

CHAPTER 6

FREIGHT

BACKGROUND & PURPOSE

The Birmingham region, once called the "Pittsburgh of the South," has an industrial heritage firmly rooted in coal, iron, and steel. As the region has grown and developed, its economy has diversified and now boasts one Fortune 500 company in the banking industry and other leaders in the medical research and building materials industries. These businesses and others are powered by the region's strong freight networks, including four Interstate highways, three Class I railroads, a port on the Marine Highway system, and an airport connected to regional freight routes, all of which are described in **Table 6.1**. These modes connect businesses to each other and to national and international markets. The region has seen strong recent growth in distribution centers, last-mile delivery, completed and planned upgrades of waterborne and air cargo facilities, and can look forward to future state investment in the rail network.

THIS CHAPTER INCLUDES:

- Regional Freight System Profile
- Freight and Commodity Flows
- Economic Impacts of the Freight Industry
- Current and Ongoing Plans and Studies
- Freight Trends
- Freight-Related Capacity Projects

THIS CHAPTER ADDRESSES:

• Goal 5: Support economic growth by ensuring the efficient movement of goods and freight to and from the region.

Freight planning presents unique challenges not typically seen when planning for passenger or active transportation. While many plans will at least mention intermodal connectivity, freight planning requires that multiple modes of transportation interface seamlessly. Since our industrialized economy requires geographic specialization, freight also requires thinking at the regional scale and beyond, as several large facilities receive and ship freight to destinations far outside the greater Birmingham region. Finally, freight planning also requires considering the positions of large and small shipping companies and carriers.

Although these unique challenges exist across the four modes supported in the region (truck, rail, ship, and air) tall freight entities have similar goals: system reliability and efficiency. However, depending on scale, there are unique considerations. **Figure 6.1** illustrates the nested considerations and priorities of freight shippers, carriers, and entities at the regional, state, and federal level.

Shippers and receivers are primarily concerned with their ability to process shipments quickly and reliably, and specific service requirements will determine mode selection and terminal location. This makes system efficiency key. For a carrier using any freight mode, system reliability will in large part determine their ability to meet service requirements, which impacts profitability and sustainability. At the regional and state level, Metropolitan Planning Organizations (MPOs) and state Departments of Transportation (DOTs) are primarily concerned with system performance, which can be tracked with performance measures. These entities are concerned with mitigating and preventing congestion, ensuring system access, and balancing the competing interests of promoting economic development and minimizing negative impacts on the environment. Federal considerations include chokepoints at international gateways and congestion and delays along domestic corridors as they facilitate trade across state lines and international borders.

REGIONAL FREIGHT SYSTEM PROFILE

The region's freight system includes:

- Highways
- Railways and rail terminals
- Waterways and ports
- Airports
- Pipelines
- Intermodal facilities

This network serves freight customers throughout the region in industrial parks and at private facilities consisting of manufacturers, warehouses, and distribution centers. **Table 6.1** highlights the key components of the Birmingham regional freight system.

Figure 6.1: Overview of the Birmingham Regional Freight System

Federal Government

Chokepoints at international gateways and along trade corridors related to equipment, infrastructure, operations, information, regulations

States, MPOs, RPCs

System congestion, mobility, safety, security, efficiency, economy, environment

Carriers

Business profitability, sustainability, return on investment

Shippers and Receivers

Service cost, speed, reliability, security, visibility

Component	Description
	National Primary Highway Freight Network includes majority of interstates and several key connectors (with connections to Port Birmingham, Colonial Pipeline, Earnest Norris Rail Yard, and BNSF Railway Dixie Hub Center)
Highways & Trucks	Interstates (I-20, I-22, I-59, I-65, I-459) provide access in all directions as well as partial beltways
	National Highway System Intermodal Connectors (providing connections to Port Birmingham, Colonial Pipeline, Birmingham International Airport, Earnest Norris Rail Yard, BNSF Railway Dixie Hub Center, and Greyhound Bus Terminal)
	State and US highways (SR 269, SR 79, SR 149, US 31, US 78, US 11, US 280)
	Local arterials
	Norfolk Southern (Class I) with two facilities: Birmingham Regional Intermodal Facility (transloading containers/trailers) and Ernest G. Norris Yard (hump yard)
	CSX Transportation (Class I) with four facilities: Boyles Yard, TDSI auto distribution terminal, TRANSFLO Terminal Service Bulk Transfer Terminal, and Central Alabama Intermodal Container Transfer Facility
Railroads	BNSF Railway (Class I) with four facilities: Birmingham Vehicle Facility (Auto), Industrial Chemicals (transloading), DC Warehouse (transloading) and Savage Services Corp. (transloading)
	Alabama & Tennessee River Railway (Class III)
	Alabama Warrior Railway (Class III)
	Birmingham Terminal Railway (Class III)
Aviation	Birmingham-Shuttlesworth International Airport (BHM) with a 12,000-foot and a 7,100- foot runway, a dedicated cargo facility and new cargo facility expected to open in 2023
	Bessemer Municipal Airport (EYK) with a 6,000-foot runway and small-scale cargo facility
	Port Birmingham with five terminals on the Locust Fork of the Black Warrior River
Ports & Waterways	Black Warrior River, part of the M-65 Marine Highway, which includes the Tennessee- Tombigbee Waterway, which connects to the M-10 Marine Highway at the Port of Mobile

HIGHWAY FREIGHT SYSTEM

The highway network is one of the most critical elements of the freight system, as nearly all freight is transported in a truck at some point on its journey. The Birmingham region's highway system is well-developed and includes interstates that provide connections in all directions: I-65 to the north and south, I-59 to the northeast and southwest, I-20 to the east and southwest, I-22 to the northwest, and I 459 as a southern bypass of Birmingham.

