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# Identifying Travel Needs for South Jersey and Shore Customers
# Final Report

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**16. Abstract**

Bus ridership has declined over the past decade both nationally and within New Jersey, with a more pronounced reduction during the COVID-19 pandemic due to changes in travel behavior and commuting patterns. Although ridership has gradually recovered in recent years, levels in many regions, including New Jersey, remain below pre-pandemic conditions. NJ TRANSIT operates an extensive bus network that supports mobility, accessibility, and regional connectivity, particularly in South Jersey and the Shore region; however, recent post-COVID travel patterns, seasonal variations in demand, and workforce-related travel needs are not fully understood, limiting the ability to design targeted service improvements. This study evaluates travel behavior and transit needs across fourteen NJ TRANSIT bus routes using onboard rider surveys and field-based employee and employer surveys. The analysis identifies travel patterns, service gaps, and unmet mobility needs across weekday, weekend, and seasonal conditions, including origin–destination patterns, rider characteristics, and factors influencing transit use and non-use. The findings highlight key service challenges, including reliability, frequency, accessibility, and competition with private vehicles, as well as workforce-related commuting needs. These data-driven insights support the development of targeted strategies to improve transit performance and enhance bus services in South Jersey and the Shore region.


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TABLE OF CONTENTS

## LIST OF FIGURES

## LIST OF TABLES

## EXECUTIVE SUMMARY

Public transportation plays a vital role in supporting New Jersey's economy, mobility, and environmental goals. Yet, bus ridership, particularly in South Jersey and along the Shore, has experienced a steady decline over the past decade, with the sharpest drop during the COVID-19 pandemic. While ridership has shown modest recovery since 2021, it remains below pre-pandemic levels, threatening the sustainability of services and the equitable access they provide. Bus transit in these regions is a critical lifeline, offering essential connections between residential areas, employment centers, and recreational destinations. Strengthening the network is therefore crucial to reducing congestion, enhancing accessibility, improving safety, and fostering economic opportunities across southern communities.

Despite NJ TRANSIT operating an extensive bus network, there is a need to better understand travel patterns and transit needs in South Jersey and the Jersey Shore region, particularly across weekday and weekend periods and during both summer and off-season conditions. This study addresses that need by focusing on identifying transit gaps and opportunities to improve bus services and support ridership growth.

Consistent with the project objectives, the research evaluates current travel patterns and unmet mobility needs through origin–destination surveys conducted on fourteen NJ TRANSIT bus routes serving the region. In addition, field-based surveys were conducted to collect input from employees and employers located along key transit corridors, including those in major employment sectors such as hospitality, retail, and tourism. These efforts were designed to capture commuting patterns, service needs, and potential barriers to transit use.

This project seeks to bridge these gaps by developing a robust understanding of travel needs and opportunities for enhancing bus service in South Jersey and the Shore region. Through employee/employer surveys, and extensive onboard rider surveys across 14 NJ TRANSIT routes (468, 317, 319, 468, 501, 502, 504, 505, 507, 508, 509, 510, 552, 553, and 559) the research team will identify existing challenges, travel behaviors, and service preferences among current, former, and potential riders. The collected data underwent statistical and geospatial analyses to reveal route-specific trends, travel patterns, and areas with unmet demand. These findings inform performance-based recommendations and route profiles to guide NJDOT and NJ TRANSIT in prioritizing service enhancements. Ultimately, this effort produced actionable strategies supported by stakeholder engagement, visual analytics, and implementation briefings to improve bus reliability, accessibility, and ridership in South Jersey. By aligning data-driven insights with community needs, the project will strengthen the foundation for equitable, efficient, and sustainable public transportation across New Jersey's southern region.

## INTRODUCTION

Effective transit planning requires a clear understanding of how people travel, the barriers they face, and the factors that influence their transportation choices. NJ TRANSIT, as the primary public transportation provider in the state, operates an extensive network of bus, rail, and light rail services that connect communities to employment centers, healthcare facilities, educational institutions, and commercial destinations. Among these services, bus transit remains one of the most accessible and widely used modes of transportation, particularly for residents who rely on public transit as their primary means of travel. (1) In regions such as South Jersey and the Shore area, bus services serve as an essential lifeline, linking residential communities with coastal employment hubs, hospitals, retail corridors, and seasonal tourism destinations that support the regional economy.

Bus ridership has declined over the past decade both nationally and within New Jersey. At the national level, transit agencies experienced significant reductions in ridership during the COVID-19 pandemic due to shifts to remote work, changes in commuting behavior, and public health concerns. (2) Although ridership has gradually recovered since 2021, it has not returned to pre-pandemic levels in many regions across the United States.

A similar trend has been observed for NJ TRANSIT bus services, where ridership declined prior to the pandemic and experienced further reductions during the COVID-19 period. While some recovery has occurred in recent years, ridership levels in many parts of the system remain below pre-pandemic conditions. (1) These trends highlight the importance of better understanding current travel behavior and service needs to support effective transit planning and ridership growth.

Across the United States, several transit agencies have responded to ridership challenges by conducting comprehensive studies of rider behavior and implementing targeted service improvements. These studies typically integrate passenger surveys, ridership data analysis, and stakeholder engagement to identify barriers to transit use and opportunities for improving service reliability, accessibility, and connectivity. Research from the Transportation Research Board indicates that transit agencies that evaluate rider needs and adapt service design accordingly are more likely to improve ridership performance and customer satisfaction. (3) Such approaches have helped many agencies redesign routes, improve service frequency, and strengthen connections between transit systems and major employment centers.

Existing planning efforts and data collection activities have been conducted in South Jersey and the Shore region to support NJ TRANSIT service planning. However, a key gap identified for this study is the limited availability of recent, post-COVID travel data for bus routes serving this region, particularly across weekday and weekend periods and during summer and off-season conditions. In addition, traditional data sources primarily capture information from current transit users and do not fully reflect the perspectives of non-riders or employees and employers. While ridership statistics provide insight into overall transit use, they often do not capture the underlying reasons why individuals do

not choose public transportation. Addressing these limitations requires direct engagement with riders, employees, and employers, as workplace location, schedules, and commuting policies can significantly influence transportation choices.

To address these gaps, this study focuses on collecting updated travel behavior data and expanding the scope of analysis to include employees and employers located along key transit corridors. The South Jersey and Shore region has unique transportation characteristics, including seasonal employment patterns, tourism-driven demand, and varying travel needs across different times of the year. Previous studies emphasize that regional differences in land use, employment patterns, and seasonal demand should be considered when designing effective transit services. [4] Capturing these dynamics requires targeted data collection efforts that reflect both rider and non-rider perspectives, as well as workforce-related travel needs, to better inform transit planning and service improvements.

Addressing these knowledge gaps is essential for ensuring that NJ TRANSIT and NJDOT can develop effective strategies for improving transit services in the region. A more detailed understanding of rider experiences, travel challenges, and employer needs can help guide service improvements that enhance reliability, accessibility, and connectivity across the transit network. By identifying the factors that influence transit use and the barriers that discourage potential riders, transportation agencies can develop targeted solutions that better align transit services with the mobility needs of local communities.

Against this backdrop, the present study was initiated to address these gaps and provide a comprehensive assessment of transit use and travel behavior in South Jersey and the Shore region. The project focuses on identifying the travel needs of current, former, and potential bus riders by collecting detailed feedback from transit users, employers, and employees across key corridors served by NJ TRANSIT bus routes. Through a combination of on-board rider surveys, employer outreach, and employee engagement, the study aims to capture a broad perspective on how transit services are currently used and how they can be improved to better serve the region.

The findings from this study are intended to provide NJDOT and NJ TRANSIT with actionable insights that can support future transit planning and service improvements. By combining direct rider feedback with data analysis and stakeholder engagement, the project seeks to identify practical strategies that can improve service reliability, enhance accessibility, strengthen connections to employment centers, and ultimately increase ridership. These efforts support broader statewide goals of promoting sustainable transportation, improving mobility equity, and ensuring that public transit remains a vital component of New Jersey’s transportation system.

## OBJECTIVE

The primary objective of this project is to identify and address the travel needs of current, former, and potential NJ TRANSIT bus riders in South Jersey and the Shore region to enhance transit accessibility, reliability, and ridership. The study aims to understand travel patterns, service gaps, and unmet mobility needs for both weekday and weekend travelers through data-driven analysis and stakeholder engagement. Specific goals include identifying opportunities to improve service design, evaluating best practices from other transit agencies, and developing actionable recommendations to support equitable and efficient bus operations. The project integrates insights from focus groups, employer interviews, and onboard surveys across 14 targeted routes to capture diverse user perspectives. Findings will guide NJDOT and NJ TRANSIT in implementing strategies that enhance service quality, improve rider satisfaction, and increase ridership, ultimately supporting the state's broader objectives for sustainable and inclusive public transportation. The following objectives of the project have been identified:

1. Understand travel patterns, identify gaps in transit service, and uncover unmet travel needs for both weekday and weekend travelers.
2. Identify specific transit needs and opportunities for improved service.
3. Identify the best practices and lessons learned from other agencies to enhance service in South Jersey and the Jersey Shore area.
4. Develop actionable recommendations for enhancing transit services, addressing identified gaps, and implementing strategies to increase ridership in the target region.

The findings from this project will establish methodologies and offer recommendations for the staff of NJDOT and NJ TRANSIT to better understand the travel needs of South Jersey and the Shore area. The anticipated outcomes of this research include recommendations for improved service and increased bus ridership in the targeted region. All research, implementation, and training activities involved key stakeholders and end-users to ensure comprehensive engagement.

## LIST OF ABBREVIATIONS AND SYMBOLS

| Abbreviation | Full Form |
|---|---|
| **ADA** | Americans with Disabilities Act |
| **AM** | Ante Meridiem |
| **API** | Application Programming Interface |
| **AVL** | Automatic Vehicle Location |
| **BRM** | Business Reply Mail |
| **CAD** | Computer-Aided Dispatch |
| **CCC** | Cross County Connection |
| **CMSRU** | Cooper Medical School of Rowan University |
| **COVID-19** | Coronavirus Disease 2019 |
| **DOT** | Department of Transportation |
| **FHWA** | Federal Highway Administration |
| **GIS** | Geographic Information System |
| **GTFS** | General Transit Feed Specification |
| **GPS** | Global Positioning System |
| **ID** | Identification |
| **ITS** | Intelligent Transportation Systems |
| **IRB** | Institutional Review Board |
| **LEHD** | Longitudinal Employer-Household Dynamics |
| **LLC** | Limited Liability Company |
| **LODES** | Origin-Destination Employment Statistics |
| **MBO** | Management by Objectives |
| **MUTCD** | Manual on Uniform Traffic Control Devices |
| **NJ** | New Jersey |
| **NJDOT** | New Jersey Department of Transportation |
| **NJTPA** | North Jersey Transportation Planning Authority |
| **NJ TRANSIT** | New Jersey Transit |
| **NYC** | New York City |
| **OD** | Origin–Destination |
| **PATCO** | Port Authority Transit Corporation |
| **PM** | Post Meridiem |
| **QR** | Quick Response Code |
| **RSU** | Roadside Unit |
| **SEPTA** | Southeastern Pennsylvania Transportation Authority |
| **SJTPO** | South Jersey Transportation Planning Organization |
| **SJTA** | South Jersey Transportation Authority |
| **TAZ** | Traffic Analysis Zone |
| **URL** | Uniform Resource Locator |
| **USDOT** | United States Department of Transportation |
| **USPS** | United States Postal Service |

| Abbreviation | Full Form |
| --- | --- |
| **Wi-Fi** | Wireless Fidelity |

# CHAPTER 1: STUDY OVERVIEW AND CONTEXT

## Background

Public transportation systems play a critical role in supporting mobility, economic activity, and equitable access to opportunities. Bus transit, in particular, provides a flexible and cost-effective mode of travel for a wide range of users, including daily commuters, students, and individuals without access to private vehicles. Reliable and accessible transit services are essential for connecting people to employment, education, healthcare, and other essential services.

In New Jersey, NJ TRANSIT operates one of the largest bus networks in the country, serving both densely populated urban areas and more dispersed suburban and coastal regions. The South Jersey and Jersey Shore region presents unique transportation characteristics compared to the northern parts of the state. Travel demand in this region is influenced by seasonal tourism, with higher activity during the summer months, as well as employment patterns that include both year-round and seasonal jobs. In addition, travel distances are often longer, and many communities rely heavily on bus transit to access major employment centers such as Atlantic City.

At the same time, recent changes in travel behavior, including those following the COVID-19 pandemic, have affected transit usage patterns. Variations in weekday and weekend travel, shifts in commuting trends, and differences in access to private vehicles have created new challenges for transit planning. While NJ TRANSIT continues to provide essential services in the region, there is a need to better understand current travel patterns, rider needs, and service gaps in order to support effective and responsive transit improvements.

## Study Overview and Approach

This study was designed to better understand transit use, travel behavior, and service needs across the South Jersey and Jersey Shore region. To achieve this, the research team collected data from multiple sources, including onboard surveys conducted on fourteen NJ TRANSIT bus routes serving the South Jersey and Shore region (Routes 317, 319, 468, 501, 502, 504, 505, 507, 508, 509, 510, 552, 553, and 559), as well as surveys of employees and employers located along these transit corridors.

Data collection was conducted across weekday and weekend periods and included spring (from mid-May), summer, and fall seasons to capture variations in travel patterns. A combination of field-based outreach and digital survey distribution methods was used to reach a broad and diverse group of participants. The collected data were then processed and analyzed to examine travel patterns, rider characteristics, and origin–destination trends, with additional spatial analysis used to understand how transit demand is distributed across the study area.

The outcomes of this study include the identification of key service challenges, such as reliability, frequency, accessibility, and affordability, as well as insights into factors influencing transit use and non-use. The findings support the development of data-driven

recommendations aimed at improving transit performance, enhancing rider experience, and increasing ridership across the South Jersey and Shore region.

### Significance of the Study

This study provides important insights into transit usage and mobility needs in the South Jersey and Jersey Shore region. By combining onboard rider surveys with employer and employee surveys, the study captures perspectives from both transit users and non-users, offering a more complete understanding of travel behavior and commuting patterns.

The findings help identify key service challenges, including reliability, frequency, accessibility, and affordability, while also highlighting differences in travel patterns across weekdays, weekends, and seasonal periods. In addition, the study provides information on workforce-related travel needs, which are critical in a region with a strong presence of tourism and service-based employment.

The results of this study can support NJ TRANSIT and transportation agencies in making informed, data-driven decisions to improve transit service performance, enhance rider experience, and expand access to employment and essential services. The study also contributes to a better understanding of how transit systems can adapt to changing travel behavior and evolving mobility needs in the region.

### Structure of the Report

This report is organized to provide a clear progression from survey development to data analysis and final recommendations. Following this introductory chapter, Chapter 2 describes the development of survey instruments, including the design of questionnaires and supporting materials such as outreach flyers. Chapter 3 presents the survey preparation and logistical framework, including outreach strategies and distribution methods used to engage participants. Chapter 4 summarizes the survey responses and highlights key challenges encountered during data collection. Chapter 5 outlines the data processing steps, including data filtration, cleaning, and evaluation of weighting considerations to ensure a reliable dataset for analysis. Chapter 6 presents the data analysis, including travel patterns, spatial distribution, and origin–destination trends. Finally, Chapter 7 summarizes the key findings, discusses major challenges identified through the analysis, and provides policy and planning recommendations. Additional supporting materials, including detailed survey distributions and supplementary data tables, are included in the appendices.

# CHAPTER 2: DESIGN SURVEY QUESTIONNAIRES

## Introduction

The development of the survey questionnaires was a critical step in preparing for the data collection phase of the study. The surveys were designed to collect information from employees and employers regarding commuting patterns, travel behavior, and the accessibility of transit services across South Jersey and the Jersey Shore region. The primary objective was to create clear and effective survey instruments capable of capturing reliable and meaningful data related to transportation needs, workplace accessibility, and potential gaps in existing transit services.

To support the survey design process, a review of questionnaires used in previous transportation and mobility-related studies was conducted. Surveys developed by academic researchers, transportation agencies, and transit planning initiatives were examined to understand commonly used question formats, response structures, and survey organization methods. This review helped identify best practices for survey development, including approaches for improving question clarity, organizing survey sections effectively, and minimizing respondent burden while ensuring that the collected information would support the objectives of the study.

Based on this review, three survey instruments were developed to address the perspectives of different respondent groups involved in the study – specifically employers, employees, and bus riders. The questionnaires were structured around key themes such as commuting behavior, travel mode choice, transit accessibility, workplace location, and perceptions of transit service availability. Both closed-ended and open-ended questions were included to allow respondents to provide quantitative responses as well as descriptive feedback about their commuting experiences.

Following multiple rounds of refinement to improve question wording and response options, the finalized surveys were prepared for implementation. These surveys serve as the primary tools for collecting information from employers and employees, providing essential data for analyzing commuting patterns, identifying transit service gaps, and supporting recommendations aimed at improving mobility and transit accessibility within the study area.

## Survey Questionnaires

Survey questionnaires for the employer, employee, and on-board surveys were developed, modified, and refined to ensure clarity, consistency, and alignment with the goals of the study.

## On Board Survey

The on-board passenger survey was developed to collect detailed information on transit users' travel behavior, trip characteristics, and demographic attributes across the South Jersey and Jersey Shore region. The survey design process was guided by a review of existing transit rider surveys and transportation behavior studies to ensure alignment with established practices in transit data collection. Question structures, response formats,

and thematic categories were informed by previous research and survey instruments used by transportation agencies and academic studies. Multiple rounds of refinement were conducted to improve clarity, question flow, and data relevance. The survey instrument was also reviewed and coordinated with stakeholders from NJ TRANSIT and the NJDOT to ensure that the questionnaire addressed agency data needs and aligned with the objectives of the study.

The survey was administered directly to passengers traveling on NJ TRANSIT bus routes serving the study region. The objective of the survey was to obtain a comprehensive understanding of how passengers use bus services, the purposes of their trips, the connections they make with other modes of transportation, and the socio-economic characteristics of transit users. The information collected through this survey supports the evaluation of transit service usage patterns and helps identify opportunities to improve mobility and accessibility within the region.

The first section of the survey focuses on trip identification and travel timing. Passengers were asked to identify the bus route they took and the time they boarded. These questions help document when and where passengers are using the service and support the analysis of ridership patterns across routes and time periods.

The survey also collects information about the origin and destination of the passenger's trip. Respondents were asked to indicate the type of location they came from and the type of location they were traveling to, such as home, work, school, shopping, recreation, medical appointments, or other activities. In addition to the trip purpose, passengers were asked to provide the approximate address or the nearest intersection of their trip origin and final destination.

Another group of questions focuses on boarding and alighting locations and access to transit services. Passengers were asked where they boarded the bus and where they planned to exit the bus during the trip. Additional questions asked how they traveled to the bus stop and how they planned to reach their final destination after leaving the bus. These questions capture the first-mile and last-mile connections associated with transit travel and help identify how passengers access transit through walking, biking, private vehicles, ridesharing services, or other transit modes.

To better understand multi-modal travel behavior, the survey asked respondents to list all bus routes or rail services used during the one-way trip in the exact order they were taken. This information helps identify transfer patterns and the role of bus routes in supporting longer regional trips. Passengers were also asked whether they would make the return trip later in the day and, if so, how they planned to complete that return journey.

Additional questions examine the frequency of transit use and fare payment behavior. Respondents were asked how often they use the specific bus route on which they were surveyed. The survey also included questions regarding the type of ticket or fare product used for the trip, the location where the ticket or pass was purchased, and the method

used to pay for transit fares. These responses provide insight into fare purchasing behavior, ticket distribution channels, and payment methods used by transit riders.
The survey also explores alternative travel options available to passengers. Respondents were asked how they would complete the trip if the bus service were not available. Possible alternatives included driving, carpooling, ridesharing services, walking, biking, or using another transit route. This information helps assess the role of bus transit in supporting essential travel and identifies potential mode shifts if transit service were unavailable.

A series of questions was included to gather demographic and household information about respondents. These questions collected information related to home ZIP code, gender, age group, ethnicity, race, and the presence of disabilities that may affect the ability to use transit services. Household characteristics were also captured, including the number of people living in the household, the number of licensed drivers, and the number of vehicles available. Household income was also requested to better understand the socio-economic characteristics of transit riders.

Additional questions focused on language proficiency, employment characteristics, and workplace information. Respondents were asked whether they speak languages other than English at home and their level of English proficiency. Employment-related questions collected information about employment status, industry sector, and the approximate distance between the respondent's residence and workplace. The survey also asked whether respondents were related to educational institutions as students, faculty members, or employees. These questions provide insights into the workforce characteristics and institutional connections of transit users within the study area.

To capture qualitative feedback, the survey included an open-ended question inviting passengers to suggest improvements to their travel experience on NJ TRANSIT bus services. This question allows respondents to provide comments regarding service reliability, accessibility, scheduling, comfort, or other aspects of the transit experience that may not be fully captured through structured survey responses.

Finally, respondents were given the option to provide contact information to enter a voluntary drawing for a monthly transit pass or a gift card. Participation in this drawing was optional, and respondents were informed that all contact information would remain confidential and would only be used for notifying selected winners.

The complete on-board passenger survey instrument used in this study is provided in Appendix A.

### Employee Survey

An employee survey was developed to collect information on commuting patterns, travel behavior, and transit accessibility among workers in South Jersey and the Jersey Shore region. The survey was designed based on a review of previous transportation surveys and workforce mobility studies to ensure that the questions reflect established practices

in transit research. Survey structure, response formats, and thematic areas were informed by prior transit rider and commuter surveys conducted by transportation agencies and academic researchers. The questionnaire was refined through multiple revisions to improve clarity, question flow, and relevance to the study objectives. The survey instrument was also reviewed in coordination with NJ TRANSIT and the NJDOT to ensure that the collected information would support regional transit planning and workforce mobility analysis.

The first section of the survey focuses on individual transit use and trip characteristics. Respondents are first asked whether they use NJ TRANSIT bus services. Those who do not use the bus are asked to identify the reasons for not using the service, including issues related to safety, cost, comfort, accessibility, service reliability, or route availability. Understanding these barriers provides insight into potential factors that discourage transit use among workers in the region.

For respondents who do use NJ TRANSIT bus services, additional questions examine frequency of transit use and the specific routes utilized for different trip purposes. Respondents are asked how often they use bus services and which routes they ride for activities such as commuting to work, school, shopping, recreation, medical visits, or personal business. These questions help identify ridership patterns and determine how bus routes support various travel needs across the region.

The survey also gathers detailed information about work-related commuting by transit. Respondents who use bus services for work trips are asked about the bus stops they use when traveling to and from their workplace. Additional questions capture the location of the workplace and the modes used to travel between home, the bus stop, and the destination. These questions provide insight into first-mile and last-mile connections and help identify how transit integrates with other transportation modes such as walking, biking, carpooling, ridesharing, or other transit services.

Another section of the survey focuses on general bus travel behavior beyond work commuting. Respondents are asked which days of the week they typically use bus services, whether they travel with children, and how they pay for their transit fares. Questions related to ticket types, purchase locations, and payment methods help evaluate fare payment preferences and the adoption of different ticketing options such as mobile applications, vending machines, or onboard purchases.

To understand the role of transit in supporting daily mobility, respondents are also asked how they would complete their trip if bus service were not available. Possible alternatives include driving, carpooling, ridesharing services, walking, biking, or using another transit route. These responses provide valuable insight into the importance of bus transit for essential travel and help identify potential shifts in travel behavior if transit services were reduced or unavailable.

The survey also includes a section dedicated to service improvement priorities. Respondents are asked to identify the aspects of NJ TRANSIT bus service they would

most like to see improved. Potential improvements include travel speed, service reliability, accessibility, scheduling, route coverage, ease of use, fare costs, payment methods, and service information. These responses help identify areas where transit services could be enhanced to better meet passenger needs.

Another group of questions focuses on employment characteristics and workplace conditions. Respondents are asked about their employment status, industry sector, and the approximate distance between their residence and workplace. Additional questions determine whether the respondent works as a seasonal employee. These questions help identify how transit services support different types of workers and industries within the study region.

The survey also examines employer-supported commuting benefits. Respondents are asked whether their employers provide transportation-related benefits such as subsidized transit passes, carpool or vanpool programs, shuttle services, bike-sharing programs, parking benefits, flexible work schedules, or remote work options. Additional questions ask respondents to evaluate how effective these programs are in meeting their commuting needs and whether additional transportation support initiatives should be introduced or expanded.

Another section of the survey focuses on sources of transit information. Respondents are asked where they obtain information about bus services, such as the NJ TRANSIT website, mobile applications, social media platforms, customer service channels, or other sources. This information helps identify how riders access service information and how communication channels influence transit awareness.

The final section of the survey collects demographic and household information to better understand the characteristics of transit users and potential riders. Questions gather information on age group, gender, ethnicity, race, disability status, and connections with educational institutions. Additional questions capture household characteristics, including the number of household members, licensed drivers, and available vehicles. Respondents are also asked about their home ZIP code, household income, languages spoken at home, and English proficiency. These questions help provide a broader understanding of the socio-economic and demographic profile of workers in the region and their relationship to transit use.

The complete employee survey questionnaire used in this study is provided in Appendix B.

**Employer Survey**

An employer survey was developed to collect information from businesses and organizations located across South Jersey and the Jersey Shore region regarding employee commuting patterns, transit accessibility, and the role of public transportation in supporting workforce mobility. The survey design was informed by a review of existing employer-based transportation surveys and mobility studies to ensure that the questionnaire aligned with established practices in workforce transportation research.

Question structure, response formats, and thematic areas were adapted from previously implemented surveys used by transportation agencies and academic studies. The questionnaire was refined through multiple iterations to improve clarity, relevance, and usability. The survey instrument was also reviewed and coordinated with NJ TRANSIT and the NJDOT to ensure that the information collected would support agency planning needs and align with the objectives of the study.

