Greenville-Pickens Area
Transportation Study

HORIZON 2050 LONG RANGE TRANSPORTATION PLAN

OCTOBER 2026



CHAPTER 6
Future Conditions Assessment

CHAPTER 6: FUTURE CONDITIONS ASSESSMENT

An assessment of the future conditions of the GPATS region's multimodal transportation system has been conducted to understand how growth in the area is anticipated to impact the region's population. This included looking at the projected future number of households and jobs across both the Appalachian Regional Model (ARM) area and the GPATS Study Area to see how they could impact travel demand throughout the GPATS Study Area under existing conditions plus any already committee projects (E+C Scenario).

GPATS Forecasted Future Growth

HOUSEHOLDS

Regional growth related to the ARM and GPATS region's population and households were forecasted based on historical growth rates, anticipated future development, and land use plans. A comparison was made to the previous ARM model and Census American Community Survey data. **Figure 27** summarizes resulting growth forecasts. This review found household growth is widely dispersed but more heavily concentrated outside of the I-185 I-385 loops and near the periphery of the GPATS boundary.

EMPLOYMENT

Regional growth related to the ARM and GPATS region's employment were forecasted based on historical growth rates and GPATS' member jurisdictions' future land use and development plans. Employment growth is widely dispersed throughout the GPATS boundary but is more heavily concentrated along interstate corridors. **Figure 28** illustrates where future employment growth is anticipated to occur within the region.

As mentioned previously, household and employment growth across the full ACOG region and GPATS region was compared to the previous iteration of the ARM to identify changes in trends across the region. According to this review, forecasted household growth is more conservative than the previous model while employment growth is more aggressive. Household growth forecasted in the MPO Study Area is higher than the average for the entire model compared to employment growth, which is lower.

Overall, forecasted household growth in the model is more conservative than recent growth in the GPATS area according to Census data, suggesting that growth may moderate compared to the rapid pace experienced over the past decade. However, employment growth is projected to exceed that of the previous model, indicating that the region is expected to remain a strong economic center. This trend could result in continued increases in commuter travel and transportation demand, particularly along major regional corridors, even if population growth occurs at a slower rate. **Table 8** further illustrates these comparisons.

	GPATS AREA ONLY	PREVIOUS MODEL (GPATS AREA ONLY)	GPATS AREA CENSUS DATA
Households	1.02%	1.18%	1.53%
Employment	1.22%	1.14%	-

Table 8 | Compound Annual Growth Rate (CAGR) for full ARM (2022–2050) & GPATS Study Area & Previous (2010–2045) Models & Census Data (2014–2025)

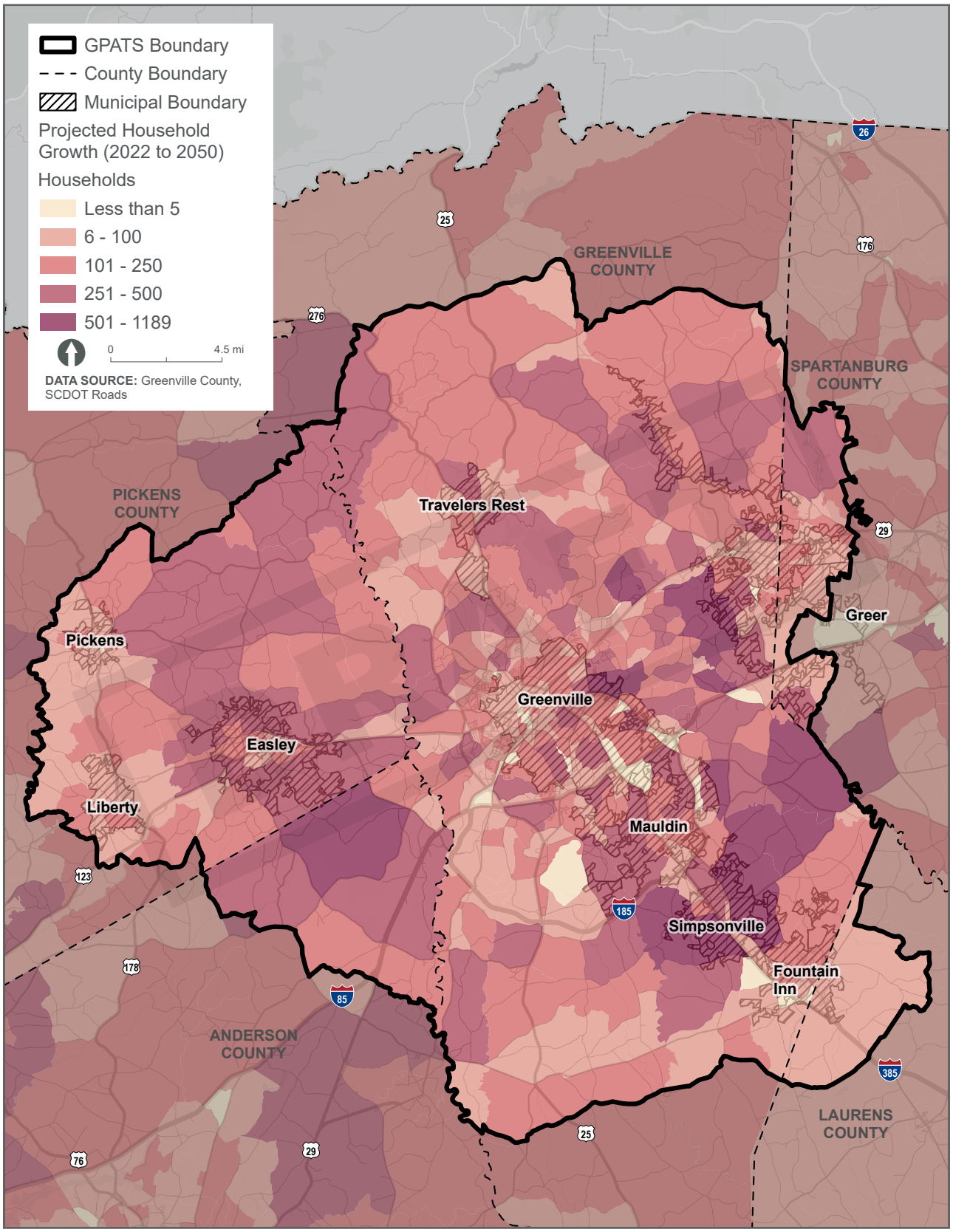


Figure 27 | Household Growth (2022–2050)

