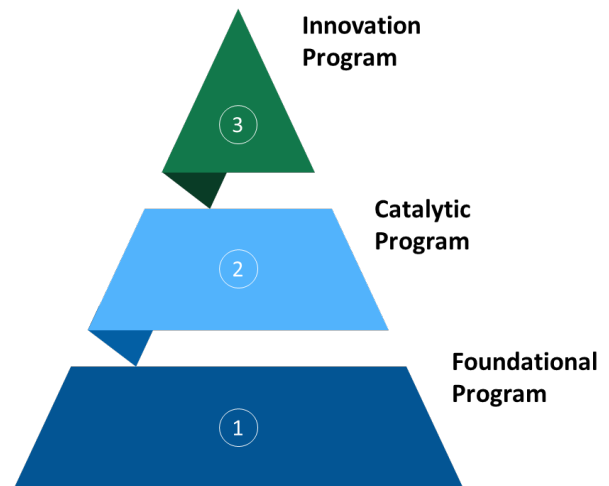


5. Georgia’s Freight Improvement Program

The GDOT Statewide Strategic Transportation Plan (SSTP), approved in 2021 and looking ahead to 2050, established three components of statewide investment around which transportation strategies were structured. The three components constitute the FCI framework introduced in Chapter 1: Foundational investments to take care of the existing system, Catalytic investments to grow the state economy, and Innovation investments to prepare for the transportation demands of the future. The SSTP does not identify specific projects for investment; instead, it defines strategies to support investment choices as they reach decision. The Georgia Freight Plan is a major step forward in the implementation of the SSTP. It defines specific project investments over the next eight years, applying \$427 million of anticipated federal NHFP funds in the fiscally constrained Freight Investment Plan (FIP) presented in this chapter. This plan proposes strategies for meeting freight demand through 2050. Similar to the SSTP, these strategies for improvement are structured around the FCI framework. While specific projects in addition to the Freight Investment Plan are not identified, the strategies for improvement defined in Chapter 4 are organized into programs that will run, grow, and develop the freight system in Georgia for the shippers and carriers that depend on it. The programs consider alternative and multimodal corridors, capitalize on technology, respond to market trends, and seek overall to maintain and strengthen the competitive performance of Georgia.



This chapter opens with the performance measures employed in this Plan to quantify and forecast the critical characteristics of freight service in the state. These measures are the Key Performance Indicators or KPIs introduced in Chapter 1, in alignment with the Governor’s objectives for supporting business and commerce and defining performance in the same terms industry uses to manage and ensure freight service for their operations and customers. KPIs are the principal target for the FCI programs of freight improvement, and they lead to safer roads, less air pollution, and lower costs to consumers for critical goods. The method of investment analysis for this Plan is described next, capturing KPIs in a network modeling framework where the effects of project investments can be estimated. Descriptions of the FCI improvement programs follow, leading into plan considerations covering military freight, environmental factors and risks, and resiliency and redundancy in the system. The final sections of the chapter summarize program and policy actions, integration with other state plans, and opportunities for multi-state collaboration.

5.1. Performance Measurement: Key Performance Indicators (KPIs)

The attraction and retention of freight-supported businesses and the livelihoods they provide depends on Georgia’s competitive performance in freight and logistics. The crucial dimensions of



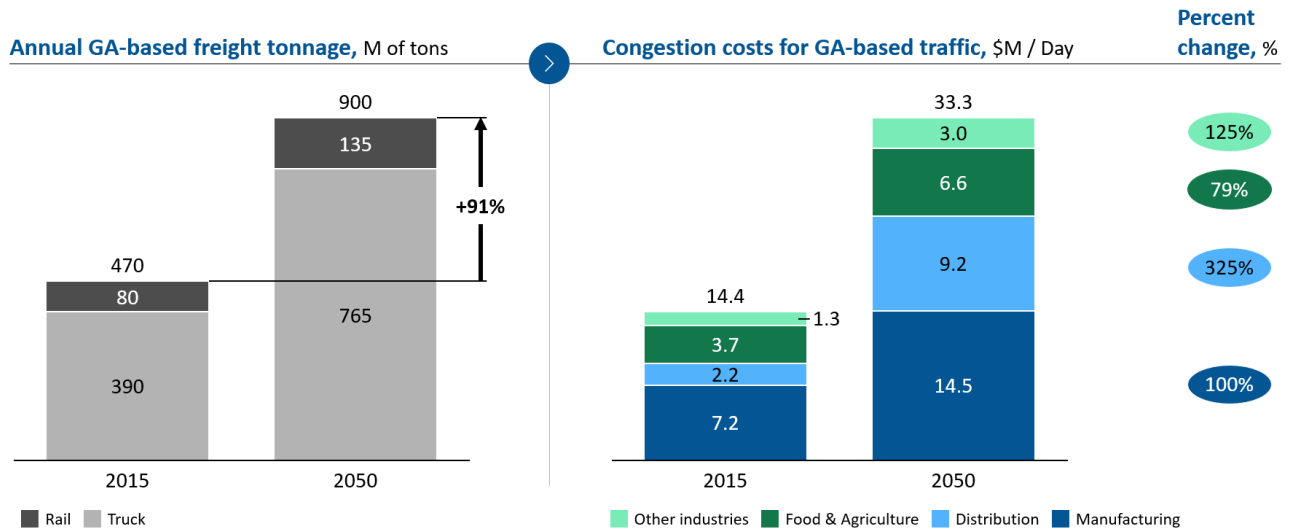
performance and the performance measures adopted in this Plan are five business-driven KPIs. Georgia's stature as a leading destination for business and their continued growth requires a carefully planned deployment of limited infrastructure resources. Therefore, GDOT's freight planning effort builds an improvement program for the state based on KPIs most important to business operations and expansion as well as economic development. KPI metrics associated with this effort are safety, reliability, speed, cost, and risk; their correspondence to strategies for performance improvement was presented in Chapter 4.

Figure 144 indicates the near-doubling of Georgia-based freight tonnage, with most of the demand on roadways as well as congestion costs, which more than double. Georgia's manufacturing and food and agriculture sectors bear about two-thirds of the costs in 2050, while costs in the distribution sector climb the fastest and account for most of the remaining third.

TRUCK TRAVEL TIME RELIABILITY INDEX

Like all states, GDOT provides the federal Truck Travel Time Reliability (TTTR) index as its freight movement performance measure in its System Performance Report. The TTTR is the ratio of the 95th percentile truck travel time to the 50th percentile, calculated annually for Interstate highways and indexed through a formula that recognizes times of day and is weighted for distance. The ratio itself is similar to the reliability KPI used in this Plan. Georgia's TTTR was stable from 2017 to 2019 at an index value around 1.44, well below (indicating more reliable than) target values above 1.6. Georgia's TTTR actually improved to 1.37 in 2020 (the latest year released), but 2020 was the pandemic year when automobile traffic fell off and trucks often had the road to themselves.

Figure 144. Forecast Growth in Freight Traffic & Costs



Source: GSTDM, S&P Global Transearch

The situation just described is the No Build scenario¹³⁶ used for investment analysis in this chapter. To produce it, the Georgia State Travel Demand Model (GSTDM) was employed and its outputs processed to combine KPIs in safety, reliability, speed and cost with traffic forecasts and industrial segmentation drawn from Transearch.¹³⁷ All of this was routed on the state roadway network and dynamic interaction with projected passenger traffic captured. The effect is that the growth, industry composition, and performance issues for freight traffic presented in previous chapters are incorporated, performance is projected into the future, and passenger activity is accounted for. The latter obviously is important because automobiles are the main component of congestion, most freight investment in highways benefits all traffic, and automobiles will divert onto highways upgraded for freight and thereby diminish the performance benefits.

The projects reviewed and those ultimately selected for this Plan have been evaluated within the GSTDM environment. Modeling considerations for the translation of KPIs into plan recommendations are summarized in **Figure 145**.

¹³⁶ No Build is defined as maintaining the current network as is along with existing funded projects, with no new additions as part of the freight plan

¹³⁷ The base year in GSTDM reflects 2015 Transearch, not the new 2019 Transearch cited elsewhere in the Plan. However, the GSTDM 2050 freight volumes were adjusted to match the new Transearch forecast. Since the key questions for investment concern future conditions and the magnitude of change they entail over three decades, the differences in base year are immaterial.



Figure 145. Definition of Modeling KPIs

KPIs	Business definitions	Infrastructure metrics
A Reliability	Meeting a committed delivery/pick-up window	Reduction in hours spent in non-recurring traffic
B Speed	Door-to-door travel time	Increases in average truck speed
C Cost	Shipping cost / freight spend	Impact on congestion costs
D Risk	Potential for interference in operations, cost structure, market, or resource access	Increase availability of alternate routes and shift to rail
E Safety/security	Mitigated harm for people, products, and systems	Social cost of safety as an annual cost and reduction in annual truck crashes

The KPI translation makes it possible to evaluate investment from the business perspective in quantitative terms. Moreover, because congestion costs reflect reliability and speed, and the social costs of safety can be taken as a proxy for business costs (such as insurance, loss and damage, and litigation), the investment benefits for four out of five KPIs (excluding risk) can be quantified in dollars. This enables a freight ratio of KPI benefits to project costs to be estimated across investment alternatives, where the benefits are reductions in KPI costs to business compared to No Build. The KPI metrics were modeled to (1) measure the performance of the statewide transportation system in moving goods and (2) understand their impacts across the state’s freight network. Modeling produced a prioritized 8-year project list based on benefit-cost results for Georgia’s freight industries. **Figure 145** previously defined the application of these metrics relative to freight network users in the modeled transportation network.

Project selection has been guided by feedback from local and state officials, the business community, and other stakeholders. Beyond impact to KPIs and benefit-cost ratios, projects were considered within the broader context of existing and emerging freight trends in the state, risks and vulnerabilities in the freight network, and the unique needs of critical industries. This allows for the prioritization of projects that may have lower KPI impacts or benefit-cost ratios but do reflect GDOT priorities that are not captured by these measures. Finally, this is a freight plan and it is measuring freight effects. While the benefits of investments for passenger traffic may be large and certainly matter to GDOT, they are beyond the scope of this Plan.

5.2. Application of KPIs

Traditional transportation KPIs were translated into business KPIs to test the impact of various investments on these critical metrics. Georgia’s Freight Plan uses these KPIs to understand how they are currently performing across the network, how the performance of those KPIs will change



over time as freight on the network continues to grow, and how different investments will impact the KPIs.

5.2.1. Safety

Safety metrics are based on the social cost of crashes, which is calculated in dollars per VMT. Crashes, which result in thousands of lives lost in Georgia each year, impact daily freight movement by introducing delay and unreliability onto normally free-flowing roadways. Non-recurring congestion caused by crashes also produce an increased delay on roadway corridors, resulting in unreliability for businesses that depend on inbound arrival of supply and outbound product shipments. GDOT can develop projects and technologies to evaluate the specific circumstances for crash occurrences at an intersection or along a corridor to mitigate overall crash frequencies, save lives, and improve free-flow operating conditions.

5.2.2. Reliability

Reliability intends to capture the degradation to predictable trips, including non-recurring traffic. This is quantified using the Vehicle Hours of Unreliability, which is defined as the difference between 95th percentile travel times and the average travel times (see bottleneck section for a more detailed definition). The Vehicle Hours of Unreliability represent the additional hours of buffer that shippers and carriers need to build into their delivery plans to ensure 95 percent on time performance. Reliability was modeled as a function of the free flow and congested speeds coming out of the statewide model, using relationships specified in the literature.

5.2.3. Speed

Speed captures the velocity of the freight on average over the journey with metrics that are based on the average speed in miles per hour (MPH). Speed metrics were modeled using state's travel demand model, which outputs the free flow speed and average congested speed throughout the roadway network. The model network has a base of year of 2015, with data on truck movements populated to reflect 2019 conditions and forecast horizon of 2050. The average speed on the modeled network shows where congestion bottlenecks occur so planners can identify projects to reduce bottlenecks and increase average speeds. Similarly, the total volume of truck traffic on a particular roadway can assist planners in determining how important that corridor is to freight transportation. The modeled roadway network measures volume in annual vehicle miles traveled (VMT). The model's annual VMT outputs are converted to daily VMT. To do so, annual VMT is divided by the freight industry's 295 working days in a year. The calculated daily speed and volume measurements help inform GDOT and businesses where roadway networks operate under free flow, congested, and safe traffic conditions.

5.2.4. Cost

Cost metrics were calculated by monetizing recurring congestion and unreliability using factors from NCHRP Research Report 925. These factors consider the average costs of operating trucks during congestion, such as fuel consumption, wages, etc., and the costs of unreliability on the trucking companies and shippers. The monetization factors from the NCHRP report were updated

to reflect driver and diesel costs in 2021. The congestion costs accrued on specific roadway links were divided by the length of the links to determine the costs per roadway mile. The total congestion costs statewide were also tracked as a KPI. Transportation planners use cost information to better estimate the benefits a particular project will provide over the costs of implementing those projects. Businesses can compare delay and unreliability costs with traffic congestion impacts to determine their business costs and profitability.