The first section of the survey gathers general information about the employer and organizational characteristics. Respondents are asked to identify the name of their company or agency, the industry sector in which they operate, the approximate size of their workforce, and the ZIP code of their business location within New Jersey. These questions help identify the types of organizations participating in the survey and allow the analysis of employer responses across different industries and geographic areas. Additional questions collect information about the work schedules used within the organization, including day, evening, night, and weekend shifts. Understanding workplace schedules is important for evaluating how transit service availability aligns with employee work hours.

The second section focuses on employee use of NJ TRANSIT bus services and related commuting challenges. Employers are asked to estimate the percentage of their workforce that currently uses NJ TRANSIT bus services to travel to and from work. This question provides an overview of transit dependency within the workforce and helps identify industries or employment centers where bus transit plays a more significant role in employee commuting. Employers are also asked to describe any challenges their employees experience when using NJ TRANSIT bus services, such as issues related to service reliability, travel time, scheduling, or accessibility.

The survey also explores how transit services influence business operations and workforce productivity. Employers are asked to describe how existing transit services affect their daily operations, employee punctuality, and workforce stability. Respondents are also invited to explain how improvements to transit services could benefit their organization, such as by improving employee access to jobs, reducing commuting barriers, or supporting recruitment and retention efforts.

Another section of the survey examines gaps in transit service and potential improvements that could better support employees. Employers are asked whether there are specific geographic areas or transit routes where they believe bus service is insufficient or unavailable. Respondents are also asked to identify the most important areas for improvement in NJ TRANSIT bus service, such as travel speed, service reliability, accessibility, scheduling, destinations served, fare costs, and ease of understanding and using transit services. These questions help identify priority areas for transit improvements from the perspective of employers whose operations depend on workforce mobility.

The survey also collects information regarding lessons learned from other transit systems and strategies that could encourage greater transit use among employees. Employers

are invited to share examples of practices implemented by other transit agencies that could be beneficial for improving bus services in South Jersey and the Shore region. In addition, respondents are asked to suggest strategies that could encourage their employees to use NJ TRANSIT bus services more frequently, such as improved schedules, expanded routes, or additional commuter benefits.

Another section focuses on employer-supported transportation programs and commuting benefits offered to employees. Employers are asked whether their organizations provide transportation-related benefits such as subsidized transit passes, carpool or vanpool programs, shuttle services, bike-sharing programs, parking benefits, flexible work schedules, or work-from-home opportunities. These questions help identify the types of employer-supported commuting programs currently in place and their potential role in supporting transit use. Employers are also asked to evaluate how effective these programs have been in meeting employee commuting needs and whether additional transportation support initiatives should be introduced or expanded.

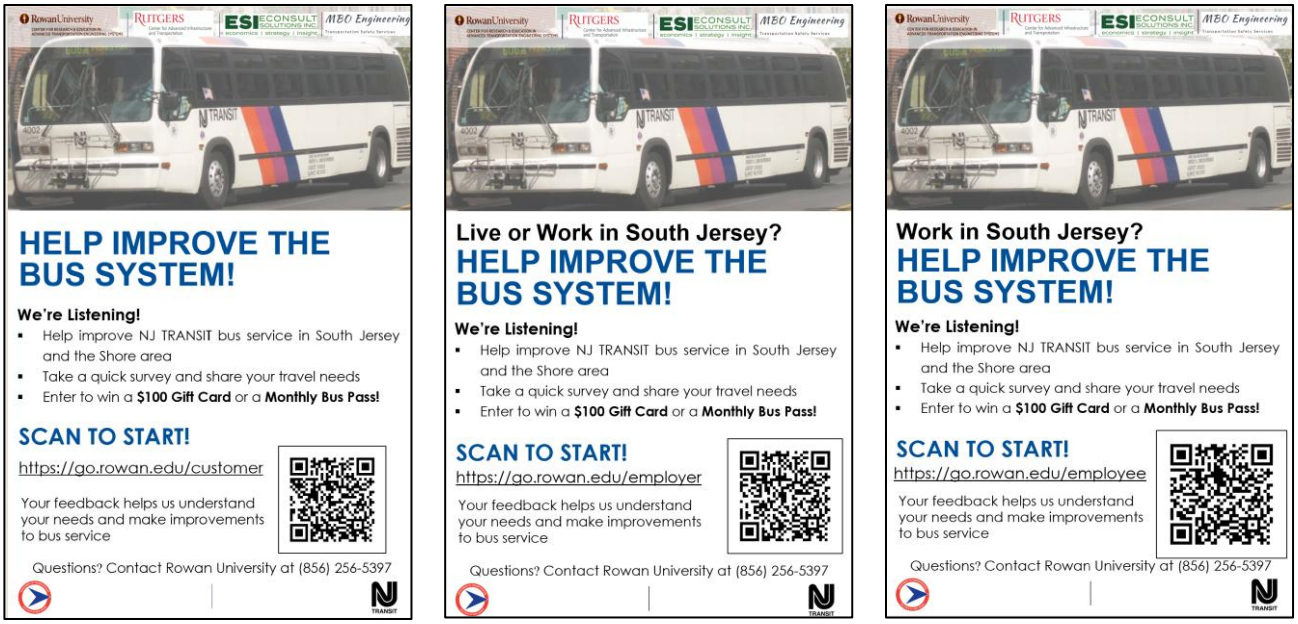
The final section of the survey provides an opportunity for additional feedback and insights regarding NJ TRANSIT bus services. Employers are invited to share any further comments or suggestions related to transit service quality, workforce accessibility, or regional mobility needs. These open-ended responses allow employers to provide detailed perspectives that may not be fully captured through structured survey questions. The complete employer survey questionnaire used in this study is provided in Appendix C.

**Survey Flyers**

Three targeted flyers were developed to support outreach for the on-board, employer, and employee surveys, respectively. These materials were created based on specific requirements and recommendations provided by agency partners and refined through internal collaboration between the research team and project sponsors. The goal was to ensure that the flyers effectively communicate the purpose and importance of the surveys while aligning with the broader objectives of the project.

Each flyer contains concise yet informative content outlining the project's scope, objectives, and potential benefits, all aimed at encouraging survey participation. To streamline access, the flyers prominently feature unique QR codes and direct web links for each corresponding survey, making them accessible to a wide range of audiences across various settings.

To evaluate the effectiveness of this outreach method, the research team has also established a separate inventory system to track and analyze responses received specifically through flyer distribution. This supported a comparative assessment of response rates and outreach success for each of the three survey types. Figure 1 showcases the final flyer designs tailored for the on-board, employer, and employee surveys.




a b c

Figure 1. Flyers for the surveys: a) On board bus survey; b) Employer Survey; c) Employee survey.

**Business Reply Mail**

Extensive coordination was undertaken with the United States Postal Service (USPS) to facilitate the implementation of Business Reply Mail (BRM) procedures necessary for survey response collection. As part of this process, a BRM account was successfully established through the local USPS BRM service office, and the requisite funds were deposited to cover anticipated mailing expenses.

In support of this effort, a return envelope was specifically designed in compliance with USPS BRM specifications. The envelope, formatted as a 9-inch by 12-inch layout, was developed as official artwork to accompany survey distributions. This envelope design ensures proper handling and returns of completed surveys and aligns with USPS processing requirements to promote efficiency and reliability in the mail-back process. Figure 2 represents the envelope artwork designed by USPS for the return of the survey.

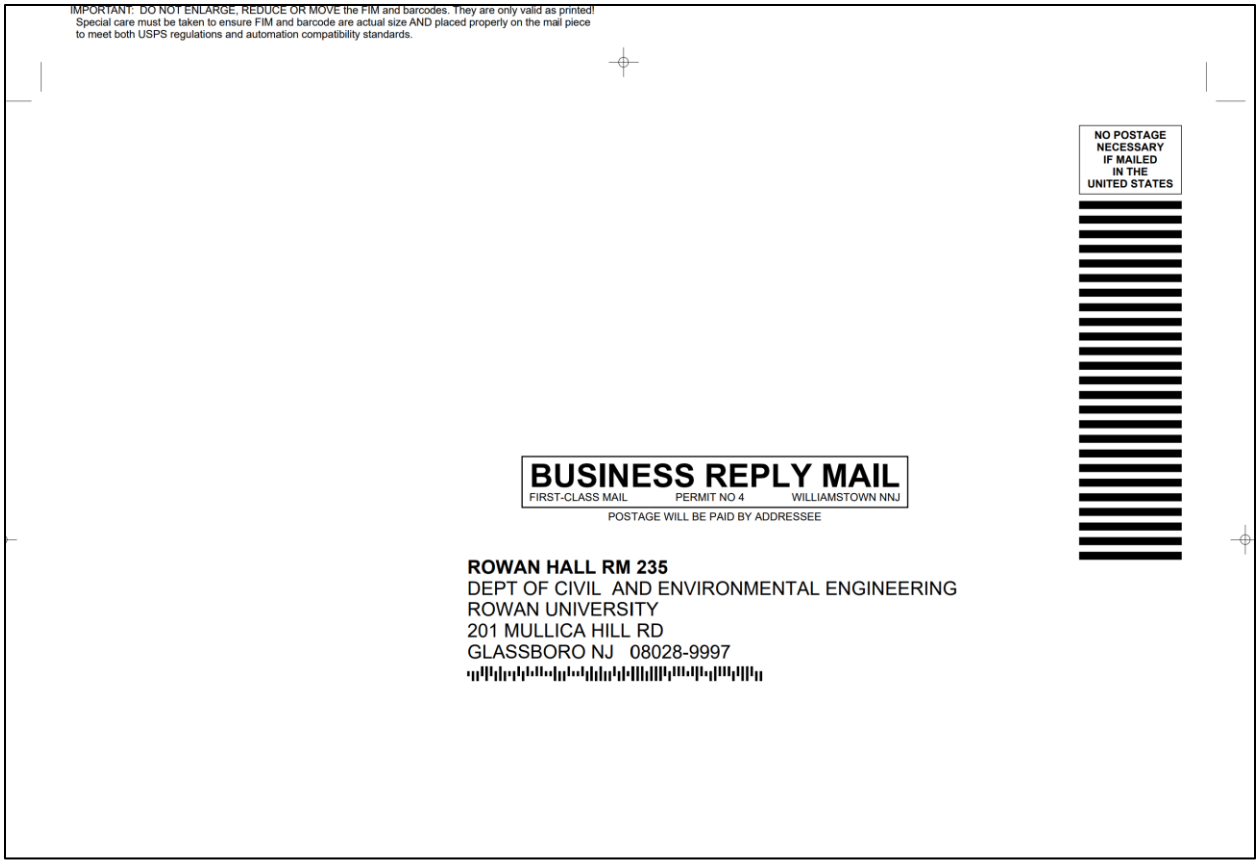



Figure 2. 9in X 12in Return Envelope Artwork for BRM.

## CHAPTER 3: SURVEY PREPARATION

### Introduction

Preparing the surveys for implementation required careful planning and coordination to ensure that data collection could be carried out efficiently across South Jersey and the Jersey Shore region. These preparations focused on organizing the logistics for administering the on-board passenger survey as well as the employer and employee surveys. Efforts were directed toward coordinating field activities, preparing survey materials, and establishing communication channels that would support broad participation from transit riders, employers, and employees throughout the study area.

To support field data collection, additional survey personnel were recruited and trained to assist with the administration of the surveys. Training sessions were organized to familiarize surveyors with the survey instruments and the procedures for interacting with respondents. These sessions covered the proper use of both paper and digital survey formats, techniques for approaching and assisting participants, and guidelines for ensuring that responses were recorded accurately. Emphasis was also placed on maintaining respondent confidentiality, following ethical data collection practices, and ensuring the safety of surveyors during field activities.

Preparation for the on-board passenger surveys included organizing surveyor assignments across the fourteen NJ TRANSIT bus routes included in the study. Route schedules and survey locations were reviewed to ensure that data collection would cover a range of service times and geographic areas. Coordination with NJ TRANSIT helped confirm service schedules and supported the organization of field operations along the selected routes.

At the same time, preparations were made for distributing the employer and employee surveys. Contact information for businesses across the study area was compiled through professional networking platforms, local business directories, and regional Chambers of Commerce. Additional employer contacts were obtained through collaboration with the New Jersey Department of Labor, allowing the survey to reach a larger number of businesses and workforce representatives across different industries.

Online outreach was also used to make the employee survey accessible to individuals working in the region. Digital announcements and social media postings were shared to inform employees about the survey and encourage participation. These online efforts complemented the employer outreach process and provided an additional opportunity for workers to share information about their commuting experiences and transportation needs.

### Survey Planning

Survey planning focused on expanding participation and increasing the number of responses across the study area. Additional surveyors were trained and deployed to cover bus routes in South Jersey and the Shore region, with particular attention given to routes where fewer responses had been collected. Outreach efforts were also expanded

by gathering employer contacts through the New Jersey Department of Labor and local Chambers of Commerce, allowing the survey to reach a wider range of businesses and employees. In addition, digital outreach was conducted through targeted posts and advertisements on platforms such as LinkedIn, Instagram, and X to increase awareness of the surveys and encourage broader participation.

***Survey Digitization***

Survey digitization activities focused on preparing the on-board, employer, and employee surveys for efficient and consistent data collection across both digital and field environments. All three surveys were implemented on the Qualtrics platform, allowing responses to be collected through a structured and user-friendly interface. The digital surveys were configured with features such as skip logic, guided response paths, and validation checks to ensure that respondents followed the appropriate question flow and that the collected data remained accurate and complete.

Additional internal testing and review were conducted to confirm that the surveys functioned properly across different devices, including computers, tablets, and mobile phones. Minor adjustments were made to improve question formatting, correct typographical errors, and refine survey logic where necessary. These refinements helped ensure that respondents could complete the surveys smoothly and that the data collection process would remain reliable during field deployment and online distribution.

Although the digital surveys allowed broader online participation, field experience indicated that paper-based surveys remained particularly effective for collecting responses from transit riders during on-board data collection. As a result, printed versions of the surveys were prepared and organized for use during field operations. Paper surveys were arranged by route and time of day to assist surveyors in distributing them efficiently while traveling along the selected bus routes.

Informational flyers were also used to support survey distribution. These flyers included QR codes and shortened survey links that directed participants to the online versions of the surveys. This approach allowed individuals who preferred completing the survey digitally to access it later using their personal devices. The combination of digital survey platforms, printed questionnaires, and flyer-based outreach helped ensure that participants could respond through multiple formats, supporting more flexible and accessible data collection.

***Survey Accessibility and Link Management***

Efforts were undertaken to ensure that the surveys were easily accessible to a wide range of participants, including transit riders, employees, and employers. Shortened survey links were created and used to simplify access to the online questionnaires. These links were distributed through multiple communication channels, including email outreach, social media platforms, flyers, and informational posters. The use of shortened links allowed participants to quickly open the surveys on their mobile devices or computers without needing to manually enter long web addresses. Response activity was also monitored to

track participation levels across the different surveys, helping identify locations or groups where additional outreach efforts were needed.

Field observations also highlighted the importance of providing multiple survey formats to accommodate different participant preferences and technological comfort levels. In some cases, transit riders had trouble scanning QR codes or using tablets, particularly individuals without smartphones or those who were less familiar with digital tools. To address this challenge and improve inclusivity, a paper version of the Spanish on-board survey was prepared to match the English version in both layout and content. Providing the survey in Spanish allowed Spanish-speaking riders to participate more easily and ensured that their perspectives were represented in the study.

### *Bus Schedule and Stop Data Preparation*

Bus schedule and stop information were systematically reviewed and updated to support the planning and implementation of the on-board survey activities. Current route schedules were obtained from the NJ TRANSIT official website and other available transit resources to ensure that the most recent weekday, Saturday, and Sunday service information was incorporated into the survey planning process. Reviewing these schedules allowed survey activities to be aligned with actual transit operations and ensured that field data collection could be conducted during active service periods.

Bus stop locations and associated information were also verified to facilitate effective field coordination. Online mapping tools were used to confirm the name, identification number, and geographic location of each bus stop along the selected routes. This information was compiled and organized for use by surveyors so that assigned stops could be easily identified and accessed during field deployment, supporting efficient and consistent data collection.

During the review process, several service updates were identified. Route 510, which was included in the survey operations during the summer data collection period, was found to no longer be in operation during the fall season. As a result, no additional survey logistics were required for that route during the fall survey period. For the remaining active routes, schedules, and travel times continued to be monitored to support the organization of survey trips and field assignments. Maintaining an updated schedule and stop information ensures that survey planning remains accurate and that data collection activities can be conducted efficiently across South Jersey and the Shore region.

### *Employer and Employee Survey Logistics*

This section describes the logistical framework used to administer and distribute the employer and employee surveys across the South Jersey and Jersey Shore study area. A structured outreach approach was developed to ensure that the surveys reached a diverse group of employers and employees representing multiple industries, employment centers, and commuting patterns. Survey distribution was carried out through a combination of digital outreach, professional networks, and direct field engagement in areas served by transit.

To establish an effective distribution network, the research team compiled and verified employer contact information using online platforms, professional networking resources, publicly available business directories, and coordination with regional partners. Collaboration with local Chambers of Commerce provided access to initial employer contacts, while coordination with the New Jersey Department of Labor expanded the outreach to more than 350 additional business contacts. These combined efforts resulted in a comprehensive employer survey distribution list representing a broad range of companies, workforce organizations, and employment sectors across the study area.

The employee survey was administered through an online platform designed to support participation using both mobile devices and desktop computers. Survey links were distributed through digital communication channels, including email outreach, professional networks, and social media platforms, allowing respondents to complete the survey at a time and location convenient to them. This approach improved accessibility and supported participation from employees with varying work schedules and locations.

To complement digital outreach, targeted field-based data collection was conducted along fourteen NJ TRANSIT bus routes serving the South Jersey and Jersey Shore region. Key corridors, transit stops, nearby streets, and major activity centers were identified and mapped to guide survey distribution efforts. Based on these locations, members of the research team conducted field visits to engage directly with employers and employees, distribute survey materials, and collect responses through in-person interactions. These combined outreach strategies expanded survey participation and supported the development of a dataset that reflects a wide range of commuting patterns and workplace transportation needs within the region.

***Employer/Employee Social Media Outreach via Social Platforms***

Social media platforms were used as a key outreach tool to promote participation in employer and employee surveys and to expand engagement across the South Jersey and Jersey Shore region. Targeted digital campaigns were implemented to reach employers and employees working in industries and geographic areas served by NJ TRANSIT bus routes, ensuring broad visibility and accessibility of the survey.

LinkedIn's Campaign Manager was used to design and manage targeted outreach campaigns focused on employers and employees within specific geographic locations. Geofencing tools were applied to direct promoted content toward key transit corridors and employment centers associated with NJ TRANSIT routes. Campaign performance was monitored using engagement metrics such as impressions, click-through rates, and interactions, and adjustments were made to content and audience targeting to improve outreach effectiveness.

Additional outreach was conducted through social media platforms, including Instagram and X, where posts provided information about the study and included direct links to the employer and employee surveys. The use of multiple platforms enabled the research team to reach a broader and more diverse audience, including professionals, employees, and community members. These coordinated social media efforts increased survey

visibility, supported broader participation, and contributed to a more representative sample of respondents across the study area.

***Regional Mapping for Survey Distribution***

Regional mapping was conducted to support the efficient distribution of surveys across the study area. Center points were generated based on the geographic distribution of the targeted facilities, allowing the study area to be organized into ten primary survey regions. Using these center points, spatial maps were developed with 5-mile and 10-mile buffer zones to clearly define the boundaries of each region. These buffer zones help identify the geographic areas where survey distribution activities will be concentrated and ensure that coverage is systematically organized across the study area. These center points were identified based on employment hotspot locations derived from NJ Business Data. After plotting the geolocations of employment centers across the study area, clusters of high employment density were identified and used to define the regional centers. The 5-mile and 10-mile buffers were then developed around these clustered locations to support efficient survey coverage and field operations.

The maps also include detailed legends that categorize the types of facilities located within each buffer zone, improving the interpretability of the mapped information. In addition, fourteen NJ TRANSIT bus routes serving the study region were incorporated and clearly labeled on the maps. Displaying these routes alongside the facility locations provides important context for understanding the relationship between transit corridors and the targeted survey locations. This information supports planning for on-board and field-based survey distribution by aligning survey efforts with bus routes and service schedules. Each region was associated with specific NJ TRANSIT bus routes to ensure coverage of all study corridors. The route distribution by region is as follows: Region 1 (Route 468); Region 2 (Route 317); Region 3 (Route 317); Region 4 (Route 317); Region 5 (Routes 317, 319, and 559); Region 6 (Routes 319 and 559); Region 7 (Route 553); Region 8 (Routes 552, 319, and 510); Region 9 (Routes 319, 502, 501, 504, 505, 552, 559, 507, and 509); and Region 10 (Route 317).

The mapped regions provide a framework for organizing field operations, including the allocation of survey personnel and transportation resources. Manpower and vehicle assignments are determined based on the number and geographic distribution of facilities within each region. Surveyors responsible for distributing surveys are provided with detailed location and contact information derived from the mapped datasets. Regional data can also be consolidated into a centralized Excel file to simplify tracking and monitoring of survey distribution activities. This structured mapping approach allows survey planners to visualize facility locations, identify logistical requirements, and coordinate field activities more effectively.

The updated mapping framework incorporates a broader range of healthcare facilities across South Jersey, expanding the geographic scope of the study. The enhanced dataset was initially filtered to include approximately 100 healthcare provider locations, which were used as the basis for planning survey distribution and manpower allocation. By integrating facility locations, regional segmentation, and transit route information, the

mapping process supports more efficient planning and targeted survey distribution throughout the study area.

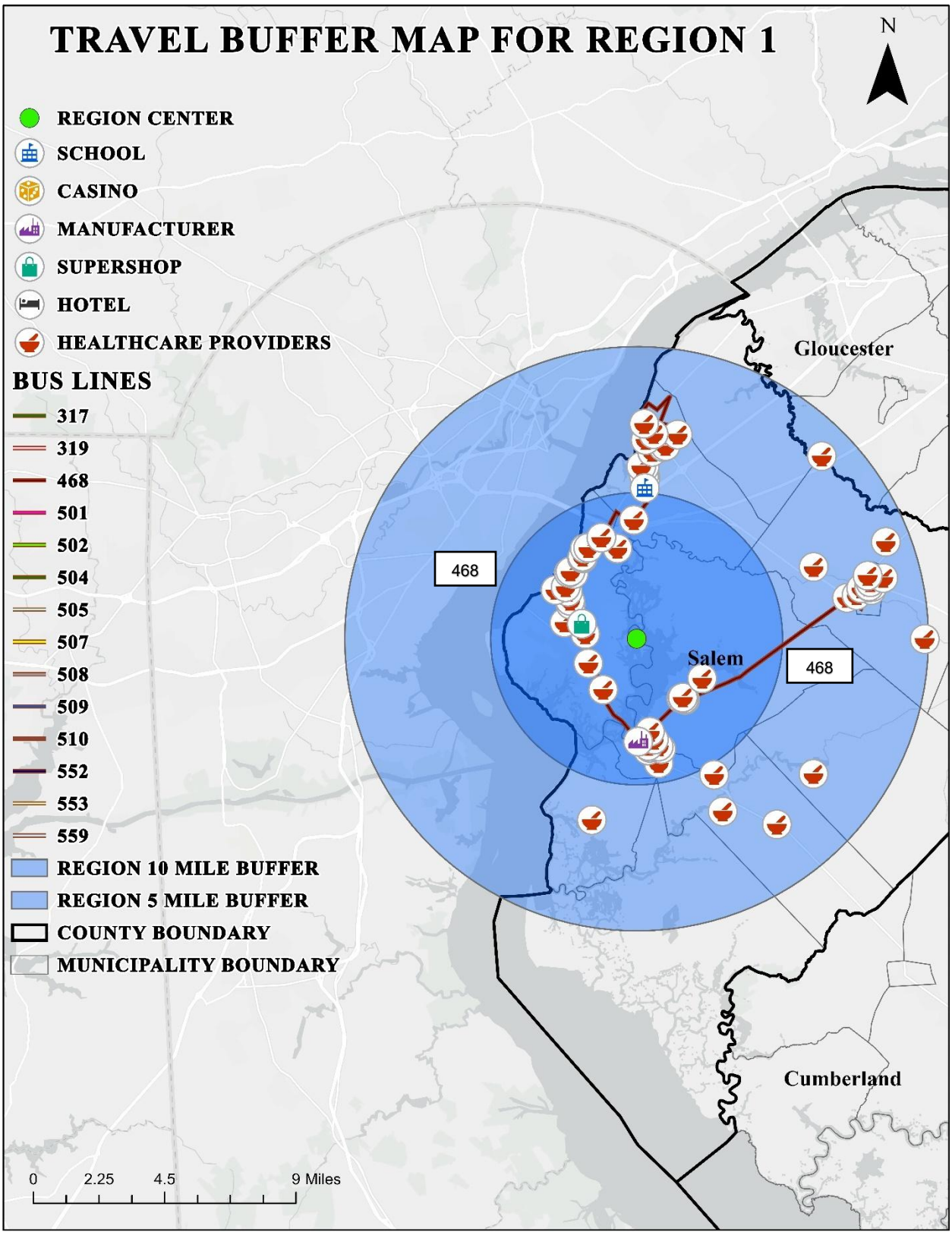



Figure 3. Travel Buffer Map for Region 1 (Salem)