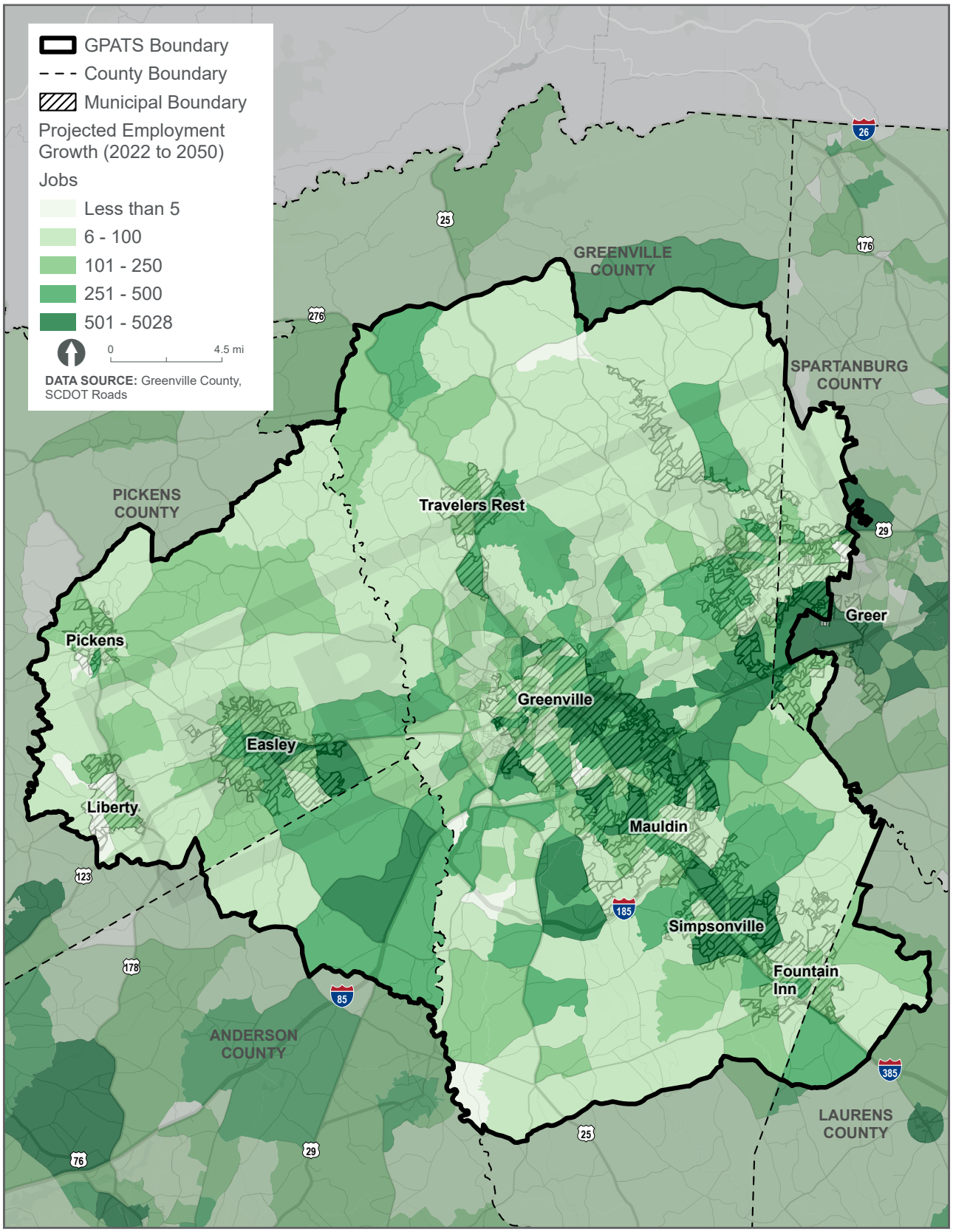


Figure 28 | Employment Growth (2022–2050)

Future Transportation System Performance

This assessment included identifying how these growth projections are anticipated to impact the future conditions of GPATS' streets and roads network and served as inputs within the ARM, the serving Travel Demand Model for GPATS' and much of the Upstate region. The ARM is a series of mathematical procedures and parameters that use future socioeconomic growth forecast to estimate future travel demand and to simulate how typical daily trips would travel along the network under these conditions. The ARM is an effective tool for comparing scenarios, including how growth or construction will impact a region's network. Refer to **Appendix C: ACOG Travel Demand Model Review** for more information about the ARM.

For the purposes of this LRTP, the project team looked at the Existing plus Committed (E+C) scenario. This scenario represents the existing GPATS transportation network plus any capital improvements already programmed, or a "business as usual" approach. This can highlight capacity and operational issues that projected growth could create for the region.

GROWTH IN DAILY TRAFFIC

Daily traffic volumes were forecasted through year 2050 based on the socioeconomic growth projections discussed above. These forecasted traffic volumes were compared to observed daily traffic volumes for the year 2022 to evaluate where traffic volumes are anticipated to grow the most. Resulting growth in daily traffic volumes for the GPATS region is shown in **Figure 29**.

According to this forecasted growth, consisting of AADT volumes between 2022–2050, the largest concentration of roads that are expected to see high growth are US Highways and Interstates that move people and goods between municipalities and into and out of the state.

Some examples include:

- US 123
- US 25
- US 29
- I-385
- I-85

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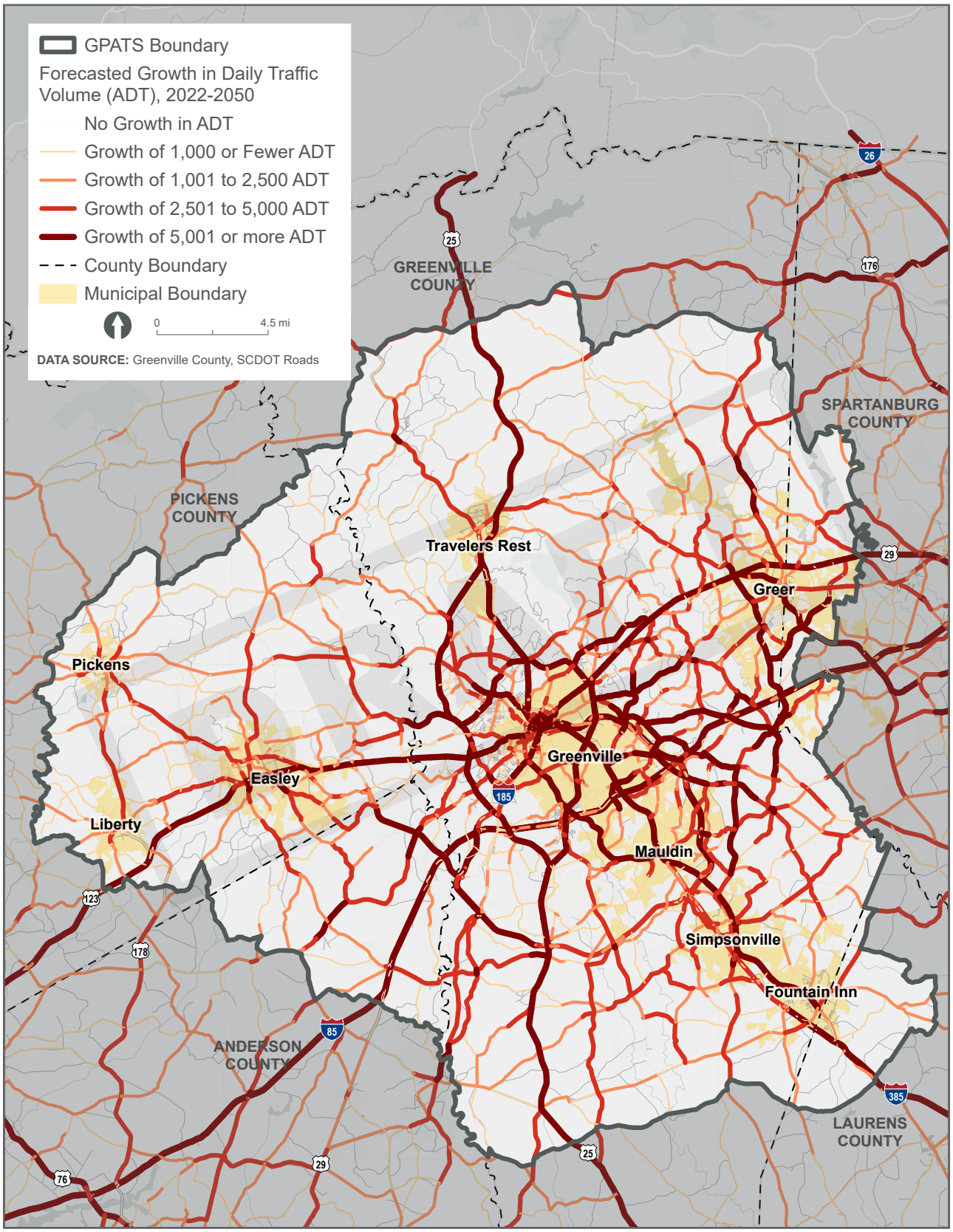