The National Highway Freight Network (NHFN) includes the following components:

- Primary Highway Freight System (PHFS)
- Other interstate portions not on the Primary Highway Freight System
- Critical Urban Freight Corridors (CUFCs)

• Critical Rural Freight Corridors (CRFCs) Most of the Interstates in the region are also part of the NHFN which demonstrates the importance of the Birmingham region within the national freight network. These segments, which include all of I-20 and I-65 within the region and portions of I-59, are eligible for freight funding first made available by the Fixing America's Surface Transportation (FAST) Act and extended by the Infrastructure Investment and Jobs Act (IIJA). No highways within the region are classified as either CUFCs or CRFCs.

PRIMARY HIGHWAY FREIGHT SYSTEM

The Primary Highway Freight System (PHFS), established under the FAST Act and refined under the IIJA, includes the most critical highway portions of the U.S. highway freight transportation system. This national network consists of 41,518 centerline miles, including 37,436 centerline miles of interstate and 4,082 centerline miles of non-interstate roads. Segments within Alabama account for **813.05** miles, of which **783.78** miles are major corridors with the remaining **29.26** miles being comprised of intermodal connectors.

Interstates within the region that carry the PHFS designation are shown in **Figure 6.2**. This includes I-65, I-20, and I-459 from I-20/I-59 on the western side of Birmingham to I-20 on the eastern side. Six of Alabama's eight intermodal connectors are in the Birmingham region. These intermodal connectors are listed in **Table 6.2**.

OTHER INTERSTATE PORTIONS NOT ON THE PRIMARY HIGHWAY FREIGHT

Facility ID	Facility Name	Facility Description	Length (miles)
AL11P	Port Birmingham – North Terminal	AL 269 (Port to I-20)	17.63
AL12P	Port Birmingham – Central Terminal	AL 269 (Port to I-20)	0.22
AL13P	Port Birmingham – South Terminal	AL 269 (Port to I-20)	0.11
AL14L	Colonial Pipeline	Facility to 28th St. to Balsam Ave. to Nabors Rd. to Ishkooda Rd. to Spaulding- Ishkooda Rd. to I-65	4.53
AL15R	Ernest Norris RR Yards	Entrance at Norfolk Southern Dr. to Ruffner Rd. to 16th St. to US 78 to Kilgore Mem. Dr. to I-20	2.78
AL4R	Burlington Northern RR Dixie Hub Center	Finley Ave. to I-65 and U.S. 78 West	1.71

Table 6.2: Intermodal Connectors on the Primary Highway Freight System

Source: FHWA





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Source: RPCGB and FHWA

SYSTEM

While not all interstates across the country are designated as part of the PHFS, they are all critical to freight movement. Within Alabama, 121.69 miles of interstate roads are included in this category, with several segments in the Birmingham region. Specifically, I-59 northeast of downtown Birmingham and I 459 between I-20 and I-59 are not included in the PHFS. Furthermore, because I-22 was not classified as an interstate at the time of the systemwide designation, it is also not on the national maps showing the PHFS nor is it shown with other non-PHFS interstates. **Figure 6.2** illustrates interstate sections that are not part of the PHFS.

These designations are not merely academic, because they carry implications for funding allocation. States whose PHFS mileage is greater than or equal to 2% of national PHFS mileage may only allocate funding toward PHFS, CRFCs, and CUFCs. Since Alabama is below this 2% threshold, the State may obligate funds for projects on all portions of the NHFN or any interstate segment.

At 1.9%, Alabama is just below this threshold. If only 17.43 more miles statewide were designated as part of the PHFS, funds would not be able to be used on interstates not part of the PHFS. If Alabama were to pass the 2% threshold, up to 17.43 miles of non-PHFS interstate within the Birmingham region would be ineligible for this funding.

Since Alabama's PHFS segments account for less than 2% of the national network, Alabama is not required to obligate funds for the PHFS, CRFCs, or CUFCs and may dedicate funds for projects on all portions of the NHFN or any interstate segment.

TRUCK SHARE OF TRAFFIC

While the Interstate Highway System is critical for allowing freight to move long distances between regions, almost all freight traveling by truck will at some point be conveyed along a federal, state, or local road. Truck volume and percentage allow us to understand how the region's roadway system accommodates this freight.

Figure 6.3 illustrates the corridors which carried a large share of trucks in 2021. These volumes are significant not only at the local level but also nationally. Of the 51 stations where the truck share of traffic equaled or exceeded 20%, 45 are located along Primary Highway Freight System segments and only six are located along other highways, which indicates that the region contains adequate PHFS facilities to accommodate current freight truck traffic. **Table 6.3** and **Table 6.4** show the top ten stations by truck share of traffic and by average annual daily truck volume, respectively.

The American Transportation Research Institute (ATRI) annually determines the top 100 truck bottlenecks nationwide based on truck GPS data. The intersection of I-65 with I-20/I-59 has not appeared on this list since 2019 when it was ranked 32nd on the list. No other points within the region have been listed since 2019. Regionally and nationally significant bottlenecks can drastically impede the flow of goods, decrease truck travel time reliability, and increase the cost for shippers, purchasers, and consumers. It is critical to identify significant bottlenecks and address congestion mitigation to support the flow of goods through the region. Relevant grants which have been extended or created as part of the IIJA include:

- National Significant Freight and Highway Projects (INFRA)
- National Infrastructure Project Assistance
- Congestion Relief





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Source: RPCGB

Table 6.3: Top 10 Locations by Truck Share ofTraffic on Birmingham's Roadways, 2021

Rank	Segment	Truck Share of Traffic
1	AL5S off-ramp to Flat Top Rd	58.0%
2	I-59/20S on-ramp from to McAshan Dr	42.6%
3	I-22W on-ramp from 41st Ave	42.0%
4	I-59/20N off-ramp to McAshan Dr	33.0%
5	I-22E on-ramp from AL5N	28.7%
6	I-59/20N off-ramp to I-459N	28.5%
7	I-65N off-ramp to I-22W	27.7%
8	I-22E off-ramp to I-65S	27.1%
9	I-59/20 at the Jefferson/ Tuscaloosa County line	27.0%
T-10	I-59 Between Exits 154 (AL174) and 156 (AL23)	27.0%
T-10	I-20 Between Exits 144 (AL25) and 147 (Kelly Creek Rd)	27.0%