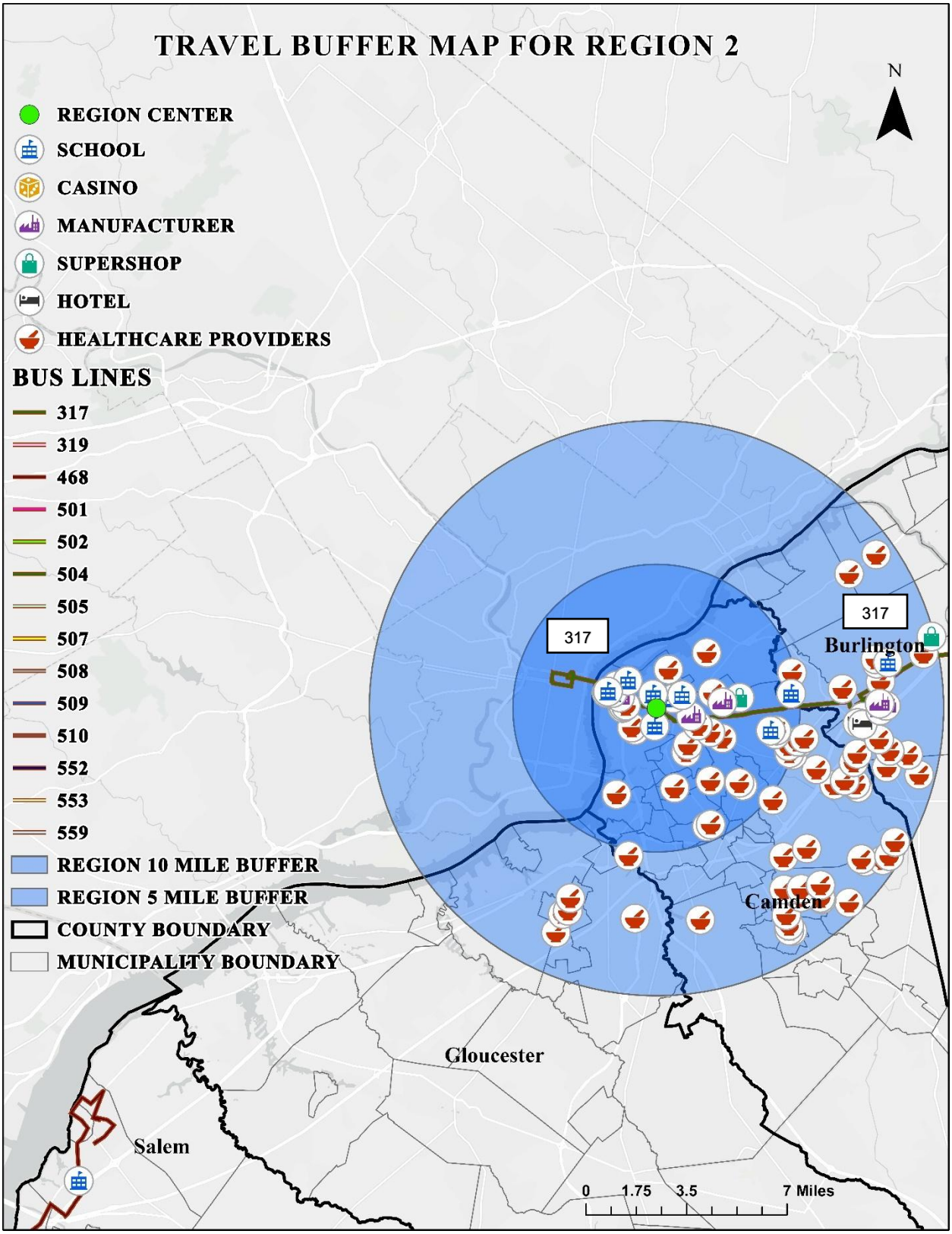



Figure 4. Travel Buffer Map for Region 2 (Burlington, Camden and Gloucester)

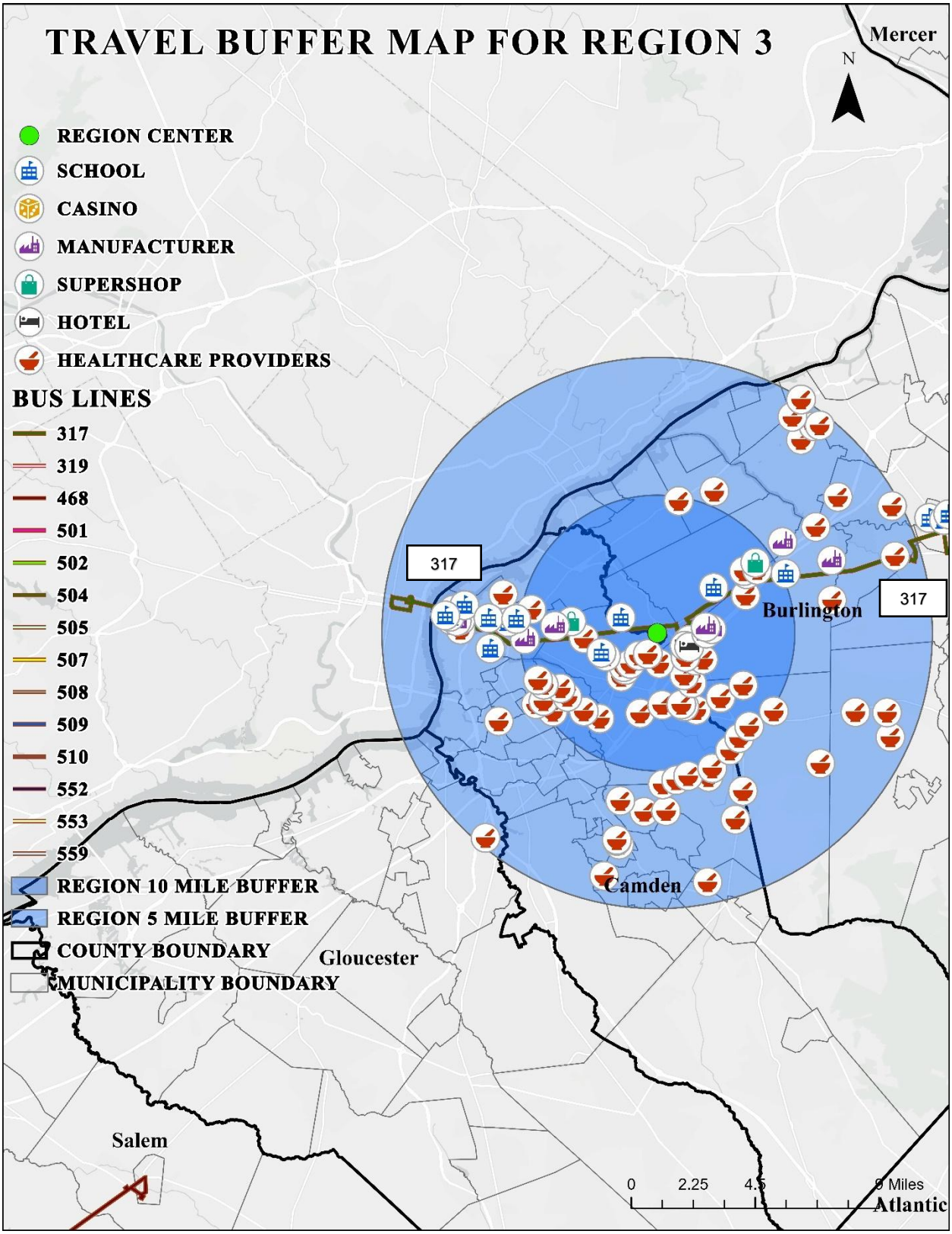



Figure 5. Travel Buffer Map for Region 3 (Burlington and Camden)

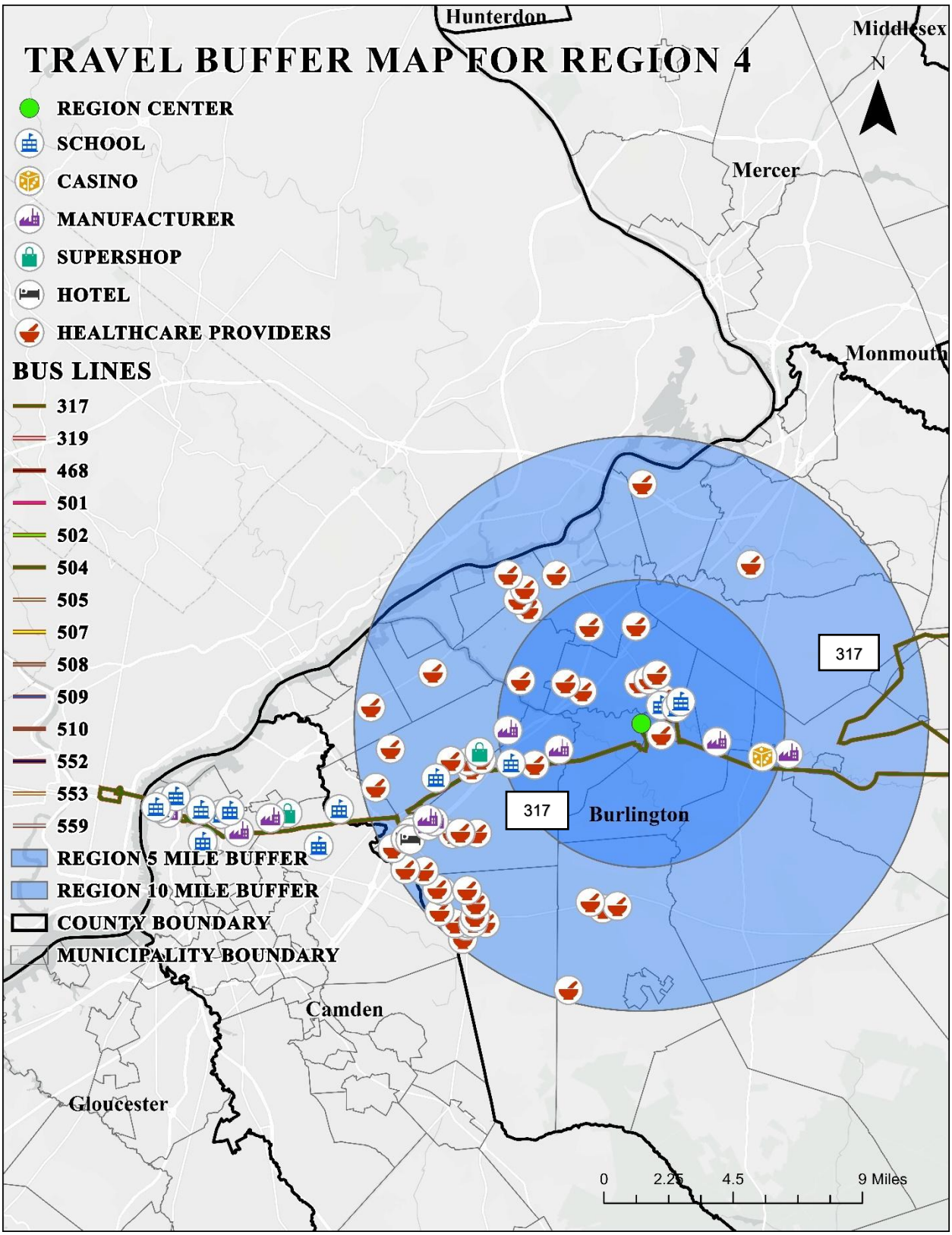



Figure 6. Travel Buffer Map for Region 4 (Burlington)

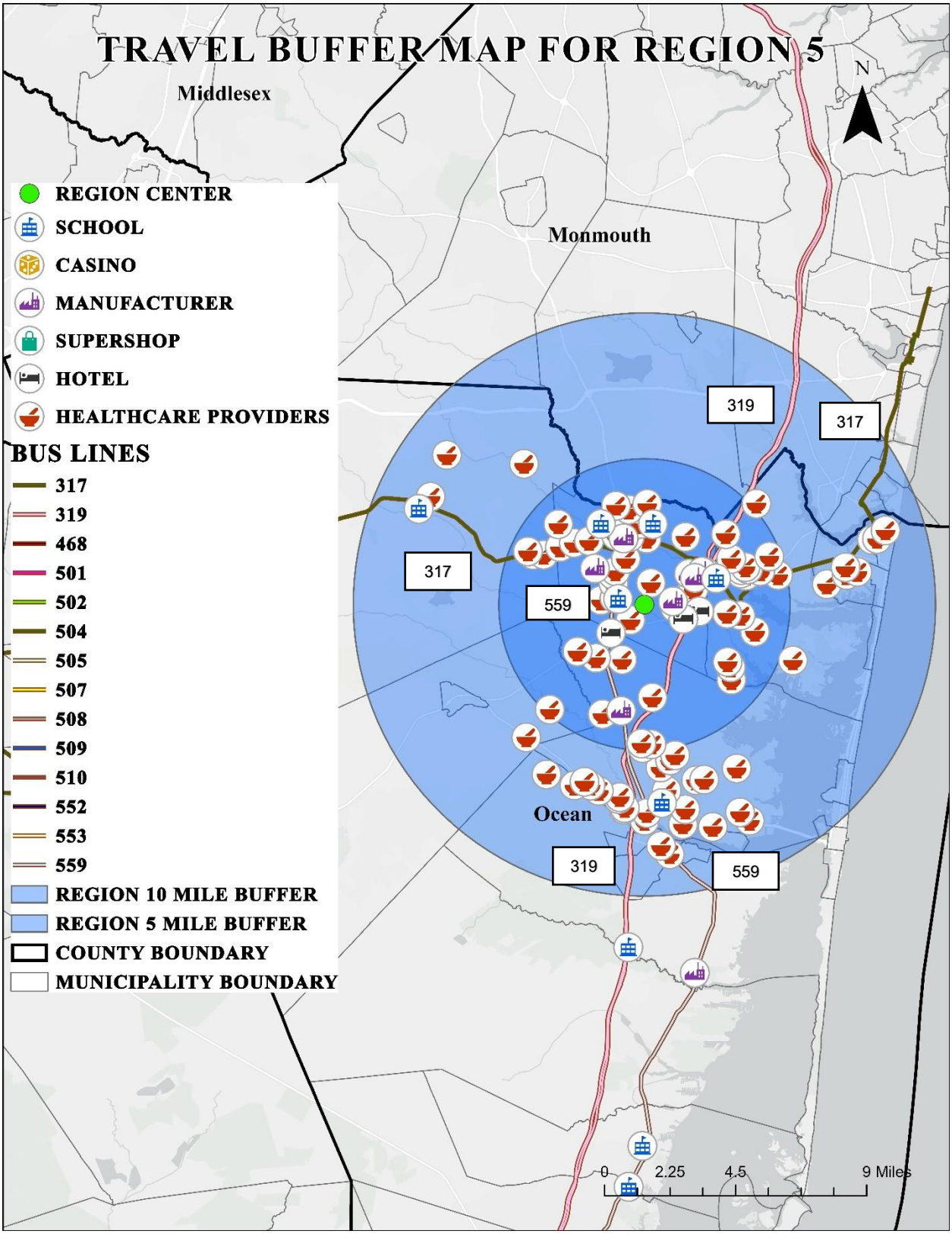



Figure 7. Travel Buffer Map for Region 5 (Ocean)

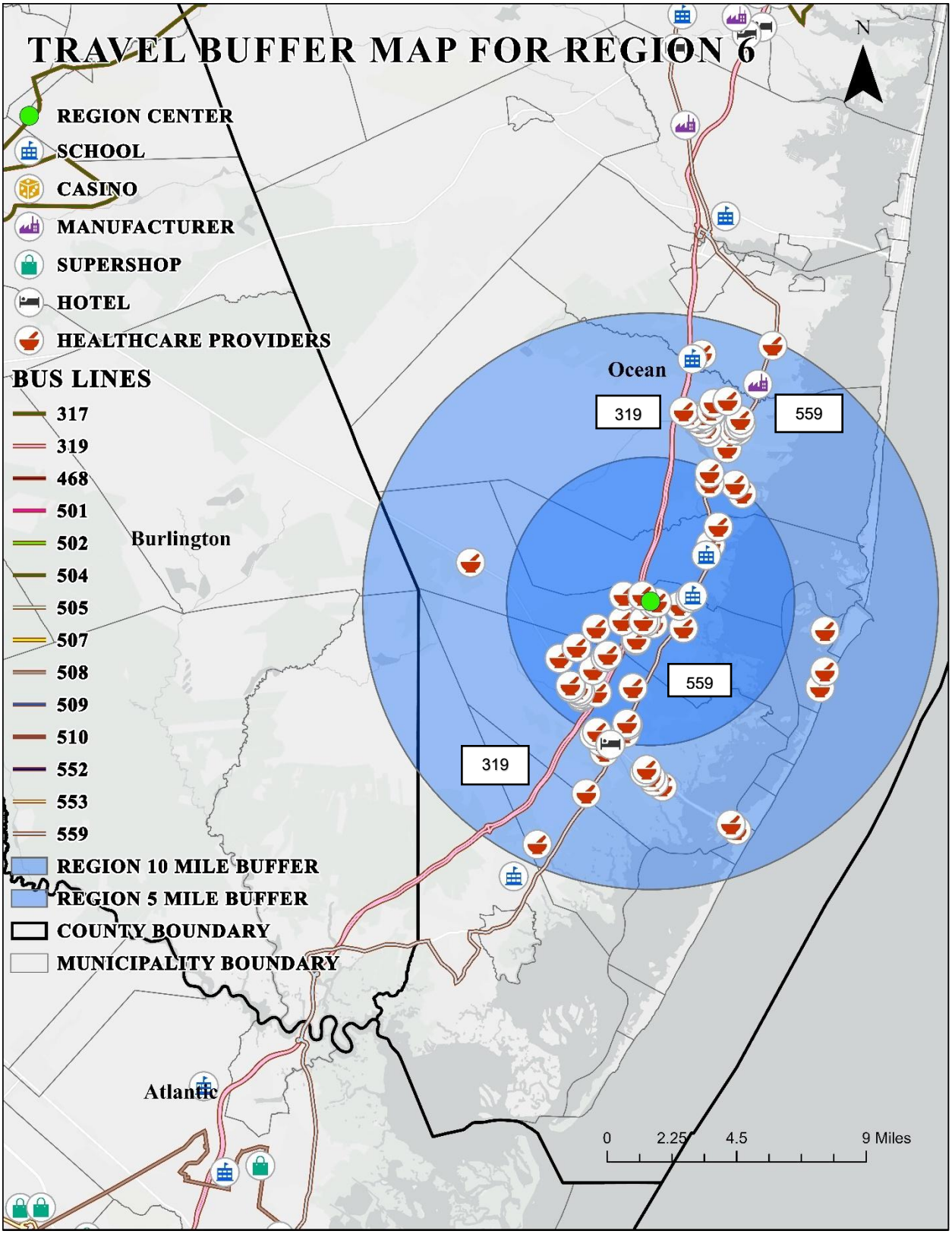



Figure 8. Travel Buffer Map for Region 6 (Ocean)

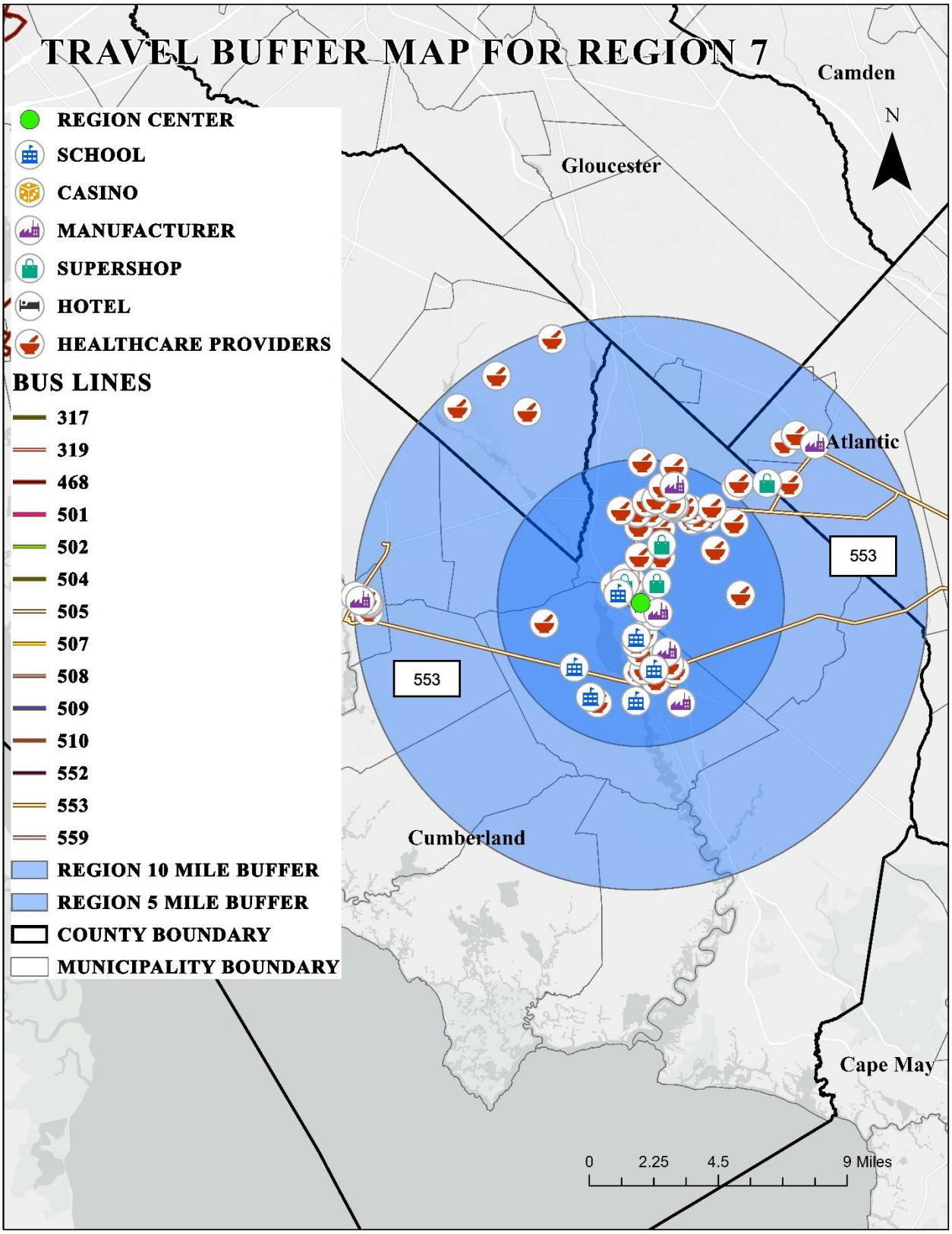



Figure 9. Travel Buffer Map for Region 7 (Atlantic and Cumberland)

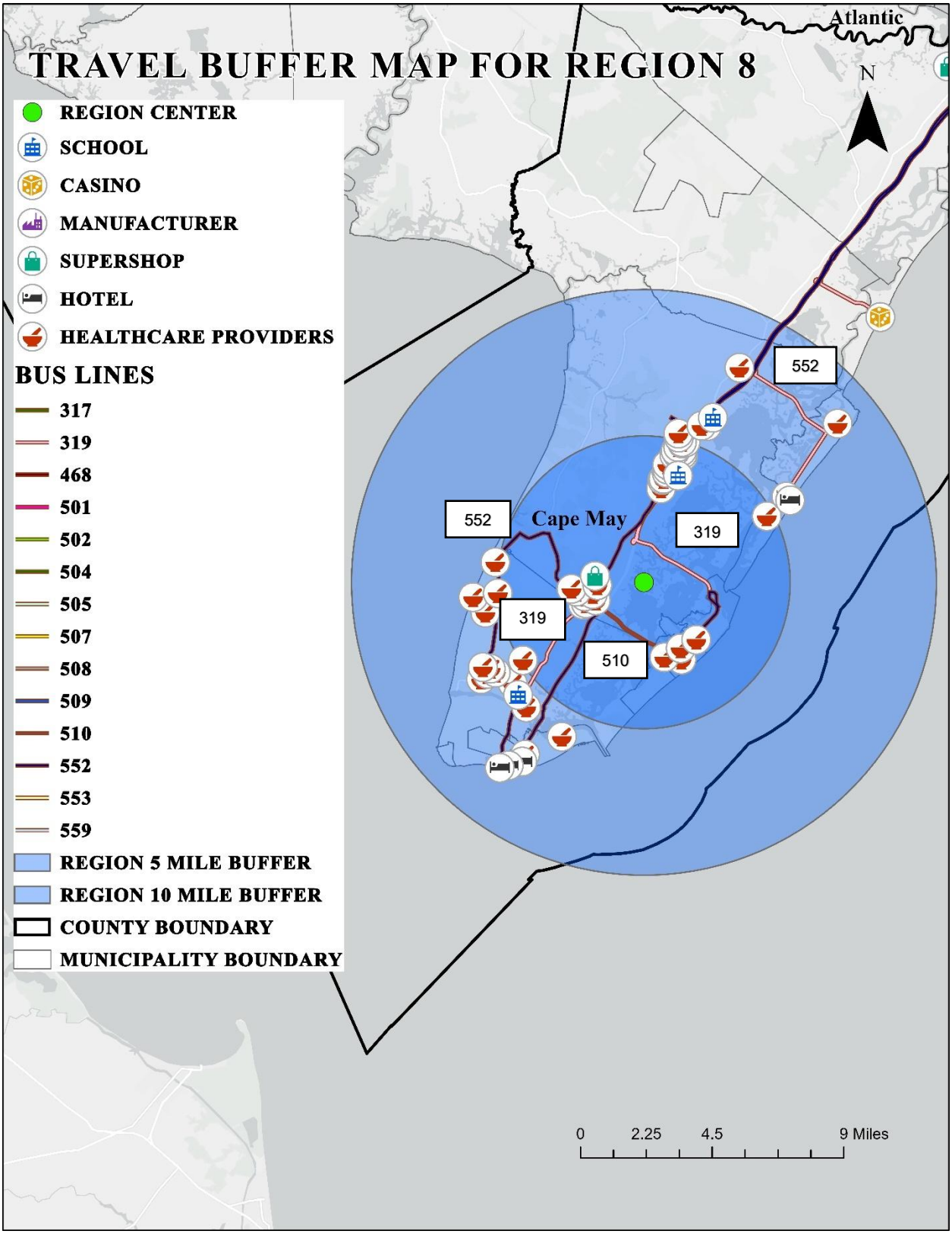



Figure 10. Travel Buffer Map for Region 8 (Cape May)