5.2.5. Risk

Risks are of different types and can be difficult to measure uniformly. Operational risk in freight transportation and supply chain logistics is concerned with service assurance, execution and resource supply within short time frames. Operational risks are associated with and measured by the KPIs discussed above: reliability, safety, speed and cost. The larger risks facing supply chains are disruptive, systemic, and of greater scale and duration: failures across tiers of suppliers, political and social issues in regions and countries, regulatory delays, illness and work stoppages affecting labor, rapid market and technology shifts, cyber attacks, and severe weather events are prominent ones. Breakdowns in any of the above can cascade through supply chains, as was seen during the global COVID-19 pandemic; multi, seaport labor disruptions, blockages at global canal passages, etc. Multi-factor metrics to capture this are not available but are being developed in federal programs such as FLOW, cited in Chapter 4.

Risks from weather events have been compiled by federal and other sources, and Georgia's exposure to them in terms of geography and infrastructure is explored later in this chapter. Route and modal redundancy can amplify or mitigate risk and thus are important to measure; analytics to do so also appear later in this chapter. The magnitude of some other risks can be inferred through the responsive strategies. Diversification of location is one example. Georgia does not control this directly yet has benefitted through growth at the Port of Savannah and in domestic manufacturing, and it influences location through competitive KPI outcomes and attractiveness to business. The relevant metrics effectively are about growth and market share in these areas.

5.2.6. KPI Outputs

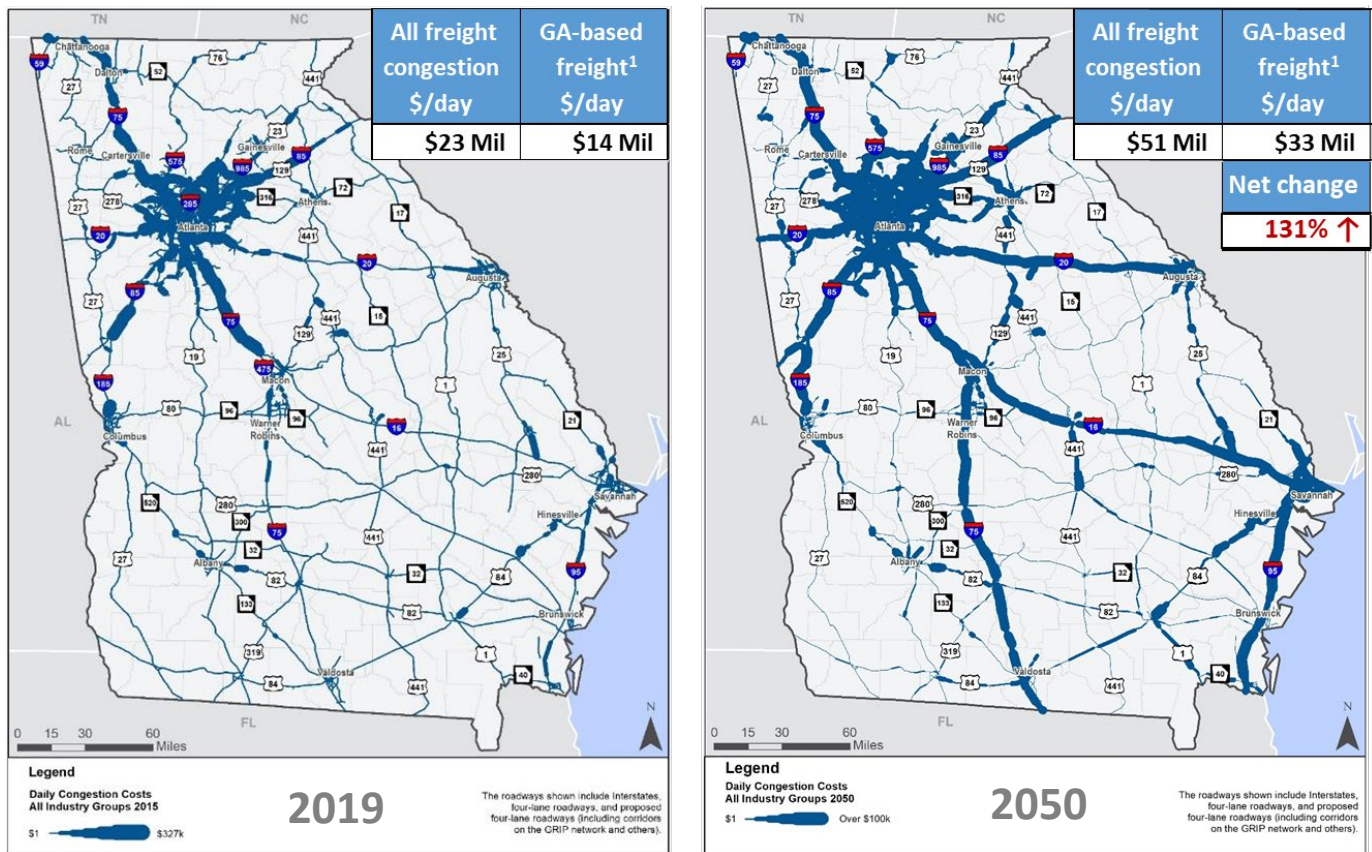
To identify potential projects that benefit Georgia's logistics-enabled businesses and make significant impacts on the KPIs for freight movement in the state, a two-step approach was used to evaluate the conditions for freight. This two-step approach uses the Georgia Statewide Travel Demand Model outputs, plus various post-processing formulas to quantify improvements that are unable to be modeled in GSTDM.

In order to start the modeling process, the GSTDM was run with a base-year scenario of the network configuration in 2015 with freight data reflecting 2019 conditions to establish a starting point for comparing model outputs. A second scenario was developed that included the projects already built, constructed, or committed by GDOT to be built to the year 2050. This scenario is called the No Build scenario, as no other improvements beyond those already existing or committed are included in the highway network, yet other input variables are increased to 2050 forecasted levels – such as population, freight demand, passenger vehicle demand, employment, etc. (matching the 2021 Georgia Statewide Strategic Transportation Plan). This No Build scenario

establishes the anticipated performance on Georgia roadways for freight and is used to identify target areas for investment.

Figure 146 shows the comparison of the daily cost of congestion in the 2015 base year network with 2019 freight data and the 2050 No Build year and which corridors would be most affected. The graphic reveals the anticipated demands falling on the Interstate system and clearly shows the intensity of impact on metro Atlanta facilities. It also demonstrates the impact to reliability and speed, and the cost implications. Georgia based freight, meaning freight that originates in or is destined for Georgia, would have an increase in congestion cost of 131 percent. Based on this analysis, initiatives that reduce congestion, add capacity, or make operational upgrades, interchange modifications and grade separations are the types of improvements desired.

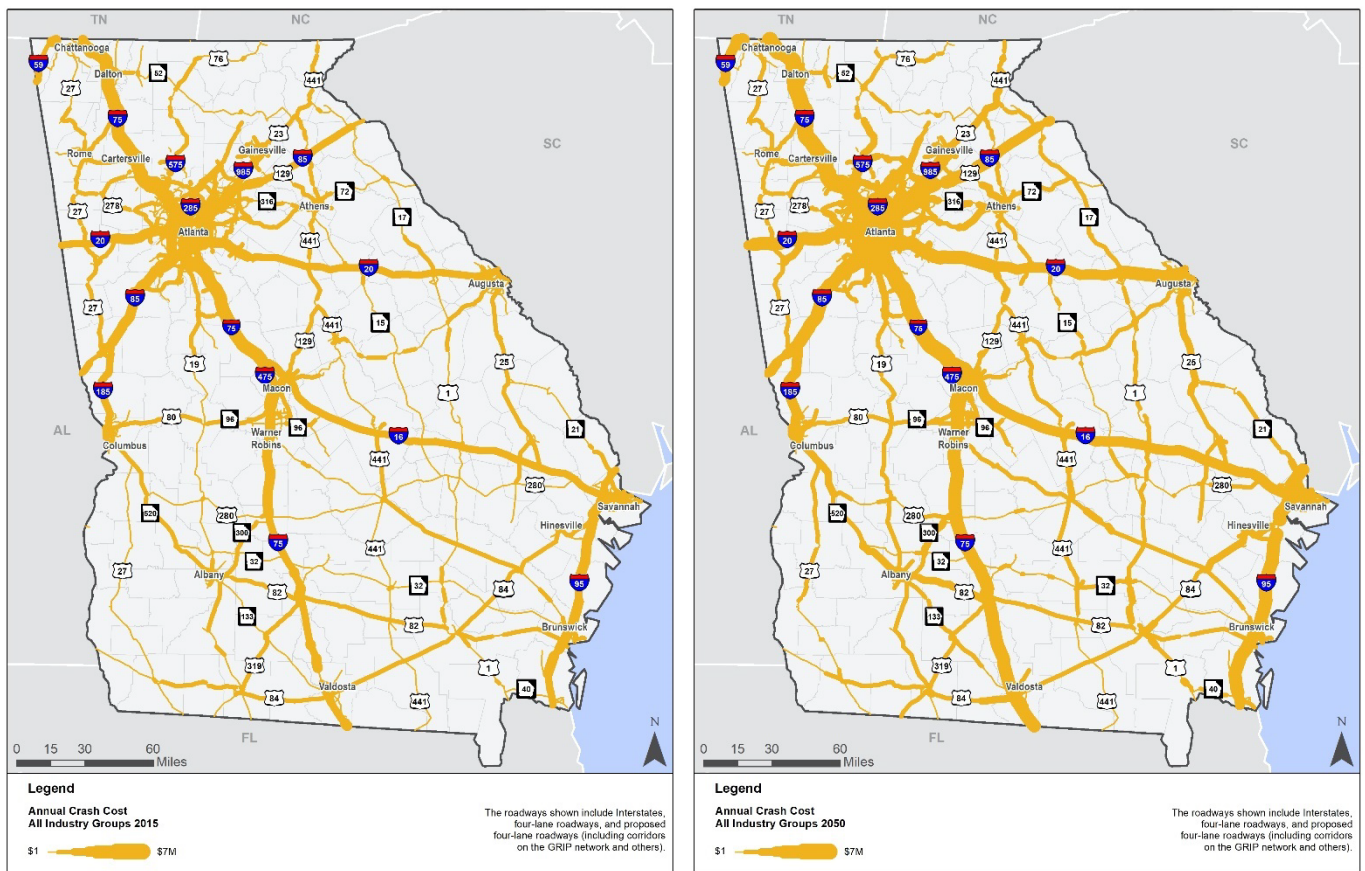
Figure 146. Comparison of 2015 Base Year Network with 2019 Freight Data and 2050 No Build Daily Congestion Costs



Core to GDOT’s mission is to provide safe and efficient roadways. Improvements that can minimize safety incidents are beneficial not only to KPIs but to quality of life. **Figure 147** below shows the annual cost of crashes statewide, and similar to the comparison for congestion, this provides insight into locations across the state where action should be taken. The Interstate corridors once more stand out as an opportunity for improvement, but additionally, there are state highways such as US 441 and US 82 where upgrades would be beneficial. From a safety perspective, controlling access and grade separating intersections are important elements for improvement programs.



Figure 147. Comparison of 2015 Base Year with 2019 Freight Data and 2050 Annual Crash Costs



5.3. Freight Investment Plan

The National Highway Freight Program (NHFP) requires a list of priority projects and description of how the funds from this program will be invested in the state. This fiscally-constrained investment plan is limited to initiatives working with NHFP funds over the next eight years. This section presents the projects chosen for this list and the process for selecting these projects. Sections 5.3.4 – 5.3.6 set forth the types of projects for long term consideration through 2050. Consistent with the SSTP/SWTP, future considerations are based on Foundational, Catalytic and Innovative investments.

5.3.1. Project Prioritization Process

The process to develop a prioritized set of fiscally-constrained projects started with identification of the measures by which projects would be selected. The following subsections explain these measures and how they were administered.