Table 6.4: Top 10 Locations by Truck Volume onBirmingham's Roadways, 2021

Rank	Segment	Average Annual Daily Truck Traffic
1	Between Exits 104 (McAshan Dr.) and 106 (I-459)	19,728
2	Between Exits 263 (3rd Ave N) and 264 (41st Ave)	19,720
3	NB Between Exits 262B (Finley Blvd) and 263 (33rd Ave N)	18,744
4	Between Exit 264 (Daniel Payne Drive) and Exit 265A (I-22)	18,650
5	I-59/20 at the Jefferson/Tuscaloosa County line	18,049
6	Between Exit 247 (Valleydale Road) and 250 (I-459)	17,271
7	I-65 north of the Jefferson County Line	17,271
8	Between Exits 261B (16th St) and 262B (Finley Blvd)	16,497
9	Between Exit 265A (I-22) and 265B (AL 3/US 31)	16,434
10	Between Exits 261 (I-59/20) and 262A (16th St)	15,831

Source: RPCGB

Source: RPCGB

COLONIAL PIPELINE

The Colonial Pipeline, which is one of the largest pipelines in the nation, originates in Houston and traverses the Birmingham region before its terminus at the Port of New York and New Jersey. The pipeline conveys up to three million barrels of refined petroleum products each day, making its uninterrupted operation vital to the region and the nation. Colonial Pipeline operates a storage facility in Birmingham, which is connected to the Interstate Highway System by the southernmost PHFS Intermodal Connector in **Figure 6.2**, identified as Facility AL14L in **Table 6.2**.

RAILWAY SYSTEM

The first railroad track in Alabama was laid down in 1830 to connect Tuscumbia to the Tennessee River. In 1832, it became just the fourth incorporated railroad in the nation—and the shortest, at 2.1 miles. Birmingham's industrial heritage included many miles of track being laid down to carry coal, ore, and other materials and goods. By the "Golden Age of Rail" prior to the turn of the century, Alabama was home to over 5,000 miles of rail, which has declined to just under 4,000 miles today. Birmingham is still one of just a few cities where major east and west railroads interchange, making it a gateway city for the Southeast, Midwest, and Northeast.

Today, the region is home to three Class I railroads, each with major rail facilities: BNSF, CSX Transportation (CSXT), and Norfolk Southern Corporation (NS). Three Class III (short line) railways operate in the region: Alabama & Tennessee River Railway (ATN), Alabama Warrior Railway (ABWR), and the Birmingham Terminal Railway (BHRR). The region's rail corridors, rail yards, and rail intermodal facilities are shown in **Figure 6.4**.

Class I railways own approximately 646 miles of track and short line railways own approximately 137 miles of track in the region. NS owns the most (41%) and is closely followed by CSX (36%). Of the Class III railways, BHRR operates the most track (11%). **Table 6.5** details the miles of track owned by each railway in the region.

Approximately 24 independent rail and truck transload facilities are located in the Birmingham region. Most of these intermodal facilities are clustered around 1st Avenue North, Finley Boulevard, I-20/59, Avenue W, and the Finley Boulevard Extension, shown in **Figure 6.4**.

RAILWAY SAFETY

At-grade rail crossings pose a risk to all users of the transportation system, including rail operators as well as motorists, cyclists, and pedestrians. There are 585 at-grade rail crossings in the metropolitan planning area. Norfolk-Southern operates the majority of these (52%) followed by CSX (30%). Birmingham Terminal (7%), Alabama & Tennessee River (6%), and

BNSF (5%). Almost two-thirds (65%) of these at-grade crossings are in Jefferson County, with Shelby County having 30%. St. Clair County includes 4%, and Blount County includes less than 1%.

The Office of Safety Analysis within the Federal Railroad Administration (FRA) collects and hosts data on incidents on highway at-grade crossings. Crossings with multiple crashes in a multiyear period may indicate the need for safety improvements. Within the region, eight at-grade crossings had multiple crashes in the three years from 2019 through 2021. Data about these crossings are found in **Table 6.6**.

Given the geographic distribution of crossings within the region, it is not surprising that six of these crossings are in Jefferson County, with the other two in Shelby County. FRA data include the type of warning or control device present at each crossing. Of the eight multi-incident crossings, four have gates, two have flashing lights, and the remaining two have cross bucks or stop signs.

On December 14, 2020, the FRA issued a final rule (49 CFR § 234.11) requiring each state to submit a State Highway-Rail Grade Crossing Action Plan (SAP) by February 14, 2022. Ten states, including Alabama, had previously been required to develop and submit an SAP to the FRA and so were required to bring their SAPs into compliance with new requirements.

The 2016 Highway-Railway Grade Crossing Action Plan and Project Prioritization Noteworthy Practices Guide, published by the FHWA, details five overall best practices employed by state agencies in administering federal and state highway-railway grade crossing protection programs. The guide may be found at: https://safety.fhwa.dot.gov/hsip/xings/fhwasa16075/ fhwasa16075.pdf.

FUTURE PORT-RAIL CONNECTION

The Kansas City Southern Railway (KCS) and Canadian Pacific Railway (CP) were two Class I railroad companies with track in the United States. The two recently merged to form CPKC. In 1994, KCS was given regulatory permission to extend track to Birmingham, although they never did so. The Watcoowned Class III railway Alabama Southern (ABS) is part of the former KCS network, which expands CPKC to Brookwood, Alabama in Tuscaloosa County. If CPKC were to reintegrate the ABS into its mainline track, then only 40 miles of track would be needed to connect CPKC to Birmingham via Port Birmingham. This would bring a fourth Class I railway company into the region along with BNSF to complement the eastern CSX and NS. This project would also strengthen intermodal connections, as Port Birmingham would be the site where these rail lines would interface, solidifying Birmingham as a gateway city between eastern and western rail.

