

APPALACHIAN REGIONAL FREIGHT MOBILITY PLAN

Appendix D LAND USE



DRAFT – FOR REVIEW

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APPALACHIAN COUNCIL OF GOVERNMENTS

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July 2021

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1. Introduction



Freight-generating industries can provide many benefits to the local economy. As the Upstate region population of South Carolina continues to grow, the greater the amount of goods and services are consumed. Freight intensive industry supports the economy in the ACOG region by providing direct and indirect employment, increased tax revenue, and contribution to regional and state economic output. A well-functioning transportation network is crucial for the efficient movement of goods. The link between freight, multimodal transportation, and land use is essential for supporting growth in the area. This land use chapter considers the importance of multimodal freight transportation to the region including identifying existing and future freight land use planning corridors and clusters.

2. Economic Context



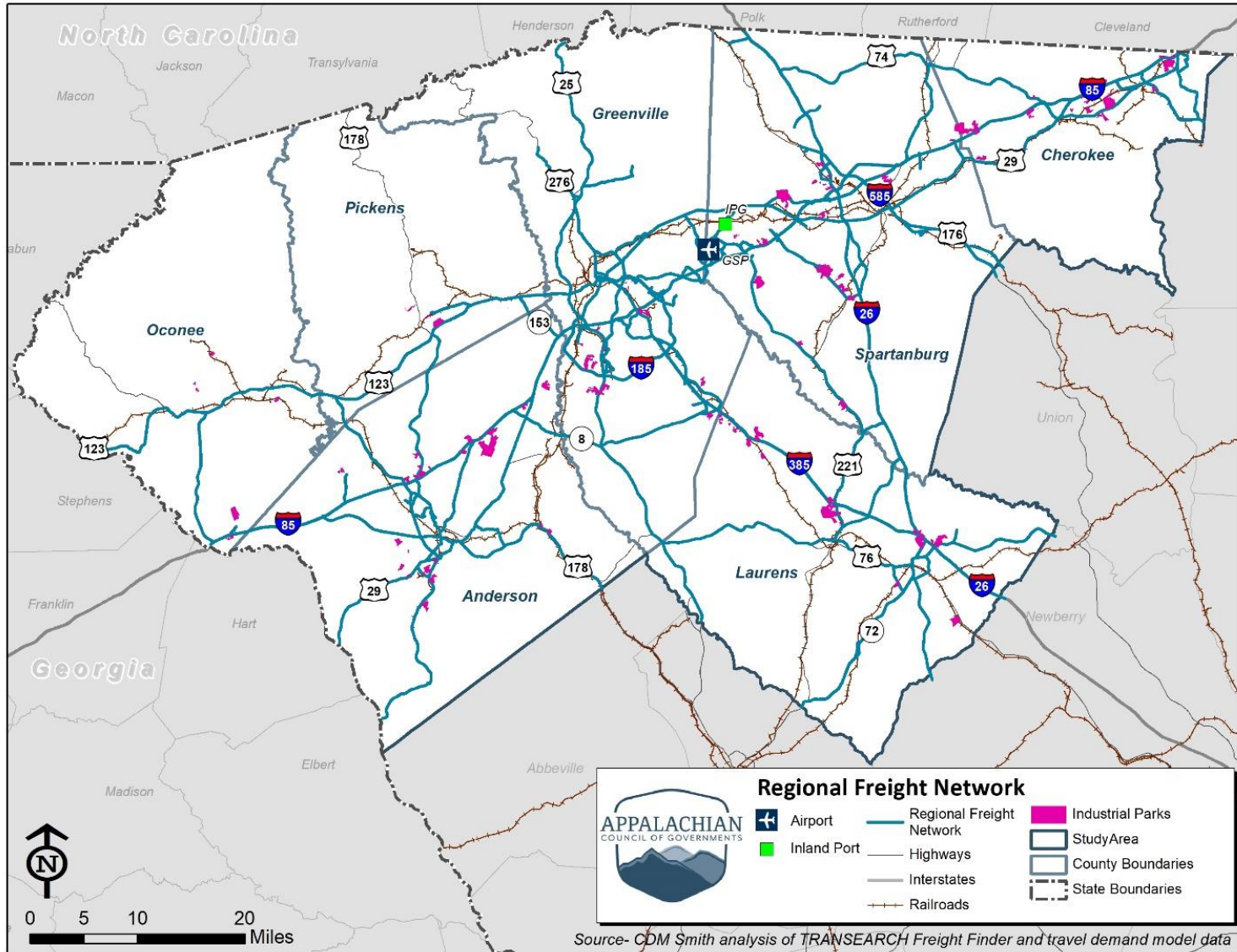
This study area represents seven of the ten counties in the Upstate region, including Greenville and Spartanburg. Three major modes of transportation carry freight in the ACOG region: truck, rail, and air. Trucks handle roughly 63 percent of all freight in North America¹ due to their ability to be used for variable length trips, but also to provide the “last mile” connections, connecting commodities carried by other modes from intermediate destinations, such as airports, rail terminals, and other freight generators to their final destinations. Since Inland Port Greer (IPG) opened in 2013, ACOG has received direct rail transfers from Port of Charleston, SC. Lastly, Greenville-Spartanburg (GSP) International Airport handles the largest amount of air cargo to the region.

