6%	0.9%	1.5%
Blankbooks and bookbinding	0.3%	0.0%	0.0%	0.6%
Industrial chemicals	1.0%	2.0%	0.9%	1.8%
Plastics materials and synthetics	2.4%	2.9%	1.7%	2.7%
Drugs	1.1%	1.6%	0.8%	1.9%
Soap, cleaners, and toilet goods	0.2%	1.6%	0.2%	1.3%
Paints and allied products	1.2%	1.7%	1.1%	1.5%
Agricultural chemicals	1.5%	2.1%	2.5%	1.9%
Miscellaneous chemical products	2.1%	2.7%	1.7%	2.5%
Petroleum refining	0.6%	1.1%	0.9%	0.9%
Miscellaneous petroleum and coal products	1.1%	1.3%	0.4%	1.2%
Tires and inner tubes	0.0%	1.1%	1.0%	1.5%
Rubber products and plastic hose and footwear	2.1%	2.9%	1.6%	2.8%
Miscellaneous plastics products, nec	2.9%	3.0%	1.5%	3.0%
Footwear, except rubber and plastic	-100.0%	no data	0.7%	-0.4%
Luggage, handbags, and leather products, nec	-3.7%	no data	1.1%	-3.6%
Metal mining	3.2%	2.7%	no data	3.0%
Coal mining	1.1%	no data	1.3%	1.5%
Crude petroleum, natural gas and gas liquids	-0.1%	0.0%	1.1%	1.2%
Oil and gas field services	0.8%	0.0%	0.2%	0.8%
Non-metallic minerals, except fuels	1.1%	1.5%	1.1%	1.4%



Commodity	O-D Pairs Within Study Area	Outbound from Study Area	Inbound to Study Area	Through
Construction	0.7%	0.8%	no data	0.7%
Railroad transportation	1.8%	2.2%	1.4%	2.0%
Trucking and warehousing	2.5%	2.8%	2.0%	2.7%
Wholesale trade	2.6%	2.8%	1.3%	2.8%
Agricultural services	1.4%	1.4%	0.4%	1.4%
Forestry, fishing, hunting, & trapping	-0.6%	no data	0.7%	0.3%
MEDIAN ANNUAL GROWTH RATES	1.3%	2.0%	1.2%	1.8%

Conclusions

The demand for freight movement within the study area is governed by the underlying economic structure of the study area – number of employees, types and locations of industries, overall population, etc. – and its relationship to the economy as a whole. Conversely, the ability to develop and support freight-generating industries within the study is dependent on the ability of the freight transportation system to support them. To understand this dynamic as fully as possible, we need to look at the region’s underlying economic structure, the region’s commodity flow patterns, and the region’s transportation system performance in combination.

Key trends and issues can be summarized as follows:

- The study area is home to a population of 1,449,603 (year 2000). Between 1990 and 2000, population grew at 1.2% annually; this rate is forecast to slow to 0.4% annually between 1998 and 2025.
- Per capita income in the study area lags behind the state of Georgia and the nation as a whole. Although per capita income actually grew slightly faster than the U.S. average between 1990 and 1998, it is forecast to grow at the national rate between 1998 and 2025 – so that this existing disparity in study area per capita income is forecast to continue.
- The 1998 unemployment rate in the study area counties is 6.18% -- more than 1.5 percentage points higher than the national average and nearly 2.0 percentage points higher than the state of Georgia. Unemployment rates are lowest in the Savannah, Macon and Columbus areas.
- The study area employment in 1998 was 783,364. During the period 1990 to 1998, employment grew at 2.0% annually, which is slightly faster than the national average; however, this rate is forecast to drop to 0.3% annually between 1998 and 2025, which is less



than the national average. This underscores the need for positive actions – including transportation and communication investments – to encourage job retention and job growth.

- In 1998, over 65% of study area employment was in service industries, government and retail trade. Among industries with a high demand for freight movement, manufacturing represented 13.2%, construction 5.2%, transportation 3.9%, wholesale trade 3.1%, farming 2.2%, agricultural/forestry/fishing 1.3%, and mining just 0.3%. Among the various classes of manufacturing, the highest employment was in food, textiles, paper, lumber and transportation equipment.
- The 2025 economy will continue to be anchored by services, government and retail trade, but there will continue to be a diverse range of freight-generating industries as well. The overall forecast is for a modest increase of 69,100 jobs in the study area (an increase of 8.8% overall). Gains are forecast primarily in the service industries and in government. A number of freight-dependent industries are expected to grow as well, including agricultural/forest/fisheries services and construction. However, most freight-dependent industries are actually forecast to lose employment. The loss is forecast to be greatest in non-durable manufacturing, farm employment, wholesale trade, and mining. Within the durable and non-durable manufacturing sectors, the forecast suggests that food, transportation equipment, lumber, paper and textiles will continue to lead in terms of job creation. But overall manufacturing employment in the study area is forecast to decline by 10,355 jobs (a 10.0% loss) between 1998 and 2025. The most significant declines are forecast for apparel (loss of 3,895 jobs), textiles (loss of 3,312 jobs), electrical equipment (loss of 1,820 jobs), tobacco (loss of 1,699 jobs) and paper (loss of 1,212 jobs).
- The output data points to more growth than the employment data would suggest. Total growth in output – measured in constant 1992 dollars – increases by 1.6% annually between 1998 and 2025, compared with an increase of only 0.3% in employment. The higher output reflects increasing productivity per employee. Certain industries in apparent decline based on the employment data – particularly durable manufacturing, non-durable manufacturing and wholesale trade – will actually increase their output substantially over the next 25 years. The overall message is that the corridor’s diversified manufacturing sectors, despite undergoing significant shifts in workforce structure, will for the most part continue to increase their output; and these industries will actually increase their need for, and dependence on, transportation and communications infrastructure within the study area.
- The study area is characterized by a larger-than-average share of slower-growing industries – particularly government, non-durable manufacturing, durable manufacturing, farming and mining. Despite this, the study area managed to create a higher than expected share of jobs within these industries between 1990 and 1998, which is attributable to local competitive advantages in terms of labor, land and transportation and other business costs, and other factors. The challenge is to expand on these advantages to optimize growth through the 1998-2025 period.



- The movement of specific commodity types into, out of, within and through the study area will grow in response to economic pressures. The median growth rates for all commodity types range from 1.2% to 2.0% annually. This is faster than employment growth, and consistent with rates for output growth. These factors can be directly applied to the year 1998 commodity flow data to develop a year 2025 forecast.

The economic data presented in this section has a critical relationship with freight movement data in the HPC 6 and US 280 corridors. We know that the region's economic structure and transportation system have, in combination, produced a certain set of commodity flows (in terms of specific commodity types and origin-destination patterns). If we understand that economic structure and how it affects specific commodity types, then we can apply future economic forecasts to generate estimates of future commodity flows over the transportation network. We are then in a position to test alternative improvements in the transportation network – to remedy forecasted deficiencies, or to create economic advantages for certain types of commodity movements to be encouraged as a matter of policy. The economic data presented in this section will ultimately serve as a baseline for an economic impact model to quantify the benefits associated with potential improvements to the HPC 6 and US 280 corridors.



5 Identification and Interviews of Major Users

Background and Purpose

This portion of the High Priority Corridor Six Report presents the methodology and findings of Subtask 1.2: Identification of the Major Users of the Corridor. In this study, we define “major users” as those industries that use the freight transportation system in the 45-county study area, including shippers, receivers, and carriers. This first section defines the purpose of identifying the major Corridor users. Subsequent sections outline the methodology used and the findings of the analysis.

This study identifies major users in order to answer a range of questions about the region’s transportation infrastructure. The primary questions driving this inquiry are:

- What are the issues, regarding infrastructure and regulation, affecting the movement of goods in the study area?
- What are the specific needs of those industries involved in the movement of commodities? and
- What are the recommendations of those industries with respect to the Corridor?

In order to answer these questions, the study team gathered data on potential users of the Corridor and selected a sample of these users to interview. The purpose of gathering this information is to:

- Map and identify the location of users of the Corridor’s transportation infrastructure to understand the spatial distribution of certain types of industries; and
- Compile a geographically representative list of shippers, receivers, and carriers for targeted interviews to answer the questions posed above.

The purpose of interviews with shippers/receivers and carriers is to fully understand freight operations in the study area and to guide the team in identifying the daily problems encountered by users of the Corridor. Those problems include poor roads, critical intersections, and impediments to access to the Corridor.

The following section presents the methodology used to collect major user data used for mapping and business identification and the rationale for selecting specific businesses for interviews.

Overview of the Approach / Methodology

Identification of Shippers and Carriers

In order to identify the potential users of the Corridor and generate a list of potential interviewees, the study team utilized five primary sources for business names and industry information. This section explains how each data source was used in the selection of major users and explains the methodology of the interview process. Sources used to identify major users are:

- Info USA (American Business Information [ABI]);



- Transearch commodity flow data (described in detail in Section __ [the commodity flow section]);
- Transportation Technical Services (TTS) Shipper, Carrier, and Private Fleet Directories;
- Georgia Department of Labor’s Area Labor Profiles; and
- Georgia DOT’s Chatham County Intermodal Freight Study.

Info USA. The primary source for business names and information for this study is the Info USA data. With nearly 12 million businesses in their database, Info USA is one of the most comprehensive sets of current business data available. The criteria for selecting specific businesses within the 45-county study area are based on past freight commodity flow studies by Cambridge Systematics, Inc., and are meant to capture the businesses from Info USA that represented the top shipping, receiving, and carrying industries in the Corridor. Specifically, using either major industry group classifications, or specific Standard Industrial Classification (SIC) codes to reflect commodity flows, we selected all businesses in the Corridor meeting the following criteria:

Major Industry Groups	
Industry	Employees
Mining	≥ 10 employees
Manufacturing	≥ 20 employees
Wholesale Distribution	≥ 10 employees

Standard Industrial Classification (SIC)		
Industry	SIC	Employees
Fishing	08	≥ 10 employees
Forestry	09	≥ 10 employees
Livestock	02	≥ 10 employees
Crops	01	≥ 10 employees
Various Transportation	42	Any Size
USPS	43	Any Size
Air Carrier	45.13	Any Size
Freight	47.31	Any Size
Packing and Crating	47.83	Any Size

Using the preceding set of criteria, Info USA generated a database of nearly 3,000 business names within the 45-county study area. Thus, our selection includes industries that typically send, receive, or carry large quantities of commodities. Businesses selected are typically related to manufacturing, transportation, and warehousing activities in the Corridor. With this set of nearly 3,000 businesses, the study team identified and mapped the location of each major user in



the Corridor. The findings section presents maps and narrative related to the identification of these major users.

From this large list, the study team also identified a targeted set of businesses as potential survey participants. The following paragraphs outline the process of selecting businesses for interviews.

Shipper and Carrier Interviews

To filter the large Info USA list into a reasonable number of potential survey participants, the study team used the other four data sources listed above: Transearch commodity flow data; Transportation Technical Services (TTS) Shipper, Carrier, and Private Fleet Directories; Georgia Department of Labor's Area Labor Profiles; and GDOT's Chatham County Intermodal Freight Study. The following paragraphs explain how each of these data sets were used to further refine the interview list and then outline other considerations in the interview selection methodology.

Transearch commodity flow data

The Transearch commodity flow data, compiled by Reebie Associates, was the first filter used to determine potential interviewees. Transearch commodity flow data (described in Section 6) was used to ensure that industries representing a significant freight movement on a county-by-county basis were represented.

Transportation Technical Services (TTS) Shipper, Carrier, and Private Fleet Directories TTS directories provided additional names of motor carriers, shippers, and private fleets located within the study area not already identified by Info USA. Study team members searched each of the three TTS directories (The Directory of Shippers, The Private Fleet Directory, and National Motor Carrier Directory) for each county in the study area to identify major users listed in Info USA.

Georgia Department of Labor's Area Labor Profiles

The study team also relied on lists of top employers by county from the Georgia Department of Labor's Area Labor Profiles to identify large businesses from each county not otherwise appearing in the Info USA data.

GDOT's Chatham County Intermodal Freight Study

Additional information on shippers and receivers in the Savannah area was obtained from this study.

Other Considerations for Interviews

To obtain even geographic representation across the study area, the team included a minimum of two firms in each county. The remaining interviews were comprised of firms located in the larger, more populated areas within the corridor (i.e., Savannah, Columbus, and Macon).

Motor carriers were chosen to give broad geographic coverage of the area. An attempt was made to ensure representation by both local and national firms providing both local and national service, by both truckload and less-than-load carriers, by both line-haul and local service providers. The team included specialty carriers of haulers of lumber, kaolin (and kaolin industry-related commodities), liquid bulk, frozen and refrigerated foods, and general



commodities including “big box” retail, textile, steel, paint, furniture, and a wide variety of other goods.

The process resulted in slightly more than 250 candidates, providing relatively even coverage in terms of the study area geography and industrial makeup. The shippers/receivers represented a significantly larger number than the motor carriers and were divided into two groups (Phase One and Phase Two). The Phase One group included two firms from each county as an initial sample. The Phase Two shippers/receivers represented a fallback group for substitution in cases where interviews were not available from Phase One shippers/receivers.

In order to prescreen area industries, a letter created by Georgia DOT specifying details of the study was generated and mailed to the 250 shippers/receivers and motor carriers. Tables 5-1, 5-2, and 5-3 show the list of letter recipients. Next, the team contacted the Phase One shippers to verify receipt of the letter, confirm that they were significant users of the corridor, obtain consent to an interview (in person or via telephone), and identify an appropriate contact to interview.



**Table 5-1
Phase One Shippers/Receivers Interview List**

Company	City	County
Brown and Williamson Tobacco Co. - Traffic Department	Macon	Bibb
YKK USA, Inc.	Macon	Bibb
Lithonia Lighting Company	Cochran	Bleckley
Sanders Logging Company	Cochran	Bleckley
Connections	Pembroke	Bryan
Hobart Corp.	Richmond Hill	Bryan
Anvil International	Statesboro	Bulloch
Briggs and Stratton	Statesboro	Bulloch
Wal-Mart Distribution Center	Statesboro	Bulloch
Hendrix Farm	Metter	Candler
Wallace Computer Svc.	Metter	Candler
Gulfstream Aerospace Corp.	Port Wentworth	Chatham
Savannah Sugar Refinery	Port Wentworth	Chatham
Intermet Machining	Fort Benning	Chattahoochee
Dickey's Peach Farm Office	Musella	Crawford
LA T Sportswear	Roberta	Crawford
Homestead Homes	Cordele	Crisp
International Paper Company	Cordele	Crisp
Gilman Paper Company	Eastman	Dodge
Reynolds Metals Company	Eastman	Dodge
Georgia Pacific Corp.	Vienna	Dooly
Tyson Foods	Vienna	Dooly
International Paper Company	Meldrim	Effingham
Fort James Corp.	Rincon	Effingham
Adrian Homes	Adrian	Emanuel
Crider's Poultry Inc.	Stillmore	Emanuel
Claxton Poultry Farms	Claxton	Evans
Newmark International Inc.	Claxton	Evans
Georgia Pacific Corp.	Brunswick	Glynn
Rich-Sea Pak Corp.	Brunswick	Glynn
Cagle's Inc.	Pine Mountain	Harris
Foster Lumber Company	Shiloh	Harris
Frito-Lay Company	Kathleen	Houston
Northrop Grumman	Perry	Houston
Apparelcraft Inc.	Wrightsville	Johnson
Crowntex Inc.	Wrightsville	Johnson
Mohawk Industries	Dublin	Laurens
Victor-Forstmann and Company	Dublin	Laurens
Oak Hill Farm Dairy	Leesburg	Lee
Southwestern Machine and Tool	Leesburg	Lee
Gift Wrap Company	Midway	Liberty
Interstate Paper Corporation	Riceboro	Liberty
GHM Rock and Sand Co. Inc.	Ludowici	Long
Smiley Enterprises Inc.	Ludowici	Long



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Agri-Link Foods	Montezuma	Macon
Weyerhaeuser Company	Oglethorpe	Macon
Baby's Dream Furniture Inc.	Buena Vista	Marion
Tyson Foods Inc.	Buena Vista	Marion



**Table 5-1
Phase One Shippers/Receivers Interview List (continued)**

Company	City	County
Smith and Son's Seafood	Darien	McIntosh
Sea Garden Seafoods Inc.	Meridian	McIntosh
Bestline Sash and Door	Ailey	Montgomery
Cedar Crossing Manufacturing	Uvalda	Montgomery
Pratt and Whitney	Columbus	Muscogee
Swift Denim Group	Columbus	Muscogee
Pyrotechnic Specialties	Byron	Peach
Blue Bird Body Company	Fort Valley	Peach
Central Georgia Co-Op	Hawkinsville	Pulaski
Pillowtex	Hawkinsville	Pulaski
Cooper Lighting	Ellaville	Schley
King's Custom Builders	Ellaville	Schley
B&S Wood Svc.	Lumpkin	Stewart
Flex-Tec Inc.	Omaha	Stewart
Cooper Lighting	Americus	Sumter
Textron Automotive Co.	Americus	Sumter
Martin Marietta Aggregates	Junction City	Talbot
Pro-Tech Fire Protection Inc.	Talbotton	Talbot
Claxton Poultry Farms	Glennville	Tattnall
Ithaca Industries	Glennville	Tattnall
Butler Sand Company	Butler	Taylor
M F & H Textiles Inc.	Butler	Taylor
Amercord Inc.	Lumber City	Telfair
Frigidaire Home Products	McRae	Telfair
Dawson Manufacturing Company	Dawson	Terrell
Tyson Foods Inc.	Dawson	Terrell
Georgia HI-TECH Fabricators, Inc.	Vidalia	Toombs
Vidalia Onion Factory	Vidalia	Toombs
GFF Inc.	Soperton	Treutlen
Piggly Wiggly	Soperton	Treutlen
Dry Branch Kaolin	Dry Branch	Twiggs
Quad Graphics Inc.	The Rock	Upton
Thomaston Mills Inc.	Thomaston	Upton
Earth Products - Webster Co. Facility	Peachtree City	Webster
Prestec Inc.	Preston	Webster
Tolleson Lumber Company	Preston	Webster
Merritt Pecan Company	Weston	Webster
McPherson Manufacturing Company	Alamo	Wheeler
Gilder Timber Inc.	Glenwood	Wheeler
Quality Pallets	Pitts	Wilcox
Ithaca Industries Inc.	Rochelle	Wilcox
Englehard Corp.	Gordon	Wilkinson



Central Georgia Corridor Study – Phase I Report

Sheperd Brothers Timber Co.	Irwinton	Wilkinson
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**Table 5-2
Phase Two Shippers/Receivers Interview List**

Company	City	County
Armstrong World Industries Inc.	Macon	Bibb
Boeing Aerospace	Macon	Bibb
Cagle's Inc.	Macon	Bibb
Cherokee Brick & Tile Co.	Macon	Bibb
Keebler Co.	Macon	Bibb
Lucas Aerospace	Macon	Bibb
Paragon Trade Brands	Macon	Bibb
Riverwood International	Macon	Bibb
Jac-Arts Inc.	Cochran	Bleckley
Sommers Co.	Richmond Hill	Bryan
William Sheppard Lumber Company	Brooklet	Bulloch
Nash Finch Co.	Statesboro	Bulloch
Risher Rosemount Petroleum	Statesboro	Bulloch
Smith-Healy Farms Inc.	Statesboro	Bulloch
Supply Sales Co.	Statesboro	Bulloch
Metter Manufacturing Co.	Metter	Candler
Pepsi-Cola Co.	Metter	Candler
Pineland Telephone Co-Op Inc.	Metter	Candler
Stone Savannah River	Port Wentworth	Chatham
Colonial Oil Group Inc.	Savannah	Chatham
Great Dane Trailers Inc.	Savannah	Chatham
International Paper Co.	Savannah	Chatham
Kemira Pigments Inc.	Savannah	Chatham
Pitney Bowes	Savannah	Chatham
Union Camp	Savannah	Chatham
American Service Contractors		Chattahoochee
Cordev Inc.		Chattahoochee
Cusseta Laundry Inc.		Chattahoochee
Atlanta Sand & Supply Co.	Roberta	Crawford
Drexel Chemical Co.	Cordele	Crisp
Marvair Co.	Cordele	Crisp
Pace America of Georgia Inc.	Eastman	Dodge
Standard Candy Co.	Eastman	Dodge
Neff Sportswear	Unadilla	Dooly
Mid GA Processing Co.	Vienna	Dooly
Sun Manufacturing	Vienna	Dooly
Doncasters	Rincon	Effingham
Ithaca Industries Inc.	Swainsboro	Emanuel
Keller Ladders Inc.	Swainsboro	Emanuel
Royonier International	Swainsboro	Emanuel
Georgia Pacific Corp.	Hagan	Evans
Milliken and Company	Pine Mountain	Harris



Anchor Glass Container Corp.	Warner Robins	Houston
Electro-Mech Scoreboard Co.	Wrightsville	Johnson
Unique Finishing	Wrightsville	Johnson
Rockwell Automation	Dublin	Laurens
Southeast Paper Mfg. Co.	Dublin	Laurens
Gilman Building Products	Dudley	Laurens

**Table 5-2
Phase Two Shippers/Receivers Interview List (continued)**

Company	City	County
Rentz Cabinet Co.	Rentz	Laurens
Albany Elevator Svc.	Leesburg	Lee
Oak Hill Farm Office	Leesburg	Lee
Chemtall Inc.	Riceboro	Liberty
Advanced Drainage Systems Inc.	Montezuma	Macon
Agri-Link Foods	Montezuma	Macon
Southern Wood Suppliers Inc.	Oglethorpe	Macon
Oakcrest Lumber Inc.	Buena Vista	Marion
Brewton-Parker College	Mt. Vernon	Montgomery
Morris Farms	Uvalda	Montgomery
Peace Distributor	Uvalda	Montgomery
Beaulieu America Columbus Div.	Columbus	Muscogee
Bill Heard Cadillac Chevrolet	Columbus	Muscogee
Cosmyl Inc.	Columbus	Muscogee
Dolly Madison	Columbus	Muscogee
Fieldcrest Cannon	Columbus	Muscogee
GNB Technologies	Columbus	Muscogee
Keebler-Sunshine	Columbus	Muscogee
Polychrome Corp.	Columbus	Muscogee
Vulcan Materials Co.	Fortson	Muscogee
Lane Packing Co.	Fort Valley	Peach
Southern Orchard Supply Inc.	Fort Valley	Peach
Hollingsworth & Vose Co.	Hawkinsville	Pulaski
Strange Farms	Ellaville	Schley
TCI Inc.	Ellaville	Schley
Redman Homes Inc.	Richland	Stewart
Tog Shop	Americus	Sumter
Plains Products Inc.	Plains	Sumter
Unimin Corp.	Junction City	Talbot
Duramatic Products Co.	Glennville	Tattnall
Mascot Pecan Co.	Glennville	Tattnall
Watson Brothers Trucking	Butler	Taylor
Taylor Orchards	Reynolds	Taylor
Lumber City Egg Marketers	Lumber City	Telfair



Malcolm Powell Logging Company	Lumber City	Telfair
Southland Housing System	McRae	Telfair
Wilkins Industries Inc.	McRae	Telfair
Cinderella Foods	Dawson	Terrell
Robin Builders Inc.	Lyons	Toombs
Truax Veneer Co.	Lyons	Toombs
Vidalia Onion Farms and Sales	Lyons	Toombs
Runners Diversified Inc.	Vidalia	Toombs
Stanley Farms	Vidalia	Toombs
Tumi Luggage Inc.	Vidalia	Toombs
Ailey Mfg. Co.		Treutlen
Imerys Pigment & Additives	Dry Branch	Twiggs
Federal Paper Board Co. Inc.	Thomaston	Upson
Keadle Lumber Enterprises Inc.	Thomaston	Upson

Table 5-2

Phase Two Shippers/Receivers Interview List (continued)

Company	City	County
Wes Tek Inc.	Thomaston	Upson
Carey Locke Logging Co.		Wheeler
Martin Resources Inc.	Rochelle	Wilcox
Wood Tech Mfg. & Supply Co.	Rochelle	Wilcox
Springhill Services Inc. Shop	McIntyre	Wilkinson



**Table 5-3
Carriers Interview List**

Company	City	County
ABF Freight System Inc.	Macon	Bibb
Consolidated Freightways	Macon	Bibb
Corporate Express Delivery Sys.	Macon	Bibb
Old Dominion Freight Line	Macon	Bibb
Ryder Integrated Logistics Inc.	Macon	Bibb
United Parcel Service	Macon	Bibb
Watkins Motor Lines	Macon	Bibb
Yellow Freight System Inc.	Macon	Bibb
Lumber Transport Inc.	Cochran	Bleckley
Bomark Transport Inc.	Garden City	Chatham
MCO Transport Inc.	Garden City	Chatham
Pier 1 Imports Warehouse	Garden City	Chatham
American Port Svc.	Port Wentworth	Chatham
Coastal Transport Co.	Port Wentworth	Chatham
McKenzie Tank Lines Inc.	Port Wentworth	Chatham
ABF Freight System Inc.	Savannah	Chatham
American Port Svc.	Savannah	Chatham
Cocke Brothers Transportation	Savannah	Chatham
Con-way Southern Express	Savannah	Chatham
East Coast Terminal	Savannah	Chatham
Old Dominion Freight Line	Savannah	Chatham
Savannah Foods	Savannah	Chatham
Southeastern Freight Lines	Savannah	Chatham
Southern Intermodal	Savannah	Chatham
Watkins Motor Lines	Savannah	Chatham
Yellow Freight System Inc.	Savannah	Chatham
Colonial Terminals Inc.	Savannah	Chatham
Claxton Cold Storage Inc.	Claxton	Evans
Condor Carriers Inc.	Perry	Houston
United Transportation	Wrightsville	Johnson
Williams Trucking Svc.	Wrightsville	Johnson
CSX Transportation	Hinesville	Liberty
A.C. White Transfer and Storage	Walthourville	Liberty
Eagle Distribution Systems	Marshallville	Macon
Burnham Service Corp.	Columbus	Muscogee
Con-way Southern Express	Columbus	Muscogee
Eastern Service Corp	Columbus	Muscogee
ESC Logistics	Columbus	Muscogee
Southeastern Freight Lines	Columbus	Muscogee
Watkins Motor Lines	Columbus	Muscogee
Yellow Freight System Inc.	Columbus	Muscogee
Con-way Southern Express	Byron	Peach
De Boer Inc.	Byron	Peach
Watson Motor Freight	Byron	Peach
Atlantic Inland Carriers	Americus	Sumter
J & M Tank Lines	Americus	Sumter
Cargo Connections	Lyons	Toombs



Old Dominion Freight Line	Vidalia	Toombs
Ben Kennedy Trucking	Preston	Webster
Springhill Services Inc. Shop	McIntyre	Wilkinson

The team also developed shipper and carrier interview guides. The guides included questions regarding general operations of the firms – including what was produced, what was moved, how much, and how frequently – to learn about the firms’ logistics operations. Then a series of questions regarding transportation in the corridor area and in Georgia were indicated. The questions were quite specific, asking the interviewees to identify poor roads, dangerous intersections, congestion, bottlenecks, and other transportation impediments. Lastly, the interviewees were solicited for their specific recommendations for improvements in the corridor area.

Shippers and receivers were interviewed on-site based on availability, with telephone interviews for those that could not be interviewed in person, by Cambridge Systematics, Inc., and Day Wilburn. Interview results are summarized below. All firm-identifying data have been stripped from the interviews to ensure confidentiality.

Summary of Key Findings

Identification of Shippers and Carriers

The team aggregated the Info USA records into several industry categories using the primary SIC code of each business record. Once aggregated by SIC, we created a cross tabulation of the data to compute the number of businesses by category for each county. Table 5-4 shows the results of that cross tabulation.

Several of the industry categories created correspond to the transportation-related industry clusters identified in the economic analysis section of the Task 1 report. This does not mean the maps show the county-by-county concentration of businesses of all the industry clusters identified; the Info USA data are limited to transportation-related industries, and the clusters are not exclusively transportation industries. For example, the business maps do not show the “federal military” cluster because that data was not available from Info USA. However, most of the clusters, including food, tobacco, and transportation equipment, are represented in the business maps.



**Table 5-4
Business Categories by County**

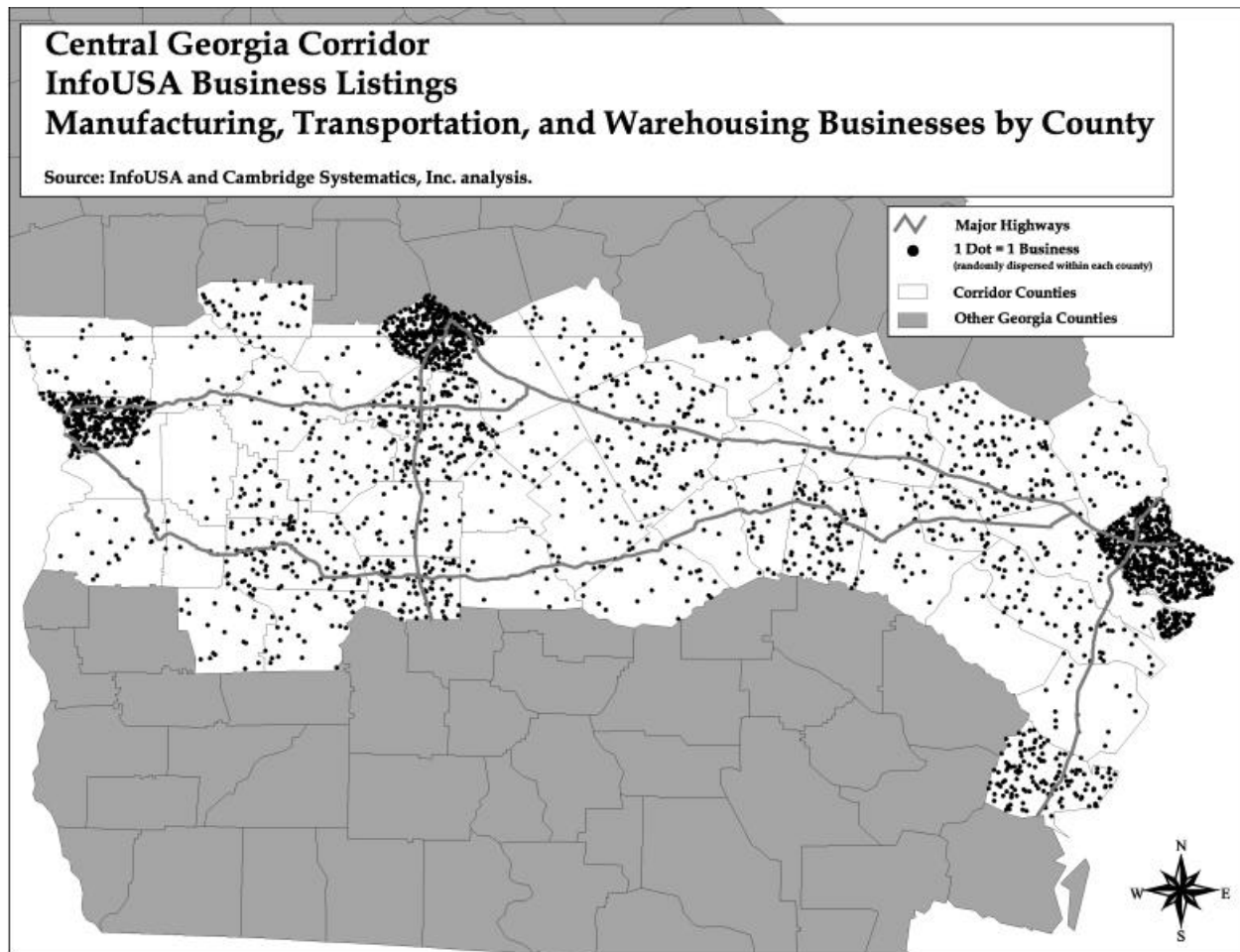
County	Ag. Food, Tobacco	Mine, Stone, Clay, Glass	Forestry, Lumber, Paper	Chem., Petro., Rubber	Textiles, Apparel	Other Manufacturing	Trans. Equip.	Trans. Carriers	Secondary Traffic	Total
Bibb	12	31	17	16	6	32	5	106	189	414
Bleckley	0	2	1	0	0	1	0	7	2	13
Bryan	1	2	1	0	0	0	0	18	8	30
Bulloch	7	6	7	2	2	10	0	38	22	94
Candler	2	1	2	0	2	1	0	2	6	16
Chatham	22	56	17	22	1	41	13	315	238	725
Chattahoochee	0	0	0	0	0	1	0	2	0	3
Crawford	0	0	0	0	1	0	0	5	2	8
Crisp	9	5	4	6	4	8	0	18	20	74
Dodge	1	2	4	0	2	2	1	12	9	33
Dooly	0	0	2	1	2	5	0	11	6	27
Effingham	1	1	5	2	0	1	0	15	2	27
Emanuel	4	1	3	0	1	14	0	14	18	55
Evans	5	1	3	1	0	5	0	9	6	30
Glynn	5	12	6	4	1	11	0	47	48	134
Harris	0	3	2	0	1	0	0	9	4	19
Houston	2	9	2	4	0	17	1	42	25	102
Johnson	1	1	1	1	4	1	0	5	2	16
Laurens	7	3	6	2	8	9	3	28	32	98
Lee	2	6	2	0	0	3	0	9	5	27
Liberty	0	4	3	6	0	2	0	31	10	56
Long	0	0	0	0	0	1	0	1	2	4
Macon	12	1	6	2	0	0	0	5	4	30

County	Ag. Food, Tobacco	Mine, Stone, Clay, Glass	Forestry, Lumber, Paper	Chem., Petro., Rubber	Textiles, Apparel	Other Manufacturing	Trans. Equip.	Trans. Carriers	Secondary Traffic	Total
Marion	1	0	1	0	0	2	0	1	0	5
McIntosh	1	0	0	0	0	0	1	9	5	16
Montgomery	4	0	0	0	2	2	0	5	7	20
Muscogee	14	35	3	7	13	30	7	85	134	328
Peach	4	1	1	4	0	3	2	14	14	43
Pulaski	3	0	1	0	1	3	0	4	3	15
Schley	1	0	5	0	0	8	0	5	2	21
Stewart	0	0	6	0	0	1	0	7	3	17
Sumter	2	3	9	4	1	12	3	23	27	84
Talbot	0	2	0	0	0	0	0	7	4	13
Tattnall	7	0	1	0	2	1	0	5	8	24
Taylor	1	2	0	0	1	0	0	13	5	22
Telfair	3	1	2	0	1	1	0	12	6	26
Terrell	2	3	0	2	3	0	0	7	4	21
Toombs	4	0	2	1	5	11	1	18	37	79
Treutlen	0	0	0	0	1	0	0	1	1	3
Twiggs	0	2	1	0	0	0	0	2	1	6
Upson	2	1	1	4	7	6	0	11	6	38
Webster	0	0	0	0	0	1	0	2	1	4
Wheeler	0	0	2	0	0	0	0	9	0	11
Wilcox	0	0	3	1	1	0	0	2	2	9
Wilkinson	0	3	3	0	0	1	0	10	8	25

Source: Info USA and Cambridge Systematics, Inc. analysis.

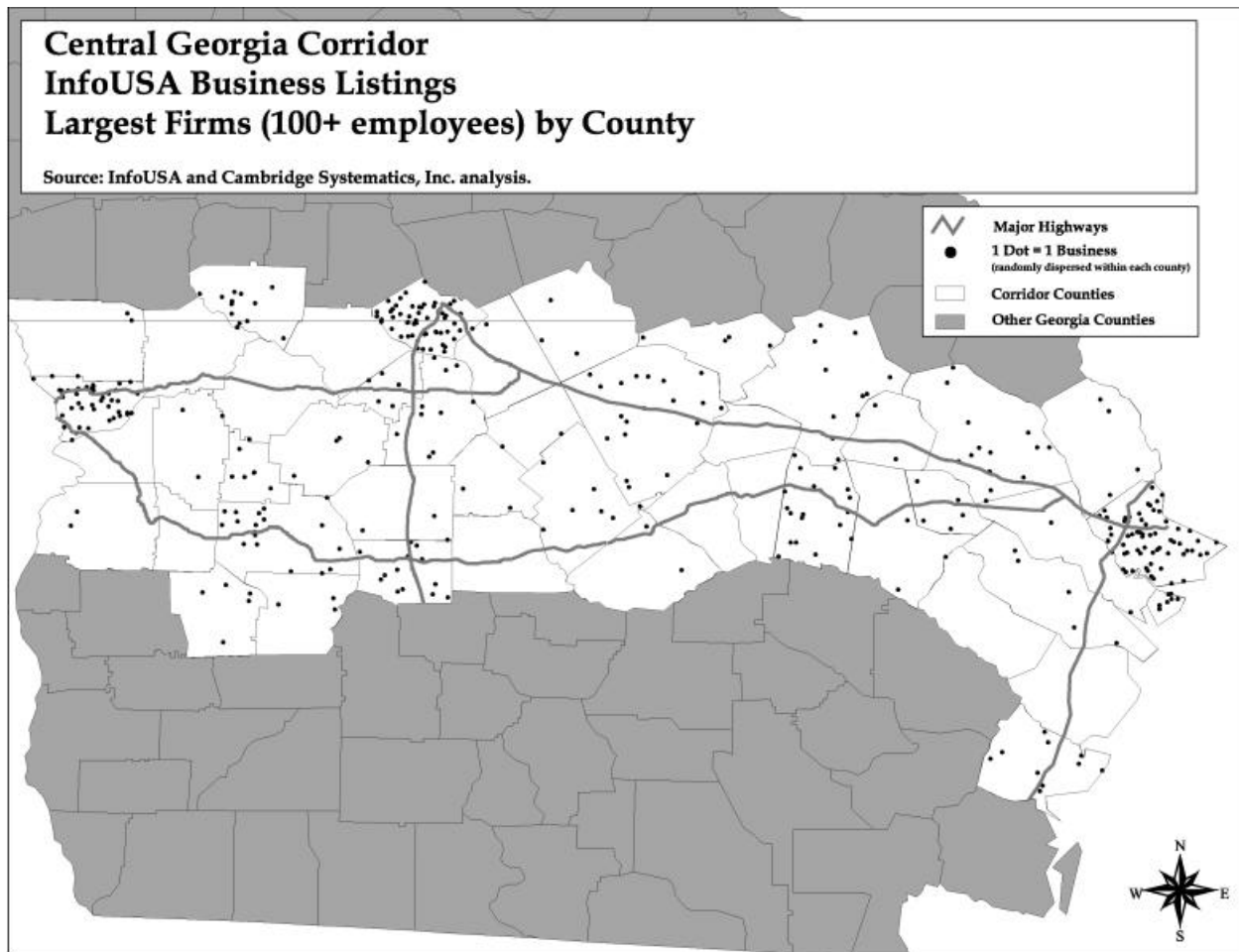
To accurately depict the relative concentrations of businesses within Corridor counties, this data was mapped using a dot density routine where each point on the map represents one business. Dot density maps are useful in communicating the density and quantity of businesses located within defined geographic areas, in this case county boundaries. One limitation of dot density mapping that should be kept in mind while looking at the maps is that, in small counties, the concentration of businesses may be exaggerated. For example, on a map showing the density of transportation carriers (trucking companies, railroads, etc.), it may seem like a smaller county has a greater density of firms when, in reality, it has approximately the same number of firms as a large county. Another point of caution is that dot density maps randomly distribute points within specified geographic areas. This means that the following maps may show clusters of points within counties. However, these points do not represent true location within counties, only relative concentration of businesses within counties. Thus, it is the number of points within each county that is important, not the specific point location within each county.

The following paragraphs describe the spatial patterns and findings of the 11 Info USA business maps and present, where relevant, additional methodological information specific to the individual maps.



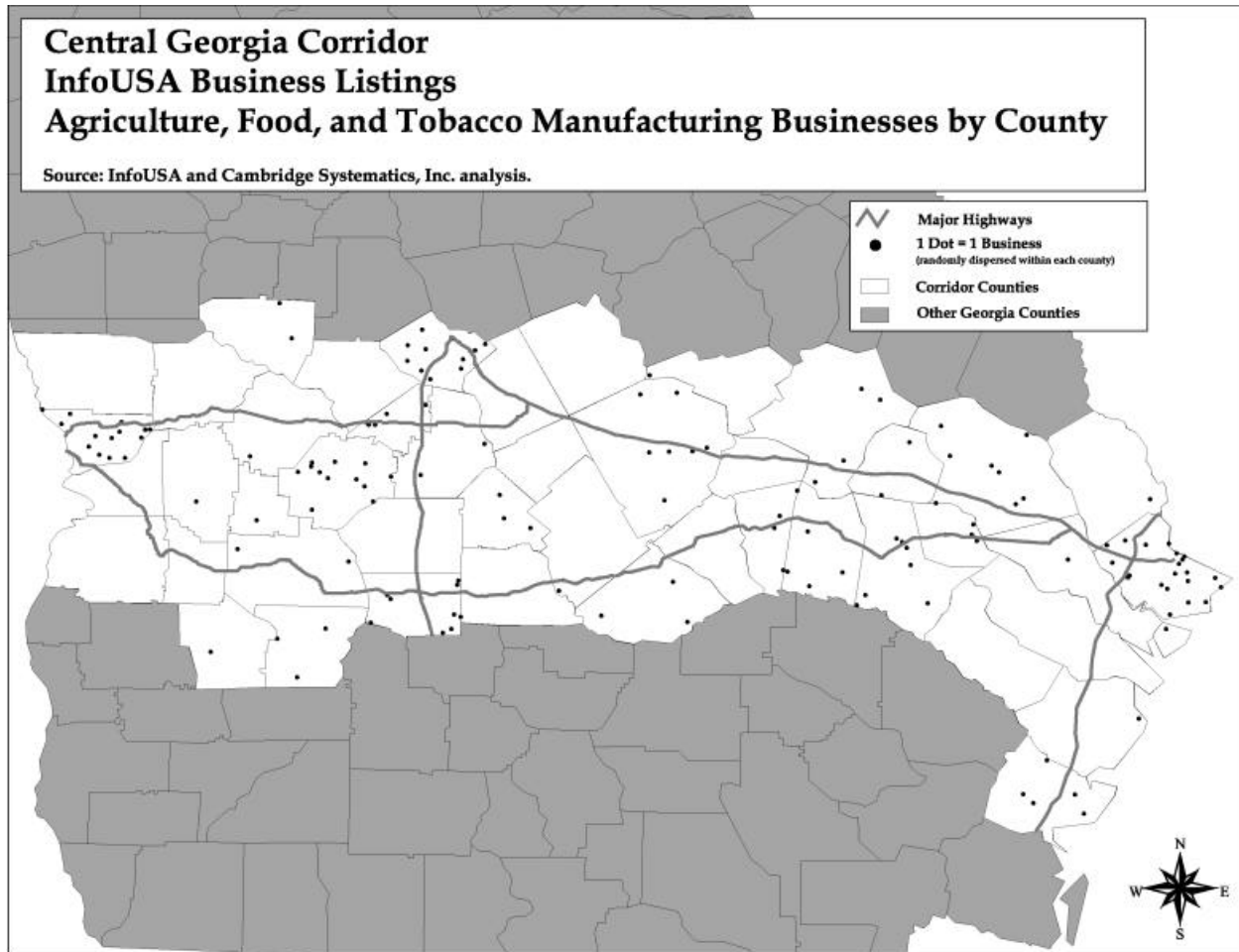
Map 1: Manufacturing, Transportation, and Warehousing Businesses by County

This map shows the relative concentration, by county, of all transportation-related business listings obtained from Info USA. As might be expected, the Corridor's three most populous counties – Muscogee (Columbus), Bibb (Macon), and Chatham (Savannah) – show the greatest concentrations of transportation-related businesses. Other notable concentrations are Glynn County (Brunswick), the Houston/Peach County area (Warner Robins, Byron, and Fort Valley), the Sumter/Crisp County area (Americus and Cordele), and Toombs County (Vidalia and Lyons). The least concentrated areas include Marion County (southeast of Columbus) and the Long/McIntosh County area between Savannah and Brunswick.