Figure 29 | 2050 Projected Growth

FORECASTED GROWTH IN FREIGHT ACTIVITY

According to the 2022 SCDOT Statewide Freight Plan, freight tonnage and value movement for South Carolina freight is forecasted to grow 84% and 115% respectively from 2019 to 2050. The SC Ports Authority indicated that the State's ports operations have a $87 billion statewide economic impact each year.[5] In the GPATS region, freight activity on non-connector roads is forecasted to grow by 46% between 2022 and 2050.

The SC Ports Authority's Annual Report indicated that 702,998 tons are moved annually across the State. In fact, according to the report the Upstate intermodal hub saw 355% cargo growth between 2014 and 2024. In fiscal year 2025, Inland Port Greer broke 200,000 rail moves, necessitating the need for an expansion. The facility expanded to accommodate 50% more cargo capacity with 9,000 feet of new rail and is anticipated to be capable of 300,000 rail lifts annually.

GPATS should continue to monitor freight growth in the area and any necessary improvements to continue to support necessary freight movements.



SC Ports Authority, Inland Port Greer

FUTURE FORECASTED TRAFFIC OPERATIONS

Further analysis of the GPATS transportation network looked at forecasted traffic operations using a Level of Service approach like the one detailed in **Chapter 5: Current Systems Performance** and the E+C scenario forecasted daily volumes. The projected LOS for the E+C scenario is shown below in **Figure 30**. Under this scenario, growth forecasts are anticipated to degrade peak hour travel conditions in the following areas:

- US 123 between Easley and Greenville
- Powdersville Road in Easley
- I-85 between Anderson County and US 153
- SC 153 between SC 81 and I-85
- I-385 between I-185 and the Southwest end of the GPATS Study Area
- SC 14 near Simpsonville and Mauldin
- Brushy Creek Road and Arlington Road in Greer

[5] scspa-2025-annual-report-final-web.pdf

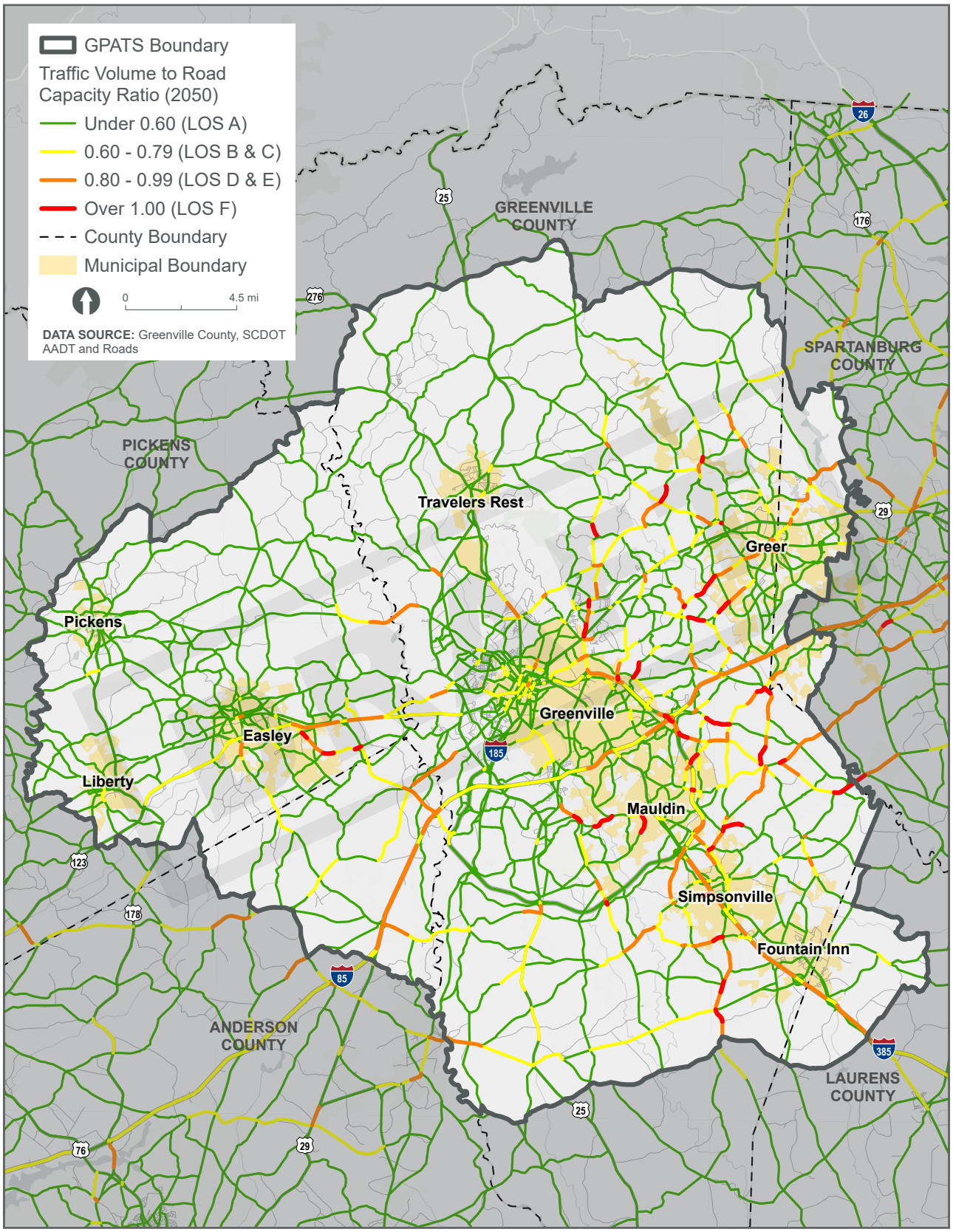


Figure 30 | Volume to Capacity Ratio (2050) Utilizing FDOT's Highway Capacity Manual-based Methodology

SYSTEM LEVEL PERFORMANCE OF THE E+C SCENARIO

Anticipated system-wide impacts of the growth anticipated across the GPATS Study Area is illustrated in the performance statistics from the ARM, which consists of the following indicators:

- **Vehicle Miles Traveled (VMT):** Total distance traveled by vehicle users on the streets and roads network.
- **Vehicle Hours Traveled (VHT):** Total time vehicle users spent traveling during each trip made on the streets and roads network.
- **Daily Trips:** Total number of daily trips made on the streets and roads network.
- **Average Trip Length (in miles):** Average length of daily trips made on the streets and roads network.
- **Average Trip Speed (in MPH):** Average speed traveled during each daily trip made on the streets and roads network.