The Upstate region of South Carolina has become home to large manufacturing companies like BMW, Michelin, Fuji, GE Power and others. Freight demand is directly related to the amount of economic activity in a region and businesses and customers depend on all modes to connect them to markets and grow the regional economy. The base map for the land use analysis was comprised of the intermodal facilities, industrial parks and regional freight network² and is shown in **Figure 2.1**.

¹ [https://www.bts.gov/newsroom/2017-north-american-freight-numbers#:~:text=Trucks%20carried%2057.7%20percent%20of,the%20value%20\(Table%202\).](https://www.bts.gov/newsroom/2017-north-american-freight-numbers#:~:text=Trucks%20carried%2057.7%20percent%20of,the%20value%20(Table%202).)

² The regional freight network is documented in the Appalachian Regional Freight Mobility Plan’s Freight Network Assessment Technical Memorandum under separate cover.

Figure 2.1: ACOG Regional Freight Network



3. Methodology



The methodology to develop this analysis included data collection. Data was collected and used to understand the connection between freight mobility and freight generating land use by analyzing industrial parks, available land use classifications, population, employment, and existing and future freight corridors and clusters of freight intensive development. The regional freight network was used to complete this land use analysis. Feedback from the study Steering Committee was used to identify roadway additions to the draft freight network, as well as any additional freight intensive land use clusters not captured by available data from this analysis.

3.1 Data Collection

To identify the freight-related land uses with the ACOG region, data was gathered for all the counties in the study area. Geospatial land use data was compiled from various counties throughout the study area and used in the mapping analysis software, ArcGIS. The list below shows the data sources used for the analysis:

- County Current Zoning Classifications as of May 2020 (Anderson, Greenville, Oconee, and Spartanburg)
- County Future Land Use Map Classifications as of May 2020 (Anderson, Cherokee, Greenville, Oconee, Pickens, and Spartanburg)
- Department of Commerce Industrial Parks inventory as of May 2020
- South Carolina Department of Transportation (SCDOT) Statewide Travel Demand Model Transportation Analysis Zone (TAZ) level population and employment projections from 2015-2045
- TRANSEARCH© Freight Finder database (2016)

4. Freight Land Use Analysis



Industrial land use patterns are critical to understanding the role freight plays on the transportation network and to the movement of freight. Coordination between local governments, metropolitan planning organizations and the SCDOT are important to understand the regional scale freight has on a given area. Successful freight planning balances the needs of freight-generating land use with the sustainable development of freight corridors and clusters.

The freight land use analysis is presented to provide an inventory of land use patterns and accessibility to transportation infrastructure and propose planning and economic development applications that support efficient and safe freight mobility to the ACOG region.

4.1 Existing and Future Freight Corridors

For this analysis it is important to understand the definition of a freight corridor as a corridor of land influenced by freight land use regulations or freight intensive land uses. Existing Freight Corridors are land corridors along the draft ACOG regional freight network, where current planning regulation (zoning) and existing freight related land use (industrial parks) and freight generators exist. Future Freight Corridors are land corridors along the draft freight network, where future land use (FULU) planning regulation (from the FULU map of the county level comprehensive plan) for freight related land use and freight generators exist.

The first step in determining the existing freight corridor was to overlay the existing freight-intensive zoning. A two-mile buffer area was created around the freight network in order to capture any first or last-mile connections to freight generating land uses. This buffer area served as a catchment area for capturing concentrations of freight related land uses and land areas regulated by industrial zoning classifications. Areas of concentration for industrial parks and industrial zoning were highlighted from this catchment area. The existing freight corridors are shown in **Figure 4.1** and **Table 4.1**. The future freight-intensive land use corridors were created by applying a desktop survey of future land use maps from the counties in the region. The same two-mile buffer was applied to the freight network to define areas of future freight-intensive land use. The future freight concentrated land areas along the draft ACOG regional freight network captured by the two-mile catchment area are shown in **Figure 4.2** and **Table 4.2**. The results of this analysis showed that current and long-range planning coordination is concentrated within the freight network determination. In each table, the corridors are described with their major freight generators, along with any associated vacant or undeveloped/ speculative industrial land.

