FULTON INDUSTRIAL BOULEVARD IMPROVEMENT DISTRICT

FREIGHT CLUSTER PLAN

Inventory and Assessment

FULTON INDUSTRIAL BOULEVARD IMPROVEMENT DISTRICT

CONTENTS

FULTON INDUSTRIAL BOULEVARD IMPROVEMENT DISTRICT

TABLES

FIGURES

1 INTRODUCTION

The Boulevard Community Improvement District (CID) is undertaking a Freight Cluster Plan (FCP) to understand how transportation infrastructure within the Fulton Industrial District (FID) is being used for the handling of freight. The purpose of the FCP is to address transportation planning, traffic operations, and related planning needs, and to identify and recommend projects and policy changes to address those needs. This technical memorandum provides a detailed inventory of the existing conditions within the CID study area and an assessment of what parts should be improved to better support the freight network. The aspects of the CID that are covered in this technical memorandum include:

- Previous studies and plans that are relevant to the study area;
- The local and regional freight network;
- Transportation infrastructure;
- Land use and zoning; and
- Current and future freight trends.

The findings in this memorandum form a major part of the foundation for policy and project recommendations to be developed in Task 6 of this study.

2 POLICY AND PLAN REVIEW

This section of the report reviews previous studies that are relevant to the CID study area and the freight cluster plan. Specifically, the review focuses on state and regional plans that have a freight focus, comprehensive transportation plans, comprehensive plans, local plans, and other major ongoing capital and maintenance projects in or adjacent to the CID. State and regional freight, rail, and truck parking plans provide insight into the overarching freight trends and issues impacting the Boulevard CID. Comprehensive transportation plans provide the long-term transportation investment plan for counties and cities. Comprehensive plans establish the vision for the future growth of cities and counties from a land-use perspective. Both are important sources of information on future investments and potential changes to land use. Local plans provide detailed information, often at the corridor and parcel levels, of the current and future transportation and land use issues impacting the CID. Examples include the CID's 2013 Master Plan, studies completed as part of the ARC's Livable Centers Initiative grant program, and plans produced as part of the City of Atlanta's neighborhood planning unit program.

It should be noted that though many of these plans were recently conducted, the long-term impacts of the COVID-19 pandemic on land use development patterns, travel behavior, and funding, could significantly alter the assumptions and forecasts on which these plans were based. However, they are still useful for understanding the current and future outlook of the CID. Some notable takeaways from the review of previous studies include the following:

- From the review of state and regional plans, considerable growth in freight volumes is expected over the long-term at the state and regional levels. This growth will result in higher volumes on major freight corridors such as SR 70/Fulton Industrial Boulevard. Furthermore, growth in freight volumes will exacerbate existing challenges (e.g., safety, travel time reliability, congestion) unless mitigating steps are taken.
- There is a region-wide shortage in truck parking for both long-term and short-term staging needs. Though a major truck parking facility is proximate to the CID, there is a complete absence of major truck parking options in Cobb County, north Fulton County, Gwinnett County, and other parts of Metro Atlanta that place a strain on the entire region. Growth in freight volumes will only worsen this current challenge without additional capacity and operational strategies to utilize existing supply more efficiently.
- The review of comprehensive transportation plans revealed that roadways within the CID have been identified as priority corridors for investments in transit, freight, and innovative transportation technologies. Examples include SR 6/Camp Creek Parkway and SR 70/Fulton Industrial Boulevard. The Southern Fulton Comprehensive Transportation Plan identified SR 6/Camp Creek Parkway as a target corridor for arterial rapid transit while SR 70/Fulton Industrial Boulevard was identified as a priority corridor for automated parking systems, electric vehicle charging stations, signal priority for transit and/or freight, and other innovative technology solutions.
- Though much of the land in the CID serves industrial purposes, thereby limiting conflicts with incompatible land uses, proposed changes to future land uses along the borders of the CID could alter this over the long term. The review of comprehensive plans and local plans showed that future plans to spur redevelopment at certain nodes in the CID could introduce higher-intensity, residential

and mixed-use developments. This was most evident along portions of Bolton Road, SR 8/US 78/US 278/Donald L. Hollowell Parkway, and Aviation Circle at the northern end of the CID. Steps must be taken to limit conflicts between potentially growing numbers of competing roadway users and enhance safety and mobility for all.

2.1 State and Regional Plans

2.1.1 Georgia Department of Transportation (GDOT) Freight and Logistics Plan Update, 2013

2.1.1.1 Objectives and Overview

The GDOT Statewide Freight and Logistics Action Plan was completed in 2013. The plan performed an assessment of the State's multimodal freight needs and provided a strategy for addressing those needs. It was conducted in conjunction with the private sector to facilitate a strategic, business-oriented approach to develop specific freight and logistics improvement solutions with the largest economic returns. The Plan integrated freight modes into GDOT activities and serves as an economic development tool for marketing Georgia and growing jobs and investment. It should be noted that GDOT has begun the process of updating the statewide freight plan.

2.1.1.2 Key Findings

Some key findings from the Georgia Freight and Logistics Action Plan include the following:

- Trucking is the backbone of the state's multimodal freight system. Trucks were estimated to carry 75 percent of the total 853 million tons of freight flowing around Georgia and 88 percent of the total value. Rail was estimated to carry just under 25 percent of total tonnage and 10 percent of total value. Water and air carried less than one percent of total tonnage and about two percent of total value.
- Trucking is the dominant mode of moving freight in Georgia and is expected to continue to be the dominant mode over the long term. It is also the primary connecting mode for marine, rail, and air cargo to final destinations in Georgia. The trucking industry experiences a significant amount of congestion in Metro Atlanta where both long-haul and local/distribution truck traffic are the highest. This congestion is forecast to get more severe (in terms of delay per vehicle), longer (in terms of the duration of peak periods), and more prevalent on the interstate corridors that connect Atlanta with its neighboring states and key trading partners.
- Metro Atlanta is the second busiest "inland port region" in the U.S. as it moves the second highest tonnage of freight of all the non-coastal metropolitan regions in the country. It is responsible for over one-third of all the freight traffic in Georgia. This large volume of freight is due to Atlanta's dual role of being the primary distribution hub in the south and also having a very significant consumer base as the most populous metropolitan region in the south.
- The Port of Savannah is the key distinguishing feature of the freight infrastructure in Georgia. It has been successful in capturing discretionary container traffic along the East Coast and boosting Georgia's economy. Deepening the Savannah Harbor and channel to accommodate the larger ships is critical to maintaining this distinction. To maximize Georgia's full potential to move marine

cargo in the longer term, an additional port in Jasper County, South Carolina will be needed along with expansion of the rail and road connections to both the Port of Savannah and the Jasper Port.

- The Georgia Freight and Logistics Action Plan determined that by investing $18-$20 billion over the next 40 years in freight improvement projects, the State could generate over $65 billion in additional economic output and thousands of new jobs.

2.1.1.3 Recommendations

For each mode, the GDOT Statewide Freight and Logistics Plan recommended a set of improvements and estimates the economic return on those investments. Just outside the CID study area, the reconstruction of the I-285 at I-20 interchange was identified as a priority in the statewide freight plan for addressing a major freight bottleneck. That project is now underway as part of GDOT's Major Mobility Investment Program (MMIP).

Also, just outside the CID study area in Cobb and Douglas Counties, the SR 6 Truck Friendly Lanes project was identified as a priority investment. This project would improve freight mobility and travel time reliability on SR 6 as it connects the Norfolk Southern Austell-Whitaker Yard to I-20. In addition to geometric improvements (e.g., wider shoulders), the project would use ITS and other transportation technologies to improve travel conditions for passengers and freight. Examples include communicating information on travel times using dynamic message signs, freight signal priority, and eliminating dilemma zones for trucks at intersections. The SR 6 Truck Friendly Lanes project is currently in the scoping phase for a No Build Concept Report.

2.1.2 GDOT Georgia State Rail Plan, 2020

2.1.2.1 Objectives and Overview

The GDOT Georgia State Rail Plan was developed for the purpose of guiding the state's rail freight and passenger transportation planning activities and project development plans for the next 20 years. The 2020 Georgia State Rail Plan provided updates to the 2015 Plan on conditions that have changed and important short-term and long-term opportunities for investment including:

- The increasing demand for passenger and freight rail services;
- Upgrades to state owned rail to ensure economic competitiveness; and
- Supporting operational improvements to maximize efficiency of the rail network and multimodal connections.

2.1.2.2 Key Findings

The 2020 Georgia State Rail Plan found that the state's position in freight rail has risen since the 2015 State Rail Plan was completed. Georgia increased in ranking among states in terms of number of freight railroads, originated rail tons, and originated rail carloads. The 2020 State Rail Plan also found that while total freight rail tonnage had decreased, the number of rail carloads had increased with the rise of intermodal traffic in the state.

Additionally, the 2020 Georgia State Rail Plan identified some key opportunities related to freight rail that could impact the CID. The CID does have some shortline rail infrastructure, which was specifically identified

in the Rail Plan as an area of opportunity. However, impacts to the CID would likely be primarily in the form of indirect impacts such as truck trip patterns that increasingly center on intermodal rail terminals due to increased rail connectivity to sea and inland ports:

- **Sea and Inland Ports.** Continued investment in rail connectivity to ports drive the capacity and ability of the rail and port network to increase job growth, attract new commerce, and sustain economic competitiveness.
- **Short Line Improvements.** Investments that upgrade the infrastructure of the short line rail network (such improved weight capacity to handle 286,000 lbs. axle loads) would boost rural economic development and help to divert freight traffic from the state's highway network.
- **Increasing the Usage of Freight Rail.** A single freight train can remove several hundred trucks from Georgia's highways leading to reduced greenhouse gas emissions and improved safety (i.e., the rate of fatalities per ton-mile for rail is substantially lower than trucking).

2.1.2.3 Recommendations

Though the 2020 State Rail Plan did not make recommendations specific to the CID study area, its emphasis on improving the efficiency and usage of freight rail would impact freight-intensive industries in the CID. The 2020 State Rail Plan noted that logistics and supply chain is a key industry supported by rail in Georgia and there are numerous warehouses, distribution centers and truck terminals located in the CID. Often, one or more of the state's intermodal terminals (such as the Norfolk Southern facilities at Inman Yard and Austell, and the CSX facility in Fairburn) are important to their operations.

2.1.3 Transportation Element of the Atlanta Regional Commission Atlanta Region's Plan, 2020

2.1.3.1 Objectives and Overview

The Atlanta Region's Plan is an interdisciplinary long-term set of strategies for maintaining and expanding infrastructure, sustaining, and diversifying the economy and fostering and strengthening healthy livable communities. The Transportation component of the Region's Plan is a fiscally constrained regional vision for transportation and mobility. As such, it serves as the federally compliant Regional Transportation Plan, but also serves a much broader context. The Plan placed a big emphasis on multimodalism by weaving together several supporting plans and studies for transit, walking/cycling, roadways, and freight.

2.1.3.2 Key Findings

The cost to implement the transportation vision defined by the 2020 RTP was estimated at $170 billion through 2050. The Plan's recommendations place a heavy focus on strategies to maintain and modernize the region's existing transportation system with nearly 60 percent of funding dedicated to projects that help to achieve that objective. The Plan also places an emphasis on managing transportation demand through demand management programs including telecommuting programs, land use planning, and expanding multimodal networks for walking cycling.

2.1.3.3 Recommendations

The Plan identifies the CID study area as a key regional freight generator as well as a focal point for highway-oriented commuting. Project recommendations that are within or proximate to the CID study area include:

- SR 70/Fulton Industrial Boulevard pedestrian enhancements from Lakeview Court to Westpark Place with a target year of 2024;
- I-285 west express lanes from I-20 west to West Paces Ferry Road with a target year of 2040;
- I-20 west express lanes from I-285 west to SR 92/Fairburn Road with a target year of 2040; and
- I-285 at I-20 interchange improvements with a target year of 2030.

2.1.4 Atlanta Regional Commission Freight Plan Update, 2016

2.1.4.1 Objectives and Overview

The goal of the 2016 Atlanta Regional Freight Mobility Plan Update was to enhance the region's economic competitiveness by providing efficient, reliable, and safe freight transportation while maintaining the quality of life in the region's communities. It accounted for the extensive amount of change that occurred since the 2008 plan was completed including impacts from the Great Recession and Federal legislative requirements in 2012's MAP-21 and the Fixing America's Surface Transportation (FAST) Act of 2015. The primary objectives of the Atlanta Regional Freight Mobility Plan Update were to:

- Assess the current plan against the latest understanding of existing conditions and forecasts;
- Update the plan based on the latest federal, state, and Atlanta regional policies;
- Support the development of a FAST Act compliant Regional Transportation Plan (RTP) as it relates to applicable freight provisions;
- Identify projects of national, state, and regional significance; and
- Define a path forward for project investment and establishment of responsive strategies and initiatives.

It should be noted that the Atlanta Regional Commission has begun the process to develop a new regional freight plan to account for the many changes that have occurred since the 2016 update was completed.

2.1.4.2 Key Findings

The 2016 Freight Plan Update projected that freight volumes in the region would substantially increase between 2013 and 2040, implying that significant infrastructure investments would be needed to keep pace with growth. Though much has changed globally and regionally (making the baseline freight volumes on which the Plan's forecasts were based already much different now), the overall trend of substantial growth is believed to still hold true. Other key issues identified in the 2016 Freight Plan Update, such as growth at the Port of Savannah, are still relevant. Importantly, the Freight Plan Update also identified clusters of industries resulting in freight-intensive land uses throughout the Atlanta Region that were considered the drivers of goods movements at the regional level, thus requiring more detailed study and understanding. The Boulevard CID study area was one of the identified freight clusters.

2.1.4.3 Recommendations

The 2016 Freight Plan Update recommended short- and long-term strategies for addressing critical freight needs and deficiencies while mitigating potential impacts. Additionally, it also combined projects from several different sources and prioritized them based on their performance against the plan's goals and objectives. Project recommendations that specifically impact the CID study area include:

- SR 70/Fulton Industrial Boulevard widening;
- Redesign of the I-285/Bolton Road interchange;
- Operational improvements at the intersection of Cascade Road and SR 70/Fulton Industrial Boulevard;
- Operational improvements at the intersections of SR 70/Fulton Industrial Boulevard with the I-20 entry and exit ramps; and
- SR 8/US 78/US 278/Donald L. Hollowell Parkway widening between SR 280/Hamilton Holmes Drive and I-285 to accommodate transit.

2.1.5 Atlanta Regional Commission Truck Parking Study, 2018

2.1.5.1 Objectives and Overview

The need for a regional truck parking study arose, in part, from an identified need in the 2016 Atlanta Regional Freight Mobility Plan. It found that Metro Atlanta lacks truck parking facilities, and that the region should better understand freight mobility issues centered on the lack of truck parking capacity. The regional truck parking study was also motivated because of the then impending federal regulation for electronic logging devices to digitally monitor truck driver hours of service. This meant hours for truck drivers would be more closely regulated, and the need for truck parking would increase to give drivers opportunities for proper rest.

The approach of the 2018 ARC Truck Parking Study was to examine the existing condition of truck parking in the region, identify where there were gaps, and make recommendations. These recommendations came in the form of new policies, new infrastructure, and new partnerships between local governments and trucking companies.

2.1.5.2 Key Findings

Key findings from the study include:

- A general lack of truck parking supply that was projected to worsen as truck volumes increase;
- A localized lack of truck parking around the region's perimeter (i.e., I-285);
- Though Fulton County leads the region in truck parking capacity, the complete absence of major truck parking options in Cobb County, north Fulton County, Gwinnett County, and others places a strain on the entire region;
- The federal requirement for electronic logging devices would increase demand for truck parking in the region even further; and
- Industries that require transportation of freight by truck will continue to grow in Atlanta, which will increase the demand for truck parking facilities even more.

2.1.5.3 Recommendations

Recommendations from the ARC Truck Parking study that impact the CID study area include:

- Requiring an assessment of truck parking needs and challenges as part of comprehensive transportation plans and freight cluster plans;
- With member jurisdictions, assess the need for increasing truck parking supply through options including
    - Expansion of existing truck stops and private lots;
    - Use of vacant industrial spaces and/or brownfield sites;
    - Coordination with shippers/receivers to allow on-site parking;
    - Expansion of existing public facilities; and
    - Use of closed public facilities.
- Sharing parking costs/benefits for new warehousing/distribution developments and other new freight-intensive land uses that generate demand for truck parking;
- Assess the Development of Regional Impact requirements for truck stops as the current thresholds for number of fuel pumping stations and truck parking spaces may be too low and a hindrance to the private sector increasing supply;
- Consider incentivizing off-peak freight operations in Metro Atlanta which would potentially allow truck drivers to seek parking during times in which the demand for truck parking is typically lower;
- Use zoning to develop truck parking facility design standards which, among other benefits, could lessen negative community impacts through the use of buffer landscaping, lighting requirements, and safety/security requirements; and
- Encourage local governments to review/update local zoning ordinances to address truck parking, including expansions of existing facilities and the construction of new facilities.

2.1.6 The Chattahoochee RiverLands Greenway Study, 2020

2.1.6.1 Objectives and Overview

The Chattahoochee RiverLands Greenway Study was a collaborative effort between ARC, Trust for Public Land, Cobb County, and the City of Atlanta to create a new vision for the Chattahoochee River. It established a vision and plan for the 100-mile river corridor which stretches from Buford Dam to Chattahoochee Bend State Park. The plan serves broadly as a corridor master plan as it directs greenspace development and guides investment within the study area. Importantly, the RiverLands Greenway Study called for the development of a network of greenspace and multi-use trails along the Chattahoochee River, including the portion in the CID study area.

2.1.6.2 Key Findings

The CID study area was identified in the RiverLands Greenway Study as Urban Core (Sub-Area 2) and noted that it is defined by industrial land uses. The study further observed that utility easements could be used to facilitate greenway alignments along the river's edge, mitigating the current lack of public access to the riverside. Furthermore, it noted that residential communities (even those close to the water) typically lack access to the Chattahoochee River and its resources. The industrial structures along SR 70/Fulton Industrial Boulevard act as a wall, separating neighborhoods like Monroe Heights, Riverside, Bolton, and

Collier Heights from the Chattahoochee River. During stakeholder outreach sessions, the public expressed interest in connecting regional trails, tributaries, public transit hubs, and existing community assets like parks, schools, and libraries to the river.

2.1.6.3 Recommendations

The RiverLands Greenway Study recommended that the preferred alignment of greenway go through the CID study area along the banks of the Chattahoochee River. The alternative alignment is still within the CID study area, but along SR 70/Fulton Industrial Boulevard. Potentially, multi-use trails could be developed along both which would greatly enhance pedestrian and bicycle mobility within the study area.

Additionally, the RiverLands Greenway Study recommended the development of the Proctor Creek Trail Extension. The Proctor Creek Trail Extension would extend the existing Proctor Creek Greenway to the Chattahoochee River in a way that protects ecologically sensitive areas while educating visitors about the importance of waterway health. Based on the preferred alignment, the Proctor Creek Trail Extension would connect with the Chattahoochee River within the CID study area near the I-285 bridge over the river.

2.2 Comprehensive Transportation Plans

2.2.1 Southern Fulton Comprehensive Transportation Plan, 2020

2.2.1.1 Objectives and Overview

The Southern Fulton Comprehensive Transportation Plan (SFCTP) is the long-term transportation investment plan for the south Fulton County portion of the Atlanta Region. It includes the Cities of Chattahoochee Hills, College Park, East Point, Fairburn, Hapeville, Palmetto, South Fulton, and Union City. It also includes the unincorporated portion of Fulton County in which much of the CID has been located. The SFCTP is an important input to the regional transportation planning process as it evaluated current and future transportation conditions in the study area and determined the multimodal transportation needs through the year 2050. It developed a recommended list of transportation projects to be implemented in the near-term (1-5 years), mid-term (6-10 years), and long-term (11 or more years) for south Fulton County. The SFCTP was most recently updated in September 2020.

2.2.1.2 Key Findings

A key finding from the SFCTP was that the CID study area has multiple corridors that are important for freight mobility (i.e., Economic Freight Corridors). Furthermore, the SFCTP determined that the investments needed on these corridors should focus on improving freight and economic activity. Examples of investments include freight signal priority, targeted roadway capacity improvements, reducing at-grade crossings, truck parking, raised medians, and intersection and roadway geometric modifications to better accommodate trucks. The SFCTP designated multiple corridors throughout south Fulton County as Economic Freight Corridors including SR 70/Fulton Industrial Boulevard in the CID study area.

The SFCTP also designated SR 70/Fulton Industrial Boulevard as a Smart Corridor. Smart Corridors are those where technology solutions to safety and mobility issues are especially relevant. Examples of these solutions include automated parking systems, electric vehicle charging stations, signal priority for transit and/or freight, and transit-pedestrian warning systems.

2.2.1.3 Recommendations

The SFCTP made multiple recommendations that impact the CID study area. For unincorporated south Fulton County (which has contained the CID), over half of the recommended projects in the fiscally constrained project list were operational improvements (e.g., traffic operations improvements at intersections, access management). About one-third of recommended projects were transit related (e.g., new transit capacity, transit stop or station amenities).

Some examples of project recommendations impacting the CID study area include:

- A feasibility study for a new roadway facility parallel to the north of SR 6/Camp Creek Parkway from SR 70/Fulton Industrial Boulevard to Butner Road;
- Widen SR 154/Campbellton Road to four lanes between SR 70/Fulton Industrial Boulevard and Reynolds Road;
- Widen SR 70/Fulton Industrial Boulevard from four to six lanes between SR 154/Campbellton Road to SR 6/Camp Creek Parkway;
- Streetscaping to include bicycle and sidewalk facilities on SR 70/Fulton Industrial Boulevard between Frederick Drive to Riverside Drive; and
- Arterial rapid transit on SR 6/Camp Creek Parkway from the College Park MARTA station to SR 70/Fulton Industrial Boulevard.

2.2.2 Connect Atlanta Comprehensive Transportation Plan, 2008

2.2.2.1 Objectives and Overview

The Connect Atlanta Plan is the CTP for the City of Atlanta. As the CTP, it guides the city's transportation investments over the long-term. The Connect Atlanta CTP was completed in 2008 with additional appendices added in 2015 that incorporated follow-up studies on transit-oriented development and truck routes, among others. Though only small portions of the CID's freight network are located in the City of Atlanta, some of the CTP's key findings and recommendations are relevant to the freight cluster plan.

2.2.2.2 Key Findings

The Connect Atlanta Plan outlined some key findings as they pertain to transit, pedestrian and bike infrastructure, freight, and other areas. Some of these key findings are summarized below:

- The provision of transit has not kept pace with the City of Atlanta's growth. Improving the city's transit services is a priority for keeping up with population growth and offering more modal options to residents.
- It is important to promote sustainable transportation modes by improving and expanding pedestrian and bicycle infrastructure.
- The Connect Atlanta Plan determined that improvements to network connectivity and developing effective goods movement strategies were essential to addressing congestion. It observed that Atlanta lacks a redundant network of streets that allow people to choose different routes. Regarding freight, the Connect Atlanta Plan determined that updating the city's truck route map, preserving

freight rail corridors, and incentivizing increased track capacity within existing corridors should be priorities.

In addition, a 2015 update of the Connect Atlanta Plan adopted as a technical appendix the Cargo Atlanta freight study. This study updated the City of Atlanta's truck route network as well as identified additional transportation improvements directed at freight mobility.

2.2.2.3 Recommendations

Recommendations from the Connect Atlanta Plan that impact the CID include the following:

- Bus Rapid Transit extension of MARTA's west line on new high-occupancy vehicle lanes on I-20 with transit stations at SR 139/Martin Luther King Jr. Drive and SR 70/Fulton Industrial Boulevard.
- New 2-lane street connecting SR 70/Fulton Industrial Boulevard and Bolton Road near the intersection of Bolton Road and Bolton Parkway.
- Widen SR 8/US 78/US 278/ Donald L. Hollowell Parkway from 2 lanes to 5 lanes to accommodate transit and freight from the Bankhead MARTA station to I-285.

Other recommendations that would impact the CID were completed or have already begun, such as signal timing revisions for the Bolton Road at SR 8/US 78/US 278/Donald L. Hollowell Parkway intersection and modifications to the I-285 at SR 8/US 78/US 278/ Donald L. Hollowell Parkway interchange.

2.2.3 Cobb County Comprehensive Transportation Plan Update: 2040, 2015

2.2.3.1 Objectives and Overview

Though outside of the CID study area, the Cobb County Comprehensive Transportation Plan 2040 (CTP 2040) was also reviewed as the CID shares with Cobb County some regional freight corridors (e.g., SR 6, US 78/US 278, SR 139). The CTP 2040 serves as the blueprint for all transportation investments by Cobb County and its municipalities for the next 25 years. It identified a variety of transportation investments for Cobb County, some of which potentially impact the CID.

2.2.3.2 Key Findings

A key finding from the CTP 2040 was the need to improve performance along major freight corridors in order to maintain economic competitiveness. Specifically, the CTP 2040 identified needs related to congestion on freight corridors, locations with high frequencies of truck crashes, and reducing the number of at-grade crossings. Furthermore, it stressed the need to replicate innovative solutions, such as the SR 6 Truck Friendly Lanes project currently being implemented by GDOT, on other freight corridors in the county.

2.2.3.3 Recommendations

Recommended improvements in the CTP 2040 that potentially impact the CID study area include:

- Interchange Improvements at I-20 and Riverside Parkway;
- Interchange improvements at I-20 and Six Flags Parkway
- Truck friendly lanes improvement projects on SR 6 from Luke Glenn Garrett Jr. Memorial Highway to the Douglas County Line; and

- Widening SR 139 from four to six lanes between Dodgen Road and US 78/US 278.

2.2.4 Douglas County Comprehensive Transportation Plan, 2008

2.2.4.1 Objectives and Overview

The Douglas County CTP identified transportation needs and implementation strategies for Douglas County. Despite being outside the CID study area, substantial portions of the CID border Douglas County and they share major freight corridors such as SR 6 and SR 154/166. It is important to note that the most recent CTP for Douglas County was completed in 2008 and the county is in the process of performing an update.

2.2.4.2 Key Findings

A key finding of the Douglas County CTP was that the southeastern quadrant of Douglas County (including parts of the City of Douglasville) is becoming one of the major freight distribution centers in the north Georgia region (i.e., the SR 6 Industrial Subarea). The Douglas County CTP further observed that the SR 6 Industrial Subarea has a unique character and needs due to the prevalent industrial land uses, primarily in the form of warehousing and distribution. The area borders and has easy access to the Fulton Industrial Boulevard district, I-285, I-20, and the Norfolk Southern Whitaker-Austell intermodal terminal which promotes the continued development of industrial land uses.

2.2.4.3 Recommendations

Some of the recommended improvements in the Douglas County CTP could impact the Boulevard CID. For instance, it recommended widening SR 154/166/Fairburn Road to 4 lanes between SR 92 to SR 70/Fulton Industrial Boulevard. The Douglas CTP also recommended designating I-20, US 78, and SR 166 as truck routes in the Unified Development Code. Neither of these recommendations appear to have been completed.

2.3 Comprehensive Plans

2.3.1 2035 Fulton County Comprehensive Plan, 2016

2.3.1.1 Objectives and Overview

Comprehensive plans are long-term documents that provide a vision for the future and help to guide the growth of a community. They act as a management tool to guide the decision-making process for land use, housing, transportation, the environment, and public facilities including public parks, community and recreation centers, and trails. The CID has been primarily within unincorporated Fulton County with small portions within the Cities of Atlanta and South Fulton. However, with the passage and signing by the Governor of House Bill 445, the CID is primarily within the City of South Fulton with the portion north of I-20 in the City of Atlanta and Fulton County Airport remaining in unincorporated Fulton County[1].The City of

[1] Brasch, B. “South Fulton gets Fulton Industrial, spells end for unincorporated land,” Atlanta Journal-Constitution, May 13, 2021, https://www.ajc.com/news/atlanta-news/south-fulton-gets-fulton-industrial-spells-end-for-unincorporated-land/B7QHR2JLZZAJXF67VIOVS762OQ/.

South Fulton is in the process of developing its first comprehensive plan, but for now relies on the 2035 Fulton County Comprehensive Plan.

2.3.1.2 Key Findings

The 2035 Fulton County Comprehensive Plan emphasized the need for improved transit connectivity to the CID, especially the SR 70/Fulton Industrial Boulevard corridor given its concentration of jobs. Additionally, the 2035 Fulton County Comprehensive Plan stressed the importance of the Fulton County Railway (FCR) to the region as it owns and operates over 33 miles of track within unincorporated Fulton County, 22 miles of which lie within the Fulton County Industrial Park.

An important aspect of the 2035 Fulton County Comprehensive Plan was its long-term vision for future land uses within the CID. It articulated that future land uses would remain consistent with current development patterns that are primarily industrial (e.g., manufacturing, warehousing). At key nodes along the SR 70/Fulton Industrial Boulevard corridor (at I-20, SR 6/Camp Creek Parkway, and SR 154/Campbellton Road), the 2035 Fulton County Comprehensive Plan designated industrial marketplace as the future land use. The industrial marketplace character area designation is intended to concentrate commercial activity at certain nodes along the SR 70/Fulton Industrial Boulevard corridor to serve the needs of employees and nearby residential neighborhoods. Commercial and retail services, such as convenience retail and shopping centers, may be included within industrial marketplace character areas. They may also include industrial uses such as wholesale trade distribution centers. Because of their proximity to intense industrial areas, the industrial marketplace does not accommodate residential uses.

2.3.1.3 Recommendations

Multiple recommendations were made as part of the 2035 Fulton County Comprehensive Plan that impact the CID study area. An example includes the recommendation for greater partnership between Fulton County and MARTA for future transit expansions into the CID study area. The comprehensive plan noted that a MARTA study found that Route 73-Fulton Industrial has the potential to accommodate extended length articulated buses that would provide higher ridership capacity.

Other recommendations included addressing the needs of residential communities within and neighboring the CID, such as redevelopment that adds activities and trail connections along the Chattahoochee River. The 2035 Fulton County Comprehensive Plan also recommended implementing gateway signage and streetscape improvements along the SR 70/Fulton Industrial Boulevard corridor and supporting/targeting areas of revitalization for attracting new businesses. In addition, the comprehensive plan recommended that strategies be developed to mitigate conflicts between industrial and non-industrial land uses.

2.3.2 City of Atlanta Comprehensive Development Plan, 2016

2.3.2.1 Objectives and Overview

The City of Atlanta Comprehensive Development Plan outlined the strategy for sustaining and improving the city's economic competitiveness, transportation network, and land uses over the long term. Key topics addressed in the Comprehensive Development Plan included demographic trends, economic development, housing, natural resources, historic resources, community facilities, transportation, urban design, and land use. The City of Atlanta Comprehensive Development Plan was most recently updated in 2016. Only a

small portion of the CID is located in the City of Atlanta. However, some of the Comprehensive Development Plan's key findings and recommendations are relevant to the freight cluster plan.

2.3.2.2 Key Findings

The Comprehensive Development Plan outlined some critical transportation needs for the City of Atlanta. Some that are relevant to the CID include the following:

- Traffic congestion;
- Insufficient connectivity between pedestrian, bicycle, transit, and roadway modes; and
- Conflicts due to the close proximity of freight infrastructure to neighborhoods and other areas sensitive to its impacts.

Regarding land use, the Comprehensive Development Plan also outlined some needs for the City of Atlanta that are relevant to the CID. For instance, it observed that industrial uses are being lost and redeveloped for non-industrial uses. It also noted that residential and mixed-use developments in industrial areas are creating land use conflicts.

2.3.2.3 Recommendations

A key recommendation from the Comprehensive Development Plan was the use of future land use designations to encourage revitalization along key corridors that serve the CID, namely SR 8/US 78/US 278/Donald L. Hollowell Parkway. For instance, the 5 miles of SR 8/US 78/US 278/Donald L. Hollowell Parkway between the Bankhead MARTA station and the city limits was designated a redevelopment area (i.e., an area that qualifies for redevelopment based on indications of slum and blight[2]). Furthermore, it adopted the D. L. Hollowell Parkway Redevelopment Plan which encourages commercial, residential, and other future development along the corridor. This policy is reflected in the designated future land uses for the corridor which include high density commercial and mixed use.

2.3.3 Cobb County 2040 Comprehensive Plan, 2017

2.3.3.1 Objectives and Overview

The Cobb County 2040 Comprehensive Plan (Cobb 2040) developed the county's long-term strategy for growth and development. The plan is also intended to assist Cobb's elected leaders in recognizing the need for, and the subsequent implementation of, important economic development and revitalization initiatives. As a neighboring jurisdiction, the long-term land use patterns articulated in Cobb 2040 have the potential to influence travel and development patterns in the CID.

2.3.3.2 Key Findings

Regarding transportation, Cobb 2040 echoed many of the findings of CTP 2040. Specifically, it determined that there is a need for increased capacity and/or improved operations along major truck freight routes through Cobb County. These include corridors shared with the CID such as SR 6, SR 139, and US 78/US 278.

[2] Official Code of Georgia Annotated, Title 36, Chapter 44.

Regarding land use, Cobb 2040 proposed future land use designations are largely consistent with the existing industrial land uses that border the CID. Notably, it designated much of the land bordering the CID as a priority industrial area (PIA) future land use. The PIA future land use designation works to preserve industrial land through a policy that applies more stringent criteria to requests to alter the land use of a PIA. Example criteria include the estimated impact to jobs, the tax base, and potential negative impacts to adjacent industrial areas.

2.3.3.3 Recommendations

Among other recommendations, the Cobb 2040 Comprehensive Plan recommended continued investment in the county's multimodal freight network. This included increased capacity and/or improved operations along major truck freight routes, evaluating safety needs at high-truck crash locations, and reducing at-grade railroad crossings. Regarding land use, Cobb 2040 recommended preserving industrial land uses for their ability to provide local jobs and contribute to the economy. It also recommended promoting development patterns that encourage an active lifestyle by providing access to open space.

2.3.4 Douglas County Comprehensive Plan Update, 2018

2.3.4.1 Objectives and Overview

The Douglas County Comprehensive Plan serves as the county's blueprint for development and growth over the next 20 years. It outlines transportation and land use policies to meet the county's needs over the long term. The Douglas County Comprehensive Plan was most recently updated in 2018 and contains some findings and recommendations that are relevant to the CID study area.

2.3.4.2 Key Findings

The Douglas County Comprehensive Plan identified its varied housing choices, growing cultural/recreational areas, water resources, and location all as valuable assets. However, it noted that the county is faced with challenges related to transportation and population growth. Specifically, the comprehensive plan identified workforce development as a challenge and stated that improved transportation access to existing employers is needed. It also determined that there is a need to target industry sectors that are suited to local resources and regional assets. The growing number of firms in the SR 6 Industrial Subarea which borders the CID is an example of this. Additionally, the comprehensive plan determined that preserving rural areas while allowing for growth and the provision of senior services are challenges.

2.3.4.3 Recommendations

An important recommendation made by the Douglas County Comprehensive Plan was that future land uses in the Sweetwater area (which is roughly between SR 6/Thornton Road to SR 154/Fairburn Road and encompasses the SR 6 Industrial Subarea), better balance industrial and residential land uses. The comprehensive plan encouraged future land uses that emphasize greenspace, reduce conflicts between freight and non-freight transportation modes, and provide amenities to residents and employees in the area. To that end, the Douglas County Comprehensive Plan designated the future land use for this area as mixed-use. Furthermore, it called for a combination of residential, hospitality, retail, and industrial land uses for the portion of Douglas County bordering the CID.

2.4 Local Plans

2.4.1 Economic and Fiscal Impact Analysis of the Fulton Industrial District Study, 2018

2.4.1.1 Objectives and Overview

The Draft Economic and Fiscal Impact Analysis of the Fulton Industrial District Study, completed in August 2018, quantified the economic and fiscal impact of the Fulton Industrial District on the jurisdictions and municipalities to which it contributes. These include Fulton County, Fulton County Schools, the City of South Fulton, the City of Atlanta, Atlanta Public Schools, and the State of Georgia. The report performed two key analyses:

- An economic impact analysis which measured economic activity, both direct and indirect, of the Fulton Industrial District.
- A fiscal impact analysis which compared the public revenues generated by the Fulton Industrial District to the cost of providing government services to the area.

Importantly, the analysis measured these impacts over the Fulton Industrial District (i.e., the 2018 boundaries of the Boulevard Community Improvement District) and its area of influence (AOI). The AOI included all land within the CID boundaries along with two additional areas that operate as part of the district's economic ecosystem: (1) the Atlanta Industrial Park in the City of Atlanta and (2) industrial areas in the City of South Fulton adjacent to the FID where a substantial number of parcels participate in the CID. Note that some of these areas, such as the Atlanta Industrial Park, are now within the formal boundaries of the CID.

2.4.1.2 Key Findings

The economic impact analysis component of the study examined how the CID and its investments affected the local economies of its municipal partners. This analysis examined factors including but not limited to jobs (e.g., number of jobs, wages, payroll), commerce (e.g., retail activity), and revenue (e.g., property taxes, sales taxes). It found that the study area (i.e., the Fulton Industrial District and its AOI) have a significant direct impact on the Metro Atlanta economy, both in terms of the direct employment and sales that occur within the region, as well as substantial indirect and induced impacts. Specifically, it found that:

- There are over 1,000 businesses in the study area that directly employ over 28,000 people. This employment activity induces an additional 41,000 jobs, leading to total employment effects of 69,000 jobs regionally.
- The combined direct payroll in 2018 was estimated to be $2.37 billion, indicating an average wage of nearly $84,500 across all industries.
- Business activity in the study area was estimated to generate a direct contribution of $15.3 million in 2018 with an induced additional indirect impact of $15.8 million. Combined, this resulted in a total economic output of $31.1 million.

- The study area's estimated impact on Gross Regional Product is more than $18.8 billion, which accounts for employment, direct and indirect economic output, and multiplier effects for demand in related industries.

Regarding fiscal impacts, the study estimated that the study area generates substantially more revenue for Fulton County and Fulton County Schools than it consumes in services. Specifically, it found that:

- Fulton County receives $18.2 million in revenue annually from the study area (e.g., the Fulton Industrial District and its AOI), while the total cost to provide County services to the study area was estimated to be $7.2 million annually. This results in an estimated annual net surplus of $11.1 million to Fulton County.
- Fulton County Schools receives over $12.4 million in revenues annually from the study area, while the local share of education costs was estimated to be $2.3 million. This results in a net surplus of $10.1 million to Fulton County Schools.
- Overall, the study area contributes $3.20 in local revenues to Fulton County and Fulton County Schools for every $1.00 worth of services received.

2.4.1.3 Recommendations

The Draft Economic and Fiscal Impact Analysis of the Fulton Industrial District Study did not make specific recommendations for policies or projects, but it did demonstrate how investments made in the CID to address transportation and other challenges generate a significant economic return. For example, besides the approximate $5.5 million in improvements directly funded by the Boulevard CID between 2013-2018, the CID has leveraged about $8.7 million in grants and matching funds for various other improvement projects (e.g., transportation, landscaping, beautification). Furthermore, these investments have far-reaching impacts beyond its boundaries and include not just transportation impacts (e.g., reduced travel times, improved roadway safety), but also positive economic and fiscal impacts to local schools and the CID's municipal partners.

2.4.2 Fulton Industrial Community Improvement District Master Plan, 2013

2.4.2.1 Objectives and Overview

Recognizing the need for strategic and targeted investment in the CID area to revive its role as a center of industrial and freight-related commerce, public and private leaders developed the CID's 2013 Master Plan. The Master Plan provided an implementation-focused vision for the area's future and established the key steps needed to achieve that vision. It developed a comprehensive set of recommendations for transportation improvements, land use, economic development, and design/aesthetic treatments.

2.4.2.2 Key Findings

A key finding from the 2013 Master Plan was that truck operations took a heavy toll on the CID's infrastructure, primarily in the form of damaged medians and sidewalks resulting from insufficient turning radii at intersections. It also observed relatively high crash rates along SR 70/Fulton Industrial Boulevard near its interchange with I-20. Portions of key corridors throughout the CID (namely SR 70/Fulton Industrial Boulevard, SR 139/Martin Luther King Jr. Drive, SR 6/Camp Creek Parkway, SR 154/Campbellton Road,

I-20, and I-285) were found to operate under congested travel conditions. The Master Plan noted that traffic volumes in the study area were projected to increase substantially by 2040, potentially worsening existing challenges.

Regarding land use, the 2013 Master Plan found that the Regional Mixed Use, Community Mixed Use and Suburban Neighborhood Residential character area designations found in portions of the CID could be detrimental to industrial development and rehabilitation as new residential developments would erode the industrial foundation of the district. Mitigating steps would be needed to prevent this from occurring. The Master Plan also noted that commercial development focused at key nodes in the CID could help to transition between industrial and non-industrial land uses and also provide needed amenities for employees.

2.4.2.3 Recommendations

The Master Plan made several recommendations that the CID has been implementing since the plan's completion. Many of those recommendations are relevant to this freight cluster plan. Some examples include:

- **Policy.** These recommendations included encouraging development consistent with the Master Plan by coordinating with the Fulton County Department of Planning and Zoning and revising the Fulton County Zoning Ordinance as necessary.
- **Infrastructure.** The 2013 Master Plan recommended targeted intersection improvements to improve freight mobility through median and radii adjustments, traffic signal timing adjustments, sidewalk and crosswalk installations, signage, and wayfinding installations, streetscaping, and the installation of sustainability-focused infrastructure elements such as native vegetation and bio-swales.
- **Funding.** These recommendations included identifying partners and coordinating with regional and state entities to pursue funding. Since the 2013 Master Plan was completed, other funding sources and partners (such as the Georgia Commission on Freight and Logistics) have become available and should be explored as part of the freight cluster plan.

2.4.3 Fulton County Executive Airport Technical Assistance Panel Report, 2020

2.4.3.1 Objectives and Overview

In coordination with the Urban Land Institute (ULI) Atlanta's Technical Assistance Panel (TAP), Fulton County conducted the Fulton County Executive Airport Technical Assistance Report in 2020 for the purpose of developing viable redevelopment strategies for the airport site. This included funding strategies and an implementation plan. As the forthcoming Airport Master Plan will focus primarily on improving areas on and adjacent to property owned by Fulton County, the TAP Report will help Fulton County to identify priorities and appropriate redevelopment opportunities to pursue as part of the Airport Master Plan.

2.4.3.2 Key Findings

Some key findings from the TAP Report include the following:

- The airport has several strengths that can be leveraged for economic growth. These include access to the Interstate system and regional centers (e.g., Downtown, Cumberland, Perimeter Center), a

substantial amount of county-owned land available for redevelopment, and proximity to the Chattahoochee River, among others.

- The TAP report identified multiple challenges that limit the airport's ability to grow economically. Examples include the visual appearance of the area surrounding the airport, lack of services for airport users, perception of crime in the area, and lack of class A industrial buildings. In addition, the TAP Report identified congestion on SR 70/Fulton Industrial Boulevard and I-20 as a limiting factor for economic development.
- The potential for development on Aviation Circle that incorporates the existing Cultural Center was cited as an opportunity for the airport in the TAP Report. The report determined that development featuring a mix of land uses would create a focal point at the airport and improve its economic competitiveness. Furthermore, regional efforts to extend MARTA service further into the area around the airport and to create a network of multi-use trails and greenspace around the Chattahoochee River (i.e., the ARC's RiverLands Plan) are also important opportunities.

2.4.3.3 Recommendations

Six major recommendations were developed by the TAP Report:

- **Create a sense of place.** The TAP Report recommended that the Fulton County Executive Airport be used to create a sense of place for the SR 70/Fulton Industrial Boulevard corridor. This would be achieved by creating a main street for the area by developing land around the airport. It would also entail introducing a mix of land uses to the airport campus, contributing to the region's efforts to create a network of greenspace around the Chattahoochee River, and streetscape improvements.
- **Leverage Aviation Community Cultural Center.** The TAP Report observed that the Aviation Community Cultural Center is an underutilized resource. It recommended organizing a committee be to assess the center's potential and craft a vision and strategic plan to maximize the facility's use.
- **Provide convenience retail and amenity space.** The need for commercial amenities within the area was frequently raised as an issue during stakeholder interviews conducted as part of the TAP Report. It recommended that future development in the area provide restaurants, grocery stores, fitness centers, and other service businesses.
- **Recruit office or flex-type use.** The TAP Report recommended that the area's roles as a logistics hub could be used to attract office developments of related industries (e.g., freight forwarding, aerospace, manufacturing).
- **Seek potential partnerships with colleges and universities that focuses on aerospace and logistics.** Though targeting specific industries for location and expansion in the Fulton County airport footprint is the TAP Report's primary goal, it also recommended that steps be taken to develop the workforce required for those industries to succeed.
- **Evaluate the long-term potential for a hotel.** Over the mid- to long-term, there could be an opportunity for a hotel on county-owned property. The county could facilitate such a deal by leveraging or creating a tax incentive.

2.4.4 Neighborhood Planning Unit G (NPU-G) Master Plan, 2010

2.4.4.1 Objectives and Overview

Neighborhood Planning Unit G (NPU-G) contains 12 neighborhoods and is located along the western boundary of the City of Atlanta. Within the CID, the NPU-G Master Plan study area included the portions of the CID north of SR 8/US 78/US 278/Donald L. Hollowell Parkway (i.e., Atlanta Industrial Park, the English Park neighborhood of the City of Atlanta). The NPU-G Master Plan serves as the blueprint for growth and economic development for its constituent neighborhoods.

2.4.4.2 Key Findings

The NPU-G Master Plan observed that the area suffers from poor connectivity. While some of the community's connectivity challenges stem from natural features (e.g., Proctor Creek, hilly terrain), others are man-made (e.g., I-285, freight rail lines). Because of the community's poor connectivity, residents have few modal options beyond automobiles or buses. Furthermore, the NPU-G Master Plan noted that the community severely lacks sidewalk and bicycle infrastructure. To address these challenges, the NPU-G Master Plan proposed that multiple investments be made to improve and expand the bicycle and pedestrian network, create new street connections, improve operations on major roadway corridors, and add new public transit options.

2.4.4.3 Recommendations

Several recommendations were made as part of the NPU-G Master Plan for improving transportation mobility. Primarily, these recommendations address the connectivity challenges observed in the study. They include the development of the Proctor Creek Greenway and Chattahoochee River Greenway multi-use trail systems, upgrading existing pedestrian and bicycle infrastructure and closing gaps in the bike/pedestrian network, transit investments to improve multimodal access, and addressing intersection and corridor-level travel time performance challenges where they exist. Some specific recommendations made in the NPU-G Master Plan that would impact the CID include the following:

- Update traffic signal timing on SR 8/US 78/US 278/Donald L. Hollowell Parkway to increase intersection efficiency and travel time reliability;
- Implement signal priority based on vehicle height on SR 8/US 78/US 278/Donald L. Hollowell Parkway to improve travel time reliability for heavy vehicles;
- I-285 creates a barrier between the NPU-G community and job opportunities in the Atlanta Industrial Park. Create a connection between NPU-G and the Atlanta Industrial Park, potentially by connecting Northwest Drive; and
- Implement bus rapid transit along SR 8/US 78/US 278/Donald L. Hollowell Parkway from the Bankhead MARTA station to the Atlanta Industrial Park.

2.4.5 Adamsville Neighborhood Planning Unit H (NPU-H) Master Plan, 2020

2.4.5.1 Objectives and Overview

Neighborhood Planning Unit H (NPU-H) contains 17 neighborhoods and is located in the western portion of the City of Atlanta. Within the CID study area, portions of major corridors (such as SR 8/US 78/US

278/Donald L. Hollowell Parkway, Bolton Road, and SR 70/Fulton Industrial Boulevard) border or are within NPU-H. The Adamsville NPU-H Master Plan represents the collective vision for the future of NPU-H's neighborhoods. It is a strategy for its residents, businesses, and other stakeholders to spur growth and development. The plan of action articulated in the NPU-H Master Plan aims to preserve and protect the quality of life while promoting growth in appropriate areas by building on the community's existing assets and identifying catalytic sites and projects that will encourage redevelopment.

2.4.5.2 Key Findings

The NPU-H Master Plan observed that the street network of NPU-H is disconnected, which limits pedestrian mobility. Furthermore, it found that there is a lack of lighting and pedestrian infrastructure on major corridors. Bolton Road and SR 139/Martin Luther King Jr. Drive were identified in the Master Plan as priority corridors for improving lighting.

Regarding land use, the NPU-H Master Plan observed that current zoning for some parcels differs from the designated future land use which may hinder the potential for redevelopment. Some areas within the CID were specifically identified for redevelopment by the NPU-H Master Plan. These include the area around Bolton Road near the Fulton County Airport and the former Bankhead Courts housing site on SR 8/US 78/US 278/Donald L. Hollowell Parkway between Bolton Road and the Chattahoochee River.