Table 9 shows the system-wide performance statistics for the base year and future year E+C scenario. As illustrated in the table, VMT, VHT, and number of daily trips are anticipated to grow by 33% while average trip lengths are anticipated to slightly decrease. Average trip speeds under the E+C scenario are expected to slightly decrease between 2022 and 2050.

	ENTIRE MODEL			GPATS AREA ONLY		
	2022	2050 EC+SWM	Growth	2022	2050 EC+SWM	Growth
Population	1,394,097	1,816,155	30%	646,926	859,640	33%
Households	535,852	697,743	30%	249,405	331,465	33%
Total Employment	688,452	1,004,170	46%	334,839	470,252	40%
Balanced Trips	4,899,229	6,424,582	31%	2,402,066	3,200,621	33%
VMT	39,026,614	52,762,590	35%	14,819,006	19,410,730	31%
VHT	835,101	1,178,504	41%	327,996	451,098	38%
Average Household Size	2.60	2.60	-	2.59	2.59	-
Trips per Household	9.14	9.21	-	9.63	9.66	-
Average Trip Speed	46.73	44.77	-	45.18	43.03	-
Average Trip Length	7.97	8.21	-	6.17	6.06	-
Average Trip Time	10.23	11.01	-	8.19	8.46	-

Table 9 | Growth Summary for the Entire Model & the GPATS Area Only

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The relationship between these measures suggests that growth in travel demand is expected to outpace the transportation system's ability to maintain current operating conditions. Average trip speeds are forecasted to decline, while average trip times increase, signaling increased congestion and reduced reliability on key corridors. Although future development patterns may place some destinations closer to homes and activity centers, resulting in shorter trips on average, the overall volume of travelers and vehicle activity is projected to place additional stress on the regional transportation network.

From a planning perspective, these findings indicate that the existing and committed transportation network alone may not be sufficient to maintain current levels of mobility through 2050. Continued investment in roadway capacity, operational improvements, intersection upgrades, freight mobility, transit, and active transportation infrastructure will be important to accommodate future growth. The results also highlight the need to provide transportation options that reduce dependence on single-occupancy vehicles and help manage future travel demand, particularly along the region's most heavily traveled corridors.

Emerging Transportation Trends & Technologies

The GPATS region is experiencing significant growth in population, employment, and travel demand, prompting increased attention to innovative and emerging transportation strategies supporting mobility, sustainability, and economic competitiveness. Trends emerging across the region have included the expansion of electric vehicle infrastructure, increased interest in connected and automated vehicle readiness, and renewed discussion of regional and intercity passenger rail as a long-term mobility option. These trends reflect a shift toward a more multimodal and technology-enabled transportation system that complements traditional roadway investments while addressing evolving travel behaviors and environmental considerations.

CHANGES IN TRAVEL DEMAND

Largely, travel by Americans has increased over time since the introduction of the automobile over 100 years ago. Recently, however, events such as the COVID-19 Pandemic and increased popularity in e-commerce have resulted in travel flattening or in some cases decreasing.

- COVID-19 significantly impacted both vehicle miles traveled (VMT) and the number of trips that individuals were taking at the time. The pandemic resulted in a rise in individuals who were working and taking classes from home, along with an increase in food, grocery, and other delivery services. In fact, the 2022 National Household Travel Survey (NHTS) reported 37% decrease in daily person trips and 32% decrease in daily vehicle trips. Similarly, the Federal Highway Administration (FHWA) reported that they saw a 14% decrease in VMT between 2020 and 2021. As can be seen in **Figure 30**, commuting patterns have only just returned to similar levels seen pre-COVID-19.
- As mentioned above, a rise in e-commerce has resulted in reduced trips associated with shopping as more purchases are made online and often delivered to homes. This is becoming popular in areas beyond traditional retail, such as online grocery shopping with home delivery and ordering food delivery to your home. In these cases, delivery drivers could be delivering to several destinations in one trip, such as several deliveries to one apartment complex or office building.

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CHANGES IN COMMUTE MODE SHARE

There has been a Nationwide decrease in commuting trips as the number of people working from home has increased over time and the corresponding vehicle miles traveled has also been impacted. The biggest dip was seen surrounding the COVID-19 Pandemic, but as can be seen in **Figure 31** below, the number of vehicle miles traveled nation-wide is only just returning to those seen pre-pandemic.