Table 6.5: Railways in the Birmingham Region

Railway Name	Railway Class	Miles of Track in the Region	Percent
Alabama & Tennessee River		28.7	3.7%
Alabama Warrior	III	19.8	2.5%
Birmingham Terminal	Ш	88.2	11.3%
BNSF		40.4	5.2%
CSXT	I	284.9	36.4%
Norfolk- Southern	I	320.5	41.0%

Source: RPCGB; Bureau of Transportation Statistics

Rail Crossing #	Highway	County	City	Railroad Name	Type of Warning Device	# of Incidents	Year(s) that Incidents Occurred	Incident Numbers
352714L	Cedar Street	Jefferson	Tarrant	CSX	Flashing lights	3	2019 and 2020	184253, 184815 and 192771
352292V	20th Avenue	Shelby	Calera	CSX	Cross bucks	2	2019 and 2020	185546 and 192431
352566U	Shannon Road	Jefferson	Alabaster	CSX	Gates	2	2019	180576 and 185959
725406N	Division Street	Jefferson	Bessemer	Norfolk Southern	Gates	2	2020	136945 and 136971
352618J	Carolina Avenue	Jefferson	Bessemer	CSX	Stop signs	2	2021	196734 and 197611
725383J	24th Street SW	Jefferson	Birmingham	Norfolk Southern	Gates	2	2019 and 2020	161932 and 138762
728032V	Jefferson Avenue SW	Jefferson	Birmingham	Norfolk Southern	Gates	2	2019 and 2020	136422 and 140106
352277T	Fulton Springs Road	Shelby	Alabaster	CSX	Flashing lights	2	2020 and 2021	191416 and 195970

Table 6.6: Public At-Grade Rail Crossings in the Metropolitan Planning Area with Multiple Crashes, 2019–2021

Source: RPCGB; Federal Railroad Administration (FRA) Office of Safety Analysis





Source: RPCGB; Bureau of Transportation Statistics; National Transportation Atlas Database

CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS (CRISI) SAFETY, TRANSPORTATION, EDUCATION, AND MOBILITY PROJECT

In June 2022, the FRA announced a \$5 million grant for the Alabama & Tennessee River Railway (ATN), for which the railway will provide a 50% match. This project will fund improvements along a 120-mile section of track from Birmingham northeast to the Port of Guntersville on the Tennessee River in Marshall County, strengthening the region's rail and intermodal capacity. Rockslide warning signals will be reactivated between Birmingham and Ragland just outside the Metropolitan Planning Area (MPA) in St. Clair County. Along the full 120mile section, tracks will be upgraded, sidings will be added to accommodate increased rail traffic, and nine bridges will receive safety improvements to ensure they can continue to safely accommodate 286,000-pound load capacities.

R.E.D.E.S.I.G.N. ALABAMA

In 2022, the City of Birmingham submitted R.E.D.E.S.I.G.N. Alabama in cooperation with the City of Trussville and Norfolk Southern for Railroad Crossing Elimination and CRISI planning grant applications. R.E.D.E.S.I.G.N Alabama is a solution to a decadeslong rail challenge that has plagued the residents of East Birmingham and Trussville, Alabama. This project will advance plans to create six miles of track unencumbered by at grade crossings on the Alabama Great Southern Railroad North, and five miles on the Alabama Great Southern Railroad South and East End Districts. This strategy will eliminate eight at grade crossings and advance two grade separation projects, increasing the fluidity of freight and passenger rail operations in the region while enhancing public mobility and safety.

As a continuation of R.E.D.E.S.I.G.N. Alabama, there is strong interest in developing a publicprivate-partnership to apply for state or federal grant funding to facilitate a comprehensive examination and study of highway-rail crossings in Jefferson County, with a focus on the West End Community and Bessemer areas, in the context of communities, schools, churches, fire departments, neighborhoods, industries and businesses that are impacted by blocked crossings. The outcome goal would be to identify crossings that can be gradeseparated, consolidated and closed so to reduce blocked crossing frequencies, improve motorist and pedestrian mobility and safety, and increase the fluidity of freight and passenger rail operations in the region.

Image Credit: RPCGB

BIRMINGHAM-SHUTTLESWORTH INTERNATIONAL AIRPORT

AVIATION SYSTEM

BIRMINGHAM-SHUTTLESWORTH INTERNATIONAL AIRPORT (BHM)

Situated off I-59 approximately four miles from downtown, BHM is the state's largest and busiest airport by total passenger volume. The airport contains a 12,000-foot runway, a 7,100-foot runway, and a dedicated cargo facility. BHM saw 622,000 enplanements in 2020, well below its 2019 figure of 1.5 million, a decline largely attributable to reduced travel during the Covid-19 pandemic. For calendar year 2021, enplanements rose almost three-quarters to over 1 million as travel patterns readjusted and travel demand rose.

While still ranking as Alabama's busiest passenger airport, its cargo volumes are comparatively lower. According to all-cargo airport reports released by the Federal Aviation Administration (FAA), BHM's landed cargo weight in 2021 was just under 173 million pounds, ranking 109th nationally. This figure has been decreasing slightly year over year, as the 2021 figure was lower than in 2020 (just over 173 million pounds) and 2019 (almost 178 million pounds). For all three years, Huntsville International–Carl T. Jones Field (HSV) has led Alabama in landed cargo weight, accounting for over 300 million pounds annually.

BHM is home to two weekday air cargo routes, with FedEx flying to and from its hub at Memphis International Airport (MEM) and UPS operating flights to and from Louisville Muhammad Ali International Airport (SDF). UPS also maintains weekly connections with Louis Armstrong New Orleans International Airport (MSY) and Pensacola International Airport (PNS). In 2021, BHM's cargo freight volume from all carriers totaled over 22,000 tons, which is in line with the totals in 2020 and 2019. Cargo flows through BHM remain imbalanced in favor of receipts, with over 2 tons offloaded for every 1 ton loaded. As cargo volumes have remained steady, so have cargo flight operations, which have oscillated between 1,600 and 1,700 annually. However, this is expected to increase, partially driven by the rise in warehousing in the region. A 2021 report commissioned by the Birmingham Airport Authority projected annual cargo operations to increase to 2,000 by 2025 and over 2,600 by 2045.