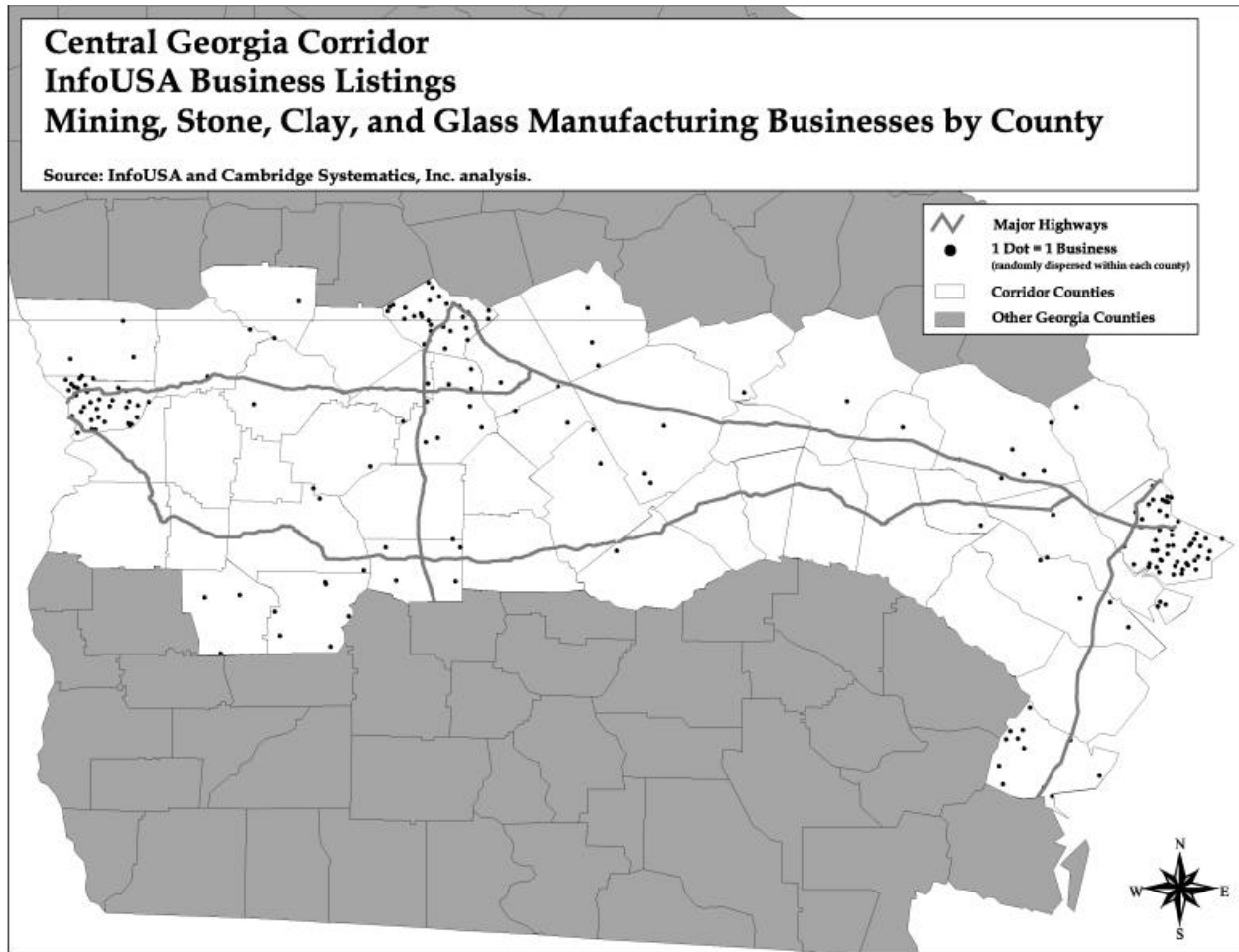
Map 2: Largest Firms (100+ employees) by County

Similar to Map 1, this map shows the distribution of all transportation-related businesses in the Corridor except that it is filtered to display only businesses with at least 100 employees. Thus, this map illustrates the spatial distribution of large firms within the corridor. According to Map 2, large firms are again located in the counties with the highest population, Chatham (70 large firms), Bibb (55), and Muscogee (42). There is a concentration of large firms in the Sumter/Crisp County area (Americus and Cordele) and also in the Toombs County (Vidalia and Lyons) area. There are fewer large businesses in the area south of Macon (Peach and Houston Counties) than in Map 1. However, there is a concentration of large firms in Upson County (Thomaston) that is not as readily apparent in Map 1. Finally, there is a general distribution of larger firms in three largest counties along I 16 (Laurens, Emanuel, and Bulloch). The U.S. 280 portion of the Corridor includes concentrations of transportation-related firms with 100 or more employees in Toombs, Evans, Sumter, and Crisp Counties.



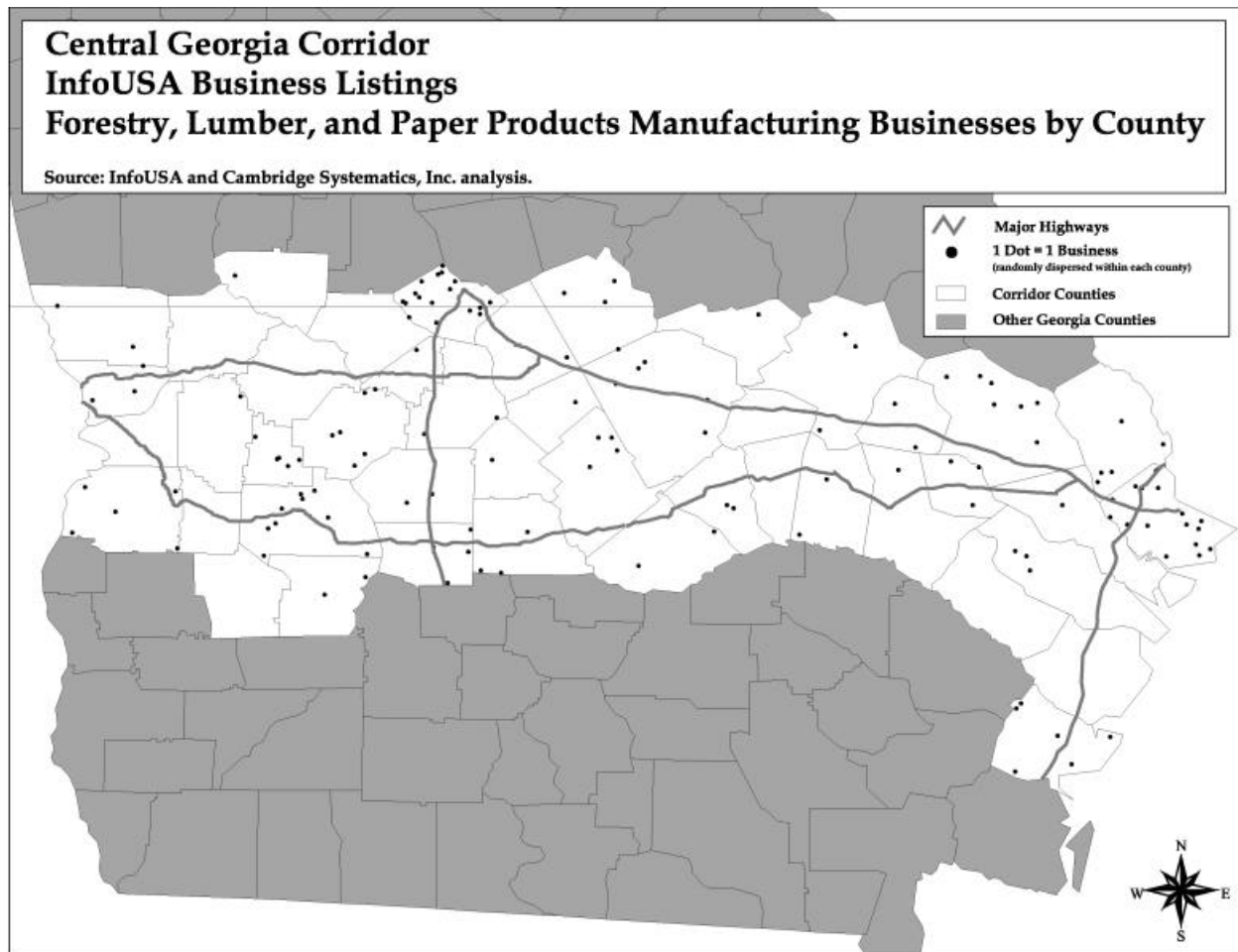
Map 3: Agriculture, Food, and Tobacco Manufacturing Businesses by County

This map shows county-by-county concentration of businesses with SIC codes for agriculture, food, and tobacco manufacturing and 10 or more employees. It includes businesses with primary SIC codes indicating agricultural production (crops and livestock); agricultural services; fishing, hunting, and trapping; food and kindred products; and tobacco products. The map shows the greatest concentration of these types of businesses in the three largest population centers, Chatham County (22 businesses), and Muscogee and Bibb Counties (12 each). Macon County (Montezuma and Oglethorpe) is a predominantly rural center for these industries, with 12 businesses. Crisp County (Cordele) also has a relatively high concentration, with nine businesses. Bulloch, Laurens, and Tattnall Counties each have seven such businesses.



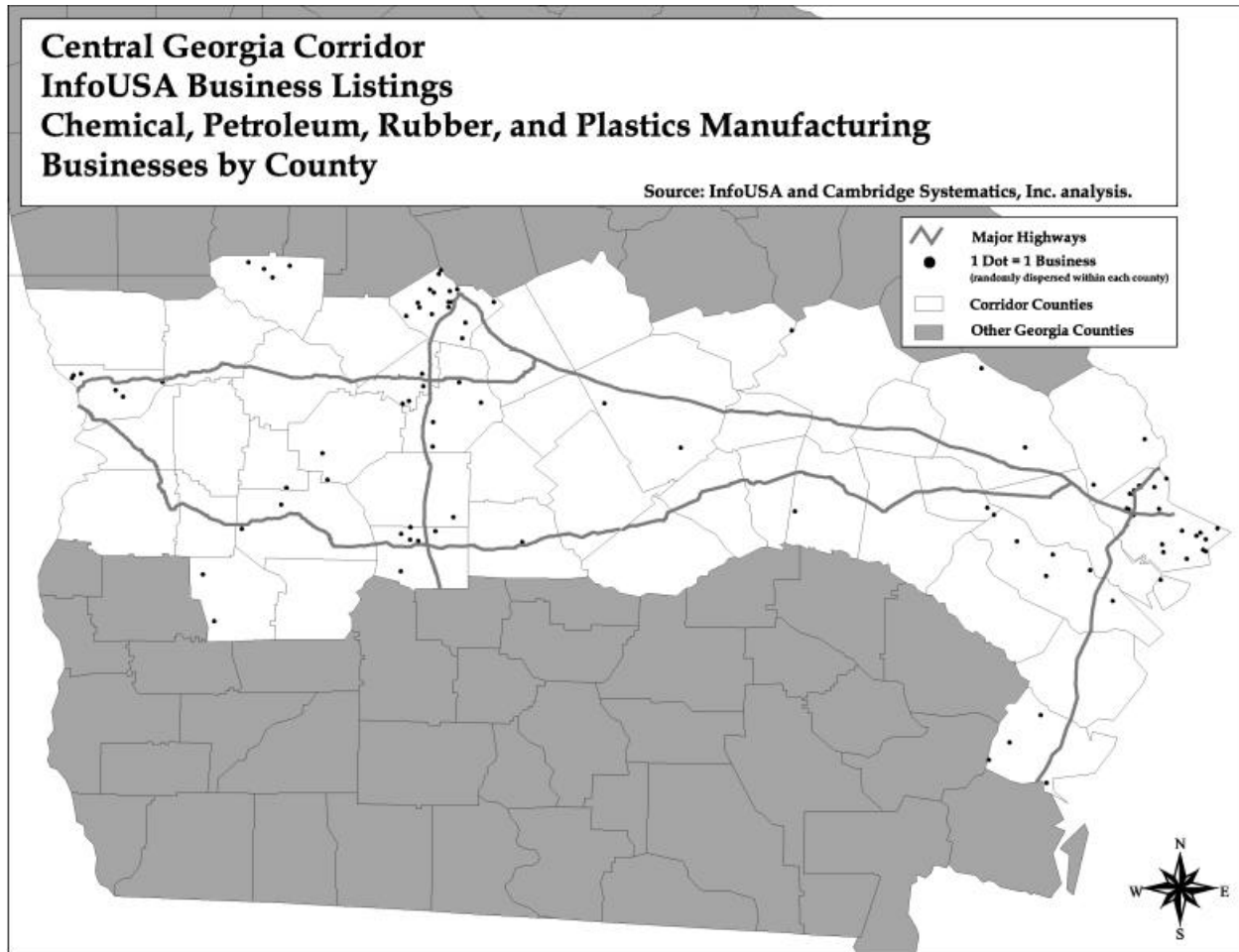
Map 4: Mining, Stone, Clay, and Glass Manufacturing Businesses by County

The businesses represented on this map have SIC codes indicating mining and handling of non-metallic minerals; manufacturing and handling of stone, clay, and glass; and construction industries. Map 4 again shows the greatest concentrations of these types of businesses in the three largest counties (Bibb [31], Chatham [56], and Muscogee [35]). Other notable concentrations are in Glynn County (Brunswick) with 12 and Houston with six businesses. Bulloch and Lee Counties each have six such businesses; Crisp has four and Liberty (south of Savannah) has four. The several of the points in Wilkinson, Twiggs, and other counties on the north side of the Corridor are kaolin clay mining/manufacturing operations.



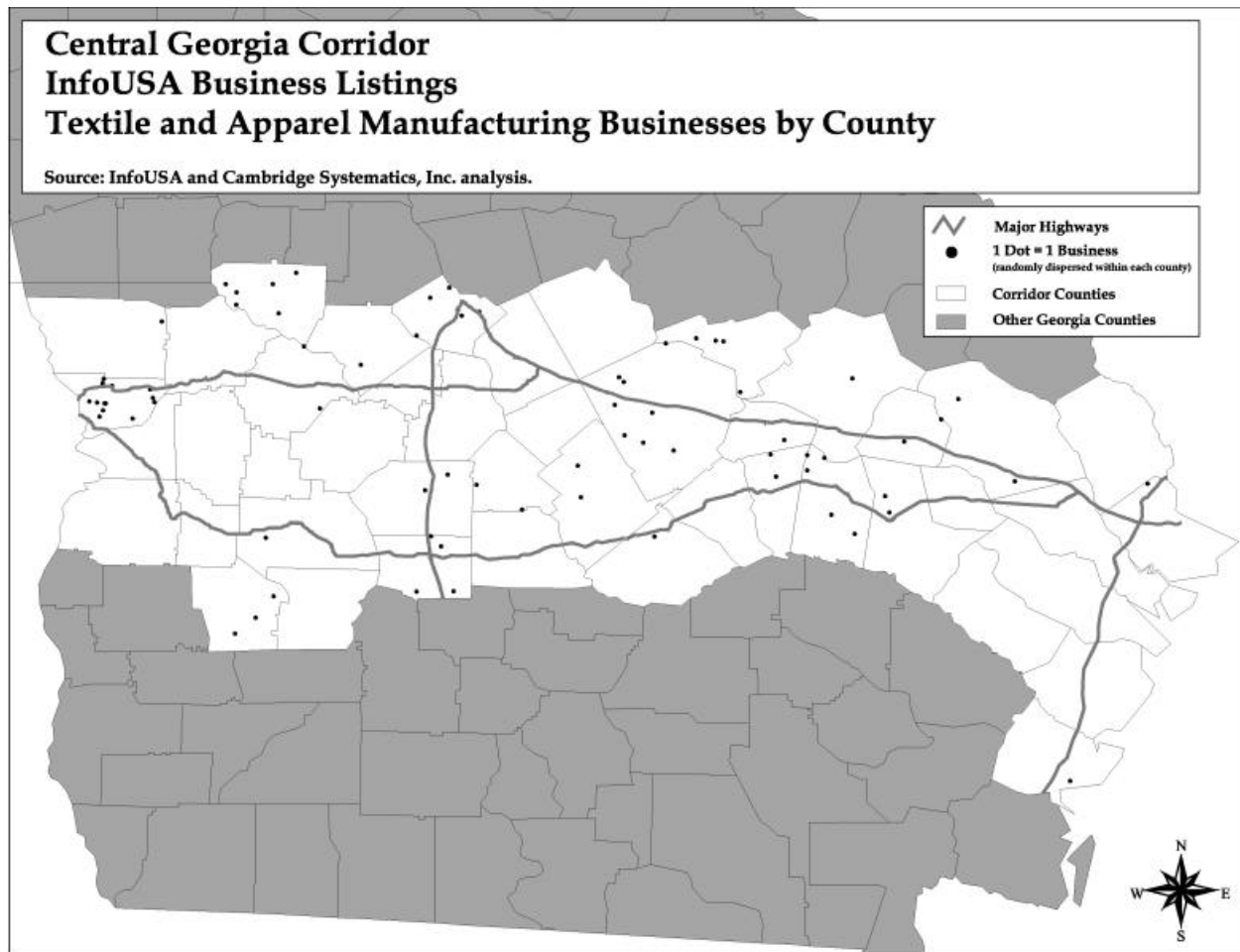
Map 5: Forestry, Lumber, and Paper Products Manufacturing Businesses by County

This map includes businesses with SIC codes indicating forestry operations; lumber and wood products manufacturing; and paper and allied products manufacturing. Unlike the previous maps, Map 5 indicates these industries are only prevalent in two of the three large population centers in the Corridor. Both Bibb and Chatham Counties have high concentrations of these businesses, with 17 each. Muscogee has only three such businesses. Other high concentrations include Sumter and Bulloch Counties, with nine and seven respectively, and a set of four counties (Glynn, Laurens, Macon, and Stewart) with six each. This is Stewart County's highest business concentration of all categories, with the exception of "transportation carriers."



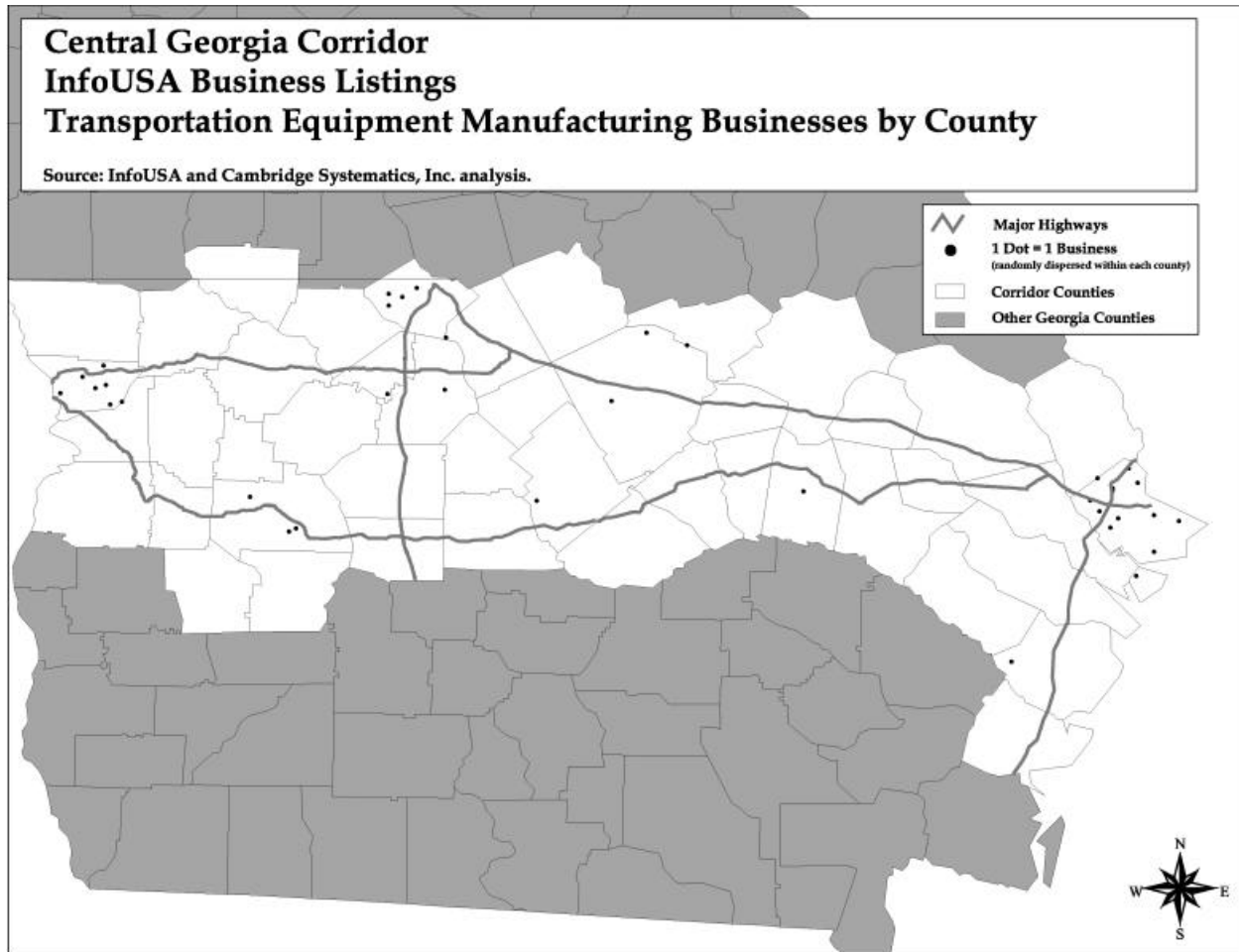
Map 6: Chemical, Petroleum, and Plastics Manufacturing Businesses by County

This map shows concentrations of businesses with SIC codes indicating manufacturing of chemical and allied products; petroleum and coal products; and rubber and miscellaneous plastics. Here, the Savannah (22 businesses) and Macon areas (16 businesses) lead the way. The Columbus area, typically comparable to the Savannah and Macon areas in other industry groups, has a lower concentration (seven businesses) of chemical and related industries. Other strong counties include Crisp (Cordele) and Liberty (south of Savannah) with six businesses each. Beyond these counties, small concentrations exist in Upson County (Thomaston), the counties south of the city of Macon (Peach and Houston) and the Brunswick area (Glynn County). Nearly 50 percent of the Corridor counties do not have such businesses.



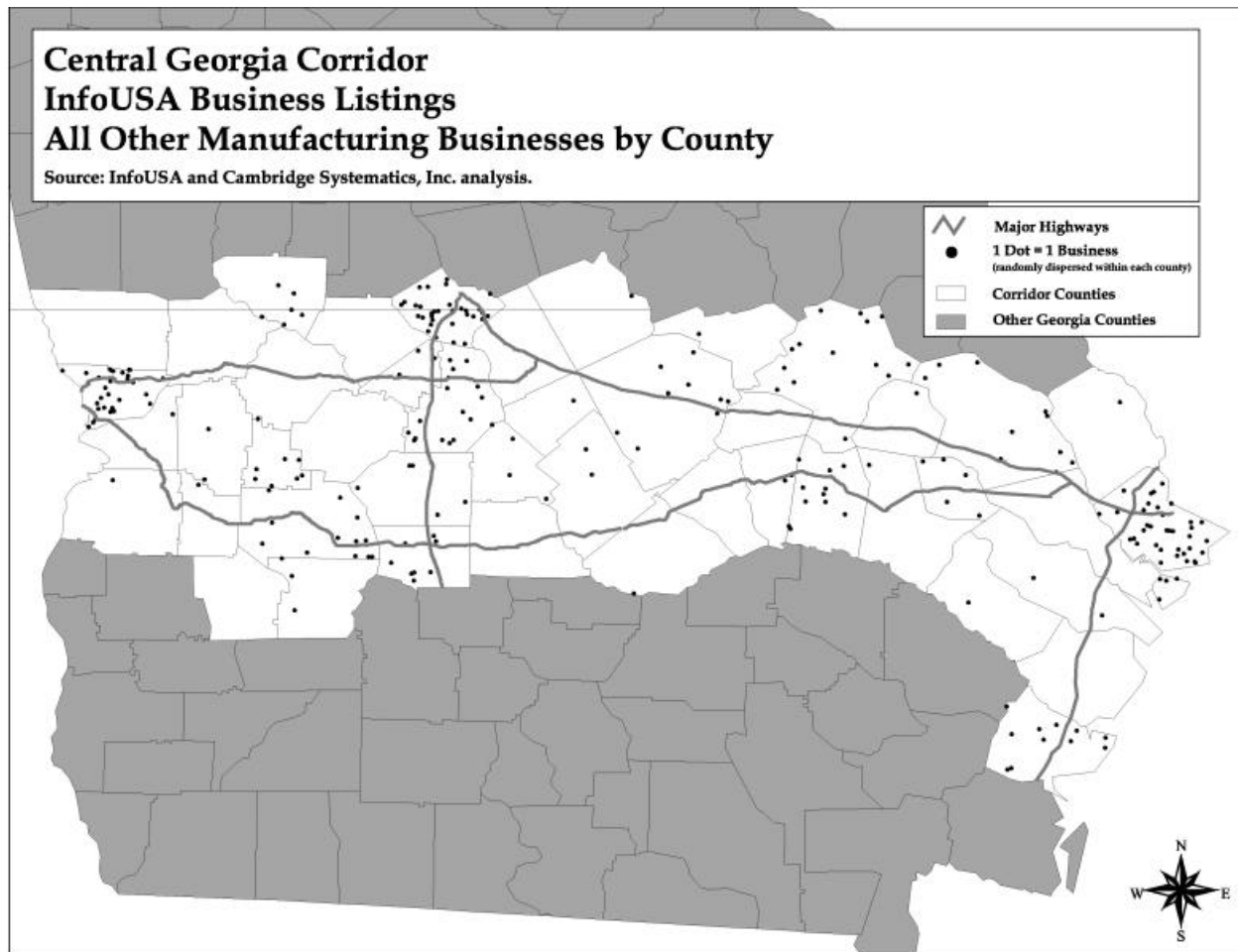
Map 7: Textile and Apparel Manufacturing Businesses by County

This map includes businesses with SIC codes indicating manufacturing of textile mill products, apparel, and other textile products. The Columbus area (Muscogee County) has the highest concentration of textile/apparel manufacturing businesses within the Corridor (13 businesses). Other concentrations include Laurens County (Dublin and vicinity) with eight businesses and Upson County (Thomaston) with seven textile/apparel manufacturing businesses. Other businesses are located in Bibb (six), Toombs (five), Crisp (four), and Johnson (four). Textile and apparel manufacturing are largely absent in the Atlantic coast counties, including Chatham (Savannah), Effingham, Glynn, Liberty, Long, and McIntosh.



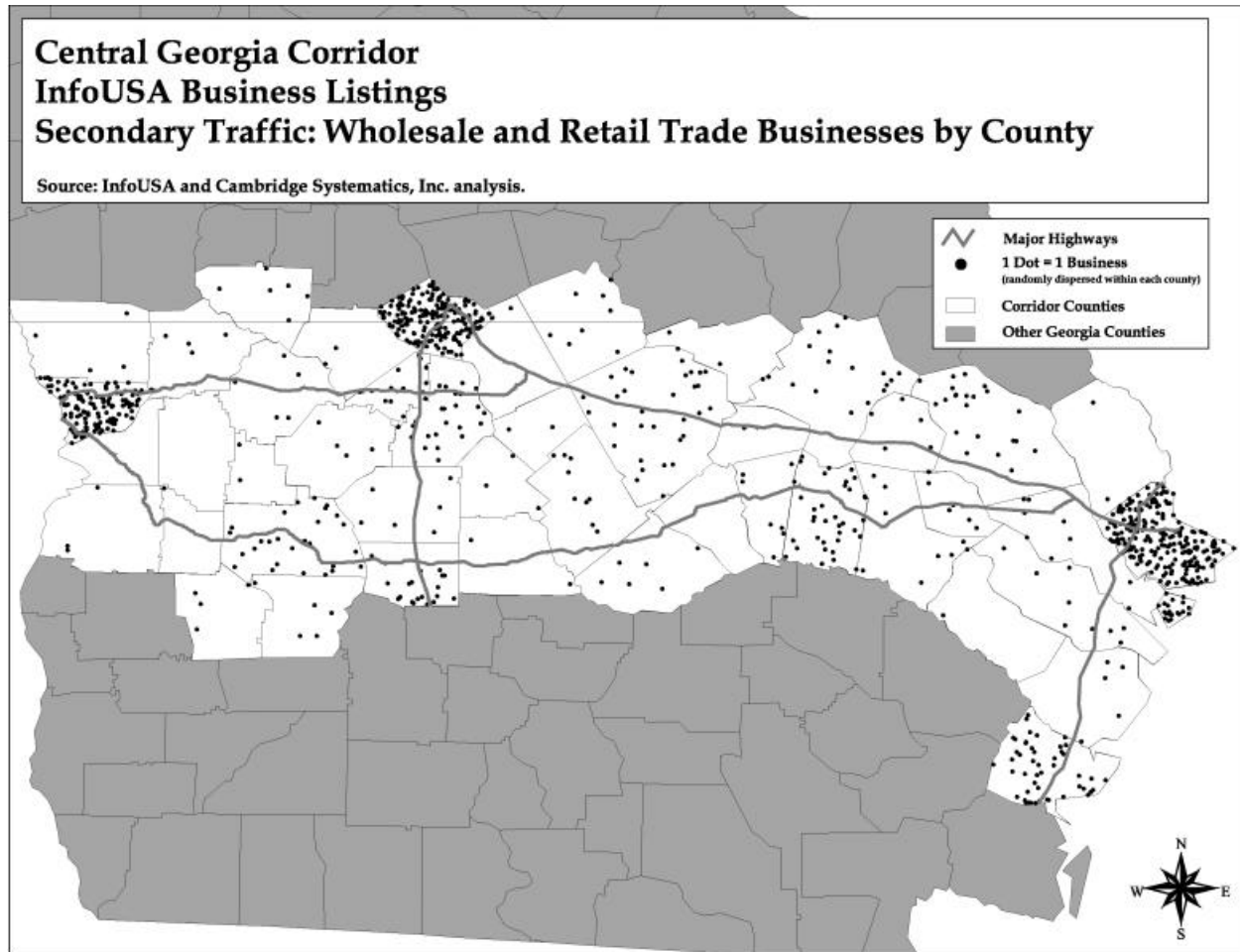
Map 8: Transportation Equipment Manufacturing Businesses by County

This map shows concentrations of transportation equipment manufacturing businesses in the three largest population centers, Chatham (13 businesses), Bibb (seven businesses), and Muscogee (five businesses) Counties. Most counties (35 of 45) do not have any businesses in this category. Other locations of transportation equipment manufacturers include Sumter and Laurens Counties, with three firms each. Peach County has two businesses in this category; Houston, Toombs, Dodge, and McIntosh each have one.



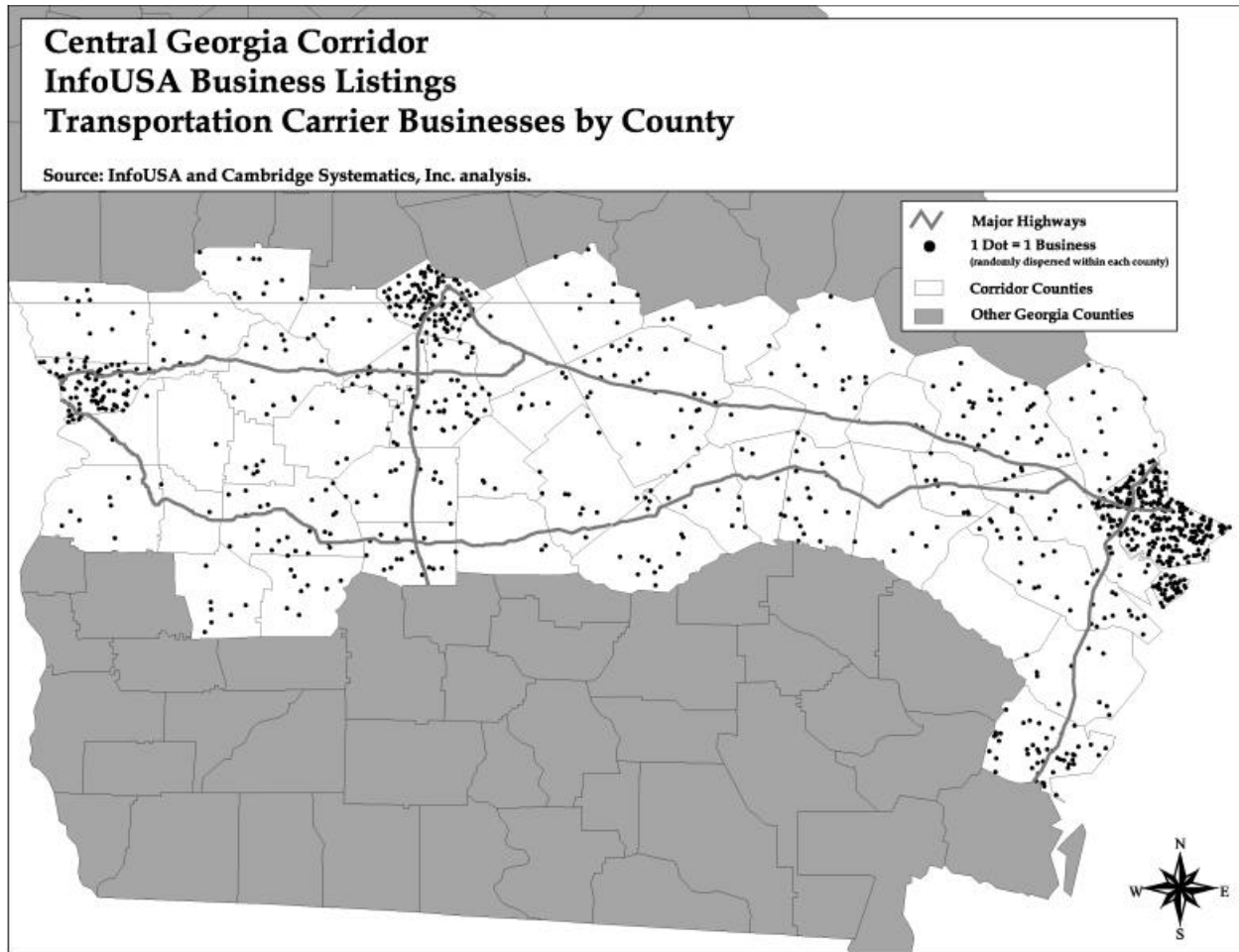
Map 9: All Other Manufacturing Businesses by County

This map includes all businesses with SIC codes indicating manufacturing of all other products not included in any of the other maps. These products include the two-digit SIC categories of furniture and fixtures; printing and publishing; primary metal industries; fabricated metal products; industrial machinery and equipment; instruments and related products; and miscellaneous manufacturing industries. The map shows the greatest concentrations of other manufacturing businesses again in the largest population centers, Columbus, Macon, and Savannah. Additional concentrations include Houston County (Warner Robins), Emanuel County (Swainsboro), Glynn County (Brunswick), and the Sumter/Crisp (Americus and Cordele) area.



Map 10: Secondary Traffic: Wholesale and Retail Trade Businesses by County

This map shows county-by-county concentration of businesses with SIC codes wholesale and retail trade businesses by county. It includes businesses with primary SIC codes indicating wholesale trade of durable and non-durable goods. The map also includes businesses with SIC codes indicating retail trade of: building materials and gardening supplies; general merchandise; food; automobiles and automobile parts; apparel and accessories; furniture and home furnishings; eating and drinking establishments; and miscellaneous retail. Because wholesale/retail trade businesses are more related to consumer demand than the other industry groups, the distribution of wholesale/retail businesses, more than any of the other maps, correlates with population. Thus, Chatham, Bibb, and Muscogee Counties have the highest concentrations followed by Glynn, Toombs, Laurens, Sumter, and Houston Counties.



Map 11: Transportation Carriers by County

This map shows the location of transportation carriers in the Corridor. Specifically, this map shows businesses with SIC codes indicating the following activities: railroad transportation; local and interurban passenger transportation; trucking and warehousing; mail delivery; water transportation; pipelines (except natural gas); and transportation services. Map 11 shows a relatively even distribution of transportation carriers throughout the Corridor. All counties, with the exception of Long, Marion, and Treutlen Counties, have at least two transportation carrier businesses. As expected, the highest concentrations of carriers are located in the three largest cities, Savannah, Columbus, and Macon. Bulloch, Glynn, Houston, and Liberty all have more than 30 carriers. Outside these concentrations, the map shows smaller concentrations in Peach County, the Sumter/Crisp County area (Americus and Cordele), and the Toombs/Evans County region (Vidalia, Lyons, and Claxton).



Summary of Business Mapping

Overall, transportation-related businesses in the Corridor are most highly concentrated in the most populous counties: Chatham, Bibb, and Muscogee. Other concentrations are typically located in the Toombs (Vidalia/Lyons) area, the Sumter/Crisp (Americus/Cordele) area, the Glynn County (Brunswick) area, and the Peach/Houston (Warner Robins) area south of Macon. As explained in the preceding paragraphs, there are industry variations in distribution. For example, transportation equipment manufacturing is almost exclusively in the largest counties, and textile manufacturing is almost completely absent in the Savannah area. Overall, Columbus, Macon, and Savannah and areas close to major interstates have more transportation-related and dependent industries than do isolated and rural areas of the corridor.

Shipper and Carrier Interviews

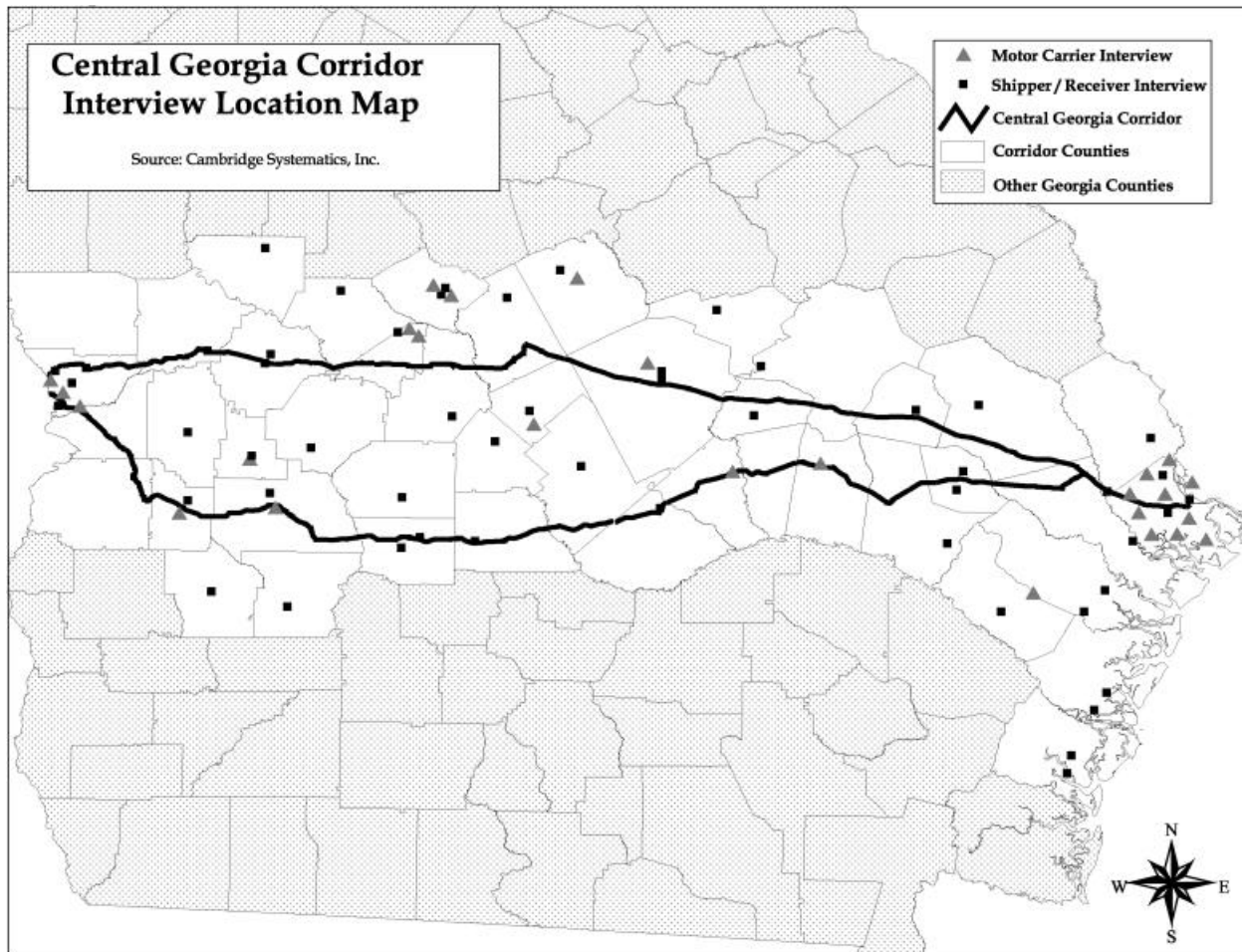
Approximately 250 shippers/receivers and motor carriers were contacted by letter and asked to participate either in person or by phone in the interview process. The 250 potential interviewees were then prescreened, with 51 being determined as not using the corridor, 9 no longer in business, 114 declined or not able to be contacted further (did not return repeated messages), and 42 shippers/receivers and 34 motor carriers interviewed. The 76 who were interviewed represent 125 facilities and terminals within the state of Georgia, including 84 within the corridor. Initially, an attempt was made to speak with two shippers/receivers in each county and, as a result of this effort, excellent geographic coverage was achieved. Figure 5-1 indicates the locations of the firms interviewed. The study team also contacted the Ports of Savannah, Brunswick, and Columbus, and railroads (NS, CSX, and Georgia Central) within the study area.

- The interviews produced useful information on:
- Key routes used and routes avoided;
- Critical intersections, congestion, and bottlenecks;
- Recommended improvements;
- Freight flow data;
- Accident and safety concerns; and
- Other business and industrial transportation-related concerns and opinions.

The major findings and issues are summarized on the following pages.



Figure 5-1
Central Georgia Corridor Interview Location Map



Regional Strengths

The following items were cited most frequently in response to the question, “What are the strengths of the region’s infrastructure?”

- The condition and reach of Georgia’s interstate and state highway system, especially I 16;
- The ongoing effort to upgrade many rural roads to four lanes;
- A responsive DOT, positive action by Chambers of Commerce to actively attract new business to the area, value of existing bypasses, and good safety enforcement; and
- Limited transportation-related impediments to doing business in Georgia.

National motor carriers headquartered outside Georgia were the least likely to find fault with the local transportation system and infrastructure. Locally based motor carriers and the larger shippers/receivers were more vocal about transportation deficiencies. The local firms in the smaller towns and less economically vital areas were quicker to praise Chambers of Commerce



and the state for the effort being made to attract business. One exception was Columbus – local industries and motor carriers were concerned with Columbus’ desire to attract “tech business” to the area, at the perceived expense of manufacturing.

Major Problems Identified

The worst transportation infrastructure problems identified include 26 intersections cited for various safety problems, of which the intersection of I-16/I-75 in Macon was cited most frequently. Congestion was cited along U.S. 280, in the Port of Savannah, and along U.S. 80/SR 96 Dublin to Columbus. Eleven roads were cited as “problematic,” with U.S. 80/SR 96 being mentioned marginally more frequently than U.S. 280 (the top two). Seven bridges were named as too narrow or having bad geometry (although four of them fell outside the study area), and three instances of poor signage were cited.

A total of 26 intersections were identified as problematic:

- I-16/I-75: poor geometry;
- SR 307 and Louisville Road: a limited turning radius causes trucks to stop traffic to turn;
- SR 57/SR 18 West: a blind curve and no warning lights coming from the west;
- SR 19/SR 36: poor signage and inadequate turning room;
- SR 49/SR 26: poor signage and difficult turning angles;
- U.S. 280/SR 520/SR 27 at Richland: the traffic light is not heeded, difficult geometry from the north, poor signage, and excessive vehicle speed;
- SR 117/SR 46 and SR 199: difficult geometry;
- U.S. 319/U.S. 441: high traffic volumes and difficult geometry;
- U.S. 441/U.S. 280: a yield rather than a stop, no easement into traffic, and a blind curve followed by a narrow bridge;
- Alfred Street/U.S. 80: lighting problems at the top of the exit from I 16 to the exit to Chatham Parkway;
- SR 307 at Louisville Road: need more than a caution light at the intersection;
- SR 257/I 16: needs lights instead of stop signs;
- Butler Bypass and SR 137: a too short yellow cycle;
- SR 82/SR 27 at Cuthbert: an overlapping green and short yellow;
- SR 21/I 95: highly congested because of trailers occupying the middle of the lane when making a left turn east or west off SR 21;
- Hudson Bridge Road on I 75: trucks can overturn;
- SR 307 and Commerce Drive: high accident area;
- SR 247/SR 96: high fatality, high accident, congested, and includes an at-grade crossing;
- Four intersections were merely referred to as “critical” or bad with no further explanation, including Abercorn and I 516, Statesboro Bypass and SR 24, U.S. 341/SR 128, and the five-way intersection of the Fort Valley Bypass.