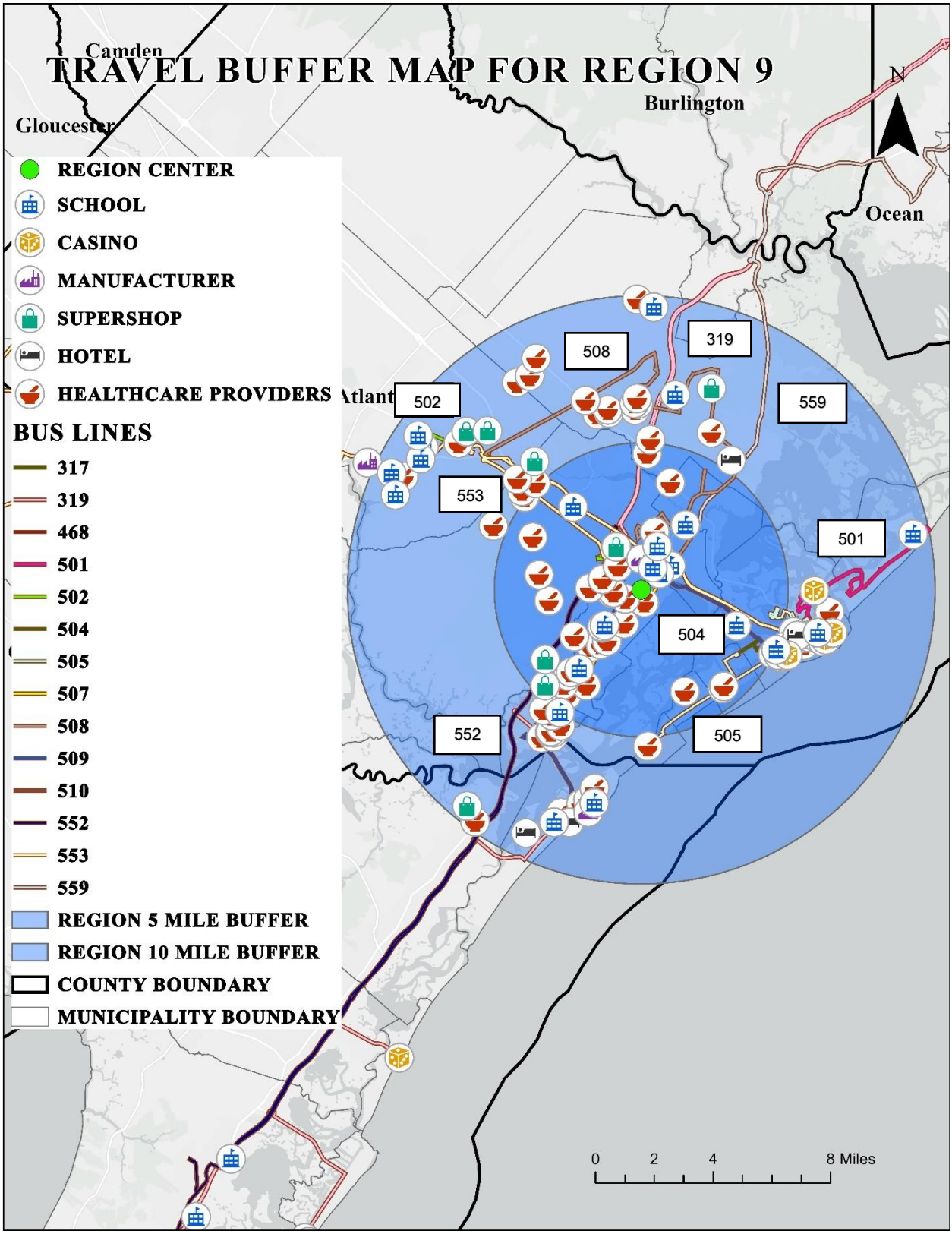



Figure 11. Travel Buffer Map for Region 9 (Atlantic and Cape May)

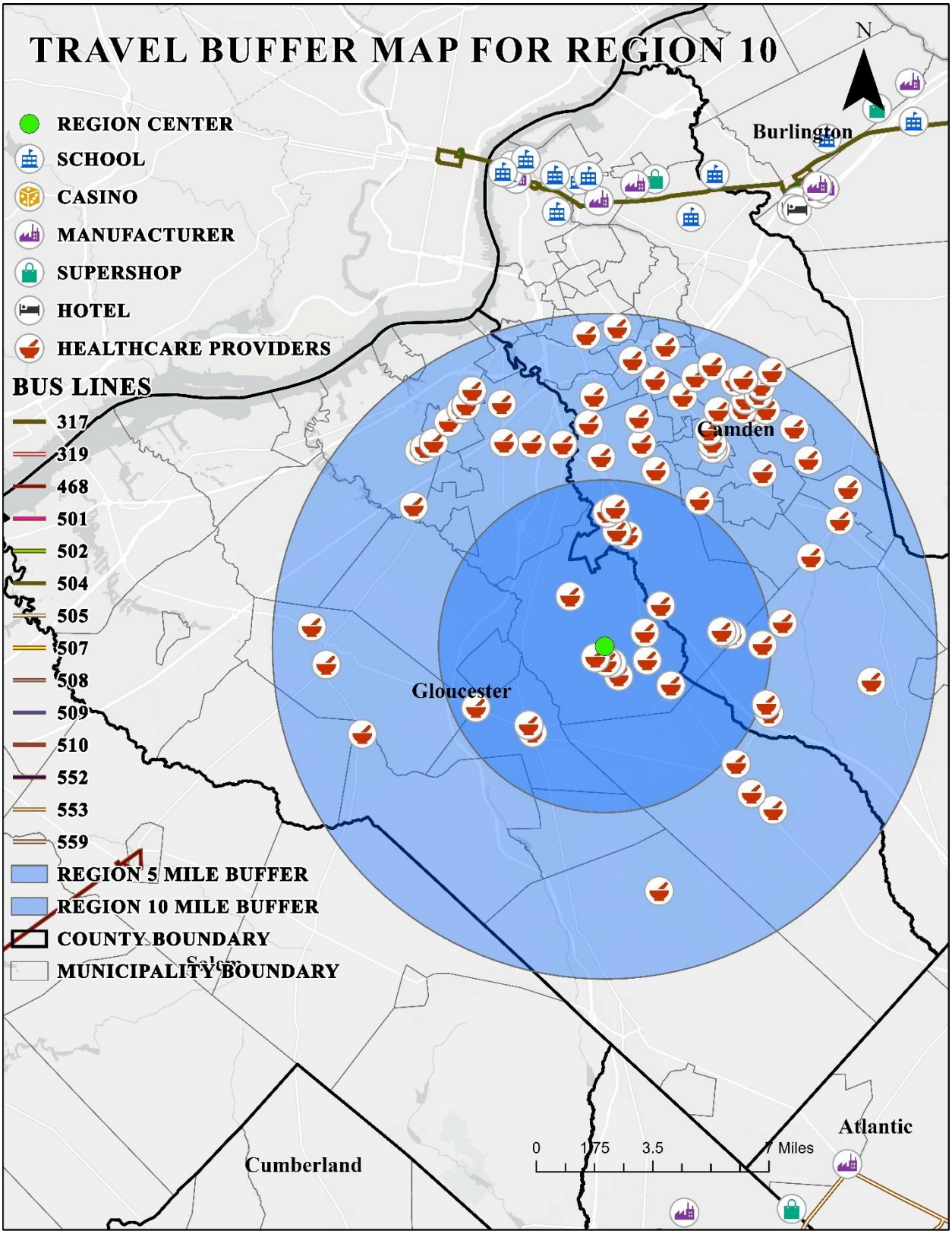



Figure 12. Travel Buffer Map for Region 10 (Gloucester and Camden)

### *Employer Location Data Sources*

To support the identification and outreach of employers along the selected NJ TRANSIT bus corridors, the research team utilized multiple data sources to develop a comprehensive database of businesses and employment centers within the study area. Two primary datasets were explored to better understand the regional employment landscape and identify potential employers whose workforce may rely on transit services. First, the Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) dataset was used to analyze employment distribution and commuting patterns across the region. [16] This dataset, maintained by the U.S. Census Bureau, integrates administrative employment records with census data to provide detailed information on where workers live and work. The LODES data allowed the team to identify high-density employment areas and major job clusters located near the NJ TRANSIT bus routes included in the study. In addition, the team utilized US Business Data (USBizData.com), a comprehensive business directory containing information on company size, industry classification, geographic location, and contact details. [17] This dataset helped verify the presence of major employers and enabled the development of a targeted list of businesses operating near the selected transit corridors. By combining insights from these datasets, the team was able to identify key employment hubs and establish a reliable foundation for employer outreach and survey distribution efforts within South Jersey and the Shore region.

### *Vendor Data Acquisitions*

Vendor evaluation and data acquisition activities were conducted to identify suitable datasets for analysis within the study area. Several vendors were contacted, including DataAxle and Maptitude, to request pricing information and sample datasets. DataAxle provided a sample dataset that was successfully integrated into ArcGIS Pro for preliminary testing and evaluation. However, due to budget constraints, alternative data sources were explored. Subsequently, Econsult Solutions Inc. provided a comprehensive dataset for healthcare providers covering the eight counties of South Jersey. This dataset included a wide geographic coverage of the region and was prepared for further spatial analysis using ArcGIS Pro.

Following data acquisition, the dataset was reviewed and filtered to support regional analysis. The dataset contained two types of healthcare provider entries: organization-based providers and individual practitioners. Cross-referencing with Google Maps confirmed that the individual-based entries represented independent healthcare practitioners, making them the primary focus for analysis. The dataset was then segmented by region, and the number of records within each category, individual providers, and total providers was documented to support subsequent analysis and mapping activities, as summarized in Table 1.

Table 1 - Comparison of Records from Datasets Based on 10 Survey Regions in the Study Area

| Region | Records individual | Records total |
|---|---|---|
| 1 | 310 | 569 |
| 2 | 13,898 | 18,126 |
| 3 | 15,638 | 20,688 |
| 4 | 10,899 | 13,234 |
| 5 | 6,856 | 9,824 |
| 6 | 988 | 1,438 |
| 7 | 1,714 | 2,522 |
| 8 | 785 | 1,142 |
| 9 | 3,587 | 5,034 |
| 10 | 6,328 | 9,090 |
| **Total** | **61,003** | **81,667** |

Given the large volume of data, the team decided to select 100 random records per region to ensure a manageable yet representative sample for mapping and analysis. Random selection was used to automate the random selection process. These 100 healthcare provider locations per region were then mapped in ArcGIS Pro, allowing for a clear visualization of their distribution across different areas.

# CHAPTER 4: CONDUCT SURVEYS: ON-BOARD BUS RIDER SURVEY AND EMPLOYEE AND EMPLOYER SURVEY

## Introduction

The on-board bus rider survey was conducted to gather detailed information on travel behavior, transit usage, and rider characteristics across the South Jersey and Shore region. Data collection for the survey was carried out over multiple seasons to capture variations in ridership patterns throughout the year. Survey responses collected from mid-May through June 20 were categorized as the spring dataset, while responses gathered from June 21 through August were classified as summer data. Data collection activities continued from September through December to develop the fall dataset.

Survey administration was conducted using both paper-based and digital survey formats to maximize participation and accessibility. Surveyors traveled along selected NJ TRANSIT bus routes and engaged directly with riders to distribute and collect surveys. This approach allowed the study to reach passengers across different routes, service times, and geographic locations within the study area.

The on-board survey remained a central component of the data collection effort. Surveyors visited routes regularly to gather responses and to improve participation on routes where response rates were initially lower. Survey distribution was coordinated with bus schedules and service operations to ensure that data collection occurred during active service periods.

During the study, some service changes were observed. For example, Route 510 operated as a seasonal summer-only service and was active during the early phase of data collection. As a result, surveys conducted along this route were limited to the earlier data collection period, and no additional surveys were administered during the fall data collection phase when the route was not in service. Data collection activities across the remaining routes continued throughout the fall season to support the development of a comprehensive dataset representing transit riders across the South Jersey and Shore region.

## Data Collection Periods

To capture potential seasonal variations in transit usage and commuting behavior, the survey data collection process was organized into three distinct phases: spring, summer, and fall. Due to the limited sample size of the spring dataset, as data collection began in mid-May, the survey data was analyzed in a combined format across all seasons to ensure statistical reliability. However, seasonal variations, including route-level distributions and weekday versus weekend patterns, are presented in Appendix E to provide additional context on temporal differences in survey responses. This approach allowed the study to account for differences in travel patterns that may occur due to changes in weather conditions, employment cycles, and transit service operations throughout the year.

The spring data collection phase included all survey responses collected from mid-May through June 20. This period marked the initial stage of survey implementation, during which on-board surveys were administered to transit riders, and outreach efforts began for employer and employee participation. The responses collected during this phase provided early insights into commuting behavior, transit usage patterns, and rider characteristics during the late spring period.

The summer data collection phase extended from June 21 through August. During this period, survey distribution continued across the selected NJ TRANSIT routes and through employer and employee outreach activities. Summer data collection allowed the study to capture travel behavior during a period when seasonal employment, tourism activity, and changing work schedules may influence transit use in the South Jersey and Shore region. Route 510 was operational during this phase, and survey responses were collected along this corridor as part of the overall dataset.

The fall data collection phase covered survey responses gathered from September through December. During this period, survey efforts continued across the remaining active NJ TRANSIT routes and through ongoing employer and employee outreach. Some service changes were observed during this phase, including the discontinuation of Route 510, and therefore, no additional surveys were conducted along that route after the summer period. The fall dataset provides additional insights into transit usage patterns as travel behavior transitions from summer seasonal activity toward more regular commuting patterns later in the year.

**Survey Methods**

Survey data collection was conducted using a mixed-method approach that included on-board rider surveys as well as employer and employee surveys. This approach allowed the study to gather information from transit users, workers, and businesses across the South Jersey and Shore region while accommodating different participation preferences. For the on-board rider survey, responses were collected directly from passengers traveling on selected NJ TRANSIT bus routes. Surveyors administered paper questionnaires during bus trips and provided flyers containing QR codes and shortened survey links for riders who preferred to complete the survey digitally. Tablets equipped with the Qualtrics application were also used to record responses electronically during field interactions. Conducting surveys directly on board allowed surveyors to engage with passengers during their trips and collect real-time feedback regarding their travel behavior and transit experiences. The employer and employee surveys were primarily distributed through direct outreach to businesses and workplaces within the study area. Contact lists developed through regional organizations and business directories were used to share survey invitations and informational materials. In addition, field visits were conducted in selected employment areas where survey materials were distributed to encourage participation. Using both in-person and digital survey options allowed participants to respond in the format most convenient for them. This mixed-method strategy helped ensure broader participation and supported the collection of responses from a diverse range of transit riders, employees, and employers throughout the study region. Table 2 shows different survey methods.

Table 2 - Different Survey Methods Were Used to Conduct the Three Surveys

| Survey | Methods |
|---|---|
| Onboard Survey | Paper Survey |
| | Flyers |
| | Tablet/Qualtrics |
| Employee Survey | Flyers |
| | Emails |
| | Qualtric/Tablet |
| Employer Survey | Emails/Social |
| | Flyers |

## Survey Outcomes

### *On-Board Survey*

A total of 983 on-board passenger surveys were completed across fourteen NJ TRANSIT bus routes serving the South Jersey and Shore region. Data collection was conducted across three seasonal phases, spring, summer, and fall, and included both weekday and weekend survey periods to capture potential variations in ridership patterns throughout the year. Following data cleaning and validation, which involved removing records with missing route identifiers, blank entries, and irrelevant route inputs, a total of 933 surveys were retained for route-level, seasonal, and weekday–weekend analysis.

The seasonal distribution of the cleaned dataset shows clear variation in response levels. Spring data collection yielded the lowest number of responses (64), largely due to the limited data collection timeframe. In contrast, summer data collection produced a substantial increase (423 responses), while fall generated the highest number of responses (446), reflecting stronger ridership and survey coverage during these periods. This pattern highlights the limitations of Spring Data for standalone analysis and reinforces the importance of combining all seasons to obtain a more balanced and representative dataset.

At the route level, survey participation was distributed across all fourteen routes, with variation in response volumes reflecting differences in service usage. Route 553 recorded the highest number of survey responses (145), followed by Route 317 (118) and Route 319 (84), while routes such as 552 (71), 502 (68), and 504 (66) also showed relatively higher participation. Moderate response levels were observed on Routes 468, 501, 505, 507, 559, 508, and 509, and Route 510 recorded the lowest number of responses (9), consistent with its seasonal summer-only operation. These differences in survey responses align with observed ridership patterns across the routes. Routes with higher average ridership, such as Route 505 (approximately 2,400–2,800 weekday riders), Route 553 (approximately 1,900–2,100 weekday riders), and Route 319 (approximately 1,400–2,100 weekday riders), also exhibited higher survey participation, reflecting greater

passenger volumes during data collection. In contrast, Route 510, which operates as a seasonal summer-only service, recorded comparatively lower ridership levels (approximately 80–110 riders on weekends), corresponding to the lower number of responses collected. Overall, the distribution of survey responses is consistent with average weekday and weekend ridership trends across the study routes. A more detailed comparison of ridership and survey distribution, including seasonal and weekday–weekend variations, is presented in the Data Analysis chapter.

Across all routes, weekday surveys accounted for the majority of responses (706), reflecting a stronger emphasis on capturing routine travel patterns such as commuting, shopping, and personal business trips. Weekend surveys (227) provided complementary insights into non-work-related travel behavior. Overall, the survey achieved comprehensive coverage across the selected transit routes and provides a robust dataset for analyzing rider travel behavior, route usage patterns, and seasonal variations in transit demand throughout the South Jersey and Shore region.

For additional details on route-level distributions, including seasonal variations and weekday versus weekend survey counts, please refer to Table 3 for the summarized breakdown of the 933 cleaned survey records, while Appendix E provides the detailed graphs and visualizations supporting these results. See Appendix D for more information on responses based on specific routes.

Table 3 - On-Board Bus Survey Summary for All Routes and Methods

| Routes | Spring | | Summer | | Fall | | Total |
|---|---|---|---|---|---|---|---|
| | Weekday | Weekend | Weekday | Weekend | Weekday | Weekend | |
| **317** | 18 | 3 | 57 | 4 | 19 | 17 | **118** |
| **319** | 7 | 2 | 50 | 2 | 19 | 4 | **84** |
| **468** | 4 | 1 | 18 | 8 | 16 | 14 | **61** |
| **501** | 5 | 2 | 25 | 0 | 12 | 14 | **58** |
| **502** | 4 | 0 | 10 | 0 | 32 | 22 | **68** |
| **504** | 0 | 6 | 23 | 1 | 19 | 17 | **66** |
| **505** | 0 | 0 | 24 | 4 | 25 | 2 | **55** |
| **507** | 0 | 0 | 21 | 4 | 23 | 7 | **55** |
| **508** | 0 | 0 | 12 | 4 | 18 | 12 | **46** |
| **509** | 2 | 0 | 13 | 0 | 16 | 13 | **44** |
| **510** | 0 | 0 | 9 | 0 | 0 | 0 | **9** |
| **552** | 1 | 0 | 29 | 3 | 31 | 7 | **71** |
| **553** | 2 | 7 | 66 | 14 | 28 | 28 | **145** |
| **559** | 0 | 0 | 21 | 1 | 27 | 4 | **53** |
| **Total** | **43** | **21** | **378** | **45** | **285** | **161** | **933** |

***Employee/Employer Survey***

Survey responses were collected through a combination of in-person outreach, email communication, and digital engagement. The research team conducted field-based outreach in several locations within the study area to engage directly with employees and employers. Data collection activities took place in locations such as Atlantic City, Salem Downtown, Woodstown Center, and Camden. Surveyors interacted with employees and employers at these locations, distributed informational flyers containing QR codes and short survey links, and collected responses using tablets during in-person conversations.

Email outreach was also used to distribute the surveys to employers and workforce organizations. Contacts obtained through local Chambers of Commerce were used to share survey information with employers across the region. Emails containing links to both the employer and employee surveys were distributed to these contacts, providing organizations with the opportunity to participate and share the survey with their networks. Several organizations agreed to distribute the survey through their internal communications and newsletters, allowing the study team to reach additional employees and employees. Tables 4 and 5 summarize the number of responses received through the data collection process during the employee/employer survey.

Table 4 - Employer Survey Response Summary

| Employer Social/Email Responded | Employer Flyer Responded | Total Employer Responded |
|---|---|---|
| 7 | 10 | **17** |

Table 5 - Employee Survey Response Summary

| Employee In-Person (Tablet-Assisted) Responses | Employee Email Responded | Employee Flyer Responded | Total Employee Responded |
|---|---|---|---|
| 75 | 3 | 70 | **148** |

**Challenges From Survey Distribution: On-Board Survey**

Several operational challenges were encountered during the administration of the on-board bus rider surveys. These challenges are consistent with issues commonly reported in transit passenger surveys and field-based data collection efforts.

***Transit Service Delays and Operational Variability***

One of the primary challenges involved service delays and unexpected operational changes on several NJ TRANSIT routes. Variations in bus arrival times, schedule adjustments, and occasional mechanical issues made it difficult for surveyors to follow predetermined field schedules. These disruptions occasionally resulted in missed buses

or reduced time available for survey distribution during certain trips. Previous studies have noted that variability in transit service reliability can affect field survey operations and reduce opportunities for consistent passenger engagement. (10)

### *Driver Cooperation and Access Constraints*

Another challenge involved limited cooperation from some bus operators when surveyors attempted to board buses to administer surveys. Although official authorization letters were presented, some drivers expressed concerns about potential disruptions to service operations or passenger movement within the vehicle. Similar issues have been documented in transit passenger survey implementations, where operator concerns and operational priorities can occasionally limit surveyor access to vehicles. (11)

### *Passenger Participation and Survey Fatigue*

Passenger participation also presented challenges during data collection. Some riders were reluctant to participate due to time constraints, lack of interest, or privacy concerns. Additionally, several riders indicated that they had already completed the survey during earlier outreach rounds and therefore declined to participate again. This phenomenon, commonly referred to as survey fatigue, occurs when respondents become less willing to participate after repeated exposure to similar survey requests. (12)

### *Limitations of Real-Time Transit Tracking Tools*

Survey coordination was further complicated by inconsistencies in real-time bus tracking applications. In some cases, the bus locations and arrival times displayed in the NJ TRANSIT tracking system did not align with the actual vehicle movements. This discrepancy created difficulties in scheduling surveyor boarding times and occasionally resulted in missed opportunities for on-board data collection. Similar limitations in real-time transit information systems have been identified in studies evaluating the accuracy of transit tracking technologies. (10)

### *Low Response from Mail-Based Surveys*

BRM surveys were also used to provide passengers with an option to return complete questionnaires by mail. However, response rates through this method were lower than anticipated. Research in survey methodology indicates that passive survey return methods, such as mail-back questionnaires, generally produce lower response rates compared with in-person survey administration. (5)

## Challenges From Survey Distribution: Employee/Employer Survey

The team faced several challenges while collecting responses for the employee and employer surveys. It was often difficult to find people willing or available to take the survey, especially during work hours when most employees and business owners were busy. Many of them also rely on their own cars instead of public transit, which made them less interested in participating in a bus-related survey. As a result, getting additional responses was difficult, with many potential participants already having completed the survey or showing little interest. Email response rates were also lower than expected, as many messages went unopened or were ignored, and flyer-based participation through QR

codes remained limited. These challenges have made it clear that reaching new and interested participants will require stronger outreach efforts, such as using more targeted online campaigns, incentives, and community partnerships to encourage greater participation.

***Limited Availability of Employees and Employers During Work Hours***

One of the primary difficulties involved identifying individuals who were available and willing to participate in the survey during outreach activities. Many employees and business owners approached during field outreach were engaged in their work responsibilities and were unable to allocate time to complete the survey. Workplace constraints and time limitations are widely recognized barriers to participation in survey research, particularly when respondents are contacted during business hours. [5] Studies on workplace surveys indicate that employees are less likely to respond when participation interferes with job responsibilities or productivity.

***Reliance on Personal Vehicles and Limited Interest in Transit Surveys***

Another challenge was related to the commuting behavior of many employees and employers in the study area. A large share of individuals contacted indicated that they rely primarily on personal vehicles rather than public transit services. As a result, some individuals perceived the survey as less relevant to their travel behavior and were less motivated to participate. Previous transportation research has shown that individuals who do not use transit are less likely to participate in surveys focused on transit usage or mobility services. [6] This bias toward respondents who already use transit is a common limitation in transit-related surveys.

***Declining Response Rates and Survey Saturation***

As outreach efforts continued, the research team observed declining response rates in several locations and networks. Some individuals reported that they had already completed the survey during earlier outreach activities. This phenomenon is often referred to as survey saturation or survey fatigue, where repeated exposure to surveys within the same population reduces the likelihood of additional participation. [7] Survey fatigue is particularly common in communities where multiple outreach campaigns occur over a relatively short period.

***Low Email Response Rates***

Email-based survey distribution also produced lower-than-anticipated response rates. Many of the distributed messages remained unopened or were overlooked by recipients. Research in survey methodology has consistently shown that email invitations often suffer from low response rates due to factors such as information overload, spam filtering, and lack of perceived relevance. [8] In many cases, recipients ignore survey invitations unless the request comes from a trusted organization or includes incentives for participation.

***Limited Participation Through QR Code Flyers***

Participation through QR codes distributed on flyers was also limited. Although QR codes offer convenient access to online surveys, several studies have found that respondents are less likely to engage with QR-based survey links without direct encouragement or

context explaining the survey purpose. [9] Passive survey recruitment methods, such as posters and flyers, typically produce lower response rates compared to direct engagement or personalized invitations.