Led by the Birmingham Airport Authority, BHM is planning to open a new cargo facility in late 2023. Currently in the design phase, the new space will total 53,000 square feet located on the existing south cargo apron. It is anticipated that a sizable portion of the space will be dedicated to a new air cargo operator to enter the Birmingham market. Construction is anticipated to cost approximately \$19 million.

In 2018, BHM completed a 20-year Airport Master Plan, which identified major upgrades and projects to sustain future growth and development. Of the items that have yet to be fully implemented, the mitigation or relocation of Village Creek is among the largest. Village Creek currently runs parallel to the main runway and is directed into a culvert under the primary taxiway. The 2018 Plan called for a taxiway to be relocated to the south, which may require the creek to be mitigated or rerouted to ensure the BHM's continued growth.

BESSEMER MUNICIPAL AIRPORT (EKY)

EKY is a general aviation airport owned by the City of Bessemer and operated by the Bessemer Airport Authority. The airport is located south of I-459, six miles southeast of Downtown Bessemer and 15 miles southwest of Downtown Birmingham. Designated as a reliever to BHM, the facility is equipped to relieve congestion and provide general aviation access to the community. EKY's 6,000-foot runway primarily supports general aviation, although it also supports small-scale cargo operations. Its proximity to the interstate and clusters of industrial facilities allows it to serve suppliers in the Mercedes-Benz Automotive Corridor, at the Jefferson Metropolitan Park locations in McCalla and along Lakeshore Parkway, and the Birmingham Regional Intermodal Facility in McCalla. EKY has undertaken several improvements in recent years, including a \$750,000 investment to build a new 14,220-squarefoot hangar for 10 aircraft. EKY also secured a \$2.7 million FAA grant for a runway resurfacing and lighting project.

MARINE HIGHWAY AND REGIONAL WATERWAY SYSTEM

REGIONAL WATERWAY SYSTEM

The Birmingham region is connected to the rest of the state and beyond by the Black Warrior River, which flows into the Tombigbee River near Demopolis and then connects with the Alabama and Tennessee rivers. Between Birmingham and Demopolis, cargo ships and barges must traverse five locks and dams on the Black Warrior: John Hollis Bankhead, Holt, William Bacon Oliver, Armistead I. Seldon, and Demopolis. The closest of these locks and dams is the John Hollis Bankhead. located just outside the Birmingham region in Tuscaloosa County. This regional waterway system links the Birmingham region to the Port of Mobile, where freight enters or leaves the state for domestic or international destinations. Figure 6.5 illustrates these waterway connections and locks and dams in context within the State of Alabama.

Traffic on the Black Warrior River waterway to and from the Birmingham region has been relatively steady in recent years, with a typical year seeing between 21,000 to 23,000 total trips. Cargo weight numbers have been similar, with annual figures between 16 and 17 million tons. The single largest commodity on the Black Warrior River waterway is coal and lignite, which accounts for almost 30% of total freight by weight on the waterway. This is also the primary commodity shipped out of the region, accounting for approximately 50% of total freight by weight. Iron and steel primary forms are the largest commodities received in the region, accounting for approximately half of all cargo, while iron and steel plates and sheets are the second leading commodities category shipped out of the region. These commodity flows indicate that while waterway freight movement is holding steady and not seeing significant growth, the Birmingham region still maintains a strong industrial base that builds upon its industrial heritage.

MARINE HIGHWAY SYSTEM

The portions of the Black Warrior River, Tombigbee River, Tennessee-Tombigbee Waterway, and Mobile River, shown in Figure 6.5, are part of the Marine Highway System, a freight-oriented network of navigable waterways overseen by the U.S. DOT's Maritime Administration to reduce landside congestion and system wear and tear. Collectively, these waterways—as well as portions of the Tennessee River and Ohio River north to Paducah, Kentucky-form Marine Highway M-65. Freight leaving Birmingham for the Port of Mobile travels south along M-65, and after being loaded onto oceangoing vessels it typically travels east or west along M-10. The M-10 route stretches from the Port of Brownsville in Brownsville. Texas to Port Everglades in Fort Lauderdale, Florida.

DID YOU KNOW?

Each Marine Highway is designated to match an associated land route. These are typically nearby interstate routes. M-65 roughly parallels I-65 north to south, and M-10 tracks I-10 east to west.

PORT BIRMINGHAM

Port Birmingham (also referred to as Birmingport) is located on the Locust Fork of the Black Warrior River approximately 22 miles northwest of downtown Birmingham. The Port is directed by the Birmingham-Jefferson County Port Authority (BJCPA), which was incorporated in 2016. The Port contains approximately two miles of river frontage and consists of five terminals: Miller Co., Parker Towing, Lynn Port, Watco, and Ergon.

As shown in **Figure 6.5**, Port Birmingham is the Birmingham region's only port-rail-truck intermodal facility. Its rail connection is Birmingham Terminal Railway, a short-track railway with its terminus on the Port Birmingham grounds. Alabama State Route 269 (Birmingport Road) is a PHFS Intermodal Connector that connects to I-20/I-59, as shown in **Figure 6.2** and identified in **Table 6.2** as



Source: RPCGB; National Transportation Atlas Database; Navigation Data Center

The RPCGB's 2019 Regional Freight Plan identified enhanced warehouse capacity as a top priority for Port Birmingham. In February 2020, the Birmingham-Jefferson County Port Authority (BJCPA) was awarded an \$840,000 Alabama Inland Port Infrastructure Program Grant from the Alabama Department of Economic and Community Affairs (ADECA). The grant was allocated to constructing a 10,000-square-foot warehouse at the Lynn Port Terminal (LPT). It is estimated that the additional warehouse will provide an additional 10,500 to 14,0000 tons of storage potential to the terminal. It is expected that the additional storage capacity will increase the number of barges that can be received each year by 18-20 barges per year, and it is estimated to reduce regional truck traffic by up to 1,200 trucks each year.