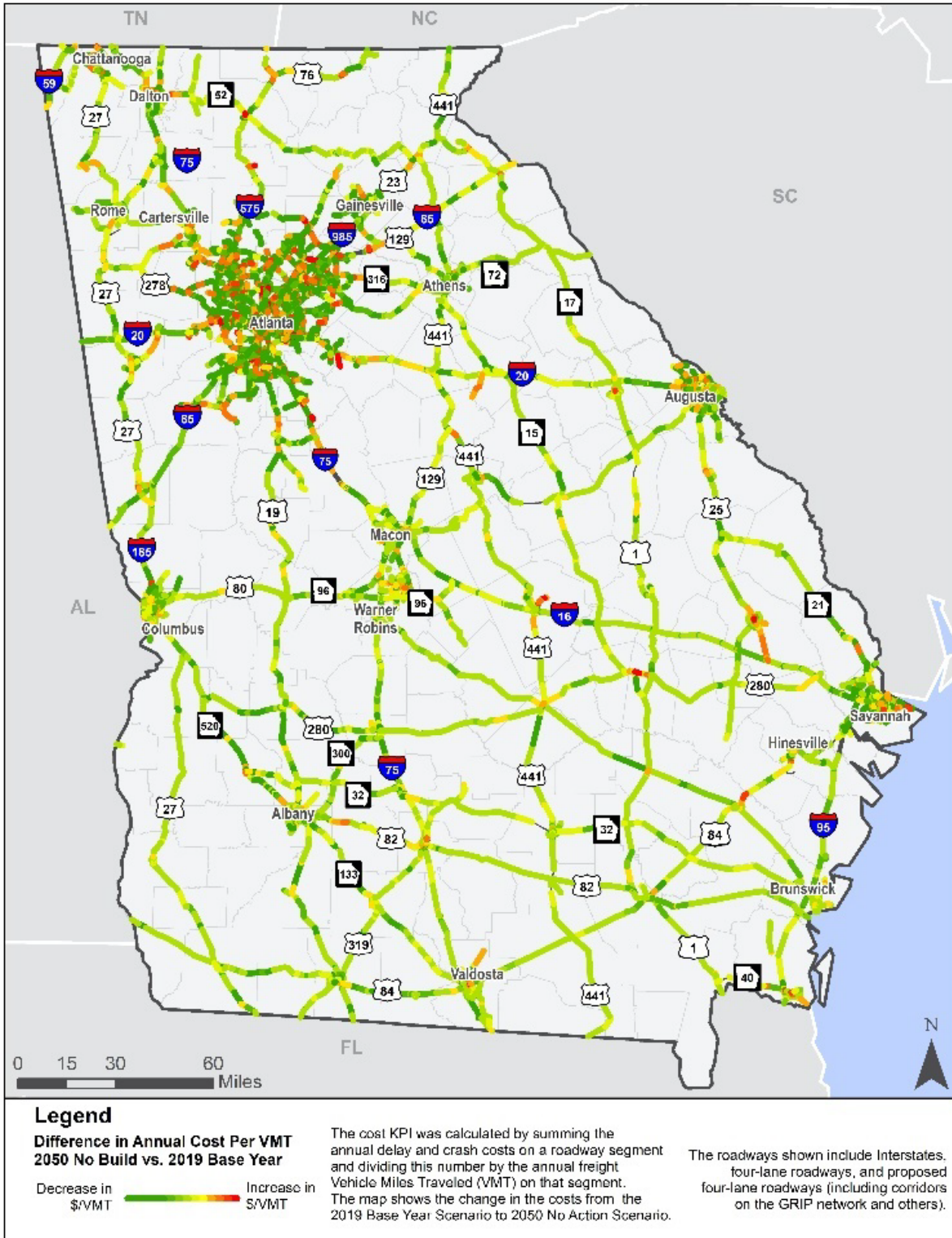


KPIs Addressed

Projects were assessed based on their ability to improve areas with diminished performance in KPI terms over the forecast horizon. The total monetized KPI projection by roadway appears in **Figure 148**, depicting the change in annual cost per VMT throughout the state from the base year to the 2050 forecast year with no build. The totals are the sum of safety costs plus all delay, the latter capturing speed and reliability changes in terms of user costs. The totals thus reflect four of the five KPIs – safety, speed, reliability and cost; the locations projected to increase in cost per VMT are shown in yellow, orange, and red. Projects that mitigate the increased cost per VMT at these locations were noted for prioritization.



Figure 148. Change in Annual Cost per VMT

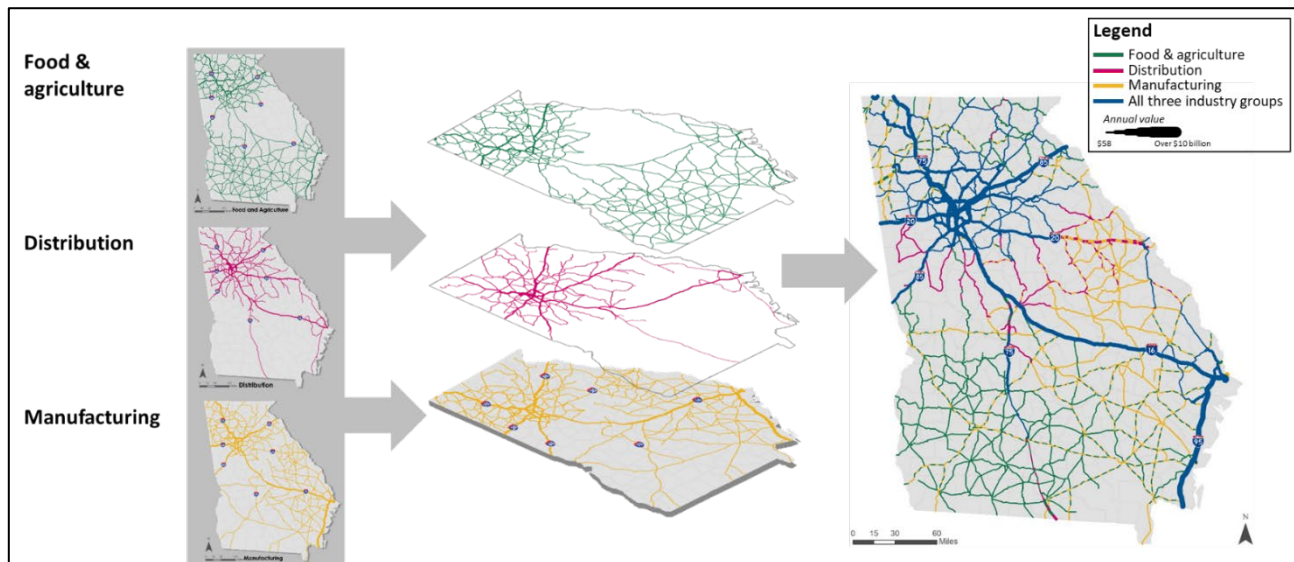


Benefits to Key Industries

Three primary industries move freight in Georgia: Food and Agriculture, Distribution, and Manufacturing, together accounting for roughly 60 percent of freight movement in Georgia and around 14 percent of its GDP. **Figure 149** displays the corridors used by trucks traveling between the top 25 Origin-Destination pairs for these three industries by inbound, outbound and intrastate direction. The maps show:

- Manufacturing commodities are concentrated around northwest GA and the ports.
- Distribution traffic moves the third highest annual tonnage in Georgia but has the fastest growth rate through 2050. Freight flows are expected to more than triple from 2019 to 2050. Distribution flows are centralized around Metro Atlanta and along the regional distribution routes where costs are highest.
- Food and agriculture commodity movements are mostly concentrated in Northeast GA, Atlanta metro, and Southwest GA, with the need to move goods between rural areas and into and through metro Atlanta.
- All of these primary industries rely on the Interstate network and northern roadways; Manufacturing and Food and Agriculture rely more heavily on GRIP Corridors in the south and east.

Figure 149. Comparison of Volumes for the Three Primary Industries



Projects that address key issues along these corridors were given elevated priority in the project list.

Heavy Haul Considerations

The prominent heavy haul sectors in Georgia are Food and Agriculture, lumber and paper Manufacturing, heavy machinery in domestic and foreign trade, and OSOW shipping overall. Projects that are located along important current and future heavy haul routes (shown earlier in **Figure 48** and **Figure 49**, respectively) were noted as significant due to the additional requirements for bridge and pavement maintenance and repair caused by heavier vehicles.

Cost Effectiveness

Cost-effectiveness is composed as the reduction in total cost to industry produced by a project investment over a 25-year period, compared to the total cost of the project. Projects with higher cost-effectiveness values were viewed more favorably when determining prioritization.

Bottlenecks

Roadway freight bottlenecks in 2019 were presented in Section 4.1.1. Forecast locations of concentrated congestion were developed with GSTDM and generally reveal deteriorating conditions at the same points, although varying in degree because of varying growth rates. Bottleneck locations were another factor considered for project prioritization.

Funding Availability

The prioritization process includes allocation of funds for improving public truck parking at existing rest areas, weigh stations, and visitor welcome centers along Interstate routes, considering these are the predominant long-haul routes where trucks are most frequently requiring safe parking for rest breaks. Projects that are currently programmed by GDOT for the years 2023-2031 were then selected to maximize available funding and to deliver projects in the construction phase. Freight traffic analysis in this plan has shown that I-75 is and will remain the primary freight corridor in Georgia; many of the selected projects therefore are along this corridor. Where additional funds were available, additional Interstate projects were prioritized to increase geographic diversity if they rank highly among the evaluation criteria.

5.3.2. Project Prioritization Results

The outcome of this process and the project scoring appears in **Table 112**. The organization of these projects into the investment plan by year with accounting for application of NHFP funds is described next.

Table 112. Prioritized Projects for NHFP Funding

GDOT PI #	Project Name	Safety	Cost/VMT	Reliability	Speed (V/C)	BCR (25-yr)	Bottleneck	3 Industry	2 Industry
0013915	I-285 @ I-20 - EAST SIDE INTERCHANGE RECONSTRUCTION	X		X		NA	X	X	
0008345	I-20 FROM SR 388 TO CR 573/WHEELER ROAD	X		X		20.66			X
0013157	I-75 @ CR 251/ROUNTREE BR RD & @ CR 253/BARNEYVILLE RD-PH II	X	X	X	X	NA			
0017271	I-95 @ SR 21 INTERCHANGE RECST	X	X	X	X	NA	X	X	
0010298	I-75 @ SR 133 - PHASE II INTERCHANGE RECST		X		X	NA			
0017182	I-75 @ CR 312/BETHLEHEM ROAD	X	X	X		NA			
0012759	I-75 SB CD SYSTEM FROM I-285 TO SR 331	X	X			NA	X	X	
0014203	I-75 FROM I-475 TO SR 155 - COMMERCIAL VEHICLE LANES	X	X	X		2.26	X	X	
311400-	I-75 FROM I-16 TO CR 478/PIERCE AVE - PHASE VI	X	X	X	X	7.27	X	X	
611010-	I-75 FROM SR 151 TO JUST SOUTH OF SR 2	X	X	X		27.22		X	
0013156	I-75 FROM LOWNDES COUNTY LINE TO SR 37 - PHASE II	X	X	X		NA	X		X
0010295	I-75 @ SR 376 - PHASE II	X		X		NA			X
0013918	I-285 @ I-20 WEST SIDE INTERCHANGE RECST	X		X		NA	X	X	
0007841	I-85 @ SR 74/SENOIA RD INTERCHANGE RECST	X	X	X		NA			X
0017411	I-95 FM FL STATE LINE TO S CAROLINA STATE LINE - ITS EXPANSION	X	X		X	NA	X	X	
0013856	I-75 @ SR 33 CONN INTERCHANGE RECST	X	X	X		NA			X
0017518	I-20 FROM SR 47 TO SR 388 - PHASE II	X	X	X		16.99			X
0017110	I-85 @ MCGINNIS FERRY ROAD - NEW INTERCHANGE - PHASE II	X		X		NA		X	

Notes: *projects without BCRs are interchanges*
NA = BCR not available, project not modeled

5.3.3. NHFP Constrained Project List

The fiscal constraint in the Freight Investment Plan is the amount of NHFP funds available to Georgia. The anticipated allocation of NHFP funds to the state is based on federal apportionment data and is assumed to be approximately \$427 million for the eight-year period from 2023 through 2031, average about \$47 million per year.

Public truck parking improvements will be programmed out of scoping phases that will utilize the lump sum funds for preliminary engineering (PE) and construction (CST) phases at a later date. Projects that are currently programmed by GDOT for the years 2023-2031 were then selected to maximize the remaining available funding and to deliver projects in the construction phase. **Table 113** presents the allocation of funding by year and project.

The projects are focused on the Interstate highways, which data shows are the primary corridors for freight travel for multiple industries throughout the state and feature many bottlenecks and areas of heavy congestion that can begin to be mitigated or resolved by implementing these projects. The projects are shown in **Figure 150**.