Major highway segments cited as problematic included:

- Various segments of U.S. 280 were identified as having problematic congestion;
- The area surrounding the Port of Savannah;
- Most Dublin main roads;



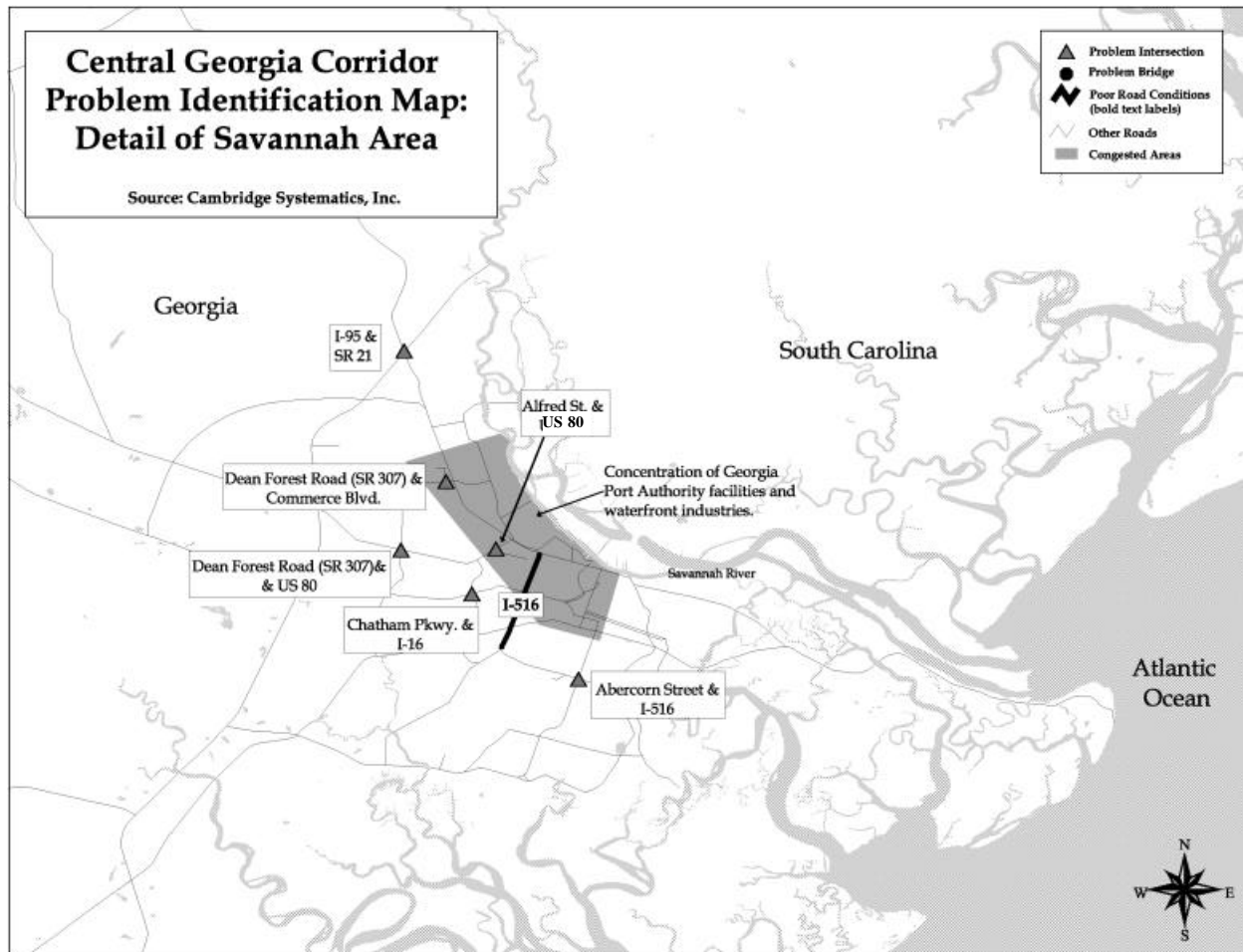
- SR 36 from Thomaston to The Rock because of industrial development and poor road condition;
- U.S. 80/SR 96 Columbus to Macon;
- The intersection of I-16 and I-75;
- SR 257, cited as “needing lights”;
- SR 196 between SR 17 and SR 84;
- The roads that run between Eufaula and I-75, Jesup and Waycross, and Atlanta and Lawrenceville;
- Flatrock Road in Columbus; and
- I-516 in Savannah.

Respondents cited the following bridges as problematic in the study area: U.S. 441 north of U.S. 280 at McRae, SR 153 between Preston and Friendship, SR 19 north of Glenwood, SR 27 near Sanford, U.S. 280 east of Dumas, and U.S. 280 identified only as “in Wilcox County” and not able to be mapped by the team. Just outside the study area, a problem bridge lies on SR 36 at Barnesville. The bridges are all generally cited as too narrow with poor geometry and bad sight.

Figures 5-2 and 5-3 illustrate the locations of the various problem areas cited.



Figure 5-3
Central Georgia Corridor Problem Identification Map:
Detail of Savannah Area



Recommended Improvements

In response to requests for recommendations for improvement, businesses interviewed most frequently suggested:

- In general, continued and aggressive four-laning of the rural highway network;
- Improvements along U.S. 280, including four-laning the length of it, bypassing towns along it, and building wider shoulders and bridges along its length;
- More bypasses on roads other than U.S. 280 including bypassing the I 16/I 75 interchange at Macon on SR 96;
- Localized improvements to various roads (widening, shoulders, etc.);
- Access from East Georgia to West Florida; and
- Access to Columbus/Alabama from the east and Augusta from the west.

A broad range of recommendations were offered, from specific re-engineering projects (notably the intersection of I-16 and I-75, which was the single most frequently mentioned item among all



the interviews) to regulatory changes regarding trailer length and weight, to bringing in competitive rail service. Respondents also suggested another bridge crossing the Oconee at Dublin, call boxes on the highways, (more) designated truck routes, fuel subsidies, lengthening some left-turn lanes for easier truck access and egress, a new ocean terminal, a “super ring” around Atlanta, and more truck parking and rest areas.

The desire to have two-lane roads widened to four lanes seems uniform among corridor interviewees. No less than 15 recommendations were made for four-laning, with nine of them referring to U.S. 280, two for “everything,” one for SR 1, one for U.S. 441, and two for local access roads.

Interviewees also suggested bypasses along U.S. 80, including at Roberta, on U.S. 441, at McRae, at Vidalia, and at “every town on U.S. 280.” When interviewees were queried regarding the impact of bypasses on local industry, motor carriers uniformly stated that their drivers did not use services in towns where stops were not programmed.

Suggested improvements include the roads between Americus and Eufaula, and between Americus and Peachtree, widening the shoulders and bridges of U.S. 280, and widening SR 196, U.S. 319, U.S. 441, and SR 1. New direct routes were suggested between Columbus/Macon and Jacksonville, Florida, between Macon and South Carolina, and to Birmingham. Also mentioned were the Fall Line Freeway, the Georgetown Flyover, and the Truman Parkway Bypass.

Business Climate

In addition to transportation infrastructure issues, a variety of general problems and regulatory issues were raised, primarily by the motor carriers. The most frequently cited were:

- Driver shortage, lack of training, lax CDL requirements, and other driver labor force issues;
- The ability for longer trailers or doubles to run on Georgia roads;
- Rising fuel costs;
- Lack of rest stops;
- Growing congestion because of new development;
- Workforce education and availability; and
- Concerns that infrastructure may not be sufficient to accommodate future development.

Motor carriers spoke on the need for increased driver training, even suggesting that the state might consider a subsidized internship program that helps offset the cost of allowing new drivers to ride with seasoned drivers for a longer interval before striking out on their own.

Weight and length issues were mentioned as the biggest regulatory problems. Concerns included scale variation and lack of calibration both among and within states, which allow drivers to “get so far and then be fined or turned back.” One carrier mentioned feeling “...lots of confusion on intermodal container act...it shifts responsibility for weight [infractions] to the to be able to pull doubles on Georgia roads was mentioned more than once. There is a fear that, as technology improves and equipment and trailers become longer, they will not be accommodated in the Georgia transportation infrastructure. Weight issues were of particular concern to the kaolin and logging industries.



Hours of service (HOS) requirements were also cited as a concern. The feeling that tightening the hours of service regulations in the current climate of driver shortages would be disastrous to the trucking industry. ITS solutions were suggested as a means to enhance safety and productivity in lieu of further HOS restrictions.

Industry Perspectives

Kaolin

The kaolin producers reported transportation problems with the railways, while the kaolin motor carriers voiced concerns on weight restrictions. Many of the kaolin producers interviewed said that railroad equipment leases were a major concern. They explained that during the CSX merger, at a time when rail service was fairly uncertain, they had been forced to lease large numbers of cars to guarantee service. Now that rail service is operating more smoothly, cars that were custom-built for the industry (and cannot be used for other commodities) are in disuse, at considerable cost to kaolin producers. An issue resulting from the rail merger is that rail is now single provider and, as freight traffic increases, there is some congestion evident in traffic to the Port of Savannah. Kaolin producers also said that backhaul opportunities are infrequent in the industry – kaolin cars cannot be used to carry any other commodity, causing trains to deadhead back to the mines/plants. Shippers/receivers and motor carriers alike mentioned the difficulties encountered in scale calibration variability and non-uniform weight limits between states. Those interviewed said that only a small percentage of this commodity moves by truck. The kaolin industry tends to be located in areas lacking in economic vitality and there is some concern that industrial development/redevelopment could price kaolin off its land.

Lumber and Paper

The team interviewed loggers, timber brokers, paper haulers, fluff processors, business form manufacturers, publishers, coated board, and paper manufacturers. The industry is geographically represented through the entire corridor, from Savannah to Columbus. The shippers/receivers were vocal on regulatory, social, political, and infrastructure topics. The lumber and paper producers perceive themselves as having to police their carriers aggressively to minimize weight infractions, and some feel that other industries (such as kaolin) are not subject to the same level of enforcement. There is a concentrated effort within the industry to increase safety, ranging from requiring all carriers to operate with full running lights at all times to firing drivers who overload. Those interviewed see overloading as a safety issue within the lumber/paper industry, primarily because of poor road conditions. Overall, the motor carriers' comments were generally limited to infrastructure concerns; only occasionally did they mention regulatory or non-infrastructure issues.

Food

The team interviewed poultry, farm, and snack foods shippers/receivers and dedicated carriers. Local producers were more vocal than national ones, and identified deficiencies relating to the road network, Port of Savannah operations, enforcement, and the decline of agriculture in general. There is little east-west movement in fruits and vegetables but there are significant east-west movements of poultry and processed foods. Georgia is an important poultry



producer; the largest poultry producer in the nation has four sites in Georgia, three in the corridor. The biggest problem faced by food producers and movers is access by rural producers to markets.

Liquid/Chemical

Shippers/receivers in these industries were, with few exceptions, satisfied with the condition of the Georgia transportation network and did not have complaints regarding regulatory issues, social concerns, or politics. Motor carriers, however, had concerns ranging from infrastructure shortcomings to regulations regarding trailer lengths and weights, hours of service, the lack of qualified drivers, and safety issues stemming from the driver shortage. Liquid bulk carriers perceive themselves as facing stiffer regulation than that facing other commodities but, conversely, they characterize their relationships with the DOT as “open, communicative, and two-way.”

Ports

The team interviewed senior managers from the Port of Savannah, who provided insight into issues related to Georgia Port Authority operations in Savannah, Garden City, Brunswick, and Columbus/Bainbridge. They were highly supportive of the High Priority Corridor Six/U.S. 280 project in general in terms of its ability to provide faster, more efficient, more cost-effective connections between the Port’s facilities and its inland users and customers. An enhanced east-west connection between Savannah and Columbus was seen positively. The Port identified a number of key issues at each of its facilities:

- At Savannah and Garden City, the primary issue is massive growth in the Port’s container business. The number of containers handled at the Garden City Container Terminal is expected to double over the next 10 years. A substantial share of this new traffic will be handled on double-stack rail cars at the Port’s 150-acre Mason Intermodal Container Transfer Facility, currently under construction. Improvements to the Norfolk Southern and CSX lead tracks into this facility will be needed, and increased rail traffic will generate increased pressure on mainline choke points such as Central Junction (an at-grade crossing of the NS and CSX mainlines in Savannah). Increased rail traffic will also impact the many highway/rail at-grade crossings in Savannah, Port Wentworth, and Garden City, and grade crossing elimination projects may need to be considered. Outside of Chatham County, the major problem seems to be intermodal transfer capacity in the Atlanta region. But despite the growth in rail share, the majority of the Port’s container traffic will continue to be handled by truck, and truck traffic increases will be substantial. The Port believes that the local highway system is generally well-suited to serve the marine terminals, but is concerned that continued development of vacant lands adjoining the terminal access routes – principally SR 307 – will reduce the highway capacity available for port traffic. They noted that the Chatham County Intermodal Freight Study had evaluated a limited-access highway connection between I-95, I-16, I-516, and the Port, and suggested that this might be one response to increased pressure on the highway network.
- At Brunswick, continued growth in automobile and bulk cargo handling is expected. The major transportation problem has been a single highway/rail at-grade crossing, which is



being eliminated. Enhanced connections between Brunswick and Columbus, as well as Alabama and Mississippi, are viewed positively.

- At Columbus and Bainbridge, the issue is not landside access but rather the availability of sufficient water. Both facilities are located on the Apalachicola-Chattahoochee-Flint (ACF) river system, and water levels in the ACF have been inadequate to allow barges to reach these facilities except during limited operating windows. This is because of a combination of factors – repeated drought years, holdbacks of water for uses located upstream, and failure to perform maintenance dredging because of concerns about disposal of the spoils – and the Port sees no indication that these issues will be resolved in the near future. Marine traffic through these facilities is therefore seen as limited, and without substantial impact on High Priority Corridor Six and U.S. 280.

Conclusions

Those who were contacted and interviewed seemed quite candid in their opinions. Their opinions and recommendations varied regarding the strengths and weaknesses of the freight transportation network within Georgia generally and within the study area specifically. The interview sample produced a fairly comprehensive set of “problem areas” and recommended strategies to be assessed as part of the overall study effort.

Quality of life and larger societal issues – particularly workforce education – were raised frequently in the context of business vitality and development. Local industry sees young people leave central Georgia at an alarming rate, and attracting industry to areas where the “best and brightest” continue to pull up stakes is difficult. A further factor is the perceived decline in certain historically important industries, such as agriculture, textiles, and kaolin. The sentiment abounds that “something is needed to replace that industry, but what?” Big box warehousing has stepped in to fill some of central Georgia’s requirement for jobs, but still, the study area includes three of Georgia’s poorest seven counties. Attracting industry is definitely viewed as one solution. It is already perceived that central Georgia has some of the best incentives available to business for relocation, and that continuing to encourage business to locate within the corridor area is vital to the economic health of central Georgia. Transportation system improvements to the U.S. 280 Corridor and High Priority Corridor Six are viewed as central to accomplishing this goal.



6 Commodity Flow Analysis

Background and Purpose

The High Priority Corridor Six/U.S. 280 project is centrally concerned with increasing the speed, efficiency, safety, and cost-effectiveness of freight movement for shippers, receivers, and carriers operating in the study area. To accomplish this goal, it is necessary to understand what types of commodities are being moved; by what modes (truck, rail, air, and water) they are being moved; and where they are being moved. With this information, it is possible to create a baseline picture that allows the team to understand current conditions, assess the performance of the current freight transportation network, and forecast future levels of demand.

This section provides an overview and summary of commodity flows into, out of, within, and through the study area and its 45 counties. The data is presented at three levels: 1) a study area overview, 2) an assessment of each county, and 3) a depiction of network-level commodity flows. Detailed information on each of the 45 counties is presented separately in Appendix X6-

Overview of the Approach / Methodology

This analysis utilizes a commodity flow database known as Transearch. The Transearch database was developed by Reebie Associates, which updates it annually. Transearch provides national-level information on the movements of specific commodities between specific origins and destinations using different modes of transportation. Information on airborne, waterborne, and rail movements is extracted from federal databases, while information on trucking activity is generated by Reebie Associates using proprietary methods. For purposes of this study, the team obtained the following data for analysis year 1998 (the most recent available at the time of the analysis):

- Domestic tons moved by rail, truck, air, and water that originated in (inbound); were destined for (outbound); or were moved within (internal) any of the 45 study area counties. International waterborne tonnage through the Ports of Savannah, Brunswick, Columbus, and Bainbridge is not included in this database; however, movements between U.S. inland/coastal destinations and these ports (which are domestic movements) are captured in the database.
- Domestic tons moved by truck that pass through any of the 45 study area counties as part of movements between origins and destinations outside the study area.

All origins and destinations – both within and outside the study area – were obtained at the county level, where available. In other cases, the team obtained data at Business Economic Area (BEA) level. A BEA is an aggregation of counties within a region. This data was further aggregated to generate state-level summaries for presentation purposes.

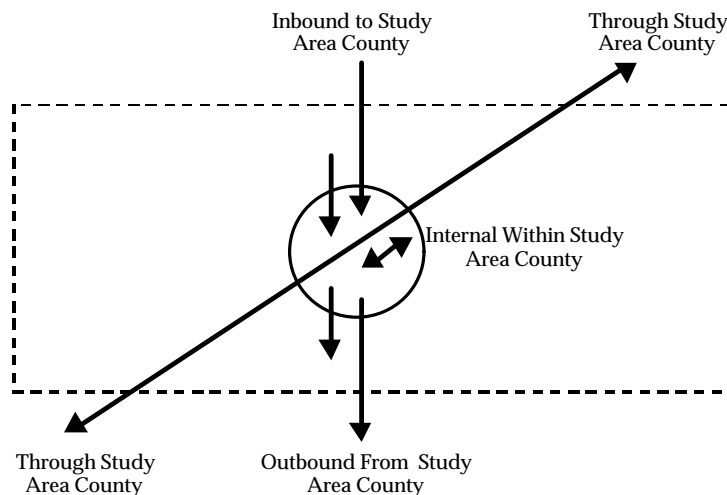
The commodity flow database itself consists of four Microsoft Access 97 files of between 500 records and 1,000,000 records in length. The database files are:



- Destination (Inbound) – Treats each study area county as a destination, and captures commodities moving into that county from any other county or business economic area in the United States;
- Origin (Outbound) – Treats each study area county as an origin, and captures commodities moving out of that county to any other county or business economic area in the United States;
- Intra (Internal) – Looks at internal movements within each county (moves where the origin and destination are both within that county); and
- Through – Looks at commodities that pass through a study area county, but do not originate and terminate in the study area.

For example, moves from New York to Chatham County would be recorded as inbound tonnage for Chatham County; moves from Chatham County to Miami would be recorded as outbound tonnage for Chatham County; moves from New York to Miami on I 95 passing through Chatham County would be recorded as through tonnage for Chatham County; and moves that begin and end in Chatham County would be recorded as internal moves for Chatham County. Figure 6-1 below illustrates these different types of moves. The circle represents a county within the study area, while the box represents the entire study area.

Figure 6-1
Standard Definition of Inbound, Outbound and Through Moves
County Frame of Reference



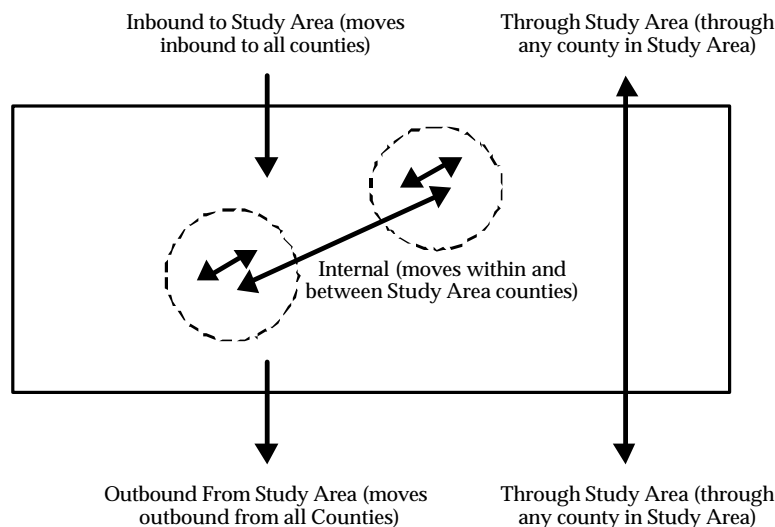
One of the challenges of commodity flow analysis – both to the reader and the analyst – is the “frame of reference” problem. Simply stated, the numbers are different if we look at the individual counties within a study area than they are if we look at the study area as a whole, because the definitions of inbound, outbound, internal, and through moves are different. Typically, the commodity flow analysis will use the county level as its frame of reference, as illustrated in Figure 6-1, unless otherwise stated.

But, in some cases, we can gain additional perspective by shifting our frame of reference to the study area as a whole, and asking how much tonnage is moving into, out of, within or through



the study area as a whole, rather than its individual counties. From this alternative viewpoint, the “internal” category captures all moves that are entirely within and between the study area counties. For example, inbound moves to Chatham County that originate in Columbus, which would normally be “inbound” to Chatham County and “outbound” to Columbus, would now be “internal” and the tonnage would be counted only once (instead of twice). This is illustrated in Figure 6-2 below.

Figure 6-2
Alternate Definition of Inbound, Outbound and Through Moves
Study Area Frame of Reference



The database provides tonnage data by commodity type. Commodity types are defined according to their Standard Transportation Commodity Code (STCC). There are different levels of STCC corresponding to different levels of detail. The four-digit level makes very fine distinctions among specific commodity types, while the two-digit level aggregates similar commodity types into larger functional classes. For example, STCC 3273 (Ready-Mix Concrete) and STCC 3271 (Concrete Products) are both included in STCC 32 (Clay, Concrete, Glass, and Stone). The team obtained commodity detail at the four-digit level and aggregated it to the two-digit level, where appropriate. The relationships between the major two-level and four-level STCC codes are presented in Table 6-1 on the following page.



Table 6-1: Standard Transportation Commodity Codes

STCC 2	Name	Commodities Included at the STCC 4 Level
1	Farm products	Grains, field crops, fruits, and vegetables
10	Metallic ores	Bauxite, aluminum ores
11	Coal	Bituminous coal
14	Nonmetallic minerals	Broken stone, gravel, sand, mineral fertilizers
19	Ordnance or accessories	Guns, ammunition
20	Food or kindred products	Meat products, poultry, dairy products, flour and sugar, liquors, soft drinks, edible oils
21	Tobacco products	Cigarettes
22	Textile mill products	Cotton fabrics, carpets, yarns
23	Apparel or related products	Clothing
24	Lumber or wood products	Primary forest materials, lumber, plywood, veneers, millwork, and cabinetwork
25	Furniture or fixtures	Furniture
26	Pulp, paper, or allied products	Pulp and pulp mill products, paper, fiber, wallpaper, paper containers, and boxes
27	Printed matter	Newspapers, periodicals, greeting cards
28	Chemicals or allied products	Potassium and sodium compounds,
29	Petroleum or coal products	Refining products, liquefied gases, asphalt
30	Rubber or misc. plastics	Tires, miscellaneous plastic products
31	Leather or leather products	Leather products
32	Clay, concrete, glass, or stone	Portland cement, clay brick or tile, concrete products, ready-mix wet cement, gypsum, processed nonmetallic minerals, kaolin clay
33	Primary metal products	Petroleum coke, primary iron and steel products, copper, aluminum and lead products, wire
34	Fabricated metal products	Heating equipment, sheet metal products, valves, pipe fittings
35	Machinery	Engines, farm machinery, construction equipment, lawn and garden equipment, machine tools
36	Electrical equipment	Transformers, motors and generators, batteries, cooking equipment, lighting fixtures
37	Transportation equipment	Car bodies, truck bodies, bus bodies, aircraft, railcars, vehicle parts and accessories
38	Instrum, photo equip, optical eq	Photographic equipment or supplies
39	Misc. manufacturing products	Furs, matches, toys, games
40	Waste or scrap materials	Metal scrap or tailings, paper waste or scrap
41	Misc. freight shipments	Miscellaneous freight shipments
42	Shipping containers	Empty shipping containers
43	Mail or contract traffic	Mail
45	Shipper association traffic	Shipper association traffic



46	Misc. mixed shipments	Freight all kinds, including loaded shipping containers not elsewhere classified
50	Secondary traffic	Warehouse and distribution traffic for a wide variety of commodity types; intermodal drayage

The Transearch database was also post-processed to include additional data:

- Truck tonnages were converted to vehicle equivalents using Vehicle Inventory and Use Survey (VIUS) data for Georgia. The VIUS data provided a range of average weights for trucks carrying different types of commodities over different distances. This information was linked to the database files with a set of lookup tables, so that each record in the database – specifying a commodity type and travel distance – was matched with the appropriate factor for converting from tons to truck equivalents. Rail tonnage was converted to railcar equivalents using a fixed factor for tons per railcar.
- Tonnages were converted to value equivalents based on average value-per-ton factors developed from the 1997 Commodity Flow Survey by Reebie Associates.
- Origin-destination flow maps were generated for the Phase I Report. Origin-destination matrices were generated from the post-processed data. Separately, Reebie Associates developed a method for assigning the origin-destination data (which describes county-to-county flows) to specific highways in the nation’s transportation network. The assignments are based on least-time paths as determined by the Oak Ridge National Laboratory.

The various files and data were aggregated and sorted into meaningful groups for purposes of presentation. The underlying detail is preserved in the database, but for clarity of presentation – particularly to the non-technical analyst – the information is far more useful in an aggregate form. A variety of aggregation methods were tested before settling on the forms presented in this Appendix. Graphs of key information were generated for “at a glance” analysis of individual counties.

In evaluating the truck data, the user should be aware that the Transearch database can underrepresent certain types of moves – such as moves between farms and local warehouses, moves between mines and local distribution/processing centers, and local or short-haul distribution by smaller vehicles. Also, trucks that are moving empty are not reported in the data, because they carry no tonnage. As a result, the number of trucks actually moving over a highway network will be greater than the number of trucks associated with the Transearch tonnage, and should be determined from vehicle counts.

Finally, because the study area includes major marine cargo terminals (at Savannah, Brunswick, and Columbus/Bainbridge), data on international commodity flows through these facilities was obtained from the draft Georgia Statewide Transportation Plan Update, and related to the Transearch data on domestic flows to and from these ports.



Summary of Key Findings

Profile of the Overall Study Area

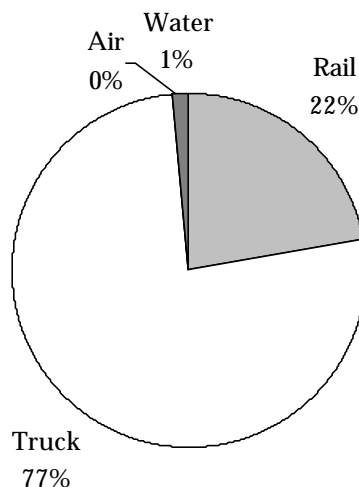
Tonnage and Value

The total of all domestic tonnage moving into and out of each of the study area counties is summarized in Table 6-2 below. Looking at domestic tonnage inbound to and outbound from the 45 study area counties, a total of 122,000,000 tons was handled in 1998. Tonnage inbound to these counties was slightly higher than tonnage outbound. As shown in Figure 6-3, trucks handled more than 75 percent of the tonnage, while rail handled just more than 22 percent. In comparison to many parts of the country, this rail share could be considered quite robust. Water handled a little more than one percent of tonnage (remember that this is domestic tonnage only and does not include international shipments through marine cargo facilities). Air cargo activity is quite low within the study area, representing less than 0.1 percent of total tonnage.

Table 6-2
Summary of Inbound and Outbound Domestic Tons by Mode

	Rail	Truck	Air	Water	Total
Inbound to counties	15,012,465	46,513,478	650	1,328,525	62,855,118
Outbound from counties	12,172,984	46,945,034	2,735	411,472	59,532,226
Total	27,185,449	93,458,513	3,385	1,739,997	122,387,344

Figure 6-3
Distribution of Inbound and Outbound Domestic Tons by Mode





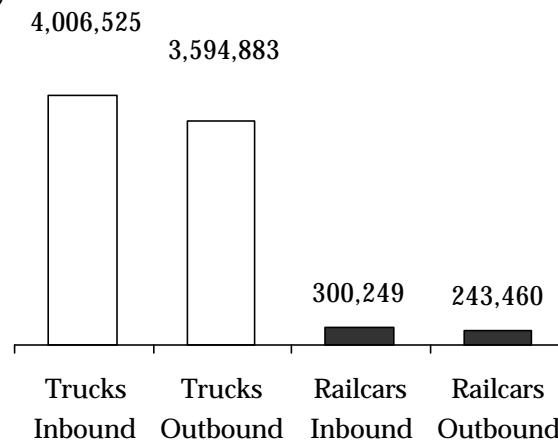
In total, the goods inbound to and outbound from these 45 counties were worth an estimated \$319 billion dollars as presented in Table 6-3. Inbound value was slightly higher than outbound value, and trucks carried by far the largest amount of cargo by value.

Table 6-3
Summary of Inbound and Outbound Domestic Value by Mode
Rail Truck Air Water Total

	Rail	Truck	Air	Water	Total
Inbound to county	\$7,578,913,363	\$165,447,106,196	\$119,470,050	\$2,858,072,903	\$176,003,562,511
Outbound from County	\$6,585,688,447	\$135,795,657,950	\$510,334,926	\$739,890,468	\$143,631,571,791
Total	\$14,164,601,810	\$301,242,764,146	\$629,804,976	\$3,597,963,371	\$319,635,134,302

More than 7.5 million loaded truck moves into and out of the study area counties were associated with this level of activity, along with almost 550,000 loaded railcar moves as shown in Figure 6-4 below. This does not include the movement of non-loaded trucks and railcars, nor does it include through movements or internal movements.

Figure 6-4
Summary of Inbound and Outbound Truck and Railcar Loads

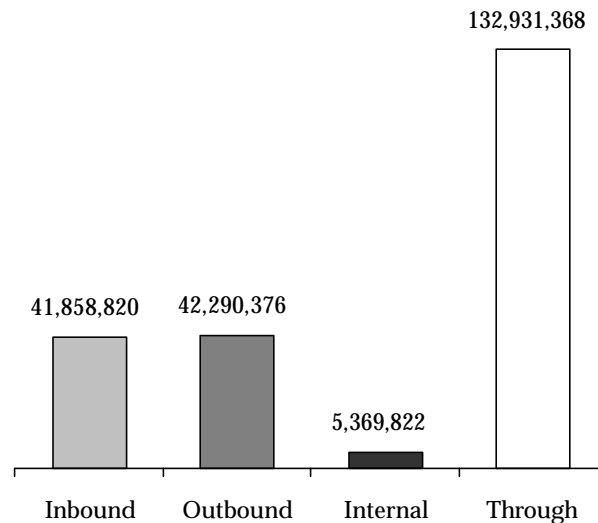


Besides freight moving into and out of the study area counties, we also see freight circulating internally within each of these counties, as well as freight passing through these counties between origins and destinations that are outside of the study area. Almost all of the internal circulation activity is by truck, with the exception of Chatham County (which has significant internal water and rail tonnage) and Glynn County (which has significant internal rail tonnage). The relationship between through truck and through rail activity could not be quantified because



of confidentiality issues associated with the use of through rail data. We can, however, make direct comparisons of inbound, outbound, internal, and through truck tonnages. These are summarized in Figure 6-5 below.

**Figure 6-5
Inbound, Outbound, Internal, and Through Truck Tonnage**



Through trucks are by far the most dominant truck moves and are higher than all other categories combined. Almost 133,000,000 through tons are entirely external to the study area – moving from an outside origin to an outside destination. This does not include an additional 94,000,000 tons that are inbound or outbound from the study area, and which may pass through one or more study area counties on their routes. Most of the through tonnage actually passes through more than one study-area county, and for purposes of this analysis, we have counted each through trip only once, regardless of how many counties it passes through. (If we did count the through truck tonnage each time it went through a different county, the through truck tonnage for all study area counties would be more than 550,000,000 million tons).

Comparing the two frames of reference – our normal “sum of counties” approach and the “study area as a whole” approach – we also see that:

- In the “sum of study area counties” frame of reference, the amount of internal truck tonnage (representing the tonnage circulating within each of the study area counties) is quite limited (715,163 tons). To some extent, this is an artifact of the database itself, which is most reliable at the county-to-county and state-to-state level, and less reliable at the internal county level because of sample size limitations.
- The internal category is much higher in the “study area as a whole” frame of reference because it includes not only truck tonnage moving within study area counties (715,163 tons), but also truck tonnage moving between study area counties (4,654,659 tons).
- The inbound and outbound truck tonnages add to 93,458,512 tons in the “sum of counties” frame of reference, but are lower (84,149,196 tons) in the “study area frame of reference” because tonnage moving between the study area counties is excluded. Even so, the inbound and outbound tonnage associated with origins or destinations outside the study area (84,149,196 tons) is far greater than the tonnage associated with moves



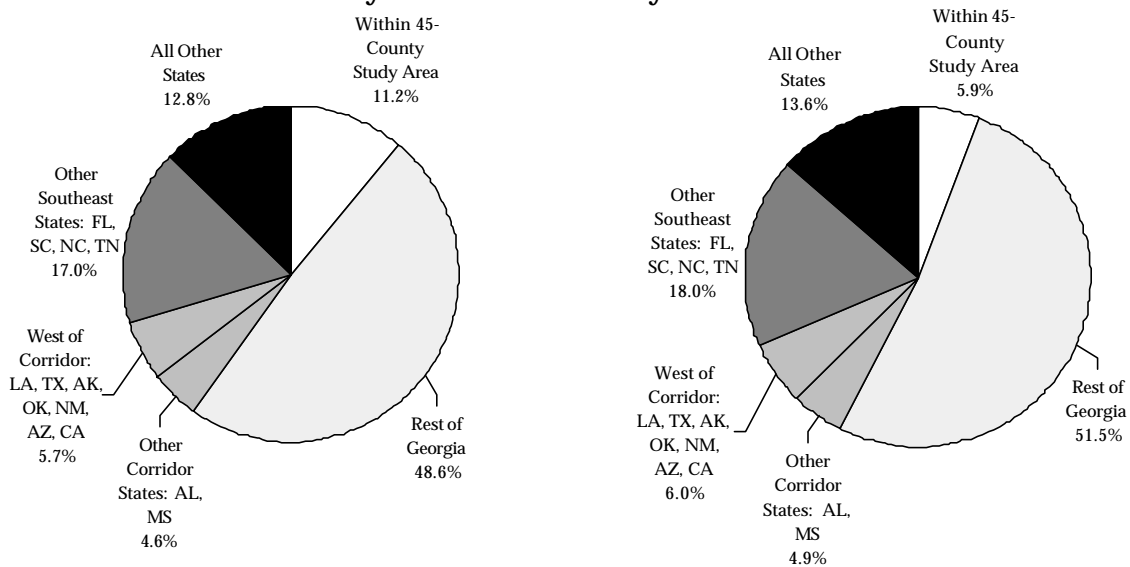
within or between the study area counties (5,369,822 tons) – which indicates that origins and destinations outside the study area itself are responsible for about 94 percent of the total truck tonnage moving into, out of, or within the study area.

Origins and Destinations

Remaining with our two frames of reference, we can provide additional detail on from where inbound tons are coming and to where outbound tons are going. The major categories are:

- Within 45-County Study Area – Moves from one study area county to another (counted at both their origin and their destination in the county frame of reference, but only once in the study area frame of reference);
- Rest of Georgia – Moves between study area counties and any other county in Georgia;
- Other Corridor States (AL, MS) – Moves between study area counties and the other two states where the HPC 6 Corridor is designated;
- West of Corridor (LA, TX, AK, OK, NM, AZ, CA) – Moves between study area counties and the states directly west of the HPC 6 Corridor;
- Other Southeast States (FL, SC, NC, TN) – Moves between study area counties and these states; and
- All Other States – Moves between study area counties and all other states.

Figure 6-6
Distribution of Inbound and Outbound Domestic Tonnage
Sum of Study Area Counties Study Area as a Whole



Looking at both these distributions, we see that by far the largest share of tonnage (about 50 percent) is between the study area and other Georgia counties outside the study area. Between six percent and 11 percent of the tonnage – depending on how it is counted – remain entirely within the study area. Around 10 percent of the tonnage is flowing between the study area counties and other states on the HPC alignment (Alabama, Mississippi, and states due west that could be reached on the alignment). Most of the remaining tonnage (17 to 18 percent) is to and



from the southeast U.S., and the remainder (13 to 14 percent) is to and from the rest of the United States.

Within this distribution of overall inbound and outbound tonnage, there are interesting differences between rail and truck activity. Rail tonnage is actually more concentrated within the 45-county study area and less focused on the rest of Georgia; it also reaches a higher share of “all other states” (principally in the northeast and midwest). Conversely, truck tonnage is more focused on Georgia and adjoining states.

**Table 6-4
Geographic Distribution of Rail and Truck Tonnage**

	Rail		Truck	
	Inbound + Outbound Tons	Share	Inbound + Outbound Tons	Share
Within 45-County Study Area	4,419,323	16.3%	9,309,316	10.0%
Rest of Georgia	8,833,496	32.5%	50,643,166	54.2%
Other Corridor States (AL, MS)	1,081,254	4.0%	4,570,817	4.9%
West of Corridor	1,384,774	5.1%	4,558,090	4.9%
Other Southeast States	4,900,838	18.0%	15,322,989	16.4%
All Other States	6,565,763	24.2%	9,054,135	9.7%
Total	27,185,449	100.0%	93,458,513	100.0%

These figures indicate that the study area is not dominated by a simple “corridor” type of move from one point to another. Rather, it is a complex set of flows with different purposes. While the HPC 6 and U.S. 280 corridors do not have to accommodate all the tonnage moved within the study area, they must accommodate the following functions:

- Providing connectivity within the study area and within the state of Georgia;
- Providing connectivity with the states due west along the HPC 6 alignment;
- Providing connectivity between study area counties and the rest of the United States;
- Accommodating internal movements within each of the study area counties; and
- Accommodating through movements.

The underlying commodity flow data is summarized in Tables 6-5 through 6-6 and illustrated in Figures 6-7 through 6-10 below.



