



IN MOTION

A STUDY OF GEORGIA'S
Logistics Industry in 2018



Selig Center for
Economic Growth
Terry College of Business
UNIVERSITY OF GEORGIA



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June 2019

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PROLOGUE

Executive Summary

In Motion analyzes the size and scope of Georgia's logistics industry and its economic impact on the state and each of Georgia's individual Service Delivery Regions. It also discusses the industry's employment growth, occupations, and prospects for growth. The analysis includes only those industries involved in the moving and storing of cargo, as well as related operations and services.

The fundamental finding is that Georgia's logistics industry is a substantial and dependable source of jobs, economic activity, and economic growth. Logistics providers in the private and public sectors are pillars and drivers of Georgia's economy that generate jobs, income, sales, greater production of goods and services, and higher tax collections. The large number of economic development announcements over the last few years strongly implies that the prospects for Georgia's logistics industry are very good.

Industry Size and Scope

The analysis of Dun & Bradstreet's Million Dollar Database shows that Georgia's logistics industry directly employed 181,245 people in 2018. The industry consists of 15,794 establishments, 14,921 in the private sector and 873 in the public sector. Providers in the private sector account for 142,652, or 79 percent, of the state's logistics jobs. Government organizations account for 38,593 of the state's logistics jobs, or 21 percent.

Georgia's 142,652 private sector logistics jobs are in four major industry groups: transportation (79 percent), warehousing and allied services (14 percent), delivery services (5 percent), and logistics services (2 percent). Within the transportation group of providers, road and air transportation are the two largest subsectors. Within the warehousing and allied services group of companies, providers in the

general warehousing and storage subsector provide most of the jobs, with refrigerated warehousing and storage companies ranking a distant second.

Government operations related to logistics account for 38,593 of the state's logistics jobs and fall into two broad groups: 20,043 (52 percent) within traditional transportation sectors and 18,550 jobs (48 percent) in regulatory and administrative agencies. The U.S. Postal Service is the largest government provider of traditional transportation services, accounting for 15,016, or 75 percent of these jobs. State government provides most (74 percent) of the regulatory and administrative jobs.

Geographically, the state's logistics jobs are concentrated in Georgia's most heavily populated areas, but all of Georgia's Service Delivery Regions (SDRs) benefit from large numbers of logistics jobs, often with concentrations in certain sectors or industry groups. For example, air transportation operations are most heavily concentrated in SDR 3 (Atlanta), SDR 12 (Coastal Georgia) and SDR 6 (Macon-Middle Georgia). Road transportation operations are more widely distributed geographically, with the heaviest concentrations in SDR 3 (Atlanta), SDR 1 (Northwest Georgia), and SDR 16 (Coastal Georgia). The rail industry group of companies is most heavily concentrated in SDR 3 (Atlanta), SDR 11 (South Central Georgia), and SDR 12 (Coastal Georgia).

The water industry group of companies is most heavily centered in SDR 12 (Coastal Georgia), SDR 3 (Atlanta), and SDR 2 (Northeast Georgia). Freight transportation arrangements operations are most heavily concentrated in SDR 3 (Atlanta), SDR 12 (Coastal Georgia), and SDR 1 (Northwest Georgia). Logistics services providers primarily are found in SDR 3 (Atlanta), SDR 12 (Coastal Georgia), and SDR 4 (West Georgia). Courier and delivery and ware-

housing and allied services providers are clustered in SDR 3 (Atlanta), SDR 12 (Coastal Georgia), and SDR 11 (South Central Georgia). Logistics operations help many rural areas diversify their economic bases, which makes their regional economies less vulnerable to the ups and downs of commodity markets, less dependent on the actions of a few large employers, and less exposed to global competition.

Economic Impact

Given the large number of jobs and the logistics industry's intense interaction with other industries, it is not surprising that Georgia's logistics industry generates substantial annual (recurring) economic impacts. In 2018, the statewide economic impacts include:

- 165,386 direct jobs (not including state and local government jobs);
- 362,778 total jobs in all industries (7 percent of all jobs in Georgia);
- \$60.7 billion in output/sales (6 percent of Georgia's total output/sales);
- \$33.5 billion in state GDP (6 percent of Georgia's total GDP);
- \$21.8 billion in labor income (7 percent of Georgia's total labor income);
- \$1.3 billion in tax revenues for state government; and
- \$1.4 billion in tax revenues for local governments.

On average, for every direct job in the logistics industry, an additional 1.19 jobs exist in other industries because of spending related to logistics providers. Of the 2018 total employment impact, 165,386 jobs represent direct employment in the logistics industries or the direct economic impact; 197,392 jobs constitute indirect and induced effect of direct employment (spending), or the multiplier (re-spending) impact. Dividing the 2018 total job impact (362,778 jobs) by the direct job impact (165,386 jobs) yields an average employment multiplier value of 2.19. In Georgia, one job out of every 14 owes its existence to the state's logistics industry. The direct employment impact is smaller than Dun & Bradstreet's employment number because state and local government jobs are excluded because the tax revenues that support such jobs are not necessarily new to the state and therefore do not necessarily constitute new, net economic impacts.

Of the \$60.7 billion output impact, \$32.5 billion (54 percent) was direct spending by logistics provid-

ers, while \$28.2 billion (46 percent) was the indirect and induced re-spending impact or the multiplier effect (i.e., the difference between the total output impact and direct spending). The average output (sales) multiplier value for the state's logistics providers therefore was 1.87, obtained by dividing the total output impact (\$60.7 billion) by direct spending (\$32.5 billion). On average, therefore every dollar of initial/direct spending generates an additional 87 cents for Georgia's economy. The output multipliers vary among the state's logistics industries, ranging from a high of 2.18 for management consulting (e.g., process, physical distribution, and logistics consulting services) to 1.67 for air transportation. The output multipliers are similar for private- and public-sector providers.

In 2018, Georgia's logistics industry generated \$1.3 billion in tax revenues for the state and \$1.4 billion in tax revenues for local governments. The air and truck transportation industries were the main contributors.

The total economic impact of direct employment in Georgia's logistics industry varies widely across the state's major industries. Five major industry sectors account for 69 percent of the total employment impact. Transportation accounts for 41 percent; government accounts for 8 percent; warehousing accounts for 7 percent, as does education and health services; and administrative, support, and waste services account for 7 percent.

The regional economic impacts are substantial and vary widely, reflecting both the number and types of providers in each service delivery region (SDR) as well as differences in regional economies and multipliers. SDR 3—the core of the Atlanta MSA—is the state's largest and most economically diverse region and has the largest economic impact as well as the largest multipliers. The large impacts reflect the presence of the international airport, the intersection of three major interstates, and Atlanta's critical role as an inland port, among other factors. SDR 12, which comprises the coastal counties and several adjacent counties, had the second largest economic impact, reflecting the presence of Georgia's two ports and the I-95 corridor.

Employment Growth

Georgia's logistics industry is both an economic driver and a major source of job growth. The analysis of data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages

shows that the number of workers employed by private logistics firms increased from 140,484 in 2010 to 182,598 in 2017, or by 30 percent, which exceeds the 20 percent gain reported for private firms in all of Georgia's industries. The 30 percent increase is double the 15 percent increase in all U.S. jobs in all industries, but it matches that reported for the logistics industry nationally.

Among Georgia's major logistics subsectors, warehousing and storage experienced the fastest job growth. Georgia's 70 percent gain exceeds the 62 percent gain estimated for the nation's warehousing and storage subsector. The fastest growing industry within this subsector is farm product warehousing and storage (133 percent job growth). Georgia's general warehousing and storage industry posted 77 percent job growth compared to 70 percent for the nation, but refrigerated warehousing and storage posted only 19 percent job growth compared to 22 percent for the U.S.

Between 2010 and 2017, the number of jobs in transportation support activities increased by 45 percent in Georgia compared to only 27 percent for the U.S. The three fastest growing industries within this subsector are: support activities for road transportation (87 percent job growth in Georgia); support activities for rail transportation (65 percent); and freight transportation arrangement (65 percent).

Government employment in logistics declined during that same period, dropping by 4 percent in Georgia and by 8 percent nationally. The jobs lost in Georgia were either in air traffic control or in the U.S. Postal Service.

Non-employers are also an important part of Georgia logistics industry. About nine of ten non-employers are sole proprietors, which includes self-employed business owners. In Georgia's logistic industry, non-employers are most likely to be involved in trucking. In 2016, 24,353 non-employer establishments were active in Georgia's truck transportation industry, which is a 25 percent increase from 2010. Over 65 percent of Georgia's non-employer trucking establishments are involved in long-distance general freight, 27 percent in local general freight, and 8 percent in specialized freight.

Logistics Occupations

Logistics activity is defined as employment in a group of related occupations across all industries rather than as employment (activity) in logistics in-

dustries. In 2017, Georgia's logistics occupations involved in the movement of freight had employment of 390,640, or 9.1 percent of employment in all occupations in Georgia. Transportation occupations not involved in the movement of freight employed 35,350 (which are not included in the 390,640 jobs reported for logistics occupations involved in the movement of freight). Georgia's ten largest logistics occupations are:

- laborers; freight, stock and material movers, hand (118,700 jobs);
- heavy and tractor-trailer truck drivers (56,450 jobs);
- industrial truck and tractor operators (33,790 jobs);
- light truck or delivery services drivers (25,390 jobs);
- shipping, receiving, and traffic clerks (23,390 jobs);
- packers and packagers, hand (23,290);
- drivers/sales workers (15,960);
- first-line supervisors of transportation and material movers (15,070);
- postal service mail carriers (10,280); and
- vehicle and truck cleaners (9,030).

The annual mean wage across all transportation and materials moving occupations was \$34,690 in 2017, but annual mean wages vary widely among logistics occupations. Georgia's ten highest paying logistics occupations are:

- air traffic controllers (\$137,600);
- commercial pilots (\$113,720);
- transportation, storage, distribution managers (\$107,010);
- airline pilots, copilots, and flight engineers (\$102,330);
- aircraft cargo handling supervisors (\$79,650);
- captain's mates, and pilots of water vessels (\$78,500);
- logisticians (\$72,230);
- transportation inspectors (\$68,110);
- ship's engineers (\$65,760); and
- railroad conductors and yardmasters (\$58,220).

Location quotients are the ratio of an occupation's share of employment in a given area (e.g., Georgia) to that occupation's share of employment in the nation as a whole. For example, an occupation that comprises 15 percent of employment in Georgia compared to 10 percent in the U.S. has a location quotient of 1.5. Location quotients are useful for studying the composition of jobs in Georgia rela-

tive to the national average and for identifying occupations with high, or low, concentrations of jobs relative to the nation as a whole. Georgia's location quotient is 1.20, ranking eighth among the states—behind Kentucky (1.33), Tennessee (1.32), North Dakota (1.26), New Jersey (1.26), Arkansas (1.26), Indiana (1.24), Mississippi (1.23).

Georgia ranks higher in many of the detailed logistics occupations than it does for transportation and material occupations overall. In terms of location quotients, Georgia ranks in the top ten among the states in thirteen logistics occupations. For example, Georgia is tops—with a location quotient of 1.96—for industrial truck and tractor operators who move materials around warehouses, storage yards, factories, and construction sites. Given the abundance of warehouse and distribution centers in the state, it is no surprise. As another example, Georgia has the highest concentration of airline pilots, copilots, and flight engineers in the continental U.S., which is extremely beneficial economically due to this occupation's very high annual mean wage of \$102,330.

Economic Prospects

Logistics will continue to grow faster than Georgia's overall economy. Growth will be widespread geographically and well balanced across the industry's subsectors, driven by the state's expanding role as a logistics and distribution center, increases in industrial and agricultural production, above-average population growth, and more spending by consumers.

Although the freight expansion will continue, some headwinds will restrain growth of Georgia's logistics industry. For example, global economic growth will not be exuberant, and freight growth tends to taper off in the later stages of the economic cycle. Simmering problems in the European Union, modest growth in many emerging markets, and an appreciated U.S. dollar suggest that the foreign sector is not strong enough to support strong gains in U.S. exports.

In Georgia, tight capacity strongly favors the logistic industry's bottom line, but higher interest rates and tighter labor markets—especially for truck drivers and airline pilots—will pressure profit margins. Carriers' profit margins will be low relative to many other industries as a result of intense competition between the transportation industry's subsectors.

Trade tensions are high and no one really knows

how the trade war is going to play out. A full-blown trade war is a major downside risk, but if avoided, the prospects for Georgia's logistics industry are quite good.

Georgia's manufacturers will increase production, providing a solid tailwind. Within manufacturing the drivers will include lumber and wood products, furniture, food, chemicals, construction materials, electronics and household appliances. In general, shipments of nondurable goods will expand much faster than shipments of durable goods.

Expected increases in agricultural production is a good sign for truckers and the ports. Higher shipments of agricultural products reflect a rebound in production after Hurricane Michael. In addition, agricultural commodity prices are likely to increase modestly in 2020. Trade tensions create considerable uncertainty for Georgia's agricultural sector, however.

Logistics will gain impetus from the continuing recovery of homebuilding and real estate development. Job growth, improving demographics, and the limited supply of older homes will boost new home construction, which matters because construction is one of the most transportation-intensive sectors of the economy.

Bigger shipments of some durable goods, such as capital equipment, appliances, and furniture will drive demand for transportation and logistics. Domestic shipments of most nondurable goods will increase, but shipments of coal, textiles, paper, printed materials, and tobacco may decline. Rate competition will be less intense, reflecting higher freight volumes, a severe shortage of truck drivers, and the lagged impacts of capacity reductions that occurred during the recession.

The abundance of projects in the economic development pipeline will be one of the main drivers of Georgia's logistics industry as well as the state's overall economy. This is not surprising, since—for six straight years—site consultants have ranked Georgia as the top state in which to do business. In addition, because it often takes many years to build out the typical project, many of those announced over the last five years contribute to the positive outlook for industrial production and—in turn—freight. A pipeline full of relocation and expansion projects will benefit the state's logistics industry in 2019 and beyond, so a great deal of the credit goes to Georgia's economic development professionals, who we believe are the best in the nation.

About the Sources

This report is divided into the five parts: industry overview, economic impact, trend analysis, occupational analysis, and economic outlook. As there is no single data source we could use for all sections, we selected several data sources, each best suited for a particular part of the report. This approach allows for a detailed analysis of up-to-date statistics, and the industry change over time. It also allows us to compensate for each source's inherent drawbacks and limitations.

But the consequence of using several data sources, different in definitions and exclusions, is that the numbers derived from each of them are not comparable across the report sections. In fact, the separate sections should be viewed as complementary, each examining a slightly different aspect of the logistics sector in Georgia.

The Dun & Bradstreet (D&B) database is the source for the Industry Overview and the Economic Impact sections. This database offers the most up-to-date information, with industry detail delivered at 6-digit NAICS and 8-digit SIC industry code levels. In addition, the data for each establishment in the database includes its geographic location down to street address. The establishments data are available without major exclusions as to the size, ownership, or legal form of organization, and includes government-run operations within the transportation and logistics

industries. Although very detailed, the Dun & Bradstreet data do not allow comparisons over time.

The Quarterly Census of Employment and Wages (QCEW), published by the U.S. Bureau of Labor Statistics, is the source we used to cover employment changes over time in the logistics sector and its industries. The QCEW data series covers about 97 percent of all employees at the 6-digit NAICS industry level. This is further broken down by ownership (private or government), which follows our project design. Since the logistics sector is subject to seasonal employment changes, we decided to use the annual data, as opposed to quarterly data.

Although quite thorough and detailed in coverage, the QCEW data series excludes self-employed workers and most employees of railroads, both crucial for the study of transportation and logistics. So, to provide as complete a picture of the industry as possible, we had to find another data source.

Non-Employer Statistics (NES), published annually by the U.S. Census Bureau, provides employment and sales data derived from the tax returns filed with the IRS by businesses with no paid employees. The NES data series covers businesses organized under several different legal forms of organization (LFO): corporations, partnerships, sole proprietorships, and S-corporations. Sole proprietorships, the largest of the LFOs, include unincorporated businesses with a

**Logistics Sector Employment,
By Data Source**

<u>Source</u>	<u>Used in Sections</u>	<u>Private</u>	<u>Employment Government</u>	<u>Total</u>
Dun & Bradstreet Database	Industry Overview; Economic Impact	142,652	38,593	181,245
Quarterly Census of Employment and Wages	Trend Analysis	184,802	27,680	212,482
Occupational Employment Statistics	Occupational Analysis	NA	NA	390,640

sole owner, and self-employed persons.

The QCEW and NES cover all employees in establishments classified under industries and sectors that fall within the scope of our study. This includes employees both directly involved in transportation and logistics jobs, such as drivers and air traffic controllers, and those who are not, such as office managers and IT specialists. Conversely, neither the QCEW nor the NES covers those in transportation and logistics-related jobs who are employed in other industries, such as truck drivers employed in retail, wholesale,

or manufacturing establishments. To account for this, we used the Occupational Employment Statistics, gathered by the U.S. Bureau of Labor Statistics, for data on employees in transportation and logistics occupations within all industries. As such, the number of transportation and logistics employees presented in this part of the report is much larger than the numbers presented in sections discussing employees in specific transportation and logistics industries.