Table 113. NHFP Allocation by Year and Project

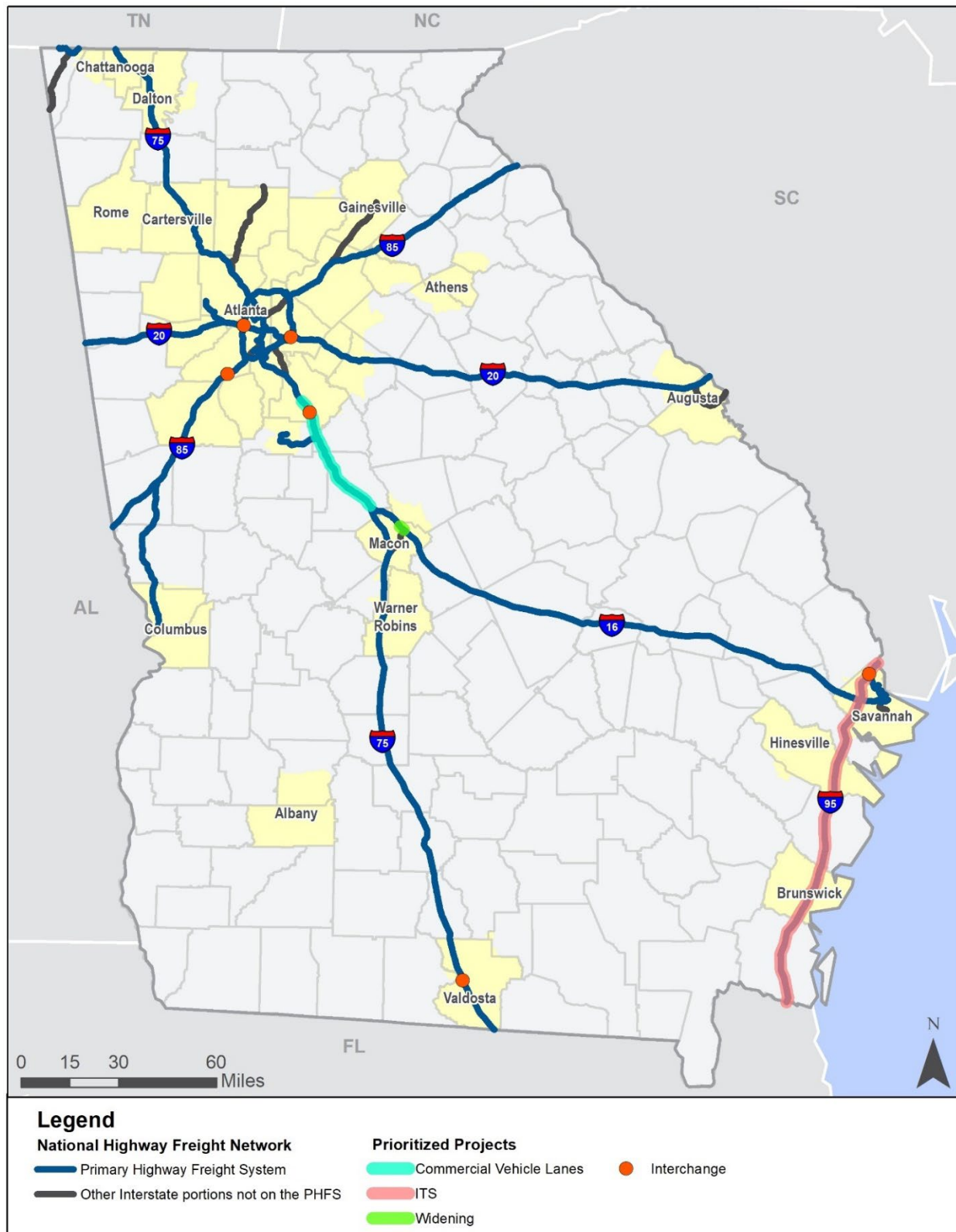
Fiscal Year	PI #	Project Description	Annual NHFP Funds Apportionment*	Federal NHFP Amount	State Funds Match Amount ^	Total NHFP + State Match	Phase
2023	0013915	I-285 @ I-20 - EAST SIDE INTERCHANGE RECONSTRUCTION	\$ 44,761,551	\$ 32,137,453	\$ 8,034,363	\$ 40,171,816	CST
	0013918	I-285 @ I-20 WEST SIDE INTERCHANGE RECST		\$ 7,050,726	\$ 1,762,681	\$ 8,813,407	PE
	0014203	I-75 FROM I-475 TO SR 155 - COMMERCIAL VEHICLE LANES		\$ 5,573,373	\$ 1,393,343	\$ 6,966,716	ROW
2024	0013915	I-285 @ I-20 - EAST SIDE INTERCHANGE RECONSTRUCTION	\$ 45,656,782	\$ 42,296,782	\$ 10,574,196	\$ 52,870,978	CST
	TBD	Public Truck Parking Lump Sum^^		\$ 3,360,000	\$ 840,000	\$ 4,200,000	
2025	0017182	I-75 @ CR 312/BETHLEHEM RD NEW INTERCHANGE	\$ 46,569,918	\$ 13,400,000	\$ 3,350,000	\$ 16,750,000	CST
	0007841	I-85 @ SR 74/SENOIA RD INTERCHANGE RECST		\$ 29,809,918	\$ 7,452,479	\$ 37,262,397	CST
	TBD	Public Truck Parking Lump Sum^^		\$ 3,360,000	\$ 840,000	\$ 4,200,000	
2026	0017411	I-95 FM FL STATE LINE TO S CAROLINA STATE LINE - ITS EXPANSION	\$ 47,501,316	\$ 16,500,000	\$ 4,125,000	\$ 20,625,000	CST
	0013915	I-285 @ I-20 - EAST SIDE INTERCHANGE RECONSTRUCTION		\$ 21,881,316	\$ 5,470,329	\$ 27,351,645	CST
	TBD	Public Truck Parking Lump Sum^^		\$ 9,120,000	\$ 2,280,000	\$ 11,400,000	
2027	0014203	I-75 FROM I-475 TO SR 155 - COMMERCIAL VEHICLE LANES	\$ 47,501,316	\$ 19,190,658	\$ 4,797,665	\$ 23,988,323	CST
	0013918	I-285 @ I-20 WEST SIDE INTERCHANGE RECST		\$ 19,190,658	\$ 4,797,665	\$ 23,988,323	CST
	TBD	Public Truck Parking Lump Sum^^		\$ 9,120,000	\$ 2,280,000	\$ 11,400,000	
2028	311400-	I-75 FROM I-16 TO CR 478/PIERCE AVE - PHASE VI	\$ 47,976,329	\$ 27,290,729	\$ 6,822,682	\$ 34,113,411	CST
	0010298	I-75 @ SR 133 - PHASE II		\$ 8,365,600	\$ 2,091,400	\$ 10,457,000	ROW
	TBD	Truck Parking Lump Sum		\$ 12,320,000	\$ 3,080,000	\$ 15,400,000	
2029	0013915	I-285 @ I-20 - EAST SIDE INTERCHANGE RECONSTRUCTION	\$ 48,456,092	\$ 48,456,092	\$ 12,114,023	\$ 60,570,115	CST
2030	0017271	I-95 @ SR 21 INTERCHANGE RECST	\$ 48,940,653	\$ 24,470,327	\$ 6,117,582	\$ 30,587,909	ROW
	0010298	I-75 @ SR 133 - PHASE II INTERCHANGE RECST		\$ 24,470,326	\$ 6,117,582	\$ 30,587,908	CST
2031	0013918	I-285 @ I-20 WEST SIDE INTERCHANGE RECST	\$ 49,430,060	\$ 49,430,060	\$ 12,357,515	\$ 61,787,575	CST

*Source: FHWA Apportionment Tables and GDOT OFM Estimates

^Source: GDOT Office of Planning

^^Public Truck Parking Projects will be programmed out of the scoping phases that will utilize the lump sum funds for PE and CST phases (see Table 114)

Figure 150. Prioritized Projects on the NHFP



5.3.4. Foundational

Foundational investments address asset management activities for cost-efficient freight operations. These investments will maintain a state of good repair on the existing statewide freight movement system and maintain and/or improve safety KPIs for the current network as freight volumes increase across Georgia.

The Foundational program focuses on reconstructing, rehabilitating, and improving existing physical assets that support logistics-enabled industries to ensure customer expectations are met.

The following foundational types of potential improvements reflect a business-as-usual approach to ensure there are efficient and reliable networks statewide:

- Interchange and bridge upgrades
- Increased truck parking and availability systems
- Rail grade crossing safety improvements
- Local assistance programs
- Signalization

Interstate and Highways

A primary mission of GDOT is to plan, maintain, and operate the State's highway system, which includes the critical corridors that enable the efficient and reliable movement of people and freight. GDOT carries out strategic projects to improve reliability of key corridors by focusing project efforts in areas where interchanges and bridges in the state's highway system do not meet current design standards.

Interchanges

As discussed in Chapter 4, truck bottlenecks are a major factor in contributing to reductions in speed and reliability and therefore increases costs. Interchanges are one of the primary locations of truck bottlenecks, especially urban interchanges, and therefore interchange rehabilitation or reconstruction is considered Foundational. Recommendations in this section include grade separations on state highways creating new interchanges that limit access to strategic state routes and therefore improving flow on those corridors. Examples of Foundational interchange improvements already in GDOT's work program include:

- Grade separation projects on SR316/US 29 at six locations
- Major Mobility Investment Program investments for I-285/I-20 east and west
- Multiple interchanges on I-75, I-85 and I-95

Bridges

The bridges on the roadway network are actively managed and inspected through existing programs at GDOT. The GDOT Bridge Maintenance Program and Bridge Structures Maintenance Plan guide the implementation of these efforts. GDOT inspects 8,414 bridges annually to determine where construction and widening projects are needed. In 2019, \$509.5 million was

invested in construction and widening efforts while \$41.9 million were invested in maintenance costs to extend bridge life by 20-25 years. Pending availability of funds, GDOT Office of Intermodal plans to maintain and replace GDOT-owned short line rail bridges and structures to continue meeting industry standards¹³⁸.

Bridge conditions that may impact the freight network include, narrow lanes, low clearances, weight limitations, or deterioration. These types of bridge characteristics can contribute to delays to the supply chain. Additionally, heavy truck volumes can also hasten degradation and therefore require more investment to maintain a state of good repair.

Rail Improvements

The Department's Office of Utilities administers a federally funded Section 130 program to evaluate and fund railroad-highway grade crossing safety improvements at public at-grade railroad crossings throughout the state of Georgia. Improvements under this Program include the installation of new or upgraded train activated warning devices (bells, gates, and flashing lights); signing and pavement marking upgrades; elimination of redundant or unnecessary crossings; and other measures to enhance the safety and operational characteristics of Georgia's public railroad-highway at-grade crossings. In 2020, forty-three (43) warning device projects totaling \$10.2 million were addressed at 266 crossings¹³⁹.

GDOT owns 465 active miles of the approximate 4,600-mile rail network in Georgia, which are partially maintained through grant awards from USDOT's Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program. The CRISI Program funds projects that improve the safety, efficiency and reliability of intercity passenger and freight rail.

Rail grade crossing safety is critical for freight movement for both rail and truck movements. Rail grade crossing initiatives improve safety by reducing the interface between rail and vehicular traffic. Additionally, improving grade crossings may help truck travel and minimize instances of trucks getting caught on railroad tracks where the crossing configuration cannot accommodate long vehicles. These objectives and more are considered when determining which crossings to improve. The recommendations of this plan are to continue to address rail grade crossings at a programmatic level to continue the work being done by the Office of Utilities. Projects may include new gates and warning device and also changeable message signs to divert traffic from blocked crossings.

Truck Parking

As described in Chapter 4, the demand for truck parking is only going to increase over time and is an immediate need throughout the state. Investment in truck parking improves safety by minimizing use of undesignated parking locations and allowing for staging locations as trucks wait for delivery windows. Reliability is also improved because drivers can spend less time navigating for parking or having to divert from their routes to find places to stop, which also helps to lower cost. According to the Owner Operator Independent Drivers Association, an average of one hour per day of truck

¹³⁸ <https://www.dot.ga.gov/GDOT/pages/BridgePrograms.aspx>

¹³⁹ <https://www.dot.ga.gov/GDOT/Pages/RailroadSafety.aspx>

drivers' time is spent searching for parking. Considering that truck drivers may work up to 14 hours in a day, this one-hour parking search equates to a 7 percent reduction in productivity, affecting wages truck drivers can earn and reducing supply chain efficiencies. **Table 114** shows the locations that are being studied by GDOT as part of three regional scoping projects for Public Truck Parking. The cost of projects that will come out of the scoping being done at these locations appears as Public Truck Parking Lump Sum in the Freight Investment Plan, from which specific projects will be identified for preliminary engineering (PE) and construction (CST).