2.4.5.3 Recommendations

Several recommendations were made as part of the NPU-H Master Plan that are relevant to the CID. For instance, multiple recommendations call for additional study of transportation-related needs such as streetscape improvements and partnering with MARTA to ensure that bus stops are improved as new development occurs. However, the recommendations that are potentially most impactful to the CID are those related to land use. Specifically, the NPU-H Master Plan recommended changing the future land use along Bolton Road between SR 8/US 78/US 278/Donald L. Hollowell Parkway and Sandy Creek, which is east of the CID's boundaries. At this node, the master plan recommended that future land use be changed from medium-density residential to a combination of high-density residential and mixed-use. The intent of this recommendation was to encourage a mix of housing types and mixed-use development that could include office and retail uses. In addition, the recommendation called for developing multi-use trails along Sandy Creek on the land owned by Fulton County.

2.4.6 D.L. Hollowell Parkway/Veterans Memorial Highway Livable Centers Initiative Study, 2010

2.4.6.1 Objectives and Overview

The D.L. Hollowell Parkway/Veterans Memorial Highway Corridor Livable Centers Initiative (LCI) Study was a joint planning effort by the City of Atlanta and Cobb County. The purpose of the LCI Study was to build upon previous studies, evaluate multi-modal transportation alternatives, encourage employment opportunities, and improve connectivity to improve the safety and mobility within the study corridor. Within the CID, the LCI study area included the portions of the CID north of the UPS SMART Hub (i.e., Atlanta Industrial Park, the English Park neighborhood of the City of Atlanta, and portions of the SR 8/US 78/US 278/Donald L. Hollowell Parkway and Bolton Road corridors).

2.4.6.2 Key Findings

The D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study noted some key challenges that are specific to portion of the SR 8/US 78/US 278/Donald L. Hollowell Parkway that traverses the CID study area. These included the need for redevelopment of under-utilized parcels and declining businesses, rehabilitation of aging and obsolete commercial building stock along SR 8/US 78/US 278/Donald L. Hollowell Parkway, upgrades to pedestrian and bike infrastructure, and improvements to transit infrastructure and service availability. The D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study also observed the need to balance industrial and residential uses/activities and truck traffic with other commuter traffic. Despite the corridor's challenges, the LCI Study noted the great potential to address them given the area's considerable assets including easy access to I-285 and I-20, job opportunities in the Boulevard CID, proximity to Fulton County Charlie Brown Airport, accessibility to MARTA, and proximity to Atlanta Downtown.

2.4.6.3 Recommendations

Several land use and transportation recommendations were made by the D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study. These included operational improvement projects to reduce traffic congestion and limit conflicts between trucks and other roadway users; connectivity projects to improve accessibility and traffic circulation; pedestrian and bicycle projects to install new sidewalks, lighting, street furniture, bus stops, signage, and trees; and transit projects to extend MARTA bus routes, add stops, provide bus stops/signage, and to pursue bus rapid transit or other high-capacity transit options.

Some specific recommendations from the D.L. Hollowell Parkway/Veterans Memorial Highway LCI Study that are relevant to the CID include:

- Widen SR 8/US 78/US 278/Donald L. Hollowell Parkway to provide 2 through lanes in each direction between Harwell Road and SR 280/James Jackson Parkway;
- Construct a new roadway to connect Bolton Road to Atlanta Industrial Parkway;
- Re-time and install video detection at signals on SR 8/US 78/US 278/Donald L. Hollowell Parkway between Atlanta Industrial Parkway and Harwell Road; and
- Install ITS including video monitoring along SR 8/US 78/US 278/Donald L. Hollowell Parkway.

Of the recommendations provided as examples, many do not appear to have been completed. For instance, SR 8/US 78/US 278/Donald L. Hollowell Parkway is primarily a 2-lane roadway between Harwell Road and SR 280/James Jackson Parkway Also, there is no connecting roadway between Bolton Road and Atlanta Industrial Parkway However, there is video monitoring along SR 8/US 78/US 278/Donald L. Hollowell Parkway.

2.5 Other Ongoing Projects and Initiatives

2.5.1 Fulton County Transportation Special Purpose Local Optional Sales Tax (TSPLOST)

In 2016, the Georgia Legislature passed Senate Bill 369 authorizing counties to consider a Special Purpose Local Option Sales Tax for transportation purposes (TSPLOST).[3] On November 8, 2016, Fulton County residents outside the City of Atlanta voted to approve a 0.75-cent sales tax for transportation purposes. Approximately $655 million was estimated to be generated from the tax over its 5-year life span. TSPLOST funds can be spent only on transportation improvements such as roads, bridges, sidewalks, bicycle paths, and other transportation-related purposes included in the legislation. The City of South Fulton manages TSPLOST projects within its boundaries including the Boulevard CID.

Ongoing TSPLOST projects within the Boulevard CID are primarily in the areas of operations and safety, pedestrian and bicycle network improvements, and streetscaping.[4] They include sidewalk improvements on Cascade Road and SR 70/Fulton Industrial Boulevard within the Boulevard CID. Ongoing TSPLOST projects also include an intersection analysis of SR 70/Fulton Industrial Boulevard with Cascade Road to identify congestion and geometric improvements. There are multiple TSPLOST projects, primarily sidewalk improvements and roadway resurfacing, being completed in the communities neighboring the CID.

2.5.2 Renew Atlanta-TSPLOST

In 2015, City of Atlanta residents voted to support a $250 million bond, Renew Atlanta, to address the city's estimated $1 billion backlog of needed facilities and infrastructure improvements.[5] For transportation, the Renew Atlanta bond included projects such as complete streets, bridge repair/replacement, resurfacing, and sidewalks, among others. The following year, Atlanta residents approved a TSPLOST which was estimated to generate approximately $260 million to fund transportation projects citywide. Projects approved as part of both measures are managed by the City of Atlanta under its Renew Atlanta-TSPLOST program.

There are a few ongoing Renew Atlanta-TSPLOST projects within or bordering the Boulevard CID. [6] These are primarily complete streets projects which are intended to prioritize safety, comfort, and accessibility for all roadway users. For example, the Cascade Road complete streets project is in its design phase and will include resurfacing, restriping, signal upgrades, bus stop enhancements, streetscapes, extended bike lanes, and pedestrian safety improvements. A complete streets project for SR 154/Campbellton Road will make various safety and multimodal improvements to that corridor and is currently in design phase. The complete streets project for SR 139/Martin Luther King Jr. Drive is currently under construction.

---

[3] Fulton County, TSPLOST, https://www.fultoncountyga.gov/inside-fulton-county/fulton-county-initiatives/tsplost, accessed May 25, 2021.

[4] Fulton County, TSPLOST Dashboard, https://tsplost.fultoncountyga.gov/projects, accessed May 25, 2021.

[5] City of Atlanta, Renew Atlanta-TSPLOST, https://www.renewatlantabond.com, accessed May 25, 2021.

[6] City of Atlanta, Renew Atlanta-TSPLOST, https://www.renewatlantabond.com/projects, accessed May 25, 2021.

2.5.3 Major Mobility Investment Program

The ongoing $11 billion GDOT Major Mobility Investment Program (MMIP) is implementing capacity investments in Georgia's most heavily traveled transportation corridors. These include I-20 and I-285 within the Boulevard CID. The purpose of the MMIP is to expand capacity, enhance safety, and improve reliability on these corridors. Some MMIP projects were specifically designed to enhance freight mobility, such as commercial vehicle lanes on portions of I-75 and the expansion of I-16 to facilitate trucks serving the Port of Savannah. Others, while not solely designed to improve freight mobility, will benefit truck movements on key corridors. This includes ongoing projects on I-285 such as the I-285/ I-20 West Interchange and the I-285 Westside Express Lanes projects just outside the CID.

The I-285/I-20 West Interchange project calls for improvements of the interchange and the addition of lanes along I-20 in Cobb, Douglas, and Fulton counties.[7] The purpose of the project, scheduled to be completed in 2026, is to improve traffic flow through the interchange. Specifically, the I-285/I-20 West Interchange project will:

- Reconstruct the interchange to remove left hand exits and modify and/or replace existing bridges and ramps;
- Construct an I-20 westbound collector-distributor (CD) system from the interchange to SR 70/Fulton Industrial Boulevard;
- Construct auxiliary lanes and improvements along 8 miles of I-20 in both directions from SR 6/Thornton Road to SR 280/Hamilton E. Holmes Drive;
- Modify and/or replace bridges along I-20;
- Add new lanes and improvements along two miles of I-285 southbound from SR 8/US 78/US 278/Donald L. Hollowell Parkway to SR 139/Martin Luther King Jr. Drive.

The I-285 Westside Express Lanes project will construct express lanes (one in each direction) on I-285 between Paces Ferry Road in Cobb County and SR 8/US 78/US 278/Donald L. Hollowell Parkway within the Boulevard CID.[8] In addition, other improvements will be completed along with the I-285 Westside Express Lanes project including bridge widenings and replacements near Atlanta Road, South Cobb Drive, Bolton Road, and SR 8/Donald L. Hollowell Parkway. This project is currently in its preliminary engineering phase as GDOT has completed environmental field studies and traffic analyses. It is scheduled to be completed in 2032.

[7] GDOT, Major Mobility Investment Program, I-285/I-20 West Interchange Project, https://0013918-gdot.hub.arcgis.com/, accessed May 24, 2021.

[8] GDOT, Major Mobility Investment Program, I-285 Westside Express Lanes Project, https://0013917-gdot.hub.arcgis.com/, accessed May 24, 2021.

2.5.4 Regional Connected Vehicle Program

The Regional Connected Vehicle Program is a partnership between GDOT and ARC that expands the footprint of Metro Atlanta's connected roadway network.[9,10] It involves installing roadside units (RSU) equipped with dedicated short-range communications (DSRC) and cellular communications, smart signals, and other technologies along major corridors to enable various mobility applications. These include:

- Emergency vehicle preemption – Preemption at select signals to improve emergency vehicle response time;
- Transit signal priority – Priority requests to signal controllers for specific transit applications and routes; and
- Freight signal priority – Signal priority for freight vehicles that are operating in cooperative platooning mode.

Through the Regional Connected Vehicle Program, the number of connected locations throughout Metro Atlanta will be expanded to up to 1,500. Within the Boulevard CID, portions of SR 6/Camp Creek Parkway, SR 70/Fulton Industrial Boulevard, and SR 8/US 78/US 278/Donald L. Hollowell Parkway are included in the program.

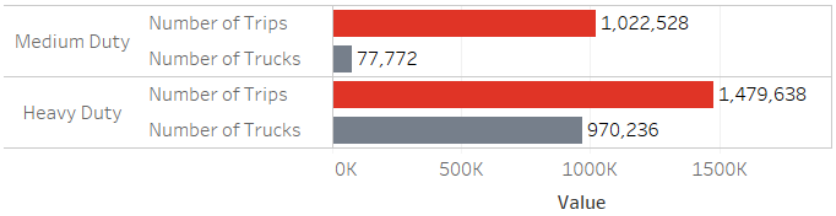
[9] GDOT 2021 Statewide Strategic Transportation Plan: 2050 Statewide Transportation Plan.

[10] Heath, A., "Achieving Safety Through Innovation and Technology," State Transportation Board Meeting, March 18, 2021, http://www.dot.ga.gov/AboutGeorgia/Board/Board%20Meeting%20Documents/March%202021%20State%20Transportation%20Board%20Meeting.pdf.

3 FREIGHT ANALYSIS

Understanding how freight moves to, from, and within the Boulevard CID is critical to assessing the transportation needs of businesses located in the CID. The INRIX Trip Path data was acquired for this study to describe the geographic and temporal patterns of truck trips involving the CID. This database reported the origins, destinations, routes, and travel times of truck trips originating, terminating, or passing through the Boulevard CID, during a 6-month period in 2019 (March, April, July, August, October, and November). These data also distinguish between the movements of medium-duty trucks (14,000 lb. 26,000 lb. Gross Vehicle Weight Rating) and heavy-duty trucks (more than 26,000 lb. Gross Vehicle Weight Rating). It represents an exceptionally powerful tool to describe trucking demand patterns throughout the region, at a level of detail not previously available, by connecting trip-level information with route-level detail. The acquisition of INRIX Trip Path data allowed the study to track how over 1 million trucks that operate in the Boulevard CID make over 2.5 million trips throughout the Atlanta region and beyond. Figure 1 shows a breakdown of these figures by truck type.

Figure 1: INRIX Data Set Totals



Source: Consultant analysis of INRIX Data

In the INRIX data, a stop is defined when vehicles do not move more than 656 feet in 10 minutes. In most cases, this represents the ultimate destination of the trip, when the truck makes a delivery or picks up a load. However, it is possible for the stop to represent refueling at a gas station or standing still during severe congestion, in which case the end of the trip does not represent the ultimate destination. Therefore, the INRIX data is better able to capture the ultimate destinations for shorter trips. In longer trips, it is more likely that trucks stop along the way, for a variety of reasons, and therefore the ultimate destinations are not fully captured. Even though the INRIX data is best suited for analyzing demand patterns for shorter trips, it was also able to pick up a significant number of trips throughout the Southeast, which describe the role that the Boulevard CID plays in the logistics of the region.

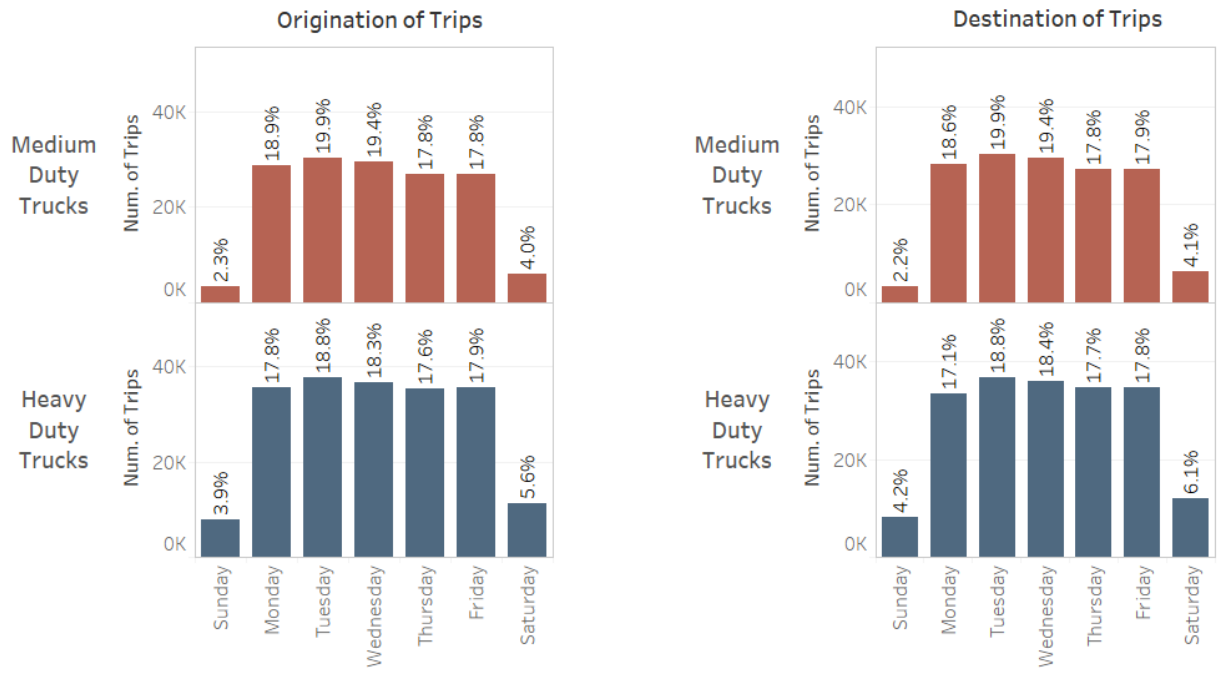
3.1 Freight Demand

3.1.1 Temporal Patterns

As expected, most truck activity in the Boulevard CID occurs during the week, with weekends seeing about a fourth to a fifth of the activity seen during the week. This can be seen in Figure 2, which shows the origination and termination of truck trips in the CID on different days of the week. This figure also shows how truck activity is fairly constant during weekdays, with Tuesdays and Wednesdays seeing slightly more activity than other weekdays. This pattern is similar for medium duty trucks and heavy-duty trucks. During

the weekends, there is proportionately more activity of heavy-duty trucks than medium-duty trucks. These day-of-week temporal patterns are consistent with the patterns observed in other industrial areas around the country.

Figure 2: Trucking Activity by Day of Week

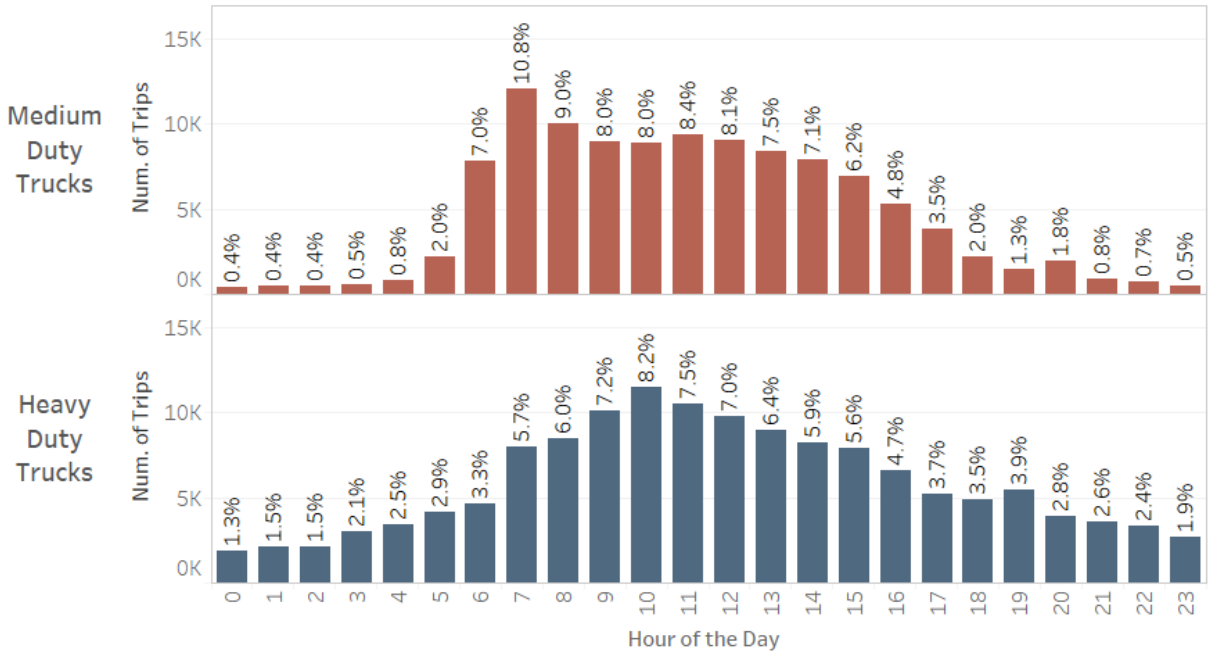


Source: Consultant analysis of INRIX Data

Medium-duty trucks and heavy-duty trucks start and end trips at different times of the day, with medium-duty truck trips starting earlier. Approximately 27 percent of all medium-duty truck trips start between 6am to 9am, while during this period only 15 percent of heavy-duty truck trips start, as can be seen in Figure 3. This is due to medium-duty trucks leaving the Boulevard CID early to begin their delivery tours. Medium-duty truck trips remain high throughout the day, until 2pm, at which time they drop off rapidly. The early afternoon, between 1 to 3pm, is likely the time when medium-duty trucks start their second shift. Heavy-duty trucks have a different time-of-day pattern. Peak trip generation occurs later, between 9 am to 12 pm, and trails-off later in the day until peaking again at 7pm. Heavy-duty trucks are observed to originate more trips at night than medium-duty trucks.

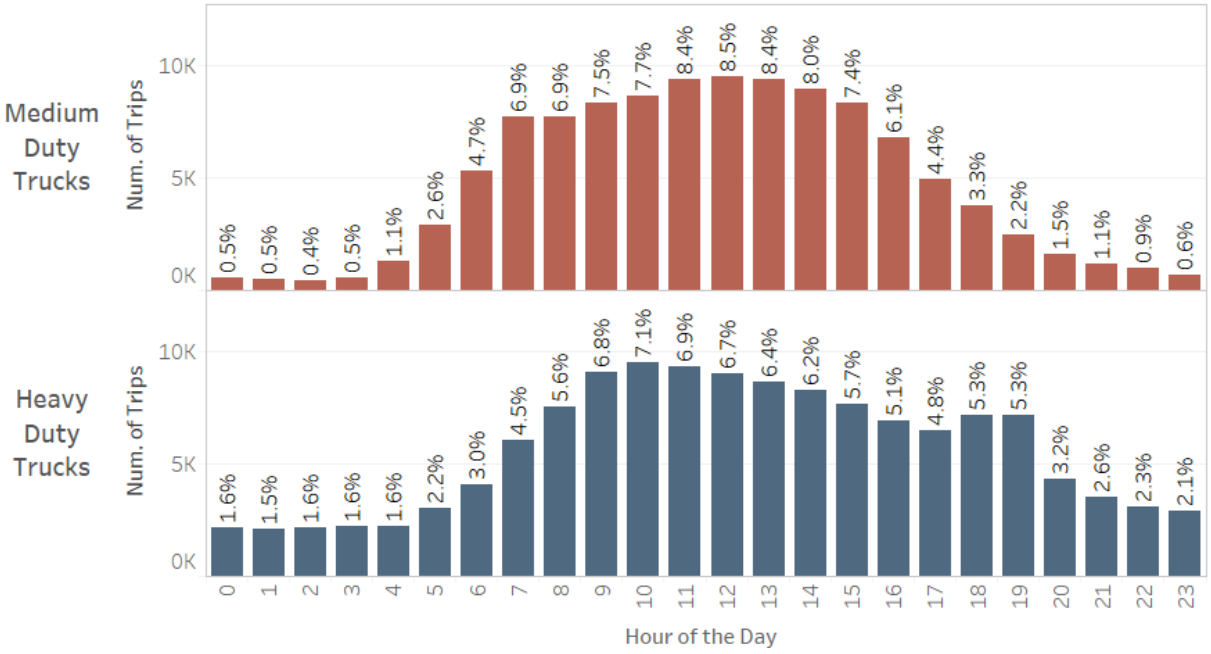
Trip arrivals observe a different pattern than trip generation. As can be seen in Figure 4, medium-duty trucks arrive at a consistent rate between 9am and 5pm, likely representing a mix of trucks making deliveries to industrial facilities in the Boulevard CID, and trucks returning from making deliveries throughout the metro Atlanta region. Heavy-duty trucks observe a similar pattern, however there is a pronounced peak observed at 7pm. This is likely driven by the operating procedure of one or several large freight generators in the Boulevard CID. As with originations, heavy-duty trucks are more apt to arrive at night than the medium-duty vehicles.

Figure 3: Hourly Origins of Truck Trips



Source: Consultant analysis of INRIX Data

Figure 4: Hourly Destination of Truck Trips

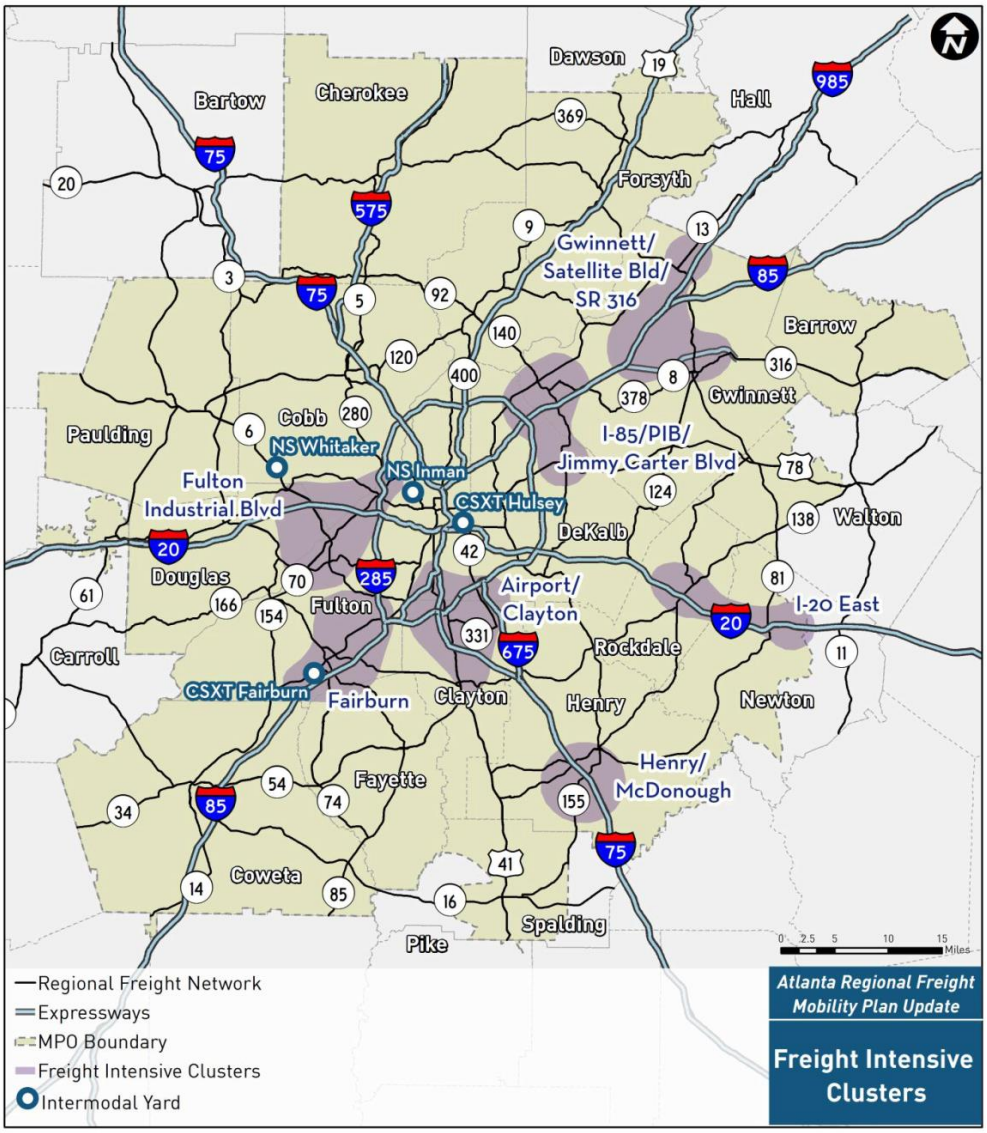


Source: Consultant analysis of INRIX Data

3.1.2 Spatial Patterns

The 2016 Atlanta Regional Freight Mobility Plan Update prepared by the Atlanta Regional Commission (ARC) identified seven freight-intensive clusters in the region that are responsible for the bulk of the freight activity in metro Atlanta. These clusters, shown in Figure 5, have a high density of manufacturing and warehousing facilities, resulting in a concentration of truck trip originations and terminations. The Boulevard CID is part of the Fulton freight cluster, which was defined to include some of the surrounding industrial activity.

Figure 5: ARC Freight-Intensive Clusters

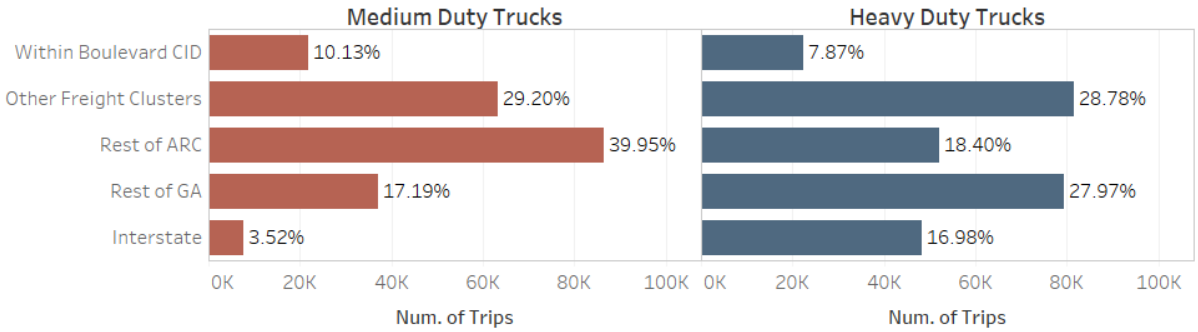


Source: ARC Atlanta Regional Freight Mobility Plan Update, 2016

The INRIX data was used to understand the spatial patterns of truck trips traveling within the Boulevard CID, between the CID and other freight clusters, between the CID and elsewhere in the ARC region, or traveling beyond. As can be seen in Figure 6, approximately 10.1 percent of medium-duty truck trips and 7.9 percent of heavy-duty truck trips involving the CID start and end within the CID (only trips longer than 2 miles were considered to avoid counting repositioning of trucks within facilities). This likely includes a mix of deliveries between facilities clustered nearby and trips where trucks park temporarily, for staging reasons, before picking up a load (see Section 3.4 for a discussion of this type of parking). The direction of travel, to or from the Boulevard CID, was not found to be a significant factor in the shares reported, therefore Figure 6 combined both directions of travel.

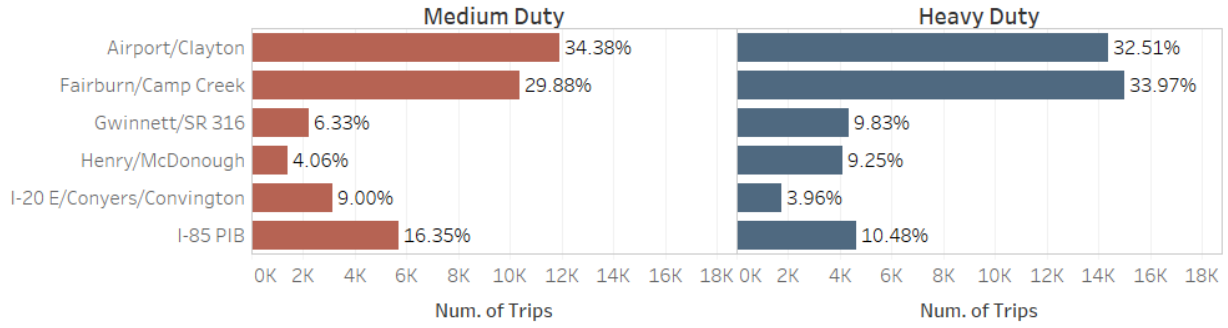
Figure 6 also shows how a significant share of truck trips involving the Boulevard CID (excluding trucks passing through) go to or come from the other 6 freight clusters in the region. This accounts for 29.2 percent of medium-duty truck trips and 28.8 percent of heavy-duty truck trips. These trips represent business-to-business deliveries in support of local economic activity. Figure 7 shows which freight clusters these trips went to or came from. The Airport/Clayton and Fairburn/Camp Creek clusters accounted for approximately two-thirds of the trips involving the Boulevard CID. This result is expected, given that both of these clusters are the closest to the CID (see Section 3.3.2 for a discussion of travel times between clusters), and include a myriad of manufacturing and warehousing activity that likely located in that region for proximity to clients or suppliers. The Fairburn/Camp Creek cluster also is home to the CSX Fairburn intermodal terminal (the NS terminals lie in the “Rest of ARC”, and the CSX Hulsey terminal has been repurposed), while the Airport/Clayton cluster contains the Hartsfield-Jackson Atlanta International Airport. This is the primary air cargo airport of the Southeast U.S., serving as an important international gateway in the region. The INRIX data also shows that the Fairburn/Camp Creek cluster and Airport/Clayton cluster attract a similar share of medium-duty trucks and heavy-duty trucks, while the Fairburn/Camp Creek cluster attracts a slightly higher share of heavy-duty trucks. A significant number of truck trips were also observed between the Boulevard CID and the remaining 4 clusters, with the I-85 Peachtree Industrial Boulevard (PIB) cluster ranking the highest.

Figure 6: Geographical Patterns of Truck Trips Involving FIB



Source: Consultant analysis of INRIX Data

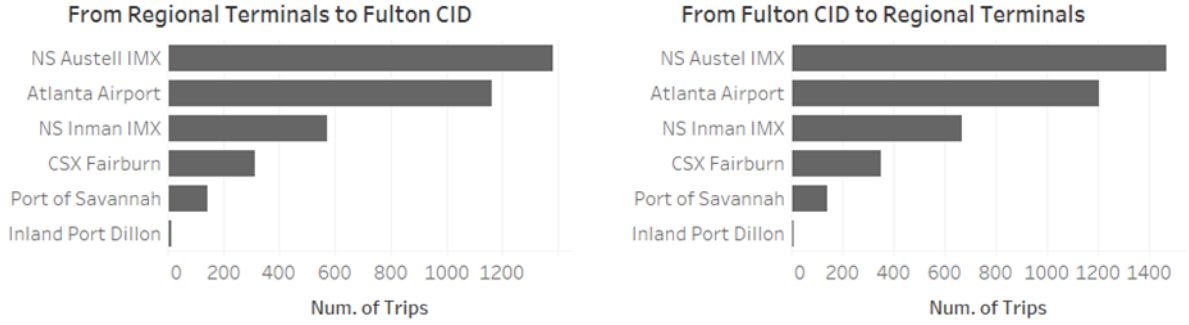
Figure 7: Geographical Patterns of Truck Trips Involving FIB and other Freight Clusters



Source: Consultant analysis of INRIX Data

Figure 8 shows how the Boulevard CID is connected to the key intermodal infrastructure in the region. The main intermodal hub for shipments involving the Boulevard CID is the Norfolk Southern (NS) Austell Intermodal Terminal. Note that the INRIX data represents a sample of all truck trips, therefore the values shown in Figure 8 account for a fraction of the activity at these facilities. However, this data does point to the Austell Intermodal Terminal being important for businesses in the CID. The second highest on this figure is the Hartsfield-Jackson Atlanta International Airport, followed by the NS Inman Intermodal Terminal. It is likely that the number of trips to and from the Port of Savannah and the Dillon Inland Port in Dillon, South Carolina are underestimated because of the likelihood of making intermediate stops on these longer trips.[11]

Figure 8: Trips to and from Regional Terminals



Source: Consultant analysis of INRIX Data

3.2 Route Analysis

An analysis was conducted to develop an understanding of the main routes used by trucks traveling within, and to/from the Boulevard CID. This information will be helpful to prioritize projects that generate the most benefits to trucking operations. As expected, the road in the Boulevard CID that carries the highest truck

[11] Although the Port of Brunswick in Brunswick, Georgia is often a significant trading partner for freight clusters, there was only one trip between the Port of Brunswick and the Boulevard CID during the period of analysis. This is most likely due to Brunswick's predominance as an auto import site, and the Boulevard CID does not have auto-related industries within its boundaries.

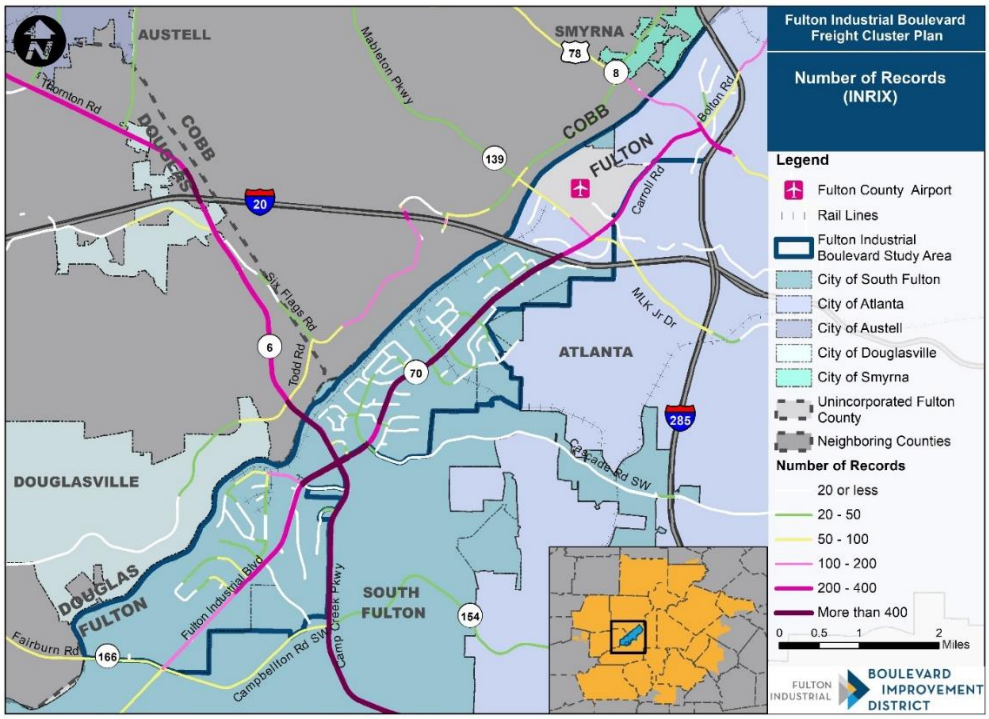
volumes according to the INRIX data is Fulton Industrial Boulevard. As shown in Figure 9, volumes are the highest occur on the intersection with Camp Creek Parkway, and on the segment bounded by I-20 on the north and Selig Drive. Volumes are also high throughout Camp Creek Parkway, which is a major freight thoroughfare in the region. It is important to remember that the INRIX data represents a sample of the whole truck population, and as such provides an estimation of relative volumes on roads. Elsewhere, this study presents data from the Georgia Department of Transportation that estimates vehicle volumes on the roads. This study also collected counts on key roads in the CID for conducting traffic analysis. However, this data only covers the main roads, and misses most of the roads in the Boulevard CID. Even if estimated, these statewide estimates are generally not as accurate for lower classification roads than they are for interstates and major roads. Therefore, the INRIX data fill that gap in describing the relative volumes and trucking activity on some of the secondary roads in the CID, which are still critical to the businesses that rely on them for their daily operations.

From Table 9, it can be seen that the following cross-streets show significant activity in the INRIX data:

- Westgate Parkway
- Great Southwest Parkway
- Phillip Lee Drive
- Wharton Drive
- Patton Drive
- Martin Luther King Jr. Drive
- Donald L. Hollowell Parkway

Most of these cross streets are unsignalized, which could cause operational issues during peak hours of the day. A traffic analysis will be presented in a forthcoming memo (Task 5 of this study), describing how the roadway infrastructure is accommodating trucks.

Figure 9: Map of Truck Volumes in the Boulevard CID



Source: Consultant analysis of INRIX Data

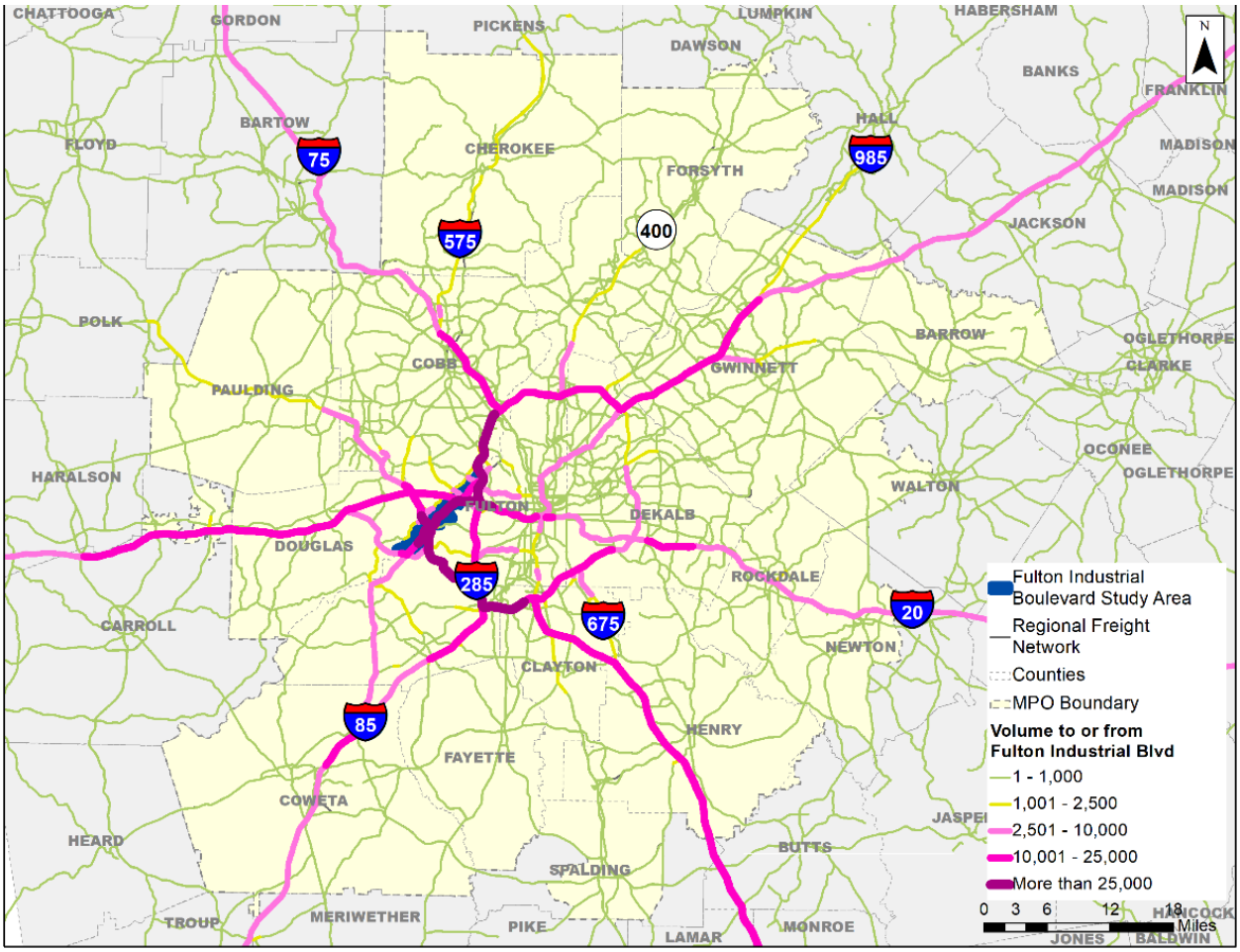
Figure 10 shows the roads used by truck trips that have origins or destinations in the Boulevard CID. This map only shows activity for truck trips on the routes that are important for the connectivity of the CID to the rest of the Atlanta region. Two routes show up prominently in this analysis (dark purple):

- North route: Trucks using the Donald Lee Hollowell Parkway to get on (off) I-285 heading (coming) north to I-75 and beyond.
- South route: Trucks using Camp Creek Parkway to get on (off) I-285 and connect to I-75 south

The important arterials used to access Boulevard CID include:

- Camp Creek Parkway
- Donald Lee Hollowell Parkway
- Thornton Rd
- Fairburn Rd
- Arthur B. Langford Jr. Parkway
- Cascade Palmetto Highway

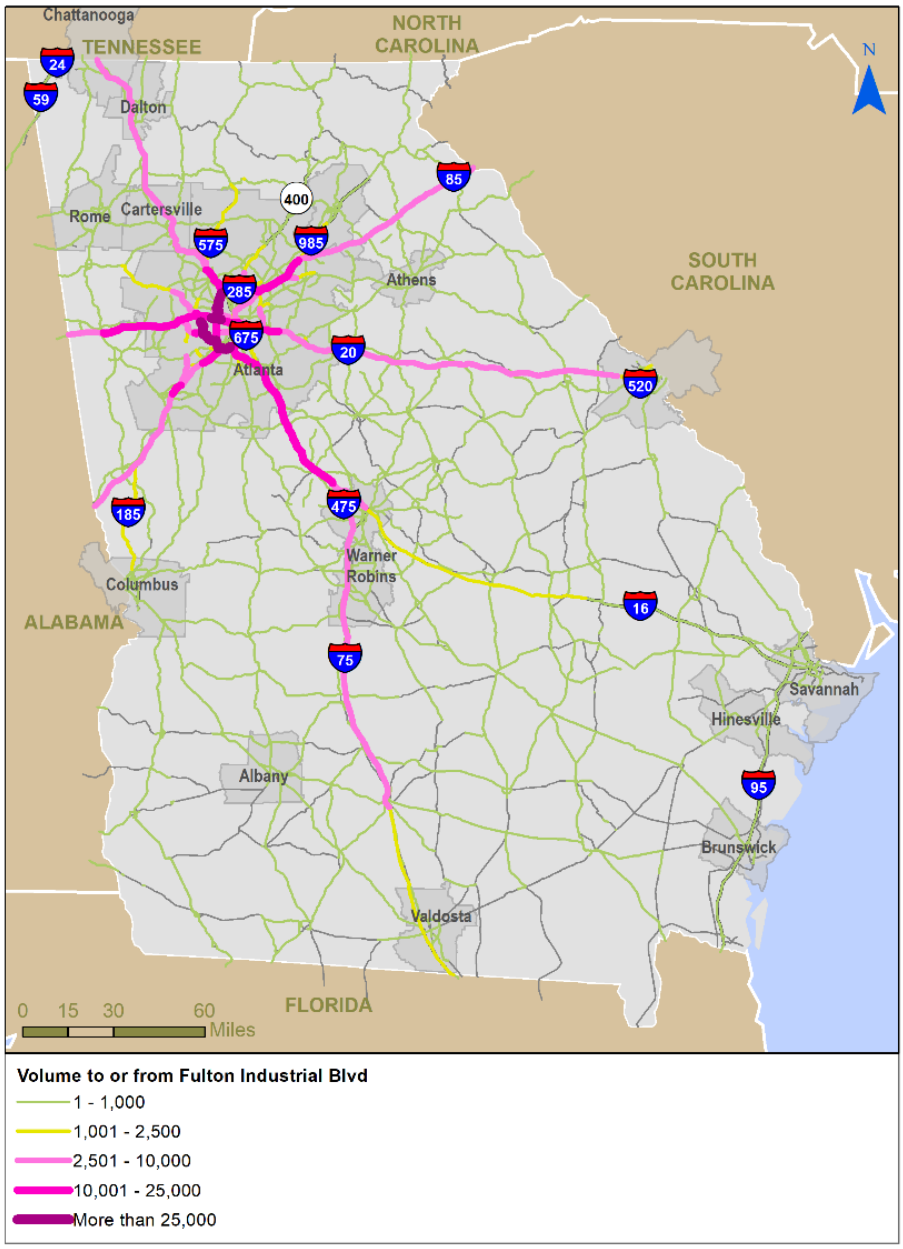
Figure 10: Map of Truck Volumes heading to or from Boulevard CID



Source: Consultant analysis of INRIX Data

Figure 11 shows the same data shown in Figure 10, but zoomed out for the state of Georgia. This shows the regional routes used by trucks that start or arrive in the Boulevard CID. Outside of the metro Atlanta region (covered above), the interstate segment used most by CID trucks is the portion of I-75 south of Atlanta. Other regional interstates, such as I-75 north of Atlanta, I-85 north and south of Atlanta, I-20 east and west of Atlanta, all have similar usage by CID trucks, reflecting the diversity of industrial activity that takes place at the CID.

Figure 11: Statewide Freight Volumes to and from Fulton Industrial Boulevard



Source: Consultant analysis of INRIX Data

3.3 Congestion Analysis

3.3.1 Recurring and Non-Recurring Congestion

An analysis was conducted to better understand congestion patterns in the Boulevard CID. This analysis followed the methodology developed by NCHRP Report 925 - *Estimating the Value of Truck Travel Time*

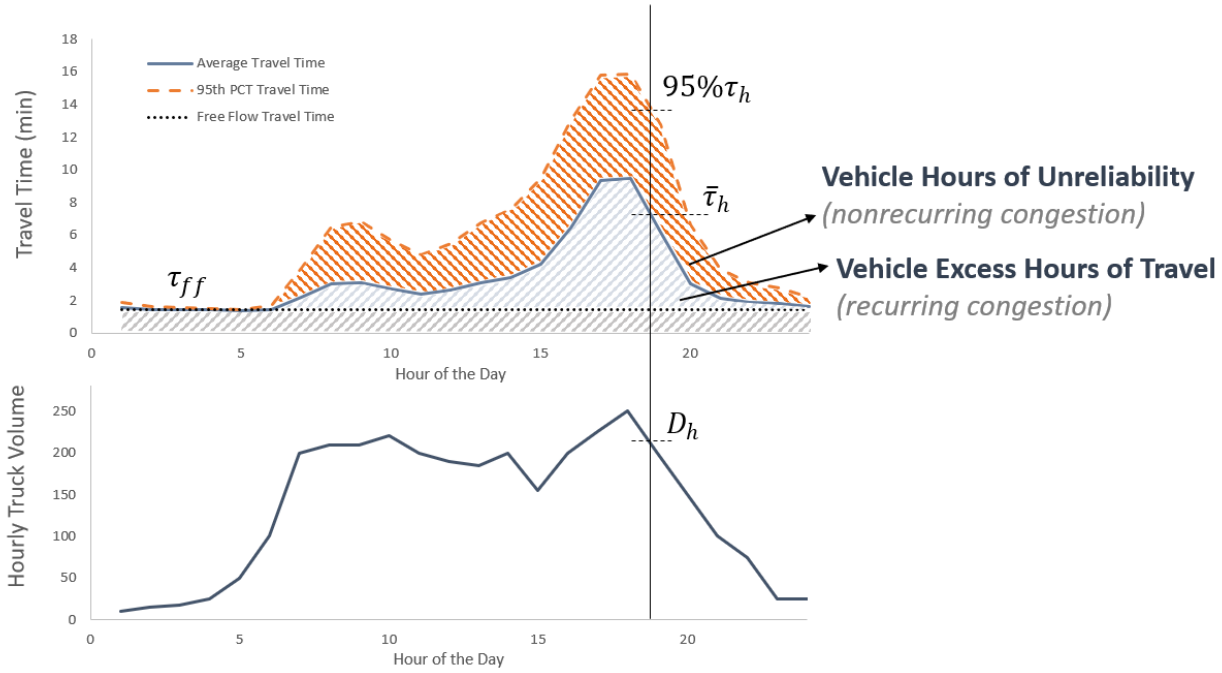
Reliability[12], which focuses on distinguishing recurring congestion from non-recurring congestion to interpret congestion from an economic perspective. Making this distinction is important because research shows that freight users are much more concerned about non-recurring congestion. Motor carriers can schedule deliveries that account for slower speeds if traveling during congested times of the day; however, non-recurring congestion is difficult to anticipate, and can cause significant unreliability not only to the motor carrier, but also to their customers (shippers and receivers). A late shipment can disrupt production, cause a stock-out at a store, or lead to a missed intermodal transfer at an airport, seaport, or rail terminal. On-time performance, which is one of the most important factors in modern-day supply chains, becomes much more difficult to achieve with high levels of non-recurring congestion.