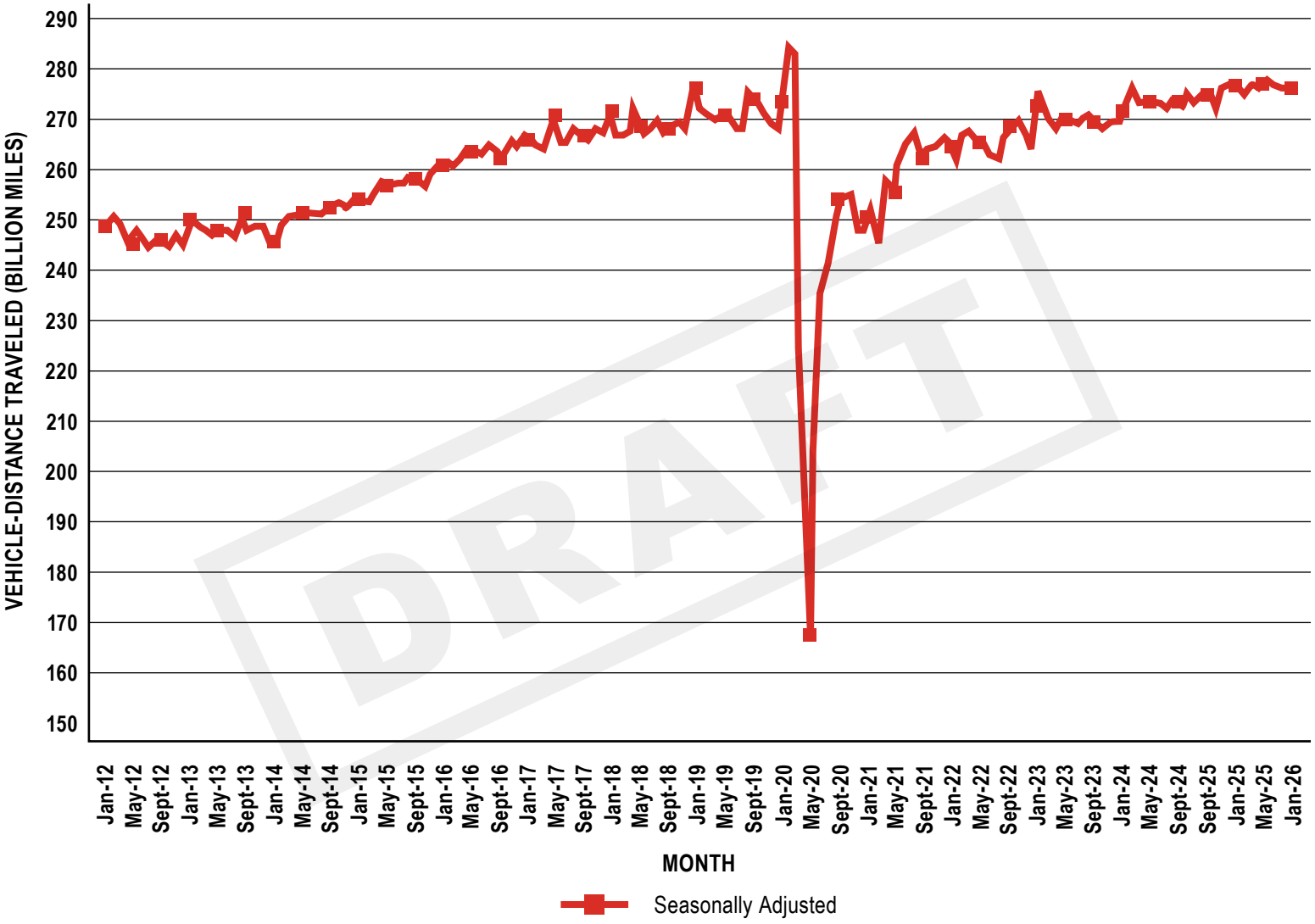


Figure 31 | Seasonally Adjusted Vehicle Miles Traveled by Month

In 2018, only 5.2% of the nation's workers were identified as working from home in comparison to 13.3% by 2024 according to 2024 ACS data. This trend applies to the GPATS region, as 14% of people were identified as working from home according to 2024 ACS data compared to the 3.2% identified in the Horizon 2040 LRTP update process. This signifies that the shift to working from home has continued to impact the nation and GPATS region, indicating a trend that could be here to stay and could impact future travel demand. The main differences between commute mode share trends seen in the GPATS region compared those seen nationally are seen in Table 10.

MEASURE	GPATS	UNITED STATES
Worked from Home (Horizon 2040/2018 Baseline)	3.2%	5.2%
Worked from Home (2024 ACS)	14.0%	13.3%
Change (Percentage Points)	+10.8	+8.1

Table 10 | Commuting Trends Comparison: GPATS & US

AGING POPULATION

The United States is seeing an increase in Americans age 65 and older. The number of residents in the age range was estimated to be over 61.2 million in 2024 or 18% of the population. This is an increase from the 16.5% in 2019.

In comparison, the State of South Carolina consisted of 19.8% of the population age 65 or above in 2024, an increase from 18.2% in 2019. GPATS experienced a similar increase with 17.7% of the population above age 65 in 2024 compared to 15% in 2019. This indicated that the population above the age of 65 in South Carolina and the GPATS region is increasing, though not at as extreme a rate as the US.

	2019			2024		
	Total Population	Population Age 65+	% Population Age 65+	Total Population	Population Age 65+	& Population Age 65+
United States	328,239,523	54,074,028	16.5%	340,110,990	61,245,283	18%
South Carolina	5,148,714	935,538	18.2%	5,478,831	1,082,724	19.8%
GPATS Study Area	608,081	93,824	15%	664,306	110,570	17.7%

Table 11 | Change in Population Age 65+ (2025 Esri)

TRANSPORTATION & LAND USE INTEGRATION

Innovative transportation planning increasingly emphasizes coordination between land use, economic development, and transportation investments. Approaches such as transit oriented development, complete streets, and activity center planning can reduce travel distances, support multimodal access, and improve overall system efficiency. For GPATS, strengthening the link between transportation and land use decisions will continue to be essential to managing growth and limiting future congestion.

ALTERNATIVE FUEL STATIONS

Electric vehicle (EV) adoption is an emerging trend within the GPATS area, supported by the gradual expansion of publicly accessible alternative fuel stations. GPATS has participated in public engagement efforts related to the South Carolina National Electric Vehicle Infrastructure (NEVI) Formula Program, a program set to strengthen charging availability by deploying DC Fast Chargers along Alternative Fuel Corridors across the state and will continue to do so as the program progresses. As shown in **Figure 32**, alternative fuel stations are distributed throughout the GPATS boundary, with concentrations near major municipalities and along key corridors.

EV registrations have been significantly increasing nationwide. In fact, EVs registered in the US rose to 4.5 million in 2024 according to data from the Alternatives Fuel Data Center (**Table 11**) compared to 1.4 million in 2021. Similarly, South Carolina saw an increase in registered EVs during this period. The number of EVs registered in South Carolina was 7,400 in 2021 compared to 26,800 in 2024.

It is also important to note the increasing trend in EV usage in public transportation as well. Transit agencies, both locally and nationally, have been transitioning towards electric or compressed natural gas (CNG) fleet vehicles. In fact, Greenlink has been transitioning its fleet overtime, with 49 new or replacement vehicles identified as CNG vehicles in their 2018 Transit Development Plan.

	2021	2024	% CHANGE
United States	1,454,400	4,503,700	210%
South Carolina	7,400	26,800	262%