By continuing to secure grants and other funding, Port Birmingham can maintain its momentum and continue its recent growth. The Truck Emissions at Ports is a competitive grant program created by the IIJA. This program funds projects that reduce truck emissions at ports, including the advancement of port electrification, accomplished through replacing older diesel-powered vehicles, equipment, and ships.

FREIGHT AND COMMODITY FLOWS

FREIGHT FLOWS

Commodity flow data places the Birmingham region's freight movement within a regional and national context. This allows us to understand what types of goods move along the transportation system, at what volumes, and to and from which origins and destinations. Freight movement forecasting gives us an understanding of how these commodity flows may change in the future. FHWA's Freight Analysis Framework (FAF) provides recent estimates and forecasts. Currently in its fifth version, FAF 5.3 estimates tonnage and value by origin and destination, commodity type, and mode for base years 2017 through 2019 and forecast for years 2022 through 2050. The Birmingham region's commodity flows are part of the Birmingham-Hoover-Talladega, AL Combined Statistical Area (CSA).

FREIGHT MODE

Trucks remain the dominant freight mode. By weight, trucks account for 72% (171.9 million tons) of commodities into, out of, and within the region. By value, this figure is 59% percent (\$116.2 billion). Rail is the second most used mode, carrying 10%



(22.9 million tons) by weight and 25% (\$48.9 billion) by value.

FREIGHT FLOW DIRECTION

Inbound freight, shown in **Figure 6.6**, accounts for substantially more freight (45% or 107.4 million tons) by direction than outbound freight (38% or 92.2 million tons), indicating that the region is a net importer of goods. Freight movement within the region accounts for a far smaller share (17% or 40.1 million tons) than either inbound or outbound flows, as shown in **Figures 6.6 and 6.7**.

SIGNIFICANT COMMODITIES

The most significant commodities moving into, out of, and within the region are all bulk products for construction or fuel, including:

- Gravel
- Gasoline
- Coal (including coal, and coal not elsewhere classified)

Combined, these account for 80% of all commodities by weight, with gravel alone accounting for 29%. Coal accounts for the largest share of inbound and outbound freight (41% and 48%, respectively) while gravel accounts for the largest share of freight movements within the region (43%). As noted in the Marine Highway and Regional Waterway section above, coal and lignite are the largest commodities by weight shipped via waterways. Much of this inbound coal is devoted to energy production, but this may change. The Birmingham region is home to Alabama's largest coal-burning power plant, Alabama Power's James H. Miller Jr. Electric Generating Plant in West Jefferson. This facility is scheduled to close in 2027, which may reduce the demand for coal to be shipped into the region.

TRADING PARTNERS

The Birmingham region's most significant state trade partner is Alabama, which accounts for approximately 60% by weight of all freight transported in the region. Mississippi, Georgia, and Tennessee are also significant trading partners. Wyoming is a geographic outlier, accounting for almost as much inbound freight to the region as Georgia. This is because Alabama Power sources much of its coal for the James H. Miller Jr. facility from Campbell County, Wyoming. **Figures 6.6** and **6.7** illustrate the Birmingham region's inbound and outbound trade flows to and from each state in kilotons for 2019.



2050 FORECASTS

Freight flow forecasts for 2050, shown in **Table 6.7**, predict a 27% increase in freight by weight, from 239.7 million tons to 303.3 million tons. Trucking is also predicted to remain the dominant mode in the region, increasing its mode share from 72% to 75%. In contrast, rail tonnage is predicted to decline by 1%. However, freight value tells a different story, as the value of freight shipped by rail is predicted to increase by 60% in inflation-adjusted dollars even as the total weight decreases. However, trucks are predicted to remain dominant in terms of freight value in 2050, still accounting for over half the total.

Freight	2019 Tonnage		2019 Value		2050 Tonnage		2050 Value	
Mode	Thousand Tons	% of Total	Million Dollars	% of Total	Thousand Tons	% of Total	Million Dollars	% of Total
Truck	171,963.4	72%	\$ 116,199	59%	227,192.6	75%	\$ 210,891	57%
Rail	22,916.7	10%	\$ 48,953	25%	20,631.7	7%	\$ 78,458	21%
Water	9.0	0%	\$ 33	0%	4,476.8	1%	\$ 1,808	0%
Air	11.6	0%	\$ 1,337	1%	23.9	0%	\$ 3,581	1%
All others	44,825.6	19%	\$ 31,351	16%	50,995.2	17%	\$ 77,891	21%
Total	239,726.2	100%	\$ 197,873	100%	303,320.2	100%	\$ 372,629	100%

Table 6.7: Comparison of Freight Modes by Weight and Value, 2019 Estimates and 2050 Forecasts

Source: RPCGB; FHWA; FAF 5.3



Figure 6.6: Inbound Commodity Flows (2019)



Source: RPCGB; FHWA; FAF 5.3



Figure 6.7: Outbound Commodity Flows (2019)

Source: RPCGB; FHWA; FAF 5.3

ECONOMIC IMPACTS OF THE FREIGHT INDUSTRY

Output measures an industry's total production value and represents what an industry contributes to the economy. IMPLAN software defines output as including employee and proprietor income, taxes on production and imports, other property income, and intermediate inputs and allows a detailed zip code-level analysis of output and employment. This software also includes detailed industry data, for which the larger freight industry is composed of the truck, rail, water, and air transportation sectors. This analysis included these sectors for the Metropolitan Planning Area (MPA).

Figure 6.8 and **Figure 6.9** illustrate the regional industry's contributions to output and employment, respectively, separated by mode of transport for 2021. **Table 6.8** contains this information as well as output per worker for each mode. In 2021 the regional freight industry employed approximately 11,704 people within the MPA and accounted for approximately \$2.3 billion in total output. Compared to the regional economy as a whole, the freight industry accounted for approximately 1.8% of the region's economic output and 1.3% of its

employment. This imbalance demonstrates that on a per-worker basis, the freight industry contributes more to the regional economy than the average industry.