Figure 12 visualizes how recurring and non-recurring congestion were quantified in the Boulevard CID. This included:

- **Recurring congestion** (blue shaded area in figure) was quantified as the number of hours of travel above free flow conditions, which was defined as the Vehicle Excess Hours of Travel (VEHT). VEHT was estimated by comparing average travel times to the free flow travel time for every hour of a typical weekday, and summing throughout the day while multiplying by the number of trucks traveling through that road each hour. While NCHRP Report 925 recommends estimating hourly vehicle volumes, counts from the INRIX data were used instead, which represent a sample of all truck activity. This leads the VEHT estimated to represent a sample of the true VEHT, and therefore useful primarily to evaluate relative congestion on roads. The VEHT metric was divided by the centerline length of the segment to compare between segments of different lengths.
- **Non-recurring congestion** (orange shaded area in figure) was quantified as the number of Vehicle Hours of Unreliability (VHU) accumulated in each segment, which was calculated as the difference between the 95th percentile travel time and the average travel time. This measure sums the hours of uncertainty that trucks face while traveling throughout the day. This is a superior way of measuring unreliability than the often-used travel time indices or buffer indices, because it is additive and focuses on non-recurring congestion, while the other metrics don't distinguish clearly between recurring and non-recurring congestion, making it hard to interpret.

[12] Guerrero, S. E., et al. (2019) Estimating the Value of Truck Travel Time Reliability, National Cooperative Highway Research Program Report 925, Transportation Research Board.

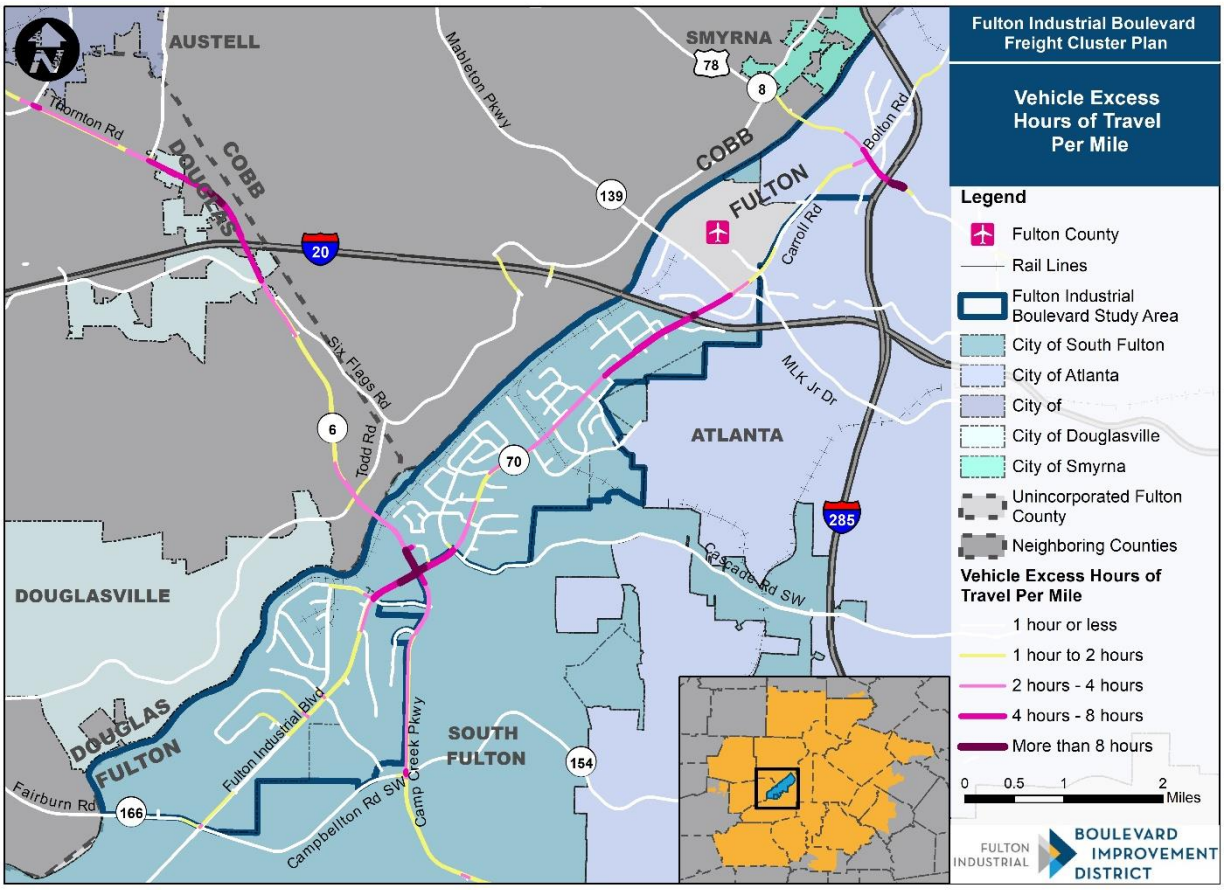
Figure 12. Example Calculation of Congestion Metrics



Source: Consultant analysis of INRIX Data

The location in the CID that generates the most recurring congestion delays for trucks is the Fulton Industrial Boulevard at Camp Creek Parkway intersection. Recurring congestion is also observed on the approach to the I-20 interchange on Fulton Industrial Boulevard. Outside of the CID boundaries, there is significant congestion on Thornton Road at the interchange with I-20, and on Donald L. Hollowell Parkway at the I-285 interchange. This second location is likely resulting from the nearby truck parking facility (largest in the Atlanta region), which drive high truck volumes and congestion on this road. While outside of the CID boundary, these congested locations impact the access of trucks to and from the CID.

Figure 13: Map of Vehicle Excess Hours of Travel Per Mile in Boulevard CID

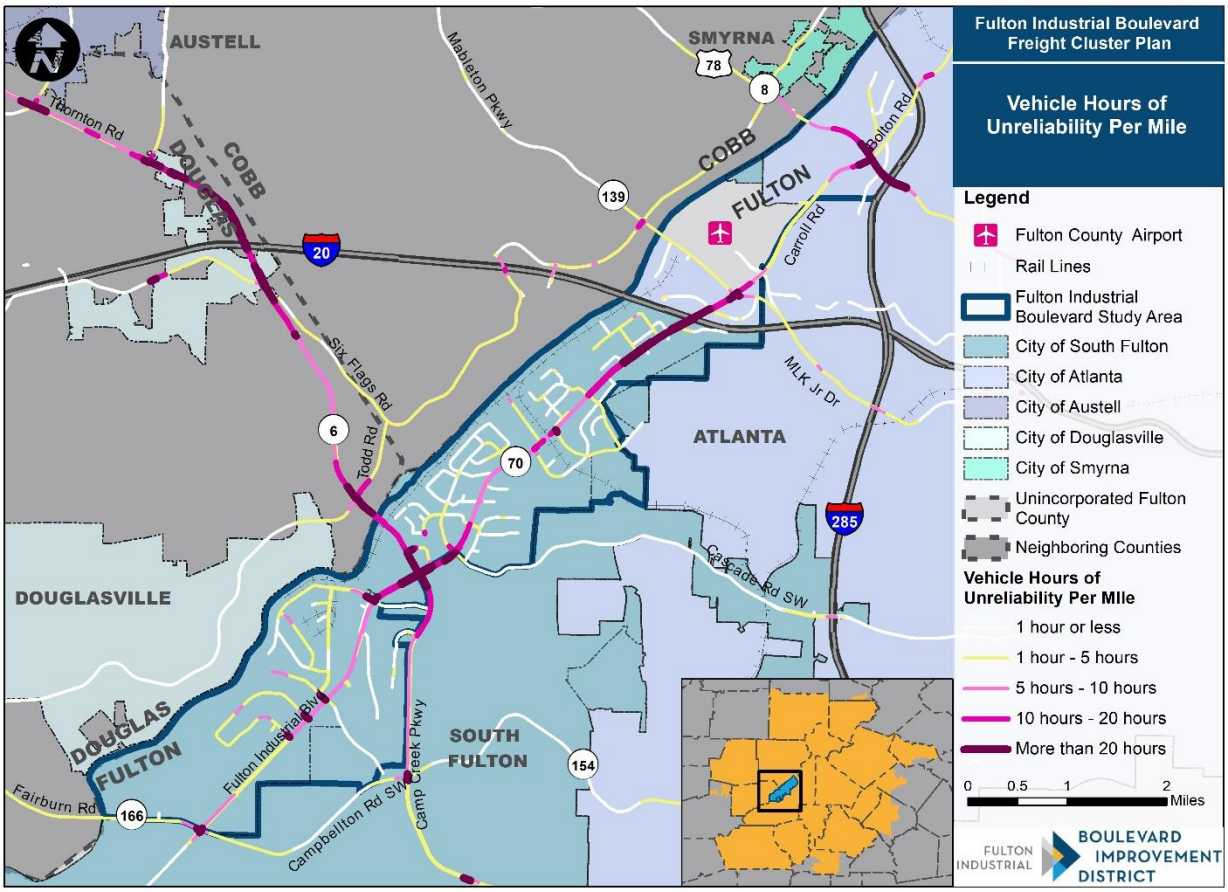


Source: Consultant analysis of INRIX Data

Non-recurring congestion patterns are shown in Figure 14. Hotspots of non-recurring congestion occur at the places where there are intersections between major roads or on/off ramps from highways. Unreliability at major intersections (such as Fulton Industrial Boulevard and Camp Creek Parkway) occurs because some trucks will be able to navigate the intersection without delay if they reach it during a green phase, while others might get stopped in lengthy queues if reaching it during a red phase. During congested times of the day these queues are larger, taking longer to evacuate, and leading to the accumulation of unreliability. Major intersections just outside the study boundaries (such as Donald Lee Hollowell Parkway and Fulton Industrial Boulevard) also generate significant unreliability for trucks heading to and from the Boulevard CID.

Access to and from major highways, particularly I-20, also accumulates unreliability not just because there are traffic signals at these locations, but because congestion spills over from the highway. Data shows this occurs on the on/off ramps accessing I-20 from Fulton Industrial Boulevard. Congestion on the interstates surrounding the Boulevard CID is a significant issue. The I-20 at I-285 interchange was recently ranked as the 4th worst bottleneck in the country by the American Transportation Research Institute, although it is being currently addressed by an on-going project.

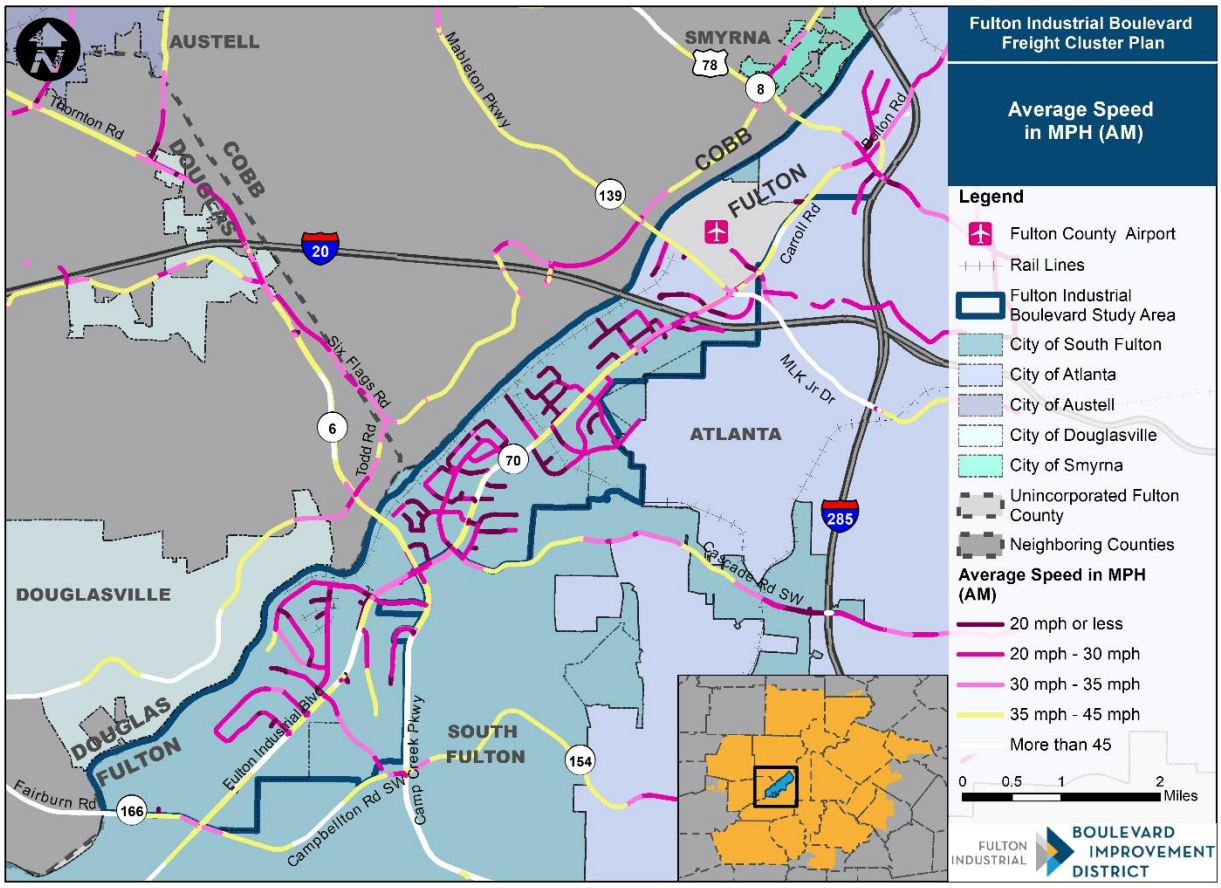
Figure 14: Map of Vehicle Hours of Unreliability Per Mile in Boulevard CID



Source: Consultant analysis of INRIX Data

Figure 15 illustrates the average weekday speeds during the morning peak period. As expected, speeds are the lowest on lower functional classification roads, and remain high on most portions of Fulton Industrial Boulevard, except for the congested locations mentioned previously. As shown in Section 3.1.1, the origination and termination of truck trips peaks during the morning.

Figure 15: Map of Average Speeds During the AM Period in Boulevard CID

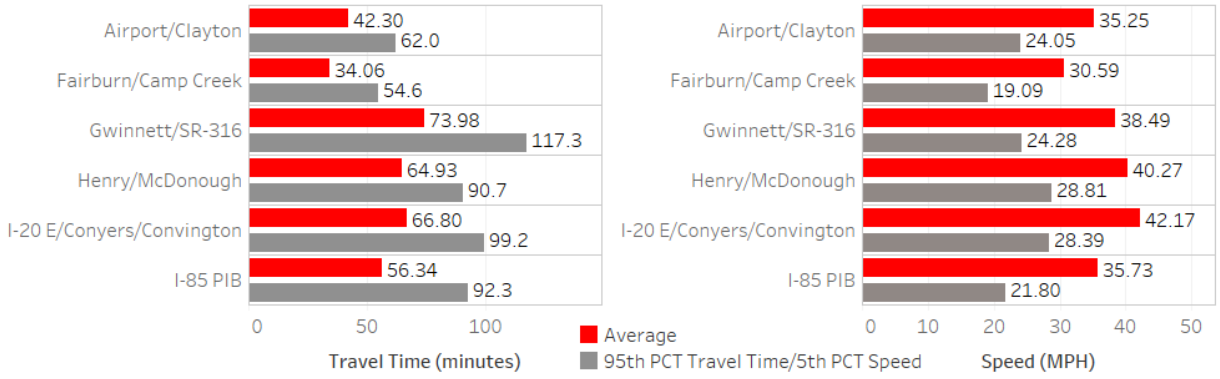


Source: Consultant analysis of INRIX Data

3.3.2 Regional Connectivity

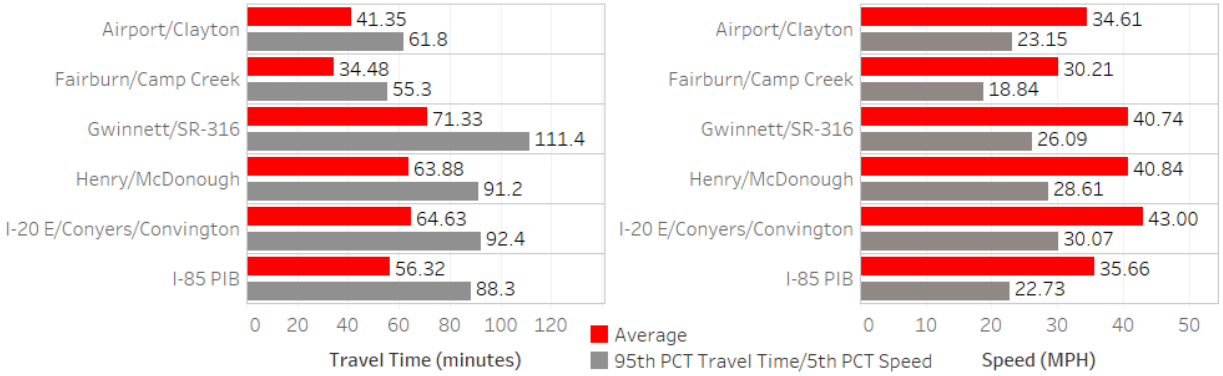
An analysis was conducted to track the travel times and speeds of trucks traveling between the Boulevard CID and other freight clusters in the region. Figure 16 shows the results for trips heading to the CID. The freight clusters that are closest to the CID—Fairburn/Camp Creek and Airport/Clayton—also have the shortest travel times, unsurprisingly. On average, it takes 34 minutes to travel from Fairburn/Camp Creek and 43 minutes to travel from Airport/Clayton. However, because of congestion, these travel times can increase significantly to 55 minutes and 62 minutes respectively. These values represent the travel times of the slowest trip out of every 20 trips (95th percentile travel times and 5th percentile speeds). During congested periods of the day, shippers and motor carriers build a buffer into their delivery schedule, above what the trip would take during normal conditions, because speeds are slower and there is greater uncertainty in arrival times. Another finding from Figure 16 is that three of the freight clusters are on average 1 hour away from the Boulevard CID: I-20 E/Conyers/Covington, Henry McDonough, and Gwinnett/SR-316. During congested times of these, these travel times can increase to an hour and a half to almost 2 hours. A similar pattern is observed in Figure 17 for trucks traveling from the Boulevard CID to other freight clusters in the region.

Figure 16: Travel Times and Speeds of Trips from Freight Clusters to Boulevard CID



Source: Consultant analysis of INRIX Data

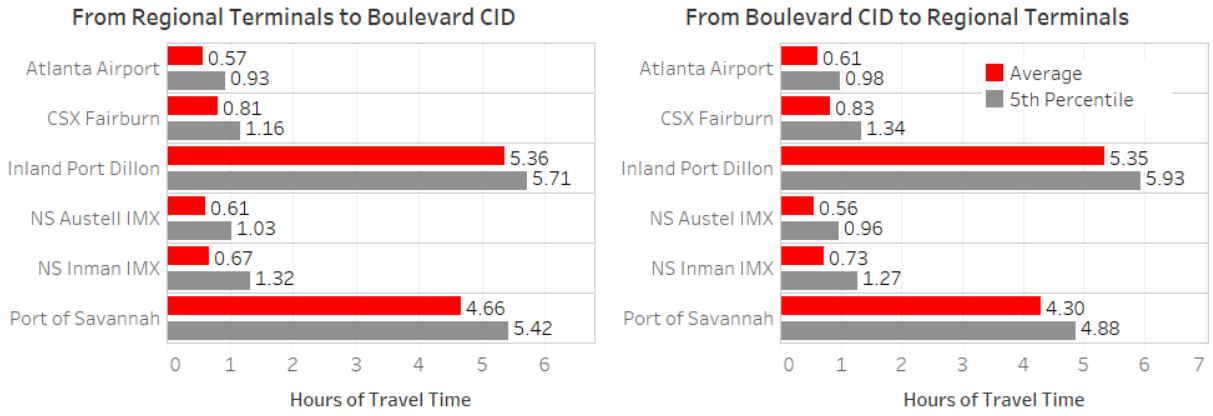
Figure 17: Travel Times and Speeds of Trips from Boulevard CID to Freight Clusters



Source: Consultant analysis of INRIX Data

Figure 18 shows the travel times between the Boulevard CID and nearby intermodal terminals. Surrounding the CID, in the Atlanta region, there are several rail intermodal terminals within a 30 to 40 minute drive. This includes the CSX Fairburn, NS Austell, and NS Inman intermodal terminals. As mentioned previously, this data also shows the speediness of accessing the Hartsfield-Jackson Atlanta International Airport from the CID, although during congested periods this trip could take upwards of 50 minutes. To reach the main seaport in Georgia, the Port of Savannah, it takes trucks 4.3 hours traveling from the CID, and 4.7 hours traveling from the port to the CID. During congested times of the day it could take trucks an additional 30 to 40 minutes to complete this journey.

Figure 18: Travel Times Between Boulevard CID and Nearby Intermodal Terminals



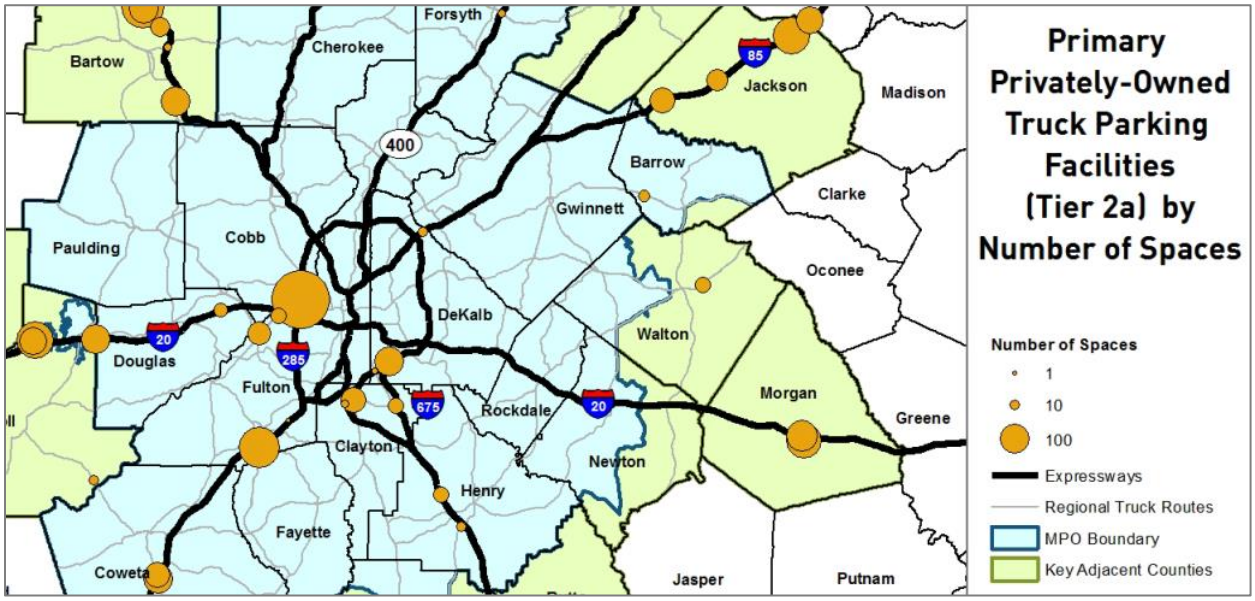
Source: Consultant analysis of INRIX Data

3.4 Truck Parking

The inability to find parking has become one of the top issues for truck drivers nationwide. Lack of parking availability at parking facilities or commercial and industrial facilities, particularly in and around urban areas, often forces drivers to spend a considerable amount of time searching for a space, which translates directly into lost productivity and higher trucking costs. It is not uncommon for drivers to run out of regulated hours of service (or just “hours”) trying to find parking, forcing them to park in undesignated locations on roadway shoulders, ramps, or public lots.

The 2018 ARC Regional Truck Parking Assessment found that locating parking in the greater Atlanta region is a challenge, with demand outstripping available capacity. A survey conducted of trucking sector participants found that 73 percent saw truck parking as a significant issue. This study, however, found that the interstate corridors surrounding the Boulevard CID (I-20 and I-285 west) have the most availability of parking spaces relative to demand in the region, making finding a space in this area easier than elsewhere (especially on I-85 or I-75). As can be seen in Figure 19, there are several private parking facilities on I-20 and I-285, surrounding the Boulevard CID. This includes the Petro Georgia Atlanta parking facility, which is the largest in the Atlanta region, and is located just northeast of the CID. Within the CID there are several parking facilities, including a Quick Trip station located at the intersection of Camp Creek Parkway and Fulton Industrial Boulevard. In addition to the private facilities shown in Figure 19, there is also a small public facility on I-20, northwest of the CID.

Figure 19: Private Truck Parking Facilities



Source: ARC Regional Truck Parking Assessment, 2018

While the ARC Regional Truck Parking Assessment found that truck parking was generally available on corridors surrounding the Boulevard CID, it is possible that availability has diminished since the publication of this study, especially with the recent surge in e-commerce. Even though the area surrounding the Boulevard CID has more parking capacity compared to other areas in Atlanta, demand could be relatively high because of the density of manufacturing and warehouse activity, and proximity to intermodal infrastructure, including the airport.

Most truck parking issues in the Boulevard CID likely relate to staging, which stems from the need of truck drivers to meet specific delivery and pickup windows. Industrial and commercial facilities receiving freight typically have a fixed number of docks and dock workers, and a limited area for trucks to park (because land is expensive), therefore they schedule deliveries within certain windows, typically 1 to 3 hours long, but often as little as 15 minutes. The receiver's operations and production counts on the delivery arriving during this time—especially in just-in-time supply chains that carry minimal inventories—placing a high premium on the shipment arriving on time. Walmart's new "on-time, in-full" program requires suppliers (and the truck lines they hire) to meet distribution center delivery windows 98% of the time, or face fines equivalent to 3% of the value of goods. Such penalties are not uncommon throughout the industry.

Delivery windows, which have become ubiquitous in modern supply-chains, place pressures on truck drivers that increase urban parking demand. The emphasis on meeting the delivery window leads truck drivers to have a strong incentive to plan to arrive early in case of congestion or unforeseen circumstances. In some instances, trucks might be allowed to enter the receiver facility early, but this is not typical, especially for establishments that generate or attract significant quantities of freight, such as distribution centers. These establishments are generally built with only the truck parking capacity to accommodate the throughput of shipments. Even when the capacity exists to park on-site, managers often discourage this for

liability and operational reasons (e.g., not having adequate facilities to accommodate third-party personnel). If there are no truck stops or rest areas or on-street parking nearby, trucks are forced to park in undesignated locations waiting for their appointment, often queuing outside of the establishment. While there are parking facilities in and around the Boulevard CID, these could become full, especially early morning, leading drivers to resort to parking in undesignated locations instead. Some drivers also do not prefer to park at these large facilities because they can be crowded, difficult to navigate, and not as convenient as parking right outside their destination.

However, undesignated parking, either outside of establishments or along major truck routes, can pose a safety risk to other vehicles, create litter or other nuisances, and is typically illegal. For example, Boggs et al. (2019)[13] found that undesignated parking at the entry or exit ramps of parking facilities leads to increases in crashes. Approximately 1/3 of the collisions on interchange ramps were at ramps adjacent to parking facilities with utilization of 90% or greater. The lack of designated parking can also cause safety issues on the road. Difficulty in finding places to rest, combined with increased pressures to maximize revenues, can lead truck drivers to undertake risky behavior by driving while fatigued (Thompson et al. 2015)[14], creating a safety risk even when the trucks are on the road.

Ensuring that adequate parking capacity is available for trucks would not only improve safety and facilitate adherence to Hours of Service regulations, but it would enhance productivity as well. Drive time is a fixed asset; the time spent looking for parking represents time that the driver is not spending moving cargo or resting. This reduces the speed and efficiency of truck transportation, thereby increasing the logistics costs of all products that rely on trucking.

3.4.1 Undesignated Parking Analysis

An analysis was conducted to identify locations in the Boulevard CID that see frequent undesignated parking. As mentioned previously, these locations could cause safety risks and deteriorate the operations of the roadway, particularly if travel lanes are being blocked. The ARC Regional Truck Parking Assessment did not identify any major undesignated truck parking locations in the Boulevard CID. However, anecdotally it is known that significant undesignated parking occurs dispersed throughout the CID, primarily for the staging reasons mentioned above. An analysis was conducted using the INRIX trip data to identify hotspots of undesignated truck parking activity.

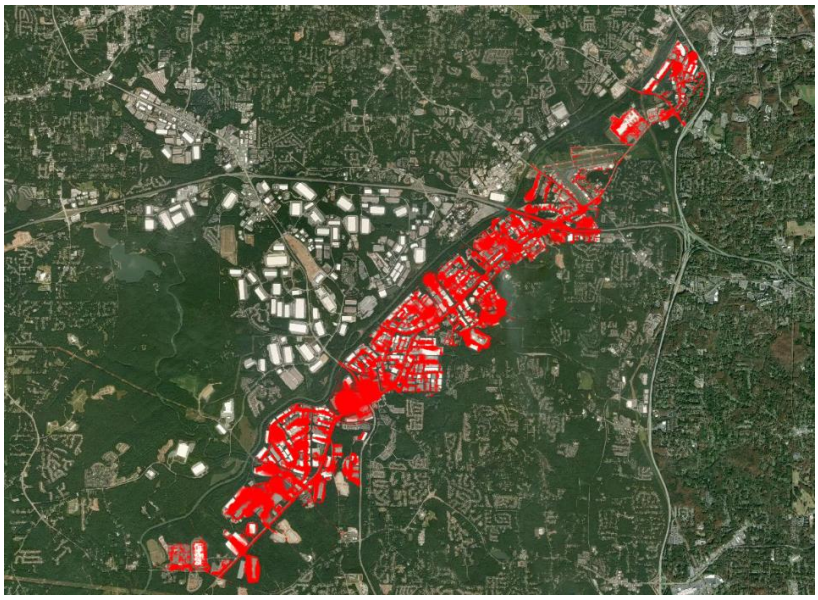
The locations where trucks are stopping in the Boulevard CID are shown in Figure 20 (termination of INRIX truck trips in the region). Most of the stops occurred at manufacturing or warehousing facilities, as expected. However, a scan was conducted to identify locations that are seeing frequent truck parking in places where they should not be parking. Some of this parking activity was found on wide driveways leading up to industrial facilities, causing minimal disruptions to other traffic or the accessibility of other facilities. However,

[13] Boggs, A., Hezaveh, A.M., Cherry, C.R. 2019. Shortage of commercial vehicle parking and truck-related interstate ramp crashes in Tennessee. In: 98th Annual Meeting of the Transportation Research Board. Washington DC.

[13] Thompson, J., Newnam, S., Stevenson, M. 2015. A model for exploring the relationship between payment structures, fatigue, crash risk, and regulatory response in a heavy-vehicle transport system. Transportation Research Part A, 82, 204–215.

some undesignated parking was found on narrow travel lanes on roads that provide access to multiple industrial facilities. Trucks parked at these locations are likely creating a significant disruption to traffic, causing them to swerve onto oncoming travel lanes, creating a safety risk. Outside of the main roadways (e.g. Fulton Industrial Boulevard, Camp Creek Parkway), most roads in the CID did not have shoulders that could accommodate trucks. This forced trucks to park on travel lanes. Some of these lanes are wide enough to accommodate multiple trucks, but most are not.

Figure 20: Analysis of Truck GPS Data to Identify Undesignated Truck Parking Hotspots



Source: Consultant analysis of INRIX Data

In addition to the scan of the INRIX data, undesignated parking locations were also identified through field observation. On April 30, 2021, a field study was conducted that included noting locations of undesignated truck parking.

Table 1 shows the undesignated parking locations identified. These locations had at least 1 truck parked, observed through either satellite imagery or the field study; often multiple trucks were observed parked at the same time. Locations identified through GPS data had multiple truck stops during the GPS data period. Most of the undesignated parking locations were not found to pose a clear safety issue to the truck or other vehicles, however seven were assessed to pose these types of issues. Parking in-lane that did not pose a clear safety issue likely involved lanes that were wide enough to accommodate multiple trucks. Parking on grass or gravel lots was uncommon, with only 2 locations identified in the CID. Figure 21 maps the undesignated parking locations based on whether they were judged to generate safety issues. Areas of undesignated parking just outside of the Boulevard CID region were not added to Table 1 or Figure 21. A significant location is the overflow parking that occurs adjacent to the truck parking facility northeast of the Boulevard CID.

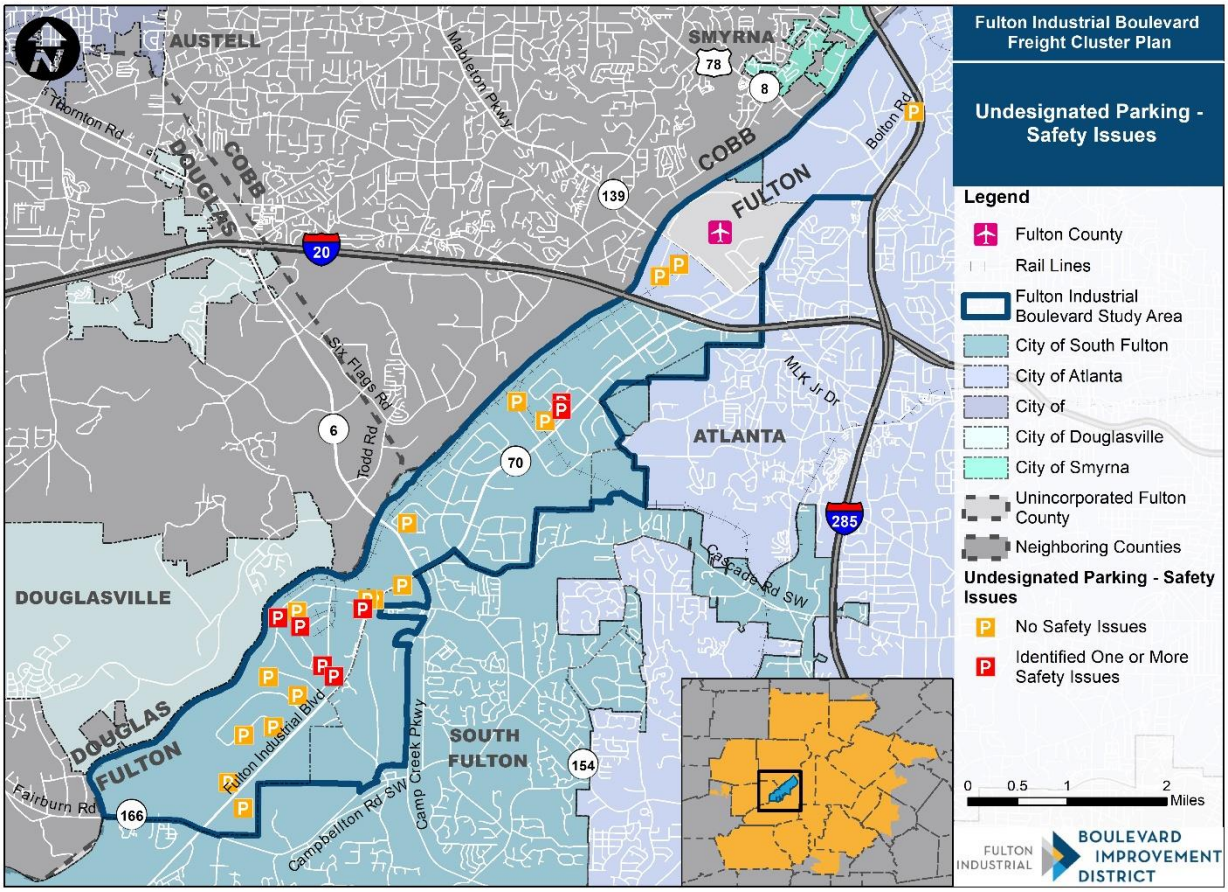
Table 1: Locations of Undesignated Truck Parking

Location #	Location	Truck Park Location	GPS Identification	Field Identification	Clear safety issues?	Parking on Grass/ Shoulder
1	1515 Northwest Dr.	Dead end		X	No	No
2	650 Distribution Dr.	Cul-de-sac	X		No	No
3	1 National Dr.	Cul-de-sac and in lane next to cul-de-sac		X	No	No
4	36 Enterprise Blvd.	In lane	X	X	Passing vehicles	No
5	55 Enterprise Blvd.	In lane next to turnaround		X	No	No
6	120 James Aldredge Blvd.	In lane		X	Passing vehicles	No
7	5225 Phillip Lee Dr.	Dead end/across railroad	X	X	No	Parking on dirt next to railroad
8	780 Wesleyan Dr.	Cul-de-sac and in lane next to cul-de-sac		X	No	No
9	6001 Boat Rock Blvd.	Empty lot at north corner	X		No	No
10	925 Greensboro Dr.	On grass between Greensboro and FIB	X		No	On grass
11	100 Fisk Dr.	In lane		X	Passing vehicles - blocked sightlines around curve	No
12	6125 Xavier Dr.	Dead end/In lane	X		No	No
13	7035 Lagrange Blvd.	In lane		X	One lane blocked	No
14	7050 Lagrange Blvd.	In lane		X	One lane blocked	No
15	6180 Purdue Dr.	In lane		X	Passing vehicles	No
16	6300 Duquesne Dr.	In lane		X	Passing vehicles	No
17	6500 Tradewater Pkwy.	In faux cul-de-sac	X	X	No	No
18	1635 Westgate Pkwy.	In lane			No	No
19	1833 Westgate Pkwy.	In lane			No	No

20	John F Varley Ct.	Cul-de-sac and in lane next to cul-de-sac	X	X	No	No
21	Lakeview Ct.	In lane	X	X	No	No
22	Eagle Vista Pkwy.	Cul-de-sac	X		No	No
23	Kendall Park Ln.	In lane	X	X	No	No

Source: INRIX Data and Consultant field observation

Figure 21: Map of Undesignated Parking Locations



Source: Consultant analysis of INRIX Data

4 EXISTING CONDITIONS AND PERFORMANCE

4.1 Roadway Characteristics

This section describes the roadway system in the Boulevard CID. The roadway characteristics considered in this section include Functional Classification (the role of each roadway in the overall roadway network), Lane Configuration (how many lanes make up each direction of travel), and Lane Widths (the typical widths of the lanes on a roadway), and Bridge Characteristics.

4.1.1 Functional Classification

FHWA classifies roadways based on their role in serving the flow of traffic through the roadway network in a hierarchy called functional classification. Planners and engineers use this hierarchy to properly channel transportation movements through a roadway network efficiently. Table 2 lists the seven functional classifications and their definitions by FHWA.

Table 2: Functional Classification Definitions

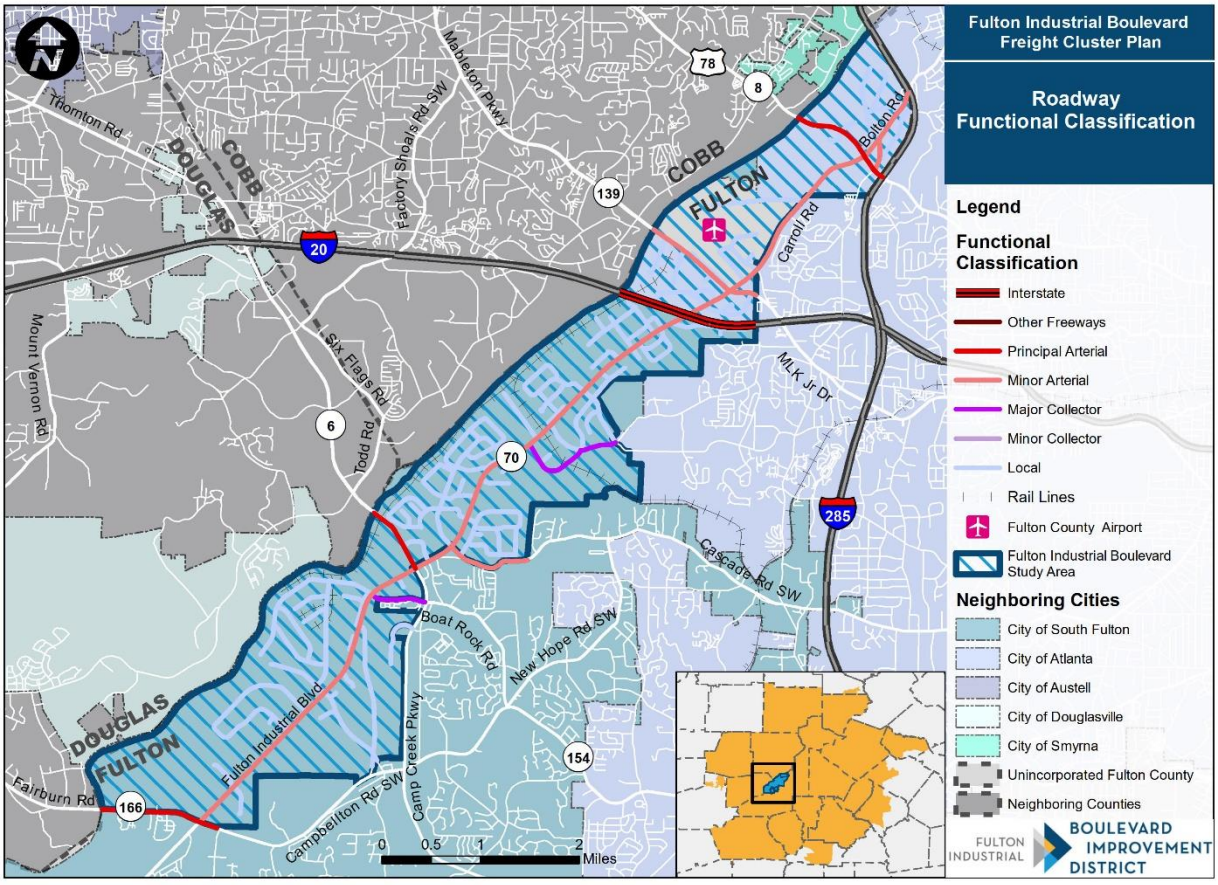
Functional Classification	Definition
Interstates	Roadways officially designated as Interstates by the Secretary of Transportation.
Other Freeways and Expressways	Roadways with directional travel lanes, usually separated by some type of physical barrier, with access and egress points limited to on- and off-ramp locations or a very limited number of at-grade intersections.
Other Principal Arterials	Roadways that serve major centers of metropolitan areas and provide a high degree of mobility through urban and rural areas. These roadways are not access-controlled, so abutting land uses can be served directly via driveways.
Minor Arterials	Roadways that service trips of moderate length and serve geographic areas that are smaller than their higher Arterial counterparts. These roadways interconnect and augment the higher Arterial system, provide intra-community continuity, and may carry local bus routes.
Major Collectors	Roadways that gather traffic from Local Roads and funnel them to the Arterial network. These roadways are longer in length, have lower driveway densities, have higher speed limits, are spaced at greater intervals, have higher annual average traffic volumes, and may have more travel lanes than Minor Collectors.
Minor Collectors	Roadways that gather traffic from Local Roads and funnel them to the Arterial network, but are shorter, have higher driveway densities, have lower speed limits, are spaced at smaller intervals, have lower annual average traffic volumes, and may have fewer travel lanes than Major Collectors.
Local Roads	These roadways account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of a trip, due to their provision of direct access to abutting land. They are often designed to discourage through traffic.

Source: FHWA

Figure 22 shows the functional classification of the roadways in the study area, as designated by FHWA. I-20 is the only Interstate within the study area, while I-285 bounds the northern portion of the study area but is not included. The main thoroughfare through the study area, SR 70/Fulton Industrial Boulevard, is

classified as a Minor Arterial. SR 70/Fulton Industrial Boulevard is a crucial route for trucks to quickly and easily transfer between industrial sites and the Principal Arterials (SR 8/US 78/US 278/Donald L. Hollowell Parkway, SR 6/Camp Creek Parkway, and SR 154/Campbellton Road) and the Interstates, I-20 and I-285, as they begin and end their journeys. Other major cross-routes that intersect SR 70/Fulton Industrial Boulevard include SR 139/Martin Luther King Jr. Drive and Cascade R Road, which are also Minor Arterials. The Major Collector roadways in the study area include Boat Rock Road as well as parts of Selig Drive and Bakers Ferry Road. These roadways collect and distribute traffic between local roads and the arterials. The rest of the roadways in the study area are considered Local Roads, a majority of which provide direct access to industrial sites.

Figure 22: Roadway Functional Classification



Source: ARC

4.1.2 Designated Truck Routes

The Boulevard CID study area contains multiple truck routes, or roadways that are recommended for truck travel due to their capability of facilitating large vehicles. There are four sets of designated truck routes that are part of the study area, described below.

4.1.2.1 National Highway Freight Network

The National Highway Freight Network (NHFN) resulted from a combination of the Primary Freight Network and the National Freight Network through the Fixing America's Surface Transportation Act (FAST Act). It was created by FHWA and contains four subsystems, as described in Table 3.

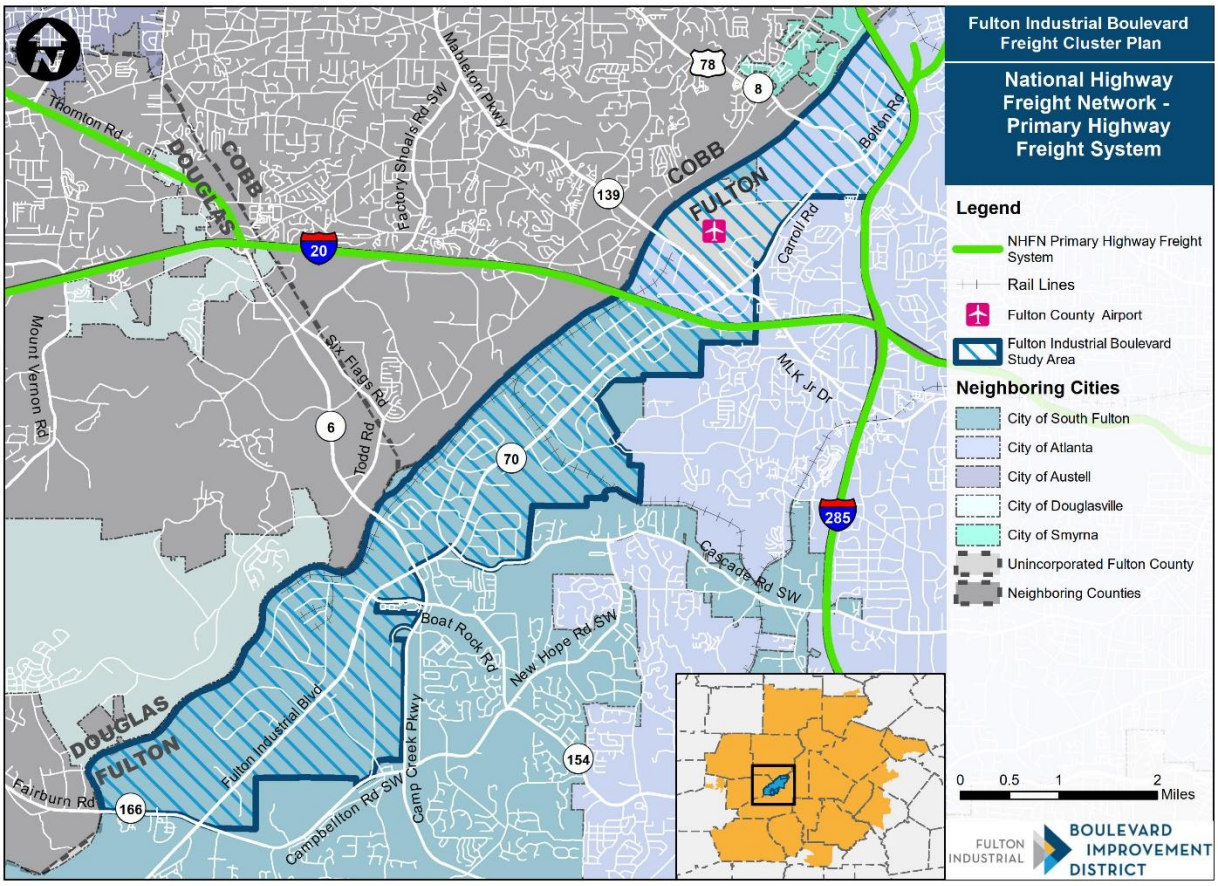
Table 3: National Highway Freight Network Subsystems

Subsystem	Definition
Primary Highway Freight System (PHFS)	This is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data. The network consists of 41,518 centerlines miles, including 37,436 centerline miles of Interstate and 4,082 centerline miles of non-Interstate roads.
Other Interstate portions not on the PHFS	These highways consist of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities. These portions amount to an estimated 9,843 centerline miles of Interstate, nationwide, and will fluctuate with additions and deletions to the Interstate Highway System.
Critical Rural Freight Corridors (CRFCs)	These are public roads not in an urbanized area which provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities. Nationwide, there are 4,412 centerline miles designated as CRFCs.
Critical Urban Freight Corridors (CUFCs)	These are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities. Nationwide, there are 2,213 centerline miles designated as CUFCs.