# CHAPTER 5: DATA ENTRY, CLEANING, AND WEIGHTING

## Introduction

To ensure the quality and reliability of the collected survey data, a structured process of data entry, cleaning, and weighting was conducted following the completion of the survey distribution phase. All responses collected through paper-based surveys during the on-board rider, employer, and employee surveys were systematically entered into the Qualtrics digital platform so that both paper and online responses could be consolidated into a single standardized database.

After the data entry process was completed, the dataset underwent a comprehensive cleaning procedure to verify accuracy and consistency across all survey responses. This process involved reviewing records for incomplete entries, duplicate responses, and formatting inconsistencies, as well as standardizing variables across the different survey instruments. These steps helped ensure that the data set remained reliable and suitable for further analysis.

In addition, weighting procedures were considered to account for variations in response rates across different routes, geographic areas, and respondent groups. However, no weight adjustments were applied in the final analysis, as the number of responses collected was determined to be sufficient and adequately representative across the study area. This approach ensures that the survey results reflect the observed data without introducing additional assumptions through weighting. Together, these processes establish a well-organized and consistent dataset that supports the analytical stages of the study

## Survey Transferring to Qualtrics

Following the completion of field data collection, survey responses recorded on paper forms were systematically transferred into the Qualtrics data management platform to create a centralized and standardized digital dataset. Responses collected from the on-board rider, employer, and employee surveys were entered manually to ensure that all information gathered during field activities was accurately captured within the digital system.

To maintain consistency with the established data collection framework, the dataset was organized according to the seasonal survey periods: spring, summer, and fall. Maintaining this separation allows for clear comparison of responses across different time periods and supports the analysis of potential seasonal variations in transit usage and travel behavior. Paper surveys collected from field surveyors were gathered on a regular basis and securely stored before being entered into the system to maintain data integrity and confidentiality.

During the data transfer process, each response was carefully reviewed to ensure accuracy and completeness. Entries were checked for typographical errors, inconsistencies, and incomplete responses, and records requiring clarification were flagged for further review. In addition, the dataset was categorized based on weekday

and weekend responses to facilitate the analysis of potential differences in travel patterns between service days.

Following data entry, initial cleaning steps were performed to address missing or irrelevant values and ensure consistency across all survey variables. The dataset was then prepared for subsequent weighting and analysis, providing a structured and reliable foundation for evaluating travel behaviors and transit service conditions across the study area.

**Data Cleaning and Weighting**

Following the completion of data entry, the survey dataset underwent a detailed cleaning and preparation process to ensure accuracy, consistency, and reliability. Responses collected from different sources, including paper surveys, online submissions, and tablet-based entries, were consolidated into a single dataset and carefully reviewed. During this process, records were examined to identify and correct inconsistencies, remove duplicate entries, and address missing or null (NaN) values. These steps helped ensure that only valid and complete responses were retained for analysis and that all survey records followed a consistent format.

To support more detailed analysis, responses from multiple-choice questions were restructured by separating them into individual variables. This approach allows for clearer interpretation of participant preferences, travel behaviors, and service perceptions across different routes and geographic areas. Standardizing the dataset in this manner also improves compatibility with statistical analysis tools and facilitates more efficient data processing.

In addition to cleaning and restructuring the dataset, weighting procedures were evaluated to address potential sampling imbalances and improve the representativeness of the survey results. However, no weighting adjustments were applied to the final dataset. The on-board survey data were analyzed in a combined format across all routes, time periods, and days of the week without applying separate weights for weekday versus weekend or seasonal (spring, summer, and fall) data. Similarly, the employer and employee survey datasets were analyzed independently and were not weighted. This decision was based on the overall sample size and distribution of responses, which were determined to provide sufficient coverage across the study area without requiring additional weighting adjustments. These considerations ensure that the dataset reflects observed conditions without introducing additional assumptions through weighting.

# CHAPTER 6: DATA ANALYSIS

## Introduction

Following the completion of data entry, cleaning, and weighting procedures, the project moved into the initial phase of data analysis. The analysis began with the survey responses collected from on-board bus riders and focused on identifying key patterns in rider characteristics, travel behavior, and transit experiences across the South Jersey and Shore regions. Using the cleaned and verified data set, the analysis explored demographic attributes of transit users, including age groups, household income levels, employment status, and primary trip purposes, to better understand the profile of riders utilizing NJ TRANSIT bus services.

The analysis also examined commonly reported travel challenges experienced by passengers. Responses were reviewed to identify recurring concerns related to service reliability, travel time, route coverage, and accessibility. Understanding these challenges provides important insights into how current transit services meet rider needs and where potential improvements may be required.

In addition, employment-related information collected through the survey was analyzed to examine the relationship between transit availability and access to workplaces. This includes assessing how bus services support commuting patterns, work schedules, and access to employment opportunities within the region.

To support these analyses, geospatial and statistical tools were used to explore ridership patterns and spatial relationships across different routes and locations. Mapping and visualization techniques were applied to better understand how transit usage varies geographically and to identify potential areas where service improvements could enhance accessibility. These initial analyses provide the foundation for more detailed statistical and spatial evaluations that will support the development of recommendations for improving transit services across South Jersey and the Shore region.

## Survey Results

The Employee and Employer Surveys have 148 employee responses and 17 employer responses as of the final reporting period. Summary findings from the employee and employer surveys are outlined in the analysis of the following sections. It gives an overview of who the participants are, how they travel, and the challenges they face.

The On-Board Bus Surveys received 983 responses, which have been analyzed to give detailed insight into trip characteristics, satisfaction with current transit services, and travel behavior.

***On-Board Bus Survey***

After continuing focus on the on-board bus rider survey, including additional weekly efforts to improve response rates, particularly for routes with lower participation, a total of 983 responses were collected, representing the overall survey sample. These results have been analyzed to provide detailed insight into trip characteristics, satisfaction with current transit services, and travel behavior. For analyses that require route-level segmentation and weekday–weekend breakdowns, a cleaned subset of 933 surveys was used after removing records with missing or inconsistent route and temporal information, and this distinction is noted where applicable throughout this section.

On-Board Bus Survey: Route-Based Responses

From the surveys conducted, Route 553 received the highest share of responses (145), followed by Route 317 (118) and Route 319 (84). These high-response routes likely reflect higher ridership levels, strong surveyor coverage, or variance resulting in more successful survey engagement during the data collection process.

In contrast, routes such as 508, 509, and 510 recorded fewer responses, indicating either lower passenger volumes, reduced surveyor access, or less engagement from riders along those corridors. Mid-range response levels were observed on routes 468, 501, 502, 504, and 552, suggesting moderate participation and steady field coverage.

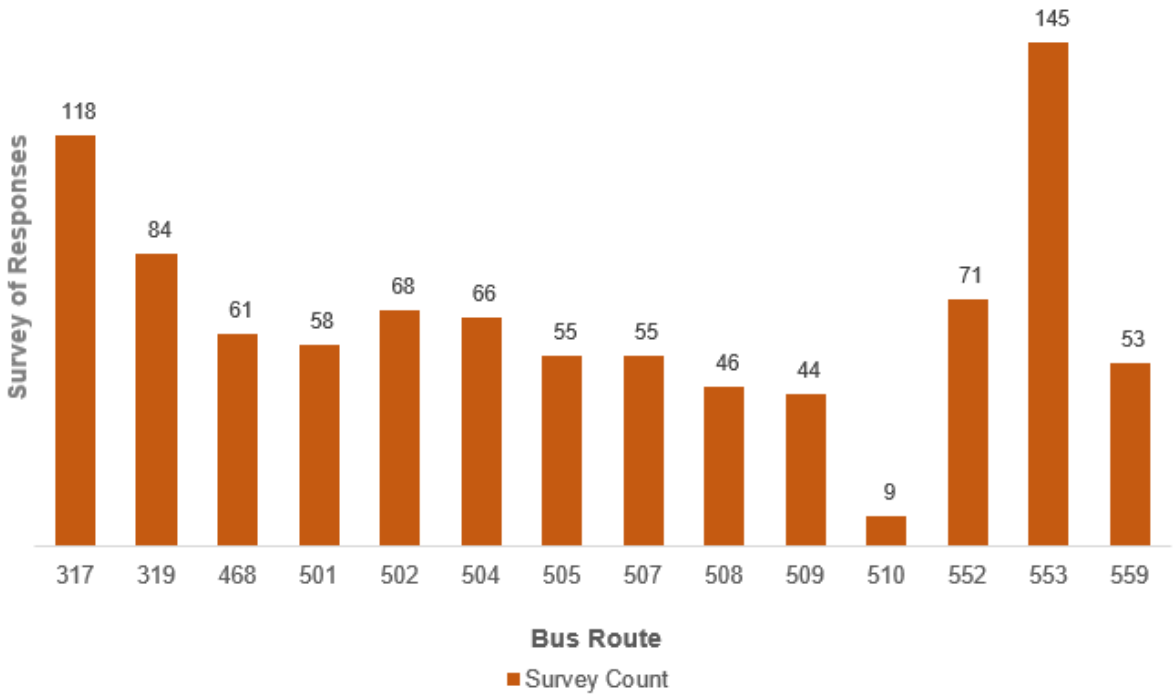



Figure 13. Counts of Survey Responses Per Route - On-board Bus Survey

Overall, the distribution demonstrates good coverage across the 14 targeted routes, with a clear concentration of responses on major intercity and high-frequency routes like 317, 319, and 553. These results provide valuable insight into the effectiveness of the on-

board data collection strategy and help identify routes where additional outreach may be needed in future phases to balance representation. Figure 13 shows the counts of survey responses collected from riders on each NJ TRANSIT bus route included in the study if there is an answer to which bus route was taken.

Demographic Outcome

*On-Board Bus Survey: Responses Based on Age and Gender*

Figure 14 (left) shows the age distribution of bus survey respondents, providing insight into the demographic results of transit riders in the study area. The largest share of respondents (22.7%) falls within the 25 to 34 years age group, followed by 35 to 44 years (21.6%) and 18 to 24 years (17.9%). Together, these groups represent most of the total responses, indicating that young and middle-aged adults make up the core of NJ TRANSIT bus riders in the South Jersey and Shore regions.

Respondents aged 55 to 64 years account for 13.5%, while those aged 45 to 54 years make up 13.3%. Meanwhile, 11% of participants were 65 years or older, suggesting that a smaller but notable portion of riders are senior citizens.

Similarly, Figure 14 (right) shows the gender distribution of bus survey respondents, providing insight into the diversity of NJ TRANSIT riders who participated in the study. Most respondents, about 57.7%, identified as male or man, while 40.7% identified as female or woman. A small percentage of participants, around 1.6% identified as non-binary, gender fluid, or preferred to self-describe their gender.

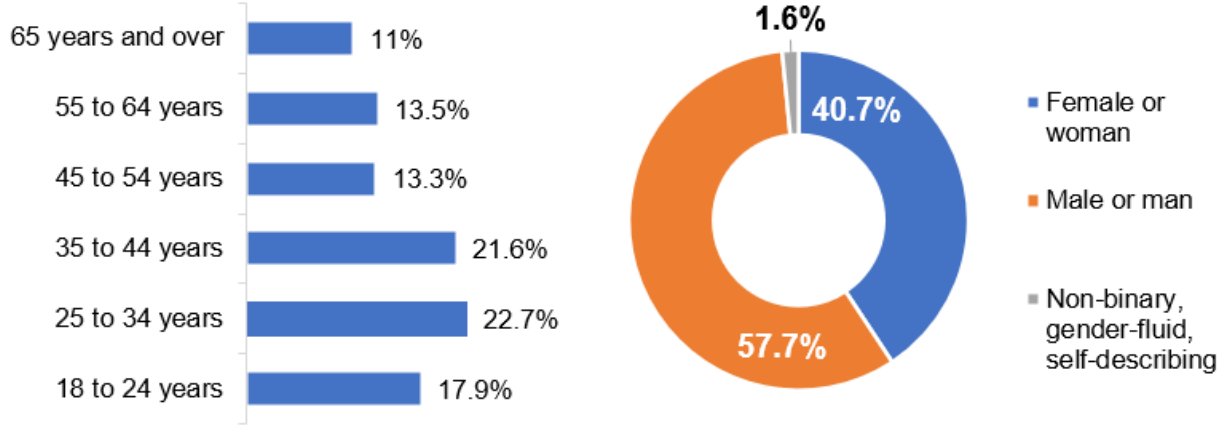



Figure 14. Age groups of Survey Respondents (left), Percentages of the Gender of the Respondents (right) - Onboard Bus Survey

On-Board Bus Survey: Responses Based on Household Size and Income

The chart below shows findings for customers who gave a response to the question regarding household size. Over half of the respondents live in smaller households of one (22.1%) or two (28.6%) persons, with an additional 21.3% consisting of 3 people. The remaining respondents were nearly evenly split with 4 (14.5%) and 5 or more greater (13.4%). Overall, the data show that most bus riders live in smaller households, reflecting individual commuters, couples, or small families who rely on public transportation for work, school, and daily activities. Figure 15 shows detailed responses based on household sizes.

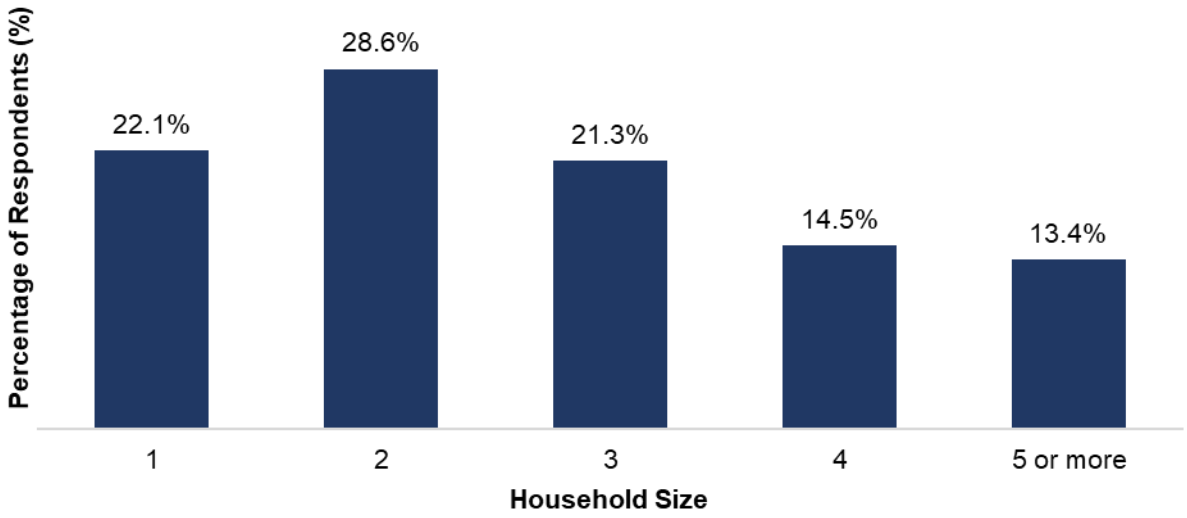



Figure 15. Responses Based on Household Size – Onboard Bus Survey

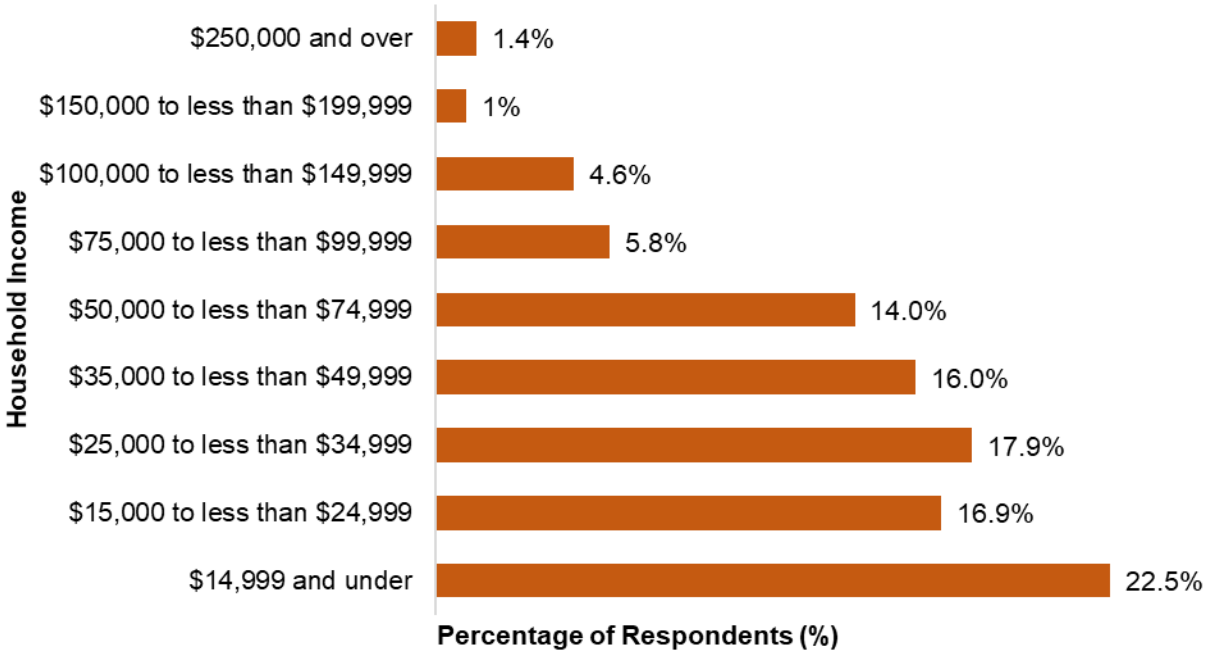



Figure 16. Responses Based on Household Income - Onboard Bus Survey

Among those who reported income levels, the largest group (22.5%) reported annual household incomes of $14,999 and under. This was followed by respondents earning $25,000 to less than $34,999 (17.9%), and those earning $15,000 to less than $24,999 and $35,000 to less than $49,999, representing 16.9% and 16.0% of responses, respectively.

Overall, the income distribution suggests that transit users responding to the survey are concentrated in lower to moderate income brackets, with relatively limited representation from higher-income households. Figure 16 shows detailed responses based on household income.

On-Board Bus Survey: Responses Based on Vehicle Ownership and Licensed Driver

The survey results on vehicle ownership and licensed drivers per household reveal important characteristics about the respondents' transportation access and household composition. In terms of vehicle ownership, the largest share of respondents (47.4%) reported owning no vehicles in their household, while 34.6% indicated ownership of one vehicle, and 12.9% reported two vehicles. Only a small percentage of respondents reported owning three vehicles (2.9%), four vehicles (1.1%), or five or more vehicles (1.1%). This distribution shows that the majority of respondents come from households with limited or no vehicle availability, with over four in ten having no vehicle at all.

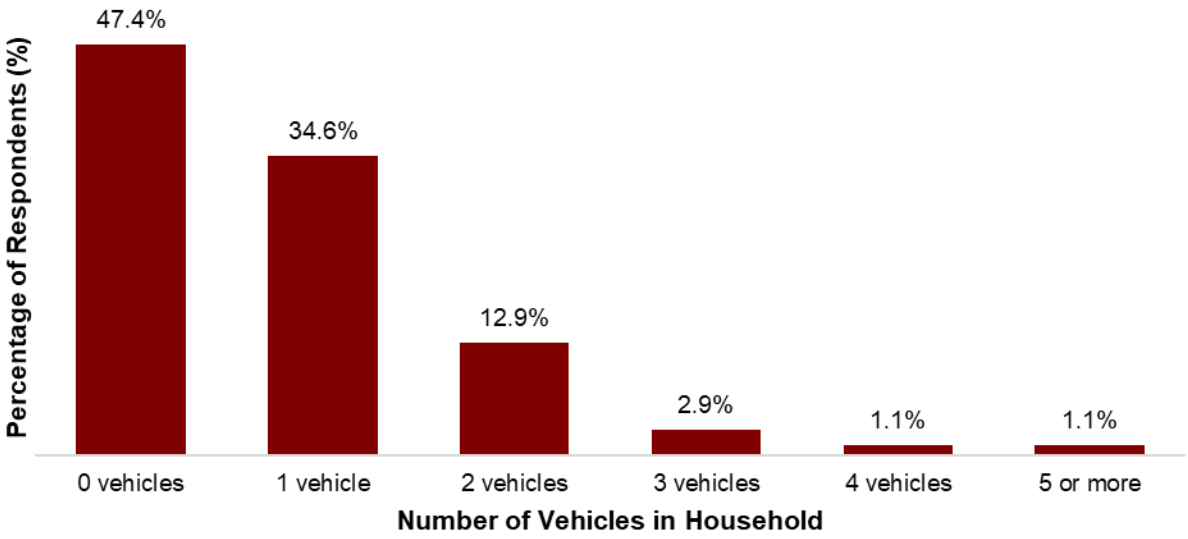



Figure 17. Response Based on Vehicle Ownership - Onboard Bus Survey

Similarly, when looking at the number of licensed drivers per household, the largest share of respondents reported having one licensed driver (38.6%), followed by 28% with no licensed drivers at all, and 22.4% with two licensed drivers. A smaller share reported three licensed drivers (7.1%), four licensed drivers (3.1%), and five or more (0.7%). The high percentage of households with zero or one licensed driver corresponds closely with the data on vehicle ownership, indicating a strong dependence on public transit among these riders.

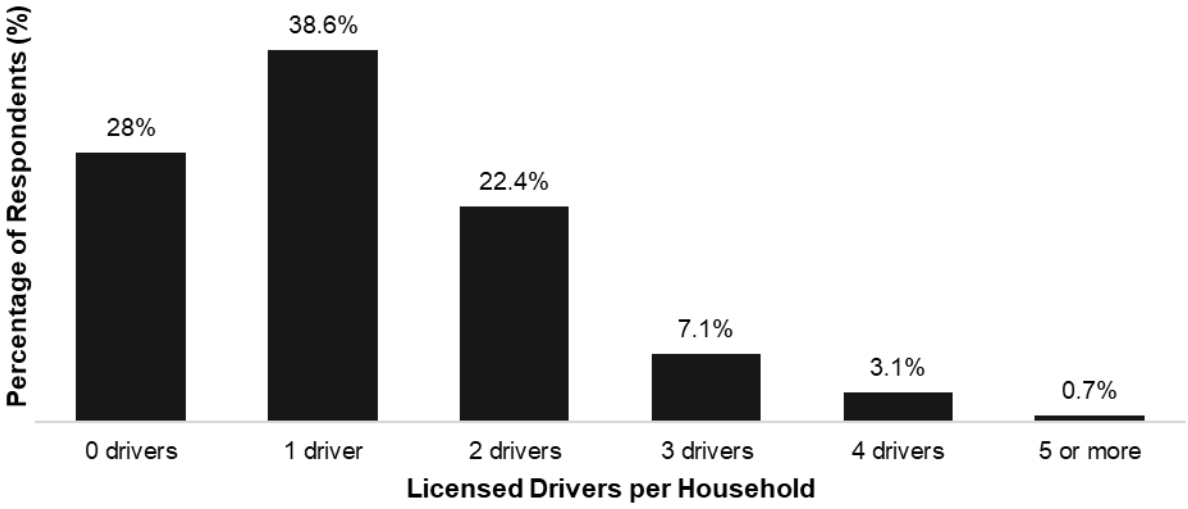



Figure 18. Responses Based on Licensed Drivers per Household - Onboard Bus Survey

### *Travel Modes, Challenges, and Outcome*

On-Board Bus Survey: Modes Used for Last Mile Travel

To reach the bus stop, the majority of respondents (67.4%) reported that they walked or used a wheelchair. This indicates that most bus riders live or work within walking distance of their boarding stops. The next most common modes were bus/shuttle (7.7%), another NJ TRANSIT bus (6.5%), personal bicycle or scooter (4.6%), and car drop-off (3.4%). Smaller portions used modes such as rideshare services like Uber or Lyft (2.1%), the NYC Subway (1.8%), or NJ TRANSIT Rail (1.1%). Only a few respondents reported using SEPTA, carpooling, bikeshare, or driving from a parked car.

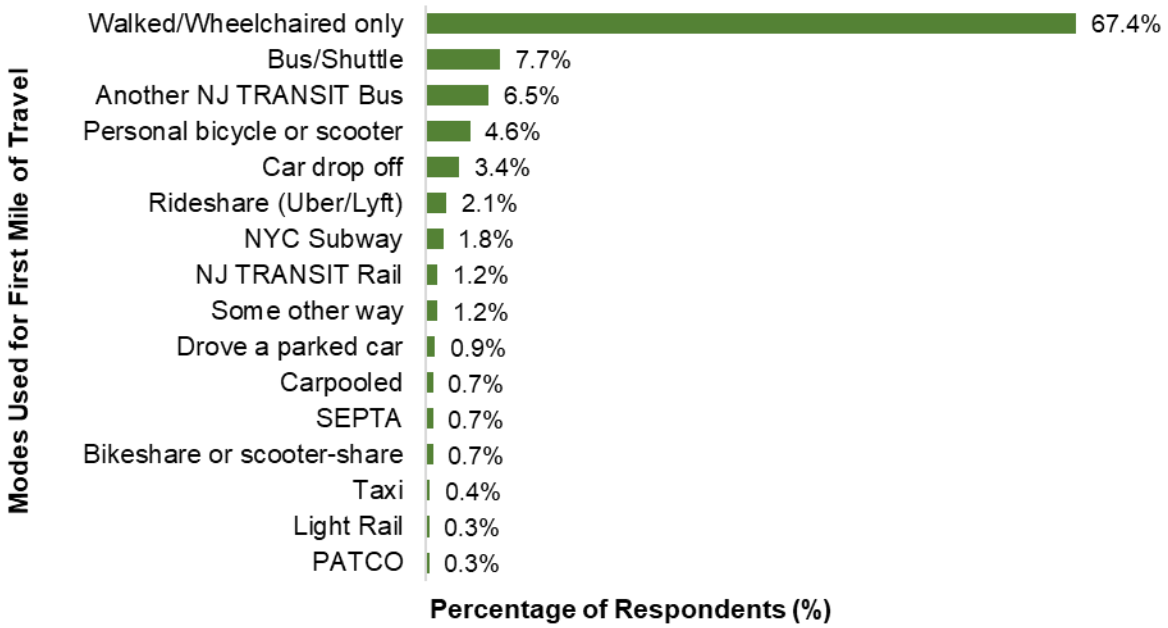



Figure 19. Modes Used for Getting to the Bus Stop - Onboard Bus Survey

Figures 19 and 20 provide more detailed information about the last-mile travel modes shared by the respondents. For travel after getting off the bus, a similar trend was observed: 72.2% of riders walked or used a wheelchair to reach their final destination, reinforcing the dominance of walking as the main first-and last-mile mode. The next highest shares were another NJ TRANSIT bus (6.8%), personal bicycle or scooter (4.4%), bus/shuttle (3.6%), and car pickup (2.4%). A small proportion used rideshare services (1.9%), the NYC Subway (1.8%), or other minor options.