Figure 4.1: Existing Freight Corridors

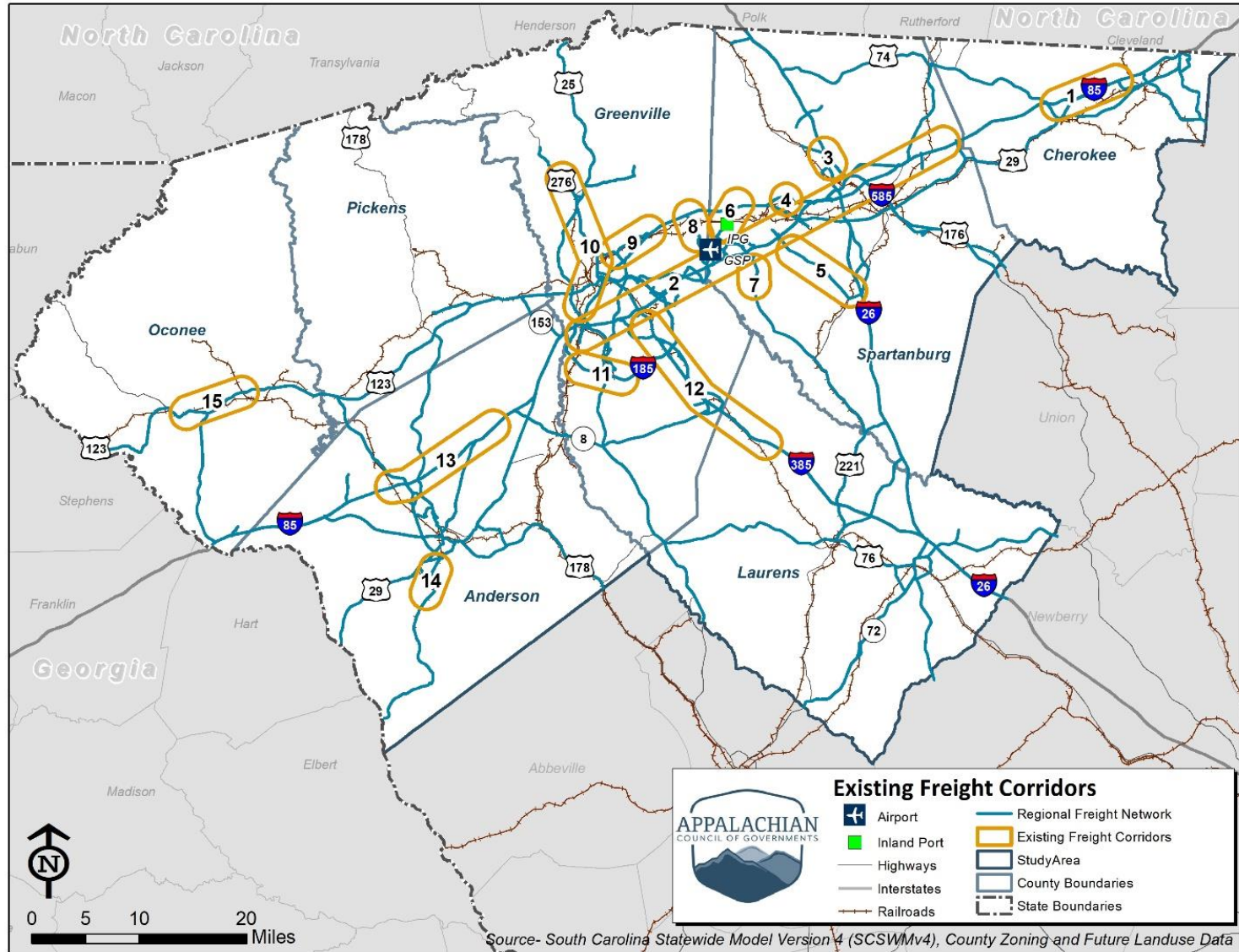


Table 4.1: Existing Freight Corridors

Corridor	Description	Freight Development Sites
1	I-85 & US 29 from Gaffney to Blacksburg	UPS Distribution and ~1,600 Acres of undeveloped Industrial Sites
2	I-85 from Anderson/Greenville County Line to Spartanburg/Cherokee County Line	BMW Plant, Proterra and ~1,300 Acres of undeveloped Industrial Sites
3	I-26 & US 176 near Willow Wood	Bass Pro Hotel Development Company and ~200 Acres of undeveloped Industrial Sites
4	SC 129 near Lyman	~825 Acres of undeveloped Industrial Sites
5	SC 290 from I-85 to US 221	Toray Composite Materials and ~1,400 Acres of undeveloped Industrial Sites
6	SC 80 GSP to Inland Port Greer	Inland Port Greer
7	SC 101 from I-85 to Brockman Rd	SSS Management Corporation and ~475 Acres of undeveloped Industrial Sites
8	US 29 & S Buncombe Rd near Greer	Mitsubishi Plant, Honeywell Aerospace, Associated Packaging Inc
9	US 29 & Rutherford Rd near Wade Hampton	Green Beverage Co, House of Raeford Farms, Gossett Concrete Piping
10	US 276 & US 29 from I-185/I-85 Interchange to North of Travelers Rest	Kohler, Metromont Corporation, Sunland Distribution, Precision North America
11	I-185 from Golden Grove to SC 146	Michelin, Magna Manufacturing and ~1,150 Acres of undeveloped Industrial Sites
12	I-385 from Mauldin to Gray Court	ZF Transmissions, Yanfeng Automotive Interiors, Grainger Distribution and ~1500 Acres of undeveloped Industrial Sites
13	I-85 from South I-85/US 76 Interchange to White Plains	TTI Ryobi Distribution Center and ~2,400 Acres of undeveloped Industrial Sites
14	SC 81 from SC 28 Bypass to Roy Arnold Rd	~730 Acres of undeveloped Industrial Sites
15	US 123 from Westminster to Seneca	Schneider Electric Manufacturing and ~50 Acres of undeveloped Industrial Sites