Source: FHWA

Figure 23 shows the NHFN corridors in the study area. I-285, I-20, and, just outside of the study area, Bolton Road and Parrot Avenue are all part of the network, along with SR 6/Thornton Road in Douglas County. All of these corridors are all part of the Primary Highway Freight System (PHFS), meaning they make up the most critical highway portions of the national freight transportation system.

Figure 23 : National Highway Freight Network Routes



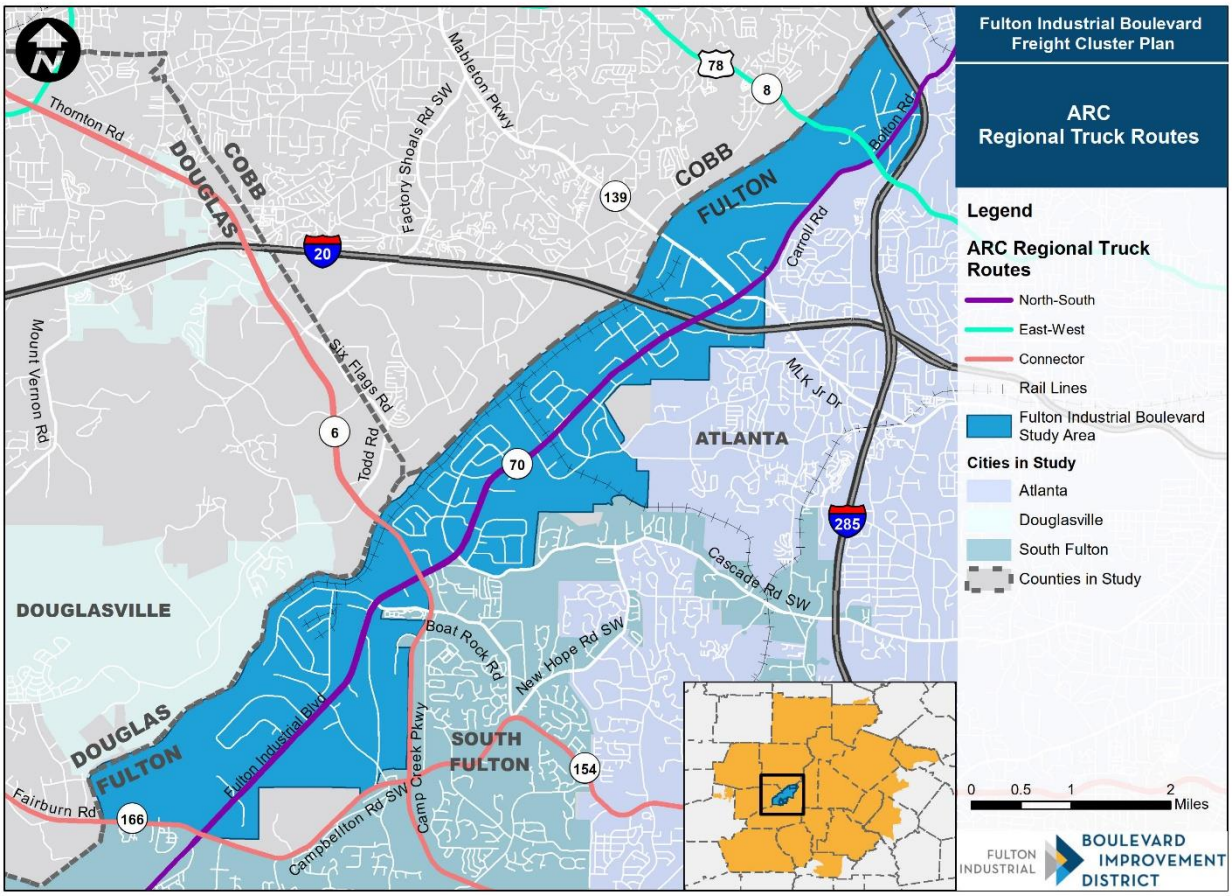
Source: FHWA

4.1.2.2 ARC Regional Truck Routes

As part of the Atlanta Strategic Truck Route Master Plan (ASTRoMaP), ARC identified important freight routes throughout the 20-county region. Roadways were rated via a number of quantitative and qualitative criteria, and the methodology for determining the network included a “path of least resistance” component, defined by roadways with a good composite rating, and a “grid” component, defined by designating both North-South and East-West routes. As such, the regional truck routes are classified as either North-South, East-West, or Connector.

Within the study area, there are four regional truck routes, as shown in Figure 24. SR 70/Fulton Industrial Boulevard is classified as a North-South route, SR 8/US 78/US 278/Donald L. Hollowell Parkway is classified as an East-West route, and both SR 6/Camp Creek Parkway and SR 154/Campbellton Road are considered Connectors. Because of their designations, these routes play a major role in inter-Atlanta freight movement, especially transportation among freight clusters.

Figure 24: ARC Regional Truck Routes

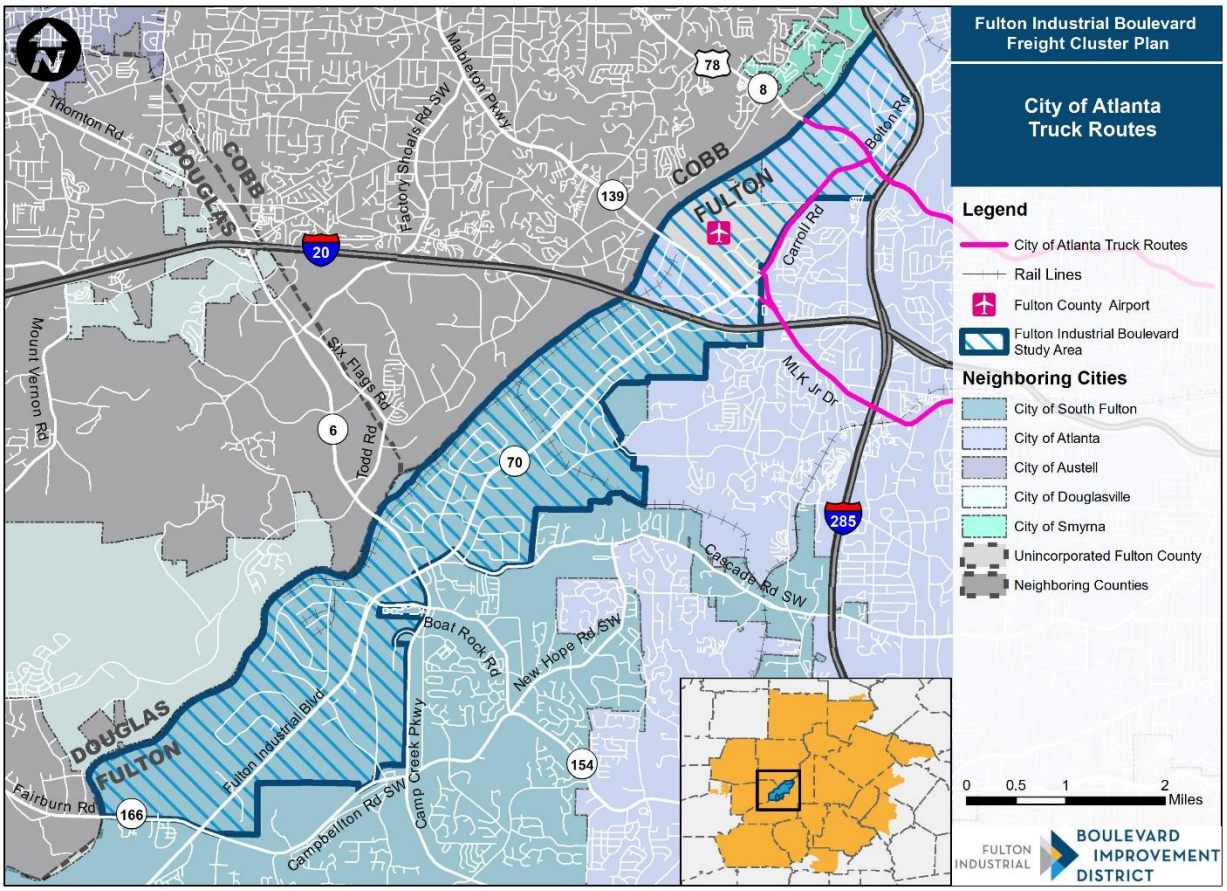


Source: ARC

4.1.2.3 City of Atlanta Truck Routes

As part of Cargo Atlanta: A Citywide Freight Study, the City of Atlanta set out to compile data from FHWA, ARC, and the City to create a freight route map within the city limits. The FHWA and ARC truck routes are shown in the above two figures, but Figure 25 shows the city-designated truck routes, which were initially introduced in the city's 1952 truck route map. These truck routes include the portions of SR 8/US 78/US 278/Donald L. Hollowell Parkway, SR 70/Fulton Industrial Boulevard, SR 139/Martin Luther King Jr. Drive, and Old Gordon Road that lie within the city limits.

Figure 25: City of Atlanta Truck Routes



Source: City of Atlanta

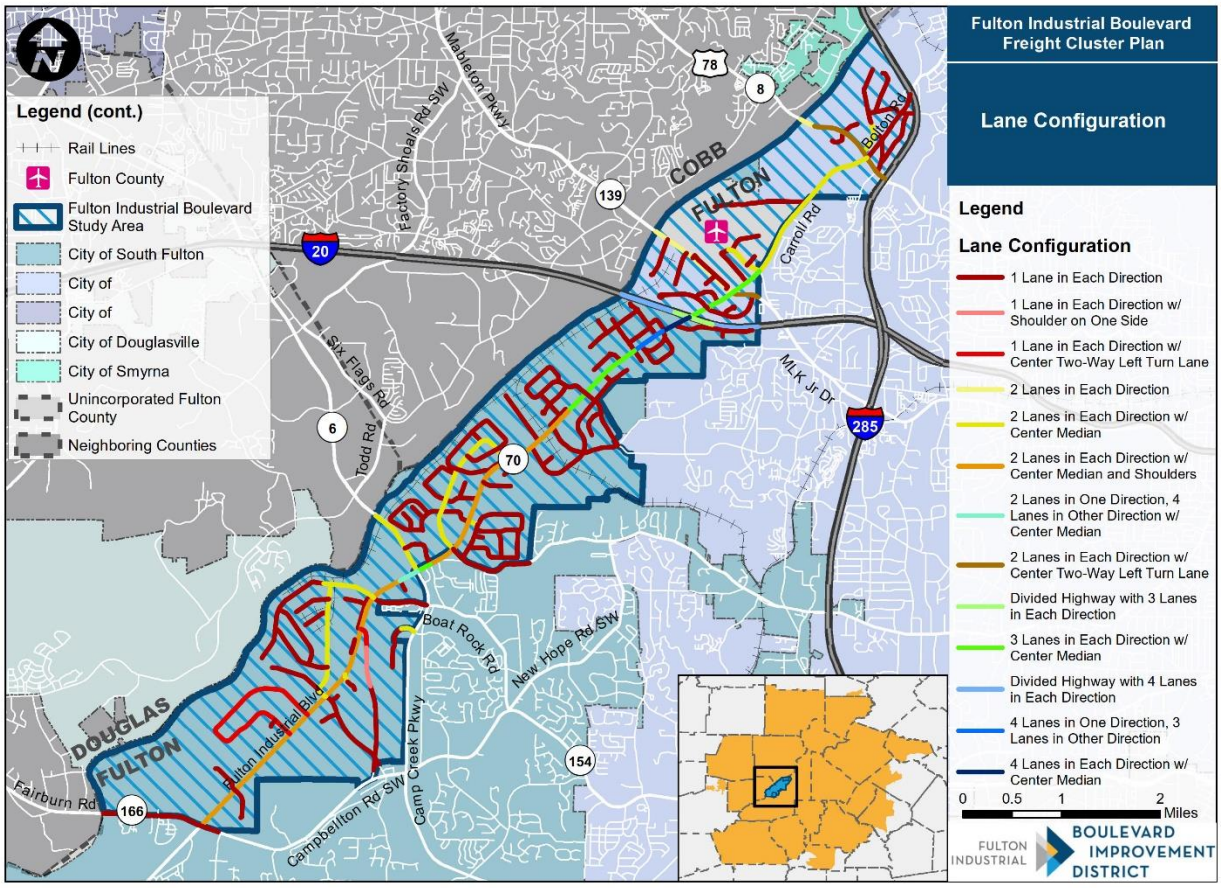
4.1.2.4 Oversized Truck Routes

Statewide, GDOT designates certain truck routes as Oversized Truck Routes, meaning these routes can accommodate trucks up to 14 ft wide, 14 ft 6 in tall, and 100 ft long, with a gross weight of up to 100,000 pounds. Within the study area, both SR 70/Fulton Industrial Boulevard and SR 6/Camp Creek Parkway are Oversized Truck Routes.

4.1.3 Lane Configuration

The lane configuration of each roadway in the Boulevard CID study area is shown in Figure 26. The lane configuration is shown for a typical section of the roadway, which represents how the roadway generally looks at segments away from intersections (so turn lanes are not included). Local Roads without a marked centerline were included in the “1 Lane in Each Direction” category.

Figure 26: Lane Configurations



Source: Google Earth and Consultant field observation

Roadways in the study area range from one lane in each direction to four lanes in each direction (for a short segment approaching I-20). Most have one lane in each direction, without a median, and are Local Roads. However, there are a few Local Roads with two lanes in each direction and a center median, including Great Southwest Parkway, Lagrange Boulevard, and parts of Boat Rock Boulevard and Aviation Cir. Additionally, three Arterials in the study area, Bolton Road, Cascade Road, and SR 154/SR 166 Campbellton Road, also have only one lane in each direction.

In the northern section of the study area, SR 70/Fulton Industrial Boulevard is configured with two lanes in each direction and a center raised median. For most of the section south of Mendel Drive, it also has two lanes in each direction, but instead with a grassy median and paved shoulders. In proximity to the I-20 interchange, SR 70/Fulton Industrial Boulevard gains a lane in each direction, and even has four lanes in each direction for a small segment directly south of I-20.

Lane configurations differ slightly for other Arterials in the study area. SR 139/Martin Luther King Jr. Drive, SR 6/Camp Creek Parkway, and SR 8/US 78/US 278/Donald L. Hollowell Parkway all have two lanes in each direction; however, SR 6/Camp Creek Parkway has a center median, and SR 8/US 78/US 278/Donald L. Hollowell Parkway has a center two-way left turn lane throughout most of the study area.

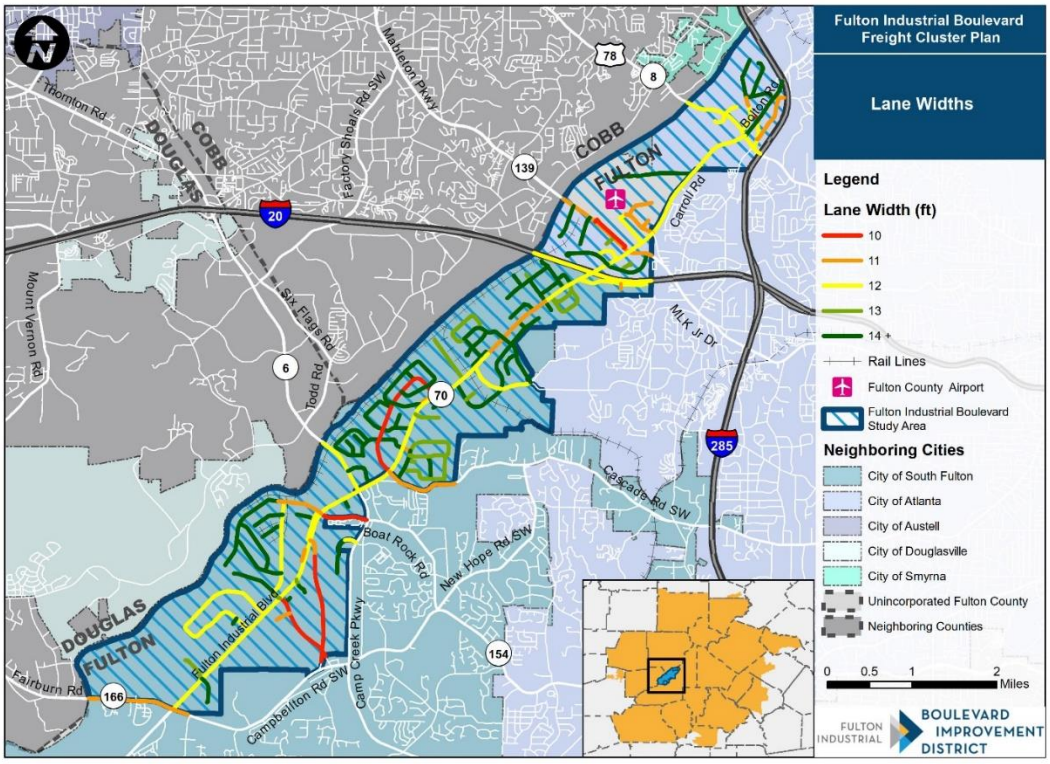
4.1.4 Lane Widths

The typical lane widths of the roadways in the study area are shown in Figure 27. Lane widths of 12 ft or more are favorable for trucks. The standard truck is around 8.5 ft wide, so lanes that are 10 or 11 ft wide provide little space on either side of the truck. However, it is important to consider that vehicles are more likely to drive faster on roadways with wider lanes, which can impact roadway/pedestrian safety.

Lane widths in the study area range from 10 ft to 20 ft. In general, the roadways with lane widths of 16 ft or greater are local roads that directly serve industrial land uses, which makes it easier for trucks to maneuver as they prepare to load and unload. Two of the roadways with 10 ft lane widths, Great Southwest Parkway and Plummer Road, are also local roads directly serving industrial land uses; however, the former has two lanes in each direction, and the latter has a 12 ft wide paved shoulder on one side in the area near the industrial land uses, both of which give trucks ample space to turn and maneuver.

SR 70/Fulton Industrial Boulevard has a consistent 12 ft lane width throughout the study area, and a paved shoulder width ranging from 10 to 12 ft in the southern half of the study area. This lane width is accommodating for trucks as they use SR 70/Fulton Industrial Boulevard, especially at the speeds seen on the roadway. The other Arterials and Collectors that intersect SR 70/Fulton Industrial Boulevard have lane widths of 11 or 12 ft, which are adequate for trucks as they use these roadways to access I-285 and other regions.

Figure 27: Lane Widths

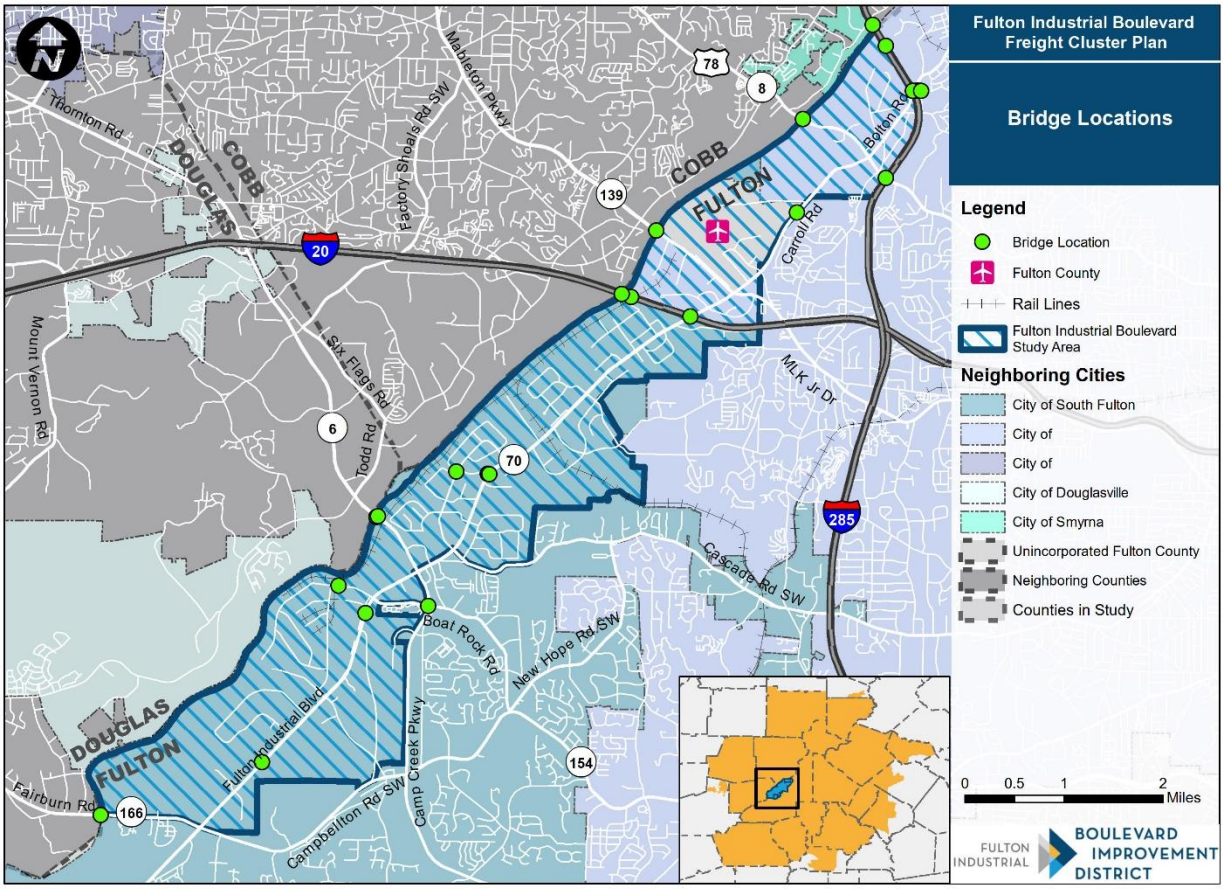


Source: Measurements from Google Earth

4.1.5 Bridges

There are 22 roadway bridges in the study area, as shown in Figure 28, which span railroads, waterways, and other roadways. This section looks at the characteristics of these bridges, including Sufficiency Rating, Load Rating, and Vertical Clearance.

Figure 28: Bridge Locations



Source: GDOT

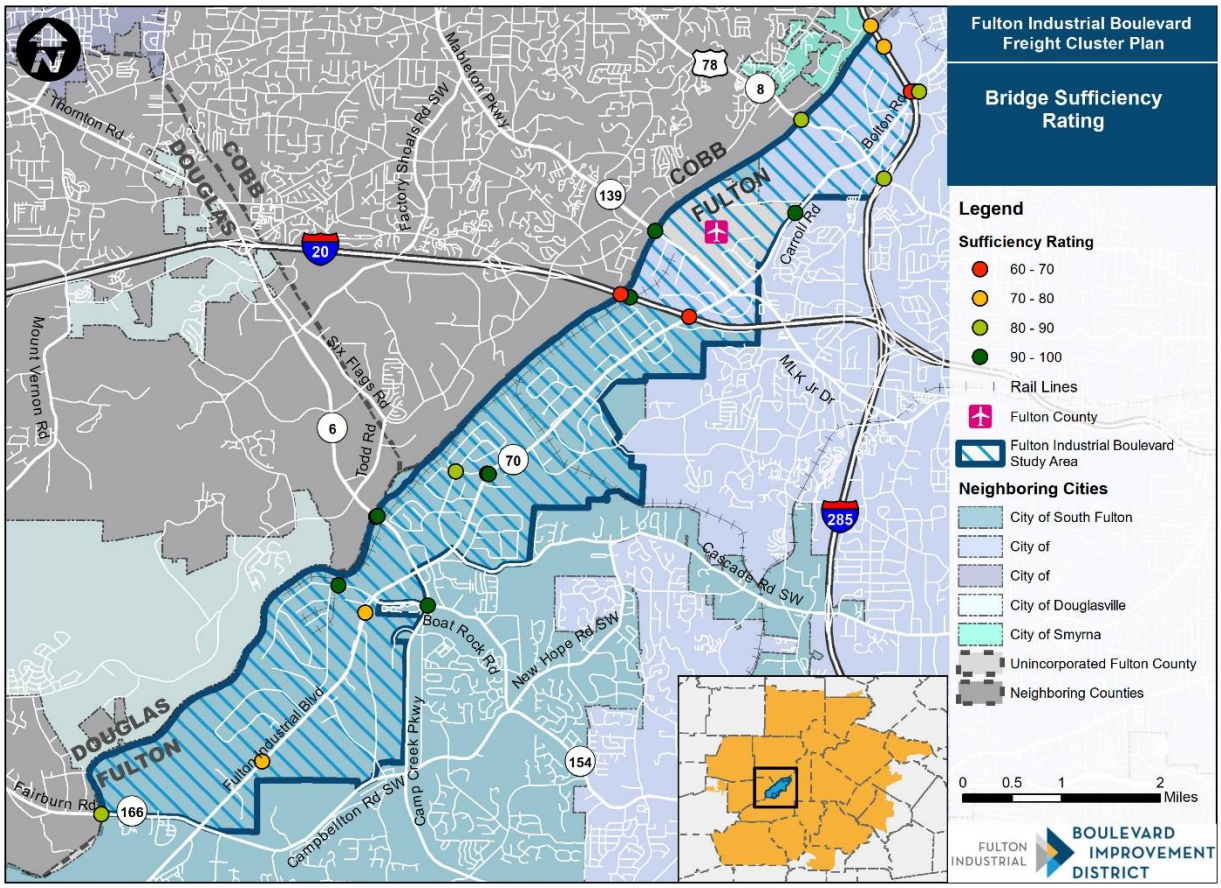
It should be noted that the SR 8/US 78/US 278/Donald L. Hollowell Parkway bridge over I-285 is set to be replaced as part of the I-285 Westside Express Lanes project under the Major Mobility Investment Program (MMIP). Construction on the bridge is set to start in 2023 and should be completed by 2026.

4.1.5.1 Sufficiency Rating

Bridge sufficiency rating was developed by FHWA to serve as a prioritization tool to allocate funds through FHWA's Highway Bridge Replacement & Rehabilitation Program (HBRRP). The three performance measures that comprise the sufficiency rating are: structural adequacy and safety (55 percent of the rating), serviceability and functional obsolescence (30 percent of the rating), and essentiality for public use (15 percent of the rating. The sufficiency rating ranges from 0 to 100; bridges with lower ratings will have higher priority for funding. Bridges with a sufficiency rating of 80 or less are eligible for rehabilitation funding, and bridges with a sufficiency rating of 50 or less are eligible for replacement funding.

The sufficiency rating of the bridges in the study area is shown in Figure 29. The bridge with the lowest sufficiency rating in the study area is the Bolton Road bridge over I-285/Proctor Creek, which has a rating of 63.2. The other bridges with a sufficiency rating between 60 and 70 include I-20 over SR 70/Fulton Industrial Boulevard, I-20 over the Chattahoochee River, and SR 70/Fulton Industrial Boulevard over Utoy Creek.

Figure 29: Bridge Sufficiency Ratings



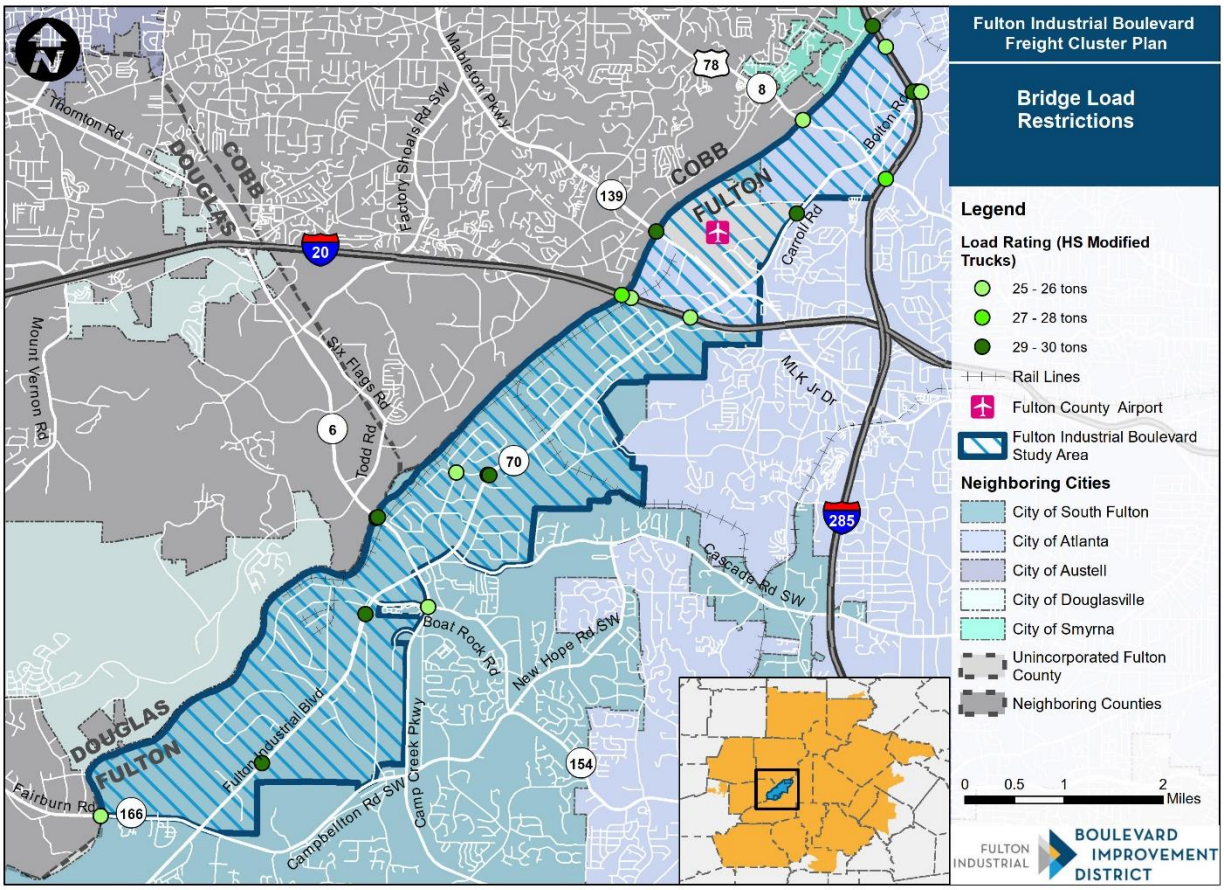
Source: GDOT

4.1.5.2 Load Rating

Bridges are given a load rating, stating the weight that the bridge is designed to withstand. The standard design vehicles used by GDOT for bridges are an HS20 truck (a standard semi-trailer truck) or an HL93 truck (either a standard semi-trailer or a semi-trailer with tandem axels). However, when considering whether a bridge should be posted (when weight restrictions are posted on a sign by the bridge), GDOT uses Legal and Specialized Hauling Vehicles as the design vehicles, and any bridge with a load rating under 36 tons for these vehicles will be posted.

The study area's bridge load ratings for an HS-modified truck (a standard semi-trailer truck configuration) are shown in Figure 30. The figure shows that all of the bridge load restrictions in the study area range from 25 to 30 tons. None of the bridges in the study area have posted weight restrictions.

Figure 30: Bridge Load Rating for Semi-Trailer Trucks



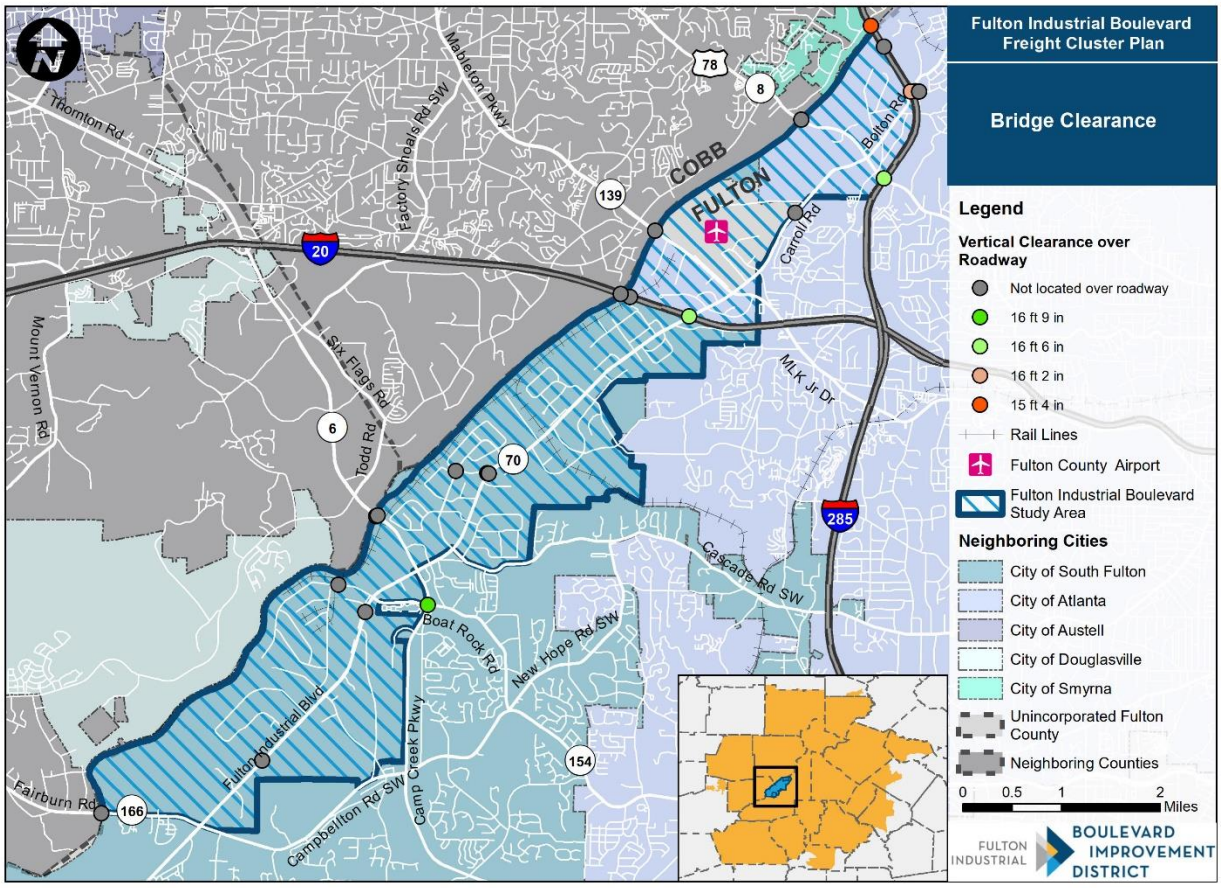
Source: GDOT

4.1.5.3 Vertical Clearance

The vertical clearance was identified for the five bridges that span other roadways in the study area, using Bridge Inspection Reports from GDOT, and can be seen in Figure 31. For bridges over Interstates, GDOT's standard minimum vertical clearance is 17 ft, but the clearance can be as low as 16 ft 6 in, with permission from the GDOT Bridge Office. The minimum vertical clearance over state routes (non-interstate) and local routes is 16 ft 9 in, although with permission it can be as low as 16 ft 6 in and 14 ft 6 in, respectively.

Of the five bridges that span other roadways in the study area, two are located above I-285: Bolton Road and SR 8/US 78/US 278/Donald L. Hollowell Parkway. The SR 8/US 78/US 278/Donald L. Hollowell Parkway bridge has a vertical clearance of 16 ft 6 in, while the Bolton Road bridge has a clearance of 16 ft 2 in. Two bridges span state routes, I-20 over SR 70/Fulton Industrial Boulevard and Boat Rock Road over SR 6/Camp Creek Parkway, which have vertical clearances of 16 ft 9 in and 16 ft 6 in, respectively. The last bridge is the I-285 bridge over the Chattahoochee River and Riverview Road, which has a 15 ft 4 in vertical clearance over Riverview Road. This bridge is within the study area, but the point where it crosses Riverview Road is just outside of the study area in Cobb County.

Figure 31: Bridge Clearances



Source: GDOT

4.2 State of Good Repair

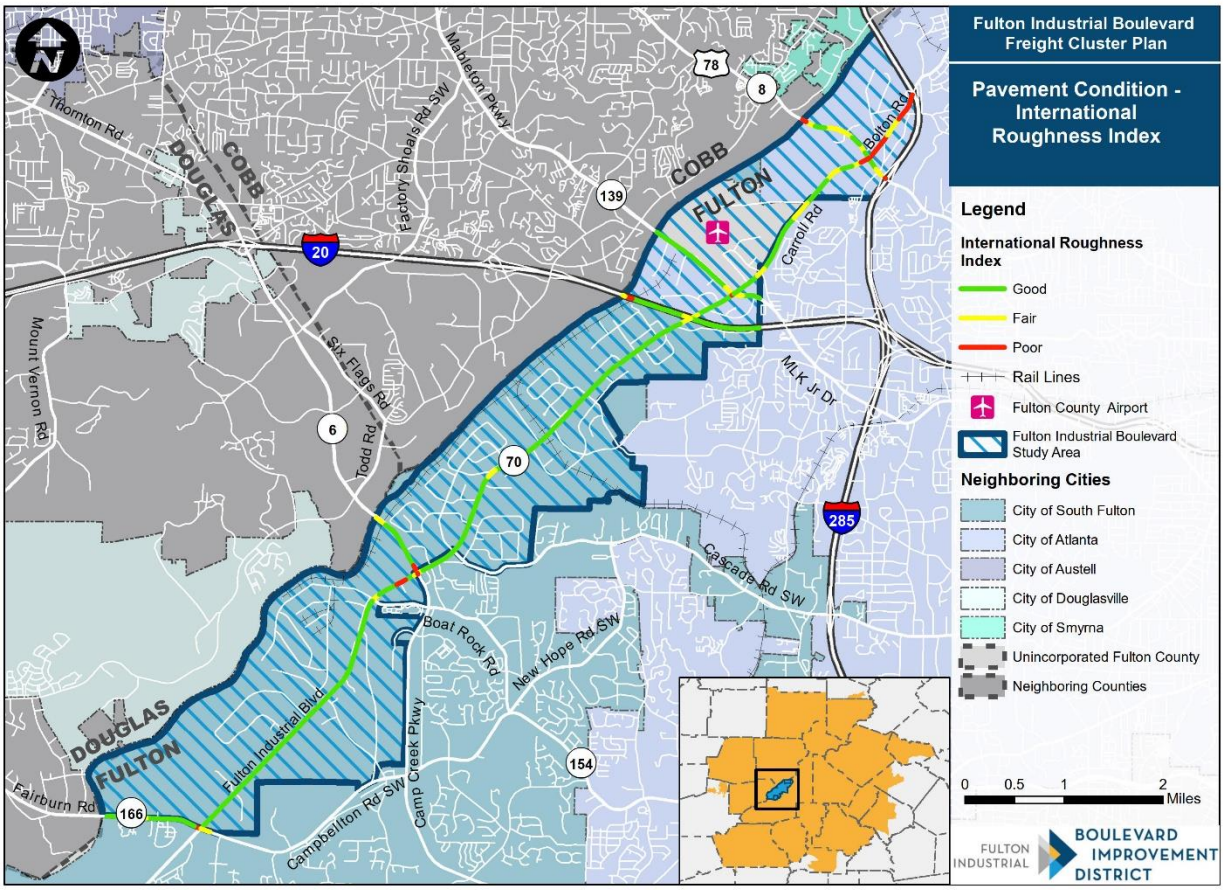
This section details the condition of the transportation assets within the Boulevard CID area, and what areas should be prioritized for maintenance. The condition of the pavements and the curbs in the study area were the two areas of focus in this assessment.

4.2.1 Pavement Condition

The condition of the roadway surfaces was analyzed using two metrics: International Roughness Index (IRI) and Present Serviceability Rating (PSR). GDOT keeps track of pavement condition on state routes, and the data is submitted to FHWA for its Highway Performance Monitoring System (HPMS). Pavement condition on state routes is measured via the IRI. In the study area, this includes I-20, SR 70/Fulton Industrial Boulevard/Bolton Road, SR 8/US 78/US 278/Donald L. Hollowell Parkway, SR 139/Martin Luther King Jr. Drive, SR 6/Camp Creek Parkway, and SR 154/SR 166 Campbellton Road. The IRI is calculated by measuring the profile along the roadway and analyzing the size of surface deviations that impact vehicle suspension movement. IRI measurements are grouped into three categories: Good (less than 95 inches/mile), Fair (between 95 and 170 inches/mile), and Poor (greater than 170 inches/mile). The IRI for the state routes in the study area is shown in Figure 32. The majority of the state routes in the study area

have a Good IRI rating. Locations with Fair or Poor IRI ratings are typically located near major intersections. The locations with Poor pavement conditions are located on Bolton Road where it crosses I-285, SR 70/Fulton Industrial Boulevard near SR 8/US 78/US 278/Donald L. Hollowell Parkway, I-20 and SR 8/US 78/US 278/Donald L. Hollowell Parkway as they approach their respective bridges over the Chattahoochee River, and at the intersection of SR 70/Fulton Industrial Boulevard and SR 6/Camp Creek Parkway.

Figure 32: Pavement Condition (IRI)



Source: FHWA

The pavement condition of all roadways in the study area was also measured using the PSR, which was developed by the American Association of State Highway Transportation Officials (AASHTO). The PSR is measured by visual inspection; the criteria for each category is shown in Table 4 below.

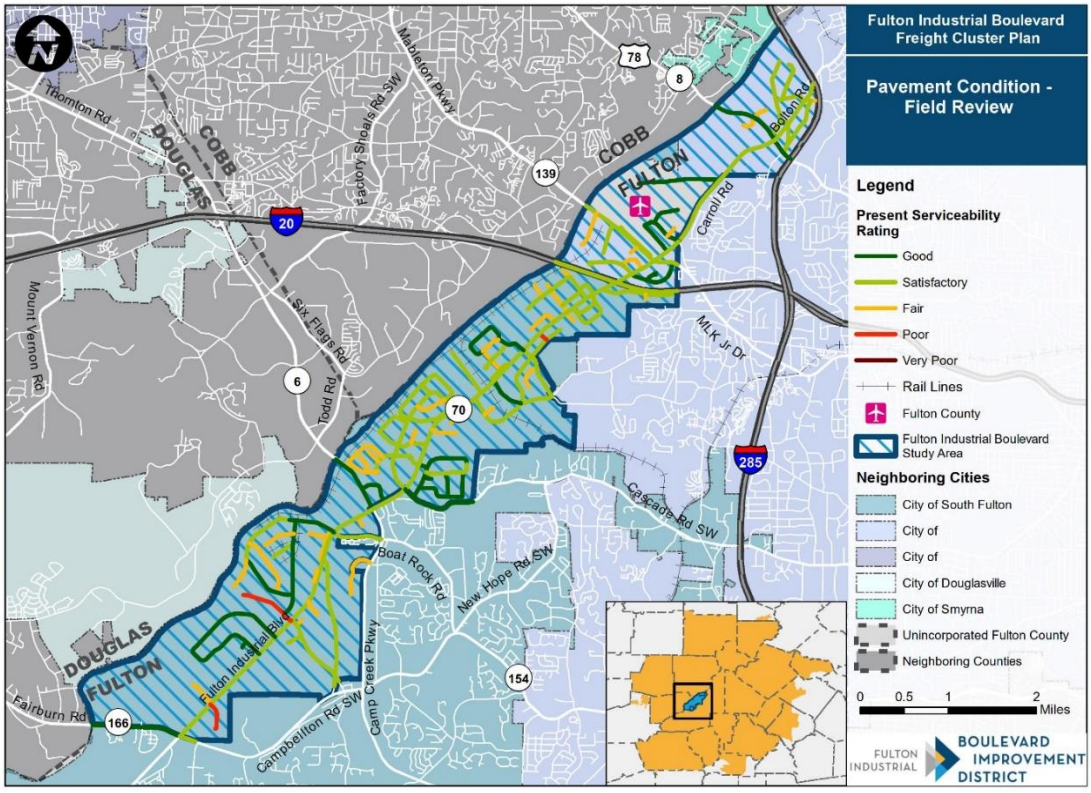
Table 4: PSR Categories

Category	Description
Good	Pavement appears to be new (or nearly new), smooth, and generally free of cracks, patches and signs of distress.
Satisfactory	Pavements in this category do not appear to be new but exhibit few visible signs of surface deterioration. This includes evidence of rutting and fine random cracks.
Fair	Pavements in this category are noticeably inferior to those of new pavements. They exhibit surface defects such as rutting, map cracking, and extensive patching.
Poor	Pavements in this category have deteriorated to such an extent that they appear to affect the flow of traffic. They are characterized by potholes and deep cracks. Other distresses include raveling, cracking, rutting and occurs over a large portion of the surface.
Very Poor	Pavements in this category are very deteriorated. Traffic appears to navigate the facility at reduced speeds. Distresses are visible over most of the surface and include large potholes and deep cracks.

Source: FHWA

Figure 33 shows the PSR for the roadways in the study area. PSR data was collected during a field visit in April 2021, where the project team drove every roadway in the corridor to observe pavement condition. As shown in the figure, there are no roadways in the study area with a Very Poor PSR. The roadways with a Poor PSR are Robinson Drive, Tradewater Parkway, and Kendall Park Ln. Around 50 percent of roadways in the study area have either a Good or Satisfactory PSR.

Figure 33: Pavement Condition (PSR)



Source: Consultant field observation

4.2.2 Curb Condition

A number of intersections in the study area were observed to have cracked curbs or off-road ruts, indicating these curbs are often mounted by turning trucks, which could signify a problem with the turning radii at these intersections. Figure 34 shows an example of a cracked curb and significant off-road rutting at the intersection of SR 70/Fulton Industrial Boulevard and Phillip Lee Drive.

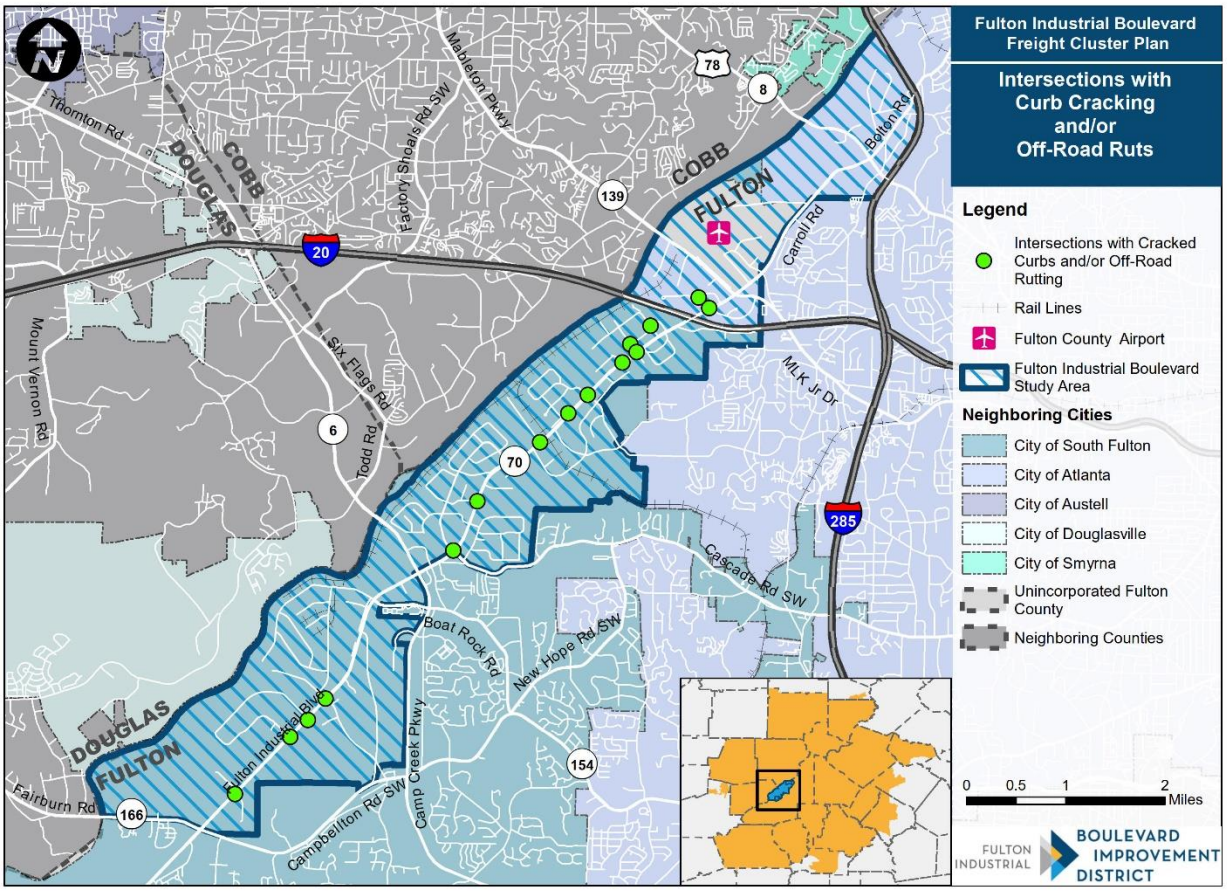
Figure 34: Curb Cracking and Off-Road Rutting at Intersection of SR 70/Fulton Industrial Boulevard & Phillip Lee Drive

Source: Consultant field observation

Intersections where significant curb cracking and/or off-road rutting was observed are shown in Figure 35. This data was collected during the aforementioned field visit. A majority of the intersections with observed curb cracking or off-road rutting are along SR 70/Fulton Industrial Boulevard. One explanation for this phenomenon is that trucks turning onto local roads from SR 70/Fulton Industrial Boulevard are transitioning from a high speed onto a narrow road, resulting in a maneuver that may be difficult to complete without mounting the curb.