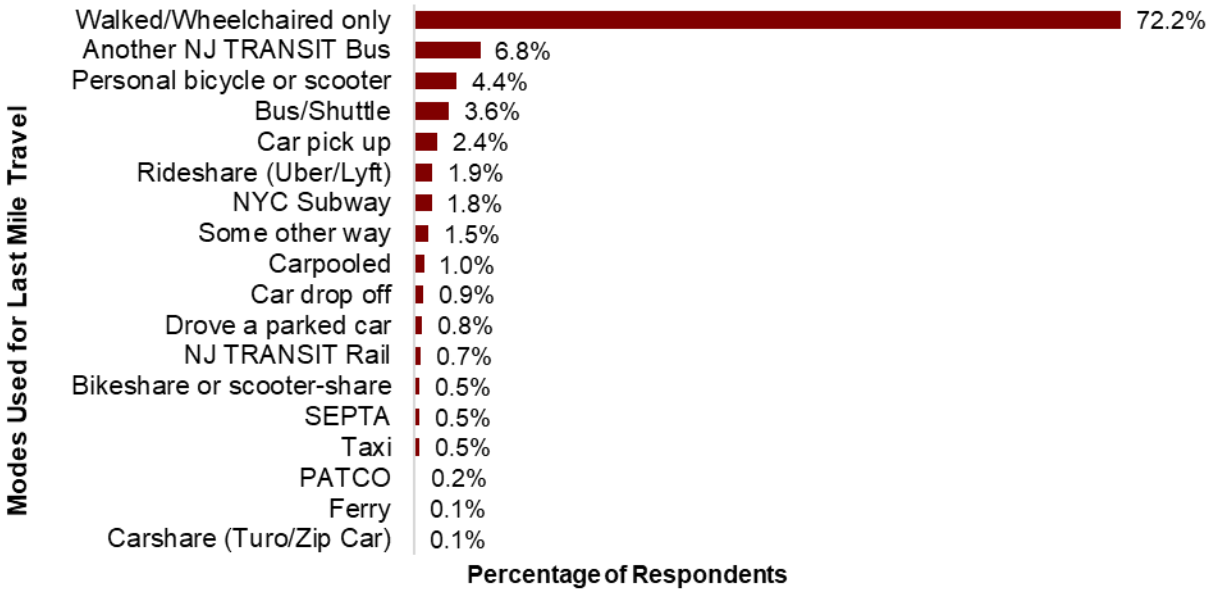



Figure 20. Modes Used by Respondents to Reach Their Destination - Onboard Bus Survey

On-Board Bus Survey: Options for Traveling in the Opposite Direction

Figure 21 illustrates the mode in which respondents travel in the opposite direction from their initial bus trip. Most respondents, 91.4%, reported that they use the same route in reverse order to make their return trips. This shows that most riders depend on the same NJ TRANSIT service for both directions of travel, indicating a consistent pattern.

A smaller portion, 7%, mentioned using different NJ Transit bus routes, suggesting flexibility in choosing alternative routes when necessary. Meanwhile, 1.3% of respondents indicated traveling in some other way, possibly by carpooling, rideshare, or other local connections, and 0.2% reported using NJ TRANSIT Rail.

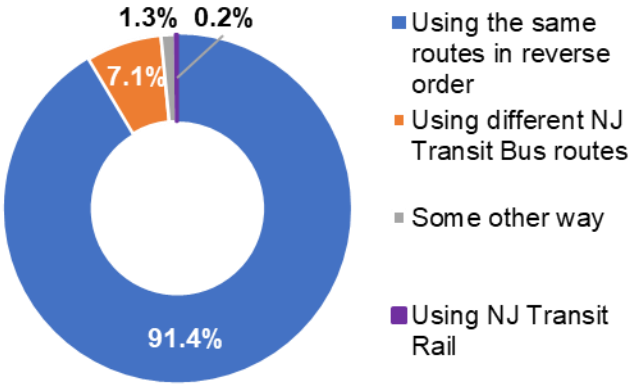



Figure 21. Modes Used by the Respondents to Travel in the Opposite Direction - Onboard Bus Survey

On-Board Bus Survey: Transit Use Frequencies

The largest share of respondents, 31%, reported using transit five days a week, suggesting that most riders are regular commuters who rely on NJ TRANSIT for their daily travel, likely for work or other activities. Another 25% use transit six to seven days a week, indicating a high level of dependence on public transportation even beyond typical weekday travel.

Meanwhile, 10% ride one to five days a year, and 10% use it three to four days a week, reflecting occasional or part-time users. About 8% reported using transit six to eleven days a year, while 7% ride one to two days a week, showing moderate but regular use. A smaller group, around 6%, reported using transit one to three days a month. Only 2% of respondents identified as first-time riders, and 1% used transit less than once a year (Figure 22).

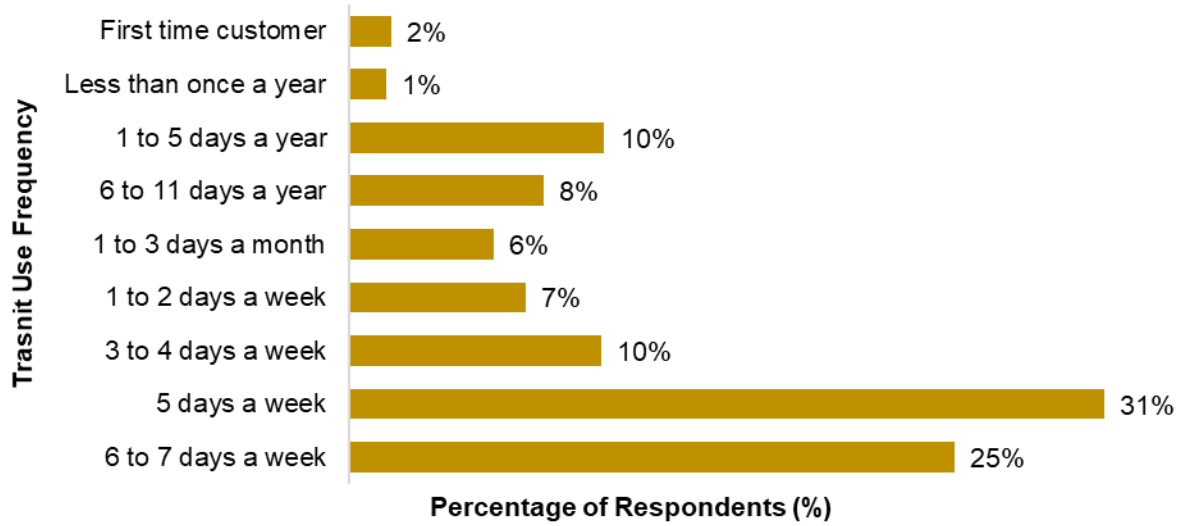



Figure 22. Transit Use Frequencies by the Respondents - Onboard Bus Survey

A significant portion of respondents (28%) reported that they would not make the trip at all if transit were not available, indicating a strong dependency on NJ TRANSIT bus services for essential travel needs such as commuting, shopping, or appointments. Another 20% mentioned they would use Uber, Lyft, or other app-based rideshare services. About 16% said they would ride with a friend or family member, showing some reliance on social networks for transportation.

Around 10% would drive a car, and 9% would switch to another bus route or train, highlighting the importance of network connectivity. Meanwhile, 6% of respondents stated they would use taxis, and smaller portions mentioned walking the entire way (3%), using bicycles or scooters (3%), some other means (3%), or carpooling (2%).

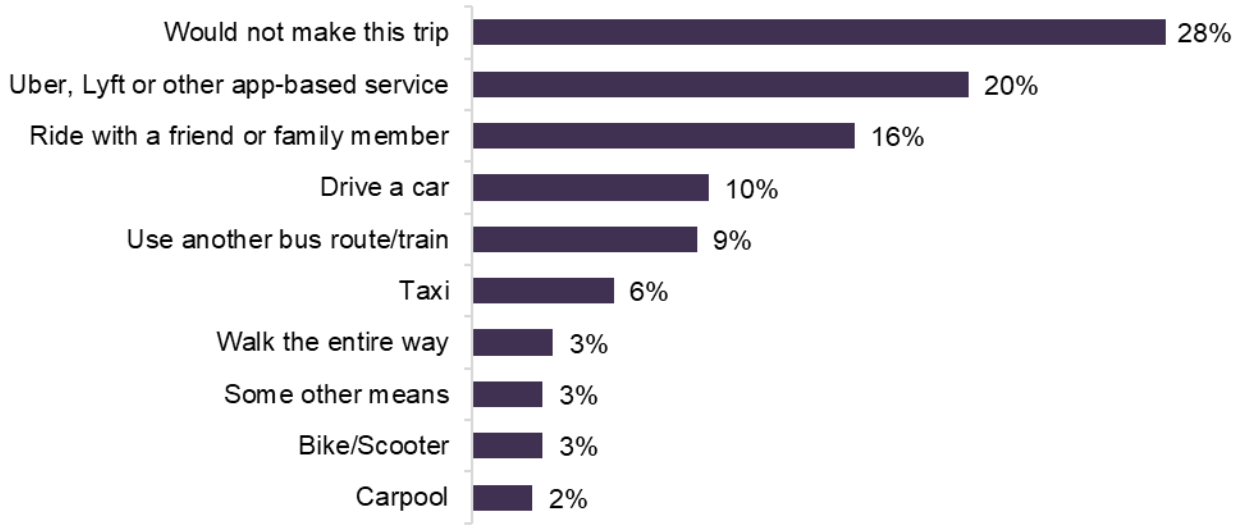



Figure 23. Alternate Modes of Travel by Respondents - Onboard Bus Survey

On-Board Bus Survey: Traveling with Disabilities

Figure 24 indicates that a large majority, 85%, reported having no disability affecting their ability to use transit services, suggesting that most riders do not face physical or sensory challenges in accessing buses. However, 6% of respondents indicated having a mobility-related disability, such as difficulty walking or climbing stairs, which can affect their ease of boarding and exiting buses or accessing stops. Another 3% reported a vision-related impairment, such as blindness or low vision, while 3% reported a disability not listed in the survey, reflecting other conditions that might still hinder transit use.

Responses from individuals with mobility, vision, and hearing challenges help to reinforce the importance of accessibility features, such as clear signage, audible announcements, and wheelchair infrastructure. In total, a little over 14% of respondents indicated a disability that makes traveling difficult. The most reported type of disability affecting travel for customers was mobility-related, such as difficulty walking or using stairs. Vision and hearing impairments that affect travel were also reported by 3.3% and 1.5% of survey respondents respectively.

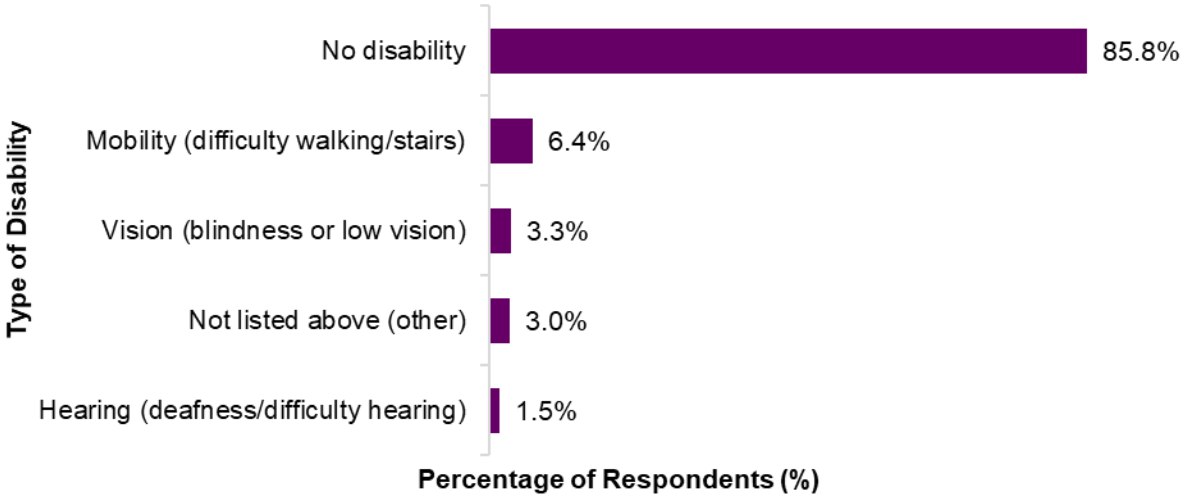



Figure 24. Disabilities that Make Traveling Difficult - Onboard Bus Survey

### *Employment Types and Sectors*

On-Board Bus Survey: Responses Based on Industry Type

Figure 25 represents the seasonal and non-seasonal workers across various employment sectors among survey respondents. The "Other" category accounts for the highest combined share at approximately 19.8%, followed by the retail sector at approximately 16.7% of all respondents, including both seasonal (3.5%) and non-seasonal (13.2%) employees. The healthcare sector follows closely with about 11.2% of respondents, with the majority being non-seasonal workers (9.5%). The hospitality and tourism sector represents around 9.3%, with 7.8% non-seasonal and 1.5% seasonal workers. Casino services account for 8.2% of respondents, while construction represents 6.7%, each employing a mix of permanent and seasonal staff. Of the 916 survey responses, 150 (16%) identified as seasonal employees while 766 (84%) responded as non-seasonal.

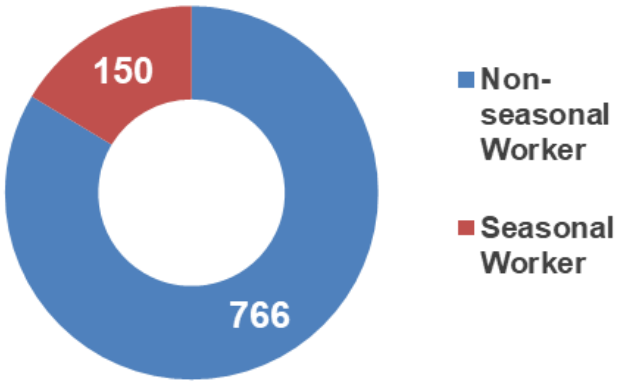



Figure 25. Number of Seasonal or Non-seasonal Employees - Onboard Bus Survey

The retired/not employed category represents 4.5% of respondents. Education accounts for 4.2%, followed by technology and manufacturing each at 3.1%. Boardwalk and retail represent 2.5%, while transportation and logistics, and agriculture and farming each account for about 2.0%. Smaller shares of respondents work in finance (1.7%), arts and entertainment (1.5%), government (1.4%), media and communications (1.2%), and energy and utilities (0.6%), indicating broader economic diversity beyond tourism and retail. Several sectors show measurable seasonal employment, underscoring their dependence on summer and tourist activity.

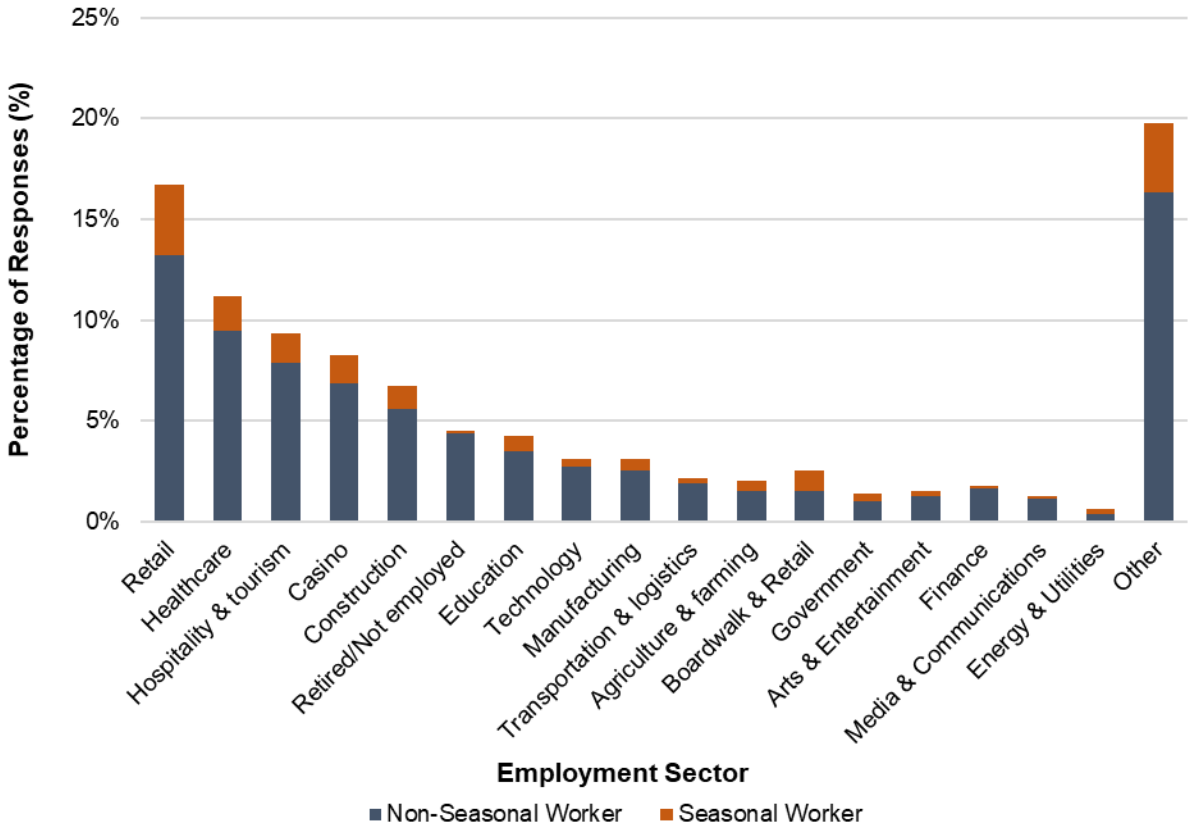



Figure 26. Percentages of Seasonal or Non-seasonal Employment by Sectors - Onboard Bus Survey

On-Board Bus Survey: Distance of Workplace from Home

The largest share, 24.6%, reported traveling 6–10 miles to work, followed closely by 22.7% who commute 1–5 miles. This suggests that nearly half of the respondents work within a 10-mile radius, indicating a relatively short commute that aligns with the coverage area of NJ TRANSIT's local bus routes. Around 16.6% of participants travel 11–20 miles, showing a moderate commuting distance often covered by regional routes.

Meanwhile, 11.5% commute more than 20 miles, reflecting long-distance riders who may rely on express or intercity routes. A smaller group, 8.7%, lives less than one mile from

their workplace, likely to walk or use short-distance transit options. About 15.8% marked “not applicable,” which may represent unemployed, retired, or remote workers. Figure 27 shows the distance between respondents’ homes and workplaces, offering insights into commuting patterns among transit users.

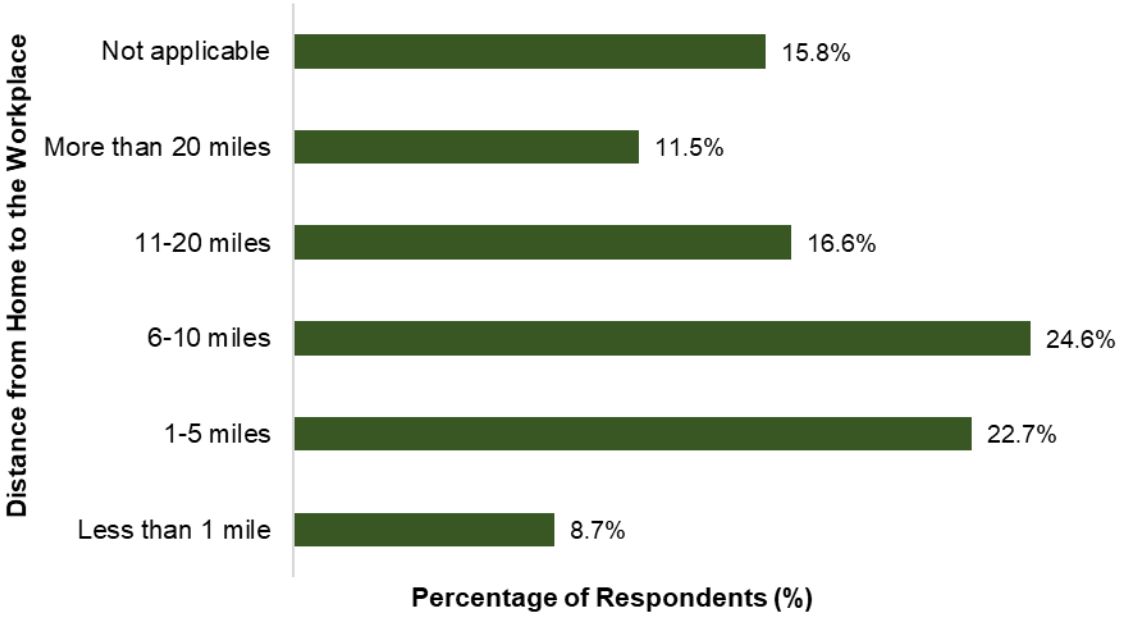



Figure 27. Distance from Home to the Workplace - Onboard Bus Survey

***Survey Response Origin Destination Analysis***

To better understand the spatial travel patterns of bus riders in the South Jersey and Shore regions, the research team conducted an origin-destination (OD) analysis specifically of the on-board survey data using the boarding and alighting stop data collected. Because the survey captured stop locations as free-text responses, a systematic matching process was required to geocode these responses to precise geographic coordinates.

The team matched each survey respondent's reported boarding and alighting stops to NJ TRANSIT's General Transit Feed Specification (GTFS) stop IDs with associated latitude and longitude coordinates. The matching was performed using numeric stop IDs as the join key. In cases where the original survey response was too vague or informal to resolve, the team conducted a manual review based on the origin and destination addresses and matching to assign the most appropriate GTFS stop ID based on route context, nearby landmarks, and cross-street descriptions.

Survey Response OD Trip Flows

Of the 983 total survey responses, 759 responses (77%) had both boarding and alighting stops successfully matched, resulting in 759 complete origin-destination pairs available for spatial analysis. The remaining responses could not be geocoded due to missing or empty stop fields in the original survey data. The 759 geocoded trips span 435 unique

stop locations and form 537 unique origin-destination stop-code pairs, as shown in Figure 28. Figure 29 and Figure 30 display the geographic distribution of matched boarding and alighting stops, respectively, across the study area. Each point represents a unique stop location where survey respondents reported boarding or alighting.

From the series of maps, the most frequently traveled corridors include the Route 319 express service between Port Authority Bus Terminal in New York City and Atlantic City Bus Terminal, the Route 317 corridor connecting Philadelphia and Cherry Hill to Toms River, and the Route 553 corridor linking Vineland and Atlantic City through the mid-South Jersey region.

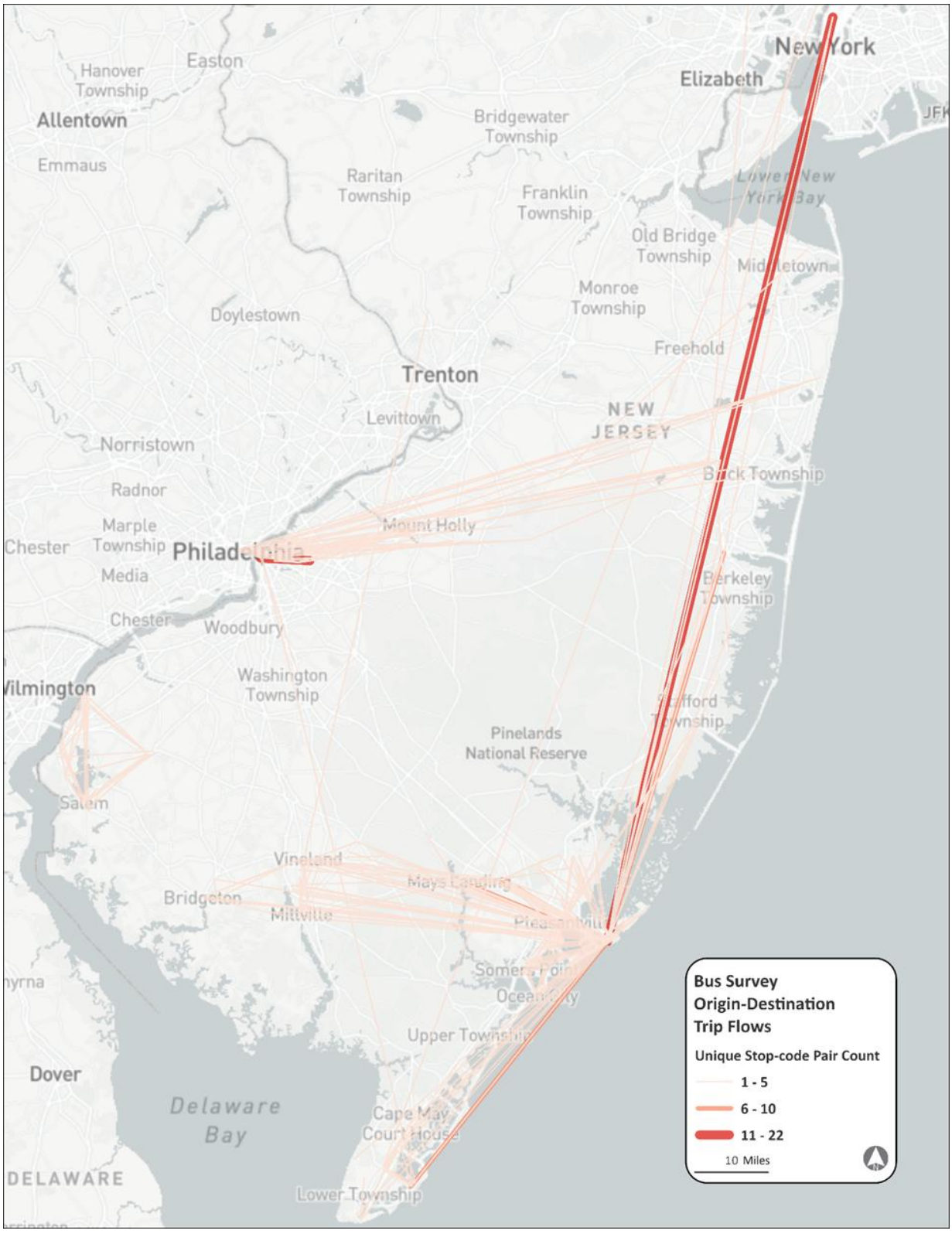



Figure 28. Unique Origin-Destination Pairs - Onboard Bus Survey

Survey Response OD Frequency by Municipality

Aggregating trips to the municipality level, the 759 geocoded trips span across 63 unique municipalities within 14 counties across New Jersey, New York, and Pennsylvania. On the boarding side, Atlantic City is the dominant origin, accounting for 288 boardings (38% of all trips). Hamilton Township in Atlantic County ranks second with 61 boardings (8%), followed by Pleasantville City with 35 boardings (5%), Camden with 34 boardings (5%), and Manhattan and Ventnor City each with 26 boardings (3%). Table 6 presents the full boarding counts for each municipality.