SECTION 1

Industry Size and Scope

The logistics industry comprises four private industry sectors—transportation, logistics, delivery, and warehousing—that together employ 142,652 people across Georgia. The largest sector, transportation, employs slightly over 112,700 people, and accounts for almost 80 percent of jobs in logistics. The sector is divided into subsectors based on the method of transporting cargo, including air, road, rail, and water transportation as well as freight transportation arrangement. In Georgia, road and air transportation are the two largest subsectors. Together they account for just under 75 percent of total employment in transportation. Freight transportation arrangement accounts for the third largest number of employees at 15 percent; rail employs about 10 percent and water employs only 1 percent of Georgians in the transportation sector.

The logistics services sector employs about 2,300 people in Georgia. Employment in logistics is a relatively small portion at 2 percent of the total logistics industry. Delivery services employs about 8,000 people, or 5 percent of the total; while warehousing and allied services employs about 19,400 Georgians, or 14 percent of the total.

General Findings

In defining the logistics industry group in Georgia, our goal is to pinpoint specific industries that have the most employees. For transportation subsectors such as air, road, rail, and water, we separated companies into three general types of industries: transportation, supporting operations, and supporting services. Some subsectors such as rail and water have a higher proportion of employment in supporting operations and services than in core transportation operations.

We define supporting operations as essential activities related to cargo movement. For example, air supporting operations include airport control tower operation and hangar operations. In the rail transportation subsector, 72 percent of employment is within supporting operations. Most rail transportation operations are in the business of rail cargo (either loading or unloading) or rail terminals and switching services. The water transportation subsector is also primarily composed of supporting operations (72 percent of employment). Marine cargo handling and towing or docking of water vessels makes up a relatively large portion of employment in water transportation.

Supporting services include operations secondarily related to movement of cargo, such as cleaning or maintenance of transportation vessels. For example, air-supporting services include aircraft cleaning and maintenance. Air transportation has the largest relative proportion of employment in supporting services across all transportation industry groups. Aircraft maintenance, cleaning, and airport lot maintenance services make up 8 percent of employment.

Geographically, employment across all sectors is concentrated in Georgia's most heavily-populated cities. Service Delivery Region (SDR) 3 (Atlanta) and Service Delivery Region 12 (Coastal Georgia) had the most concentrated employment, but other Georgia SDRs also have heavy concentration of operations in certain sectors or industry groups.

SDR 3, which encompasses the Atlanta MSA, dominates the state as a transportation and logistics hub. It ranks first in employment count across all sectors and industry groups except for water transportation. Coastal Georgia (SDR 12) ranks among the top three across all sectors. SDR 12 is first in wa-

METHODOLOGY

For this study, we define the logistics industry as those industries involved in moving and storing cargo, as well as related operations and services. The goal of this analysis is to determine the concentration of employment and number of companies across Georgia and within its twelve service delivery regions. To do so, we compiled a list of companies by filtering existing industry classifications (NAICS and SIC) to meet the criteria of moving or touching cargo. When possible, industries which primarily serve passengers or general consumers were eliminated.

Using Dun & Bradstreet's Million Dollar Database as the primary data source, database searches were filtered by geographic location (Georgia) and performed for transportation and warehousing sectors (NAICS 48 and 49), logistics (NAICS 541614), and government administration programs (NAICS 926120). By performing these database searches and filtering by 6-digit NAICS and 8-digit SIC, we created a database of individual business listings to use in the analysis.

The Dun & Bradstreet database features detailed information about individual businesses including location, number of employees, sales, ownership, line of business, and more. The variables utilized in this analysis are county location, employment at individual site, primary 6-digit NAICS code, and primary 8-digit SIC code. We originally planned to use D&B sales and 3-year employment trends, but data were not uniformly available for individual business locations.

We separated the list of private businesses into four large industry sectors: transportation, logistics, delivery, and warehousing. Based on their complexity, the industry sectors were broken into progressively more specific subsectors, industries, and industry subgroups. Federal, state, and local government operations under transportation, warehousing, and logistics were grouped in a separate tabulation.

Existing industry classifications within traditional transportation sectors exclude businesses such as Information Technology in transportation, warehousing, and logistics. IT is a necessary component of logistics, however, so we include a separate tabulation of companies in Georgia that provide services to transportation, warehousing, and logistics firms. These firms are grouped for analysis based on a directory supplied by the client, the Georgia Center of Innovation for Logistics. Firms are delineated by employment class, location type, ownership, location, and line of business.

ter transportation employment, not surprisingly due to the presence of the ports of Savannah and Brunswick. South Central Georgia (SDR 11) ranks second in rail transportation and third in delivery and warehousing. Other SDRs rank among the top three by employment: Northwest Georgia (SDR 1) ranked second in road transportation and third in freight transportation arrangement; Northeast Georgia (SDR 2) ranked third in water transportation; West Atlanta (SDR 4) ranked third in logistics services; and Macon-Middle Georgia (SDR 6) ranked second in air transportation.

Government operations related to the logistics industry are tabulated separately in our analysis. Government organizations were divided into two groups: operations classified within traditional transportation sectors (NAICS 48-49) and regulatory and

administrative agencies (NAICS 92). Government operations in traditional transportation and logistics sectors include air traffic control, other airport operations, and the postal service. The U.S. Postal Service makes up 75 percent of employment within this group. The Federal Aviation Administration is the second-largest government employer at 23 percent of employment within NAICS 48-49. Regulatory and administrative operations are separated by level of government. In Georgia, state-level government dominates employment in regulatory and administrative operations at 74 percent. Federal-level regulatory agencies account for 13 percent of employment and county-level accounts for 7 percent of employment in regulatory and administrative operations.

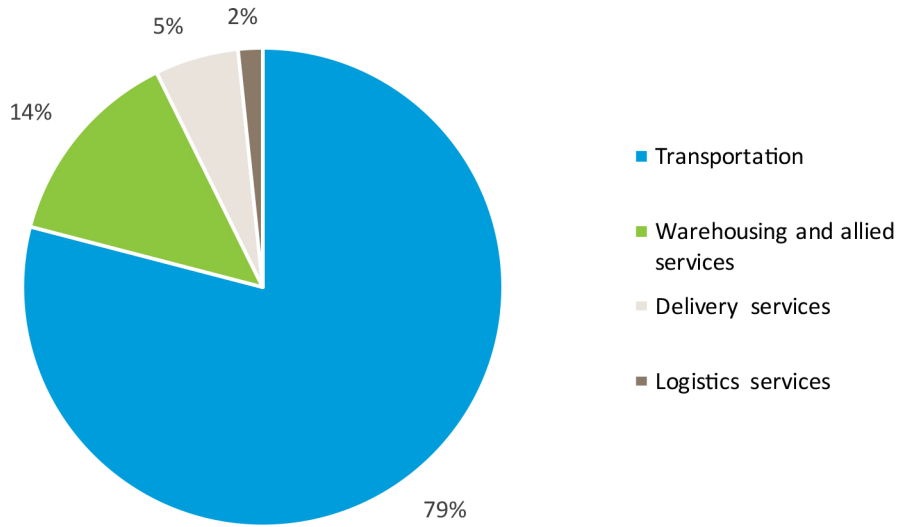
Although existing industry classifications within traditional transportation sectors exclude businesses such as Information Technology in transportation, warehousing, and logistics, IT is a necessary component of logistics. Thus, we include a separate tabulation of companies in Georgia that provide services to transportation, warehousing, and logistics firms. The selected Logistics IT and Technology company list contained a diversity of large and small firms. About half of all firms in the client company list had fewer than 50 employees; 18 percent of firms had between 51 and 200 employees; and another 18 percent had

1,000 or more employees. Eleven percent of firms did not provide data on number of employees. Seventy-three percent of firms in the client company list were headquartered in Georgia, 23 percent were branch locations. Seventy-six percent of firms were privately owned, while 15 percent were publicly traded. The client company list also includes 103 firms that are found in the Dun & Bradstreet database. An additional 12 firms are found in the PrivCo database, for a total of 115 firms. Of these 115 firms, 87 percent are located in Atlanta, and Atlanta-based firms encompass 96 percent of employment.

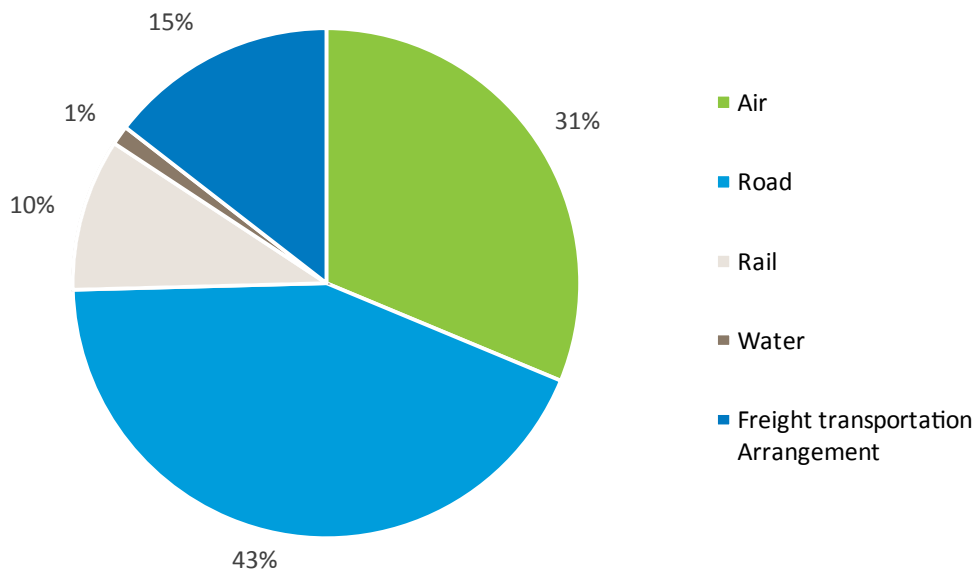
Table 1
Logistics Employment and Establishments,
By Sector and Subsector

<u>Sector / Subsector</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Transportation		
Air	607	35,244
Road	9,150	48,886
Rail	945	10,880
Water	114	1,382
Freight transportation arrangement	2,142	16,398
Logistics services		
Transportation consultants	119	2,021
Materials management	25	328
Delivery		
Couriers and express delivery services	420	3,795
Local messengers and local delivery	430	4,245
Warehousing and allied services		
Farm product warehousing and storage	53	415
General warehousing and storage	793	16,121
Refrigerated warehousing and storage	61	1,933
Packing, crating, containerization	53	928
Other warehousing operations	9	76
Totals by Sector		
Transportation	12,958	112,790
Warehousing and allied services	969	19,473
Delivery services	850	8,040
Logistics services	144	2,349
Total	14,921	142,652

Figure 1
Logistics Employment by Sector



Transportation Employment by Subsector



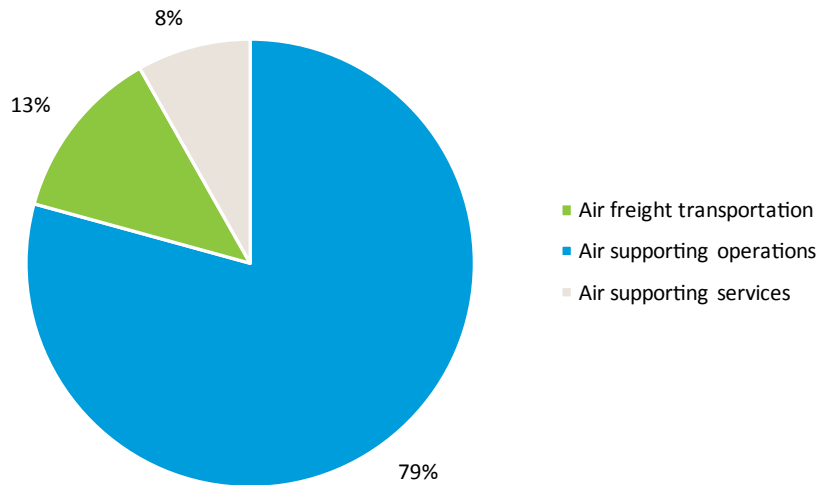
**Table 2
Air Industry Employment and Establishments,
By Industry and Group**

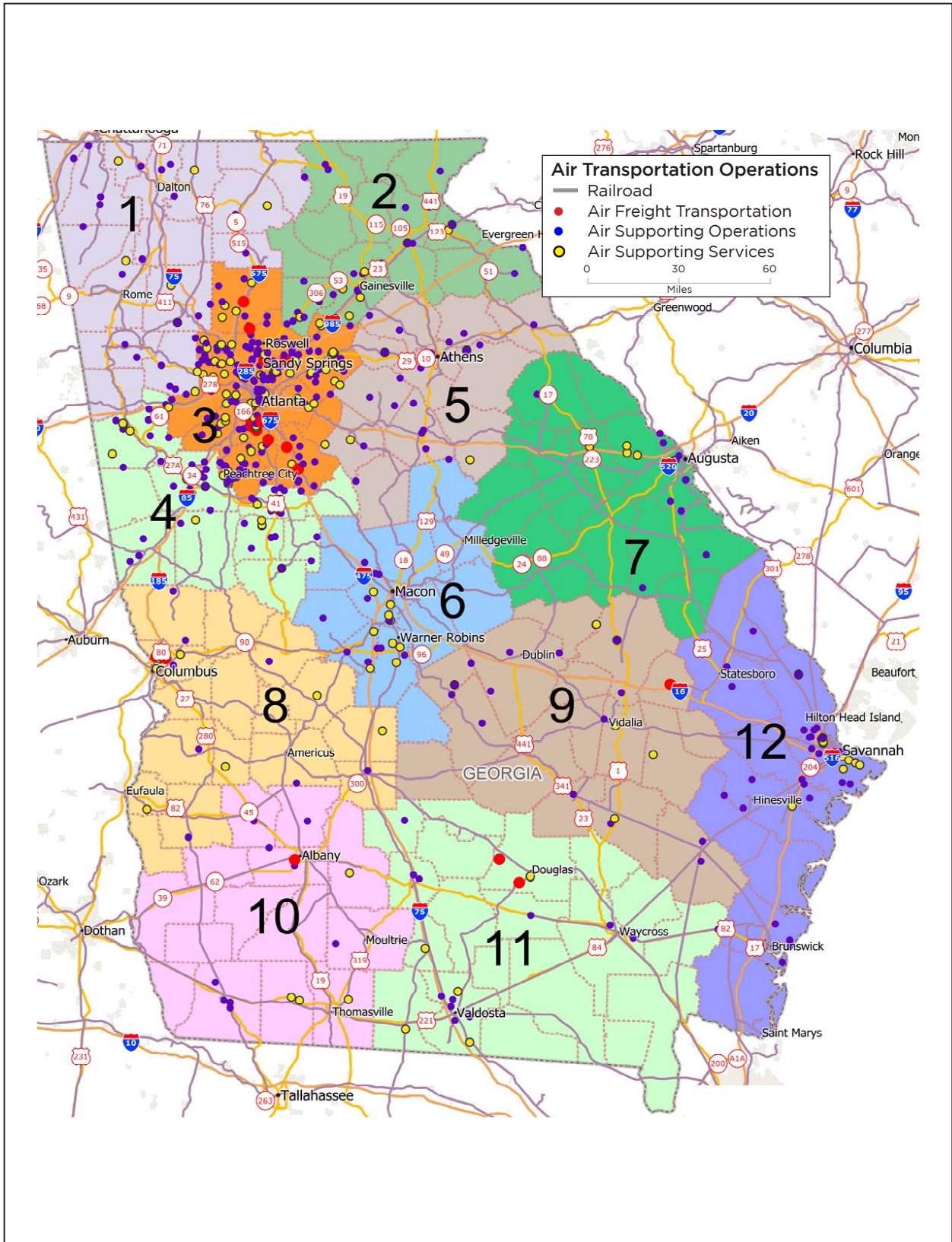
<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Air freight transportation		
Air cargo carriers scheduled	25	27,937
Air cargo carriers nonscheduled	1	2
Total	26	27,939
Air supporting operations		
Air freight handling	5	180
Airport control tower operation	2	102
Airport flying field and services	397	4,088
Hangar operations and aircraft storage services	4	32
Other airport operation services	1	14
Total	409	4,416
Air supporting services		
Aircraft cleaning, upholstery repairs	34	352
Aircraft maintenance, repair and servicing	122	2,003
Road and airport lot maintenance services	16	534
Total	172	2,889

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 6 (Macon-Middle Georgia)
- 3 SDR 12 (Coastal Georgia)