Table 12 | Growth in Electric Vehicle Registrations in the US & SC

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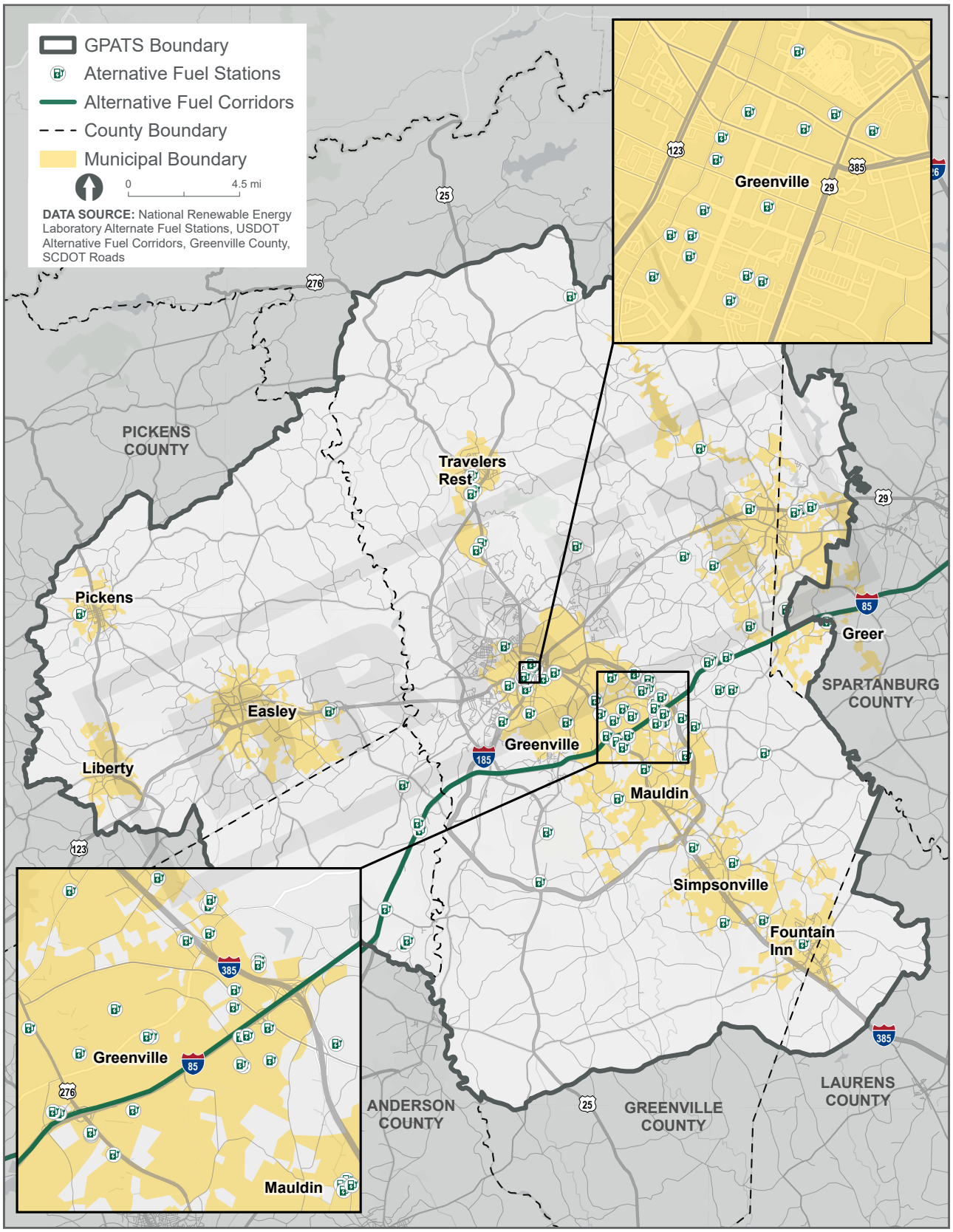


Figure 32 | Alternative Fuel Infrastructure

REGIONAL & HIGH-SPEED RAIL CONSIDERATIONS

Regional and high speed rail has emerged as a longer term mobility concept of interest for the GPATS area, particularly given the region's position within the rapidly growing Upstate and broader Southeast mega-region. Interest in enhanced passenger rail service reflects a desire to improve intercity connectivity, provide alternatives to long distance automobile travel, and support economic development by linking major employment and population centers.

An an analysis for the feasibility of construction of a high-speed rail line between Atlanta and Charlotte was initiated in 2013 when the Federal Rail Administration (FRA) published a Notice of Intent for a Tier 1 EIS in Partnership with the Georgia Department of Transportation (GDOT). It included consideration of six potential routes, including three shared use alternatives:

- The Norfolk Southern (NS) railroad corridor known as the Southern Crescent Corridor route
- CSX Transportation (CSX) right-of-way between Atlanta, GA, and Chester, SC, through Athens, GA and NS right-of-way between Chester, SC, and Charlotte, NC, through Rock Hill, SC
- CSX right-of-way between Atlanta and Augusta, GA, and NS right-of-way between Augusta and Charlotte through Columbia, SC
- The I-85 corridor through Greenville and Spartanburg, SC
- The I-20 and I-77 corridor through Columbia, SC
- A greenfield corridor allowing the project team to define a fully grade-separated route alignment with optimal geometric characteristics for high-speed passenger rail service

The Tier 1 EIS was completed, and the Greenfield Corridor Alternative was identified as the preferred alternative in the final EIS and Record of Decision released in June 2021. This alternative includes one stop in Anderson and one stop within the GPATS Study Area at the Greenville-Spartanburg International Airport. Further environmental review, planning, and engineering is needed to implement this project.

As planning continues for a high-speed route between Charlotte and Atlanta, GPATS is presented with an opportunity to plan local regional rail that could support the region and work in harmony with future high-speed efforts. This will require some extensive coordination with local rail agencies and could be a valuable opportunity for utilization of programs like the Corridor Identification & Development Program through the FRA. Any advancement of passenger rail will require substantial coordination with state and regional partners, careful evaluation of ridership potential, and integration with local transit, bicycle, and pedestrian networks. While rail implementation remains a long-range consideration, continued planning and preservation of potential corridors can help ensure that GPATS remains positioned to participate in future regional rail initiatives as travel demand and funding opportunities evolve.

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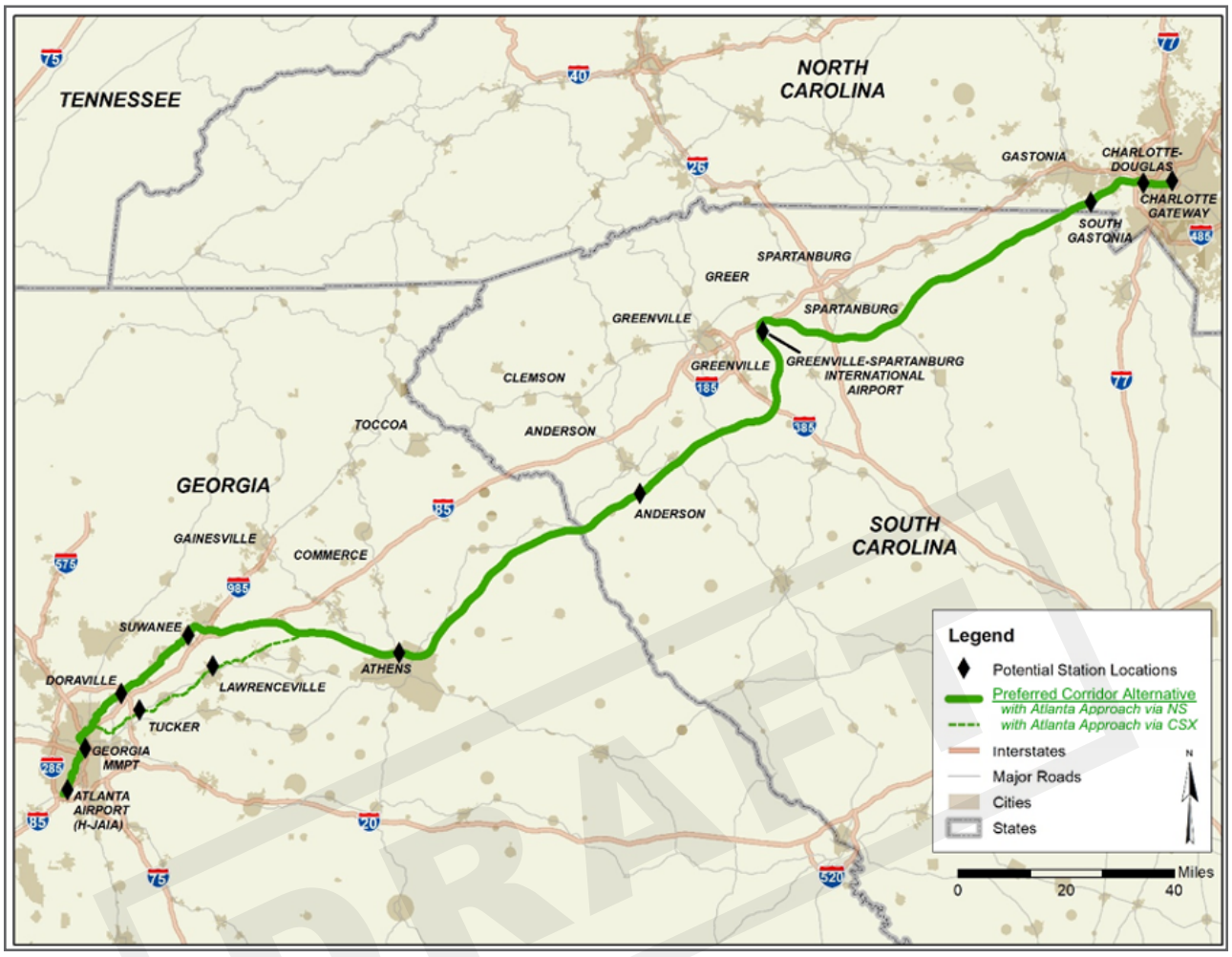