Table 6 - Survey Boarding Locations by Municipality - Onboard Bus Survey

| Municipality | Boarding Trips | Share of Total |
|---|---|---|
| **Atlantic City** | 288 | 38% |
| **Hamilton Township** | 61 | 8% |
| **Pleasantville City** | 35 | 5% |
| **Camden** | 34 | 4% |
| **Ventnor City** | 26 | 3% |
| **Manhattan** | 26 | 3% |
| **Wildwood City** | 23 | 3% |
| **Middle Township** | 23 | 3% |
| **Vineland City** | 18 | 2% |
| **Brigantine City** | 18 | 2% |
| **Other Municipalities** | 207 | 27% |
| **Total** | **759** | **100%** |

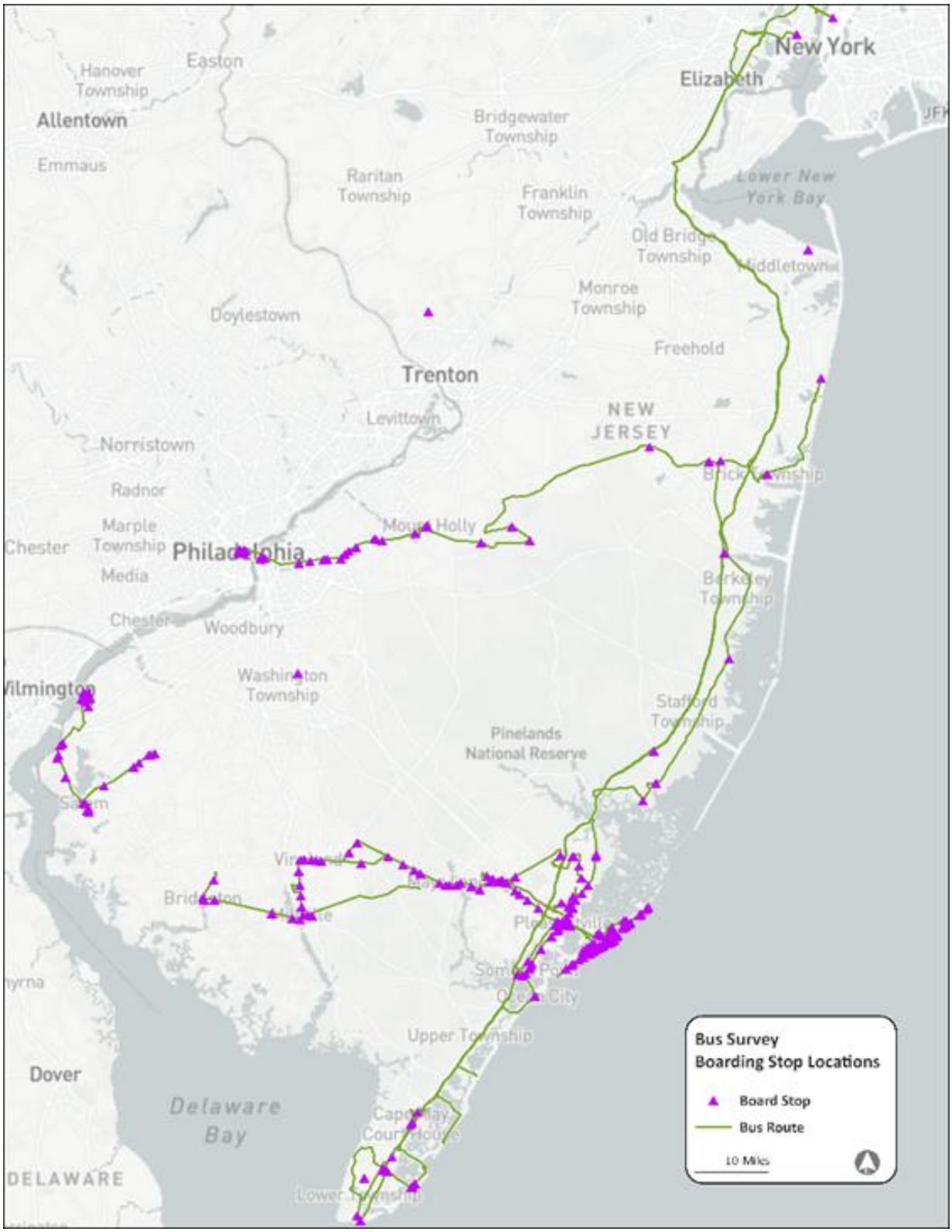



Figure 29. O-D Pairs and Geographic Distribution of Boarding Stops - Onboard Bus Survey

On the alighting side, Atlantic City again leads as the primary destination with 235 alightings (31% of all trips). Hamilton Township ranks second with 61 alightings (8%), followed by Middle Township in Cape May County with 42 alightings (6%), Pleasantville City with 36 alightings (5%), and Ventnor City with 28 alightings (4%).

Overall, nearly 60% of all geocoded trips have Atlantic City as either the origin or destination, reinforcing its role as the central transit hub in the study area. Table 7 presents the full alighting counts for each municipality.

Table 7 - Survey Alighting Locations by Municipality - Onboard Bus Survey

| Municipality | Alighting Trips | Share of Total |
|---|---|---|
| **Atlantic City** | 235 | 31% |
| **Hamilton Township** | 61 | 8% |
| **Middle Township** | 42 | 6% |
| **Pleasantville City** | 36 | 5% |
| **Ventnor City** | 28 | 4% |
| **Manhattan** | 25 | 3% |
| **Vineland City** | 23 | 3% |
| **Cherry Hill** | 20 | 3% |
| **Galloway Township** | 20 | 3% |
| **Camden** | 20 | 3% |
| **Other Municipalities** | 249 | 33% |
| **Total** | **759** | **100%** |

Figure 30. O-D Pairs and Geographic Distribution of Matched Alighting Stops - Onboard Bus Survey

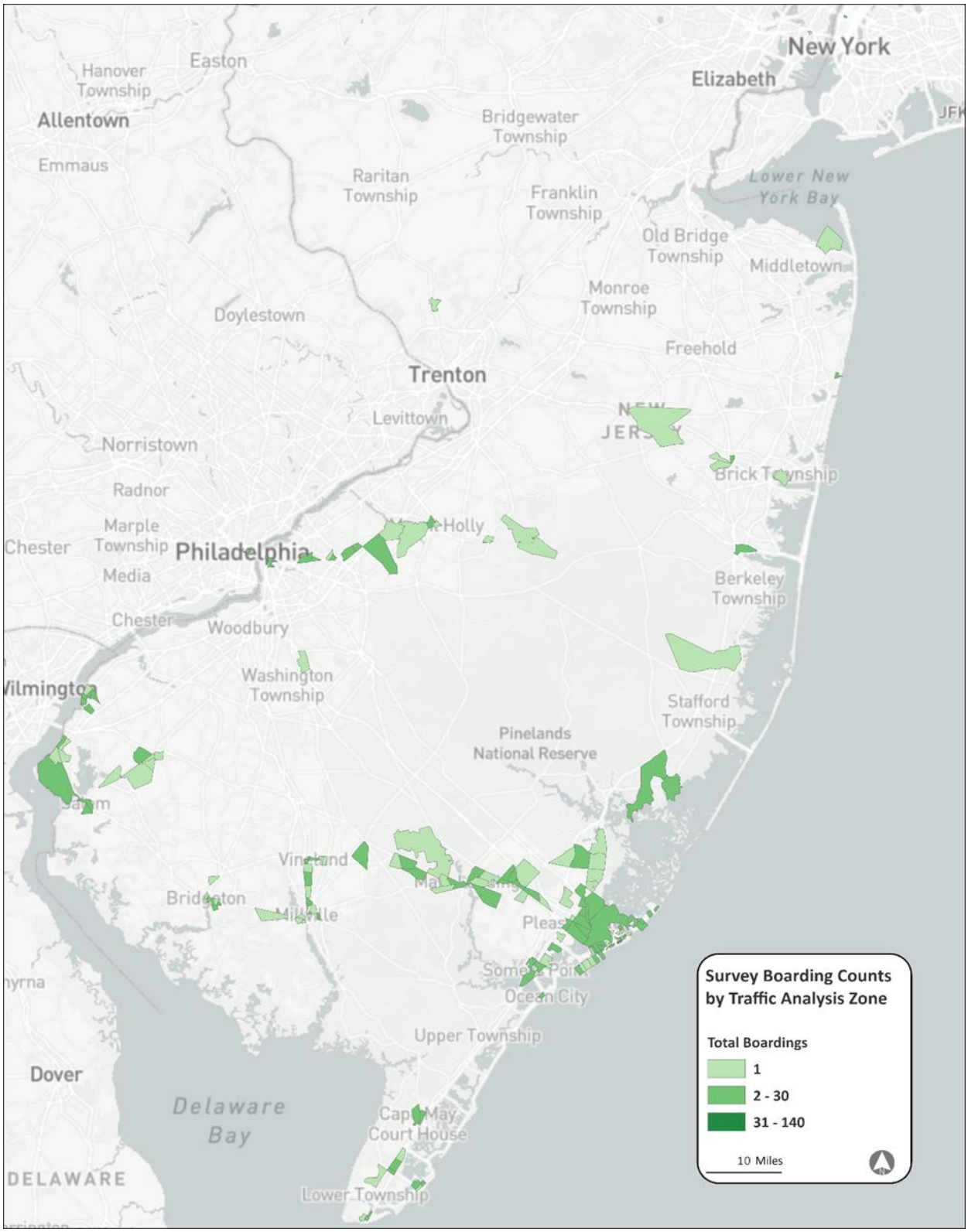


Figure 31. Survey Boarding Counts by Traffic Analysis Zone (TAZ) - Onboard Bus Survey

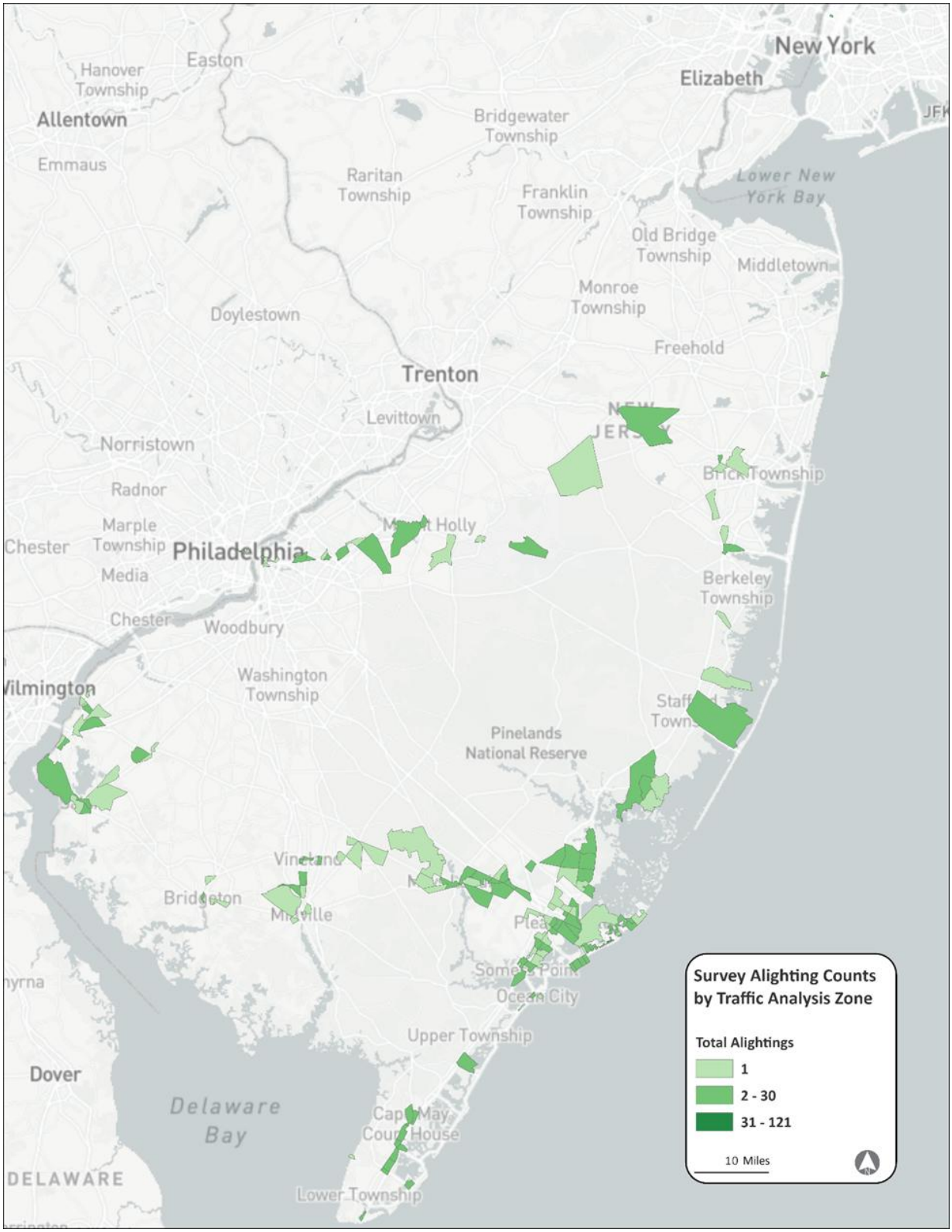



Figure 32. Survey Alighting Counts by Traffic Analysis Zone (TAZ) - Onboard Bus Survey

### *Qualitative Survey Response Summaries*

General Takeaways

- To complement the quantitative survey findings, 635 open-ended survey responses were reviewed and coded to identify recurring themes related to service improvements. Of these, 615 responses contained substantive written feedback, while approximately 88 expressed general satisfaction or no suggested improvements, and 33 reflected non-substantive entries (e.g., “N/A” or “none”). While individual comments reflect personal experiences, the volume and repetition of specific issues provide insight into broader system-level patterns. The write-in responses suggest that riders’ priorities are largely centered on the reliability, availability, and affordability of service, with additional concerns related to vehicle conditions, stop infrastructure, customer experience, and onboard amenities. Collectively, these comments highlight the areas where operational performance and rider expectations intersect most strongly:

- *Reliability is the dominant concern for riders.* The most consistent theme across the write-ins relates to service reliability and schedule adherence. At least 89 comments regarded buses being late, not arriving as expected, or failing to follow published schedules. Riders frequently described uncertainty about arrival times and the difficulty of planning trips when service is inconsistent. This pattern suggests that improving on-time performance is likely to have the greatest impact on overall rider satisfaction.

- *Vehicle conditions and onboard comfort influence perceptions of quality*. Riders also highlighted the importance of the physical travel experience. At least 83 comments referenced negative experiences relating to cleanliness, crowding, seating comfort, air-conditioning performance, or overall vehicle condition. These responses indicate that even when service is available, the quality of the ride can significantly shape perceptions of transit reliability and value.

- *Service frequency shapes system usability.* Closely related to reliability, riders emphasized the importance of service availability. At least 71 comments called for more frequent service, additional buses on existing routes, or expanded evening and weekend coverage. Many riders noted that hourly service intervals limit flexibility for commuting and other routine travel needs. These responses indicate that a lack of frequency was a key determinant that deterred transit as a viable mobility option for their travel. Notably, a number of these comments referenced specific routes or corridors, which are examined in greater detail in the route-level analysis that follows.

- *Expectations for modern amenities and information tools are growing*. Riders expressed increasing expectations for onboard amenities and reliable information systems. At least 57 comments referenced Wi-Fi, charging ports, restrooms, or similar amenities, while 33 comments referenced the mobile app, bus tracking, or

payment systems. These responses suggest that information reliability and onboard convenience are becoming more integral components of the rider experience.

- *Affordability remains a meaningful barrier for some riders.* Cost considerations were also prominent in the feedback. At least 50 comments referenced fare levels, reduced ticket prices, or expanded discount options. Riders frequently connect affordability to their ability to use transit regularly, suggesting that fare policy and service improvements should be considered together when evaluating strategies to increase ridership.

- *Stop infrastructure from affecting accessibility and safety.* At least 44 comments focused on bus stop conditions, including requests for additional shelters, benches, signage, or more conveniently located stops. Riders frequently described exposure to weather, difficulty identifying stop locations, and long walking distances. These concerns underscore the importance of first- and last-mile conditions in shaping the usability of the transit system. It is also important to note that the authority to designate a bus stop rests with the municipality of the desired bus stop location. (10)

- *Customer experience and driver interactions matter.* Lastly, while less prevalent than operational concerns, at least 39 comments referenced negative experiences or concerns about driver behavior, professionalism, or customer service interactions. Riders' day-to-day interactions with staff can disproportionately influence their overall perception of service quality, suggesting that customer experience initiatives may complement operational improvements.

Route-level Comments based on Rider Route

To understand any systemwide concerns recurring through comments across various routes within the network, open-ended survey responses were also analyzed based on the specific route reported by respondents. The routes listed in the table below reflect the routes riders were using at the time of the survey. As such, it can help to provide some insight into how service conditions are experienced across different parts of the system, even when respondents did not reference routes directly in their written feedback.

Routes with the highest number of associated write-in comments included Routes 553, 317, 552, and 504, followed by Routes 507, 505, 319, 509, 502, and 501. Across these routes, riders most frequently raised issues related to service frequency, reliability, affordability, stop access, and onboard conditions, though the relative prominence of these concerns varied by corridor. Collectively, these route-level patterns reinforce systemwide findings while helping to identify locations where riders experience service constraints most acutely.

Table 8 - Feedback Responses of Dominant Issues by Rider Route - Onboard Bus Survey

| Route | # Comments | Dominant Issues Raised |
|---|---|---|
| 553 | 114 | Strong affordability concerns (requests for reduced fares); requests for additional stops and expanded service coverage; some reliability and frequency issues. |
| 317 | 65 | Requests for more frequent service, reliability concerns (late or missed buses), stop signage, and access issues; some requests for onboard amenities. |
| 552 | 52 | Requests for amenities (Wi-Fi, charging ports); cleanliness and comfort concerns; some reliability and driver behavior comments. |
| 504 | 51 | Stop infrastructure and stop placement concerns (shelters, signage); some affordability and cleanliness issues. |
| 507 | 42 | Reliability and schedule consistency concerns; issues with app and service information; some customer service comments. |
| 505 | 40 | Stop access and infrastructure concerns; some reliability and affordability comments. |
| 319 | 39 | Requests for more frequent service, cleanliness, and comfort concerns; some reliability issues. |
| 509 | 37 | Service frequency concerns, some driver behavior, and information reliability issues. |
| 502 | 35 | Reliability and schedule adherence concerns, requests for increased service, affordability, and stop access issues. |
| 501 | 32 | Frequency and reliability concerns; some comfort and stop accessibility comments. |

Stop Location and Stop Infrastructure Requests by Route

To better understand how first- and last-mile conditions affect rider experience, open-ended survey responses were reviewed for comments related to bus stop locations, stop infrastructure, and accessibility. These comments include requests for additional stops, relocation of existing stops, and improvements such as shelters, benches, and signage. While stop-related concerns were raised across multiple routes, they were most concentrated on a subset of corridors, suggesting localized access challenges. The table below summarizes the routes most frequently associated with stop-related feedback, providing insight into where riders perceive gaps in stop coverage or stop quality.

Table 9 - Feedback Responses of Stop Location and Infrastructure - Onboard Bus Survey

| Route | Total Comments | Stop-Related Mentions | % Stop-Related |
|---|---|---|---|
| 504 | 51 | 12 | 23.5% |
| 505 | 40 | 7 | 17.5% |

| Route | Total Comments | Stop-Related Mentions | % Stop-Related |
|---|---|---|---|
| 553 | 114 | 17 | 14.9% |
| 317 | 65 | 9 | 13.8% |
| 508 | 29 | 4 | 13.8% |
| 559 | 31 | 4 | 12.9% |
| 502 | 36 | 4 | 11.1% |
| 468 | 29 | 3 | 10.3% |
| 501 | 32 | 3 | 9.4% |
| 552 | 52 | 4 | 7.7% |
| 509 | 37 | 1 | 2.7% |
| 319 | 39 | 1 | 2.6% |
| 507 | 42 | 1 | 2.4% |

*Service Frequency Requests by Route*

To further understand where service availability constraints are most acutely experienced, open-ended responses were analyzed for comments related to service frequency, including requests for more buses, shorter headways, expanded evening or weekend service, and increased trip availability. Reviewing these responses by rider-reported route provides insight into corridors where service levels may limit the usability of transit for routine travel needs.

While frequency concerns were raised across a range of routes, they were most pronounced on a subset of corridors, suggesting localized pressure related to service adequacy. Routes 319, 317, and 501 show the highest concentration of frequency-related feedback relative to total comments on those routes. The table below summarizes these patterns.

Table 10 - Feedback Responses of Service Frequency Requests by Rider Route - Onboard Bus Survey

| Route | Total Comments | Frequency-Related Mentions | % Frequency-Related |
|---|---|---|---|
| 319 | 39 | 11 | 28.2% |
| 317 | 65 | 13 | 20.0% |

| Route | Total Comments | Frequency-Related Mentions | % Frequency-Related |
|---|---|---|---|
| 501 | 32 | 6 | 18.8% |
| 508 | 29 | 5 | 17.2% |
| 509 | 37 | 5 | 13.5% |
| 507 | 42 | 5 | 11.9% |
| 505 | 40 | 4 | 10.0% |
| 559 | 31 | 3 | 9.7% |
| 552 | 52 | 5 | 9.6% |
| 553 | 114 | 10 | 8.8% |
| 502 | 36 | 3 | 8.3% |
| 468 | 29 | 2 | 6.9% |
| 504 | 51 | 2 | 3.9% |

**Employee Survey**

The employee survey aims to capture the travel patterns and ridership habits of employees in the study area. The employee survey was distributed to employees selected by employers in the study area, not all of whom are NJ Transit bus riders. This analysis examines select survey results, such as demographics and ridership uses for both the bus-using, non-bus-using, and combined user and non-user cohorts. Each subset provides insight into a different group of users or potential users in the NJ Transit sphere. Due to low response yield, the sample sizes in the survey data may not be representative of the true characteristics of the wider employee demographic.

Employee Survey: Responses Based on Age and Gender

Figure 33 (left) shows the age distribution of Employee Survey respondents. Three-quarters of all responses are working-age adults between the ages of 25 and 54 years old. This group forms the core cohort of NJ TRANSIT bus riders in the study area. Within that group, the largest share of respondents (28%) falls within the 25 to 34 years age group, followed by 35 to 44 years (26%) and 45 to 54 years (21%).

Respondents between 18 and 24 years account for 17% of participants, reflecting a meaningful young adult ridership, likely to include students and early-career commuters. In contrast, older age groups are less represented, with those aged 55 to 64 years comprising only 5% of respondents and those 65 years and older making up 3%. This

relatively low senior ridership may suggest that older adults in the study area rely less on bus transit compared to younger and middle-aged populations.

Figure 33 (right) contains the gender distribution of Employee Survey respondents, which shows a wider male representation. Most respondents, about 60%, identified as male or man, while 37% identified as female or woman. Together, these responses suggest that both men and women are active users of NJ TRANSIT bus services in the study area, with a moderately higher representation of male riders.