**Figure 2
Air Transportation Employment by Industry**





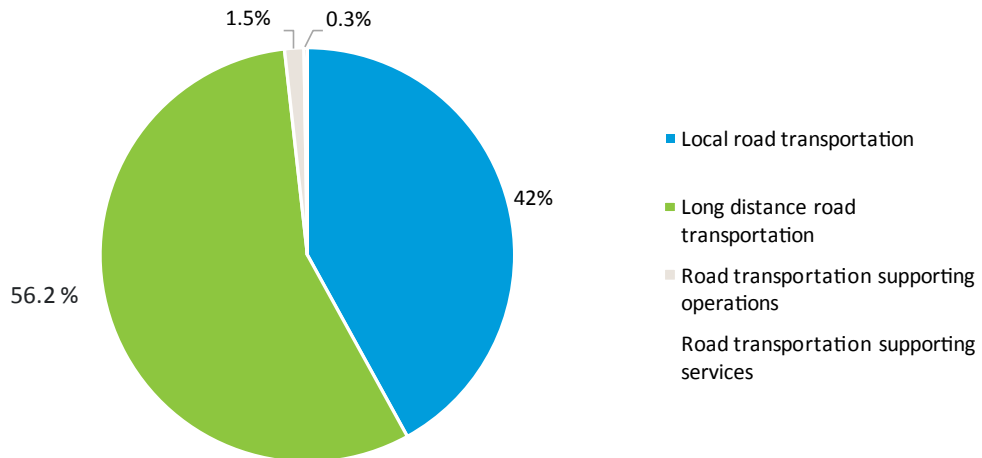
**Table 3
Road Industry Employment and Establishments,
By Industry and Group**

<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Local road transportation		
Dump truck	180	1,098
Farm and animal	19	145
Liquids	21	210
Lumber and timber	15	53
Other local road transportation	30	195
Trucking and delivery	6,328	18,825
Total	6,593	20,526
Long distance road transportation		
Automobiles	135	1,614
Building materials	13	55
Heavy hauling and heavy machinery	143	1,542
Liquid	13	351
Long distance trucking	2,008	23,396
Mobile homes	30	161
Refrigerated products	21	260
Trailer or container	17	117
Total	2,380	27,496
Road supporting operations		
Inspection services	32	80
Toll, weighing, terminal facilities	127	655
Total	159	735
Road supporting services		
Other road transportation services	18	129

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 1 (Northwest Georgia)
- 3 SDR 12 (Coastal Georgia)

**Figure 3
Road Transportation Employment by Industry**



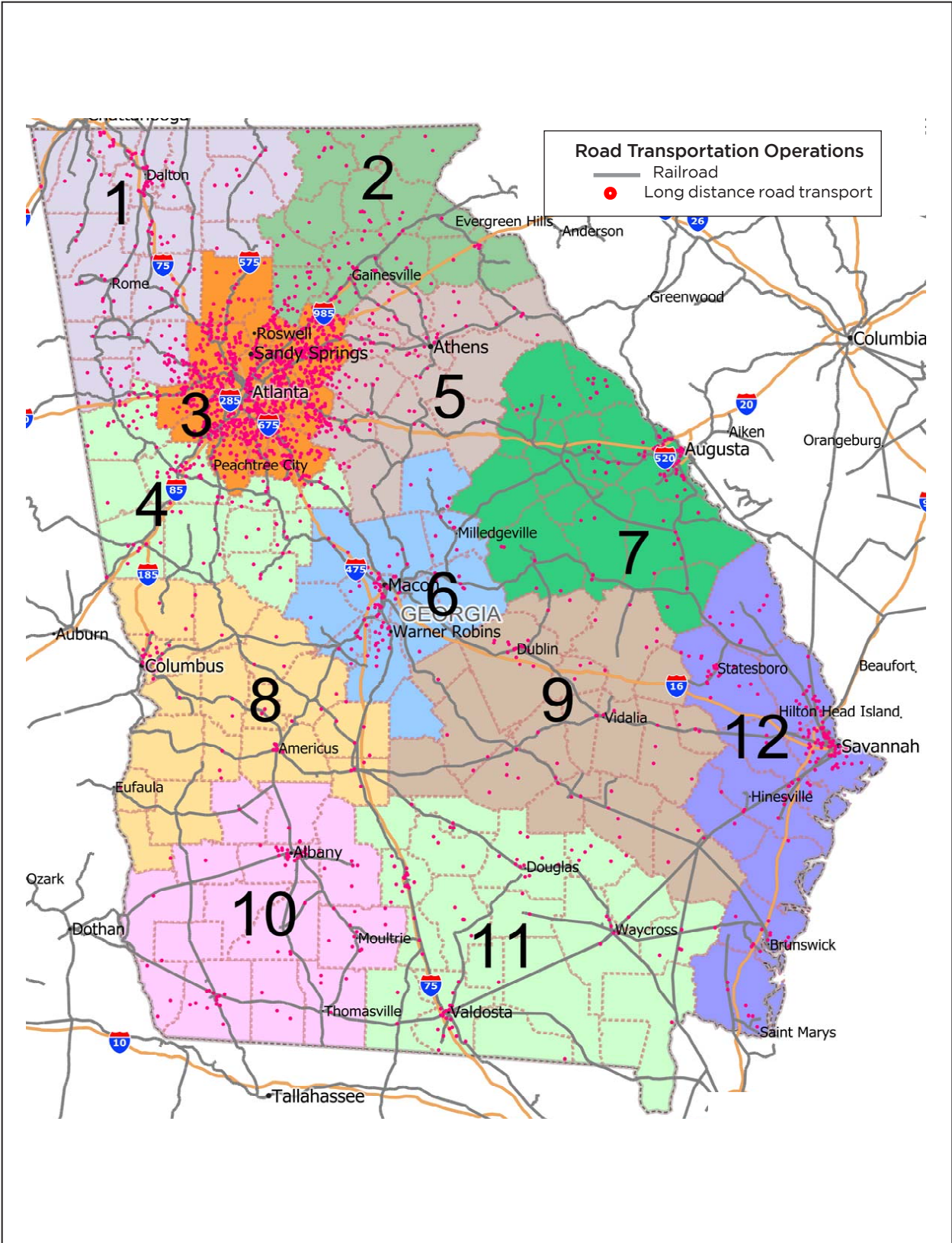


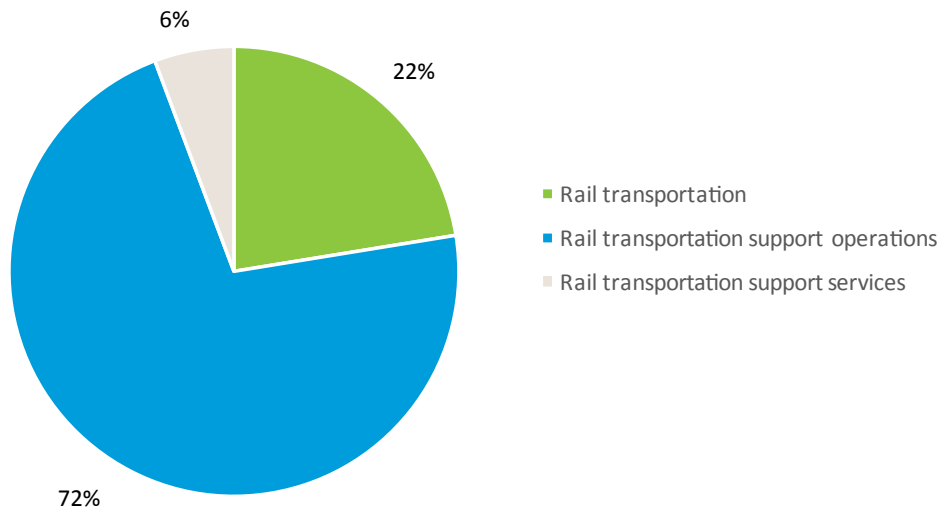
Table 4
Rail Industry Employment and Establishments,
By Industry and Group

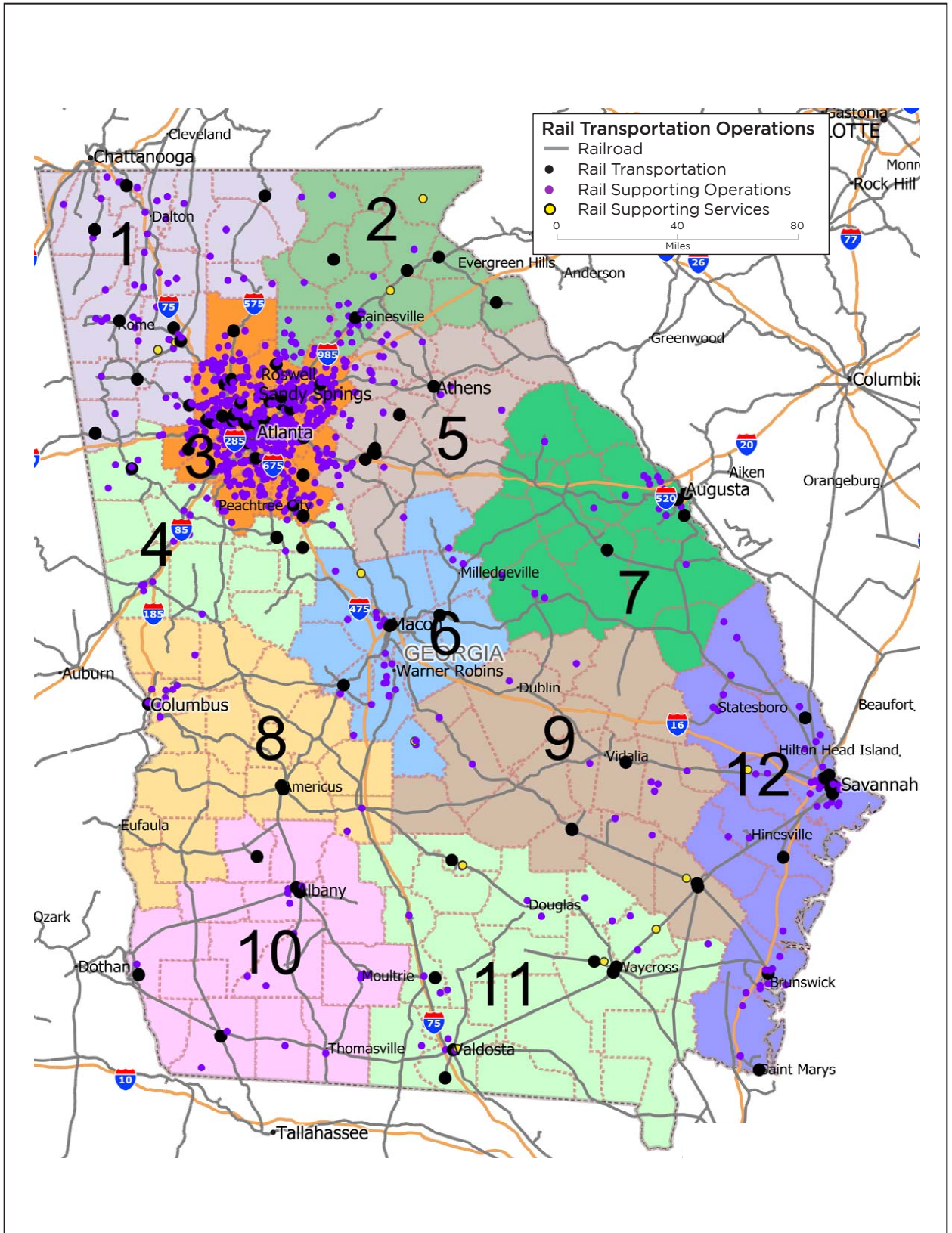
<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Rail transportation		
Belt line railroads	1	21
Railroads, line-haul operating	89	2,299
Interurban railways	6	121
Total	96	2,441
Rail transportation support operations		
Railroad cargo services, loading, unloading	814	4,489
Railroad terminals and switching services	17	3,328
Total	831	7,817
Rail transportation support services		
Rail car cleaning, temp control, ventilation, repair, maintenance	18	622

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 11 (South Central Georgia)
- 3 SDR 12 (Coastal Georgia)

Figure 4
Rail Transportation Employment by Industry





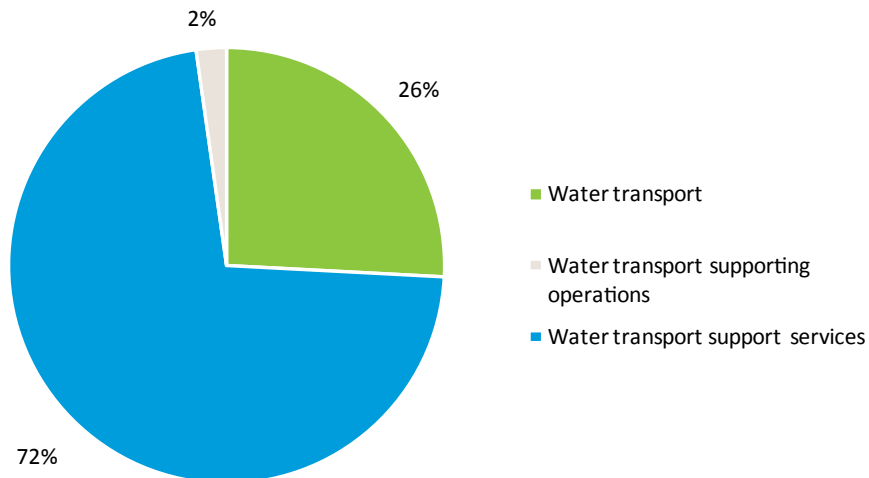
**Table 5
Water Industry Employment and Establishments,
By Industry and Group**

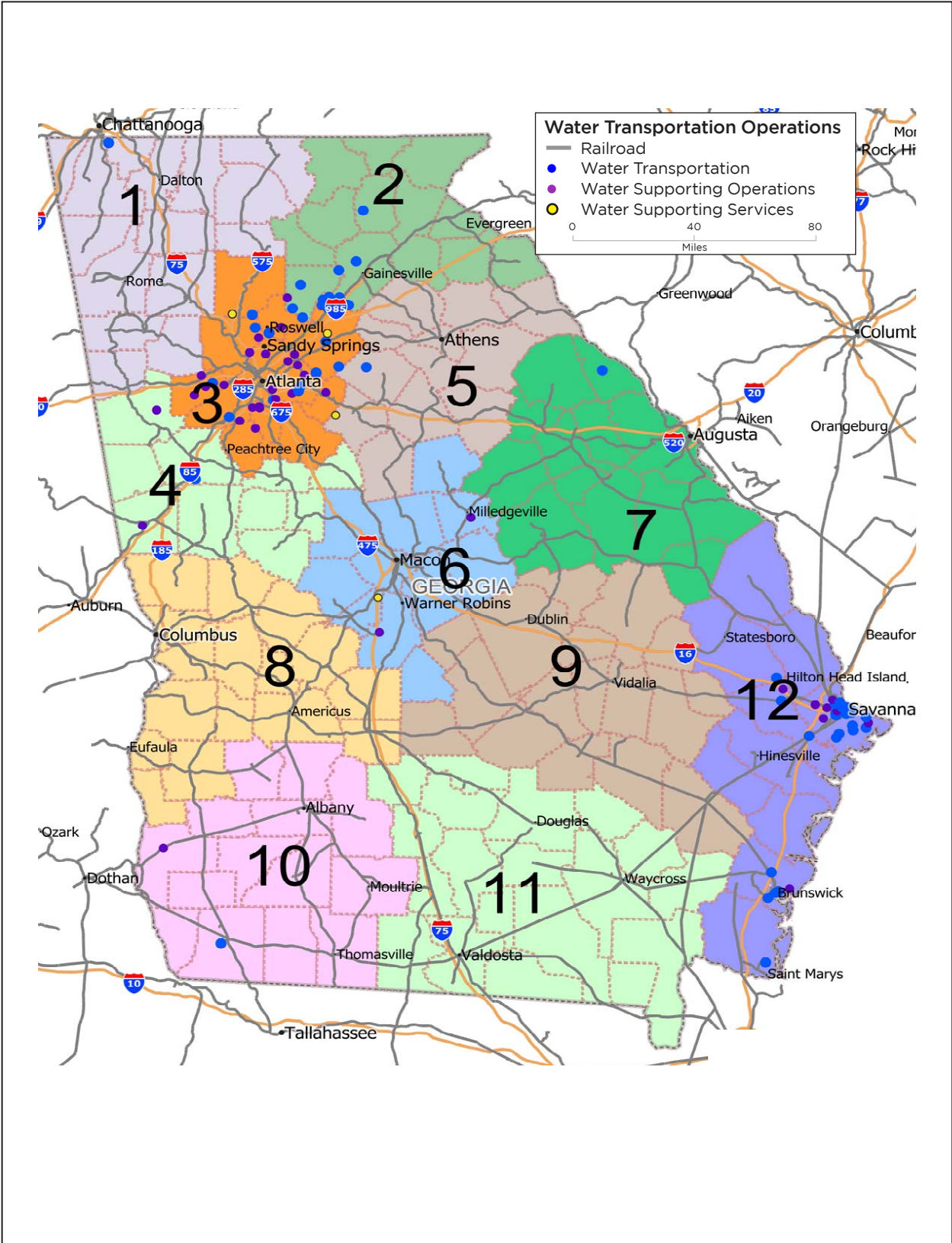
<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Water transport		
Coastal and great lakes freight transportation	18	127
Deep sea freight transportation	12	150
Inland water freight transportation	10	80
Total	40	357
Water transport support operations		
Marine cargo handling	21	619
Marine surveying, salvaging, piloting and other services	17	91
Port and harbor operations (docks, piers, terminals operation and maintenance)	2	10
Towing, tugboat, docking, shifting	30	274
Total	70	994
Water transport support services		
Cleaning services	4	31