Figure 33 | Charlotte to Atlanta High Speed Rail Preferred Alternative (EIS & Record of Decision)

CONNECTED & AUTOMATED VEHICLE (CAV) READINESS

While widespread deployment of fully autonomous vehicles remains a longer term prospect, incremental advancements in connected vehicle technologies are already influencing roadway operations. CAVs are considered to fall into two groups – connected vehicles (CV) and autonomous vehicles (AV). This technology involves complex connectivity to inform these vehicles about their surroundings including:

- **Vehicle-to-Vehicle (V2V):** Information on speed, location, and heading.
- **Vehicle-to-Infrastructure (V2I):** Information on signal timing, work zones, crashes, congestion, and weather conditions.
- **Vehicle-to-Pedestrian (V2P):** Information between vehicles and non-motorized users on and off crosswalks and bicyclists.
- **Vehicle-to-Everything (V2N to V2E):** Data transmitted to a central location for analysis, including demand management, travel times, and incident response.

These communication tactics help reduce the occurrence of vehicle crashes and improve system operations by analyzing data and sharing it in real time, providing for optimized management of the transportation network. Vehicle to infrastructure (V2I) applications, such as adaptive signal timing, queue warnings, and real time traveler information, can improve safety and reliability on congested corridors.

AVs refer to vehicles that incorporate varying degrees of automated driving technologies and range from blind spot detection to adaptive cruise control. Advances in this technology have led to pilot vehicles that are driven entirely by on-board computer systems and require little to no human intervention. The Society of Automotive Engineers (SAE) identifies six levels of automation further detailed in **Figure 34**. These technologies have been researched and developed for highway freight vehicles as well, such as Aurora Innovation, Inc.'s fully autonomous trucks and driver-less operations along I-45 in Texas. In fact, experts have stated they expect 13% of trucks operating on US roads to be fully autonomous by 2035.[6]

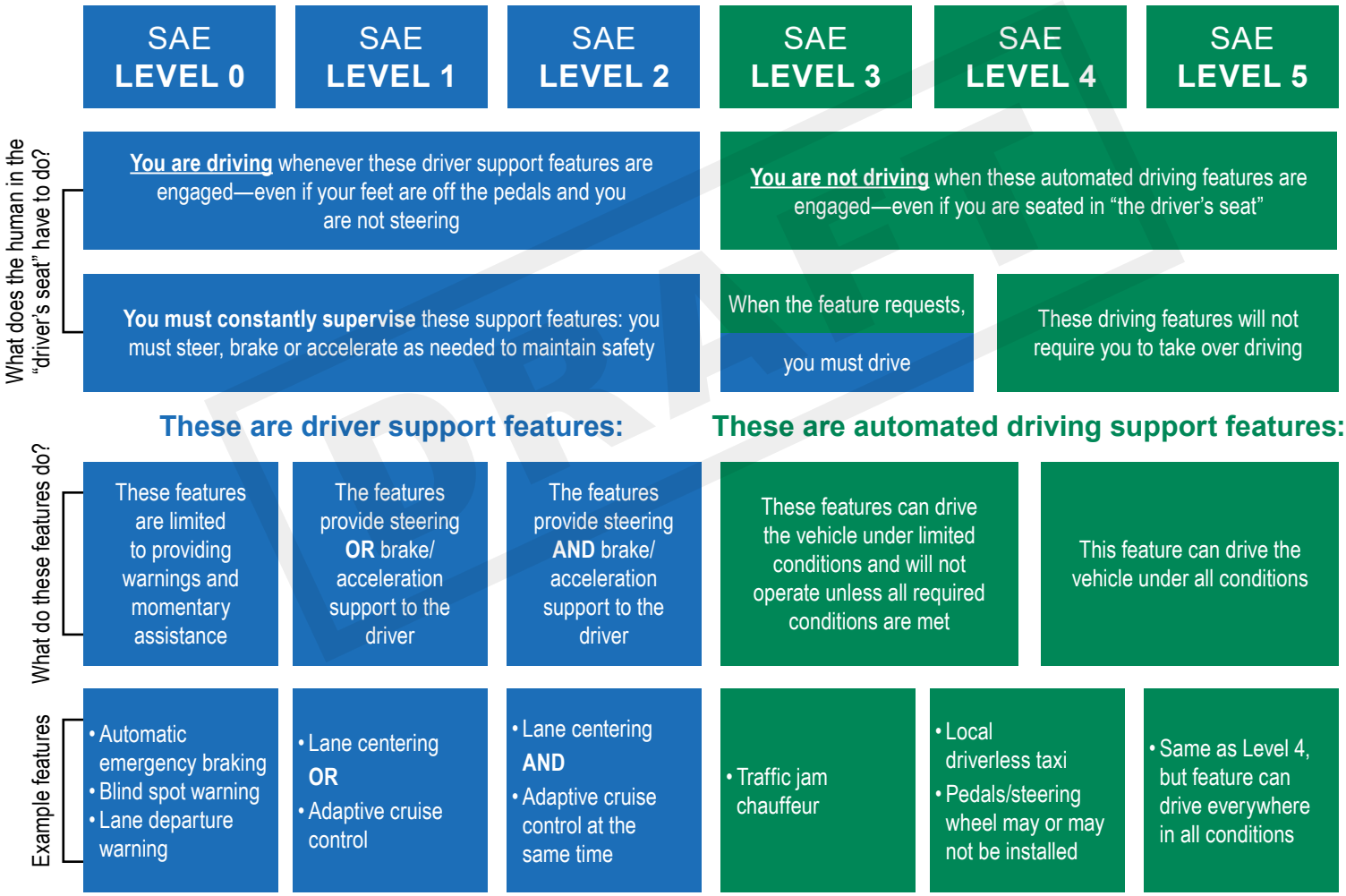


Figure 34 | SAE - Levels of Driving Automation (SAE International)

It is anticipated that automation will continue to advance and new features will become available to consumers over time as safety and reliability testing continues. GPATS can support CAV readiness through consistent roadway markings, communications infrastructure, and policies that allow the region to adapt as automation levels increase over the planning horizon.