Source: South Carolina Department of Commerce Industrial Park Inventory and Google Earth

Figure 4.2: Future Freight Corridors (2045)

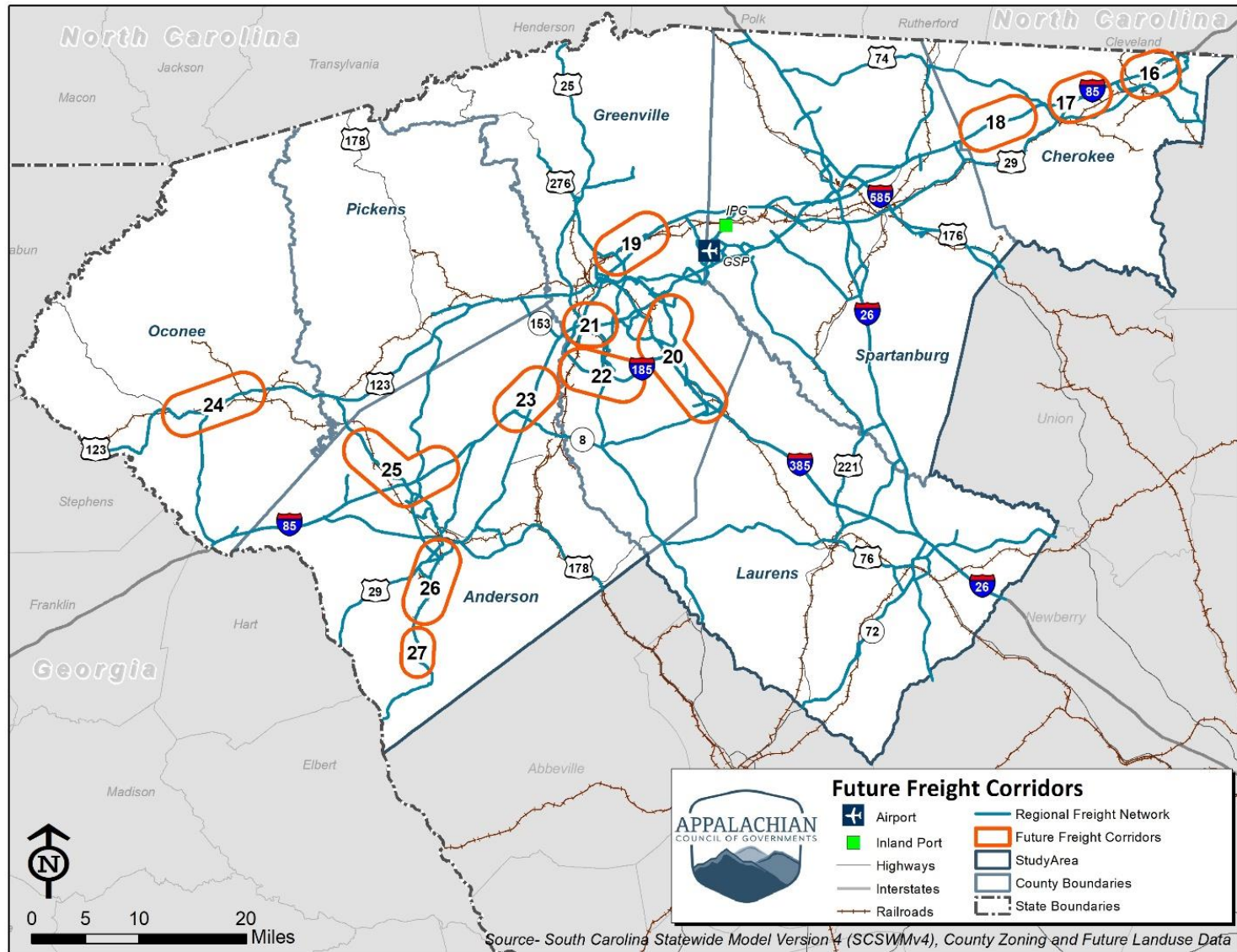


Table 4.2: Future Freight Corridors (2045)