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 12 (Coastal Georgia)
- 2 SDR 3 (Atlanta)
- 3 SDR 2 (Northeast Georgia)

**Figure 5
Water Transportation Employment by Industry**





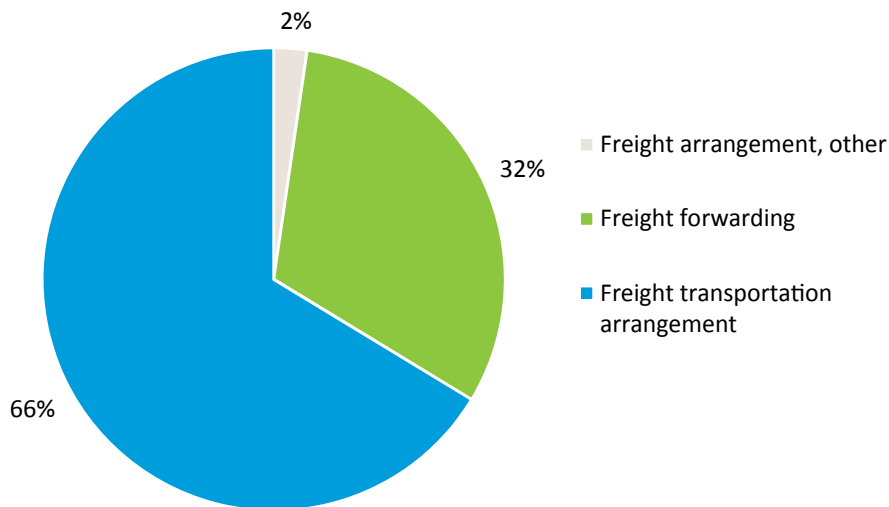
**Table 6
Freight Transportation Employment and Establishments,
By Industry and Group**

<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Freight forwarding		
Freight forwarding, foreign, domestic	517	5,146
Freight transportation arrangement		
Customhouse brokers	37	351
Shipping agents and brokers	1,204	7,742
Transportation agents and brokers	360	2,781
Total	1,601	10,874
Freight arrangement, other		
Customs, freight consolidation, documents preparations, etc.	24	378

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 12 (Coastal Georgia)
- 3 SDR 1 (Northwest Georgia)

**Figure 6
Freight Transportation Employment by Industry**



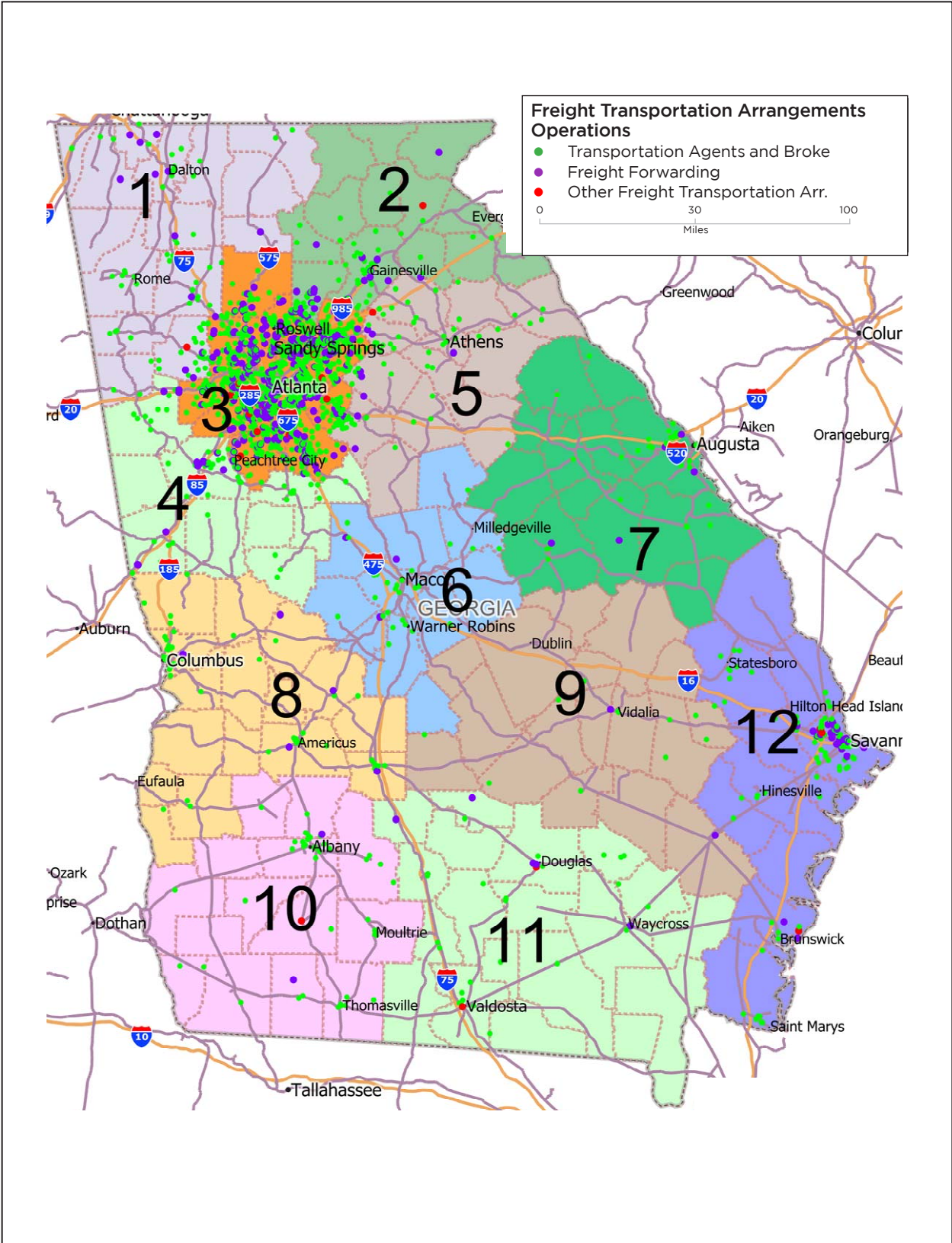


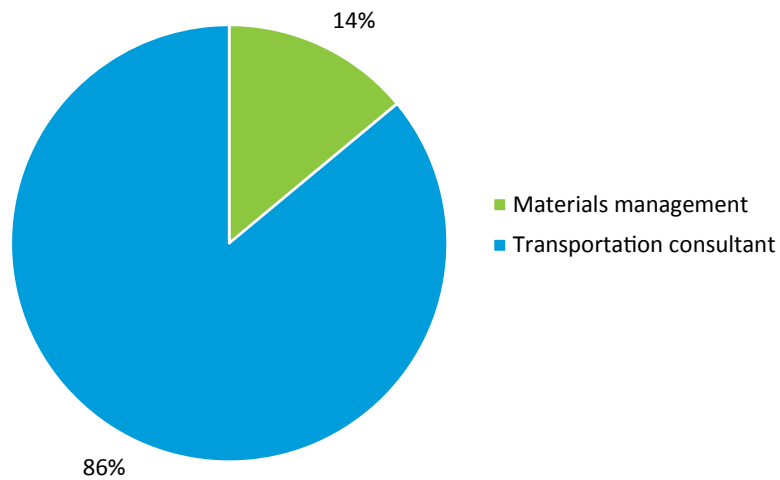
Table 7
Logistics Services Employment and Establishments,
By Industry and Group

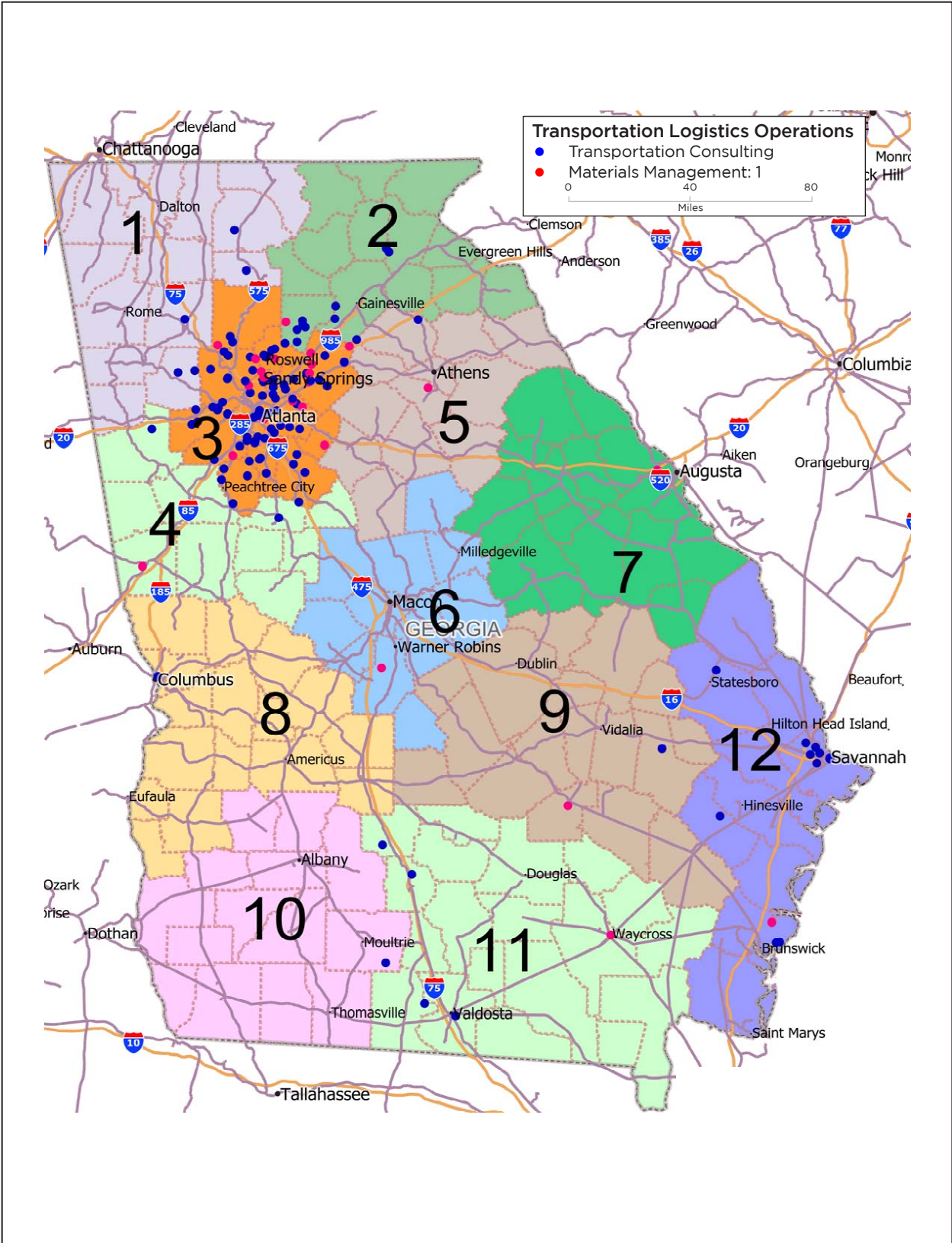
<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Logistics		
Materials management	25	328
Transportation consultants	119	2,021
Total	144	2,349

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 12 (Coastal Georgia)
- 3 SDR 4 (West Atlanta)

Figure 7
Logistics Services Employment by Industry





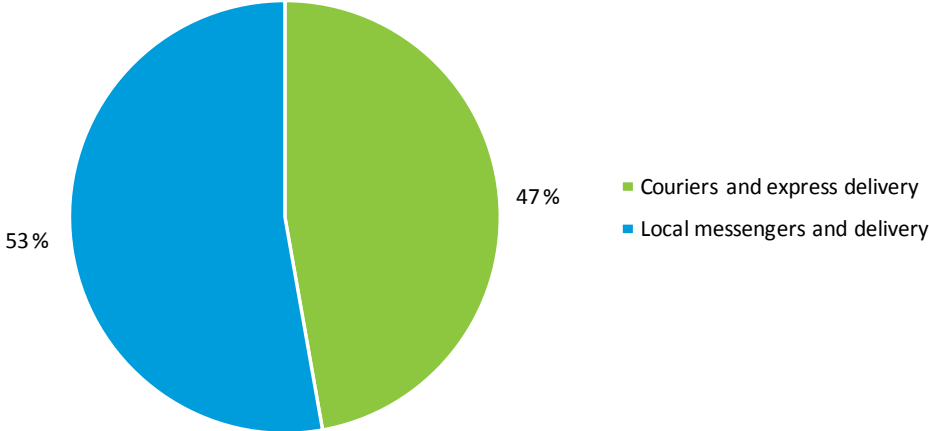
**Table 8
Delivery Employment and Establishments,
By Industry and Group**

<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Couriers and express delivery		
Air courier services (package, letter, parcel)	75	2,355
Courier services (except by air)	345	1,440
Total	420	3,795
Local messengers and delivery		
Other local delivery services (bicycle, motorcycle)	3	7
Package, parcel delivery, vehicular (local or between cities)	427	4,238
Total	430	4,245

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 12 (Coastal Georgia)
- 3 SDR 11 (South Central Georgia)

**Figure 8
Delivery Employment by Industry**



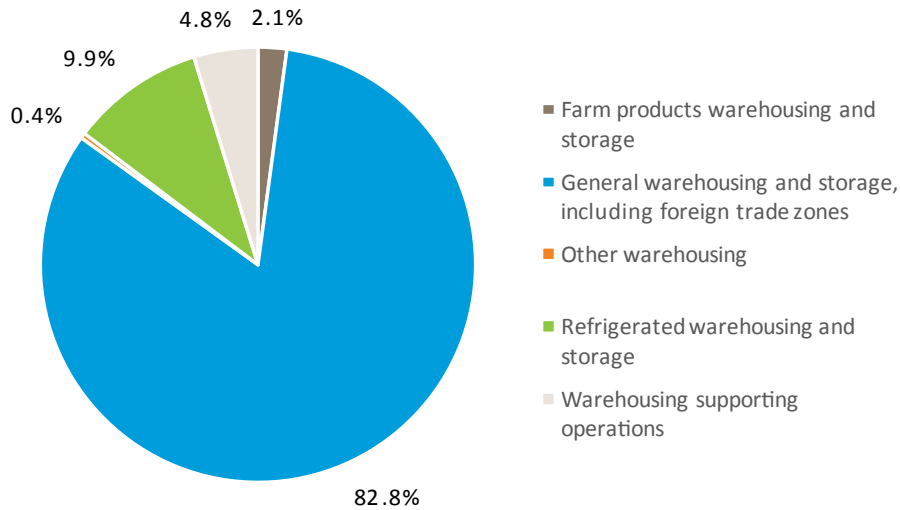
**Table 9
Warehousing Employment and Establishments,
By Industry and Group**

<u>Industry / Group</u>	<u>Number of Establishments</u>	<u>Private Employment</u>
Warehousing and allied services		
Farm products warehousing and storage	53	415
General warehousing and storage, inc. foreign trade zones	793	16,121
Refrigerated warehousing and storage	61	1,933
Packing, crating, containerization	53	928
Other warehousing	9	76
Total	969	19,473

Concentrations by Service Delivery Region (Ranked)

- 1 SDR 3 (Atlanta)
- 2 SDR 12 (Coastal Georgia)
- 3 SDR 11 (South Central Georgia)