[6] *Driverless Trucks are Rolling in Texas, Ushering in New Era, https://www.axios.com/2025/04/23/texas-driverless-trucks*

MICROMOBILITY

Micromobility is defined as "a category of modes of transportation that includes very light, low-occupancy vehicles such as electric scooters (e-scooters), electric skateboards, shared bicycles, and electric pedal assisted bicycles (e-bikes)" by FHWA.[7] It is a common form of transportation in city centers and can be used to increase accessibility to public transportation and to replace short trips often taken by car. In fact, in a 2023 Report on Shared Micromobility, NACTO sited that in 13 years people took 887 million trips on shared bikes and scooters in the US and Canada.[8] While the forms of micromobility currently seen in the GPATS region are limited, this mode of transportation is actively expanding into and impacting the region. **Forms of micromobility seen across the nation include:**

Shared Bicycles & E-Bikes (Station Based)

Station-based bicycles and electric bicycles, or e-bikes, using a system of docking stations across a region allow individuals to rent bicycles at various locations and return them at different stations near their destinations. This is often done through an application on a smart phone. The GPATS region has seen its own introduction of a bike share system, known as BCycle, located in the City of Greenville. There are stations located in several locations around the City, allowing bicycles to be removed and docked from a variety of locations including City Hall, the Greenville Zoo, Unity Park, the Next Innovation Center, and the local YMCA. While not within the GPATS Study Area, Clemson University is also home to its own BCycle bikeshare system. This is evidence that there is demand in the area for alternative forms of mobility separate from the average automobile. In fact, across the US, the number of trips made using shared bicycles and e-bikes totaled 61 million in 2023 with the largest increase in annual trips being for e-bikes with an increase of 40% from 2022 to 2023.

Dockless E-Bikes & E-Scooters

While not currently used in the GPATS region, dockless e-bikes and e-scooters are also becoming more common across the US and refer to fleet systems that do not dock in fixed locations. These fleets often are assigned to geofences that limit where they can be rented and returned. Like their station-based counterpart, these systems often use an application on a smart phone. While jurisdictions within the GPATS region do not offer dockless e-bikes or e-scooters, it has become fairly common to see privately owned e-bikes and e-scooters within the MPO boundary. This aligns with a nationwide increase in the percentage of bicycle riding Americans that use E-bikes. Reports have documented an increase in from 7.8% in 2021 to 19.4% in 2023.[9]

Micromobility as a Service

Mobility as a Service (MaaS) refers to an approach to travel that integrates identification of routes to destinations utilizing several modes of transportation within a single interface and using a single payment mechanism. Users are able to plan entire trips across several modes of transportation and tailor trips to an individual's specific needs.[10]

[7] *Bikeshare and E-scooters in the US | BTS Data Inventory, https://data.bts.gov/stories/s/Bikeshare-and-e-scooters-in-the-U-S-/fwcs-jprj/*

[8] *Shared Micromobility Report: 2023 - NACTO, https://nacto.org/publication/shared-micromobility-report-2023/*

[9] *Electric Bicycle Market Insights From Industry Experts, https://www.peopleforbikes.org/news/electric-bicycle-market-insights-2024*

[10] *Towards the Promise of MaaS in the US (July 2020), https://sharedusemobilitycenter.org/wp-content/uploads/2020/09/Towards-the-Promise-of-MaaS-in-the-US-July-2020-Shared-Use-Mobility-Center.pdf*

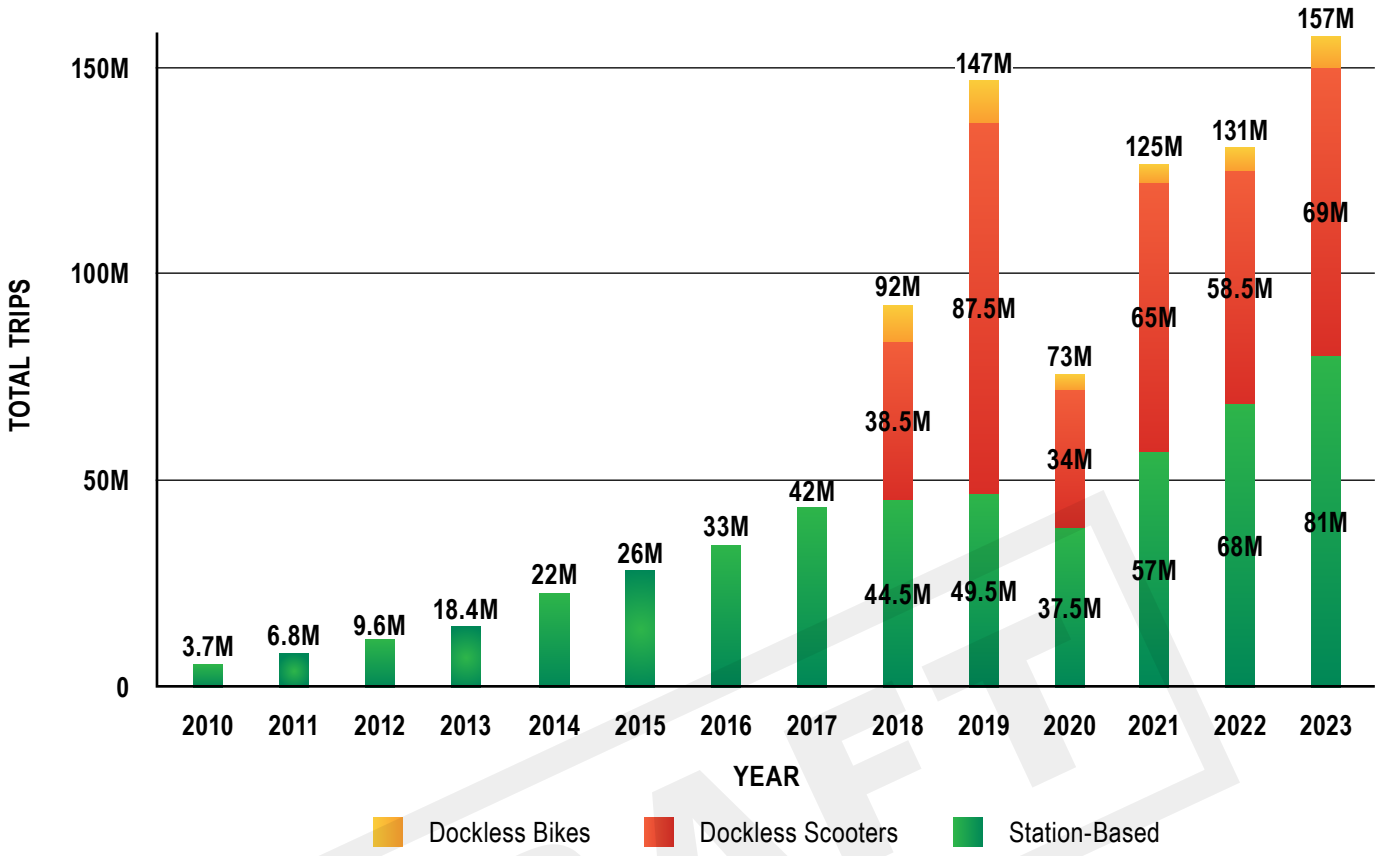


Figure 35 | Shared Micromobility Ridership in the US and Canada, 2010–2023 (NACTO)

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GPATS Horizon 2050

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