Corridor	Description	Freight Development Sites
16	I-85 & US 29 from Blacksburg to Cherokee County Line/NC	Vulcan Materials, The Recon Group and ~725 Acres of undeveloped Industrial Sites
17	I-85 near Gaffney	UPS Distribution and ~1,400 Acres of undeveloped Industrial Sites
18	I-85 from Spartanburg/Cherokee County Line to South of SC 11	Dollar Tree Distribution Center and ~1,200 Acres of undeveloped Industrial Sites
19	US 29 & Rutherford Rd near Wade Hampton	Green Beverage Co, House of Raeford Farms, Gossett Concrete Piping
20	I-385 from I-85/I-385 Interchange to Fountain Inn	Grainger Distribution, Milliken Autovation and ~300 Acres of undeveloped Industrial Sites
21	I-85 from I-185/I-85 Interchange to I-85/SC 291 Interchange	YRC Freight, Thomas Sand Co and ~55 Acres of undeveloped Industrial Sites
22	I-185 from Golden Grove to SC 146	Michelin, Magna Manufacturing and ~1,150 Acres of undeveloped Industrial Sites
23	I-85 from North of SC 86 to White Plains	Coca Cola, Budweiser, Century Concrete and ~900 Acres of undeveloped Industrial Sites
24	US 123 from Westminster to Seneca	Schneider Electric Manufacturing and ~50 Acres of undeveloped Industrial Sites
25	US 76 from Pendleton to I-85/US 76 Interchange and I-85 from I-85/US 76 Interchange to South of SC 81	Anderson Industries, Glen Raven Custom Fabrics and ~600 Acres of undeveloped Industrial Sites
26	SC 81 near Anderson	Owens Corning, Electrolux, Quality Tissue and ~725 Acres of undeveloped Industrial Sites
27	SC 81 from SC 412 to Good Hope Church Rd	Taylor Pallets & Recycling

Source: South Carolina Department of Commerce Industrial Park Inventory and Google Earth

4.2 Land Use Clusters

To understand freight land use concentrations, clusters were identified of freight-intensive activity. These clusters were identified using data from the industrial parks inventory, TRANSEARCH data, population and employment growth data from the travel demand model and land use data sets in the seven-county study area. This data was compared to employment forecasts and land use datasets. Manufacturing, wholesale distribution, warehousing and mining were the key employment sectors used in the evaluation from the travel demand model. Employment forecasts from 2015 to 2045 are provided to give employment growth at the TAZ level. Job growth over 100 jobs was used as the threshold indicating significant employment growth in the combined sectors at TAZ level, as it was the first natural break indicating significant clustering of forecast growth. The resulting analysis concluded with the identification of three types of land use clusters:

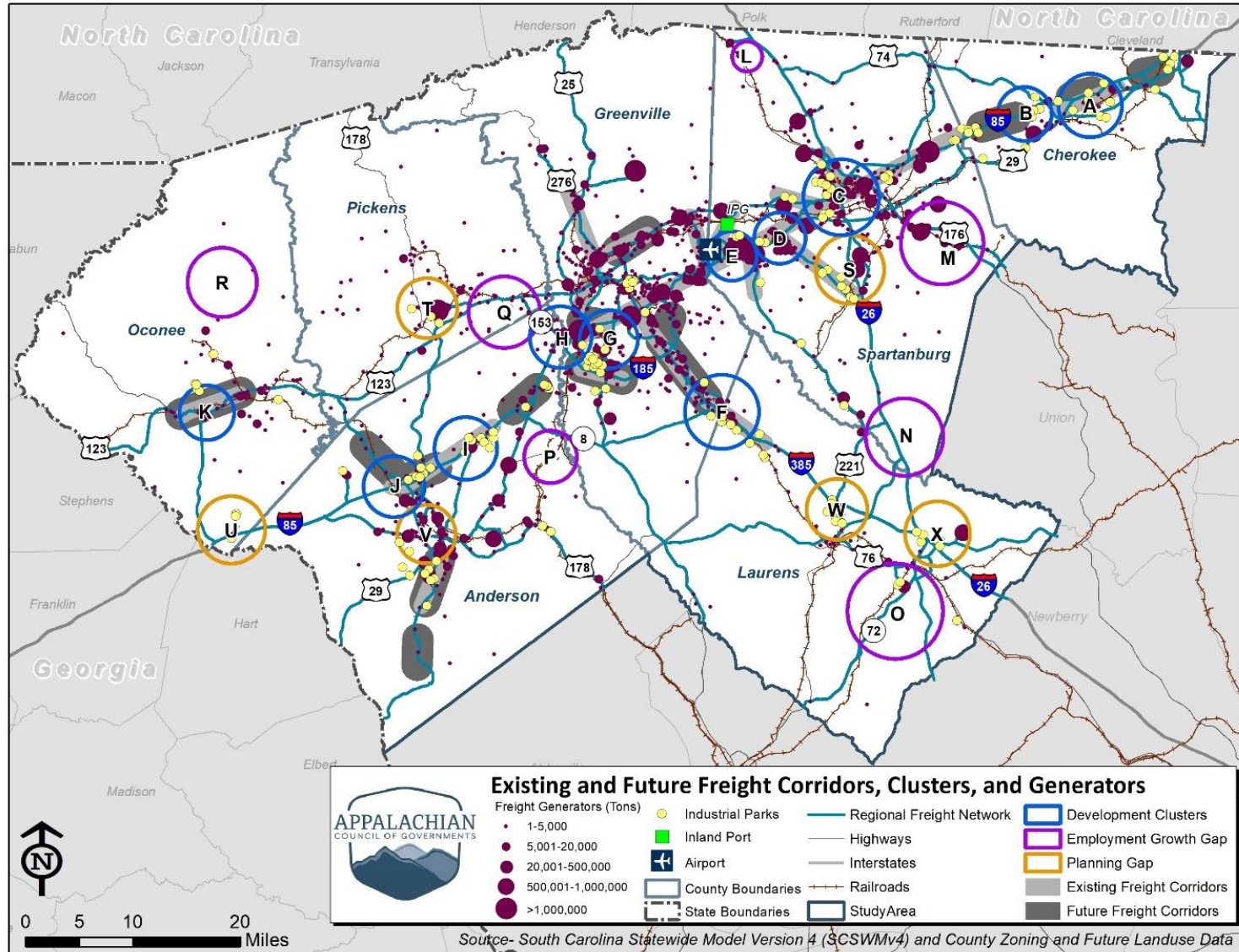
4.2.1 Development Clusters

Planned freight land use areas within the TAZ, on the identified freight network, and within the existing and future freight corridors were identified where employment opportunities increased by more than 100 jobs from 2015-2045. These clusters are detailed in **Table 4.3**. There are eleven identified clusters of freight intensive activity in the study area, illustrated in **Figure 4.3**.

Table 4.3: Development Clusters

Letter	Description	Employment Growth	Freight Development Sites
A	East Gaffney (Victory Trail Rd)	303	UPS Distribution and ~1,600 Acres of undeveloped Industrial Sites
B	Gaffney (Hyatt St)	1,311	Nestle Frozen Foods and ~275 Acres of undeveloped Industrial Sites
C	I-85/I-26 Interchange	1,119	CTMI, Freeman Gas and ~350 Acres of undeveloped Industrial Sites
D	I-85 (Exit 63, SC 290)	1,589	Sealed Air Corp, Albis Barnet Polymer and ~250 Acres of undeveloped Industrial Sites
E	BMW Plant (Exit 58, Brockman McClimon Rd)	7,500	BMW Plant, N W White and Co and ~75 Acres of undeveloped Industrial Sites
F	I-385 (Exit 22, N Old Laurens Rd)	372	Para-Chem Inc and ~600 Acres of undeveloped Industrial Sites
G	Donaldson Center Airport (Exit 7A)	691	Miller Pipeline Corp and ~475 Acres of undeveloped Industrial Sites
H	I-85/I-185 Interchange	284	Thomas Sand Co and ~50 Acres of undeveloped Industrial Sites
I	I-85 (Exit 27, SC 81)	615	Robert Bosch LLC and ~1800 Acres of undeveloped Industrial Sites
J	I-85/US 76 Interchange	605	Anderson Industries Inc and ~375 Acres of undeveloped Industrial Sites
K	Westminster (SC 11)	1,112	~50 Acres of undeveloped Industrial Sites

Figure 4.3: Existing and Future Land Use Clusters (2015-2045)



4.2.2 Planning Gaps

Planning gaps are areas where freight generator land uses (industrial parks, truck parking, commercial freight generators) are present where existing or future freight corridors do not exist, i.e. location of existing freight land use where planning regulation does not appear, or where there lacked sufficient available data to identify industrial freight related land use clusters. These clusters are illustrated in **Figure 4.3** and listed in **Table 4.4**.

4.2.3 Employment Growth Gaps

Employment Growth Gaps are areas where job growth has increased by more than 100 jobs from 2015-2045 within the TAZ, off the identified freight network, and outside of existing and future freight corridors, i.e., job growth experienced outside of planned freight land use areas. These Employment Growth Gaps are shown in **Figure 4.3** and in **Table 4.5**.

Table 4.4: Planning Gaps

Letter	Description	Freight Development Sites
S	I-26 South of Spartanburg	Colonial Fuel & Lubricant Services, Inc. and ~1400 Acres of undeveloped Industrial Sites
T	Pickens County near US 123	Vulcan Materials and ~450 Acres of undeveloped Industrial Sites
U	Oconee County at State Line	~500 Acres of undeveloped Industrial Sites
V	SC 28 West of Anderson	Hanson Aggregates, Unaflex Industrial and ~275 Acres of undeveloped Industrial Sites
W	Wal-Mart Distribution Center (Laurens County)	Walmart DC and ~1,200 Acres of undeveloped Industrial Sites
X	SC 72 Southwest of Clinton	Milliken and Co and ~1125 Acres of undeveloped Industrial Sites

Table 4.5: Employment Growth Gaps

Letter	Description	Employment Growth	Freight Development Sites
L	US 176 near Landrum	110	South Carolina Elastic, Bommer Industries
M	SC 295 near Rosewood	563	Dearybury Oil and Gas, Carolina Petroleum and Petroleum Distributors Inc
N	SC 92 (I-26 Exit 41)	108	Currently no Generators, vacant land
O	SC 72 near Clinton	106	Sterilite Corp and ~125 Acres of undeveloped Industrial Sites
P	SC 20 near Williamston	266	Premier Color Group and Experimental Fabrics Inc
Q	US 123 near Easley	458	Kongsberg Automotive, NU Life Environmental and ~3 Acres of undeveloped Industrial Sites
R	SC 11 near Tamasee	119	Currently no Generators, vacant land

Summary statistics about the clusters indicate that eight out of the 11 Development Clusters have rail access, while five of the seven Employment Growth Gap clusters have rail access. Ten of the 11 Development Clusters are located on the interstate system, and one of the seven gap clusters are located on the interstate system.