**Figure 9
Warehousing Employment by Industry**



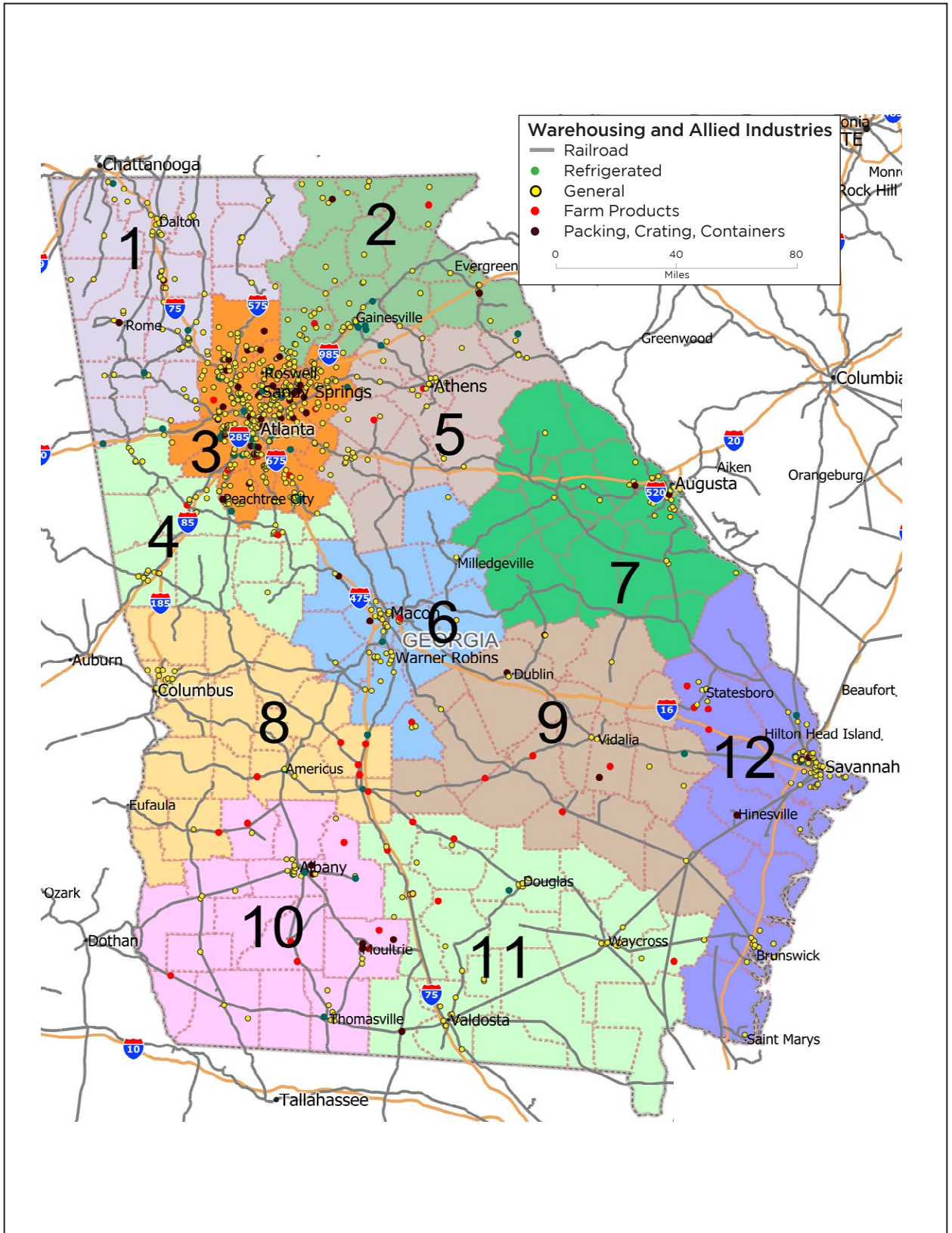


Table 10
Government Employment and Establishments,
in NAICS 48-49 and 92

<u>NAICS</u>	<u>Description / Company Name</u>	<u>Number of Records</u>	<u>Public Employment</u>
48111	Air traffic control		
	Federal Aviation Administration	42	4,640
	The Army, U.S .Department of Defense	1	5
	County of Clayton	1	182
	Total	44	4,827
488119	Other airport operations		
	Georgia Department of Defense	1	200
491110	Postal service		
	U.S. Postal Service	536	15,016
	Grand Total	581	20,043
926120	Regulation and Administration of Transportation Programs		
	City	22	521
	County	46	1,262
	County/city	2	88
	County/school district	2	212
	Federal	23	2,363
	Federal Coast Guard	8	328
	Other	15	92
	State	174	13,684
	Total	292	18,550

Table 11
Selected Logistics IT and Technology Firms,
Establishments and Employment
By Location Type and Ownership

<u>Employment</u>	<u>Total Number of Companies</u>	<u>Location type</u>			<u>Ownership</u>			
		<u>HQ</u>	<u>Branch</u>	<u>Unspecified</u>	<u>Private</u>	<u>Public</u>	<u>Partnership</u>	<u>Unspecified</u>
		<u>Number of Companies</u>			<u>Number of Companies</u>			
0-50 (Incl. 40 under 20)	99	93	5	1	90	2	1	6
51-200	40	32	8	-	33	6		1
201-500	12	8	4	-	10	2		-
501-1000	5	3	2	-	2	3		-
1000+	38	8	29	1	19	19		-
NA	23	15	1	7	10	1		12
Total	217	159	49	9	164	33	1	19

By Location and Line of Business—Dun & Bradstreet Database*

<u>Location</u>	<u>Number of Companies</u>	<u>Employment</u>
Atlanta	90	9,230
Athens	1	6
Macon	2	47
Savannah	6	194
Other	4	439
Line of business		
Manufacturing	12	3,978
Materials transport consult	15	339
IT services	63	4,944
Wholesale comp and electronics	9	441
Other	4	214

By Location and Line of Business—PrivCo Database**

Location		
Atlanta	12	6,520
Line of business		
IT services	9	3,658
Supply chain and logistics	3	2,862

*Firms we were able to locate in the Dun & Bradstreet database.

**Firms we were able to locate in the PrivCo database; may include corporate employment outside of Georgia.

SECTION 2

Economic Impact

The logistics industry's operations are reliable sources of employment and spending which generate substantial economic impacts for those who live, work, and do business in Georgia. Logistics providers in the public and private sector are drivers of Georgia's economy that generate jobs, income, sales, greater production of goods and services, and higher tax collections for all levels of government. In addition to reporting the economic impacts on the state, the economic impacts of Georgia's logistics industry on each of the state's twelve service delivery regions are provided.

In short, the statewide economic impact of Georgia's logistics industry in 2018 were:

- 165,386 direct jobs (not including state and local government jobs);
- 362,778 total jobs in all industries (7 percent of all jobs in Georgia);
- \$60.7 billion in output/sales (6 percent of Georgia's total output/sales);
- \$33.5 billion in state GDP (6 percent of Georgia's total GDP);
- \$21.8 billion in labor income (7 percent of Georgia's total labor income);
- \$1.3 billion in tax revenues for state government; and
- \$1.4 billion in tax revenues for local governments.

Output/Sales Impact

Measured in the simplest and broadest possible terms, the total output impact of Georgia's logistics industries was \$60.7 billion in 2018. Output is gross receipts or sales, plus or minus inventory. Of the \$60.7 billion output impact, \$32.5 billion (54 percent) was direct spending by logistics providers, while \$28.2 billion (46 percent) was the indirect and

induced re-spending impact or the multiplier effect (i.e., the difference between the total output impact and direct spending). The multiplier captures the regional economic repercussions of the flows of re-spending that take place throughout Georgia until the initial spending has completed leaked from the state.

The average multiplier value for the state's logistics providers was 1.87, obtained by dividing the total output impact (\$60.7 billion) by direct spending (\$32.5 billion). On average, therefore, every dollar of initial/direct spending generated an additional 87 cents for Georgia's economy. Thus, for all logistics industries, the output impact was 1.87 times greater than initial/direct spending. The output multipliers vary among the state's logistics industries, ranging from a high of 2.18 for management consulting (e.g., process, physical distribution, and logistics consulting services) to 1.67 for air transportation, but most logistics industries had multiplier values close to the overall average of 1.87. The output multipliers were similar for private- and public-sector providers.

Value-Added Impact

Georgia's logistics providers generated a value-added impact of \$33.5 billion, or 55 percent of the \$60.7 billion output impact (with domestic and foreign trade comprising the remaining 45 percent of the output impact). This represents 6 percent of Georgia's 2018 GDP, which consists of employee compensation, proprietor income, other property income, and indirect business taxes. State GDP (value-added) impacts exclude expenditures related to foreign and domestic trade, so they provide a better measure of Georgia's actual economic production than the more inclusive output impacts.

METHODOLOGY

The Selig Center used the IMPLAN Online software system to estimate the economic impacts based on direct employment by providers of transportation and logistics services. The Dun & Bradstreet Million Dollar Database was the primary data source for logistics employment. The Selig Center built regional models for Georgia and each of its twelve service delivery regions using the most recent IMPLAN Online data files. The D&B employment counts were reallocated to industrial sectors recognized by the model, so the IMPLAN industry classification is not the same as that used elsewhere in this report. Using the IMPLAN Online models and Type SAM multipliers, indirect and induced economic impacts (the multiplier effects) associated with direct employment were estimated in terms of employment, output, GDP (value added), labor income, and tax collections by state and local governments. All dollar amounts are in 2018 dollars.

Total industry output is gross receipts or sales, plus or minus inventory, or the value of production by industry (including households) for a given period. Total output impacts are the most inclusive, largest measures of economic impact. One problem with this, however, is that it includes the value of inputs produced by other industries, which means that some double counting of economic activity is inevitable. The other measures of economic activity (value added, labor income, and employment) are free from double counting and provide a much more realistic measure of economic impact.

The sum of the direct, indirect, and induced economic impacts is the total economic impact. The multiplier effect refers to the indirect and induced economic impacts and is a concept common to most economic impact studies. Multipliers measure the response of the local economy to a change in demand or production. In essence, multipliers capture the impact of the initial round of spending plus the impacts generated by successive rounds of re-spending of those initial dollars. The magnitude of a particular multiplier depends upon what proportion of each spent dollar leaves the region during each round of spending. Multipliers therefore are unique to the region and to the industry.

The multiplier traces the flows of re-spending that occur throughout the region until the initial dollars have completely leaked to other regions. Multiplier effects within large, self-sufficient areas are typically larger than those in small, rural, or specialized areas that are less able to capture spending for necessary goods and services. It is no surprise that the multipliers for Georgia are larger than the multipliers for its service delivery regions.

Labor Income Impact

Georgia's logistics providers generated a labor income impact of \$21.8 billion, or 65 percent of the value-added impact, and 7 percent of Georgia's labor income. Labor income is all forms of employment income, including wages, salaries, and proprietors' income.

Employment Impact

The economic impact of Georgia's logistics industry probably is most easily understood in terms of its effects on employment, which in 2018, provided 362,778 jobs, or 7 percent of all the nonfarm jobs held by Georgians (based on the U.S. Bureau of Labor Statistics household definition of employment), or about one job in 14. Of this total, 165,386 jobs represent direct employment in logistics or the direct

economic impact; 197,392 jobs constitute indirect and induced effect of direct employment (spending), or the multiplier (re-spending) impact. Dividing the total job impact (362,778 jobs) by the direct job impact (165,386 jobs) yields an average multiplier value of 2.19. On average, for every direct job in the logistics industry, 1.19 additional jobs exist in other industries because of spending related to logistics providers. The value of the employment multiplier indicates a relatively high degree of interaction between the logistics industry and the state's overall economy.

Private sector logistics companies account for 89 percent of the total employment impact of Georgia's logistics industry, or 323,841 of the 362,778 jobs. Within the private sector, truck transportation companies account for the largest employment impact

(99,087 jobs). Air transportation (87,304 jobs) and support activities (78,174 jobs) generate the second and third largest economic impacts, respectively. Public sector jobs account for 11 percent of the total employment impact, or 38,937 of the 362,778 jobs.

Employment includes total wage and salary employees as well as the self-employed. It encompasses both full- and part-time jobs and is expressed in annual average jobs.

The direct employment impact (165,386 jobs) is smaller than Dun & Bradstreet's employment numbers (181,245) because state and local government jobs are not included in the direct employment impact. The tax revenues that support state and local government jobs are not necessarily new to the state and therefore do not necessarily constitute net, new economic impacts. This exclusion ensures that the reported economic impacts are not overstated.

Tax Revenue Impact

In 2018, Georgia's logistics industry generated \$1.3 billion in tax revenues for the state and \$1.3 billion in tax revenues for local governments. The air and truck transportation industries were the primary contributors to tax revenues.

Economic Impact by Industry

The total economic impact of direct employment in logistics varies widely across Georgia's major industries. The findings are as expected, however. For example, five major industry sectors account for 69 percent of the total employment impact: transportation accounts for 41 percent; government accounts for 8 percent, reflecting large numbers of direct jobs

at the Post Office and other federal agencies; and warehousing accounts for 7 percent. Education and health services account for 7 percent; and administrative, support, and waste services account for 7 percent of the employment impact, reflecting indirect and induced jobs.

Regional Economic Impact

The economic impact of the logistics industry on the state's service delivery regions reflects both the number and types of providers in each region as well as differences in regional economic multipliers. In general, the largest, most economic diverse service delivery regions had the largest economic impacts.

Service delivery region 3, which comprises the core of the Atlanta MSA, is the state's largest and most economically diverse region and had the largest economic impact as well as the largest multipliers. This reflects the presence of the international airport, the confluence of three interstates, and Atlanta's critical role as an inland port, among other factors. Service delivery region 12, which comprises the coastal counties and several neighboring counties, had the second largest economic impact, reflecting the presence of Georgia's two deepwater ports as well as the I-95 corridor.

Note that due to differences in multipliers as well as the inclusion or exclusion of various governments, the summation of the economic impacts for the state's twelve service delivery regions does not and should not equal the total statewide economic impact.

**Table 12
Employment Impact, 2018
(number of jobs)**

<u>IMPLAN's Industry Classification</u>	<u>Dun & Bradstreet Employment</u>	<u>Direct Employment Impact</u>	<u>Indirect and Induced Employment Impact</u>	<u>Total Employment Impact</u>
Private Sector, Total	142,652	142,652	181,188	323,841
Transportation				
Air	27,939	27,939	59,365	87,304
Rail	2,441	2,441	4,639	7,080
Water	371	371	1,405	1,776
Truck	48,022	48,022	51,065	99,087
Support activities	35,021	35,021	43,153	78,174
Couriers and Messengers	8,040	8,040	5,971	14,012
Warehousing and Storage	18,469	18,469	13,074	31,543
Management Consulting	2,349	2,349	2,516	4,865
Public Sector, Total	38,593	22,734	16,204	38,937
Grand Total	181,245	165,386	197,392	362,778

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

**Table 13
Output Impact, 2018
(2018 dollars)**

<u>IMPLAN's Industry Classification</u>	<u>Direct Output Impact</u>	<u>Indirect and Induced Output Impact</u>	<u>Total Output Impact</u>
Private Sector, Total	29,886,221,444	25,958,014,238	55,844,235,683
Transportation			
Air	12,769,998,844	8,587,482,010	21,357,480,854
Rail	822,602,932	711,410,584	1,534,013,516
Water	246,185,048	225,326,602	471,511,650
Truck	7,449,607,318	7,489,710,289	14,939,317,606
Support Activities	5,504,525,113	5,892,518,184	11,397,043,298
Couriers and Messengers	982,737,441	849,670,046	1,832,407,487
Warehousing and Storage	1,815,297,524	1,853,285,636	3,668,583,161
Management Consulting	295,267,224	348,610,887	643,878,111
Public Sector, Total	2,625,670,746	2,245,177,319	4,870,848,065
Grand Total	32,511,892,190	28,203,191,557	60,715,083,748

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 14
GDP and Labor Income Impact, 2018
(2018 dollars)

<u>IMPLAN's Industry Classification</u>	<u>GDP Impact</u>	<u>Labor Income Impact</u>
Private Sector, Total	29,746,601,622	18,903,700,062
Transportation		
Air	11,715,324,806	6,880,836,324
Rail	787,100,935	486,279,280
Water	178,369,636	96,577,080
Truck	7,458,813,854	4,968,081,590
Support Activities	5,972,540,725	4,062,464,181
Couriers and Messengers	1,065,100,536	655,994,485
Warehousing and Storage	2,177,620,370	1,440,969,724
Management Consulting	391,730,760	312,497,398
Public Sector, Total	3,740,651,633	2,850,545,431
Grand Total	33,487,253,255	21,754,245,493

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 15
Output and Employment Multipliers, 2018

<u>IMPLAN's Industry Classification</u>	<u>Employment Multiplier</u>	<u>Output Multiplier</u>
Private Sector, Total	2.27	1.87
Transportation		
Air	3.12	1.67
Rail	2.90	1.86
Water	4.79	1.92
Truck	2.06	2.01
Support Activities	2.23	2.07
Couriers and Messengers	1.74	1.86
Warehousing and Storage	1.71	2.02
Management Consulting	2.07	2.18
Public Sector, Total	1.71	1.86
Grand Total	2.19	1.87

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 16
State and Local Government Tax Revenues, 2018
(2018 dollars)

<u>IMPLAN's Industry Classification</u>	<u>State Government Tax Revenues</u>	<u>Local Government Tax Revenues</u>
Private Sector, Total	1,183,314,194	1,313,073,147
Transportation		
Air	625,090,217	799,781,333
Rail	26,267,568	26,526,405
Water	5,942,863	6,292,870
Truck	238,425,576	224,751,747
Support Activities	181,969,834	163,469,279
Couriers and Messengers	29,403,046	25,539,398
Warehousing and Storage	63,957,657	56,513,950
Management Consulting	12,257,433	10,198,165
Public Sector, Total	86,763,951	63,115,054
Grand Total	1,270,078,145	1,376,188,201

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 17
Employment Impact,
by Industrial Sectors

<u>Impacted Industry</u>	<u>Employment (full- and part-time jobs)</u>	<u>Percent Distribution</u>
Agriculture, forestry, fishing	431	0.1
Mining	352	0.1
Utilities	616	0.2
Construction	2,763	0.8
Manufacturing	2,314	0.6
Wholesale trade	6,330	1.7
Retail trade	20,193	5.6
Transportation	148,769	41.0
Warehousing	24,052	6.6
Information	2,949	0.8
Finance, insurance, real estate	23,851	6.6
Professional, scientific, tech services	14,502	4.0
Administrative, support, waste services	24,248	6.7
Educational and health services	24,777	6.8
Arts, entertainment, recreation	3,938	1.1
Accommodation and food services	19,545	5.4
Other services	14,772	4.1
Government	28,377	7.8
Total	362,778	100.0

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 18
Employment Impact,
by State Service Delivery Regions, 2018
(number of jobs)