The standard minimum turning radius for a semi-trailer truck is 45 ft, so at intersections with smaller turning radii, especially those with high truck volumes, it may be beneficial to increase the turning radii. However, larger turning radii can affect the safety of pedestrians, as they increase the distance a pedestrian has to cross the roadway and allow other vehicles to make turns at a higher rate of speed. Therefore, in areas with high pedestrian activity, it is important to weigh the costs and benefits of increasing turning radii.

Figure 35: Intersections with Curb Cracking and/or Off-Road Ruts



Source: Consultant field observation

4.3 Vulnerable Transportation Assets

One important consideration of the overall transportation network is its vulnerability to natural or human disasters. The Boulevard CID is exposed to many types of risks that could adversely affect its transportation system and impact businesses negatively. The main natural risk faced by the CID is flooding related, given that the Chattahoochee River runs across north of the CID. However, other natural risks are also possible, including from severe storms. In May of 2021 a tornado made touchdown in the CID, causing significant damage to several facilities. However, this damage was cleaned relatively quickly, and operations resumed normality soon after.

4.3.1 Flooding

The Chattahoochee River and its tributaries are the main sources of flooding potential in the study area. Flooding potential data from the Federal Emergency Management Agency (FEMA) was analyzed in and around the study area, and the results are shown in Figure 36. The analysis included flooding potential for both 100-year and 500-year flooding events, which are defined as major floods that statistically on average occur every 100 and 500 years, respectively. Flooding can affect freight movement in three main ways: causing roadways and railways to become impassable due to high water or debris, causing immediate or

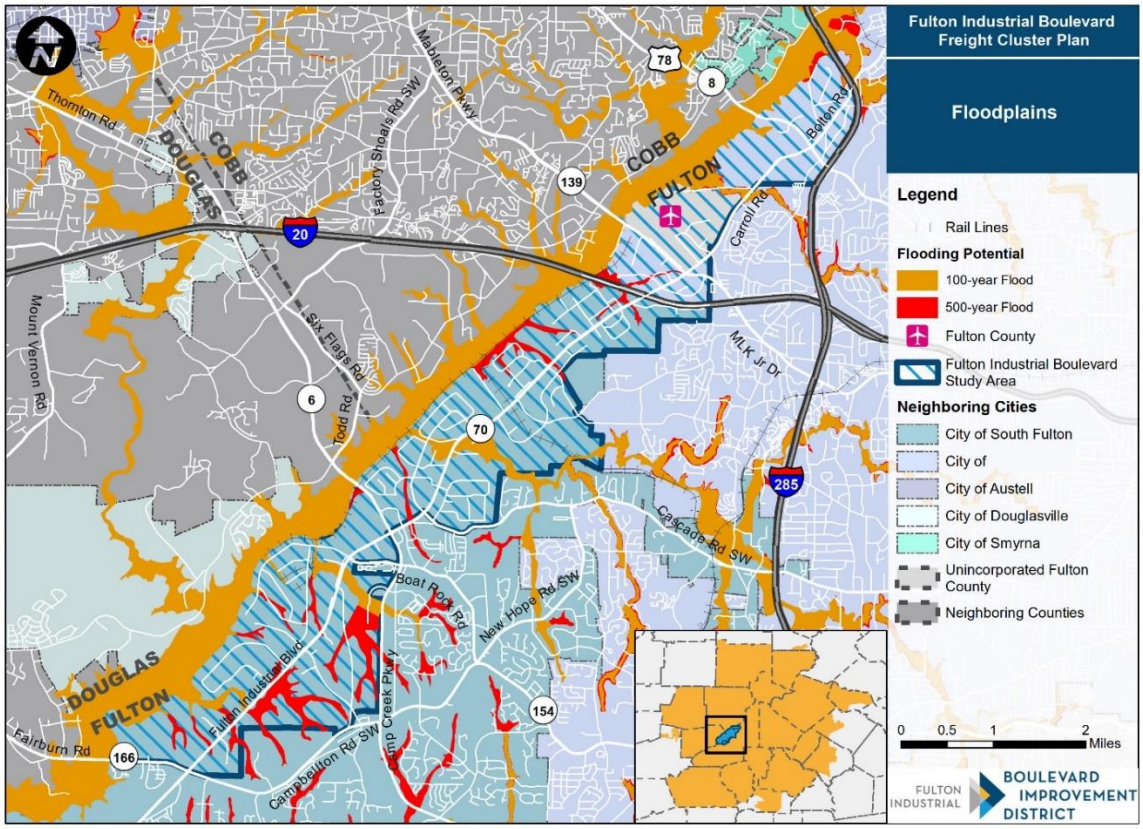
long-term pavement and rail damage, or moving and damaging freight equipment, such as parked truck trailers or forklifts.

The Fulton County Railroad runs parallel to the Chattahoochee River, and would be significantly affected by a 100-year flooding event. The roadways in the study area that would mainly be affected by an 100-year flooding event are those that are located near a tributary such as Sandy Creek (Sandy Creek Road and SR 70/Fulton Industrial Boulevard), Utoy Creek (Tulane Drive, Bucknell Drive, and SR 70/Fulton Industrial Boulevard), and the unnamed creek that crosses SR 70/Fulton Industrial Boulevard south of Boat Rock Road (SR 70/Fulton Industrial Boulevard and Westlake Parkway), or the roadways that are located near the Chattahoochee River, such as SR 154/Campbellton Road and Distribution Drive.

A 500-year flooding event would affect a few locations in addition to those mentioned above. The areas most affected by a 500-year flooding event are SR 70/Fulton Industrial Boulevard near Westgate Parkway, the area near the intersection of Lagrange Boulevard and Duquesne Drive, and Wharton Cir.

A monitoring station is located in the middle of the study area where the Utoy Creek meets the Chattahoochee River. The “flood stage” at this monitoring location is 18 feet and the “action stage” is 16 feet. The action stage indicates when flood mitigation procedures need to go into effect. Since 2010 the flood stage has been met once and the action stage five times according to data from the United States Geological Survey.

Figure 36: Floodplains



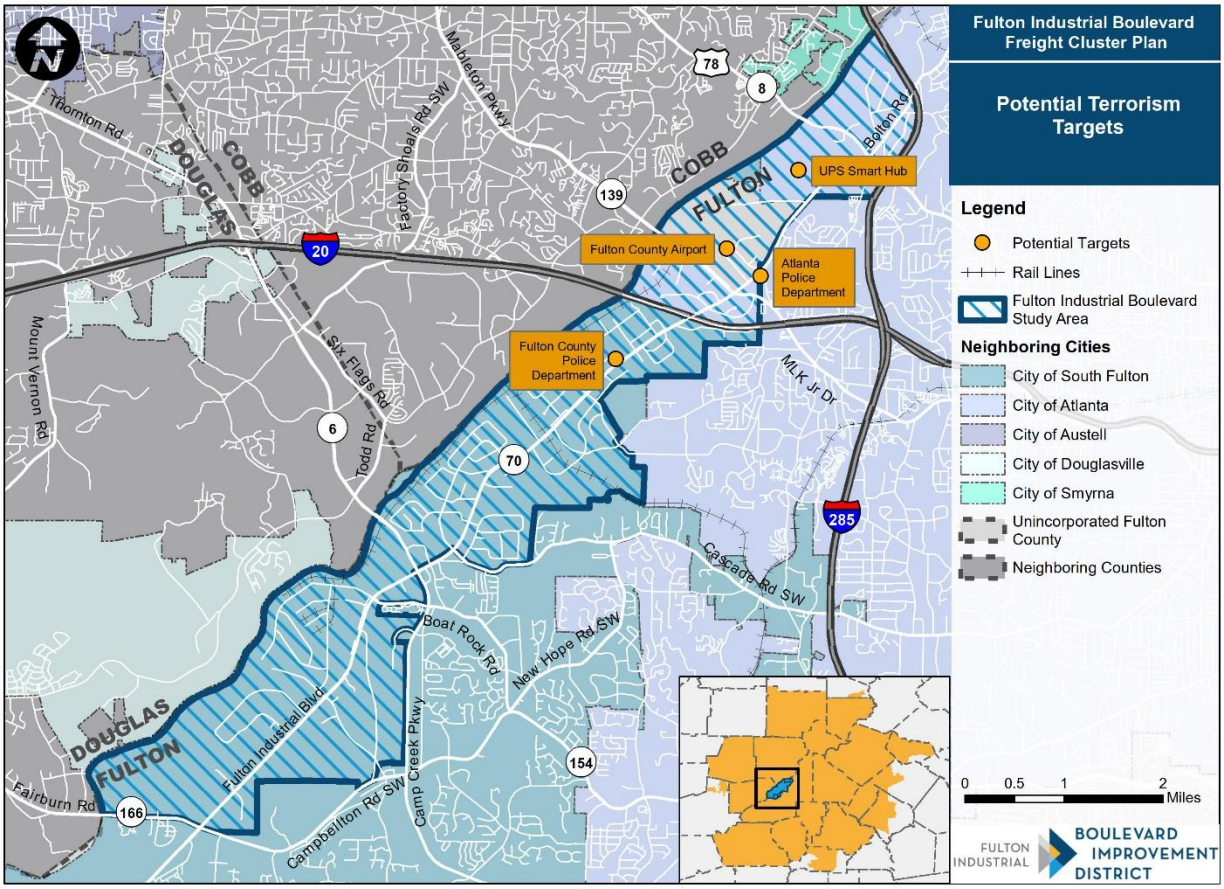
Source: ARC

4.3.2 Terrorism

Another threat in the study area is the threat of terrorism. Terrorism is defined as the unlawful use of violence and intimidation, especially against civilians, in the pursuit of political aims. In its 2020 Biennial National Strategy for Transportation Security, the Transportation Security Administration (TSA) says: "transportation assets may be targeted by terrorists, used as weapons, or used to execute attacks". Thus, it is important to monitor the security of certain assets in the study area that may be vulnerable to terrorist attacks.

Figure 37 shows the four vulnerable transportation assets in the study area. The most vulnerable asset in the study area is the Fulton County Airport, due to the size of the property, making it difficult to monitor the entire property line, and the vulnerability of airplanes in general. Additionally, the UPS SMART Hub, which is the company's second-biggest ground transportation hub in the U.S., and the two police stations in the study area may also be targets for terrorism.

Figure 37: Potential Terrorism Targets



Source: Consultant analysis

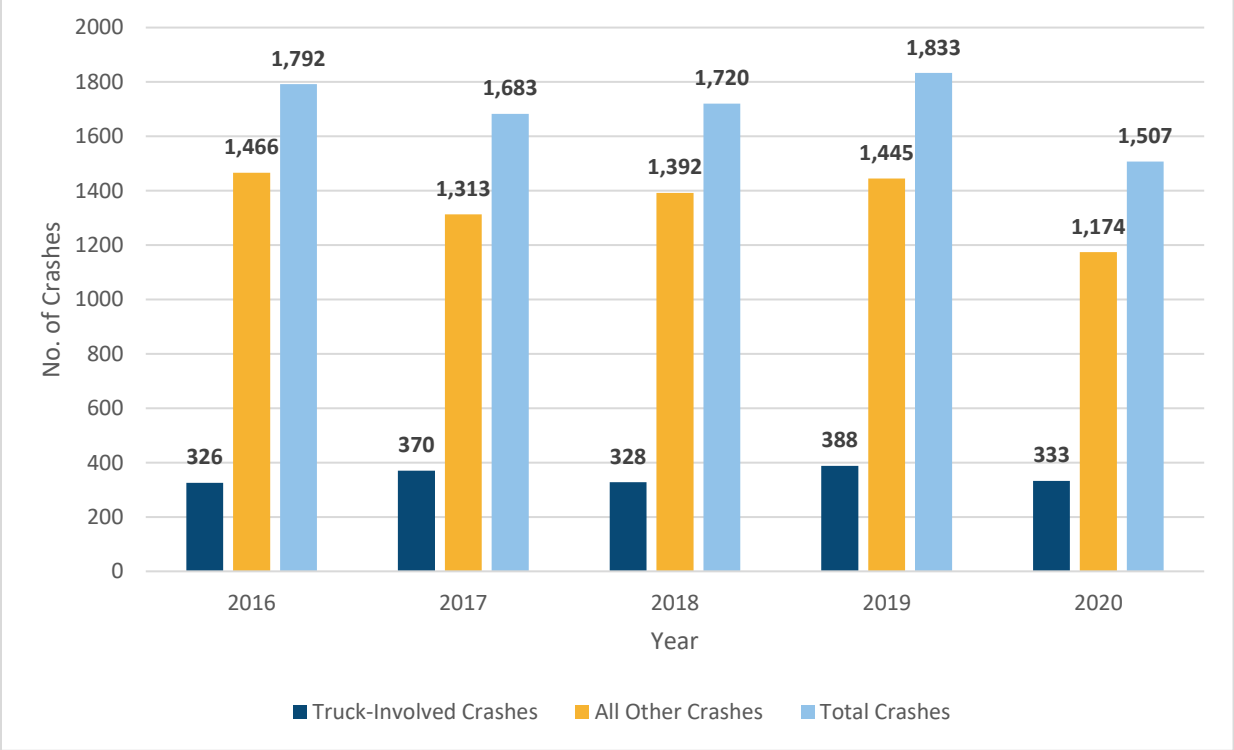
4.4 Safety Analysis

This section of the report examines the safety performance of the CID study area's freight system. Transportation safety is extremely important and is one of the highest priorities at all levels of transportation planning and engineering – national, statewide, and local. The safety analysis was conducted using data provided by the GDOT Crash Reporting Office for the 2016 to 2020 time period.

4.4.1 Crashes by Vehicle Type

Based on the data, there were 8,535 crashes in the study area over the analysis period (see Figure 38). Of that total, about 20 percent (1,745 crashes) involved trucks. In comparison, between 2016 and 2020 commercial vehicle crashes averaged about 4.4 percent of total crashes statewide.[15] As shown in Figure 38, the years 2016 and 2020 represented high and low points, respectively, for crashes in the Boulevard CID. The total number of crashes peaked at 1,833 in 2019, while 2020 recorded the lowest number of crashes pre-pandemic.

Figure 38: Total Crashes, 2016 to 2020



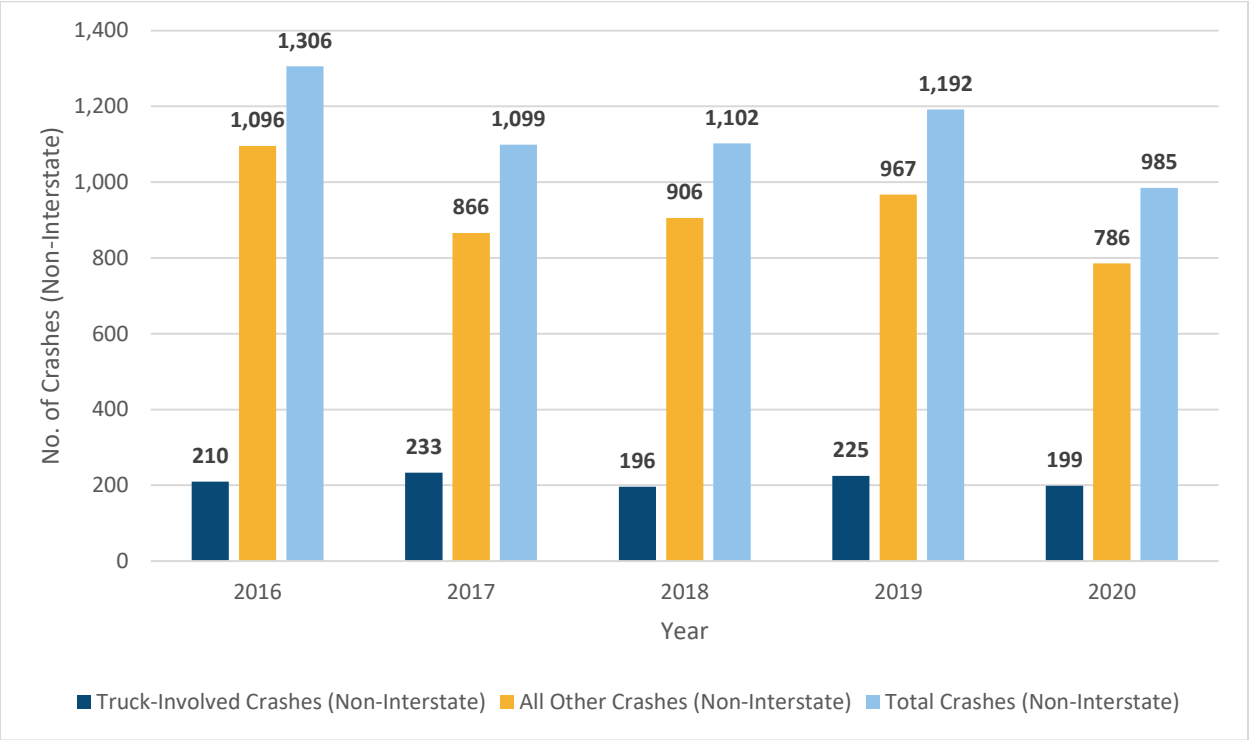
Source: GDOT, Crash Reporting Office; Consultant analysis

About two-thirds of all crashes over the analysis period (5,684 in total) occurred on non-Interstate roadways as shown in Figure 39. Of that total, about 19 percent (1,063 crashes) involved trucks. Crashes on non-

[15] GDOT Georgia Electronic Accident Reporting System (GEARS) Database, www.gearsportal.com, accessed May 15, 2021.

Interstate roadways show a similar trend as total crashes as the years 2016 and 2020 represented high and low points, respectively, for crashes in the Boulevard CID.

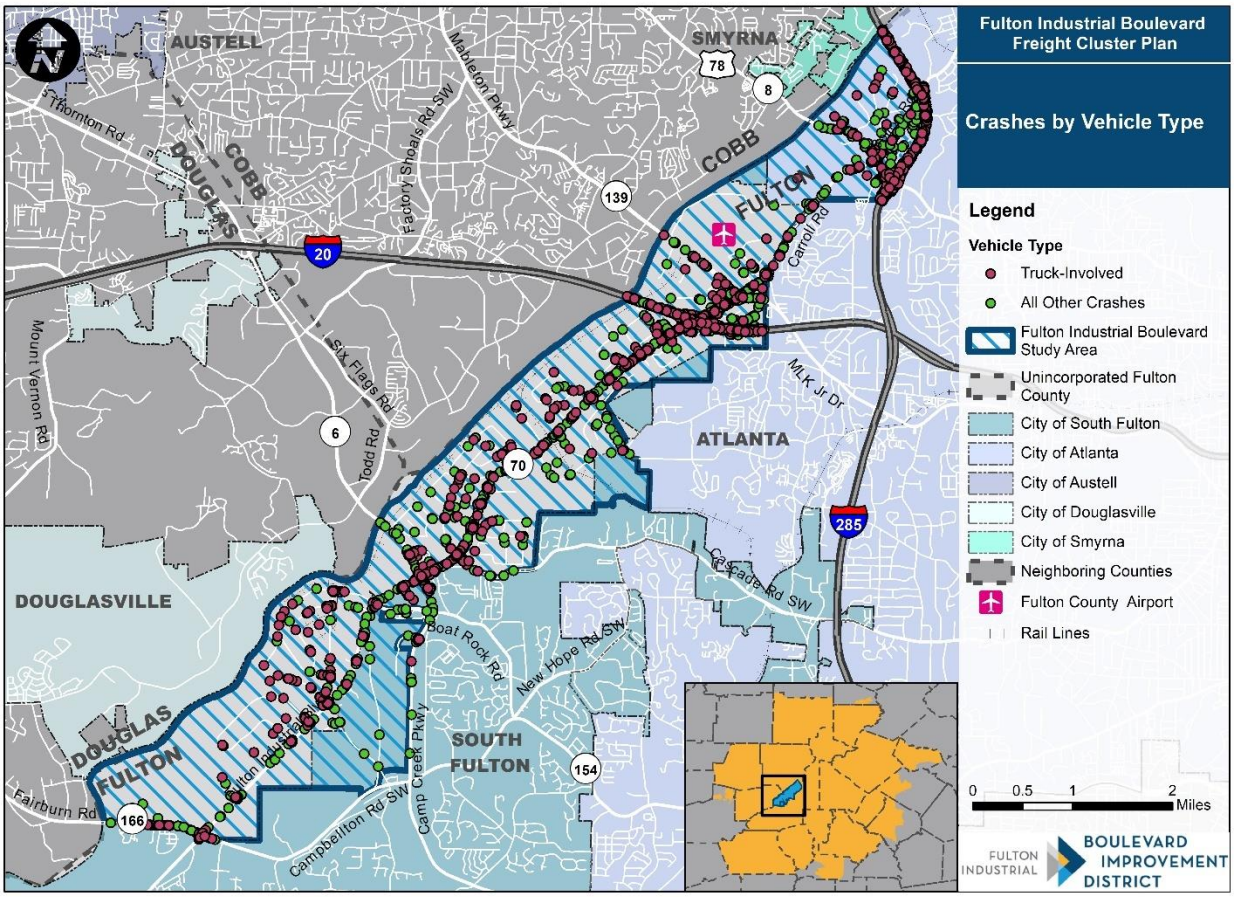
Figure 39: Total Crashes on Non-Interstate Roadways, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis

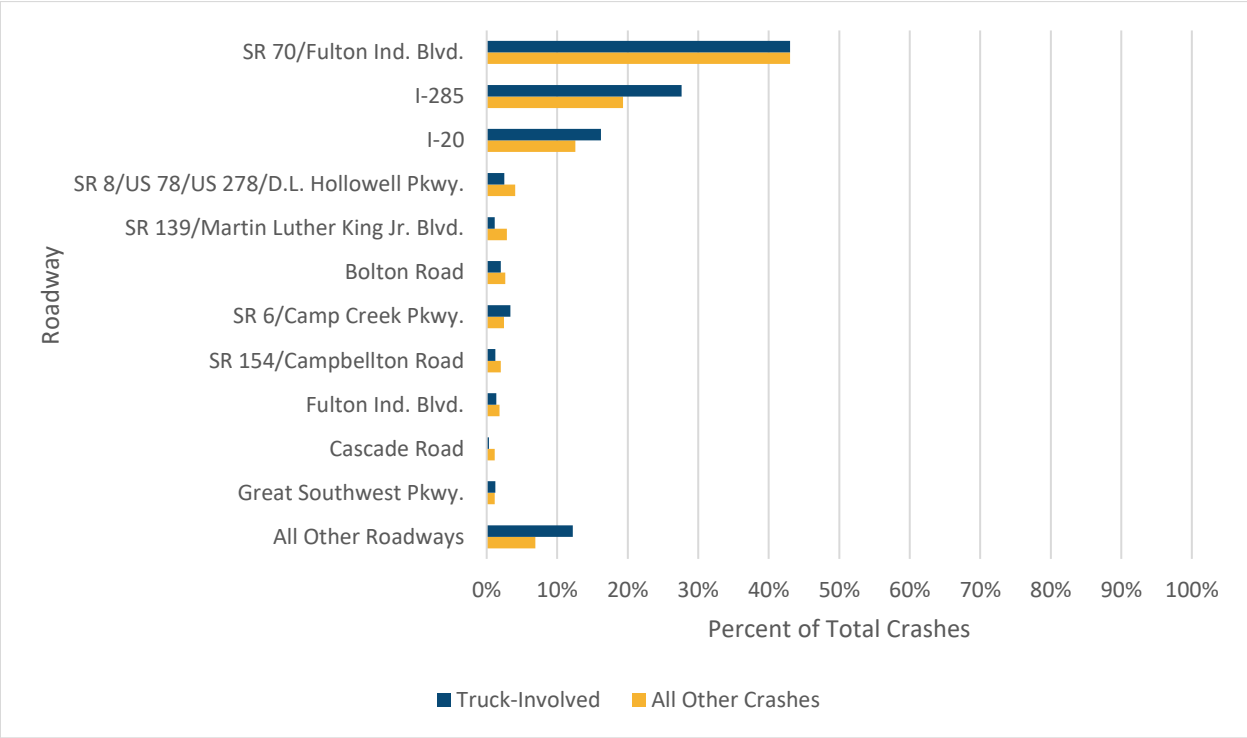
As can be seen in Figure 40 and shown in greater detail in Figure 41, most crashes in the study area (both truck-involved and non-truck-involved) are clustered along its major corridors. These include SR 70/Fulton Industrial Boulevard, I-285, and SR 8/US 78/US 278/Donald L. Hollowell Pkwy. These corridors accounted for about 77 percent of truck-involved crashes and 75 percent of all other crashes observed over the analysis period.

Figure 40: Crashes by Vehicle Type



Source: GDOT, Crash Reporting Office; Consultant analysis

Figure 41: Share of Crashes by Major Roadway, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis [16]

Based on data from the Federal Railroad Administration (FRA), only one crash occurred at a highway-rail crossing over the analysis period. This crash occurred at crossing 6400071M, which is located on Boat Rock Boulevard east of Lagrange Boulevard. There were no injuries, and based on the FRA incident report, the crash occurred because of an employee error during a switching maneuver.

4.4.2 Crash Severity and Manner of Collision

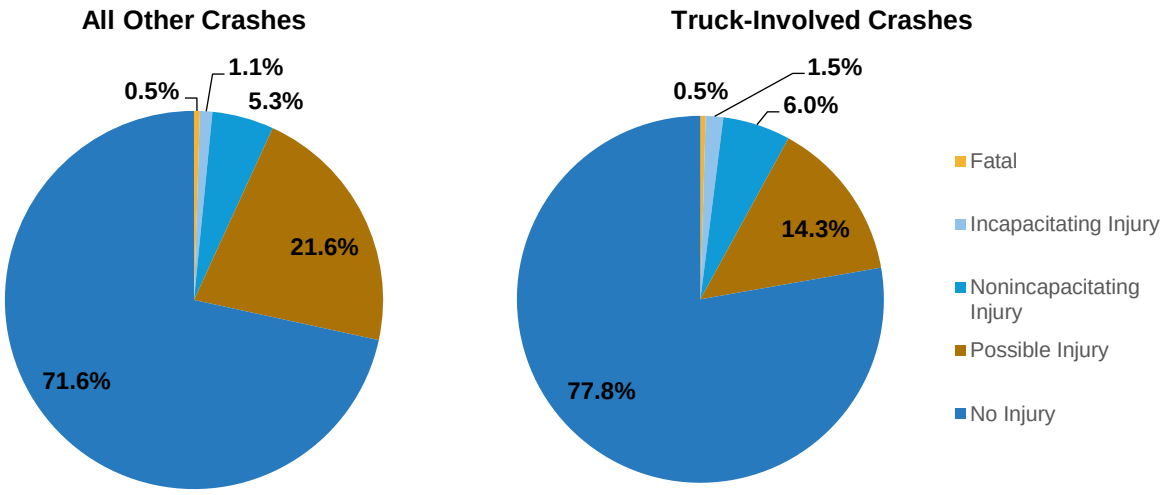
Most crashes in the study area did not result in an injury. As shown in Figure 42, about 78 percent of truck-involved and nearly 72 percent of non-truck-involved crashes resulted in no apparent injury to those involved. About 2 percent of crashes involving a truck resulted in a serious injury or fatality over the analysis period. This is slightly higher than the rate for all other crashes, as about 1.6 percent of those resulted in a serious injury or fatality.

Fatal and incapacitating injury crashes are primarily clustered along the SR 70/Fulton Industrial Boulevard corridor, as shown in Figure 43. Over the 2016-2020 analysis period, about 49 percent of fatal and

[16] Note that Fulton Ind. Blvd. refers to the segment east of SR 8/US 78/US 278/Donald L. Hollowell Parkway where state ownership ends.

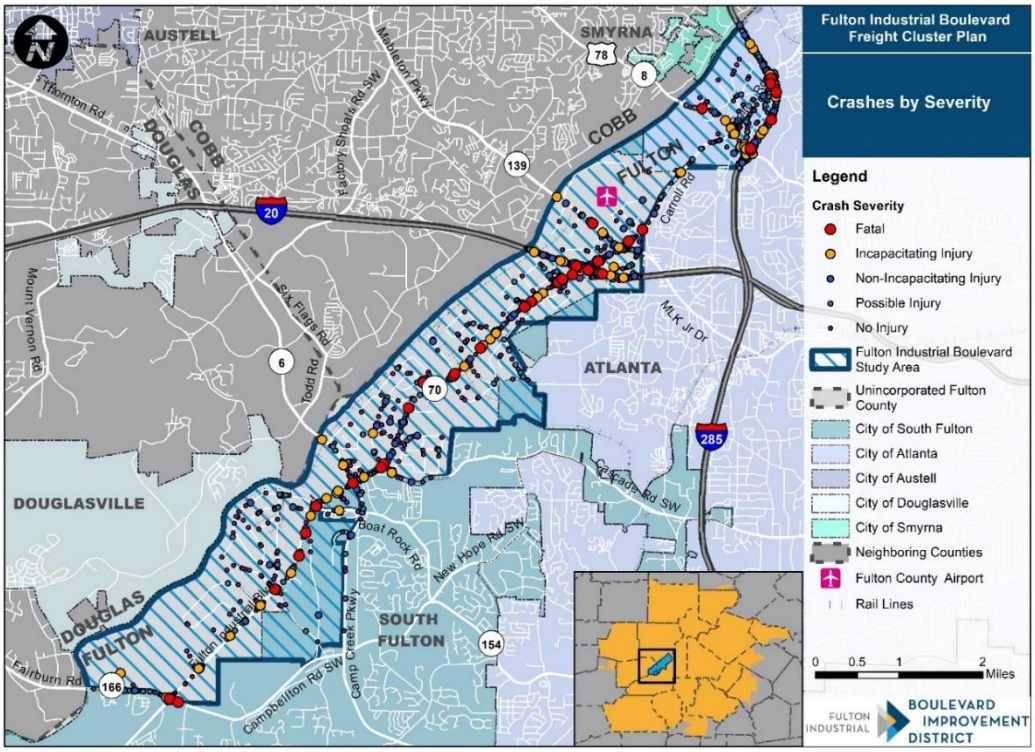
incapacitating injury crashes occurred on SR 70/Fulton Industrial Boulevard. I-285 and I-20 accounted for 21 and 9 percent of fatal and incapacitating injury crashes, respectively.

Figure 42: Crashes by Severity, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis

Figure 43: Crashes by Severity, 2016 to 2020



Source: GDOT Crash Reporting Office; Consultant analysis

For crashes involving trucks, angle, sideswipe same direction, and rear end collision types were the most prevalent as shown in Figure 44 (refer to Table 5 for descriptions of these collision types). These accounted for over 90 percent of crashes observed during the analysis period. Head on and angle collisions are the most severe crash types, accounting for approximately 2 percent and 34 percent of truck-involved crashes, respectively. The prevalence of angle crashes may be due to many factors, including excessive speed, drivers not obeying traffic signals, and poor visibility of traffic signals due to the prevalence of large trucks in the study area.[17] Lane width and worn or inadequate pavement markings are typical contributing factors for sideswipe crashes.[18] For rear end crashes, congestion and inappropriate approach speeds are contributing factors.[19]

Table 5: Manner of Collision Descriptions

Manner of Collision	Description
Angle	Collision results from two or more motor vehicles traveling in directions that are perpendicular.
Rear End	Collision results from two motor vehicles traveling in the same direction.
Head-on	A collision in which the front end of one motor vehicle collides with the front end of another motor vehicle, while the two vehicles are traveling in opposite directions.
Sideswipe – Same Direction	A collision where two motor vehicles collide side to side while proceeding in the same direction.
Sideswipe – Opposite Direction	A collision where two motor vehicles collide side to side while proceeding in the opposite direction.
Not a Collision with a Motor Vehicle	A motor vehicle collision that does not involve another motor vehicle, overturning, or pedestrian.

Source: Georgia Uniform Motor Vehicle Accident Report Training Manual, version 3.0, January 2018

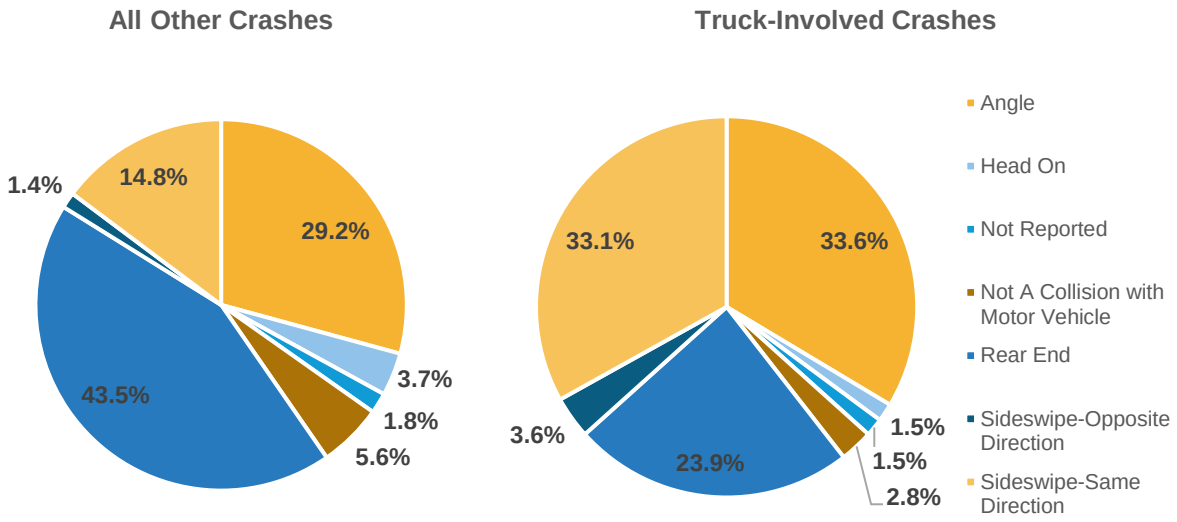
Angle, sideswipe same direction, and rear end were also the most common collision types for crashes that did not involve trucks. They accounted for about 89 percent of crashes for all other vehicles. However, rear end was a much more prevalent collision type and sideswipe (same direction) was a much less prevalent collision type when compared to truck-involved crashes. Nearly 44 percent of crashes for all other vehicle types were rear end compared to 24 percent for truck-involved crashes. About 15 percent of crashes for all other vehicle types were sideswipe same direction, compared to 33 percent for truck-involved crashes. The differences between the physical and operational characteristics of trucks compared to passenger vehicles likely contribute to this observation. For instance, because trucks are much larger than passenger vehicles and occupy a greater share of lane width, they may be more susceptible to sideswipe crashes.

[17] American Association of State Highway and Transportation Officials (2009). *Highway Safety Manual*. Exhibit 6-4 and Exhibit 6-5, pgs. 6-6 to 6-7, 1st edition.

[18] Ibid.

[19] Ibid.

Figure 44: Crashes by Manner of Collision, 2016 to 2020



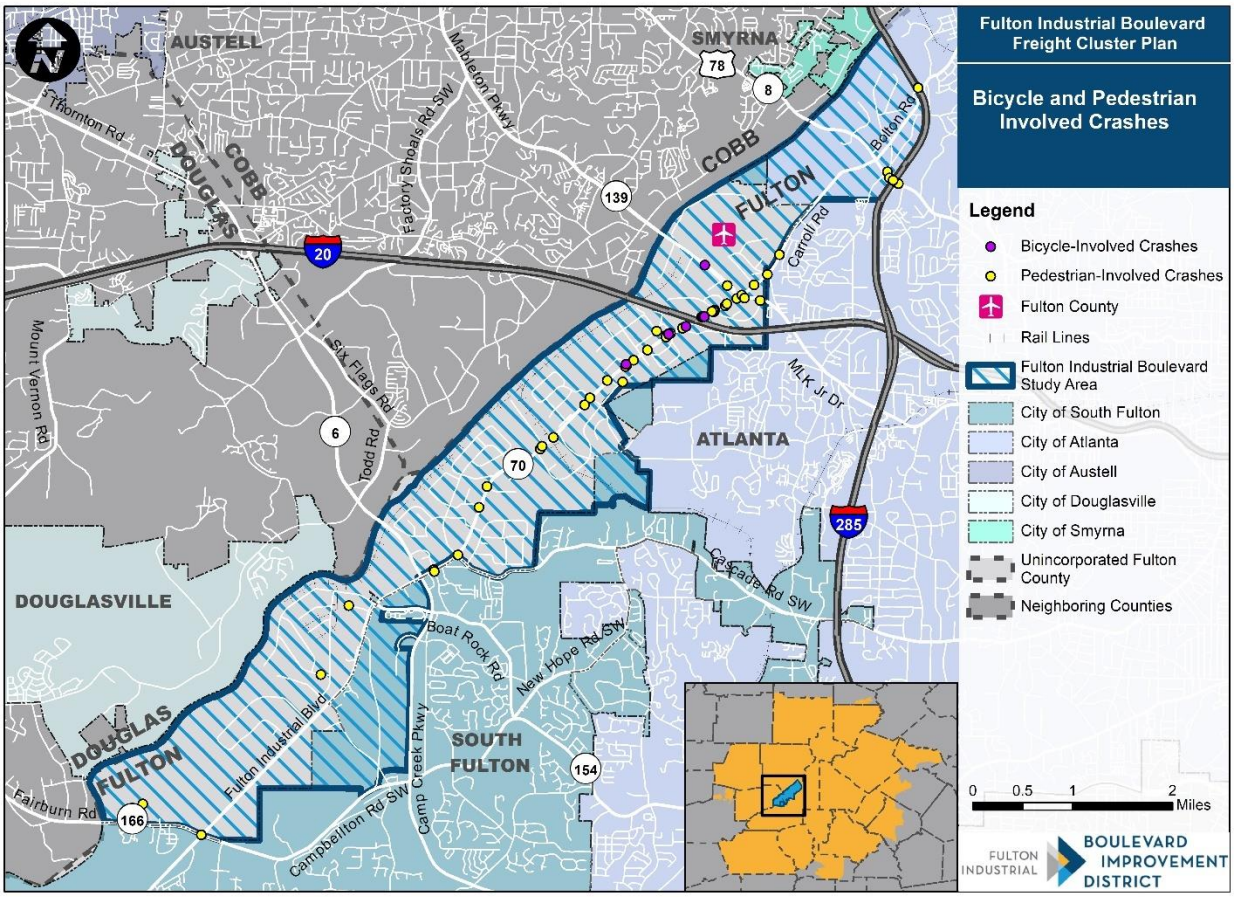
Source: GDOT, Crash Reporting Office; Consultant analysis

4.4.3 Bicycle and Pedestrian Safety

There were 5 crashes involving bicycles over the 2016-2020 analysis period (see Figure 45). None of these crashes involved a truck and none resulted in fatalities. Four of the bicycle crashes occurred on SR 70/Fulton Industrial Boulevard and 1 occurred on SR 139/Martin Luther King Jr. Drive. Those bicycle-involved crashes occurring on SR 70/Fulton Industrial Boulevard happened on the roughly 1-mile stretch between I-20 and Marvin Miller Drive. This suggests that this portion of the SR 70/Fulton Industrial Boulevard corridor should receive greater focus for improving bicycle safety.

The prevalence of bicycle crashes in this area may be driven by the presence of transit as cycling may be used to close the first-/last-mile gap between employment centers and bus stops. Bicycle crashes in this area may also be driven by the presence of numerous closely spaced driveways and the proximity of the I-20 interchange. Both of these create numerous conflict points between motorists and cyclists. Notably, 3 of the 4 bicycle crashes on SR 70/Fulton Industrial Boulevard happened at night. Additionally, 2 of the 3 bicycle crashes that occurred at night were at locations that were unlit at the time according to the crash data. This suggests that lighting improvements may enhance bicycle safety along this portion of the corridor.

Figure 45: Crashes Involving Bicycles and Pedestrians, 2016 to 2020



Source: GDOT, Crash Reporting Office; Consultant analysis

Over the analysis period, there were 58 crashes involving a pedestrian in the study area as shown in Figure 45. The majority of these crashes, over 75 percent, were located on SR 70/Fulton Industrial Boulevard. Thirteen of the pedestrian crashes resulted in a fatality. Fatal pedestrian crashes were concentrated on SR 70/Fulton Industrial Boulevard as 11 of the 13 crashes occurred on that corridor between SR 139/Martin Luther King Jr. Drive and Mendel Drive/Wharton Drive. Only 2 of the pedestrian crashes involved trucks. The truck-pedestrian crashes were not fatal but did result in injuries.

The majority of the pedestrian-involved crashes on SR 70/Fulton Industrial Boulevard (about 60 percent) occurred on the 1.75-mile stretch between SR 139/Martin Luther King Jr. Drive and Mendel Drive/Wharton Drive. Nearly all of the pedestrian crashes on SR 70/Fulton Industrial Boulevard (about 89 percent) happened on the portion between SR 6/Camp Creek Parkway and SR 139 Martin Luther King Jr. Drive. Pedestrian infrastructure (e.g., sidewalks, crosswalks) is intermittent along this portion of SR 70/Fulton Industrial Boulevard and is largely missing south of Mendel Drive/Wharton Drive (see Figure 46). Also, there are 36 MARTA bus stops on SR 70/Fulton Industrial Boulevard between SR 6/Camp Creek Parkway and SR 139 Martin Luther King Jr. Drive which contribute to pedestrian activity.

Figure 46: Mendel Drive/Wharton Drive at SR 70/Fulton Industrial Boulevard.

Source: Google Earth

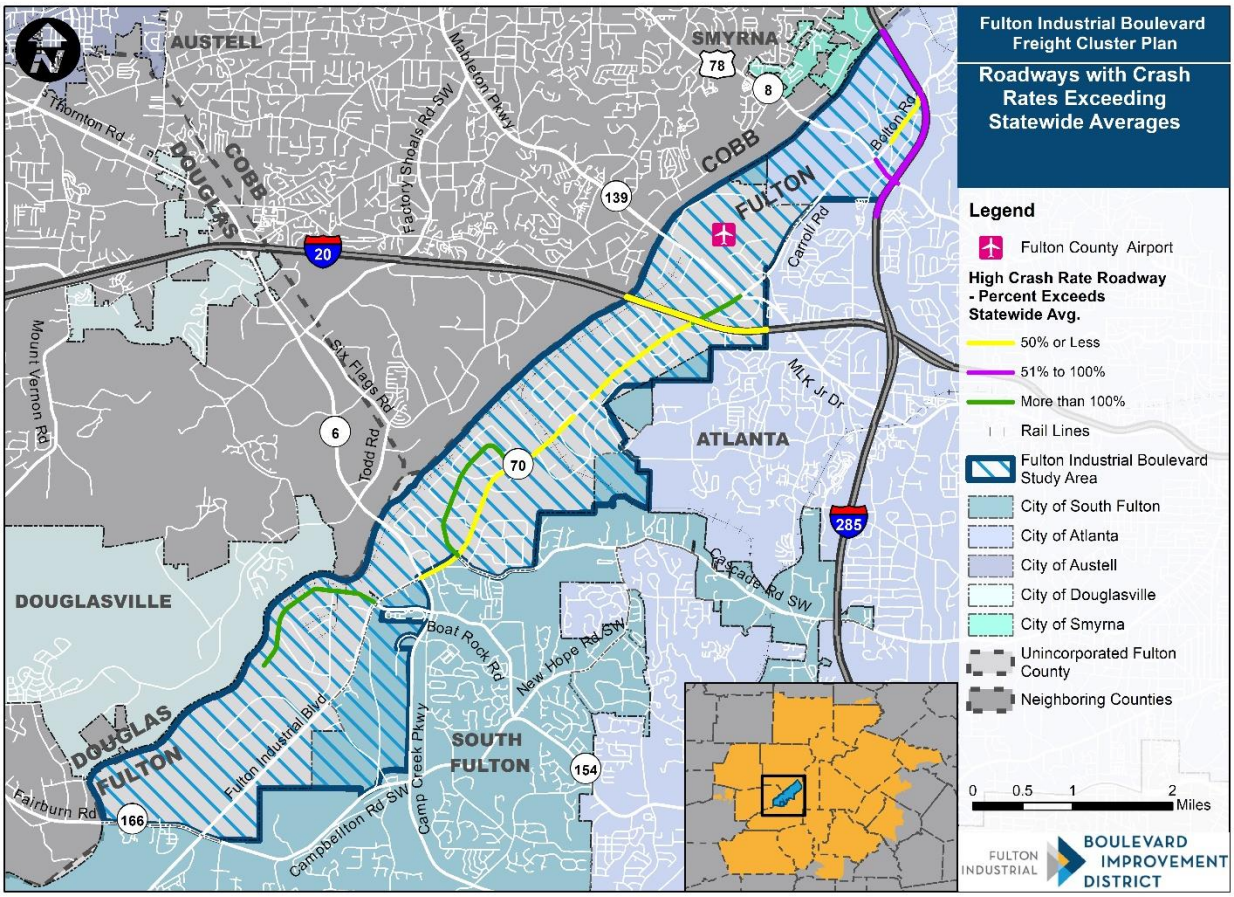
4.4.4 Crash Rates on Key Corridors

An important consideration is the crash rate for all vehicles along key corridors, as it considers the level of exposure by vehicle miles traveled (VMT)[20]. Generally, roadways that have higher volumes are more exposed to the risk of a crash. As shown in Figure 47 and Table 6, multiple corridors in the study area have segments with crash rates that exceed statewide averages for similar roadways.[21] For example, SR 70/Fulton Industrial Boulevard between I-20 and Mendel Drive/Wharton Drive is estimated to have a crash rate of over 800 crashes per 100 million vehicle-miles (100 MVM). This exceeds the statewide average for other minor arterials in urbanized areas, which is about 540 crashes per 100 MVM, by nearly 50 percent. Similarly, Bolton Road between I-285 and SR 70/Fulton Industrial Boulevard has a crash rate of nearly 650 crashes per 100 MVM, exceeding the rate for other minor arterials across the state by about 20 percent. Other roadways in the study area with crash rates that exceed statewide averages include I-20, I-285, Great Southwest Parkway, Boat Rock Boulevard, and SR 8/US 78/US 278/Donald L. Hollowell Parkway between SR 70/ Fulton Industrial Boulevard and I-285.

[20] Note that the crash rate analysis uses the annual average number of crashes and the most recent available AADT estimate from the GDOT Office of Transportation Data as provided in its "Traffic" database (http://www.dot.ga.gov/DS/Data#tab-4), which is maintained to meet the needs of its federally required traffic monitoring program. At the time of the analysis, 2018 was the most recent available database.

[21] Statewide crash rates by functional class were provided by the GDOT Crash Reporting Office.

Figure 47: Crash Rates on Key Corridors that Exceed Statewide Averages



Source: GDOT Crash Reporting Office; GDOT Road & Traffic Data; Consultant analysis

Table 6: Crash Rates on Key Corridors Exceeding Statewide Averages

Functional Classification	2018 Statewide Avg. Crash Rate (Crashes per 100 MVM)	Roadway	Location	Crash Rate (Crashes per 100 MVM)
Interstate	201	I-20	CID Boundaries	265
		I-285	CID Boundaries	336
Principal Arterial (Non-Freeway)	581	SR 8/US 78/US 278/Donald L. Hollowell Pkwy.	SR 70/Fulton Industrial Blvd. to CID Boundary East	1,100
Minor Arterial	540	SR 70/Fulton Industrial Blvd.	SR 139/Martin Luther King Jr. Blvd. to I-20	1,961
			I-20 to Mendel Dr./Wharton Dr.	801
			James Aldredge Blvd. to SR 6/Camp Creek Pkwy.	710
		Bolton Road	I-285 to SR 70/Fulton Industrial Blvd.	647

Local	233	Boat Rock Blvd.	SR 70/Fulton Industrial Blvd. to western terminus	525
		Great Southwest Pkwy.	All, from northern to southern terminus	783

Source: GDOT Crash Reporting Office; GDOT Road & Traffic Data; Consultant analysis

4.4.5 Potential Contributing Factors to Safety Challenges

Detailed recommendations for addressing the CID's transportation safety challenges will be developed as part of Task 6. However, there are many factors that potentially contribute to the relatively high crash rates observed on multiple corridors throughout the CID that should be considered in the development of those recommendations. One important factor is the density of access points along these corridors in the form of driveways and intersecting roadways. Each driveway and intersecting roadway create multiple conflict points among vehicles and between vehicles with other roadway users. As several of the CID's main corridors are already median-separated, other access management solutions must be explored such as driveway consolidation and inter-parcel access.