5. Steering Committee Feedback



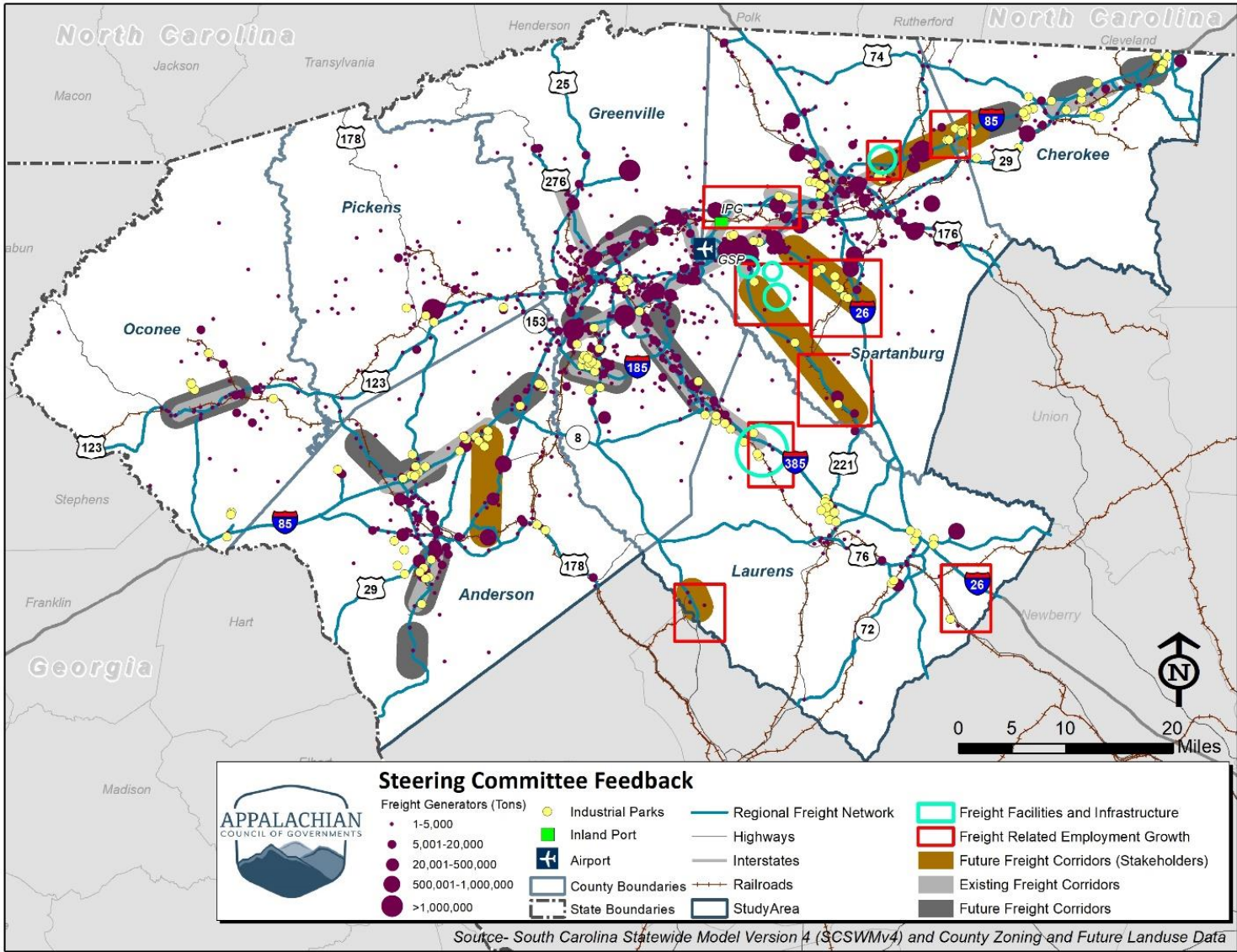
The Steering Committee was presented with the land use and network assessment analysis. For the purposes of this land use analysis, data gaps existed in the county zoning and future land use information provided for the study, as some county information was not obtained. Additionally, some counties in the region do not currently use zoning as a tool to regulate land use, as is the case in Cherokee County. Other counties, such as Spartanburg County, use a land suitability model for determining future land use, which can be difficult to normalize with traditional Euclidean Zoning and Future Land Use regulatory methods used in the other counties of the study area.