Service Delivery Region and Sector	Dun & Bradstreet Employment	Direct Employment Impact	Indirect and Induced Employment Impact	Total Employment Impact
Region 1	8,343	8,211	4,591	12,802
Total Private	6,099	6,099	3,901	10,000
Total Public	2,244	2,112	690	2,802
Region 2	6,171	6,157	3,943	10,101
Total Private	4,395	4,395	3,315	7,711
Total Public	1,776	1,762	628	2,390
Region 3	113,229	112,856	132,984	245,840
Total Private	94,203	94,203	120,479	214,682
Total Public	19,026	18,653	12,505	31,158
Region 4	5,639	5,465	3,333	8,798
Total Private	3,778	3,778	2,705	6,483
Total Public	1,861	1,687	628	2,315
Region 5	5,016	4,979	3,151	8,129
Total Private	3,690	3,690	2,583	6,273
Total Public	1,326	1,289	568	1,856
Region 6	4,815	4,518	4,012	8,531
Total Private	3,744	3,744	3,622	7,366
Total Public	1,071	774	390	1,165
Region 7	5,658	5,473	3,454	8,927
Total Private	3,573	3,573	2,704	6,277
Total Public	2,085	1,900	750	2,650
Region 8	4,106	3,774	2,120	5,894
Total Private	2,452	2,452	1,708	4,160
Total Public	1,654	1,322	412	1,734
Region 9	3,546	3,506	1,671	5,178
Total Private	2,120	2,120	1,318	3,439
Total Public	1,426	1,386	353	1,739
Region 10	4,652	4,506	3,012	7,517
Total Private	3,372	3,372	2,569	5,941
Total Public	1,280	1,134	443	1,576
Region 11	6,566	6,504	4,151	10,654
Total Private	5,162	5,162	3,712	8,873
Total Public	1,404	1,342	439	1,781
Region 12	13,504	13,213	10,039	23,252
Total Private	10,064	10,064	8,640	18,704
Total Public	3,440	3,149	1,399	4,548

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 19
Output Impact,
by State Service Delivery Regions, 2018

Service Delivery Region and Sector	Direct Output Impact	Indirect and Induced Output Impact	Total Output Impact
Region 1	1,067,385,562	551,560,020	1,618,945,582
Total Private	904,353,087	469,329,006	1,373,682,093
Total Public	163,032,475	82,231,014	245,263,489
Region 2	757,551,480	500,031,811	1,257,583,291
Total Private	624,448,079	420,346,436	1,044,794,514
Total Public	133,103,401	79,685,375	212,788,777
Region 3	25,280,083,642	20,054,096,547	45,334,180,191
Total Private	22,896,086,605	18,237,772,793	41,133,859,399
Total Public	2,383,997,037	1,816,323,754	4,200,320,792
Region 4	649,188,985	375,905,523	1,025,094,507
Total Private	514,835,008	305,195,782	820,030,789
Total Public	134,353,977	70,709,741	205,063,718
Region 5	570,132,587	365,465,760	935,598,347
Total Private	456,354,277	298,176,682	754,530,959
Total Public	113,778,310	67,289,078	181,067,388
Region 6	610,367,336	472,065,258	1,082,432,593
Total Private	541,533,950	426,698,840	968,232,789
Total Public	68,833,386	45,366,418	114,199,804
Region 7	725,473,504	427,686,945	1,153,160,449
Total Private	566,529,399	336,939,022	903,468,421
Total Public	158,944,105	90,747,923	249,692,028
Region 8	480,772,975	262,307,677	743,080,653
Total Private	373,465,077	213,166,679	586,631,756
Total Public	107,307,898	49,140,998	156,448,897
Region 9	412,222,665	197,162,037	609,384,702
Total Private	322,616,506	157,009,777	479,626,283
Total Public	89,606,159	40,152,260	129,758,419
Region 10	560,959,551	342,866,305	903,825,857
Total Private	476,376,239	292,680,706	769,056,945
Total Public	84,583,312	50,185,599	134,768,912
Region 11	846,376,459	482,718,567	1,329,095,025
Total Private	750,326,697	432,608,359	1,182,935,056
Total Public	96,049,762	50,110,208	146,159,969
Region 12	1,862,712,347	1,241,428,180	3,104,140,528
Total Private	1,568,581,796	1,072,790,862	2,641,372,659
Total Public	294,130,551	168,637,318	462,767,869

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 20
GDP and Labor Income Impact,
by State Service Delivery Regions, 2018
(2018 dollars)

Service Delivery Region and Sector	GDP Impact	Labor Income Impact
Region 1	825,618,927	605,978,394
Total Private	631,996,847	444,274,974
Total Public	193,622,080	161,703,420
Region 2	673,058,286	490,748,462
Total Private	505,756,776	353,102,528
Total Public	167,301,510	137,645,934
Region 3	26,397,529,979	16,801,784,395
Total Private	22,994,416,880	14,247,204,299
Total Public	3,403,113,099	2,554,580,096
Region 4	544,455,569	404,287,527
Total Private	381,696,480	270,644,182
Total Public	162,759,089	133,643,345
Region 5	467,202,520	340,350,476
Total Private	328,746,720	225,276,326
Total Public	138,455,800	115,074,150
Region 6	525,626,012	367,442,967
Total Private	437,962,805	295,904,413
Total Public	87,663,207	71,538,554
Region 7	627,711,251	458,880,917
Total Private	429,211,727	295,710,416
Total Public	198,499,524	163,170,501
Region 8	398,366,508	295,019,348
Total Private	273,511,582	189,460,754
Total Public	124,854,926	105,558,594
Region 9	316,375,243	236,741,116
Total Private	210,608,228	149,989,934
Total Public	105,767,015	86,751,182
Region 10	458,179,090	329,534,602
Total Private	353,982,566	243,641,200
Total Public	104,196,524	85,893,402
Region 11	701,519,258	492,567,408
Total Private	584,769,682	397,220,806
Total Public	116,749,576	95,346,602
Region 12	1,705,413,431	1,207,823,816
Total Private	1,324,235,219	910,980,680
Total Public	381,178,212	296,843,136

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 21
Employment and Output Multipliers,
by State Service Delivery Regions, 2018

Service Delivery Region and Sector	Employment Multiplier	Output Multiplier
Region 1	1.56	1.52
Total Private	1.64	1.52
Total Public	1.33	1.50
Region 2	1.64	1.66
Total Private	1.75	1.67
Total Public	1.36	1.60
Region 3	2.18	1.79
Total Private	2.28	1.80
Total Public	1.67	1.76
Region 4	1.61	1.58
Total Private	1.72	1.59
Total Public	1.37	1.53
Region 5	1.63	1.64
Total Private	1.70	1.65
Total Public	1.44	1.59
Region 6	1.89	1.77
Total Private	1.97	1.79
Total Public	1.51	1.66
Region 7	1.63	1.59
Total Private	1.76	1.59
Total Public	1.39	1.57
Region 8	1.56	1.55
Total Private	1.70	1.57
Total Public	1.31	1.46
Region 9	1.48	1.48
Total Private	1.62	1.49
Total Public	1.25	1.45
Region 10	1.67	1.61
Total Private	1.76	1.61
Total Public	1.39	1.59
Region 11	1.64	1.57
Total Private	1.72	1.58
Total Public	1.33	1.52
Region 12	1.76	1.67
Total Private	1.86	1.68
Total Public	1.44	1.57

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

Table 22
State and Local Government Tax Revenues,
by State Service Delivery Regions, 2018
(2018 dollars)

Service Delivery Region and Sector	State Government Tax Revenues	Local Government Tax Revenues
Region 1	24,816,121	22,207,809
Total Private	19,775,662	18,716,731
Total Public	5,040,459	3,491,078
Region 2	20,382,411	17,397,429
Total Private	15,860,985	14,428,172
Total Public	4,521,426	2,969,257
Region 3	1,025,922,272	1,071,888,360
Total Private	942,620,816	1,017,848,064
Total Public	83,301,456	54,040,296
Region 4	16,086,518	15,034,501
Total Private	11,862,098	11,890,344
Total Public	4,224,420	3,144,157
Region 5	14,354,821	13,571,444
Total Private	10,669,458	10,820,381
Total Public	3,685,363	2,751,063
Region 6	17,132,896	16,988,182
Total Private	14,728,078	15,155,133
Total Public	2,404,818	1,833,049
Region 7	18,052,329	15,455,764
Total Private	13,027,983	12,149,256
Total Public	5,024,346	3,306,508
Region 8	10,451,322	11,582,880
Total Private	7,871,988	9,465,429
Total Public	2,579,334	2,117,451
Region 9	9,030,672	8,666,591
Total Private	6,475,306	6,710,428
Total Public	2,555,366	1,956,163
Region 10	14,592,883	14,057,523
Total Private	11,705,519	11,873,912
Total Public	2,887,364	2,183,611
Region 11	21,139,088	20,785,710
Total Private	18,121,987	18,375,645
Total Public	3,017,101	2,410,065
Region 12	47,067,075	48,497,566
Total Private	37,954,642	41,214,519
Total Public	9,112,433	7,283,047

Source: Estimated by the Selig Center for Economic Growth, Terry College of Business, University of Georgia, 2019.

SECTION 3

Employment Growth

The review of publicly available government data covering the logistics industries is based on the Quarterly Census of Employment and Wages, gathered and published by the U.S. Bureau of Labor Statistics. This source provides employment data for employees covered by the Unemployment Insurance (UI) programs of the United States, which amounts to 97 percent of the U.S. workforce.

We define the logistics sector as establishments within industries directly involved in the moving and storing of cargo. The logistics subsectors include air, rail, water, and truck transportation, support activities for transportation, postal service, couriers and messengers, and warehousing and storage. Logistics consulting services, although not formally classified as a NAICS subsector, is also included.

Whenever detailed industry data was available, the sectors are narrowed down to the sum of industries that meet the project scope. In some cases, most notably air transportation, the whole sector was included in calculations, as the establishments involved in moving and storing cargo are also involved in passenger transportation, making it difficult to outline the size of their cargo operations. In other cases, the detail provided by the 6-digit NAICS classification was not sufficient to remove industry parts not directly involved in moving or storing cargo.

Because the logistics industries are subject to a high level of seasonal changes in employment, we use annual averages instead of quarterly data. The last available annual data for the QCEW series is 2017.

The transportation and warehousing subsectors within the scope of this report typically are more concentrated in Georgia than in the rest of the country, which means that their shares of jobs within

the economy exceed the U.S. average. Within the logistics-specific industries, these concentrations are even higher. economy exceed the U.S. average. Within the logistics-specific industries, these concentrations are even higher.

The Quarterly Census of Employment and Wages reports that 182,598 workers were employed by private companies within the logistics sector in Georgia in 2017. The sector as a whole increased its total employment by 30 percent between 2010 and 2017, about the same as the U.S. average for the corresponding industry group, but faster than both Georgia and U.S. economy-wide employment growth (19.9 percent and 15.2 percent, respectively).

The number of logistics jobs in Georgia grew faster than the U.S. average in all subsectors, except for air and water transportation, and private employment in the Postal Service. Warehousing and storage and support activities for transportation expanded especially rapidly in Georgia, with 70.4 percent and 44.5 percent employment growth between 2010 and 2017, far surpassing the U.S. average. The couriers and messenger subsector grew by 30.2 percent, also fast, but in line with the average U.S. growth for this subsector.

Logistics Industries

Trucking, the largest of the logistics subsectors, reported 49,054 jobs in 2017. It expanded by 23.4 percent between 2010 and 2017, above the economy-wide job growth, but slower than the logistics sector average. Within the subsector, long-distance freight trucking industries experienced much faster job growth, and provided larger shares of jobs than was typical for the U.S. as a whole.

The employment share of Georgia's general long-distance freight trucking (less than truckload) was

almost twice the U.S. average in 2017. The industry expanded by 37.2 percent between 2010 and 2017, compared to 22.5 percent growth for the U.S. Specialized long-distance trucking, both large (employing over 5,000 workers), and concentrated (employment share 1.3 times larger than the U.S. average) grew in employment size by 74.7 percent between 2010 and 2017. Local freight trucking industries have also added jobs, but at slower rates. Compared to the rest of the country, local freight trucking is fairly small in relative employment share.

Warehousing and storage, the second largest, fastest growing, and highly concentrated subsector grew in employment size by 70.4 percent between 2010 and 2017. The subsector provided 43,447 jobs in 2017. General warehousing provided most of the jobs, and grew in size by 76.8 percent. Among agriculture-related operations, refrigerated warehousing and storage, with close to 4,000 workers, expanded more slowly, but held a share of the state's jobs over twice the average for the United States. Farm product warehousing, while much smaller (941 jobs), has registered job growth of over 132 percent, and industry concentration almost three times the U.S. average.

Air transportation, the third largest, but one of the slower growing subsectors, has the highest concentration of jobs among the logistics subsectors in Georgia. The subsector increased by just 2.8 percent in employment size between 2010 and 2017 and reported 39,998 jobs in 2017. Air transportation jobs add up to a share of jobs that is 2.7 times larger than the national average.

Support activities for transportation in Georgia reported 25,032 jobs in 2017, and expanded by 44.5 percent between 2010 and 2017, well above the average for the logistics industries. The subsector's job concentration in Georgia exceeds the U.S. average.

Some areas within the support activities for transportation subsector expanded even faster pace than the subsector's average. Freight transportation arrangement, by far the largest of these services, has grown by 64.5 percent between 2010 and 2017. The industry provided 11,060 jobs in 2017, which amounted to a job share that is 1.7 times larger than the U.S. average.

Selected support services for road transportation, employing over 2,000 workers in 2017, expanded at a rate that almost doubled the average for this industry group in Georgia (87.3 percent between 2010 and 2017). The industry is also highly concentrated,

with a share of jobs close to twice the U.S. average. Support activities for rail transportation, although much smaller in size (1,479 jobs), also registered a rapid job growth (64.7 percent) and provided a relatively large share of jobs (1.5 times the U.S. average). Marine cargo handling, the second largest industry within the transportation support services subsector, expanded at a slower 32.6 percent pace, but provided the share of jobs over twice the average size for the U.S. as a whole.

Couriers and messenger services also provide a larger share of jobs in Georgia than is typical for the U.S. on average. The subsector expanded by 30.2 percent between 2010 and 2017, below the average for other logistics industries. In 2017, the subsector reported 23,944 jobs. Most of them are in the couriers and express delivery services, which is highly concentrated in Georgia (1.3 times higher than U.S. average), but slower in job growth. The much smaller local messengers and local delivery segment (1,225 jobs) expanded by 40 percent, basically at the logistics industry average rate.

Process and logistics consulting services, relatively small in relative employment share, expanded by 78.2 since 2010. The industry provided 2,990 jobs in 2017, slightly above the median for the logistics industries in Georgia, but its rapid expansion ranked third among logistics industries.

Private employment in rail, and water transportation in the Postal Service together accounted for just 431 jobs. All of these subsectors are relatively small compared to the average U.S. shares of jobs they provide. The bulk of employment in postal service and water transportation is provided by government establishments and reported with government employment.

Non-Employer Establishments

Non-employers are a vital part of logistics. Non-employer establishments report no employment, and most are classified as sole proprietors, which includes self-employed business owners. Some categories of non-employers, such as partnerships, may involve the activity of more than one person, so the number of establishments is not synonymous with the number of persons involved in these operations. On average, sole proprietors account for close to 90 percent of non-employer establishments within the transportation, warehousing, and logistics subsectors.

Non-employer firms are most likely to be involved

in trucking. In 2016 (the most recent year for which data are available), 24,353 non-employer establishments were active in truck transportation. Over 65 percent of that number were active in long-distance general freight transportation. Over 90 percent of non-employer trucking firms were categorized as sole proprietorships.

With 6,269 establishments, courier and messenger firms are the second largest group of non-employers in logistics. Almost all of these businesses (98.1 percent) are run by sole proprietors. The third largest group (6,106 firms) of non-employers are involved in transportation support activities, and over 92 percent of these firms belonged to sole proprietors. This particular segment has seen the fastest growth in the number of establishments (39.8 percent) between 2010 and 2016.

Compared to the U.S. average, more non-employers in Georgia work in truck transportation, especially long-distance freight trucking. Except for air transportation and support activities for transportation, the number of establishments in all of the non-employer logistics subsectors expanded faster in Georgia than in the U.S. on average. The difference is most pronounced in the relatively small group of warehousing and storage non-employer establishments, and in the much larger couriers and messengers segment.

Government Employment in Logistics

In 2017, federal and state government together employed 27,680 logistics workers-- 21,883 at the federal level and 5,797 at the state level. This number excludes workers involved in passenger transportation, which is where most of the transportation-related activities of local governments concentrate. The number of both federal and state workers involved in logistics shrank in Georgia between 2010 and 2017, but state government lost a much larger

percentage of workers than the federal government (9.4 percent employment loss for state employment versus a 2.7 percent drop for federal government).

Of 21,883 federal logistics workers, over 78 percent work for the Postal Service, 20 percent are employed in transportation administration programs, and 1.6 percent work in air traffic control. Georgia's state government employs 5,797 transportation workers: 69 percent in air traffic control, and 31 percent in transportation program administration.