Table 114. Public Truck Parking Scoping Locations

ID	County	Location
1	Monroe	Rest Area 22 (SB I-75)
2	Cook	Rest Area 5 (NB I-75)
3	Whitfield	Visitors Center Ringgold (I-75)
4	Haralson	Visitors Center Tallapoosa (I-20)
5	Turner	Rest Area 9 (SB I-75)
6	Gordon	Rest Area 34 (NB I-75)
7	Monroe	Weigh Station 6 (NB I-75)
8	Monroe	Weigh Station 6 (SB I-75)
9	Bibb	Rest Area 19 (NB I-475)
10	Turner	Rest Area 10 (NB I-75)
11	Franklin	Weigh Station 2 (SB I-85)
12	Franklin	Visitors Center Lavonia
13	Dooly	Rest Area 14 (SB I-75)
14	Dooly	Rest Area 13 (NB I-75)
15	Dooly	Rest Area 14 (SB I-75)
16	Lowndes	Weigh Station 8 (SB I-75)
17	Richmond	Visitors Center Augusta (I-20)
18	Bryan	Weigh Station 7 (WB I-16)
19	Bryan	Weigh Station 7 (EB I-16)
20	Morgan	Rest Area 52 (EB I-20)
21	Laurens	Rest Area 88 (WB I-16)
22	McIntosh	Weigh Station 9 (NB I-95)
23	Lowndes	Weigh Station 8 (NB I-75)



Signalization

GDOT “operates and maintains over 3,000 traffic signals across the State of Georgia, out of approximately 6,500 on-system signals and over 10,000 total traffic signals in the state. GDOT also manages and operates over 200 Interstate ramp meters in the Metro Atlanta area. Of the on-system signals not maintained and operated by GDOT, the local municipalities and governments rely on GDOT support with much of the equipment and infrastructure required to operate these signals. There are approximately 100 local agencies and municipalities in the State of Georgia that operate and maintain their own traffic signals and systems, relying on the Department for support in these efforts. The programs GDOT offers for support range from detector repair and maintenance all the way to active management of a traffic signal system.”¹⁴⁰

GDOT developed traffic signal programs to manage the traffic signals throughout the state. These programs support different geographical areas but are intended to address local and regional transportation needs in a consistent manner, leveraging methods and techniques learned from each program. These programs are the Regional Traffic Operations Program (RTOP) within metro Atlanta and Regional Traffic Signal Operations (RTSO) program for areas outside of metro Atlanta. GDOT proactively approaches the maintenance, monitoring, and operations to address signal issues.¹⁴¹

Signals within freight intensive areas, such as freight clusters defined by the Atlanta Regional Commission (ARC), may require modifications in programming to support freight mobility in those areas. Truck signal priority is a strategy that may be employed in areas with high truck volumes to extend the green time at signalized intersections to allow more trucks through without stopping. The benefit of this type of improvement is increased safety by reducing potential for trucks to be caught in a red light cycle thereby reducing both truck idling and opportunities for crashes and increasing supply chain efficiency, especially in key bottlenecks. This Plan identifies freight-based signal programs, such as improvements around the Port of Savannah, within freight clusters, and other freight intensive sites to be coordinated with the Office of Traffic Operations for implementation.

Assistance Programs

Although GDOT has pre-existing programs to finance the improvements of existing Interstate and highway systems, as well as their freight and rail systems, the available funds allocated for these programs are limited when compared to all improvements needed to the entire system. Further consideration should be given to additional assistance programs, which may include:

- Expanded Local Maintenance Improvement Grant (LMIG) program for freight safety
- Local assistance program for Urban Curbside Management policy and projects
- Funding for safety and condition improvements on GDOT freight corridors

¹⁴⁰ Statewide Traffic Operations and Response Management Program, Concept of Operations, April 2019

¹⁴¹ Statewide Traffic Operations and Response Management Program, Concept of Operations, April 2019

5.3.5. Catalytic

Catalytic investments are meant to build upon the Foundational to support and develop key industries throughout Georgia, as well as to maintain or improve current network performance as freight movement increases. This category of potential investments focuses on strategic infrastructure expansions to aid economic development and increase the customer base for business.

Catalytic investments are looked at in two ways: highway and multi-modal. The highway investments feature initiatives for road building, especially for last-mile freight movement. The multi-modal investments feature advancement-based initiatives that improve modal choice and redundancy, and support highway relief through alternative rail, water, and air networks. Potential Catalytic investments could include:

- Road, rail, and airport capacity projects
- Expanded capacity on Interstate highways
- Access to inland ports and intermodal stations
- Rail grade crossings
- Local assistance programs

Interstate and Highways

GDOT’s Major Mobility Investment Program (MMIP) is implementing capacity investments in Georgia’s most heavily traveled transportation corridors over the next decade. Completion of MMIP projects will expand capacity, enhance safety, and improve reliability for Georgia’s businesses and residents. While not solely designed to improve freight mobility, many MMIP projects will benefit truck movements in key corridors, especially I-285 and I-75. Some MMIP projects are specifically designed to enhance freight mobility, including new commercial vehicle lanes on portions of I-75, capacity additions to I-85 to serve the industrial and distribution hubs in Northeast Georgia, and expansion of the I-16 trade corridor serving Port of Savannah traffic, including an improved interchange with I-95¹⁴².

As demonstrated in Chapter 4, freight traffic is most reliant on the Interstate system in Georgia, therefore an objective of the Catalytic investments are to improve performance through strategic Interstate upgrades and appropriate improvements on state routes that can offer alternative high-performance roadways.

Commercial Vehicle Lanes and Interstate Capacity

As seen through the assessment of truck movement and volumes throughout the state, 20 percent of the truck volumes pass through Georgia, with Georgia as neither the origin nor destination. This type of travel supports development of Commercial Vehicle Lanes (CVL), which are improvements with very limited access serving trucks only. As noted by the FAC, this type of infrastructure brings benefits in safety by removing interaction with regular vehicular traffic, improves reliability with

¹⁴² 2021 Statewide Strategic Transportation Plan: 2050 Statewide Transportation Plan, page 54



designated truck only lanes, and improves cost by reducing delay and congestion. GDOT's I-75 Commercial Vehicle Lanes (CVL) project, as part of the MMIP, is the nation's first CVL project. The purpose is to improve mobility and safety for freight operators and passenger vehicles, modernizing freight infrastructure and operations to grow the economy, increase competitiveness, and improve quality of life¹⁴³.

Additional Interstate capacity is also warranted where truck volumes are heaviest and where trucks contribute to bottlenecks. In particular, I-75 southward from Macon to Florida and I-20, I-16 and I-95 were identified as primary Interstates for truck movements, both for freight originating in or destined to Georgia, as well as through-truck movements.

Governor's Roadway Improvement Program (GRIP) Corridors

"The Governor's Road Improvement Program (GRIP) is a system of economic development highways that, when complete, will connect 95 percent of Georgia cities with populations of 2,500 or more to the Interstate Highway System. It will also place 98 percent of Georgia's population within 20 miles of a four-lane road."¹⁴⁴

This system of over 3,000 miles of roadway provides excellent statewide coverage and supports freight mobility and market access for rural Georgia. This Plan recommends the completion of key corridors in the program such as US 280 as an east west connection and US 441 as a strategic north south corridor serving truck traffic to and from the Port of Savannah. Another form of upgrade is grade separation on strategic corridors. Similar to the projects on SR 316 currently in development and construction phases, this type of initiative would convert signalized intersections to grade separated intersections, with benefits such as increased safety, reliability, and speed.

Options for New Limited Access and Interstate

Interstates are the primary routes for trucks, especially for long haul movements, and therefore an area of focus for much of the Catalytic program, due to the safety and reliability benefits of limited-access configurations. Options include upgrading corridors to limited access Interstate, such as US 280 and US 27, or to constructing new Interstates. Modeling analysis indicates that US 27 could establish an alternate route between Tennessee and Florida, relieving truck traffic in metropolitan Atlanta. Additionally, the Bipartisan Infrastructure Law includes a corridor designation for a new Interstate I-14 covering five states, Texas, Louisiana, Mississippi, Alabama and Georgia. Within Georgia, the corridor designation connects Columbus to Augusta by way of Macon. Before inserting these infrastructure investments in the Department's long-range plans, substantial further evaluation of these corridors is required, including cost-benefit analysis, environmental assessments, and community engagement.

¹⁴³ <https://0014203-gdot.hub.arcgis.com/>

¹⁴⁴

<https://www.dot.ga.gov/GDOT/Pages/GRIP.aspx#:~:text=The%20Governor%27s%20Road%20Improvement%20Program,to%20the%20Interstate%20Highway%20System.>



Sea and Inland Port Improvements

Georgia is home to an interconnected network of seaports, inland waterways, private marine terminals, and inland ports. The vast majority of Georgia's marine tonnage moves through terminals owned and operated by the Georgia Ports Authority (GPA). GPA's facilities include the Port of Savannah, which consists of the Garden City Terminal and the Ocean Terminal, North America's busiest single terminal container facility. They also include the Port of Brunswick and its Colonel's Island Terminal, which is the second busiest port in the United States for total roll-on/roll-off cargo. In 2019, over 37.5 million tons of goods moved through these ports¹⁴⁵. GPA has identified an "inland port" system to serve the Port of Savannah. This system includes locations in Murray County (Appalachian Regional Port) and Decatur County (Bainbridge Terminal). The Northeast Georgia Inland Port is in early stages of planning in Hall County.

Analysis indicates improvements to roadways, railroads, and grade crossings in the vicinity of the port would be Catalytic to logistics-enabled businesses in the state. The Catalytic program encompasses overall improvements to access the existing ports and intermodal facilities and freight flows to and from inland ports, in coordination with the Georgia Ports Authority.

Rail Improvements

At 4,684 miles, Georgia's rail network is the seventh largest in the nation. Most of Georgia's rail network is owned by private freight railroad companies. The following own Georgia's rail network:

- 4,061 miles owned by private freight railroads
- 465 miles are owned by GDOT
- 118 miles are owned by the Georgia State Properties Commission
- 41 miles are owned by the Georgia Ports Authority

Two Class I's operate in the State of Georgia: CSX Transportation and Norfolk Southern (NS). All other railroads operating in Georgia fall into the Class III revenue threshold (short lines). Class I railroads tend to focus on providing long-distance line haul service, connecting Georgia with other parts of the U.S., Canada, and Mexico. Short line (Class III) railroads tend to provide last-mile service, connecting Georgia businesses to the rail transportation network. These connections provide access to raw materials and global markets. Class I's operate the majority of trackage in Georgia (68 percent combined). Short lines operate the remaining 32 percent. GDOT owns 465 active rail miles in the state which is leased to Class I and Short Line operators.¹⁴⁶ Georgia's extensive rail network provides system redundancy and may offer some opportunities to divert more cargo to rail throughout the state, especially through inland port connections. By upgrading rail infrastructure and improving travel time on rail corridors, the mode becomes a more viable choice for businesses if it is competitive with truck service.

¹⁴⁵ Georgia Ports Authority.

¹⁴⁶ Georgia State Rail Plan, <https://www.dot.ga.gov/InvestSmart/Rail/StateRailPlan/Georgia%20SRP%20Final%20Draft.pdf>

At-grade rail crossings can cause railroad delays when incidents occur and when crossings are blocked. Multimodal Catalytic investments could help eliminate certain grade crossings through the construction of additional grade separations, where warranted. Other multimodal Catalytic investments could include possible reactivation of rail corridors, extension of sidings and improvement to intermodal site access. GDOT will continue further analysis to specify priority locations and viability of various infrastructure solutions.

Airport Capacity Improvements

Georgia is served by a diverse mix of airports ranging in size from small general aviation airports to corporate general aviation reliever airports to Hartsfield-Jackson Atlanta International, the world's busiest commercial airport¹⁴⁷.

In 2018, Hartsfield-Jackson had over 51.8 million enplanements and the other eight commercial service airports had over 1.8 million enplanements combined¹⁴⁸. Hartsfield-Jackson also is a key air cargo facility, the 13th busiest in the United States, moving over 2.9 billion pounds of cargo in 2018. The other major air cargo airport in Georgia is the Southwest Georgia Regional Airport, located in Albany, which moved over 186 million pounds of cargo in 2018. Georgia's aviation system is a major contributor to the Georgia economy. In 2019, the economic impact of Georgia's airports was over \$73.7 billion, supporting more than 450,502 jobs with an annual payroll of \$20.2 billion, and \$196.5 million in direct aviation-related tax revenues to the State¹⁴⁹.

GDOT's Aviation Program has the responsibility of helping to assure that publicly owned airports in Georgia are safe, adequate, and well maintained. Georgia DOT serves two primary functions in providing airport aid: Airport Development and Aviation Planning. Airport Development provides technical assistance to city, county, and other local airport sponsors as well as private entities on airport and aviation matters including construction, maintenance, and operations of airport facilities, and airport navigational aid facilities. Aviation Planning is charged with planning a safe, comprehensive, accessible, and integrated statewide system of public-use airports¹⁵⁰.

GDOT recently completed an Air Cargo Capacity study and the recommendations of that plan are included here by reference. The types of initiative included are expanded air cargo capacity, apron improvements and road feeder access improvements to airports. Some highlights from the Air Cargo study are:

- Apron rehabilitation at Statesboro and Swainsboro airports
- Air cargo capacity improvements at Savannah/Hilton Head International Airport
- Air cargo capacity at Southwest Regional Airport in Albany
- Airport Distribution Center at Hartsfield Jackson Atlanta International Airport

¹⁴⁷ Airports Council International Annual World Airport Traffic Report, 2019

¹⁴⁸ Federal Aviation Administration Passenger Boarding Data, 2018

¹⁴⁹ GDOT Statewide Airport Economic Impact Study, 2020

¹⁵⁰ <https://www.dot.ga.gov/GDOT/pages/AirportAid.aspx>

In addition, roadway improvements are beneficial to air cargo, which is acutely sensitive to reliable transportation service:

- Upgrades in metropolitan Atlanta and in proximity to other Georgia airports improve regional truck pick-up and delivery performance for domestic and international freight.
- Upgrades to the Interstate highway system improve performance for long distance Road Feeder Service, which connects the cargo capacity of international passenger flights at Hartsfield-Jackson to businesses across the Southeast. Reliable road feeder connections also help attract international freighter flights, a market in which Atlanta lags behind Miami.