The Steering Committee was presented a series of three maps and asked to validate findings, bridge data gaps, and incorporate additional known freight intensive land use corridors, clusters and freight dependent infrastructure, based upon local field knowledge, industry experience, and approved or speculative permitting and siting information. Steering Committee feedback from the network assessment presentation resulted in the addition of the following roadways to the regional freight network in **Table 5.1**. Meeting attendees also provided additional future freight corridors, freight related employment growth, and freight facilities and infrastructure which are represented in **Figure 5.1**.

Table 5.1: Roadways Added to Regional Freight Network Based on Stakeholder Input

County	Roadway
Spartanburg	SC 101
Spartanburg	SC 290
Anderson	US 29
Spartanburg	SC 80
Spartanburg	SC 129

Figure 5.1: Steering Committee Feedback



6. Land Use Opportunities and Observations



Zoning and local comprehensive planning have impacts on freight mobility and freight dependent land uses. The connection between freight mobility and land use planning is visualized throughout this chapter by linking the draft freight network with the identification of existing and future freight corridors and freight intensive land development clusters in the study area. Coordination of land use and transportation planning efforts can help mitigate some of the negative impacts of freight-generating land uses, including air quality issues, greenhouse gas emissions, environmental justice issues, and increased freight volume.³

Table 6.1 summarizes the observations of the freight land use analysis.

Table 6.1: Observations

Observations	Potential Recommendations
1. Local, regional, and state transportation and land use planning decisions are interdependent and should be better coordinated.	Encourage regional and local coordination with SCDOT at the Planning, District and Regional Production Group levels
	Land development regulations and permit approvals should consider incorporating traffic impact studies
	Continue to plan for future freight related development along existing freight corridors
2. Future freight development should consider rail corridors to promote and maximize rail efficiency and intermodal movements.	Continue to foster growth of the Inland Port Greer and develop strategies to mitigate freight movement impacts to surrounding communities and neighborhoods
	Take advantage of underutilized/underserved land with rail access, as well as encourage industrial siting in proximity to the freight network corridors
	Vacant industrial sites with accessibility to rail should be a focus of the regional economic development marketing strategy
3. Improve coordination between local governments, ACOG, Upstate Alliance, Department of Commerce and South Carolina State Ports Authority (SCPA) on the economic development and industrial recruitment strategy for the region and its impacts on land use.	Compare local goals and objectives with state and regional economic development strategies
	Zoning and future land use determinations should complement local and regional planning and economic development goals by aligning comprehensive planning, building permitting and local and regional economic development marketing strategies
	Local land use decision making should account for regional impacts to the transportation network by aligning local, regional and state comprehensive land use and economic development strategic plans to the COG and MPO Long Range Transportation Planning (LRTP) process

³ https://ops.fhwa.dot.gov/publications/fhwahop12006/sec_1.htm

Using these observations as a basis, **Table 6.2** presents five planning and programming recommendations as valuable opportunities for greater coordination between land use planning and freight mobility planning in the ACOG region. These opportunities will guide subsequent plan development to further identify needs at the project level, as well as develop a mechanism to align project programming and project delivery processes.

Table 6.2: Land Use Opportunities

Observations	Opportunity	Description
1, 2, 3	Sub-Area & Neighborhood Freight Plan Program	Develop strategies and design standards to reduce conflicts between freight, auto, transit, and bike/ped for small towns and neighborhoods
1, 2	At-Grade Rail Crossing Program	Prioritize and program at-grade crossing project improvements
1, 3	Regional Truck Parking Plan	Identify and prioritize sites for future truck parking facilities
2, 3	Regional Freight Development Study	Determine freight related planned acreage and future industry cluster recruitment and marketing strategies
3	Regional Supply Chain Resiliency Strategy	Develop a strategy to create immunity to local and global impacts to the network supply chain

7. Next Steps



This study identifies the current land use conditions for the seven-county study area. The freight network and land use analysis provide a starting point for ACOG and its member governments to encourage freight-related land use growth. Parcels and tracts of land surrounding the freight network are locations where freight-related industry may be located and targeted to accommodate future freight related growth and development.

Coordinating with SCDOT, this information should be shared and communicated with county and regional economic development agencies, as well as the South Carolina Department of Commerce and SCPA. This analysis will serve as the baseline to align local land use decision-making with regional and statewide economic development marketing strategy. Having a freight land development strategy that is aligned from the local to state level will result in coordinated land use decisions that will align with and better meet the goals, objectives, and needs of the ACOG regional freight transportation network.

Freight system needs and network gaps will be determined building upon the freight land use analysis provided herein. The existing and future freight planning network corridors, development clusters, and employment growth and planning gaps will help identify where the needs are focused for future economic growth. This information can be compared to freight network performance, such as level of service, reliability and safety, in attempts to determine system needs that will work to mitigate congestion, safety, and environmental impacts along the network. Freight network needs will then be compared to planned and programmed projects to understand where ACOG member projects are addressing freight needs and where gaps may exist that constitute unmet needs. Such gaps will form the basis for developing prioritized program, policy, and project recommendations to achieve regional freight network performance goals and objectives.