Another potential contributing factor is roadway and intersection geometry. Sideswipe same direction crashes accounted for a significant share of total crashes over the analysis period. As previously discussed, lane width and inadequate pavement markings are typical contributing factors to this type of crash. Therefore, potential solutions to mitigate these types of crashes include widening lane widths where possible, re-striping corridors where pavement markings have become worn, and adding or replacing raised reflective pavement markers. As about 87 percent of the CID's sideswipe same direction crashes occurred on SR 70/Fulton Industrial Boulevard, I-285, and I-20, re-striping worn markings and replacing raised reflective pavement markers are likely the most relevant investments.

Visibility at intersections is another factor to consider given the prevalence of truck traffic throughout the CID. Large vehicles can limit the visibility of passenger vehicles that trail them in the traffic stream. At intersections, this can obscure a driver's visibility of a traffic signal and other vehicles which can contribute to rear end and angle collisions. To improve visibility, some agencies use side-mounted in addition to overhead traffic signals.

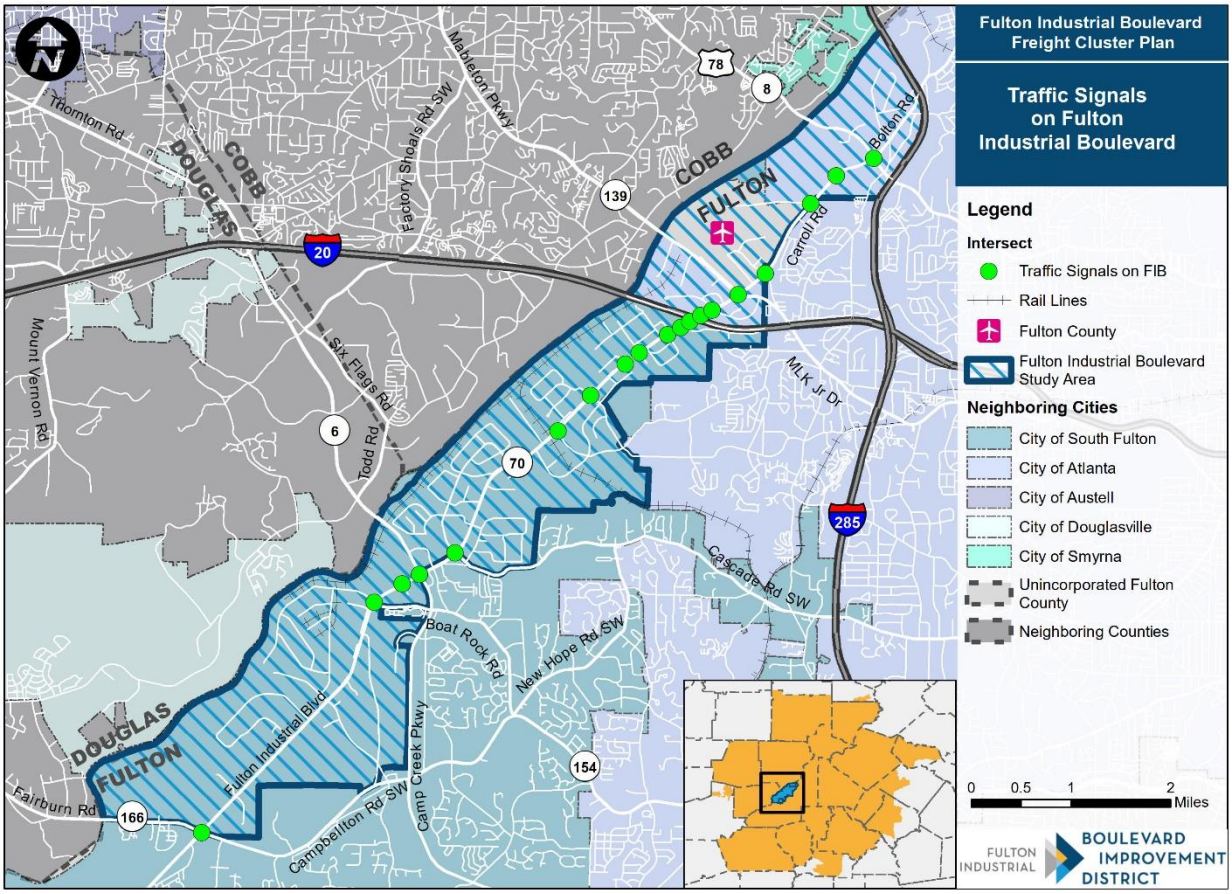
4.5 ITS and Technology

A major revolution for surface transportation in the region has begun. The future will see all modes of transportation communicating with each other and providing 360-degree awareness, while delivering a safe and seamless intelligent mobility network. This section provides an understanding and helps develop a guidance on emerging technologies for the CID. The existing Intelligent Transportation System (ITS) infrastructure was reviewed along the entire SR 70/Fulton Industrial Boulevard corridor. The project team also looked at the emergency vehicle, transit, and freight/commercial vehicle operations along with traffic incident management (TIM), work zone safety, and traveler information. Emerging mobility solutions will continue to evolve and provide the CID with opportunities to provide the right solutions to public needs.

These technologies can provide help them with safety, transit, freight/commercial vehicle, traffic incidents and traveler information.

Figure 48 shows the locations of the signals and Table 7 below lists the results of the field inventory. A 96-single mode (SM) fiber optic cable is installed along the corridor from Boat Rock Road to the UPS driveway south of SR 8/US 78/US 278/Donald L. Hollowell Parkway. The fiber looks to have breaks at Marvin Miller Drive and Commerce Drive.

Figure 48: Traffic Signals on Fulton Industrial Boulevard



Source: Consultant field observation

Table 7: ITS Signal Inventory along Fulton Industrial Boulevard

Intersection	Signal Inventory
SR 154/Campbellton Road	• 4G Communication • CCTV • 2070 LX – MaxTime • 332 Cabinet
Boat Rock Road	• 4G Communication • Fiber Optics – 96 SM

	• 2070 LX – MaxTime • 332 Cabinet
Lakeview Court	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Northeast corner pedestrian pole missing
SR 6/Camp Creek Parkway	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit • CCTV
Cascade Road	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV
Wharton Drive	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet
Marvin Miller Drive	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet
Patton Drive	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet
Commerce Drive	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV
Shirley Drive	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV
I-20 Eastbound	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit
I-20 Westbound	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit
Wendell Drive	• 4G Communication

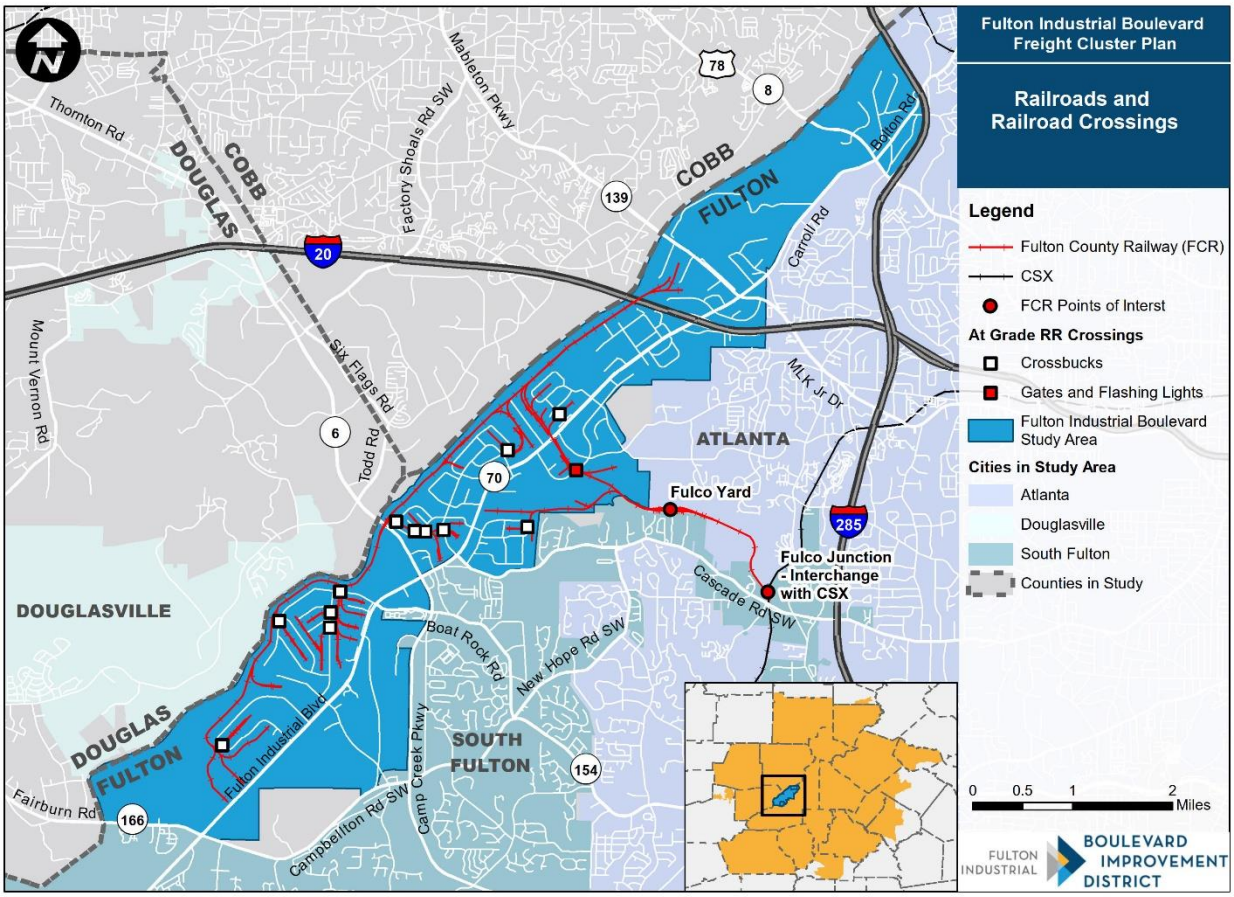
	• Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
SR 139/Martin Luther King Jr. Drive	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit
Aviation Circle/Old Gordon Road (Fulton County TCC)	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
Sandy Creek Road	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
UPS Driveway	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • Roadside Unit
SR 8/US 78/US 278 Donald L. Hollowell Parkway	• 4G Communication • Fiber Optics – 96 SM • 2070 LX – MaxTime • 332 Cabinet • CCTV • Roadside Unit

Source: Consultant field review

4.6 Rail

Figure 49 below shows the Railroad infrastructure in the Fulton Industrial Boulevard study area. The study area is served by the Fulton County Railway (FCR), a Class III railroad owned and operated by Omnitrax. FCR owns and operates 25 miles of track, including the Fulco Yard facility which lies just to the east of the study area. FCR interchanges with the class 1 railroad CSX at Fulco Junction and handles approximately 11,500 carloads per year. FCR serves over 40 customers within the study area, with chief commodities including food and beverage products, building materials, consumer goods, and paper and plastics. There are no height restrictions, bridges, or sections of track incapable of handling 286k-lb capacity railcars (Heavy-Axle Loads) on the FCR, therefore there are no issues or bottlenecks for receiving freight from class 1 railroad shipping partners.

Figure 49: Rail and Railroad Crossings



Source: Omnitrax

There are 13 at-grade railroad crossings in the study area. All but one crossing are signed only with RR crossbucks and all crossings are limited to 10 mph rail-operation speed. The crossing of Selig Drive has both crossbucks and gates with flashing lights. The FCR is grade-separated at the three major corridors that it intersects in the study area. Fulton Industrial Boulevard, Camp Creep Parkway, and Interstate 20 all have bridges passing above the FCR.

4.7 Transit, Bicycle, and Pedestrian Connectivity

The availability of transit, bicycle, and pedestrian facilities is an important aspect of the CID, as these three modes of transportation intersect with the freight transportation network in many facets. For example, a number of freight employees utilize at least one of these methods to commute to and from their job, and pedestrian and bicyclist safety is tied closely to freight traffic, as mentioned in the Safety Analysis section. This section of the report details the characteristics of the transit, bicycle, and pedestrians throughout the CID.

4.7.1 Data Collection Process

The project team collected background data to aid the development of recommendations to improve freight movement and job access in the study area. Site specific, field data was primarily collected on-site using a tool called ArcGIS Collector, which is a mobile data collection app that integrates with ESRI software and allows geospatial data to be collected and catalogued. On-site data collection occurred on March 19, 2021 between the hours of 10:00 AM and 3:00 PM. Aerial and Street View data from Google were used to conduct quality control and supplement the on-site data collection efforts.

The following table lists each feature that was collected, how the data were recorded, and all attributes associated with each feature.

Table 8: Summary of Field Data

Feature	Types of Data	Attributes
Bus Stops	Point & Photo	Shelter present
		Bench present
		Lighting present
		Trash container present
		Lacks sidewalk connections
		Lacks safe crossing
		Lacks clear signage
Bike facility	Line & Photo	Sharrow
		Striped bike lane
		Buffered bike lane
		Protected bike lane
Sidewalks present	Line & Photo	Location
Pedestrian crossings	Point & Photo	Crosswalk
		Signalized intersection
		Pedestrian Hybrid Beacon
		2-way stop intersection
		4-way stop intersection
		Pedestrian crossing time

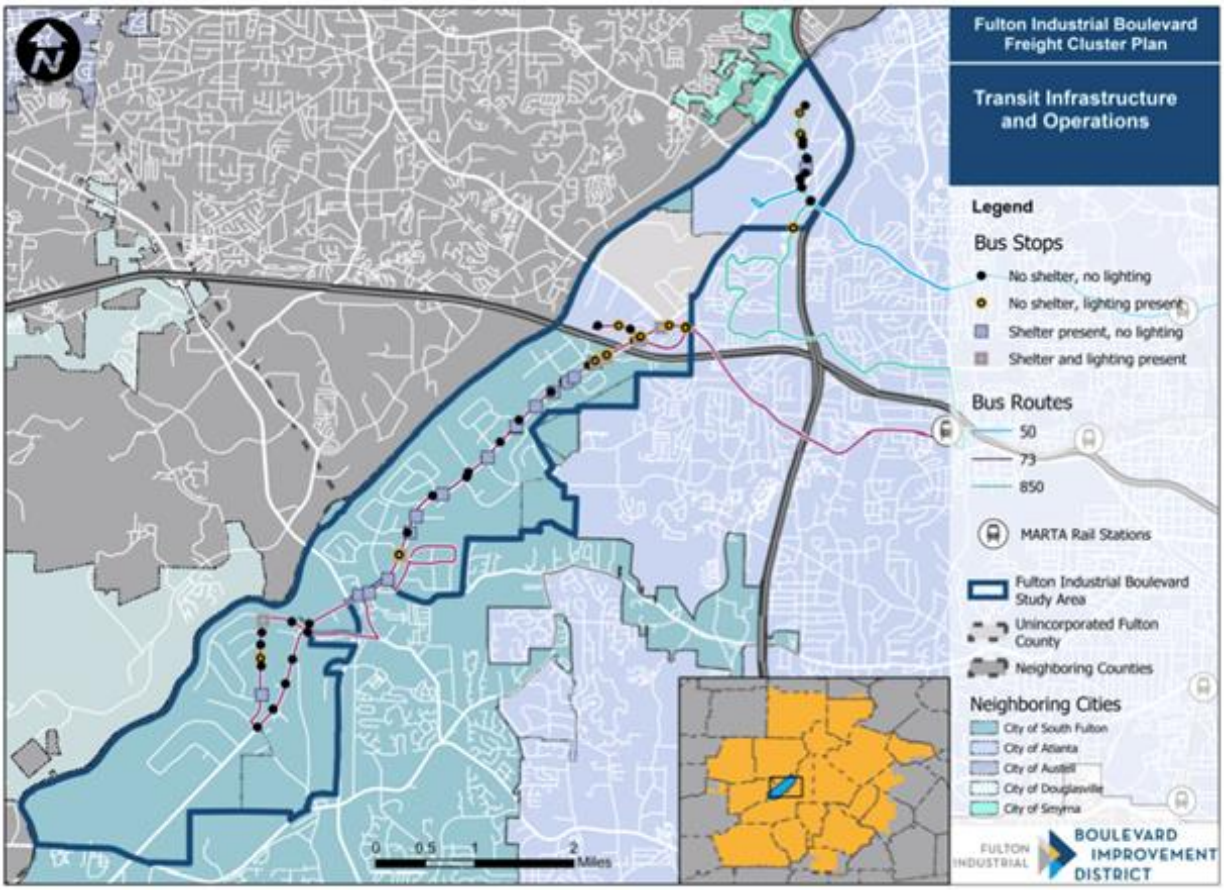
Source: Consultant analysis

In addition to the data collection efforts discussed above, the project team also reviewed publicly available transit route and frequency data, American Community Survey data, flood plain data, and information on the presence of pipelines.

4.7.2 Transit Infrastructure and Operations

There are three bus routes that provide service within the Fulton Industrial Boulevard CID. Figure 50 showcases the routes along with information on the location of bus stops and whether bus stops include shelters and/or lighting. All information in this section is based on current operations. MARTA is conducting a major review of its operations, which could result in future changes to routes and service hours in the study area.

Figure 50: Transit Infrastructure and Operations



Source: MARTA; Consultant field observation

Bus Route 73, Fulton Industrial runs east from the HE Holmes rail station to Martin Luther King Jr. Drive and then along Fulton Industrial Boulevard to Tradewater Parkway. Alternating trips run within LaGrange Boulevard and Boat Rock Boulevard at the southern end of Fulton Industrial Boulevard. Buses run from HE Holmes station from 4:40 AM to 1:20 AM on weekdays and from 5:40 AM to 1:20 AM on weekends. Buses generally run every 20 to 30 minutes.

Route 50, Donald E Hollowell Parkway runs from the UPS Distribution Center on Fulton Industrial Boulevard to the Bankhead rail station. Every hour the route extends to the North Avenue Rail Station. The route runs from 4:40 AM to 12:40 AM on weekdays and 5:30 AM to 12:00 AM on weekends. Buses generally run every 20 to 30 minutes.

Route 850, Carroll Heights/Fairburn Heights runs from Atlanta Industrial Park along Atlanta Industrial Parkway, connects to Route 50 at Donald Lee Hollowell Parkway, and then serves the study area generally via Bolton Road and Collier Drive before connecting to the HE Holmes rail station via HE Holmes Drive. The route runs from 5:15 AM to 12:00 AM on weekdays and weekends. Buses generally run every 55 to 65 minutes.

No bus service runs south of Tradewater Parkway.

The project team identified 80 bus stops in the study area and tracked the features of each. On average, stops are spaced approximately 0.25 miles apart. Of the 80 bus stops,

- 20 (25%) have shelters;
- 25 (31%) have benches;
- 17 (21%) have lighting;
- 22 (28%) have sidewalk connections;
- 10 (13%) have safe pedestrian crossings;
- 70 (88%) have clear signage; and
- 27 (34%) have trash receptacles.

No bus stops have all seven features. Six bus stops have six of the features listed above. Figure 51, a shelter at the corner of Fulton Industrial Boulevard and Westgate Drive, is an example of a typical shelter in the study area. It includes four of the seven features we tracked: A shelter, bench, trash container, and clear signage. It does not have lighting, sidewalk connections, or a safe street crossing.

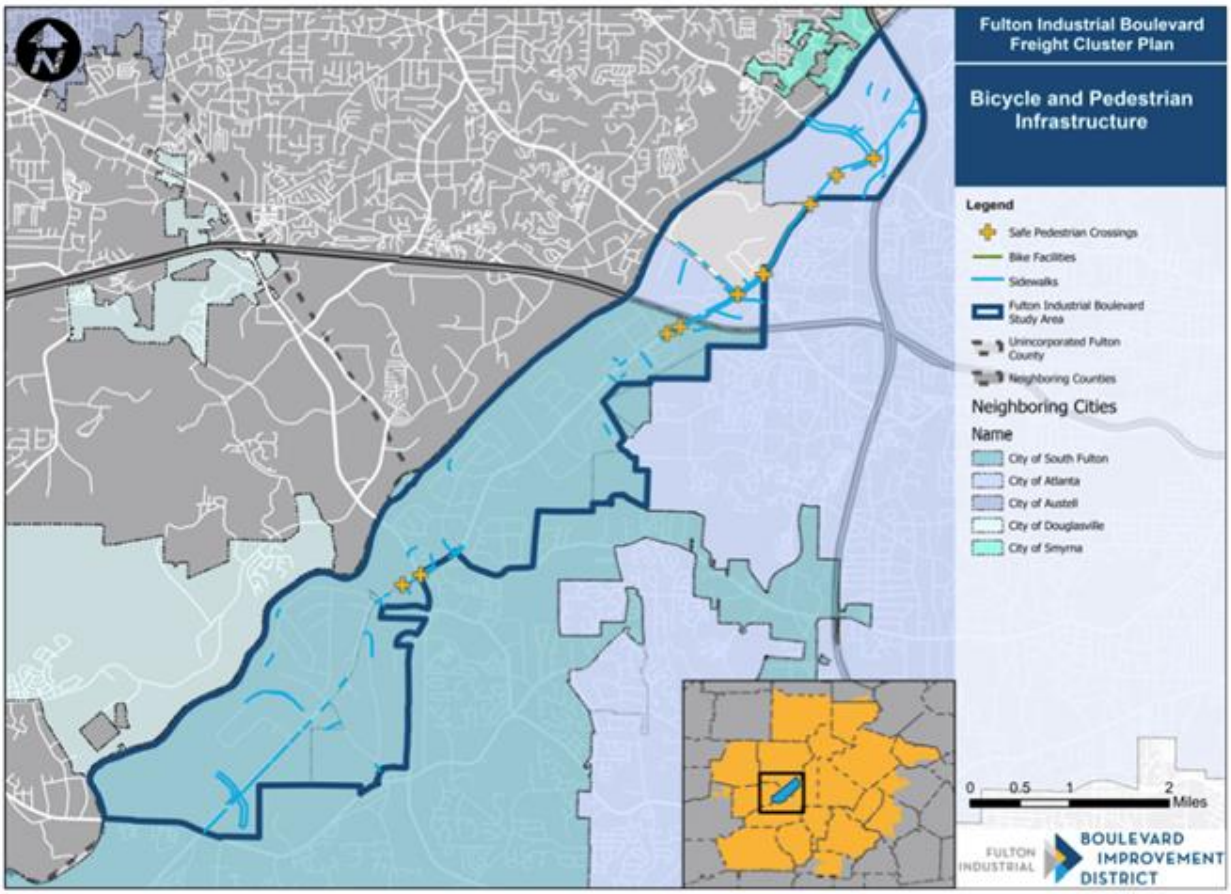
Figure 51: Bus Stop 900696

Source: Consultant field observation

4.7.3 Bicycle and Pedestrian Infrastructure

Bicycle infrastructure is not present in the study area and sidewalk availability is varied along Fulton Industrial Boulevard, which has nine signalized pedestrian crossings with crosswalks and average allowed crossing times of 34 seconds. Figure 52 shows the location of the signalized pedestrian crossing and where sidewalks are present.

Figure 52: Bicycle and Pedestrian Infrastructure



Consultant field observation

There are generally no sidewalks on cross and adjacent streets to Fulton Industrial Boulevard. Most of the street networks connected by Lagrange Boulevard SW and Great Southwest Parkway SW have wide shoulders where people can walk and bike. However, there is limited lighting at night, and lighting is not guaranteed at many of the bus stops, as shown in Figure 50. Walking paths are common along sections of Fulton Industrial Boulevard that lack sidewalks indicating demand for pedestrian travel in areas without sidewalks.

4.8 Transportation Demand Management and Job Access

Transportation demand management (TDM) is a collection of strategies that shift the how, when, and where of people's travel to increase transportation system efficiency, reduce single occupancy vehicle (SOV) travel, improve air quality, and increase mobility for people who do not own a vehicle or have limited access to a vehicle. TDM has the potential to improve employee access to job opportunities within the Fulton Industrial Boulevard Improvement District, reduce employee vehicle trips, and help attract more employees.

Georgia Commute Options assists Atlanta region employers with the development and implementation of TDM programs. Currently there are no official Georgia Commute Options partners in the Fulton Industrial Boulevard area. However, this planning process offers an opportunity to determine the specific transportation needs of Fulton Industrial Boulevard employers and identify both infrastructure and TDM strategies that can meet those needs to improve employee job access and decrease the number of vehicle trips that employees make into the study area.

There are several organizations providing workforce development initiatives within the Atlanta region, including job access assistance. The Atlanta Regional Commission's Workforce Solutions Division manages WorkSource Atlanta Regional, which helps employers find talent and provides training for both new and existing employees. While transportation is not a specific service offering, it is one of the largest barriers to job placement. This study may offer an opportunity to connect TDM strategies and workforce development activities.

To identify effective TDM strategies, it is important to understand where employees work, where they are traveling from, how they travel to work, and what travel options may make most sense for them.

Employee work location data was obtained from Reference USA, which reports the location of employers and the number of employees at employment sites. It uses data from the White Pages, Securities and Exchange Commission, US Postal Service, and US Census. Table 9 summarizes the Reference USA data and shows the number of employers within the study area and the associated number of employees at each employer.

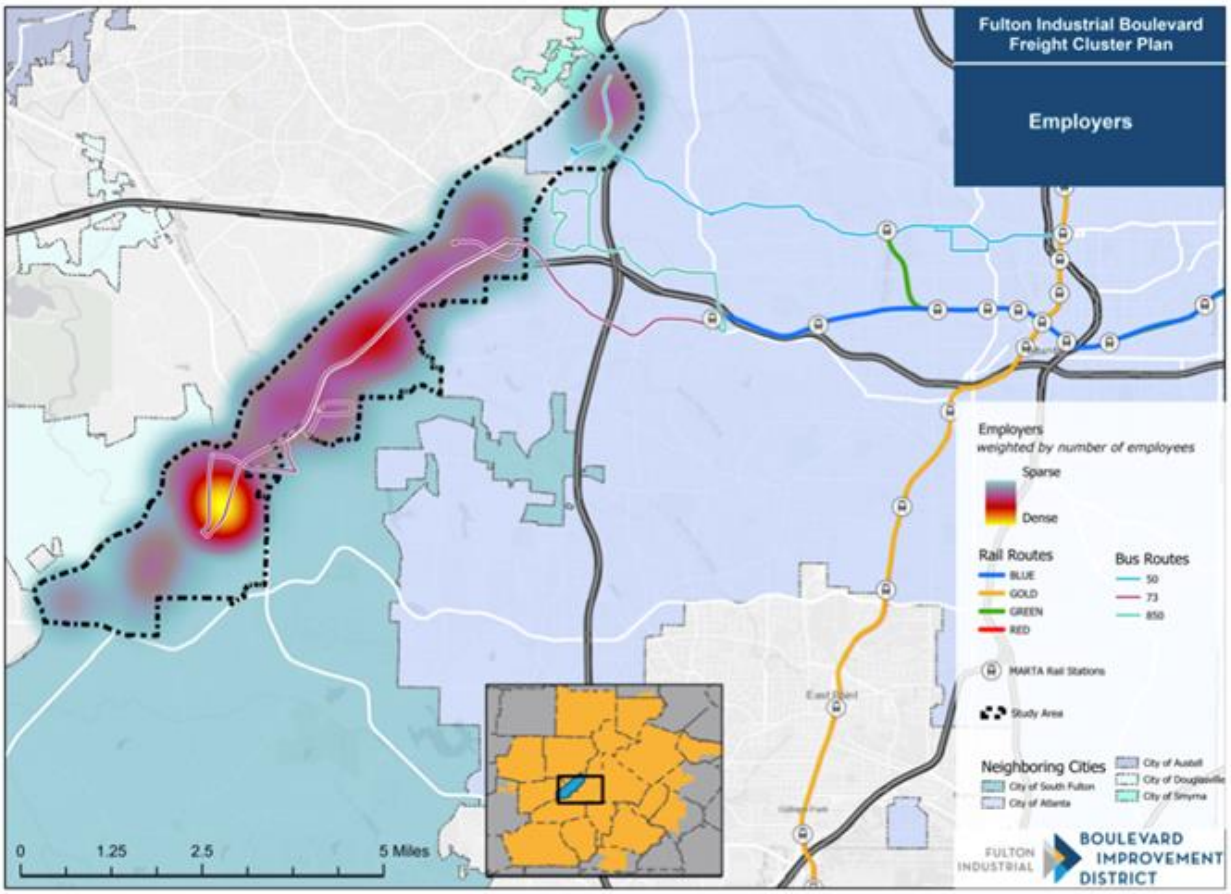
Table 9: Employer and Employee Count

Employee Count	Number of Employers
1-4	302
5-19	407
20-49	134
50-99	40
100-499	40
500-700	3

Source: Reference USA

Figure 53 is a map that shows the density of employment within the study area (using the same Reference USA data) versus available transit service. The map shows a large geographic area that includes MARTA's rail lines because some employees may choose to ride rail service to connect to local transit routes. The map shows that the local transit routes serve the densest employment areas.

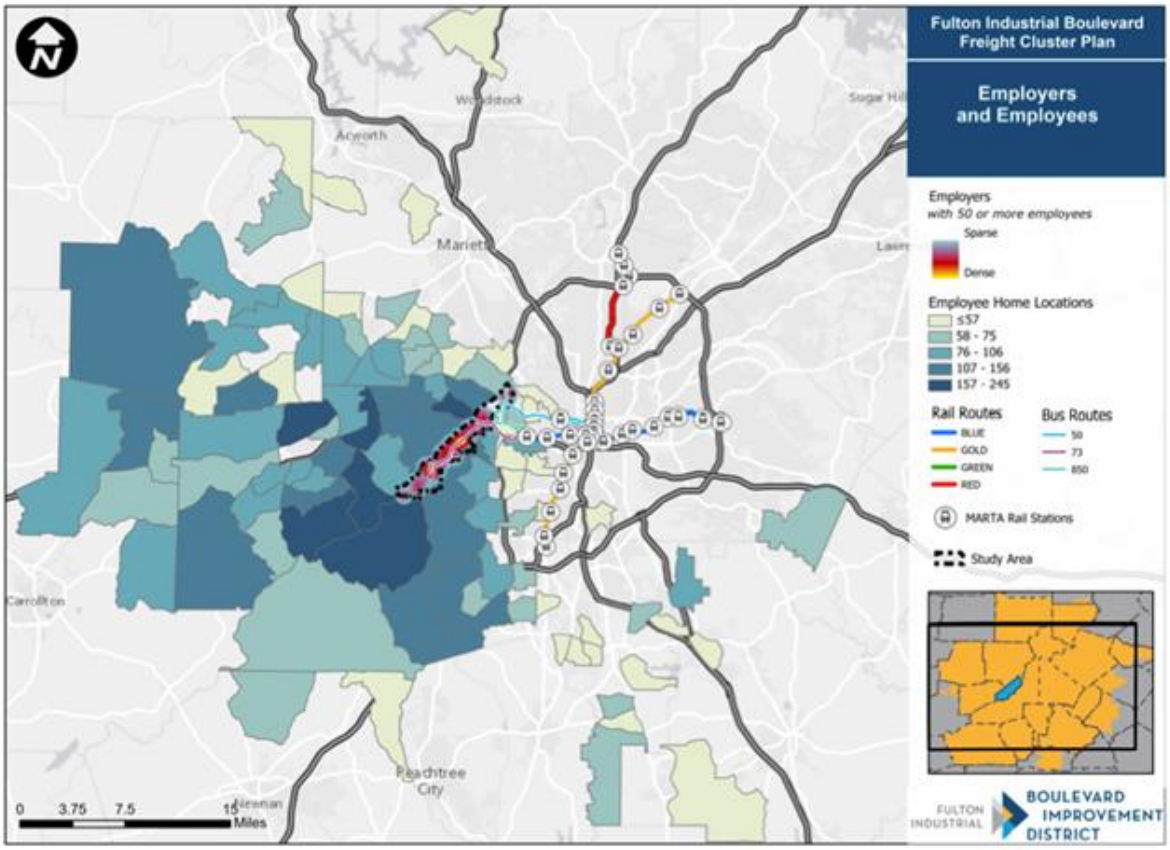
Figure 53: Employment Density Versus Available Transit



Source: Reference USA

Figure 54 shows the same information but adds another layer that shows where employees live. The employee home location data was gathered using OnTheMap, a product of the US Census Bureau's Longitudinal Employer-Household Dynamics program. While Figure 53 shows that employment sites are well served by local bus service, the addition of home location data in Figure 53 shows that most employees do not live where they can access transit service. This indicates that transit service and non-transit investments may be necessary to better connect employees with jobs.

Figure 54: Job Access Via Transit



Source: Reference USA; OnTheMap

Table 10 shows the mode split of employees in the study area. Data for this table came from the Census Transportation Planning Products Program, which produces special tabulations of American Community Survey data. Carpooling and transit rates in the study area are almost identical to the regional averages of 11% and 3% respectively. The drive alone rate in the study area is 83%, which is higher than the regional average of 78%. The variation is due almost entirely to the lack of employees working from home.

Table 10: Employee Commute Modes

Mode	Number of Commuters	Percent of Commuters
Drive alone	9,695	83%
Carpool	1,250	10%
Bus	320	3%
Bicycle	4	0%
Walk	15	0%
Other Mode	165	1%
Worked at home	105	1%

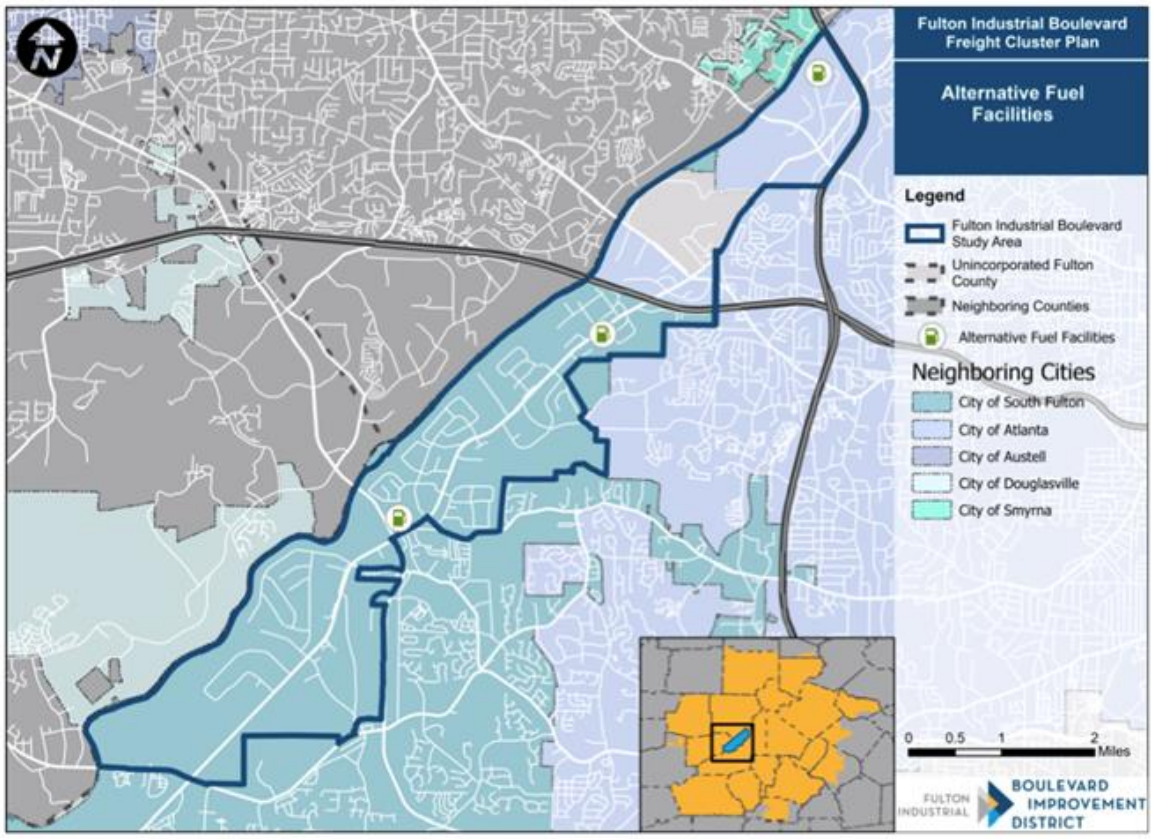
Source: Census Transportation Planning Products Program (CTPP)

4.9 Other Transportation Assets

4.9.1 Alternative Fuel Facilities

The project team identified three publicly available alternative fuel facilities along Fulton Industrial Boulevard, and they are shown in Figure 55. The facilities included electric vehicle charging and compressed natural gas facilities. Photographs of the facilities are provided in Figure 56 to Figure 58.

Figure 55: Alternative Fuel Facilities



Source: Consultant field observation

At the north end of the study area, on Atlanta Industrial Parkway, there is a publicly available passenger vehicle charging station with two chargers. It is unclear whether these chargers are functioning.

Figure 56: Passenger EV Charging Station

Source: Consultant field observation

On Patton Drive, at a Shell gas station, there are three TrilliumCNG natural gas pumps available.

Figure 57: TrilliumCNG Pump

Source: Consultant field observation

On Bakers Ferry Road, at the Thornton Road intersection, there are five natural gas pumps available at the Clean Energy station. This location is also a truck stop.

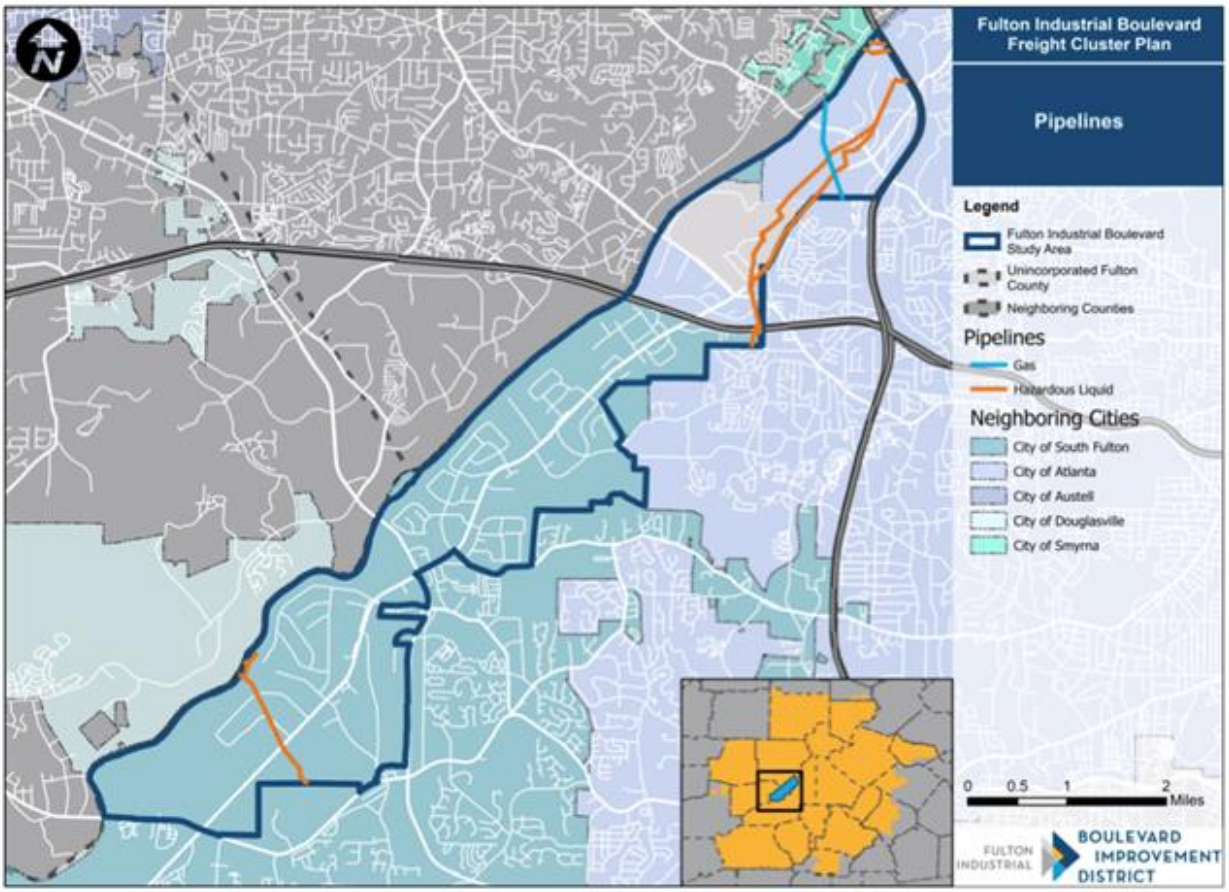
Figure 58: Clean Energy CNG Pumps

Source: Consultant field observation

4.9.2 Pipelines

Gas and hazardous liquid pipelines are shown in Figure 59. The data came from the National Pipeline Mapping System (NPMS), which is under the jurisdiction of the Pipeline and Hazardous Materials Safety Administration (PHMSA). The map does not contain gas gathering or distribution pipelines. This map represents the best available data. The map should not be assumed to represent all pipelines that run through the study area.

Figure 59: Pipelines



Source: National Pipeline Mapping System

4.10 Land Use and Zoning

Transportation has a strong relationship with the current land use and development patterns in an area. Additional roadway and transit capacity may be necessary to support an influx of new homes, while greater turning radii may be necessary to accommodate trucks maneuvering intersections to access a nearby distribution center. Likewise, these transportation investments spur new development and redevelopment as companies and communities take advantage of improved accessibility and new capacity. This report describes the current land uses within the CID study area and examines potential future land uses. It also discusses the implications of current and future land use decisions on the CID's transportation system, highlighting instances where conflicts may arise between freight-intensive and non-freight-intensive land uses so that they may be addressed through future infrastructure, policy, and programmatic solutions.

The majority of land within the CID is industrial and is predominantly surrounded by single-family residential land uses. This implies that while there are few incompatible land uses within the CID (e.g., a residential development surrounded by industrial parcels), incompatible land uses do exist at the CID's boundaries. This can create challenges in the form of freight and non-freight vehicle conflicts along the study area's

main corridors, such as SR 70/Fulton Industrial Boulevard. Furthermore, the long-term vision for future land use may create additional conflicts at certain locations unless steps are taken to mitigate them. This can be seen primarily in the form of high-density commercial and/or mixed-use future land uses near Bolton Road and SR 8/US 78/US 278/Donald L. Hollowell Parkway at the northern boundary of the CID.

4.10.1 Existing Land Uses

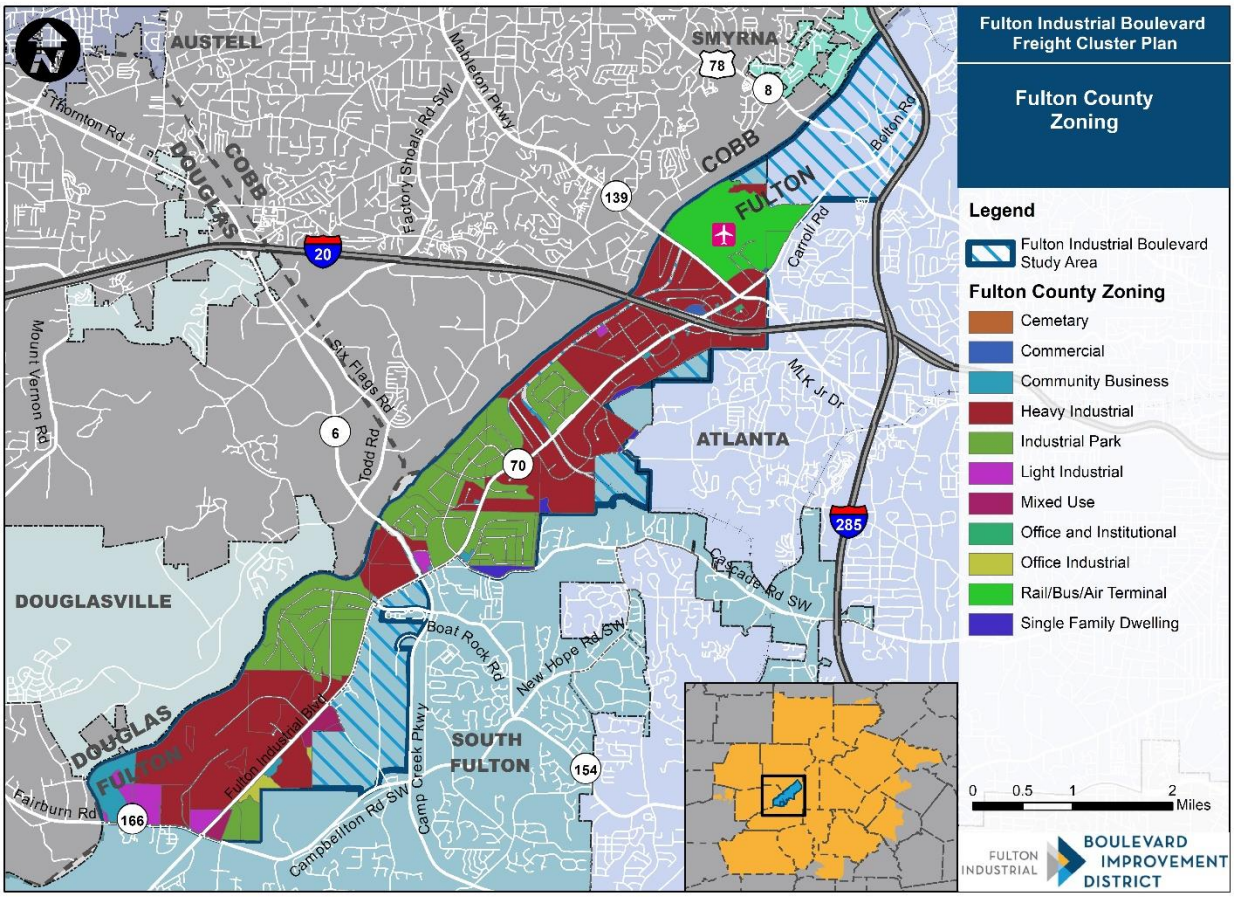
The analysis of existing land uses primarily relies on data collected as part of the comprehensive plans for Fulton County and the City of Atlanta. Comprehensive plans are long-term documents that provide a vision for the future and help to guide the growth of a community. With the passage and signing by the Governor of House Bill 445, the CID is primarily within the City of South Fulton with the portion north of I-20 in the City of Atlanta and Fulton County Airport remaining in unincorporated Fulton County[22]. The City of South Fulton is in the process of developing its first comprehensive plan; it currently relies on the 2035 Fulton County Comprehensive Plan developed in 2016. The comprehensive plans of neighboring jurisdictions (e.g., Cobb County and Douglas County) were also examined to understand their potential impacts on the CID. Where available, the existing land use analysis uses a jurisdiction's designated character areas or other classifications that characterize the common form of development and land use patterns. Zoning data is used when this data is not available.

As shown in Figure 60[23], the existing land use in the CID is predominantly industrial or heavy industrial. Many of the CID's industrial properties are used for warehousing and distribution centers. Despite many of the CID's industrial properties being older developments not well-suited for modern logistics needs, feedback from stakeholders indicate that these properties are being renovated for those purposes due to the CID's desirable location near multiple regional centers (e.g., Downtown Atlanta, Cumberland). Much of the CID's commercial development is clustered around the I-20 interchange with SR 70/Fulton Industrial Boulevard.

[22] Brasch, B. "South Fulton gets Fulton Industrial, spells end for unincorporated land," Atlanta Journal-Constitution, May 13, 2021, https://www.ajc.com/news/atlanta-news/south-fulton-gets-fulton-industrial-spells-end-for-unincorporated-land/B7QHR2JLZZAJXF67VIOVS762OQ/.

[23] Note that Fulton County Airport is zoned as Single Family Dwelling, but Figure 1 depicts the actual land use.