Truck Parking

As documented earlier when discussing public truck parking locations, freight volumes will continue to increase through 2050 and truck drivers will need safe, accessible locations to park for required periods of rest. In Georgia, private truck parking provides 94 percent of the current supply, so the state's ability to impact the overall availability of spaces is limited. GDOT and other governmental entities can consider some options to support the growth of private truck parking in Georgia:

- Explore Public- Private Development Agreements/ Partnerships (P3) through process already established by GDOT and other state DOTs.
- Increase funding for truck parking through partnerships with local governments and the private sector that would seek federal grant funds.
- Partner with other State agencies to consider truck parking options.

Assistance Programs

Although GDOT has pre-existing programs to finance the improvements of existing Interstate and highway systems, as well as their freight and rail systems, the available funds allocated for these programs are limited when compared to all improvements needed to the entire system. Further consideration can be given to incorporate additional assistance and fund allocations to aid Catalytic investments particularly related to economic development sites and truck parking.

5.3.6. Innovative

Innovative investments focus on developing, piloting, and deploying new and emerging technologies and business practices for freight and logistics. Georgia can improve freight movement throughout the state by leading the effort to develop new technologies for transportation asset management and advanced freight operations. Technology related investments across the state's transportation system will help maintain and improve network performance while continuing to position Georgia as an innovation hub.

Support for new technologies will accelerate industry trends, facilitate growth of emerging technologies, and give existing business industries in Georgia a first-class freight experience. Some examples of innovation categories are:

- Safety Technologies
- Freight Collaboration Systems

- Connected and Autonomous Vehicle (CAV) Implementation

While many of these activities may be driven by the private sector, GDOT can play a role supporting research and pilots, sharing public data, and facilitating roadside technology infrastructure - notably broadband connectivity. With technologies rapidly evolving, specific strategies and opportunities must be identified on an ongoing basis.

Innovative investments are intended to be coupled with Catalytic, due to ways that infrastructure and technology can work together. The value of Innovative improvements is high because for a relatively small investment therefore a positive effect across KPIs. Notably, these technologies improve safety through information and most specifically via CAV, enabling vehicles to communicate with one another and thereby reducing opportunities for crashes. Other systems improve communications about conditions of the facilities in real time, thereby reducing risk and improving operational decision-making about delivery windows, for example, or arrangements for truck parking.

Safety Technologies

Technological advancements change quickly but provide benefits to safety for drivers, the traveling public and more. Some of the types of safety technologies include Advanced Driver-Assistance Systems (ADAS), which are systems of cameras and devices embedded into the vehicle to help drivers detect obstacles and avoid crashes. ADAS elements are a component for implementing CAV as well and are discussed more in Section 4.4.3. Other areas of emerging safety technologies are in artificial intelligence (AI) that can be used to assess large databases of information collected on driver behavior and vehicle performance, to inform fleet and staff management.

Highlights of the plan supporting technological advancement for safety feature such systems as DriveWyze Truck Safety Cab Messaging, which informs electronic logging devices (ELD) and other systems for on-road monitoring of fleets and can sense brake heat or facilitate weigh station bypasses. Another safety technology to consider is Automated Incident Detection (AID), which can be integrated with other ITS investments.

USDOT collaborates with states to provide Work Zone Data Exchange specifications, which allow infrastructure owners to share work zone data for third party use. This data can then be made available through other applications to provide advanced notification of conditions, allow for truckers to plan different routes to avoid work zones, and improve safety outcomes for those working in the work zone and those travelling near it. Although some or much of the investment will be made by the private sector, GDOT can ensure that technology systems and ITS on the roadways can appropriately interface with other applications through embedded technology systems on the roadways and at rail crossings.

Freight Collaboration Systems

Freight collaboration systems involve data and information sharing among supply chain managers, service providers, infrastructure providers, freight vehicles and infrastructure itself. The objective is better decision making and ultimately the optimization of operations in real time. Automation of the

process improves speed, precision and cost in many cases; Vehicle-to-Infrastructure data exchange and Internet of Things concepts are two examples of highly automated interactions.

The technology and adoption of these systems will continue to advance over the three-decade horizon of this Plan. They can be expected to have a material effect on delay costs and freight productivity statewide, ranging from Interstate to first and last mile operations and to complex logistical ecosystems like ports, airports and other intermodal centers. While much of the investment will be by the private sector, freight system performance will benefit from their investment, and GDOT will continue to seek options to be a partner in such opportunities. Roadside sensors, communications infrastructure, and the reporting and management of road conditions are ways GDOT is participating today. This will further evolve, and the Foundational and Catalytic investments in this plan produce an upgraded environment in which collaborative systems can function and be supported.

Connected and Autonomous Vehicle (CAV) Implementation

The technology enabling connected and autonomous vehicle operation is continuing to grow in deployments in new trucks and automobiles, notably through advanced driver assistance systems (ADAS). GDOT has been supporting their function in many ways, from lane striping to broadband and vehicle-to-infrastructure systems examples of the latter. Driverless truck operations continue to be researched and developed by the private sector. As the technology continues to improve, affecting the efficiency as well as the safety of trucks and of their interaction with automobiles similarly equipped. Over three decades, the strides in this technology are likely to be substantial and profound.

CAV implementation involving freight and passenger vehicles will improve speeds and reliability especially on Interstate highways, where limited access and truck-friendly designs create favorable conditions. Commercial vehicle lanes in the Catalytic program magnify this advantage while continuing ITS programs undergird it, such that the Innovative program element is mostly directed toward CAV network planning and design.

5.4. Plan Considerations

Previous sections discuss recommendations to meet critical issues to benefit freight mobility in Georgia. This section compiles other considerations in implementation of this Freight Plan including potential studies to advance opportunities from the recommendations and discussion of how the plan meets specific considerations required by the Bipartisan Infrastructure Law and proceeding guidance.

5.4.1. Military Freight

The Strategic Highway Network (STRAHNET) and the Strategic Rail Corridor Network (STRACNET) are designated nationally to prioritize infrastructure and connectivity needs for national defense. In addition, in 2022 the United States Transportation Command (USTRANSCOM), in coordination with FHWA, designated 18 Power Projection Platform (PPP) highway routes connecting vital military installations to seaports and airports. One of those routes is entirely in Georgia and two more traverse the state:

- Fort Gordon, GA (near Augusta) to the Port of Savannah, GA, mainly following US 25 and I-16
- Fort Benning, GA (near Columbus) to the Port of Jacksonville, FL, mainly following US 280, US 82, and I-75 in Georgia
- Fort Campbell, KY to the Port of Jacksonville, FL, mainly following I-75 across Georgia and using I-285 through Atlanta

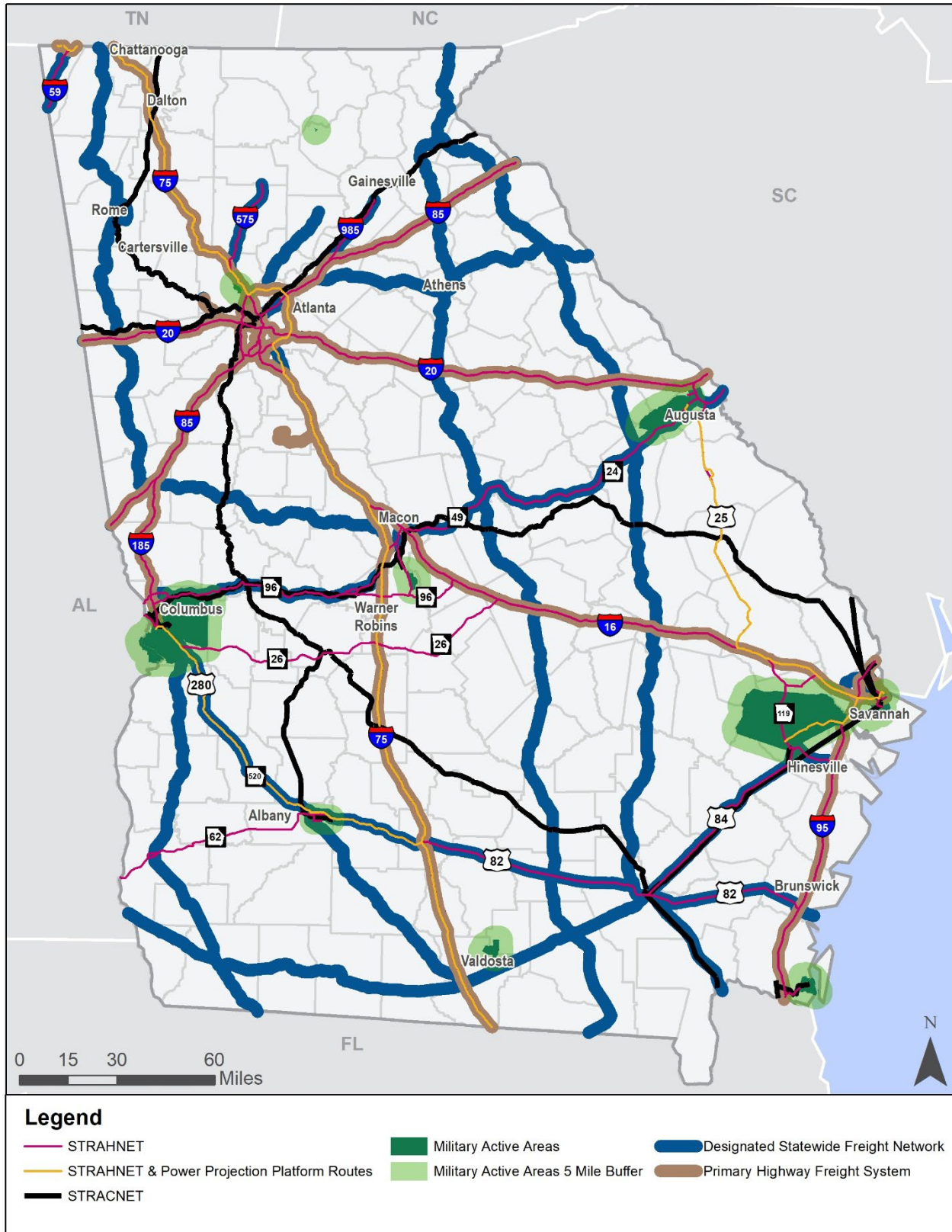
The PPP routes, STRAHNET, STRACNET, and Georgia's 11 military bases representing the four major armed services - Army, Navy, Marine Corps and Air Force - are depicted in **Figure 151**. The map also shows the Primary Highway Freight System (PHFS), which covers a majority of the PPP and STRAHNET routes in the state. Other STRAHNET routes are along Georgia's State Freight Network (SFN), which is the state's core system for roadway freight. Four projects on the NHFP Constrained Project List (from Section 5.3.3) are located along the PPP route from Fort Campbell to the Port of Jacksonville: the commercial vehicle lanes on I-75 from I-475 to SR 155, a new interchange at I-75 and Bethlehem Road, and reconstructions at the I-75/SR 133 interchange and the I-285/I-20 eastside interchange.

GDOT works in collaboration with the Department of Defense and specifically with USTRANSCOM to support the movement of military equipment and freight. STRAHNET and SFN routes are priority factors in GDOT's allocation of maintenance funds. The forms of funded maintenance encompass traffic signals and devices, bridges and bridge repair, pavement/concrete marking and preservation, guardrails and landscaping, and the installation of sound barriers. The GDOT Major Mobility Investment Program includes widening of I-16 between I-95 and I-516 and reconstruction of the I-16 at I-95 Interchange, a set of improvements beneficial to the Fort Gordon route to the port, and due for completion in 2023. Additional investments identified in this Plan affect all of the PPP facilities, notably on I-75, I-285, I-20 and I-16, including the I-75 northbound Commercial Vehicle Lanes Project between Macon and south Metro Atlanta, which will speed vehicles returning north from Jacksonville for reloading at Fort Campbell.

There are initiatives with indirect benefits as well, such as improvements to Atlanta truck routes that can relieve and improve reliability on I-285. Georgia's ports and access to them by road and rail are a major strategic focus that this Plan identifies; the container operations at Savannah are a key example, while the roll-on/roll-off capabilities at Brunswick serve wheeled equipment and provide redundancy to similar capabilities at Jacksonville just 70 miles away.



Figure 151. Military Freight Network



5.4.2. Environmental Considerations

GDOT strives for excellence in the environmental review process and in addition to policies and procedures committed to ensure compliance with federal regulations. The GDOT Resiliency Committee is made up of management from various important offices, with the goal to:

- Recommend Projects for grant submittal
- Hazard and Risk Assessments
- Determine which projects to build resilience into
- Determine how to capture costs for reimbursements
- Expansion of the resilience program

The Offices of Maintenance, Roadway Design, Traffic Operations, Bridge Design, Environmental Services, Roadway Design, Performance Management and Research, Construction, Planning, Design Policy and Support, and Program Delivery. A goal of the committee is to prepare a statewide Resiliency Plan in 2023.