**Table 6-5
Inbound Domestic Commodity Flows by Origin State**

State	Rail Tons	Truck Tons	Air Tons	Water Tons	Total	Percentage
GA	7,854,708	31,466,625	399	-	39,321,732	62.6%
FL	775,777	3,204,309	1	291,037	4,271,124	6.8%
AL	442,769	2,213,906	-	8,688	2,665,364	4.2%
SC	674,745	1,667,939	-	7,506	2,350,190	3.7%
LA	485,822	1,195,271	-	426,091	2,107,184	3.4%
TN	678,987	943,211	-	-	1,622,198	2.6%
NC	334,758	1,259,810	223	-	1,594,792	2.5%
TX	192,967	718,123	-	534,900	1,445,990	2.3%
KY	1,113,798	208,702	-	-	1,322,500	2.1%
MS	155,872	905,564	-	2,806	1,064,242	1.7%
IL	448,172	317,634	1	-	765,807	1.2%
OH	63,935	464,754	1	-	528,690	0.8%
IN	344,692	178,557	-	-	523,249	0.8%
VA	309,801	181,301	2	2,500	493,604	0.8%
NY	151,266	172,399	6	9,107	332,778	0.5%
MO	107,024	212,734	10	-	319,768	0.5%
MN	256,900	20,015	-	-	276,915	0.4%
PA	65,704	163,955	1	-	229,660	0.4%
AR	76,888	130,572	-	-	207,460	0.3%
NM	42,431	144,171	-	-	186,602	0.3%
CA	11,978	173,319	-	-	185,297	0.3%
DC	70,920	71,353	2	40,101	182,376	0.3%
WI	74,300	88,501	-	-	162,801	0.3%
MI	69,736	46,315	-	-	116,051	0.2%
WV	19,970	81,928	-	-	101,898	0.2%
WY	89,309	6,736	-	-	96,045	0.2%
IA	37,160	45,716	-	-	82,876	0.1%
OK	15,666	39,158	-	-	54,824	0.1%
ID	2,328	29,898	-	-	32,226	0.1%
AZ	-	30,379	2	-	30,381	0.0%
ME	22,120	3,983	-	-	26,103	0.0%
MD	-	21,110	-	4,812	25,921	0.0%
WA	-	25,388	-	-	25,388	0.0%
KS	7,146	14,341	-	-	21,487	0.0%
MA	880	12,669	-	-	13,549	0.0%
OR	2,848	8,131	-	-	10,979	0.0%
NE	2,736	7,435	-	-	10,171	0.0%
VT	-	7,364	-	-	7,364	0.0%
SD	-	6,235	-	-	6,235	0.0%
NV	3,600	2,494	-	-	6,094	0.0%
CO	-	5,596	-	-	5,596	0.0%
UT	890	4,057	-	-	4,947	0.0%
MT	3,862	362	-	-	4,224	0.0%
NJ	-	2,834	-	977	3,812	0.0%
DE	-	3,576	-	-	3,576	0.0%
ND	-	2,452	-	-	2,452	0.0%
CT	-	2,339	-	-	2,339	0.0%
RI	-	233	-	-	233	0.0%
NH	-	26	-	-	26	0.0%
Total	15,012,465	46,513,478	650	1,328,525	62,855,118	100.0%



Table 6-6
Outbound Domestic Commodity Flows by Destination State

State	Rail Tons	Truck Tons	Air Tons	Water Tons	Total	Percentage
GA	5,398,112	28,485,857	1,895	-	33,885,864	56.9%
FL	1,084,555	3,267,219	-	16,212	4,367,986	7.3%
NC	770,501	2,364,121	812	195,688	3,331,122	5.6%
TN	332,563	1,330,924	-	-	1,663,487	2.8%
SC	248,951	1,285,457	-	101,469	1,635,877	2.7%
AL	390,589	1,185,515	-	-	1,576,104	2.6%
NY	252,251	1,072,760	10	6,553	1,331,575	2.2%
WI	437,258	754,971	-	-	1,192,229	2.0%
OH	372,894	755,997	-	-	1,128,891	1.9%
TX	331,590	742,097	-	1,361	1,075,048	1.8%
LA	223,794	500,010	-	67,459	791,263	1.3%
OK	-	741,868	-	-	741,868	1.2%
PA	298,120	438,223	1	1,632	737,976	1.2%
ME	403,299	317,492	-	-	720,791	1.2%
DC	135,656	574,571	-	-	710,227	1.2%
IL	126,384	530,446	13	-	656,843	1.1%
VA	190,488	291,879	-	9,996	492,363	0.8%
KY	144,603	254,134	-	-	398,737	0.7%
MS	92,024	265,832	-	11,102	368,958	0.6%
MI	162,201	176,530	2	-	338,733	0.6%
MO	161,260	162,798	-	-	324,058	0.5%
CA	74,474	247,027	1	-	321,502	0.5%
MN	184,806	131,106	-	-	315,912	0.5%
IN	56,689	225,500	-	-	282,189	0.5%
AR	112,756	123,548	-	-	236,304	0.4%
MA	67,554	142,569	1	-	210,124	0.4%
IA	14,520	118,077	-	-	132,597	0.2%
OR	43,685	61,266	-	-	104,952	0.2%
WV	2,640	72,750	-	-	75,390	0.1%
WA	15,538	45,015	-	-	60,553	0.1%
MD	5,330	47,356	-	-	52,686	0.1%
NE	-	43,696	-	-	43,696	0.1%
CO	3,192	39,684	-	-	42,876	0.1%
AZ	6,052	24,361	-	-	30,413	0.1%
KS	-	29,855	-	-	29,855	0.1%
CT	21,360	6,830	-	-	28,190	0.0%
NJ	1,320	23,123	-	-	24,443	0.0%
UT	-	13,484	-	-	13,484	0.0%
VT	3,956	8,571	-	-	12,527	0.0%
ID	-	9,388	-	-	9,388	0.0%
MT	-	8,474	-	-	8,474	0.0%
DE	-	7,063	-	-	7,063	0.0%
NV	-	6,812	-	-	6,812	0.0%
SD	2,018	3,237	-	-	5,255	0.0%
ND	-	3,493	-	-	3,493	0.0%
NM	-	2,305	-	-	2,305	0.0%
RI	-	700	-	-	700	0.0%
NH	-	667	-	-	667	0.0%
WY	-	378	-	-	378	0.0%
Total	12,172,984	46,945,034	2,735	411,472	59,532,226	100.0%



Figure 6-7
Origin States for Inbound Tonnage (Truck) to Study Area Counties

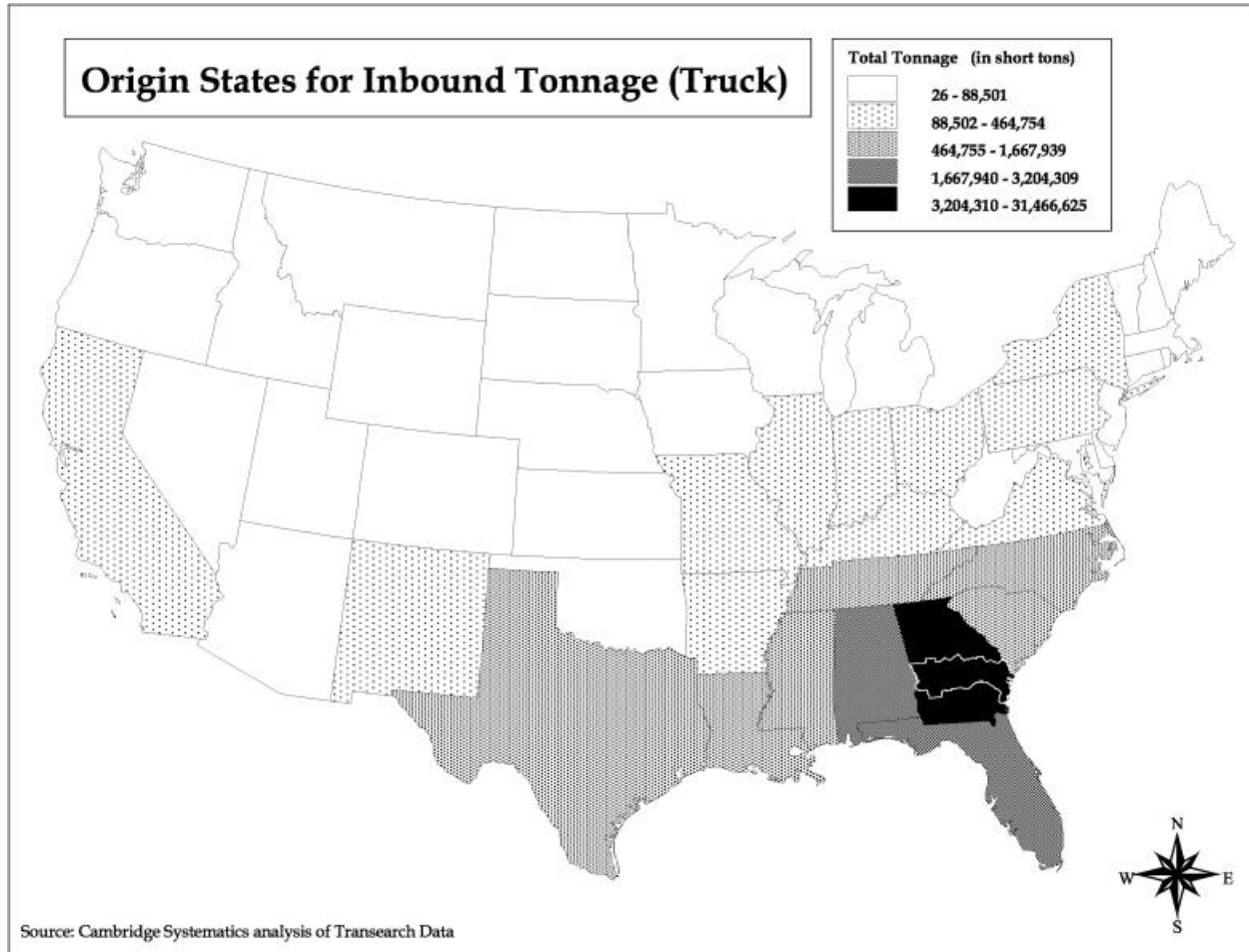




Figure 6-8
Destination States for Outbound Tonnage (Truck) from Study Area Counties

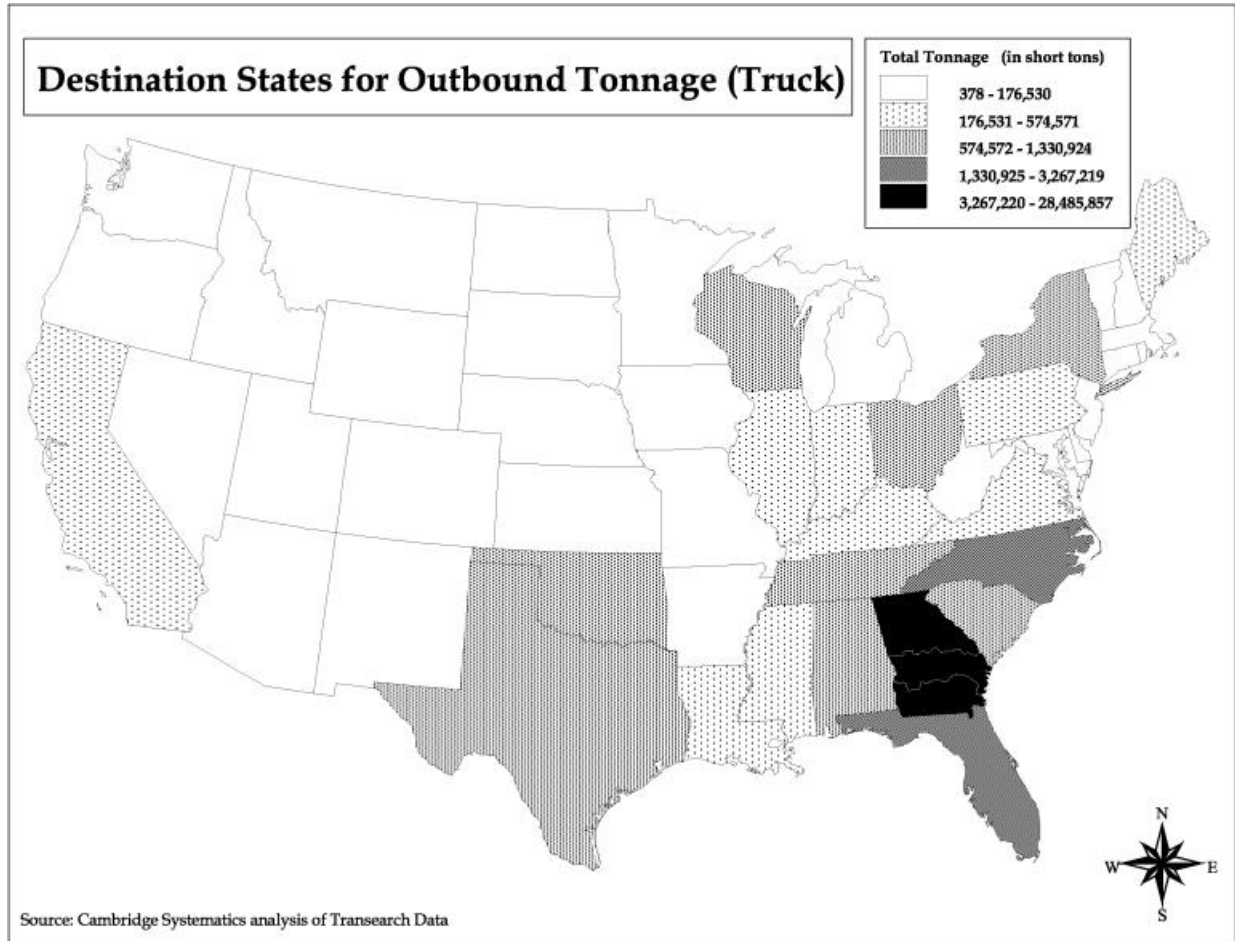




Figure 6-9
Origin States for Inbound Tonnage (Rail) to Study Area Counties

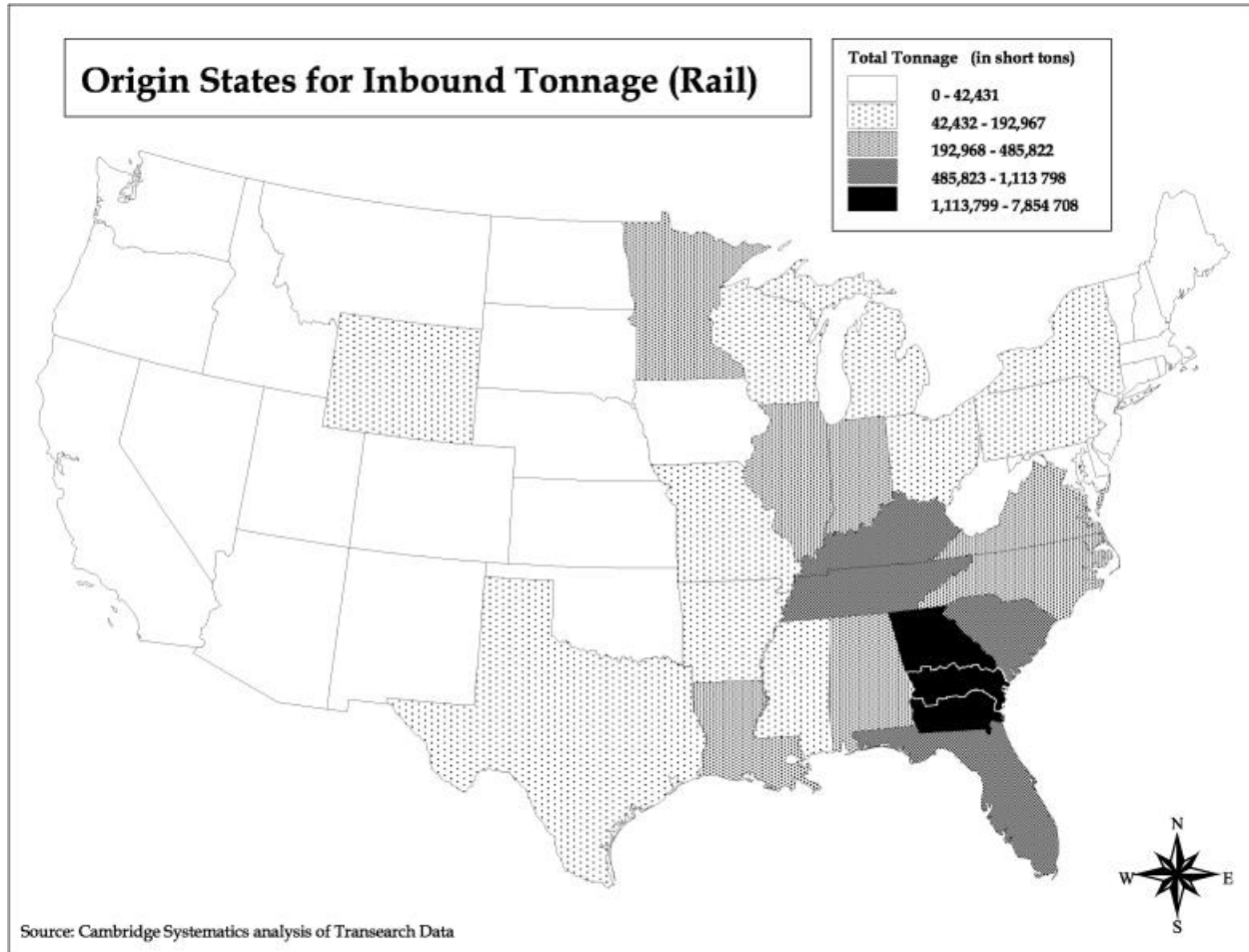
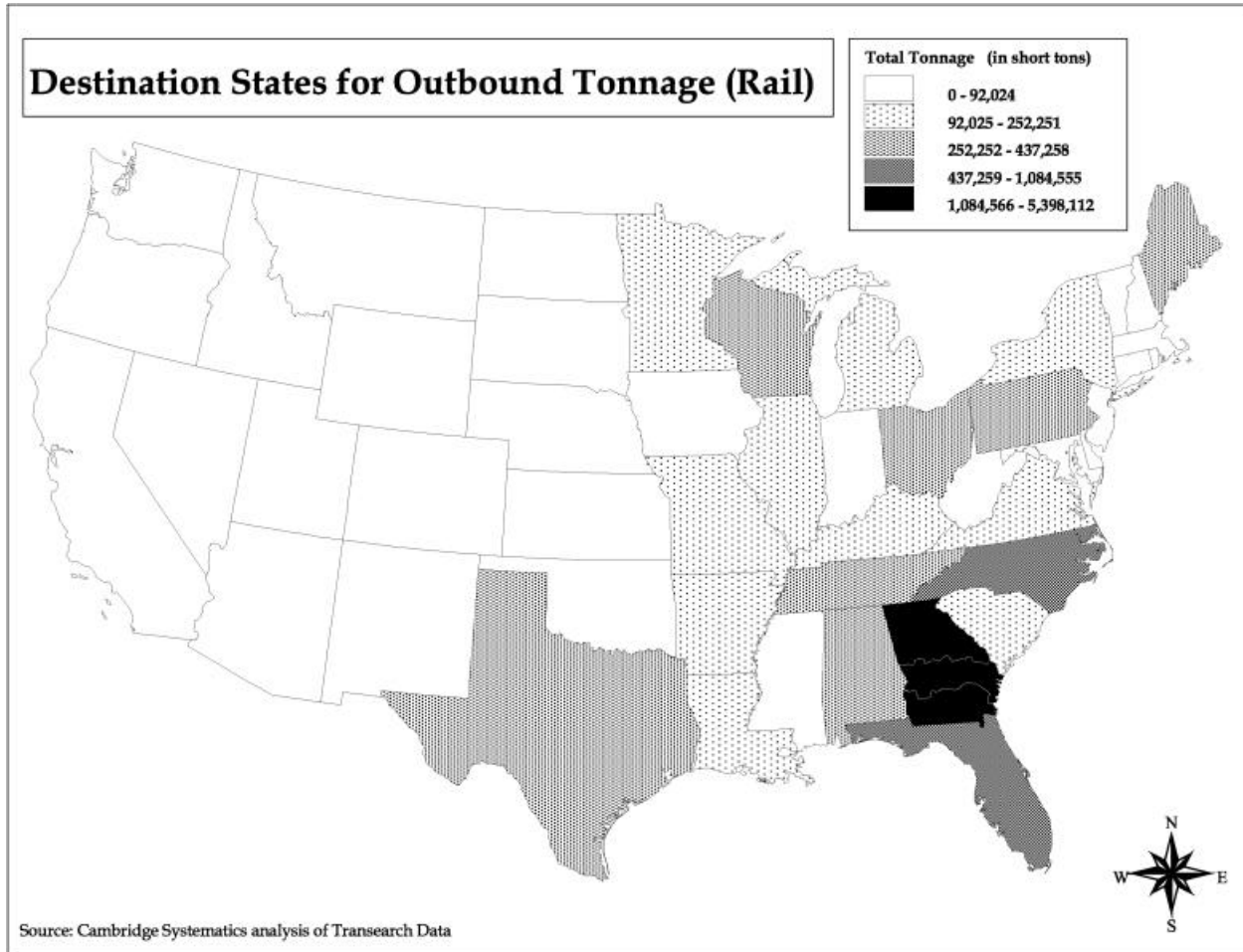




Figure 6-10
Destination States for Outbound Tonnage (Rail) from Study Area Counties



The state of Georgia (including the study area itself) is by far the most significant generator of tons moving inbound to and outbound from the study area counties. Looking in more detail at



these within-state flows, we see that 24 percent of the within-state tonnage is to and from Fulton County and more than 40 percent of the within-state tonnage is to and from the greater Atlanta region. The Atlanta area generates more tonnage into and out of the study area than any other region – or state, for that matter – in the country.

Table 6-7
Origins and Destinations for Study Area Tonnage Within State of Georgia

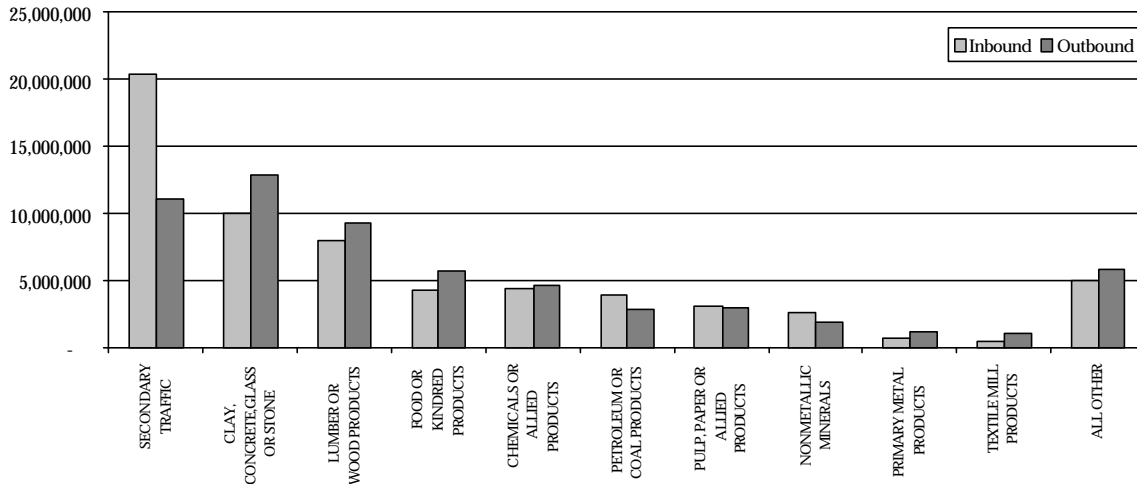
County	Rail Tons	Truck Tons	Air Tons	Water Tons	Total	Percentage
Fulton	392,054	17,201,513	2,294	-	17,595,861	24.0%
Gwinnett	261,813	4,287,098	-	-	4,548,911	6.2%
Chatham	1,744,484	2,289,317	-	-	4,033,802	5.5%
Dekalb	150,012	3,362,899	-	-	3,512,911	4.8%
Cobb	-	2,606,057	-	-	2,606,057	3.6%
Richmond	595,353	1,954,429	-	-	2,549,782	3.5%
Bibb	543,155	1,545,888	-	-	2,089,043	2.9%
Washington	1,275,102	283,253	-	-	1,558,356	2.1%
Dougherty	295,367	1,084,407	-	-	1,379,774	1.9%
Clayton	70,493	1,278,760	-	-	1,349,253	1.8%
Hall	103,920	1,217,488	-	-	1,321,408	1.8%
Wilkinson	730,698	390,957	-	-	1,121,655	1.5%
Muscogee	85,955	958,568	-	-	1,044,523	1.4%
All Other	7,004,413	21,491,848	-	-	28,496,261	38.9%
Total Georgia Tonnage	13,252,820	59,952,482	2,294	-	73,207,596	100.0%

Commodity Types

Figure 6-11 below is a bar chart showing the distribution of inbound and outbound tons by commodity class at a fairly aggregated (two-digit STCC) level. The graph provides a quick visual ranking of the most important commodity classes. Inbound and outbound tons are graphed separately to highlight the directionality (or lack thereof) of particular commodity classes.



Figure 6-11
Inbound and Outbound Domestic Tonnage by Commodity Type



We see that secondary traffic – principally associated with warehousing and distribution of a wide variety of commodity types – is the leading class of tonnage. Clay, concrete, glass, and stone – which includes kaolin clay, wet cement, and other heavy materials – is the second leading class. Lumber, food, and chemicals round out the top five classes. Overall, the picture is one of highly diversified types of commodity movements.

Looking at commodities moving inbound to study area counties, secondary traffic is clearly dominant. Looking at the outbound commodities, however, we see that Clay, concrete, glass, and stone is the leading type. Generally, we can interpret this to mean that the study area counties are exporting more raw materials and manufactured products, and importing more warehoused products and consumer goods.

Tables 6-8 through 6-11 on the following pages provide additional detail on these commodity types and highlight the differences between truck-oriented commodities (such as secondary traffic and food) and rail-oriented commodities (such as kaolin, wood pulp, and coal).



**Table 6-8
Inbound Domestic Commodity Types, Two-Digit STCC Level**

STCC 2	Commodity Type	Rail Tons	Truck Tons	Air Tons	Water Tons	Total
50	Secondary traffic	-	20,393,345	-	-	20,393,345
32	Clay, concrete, glass, or stone	3,542,332	6,403,031	1	-	9,945,364
24	Lumber or wood products	1,991,613	5,951,960	-	-	7,943,573
28	Chemicals or allied products	1,316,939	2,932,946	34	194,003	4,443,922
20	Food or kindred products	535,658	3,793,663	-	-	4,329,321
29	Petroleum or coal products	414,985	2,830,628	-	748,409	3,994,022
26	Pulp, paper, or allied products	1,350,938	1,760,790	5	-	3,111,733
14	Nonmetallic minerals	2,610,755	-	-	553	2,611,308
11	Coal	1,085,369	92,912	-	-	1,178,282
40	Waste or scrap materials	479,134	-	-	384,224	863,358
33	Primary metal products	36,861	641,669	2	-	678,533
1	Farm products	446,273	147,961	-	-	594,234
46	Misc. mixed shipments	515,214	-	240	-	515,454
22	Textile mill products	-	437,284	-	-	437,284
37	Transportation equipment	84,166	336,070	23	-	420,259
10	Metallic ores	362,718	-	-	-	362,718
35	Machinery	72,611	126,657	35	-	199,304
34	Fabricated metal products	-	175,921	1	-	175,922
30	Rubber or misc. plastics	-	171,454	-	-	171,454
42	Shipping containers	106,948	-	-	-	106,948
27	Printed matter	-	82,968	13	-	82,981
36	Electrical equipment	508	82,331	16	-	82,854
25	Furniture or fixtures	-	51,392	-	-	51,392
41	Misc. freight shipments	42,332	-	-	1,337	43,670
39	Misc. manufacturing products	-	40,634	-	-	40,634
23	Apparel or related products	800	22,874	9	-	23,683
21	Tobacco products	-	17,780	-	-	17,780
38	Instrum, photo equip, optical eq	-	16,790	-	-	16,790
19	Ordnance or accessories	8,640	-	-	-	8,640
45	Shipper association traffic	7,670	-	-	-	7,670
31	Leather or leather products	-	2,417	-	-	2,417
43	Mail or contract traffic	-	-	271	-	271
Total		15,012,465	46,513,478	650	1,328,525	62,855,118





**Table 6-9
Inbound Domestic Commodity Types, Detail on Top Five Classes**

STCC	Commodity Type	Rail Tons	Truck Tons	Air Tons	Water Tons	Total
50	Secondary traffic	-	20,393,345	-	-	20,393,345
5010	Warehouse and distribution center	-	18,759,119	-	-	18,759,119
5020	Rail intermodal drayage	-	1,569,845	-	-	1,569,845
5030	Air freight drayage	-	64,382	-	-	64,382
	Other	-	0	-	-	0
32	Clay, concrete, glass, or stone	3,542,332	6,403,031	1	-	9,945,364
3295	Nonmetal minerals, processed	3,368,215	1,036,936	-	-	4,405,151
3273	Ready-mix concrete, wet	-	4,303,700	-	-	4,303,700
3271	Concrete products	-	717,720	-	-	717,720
3241	Portland cement	91,560	92,832	-	-	184,393
3275	Gypsum products	45,418	137,817	-	-	183,235
3251	Clay brick or tile	-	46,723	-	-	46,723
3296	Mineral wool	9,685	26,090	-	-	35,775
3274	Lime or lime plaster	27,454	327	-	-	27,781
	Other	-	40,886	1	-	40,887
24	Lumber or wood products	1,991,613	5,951,960	-	-	7,943,573
2411	Primary forest materials	1,926,407	4,390,927	-	-	6,317,334
2429	Misc. sawmill or planing mill	-	648,432	-	-	648,432
2421	Lumber or dimension stock	20,690	477,694	-	-	498,384
2432	Plywood or veneer	38,778	246,237	-	-	285,015
2433	Prefab wood buildings	-	67,146	-	-	67,146
2491	Treated wood products	3,013	45,972	-	-	48,985
2431	Millwork or cabinetwork	-	26,955	-	-	26,955
2499	Misc. wood products	2,724	22,654	-	-	25,378
	Other	-	25,943	-	-	25,943
28	Chemicals or allied products	1,316,939	2,932,946	34	194,003	4,443,922
2812	Potassium or sodium compound	518,129	1,115,558	8	27,504	1,661,199
2818	Misc. industrial organic chemicals	256,412	267,487	5	29,366	553,270
2879	Misc. agricultural chemicals	-	401,749	2	-	401,751
2821	Plastic mater or synth fibers	79,791	295,255	2	104	375,153
2861	Gum or wood chemicals	187,704	87,598	-	596	275,897
2819	Misc. indus inorganic chemicals	179,661	47,035	10	30,341	257,047
2899	Chemical preparations, nec	30,898	180,672	2	28,535	240,107
2815	Cyclic intermediates or dyes	8,178	104,496	2	46,779	159,454
	Other	56,166	433,097	3	30,777	520,044
20	Food or kindred products	535,658	3,793,663	-	-	4,329,321
2086	Soft drinks or mineral water	-	733,251	-	-	733,251
2092	Soybean oil or by-products	120,676	470,689	-	-	591,365
2061	Sugar mill prod or by-prod	222,146	251,839	-	-	473,985
2091	Cottonseed oil or by-prod	25,880	368,692	-	-	394,572
2082	Malt liquors	-	310,606	-	-	310,606
2042	Prepared or canned feed	16,600	229,896	-	-	246,496
2041	Flour or other grain mill products	4,184	174,756	-	-	178,940
2046	Wet corn milling or milo	43,730	127,959	-	-	171,689
	Other	102,442	1,125,974	-	-	1,228,416



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	All other	7,625,923	7,038,533	615	1,134,523	15,799,593
Total		15,012,465	46,513,478	650	1,328,525	62,855,118



Table 6-10
Outbound Domestic Commodity Types, Two-Digit STCC Level

STCC 2	Commodity Type	Rail Tons	Truck Tons	Air Tons	Water Tons	Total
32	Clay, concrete, glass or stone	3,742,182	9,174,047	4	-	12,916,234
50	Secondary traffic	-	11,044,620	-	-	11,044,620
24	Lumber or wood products	1,409,111	7,894,882	-	-	9,303,993
20	Food or kindred products	350,777	5,333,496	-	-	5,684,273
28	Chemicals or allied products	1,194,367	3,464,393	419	-	4,659,179
26	Pulp, paper or allied products	1,637,238	1,308,169	-	-	2,945,407
29	Petroleum or coal products	163,370	2,396,297	-	304,413	2,864,080
14	Nonmetallic minerals	1,986,351	-	-	421	1,986,773
33	Primary metal products	54,924	1,130,207	20	-	1,185,151
22	Textile mill products	-	1,074,552	11	-	1,074,563
34	Fabricated metal products	-	646,608	9	-	646,617
1	Farm products	159,369	476,275	-	-	635,644
10	Metallic ores	589,987	-	-	-	589,987
37	Transportation equipment	51,570	523,691	316	-	575,577
30	Rubber or misc. plastics	2,210	491,479	6	-	493,695
35	Machinery	24,515	413,849	421	-	438,786
36	Electrical equipment	-	427,053	282	-	427,335
46	Misc. mixed shipments	420,456	-	18	-	420,474
40	Waste or scrap materials	257,442	-	-	98,697	356,139
21	Tobacco products	-	230,487	-	-	230,487
11	Coal	-	218,108	-	-	218,108
39	Misc. manufacturing products	-	189,680	12	-	189,692
25	Furniture or fixtures	-	175,953	-	-	175,953
23	Apparel or related products	-	139,735	18	-	139,754
27	Printed matter	-	123,486	18	-	123,504
42	Shipping containers	55,150	-	-	-	55,150
31	Leather or leather products	-	51,840	-	-	51,840
41	Misc. freight shipments	40,312	-	-	7,940	48,253
38	Instrum, photo equip, optical eq	-	16,125	91	-	16,217
19	Ordnance or accessories	15,473	-	-	-	15,473
45	Shipper association traffic	10,196	-	-	-	10,196
47	Small packaged freight shipments	7,982	-	-	-	7,982
43	Mail or contract traffic	-	-	1,090	-	1,090



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Total		12,172,984	46,945,034	2,735	411,472	59,532,226
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Table 6-11
Outbound Domestic Commodity Types, Detail on Top Five Classes

STCC	Commodity Type	Rail Tons	Truck Tons	Air Tons	Water Tons	Total
32	Clay, concrete, glass, or stone	3,742,182	9,174,047	4	-	12,916,234
3295	Nonmetal minerals, processed	3,328,212	2,745,930	4	-	6,074,147
3273	Ready-mix concrete, wet	-	3,779,222	-	-	3,779,222
3241	Portland cement	307,684	758,780	-	-	1,066,464
3271	Concrete products	-	834,842	-	-	834,842
3275	Gypsum products	-	410,193	-	-	410,193
3251	Clay brick or tile	103,592	204,213	-	-	307,805
3281	Cut stone or stone products	-	165,585	-	-	165,585
3253	Ceramic floor or wall tile	-	82,592	-	-	82,592
	Other	2,694	192,690	-	-	195,384
50	Secondary traffic	-	11,044,620	-	-	11,044,620
5010	Warehouse and distribution center	-	9,480,706	-	-	9,480,706
5020	Rail intermodal drayage	-	1,537,154	-	-	1,537,154
5030	Air freight drayage	-	26,761	-	-	26,761
	Other	-	-	-	-	-
24	Lumber or wood products	1,409,111	7,894,882	-	-	9,303,993
2411	Primary forest materials	1,062,392	5,100,867	-	-	6,163,259
2421	Lumber or dimension stock	168,650	626,568	-	-	795,218
2429	Misc. sawmill or planing mill	-	620,424	-	-	620,424
2432	Plywood or veneer	23,631	514,124	-	-	537,756
2491	Treated wood products	75,952	292,851	-	-	368,803
2433	Prefab wood buildings	-	323,463	-	-	323,463
2499	Misc. wood products	78,486	152,768	-	-	231,254
2498	Wood prod, nec	-	36,915	-	-	36,915
	Other	-	226,903	-	-	226,903
20	Food or kindred products	350,777	5,333,496	-	-	5,684,273
2086	Soft drinks or mineral water	-	821,863	-	-	821,863
2062	Sugar, refined, cane, or beet	244,598	404,427	-	-	649,025
2082	Malt liquors	-	594,623	-	-	594,623
2017	Processed poultry or eggs	-	321,220	-	-	321,220
2016	Dressed poultry, frozen	4,708	307,818	-	-	312,526
2092	Soybean oil or by-products	3,742	306,745	-	-	310,487
2015	Dressed poultry, fresh	-	308,815	-	-	308,815
2093	Nut or veg oils or by-products	70,185	174,118	-	-	244,303
	Other	27,544	2,093,868	-	-	2,121,412
28	Chemicals or allied products	1,194,367	3,464,393	419	-	4,659,179
2812	Potassium or sodium compound	122,522	1,198,538	-	-	1,321,060
2818	Misc. industrial organic chemicals	195,502	610,538	-	-	806,040
2819	Misc. industrial inorganic chemicals	634,352	79,628	-	-	713,980
2879	Misc. agricultural chemicals	4,956	388,079	-	-	393,035
2871	Fertilizers	12,217	249,554	-	-	261,770
2813	Industrial gases	4,040	221,344	-	-	225,384
2821	Plastic mater or synth fibers	30,766	169,704	-	-	200,470
2861	Gum or wood chemicals	95,518	97,780	-	-	193,298



	Other	94,494	449,228	419	-	544,141
	All other	5,476,546	10,033,596	2,312	411,472	15,923,926
Total		12,172,984	46,945,034	2,735	411,472	59,532,226

Profiles of Individual Counties Within the Study Area

Among the 45 study area counties, there is broad variation in overall freight activity, origin and destination patterns, and commodities moved. Individual reports on each of the 45 study area counties are contained in Appendix XX, and some of their key attributes are described below.

Tonnage and Modal Share

The counties within the study area are widely divergent in terms of their types and levels of freight activity. By a wide margin, the leading county in terms of inbound and outbound tonnage is Chatham County, which is home to a number of major industries, as well as the Port of Savannah, and accounts for 33 percent of the study area’s inbound and outbound tonnage. Other leading counties for freight tonnage include Bibb, Muscogee, Glynn (home to the Port of Brunswick), Wilkinson, and Houston Counties; this is consistent with the business locations and economic profile data presented in Section 5. Other counties with more than two million tons include Twiggs, Crisp, Laurens, Sumter, and Liberty; together, the 11 counties with more than two million tons represent 83 percent of the total inbound and outbound tonnage in the study area.

The most significant impact of this is that trip origins and destinations are not evenly distributed throughout the study area, but tend to be heavily clustered in areas of more intense economic activity, separated by areas of lesser activity. This, in turn, implies several levels of functionality for the HPC 6 and U.S. 280 corridors:

- Serving established clusters of intense freight movement and economic activity, including Georgia’s international seaports;
- Serving smaller but economically important clusters that currently exist outside of major activity areas; and
- Serving economically emergent (or potentially emergent) areas by accommodating future development of freight-generating land uses.

Most of the study area counties show a balance between inbound and outbound tonnage, although some are characterized by imbalances. For example, Glynn County tonnage is 71 percent inbound (much of it for export through the Port of Brunswick). Tattnall County, on the other hand, is 86 percent outbound (principally secondary traffic and metal products).

In terms of modal share, most of the study area counties are dominated by trucks. Some counties – including Emmanuel, Toombs, Tattnall, and Harris – show 100 percent of their tonnage by truck. But there are many counties that also move a substantial share of their traffic by rail, including Talbot (87 percent), Crawford (78 percent), Effingham (53 percent), and Macon (50 percent). Not surprisingly, the only counties to show significant domestic waterborne tonnage are Chatham (four percent) and Glynn (two percent); international waterborne tonnage through



the Ports of Savannah and Brunswick is discussed later in this section of the report. Air cargo tonnage is not significant in any of the study area counties, although air cargo service can be an important attribute of a region’s attractiveness to specific types of businesses.

**Table 6-12
Inbound and Outbound Tonnage by County**

County	Total Tonnage	Tons		Share	
		Inbound	Outbound	Inbound	Outbound
Chatham	40,347,837	21,539,345	18,808,492	53%	47%
Bibb	17,904,983	7,273,151	10,631,832	41%	59%
Muscogee	10,155,944	5,250,818	4,905,126	52%	48%
Glynn	9,294,888	6,570,653	2,724,235	71%	29%
Wilkinson	5,822,737	3,305,359	2,517,378	57%	43%
Houston	3,916,469	2,071,673	1,844,796	53%	47%
Twiggs	3,060,652	1,640,453	1,420,198	54%	46%
Crisp	3,010,120	1,861,793	1,148,327	62%	38%
Laurens	2,631,814	970,048	1,661,767	37%	63%
Sumter	2,580,836	1,228,386	1,352,450	48%	52%
Liberty	2,483,392	1,740,682	742,710	70%	30%
Bulloch	1,943,918	1,014,389	929,529	52%	48%
Macon	1,877,273	1,078,926	798,347	57%	43%
Effingham	1,790,958	1,409,359	381,598	79%	21%
Emanuel	1,735,176	718,090	1,017,086	41%	59%
Toombs	1,315,489	397,275	918,214	30%	70%
Tattnell	1,273,219	183,241	1,089,978	14%	86%
Evans	1,262,566	446,307	816,259	35%	65%
Harris	1,194,226	588,269	605,957	49%	51%
Talbot	1,111,010	138,748	972,261	12%	88%
Peach	994,214	450,471	543,742	45%	55%
Dodge	885,828	324,683	561,146	37%	63%
Dooly	799,094	189,616	609,478	24%	76%
Stewart	754,845	194,138	560,708	26%	74%
Upson	660,902	415,955	244,948	63%	37%
Terrell	398,928	179,588	219,340	45%	55%
Telfair	361,506	191,311	170,195	53%	47%
Candler	337,409	71,254	266,155	21%	79%
Bleckley	303,856	220,765	83,091	73%	27%
Taylor	254,389	78,256	176,133	31%	69%
Crawford	245,604	49,370	196,234	20%	80%
McIntosh	190,073	134,638	55,436	71%	29%
Marion	188,418	141,658	46,760	75%	25%
Bryan	182,548	117,304	65,244	64%	36%
Chattahoochee	170,063	92,715	77,348	55%	45%
Wilcox	166,675	73,154	93,522	44%	56%
Schley	163,240	126,230	37,010	77%	23%
Lee	132,707	106,296	26,411	80%	20%
Pulaski	132,673	80,241	52,432	60%	40%
Wheeler	108,657	28,873	79,784	27%	73%



Johnson	94,462	63,386	31,076	67%	33%
Treutlen	42,861	29,919	12,943	70%	30%
Webster	38,148	7,381	30,767	19%	81%
Montgomery	36,416	34,512	1,904	95%	5%
Long	30,322	26,440	3,882	87%	13%
Total	122,387,344	62,855,118	59,532,226	51%	49%



**Table 6-13
Inbound and Outbound Modal Share by County**

Name	Total Tonnage	Rail Tons	Truck Tons	Air Tons	Water Tons	Rail Share	Truck Share
Chatham County	40,347,837	11,403,436	27,376,191	2,885	1,565,326	28%	68%
Bibb County	17,904,983	2,442,398	15,462,538	47	-	14%	86%
Muscogee County	10,155,944	969,607	9,185,916	420	-	10%	90%
Glynn County	9,294,888	2,722,669	6,397,513	34	174,671	29%	69%
Wilkinson County	5,822,737	2,188,282	3,634,455	-	-	38%	62%
Houston County	3,916,469	662,148	3,254,321	-	-	17%	83%
Twiggs County	3,060,652	331,774	2,728,878	-	-	11%	89%
Crisp County	3,010,120	212,924	2,797,196	-	-	7%	93%
Laurens County	2,631,814	291,666	2,340,148	-	-	11%	89%
Sumter County	2,580,836	870,713	1,710,123	-	-	34%	66%
Liberty County	2,483,392	580,853	1,902,539	-	-	23%	77%
Bulloch County	1,943,918	137,426	1,806,492	-	-	7%	93%
Macon County	1,877,273	938,073	939,200	-	-	50%	50%
Effingham County	1,790,958	957,976	832,981	-	-	53%	47%
Emanuel County	1,735,176	7,906	1,727,270	-	-	0%	100%
Toombs County	1,315,489	-	1,315,489	-	-	0%	100%
Tattnall County	1,273,219	-	1,273,219	-	-	0%	100%
Evans County	1,262,566	54,094	1,208,472	-	-	4%	96%
Harris County	1,194,226	-	1,194,226	-	-	0%	100%
Talbot County	1,111,010	966,673	144,336	-	-	87%	13%
Peach County	994,214	21,205	973,008	-	-	2%	98%
Dodge County	885,828	416,694	469,134	-	-	47%	53%
Dooley County	799,094	152,714	646,380	-	-	19%	81%
Stewart County	754,845	-	754,845	-	-	0%	100%
Upson County	660,902	123,012	537,890	-	-	19%	81%
Terrell County	398,928	103,790	295,138	-	-	26%	74%
Telfair County	361,506	27,401	334,105	-	-	8%	92%
Candler County	337,409	73,560	263,849	-	-	22%	78%
Bleckley County	303,856	8,042	295,814	-	-	3%	97%
Taylor County	254,389	165,903	88,486	-	-	65%	35%
Crawford County	245,604	190,739	54,865	-	-	78%	22%
McIntosh County	190,073	-	190,073	-	-	0%	100%
Marion County	188,418	-	188,418	-	-	0%	100%
Bryan County	182,548	-	182,548	-	-	0%	100%
Chattahoochee County	170,063	71,500	98,563	-	-	42%	58%
Wilcox County	166,675	35,690	130,985	-	-	21%	79%
Schley County	163,240	7,136	156,104	-	-	4%	96%
Lee County	132,707	22,488	110,219	-	-	17%	83%
Pulaski County	132,673	-	132,673	-	-	0%	100%
Wheeler County	108,657	-	108,657	-	-	0%	100%
Johnson County	94,462	8,313	86,149	-	-	9%	91%
Treutlen County	42,861	-	42,861	-	-	0%	100%
Webster County	38,148	18,642	19,506	-	-	49%	51%
Montgomery County	36,416	-	36,416	-	-	0%	100%
Long County	30,322	-	30,322	-	-	0%	100%



Totals	122,387,344	27,185,449	93,458,513	3,385	1,739,997	22.2%	76.4%
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Figure 6-12
Origin Counties for Outbound Tonnage (Truck)

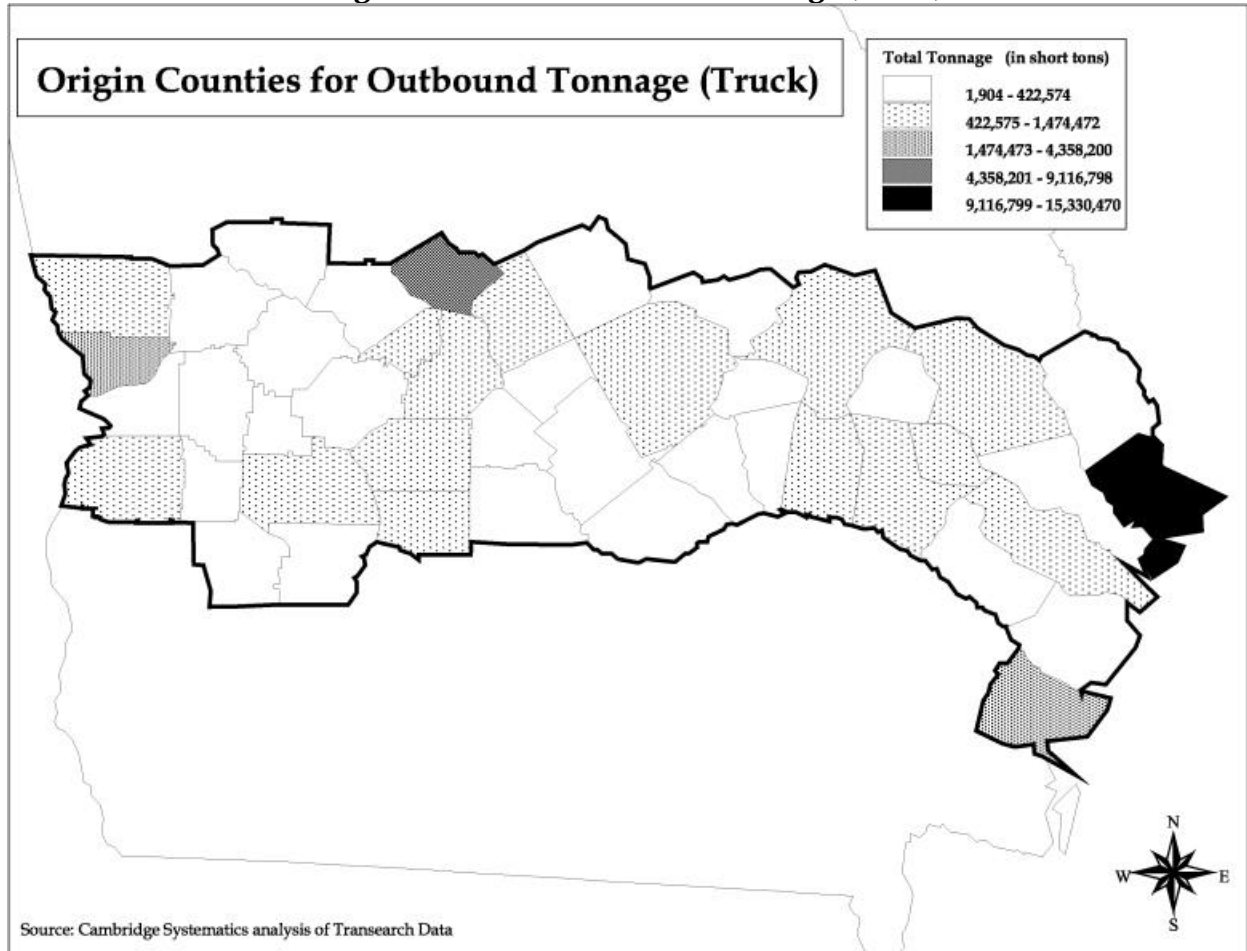




Figure 6-13
Destination Counties for Inbound Tonnage (Truck)