The federal government runs the two largest government logistics operations in Georgia—the U.S. Postal Service and the activities included under transportation program administration. The U.S.P.S. accounts for 62 percent, and the federal transportation administration programs account for 16 percent of Georgia's government employment in logistics. The state government's air traffic control operation is the third largest government-run logistics operation in Georgia (15 percent of government employment in logistics).

Even though both federal and state employment in logistics shrank between 2010 and 2017, federal and state transportation administration programs, and federal air traffic control have expanded their ranks. The largest (25.3 percent) job gain was registered in state operations within transportation program administration. At the same time, employment in state-run air traffic control operations shrank by 19 percent and the U.S. Postal Service in Georgia lost 5 percent of its employees.

Despite employment losses between 2010 and 2017, employment share provided by state-run air traffic control is 33 times larger in Georgia than the national average. Federal employment in transportation program administration is also more concentrated in Georgia, with employment share 1.3 times larger than the U.S. average.

**Table 23
Private Employment in Logistics in Georgia, 2017**

NAICS	Subsectors/ Industries	2017 Employment	2010-2017 Employment Change (%)	2017 Relative Employment Concentration*
Economy-wide TOTAL		3,699,460	19.9	NA
Logistics TOTAL		184,802	30.0**	NA
481	Air transportation	39,998	2.8	2.68
482	Rail transportation	13	-7.1	0.83
483	Water transportation	212	-24.8	0.16
483111	Deep sea freight transportation	177	-26.9	0.56
483113	Coastal and great lakes freight transportation	35	-12.5	0.11
484	Truck transportation	49,054	23.4	1.19
484121	General freight trucking, long-distance (full-load)	20,428	10.1	1.35
484122	General freight trucking, long-distance (partial load)	14,719	37.2	1.96
484230	Other specialized trucking, long-distance	5,148	74.7	1.27
484220	Other specialized trucking, local	4,917	5.9	0.74
484110	General freight trucking, local	3,842	34.2	0.51
488	Support activities for transportation	25,032	44.5	1.29
488510	Freight transportation arrangement	11,065	64.5	1.69
488320	Marine cargo handling	4,129	32.6	2.21
488190	Other support activities for air transportation	2,677	2.8	0.79
488490	Other support activities for road transportation	2,171	87.3	1.87
0	Other airport operations	2,024	NA	0.69
488210	Support activities for rail transportation	1,479	64.7	1.49
488999	All other support activities for transportation	646	16.6	1.56
488991	Packing and crating	435	44.0	0.79
488330	Navigational services to shipping	226	-49.1	0.48
0	Air traffic control	180	NA	2.55
491	Postal service	112	-27.7	0.52
492	Couriers and messengers	23,944	30.2	1.19
492110	Couriers and express delivery services	22,719	29.7	1.26
492210	Local messengers and local delivery	1,225	40.0	0.58
493	Warehousing and storage	43,447	70.4	1.46
493110	General warehousing and storage	38,681	76.8	1.42
493120	Refrigerated warehousing and storage	3,825	18.9	2.15
493130	Farm product warehousing and storage	941	132.9	2.82
541614	Process and logistics consulting services	2,990	78.2	0.82

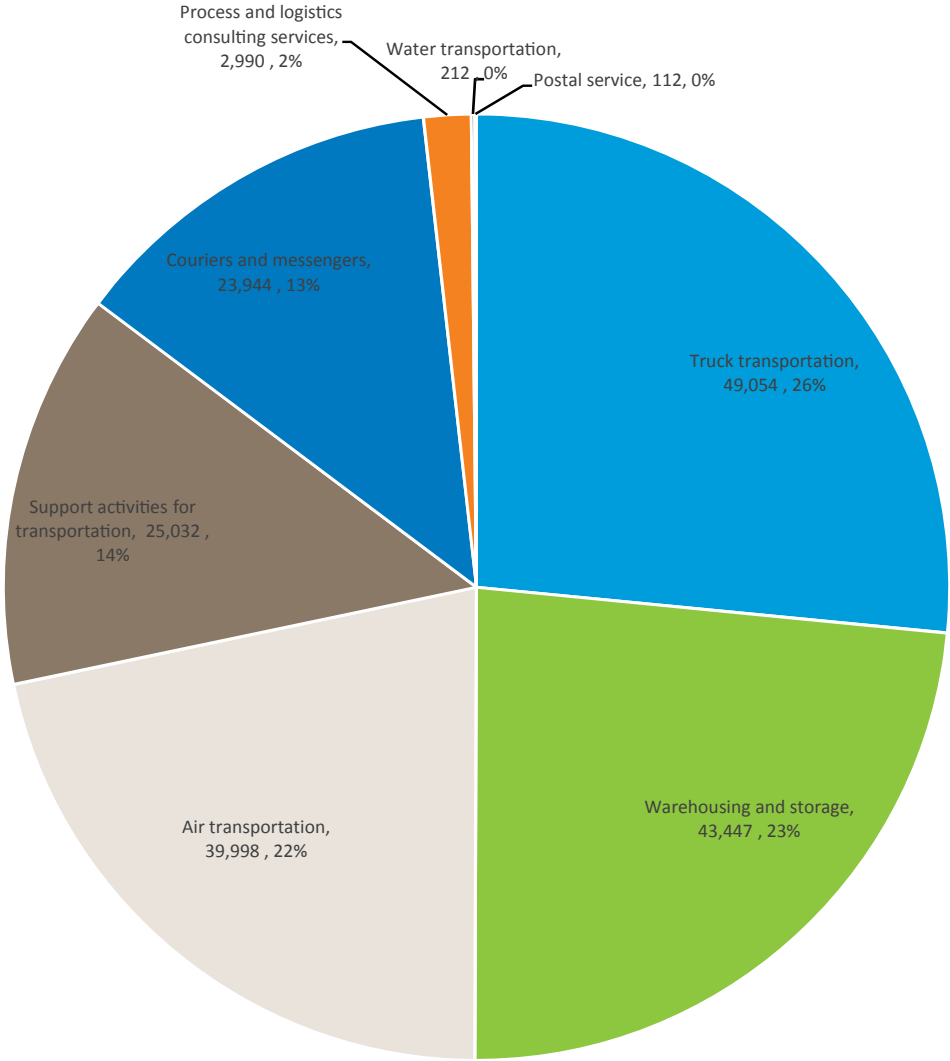
NA Not available.

* Quotients for industries and whole subsectors as reported by the QCEW.

** Calculations based on totals for industries for which both 2010 and 2017 are available.

Source: Selig Center for Economic Growth, based on Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Private Employment in Logistics in Georgia, by Subsector* in 2017



*Employment in sectors reporting at least 100 employees.

Source: Selig Center for Economic Growth, based on Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

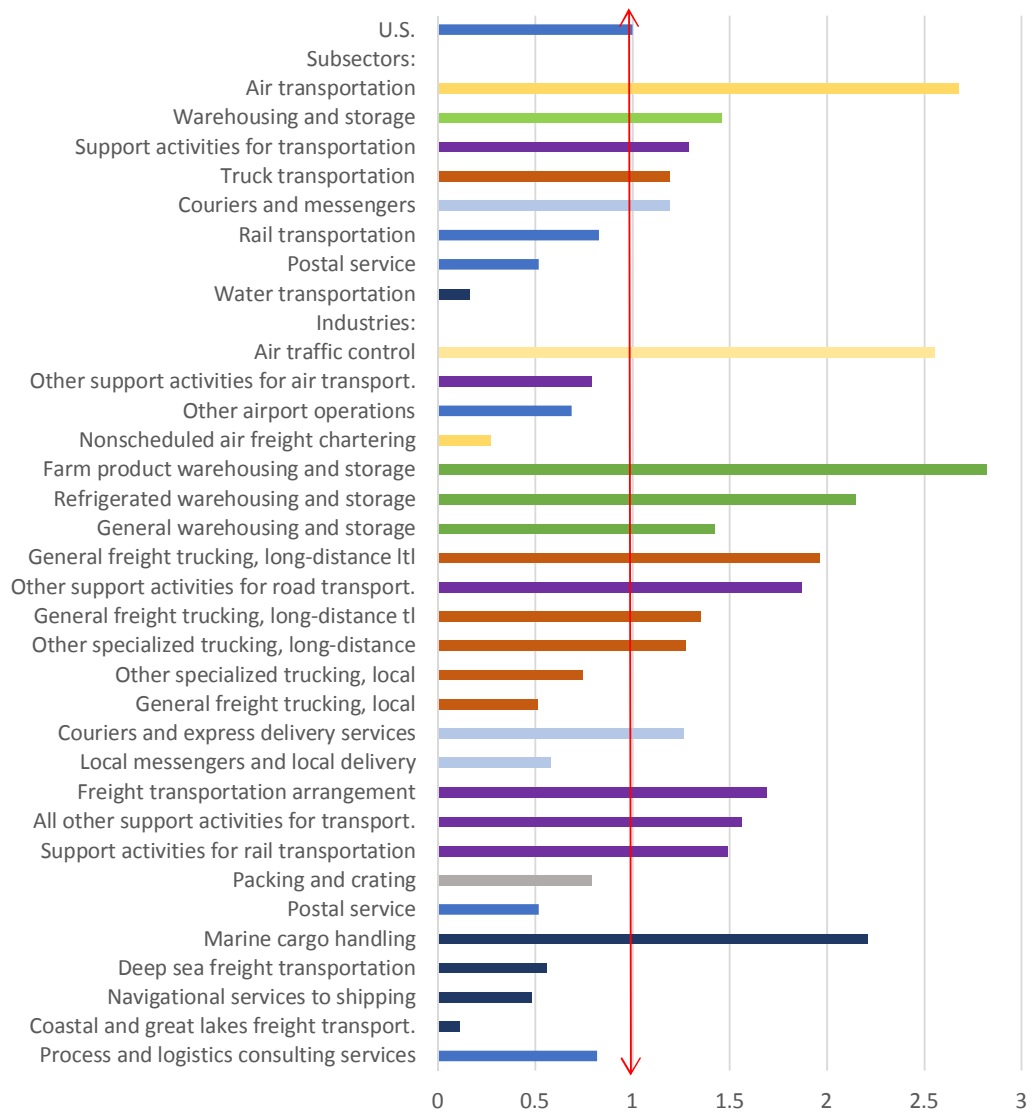
Table 24
Private Employment in Logistics in Georgia and the U.S.,
2010 and 2017

NAICS	Subsectors/ Industries	2010-2017 Employment		Change (percent)	
		Georgia	Employment	Georgia	U.S.
		2010	2017		
Economy-wide TOTAL		3,084,772	3,699,460	19.9	15.2
Logistics TOTAL		140,484	182,598	30.0	30.8
481	Air transportation	38,919	39,998	2.8	10.1
482	Rail transportation	14	13	-7.1	-10.8
483	Water transportation	282	212	-24.8	3.0
483111	Deep sea freight transportation	242	177	-26.9	-9.3
483113	Coastal and great lakes freight transportation	40	35	-12.5	4.3
484	Truck transportation	39,737	49,054	23.4	16.2
484121	General freight trucking, long-distance (full-load)	18,558	20,428	10.1	7.7
484122	General freight trucking, long-distance (partial load)	10,726	14,719	37.2	22.5
484230	Other specialized trucking, long-distance	2,946	5,148	74.7	24.4
484220	Other specialized trucking, local	4,645	4,917	5.9	16.3
484110	General freight trucking, local	2,862	3,842	34.2	23.6
488	Support activities for transportation	15,802	22,828	44.5	26.6
488510	Freight transportation arrangement	6,725	11,065	64.5	27.8
488320	Marine cargo handling	3,115	4,129	32.6	47.6
488190	Other support activities for air transportation	2,605	2,677	2.8	20.5
488490	Other support activities for road transportation	1,159	2,171	87.3	23.4
488210	Support activities for rail transportation	898	1,479	64.7	48.7
488999	All other support activities for transportation	554	646	16.6	51.0
488991	Packing and crating	302	435	44.0	9.3
488330	Navigational services to shipping	444	226	-49.1	-16.8
491	Postal service	155	112	-27.7	59.7
492	Couriers and messengers	18,396	23,944	30.2	28.3
492110	Couriers and express delivery services	17,521	22,719	29.7	25.2
492210	Local messengers and local delivery	875	1,225	40.0	63.7
493	Warehousing and storage	25,501	43,447	70.4	61.7
493110	General warehousing and storage	21,881	38,681	76.8	70.3
493120	Refrigerated warehousing and storage	3,216	3,825	18.9	22.2
493130	Farm product warehousing and storage	404	941	132.9	29.4
541614	Process and logistics consulting services	1,678	2,990	78.2	28.9

NOTE: Only industries with published Georgia 2010 and 2017 employment are included. 2010 data for Other airport operations and Air traffic control are not available for Georgia.

Source: Selig Center for Economic Growth, based on Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Employment Concentration* by Industry in Georgia, 2017



*Values greater than 1 indicate employment share exceeding the U.S. average, values smaller than 1 indicate employment concentration below U.S. average.

Source: Selig Center for Economic Growth, based on: Bureau of Labor Statistics Quarterly Census of Employment and Wages.

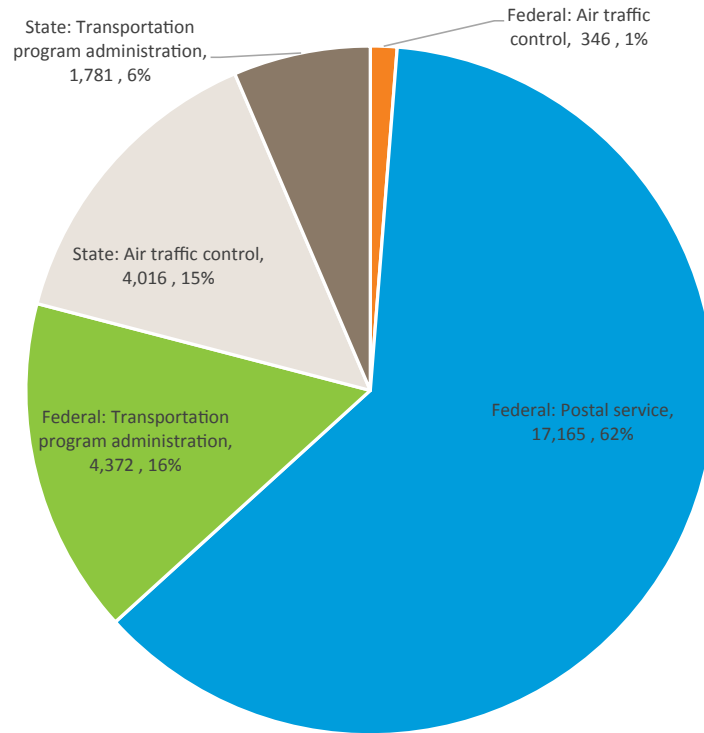
Table 25
Government Employment in Logistics in Georgia and the U.S.,
2010 and 2017

<u>Ownership/ Industry</u>	<u>Georgia Employment</u>		<u>2010-2017</u> <u>Employment</u> <u>Change (%)</u>		<u>2017 Relative</u> <u>Employment</u> <u>Concentration</u> <u>(U.S. = 1)</u>
	<u>2010</u>	<u>2017</u>	<u>Georgia</u>	<u>U.S.</u>	
Federal government					
Air traffic control	336	346	2.98	-1.70	1.0
Postal service	18,067	17,165	-4.99	-6.24	0.9
Transportation program admin.	4,081	4,372	7.13	0.12	1.33
Total	22,484	21,883	-2.67	-5.3	NA
State government					
Air traffic control	4,979	4,016	-19	-47.8	32.8
Transportation program admin.	1,421	1,781	25.3	-5.84	0.33
Total	6,400	5,797	-9.42	-7.5	NA
Grand total	28,884	27,680	-4.17	-7.5	NA

NOTE: Industries with more than 100 employees. Excludes passenger transportation.
NA Not applicable.

Source: Selig Center for Economic Growth, based on: Bureau of Labor Statistics, the Quarterly Census of Employment and Wages.

Government Employment in Logistics in Georgia, 2017



*Employment in sectors reporting at least 100 employees. Excludes passenger transportation.

Source: Selig Center for Economic Growth, based on Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Table 26
Non-Employer Establishments in Logistics in Georgia, 2010-2016

NAICS	Subsectors/ Industries	Establishments (number)		2010-2016 Change (percent)	
		2010	2016	Georgia	U.S.
481	Air transportation	702	748	6.6	7.5
483	Water transportation	112	115	2.7	0.4
484	Truck transportation	19,518	24,353	24.8	19.7
488	Support activities for transportation	4,369	6,106	39.8	57.3
492	Couriers and messengers	4,958	6,269	26.4	18.5
493	Warehousing and storage	367	501	36.5	27.4
Industries					
48411	General freight trucking, local	5,588	6,486	16.1	11.4
48412	General freight trucking, long-distance	12,088	15,868	31.3	27.3
4842	Specialized freight trucking	1,842	1,999	8.5	4.7

Source: Selig Center for Economic Growth, based on U.S. Census Bureau, Nonemployer Statistics, 2010, 2016.