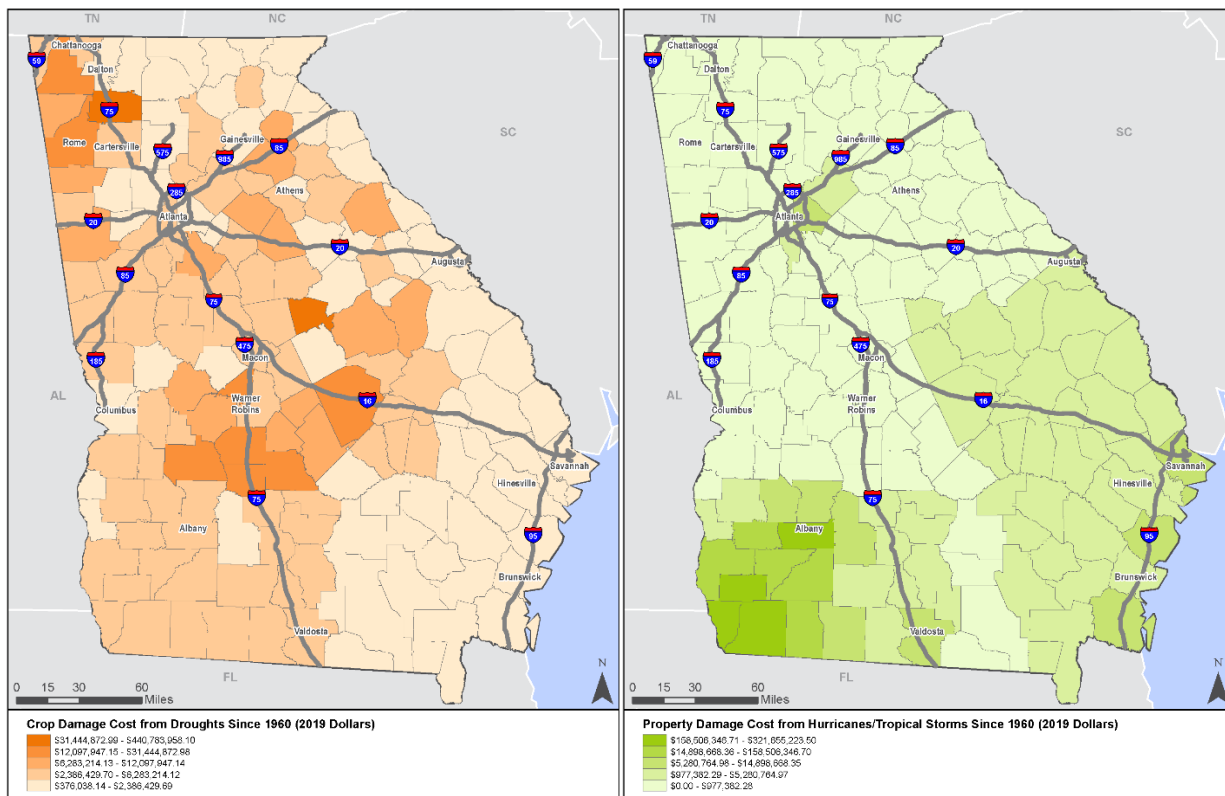
Additionally, GDOT fosters stewardship and improvement of policies and procedures through the Interagency Office of Environmental Quality and the Planning and Environmental Linkages Task Force. These existing groups serve as resources for ensuring that freight projects adhere to the strategies set forth.

Extreme weather and Natural Disasters

GDOT Office of Planning is coordinating with Georgia Tech to document the effects of extreme weather events in Georgia, The resiliency focused project also aims to develop and apply approaches for implementing and improving resilience efficiently across Georgia's transportation system– the organization, its institutions – policies, business processes (i.e., work methods), plans and procedures, and the physical transportation system (including its smart components), supported by decision-making tools and data.

Counties that have been impacted by extreme weather are shown in **Figure 152**. As documented in this Plan, the movement of food and agriculture is a key industry within the state and events that impact crops affect that industry. Georgia benefits from a degree of protection from severe storms because its relatively short coastline lies further west from the Atlantic Ocean than Florida and the Carolinas, and thus has historically been less exposed to wind and water. **Figure 152** displays where weather events have posed a material risk to industry in Georgia, particularly to farmlands in the southern part of the state.

Figure 152. Cost of Extreme Weather Events



Drought can be exacerbated by extreme heat, and high temperatures can be common across the southern United States. Extreme heat may pose risks to Georgia’s infrastructure.

Accordingly, GDOT created the position of Manager of Emergency Operations to implement policies and regulations when events occur and coordinate with other state agencies such as the Georgia Emergency Management and Homeland Security Agency. Policies are in place with defined roles and responsibilities and a unified response from necessary state agencies.

Georgia has developed guidebooks for dealing with extreme winter weather and hurricanes. These detail specific recommendations for the public to safely evacuate from areas in danger of hurricanes or tropical storms. GDOT has designated certain roadways as hurricane evacuation routes; I-16 (a key facility for investment in this Plan) becomes a one way “contra-flow” evacuation corridor from Savannah to Dublin in the event of emergencies. GDOT has a Road Weather Information System (RWIS) designed to monitor road conditions during severe winter weather.

A project is being developed to use Unmanned Aerial Vehicles (UAV) to assess damage after severe weather events. These UAVs will be able to assess damage to the state’s transportation system in a more efficient manner to assist first responders to rescue and cleanup efforts.



Flooding and Stormwater Runoff

GDOT has policies and procedures in place to address potential flooding and stormwater runoff as a part of the Plan Development Process (PDP)¹⁵¹ to ensure standards are met during planning and engineering of projects, including freight projects. GDOT is issued a National Pollutant Discharge Elimination System (NPDES) stormwater permit from the Georgia Environmental Protection Division (EPD), a division of the Georgia Department of Natural Resources (GADNR) approximately every five years with updates as needed based on regulatory changes. This permit authorizes GDOT to discharge stormwater from a municipal separate storm sewer system (MS4) to the waters of the state of Georgia using appropriate stormwater management. Guidance for meeting stormwater management requirements can be found in MS4 Plan Development Process flow chart¹⁵², GDOT's *Drainage Design for Highways Manual* and Georgia Soil and Water Conservation Commission (GSWCC) *Manual for Erosion and Sediment Control in Georgia*.

GDOT evaluates the potential for floodplain impacts in planning and designing projects for applicable projects, in accordance with *Executive Order 11988 Floodplain Management*, and impacts to downstream properties. GDOT Drainage Design for Highways includes technical requirements. GDOT's Office of Bridge Design and Maintenance reviews all hydraulic reports for bridges crossing water. GDOT's Office of Environmental Services (OES) has a *Floodplain Toolkit* for assessing impacts and coordinating with appropriate offices within GDOT to design for minimizing impacts to floodplains and therefore mitigating for flooding in the PDP. These policies and procedures serves as the strategy for minimizing flooding and stormwater runoff that may be associated with freight.

Air Pollution

The Clean Air Act (CAA) 42 U.S.C. §7401 et seq. (1970) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. Air quality in Georgia is monitored by the Georgia Environmental Protection Division (EPD). **Table 115** shows the air quality statistics from EPA for the counties that are measured in Georgia and that all measurements are under the thresholds. In October 2015, the EPA changed the threshold for ozone from 0.075 parts per million to 0.070 ppm, and in August 2018 seven metro Atlanta counties (Bartow, Clayton, Cobb, DeKalb, Fulton, Gwinnett and Henry) were designated as nonattainment for the 2015 ozone NAAQS. In October 2022, EPA redesignated the nonattainment area to attainment. As part of the redesignation the Atlanta area is in maintenance and the EPA has approved the State's plan for maintaining attainment.¹⁵³

¹⁵¹ See PDP Sections 5.13, 6.3.3, and 7.3.4

¹⁵² <https://www.dot.ga.gov/PartnerSmart/DesignManuals/PDP/MS4%20Preconstruction%20PDP%20Process.pdf>

¹⁵³ <https://www.govinfo.gov/content/pkg/FR-2022-10-17/pdf/2022-21653.pdf>

Table 115. Air Quality Measurements from EPA for Georgia

County	CO 8-hr (ppm)	Pb 3-mo (µg/m ³)	NO ₂ AM (ppb)	NO ₂ 1-hr (ppb)	O ₃ 8-hr (ppm)	PM ₁₀ 24-hr (µg/m ³)	PM _{2.5} Wtd AM (µg/m ³)	PM _{2.5} 24-hr (µg/m ³)	SO ₂ 1-hr (ppb)
Bibb County	ND	ND	ND	ND	0.063	ND	9.8	24	3
Chatham County	ND	ND	ND	ND	0.058	ND	10.1	22	50
Chattooga County	ND	ND	ND	ND	0.056	ND	ND	ND	ND
Clarke County	ND	ND	ND	ND	0.06	ND	10.1	25	ND
Clayton County	ND	ND	ND	ND	ND	ND	8.9	19	ND
Cobb County	ND	ND	ND	ND	0.062	ND	8.8	20	ND
Coffee County	ND	ND	ND	ND	ND	ND	6.8	15	ND
Columbia County	ND	ND	ND	ND	0.056	ND	ND	ND	ND
Dawson County	ND	ND	ND	ND	0.061	ND	ND	ND	ND
DeKalb County	1	ND	14	50	0.067	44	9.7	22	2
Dougherty County	ND	ND	ND	ND	ND	ND	10.1	30	ND
Douglas County	ND	ND	ND	ND	0.07	ND	ND	ND	ND
Floyd County	ND	ND	ND	ND	ND	ND	IN	IN	ND
Fulton County	2	ND	17	46	0.066	32	9.7	20	4
Glynn County	ND	ND	ND	ND	0.054	ND	7.7	18	IN
Gwinnett County	ND	ND	ND	ND	0.065	ND	IN	IN	ND
Hall County	ND	ND	ND	ND	ND	ND	9.1	21	ND
Henry County	ND	ND	ND	ND	0.066	ND	ND	ND	ND
Houston County	ND	ND	ND	ND	ND	ND	9.6	26	ND
Lowndes County	ND	ND	ND	ND	ND	ND	8.5	21	ND
Murray County	ND	ND	ND	ND	0.063	ND	ND	ND	ND
Muscogee County	ND	IN	ND	ND	0.061	ND	11.1	35	ND
Paulding County	ND	ND	ND	ND	ND	ND	IN	IN	ND
Pike County	ND	ND	ND	ND	0.061	ND	ND	ND	ND
Richmond County	ND	ND	ND	ND	0.064	58	12.1	38	59
Rockdale County	ND	ND	ND	ND	0.063	ND	ND	ND	ND
Sumter County	ND	ND	ND	ND	0.059	ND	ND	ND	ND
Walker County	ND	ND	ND	ND	ND	ND	IN	IN	ND



Washington County	ND	ND	ND	ND	ND	ND	10.7	26	ND
Wilkinson County	ND	ND	ND	ND	ND	ND	IN	IN	ND

CO - Second maximum non-overlapping 8-hour concentration (applicable NAAQS is 9 ppm)
Pb - Maximum rolling 3 month average (applicable NAAQS is 0.15 µg/m³)
NO₂ (AM) - Arithmetic mean concentration (applicable NAAQS is 53 ppb)
NO₂ (1-hr) - 98th percentile daily maximum 1-hour concentration (applicable NAAQS is 100 ppb)
O₃ - Fourth daily maximum 8-hour concentration (applicable NAAQS is 0.070 ppm)
PM₁₀ - Second maximum 24-hour concentration (applicable NAAQS is 150 µg/m³)
PM_{2.5} (Wtd AM) - Weighted annual mean concentration (applicable NAAQS is 12 µg/m³)
PM_{2.5} (24-hr) - 98th percentile 24-hour concentration (applicable NAAQS is 35 µg/m³)
SO₂ - 99th percentile daily maximum 1-hour concentration (applicable NAAQS is 75 ppb)
ND - No Data
IN - Insufficient data to calculate summary statistic
µg/m³ - micrograms per cubic meter
ppm - parts per million
ppb - parts per billion

Additionally, GDOT has completed their National Electric Vehicle Infrastructure (NEVI) Deployment Plan to plan for electric vehicle charging along Alternative Fuel Corridors within the state. As transportation is a source of air pollutants, this supports efforts to positively affect air quality. Additionally, one focus of Plan recommendations is treatment of freight bottlenecks in the state, which improves flow, minimizes idling time and has a net benefit for air quality.

The State’s plan for air quality maintenance, investment in zero-emissions infrastructure and projects that reduce freight bottlenecks, serve as the strategy for minimizing impacts to local air pollution that may be associated with freight.