Figure 60: Fulton County Zoning



Source: Fulton County, Department of Public Works

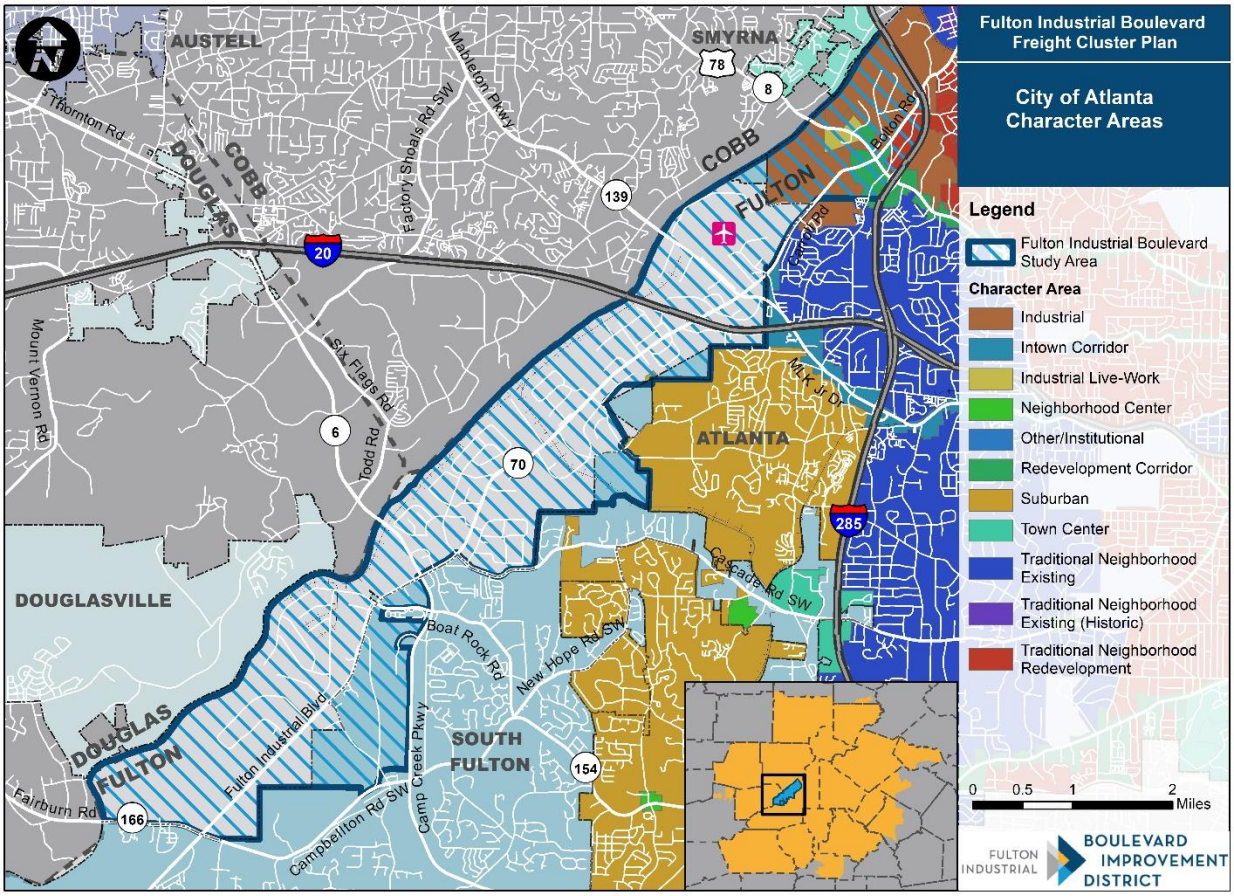
Note: Fulton County Airport is zoned as Single-Family Dwelling, but the actual land use is shown in this map.

Land use in the CID consists almost exclusively of industrial and heavy industrial with limited commercial, and community business. This limits the potential for conflicting or incompatible land uses. The largest concentration of residential land use within the CID is clustered at the northern boundary. The English Park neighborhood of the City of Atlanta is roughly bounded by I-285, Bolton Road, and SR 8/US 78/US 278/Donald L. Hollowell Parkway. The neighborhood primarily consists of detached, single-family residences and is surrounded by industrial or commercial land uses (see Figure 61). Along the CID's eastern boundary, single- and multi-family residential are the predominant land uses with the multi-family portion being concentrated near the intersection of SR 70/Fulton Industrial Boulevard and SR 8/US 78/US 278/Donald L. Hollowell Parkway.

A similar pattern of single-family land use bordering the CID was observed for the City of South Fulton as shown in Figure 62. Towards the southern end of the CID along SR 154/Campbellton Road, large parcels of land bordering the CID are zoned for single-family residential. The same is true of other major corridors that serve as boundaries for the CID, including SR 6/Camp Creek Parkway and Cascade Road. While there

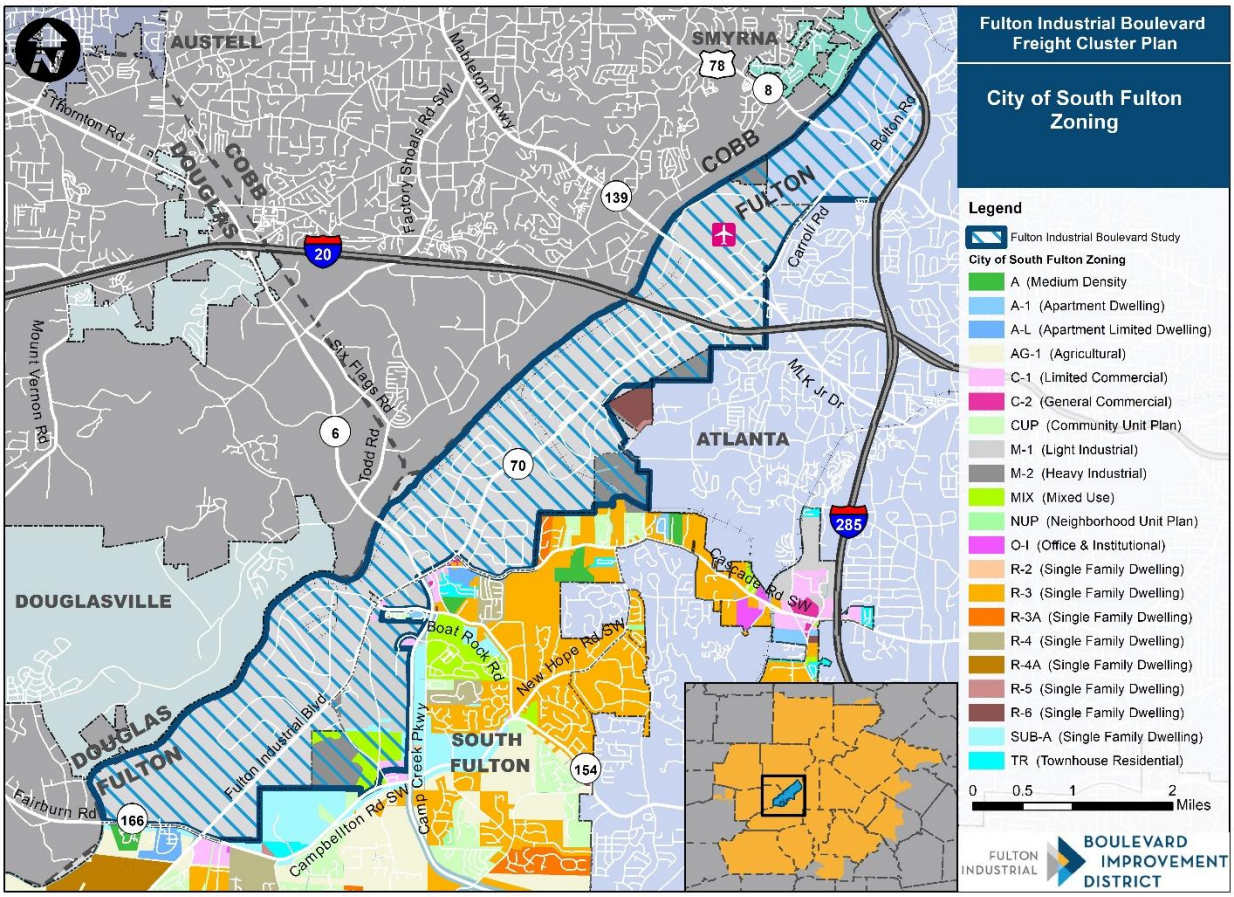
are very few incompatible land uses within the CID, they do exist at its boundaries. This creates conflicts between freight and non-freight vehicles as commuters traverse freight-intensive tracts of land to access residential communities from the study area's main corridors (e.g., SR 70/Fulton Industrial Boulevard, SR 6/Camp Creek Parkway, Cascade Road, etc.).

Figure 61: City of Atlanta Character Areas



Source: City of Atlanta, Office of Zoning and Development

Figure 62: City of South Fulton Zoning



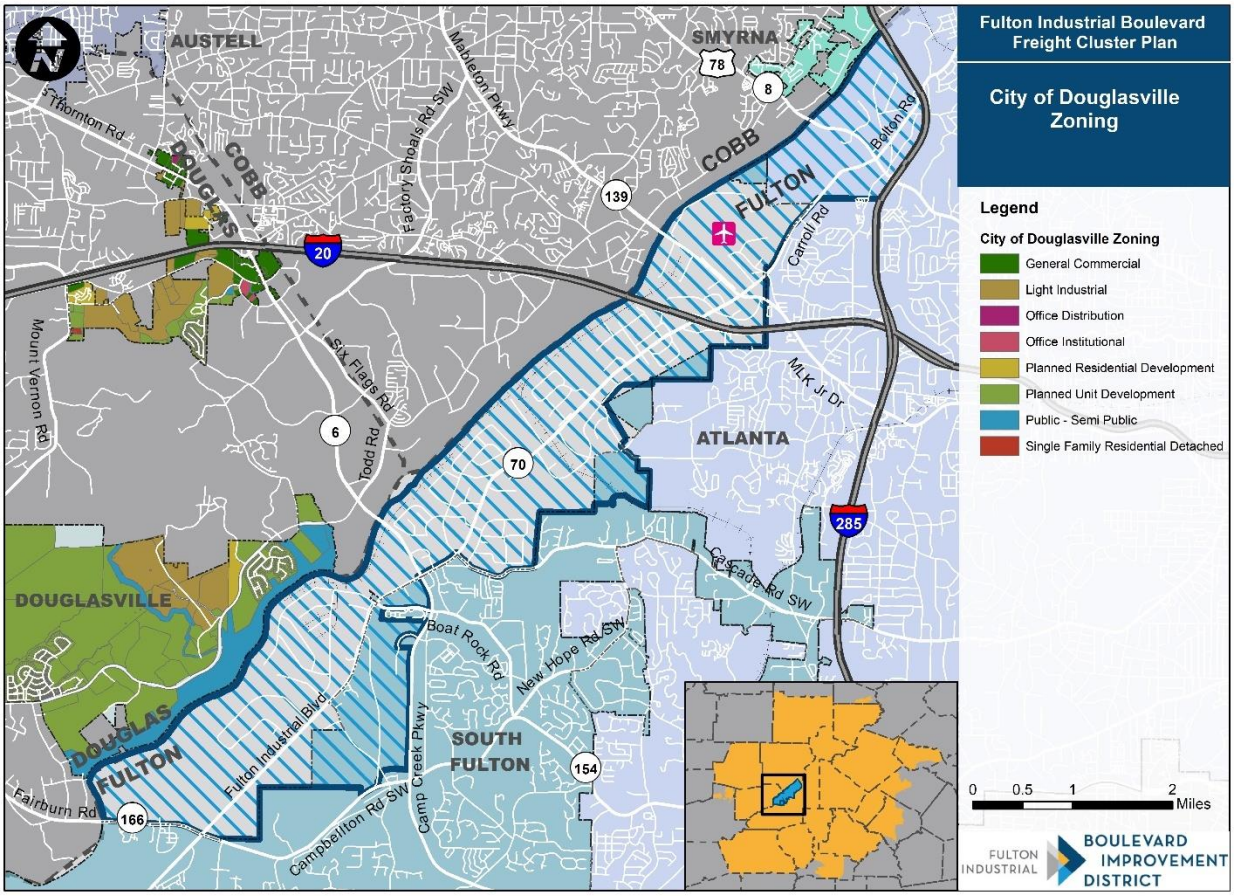
Source: City of South Fulton, Open GIS Site

The existing land uses in neighboring jurisdictions were also examined, including the City of Douglasville, Douglas County, and Cobb County. Though outside of the study area, the land use decisions made in these communities have the ability to impact traffic patterns and development activity within the CID as they share key corridors including SR 6/Camp Creek Parkway, SR 139/Martin Luther King Jr. Drive, SR 154/Campbellton Road, and SR 8/US 78/US 278/Donald L. Hollowell Parkway. A relatively small portion of unincorporated Douglas County borders the CID along SR 6/Camp Creek Parkway and like most of the CID has industrial land uses. As shown in Figure 63, much of the land in the portion of the City of Douglasville that borders the CID is zoned as either public land or planned unit development (PUD). The PUD zoning classification is intended to encourage the best possible site plans and building arrangements under a unified plan of development, rather than under lot-by-lot regulation.[24] Generally, this allows for mixed-use development.

[24] Code of Ordinances of the City of Douglasville, Appendix A, Section 4.03.

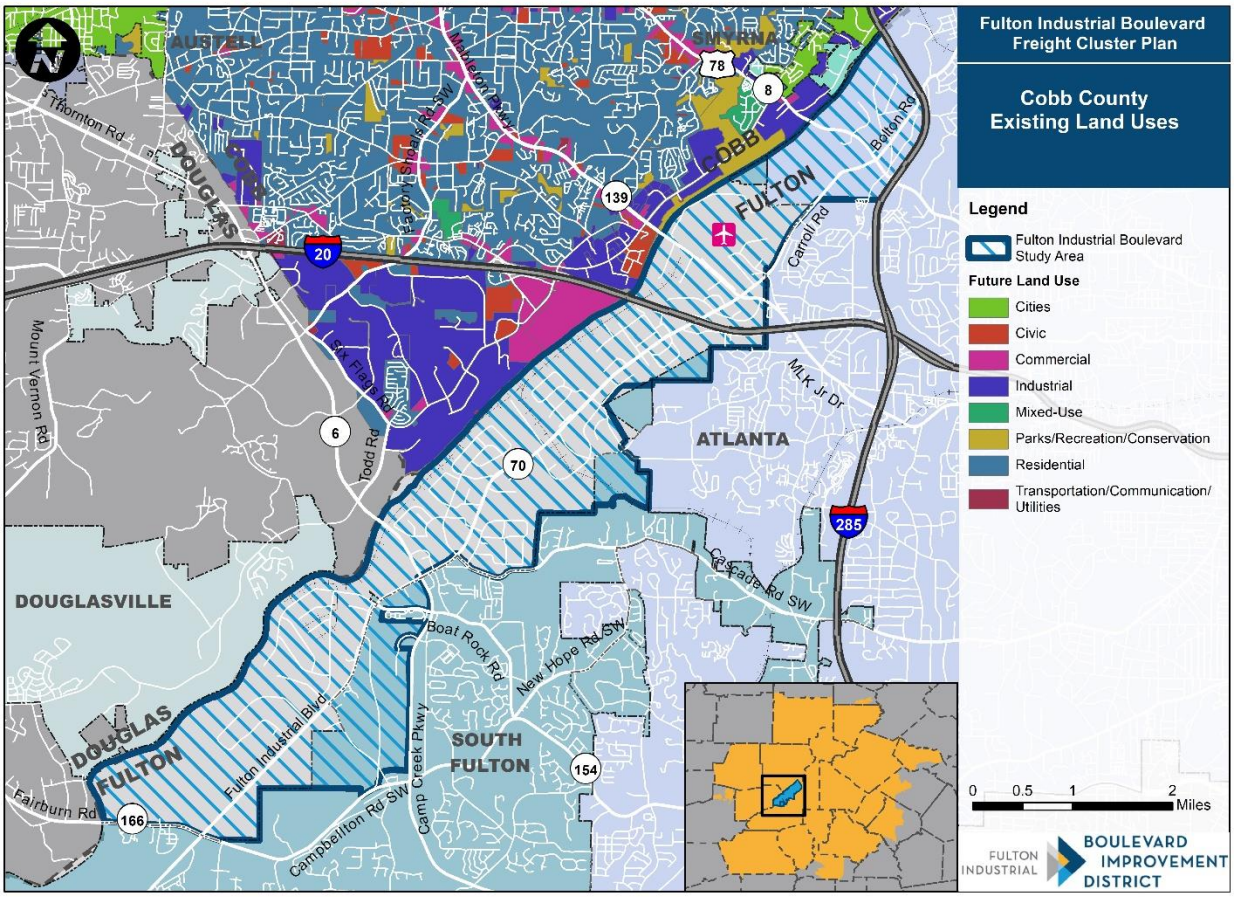
For the portion of Cobb County that borders the CID, existing land uses are largely industrial (see Figure 64). This is primarily the case for the unincorporated area of Cobb County bounded by I-20, the Chattahoochee River, and the Cobb-Douglas County line. Industrial land uses are also present in Cobb County north of I-20 along the Chattahoochee River, but residential land uses also become more prevalent.

Figure 63: City of Douglasville Zoning



Source: Douglas County Planning and Zoning Department; Consultant analysis

Figure 64: Cobb County Existing Land Uses



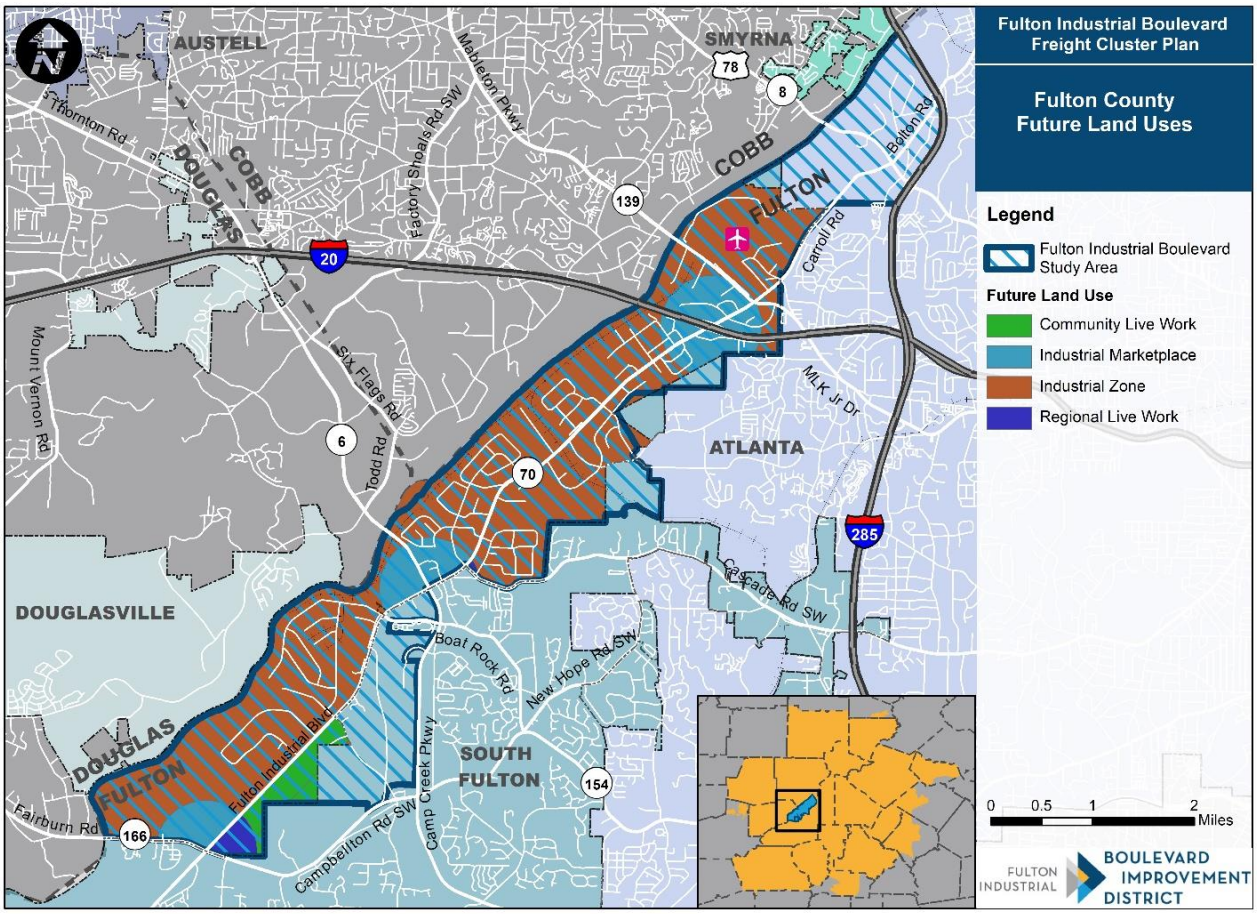
Source: Cobb County, Office of Community Development

4.10.2 Future Land Uses

The CID's municipal partner comprehensive plans were also examined to understand how land uses may evolve over time. In addition to the comprehensive plans, a number of subarea plans that include portions of the CID and address land use have been conducted over the years. These include the Neighborhood Planning Unit H (NPU-H) Master Plan, the Boulevard CID Master Plan, Fulton County Executive Airport Technical Assistance Panel Report, and the Chattahoochee Riverlands Greenway Study. These plans provide insight at the neighborhood scale into the types of developments that may characterize future land use in the CID study area and have an impact on freight mobility.

As shown in Figure 65, the long-term vision for the portion of the CID in unincorporated Fulton County is consistent with current development patterns. The CID is shown as an industrial zone which includes manufacturing, warehousing, and other economic activities that are characteristic of current land uses. At key nodes along the SR 70/Fulton Industrial Boulevard corridor (at I-20, SR 6/Camp Creek Parkway, and SR 154/Campbellton Road), an industrial marketplace is shown as future land use. The industrial marketplace character area designation is intended to concentrate commercial activity at certain nodes along the SR 70/Fulton Industrial Boulevard corridor to serve the needs of employees and nearby residential neighborhoods.

Figure 65: Fulton County Future Land Uses



Source: Fulton County, Department of Public Works

The industrial marketplace character area designation is consistent with many of the long-term land use recommendations in the Fulton County Executive Airport Technical Assistance Panel (TAP) Report and the Chattahoochee Riverlands Greenway Study. The TAP Report focused on market opportunities at Aviation Circle and the intersection of SR 139/Martin Luther King Jr. Drive and SR 70/Fulton Industrial Boulevard. Some of the TAP Report's recommendations included adding a mix of office or flex-type uses to the airport campus, developing land around the airport to create a Main Street or Town Center, and providing convenience retail and amenity space (e.g., grocery, fitness center, pocket park).

The Chattahoochee Riverlands Greenway Study focused on identifying the actions needed to improve the ecological health of the Chattahoochee River and to create a network of linear greenways along its banks in Metro Atlanta. Within the CID study area, the greenway (e.g., multi-use trail) would have a public access point at the northern boundary of the CID and also connect to the Proctor Creek Trail (see Figure 66). The development of a greenway in the CID study area would provide a common space and active transportation amenity for the area's businesses and residents. In addition, the use of greenspace as a buffer between industrial and non-industrial land uses is generally viewed as a best practice for mitigating freight-related

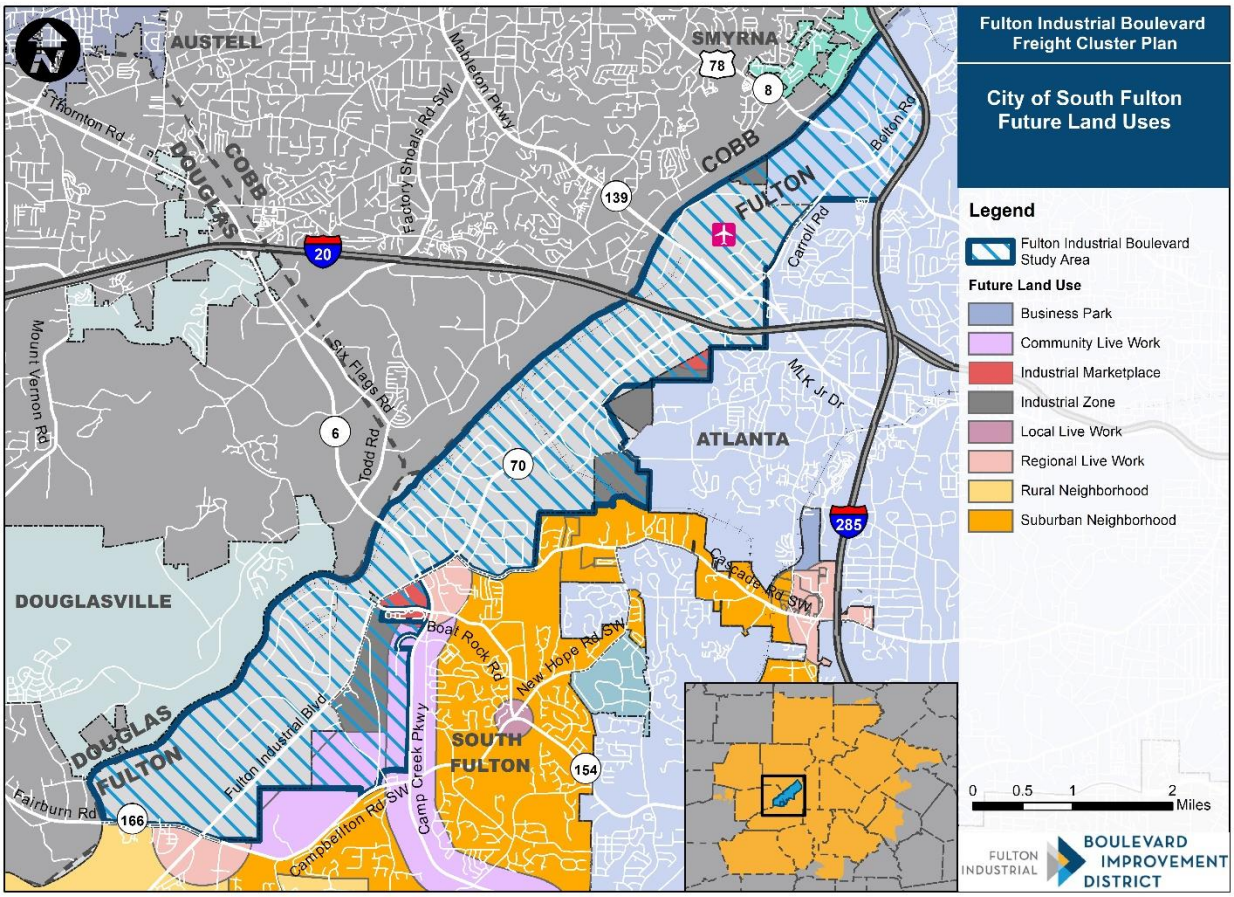
conflicts. However, steps would need to be taken to facilitate safe pedestrian and bicyclist access to the greenway at points where the greenway and freight network intersect.

Figure 66: Proctor Creek Trail Extension

Source: Chattahoochee RiverLands Greenway Study, 2020

Future land uses for the City of South Fulton are shown in Figure 67. Overall, the long-term vision for land that borders the CID is to develop in a manner that can be described as suburban neighborhood or community live work in character. The intent of the suburban neighborhood character area is to provide a wide diversity of housing types and affordability while preserving the surrounding natural, agricultural, and rural areas. The intent of the community live work character area is to provide a mix of commercial, office, and residential uses at intersections and along corridors. It allows the vertical and horizontal mixing of uses, which includes medium and high-density residential housing, such as duplexes and townhomes. Commercial services, such as banks, drug stores, offices, and multi-tenant shopping centers, are also allowed. The community live work designation along major corridors such as SR 6/Camp Creek Parkway and SR 154/Campbellton Road encourages much more commercial and higher density residential development than currently exists.

Figure 67: City of South Fulton Future Land Uses



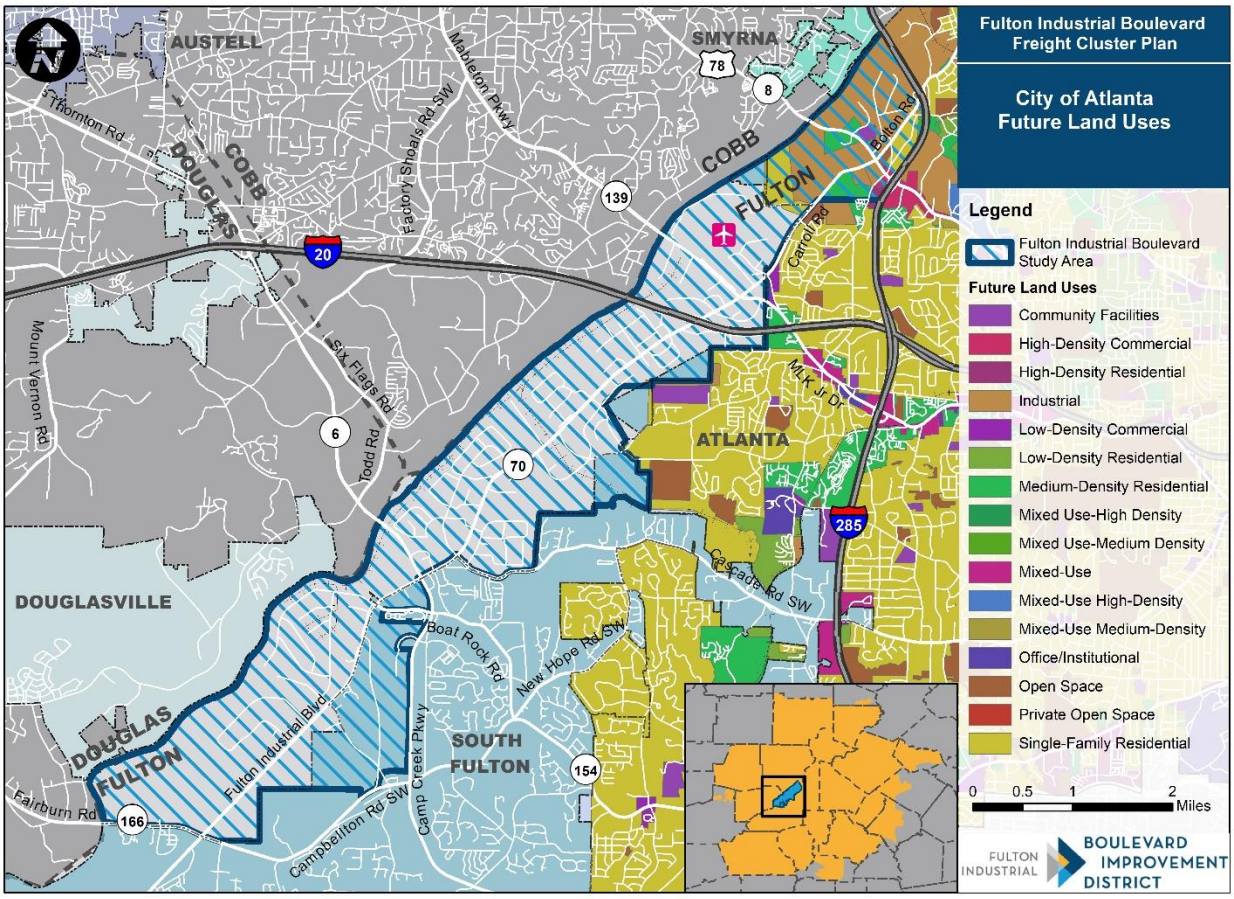
Source: City of South Fulton, Open GIS Site

The long-term vision for future land use in the areas of the City of Atlanta that border the CID are largely consistent with existing land uses, which is primarily single-family residential (see Figure 68). However, there is encouragement of some medium- and high-density residential near the SR 8/US 78/US 278/Donald L. Hollowell Parkway and Bolton Road node at the northern end of the CID. Also at this node, the future land use designation denotes high-density commercial and mixed-use for parcels just outside the CID along SR 8/US 78/US 278/Donald L. Hollowell Parkway (see Figure 69). Notably, a portion of the Petro travel center at this location is designated as high-density commercial for a future land use while the remainder is designated as industrial. The high-density land use designation at this site would allow for commercial uses such as retail, restaurants, office, and services with building heights over 3 stories being typical.

Additional insight into future land uses for areas bordering the CID are drawn from the 2020 NPU-H Master Plan. The NPU-H Master Plan provides the strategy for the growth and development of NPU-H's neighborhoods. This includes areas within the CID (e.g., the United Parcel Service [UPS] Southeast Metropolitan Automated Routing Terminal [SMART] Hub) and multiple neighborhoods along its borders. Land use was a core component of the master plan.

Notably, the NPU-H Master Plan recommended changing the future land use along Bolton Road between SR 8/US 78/US 278/Donald L. Hollowell Parkway and Sandy Creek, which is east of the CID's boundaries. At this node, the master plan recommended that future land use be changed from medium-density residential to a combination of high-density residential and mixed-use. As shown in Figure 70, the intent of this recommendation was to encourage a mix of housing types and mixed-use development that could include office and retail uses. In addition, the recommendation called for preserving landscape buffers for I-285 and the Fulton County Airport-Brown Field and developing multi-use trails along Sandy Creek on the land owned by Fulton County.

Figure 68: City of Atlanta Future Land Uses



Source: City of Atlanta, Office of Zoning and Development

Figure 69: City of Atlanta Future Land Uses Near the Bolton Node

Source: City of Atlanta, Office of Zoning and Development

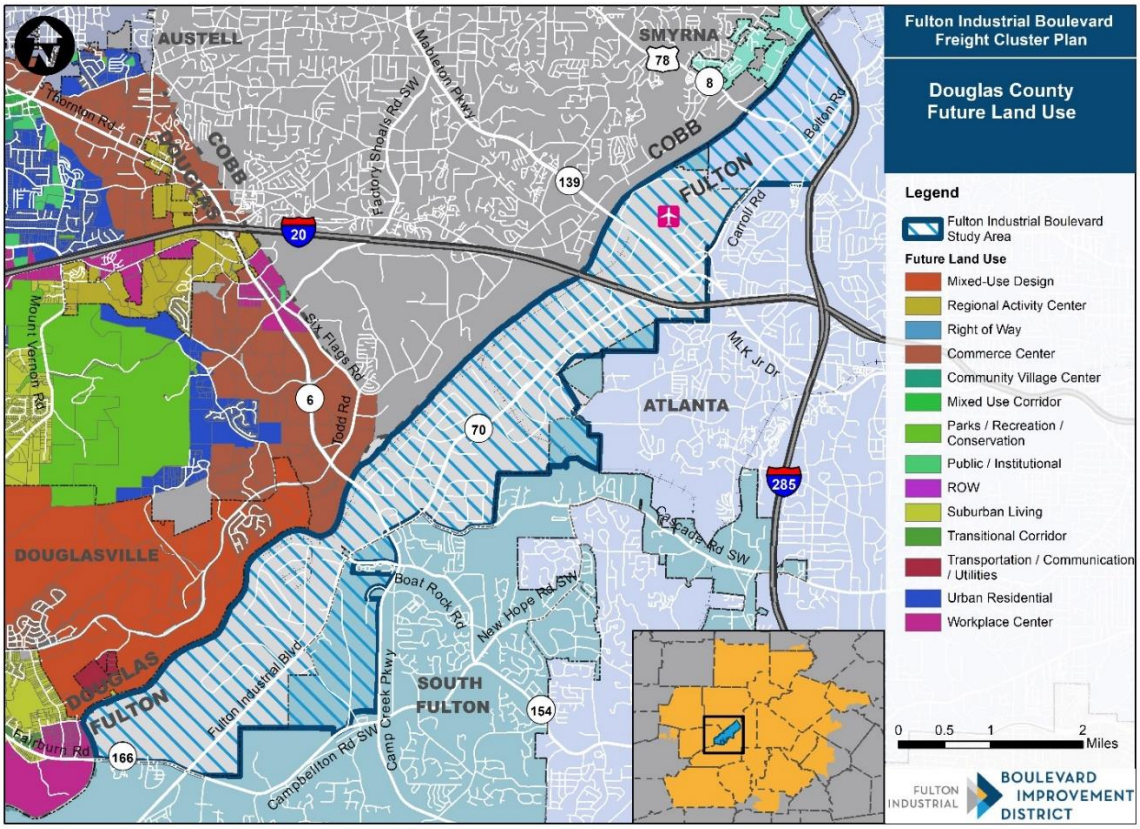
Figure 70: NPU-H Master Plan Future Land Uses Along Bolton Road

Source: City of Atlanta, NPU-H Master Plan, October 2020

Future land uses in neighboring jurisdictions, namely the City of Douglasville and Cobb County, were also examined in order to understand their potential impacts on the CID. The long-term vision for the portion of the City of Douglasville bordering the CID (e.g., the Sweetwater area which is roughly between SR 6/Thornton Road to SR 154/Fairburn Road) is outlined in the 2018 Comprehensive Plan Update and the Sweetwater Master Plan. The plans encourage future land uses that emphasize greenspace, reduce conflicts between freight and non-freight transportation modes, and provide amenities to residents and employees. The future land use is designated as mixed-use (see Figure 71), which is intended to encourage innovative designs that include at least two types of land use that are otherwise not allowed together in order to promote unique solutions to growth issues. In the Sweetwater area, mixed-use calls for a combination of residential, hospitality, retail, and industrial.

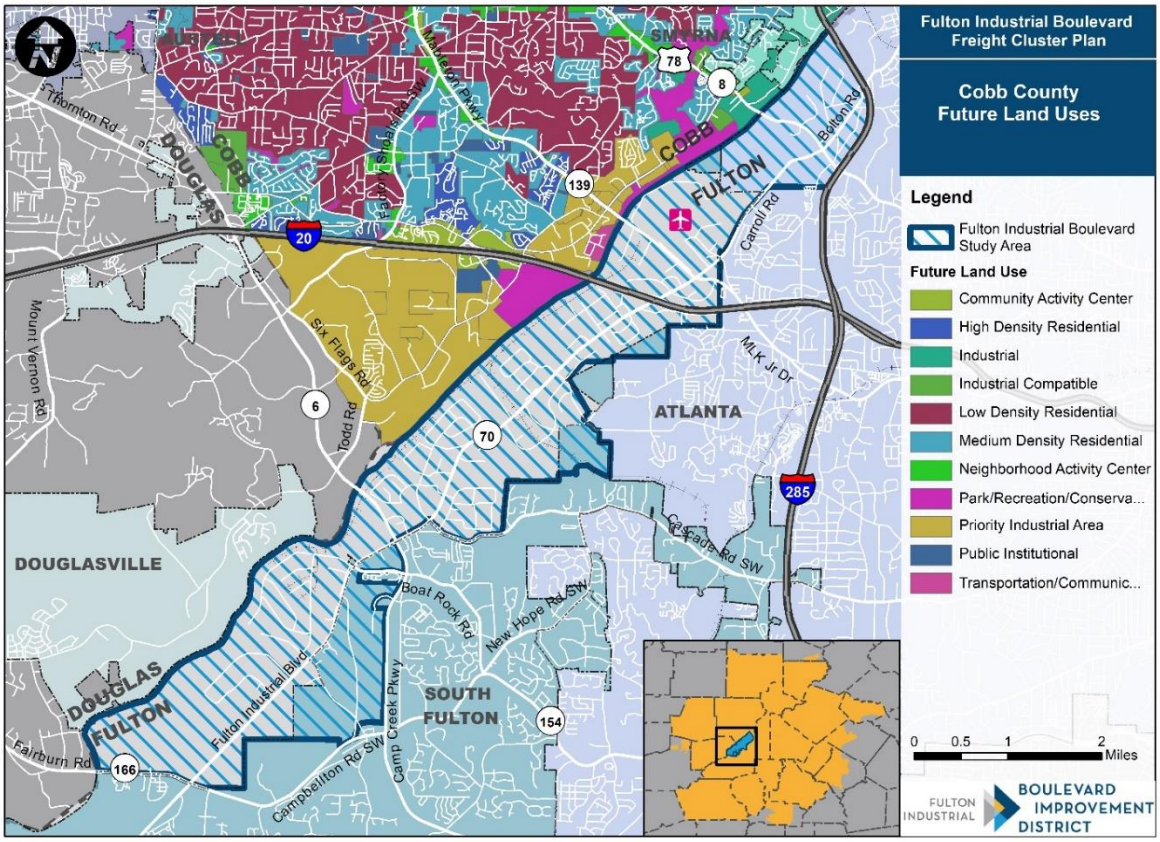
For the portion of Cobb County that borders the CID, proposed future land uses are largely consistent with existing land uses (see Figure 72). Much of the portion of the unincorporated area of Cobb County that borders the CID has a priority industrial area (PIA) future land use designation. The PIA category strategically protects the most important industrial and industrial compatible land areas in unincorporated Cobb County. Increased development throughout the County has resulted in the conversion of industrial properties to other land uses. Under the PIA designation, more stringent criteria must be considered in attempts to alter the land use. Criteria include the estimated impact to jobs and tax base, viability of the new land use, cost of transitioning to a new land use, and potential negative impacts to adjacent industrial areas.

Figure 71: Douglas County Future Land Uses



Source: Douglas County, Planning and Zoning Department

Figure 72: Cobb County Future Land Uses



Source: Cobb County Cobb Open GIS Data Library

4.10.3 Land Use Considerations for the CID Study Area

Detailed recommendations for addressing challenges related to land use will be developed as part of Task 6. Some issues to consider include the following:

- The majority of land within the CID is industrial, which is a positive attribute as it limits the potential for conflicts resulting from incompatible land uses. However, the CID is surrounded by predominantly single-family residential land uses. Incompatible land uses at the CID's boundaries can create challenges in the form of freight and non-freight vehicle conflicts along the study area's main corridors, such as SR 70/Fulton Industrial Boulevard.
- Fulton County is expected to add over 462,000 residents by 2050 relative to the 2015 baseline.[25] The areas surrounding the Boulevard CID are likely to share in that growth, implying more residents in its neighboring communities. This further implies growth in commuter traffic volumes as those

[25] Atlanta Regional Commission, ARC Series 16 Forecast Dashboard, https://33n.atlantaregional.com/arc-series-16-forecast.

residents will use shared corridors with the CID (e.g., Cascade Road, SR 154 Campbellton Road, SR 70/Fulton Industrial Boulevard) to access jobs, shopping, and their homes.

- Related to expected growth in residential development in the communities surrounding the Boulevard CID is corresponding growth in e-commerce home deliveries to those areas. Discussed in greater detail in the Emerging Freight Trends section, the Boulevard CID is currently (and expected to continue) a prime target for the development of e-commerce logistics facilities. Much of the e-commerce traffic activity to serve those growing communities could emanate from the Boulevard CID.
- The long-term vision for high-density commercial and mixed-use future land uses at certain locations (e.g., Bolton Road at the northern end of the CID, SR 8/US 78/US 278/Donald L. Hollowell Parkway at the northern end of the CID, Fulton County Airport) in or near the CID may create conflicts unless steps are taken to mitigate them. Potential mitigation steps could be taking action to preserve industrial land uses, creating buffer zones to separate industrial and non-industrial land uses, and operational strategies that work to separate freight and non-freight traffic on different corridors, among others.
- Though the development of publicly owned land along the Chattahoochee River does not represent a conflict in land use, it does reinforce the importance of pedestrian infrastructure throughout the CID to facilitate access to this future amenity. It also reinforces the importance of supporting investments in environmental infrastructure, such as bioswales to concentrate and convey stormwater runoff.

5 TRENDS AND EXPECTED CHANGES

This section of the report identifies emerging trends and issues that are impacting, or could potentially impact, drivers of freight demand and logistics patterns. Trends that increase or alter how goods move could result in a larger volume of freight moving in the CID study area, create new challenges, and/or exacerbate existing challenges. Changes in transportation cost (due to labor, regulatory, economic, technological, or other factors) could induce additional freight travel demand if the cost trends downward, or limit growth in freight demand if costs increase significantly. Understanding how trends could impact freight demand and mobility is important for determining investment needs and ultimately identifying solutions.

5.1 Growth in Electronic Commerce

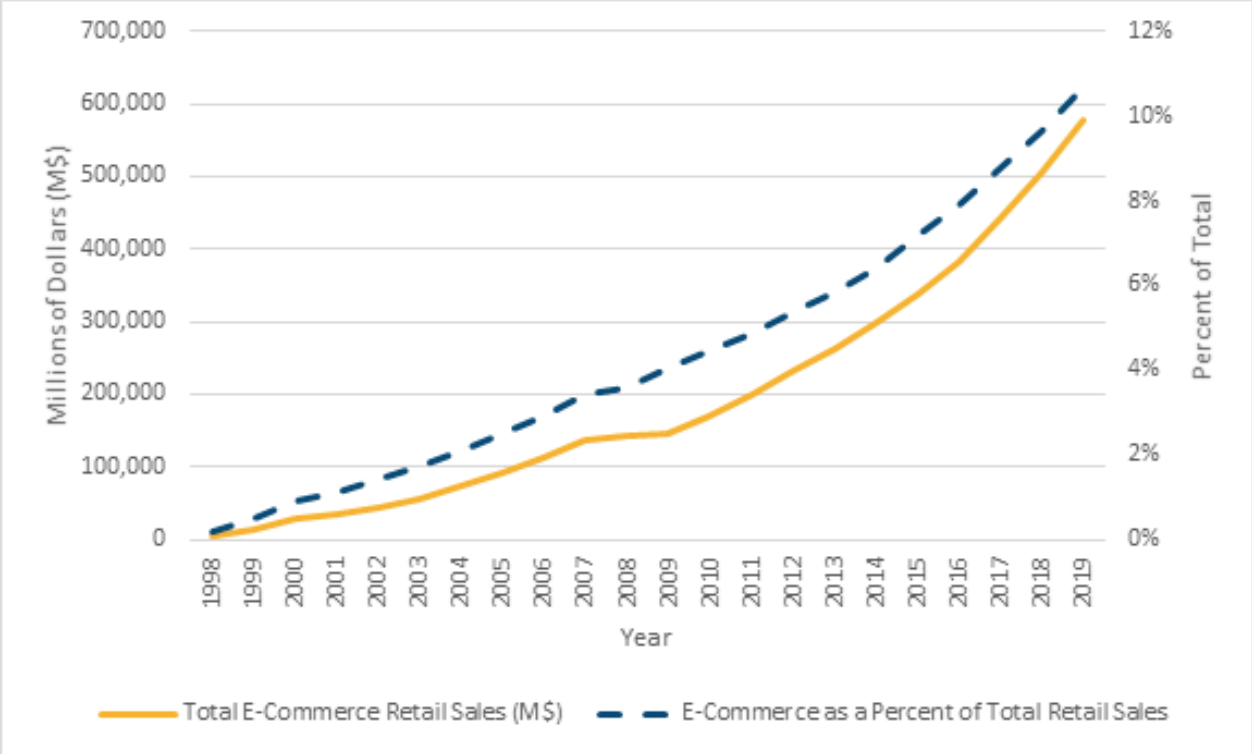
Electronic commerce (e.g., e-commerce) is the use of electronic devices and technologies to conduct commerce and trade, including purchasing goods and services on the internet with electronic banking. E-commerce increased from about 4 percent of total retail activity in 2010 to approximately 11 percent of total retail sales, nearly $579 billion, in 2019 (see Figure 73).[26] Preliminary data from 2020 indicates that e-commerce's market share has grown to over 13 percent of total retail sales.[27] Non-store retailers account for the vast majority of e-commerce retail sales, comprising 86 percent of total sales (nearly $499 billion) in 2019.[28] Motor vehicles and parts dealers are the second largest category, accounting for over 7 percent (nearly $43 billion) of online purchases. However, as e-commerce has more broadly infiltrated the overall economy in recent years, the market segments with the largest growth in sales have been the smaller categories of clothing, food and beverage, and furniture stores. Between 2010-2019, annual growth in these three segments was 32 percent, 23 percent, and 23 percent, respectively, far outpacing the overall 2010-2019 annual growth rate of 15 percent for e-commerce sales.

[26] U.S. Census Bureau, "Estimated Annual U.S. Retail Trade Sales – Total and E-Commerce: 1998-2019," Annual Retail Trade Survey: 2019.

[27] U.S. Census Bureau, U.S. Census Bureau News, "Quarterly Retail E-Commerce Sales 4th Quarter 2020," February 19, 2021, https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf.

[28] U.S. Census Bureau, "Estimated Annual U.S. Retail Trade Sales – Total and E-Commerce: 1998-2019," Annual Retail Trade Survey: 2019.