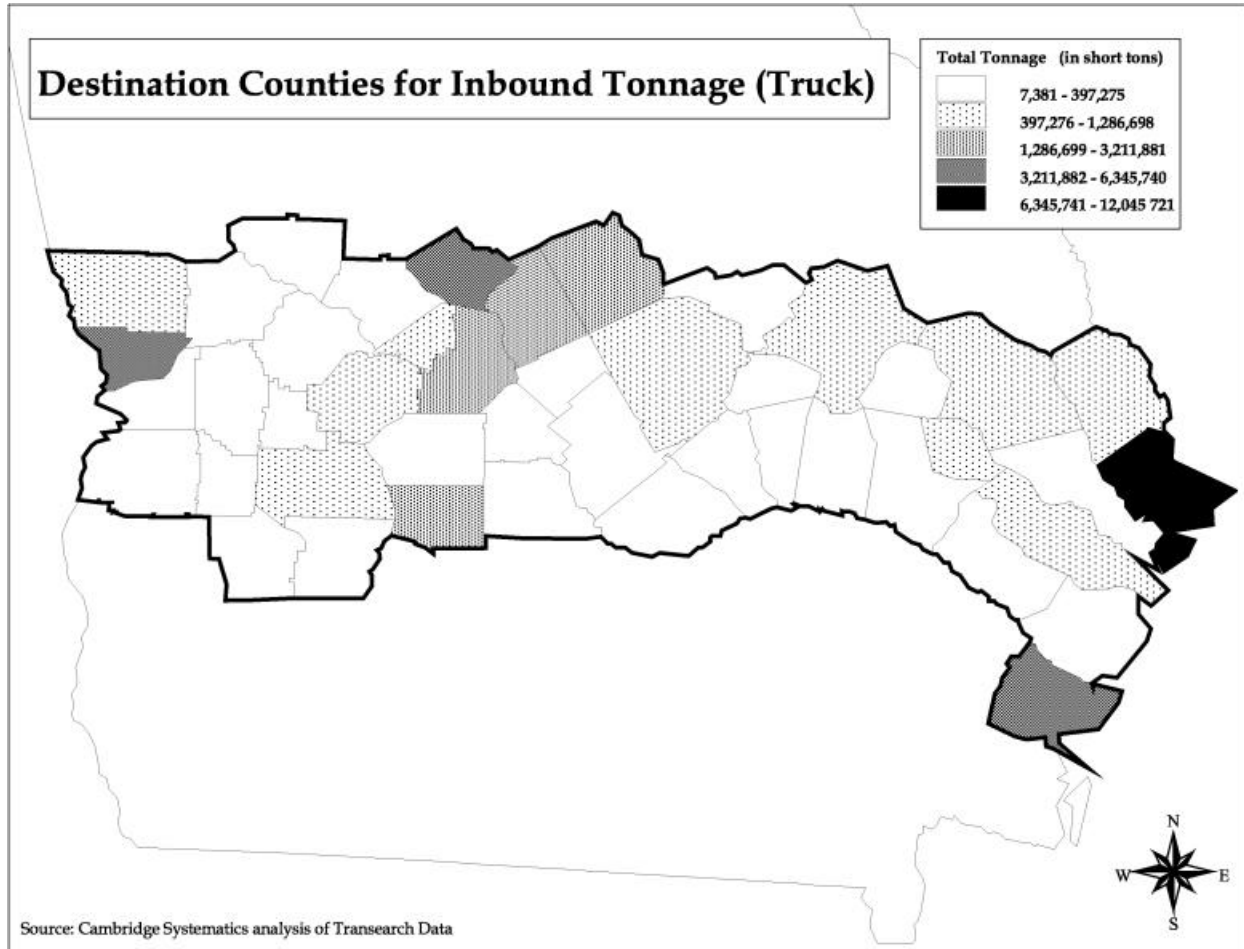




Figure 6-14
Origin Counties for Outbound Tonnage (Rail)

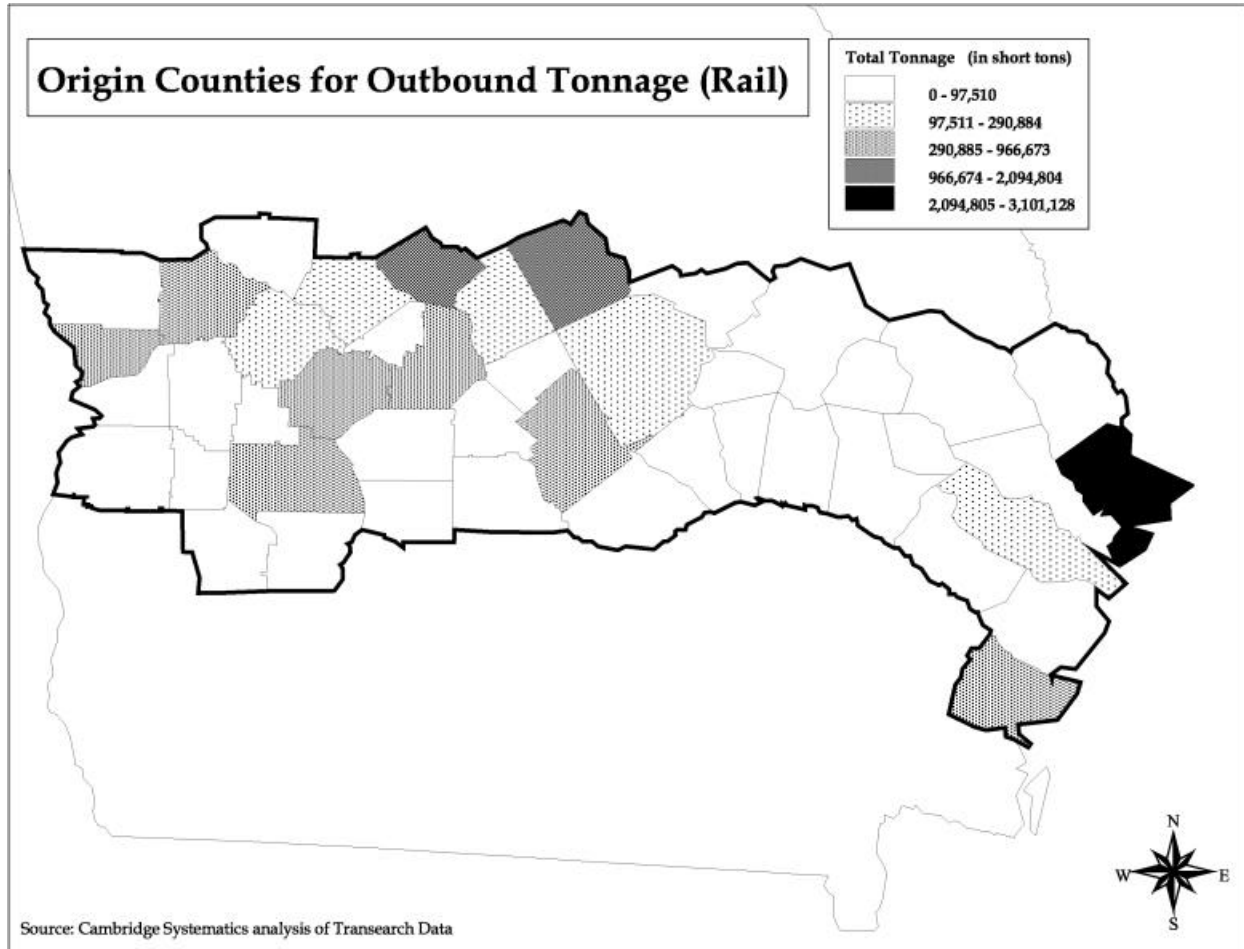




Figure 6-15
Destination Counties for Inbound Tonnage (Rail)

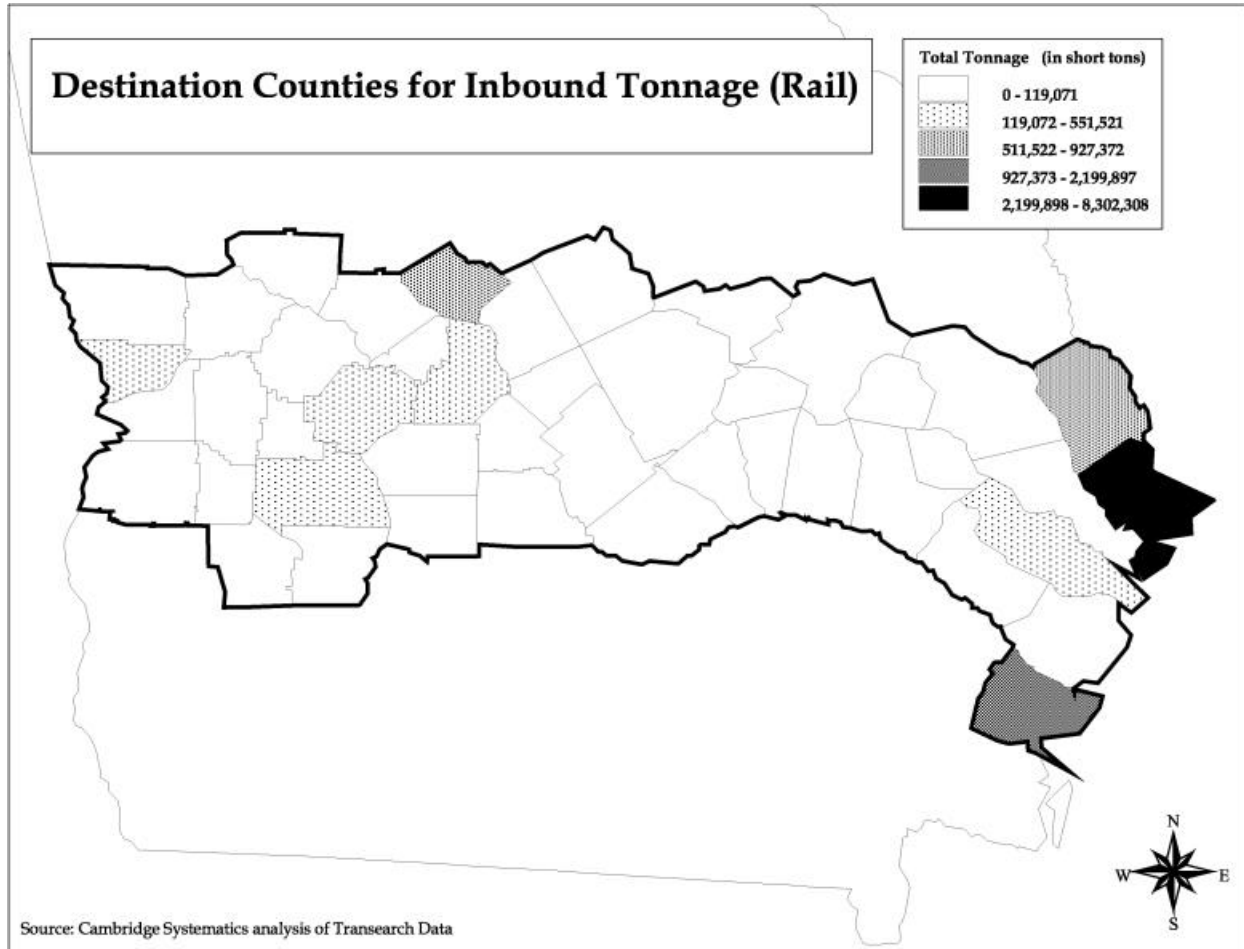




Table 6-14
Summary of Inbound and Outbound Truck and Railcar Loads

County	Total Tons	Trucks		Railcars	
		In	Out	In	Out
Chatham	40,347,837	640,117	923,261	166,046	62,023
Bibb	17,904,983	763,131	902,343	18,547	30,301
Muscogee	10,155,944	321,391	327,512	8,461	10,931
Glynn	9,294,888	259,908	119,790	43,998	10,455
Wilkinson	5,822,737	496,145	23,710	1,870	41,896
Houston	3,916,469	167,682	172,174	5,836	7,406
Twiggs	3,060,652	192,264	130,756	818	5,818
Crisp	3,010,120	219,764	57,224	2,308	1,950
Laurens	2,631,814	69,469	156,751	791	5,042
Sumter	2,580,836	73,099	49,358	6,954	10,461
Liberty	2,483,392	100,921	30,027	9,080	2,537
Bulloch	1,943,918	58,646	59,661	2,381	367
Macon	1,877,273	61,051	20,069	10,230	8,531
Effingham	1,790,958	40,764	15,846	18,012	1,148
Emanuel	1,735,176	66,215	54,117	158	-
Toombs	1,315,489	31,884	113,928	-	-
Tattnall	1,273,219	11,001	112,087	-	-
Evans	1,262,566	35,464	40,390	-	1,082
Harris	1,194,226	96,235	44,630	-	-
Talbot	1,111,010	32,979	447	-	19,333
Peach	994,214	36,800	30,329	304	120
Dodge	885,828	24,406	9,272	601	7,733
Dooly	799,094	7,860	95,763	1,665	1,389
Stewart	754,845	16,886	30,198	-	-
Upson	660,902	47,826	12,570	1,030	1,430
Terrell	398,928	13,224	6,929	276	1,800
Telfair	361,506	14,571	9,322	208	340
Candler	337,409	4,033	10,663	64	1,407
Bleckley	303,856	16,737	5,430	161	-
Taylor	254,389	5,802	756	76	3,242
Crawford	245,604	3,795	539	-	3,815
McIntosh	190,073	9,156	3,651	-	-
Marion	188,418	14,712	2,398	-	-
Bryan	182,548	6,203	5,781	-	-
Chattahoochee	170,063	5,494	467	-	1,430
Wilcox	166,675	4,157	4,097	374	340
Schley	163,240	14,622	1,639	-	143
Lee	132,707	5,601	395	-	450
Pulaski	132,673	5,725	2,605	-	-
Wheeler	108,657	1,560	4,175	-	-
Johnson	94,462	3,780	1,247	-	166
Treutlen	42,861	1,798	736	-	-
Webster	38,148	383	1,510	-	373



Montgomery	36,416	1,901	101	-	-
Long	30,322	1,363	226	-	-
Total	122,387,344	4,006,525	3,594,883	300,249	243,460

**Table 6-15
Inbound, Outbound, Internal, and Through Truck Tons**

County	Inbound	Outbound	Internal	Through	Total, All Types	Through Share
Bibb	6,345,740	9,116,798	137,994	52,856,097	68,456,629	77%
Chatham	12,045,721	15,330,470	453,196	27,519,119	55,348,506	50%
Houston	1,779,849	1,474,472	9,449	46,758,486	50,022,256	93%
Crisp	1,746,380	1,050,817	1,533	46,770,348	49,569,078	94%
Peach	435,253	537,755	509	46,847,335	47,820,852	98%
Dooly	106,362	540,018	165	46,769,162	47,415,707	99%
Crawford	49,370	5,495	-	46,820,461	46,875,326	100%
Glynn	4,232,979	2,164,534	7,834	25,806,876	32,212,223	80%
Harris	588,269	605,957	1,824	30,325,366	31,521,416	96%
Liberty	1,286,698	615,841	3,063	27,118,669	29,024,271	93%
Effingham	508,777	324,204	520	27,528,365	28,361,866	97%
Bryan	117,304	65,244	-	27,520,247	27,702,795	99%
McIntosh	134,638	55,436	-	25,602,007	25,792,081	99%
Muscogee	4,827,716	4,358,200	73,890	7,337,640	16,597,446	44%
Twiggs	1,599,563	1,129,314	9,530	8,448,854	11,187,261	76%
Laurens	930,505	1,409,643	4,482	4,244,625	6,589,255	64%
Bleckley	212,723	83,091	50	6,143,942	6,439,806	95%
Wilkinson	3,211,881	422,574	235	2,751,859	6,386,549	43%
Emanuel	710,184	1,017,086	2,752	3,674,039	5,404,061	68%
Stewart	194,138	560,708	249	4,639,953	5,395,048	86%
Chattahoochee	92,715	5,848	-	4,760,259	4,858,822	98%
Treutlen	29,919	12,943	-	4,349,735	4,392,597	99%
Telfair	180,918	153,187	4	3,646,541	3,980,650	92%
Toombs	397,275	918,214	1,161	2,605,780	3,922,430	66%
Dodge	294,627	174,508	199	3,328,749	3,798,083	88%
Bulloch	895,318	911,174	1,521	1,692,688	3,500,701	48%
Terrell	165,810	129,328	7	2,427,206	2,722,351	89%
Montgomery	34,512	1,904	-	2,642,168	2,678,584	99%
Candler	68,042	195,807	23	2,368,862	2,632,734	90%
Tattnall	183,241	1,089,978	283	1,248,487	2,521,989	50%
Lee	106,296	3,923	-	2,381,494	2,491,713	96%
Webster	7,381	12,125	-	2,268,867	2,288,373	99%
Sumter	880,698	829,425	3,003	115,467	1,828,593	6%
Long	26,440	3,882	-	1,516,662	1,546,984	98%
Wheeler	28,873	79,784	-	1,324,510	1,433,167	92%
Evans	446,307	762,165	838	6,540	1,215,850	1%
Wilcox	54,466	76,520	-	1,057,640	1,188,626	89%
Macon	567,406	371,795	763	247,592	1,187,556	21%



Upton	364,467	173,424	31	59,668	597,590	10%
Talbot	138,748	5,588	–	253,690	398,026	64%
Marion	141,658	46,760	–	199,093	387,511	51%
Pulaski	80,241	52,432	–	219,340	352,013	62%
Schley	126,230	29,874	1	183,542	339,647	54%
Taylor	74,456	14,030	55	219,119	307,660	71%
Johnson	63,386	22,763	–	140,335	226,484	62%
Total	46,513,478	46,945,034	715,163	554,747,484	648,921,166	85%

Looking at truck and railcar load equivalents, we see that the major freight handling counties – Chatham, Bibb, Muscogee, Glynn, Wilkinson, and Houston – are also the leaders in terms of truckloads handled. Bibb County handles more than 1.6 million truck loads annually. Chatham County is the leader – by a wide margin – in terms of railcar loads handled (almost 250,000); Bibb, Glynn, and Wilkinson also handle significant numbers of railcar loads. These figures do not include movements by empty trucks or empty railcars, so the total numbers of truck trips and railcar trips into and out of these counties are actually higher.

If we examine the truck tonnage in more detail, we find that 85 percent of the tonnage moving into, out of, within, or through the study area counties (more than 550,000,000 tons, if we count the tonnage each time it passes through a study area county) is associated with through trips. This includes through trips that begin and end outside the study area, as well as through trips that begin or end in a different county within the study area. The only counties not experiencing high levels of through trips are Sumter, Evans, Macon, and Upton. The clear message is that most of the truck capacity in a specific county is devoted not to meeting the access needs of that specific county, but to meeting the access needs of other study area counties as part of an overall freight network. This underscores the need for a corridor-level, regional network approach to freight movement within central Georgia.

Origins and Destinations

The study area counties exhibit a wide range of characteristics with respect to their origin and destination patterns – some counties ship and receive almost entirely within the state of Georgia, while others have southeastern U.S. focus, while still others are more oriented to the entire U.S. market.

- Shares of trade within the 45-county study area range from lows of one percent (Talbot) and two percent (Webster) to highs of 19 percent (Wilkinson) and 18 percent (Macon). However, most counties fall within a range of seven to 14 percent, indicating relatively consistent levels of within-study area tonnage flows (on a percentage basis) among the different counties.
- Shares of trade to and from the rest of Georgia range from lows of 30 percent (Webster) and 32 percent (Macon) to highs of 96 percent (Crawford) and 87 percent (Taylor). The higher tonnage counties tend to fall in the 40 to 60 percent range, while there is more variation in the lower tonnage counties.
- Shares of trade outside of the state of Georgia range from lows of one percent (Crawford) and seven percent (Taylor) to highs of 57 percent (Effingham), 50 percent (Macon), 49 percent (Chatham and Glynn), and 47 percent (Bibb). In general, the highest



tonnage counties had the highest share of traffic outside of the state of Georgia; in the case of Chatham and Glynn, a significant share can be attributed to port-related activity.



Table 6-16
Distribution of Inbound and Outbound Tonnage by County

County	Total Tonnage	Share of Tonnage To/From:					
		Study Area	Other Georgia	Mississippi, Alabama	Other West	Other Southeast	Rest of U.S.
Chatham	40,347,837	10%	41%	4%	9%	24%	12%
Bibb	17,904,983	12%	41%	6%	5%	14%	22%
Muscogee	10,155,944	10%	60%	5%	4%	12%	9%
Glynn	9,294,888	11%	40%	10%	8%	20%	11%
Wilkinson	5,822,737	19%	49%	3%	3%	10%	16%
Houston	3,916,469	14%	61%	3%	2%	10%	10%
Twiggs	3,060,652	16%	64%	4%	2%	8%	6%
Crisp	3,010,120	10%	60%	5%	3%	16%	6%
Laurens	2,631,814	12%	59%	2%	3%	17%	7%
Sumter	2,580,836	18%	42%	6%	3%	11%	20%
Liberty	2,483,392	10%	59%	2%	5%	15%	9%
Bulloch	1,943,918	9%	56%	3%	4%	19%	9%
Macon	1,877,273	18%	32%	3%	7%	11%	29%
Effingham	1,790,958	5%	38%	1%	1%	11%	44%
Emanuel	1,735,176	12%	67%	3%	2%	13%	3%
Toombs	1,315,489	14%	62%	2%	2%	13%	7%
Tattnall	1,273,219	13%	58%	2%	2%	17%	8%
Evans	1,262,566	10%	62%	2%	2%	18%	6%
Harris	1,194,226	10%	67%	7%	2%	9%	5%
Talbot	1,111,010	1%	68%	1%	1%	27%	2%
Peach	994,214	9%	58%	3%	7%	16%	7%
Dodge	885,828	7%	76%	1%	3%	10%	3%
Dooley	799,094	15%	57%	2%	5%	13%	8%
Stewart	754,845	8%	53%	16%	0%	20%	3%
Upson	660,902	12%	58%	4%	4%	10%	12%
Terrell	398,928	6%	52%	2%	10%	16%	14%
Telfair	361,506	7%	60%	5%	2%	14%	12%
Candler	337,409	7%	59%	21%	1%	9%	3%
Bleckley	303,856	11%	72%	2%	1%	13%	1%
Taylor	254,389	6%	87%	0%	1%	2%	4%
Crawford	245,604	3%	96%	0%	0%	1%	0%
McIntosh	190,073	11%	60%	2%	5%	15%	7%
Marion	188,418	9%	73%	5%	2%	8%	3%
Bryan	182,548	12%	74%	1%	2%	9%	2%
Chattahoochee	170,063	8%	84%	1%	2%	4%	1%
Wilcox	166,675	6%	67%	1%	0%	10%	16%
Schley	163,240	13%	68%	5%	3%	8%	3%
Lee	132,707	10%	70%	0%	1%	3%	16%
Pulaski	132,673	9%	77%	1%	1%	10%	2%
Wheeler	108,657	9%	75%	1%	0%	13%	2%
Johnson	94,462	14%	73%	2%	5%	4%	2%
Treutlen	42,861	9%	80%	0%	0%	10%	1%



Webster	38,148	2%	30%	3%	1%	35%	29%
Montgomery	36,416	13%	79%	2%	0%	4%	2%
Long	30,322	15%	75%	0%	3%	7%	0%
Total	122,387,344	11%	49%	5%	6%	17%	13%



Commodity Types

Eight two-digit commodity classes account for 90 percent of the inbound tonnage and 86 percent of the outbound tonnage of the study area. These classes are:

- STCC 14 – Non-Metallic Minerals,
- STCC 20 – Food or Kindred Products,
- STCC 24 – Lumber or Wood Products,
- STCC 26 – Pulp, Paper or Allied Products,
- STCC 28 – Chemicals and Allied Products,
- STCC 29 – Petroleum or Coal Products,
- STCC 32 – Clay, Stone, Concrete, Glass, and
- STCC 50 – Secondary Traffic.

As with origins and destinations, the study area counties exhibit differences with respect to the types of commodities they handle, and the degree to which they specialize in certain commodities. Tables 6-17 and 6-18 on the following pages indicate the relative shares of each county's tonnage that are associated with these commodity classes. The leading percentage class for each county is highlighted in bold face.



**Table 6-17
Inbound Tonnage, Commodity Types by County**

County	STCC								
	14 Non- Metallic Minerals	20 Food	24 Lumber, Wood	26 Pulp, Paper	28 Chemicals	29 Petroleum, Coal	32 Stone, Clay, Glass, Concrete	50 Secondary Traffic	All Other
Chatham	7%	7%	10%	8%	8%	9%	22%	19%	12%
Bibb	2%	13%	16%	3%	9%	4%	14%	28%	11%
Glynn	8%	5%	23%	12%	13%	5%	8%	19%	6%
Muscogee	1%	12%	13%	4%	6%	6%	18%	30%	10%
Wilkinson	2%	0%	1%	0%	0%	0%	1%	94%	1%
Houston	0%	7%	12%	1%	4%	5%	22%	40%	8%
Crisp	0%	2%	6%	0%	5%	1%	4%	79%	2%
Liberty	12%	3%	20%	1%	8%	5%	10%	38%	2%
Twiggs	0%	0%	1%	0%	0%	1%	6%	92%	1%
Effingham	8%	1%	7%	0%	3%	26%	9%	18%	28%
Sumter	1%	2%	14%	0%	10%	3%	16%	32%	20%
Macon	0%	15%	7%	1%	4%	1%	4%	31%	35%
Bulloch	9%	6%	22%	2%	2%	7%	17%	22%	12%
Laurens	0%	5%	26%	2%	5%	5%	17%	32%	8%
Emanuel	0%	4%	19%	0%	2%	5%	10%	57%	2%
Harris	0%	15%	9%	2%	0%	3%	13%	54%	3%
Peach	0%	3%	22%	1%	10%	7%	18%	33%	7%
Evans	0%	14%	11%	5%	0%	4%	20%	45%	1%
Upton	0%	6%	16%	12%	5%	8%	21%	26%	6%
Toombs	0%	6%	17%	1%	1%	7%	21%	36%	10%
Dodge	0%	6%	13%	10%	3%	6%	17%	42%	3%
Bleckley	0%	2%	12%	1%	4%	5%	38%	35%	3%
Stewart	0%	0%	20%	1%	0%	3%	7%	68%	1%
Telfair	0%	4%	12%	0%	0%	6%	19%	49%	9%
Dooly	0%	7%	11%	0%	45%	5%	13%	15%	3%
Tattnall	0%	6%	26%	1%	1%	12%	29%	21%	4%
Terrell	0%	6%	12%	1%	4%	7%	19%	42%	9%
Marion	0%	3%	9%	0%	0%	3%	10%	72%	1%
Talbot	0%	1%	6%	0%	1%	4%	10%	78%	0%
McIntosh	0%	3%	12%	1%	2%	6%	19%	55%	1%
Schley	0%	0%	5%	0%	4%	2%	7%	79%	3%
Bryan	0%	7%	33%	1%	1%	15%	35%	4%	3%
Lee	0%	9%	30%	1%	0%	18%	40%	1%	2%
Chattahoochee	0%	10%	24%	1%	0%	17%	35%	11%	2%
Pulaski	0%	4%	25%	2%	1%	13%	30%	23%	3%
Taylor	0%	3%	13%	0%	9%	9%	23%	21%	23%
Wilcox	0%	12%	17%	0%	17%	9%	23%	23%	1%
Candler	0%	3%	24%	2%	0%	10%	36%	17%	7%
Johnson	0%	5%	22%	0%	0%	13%	33%	16%	10%
Crawford	0%	8%	27%	0%	1%	17%	43%	3%	1%
Montgomery	0%	6%	24%	0%	0%	18%	47%	2%	4%
Treutlen	0%	4%	20%	0%	0%	16%	43%	14%	2%
Wheeler	0%	3%	37%	0%	0%	11%	36%	8%	4%
Long	0%	5%	22%	0%	0%	24%	47%	2%	1%



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Webster	0%	2%	13%	0%	0%	17%	62%	5%	0%
Total	4%	7%	13%	5%	7%	6%	16%	32%	10%



Table 6-18
Outbound Tonnage, Commodity Types by County

County	STCC								
	14 Non- Metallic Minerals	20 Food	24 Lumber, Wood	26 Pulp, Paper	28 Chemicals	29 Petroleum, Coal	32 Stone, Clay, Glass, Concrete	50 Secondary Traffic	All Other
Chatham	0%	10%	5%	5%	14%	13%	11%	24%	18%
Bibb	0%	7%	10%	7%	7%	3%	41%	18%	6%
Muscogee	10%	20%	3%	1%	4%	0%	17%	27%	18%
Glynn	5%	12%	6%	14%	22%	4%	23%	2%	13%
Wilkinson	0%	0%	11%	0%	0%	0%	88%	0%	1%
Houston	0%	0%	12%	0%	1%	0%	52%	31%	5%
Laurens	0%	4%	29%	13%	1%	0%	9%	33%	13%
Twiggs	0%	0%	3%	0%	0%	0%	64%	33%	0%
Sumter	0%	0%	42%	1%	5%	0%	0%	1%	51%
Crisp	0%	3%	71%	0%	9%	0%	5%	1%	12%
Tattnall	0%	2%	3%	0%	1%	0%	0%	48%	47%
Emanuel	0%	10%	84%	0%	0%	0%	0%	1%	4%
Talbot	99%	0%	1%	0%	0%	0%	0%	0%	0%
Bulloch	0%	10%	51%	1%	1%	0%	1%	3%	34%
Toombs	0%	2%	21%	1%	0%	0%	13%	55%	9%
Evans	0%	49%	26%	0%	0%	0%	21%	2%	2%
Macon	0%	32%	19%	45%	0%	0%	2%	0%	2%
Liberty	0%	0%	63%	14%	13%	0%	0%	2%	8%
Dooly	0%	2%	19%	0%	0%	0%	0%	77%	2%
Harris	0%	72%	25%	0%	0%	0%	1%	1%	1%
Dodge	0%	10%	75%	12%	1%	0%	0%	1%	1%
Stewart	0%	0%	97%	1%	0%	0%	0%	0%	2%
Peach	0%	0%	39%	0%	27%	0%	3%	1%	29%
Effingham	0%	0%	69%	0%	1%	0%	10%	4%	16%
Candler	0%	1%	2%	0%	0%	0%	64%	2%	32%
Upson	0%	4%	35%	17%	0%	0%	0%	5%	39%
Terrell	0%	52%	0%	0%	0%	0%	15%	1%	32%
Crawford	97%	0%	2%	0%	0%	0%	0%	0%	1%
Taylor	92%	5%	0%	0%	0%	0%	0%	0%	2%
Telfair	0%	9%	38%	0%	0%	0%	27%	6%	19%
Wilcox	0%	1%	73%	0%	9%	0%	6%	1%	10%
Bleckley	0%	8%	55%	0%	1%	0%	0%	11%	25%
Wheeler	0%	0%	93%	2%	0%	0%	0%	3%	3%
Chattahoochee	0%	0%	92%	2%	0%	0%	0%	0%	6%
Bryan	0%	0%	32%	5%	0%	0%	19%	6%	38%
McIntosh	0%	33%	0%	7%	0%	0%	0%	13%	46%
Pulaski	0%	7%	23%	3%	0%	34%	17%	7%	9%
Marion	0%	90%	0%	0%	0%	0%	0%	6%	4%
Schley	0%	0%	60%	2%	0%	0%	0%	2%	36%
Johnson	0%	14%	0%	0%	9%	0%	0%	9%	67%
Webster	0%	2%	61%	0%	0%	0%	0%	1%	37%
Lee	0%	2%	0%	0%	0%	0%	0%	2%	96%
Treutlen	0%	0%	33%	0%	0%	0%	0%	26%	41%
Long	0%	0%	0%	90%	0%	0%	0%	10%	0%



Montgomery	0%	20%	0%	0%	0%	0%	0%	7%	73%
Total	3%	10%	16%	5%	8%	5%	22%	19%	14%

Relationship of Domestic and International Commodity Flows

Georgia’s ports and waterways – both publicly and privately owned and operated – are a vital component of its statewide transportation system and its link to international markets. Taken together, more than 20 million tons of commodities were moved through nearly 40 public and private terminals in the state of Georgia in calendar year 1998. The presence of these facilities – the Port of Savannah in Chatham County, the Port of Brunswick in Glynn County, and the Port of Columbus in Muscogee County – places unique demands on the landside transportation system, because import and export goods (international cargo moves) must be moved to and from these ports by truck and rail (as domestic cargo moves).

Port of Savannah, Chatham County

The Port of Savannah is one of the premier port complexes in the United States. It is comprised of public and private terminals arrayed along the Savannah River, and handles a diverse range of containerized and non-containerized cargoes. In 1998, the Port of Savannah ranked seventh among U.S. Atlantic Coast ports in terms of container traffic (730,611 TEUs); fourth among U.S. Atlantic Coast ports in terms of international tonnage (14,574,907 short tons); and 39th among all U.S. ports in terms of total tonnage (17,710,606 short tons).

Over the past decade, the Port of Savannah has been one of the fastest-growing ports in the country. Data for fiscal year 2000 show that the Georgia Ports Authority facilities at Garden City and Ocean Terminal handled 9,581,181 tons and 845,408 TEUs. Data for fiscal year 2001 shows that the container total has risen to 1,020,000 TEUs.

The port district includes major facilities located on the Savannah River within the cities of Savannah, Garden City, and Port Wentworth. Most of the terminals are located upriver (west and north) from Savannah’s historic downtown waterfront; although several are located downriver. The Savannah River provides access to the Atlantic Ocean and the Atlantic Intracoastal Waterway. The Port of Savannah primarily handles deep-draft ocean-going vessels. Containerized cargoes are handled at Georgia Ports Authority’s (GPA’s) Containerport at Garden City and non-containerized cargoes are handled at GPA’s Ocean Terminal in Savannah and at numerous private terminals along the Savannah River. The port district also includes several small commercial fishing and vessel mooring and repair facilities on the Wilmington River, but these do not handle substantial volumes of cargo.

The Port of Savannah includes two public terminals owned and operated by GPA. GPA’s Containerport in Garden City comprises 1,120 acres and more than 7,600 contiguous linear feet of vessel berthing, making it one of the largest container terminals in the United States. The Containerport also includes some handling of liquid bulk, roll-on and roll-off, and non-containerized general cargoes. GPA’s Ocean Terminal in Savannah comprises 208 acres and more than 6,600 linear feet of vessel berthing, and handles a variety of non-containerized general cargoes. The Port of Savannah also includes 20 privately owned terminals engaged in cargo



handling. Some of these terminals are primarily designed for the movement of waterborne commodities for multiple customers, while others are essentially manufacturing facilities that have the capability of shipping and receiving their own materials and products by vessel as an alternative to truck and rail.

**Table 6-19
Port of Savannah Waterborne Commodity Flows, CY 1998**

Commodity	Short Tons	Containers (TEUs)
Foreign Imports	8,279,000	
Sand, gravel, rock, stone	928,000	
Petroleum products	812,000	
Iron and steel products	799,000	
Chemicals	787,000	
Lime, cement, glass	701,000	
Foreign Exports	6,296,000	
Sulfur, clay, salt	2,642,000	
Paper products	886,000	
Pulp, waste paper	677,000	
Chemicals	509,000	
Forest products	335,000	
Total	14,575,000	734,866

Sources: U.S. Army Corps of Engineers, Waterborne Commerce of the United States, 1998; and Georgia Ports Authority.

According to the Transearch database, domestic commodity flows inbound to and outbound from Chatham County total 40,347,837 tons for 1998. Truck and rail flows inbound and outbound total 38,779,627 tons (27,376,191 for truck; 11,403,436 for rail). If we make the simplifying assumption that each ton of international cargo moved “over the wharf” at the Port of Savannah corresponds to an equivalent ton of domestic cargo moved to or from Chatham County by truck or rail, then we find that international cargo generates around 38 percent (14,575,000 tons divided by 38,779,627 tons) of the domestic tonnage moved into and out of Chatham County. In practice, the situation is far more complicated – international goods can be handled and processed multiple times (using multiple modes) before entering or leaving Chatham County, and some international goods originate or terminate in Chatham County and never show up as inbound or outbound domestic flows – but this is a reasonable order-of-magnitude approximation of international trade as a generator of truck and rail traffic in Chatham County.

Port of Brunswick, Glynn County



The Port of Brunswick is located at Brunswick in the southeastern corner of Georgia, just inland from the Atlantic Ocean and the Atlantic Intracoastal Waterway (see Figure 6-3). The Brunswick River is the main link between the ocean and the multiple waterways serving the Port’s various terminals. The Port of Brunswick handles deep-draft ocean-going vessels, along with shallow draft barges and commercial fishing vessels. It does not handle any containerized cargoes, but does handle nearly every other type of cargo (break bulk, roll-on and roll-off, liquid bulk, and dry bulk). The Port includes three terminals owned by the Georgia Ports Authority (two of which are operated by GPA), along with numerous privately owned terminals. In 1998, the Port of Brunswick was 112th on the U.S. Army Corps of Engineer’s list of the top 150 U.S. tonnage ports, ranking it as a complex of both statewide and national significance.

The Port of Brunswick includes three GPA terminals. The Colonel’s Island Terminal comprises 345 acres and more than 2,000 feet of berthing area, and primarily handles automobiles (as roll-on and roll-off cargo) and grains and other agricultural products (as dry bulk). The Mayor’s Point Terminal comprises 22 acres and 1,750 feet of berthing area, and primarily handles forest products (as break bulk). Marine Port Terminals, Inc. comprises 145 acres and more than 2,400 feet of berthing area. It handles a mix of forest products, gypsum, and petroleum products, and is the only one of the three not operated by GPA itself. The Port of Brunswick also includes five privately owned terminals (this excludes a number of small docks that receive seafood). These are principally manufacturing facilities that have the capability of shipping and receiving their own materials and products by vessel as an alternative to truck and rail.

**Table 6-20
Port of Brunswick Waterborne Commodity Flows, CY 1998**

Commodity	Short Tons	Autos (Units)
Foreign Imports	1,380,000	
Sand, gravel, rock, stone	589,000	
Nonmetallic minerals	332,000	
Vehicles and parts	167,000	
Foreign Exports	957,000	
Pulp, waste paper	543,000	
Paper products	161,000	
Processed grain, animal feed	107,000	
Total	2,337,000	163,064

Sources: U.S. Army Corps of Engineers, Waterborne Commerce of the United States, 1998; and Georgia Ports Authority.

According to the Transearch database, domestic commodity flows inbound to and outbound from Glynn County total 9,294,888 tons for 1998. Truck and rail flows inbound and outbound



total 9,120,182 tons (6,397,513 for truck; 2,722,669 for rail). If we make the same simplifying assumption as we did for Chatham County, then we find that international cargo generates around 26 percent (2,337,000 tons divided by 9,120,182 tons) of the domestic tonnage moved into and out of Glynn County.

Port of Columbus, Muscogee County

The Port of Columbus is a barge port on the Apalachicola-Chattahoochee-Flint (ACF) River inland waterway system, which links the interior of Georgia with the Gulf of Mexico and the Gulf Intracoastal Waterway. It handles liquid and dry bulk commodities moved on shallow-draft barges. The Port includes a public terminal operated by the Georgia Ports Authority, along with a privately owned terminal. Two other privately owned terminals are also located on the Chattahoochee River at Cedar Springs, downstream from Columbus near Bainbridge. The GPA facilities handled around 65,000 tons in 1998, all of it domestic; the Transearch database indicates that the entire county handled 174,671 tons of domestic waterborne cargo in 1998. International cargo, therefore, plays no part in generating domestic truck and rail moves into and out of Muscogee County.

Commodity Flows and the Transportation Network

Thus far, the commodity data has been used to develop detailed characterizations of the study area as a whole and its component counties. To understand how these commodity movements relate to the national transportation system, and more specifically how they impact the HPC 6 and US 280 alignments, we need to look more closely at rail and truck flows and the physical pathways they follow.

Rail Volumes and Flows

Rail volumes are made up of commodities moving into and out of the study area counties, commodities moving within the study area counties, and commodities moving through the study area counties. For inbound tonnage, the leading origin is the state of Georgia itself, followed by the states of Florida, South Carolina, Tennessee and Kentucky; for outbound tonnage, the leading destination is also the state of Georgia itself, followed by the states of Florida and North Carolina. Rail is generally increasingly economic (compared to truck) as distances increase, and we see that the study area has significant rail tonnage originating and terminating in the Midwest (Minnesota, Wisconsin, Illinois, Indiana), Northeast (Maine, Pennsylvania, Ohio) and Southwest (Texas, Louisiana).

These state-to-state flows have actually been built up from county-to-county and county-to-business economic area “trip tables” indicating the tons moved from each origin to each destination. There are interesting differences between the inbound and outbound patterns, and between the rail intermodal (container, trailer on flatcar, and “piggyback” services) and the rail carload (all other – boxcar, flatcar, hopper car, tank car, etc.) patterns. Partial summaries of the larger trip tables are presented in Tables 6-21 through 6-24 on the following page.