Wildlife Habitat Loss

In certain areas of the state, wildlife habitat can be lost due to road construction and expansion by converting land to roadway use, or by creating fragmentation of wildlife habitat. New roadways may also impact wildlife movement which can contribute to road-related mortality of wildlife. This may also prevent dangers to motorists that come into contact with wildlife on the roadways. Many of the project recommendations in the Plan are along existing roadway corridors. These would be assessed for potential impacts to wildlife and possible consideration of wildlife crossing investments. **Figure 153** below shows the locations of critical habitat in Georgia and areas for conservation that serve as habitat for wildlife.

The Georgia Department of Natural Resources (GDNR) has a State Wildlife Action Plan to conserve populations of species and their habitats. The State Wildlife Action Plan (SWAP) uses the best available data to provide a comprehensive, adaptable assessment of conservation options and the best ways to address them. Within the SWAP, GDNR

identifies high priority conservation area for wildlife and at-risk species. The SWAP specifically identifies the partnership with GDOT to minimize impacts to high priority species when developing road construction and maintenance projects.

GDOT conducts ecological surveys and impact assessments for transportation investments to minimize or avoid adverse effects to the natural environment. This is managed through the Office



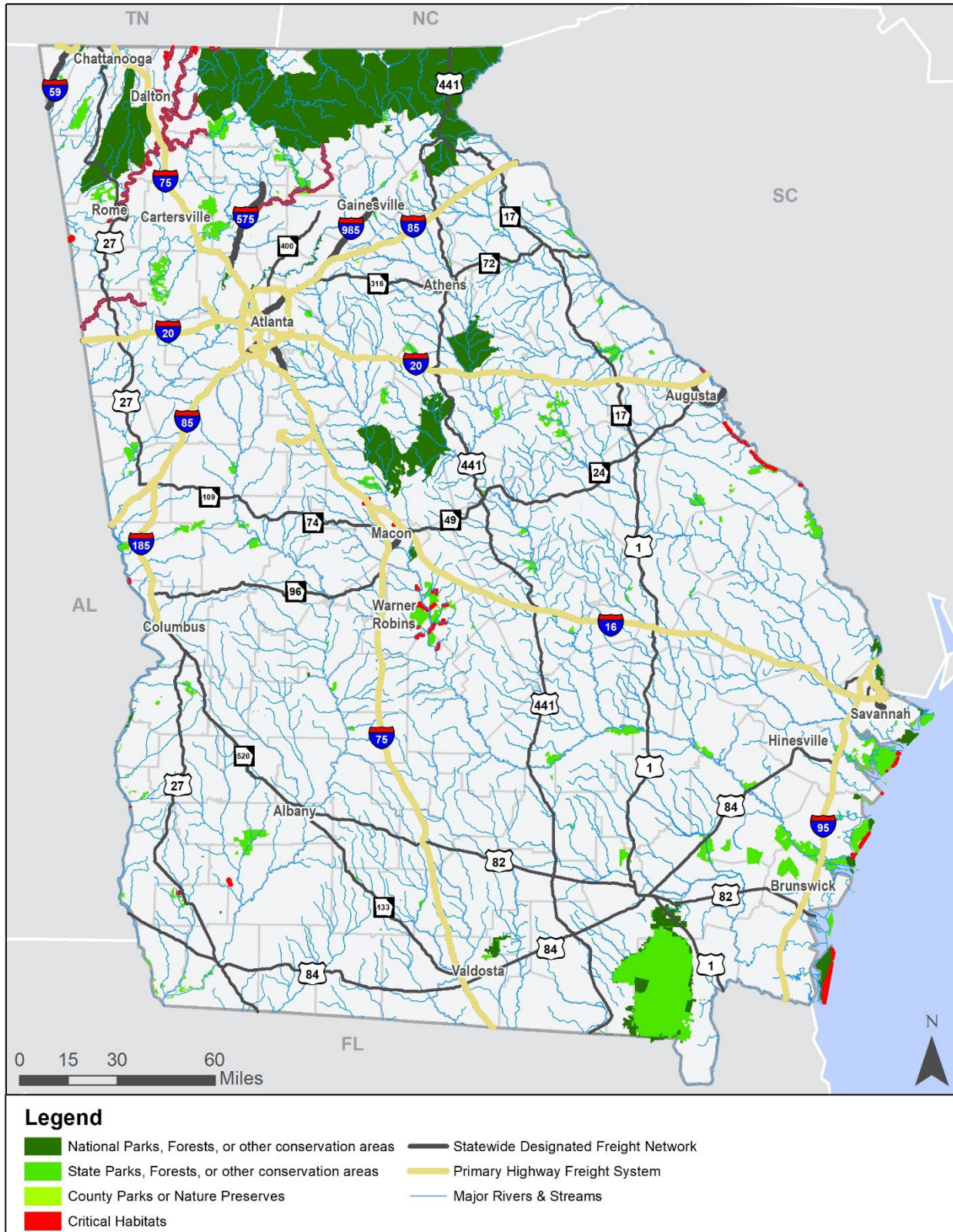
of Environmental Services and the procedures are detailed in guidebooks available on GDOT's web site. If it is determined during the ecological surveys that mitigation measures are needed for wildlife and/or protected species, mitigation measures would be recommended to minimize impact. There are a broad spectrum of mitigation measures to limit interaction with wildlife, including but not limited to design features such as wildlife crossing signs to alert drivers, safe passageways for wildlife crossings such as tunnels or overpasses, and minimizing disruption to conservation areas. FHWA provides resources on best practices related to wildlife in the Environmental Review Toolkit¹⁵⁴.

The strategy to address wildlife habitat loss is accomplished through continued coordination with GDNR, conducting project specific ecology reviews and using best practices from FHWA for mitigating wildlife interactions.

¹⁵⁴ https://www.environment.fhwa.dot.gov/env_topics/wildlife.aspx



Figure 153. Critical Habitat



5.4.3. Integration with other State plans

The Georgia Freight Plan was carefully planned to draw from and build on other Georgia state planning efforts, tools, and products, and to (in turn) inform updates to future state planning efforts, tools, and products.

One of the initial work steps was to identify, assemble, and review a comprehensive list of relevant state resources, as listed in **Table 116**. These resources informed the Freight Plan’s goals, technical analysis methods, inventory of potential projects, performance measurement approach, and final recommendations.

Table 116. Summary of State Plan Resources Integrated with the Georgia Freight Plan

Document	Source
Georgia Statewide Freight and Logistics Plan 2010-2050	www.dot.ga.gov/freight
Georgia 2050 Statewide Transportation Improvement Plan (SWTP)	https://www.dot.ga.gov/GDOT/Pages/SSTP.aspx
Georgia 2021 Statewide Strategic Transportation Plan (SSTP)	https://www.dot.ga.gov/GDOT/Pages/SSTP.aspx
Georgia State Rail Plan (2021)	https://www.dot.ga.gov/InvestSmart/Rail/StateRailPlan/Georgia%20SRP%20Final%20Draft.pdf
Georgia State Rail Grade Crossing Action Plan (2011) and Update	https://railroads.dot.gov/GARISA
Georgia Statewide Aviation System Plan (2018)	https://www.dot.ga.gov/InvestSmart/Aviation/AirportAid/StatewideAviationSystemPlan.pdf
Georgia Statewide Air Cargo Study (2022)	https://www.dot.ga.gov/InvestSmart/Aviation/Documents/AirCargo/TechnicalReport_AirCargoStudy.pdf
Georgia Ports Authority data and publications	https://gaports.com/publications/
GDOT Traffic Operations data and publications	https://www.dot.ga.gov/GDOT/pages/RoadTrafficData.aspx
GDOT State Route Prioritization/TAM (2018)	https://www.dot.ga.gov/InvestSmart/TAM/GeorgiaStateRoutePrioritization.pdf
GDOT Regional Studies (47 total)	https://www.dot.ga.gov/GDOT/Pages/Studies.aspx



The Freight Plan is designed to implement a statewide vision and corresponding goals and objectives. It utilizes data collected in previous studies, data and modeling tools maintained by GDOT and other state agencies on an ongoing basis, the most current available Federal data, and state-of-the-practice commercial data sources. While it carries forward many of the recommendations identified in previous studies, it also adds many significant new recommendations developed through the Freight Plan analysis. Finally, it places the recommendations firmly within a performance-based framework that quantifies the benefit of project/policy opportunities, looking at all modes through the year 2050. As a result, the Georgia Freight Plan is well-positioned to serve as an effective platform document for future updates to statewide transportation plans, modal system plans, and multi-state planning efforts.

5.4.4. Opportunities for Multi-State Alignment

This Plan presents an opportunity to align investment strategies and planning efforts with states that are positioned up or down stream in key supply chains. Key areas for alignment include: technology, policy and planning, corridor development, and supply chain resiliency.

This Plan recommends strategies to expand truck parking, implement technology to improve truck parking data-sharing, and innovations such as commercial vehicle only lanes. Multi-state groups such as ITTS and ETC can serve as a forum for collaboration among states and ensuring that new innovations are implemented seamlessly across state boundaries. Similarly, the development of policies for usage of commercial vehicle lanes should be coordinated to manage driver expectations on long-haul trips.

Investments on freight corridors, including the Primary Highway Freight System (PHFS), should be coordinated with neighboring states at the planning stage to identify priorities and during project development to coordinate on phasing and construction impacts. For example, Georgia and South Carolina are coordinating a series of I-85 capacity projects underway in each state, with longer range plans to reach the state line. Activities such as construction lane closures and coordinating financing of Interstate bridges will be key to advancing multi-state freight corridor projects.

Supply chain resiliency is a critical issue for today's freight industry. Coordination amongst state DOTs, Port Authorities, and other key freight stakeholders can help identify opportunities for redundancy in transportation systems and develop coordinated emergency plans. Coordination of Georgia's inland port strategy with that of neighboring states could result in new strategies to reduce highway congestion and improve the efficiency of seaports.

5.4.5. Summary of Program and Policy Actions

Specific programs are included in Foundational and Catalytic investment categories to support maintenance programs, provide for urban curbside management, support driver training, provide access to economic development sites, and employ information services for truck parking. Recommended policies build on these program recommendations to support freight trends in Georgia and continue to monitor and assess new and changing markets, emerging technologies, and alternative fuels. The following sections describe the three factors and associated policies.

E-commerce

E-commerce and facility expansion is steadily changing the Georgia freight distribution network. Shifts to omnichannel and online shopping has been spurred by changing consumer expectations and digitization of payments and shopping. E-commerce requires three times the warehouse space to move the same volume as traditional retail, resulting in additional warehouse and real-estate needs¹⁵⁵. To add to this, reverse logistics is a large and important component of the e-commerce supply chain with unique challenges and complexities for e-tailers and supply chain partners; for example, reverse logistics require an average of up to 20 percent more space¹⁵⁶. The requirement of more space has implications for demand changes affecting the transportation network. The policy is to facilitate more regional and multi-jurisdictional coordination to understand the evolution of e-commerce, and to support economic development objectives with a process for understanding the demands on the transportation network and the necessary first mile/last mile connectivity.

Port of Savannah

The Port of Savannah has become a global gateway-of-the-future. As global geopolitics and pandemic supply chain volatility have risen, shifting trade patterns have led to an increased focus on East Coast ports. Savannah is leading the East Coast port market share growth for containerized import and export volumes as these gateway shifts occur. By creating a significant increase in freight traffic in new routes and directions, the associated volumes also can increase congestion, especially around intermodal terminals and distribution centers, resulting in a need for new surface transportation infrastructure. The Department will aim to prioritize roadway and multimodal projects that enable cargo flow to and from the Port of Savannah to reduce delay and cost to U.S. supply chains.

Advanced Technologies

As discussed in Section 4.4, technology changes and advancements are rapidly occurring. Autonomous driverless operations in controlled environments will be tested in the near term; trucks in point-to-point operations capable of autonomy but retaining drivers for safety are apt to appear in the 2030's. This has the potential for increased efficiency, reliability, and speed; however, the development and ramp up phases could be a hindrance to each of those KPIs. The policy is to continue to remain agile in technology and invest in systems with universal function to facilitate private sector collaboration.

5.5. Conclusion

The Department seeks to support logistics-enabled businesses in Georgia by investing in a portfolio of freight projects that support and enable economic growth in the state. GDOT's metrics-driven approach to freight planning aims to invest taxpayer funds in a freight network results in tangible benefits for logistics-enabled industries.

¹⁵⁵ Source: Department of Commerce; Prologis

¹⁵⁶ Source: Freight Waves



Georgia has steadily grown as a leading destination for business and is projected to maintain a growth rate of 2 to 5 percent in its three key industry groups: distribution, manufacturing, and food and agriculture. To maintain growth and preserve Georgia's status as the premier destination for business, the Department seeks address the effects of a projected increase in freight volume, value, and tonnage through 2050. These critical investments in Georgia's infrastructure are being considered for their strategic importance to these vital industries and their contribution to the state's current and future economic growth.