However, some freight modes contribute far more to regional output on a per-worker basis than others. Output per worker measures each worker's contribution to economic output, which can be used as a measure of efficiency. The two freight modes with the highest output per worker are water and rail, with approximately \$476,400 and \$389,100, respectively, compared to \$174,500 for air and \$166,600 for trucking. It is no surprise that water and rail rank as the most efficient by this metric because these modes allow few workers to move large amounts of cargo. Air freight ranks as less efficient than would be expected. This could be attributed to the Birmingham region's relative underdevelopment of the air freight industry relative to all other freight modes. Planned investments at Birmingham-Shuttlesworth International Airport are anticipated for this mode's employment and output and may increase output per worker as economies of scale are realized.

Freight Sectors	Output (Millions of Dollars)	Percent of Regional Output	Employment	Percent of Regional Employment	Output Per Worker (Thousands of Dollars)
Air Transportation	\$ 40.3	< 0.5%	231	< 0.5%	\$ 174.5
Rail Transportation	\$564.7	0.5%	1,451	0.2%	\$ 389.1
Water Transportation	\$ 13.7	< 0.5%	29	< 0.5%	\$ 476.4
Truck Transportation	\$ 1,664.6	1.3%	9,993	1.5%	\$ 166.6
Freight Industries Total	\$ 2,283.2	1.8%	11,704	1.7%	\$ 195.0
All Industries Total	\$ 124,918.1	-	676,165	_	\$ 184.7

Table 6.8: Freight Contributions to Output and Employment by Mode, 2021

Source: IMPLAN 2021









Figure 6.9: Freight Contributions to Employment by Mode, 2021

■ All Industries Total ■ Air Transportation ■ Rail Transportation ■ Water Transportation ■ Truck Transportation Source: IMPLAN 2021

CURRENT AND ONGOING PLANS AND STUDIES

The MPO intends to continue freight planning efforts in the region by building on the success of past plans and undertaking new ones. The Birmingham Regional Freight Plan, the region's first, was prepared by Cambridge Systematics and the RPCGB and adopted in 2019. Regional freight entities have begun implementing recommendations from the plan. ALDOT is currently in the process of updating the Statewide Freight Plan, the current version of which was adopted in 2017. Information on the new statewide freight plan will be made available at: https:// www.dot.state.al.us/programs/FreightPlanning. html. The RPCGB is also participating in ALDOT's Statewide Freight Advisory Committee and sharing data that is needed for the plan update, which will be completed after the Statewide Freight Plan Update.

The MPO remains devoted to interregional cooperation. MPO staff assisted the Tennessee Department of Transportation (TDOT) with a freight study "Freight Movement along Freight Alley – The Greater Chattanooga Region" by providing data and matching funds. The TDOT study was primarily funded by an FHWA National Economic Partnership Grant. For more information, please see the **callout box on page 25**.

The State of Alabama is in the process of updating the 2014 Alabama State Rail Plan. The updated plan, which is expected to be released in 2023, will include freight-related sections concerning blocked crossings, grade crossing safety improvements, other rail safety concerns, and railroad infrastructure or capacity improvements.

INTERREGIONAL COOPERATION WITH TDOT

In March 2019, the Tennessee Department of Transportation (TDOT) was awarded a National Economic Partnership Grant by FHWA for a freight study entitled "Freight Movement along Freight Alley – The Greater Chattanooga Region." The study encompassed a 58-county tri-state region including portions of Tennessee, Georgia, and Alabama within the Piedmont Atlantic Megaregion. The RPCGB, on behalf of the Birmingham MPO, was one of 20 consortium members alongside TDOT for the study. The RPCGB provided \$5,000 in matching funds and assisted with data collection as a consortia member.

In January 2021, FHWA approved the 178page report which can be found at: https:// www.tn.gov/content/dam/tn/tdot/freight-andlogistics/Consolidated%20NEP%20Final%20 Report%20with%20Appendices.pdf. The report includes:

- Executive Summary
- Introduction and Description of the Challenge
- Partners and Roles
- Methodology and Process
- Challenges and Solutions
- Results and Analysis
- Conclusions and Next Steps
- Freight Mobility and Economic Competitiveness in the Freight Alley Region
- Georgia Tech Literature Review
- Thrive Freight Mobility Survey Report
- Truck Parking Information

FREIGHT TRENDS

LESS THAN TRUCKLOAD (LTL)

Less than truckload (LTL) freight refers to freight loads too large for parcel carriers, but not large enough to be economical for a full truckload. As a rule of thumb, LTL may weigh approximately 100 lbs. to 10 tons (20,000 lbs.). Many parcel carriers will not handle cargo that cannot be broken down into units weighing less than 100 lbs., which sets the lower threshold for LTL. On the other end of the spectrum, a typical semi-truck can haul between 21-24 tons (42,000-48,000 lbs.), and it is rarely economical to haul a truck with a load less than half its carrying capacity.

LTL services meet a market need by bridging the gap between packages that can be delivered by parcel carrier and freight best suited for fullsize trucks. Many companies that ship freight infrequently, or that need to move large or bulky items, will choose LTL services. LTL freight could include deliveries of furniture and appliances, palletized commodities, or small quantities of bulk material. The Birmingham region is home to numerous shipping companies that offer LTL services, many of which also ship full truckload freight.

According to the U.S. Census Bureau's 2017 Commodity Flow Survey, LTL freight accounted for 51% of all truck shipments nationwide. In 2020, the domestic LTL market was estimated to be worth \$46 billion. LTL tonnage nationally dipped 1.1% in 2020, largely as a result of the COVID-19 pandemic but rebounded by 8% in 2021. This market is anticipated to continue its growth, buoyed in part by consistently high demand for consumer goods.

LAST MILE DELIVERY

Last mile delivery refers to the final leg of the freight journey made by an individual item to its final destination. This is typically the costliest segment of transportation on a per-mile basis, particularly for home delivery of consumer goods, and is responsible for a significant portion of the total cost of shipping. This is because goods that were shipped together for most of their journey must be dispersed to individual homes and businesses.