Figure 73: Annual E-Commerce Retail Sales, 1998-2019



Source: U.S. Census Bureau, Annual Retail Trade Survey, 2019

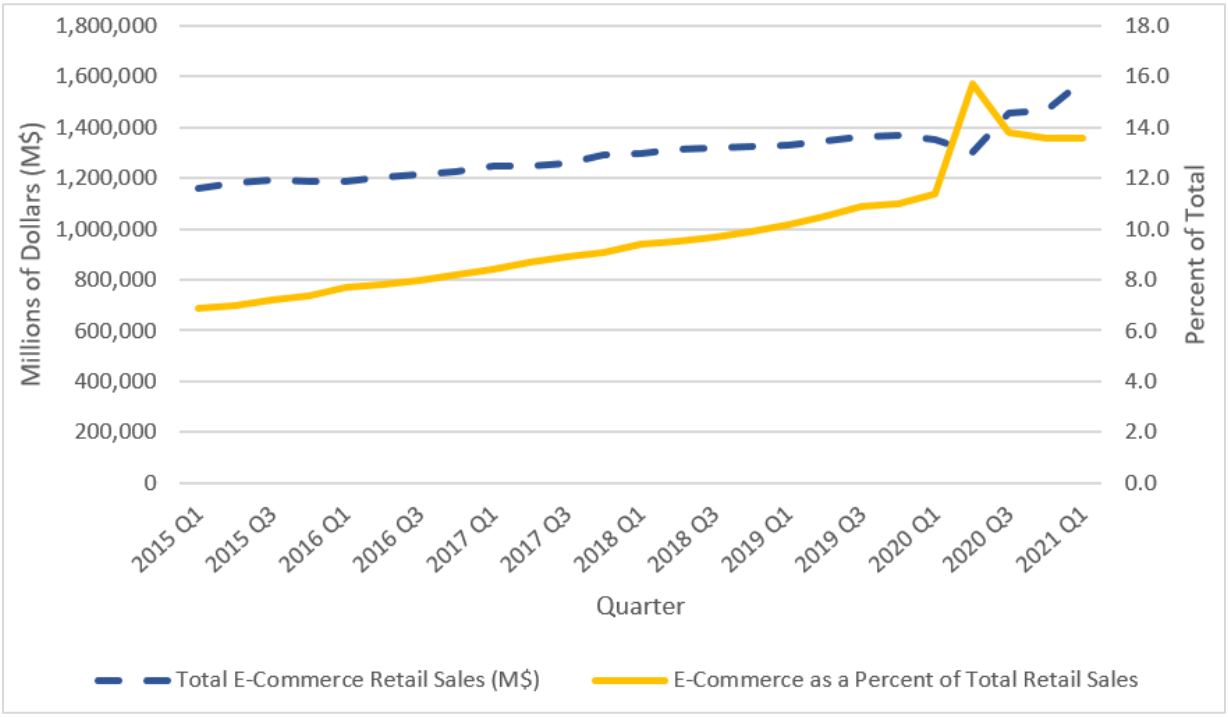
Growth in e-commerce demand appears to have been accelerated over the short-term by the COVID-19 pandemic. This is evident in preliminary quarterly e-commerce data gathered by the U.S. Census Bureau.[29] Shelter-in-place orders in the U.S. began late in the first quarter of 2020 with California issuing the first order in the U.S. on March 19[30] and Georgia issuing its first order on March 23[31]. As shown in Figure 73, there was a sharp increase in e-commerce retail sales as a percentage of total retail sales between the first and second quarters of 2020. After the peak in demand at the beginning of quarter 2, e-commerce sales as a percentage of total retail sales declined over the remainder of 2020. However, even with the decline e-commerce's 2020 market share of retail sales will likely be well above its 2019 value once the data are finalized.

[29] Retail Indicators Branch, U.S. Census Bureau, Estimated Quarterly U.S. Retail Sales (Adjusted): Total and E-commerce, 2021.

[30] Executive Department, State of California, Executive Order N-33-20, https://www.gov.ca.gov/wp-content/uploads/2020/03/3.19.20-attested-EO-N-33-20-COVID-19-HEALTH-ORDER.pdf.

[31] State of Georgia, Executive Order 03.23.20.01, https://gov.georgia.gov/executive-action/executive-orders/2020-executive-orders.

Figure 74. Quarterly E-Commerce Retail Sales, 2015-2021



Source: U.S. Census Bureau, Retail Indicators Branch, 2021

Some of the long-term demographic factors driving e-commerce growth include total population, population density, a relatively high population of millennials, families with young children, higher than median household incomes, and higher disposable incomes. The steady growth of e-commerce as a preferred method for purchasing consumer goods has impacted freight traffic and land use patterns in metropolitan regions, including Metro Atlanta. Proximity to the urban core as well as suburban populations drive last-mile demand, particularly for regions that are geographically spread out. Areas like the Boulevard CID are proximate to both urban and suburban areas, making it a desirable location for fulfillment center facilities.

5.2 Warehouse/Distribution Center Design and Urban Infill

The development of high-cube warehouses and urban infill logistics facilities are two related trends accompanying the growth of e-commerce as the preferred method for purchasing consumer goods. High-cube warehouses are generally considered to be buildings with at least 200,000 gross square feet of floor area, with a ceiling height of 24 feet or more, and are used primarily for the storage and/or consolidation of goods before their distribution to retail locations or other warehouses. Their high ceilings allow them to take advantage of greater storage volumes on a smaller footprint bringing cost savings and operational efficiencies to supply chains, hence their burgeoning popularity. The use of technology and automation facilitate the efficient storage and retrieval of goods at such heights, where previously these buildings would need to operate over a larger footprint. The scarcity of land, especially near urban cores, results in larger footprints being costly and, in some cases, infeasible as additional land is simply not available. Fulfillment centers for e-commerce are considered a type of high-cube warehouse along with transload facilities, short-term storage, cold storage, and parcel hubs.

Despite the preference for high-cube warehouses and newer facilities that are typically built as part of greenfield developments away from the urban core, retailers have become sensitive to the unintended consequences of this supply chain strategy. These include the impacts of distance, congestion, and poor travel time reliability on meeting consumer expectations for same-day and next-day delivery. As a result, a common practice is to position fulfilment centers close to populations centers with good access to major highways. This contrasts with previously observed trends of industrial land uses generally sprawling away from city centers. Achieving this requires existing urban infill industrial facilities to be re-purposed or rehabilitated to meet modern e-commerce logistics needs.

Both trends have already impacted the Boulevard CID and will continue to do so as growth in e-commerce demand continues. For example, UPS opened its SMART Hub, a 1.2 million square foot high-speed processing facility capable of processing approximately 100,000 parcels per hour, in the CID in 2018. Other companies have re-purposed or rehabilitated older buildings in the CID, raising ceilings and making other improvements, so that they may serve e-commerce demand. Also, in 2020 Amazon opened in the CID a more than 1.1 million square foot fulfillment center along SR 154/Campbellton Road with 40-foot minimum clear heights.[32] As the CID is less than 1 hour from the core of the Metro Atlanta region and is also proximate to other regional centers, such as Perimeter Center and Cumberland, it will continue to be attractive for this type of development. As the population density and economic activity of Metro Atlanta grows, so too will the demand for goods delivered via e-commerce channels; this will result in the continued demand for land and buildings that can be repurposed to meet this growing need.

5.3 Advances in Supply Chain Operations and Design

Related to the trend of e-commerce and urban infill is the advancement of supply chain operations and design. Emerging trends in this area include warehouse automation, the use of big data and analytics for siting freight facilities (i.e., selecting an ideal location for meeting demand while meeting other objectives such as minimizing costs), and the Internet of Things. Both traditional warehouses and e-commerce fulfillment centers are becoming more automated. Despite the high cost of the initial investment, automated warehouses can result in cost savings over time. Fully automated warehouses can operate nonstop. Additionally, automated warehouses can increase throughput (the amount of goods processed per square foot) as aisles between storage racks can be narrower and the height of the racks taller due to the absence of forklifts. Automated warehouses allow more product to be handled and stored horizontally and vertically, incentivizing building designs with high ceiling heights (24 feet or more) to take advantage of the ability of equipment to reach higher heights. Amazon opened its first automated fulfillment center, an 855,000 square foot facility with 13 miles of conveyance, in St. Peters, MO in 2019.[33] In 2020, the company opened a 640,000 square foot robotics fulfillment center in Gwinnett County near Stone Mountain.[34] As the cost of

[32] https://www.connectcre.com/atlanta/amazon-expands-atlanta-footprint-with-1-1m-sf-logistics-deal/

[33] Kukuljan, S. “Inside Missouri's first Amazon fulfillment center.” St. Louis Business Journal, June 26, 2019, https://www.bizjournals.com/stlouis/news/2019/06/26/inside-missouris-first-amazon-fulfillment-center.html.

[34] Yeomans, C., “Amazon preparing to open first robotics fulfillment center in south Gwinnett County”, Gwinnett Daily Post, September 1, 2020, https://www.gwinnettdailypost.com/local/amazon-preparing-to-open-first-robotics-fulfillment-center-in-south-gwinnett-county/article_002c6fa6-ec71-11ea-9a3a-bf7f9f5ddd63.html.

automation technology declines over time, warehouses that deploy it will become more pervasive throughout the U.S., including Metro Atlanta.

Another trend is the use of big data and analytics to make freight facility location decisions. These data and analytics are being used as part of supply chain modeling and optimization tools. Supply chain modeling and optimization involves the application of mathematical models to determine the ideal locations of supply chain facilities (e.g., warehouses, distribution centers), inventory levels at those locations, and other operational aspects for the purpose of minimizing operational costs. In the 2020 iteration of an annual survey of third-party logistics (3PL) services conducted by the Pennsylvania State University, 39 percent of shippers indicated that network modeling and optimization were capabilities they looked for in 3PL providers, while 62 percent of 3PL providers indicated that they offer those capabilities.[35] As noted in the Technology Association of Georgia's 2020 State of Georgia's Supply Chain/Logistics Technology Ecosystem report, the application of big data and analytics to supply chains includes artificial intelligence.[36] The predictive capabilities of artificial intelligence in network planning are allowing markets to become more proactive, for example, by estimating how many freight vehicles are needed at specific locations based on demand.

The Internet of things (IoT) is another emerging trend that is relevant for freight planning. IoT, or the "Physical Internet," describes the network of physical objects – or "things" – that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. The potential for IoT to positively impact the transport, handling, and storage of goods and other supply chain management activities is substantial. IoT's core abilities of allowing physical objects to connect and exchange data complements supply chain management's main objectives of tracking and monitoring cargo, inventory, and assets.[37] For example, a shipment of medications can communicate to a supply chain manager or connected thermostat that its temperature has gone outside its acceptable range; a truck enabled with a predictive maintenance application can alert a fleet manager that a repair is needed before breakdown occurs; a retail store outfitted with IoT sensors can automate in-store inventory levels and provide customers with no-contact payment options, such as the fully automated Amazon Go Grocery store[38]. Other key areas of supply chain management impacted by IoT include real-time location tracking, storage condition monitoring (e.g., goods that must be stored at certain temperature ranges), forecasting product movement and arrivals, goods location in the warehouse, improved asset management, automation, and improved resource management, among others. Overall, for the private sector IoT could enable better on-time delivery performance, lower supply chain costs, and reduced prices for end consumers.

This trend is relevant to public sector freight planning because these connected devices can also be leveraged to improve conditions on public roadways and reduce environmental impacts. A critical component of IoT is its ability to interact with smart infrastructure. For example, IoT devices that

[35] http://3plstudy.com/3plindex.php

[36] https://www.tagonline.org/wp-content/uploads/2020/01/2019-Supply-Chain-Report_compressed.pdf

[37] Ceurstemont, S. "How the 'physical internet' could revolutionise the way goods are moved", Horizon Magazine, February 15, 2021, https://horizon-magazine.eu/article/how-physical-internet-could-revolutionise-way-goods-are-moved.html

[38] Golden, H., "'Just walk out': Amazon debuts its first supermarket with no checkout lines", The Guardian, February 27, 2020, https://www.theguardian.com/us-news/2020/feb/25/amazon-go-grocery-supermarket-seattle-technology.

communicate with connected infrastructure (e.g., smart traffic signals, dynamic message signs, weigh-in-motion stations) could provide more accurate corridor-level estimates of freight travel times and volumes, allowing traffic conditions on those corridors to be better managed. Improved management could be achieved through freight signal priority, truck parking information systems, and other freight-specific operational strategies (refer to the Transportation Data and Operational/Management Technologies for more details on these applications). Overall, IoT devices have the potential to provide transportation engineers, planners, and other professionals more abundant and improved data on freight operations which would allow them to better develop strategies for addressing current and future needs. This, of course, assumes that the data from IoT devices is shared with the public sector as it is privately owned.

5.4 Connected and Autonomous Freight Vehicles

While much of the attention on connected and autonomous vehicle technology has focused on passenger cars, an increasing number of trucks are utilizing these technologies including sensors, communications, and/or processing software technologies for both steering and braking assistance. Due to ongoing industry challenges to attract new drivers and the continued need to improve safety, the benefits of greater vehicle automation to the trucking industry are substantial. The Society of Automation Engineers' automation levels classification scheme is the industry standard in terms of measuring the degree of automation in a vehicle (see Table 11). Currently, there are no viable commercial systems for fully autonomous trucks. The highest level of truck automation commercially available is "advanced driver assistance" (Level 1). Partial and conditional automation are in the pre-commercial stage, and high and full automation are in research and development and are not likely to be available over the medium-term.

Table 11: Society of Automation Engineers (SAE) Automation Levels

Level	Title	Description
0	No Automation	Zero autonomy; the driver performs all driving tasks.
1	Driver Assistance	Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.
2	Partial Automation	Vehicle has combined automated functions, like acceleration and steering, but the driver must be ready to take control of the vehicle at all times with notice.
3	Conditional Automation	Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.
4	High Automation	The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.
5	Full Automation	The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Source: Society of Automation Engineers

Advanced driver assistance systems (ADAS) enhance the safety, efficiency, or experience of driving by assisting in or automating real-time functions traditionally performed by the driver. They use a variety of internal and external sensors (such as GPS, video, radar, and lidar) to provide information to drivers about navigation and potential conflicts. ADAS form the foundation of autonomy and represent a significant

advance in vehicle safety even without full autonomy. Multiple studies have found these technologies to be effective at reducing truck crashes.[39,40,41,42,43] Examples of these systems include:

- Electronic stability control (ESC) and roll stability control (RSC) which use real-time information such as weight, speed, acceleration, and steering to detect the potential for a vehicle rollover or loss of steering control.
- Forward collision warning (FCW) systems which provide a warning to the driver if the distance or time to the lead vehicle falls below a certain threshold (or a series of escalating warnings as the risk of a collision increases).
- Autonomous emergency braking (AEB) which allows the vehicle to brake independently of the driver to avoid or mitigate an imminent rear-end collision. AEB is often integrated with FCW as a forward collision avoidance system (FCAS).

There are multiple companies actively engaged in the development of fully autonomous trucks. On a per-mile basis, labor and fuel are the two highest operational costs for the trucking industry. In theory, if drivers could be replaced then autonomous trucks would significantly reduce both of these costs. Other potential benefits include reduced driver stress, fewer accidents, less congestion, and lower carbon emissions. Thus, given the trucking industry's tight profit margins and the ongoing labor challenge of recruiting new drivers, some have predicted that autonomous trucks will outpace autonomous passenger vehicles in terms of widespread commercial adoption.[44, 45, 46] Nevertheless, the prevailing view in the motor carrier industry is that autonomous operations will not find public acceptance until autonomous automobiles become common.

An example of one company pushing the trend towards autonomous trucks is Embark. Embark is currently testing a system that automates the freeway portion of a truck's journey and allows the driver to take over to navigate the more complex local roads. The approach is designed to enable truck drivers to complete more journeys per day, while spending less time actually driving. Another example company is TuSimple, which has been performing depot-to-depot test runs in Phoenix, Tucson, Dallas, El Paso, Houston, and

---

[39] Hickman, J. et al., "Onboard Safety Systems Effectiveness Evaluation Final Report," Federal Motor Carrier Safety Administration, FMCSA-RRT-12-012, 2013, https://rosap.ntl.bts.gov/view/dot/10.

[40] Woodroofe, J. et al., "Safety Benefits of Stability Control Systems for Tractor-Semitrailers," National Highway Traffic Safety Administration, DOT HS 811 205, 2009, https://deepblue.lib.umich.edu/handle/2027.42/64283.

[41] Federal Motor Carrier Safety Administration, "Benefit-Cost Analyses of Onboard Safety Systems," Tech Brief, FMCSA-RRT-09-023, February 2009

[42] National Transportation Safety Board, "The Use of Forward Collision Avoidance Systems to Prevent and Mitigate Rear-End Crashes," 2015, https://www.ntsb.gov/safety/safety-studies/Documents/SIR1501.pdf.

[43] Belzowski, B. et al., "Tracking the Use of Onboard Safety Technologies Across the Truck Fleet," Federal Motor Carrier Safety Administration, DTMC75-07-C-00004, 2009, https://rosap.ntl.bts.gov/view/dot/24615.

[44] Deloitte, "Autonomous trucks lead the way," February 17, 2001, https://www2.deloitte.com/us/en/insights/focus/future-of-mobility/autonomous-trucks-lead-the-way.html/#endnote-sup-6

[45] Reuters, "Daimler takes 'reality check' on robotaxis," November 14, 2019, https://www.reuters.com/article/us-daimler-autonomous/daimler-ceo-says-robotaxis-business-is-not-realistic-idUSKBN1XO1FM.

[46] Naughton, K., "Waymo CEO Sees Driverless Trucking Catching on Faster than Taxis," Bloomberg, October 28, 2019, https://www.bloombergquint.com/business/waymo-ceo-driverless-cargo-delivery-may-arrive-before-taxi-cabs.

San Antonio[47] Other companies with promising pilot programs include Waymo (a subsidiary of Google's parent Alphabet), Aurora, Locomation, and Plus.ai.

Another motivating factor behind the emerging trend of autonomous trucks is that it provides the ability for fleet operators to deploy trucks in platoons. Truck platoons use vehicle-to-vehicle (V2V) communications and autonomous vehicle control technology to electronically "tether" tractor-trailers together in a convoy formation.[48] These vehicles automatically maintain a set, close distance between each other while connected (about 20 to 75 feet[49]). The truck at the head of the platoon acts as the leader, with the trailing vehicles reacting and changing in its movement. Early phases of truck platooning are expected to still use drivers, though at SAE Level 5 autonomy platoons could operate with a driver only in the lead vehicle with the remaining vehicles being automated. One of the primary benefits of platooning is greater fuel efficiency (and the associated cost savings), which stems from reduced aerodynamic drag on the following vehicle(s). One study estimated that the lead truck may experience fuel savings of up to nearly 5 percent while trailing trucks may experience savings of up to nearly 10 percent.[50] Another potential benefit is safety as braking is automatic and immediate with connected trailing vehicles only needing a fraction of the time it would require for a human to react.

While the private sector has been leading the development of connected and autonomous vehicle technology, the government has also been investing. Investments in smart infrastructure and developing policies and regulations to support connected and autonomous vehicle technology have been made at the federal, state, and regional level. At the federal level, USDOT has funded the Ann Arbor Connected Vehicle Environment, Connected Vehicle Pilots Program, and the Advanced Transportation and Congestion Management Technologies Deployment Program to advance vehicle communications technologies.[51] USDOT also released its Federal Automated Vehicle Policy in 2016, the Automated Driving Systems 2.0: Vision for Safety in 2017, and Preparing for the Future of Transportation: Automated Vehicle 3.0 in 2018, which provides more detailed guidance and best practices in terms of testing and deployment of automated technologies. At the statewide level, GDOT is engaged in the Statewide Connected Vehicle Deployment Experience and Plan. The goal of this program is to develop infrastructure, network, and business processes to support V2I infrastructure applications that would improve safety and mobility.[52] The program includes pilot projects to deploy roadside units on SR 141/Peachtree Street and SR 8/Ponce de Leon Ave. Regional initiatives include the Atlanta Regional Commission's Connected Vehicle Project and the Gwinnett County Connected Vehicle Technology Master Plan. These initiatives involve installing 1,700 roadside units

[47] Ackerman, E. "This Year, Autonomous Trucks Will Take to the Road With No One on Board," IEEE Spectrum, January 4, 2021.

[48] European Automobile Manufacturers Association, https://www.acea.be/uploads/publications/Platooning_roadmap.pdf.

[49] Lammert, M., Duran, A., Diez, J., Burton, K. et al., "Effect of Platooning on Fuel Consumption of Class 8 Vehicles Over a Range of Speeds, Following Distances, and Mass," SAE Int. J. Commer. Veh. 7(2):2014, doi:10.4271/2014-01-2438

[50] Ibid.

[51] https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf

[52] https://traffic.transportation.org/wp-content/uploads/sites/26/2018/07/GDOT-Connected-Vehicles.pdf

(RSU) that communicate with dedicated short-range communications (DSRC) and cellular technology along and near smart corridors.

5.5 Commercial Vehicle Electrification

While passenger cars have generated the most sales of electric vehicles, electric trucks are seen as vital to reducing business costs and the overall environmental impact of the transportation sector. For example, fuel typically represents the second highest cost to motor carriers (about 24 percent of total cost), behind driver wages, on a per mile basis.[53] Historically, electricity prices have been lower and more stable than gasoline and diesel prices and thus electricity offers the opportunity for an industry characterized by tight profit margins to achieve considerable cost savings. In addition, studies have estimated that the total cost of ownership of battery electric day cab tractors is lower than their diesel counterparts over the long-term.[54], [55] Day cabs for regional operations (i.e., an operating range of 250 to 300 miles) are expected to be the first application for electric trucks.

Besides the ability of freight vehicle electrification to reduce business costs, the potential to mitigate the negative externalities attributed to goods movement is a motivating factor. For example, while medium- and heavy-duty vehicles represented only about 5 percent of registered vehicles in 2018, they were responsible for over 26 percent of the U.S. transportation sector's fuel consumption[56] and 23 percent of the sector's greenhouse gas (GHG) emissions[57]. Electrification would also help to address an important transportation equity challenge related to public health. Respiratory diseases attributed to tailpipe emissions disproportionately affect disadvantaged communities due to their proximity to major highways, rail yards, trucking terminals, and other freight-intensive land uses.[58] Because of the potential economic and environmental benefits of electrification, several operators of private (e.g., Walmart and Amazon) and for-profit fleets (e.g., Knight-Swift and Dependable Highway Express) have made investments to achieve electric and zero-emission fleets.[59]

---

[53] American Transportation Research Institute, Operational Costs of Trucking, 2019.

[54] California Air Resources Board, "Advanced Clean Trucks Total Cost of Ownership Discussion Document: Preliminary Draft for Comment," February 22, 2019, https://ww2.arb.ca.gov/sites/default/files/2020-06/190225tco_ADA.pdf.

[55] Phadke, A. et al., "Why Regional and Long-Haul Trucks are Primed for Electrification Now," March 2021, Lawrence Berkeley National Laboratory, https://eta-publications.lbl.gov/sites/default/files/updated_5_final_ehdv_report_033121.pdf.

[56] FHWA, Table VM-1 - Highway Statistics 2018 – Policy: Federal Highway Administration, https://www.fhwa.dot.gov/policyinformation/statistics/2018/pdf/vm1.pdf.

[57] Environmental Protection Agency – Office of Transportation and Air Quality,

Fast Facts: U.S. Transportation Sector Greenhouse Gas Emissions 1990-2018, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100ZK4P.pdf.

[58] American Lung Association, American Lung Association Energy Policy Development: Transportation Background Document, 2015, www.lung.org/getmedia/10333ba7-8f6f-472e-8392-1388cd5fd754/transportation-backgrounder.pdf.pdf.

[59] Ronan, D., "Trucking Industry Making Strides Toward Electrification," Transport Topics, March 11, 2021, https://www.ttnews.com/articles/trucking-industry-making-strides-toward-electrification.

Despite the potential for electrification to generate industry cost savings and positive environmental and transportation equity impacts, it is not without its challenges. This is evidenced by the low market penetration of electric freight vehicles. Only about 600 electric heavy-duty vehicles are estimated to have been sold in the U.S. and Canada in 2019.[60,61] Some of the key barriers to heavy-duty vehicle electrification include[62]:

- **Higher Upfront Vehicle Costs.** High vehicle purchase price is perceived as one of the largest barriers to freight electrification. Electric trucks may be as much as 3.5 times the average cost of a diesel truck.[63] Batteries are the most expensive component of an electric vehicle. High upfront costs particularly impact smaller carriers and owner-operators as they are not likely to have the capital or confirmed client demand to invest in electric vehicles.
- **Costly and Complex Charging Infrastructure Processes.** The planning and installing of electric vehicle infrastructure are one of the largest barriers to deploying an electric truck fleet. Electric vehicle charging stations vary in the speed (and subsequently cost) with which they can fully charge a vehicle. Aside from selecting and purchasing the stations, motor carriers must deal with the complexity and cost associated with siting, planning, commercial utility interconnection requirements, construction permitting, and final installation. To address this barrier, some automotive, utility, and infrastructure companies are testing technology that allows electric vehicles to charge while in-motion via under-road pads that wirelessly transmit electricity to receivers mounted underneath vehicles or using overhead wires.[64] The process, known as dynamic charging, could reduce the cost of charging infrastructure for motor carriers if they could rely on a publicly available source of energy to supplement their own investments.
- **Commercial and Industrial Electricity Rate Structures.** Electricity charging costs in the U.S. are on average much lower than comparative diesel fueling costs.[65] However, the combination of substantial electricity demand requirements, limited down time to charge larger class vehicles, and utility market rate structures can greatly reduce the financial savings of electricity over diesel. Heavy-duty vehicles must be able to charge at reasonably priced rates that meet their operational needs. Without greater flexibility in rate structures, it may be financially challenging for fleet operators to consider electrifying their fleets.

---

[60] Environmental Defense Fund, Race to Zero, October 2020, https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT_EDF_PQ-FINAL.pdf

[61] The Environmental Defense Fund report defines heavy-duty vehicles are defined as those with gross vehicle weight ratings of 7,716 lbs. or more.

[62] Electrification Coalition, Electrifying Freight: Pathways to Accelerating the Transition, https://www.electrificationcoalition.org/wp-content/uploads/2020/11/Electrifying-Freight-Pathways-to-Accelerating-the-Transition.pdf.

[63] This estimate is based on 2018 average capital costs for heavy-duty diesel and electric trucks presented in the 2019 California Air Resources Board "Advanced Clean Trucks Total Cost of Ownership Discussion Document: Preliminary Draft for Comment" report.

[64] Hodari, D., "These Companies Want to Charge Your Electric Vehicle as You Drive," Wall Street Journal, January 18, 2021.

[65] "Fuel Prices." Alternative Fuels Data Center: Fuel Prices, U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Office, afdc.energy.gov/fuels/prices.html.

- **Limited Availability of Certified Service Centers and Technicians.** Without certified facilities and technicians, many fleet operators may be resistant to electrify their fleets until they can be assured that timely repairs can be made to their vehicles in order to protect against extended periods of downtime. Commercial vehicle fleets have very demanding operational requirements that require close monitoring to ensure optimal operational efficiency and minimal disruptions to fleet operations. While diesel trucks have a large network of highly capable and knowledgeable service centers and technicians to support their operation, this is not the case for heavy-duty electric vehicles.
- **Concerns with Grid Resiliency.** As electric truck fleets become more common, there is concern that without significant investments in utility upgrades to current grid infrastructure, local grid networks may be pushed beyond their current distribution capacity. This can create disruptions to services or a slowdown of fleet electrification efforts. Electric trucks have very high electrical demand requirements, and their widespread deployment would create large new demand for electricity. Evaluating the need for increasing grid distribution capacity is therefore essential to providing sufficient reliability to support a fully electrified freight transportation system.

Local initiatives to promote the adoption of electric vehicle technology are an opportunity for the CID, potentially in the form of a pilot program aimed at commercial vehicles. For instance, Georgia Power allows customers to apply for funding to assist in the installation of the infrastructure required to support electric transportation charging systems at their facilities.[66] This includes businesses that operate vehicle fleets, such as a motor carrier. In interviews for this study, Georgia Power expressed confidence that the electric grid in the region can be adapted to the expected new demand.

5.6 Transportation Data and Operational/Management Technologies

The intersection of technology innovation and transportation continues to influence freight movement. Technology advancements can be used to address freight transportation needs and issues; support future growth in freight volume and flow; improve freight mobility across all modes in terms of safety, efficiency, and reliability; and foster increased economic growth through reduced transportation cost and enhanced productivity. The trend of applying transportation data and operational/management technologies to freight transportation challenges will continue to persist as alternative improvements, such as large-scale capacity enhancements, can be costly and take much longer to implement.

There are multiple intelligent transportation system (ITS) technologies that may be applied to freight mobility. These include smart roadside and virtual weigh-in-motion (WIM) applications that allow for wireless roadside inspections, automated electronic clearance at roadside check facilities, and automated

[66] Georgia Power, Make Ready Electric Transportation Program, https://www.georgiapower.com/business/products-programs/business-solutions/electric-transportation-business-programs.html.

commercial vehicle safety inspections at roadside check locations. Examples of ITS technologies that are particularly relevant to the CID include the following:

- **Dynamic Route Guidance.** This ITS application provides advanced route planning and guidance that is responsive to current conditions. It includes technologies that incorporate real-time traffic and roadway conditions, allowing drivers to make re-routing decisions to a more optimal route. The INRIX Artificial Intelligence (AI) Traffic tool is an example of dynamic route guidance. It detects changes in road conditions and alerts drivers instantaneously via a mobile application. This application can be used to inform drivers about slowdowns, incidents, and weather conditions allowing them to make dynamic routing decisions.
- **Freight Signal Priority.** This application provides traffic signal priority for freight vehicles with the objectives of reducing delays, increasing travel time reliability, and improving safety at intersections. It includes vehicle-to-infrastructure (V2I) technologies that allow freight vehicle on-board equipment to communicate with traffic signal control equipment for the extension of green phases or other actions to enhance freight mobility and overall transportation safety. An example of this is SR 6/Thornton Road in Douglas and Cobb Counties. The project integrated roadway geometric and capacity improvements with freight ITS elements to create a truck friendly corridor. The technology elements included dilemma zone protection for trucks and traffic responsive signal timing based on sensing mix of vehicles and adjusting for heavy truck volumes.
- **Commercial Vehicle Parking.** This ITS application provides parking information to motor carriers both pre-trip and enroute. It is commonly referred to as a Truck Parking Information Management Systems (TPIMS). Parking availability information is collected from truck parking areas using technologies such as closed-circuit television (CCTV) cameras, in-ground sensors, above-ground radar, and side laser scanners. The raw data is processed and supplied to fleet managers, mobile devices used by commercial vehicle operators, to dynamic message signs (DMS) on the roadway, or directly to in-vehicle systems. The Florida DOT's Truck Parking Availability System (TPAS) is an example of this ITS application. The FDOT TPAS uses CCTV, microwave vehicle detection, and in-ground sensors in the truck spaces at interstate rest areas, welcome centers, and weigh stations to monitor the number of available truck parking spaces. That information is used to inform drivers of truck parking availability using the State's FL511 website and mobile application, third-party mobile applications, and roadside DMS.
- **Smart Work Zones.** Any construction on or adjacent to one of the CID's major corridors has the potential to limit mobility throughout the study area. This ITS application manages work zones by controlling traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Traffic conditions are monitored using CCTV cameras and controlled using field devices such as dynamic message signs (DMS), Highway Advisory Radio (HAR), and gates and barriers. Information on work zone speeds and delays are provided to the motorists prior to entering the work zones. In addition, this application can provide warnings to personnel within a work zone about potential hazards such as a vehicle moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).

Building on the trend of applying technology to freight transportation operational challenges, the cumulation of large datasets and their real-time application to operational decisions is also being leveraged as a tool

for improvement. In some technology applications, such as dynamic route guidance and freight signal priority, these datasets are key inputs to operational strategies. The Denver region's Enterprise Data Management Ecosystem (EDME) is an example application of using large, real-time datasets to meet freight transportation and other challenges. The EDME is a processing engine that gathers information from multiple disparate data sets (including sensors, detection devices, and other ITS field devices) for use by the various components that comprise the region's smart city program. The Intelligent Vehicles component of Denver's smart city program is particularly relevant to the CID. It includes the Freight Efficiency Corridor Program which uses dedicated short-range communications (DSRC) to improve freight travel time reliability along key truck corridors. This type of approach to improve freight mobility and safety could be deployed on SR 70/Fulton Industrial Boulevard and other major freight corridors in the study area.

5.7 Emerging Freight Trends Considerations for the CID Study Area

Some issues related to emerging freight trends to consider as recommendations are developed as part of Task 6 include the following:

- **E-Commerce and Urban Infill.** Areas like the Boulevard CID, which are proximate to both urban and suburban centers of demand for e-commerce goods, are desirable for fulfillment center and other e-commerce facilities. As the population density and economic activity of Metro Atlanta grows, so too will the demand for goods delivered via e-commerce channels; this will result in the continued demand for land and buildings in the CID that can be repurposed to meet this growing need. This highlights the importance of investments to not only support freight mobility, but also those to support employees that must access the CID.
- **Advances in Supply Chain Operation and Design.** Trends in advances in supply chain operation and design are related to the trend in e-commerce and urban infill, especially warehouse automation. This is relevant for the CID as automation can result in a higher intensity use of a parcel (i.e., greater volumes of trucks and other vehicles), though the underlying land use has not changed. The increase in intensity is due to the ability of automated warehouses to increase throughput. As a result, the CID's transportation needs may evolve more quickly as this supply chain practice becomes more widespread.
- **Connected and Autonomous Freight Vehicles.** Given the role played by SR 70/Fulton Industrial Boulevard as a regional freight corridor and the prevalence of freight-intensive land uses throughout the CID, a potential opportunity for the CID is to serve as a pilot site for the continued development of these technologies. This is supported by the 2020 Southern Fulton Comprehensive Transportation Plan which identified SR 70/Fulton Industrial Boulevard as one of a few "smart corridors" on which to focus innovative technology investments.
- **Commercial Vehicle Electrification.** Commercial vehicle electrification is another trend that represents an opportunity as a pilot site for the CID. There are multiple businesses within the CID that operate fleets of commercial vehicles that operate over consistent ranges and working hours. These types of businesses are potentially ideal for commercial vehicle electrification. Ongoing

efforts by Georgia Power and other regional stakeholders to promote the adoption of this technology represent a partnership opportunity for the CID.

- **Transportation Operations Technologies.** Emerging technologies in the transportation operations field provide options for addressing the CID's freight transportation challenges, particularly as it relates to mobility and truck parking. ITS technologies such as dynamic route guidance and freight signal priority would help to improve travel time reliability on corridors such as SR 70/Fulton Industrial Boulevard. Commercial vehicle truck parking ITS technologies could help to alleviate staging and other parking challenges in the CID by providing motor carriers with advanced information on the availability of parking spaces and corridor travel times.

6 OPPORTUNITIES AND NEEDS ASSESSMENT

An assessment was conducted to identify opportunities and needs relative to the objectives of the Boulevard CID. This data-driven assessment relied primarily on the findings of the previous sections of this report (Inventory and Assessment). Stakeholder feedback will be considered further in Task 6 where specific solutions are developed. While emphasis was placed on identifying existing opportunities and needs, the assessment also considered deficiencies that are likely to arise in the coming decades from expected trends and changes in roadway infrastructure.

6.1 Capacity and Congestion

The reduction of roadway congestion and elimination of bottlenecks is a key objective of the Boulevard CID, as it makes trucking transportation more efficient and reliable, improving the competitiveness of local businesses. The analysis of roadway performance showed that truck congestion in the Boulevard CID concentrates at major intersections, including intersections that lead to on/off ramps to access the interstates. The metrics used to quantify truck congestion considered both where speeds slow down the most and where truck volumes are the highest. As expected, the highest truck volumes can be found along Fulton Industrial Boulevard, with volumes peaking on the intersection of this road with Camp Creek Parkway and also peaking on the stretch bounded by I-20 and Selig Drive. The other cross-streets with the highest truck volumes are:

- Westgate Parkway
- Great Southwest Parkway
- Phillip Lee Drive
- Wharton Drive
- Patton Drive
- Martin Luther King Jr. Drive
- Donald L. Hollowell Parkway

Within the CID, congestion was found to be the highest at the following locations:

- The intersection of Fulton Industrial Boulevard and Camp Creek Parkway, which accumulated the most congestion.

- The intersection of Fulton Industrial Boulevard and on/off ramps of I-20.
- The intersection of Fulton Industrial Boulevard and Martin Luther King Jr. Dr.

Outside of the study boundaries there are several locations that also generated significant congestion, which affects trucks heading to or coming from the Boulevard CID. This included:

- The intersection of Fulton Industrial Boulevard and Donald Lee Hollowell Parkway
- The intersection of Thornton Road and on/off ramps on I-20
- The intersection of Donald Lee Hollowell Parkway and on/off ramps on I-285 West

A traffic analysis will be conducted in Task 5 that evaluates the causes of congestion and makes recommendations for cost-effective solutions.

Several trends are likely to worsen congestion in the Boulevard CID over the coming decade:

- Growth of e-commerce and fulfillment activities in the CID (e.g. Amazon, UPS, etc.) will likely increase truck volumes considerably (GPS data show that the CID is already a hub for medium-duty truck trips throughout metro Atlanta region)
- Growth of population in surrounding neighborhoods, especially if high-density mixed-use developments are pursued
- Shift towards urban warehousing close to population concentrations (urban infill)
- Advances in supply chain design and warehousing automation that are increasing the intensity of freight activities at facilities (taller and faster warehouses), increasing truck volumes

6.2 Safety

Roadway safety is a key priority for the Boulevard CID, just like it is a priority for all planning agencies in metro Atlanta. Minimizing the frequency and severity of crashes is important not just because of the loss of life and property damage involved, but also because crashes are a key contributor to roadway congestion and unreliability. Unexpected slowdowns could lead trucks to miss their delivery windows, having downstream effects along the supply chain, including on production.

A crash in the Boulevard CID was found to be 450% more likely to involve a truck than elsewhere in Georgia. This reflects both the higher truck volumes in this area and higher crash risks. An analysis found that many roadways in the CID had higher crash rates than statewide averages for similar roads. This finding, combined with the high proportion of truck-involved crashes, suggests that mitigation measures are warranted to improve the safety of truck operations. The roads with higher crash rates than average were:

- I-20 in the CID Boundaries (31% higher than state average)
- I-285 West in the CID Boundary (67% higher than state average)
- Fulton Industrial Boulevard between Martin Luther King Jr. Dr. and I-20 (263% higher than state average)
- Fulton Industrial Boulevard between I-20 to Mendel Dr./Wharton Dr. (48% higher than state average)
- Fulton Industrial Boulevard between James Aldredge Blvd. to Camp Creek Pkwy (31% higher than state average)
- Boat Rock Blvd. between Fulton Industrial Blvd. to western terminus (125% higher than state average)
- Bolton Road between Donald L. Hollowell Pkwy and East Boundary of CID (20% higher than state average)

- Great Southwest Pkwy (240% higher than state average)

Pedestrian safety is also an area of concern for the Boulevard CID. From 2016 to 2020 there were 58 crashes involving a pedestrian within the CID, resulting in 13 fatalities. Most of these crashes and fatalities occurred on Fulton Industrial Boulevard, likely from transit users crossing this wide and high-speed road, sometimes not through designated pedestrian crossings. Several pedestrian crashes occurred on portions of Fulton Industrial Boulevard without signalized crossings (3.6 mile stretch between Camp Creek Parkway and Commerce Circle SW). Pedestrian safety issues were not found to be truck related, as trucks were only involved in 2 of the pedestrian crashes and they were non-fatal. The area of highest risk for pedestrian crashes is the 1.75-mile stretch of Fulton Industrial Boulevard from SR 139/Martin Luther King Jr. Drive and Mendel Drive/Wharton Drive, which accounted for 60 percent of pedestrian crashes.

Bike safety is also important, as some workers in the Boulevard CID use bikes to get from bus stops to their workplaces (although in outreach for this study, employers reported little bike activity). There were only 5 bike crashes from 2016 to 2020 and none of them involved trucks.

Safety issues were found influenced by:

- **Density of access points:** Along Fulton Industrial Boulevard there exists a high density of driveways and intersecting roads, which create multiple conflict points among vehicles and between vehicles with other users. As several of the CID's main corridors are already median-separated, other access management solutions should be explored such as driveway consolidation and inter-parcel access.
- **Roadway and intersection geometry:** Sideswipe same direction crashes accounted for a significant share of total crashes over the analysis period. As previously discussed, lane width and inadequate pavement markings are a common contributing factor to this type of crash. Potential mitigation solutions include widening lane widths where possible, re-striping corridors where pavement markings have become worn, and adding or replacing raised reflective pavement markers. Striping is also an aid to the lane-keeping technology increasingly common in automobiles and trucks.
- **Visibility:** The prevalence of truck traffic throughout the CID can limit the visibility of passenger vehicles that trail them in the traffic stream. At intersections, this can obscure a driver's visibility of a traffic signal and other vehicles, which can contribute to rear end and angle collisions. To improve visibility, some agencies use side-mounted signals in addition to overhead traffic signals. Visibility can also be improved with better lighting, signage and markings.

Specific projects that address these safety issues will be recommended in Task 6 of this study.

In the short-term, it is likely that advances in truck connectivity and driver aids have the potential to reduce truck involved crashes in the Boulevard CID. While likely, this has yet to be verified by national research on how these technologies are deployed and used in trucking. In the long-term, many opportunities exist for technology to improve truck safety.

6.3 Condition

The pavement condition on state routes (Fulton Industrial Boulevard and major cross-streets) was generally Good, as evidenced by the IRI measure. However, Poor or Fair pavement conditions were present on:

- The approaches to intersections, as frequent vehicle decelerations (especially trucks) affect pavements.

- Bolton Road on the eastern end of the Boulevard CID has Poor condition from Donald L. Hollowell Parkway to I-285 West.

The pavement condition on non-state routes ranged from Good to Poor according to the PSR measure, with no road rating as Very Poor. The roadways that rated Poor on this metric were:

- Robinson Drive
- Tradewater Parkway
- Kendall Park Lane

Several intersections in the study area were observed to have cracked curbs or off-road ruts, indicating these curbs are often mounted by turning trucks, which could signify a problem with the turning radii at these intersections. Most of the intersections with observed curb cracking or off-road rutting are along SR 70/Fulton Industrial Boulevard. One explanation for this phenomenon is that trucks turning onto local roads from SR 70/Fulton Industrial Boulevard are transitioning from a high speed onto a narrow road, resulting in a maneuver that may be difficult to complete without mounting the curb.

All 22 bridges in the Boulevard CID were found to have adequate load ratings of between 25 to 35 tons, and none had posted weight restrictions. Most of these bridges were also found to have adequate Sufficiency Ratings. The bridges with the lowest sufficiency ratings (between 60 to 70) were:

- Bolton Road bridge over I-285/Proctor Creek
- I-20 over SR 70/Fulton Industrial Boulevard, I-20 over the Chattahoochee River
- SR 70/Fulton Industrial Boulevard over Utoy Creek.

6.4 Truck Parking

There are two types of truck parking needs in the Boulevard CID:

- **Staging parking:** The need for truck drivers to meet delivery schedules leads them to park near their destination (industrial or commercial facilities). Some of these drivers will park at commercial truck parking facilities in and around the CID, but many of them find it cumbersome to find a space at these facilities and prefer to park in undesignated locations throughout the CID. Because of the lack of shoulders in the CID, this often involves parking on travel lanes. This dispersed type of parking represents a safety risk for all vehicles and can disrupt traffic operations. Field observation and an analysis of GPS data identified 23 locations in the Boulevard CID where undesignated truck parking is common, with 7 of these locations representing a clear safety issue for other vehicles. To reduce undesignated parking, a pilot program could be explored where industrial facilities provide accommodation for trucks arriving just before their delivery appointments. Some jurisdictions in the U.S. have implemented regulations requiring truck parking accommodation.
- **Overnight parking:** Truck drivers must adhere to regulations around their rest requirements, which leads to a demand for long-term parking along major freight routes, often overnight. The availability of overnight parking was not a major concern in the Boulevard CID, as this general area of metro Atlanta was found to have the best availability of these types of spaces according to an analysis by the ARC. The largest truck parking facility in metro Atlanta, Petro travel center, is located just north east of the CID boundary, and there are several other public and commercial parking facilities in and around the CID.

The City of Atlanta has designated part of the Petro travel center parking as high-density commercial in their future land use maps. If implemented, this change could drastically reduce the availability of truck parking adjacent to the Boulevard CID, likely increasing undesignated parking.

6.5 ITS

Emerging technologies in the transportation operations field provide options for addressing the CID's freight transportation challenges, particularly as it relates to mobility and truck parking. ITS technologies such as dynamic route guidance and freight signal priority would help to improve travel time reliability on corridors such as SR 70/Fulton Industrial Boulevard. Much of the Fulton Industrial Boulevard has fiber optic cable connectivity that would allow for advanced signal coordination, particularly during peak hours of the day. The analysis of GPS data showed that truck activity peaks at different times than regular commuting peak hours. Advanced signal timing could consider these patterns, by type of truck, to facilitate certain types of truck moves, particularly at the start and end of tour shifts to supply the metro Atlanta region.

Commercial vehicle truck parking ITS in the main private parking facilities could help to alleviate staging and other parking challenges in the CID by providing motor carriers with advanced information on the availability of parking spaces and corridor travel times.

6.6 Land Use and Zoning

Presently, there do not exist major land use challenges in the Boulevard CID, with most of the land being zoned as industrial, limiting conflicts with incompatible land uses. However, there are two minor challenges that should be tracked and potentially addressed:

- **Incompatible land uses at boundary:** The CID is surrounded by predominantly single-family residential land uses. Incompatible land uses at the CID's boundaries can create challenges in the form of freight and non-freight vehicle conflicts along the study area's main corridors, such as SR 70/Fulton Industrial Boulevard, potentially increasing safety risks.
- **Lack of commercial services:** The CID currently offers limited commercial services and amenities such as restaurants. This affects both workers in the CID and nearby residents. This challenge is partially caused by the lack of commercial zoning in the CID.

Looking to the future, there are two major land use challenges that have the potential to have a significant impact on the Boulevard CID:

- **Rapid population growth:** Fulton County is expected to add over 462,000 residents by 2050 relative to 2015.[67] The areas surrounding the Boulevard CID are likely to share in that growth, implying more residents in its neighboring communities. This further implies growth in commuter traffic volumes as those residents use shared corridors with the CID (e.g., Cascade Road, SR 154 Campbellton Road, SR 70/Fulton Industrial Boulevard), creating additional conflicts with the CID's freight traffic. This growth is also likely to put pressure on land values and zoning within the CID. The population growth surrounding the CID, combined with the increase in e-commerce activity, make the CID an ideal location for fulfillment center facilities.
- **Conflicts with high-density commercial and mixed-use vision:** The long-term vision for high-density commercial and mixed-use future land uses at certain locations in or near the CID (e.g.,

[67] Atlanta Regional Commission, ARC Series 16 Forecast Dashboard, https://33n.atlantaregional.com/arc-series-16-forecast.

Bolton Road at the northern end of the CID, SR 8/US 78/US 278/Donald L. Hollowell Parkway at the northern end of the CID, Fulton County Airport) may create conflicts unless steps are taken to mitigate them. Potential mitigation steps could be taking action to preserve industrial land uses, creating buffer zones to separate industrial and non-industrial land uses, and operational strategies that work to separate freight and non-freight traffic on different corridors, among others.

6.7 Work Force Accessibility

The ability of businesses in the Boulevard CID to access a skilled and diverse work force is imperative to ensure competitiveness. This not only involves roadway access, but also transit, bicycle, and pedestrian connectivity. The following needs were identified in the Boulevard CID:

- **Transit service and quality:** There are currently 3 bus routes that cover most of the CID (especially areas of employment concentration) with headways of 20 to 65 minutes. Opportunities exist to expand this service to cover more areas of the CID (including south of the CID) and improve headways. Bus stop spacing is typical of the region, however rationalizing stop locations and improving bike-ped infrastructure could improve travel times and service. Field observation indicated that all bus stops could be improved along at least one of the following dimensions: shelters, benches, lighting, sidewalk connectivity, pedestrian crossing, signage and trash receptacles. Promotion of Georgia Commute Options within the CID encourage further transit use. A broader challenge not unique to the Boulevard CID is that the locations where employees live do not match up well with the availability of transit routes serving the CID.
- **Limited bike and pedestrian infrastructure:** Most minor streets in the CID do not have sidewalks, and there are significant areas of the CID with no sidewalk connectivity. There are no bike lanes in the CID. There are nine signalized pedestrian crossings on the 12mile+ corridor of Fulton Industrial Boulevard, with the 3.6mile stretch between Camp Creek Parkway and Commerce Circle SW not having any. While it is unrealistic to expect the whole Boulevard CID area to be covered by an extensive pedestrian and bike network, steps should be taken to add links to the existing network that connect transit stops to major employers to commercial activities.
- **Limited lighting:** The CID currently has limited lighting on existing sidewalks, including bus stops. This represents a safety and security risk at night.

7 CONCLUSION

Since its founding in 2010 and subsequent Master Plan, the Boulevard CID and its partners have made great strides in returning the district to preeminence. As the largest industrial corridor in the Southeast, this accomplishment has significance to the Atlanta metropolitan region, the State of Georgia, and to the nation. The CID's program has made a robust approach to safety a paramount objective, tackling crime and the conditions enabling it as well as vehicular and pedestrian hazards. This has been accompanied by improvements to the physical appearance of the landscape, associated branding, and upgrades to roadway conditions. The district's geographic location already is superb, situated at the edge of Atlanta's perimeter and interstate system, in ready range of Hartsfield International Airport, major rail intermodal terminals, and the city itself. The CID's improvements have mitigated detriments that could offset its attractions and allowed it to compete as a business location with new and established developments elsewhere. The fact that a world-class UPS facility and a spacious Amazon fulfillment center now sit at either end of the Fulton Industrial corridor speaks volumes to the success of the program. Even the historical issue of obsolescence among legacy buildings has receded, because the innate quality of the location has demonstrably overridden such concerns amidst the continuing surge in demand for e-commerce properties.

A competitive market position remains competitive through continuing investment in performance, access, facilities, technology and brand. The findings of this technical memorandum have determined a range of needs and opportunities through which this can be done, enabling the Boulevard CID to build on its strengths and prepare for the future. The next step is to establish recommendations and priorities for physical and policy initiatives based on these findings, and on inputs from the stakeholders of the district.