**Table 6-21
Inbound Rail Intermodal Tonnage by Origin and Destination**

Rail Intermodal From:	Total Tons	To Chatham Co.	To Houston Co.
New Orleans, LA -MS	114,856	114,856	
Memphis, TN-AR-MS-KY	73,818	73,818	
Chicago-Gary-Kenosha, IL-IN-WI	64,456	64,456	
Johnson City-Kingsport-Bristol, TN-VA	59,806	59,806	
Fulton County, GA	55,540	55,540	
Philadelphia-Wilmington-Atl. City, PA -NJ-DE-MD	36,968	36,968	
Jefferson County, GA	35,848	35,848	
Miami-Fort Lauderdale, FL	30,152	30,152	
Louisville, KY-IN	26,340	26,340	
Washington County, GA	23,480	23,480	
Charleston-North Charleston, SC	21,678	21,678	
Nashville, TN-KY	20,444	20,444	
Huntsville, AL-TN	18,516	18,516	
Jacksonville, FL-GA	17,334	17,334	
Washington-Baltimore, DC-MD-VA-WV-PA	13,658	13,658	
Dallas-Fort Worth, TX-AR-OK	11,414	11,414	
Norfolk-Virginia Beach-Newport News, VA-NC	10,438	10,438	
Charlotte-Gastonia-Rock Hill, NC-SC	10,154	10,154	
Mobile, AL	9,700	9,700	
Cincinnati-Hamilton, OH-KY-IN	9,464	9,464	
Houston-Galveston-Brazoria, TX	9,362	9,362	
Tampa-St. Petersburg-Clearwater, FL	9,268	9,268	
Birmingham, AL	7,886	7,886	
New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-VT	7,650	7,650	
Orlando, FL	5,326	5,326	
St. Louis, MO-IL	4,940	4,940	
Twiggs County, GA	4,432	4,432	
Kansas City, MO-KS	3,066	3,066	
Evansville-Henderson, IN-KY-IL	3,000	3,000	
Peoria-Pekin, IL	2,314	2,314	
Bibb County, GA	1,940	1,940	
Wausau, WI	1,880		1,880
Lexington, KY-TN-VA-WV	1,704	1,704	
Greensboro-Winston-Salem-High Point, NC-VA	1,200	1,200	
Cleveland-Akron, OH-PA	940	940	
Sacramento-Yolo, CA	900	900	
Salt Lake City-Ogden, UT-ID	890	890	
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-RI-VT	880	880	
Beaumont-Port Arthur, TX	800	800	
Columbus, OH	600	600	
Detroit-Ann Arbor-Flint, MI	466	466	



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Greenville-Spartanburg-Anderson, SC-NC	200	200	
TOTAL	733,708	731,828	1,880



Table 6-22
Outbound Rail Intermodal Tonnage by Origin and Destination

Rail Intermodal To:	Total Tons	From Bibb Co.	From Chatham Co.	From Houston Co.	From Twiggs Co.
New Orleans, LA-MS	69,286		69,286		
Memphis, TN-AR-MS-KY	62,120		62,120		
Fulton County, GA	50,326		50,326		
Charleston-North Charleston, SC	49,864		46,416		3,448
Jacksonville, FL-GA	49,134		49,134		
Miami-Fort Lauderdale, FL	48,048		48,048		
Philadelphia-Wilmington-Atl. City, PA-NJ-DE-MD	46,048		46,048		
Cincinnati-Hamilton, OH-KY-IN	42,394		42,394		
Chicago-Gary-Kenosha, IL-IN-WI	35,140		32,400	2,740	
Tampa-St. Petersburg-Clearwater, FL	16,522		16,522		
Kansas City, MO-KS	15,796		15,796		
Washington-Baltimore, DC-MD-VA-WV-PA	14,976		14,976		
Mobile, AL	14,504		14,504		
Johnson City-Kingsport-Bristol, TN-VA	14,316		14,316		
Houston-Galveston-Brazoria, TX	12,354		12,354		
Norfolk-Virginia Beach-Newport News, VA-NC	12,044		12,044		
Nashville, TN-KY	11,364		11,364		
Louisville, KY-IN	7,996		7,996		
Dallas-Fort Worth, TX-AR-OK	7,496		7,496		
Columbus, OH	7,162		7,162		
Huntsville, AL-TN	6,902		6,902		
Chatham County, GA	6,372	1,940			4,432
Charlotte-Gastonia-Rock Hill, NC-SC	4,936		4,936		
Orlando, FL	4,640		4,640		
Birmingham, AL	4,054		4,054		
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-RI-VT	3,110		3,110		
Knoxville, TN	2,304		2,304		
Los Angeles-Riverside-Orange County, CA-AZ	1,678		1,678		
Evansville-Henderson, IN-KY-IL	1,392		1,392		
Detroit-Ann Arbor-Flint, MI	1,200		1,200		
New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-VT	1,200		1,200		
Denver-Boulder-Greeley, CO-KS-NE	880		880		
Phoenix-Mesa, AZ-NM	790		790		
St. Louis, MO-IL	200		200		
TOTAL	626,548	1,940	613,988	2,740	7,880



**Table 6-23
Inbound Rail Carload Tonnage by Origin and Destination**

Rail Carload From:	Total Tons	To Bibb Co.	To Chatham Co.	To Effingham Co.	To Glynn Co.	To Other
Washington Co., GA	1,236,022	4,702	1,227,220		1,700	2,400
Warren County, GA	1,169,164	3,858	732,369		226,722	206,215
Lexington, KY-TN-VA-WV	1,044,594	191,252	293,268	327,815		232,259
Wilkinson County, GA	730,698		730,698			-
Jefferson County, GA	712,487	70,491	550,454			91,542
Monroe County, GA	546,077	61,406	117,881		366,790	-
Jones County, GA	491,945	13,727	355,766	115,864		6,588
Bibb County, GA	358,746		279,320		76,372	3,054
Miami-Fort Lauderdale, FL	282,020	3,842	278,178			-
Richmond County, GA	275,107	15,218	130,702		77,507	51,680
Sumter County, GA	257,177	7,200	249,977			-
Chicago-Gary-Kenosha, IL-IN-WI	234,390	6,192	57,266	19,916		151,015
Minneapolis -St. Paul, MN-WI-IA	225,410			225,410		-
Macon County, GA	213,084	11,256	180,228		21,600	-
Knoxville, TN	204,148	40,775	119,258			44,114
Glynn County, GA	202,155	123,268	4,540			74,347
Mobile, AL	188,507		88,394			100,113
Chatham County, GA	176,333	3,850			102,294	70,189
Nashville, TN-KY	161,726			23,496		138,230
Baton Rouge, LA -MS	160,926	3,980	87,734			69,212
Evansville-Henderson, IN-KY-IL	158,505	9,502	59,280			89,723
Newberry County, SC	156,000				156,000	-
Indianapolis, IN-IL	155,615					155,615
Lowndes County, GA	143,512	9,876	40,166		74,054	19,416
McCormick County, SC	135,000				135,000	-
Morgan County, GA	125,124				125,124	-
Wilmington, NC-SC	122,146		122,146			-
Champaign-Urbana, IL	121,359	6,800	11,526			103,033
Jacksonville, FL-GA	118,025	11,145	102,530	4,350		-
New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-VT	113,014		93,898	8,030		11,086
Norfolk-Virginia Beach-Newport News, VA -NC	110,025		22,402	75,585		12,038
Houston-Galveston-Brazoria, TX	108,769	49,115	9,850			49,804
Twiggs County, GA	105,876		105,876			-
Greenville-Spartanburg-Anderson, SC-NC	105,726		61,176			44,550
Charlton County, GA	102,000		102,000			-
All Other	3,527,345	279,916	1,356,377	100,117	836,734	954,200
TOTAL	14,278,757	927,372	7,570,480	900,582	2,199,897	2,680,425



Table 6-24
Outbound Rail Carload Tonnage by Origin and Destination

Rail Carload To:	Total Tons	From Bibb Co.	From Chatham Co.	From Talbot Co.	From Wilkinson Co.	From Other
Chatham County, GA	1,561,779	279,320			730,698	551,761
Jacksonville, FL-GA	479,458	2,240	249,355	117,014		110,849
Greenville, NC	374,159		333,967			40,192
Wayne County, GA	357,896		19,312			338,584
Richmond County, GA	320,246		187,834		113,316	19,096
Camden County, GA	304,778			22,928		281,850
Dougherty County, GA	292,529		3,838			288,691
Fulton County, GA	279,328		45,618	186,120		47,589
Gwinnett County, GA	261,813			15,484		246,329
Glynn County, GA	246,858	76,372	100,782			69,704
Decatur County, GA	232,740		48,313		65,424	119,003
Portland, ME	215,318	112,390	18,728		80,328	3,872
Wausau, WI	200,214	94,944	3,974		85,474	15,822
Orlando, FL	193,907	21,390	20,084	118,558		33,875
Charlotte-Gastonia-Rock Hill, NC-SC	191,410	57,888	27,988		99,134	6,400
Bangor, ME	187,981	40,339			147,642	-
Bibb County, GA	182,469		3,850			178,619
Coffee County, GA	177,578		3,116	174,462		-
Birmingham, AL	175,958	53,446	11,032		2,246	109,234
Duluth-Superior, MN-WI	173,828	114,716	3,774		23,772	31,566
Dallas-Fort Worth, TX-AR-OK	160,570	11,550	7,740		104,944	36,336
Brantley County, GA	137,523			137,523		-
New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-VT	131,510		64,130		17,540	49,840
Philadelphia-Wilmington-Atl. City, PA-NJ-DE-MD	131,134	2,880	92,224			36,030
DeKalb County, GA	127,286	6,634	28,358			92,294
Washington-Baltimore, DC-MD-VA-WV-PA	120,680	3,818	21,180		69,722	25,960
Monroe, LA	114,870	83,036	4,320		27,514	-
Charleston-North Charleston, SC	111,339	5,168	73,863			32,308
Ware County, GA	111,290			111,290		-
Green Bay, WI-MI	109,898	42,842	8,470		42,566	16,020
Cincinnati-Hamilton, OH-KY-IN	108,988	36,560	19,080		11,788	41,560
Appleton-Oshkosh-Neenah, WI	107,512		13,336		86,246	7,930
Hall County, GA	103,920	2,000	91,430			10,490
Tampa-St. Petersburg-Clearwater, FL	99,632	26,692		15,560		57,381
Columbus, OH	99,002				51,708	47,294
Huntsville, AL-TN	96,562	73,228	21,094			2,240
All Other	3,264,472	365,633	960,349	67,734	334,742	1,536,013
TOTAL	11,546,436	1,513,086	2,487,140	966,673	2,094,804	4,484,733



Looking at intermodal rail tonnage, we see that Chatham County is the only county handling significant volumes. Its major trading partners include: New Orleans, Memphis, Atlanta, Charleston, Jacksonville, Miami, Philadelphia, Chicago and Cincinnati. This traffic is largely linked to the import and export of intermodal shipping containers through the Port of Savannah. Total intermodal rail tonnage to/from Chatham County is 1,345,716 tons, which is the equivalent of about 192,000 twenty-foot equivalent units (TEUs) or 113,000 containers.

We see a very different story for rail carload tonnage. On the inbound side, we see that Chatham County receives over half the rail carload tonnage inbound to study area counties. Eight of the top ten rail carload origin regions are counties within Georgia; the other two are Lexington, KY and Miami, FL. By far the largest single rail move is from Washington County, GA to Chatham County (1,227,220 tons, of which 1,054,500 tons are kaolin clay). The second largest move is from Warren County, GA to Chatham County (732,369 tons) and the third largest move is from Wilkinson County, GA to Chatham County (730,698 tons). Glynn County, which receives shipments for export through the Port of Brunswick, ranks second in inbound rail carload tonnage; Bibb County ranks third; and Effingham County ranks fourth. Together, these four counties account for 81% of rail carload tonnage inbound to the study area.

The rail carload tonnage outbound from the study area is more evenly distributed among the study area counties. Chatham County is still the leading county, but is not nearly as dominant, accounting for 22% of outbound rail carload flows. Wilkinson, Bibb and Talbot counties round out the top four, which together represent 61% of total rail carload tonnage outbound. Nine of the top ten rail carload destinations are within Georgia, the largest of which is Chatham County itself.

Using these trip tables, we can map the inbound and outbound commodity flows. However, this information does not include the effect of through tonnage. Therefore, the team has obtained national-level rail network flows developed by Reebie Associates for the U.S. Department of Transportation's "Multimodal Freight Analysis Framework" project. The national-level flows include all movements between U.S. origins and destinations, and provide network-level approximations of total rail tonnage flows within the study area.

Figure 6-16 on the following page shows the pattern of rail carload tonnage flows in the southeastern United States. Within the state of Georgia, the dominant pattern is the concentration of rail activity in Atlanta -- the highest-density rail carload tonnage link in the state is between Atlanta and Macon, and the Atlanta-Birmingham, Atlanta-Montgomery, Atlanta-New Orleans, Atlanta-Nashville, Atlanta-Charlotte, Atlanta-Columbia and Atlanta-Jacksonville (via Waycross and Valdosta) lines are also heavily used. Another important pattern, although less dominant, is north-south traffic along the eastern seaboard between the Carolinas, Savannah and Brunswick, and Florida.



Figure 6-16
Regional Carload Tonnage (Rail)

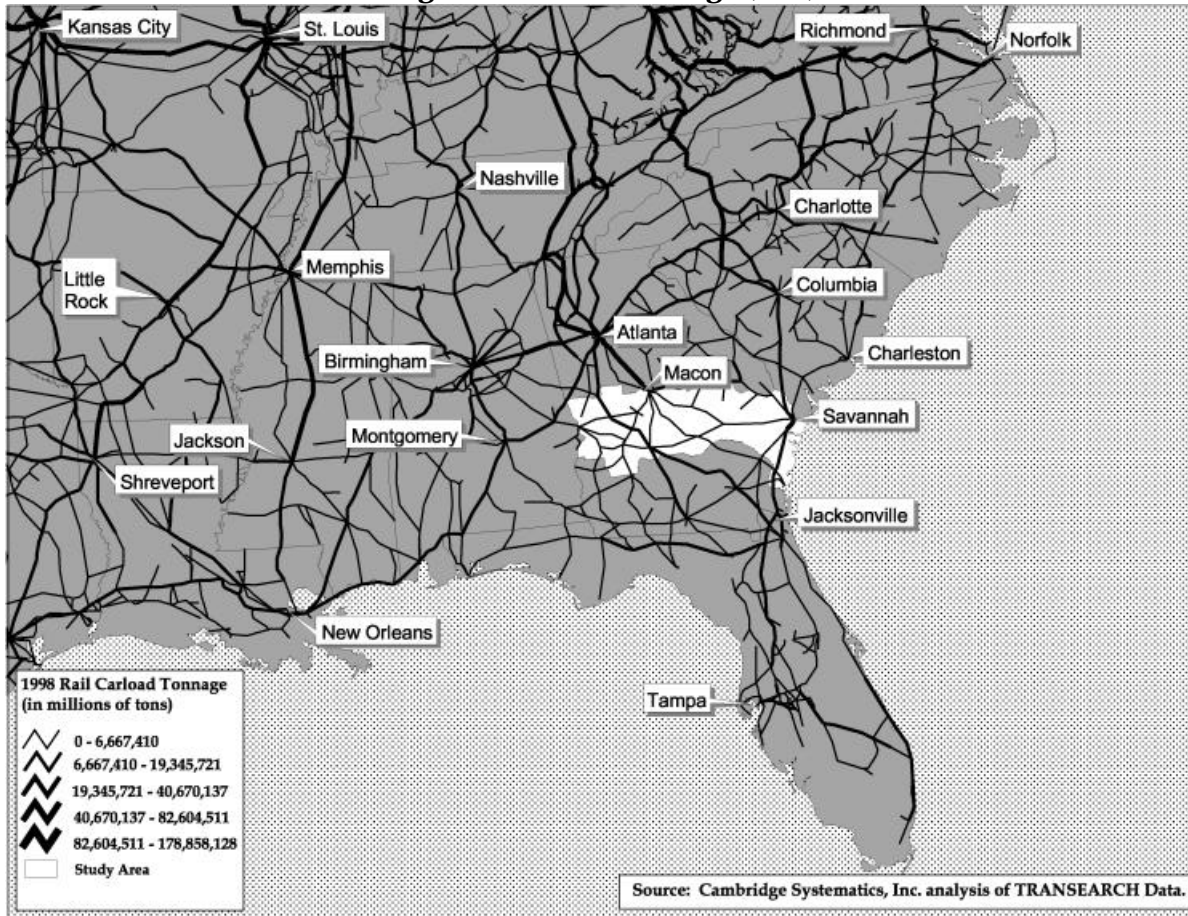
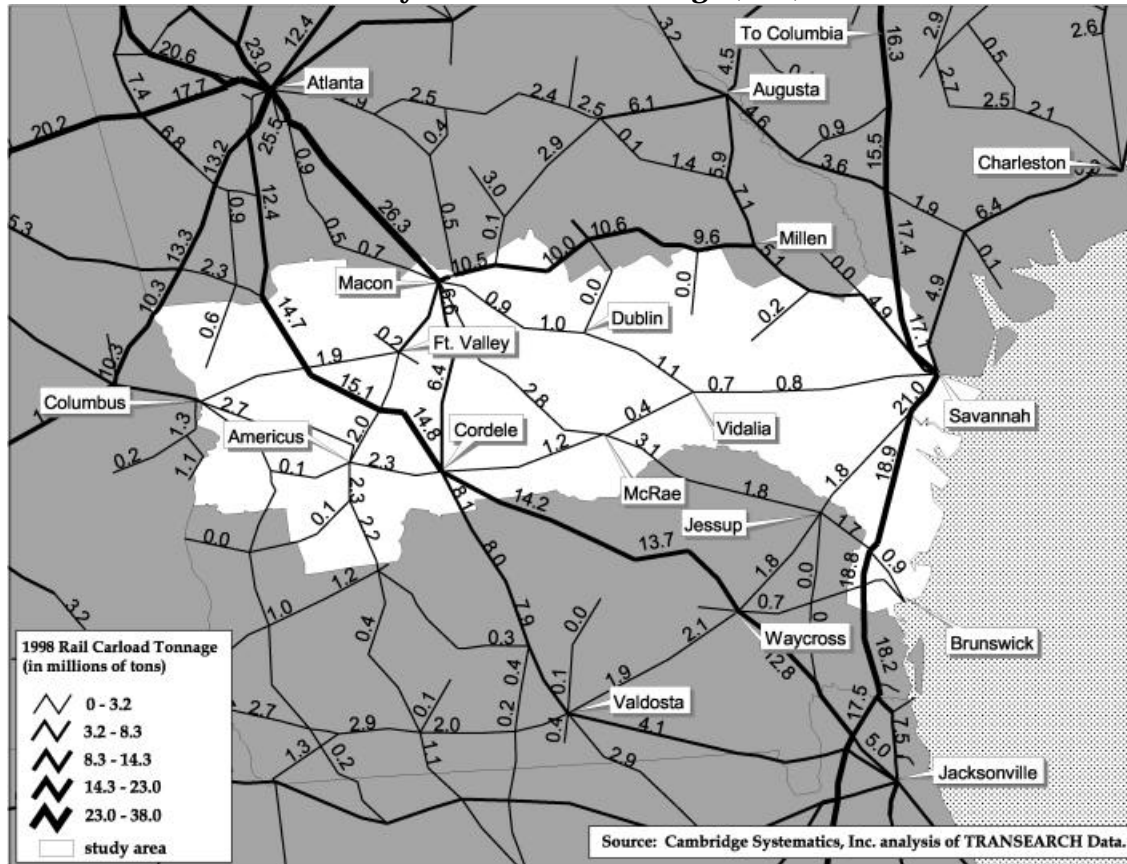


Figure 6-17 shows rail carload tonnage in the study area in greater detail. The coastal rail line south of Savannah carries the highest carload tonnage (18.8 to 21 million tons, depending on the segment). Other high carload tonnage tracks include the Savannah to Columbia, South Carolina line (17.1 million tons within the study area); the Macon to Atlanta line (16.8 million tons within the study area and increasing in tonnage north to Atlanta); the Atlanta to Jacksonville line cutting through the western portion of the study area from Talbot County to Cordele (over 14.7 million tons); and the western segments of the Macon to Savannah line (via Millen, Georgia, with over 10 million tons within the study area). Other important carload tonnage segments include the Macon to Cordele line (over 6 million tons); the Macon to Albany line (via Fort Valley and Americus, with over 2 million tons); the Columbus to Cordele line (over 2 million tons); and the Macon to Jessup line (via McRae, with nearly 3 million tons). The rail segments paralleling the HPC 6 and US 280 corridor alignments are not heavily used east of I-75 (where the preferred service appears to be via Macon and Millen), but are more heavily used west of I-75.



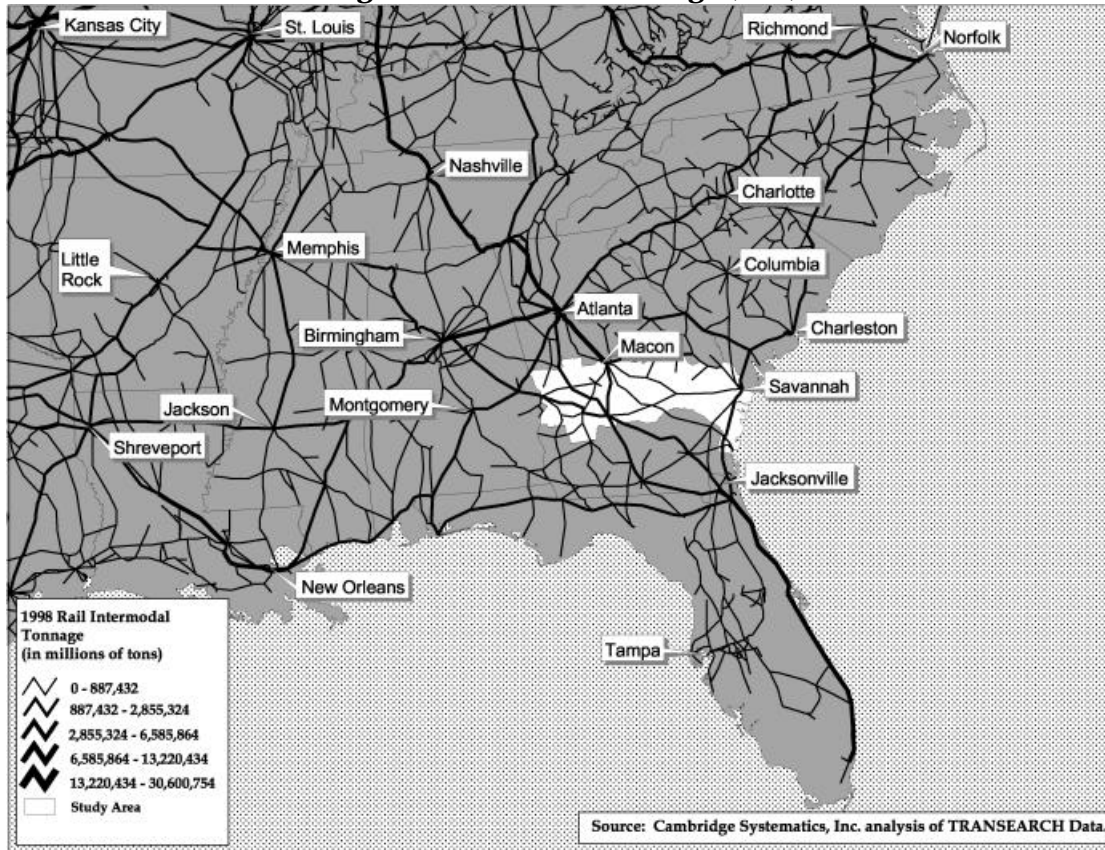
Figure 6-17
Study Area Carload Tonnage (Rail)



Rail intermodal flows are substantially less than rail carload flows on a tonnage basis, and show a somewhat different distribution pattern in that they tend to be more concentrated at major seaports and urban centers than rail carload flows. As illustrated in Figure 6-18, we still see the heavy concentration of activity in the Atlanta region (particularly on the Atlanta-Jacksonville route) and along the eastern seaboard (with flows in and out of the Port of Savannah and other Atlantic coast intermodal marine terminals).



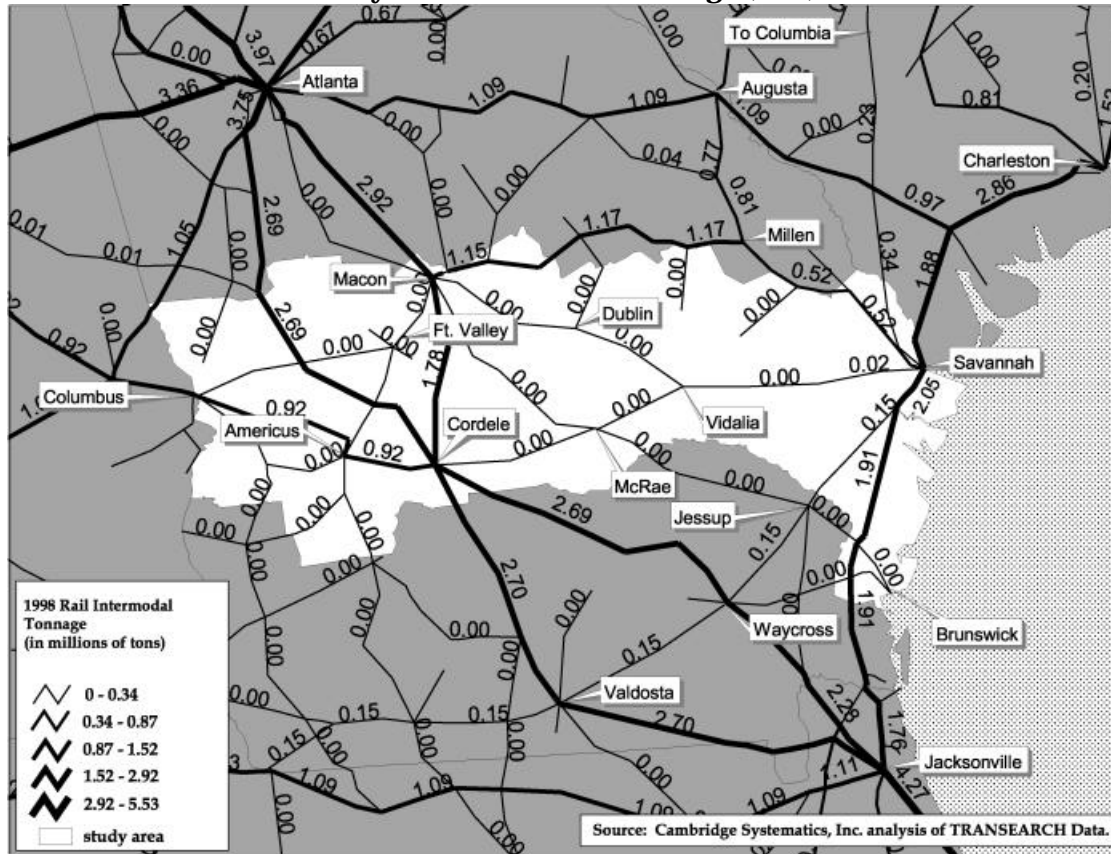
Figure 6-18
Regional Intermodal Tonnage (Rail)



At the study area level, Figure 6-19 shows that intermodal flows follow a similar pattern as carload tonnage flows. For example, lines between Savannah and Jacksonville, Macon and Atlanta, and Atlanta and Cordele carry the heaviest intermodal tonnage. The figure shows little, if any, intermodal flows over track between Columbus and Macon, Macon and Vidalia, Cordele and Vidalia, and Vidalia and Savannah. (When reading the maps, it is important to keep in mind that labels indicating “0.0” million tons do not necessarily indicate that a particular segment has no tonnage; the labels only indicate a segment carries less than 100,000 tons). Intermodal movements along the lines paralleling the HPC 6 and US 280 corridors are minimal.



Figure 6-19
Study Area Intermodal Tonnage (Rail)



Truck Flows and Volumes

As with rail, in order to determine how the study area truck flows impact the HPC 6 and US 280 corridors, we need to examine the general origin/destination patterns, develop county-level origin-destination matrices, and map the origin-destination information against the national truck network.

For inbound tonnage, the leading origin is the state of Georgia itself, followed by the states of Florida and Alabama. For outbound tonnage, the leading destination is also the state of Georgia itself, followed by the states of Florida and North Carolina. On the inbound side, most of the tonnage originates in the southeast and southwest, with decreasing volumes to more distant states. On the outbound side, there is more traffic to distant states in the northeast and midwest. The major origin-destination pairs and associated tonnages for these truck moves are indicated in Tables 6-25 and 6-26 below. (The complete origin-destination tables contain over 63,000 cells, so these are substantially abridged for presentation purposes.)



**Table 6-25
Inbound Truck Tonnage by Origin and Destination**

Truck From:	Total Tons	To Bibb County	To Chatham Co.	To Glynn County	To Mus-cogee Co.	To Other
Fulton County, GA	8,761,641	1,097,311	1,545,209	540,121	927,521	4,651,478
Gwinnett County, GA	3,007,117	328,757	520,063	185,027	263,964	1,709,305
DeKalb County, GA	1,535,757	188,228	305,770	88,300	178,518	774,941
Richmond County, GA	1,336,451	154,205	268,262	81,540	137,805	694,638
Chatham County, GA	1,313,427	227,485		101,075	180,438	804,430
Jacksonville, FL-GA	1,209,487	31,693	926,076		25,080	226,638
Miami-Fort Lauderdale, FL	961,098	89,446	427,330		62,411	381,911
Bibb County, GA	959,204		318,889	121,563	97,557	421,195
Cobb County, GA	905,406	118,540	210,202	46,312	120,869	409,483
Clayton County, GA	795,406	89,612	143,497	48,294	78,829	435,175
Hall County, GA	764,479	101,014	175,464	39,614	100,517	347,870
Dougherty County, GA	723,980	110,784	108,093	104,435	59,988	340,680
Charleston-North Charleston, SC	612,275	64,006	366,239		33,190	148,841
Mobile, AL	580,023	46,706	273,894		40,279	219,144
Clarke County, GA	577,038	72,364	112,891	33,132	74,480	284,171
Memphis, TN-AR-MS-KY	495,525	115,373	147,580		164,479	68,093
Muscogee County, GA	464,710	72,813	103,274	30,160		258,463
Tupelo, MS-AL-TN	443,435	215,269	189,252		7,618	31,296
Greenville-Spartanburg -Anderson, SC-NC	425,038	37,853	210,277		34,304	142,603
Elbert County, GA	420,584	55,458	86,672	20,299	67,846	190,309
Whitfield County, GA	398,624	83,629	73,341	27,291	52,729	161,634
New Orleans, LA-MS	392,842	5,195	310,207		40,118	37,322
Houston-Galveston-Brazoria, TX	385,186	85,822	202,648		21,373	75,343
Wilmington, NC-SC	374,465	45,026	146,261		30,391	152,787
Birmingham, AL	361,567	38,107	143,795		37,911	141,755
Baton Rouge, LA-MS	347,448	78,881	242,309		5,610	20,648
Floyd County, GA	339,082	45,141	73,909	18,890	48,985	152,156
Jackson County, GA	338,649	46,954	72,397	16,713	58,569	144,016
Columbia, SC	324,711	31,614	149,406		28,301	115,391
Barrow County, GA	322,665	38,608	61,100	18,872	38,291	165,794
Jackson, MS-AL-LA	319,582	79,155	148,720		28,851	62,856
Orlando, FL	317,718	46,016	90,096		35,218	146,388
Colquitt County, GA	312,238	58,386	58,963	19,002	34,388	141,500
Putnam County, GA	290,982	46,347	112,610	26,016	24,030	81,980
Cleveland-Akron, OH-PA	273,559	107,117	120,901		10,285	35,255
Tampa-St. Petersburg-Clearwater, FL	264,240	28,962	147,894		19,770	67,614
All Other	14,857,839	2,263,862	3,452,229	2,666,323	1,657,203	4,818,224
TOTAL	46,513,478	6,345,740	12,045,721	4,232,979	4,827,716	19,061,322



Table 6-26
Outbound Truck Tonnage by Origin and Destination

Truck To:	Total Tons	From Bibb County	From Chat-ham County	From Glynn County	From Mus-cogee County	From Other
Fulton County, GA	8,439,872	1,098,285	2,153,913	472,737	834,659	3,880,277
DeKalb County, GA	1,827,141	297,955	551,559	80,172	198,868	698,588
Cobb County, GA	1,700,651	272,036	564,871	66,310	177,836	619,598
Gwinnett County, GA	1,279,982	206,068	386,018	54,212	133,202	500,482
Jacksonville, FL-GA	1,109,069	53,911	733,590		35,701	285,867
Miami-Fort Lauderdale, FL	1,072,212	141,807	407,230		94,659	428,517
Chatham County, GA	975,890	318,889		40,543	103,274	513,183
Charlotte-Gastonia-Rock Hill, NC-SC	807,309	231,243	228,921		54,345	292,799
New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-VT	775,053	106,158	509,515		43,656	115,723
Carroll County, GA	643,748	69,555	144,776	11,952	75,809	341,656
Wilmington, NC-SC	633,703	205,597	312,759		9,955	105,393
Richmond County, GA	617,978	122,663	204,000	24,785	76,170	190,359
Birmingham, AL	591,231	92,944	112,562		70,028	315,697
Greenville-Spartanburg-Anderson, SC-NC	590,041	60,293	194,725		77,920	257,104
Bibb County, GA	586,684		227,485	80,190	72,813	206,196
Memphis, TN-AR-MS-KY	586,265	98,616	241,705		47,522	198,422
Washington-Baltimore, DC-MD-VA-WV-PA	574,506	290,509	129,260		41,697	113,040
Muscogee County, GA	493,859	97,557	180,438	23,307		192,557
Clayton County, GA	483,354	81,972	154,828	17,641	51,692	177,220
Hall County, GA	453,009	82,161	158,958	14,553	52,630	144,706
Oklahoma City, OK	444,169	72,071	153,647		53,420	165,031
Charleston-North Charleston, SC	435,474	21,792	356,580		8,779	48,323
Chicago-Gary-Kenosha, IL-IN-WI	400,403	92,169	194,140		21,977	92,117
Orlando, FL	398,035	101,979	100,393		33,704	161,958
Lowndes County, GA	392,384	77,861	132,278	8,523	48,947	124,775
Wausau, WI	365,219	360,435	3,266		808	709
Whitfield County, GA	361,712	61,134	114,503	14,654	53,131	118,290
Dougherty County, GA	360,427	64,030	124,956	10,546	42,170	118,724
Wilkinson County, GA	352,580	65,465	131,107	520	44,663	110,825
Greenville, NC	346,186	140,716	84,977		7,164	113,329
Glynn County, GA	344,157	121,562	101,075		30,160	91,360
Chattanooga, TN-GA	333,863	14,809	205,487		21,473	92,094
Clarke County, GA	317,635	59,003	95,021	11,437	38,342	113,832
Floyd County, GA	315,568	56,575	104,015	8,873	38,992	107,112
Bangor, ME	306,409	305,582	376		272	179
Philadelphia-Wilmington-Atl. City, PA-NJ-DE-MD	305,027	62,991	139,012		20,335	82,688
All Other	16,924,233	3,510,402	5,692,525	1,223,580	1,641,428	4,856,298
TOTAL	46,945,034	9,116,798	15,330,470	2,164,534	4,358,200	15,975,032



Trucking patterns involve substantially more origin-destination pairs than rail patterns. One would expect that the inbound and outbound truck tonnage would be more evenly distributed among the study area counties than the rail tonnage, and this turns out to be the case. The top four counties for inbound tonnage (Chatham, Bibb, Muscogee, and Glynn) account for 59% of the inbound tonnage, and the top four counties for outbound tonnage (the same) account for 66% of outbound tonnage. Interestingly, however, when we look at the origins and destinations outside the study area, we actually see more geographic clustering with trucks than with rail – Fulton County, Gwinnett County, Cobb County and DeKalb County are clearly dominant. For inbound moves, the leading origin-destination pairs are Fulton to Chatham, Fulton to Bibb and Fulton to Muscogee; for outbound moves, the leading pairs are Chatham to Fulton, Bibb to Fulton and Muscogee to Fulton.

National-level truck flows were also developed by Reebie Associates and mapped as part of the U.S. Department of Transportation's "Multimodal Freight Analysis Framework" project. As with rail, these maps include all national flows, not just flows inbound to and outbound from the study area. The national flows depicted on Figure 6-20 on the following page indicate – not surprisingly -- that the largest truck flows within the state of Georgia are correlated with the interstate highway system, and that they center on Atlanta. The heaviest tonnage segments in Georgia are Atlanta-Macon-Orlando, Atlanta-Birmingham, Atlanta-Charlotte and Atlanta-Nashville. Just below these segments in terms of volume are I-95 through Savannah and Brunswick and I-16 from Savannah to Macon.



Figure 6-20
Regional Truck Tonnage

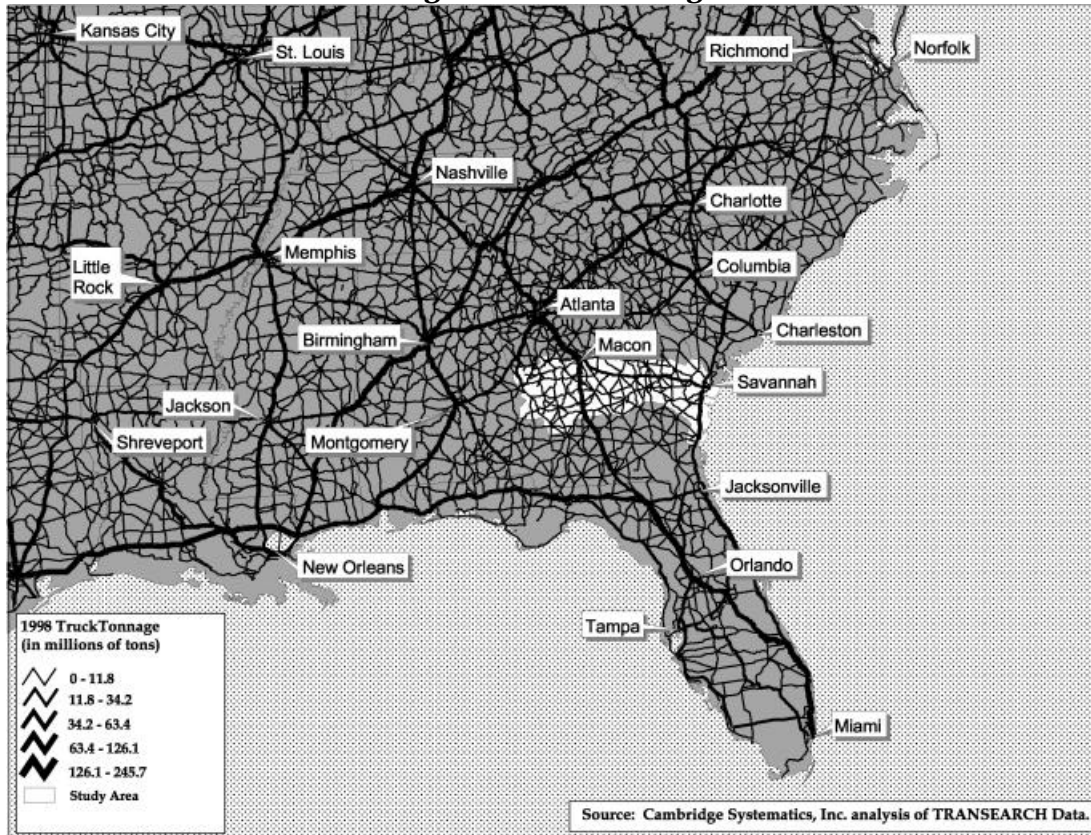


Figure 6-21 on the following page shows more specifically which roads and highways in Central Georgia carry the greatest tonnage. The highest tonnage segments include: I-475 west of Macon (with 61.4 million tons); I-75 south of Macon (58.6 million tons); I-95 north and south of Savannah (32.9 to 35 million tons); I-16 from Macon to Savannah (24.6 to 31.7 million tons); I-185 north of Columbus (over 12.6 million tons); and U.S. 280 south of Columbus (8 million tons). Further detail of the corridor routes (I-16, S.R. 96, U.S. 80, and U.S. 280) is provided in the following figure, 6-22. It is important to note here, as with the railroad maps, labels indicating “0.0” million tons do not necessarily indicate that a particular segment has no tonnage; the labels only indicate a segment carries less than 100,000 tons (0.1 million tons).



Figure 6-21
Study Area Truck Tonnage

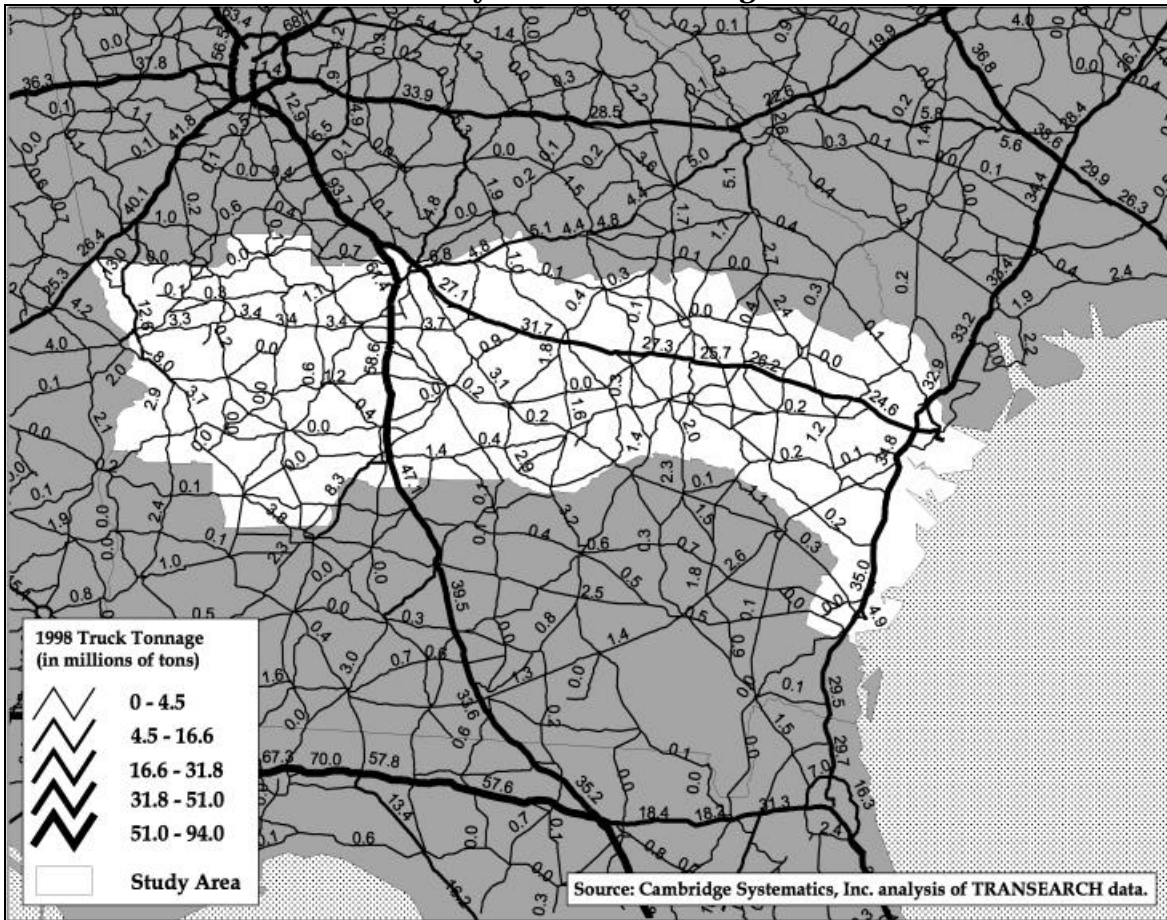
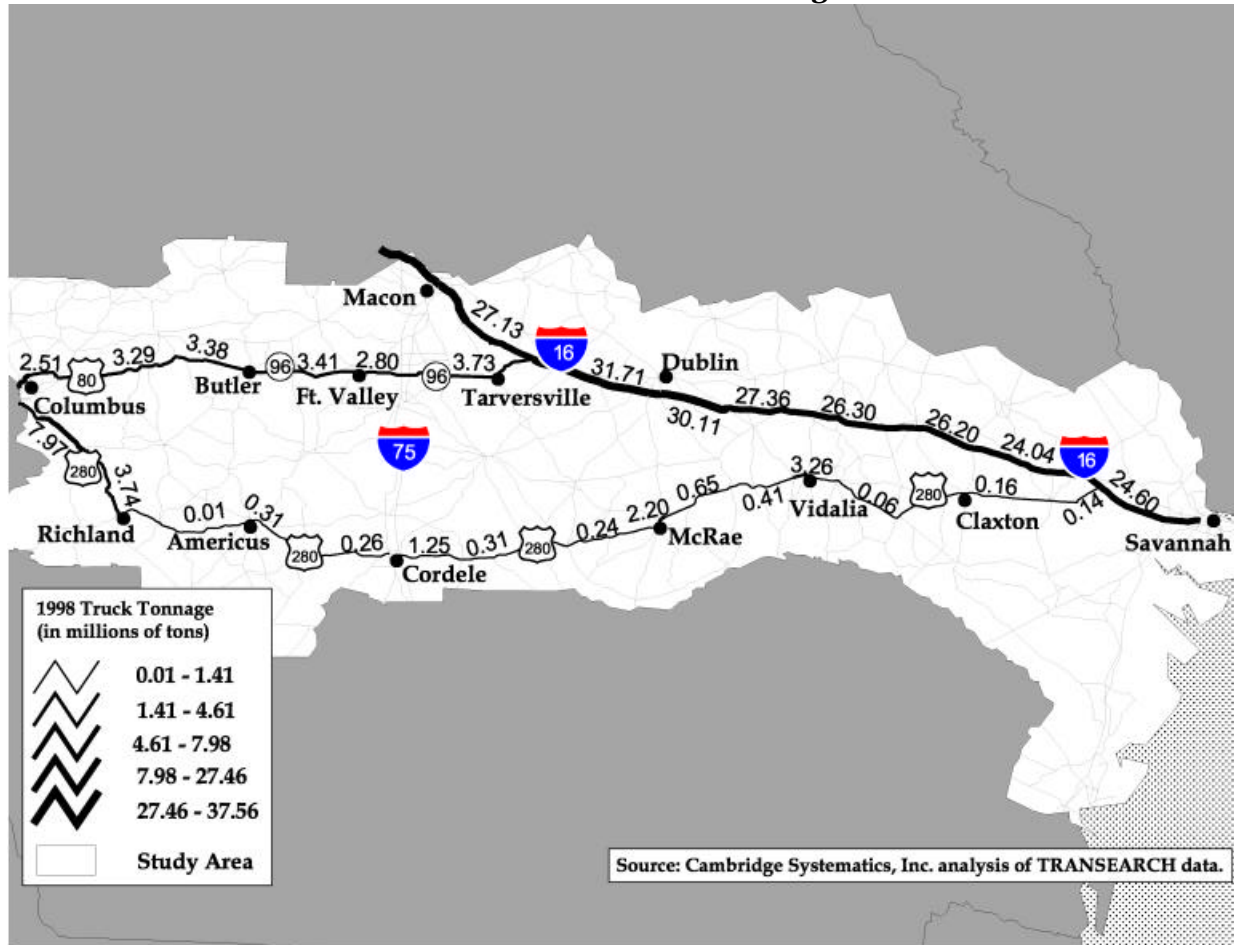




Figure 6-22
Corridor Routes Truck Tonnage





Conclusions

The commodity flow data presented in this section has been used to develop an overall profile of freight movement within the study area as a whole, within the individual counties comprising the study area, and within the highway and rail transportation network serving the study area. Key findings include:

- Looking at domestic tonnage inbound to and outbound from the 45 study area counties, a total of 122,000,000 tons was handled in 1998. Tonnage inbound to these counties was slightly higher than tonnage outbound. Trucks handled more than 75 percent of the tonnage, while rail handled just more than 22 percent. Water handled a little more than one percent of domestic tonnage (not including international shipments through the Ports of Savannah and Brunswick). Air cargo activity is quite low within the study area, representing less than 0.1 percent of total tonnage.
- More than 7.5 million loaded truck moves into and out of the study area counties were associated with this level of activity, along with almost 550,000 loaded railcar moves.
- Through trucks are by far the most dominant truck moves and are higher than all other categories combined. Almost 133,000,000 through tons are entirely external to the study area. This does not include an additional 94,000,000 tons that are inbound or outbound from the study area, and which may pass through one or more study area counties on their routes.
- By far the largest share of tonnage (about 50 percent) is between the study area and other Georgia counties outside the study area, and the Atlanta area generates more tonnage into and out of the study area than any other part of the country. Eleven percent of the tonnage remains entirely within the study area. Around ten percent of the tonnage is flowing between the study area counties and other states on the HPC alignment (Alabama, Mississippi, and states due west that could be reached on the alignment). Most of the remaining tonnage (17 to 18 percent) is to and from the southeast U.S., and the remainder (13 to 14 percent) is to and from the rest of the United States. These figures indicate that the study area is not dominated by a simple “corridor” type of move from one point to another. Rather, it is a complex set of flows with different purposes:
 1. Providing connectivity within the study area and within the state of Georgia;
 2. Providing connectivity with the states due west along the HPC 6 alignment;
 3. Providing connectivity between study area counties and the rest of the U.S.;
 4. Accommodating internal movements within each of the study area counties; and
 5. Accommodating through movements.
- We see that secondary traffic – principally associated with warehousing and distribution of a wide variety of commodity types – is the leading class of tonnage. Clay, concrete, glass, and stone – which includes kaolin clay, wet cement, and other heavy materials – is the second leading class. Lumber, food, and chemicals round out the top five classes. Overall, the picture is one of highly diversified types of commodity movements.
- Looking at commodities moving inbound to study area counties, secondary traffic is clearly dominant. Looking at the outbound commodities, however, we see that Clay, concrete, glass, and stone is the leading type. Generally, we can interpret this to mean that the study area counties are exporting more raw materials and manufactured products, and importing more warehoused products and consumer goods.