Last mile delivery and LTL shipping are not mutually exclusive, and a large portion of last-mile freight can also be classified as LTL, particularly for home delivery. Last mile delivery often begins at a regional or local distribution center where freight is sorted and loaded onto trucks for final delivery. Major distribution centers in the region are included in the Major Freight Generator category shown in **Figure 6.10**.



Image Credit: RPCGB

FREIGHT GENERATORS

Distribution centers and warehouses are, collectively, freight generators. From a transportation standpoint, these facilities are responsible for much of the freight on the region's roads and highways, as they both receive and disperse large quantities of truckload and LTL freight. As the region's economy, online commerce, and home delivery have continued to grow, a cluster of these freight generating facilities has emerged in the region. Major freight generating facilities in the region are shown in **Figure 6.10**.

Distribution centers recently constructed or expanded within the region include:

- Amazon: 850,000-square-foot distribution center on its 133-acre Bessemer site, and a planned distribution center on the former Century Plaza site in Birmingham
- Buffalo Rock: Distribution center in Birmingham
- Carvana: Distribution center in Bessemer
- Coca-Cola: Bottling plant and distribution center in Birmingham
- Dollar General: Distribution center in Bessemer
- FedEx: Distribution center in Homewood
- Lowe's: Bulk distribution facility in Bessemer
- Motion Industries: Industrial distribution center (expansion) in Irondale
- WeatherTech: Wholesale distribution center in Irondale

According to the Economic Development Partnership of Alabama (EDPA), the facilities listed above collectively represent an estimated \$329.4 million investment.

There is reason to think this sector can continue to grow within the region. Bessemer is a good example of a local economic cluster that provides benefits such as a shared labor pool to businesses in the same industry. The region also benefits from abundant industrial land, much of which can accommodate future expansion. For example, the A-USA Rail Corridor project will build out an additional 104 acres at the Jefferson Metropolitan Park in McCalla and will develop land on the 1,540acre megasite in Calera.

Infrastructure investments have been necessary to accommodate these distribution centers and other freight-related industries. The EIDA has facilitated several rounds of infrastructure developments in recent years around the Jefferson County Metropolitan Park locations in McCalla and on Lakeshore Parkway. Jefferson County announced a suite of transportation projects to benefit freight movement and accommodate future growth. Lakeshore Parkway will be extended and realigned to form a single intersection with Morgan Road at SR 150. South of this intersection near the Carvana facility, Morgan Road will be widened from two to five lines.

The EIDA has made both Jefferson Metropolitan Park locations shovel-ready with utility hookups for natural gas, water, sewer, electric, and fiber optic internet. All these systems have excess capacity to handle future growth. The EIDA has also completed preliminary geotechnical, wetlands, ecological, cultural, and historical resource reviews for all sites.

In 2018, the EDIA expanded the Jefferson Metropolitan Park in McCalla by approximately 400 acres comprising the Red Rock North and Red Rock South properties. The first resale on this tract occurred in 2021 when Gulf Distributing purchased 30 acres for a 163,000-square-foot office and distribution facility.

The State of Alabama also offers tools to help businesses find available land. The EDPA maintains the AdvantageAlabama website (www. advantagealabama.com), which contains a searchable database of commercial and industrial properties. These property listings include contact information to facilitate sales or leases. Within the Birmingham region, one of the more prominent available sites is the 1,420-acre megasite near Westover in Shelby County.





Source: RPCGB; National Transportation Atlas Database; Navigation Data Center

FREIGHT-RELATED CAPACITY PROJECTS

Table 6.9 contains a list of fiscally constrained capacity projects from **Appendix A: Capacity** Projects that would facilitate the movement of freight through and within the region. The project locations are illustrated in Figure 6.11 and are identified by Map ID number, which corresponds to Table 6.9. These projects shown were identified as "High Priority" in the RPCGB's Birmingham Regional Freight Plan, which was adopted by the Birmingham MPO in March 2019. The list of roadway projects in the Regional Freight Plan were identified based on data analysis, extensive stakeholder interviews and input, and a scoring system based off 10 evaluation criteria. These scores were then ranked and converted into high, medium, or low priority projects.

BIRMINGHAM REGIONAL FREIGHT PLAN

In March 2019, the Birmingham Metropolitan Planning Organization (MPO) adopted its firstever Regional Freight Plan to better incorporate freight needs in the transportation planning and project development processes, as well as to help educate elected officials about the importance of freight mobility to the region's economy and quality of life. The Plan identifies key policies and infrastructure improvements necessary to maintain the region's competitive edge in a rapidly evolving global economy. The full Plan may be accessed at www.rpcgb.org/ freight.

MPO Map ID	Project Description	Jurisdiction/ Project Sponsor
1190	SR-5 (US-78) Add Lanes From Finley Blvd to Pratt Hwy (2nd St) (Phase 2)	ALDOT
1331	Reconstruction and Lane Addition on I-59 from I-459 to CR-10 (Chalkville Mountain Road) and I-459 from .34 miles south of SR-7 (US-11) to I-59	ALDOT
223	Oxmoor Blvd-Green Springs to Barber Court. Intersection Improvements At Barber Ct. and Oxmoor Rd.	Homewood
660	I-65 Auxiliary Lanes Birmingham - From Oxmoor Road NB to Greensprings Avenue/Greensprings Road SB to Oxmoor Road, Bridge replacement at Valley Ave	ALDOT
1191	SR-150 from Morgan Rd at Bessemer to MP 4.3 W of Parkwood Rd. Phase I	ALDOT
111	Pelham TOPICS, Widen CR 52 from I-65 to US 31 from 3-lane to 4-lane	ALDOT
120	Shelby CR-11 From US-31 to East Weatherly Entrance (Henderson Rd.). Widen 2 to 3 Lanes	Jefferson County
1187	Brooklane Dr. from Allison Bonnett to 19th St/Hueytown Rd	Hueytown

Table 6.9: Freight Contributions to Output and Employment by Mode, 2021

Source: RPCGB



Figure 6.11: Freight-Related Roadway Projects from the Fiscally Constrained Project List

Source: RPCGB