SECTION 4

Logistics Occupations

Logistics activity is defined as employment in a group of related occupations across all industries rather than employment (activity) in logistics industries. The findings are derived from the U.S. Bureau of Labor Statistics Occupation Employment Statistics (BLS OES) program, based on data for May 2017 (released in 2018). The analysis covers only occupations involved in the movement or storage of freight/cargo, and excludes transportation occupations such as drivers of ambulances, buses, and taxis; subway and streetcar operators; and flight attendants.

Employment

We only included logistics occupations involved in the movement of freight (390,640 workers, or 9.1 percent all jobs in the state). Georgia's ten largest logistics occupations are:

- laborers; freight, stock and material movers(118,700);
- heavy and tractor-trailer truck drivers (56,450);
- industrial truck and tractor operators (33,790);
- light truck, delivery services drivers (25,390);
- shipping, receiving, and traffic clerks (23,390);
- packers and packagers, hand (23,290);
- drivers/sales workers (15,960);
- first-line supervisors of transportation and material-moving workers (15,070);
- postal service mail carriers (10,280); and
- vehicles/trucks cleaners (9,030).

The BLS OES program defines occupation employment as wage and salary employment in an occupation. This excludes the self-employed, owners and partners in unincorporated firms, household workers, or unpaid family workers. In addition, the BLS OES data do not include most jobs in agriculture.

Annual Mean Wage

The annual mean wage across all transportation and materials moving occupations was \$34,690 in 2017, but annual mean wages vary widely among logistics occupations. Georgia's ten highest paying logistics occupations include:

- air traffic controllers (\$137,600);
- commercial pilots (\$113,720);
- transportation, storage, and distribution managers (\$107,010);
- airline pilots, copilots, flight engineers (\$102,330);
- aircraft cargo-handling supervisors (\$79,650);
- captain's mates, water vessel pilots (\$78,500);
- logisticians (\$72,230);
- transportation inspectors (\$68,110);
- ship's engineers (\$65,760); and
- railroad conductors and yardmasters (\$58,220).

These estimates are conservative because they do not include overtime pay, severance pay, shift differentials, nonproduction bonuses, employer cost for supplementary benefits, and tuition reimbursements.

Location Quotient

Location quotients are the ratio of an occupation's share of employment in a given area (e.g., Georgia) to that occupation's share of employment in the nation as a whole. For example, an occupation that makes up 15 percent of employment in Georgia compared to 10 percent of U.S. employment has a location quotient of 1.5. Location quotients are useful for studying the composition of jobs in Georgia relative to the national average and for identifying occupations with high—or low—concentrations of jobs relative to the nation.

Across all of Georgia's transportation and materials moving occupations, Georgia's location quotient was 1.20, ranking eighth among the states—behind Kentucky (1.33), Tennessee (1.32), North Dakota (1.26), New Jersey (1.26), Arkansas (1.26), Indiana (1.24), and Mississippi (1.23). Wyoming (1.18) and Illinois (1.16) round out the top ten.

Georgia ranks higher in many of the detailed logistics occupations than it does for transportation and material occupations overall. In terms of

location quotients, Georgia ranks in the top ten in thirteen occupations. For instance, it is top among the states with the highest location quotient (1.96) for industrial truck and tractor operators who move materials around warehouses, storage yards, factories, or construction sites. Given the vast number of warehouse and distribution centers, it is no surprise that Georgia employed industrial truck and tractor operators at nearly twice the national average.

Rank	Occupation	Employment	Annual Mean Wage	Location Quotient
1	Industrial truck and tractor operators	33,790	33,570	1.96
3	Airline pilots, copilots, flight engineers	6,760	102,330	2.66
4	Airfield operations specialists	520	57,260	1.80
	Laborers; freight, stock, and material movers	118,700	27,190	1.45
	Transit and railroad police	420	58,060	2.52
	Aircraft cargo-handling supervisors	620	79,650	2.46
5	Cargo and freight agents	4,290	42,830	1.58
	Rail yard engineers, dinkey operators, hostlers	310	26,550	1.69
	Traffic technicians	420	36,960	1.98
8	Driver/sales workers	15,960	25,610	1.24
	Transportation inspectors	1,410	68,110	1.56
9	First-line supervisors of transportation/material-moving workers	15,070	53,030	1.26
10	Shipping, receiving, traffic clerks	23,290	32,560	1.15

Table 27
Occupational Employment and Wage Estimates
for Georgia's Logistics Occupations in 2017

<u>Occupational Title</u>	<u>Employment</u>	<u>Annual Mean Wage</u>	<u>Location Quotient</u>
ALL OCCUPATIONS IN GEORGIA	4,303,530	47,200	1.00
ALL TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS	362,710	34,690	1.20
Involved in Freight Movement			
Aircraft cargo handling supervisors	620	79,650	2.46
First-line supervisors of transportation and material moving workers, exc. aircraft cargo handling supervisors	15,070	53,030	1.26
Airline pilots, copilots, and flight engineers	6,760	102,330	2.66
Commercial pilots	1,020	113,720	0.88
Air traffic controllers	890	137,600	1.29
Airfield operations specialists	520	57,260	1.80
Driver/sales workers	15,960	25,610	1.24
Heavy and tractor-trailer truck drivers	56,450	42,510	1.07
Light truck or delivery services drivers	25,390	36,280	0.96
Motor vehicle operators, all other	1,090	28,790	0.63
Locomotive engineers	1,080	na	1.00
Rail yard engineers, dinkey operators, and hostlers	310	26,550	1.69
Railroad conductors and yardmasters	1,010	58,220	0.75
Sailors and marine oilers	170	43,860	0.18
Captains, mates, and pilots of water vessels	270	78,500	0.25
Ship engineers	50	65,760	0.23
Automotive and watercraft service attendants	3,020	24,100	0.84
Traffic technicians	420	39,690	1.98
Transportation inspectors	1,410	68,110	1.56
Transportation attendants, except flight attendants	210	18,760	0.29
Transportation workers, all other	1,040	28,760	0.90
Conveyor operators and tenders	750	29,720	0.93
Crane and tower operators	610	43,660	0.46
Excavating and loading machine and dragline operators	1,150	42,140	0.84
Industrial truck and tractor operators	33,790	33,570	1.96
Cleaners of vehicles and equipment	9,030	23,400	0.80
Laborers and freight, stock, and material movers, hand	118,700	27,190	1.45
Machine feeders and offbearers	3,110	29,810	1.39
Packers and packagers, hand	23,290	23,600	1.10
Pump operators, except wellhead pumpers	80	46,610	0.24
Refuse and recyclable material collectors	3,320	31,670	0.95
Tank car, truck, and ship loaders	310	49,560	0.99
Material moving workers, all other	460	44,490	0.59
Sub Total	327,360	NA	NA

(continued)

Table 27 (continued)
Occupational Employment and Wage Estimates
for Georgia's Logistics Occupations in 2017

Occupational Title	Employment	Annual Mean Wage	Location Quotient
OTHER LOGISTICS-RELATED OCCUPATIONS			
Transportation, storage, and distribution managers	4,200	107,010	1.17
Logisticians	6,310	72,230	1.31
Transit and railroad police	420	58,060	2.52
Transportation security screeners	1,340	39,940	1.05
Cargo and freight agents	4,290	42,830	1.58
Couriers and messengers	2,460	26,790	1.06
Dispatchers, except police, fire, and ambulance	5,620	38,970	0.94
Postal service clerks	2,230	51,340	0.89
Postal service mail carriers	10,280	50,110	1.01
Postal service mail sorters, processors, and processing machine operators	2,840	50,870	0.84
Shipping, receiving, and traffic clerks	23,290	32,560	1.15
Sub Total	63,280	NA	NA
GRAND TOTAL, ALL LOGISTICS OCCUPATIONS	390,640	NA	NA

NA Not Available.

The grand total for logistics occupations excludes occupations not involved in the movement or storing of freight/cargo, which employed 35,350. Examples of these occupations are drivers of ambulances, buses, and taxis; subway and streetcar operators; flight attendants; and parking lot attendants.

Source: Selig Center for Economic Growth, Terry College of Business, University of Georgia. Based on estimates of employment, annual mean wage, and location quotients provided by the U.S. Department of Labor, March 2019.

SECTION 5

Economic Prospects

Transportation and logistics will continue to grow faster than Georgia's overall economy. Growth will be widespread geographically and well balanced across the industry's subsectors, thanks to more spending by consumers; increases in industrial production; more projects under development; and above-average population growth.

In Georgia, tight capacity strongly favors the industry's bottom line, but higher interest rates and tighter labor markets—especially for truck drivers and airline pilots—will pressure profit margins. Carriers' profit margins will be low relative to many other industries due to intense competition between the transportation industry's subsectors.

Trade tensions are high and a full-blown trade war is the major downside risk for transportation and logistics providers. If this is avoided, the prospects for Georgia's transportation and logistics industry are quite good. Total statewide cargo volumes will outpace state and national GDP growth, and will be quite an accomplishment for an industry that typically moves in lockstep with the overall economy. Georgia's manufacturers will increase production by about 2 percent in 2019, providing a solid tailwind. In addition, there are many economic development projects in the pipeline.

Within manufacturing, the drivers include lumber and wood products, furniture, food, chemicals, construction materials, electronics and household appliances. Increases in agricultural production are a good sign for truckers and the ports. In general, shipments of nondurable goods will expand much faster than shipments of durable goods, reflecting the gradual reduction of wealth-effect spending by households.

Transportation and logistics will gain impetus from the continuing recovery of homebuilding and

real estate development. Job growth, improving demographics, and the limited supply of older homes will boost new home construction. That matters because construction is one of the most transportation-intensive sectors of the economy.

Trucks

Growth in truck freight coupled with a severe—and worsening—shortage of drivers means even tighter capacity in 2019-20. The scarcity of drivers will push up wage and salaries, especially for the more labor-intensive less than truckload segment of the market. Low fuel prices may help long-haul truckers compete with the railroads, which are much more fuel efficient than trucks. Competition from the railroads will not overly impact short-haul truckers, however. In 2019, trucking firms probably will not be able to raise rates sufficiently to fully offset higher labor costs, but their pricing power remains strong. Net profit margins are likely to narrow slightly.

Trucking firms will continue to benefit from businesses' outsourcing of their transportation and logistics needs, but tight capacity will force more businesses to build or expand their in-house trucking capabilities. In addition, supply chains will continue to become more complex, putting more emphasis on just-in-time inventory systems and global supply networks. These trends will prompt more companies to turn to outside trucking and logistics firms to satisfy their transportation and distribution needs, but capacity constraints will limit their ability to do so. The increased proportion of inputs and products from overseas will focus the trucking industry's growth on port cities, especially those with large port-focused distribution centers, such as Savannah.

In 2019, credit will be more expensive but available, which will allow more carriers to add new

trucks. Still, the driver shortage (the average age of truck drivers is over 55) will severely limit how much fleet expansion actually occurs.

Meanwhile, several factors will push trucking companies to get bigger. First, more outsourcing of products from overseas favors carriers that can manage domestic and global distribution. Second, large retailers often prefer to deal with select trucking firms that offer the broadest range of services, and large trucking companies can achieve economies of scale in distribution. Third, larger companies find it easier to hire drivers. Finally, complex regulations, escalating operating costs, and volatile fuel prices will prompt private companies to disband their own fleets in favor of full-service leasing or contracting with trucking firms for dedicated operations.

In the wake of new fuel emissions standards, new equipment costs have risen substantially, but newer trucks use fuel more efficiently and thus impart substantial long-term savings. Nonetheless, high insurance costs and high deductibles are an ongoing problem, especially for firms that transport hazardous materials.

Volatile fuel prices are almost a given in the forecast for the transportation and logistics industry. Due to political instability in major oil-producing countries, fuel costs could become a factor, but the more likely scenario is that fuel costs rise only moderately in 2019. Looking ahead, the increased usage--and more timely imposition--of fuel surcharges will better shield margins from swings in diesel prices, but the long-term trend towards higher fuel prices is not good for the trucking industry's profitability because it undermines competition with the railroads.

The digitization of the freight brokerage process is a new, scalable, disruptor for the traditional freight brokerage industry. Digital freight matching platforms that use the Internet and mobile apps to match shippers with carriers will replace many of today's manual processes, and venture capital is eager to support it. Startups will take market share from traditional freight brokers, including third-party logistics providers (3PL) and Loadboards. Traditional freight brokers and 3PLs, meanwhile, will respond by implementing their own digital freight matching services. Digital capacity therefore is poised to grow much faster than the volume of shipments, and consequently, the industry will consolidate. A small number of digital freight brokerage companies will achieve scale that will allow them to prosper. Other companies will succeed by either by focusing on a

local market or by focusing on specialty freight lines such as heavy equipment or e-commerce fulfillment.

Railroads

Georgia's rail network is the largest in the Southeast, with Norfolk-Southern and CSX providing most rail service. Business conditions for railroads have been difficult, but should gradually improve. Demand growth will exceed capacity growth, and overall profits will increase. Margins also will benefit from significant improvements in productivity stemming from recent capital investments.

The success of Georgia's ports is a big plus for Georgia's railroads as changes in international shipping patterns bring more traffic to Atlantic coast ports. In addition, now that the wider, deeper Panama Canal is open, East Coast ports that are ready to service the bigger ships should see substantial increases in container traffic, which will benefit railroads and truckers. Georgia's railroads will see even greater benefits from this trend once the Savannah harbor is deepened to accommodate the larger vessels.

Coal is the rail industry's largest source of shipments and a major contributor to its profits; however, restrictions on carbon emissions and low natural gas prices will encourage utilities to become much less dependent on coal to generate electricity. Consequently, coal's contribution to the rail industry's total revenues and profits will diminish as electric utilities switch to generating technologies with smaller carbon footprints.

Airlines

More business activity, higher corporate profits, and higher disposable personal income are the primary drivers behind increasing passenger demand for air travel. Higher demand coupled with better control of capacity—in part due to recent mergers—will help improve profit margins.

Airlines' security costs, debt service costs, and federal tax burdens will continue to rise. The possibility of higher oil prices remains a perennial threat to airlines' profitability, but a big swing in fuel prices is not expected in 2019. Other major problems are the ever-increasing tax bite and a pilot shortage.

On an optimistic note, the industry's domestic capacity will remain tight, which suggests that their pricing power in the domestic market will be maintained. The key to boosting the airline industry's long-term profitability will be to prevent capacity from growing faster than demand. Unfortunately,

airlines have done a poor job of limiting capacity expansion when profits rise.

One positive factor is that international deregulation of the industry will encourage more global travel. International shipments of air cargo will increase much faster than passenger traffic, thanks to shrinking product cycles, far-flung markets for raw materials and products, and a shift towards exporting smaller, more expensive goods. Of course, a full-blown trade war or stricter visa requirements would severely reduce the prospects for international air carriers.

Because time to market is increasingly important, the prospects for Georgia's air cargo industry are good. Air cargo—much of which flies in the holds of passenger planes—will increase due to greater production of high-value, time- and temperature-sensitive goods as well as shorter restocking cycles. The growth of e-commerce strongly favors providers of air cargo services. In addition, the pharmaceutical industry will depend on airfreight to ship perishable biological drugs and vaccines. Barring a major step back from globalization, air cargo volumes are likely to grow faster in the next decade than in the previous decade, boosting the share of the airline industry's overall revenues contributed by air cargo operations. Conversely, airport congestion, protectionism, and more interest in on-shore manufacturing are threats to Georgia's air cargo industry, which is focused on Atlanta's international airport.

Ports

Georgia's ports will outperform its peers by tapping directly into the growth that is taking place overseas, by diversifying its services, and by taking market shares from other U.S. ports. Higher demand for consumer goods, and increases in industrial and agricultural production will boost shipments through Georgia's ports. One headwind will be the strong

U.S. dollar, which will be a problem for export shipments, but will continue to spur imports. The main risk to Georgia ports is a full-blown trade war, which would severely reduce the volume of imports and exports. Because maritime commerce constitutes a larger part of Georgia's economy than the nation's economy, a trade war would be especially problematic for Georgia and its prospects for growth.

The superb performance of Georgia's ports relative to other economic sectors and other American ports reflects strong comparative advantages that allow them to expand their share of regional and national waterborne cargo traffic. The Port of Savannah is the largest single container terminal in North America and is the fourth busiest U.S. container port, behind only Los Angeles, Long Beach, and New York/New Jersey. It is the second busiest for the export of American goods by tonnage. The Port of Brunswick specializes in non-containerized trade and is the second busiest U.S. port for transporting new cars and heavy machinery.

The expanded Panama Canal is forcing shippers to move their largest and most profitable operations to ports that can accommodate the larger Panamax ships, so deepening Savannah Harbor is vital. The larger ships will be much more fuel efficient than the smaller ships currently in use, allowing cargo to move with greater fuel efficiency and reducing greenhouse emissions per ton of cargo transported.

To attract substantial additional traffic from across the Southeast and Midwest, the Georgia Ports Authority recently opened the inter-modal Appalachian Regional Port—an inland rail terminal—in Chatsworth, and is building another one in Gainesville. This will allow CSX and Norfolk Southern to provide more frequent and faster rail services to Memphis, St. Louis, Chicago, and cities in the Ohio Valley, so cargo can move from ship to rail within 24 hours.



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