- The counties within the study area are widely divergent in terms of their types and levels of freight activity. By a wide margin, the leading county in terms of inbound and outbound tonnage is Chatham County, which is home to a number of major industries, as well as the Port of Savannah, and accounts for 33 percent of the study area’s inbound and outbound tonnage. Other leading counties for freight tonnage include Bibb, Muscogee, Glynn (home to the Port of Brunswick), Wilkinson, and Houston Counties. Other counties with more than two million tons include Twiggs, Crisp, Laurens, Sumter, and Liberty; together, the 11 counties with more than two million tons represent 83 percent of the total inbound and outbound tonnage in the study area. The most significant impact of this is that trip origins and destinations are not evenly distributed throughout the study area, but tend to be heavily clustered in areas of more intense economic activity, separated by areas of lesser activity. This, in turn, implies several levels of functionality for the HPC 6 and U.S. 280 corridors:
 1. Serving established clusters of intense freight movement and economic activity, including Georgia’s international seaports;
 2. Serving smaller but economically important clusters that currently exist outside of major activity areas; and
 3. Serving economically emergent (or potentially emergent) areas by accommodating future development of freight-generating land uses.
- In terms of modal share, most of the study area counties are dominated by trucks. Some counties – including Emmanuel, Toombs, Tatnall, and Harris – show 100 percent of their tonnage by truck. But there are many counties that also move a substantial share of their traffic by rail, including Talbot (87 percent), Crawford (78 percent), Effingham (53 percent), and Macon (50 percent).
- Georgia’s ports and waterways – both publicly and privately owned and operated – are a vital component of its statewide transportation system and its link to international markets. Taken together, more than 20 million tons of commodities were moved through nearly 40 public and private terminals in the state of Georgia in calendar year 1998. The presence of these facilities – the Port of Savannah in Chatham County, the Port of Brunswick in Glynn County, and the Port of Columbus in Muscogee County – places unique demands on the landside transportation system, because import and export goods (international cargo moves) must be moved to and from these ports by truck and rail (as domestic cargo moves).
- For inbound and outbound rail intermodal tonnage, we see that Chatham County is the only county handling significant volumes. This traffic is largely linked to the import and export of intermodal shipping containers through the Port of Savannah. Looking at the national-level flows, rail intermodal flows are substantially less than rail carload flows on a tonnage basis, and tend to be more concentrated at major seaports and urban centers. The dominant patterns are in the Atlanta region (particularly on the Atlanta-Jacksonville route) and along the eastern seaboard (with flows in and out of the Port of Savannah and other Atlantic coast intermodal marine terminals). Within the study area level, the lines between Savannah and Jacksonville, Macon and Atlanta, and Atlanta and Cordele carry the heaviest intermodal tonnage; there are little, if any, intermodal rail flows between Columbus and Macon, Macon and Vidalia, Cordele and Vidalia, and Vidalia and Savannah. Intermodal movements along the lines paralleling the HPC 6 and US 280 corridors are minimal.



- For inbound and outbound rail carload tonnage, Chatham County handles most of the inbound tonnage, but the outbound tonnage is more evenly distributed among other study area counties. Other significant rail counties include Glynn, Bibb, Effingham, Wilkinson and Talbott. Looking at the national-level flows, the dominant pattern is the concentration of rail activity in Atlanta. Within the study area, the coastal rail line through Savannah carries the highest carload tonnage; other high carload tonnage tracks include the Savannah to Columbia, South Carolina line, the Macon to Atlanta line, the Atlanta to Jacksonville line, and the western segments of the Macon to Savannah line (via Millen, Georgia). Other important carload tonnage segments include the Macon to Cordele line, the Macon to Albany line, the Columbus to Cordele line, and the Macon to Jessup line (via McRae, with nearly 3 million tons). The rail segments paralleling the HPC 6 and US 280 corridor alignments are not heavily used east of I-75 (where the preferred service appears to be via Macon and Millen), but are more heavily used west of I-75.
- Inbound and outbound truck tonnage is more evenly distributed among would be more evenly distributed among the study area counties than the rail tonnage. The top four counties for inbound tonnage (Chatham, Bibb, Muscogee, and Glynn) account for 59% of the inbound tonnage, and the top four counties for outbound tonnage (the same) account for 66% of outbound tonnage. Interestingly, however, when we look at the origins and destinations outside the study area, we actually see more clustering around the Atlanta region. Looking at national-level truck flows, we see that the heaviest flows are correlated with the interstate highway system, and that they center on Atlanta. Within the study area, the heaviest segments are I-475 west of Macon, I-75 south of Macon, I-95 north and south of Savannah, I-16 from Macon to Savannah, I-185 north of Columbus and U.S. 280 south of Columbus.

In subsequent phases of the study effort, this extensive base of data will allow the team to:

- Forecast future county-to-county flows by commodity type and mode;
- Forecast future volumes over the HPC 6 and US 280 corridors;
- Determine the extent to which different types of improvements to the HPC 6 and US 280 corridors would affect existing routing patterns (by diverting traffic to or from alternative routes);
- Determine the extent to which rail improvements might generate increases in rail share (in lieu of truck traffic); and
- Develop measures of system volumes and congestion to allow for evaluation of alternative improvement strategies.



7 Existing Transportation System Performance

Background and Purpose

One of the primary purposes of the Central Georgia Corridor Study is the identification of existing and anticipated future transportation infrastructure needs. Phase I addresses existing conditions, while Phase II will evaluate expected future conditions. Once existing needs are identified, short-term investment strategies and transportation projects are developed, prioritizing projects within the Georgia DOT work program can be initiated. Conducting an inventory of existing transportation system components, such as highway and rail networks is the first step in the process of gaining a comprehensive understanding of system performance. System components can then be evaluated using well-structured performance measures that provide an objective analytical approach to identifying deficiencies and system infrastructure needs. For this study, system performance will be combined with information from interviews, and the analysis of other transport data to develop a comprehensive description of the study area's needs.

To develop transportation system investment strategies and projects for the study area, it is also essential to understand the important role transportation investments play in economic development. Transportation system investments combined with a variety of other social and economic factors are ultimately intended to improve the quality of life. Reducing congestion, improving safety, and maintaining infrastructure are central transportation investment goals. Encouraging and sustaining healthy economic conditions is also a key role in defining transportation investments – particularly in rural areas. Areas in the study may not be encountering significant congestion or safety needs, but may gain significant economic benefits from transportation investments. There are areas in the study area that may require a greater emphasis on social and economic programs to help with economic sustainability.

The intent of this section is to provide a technical assessment of transportation system performance along with an assessment of the availability of transportation infrastructure within the study area. While transportation infrastructure plays an important role in the economic health of a region, there are several factors beyond infrastructure that can influence economic growth. A critical element of this section simultaneously addresses both the existing economic vitality and the availability of the existing transportation system that serves each county. The intent is to match economic vitality with existing transportation infrastructure to identify any potential gaps.

Overview of the Approach / Methodology

This section provides a summary of transportation system components and provides a summary of the performance of each component. An assessment of appropriate investment strategies at the county level is also provided, in the context of county economic conditions and existing regional transportation accessibility. Superimposing county economic conditions with a measure transportation accessibility provides a framework to group counties into investment strategy

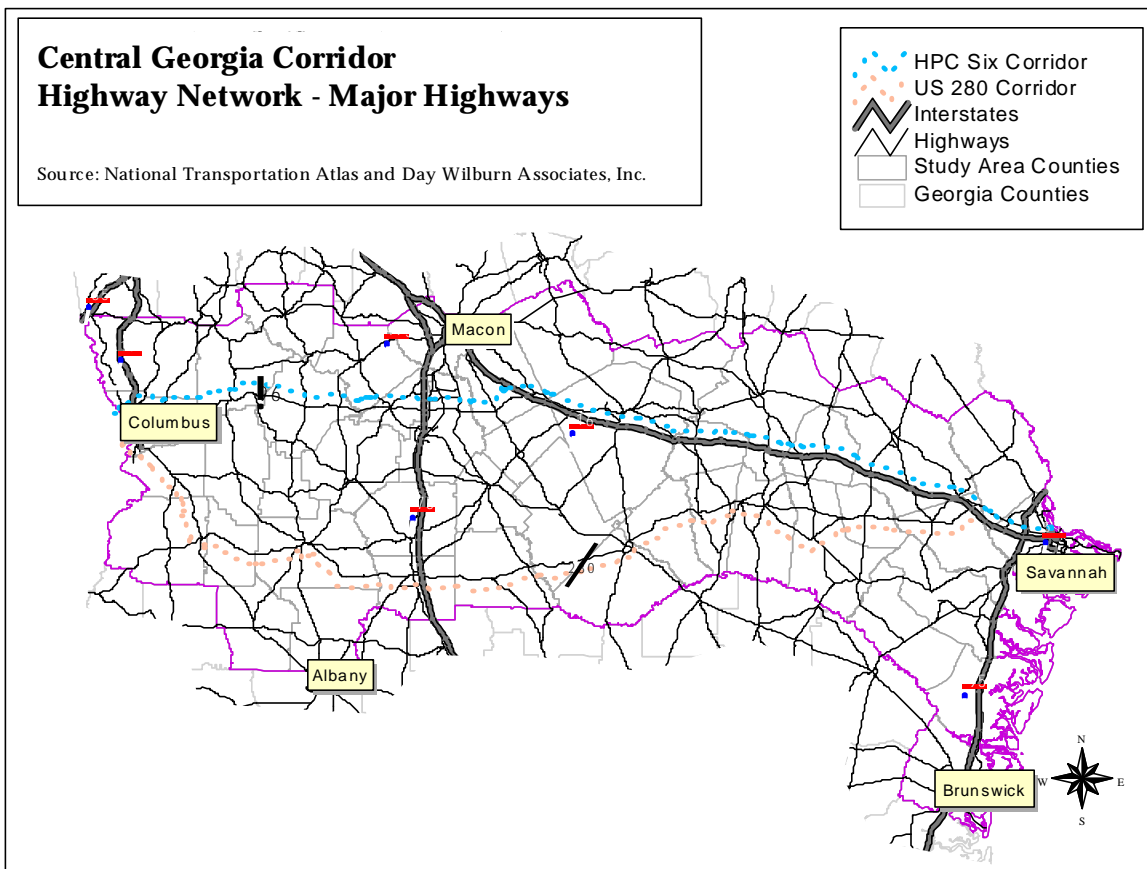


categories. It also remains consistent with other State initiatives, including the Georgia Rural Development Council work on organizing economic development strategies for all Georgia counties.

Transportation System Components – Highway Network

The major interstate highways serving the study area are I-95 along the coast, I-75 in the central region, and I-16 traveling between Macon and Savannah. Connecting interstates in the study area include I-185 serving Columbus, I-475 near Macon, and I-516 in Savannah. The study area is served by numerous US highways.

Figure 7-1





The Governor’s Road Improvement Program (GRIP) is a planned system of multi-lane highways throughout the State of Georgia (Figure 7-2). Much of the GRIP system is complete or under construction. US highways in the study area that are on the GRIP system include US27, US19, US441, US84, and US1. The State Legislature also recently added US280 to the GRIP system. Portions of US341, US301, and State Route (SR) 21 are also on the GRIP system.

Figure 7-2
(Source: GDOT)

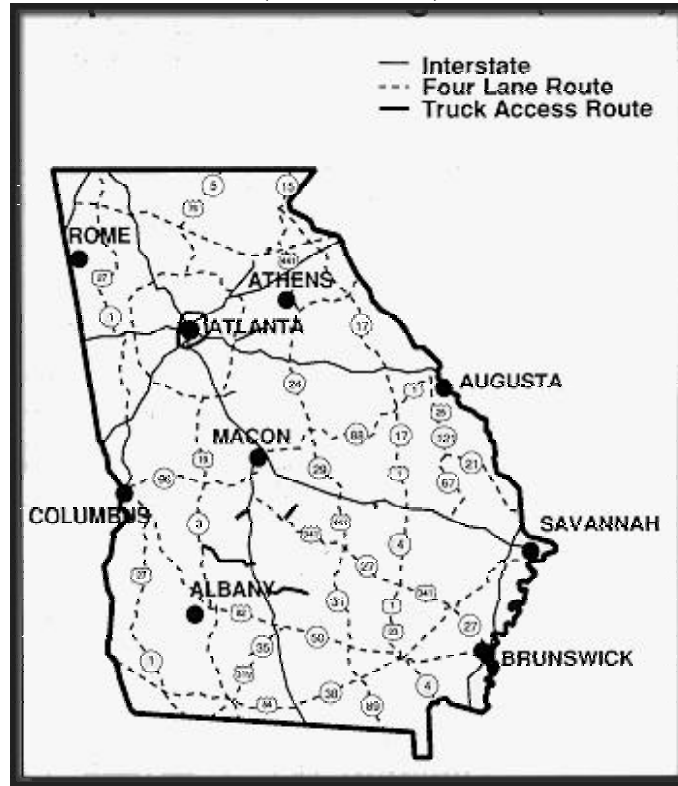
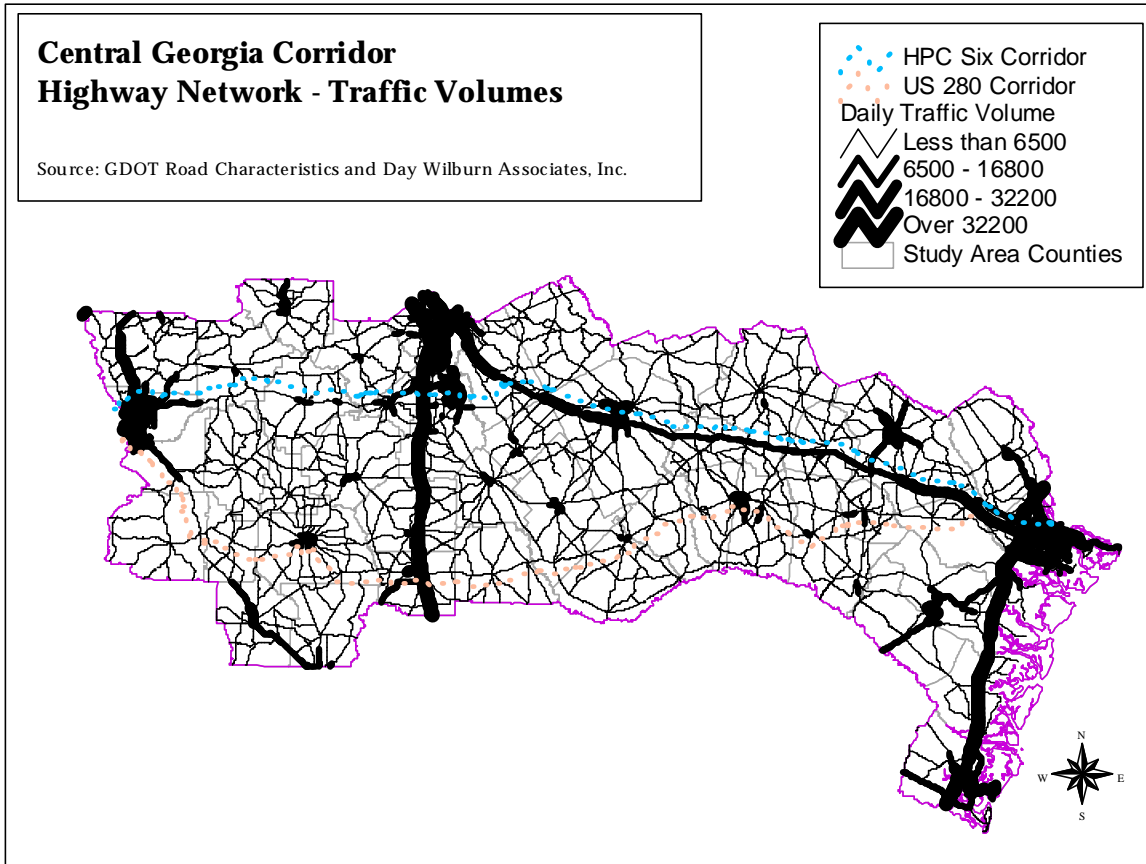


Figure 7-3, provides a visual representation of Georgia DOT traffic count data. The highest traffic volumes in the study area are primarily in and near metropolitan areas. Significant traffic volumes also occur in portions of the small urban areas such as Statesboro, Hinesville, Swainsboro, Vidalia, Dublin, Americus, and Thomaston. With the exception of interstate highways and access routes to/from metropolitan core cities, there are few clear patterns of major corridor flows in the study area.



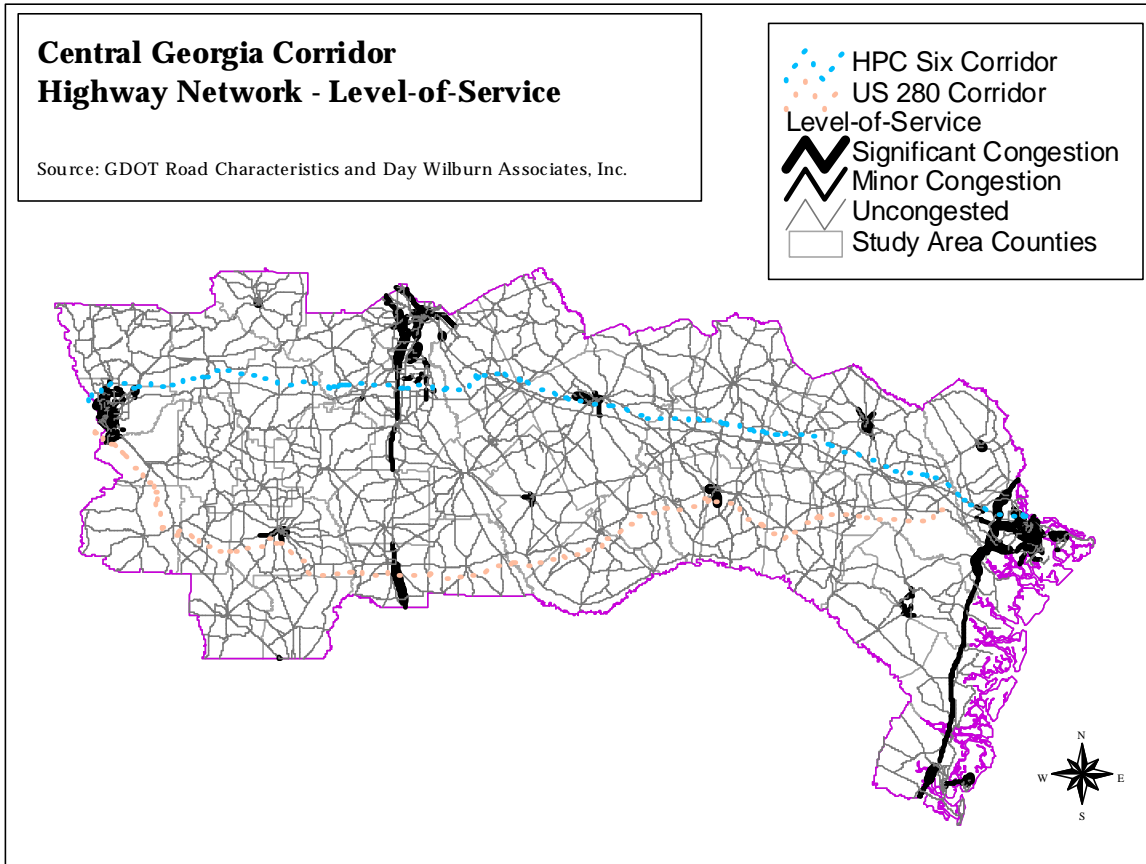
Figure 7-3



To estimate levels of congestion in the corridor, traffic handling capacity of the highway system must be quantified. Data from the Highway Performance Monitoring System (HPMS) provide a standardized process for developing system capacities on a regional or statewide basis. Through the HPMS program, the Federal Highway Administration (FHWA) requires states to collect and report detailed statistics on a large number of specified roadway segments. The data is used to compare the overall system performance of highway networks throughout the US. Using HPMS data for study area roadways, average capacities per lane were calculated by roadway functional class. The calculated capacities were applied to each highway segment to estimate a level-of-service by simply dividing each road segment's traffic count by the estimated capacity for that segment (volume/capacity). Figure 7-4 identifies congested areas and is consistent with the traffic volumes illustrated in Figure 7-5. The congestion problems logically follow the same pattern, occurring primarily in metropolitan and small urban areas. Few clear areas of congestion currently occur in the study area. Phase II of the project will examine future transportation demands that could indicate additional facilities that may experience congestion if no additional transportation improvements are implemented.



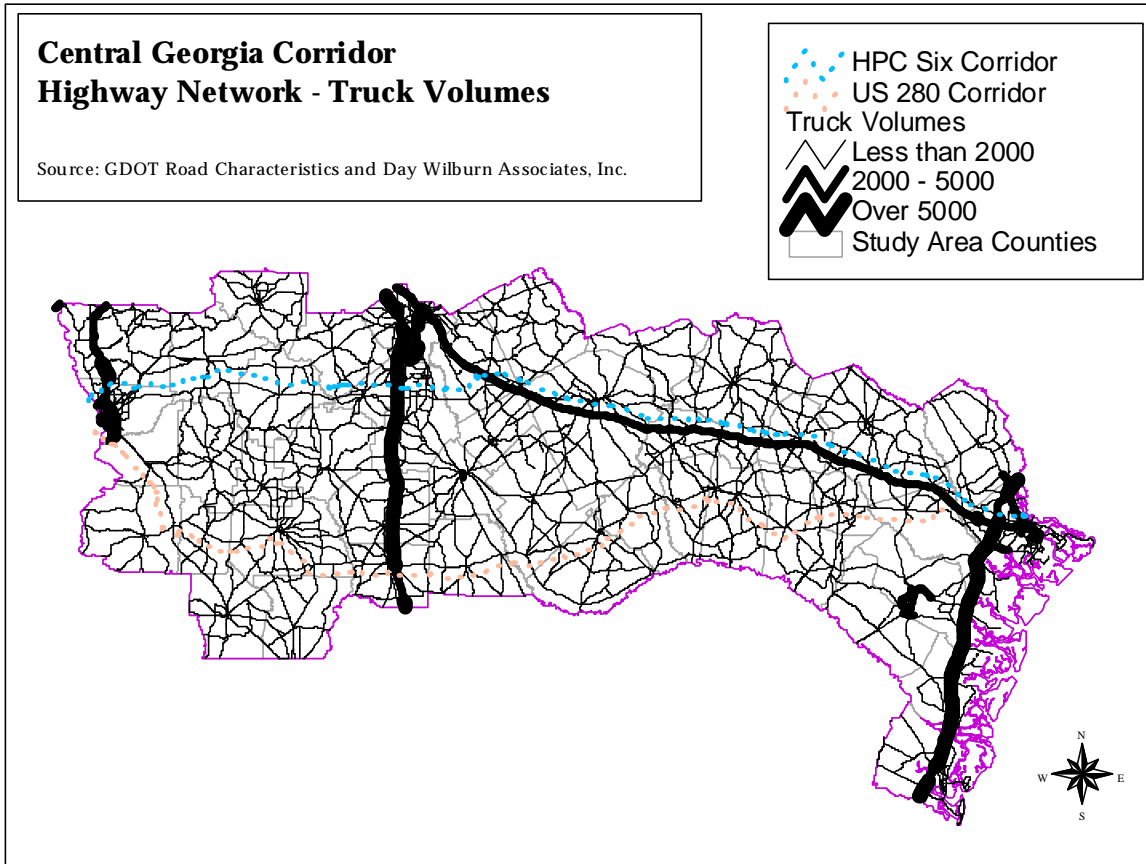
Figure 7-4



Since trucks have a significant impact on roadway capacity, maintenance and safety, it is important to identify corridors with high truck volumes. Georgia DOT maintains estimates of the percentage of trucks using various types of roadways. Generally, these estimates place the highest percentage of trucks on interstate highways. Since rural interstates have lower overall traffic volumes than urban interstates, they typically have higher truck percentages. This is also true for non-interstate highways, where rural highways carry a higher percentage of the trucks than urban highways. When the truck percentages are applied to traffic counts, the estimated number of trucks closely follows the observed overall traffic volume. The highest truck volumes occur on interstate highways, in metropolitan areas, and in small urban areas. This is generally consistent with the results obtained in the commodity flow analysis documented in Section 6 of this report. Phase II of the study will include an examination of the impact of trucks on highway maintenance.



Figure 7-5



Safety is another measure of overall highway system performance and is particularly relevant when addressing truck travel. Accident rates per million vehicle miles traveled were calculated as measure of highway safety using Department of Public Safety (DPS) accident data for 1995-1997. The rates are compared to statewide averages for similar roadways to identify road segments with an unusually high number of accidents. Segments exceeding the statewide average for similar facilities occur throughout the study area, with a slight disproportionate share occurring in rural counties.

If traffic volumes are low, a small number of accidents can produce high accident rates. In fact, a single accident in a three-year analysis period can produce an accident rate exceeding the statewide average if traffic volumes are very low. To identify segments with unusually high accident rates, more stringent requirements should be applied.

For this assessment, segments having an unusually high number of accidents were limited to locations where the average number of accidents over a three-year period is equal to or exceeds one, and the accident rate is equal to or exceeds twice the statewide average. Using these criteria, few high accident locations exist in rural areas, except in locations near intersections with other significant highways. The most significant high accident locations are in metropolitan



or small urban areas. Accidents involving large commercial vehicles occur primarily on interstate highways and in metropolitan areas. Commercial vehicle accidents, excluding those on interstate highways, are more dispersed, occurring throughout the study area. There were 84 accidents occurring at railroad crossings from 1995 to 1997, eight involved fatalities. Although most railroad crossing accidents occurred in metropolitan areas, most of the fatalities occurred in rural areas.

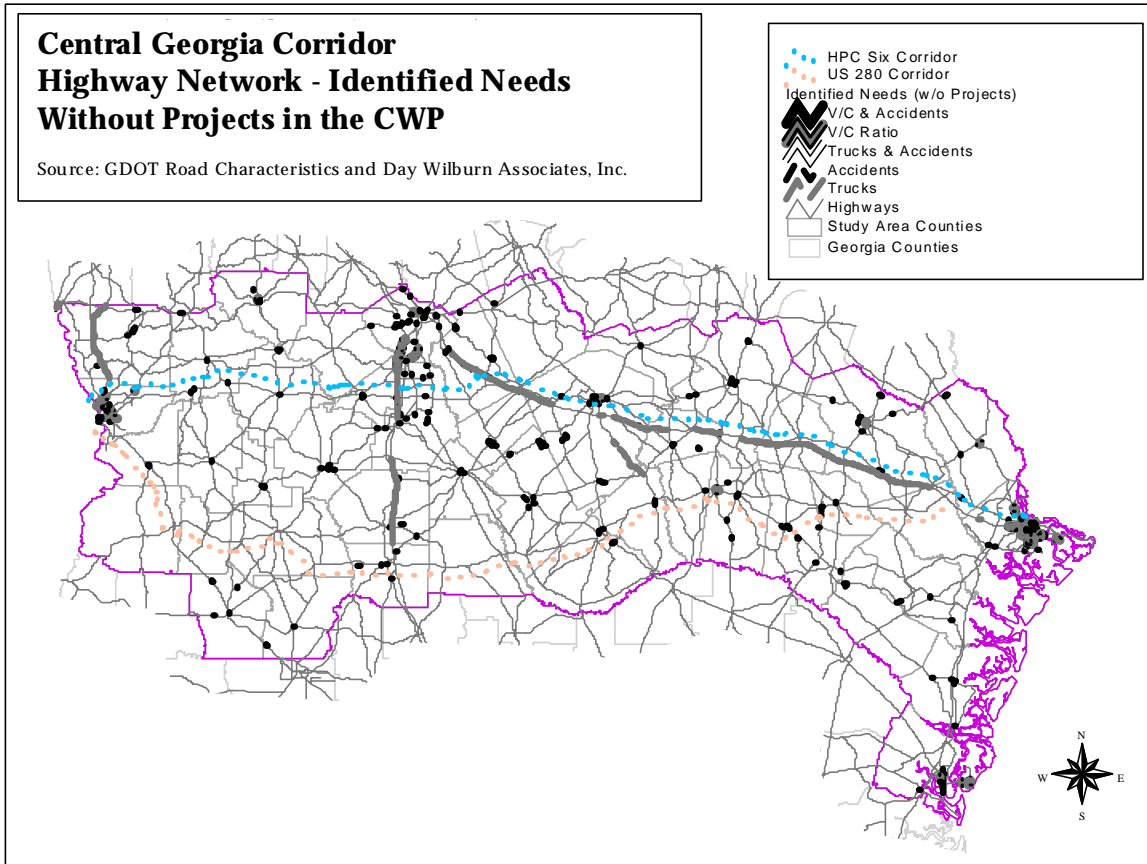
The Georgia DOT's Construction Work Program (CWP) provides a statewide list of transportation projects over a six-year period. The CWP also includes long-range projects that lack sufficient funding to be included in the six-year program, but will be considered for funding when sources are identified. Currently the CWP (as of February 2001) includes a strong focus on completing the GRIP system within the study area. Significant portions of US27, US19, SR96, US341, US441, US1, and US84 are programmed for construction within the next six-years. I-95 is also programmed for widening within the next six-years. Widening a portion of US280 west of I-75 is included as a long-range project (beyond six-years).

To develop a general picture of the infrastructure and safety needs in the study corridor, a simple set of criteria were used. Road segments with a volume equal to or exceeding 70% of the estimated capacity, with accident rates twice the statewide average or higher¹, or with a truck percentage of 20% or higher were identified. The list of identified road segments was reduced to include only locations where no projects that addressed the potential need were included in the current CWP. Figure 7-6 displays the resulting segments.

¹ Excluding locations where the average number of accidents per year is less than one.



Figure 7-6



In general, the primary existing infrastructure needs² are in metropolitan and small urban areas. Congestion problems are almost entirely limited to metropolitan areas. The highest truck volumes are generally on interstate highways, with rural highways generally carrying a larger percentage of trucks than urban highways. These general observations and specific identified needs will be used to develop “fast-track” projects and later to guide alternatives analysis.

² Excluding economic development as a criterion for defining “need.”



Transportation System Components – Rail Network

The study area is served by a relatively extensive rail network, consisting of approximately 1360 miles of track. There are two major railroad companies serving the study area, Norfolk Southern Railroad and CSX Railroad. These carriers operate approximately 700 miles of railroad in the study area. Table 7-1 displays the estimated major carrier mileage within each of the study area counties. Figure 7-7 highlights the rail network. The map also illustrates short-line railroad lines that serve the study area. One notable corridor related to this study is the rail line that parallels the US280 corridor. This rail line is owned by the State of Georgia.

The Georgia Ports Authority (GPA) is constructing a major new intermodal rail facility in Chatham County, the Mason Intermodal Container Transfer Facility (ICTF). According to the GPA, the facility will span “over 150 acres, *and* at final build-out will include 40,000 feet of lead track and 80 acres for container storage and marshaling.”

*Mason Intermodal Container Transfer Facility
(Source: Georgia Ports Authority)*

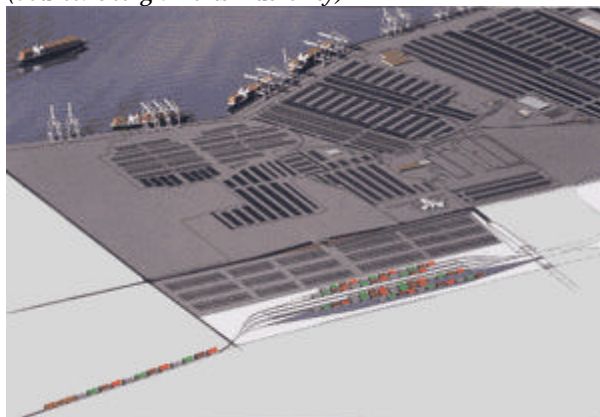
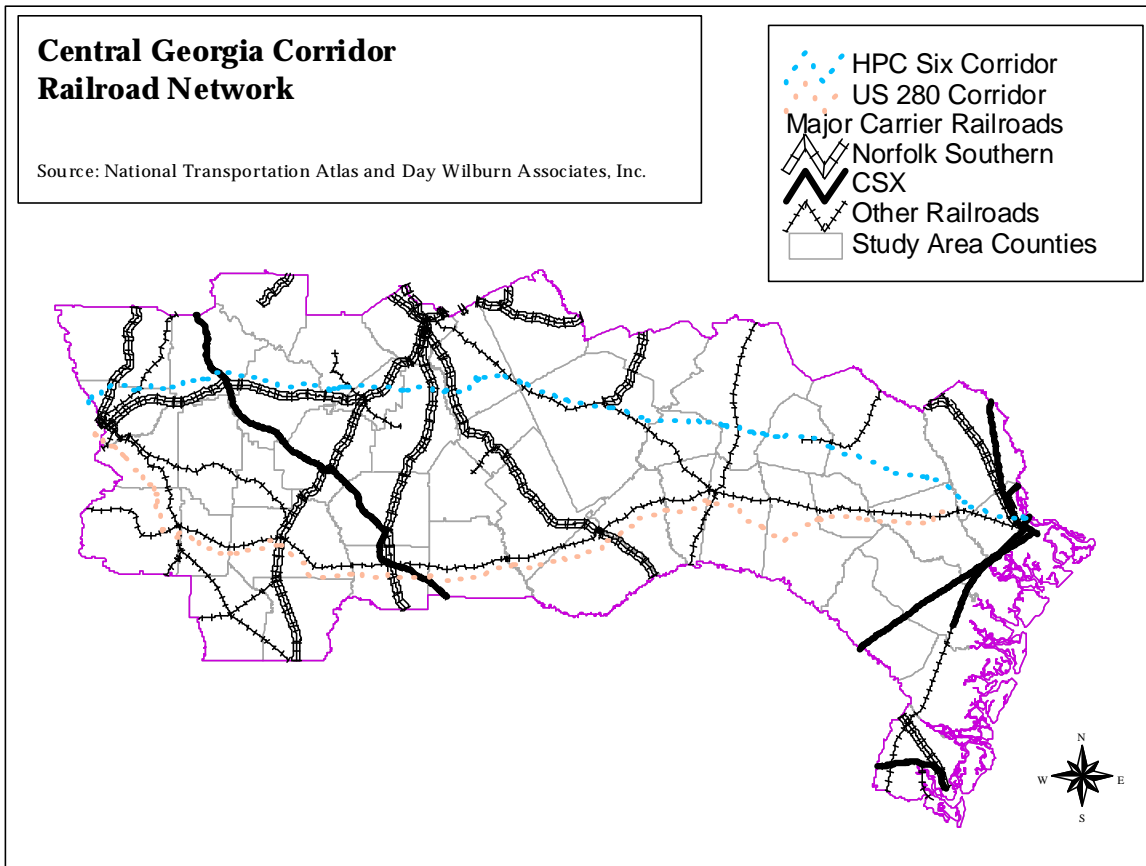


Table 7-1

County	Miles of Major Carrier Rail
Bibb	55.6
Bleckley	15.2
Bryan	15.6
Bulloch	0.0
Candler	0.0
Chatham	64.2
Chattahoochee	0.0
Crawford	4.3
Crisp	32.6
Dodge	28.6
Dooly	38.7
Effingham	51.3
Emanuel	0.0
Evans	0.0
Glynn	42.4
Harris	21.0
Houston	30.4
Johnson	10.1
Laurens	11.6
Lee	21.1
Liberty	26.2
Long	13.2
Macon	45.9
Marion	0.0
McIntosh	0.0
Montgomery	0.0
Muscogee	35.7
Peach	25.0
Pulaski	0.0
Schley	0.0
Stewart	0.0
Sumter	21.6
Talbot	40.6
Tattnall	0.0
Taylor	40.0
Telfair	20.6
Terrell	0.0
Toombs	0.0
Treutlen	0.0
Twiggs	22.1
Upton	10.9
Webster	0.0
Wheeler	0.0
Wilcox	6.1
Wilkinson	32.8



Figure 7-7



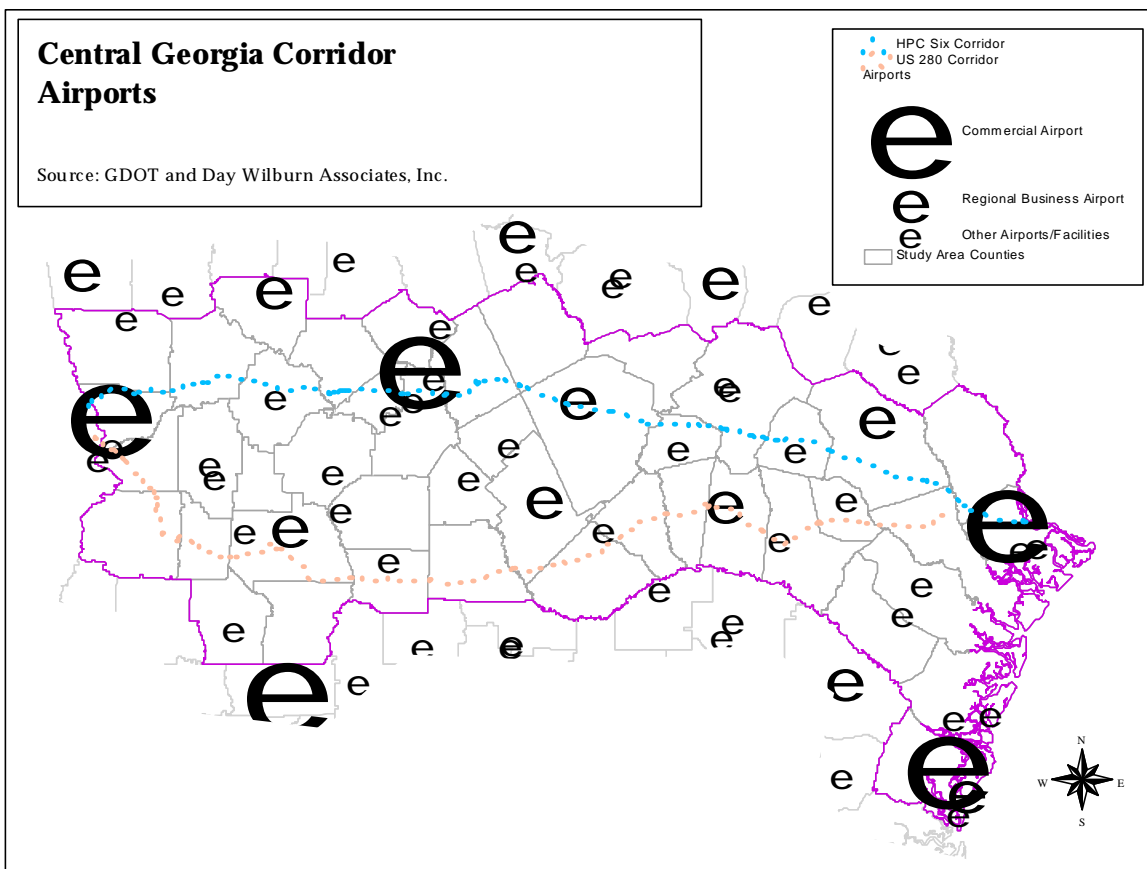
The primary rail traffic is almost exclusively on major rail carrier lines, specifically on lines along the coast, from Savannah to Atlanta, and from Florida to Atlanta. Detailed rail statistics are documented in the commodity flow chapter.



Transportation System Components – Airports

There are four commercial airports within the study area, Savannah International, Middle Georgia Regional (Macon-Warner Robins), Columbus Metropolitan, and Brunswick-Glynco Jetport. Southwest Georgia Regional in Albany also serves several counties in the study area. Savannah International handles a large majority of air passengers using airports in the study area (777,217 in 1999). The market area for Hartsfield Atlanta International extends well into the study area. Since the Columbus and Macon-Warner Robins areas are well within Hartsfield’s domain, the Columbus Regional (94,120 in 1999) and Middle Georgia Regional (30,493 in 1999) airports handle relatively few passengers.

Figure 7-8



Within the State of Georgia over 99% of air cargo is handled by Hartsfield Atlanta, Savannah International, and Southwest Georgia Regional airports. Express packaging services such as UPS and Federal Express use these airports as distribution hubs that serve the entire study area. Air cargo’s share of the overall cargo shipped within the study area is less than one-percent.

General aviation airports serve an important role in attracting new businesses, particularly those equipped to serve corporate jets using high level weather, navigational, and approach equipment. The Georgia Statewide Aviation System Plan (GSASP) classifies general aviation



airports into categories according to the sophistication of the airport's equipment and physical characteristics such as runway length. The three classifications used in the GSASP are:

- Level III – Business Airport of Regional Impact
- Level II – Business Airport of Local Impact
- Level I – Minimum Standard Utility Airports:

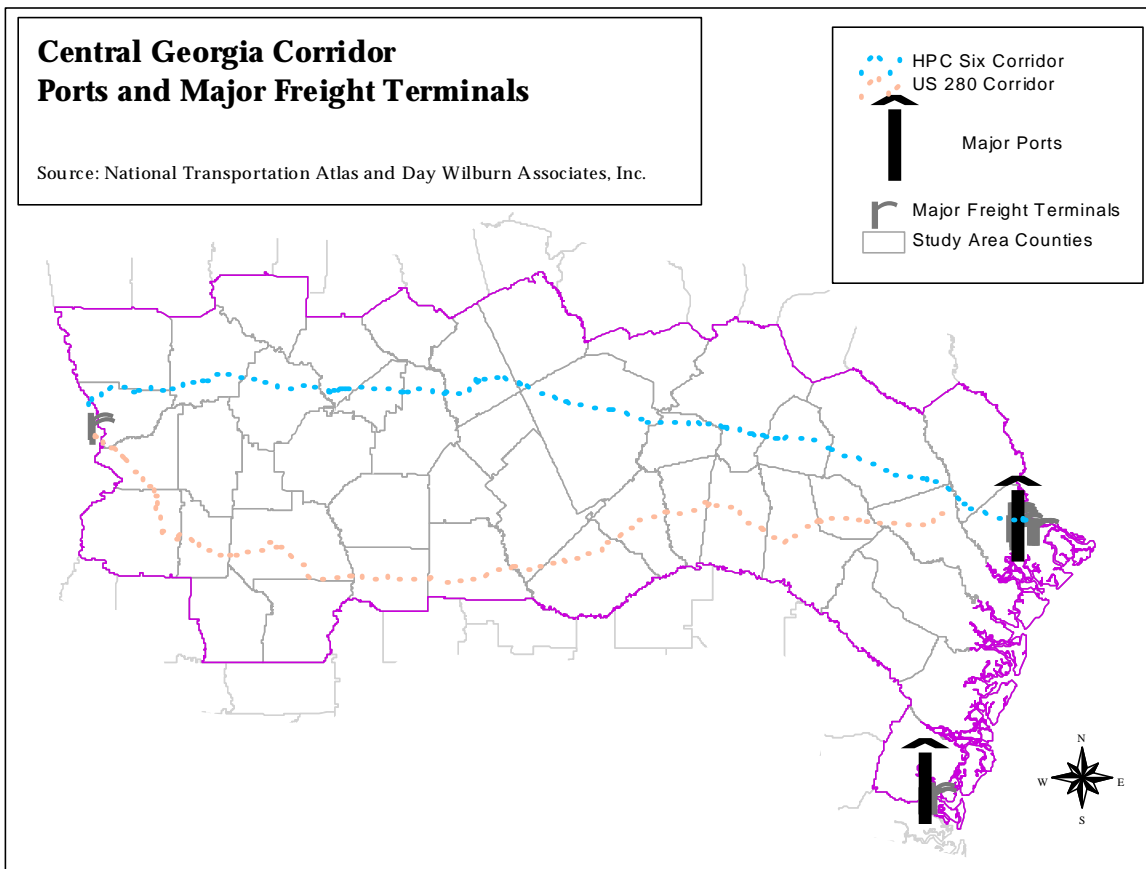
Level III airports are generally capable of handling corporate aircraft using precision guidance equipment. Level II airports are generally capable of handling corporate aircraft using non-precision guidance equipment. Level I airports generally serve non-corporate general aviation aircraft. Upon full implementation of the GSASP, every area in the state will be within a 45-minute drive of a Business Airport of Regional Impact and within 30-minutes of a Business Airport of Local Impact.



Transportation System Components – Ports

The Georgia Ports Authority (GPA) operates port facilities in Savannah, Brunswick, Columbus, and Bainbridge. Each facility is within the study area, except Bainbridge. The facilities in Savannah and Brunswick are large deepwater ports and Columbus is strictly a river barge facility.

Figure 7-9



The Port of Savannah is one of the leading ports in the United States, consisting of GPA’s Garden City Terminal and Ocean Terminal, and numerous privately owned facilities along the Savannah River. At over 1000 acres, GPA’s largest facility is the Garden City Terminal handles many types of cargo, but primarily specializes in containerized cargo. When open, the Mason ICTF will serve the Garden City Terminal. GPA’s Ocean Terminal is over 200 acres and handles non-containerized cargo. Private terminals in the Port of Savannah handle a significant amounts of cargo, with some serving multiple customers and others serving individual manufacturers.

The Port of Brunswick, is also an important seaport, specializing in the transport of automobiles and other non-containerized cargo. GPA has three facilities in the Port of Brunswick. Colonel’s Island Terminal is nearly 350 acres and primarily handles automobiles and agricultural products. GPA’s other Brunswick facilities, Mayor’s Point Terminal and Marine Port Terminal, consist of



over 150 acres and handle non-containerized cargo. The Port of Brunswick also consists of several privately operated terminals that principally serve individual manufacturers.

Port facilities in Columbus handle far less cargo than Savannah and Brunswick. Terminal facilities in Columbus are served by barges and operate as an alternative to transport by truck or rail.



The Transportation System's Role in Economic Development

The Georgia Rural Development Council's (GRDC) recommendations for infrastructure investment strategies differ for areas with varying economic conditions. Recommendations call for key infrastructure investment, the provision of more transportation options, and preservation of intrinsic qualities in areas with growing economies. In areas with stable economies, the GRDC recommendations attempt to broaden the sphere of economic influence with key infrastructure investments and workforce investments. In areas with lagging or declining economies, the recommendations focus on better connection to the "regional growth engines."

To be consistent with the recommendations of the GRDC, this study relies on the Council's Economic Vitality Index (EVI), and identifies areas that serve as "regional growth engines." Growth engines are categorized as central cities of counties with an EVI other than lagging or declining, a population of at least 20,000, and an employment of at least 10,000. The following areas meet the criteria:

- Metropolitan Areas:
 - Brunswick
 - Columbus
 - Macon-Warner Robins-Perry
 - Savannah
- Small Urban Areas:
 - Americus
 - Dublin
 - Statesboro
 - Thomaston
 - Vidalia-Lyons

Although Albany is just outside the study area, it also serves as a growth engine. Cordele nearly qualifies, only lacking a county employment of at least 10,000 (9,395).

To determine how transportation infrastructure is currently influencing economic growth, a transportation "accessibility index" was developed gauge the impact that transportation infrastructure could have on county economic status. The accessibility index represents an unweighted numeric value that captures the amount of transportation infrastructure *accessible* to each county. The following factors were used to develop the index.

- Proximity to an interstate highway
- Proximity to a commercial airport
- Proximity to a business airport of regional impact (GSASP Level III)
- Proximity to major freight terminals (ports and intermodal rail facilities)
- Miles of multilane highways
- Miles of major rail carrier railroads



Each county received a score for each factor according to its percentile ranking compared to other counties in the study area. Scores were assigned according to the following percentiles:

Percentile Range	Score
90+%	4
70-89%	3
50-69%	2
40-49%	1
<40%	0

The average of the scores for each factor determined each county’s assigned transportation accessibility index according to the following ranges:

Average Score	Accessibility Index
3.5 or higher	Excellent
2.5-3.5	Good
1.5-2.5	Average
0.5-1.5	Low
<0.5	Poor

By overlaying the transportation accessibility index and the economic vitality index, a comparison between access to transportation infrastructure and the economic status of each county can be made. The following section summarizes the bivariate assessment of transportation access and economic vitality.



Summary of Key Findings

Thirty-eight percent (38%) of the study area population is categorized as “Growing” counties, 42% as “Existing and Emerging Growth Centers,” 18% as “Lagging” counties, and less than 2% as “Declining” counties. A major of the study area’s population resides in counties with relatively stagnant or poor economic conditions. Transportation infrastructure investment is one of the mechanisms needed to improve economic conditions. However, over 75% of the study area population resides in counties with good or excellent regional transportation access. Therefore, to encourage improved economic conditions it is important to direct transportation investments toward areas that need improved regional accessibility. It is important to direct transportation investments, particularly given limited funding resources, to areas that have existing transportation deficiencies or are most likely to benefit economically.

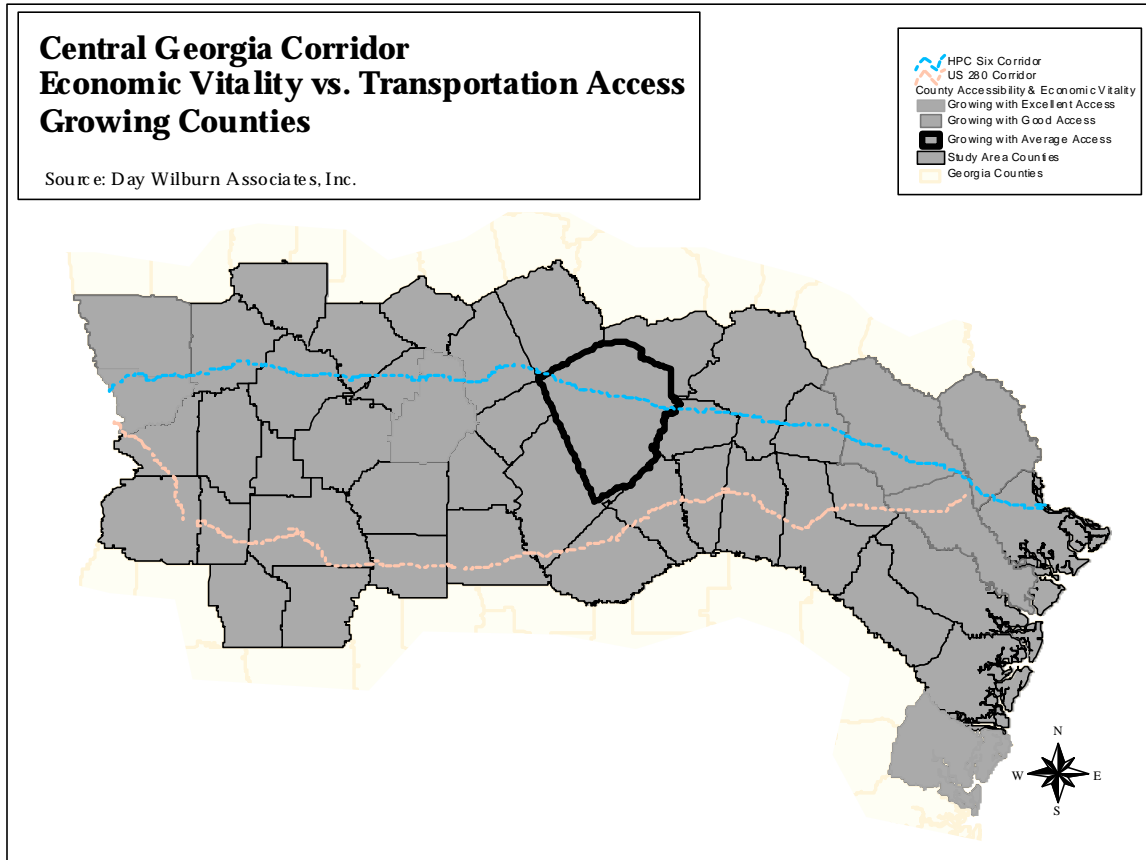
Each of the metropolitan area growth areas (Brunswick, Columbus, Macon-Warner Robins-Perry, and Savannah) has excellent regional transportation access. Transportation infrastructure investment is primarily needed in these areas to address capacity, efficiency, and safety. Specific rural portions in the study area would benefit economically from improvements in regional accessibility. Certain safety and operational improvements also exist in rural areas.

Of the small urban area growth areas (Americus, Dublin, Statesboro, Thomaston, Vidalia-Lyons), Americus and Statesboro also have good transportation access. Dublin, Thomaston, and Vidalia-Lyons have average regional transportation access, and would likely benefit most from transportation infrastructure investments.

The remainder of this section summarizes county specific findings grouped by EVI categories.



Figure 7-10



Growing Counties

There are eight counties in the study area classified in the “Growing” category (Harris, Muscogee, Houston, Laurens, Bulloch, Effingham, Bryan, and Glynn). With exception of Laurens and Bulloch, the counties represent metropolitan core or metropolitan suburban counties with good or excellent transportation access. Metropolitan core counties such as Muscogee, Houston, and Glynn primarily need specific highway capacity improvements. Suburban metropolitan counties such as Harris, Bryan, and Effingham primarily need transportation improvements to better connect them to their respective metropolitan core counties and operational improvements to help keep pace with new residential development.

Laurens County has good transportation access given the proximity to I-16 along with the business airport. Laurens is not currently served well by multilane highways, major rail carriers, a passenger airport, or a major freight terminal. Completion of US 441 widening projects that are currently under construction will improve the county’s accessibility.

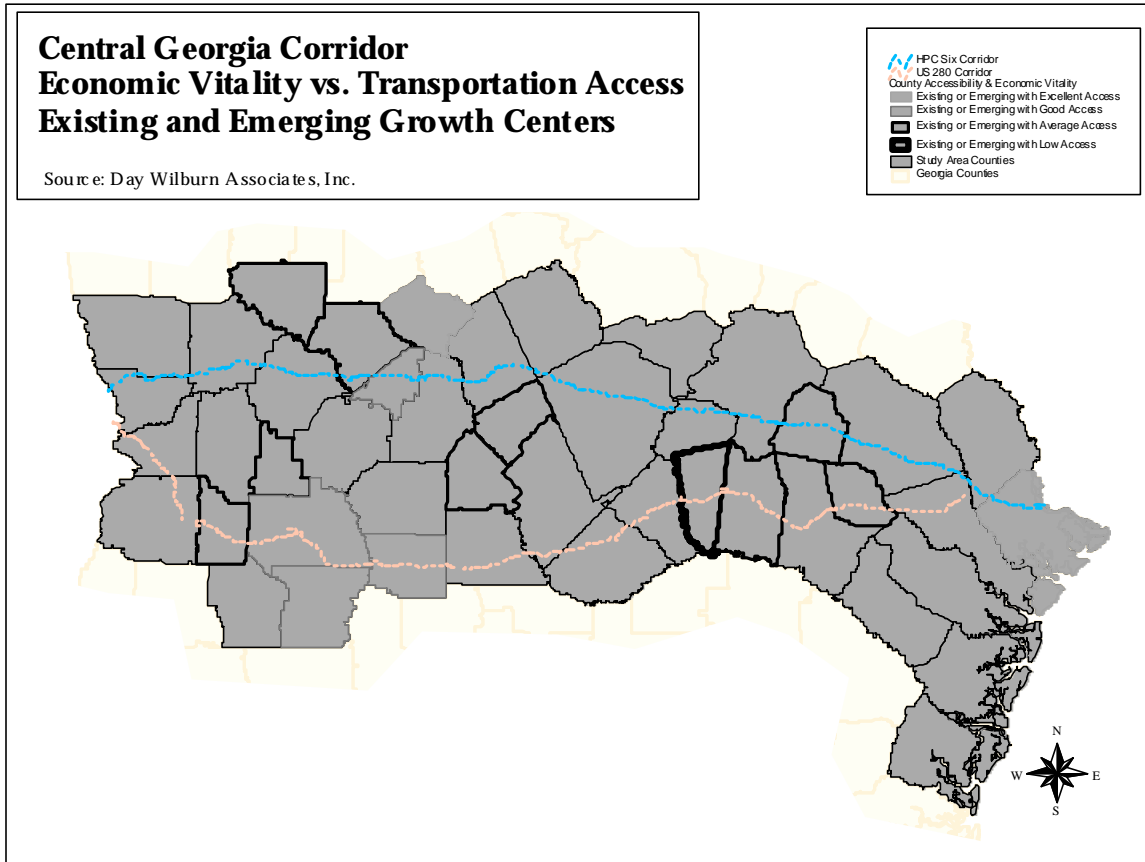
Overall, Bulloch County has excellent transportation access. The only regional weakness is lack of service by major rail carriers. Georgia Southern University (GSU) is located in Bulloch County



and is the study area's only regional university. GSU has been a catalyst for economic development in the county. GSU has the potential to be a significant resource for improving the economic conditions in counties that are relatively close.



Figure 7-11



Existing and Emerging Growth Centers

There are sixteen counties within the study area classified as “Existing and Emerging Growth Centers” (Upson, Crawford, Bibb, Peach, Schley, Webster, Sumter, Lee, Crisp, Pulaski, Bleckley, Montgomery, Toombs, Candler, Evans, and Chatham).

Bibb and Chatham Counties represent metropolitan core counties with excellent regional transportation access. The metropolitan core counties primarily need specific highway capacity improvements. Chatham County has specific port related needs that are essential to the long-term competitiveness of Georgia ports.

Four counties have good regional transportation access (Lee, Sumter, Crisp, and Peach). Lee County is dealing with suburban growth. Lee County has good radial access and connectivity to Dougherty County, but lacks good cross-county access. Crisp County’s only regional accessibility weak point is airport access. Sumter County primarily lacks multilane highways, with connectivity to I-75 being a particular need. Peach County lacks major rail service.

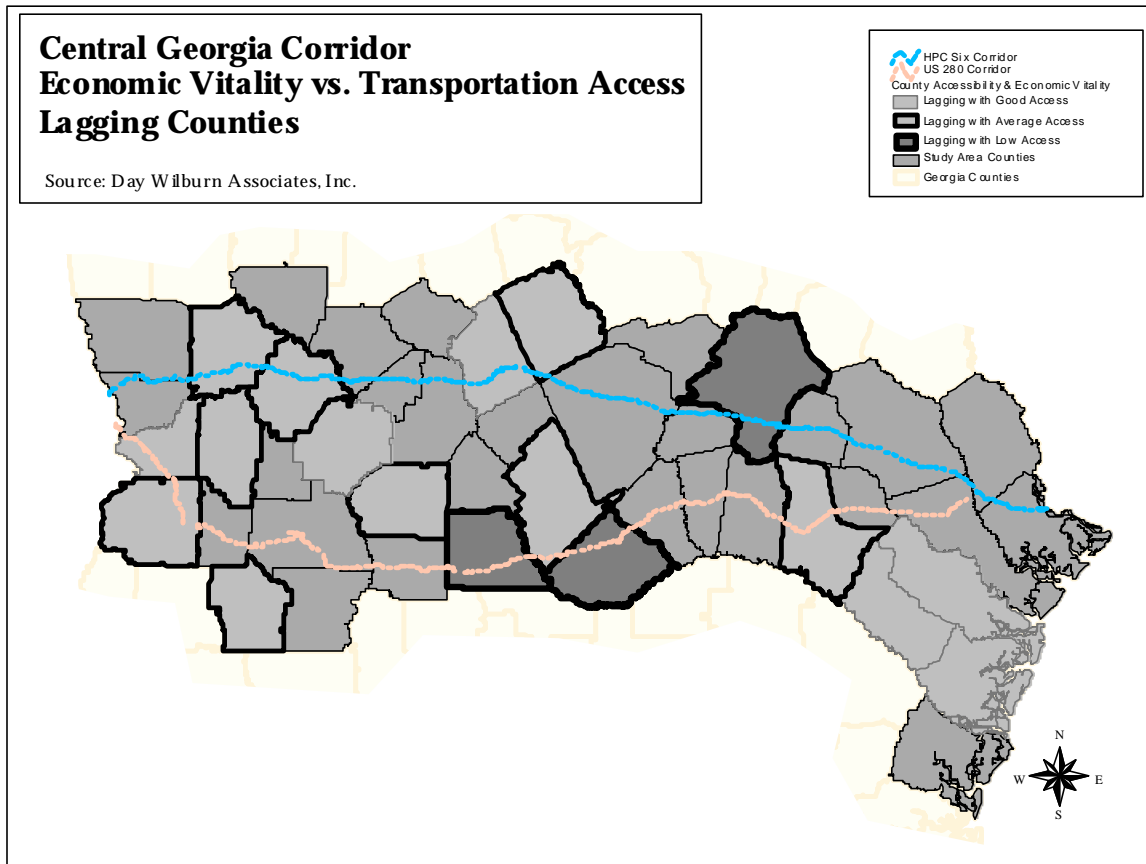


Nine counties have average regional transportation access (Webster, Schley, Upson, Crawford, Pulaski, Bleckley, Toombs, Candler, and Evans). Webster County has good access to I-185 via US280, poor access to I-75 and lacks major rail service. Schley County has poor interstate access, lacks multilane highways and major rail service. Upson County primarily lacks good access to interstate highways. Crawford and Pulaski Counties lack multilane highways and major rail service. Bleckley County primarily lacks multilane highways. Toombs County lacks connectivity to I-16, multilane highways, major rail service, and passenger airport access. Candler County lacks multilane highways, major rail service, and passenger airport access. Evans County lacks major rail service and airport access.

Montgomery County has poor regional transportation access. Montgomery County lacks multilane highways, major rail service, passenger airport access, and freight terminal access.



Figure 7-12



Lagging Counties

There are eighteen counties within the study area classified as “Lagging” (Stewart, Chattahoochee, Marion, Talbot, Taylor, Macon, Terrell, Dooly, Wilcox, Dodge, Telfair, Twiggs, Wilkinson, Emanuel, Tattnall, Long, McIntosh, and Liberty).

Six counties have good regional transportation access (Chattahoochee, Macon, Twiggs, Long, McIntosh, and Liberty). Chattahoochee County lacks major rail service. Macon County lacks multilane highways, with connectivity to I75 being a particular issue. Twiggs County lacks multilane highway access. Long County lacks multilane access to interstates, but has good regional transportation access. McIntosh County lacks multilane highways and major rail service. Liberty County lacks access to a business airport.

Nine counties have average regional transportation access (Stewart, Marion, Talbot, Taylor, Terrell, Dooly, Wilkinson, Dodge, and Tattnall). Stewart County has good access to I185 via US280, but lacks major rail service and access to a business airport. Marion County lacks multilane highways, major rail service, and access to a business airport. Talbot and Taylor Counties lack good access to interstate highways, multilane highways, and access to a business

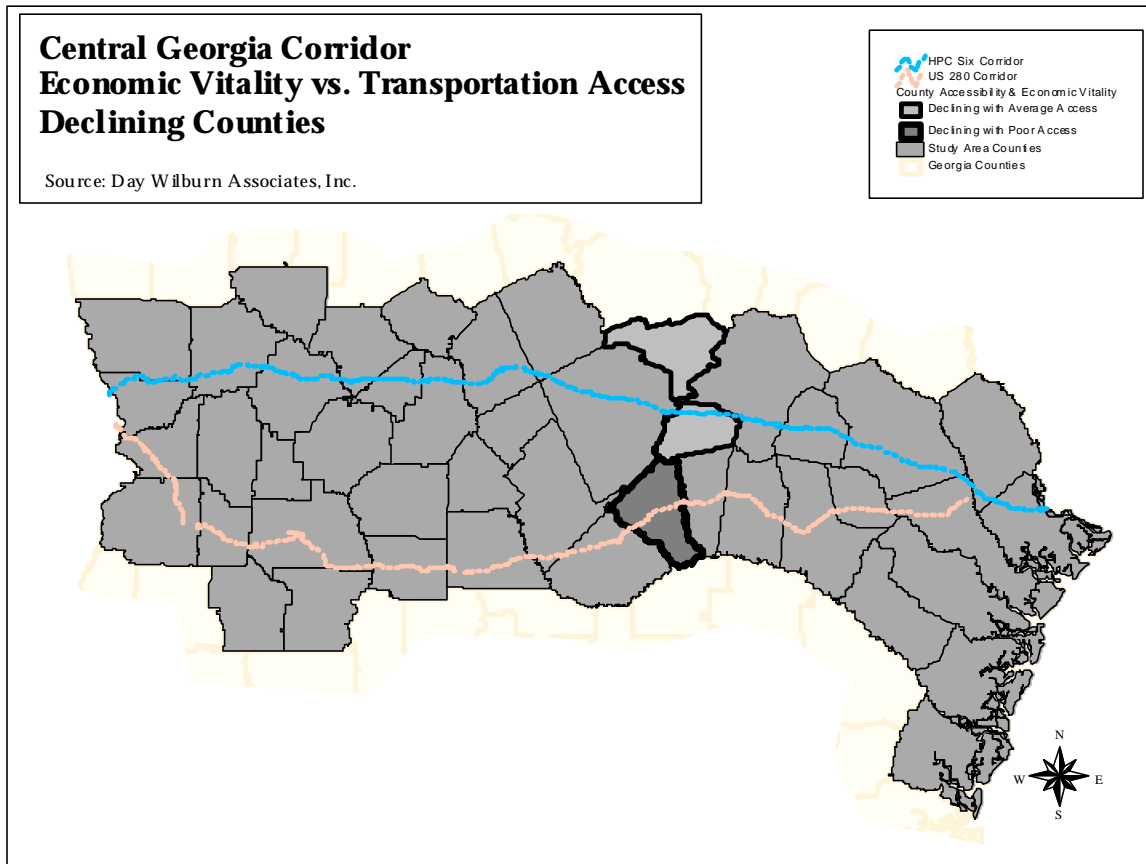


airport. Terrell County is not close to an interstate and lacks major rail service. Dooly and Wilkinson Counties primarily lack multilane highways. Dodge County lacks multilane highway access to interstates and is not close to a major freight terminal. Tattnall County primarily lacks multilane highways and major rail service.

Three counties have poor regional transportation access (Wilcox, Telfair, and Emanuel). Wilcox County lacks multilane access to interstates, multilane highways, major rail service, passenger airport access, and freight terminal access. Telfair County lacks access to interstates, multilane highways, passenger airport access, and freight terminal access. Emanuel County lacks multilane highways, major rail service, and access to airports.



Figure 7-13



Declining Counties

There are three counties within the study area classified as “Declining” (Wheeler, Treutlen, and Johnson).

Treutlen and Johnson Counties have average regional transportation access. Treutlen County has good access to I-16 but lacks multilane highways, major rail service, and access to a passenger airport. Johnson County primarily lacks multilane highways, major rail service, and access to a passenger airport.

Wheeler County has low regional transportation access. Wheeler County is relatively close to I-16 and a business airport, but is otherwise lacking in each measure of regional transportation access.

These counties need improved transportation connections to nearby “growth engines” such as Dublin and Vidalia. Initially, rural transit service to/from Dublin and Vidalia should be considered. These counties would also benefit from providing Vidalia improved access to/from I-16.



Conclusions

This Phase I report documents a baseline assessment of existing transportation system activity and performance. Subsequent phases of the project will include assessments of future anticipated transportation system performance and the development of comprehensive strategies for meeting the study area's needs.

Findings of this transportation system performance evaluation are based on objective performance measures for congestion, safety, and accessibility. Existing congestion problems are almost exclusively within metropolitan counties, with limited congestion occurring in small urban areas. Road segments with accident rates that are well above the statewide average exist throughout the study area, with concentrations in metropolitan areas and at significant rural intersections. An examination of economic conditions compared to measures of regional accessibility showed that improvements in regional accessibility are needed in most study area counties, particularly in rural counties.

Table 9-2 contains a summary of the findings of the transportation system performance evaluation. Potential improvement options are also provided. These options corroborate with Georgia Rural Development Council initiatives to support economic engines and increase accessibility to/from economic engines. Potential improvements listed in table 9-2 are regional in nature. Localized analysis would reveal many additional needs, particularly in metropolitan areas.

Improvements in landside access to ports in Savannah & Brunswick are essential to the economic vitality of the State of Georgia. Savannah in particular has significant landside access issues. State Routes 21 and 307 are key facilities for accessing Savannah's ports. SR 21 also functions as a major commuter route between Effingham County and Savannah. It is important that congestion in the corridor be addressed to insure efficient movement of freight. SR 307 serves as a significant link between Savannah's ports and I-16. The corridor includes several problematic at-grade rail crossings. Two key highway/rail grade separation projects in Savannah warrant particular emphasis. These grade separations, one on SR 25 and the other on SR 307, will allow the Macon Intermodal Container Facility to be fully integrated into the Garden City Terminal. A similar highway/rail grade-separation project exists in Brunswick on US17.

An additional study related activity includes the preparation of a list of potential short-term projects using data and supporting information collected during phase I. High priority ("fast-track") projects will be selected and funding procedures initiated.



Table 7-2

Transportation System Performance Summary			
County	Transportation Accessibility	Primary Regional Transportation Need(s) – Study Related *	Improvement plans & options
Growing Counties			
Bryan	Good	Access to/from Savannah & I-95 congestion	I-95 & US17 (Chatham County) widening
Bulloch	Good	Access to/from GSU	US301, SR25, and SR67 widening
Effingham	Good	Access to/from Savannah & I-16	SR119 operational improvements & US80 widening
Glynn	Excellent	I-95 congestion & port landside access	I-95 widening & highway/rail separation on US17
Harris	Good	Multilane highways	US27 and SR85 widening
Houston	Excellent	SR96 Operational Improvements	Accelerate SR96 improvements
Laurens	Average	Multilane highways	US441 widening
Muscogee	Excellent	Urban congestion	US280 operational improvements or widening
Existing and Emerging Growth Centers			
Bibb	Excellent	I-16/I-75 operational improvements & urban congestion	I-16/I-75 CD system project
Bleckley	Average	Multilane highways	US23 widening
Candler	Average	Multilane highways	Improved connections to Statesboro & Vidalia
Chatham	Excellent	Port landside access & urban congestion	Multiple highway/railroad grade separations, SR21 upgrade
Crawford	Average	Multilane highways	Upgrades to US80 from/to Bibb County (safety improvements)
Crisp	Good	I-75 Capacity & US280 Safety	I-75 and US280 widening
Evans	Average	Multilane highways	US301 widening
Lee	Good	Connectivity to Albany	SR91 widening
Montgomery	Low	Access to I-16, multilane highways	US280 widening and operational improvements to US221
Peach	Good	Safety improvement to SR96	SR96 widening
Pulaski	Average	Multilane highways	US341 widening
Schley	Average	Multilane highways	US19 widening
Sumter	Good	Multilane highways	US280 and US19 widening
Toombs	Average	Multilane highways & I-16 access	US280 and US1 widening; SR297 operational improvements
Upson	Average	Interstate access	SR36 operational improvements
Webster	Average	Interstate access	US280 widening
Lagging			
Chattahoochee	Good	Connectivity to Columbus	Rural transit service
Dodge	Average	Interstate access	US341 and US23 widening
Dooly	Average	Access to/from Americus	SR27 operational improvements
Emanuel	Low	I-16 access and multilane highways	US1 widening
Liberty	Good	I-95 congestion & connectivity to Savannah	I-95 and SR196 widening
Long	Good	Access to interstates	US301 and US84 widening
Macon	Good	I-75 access and multilane highways	SR49, SR224, and SR 26 operational improvements
Marion	Average	Access to/from Columbus and Americus	Rural transit service
McIntosh	Good	I-95 congestion & multilane highways	I-95 widening
Stewart	Good	Access to/from Columbus	Rural transit service and US27 widening
Talbot	Average	Multilane highways	SR96 widening
Tattnall	Average	Multilane highways	US280 widening
Taylor	Average	Multilane highways	US19 and SR96 widening
Telfair	Low	Multilane highways	US441 and US280 widening
Terrell	Average	Access to/from Albany	Rural transit service
Twiggs	Good	Multilane highways	US23 and SR96 widening
Wilcox	Low	Multilane highways	US280 widening
Wilkinson	Average	Multilane highways	US441 widening
Declining			
Johnson	Average	Access to/from Dublin	Rural transit & US341 operation improvements



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Treutlen	Average	Access to/from Dublin & Vidalia	Rural transit & SR29 improvements to/from I-16 & Vidalia
Wheeler	Low	Access to/from Vidalia	Rural transit & US280 widening

* Omits major rail access and airport access. Rail service is a business decision by the railroads and can only be improved through negotiations with them. The Georgia State Aviation System Plan provides reasonable assumptions regarding likely airports upgrades.



Appendix A – Demographic and Economic Profiles

Introduction

This Appendix presents demographic and economic profiles of each of the 45 study area counties. The demographic profiles provide characteristics of each county's population as compared to the State of Georgia, including %change in population, components of population change, racial breakdowns, and age. The economic profiles provide data used to develop the Economic Vitality Index used by the Georgia Rural Development Council.



Appendix B – Commodity Flow Profiles

Introduction

This Appendix presents commodity flow data for each of the 45 study area counties, plus a summary total for all 45 counties. This data is intended to supplement the commodity flow data presented in the Phase I Report by offering a much greater level of detail and analysis for each study area county.

The source of this data is a commodity flow database known as Transearch. The Transearch database was developed by Reebie Associates, who updates it annually. Transearch provides national-level information on the movements of specific commodities between specific origins and destinations, using different modes of transportation. Information on airborne, waterborne, and rail movements is extracted from federal databases, while information on trucking activity is generated by Reebie Associates using proprietary methods.

For purposes of this study, the team obtained the following data for analysis year 1998 (the most recent available at the time of the analysis):

- Domestic tons moved by rail, truck, air, and water that originated in (inbound), were destined for (outbound), or were moved within (internal) any of the 45 study area counties. International waterborne tonnage through the Ports of Savannah, Brunswick, Columbus, and Bainbridge is not included in this database; however, movements between U.S. inland/coastal destinations and these ports (which are domestic movements) are captured in the database.
- Domestic tons moved by truck that pass through any of the 45 study area counties as part of movements between origins and destinations outside the study area.

The database provides tonnage data by commodity type. Commodity types are defined according to their STCC (Standard Transportation Commodity Code). There are different levels of STCC, corresponding to different levels of detail. The four-digit level makes very fine distinctions among specific commodity types, while the two-digit level aggregates similar commodity types into larger functional classes. For example, STCC 3273 (Ready-Mix Concrete) and STCC 3271 (Concrete Products) are both included in STCC 32 (Clay, Concrete, Glass, and Stone). The team obtained commodity detail at the four-digit level, and aggregated it to the two-digit level where appropriate.



**Table B-1
Standard Transportation Commodity Codes**

STCC 2	Name	Commodities Included at the STCC 4 Level
1	FARM PRODUCTS	Grains, field crops, fruits and vegetables
10	METALLIC ORES	Bauxite, aluminum ores
11	COAL	Bituminous coal
14	NONMETALLIC MINERALS	Broken stone, gravel, sand, mineral fertilizers
19	ORDNANCE OR ACCESSORIES	Guns, ammunition
20	FOOD OR KINDRED PRODUCTS	Meat products, poultry, dairy products, flour and sugar, liquors, soft drinks, edible oils
21	TOBACCO PRODUCTS	Cigarettes
22	TEXTILE MILL PRODUCTS	Cotton fabrics, carpets, yarns
23	APPAREL OR RELATED PRODUCTS	Clothing
24	LUMBER OR WOOD PRODUCTS	Primary forest materials, lumber, plywood, veneers, millwork and cabinetwork
25	FURNITURE OR FIXTURES	Furniture
26	PULP, PAPER OR ALLIED PRODUCTS	Pulp and pulp mill products, paper, fiber, wallpaper, paper containers and boxes
27	PRINTED MATTER	Newspapers, periodicals, greeting cards
28	CHEMICALS OR ALLIED PRODUCTS	Potassium and sodium compounds,
29	PETROLEUM OR COAL PRODUCTS	Refining products, liquefied gases, asphalt
30	RUBBER OR MISC. PLASTICS	Tires, miscellaneous plastic products
31	LEATHER OR LEATHER PRODUCTS	Leather products
32	CLAY, CONCRETE, GLASS, OR STONE	Portland cement, clay brick or tile, concrete products, ready-mix wet cement, gypsum, processed nonmetallic minerals, kaolin clay
33	PRIMARY METAL PRODUCTS	Petroleum coke, primary iron and steel products, copper, aluminum and lead products, wire
34	FABRICATED METAL PRODUCTS	Heating equipment, sheet metal products, valves, pipe fittings
35	MACHINERY	Engines, farm machinery, construction equipment, lawn and garden equipment, machine tools
36	ELECTRICAL EQUIPMENT	Transformers, motors and generators, batteries, cooking equipment, lighting fixtures
37	TRANSPORTATION EQUIPMENT	Car bodies, truck bodies, bus bodies, aircraft, railcars, vehicle parts and accessories
38	INSTRUM, PHOTO EQUIP, OPTICAL EQ	Photographic equipment or supplies
39	MISC. MANUFACTURING PRODUCTS	Furs, matches, toys, games
40	WASTE OR SCRAP MATERIALS	Metal scrap or tailings, paper waste or scrap
41	MISC. FREIGHT SHIPMENTS	Miscellaneous freight shipments
42	SHIPPING CONTAINERS	Empty shipping containers
43	MAIL OR CONTRACT TRAFFIC	Mail



45	SHIPPER ASSOCIATION TRAFFIC	Shipper association traffic
46	MISC. MIXED SHIPMENTS	Freight all kinds, including loaded shipping containers not elsewhere classified
50	SECONDARY TRAFFIC	Warehouse and Distribution traffic for a wide variety of commodity types; intermodal drayage



All origins and destinations – both within and outside the study area – were obtained at the county level where available. In other cases, the team obtained data at BEA (Business Economic Area) level. A BEA is an aggregation of counties within a region. This data was further aggregated to generate state-level summaries for presentation purposes.

The commodity flow database itself consists of four Microsoft Access 97 files of between 500 records and 1,000,000 records in length. The database files are:

- Destination (Inbound) – treats each study area county as a destination, and captures commodities moving into that county from any other county or business economic area in the United States;
- Origin (Outbound) – treats each study area county as an origin, and captures commodities moving out of that county to any other county or business economic area in the United States;
- Intra (Internal) – looks at internal movements within each county (moves where the origin and destination are both within that county); and
- Through – looks at commodities that pass through a study area county while moving between origins and destinations outside the study area.

For example: moves from New York to Chatham County would be recorded as inbound tonnage for Chatham County; moves from Chatham County to Miami would be recorded as outbound tonnage for Chatham County; moves from New York to Miami on I-95 passing through Chatham County would be recorded as through tonnage for Chatham County; and moves that begin and end in Chatham County would be recorded as internal moves for Chatham County.

This database was post-processed to include additional data to support this study:

- Truck tonnages were converted to vehicle equivalents using VIUS (Vehicle Inventory and Use Survey) data for Georgia. The VIUS data provided a range of average weights for trucks carrying different types of commodities over different distances. This information was linked to the database files with a set of lookup tables, so that each record in the database – specifying a commodity type and travel distance – was matched with the appropriate factor for converting from tons to truck equivalents. Rail tonnage was converted to railcar equivalents using a fixed factor for tons per railcar.
- Tonnages were converted to value equivalents based on average value-per-ton factors developed from the 1997 Commodity Flow Survey by Reebie Associates.
- Origin-destination flow maps were generated for the Phase I Report. Origin-destination matrices were generated from the post-processed data. Separately, Reebie Associates developed a method for assigning the origin-destination data (which describes county-to-county flows) to specific highways in the nation's transportation network. The assignments are based on least-time paths as determined by the Oak Ridge National Laboratory.

The various files and data were aggregated and sorted into meaningful groups for purposes of presentation. The underlying detail is preserved in the database, but for clarity of presentation – particularly to the non-technical analyst – the information is far more useful in an aggregate



form. A variety of aggregation methods were tested before settling on the forms presented in this Appendix. Graphs of key information were generated for “at a glance” analysis of individual counties.

In evaluating the truck data, the user should be aware that the Transearch database can underrepresent certain types of moves – such as moves between farms and local warehouses, moves between mines and local distribution/processing centers, and local or short-haul distribution by smaller vehicles. Also, trucks that are moving empty are not reported in the data, because they carry no tonnage. As a result, the number of trucks actually moving over a highway network will be greater than the number of trucks associated with the Transearch tonnage, and should be determined from vehicle counts.

Description of Reports

This appendix contains a one-page summary profile of the 45-county study area and each of its counties. The following information is presented.

Summary of Inbound and Outbound Tons by Mode

In the “Total of 45 Study Area Counties” report, “Inbound to Study Area” means inbound to any of the 45 study area counties from any other county or business economic area, including other counties in the study area. “Outbound from Study Area” means outbound from any of the study area counties to any other county or business economic area, including other counties in the study area.

In the County reports, “Inbound to County” means inbound to that specific county from any other county or business economic area, including other counties in the study area. “Outbound from County” means outbound from that specific county to any other county or business economic area, including other counties in the study area.

Summary of Inbound and Outbound Value by Mode

This table presents the value equivalents for the tonnage information. Generally, trucks and air carry higher value commodities, and the value associated with truck and air tonnage is higher than the value associated with rail and water tonnage. Depending on the mix of modes and commodities, we may see that a county has more tonnage inbound but more value outbound, or vice-versa.

Inbound and Outbound Tons by Mode

This is a pie chart showing how the total of inbound and outbound tonnage is distributed between the four modes (rail, truck, water, and air). It excludes internal tons (tonnage entirely within a county), which usually represents local distribution by truck and tends to be a very small number in comparison to inbound and outbound tonnage. In most counties, trucks are dominant, but rail is significant in several counties. Air cargo, which is high-value and lightweight, shows up as a small percentage of total tons. Water tonnage also shows up as a small number, because this figure represents only domestic moves via the inland and coastal U.S. waterways.



Truck Tons Including Through Moves

This is a bar chart presenting the truck tonnages in more detail. It compares the inbound and outbound truck tonnages with the internal tons and through tonnages.

In the County-level reports, the through tonnage is the tonnage that passes through any part of the county between origins and destinations outside the study area. The vast majority of this tonnage is associated with movements along I 75 and I 95.

In the “Total of 45 Study Area Counties,” the through tonnage is calculated differently. It is not the sum of what is passing through every county, because this would double-count the tonnage that moves through more than one county. Rather, it represents tons that move through any of the 45 counties, counted just one time.

Inbound and Outbound Vehicle Equivalents

This is a bar chart representing the vehicle equivalents for truck and rail tonnage inbound to and outbound from the study area. These represent load-carrying trips by trucks and railcars, and do not include non-load-carrying trips. Depending on the mix of modes and commodities, we may see that a county has more truck tonnage inbound but more truck equivalents outbound, or vice-versa.

Inbound versus Outbound Value

This is a pie chart showing the distribution of total inbound versus outbound value.

Inbound and Outbound Tons by Commodity Class

This is a bar chart showing the distribution of inbound and outbound tons by commodity class at a fairly aggregated (two-digit STCC) level. The graph provides a quick visual ranking of the most important commodity classes. Inbound and outbound tons are graphed separately to highlight the directionality (or lack thereof) of particular commodity classes.

Distribution of Inbound and Outbound Tons

This is a pie chart showing from where inbound tons are coming and to where outbound tons are going. The major categories are:

- Within 45-County Study Area – moves from one study area county to another;
- Rest of Georgia – moves between study area counties and any other county in Georgia;
- Other Corridor States (AL, MS) – moves between study area counties and the other two states where the HPC 6 Corridor is designated;
- West of Corridor (LA, TX, AK, OK, NM, AZ, CA) – moves between study area counties and the states directly west of the HPC 6 Corridor;
- Other Southeast States (FL, SC, NC, TN) – moves between study area counties and these states; and
- All Other States – moves between study area counties and all other states.



Table B-2
List of Commodity Flow Reports

Report #	FIPS Code	Name
1		Total of 45 Study Area Counties
2	13021	Bibb County, Georgia
3	13023	Bleckley County, Georgia
4	13029	Bryan County, Georgia
5	13031	Bulloch County, Georgia
6	13043	Candler County, Georgia
7	13051	Chatham County, Georgia
8	13053	Chattahoochee County, Georgia
9	13079	Crawford County, Georgia
10	13081	Crisp County, Georgia
11	13091	Dodge County, Georgia
12	13093	Dooly County, Georgia
13	13103	Effingham County, Georgia
14	13107	Emanuel County, Georgia
15	13109	Evans County, Georgia
16	13127	Glynn County, Georgia
17	13145	Harris County, Georgia
18	13153	Houston County, Georgia
19	13167	Johnson County, Georgia
20	13175	Laurens County, Georgia
21	13177	Lee County, Georgia
22	13179	Liberty County, Georgia
23	13183	Long County, Georgia
24	13191	McIntosh County, Georgia
25	13193	Macon County, Georgia
26	13197	Marion County, Georgia
27	13209	Montgomery County, Georgia
28	13215	Muscogee County, Georgia
29	13225	Peach County, Georgia
30	13235	Pulaski County, Georgia
31	13249	Schley County, Georgia
32	13259	Stewart County, Georgia
33	13261	Sumter County, Georgia
34	13263	Talbot County, Georgia
35	13267	Tattnall County, Georgia
36	13269	Taylor County, Georgia
37	13271	Telfair County, Georgia
38	13273	Terrell County, Georgia
39	13279	Toombs County, Georgia
40	13283	Treutlen County, Georgia
41	13289	Twiggs County, Georgia
42	13293	Upson County, Georgia
43	13307	Webster County, Georgia
44	13309	Wheeler County, Georgia
45	13315	Wilcox County, Georgia



46	13319	Wilkinson County, Georgia
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Appendix C – Georgia Heritage Program Conservation Status List

Introduction

This appendix presents a summary of the Georgia Heritage Program Conservation Status List which compiles recent estimates of protected, threatened, and endangered species within the State. The list is maintained by the Georgia Department of Natural Resources and is available via the Internet at <http://www.dnr.state.ga.us/dnr/wild/>.

The report in this appendix provides a table listing the species within the study area, grouped by US Geological Survey (USGS) Quadrangles. Index maps of USGS quadrangles are provided to assist in finding desired quadrangles.

Georgia DNR has requested that the following disclaimer appear anytime the Georgia Heritage Program Conservation Status List is displayed:

DISCLAIMER FOR GEORGIA NATURAL HERITAGE PROGRAM ELEMENT OCCURRENCE DATA

Please keep in mind the limitations of our database. The data collected by the Georgia Natural Heritage Program comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of a recent on-site survey by our staff. Many areas of Georgia have never been surveyed thoroughly. Therefore, the Georgia Natural Heritage Program can only occasionally provide definitive information on the presence or absence of rare species in a given area. Our files are updated constantly as new information is received. Thus, information provided by our program represents the existing data in our files on the date indicated on this Web page and should not be considered a final statement on the species or area under consideration.