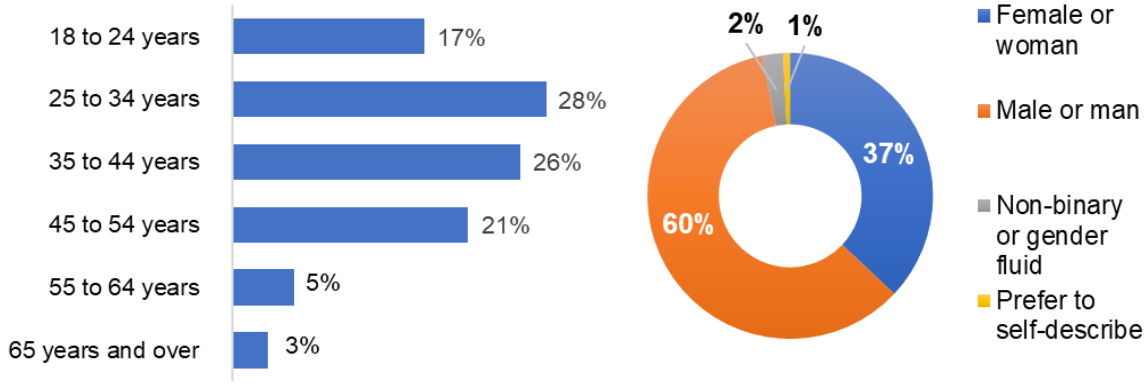



Figure 33. Age Groups of Survey Respondents (left) and Percentages of the Gender of the Respondents (right) - Employee Survey

A small share of respondents identified outside of the binary categories or opted out of disclosing their gender. About 2% identified as non-binary or gender fluid, and 1% preferred to self-describe their gender.

Responses Based on Household Size

Figure 34 shows the distribution of household sizes among the respondents of the Employee Survey. The results of this figure suggest that most NJ TRANSIT riders do not live alone. The largest share of respondents (33.9%) reported living in two-person households, followed by four-person households (23.9%) and three-person households (18.3%). Together, these groups represent roughly 76% of responses.

Respondents living in households of five or more people account for 13.8% of participants, while those living alone make up about 10%, indicating that single-person households are the least common living arrangement among surveyed riders.

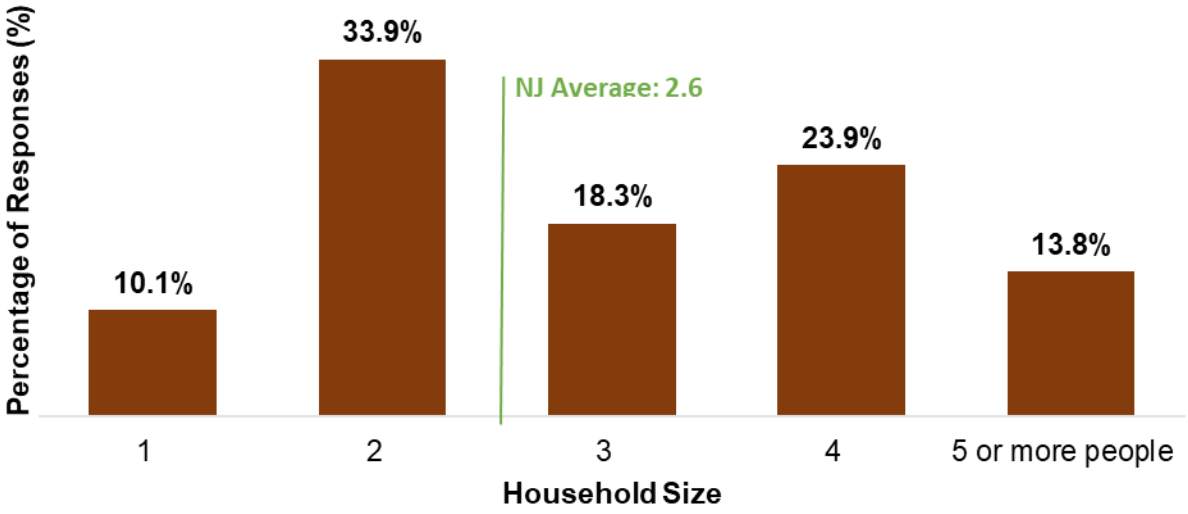



Figure 34. Responses Based on Household Size[1] - Employee Survey

Employee Survey: Responses Based on Household Income

Figure 35 shows the household income distribution of Employee Survey respondents, providing insight into the economic standing of surveyed employees in the study area. The largest category of respondents, among those who disclosed their income, reported earning between $25,000 and $34,999 annually (24%), followed by $35,000 to less than $49,999 (21%) and $15,000 to less than $24,999 (15%). Together, respondents earning less than $50,000 per year account for almost three-quarters of all responses (73%).

A smaller percentage of employees are in higher income brackets, with 14% of respondents earning between $50,000 and $74,999, and 7% earning between $75,000 and $99,999. Those earning $100,000 or more represent a small combined share (6%).

[1] NJ average from US Census. 2024 ACS 5-year estimate.

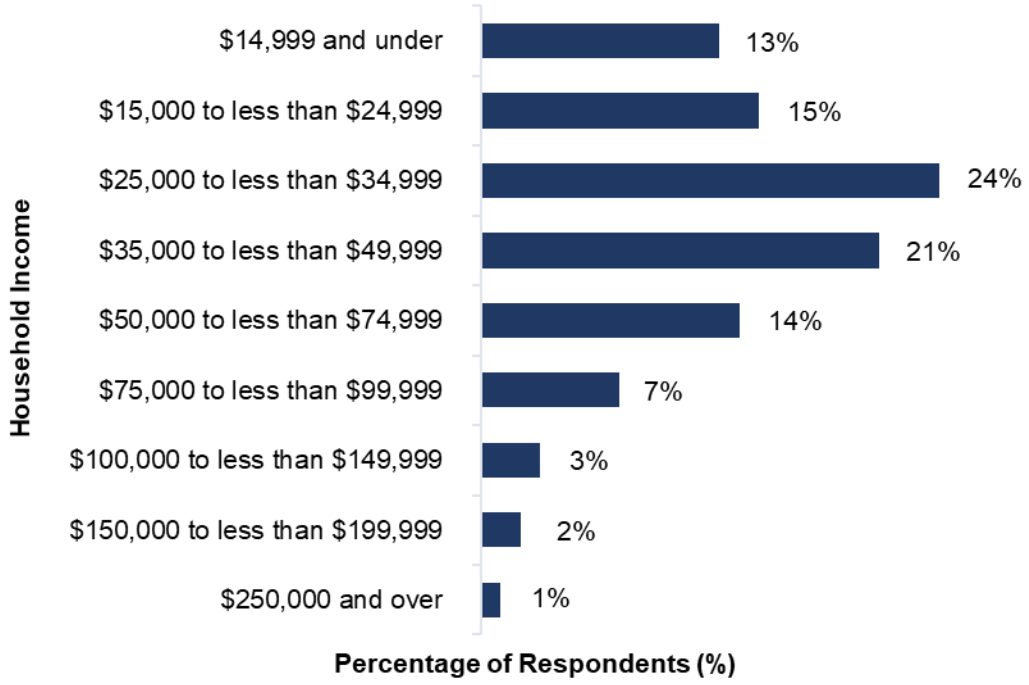
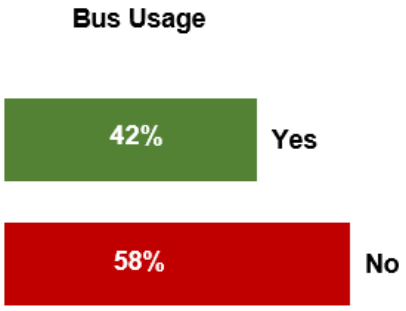



Figure 35. Responses Based on Household Income – Employee Survey

Employee Survey: Bus Usage Among Employees




| Reasons for Not Using Bus Service | |
|---|---|
| I have a car or a ride | 75 |
| The bus does not go where I need to go | 18 |
| The bus hours of operation do not meet my needs | 10 |
| The bus ticket is too expensive | 10 |
| I do not feel safe riding the bus or at the bus stop | 9 |
| The bus stop is too far from my home | 9 |
| The bus is not comfortable | 6 |
| The bus does not run on time | 5 |
| Other reason | 6 |

***Respondents could select multiple reasons***

Figure 36. Percent of Employees Who Use Bus Service (left), Reasons for Not Using Bus Service (right)

About 58% of respondents do not use the bus service, while the remaining 42% do use the bus service (Figure 36, left). The “Yes” portion of responses encompasses those who use bus service at any frequency. Although most employees do not use the bus service, a large minority do.

Employee Survey: Reasons for Not Using Bus (Non-Users)

Figure 36 (right) shows the most cited reasons why respondents do not use NJ Transit bus services, and respondents were allowed to provide multiple reasons. The most

frequently cited reason was personal vehicle availability, with 75 respondents indicating that they have a car or someone who can give them a ride. This indicates that for most non-riders, access to a private vehicle remains the primary alternative to bus transit.

Beyond personal vehicle access, respondents cited a range of service-related barriers. Eighteen respondents indicated that the bus does not serve their needed destinations, while 10 noted that hours of operation do not meet their needs, and another 10 cited the cost of bus tickets as a deterrent. Safety concerns at bus stops or on the bus were raised by nine respondents, matching the number who reported that the nearest bus stop is too far from their home. Comfort and reliability were less commonly cited reasons, with six respondents finding the bus uncomfortable and five noting that it does not run on time. Taken together, these findings suggest that while vehicle availability is the dominant barrier, improvements to route coverage, service hours, affordability, and safety could meaningfully expand ridership among current non-users.

Employee Survey: Bus Use Frequency

Figure 37 shows how often Employee Survey respondents use NJ TRANSIT bus services in response to the survey question “How often do you use the NJ TRANSIT bus service?” The largest share of respondents (31%) reported using the bus three to four days a week, followed by one to two days a week (25.9%) and five days a week (17.2%). Together, these groups represent nearly three-quarters of all responses, indicating that the majority of surveyed riders use NJ TRANSIT bus services on a frequent, recurring basis.

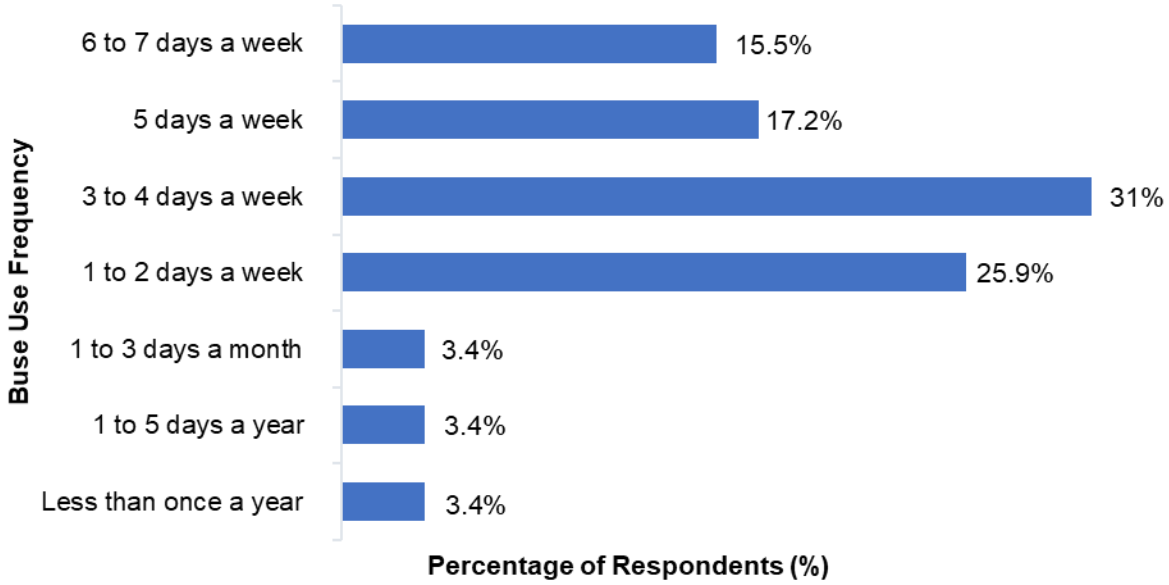



Figure 37. Bus Use Frequencies by Employee Respondents

Respondents who use the bus six to seven days a week account for 15.5%, suggesting that a notable portion of respondents depend on bus services for nearly all of their daily travel needs. In contrast, less frequent riders made up a smaller share of the survey

population, with 3.4% reporting use one to three days a month, 3.4% reporting one to five days a year, and 3.4% reporting use less than once a year.

Employee Survey: Route Usage and Trip Purposes (Bus Users)

Figure 38 shows the total number of recorded trips by purpose among Employee Survey respondents. Work and social trips were the most frequently recorded, accounting for 56 and 54 trips respectively, together comprising the majority (110 trips) of the 151 total trips observed. Personal business trips numbered 19, while medical and school-related trips each accounted for 11 trips, rounding out the remaining travel purposes captured in the data.

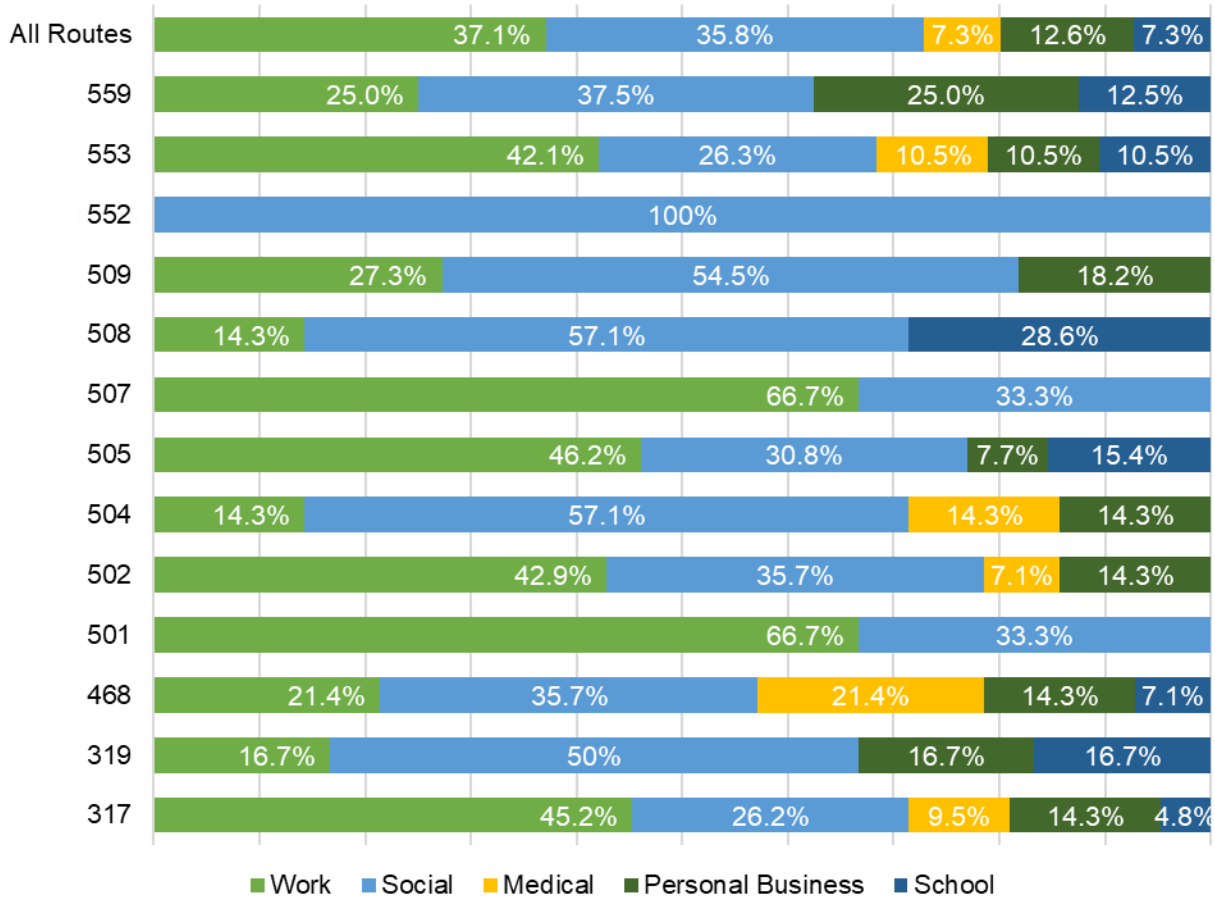



Figure 38. Route Usages and Trip Purposes by the Employee Respondents[2]

Employee Survey: Commute Distance

[2] The "Social" category is the aggregated Entertainment/Recreation, Shopping, and Social/Visiting Family or Friends categories. The "Work" category is aggregated using the Company Business and Work Categories.

Figure 39 shows the distribution of commute distances among Employee Survey respondents. Results from survey questions regarding Distance from Home to the Workplace for respondents of the employee workplace represented a normal distribution across distance segments. The largest segment of survey respondents (41%) lived within 6-10 miles, with the next largest groups in the distance groups to either side, 1-5 miles and 11-20 miles, combining for another 40% of survey respondents. About 6-7% of survey respondents fell into the closest and furthest distance categories of less than 1 mile or greater than 20 miles.

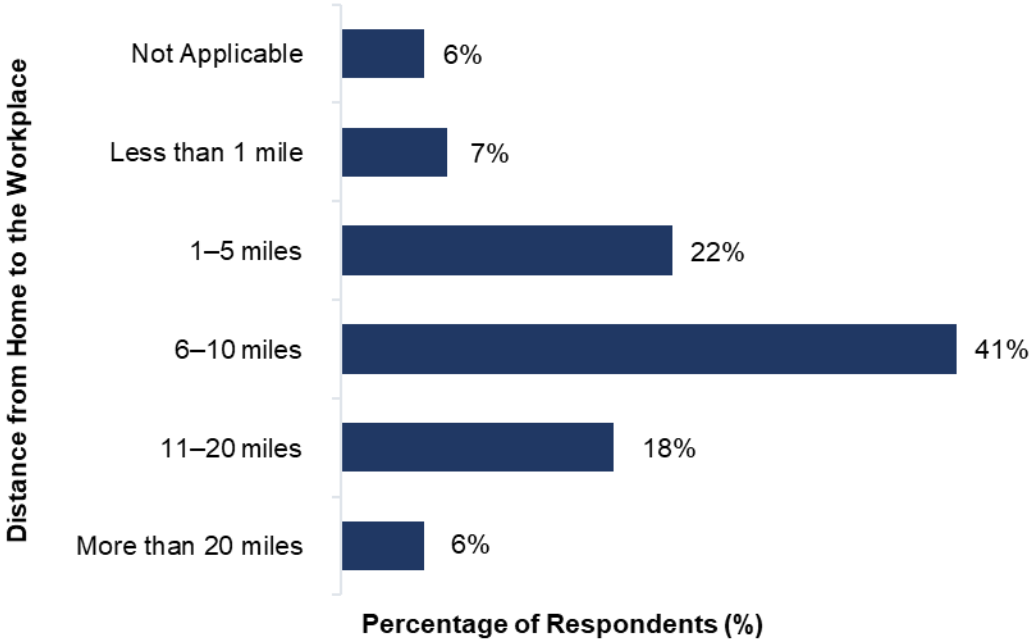



Figure 39. Distance from Home to the Workplace by the Employee Respondents

Employment Types and Sectors

Figure 40 shows the distribution of employment sectors among employee survey respondents. By far the largest share of respondents (33%) work in retail, reflecting the significant presence of retail employment among surveyed workers. The next most represented sectors are education (7%), finance (7%), healthcare (7%), hospitality and tourism (7%), and technology (6%).

Government and arts and entertainment each account for 3%, while transportation and logistics and students each represent 4% of respondents. Construction, manufacturing, casinos, and retired or not employed respondents each make up 2%, and agriculture and farming, as well as energy and utilities, each account for 1%.

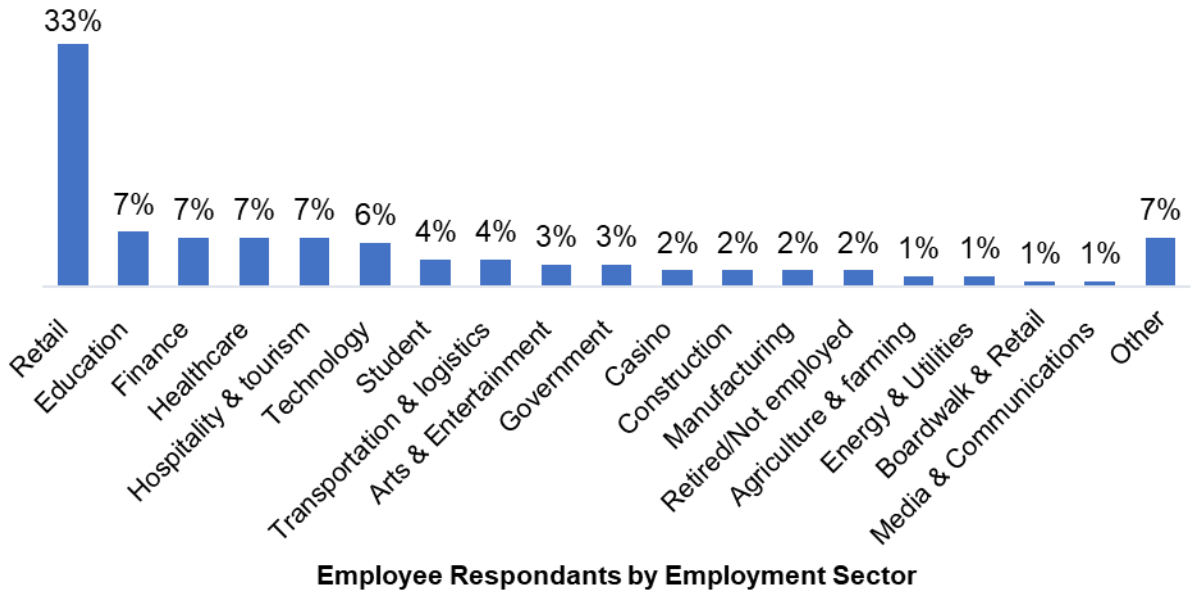



Figure 40. Percentages of Seasonal or Non-Seasonal Employment by Sectors

***Employer Survey***

The employer survey reflects responses from 17 different employers in the region. It provides insights into the industry, size, and priorities from those employers; however, it should be noted that, as stated, the sample size is small given the quantity of responses.

Employers by Business Sector

Figure 41 (left) shows the distribution of employers surveyed by each industry sector. The largest share of participating employees operates in retail (46%), making it by far the most represented sector in the survey. Education and government each account for 15% of employers, together representing nearly a third of all participating organizations. Arts and entertainment, casinos, and finance each comprise 8% of surveyed employees, rounding out the remaining sectors represented in the study.

*Employer Survey: Organization Size*

Figure 41 (right) shows the distribution of surveyed employees by number of employees. Most participating employees (54%) reported having fewer than 50 employees, indicating that small businesses make up the largest share of organizations surveyed. Mid-to-large-sized employers are less represented, with 15% reporting between 500 and 1,000 employees and 8% falling in the 200 to 500 range. Only 8% of employers reported having more than 1,000 employees. An additional 15% of employers preferred not to disclose their company size.

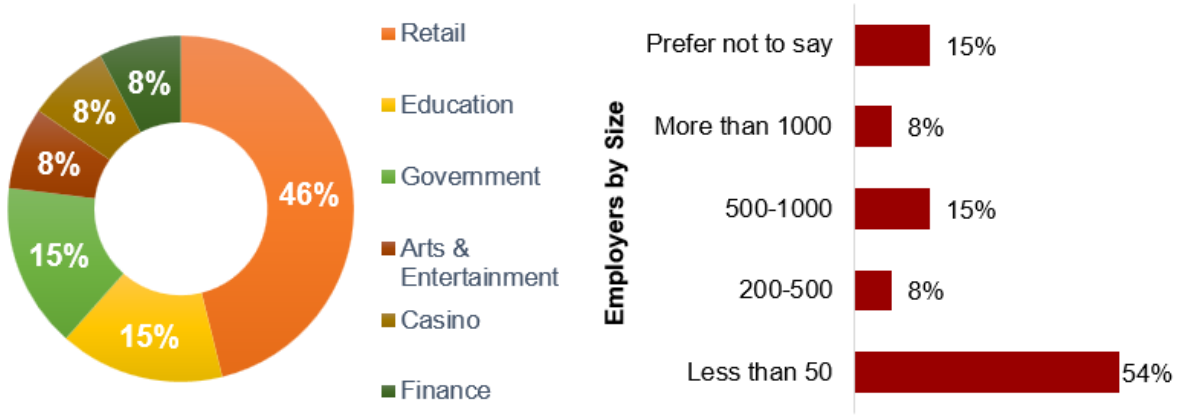



Figure 41. Business Sector by the Employer Respondents (left), Organization Size by the Employer Respondents (right)

Table 11 displays the most frequently cited service improvement priorities, chosen from a list of options, among surveyed employers when asked, “What would you most like to improve about NJ TRANSIT bus service to better serve your employees?” The responses offer some insight into changes that these respondents feel could most effectively expand NJ TRANSIT bus ridership among their employees. Cost was identified as the top priority, cited by 5 employers, suggesting that fare affordability remains a significant barrier to attracting and retaining riders in the study area. Schedules, destinations, service notifications, and getting to the bus were each cited by 4 employers, reflecting a broad consensus that improvements to service frequency and coverage, real-time communication, and first- and last-mile connectivity are equally critical to growing ridership among the workforces.

Table 11 - Top Improvement Priorities (by Employer respondents)

| Priorities | Employer Responses |
|---|---|
| Cost | 5 |
| Schedules | 4 |
| Destinations | 4 |
| Service Notifications | 4 |
| Getting to the Bus | 4 |
| Service Reliability | 3 |
| Mobility/Accessibility | 2 |
| Other | 2 |
| Ease of Use | 2 |

| | |
|---|---|
| Travel Speed | 2 |
| Fare Collection | 2 |

Service reliability was raised by 3 employers, underscoring that consistent and dependable service is a foundational expectation for commuters who may otherwise default to personal vehicles. Mobility and accessibility, ease of use, travel speed, and fare collection were each cited by 2 employers, indicating that while these factors are somewhat lower in priority, they nonetheless represent meaningful opportunities to reduce friction and improve the overall rider experience.

## Origin Destination Matrix

To better understand travel demand patterns across the South Jersey and Shore transit system, OD matrices were developed using multiple transportation datasets to estimate the trips within the study area and the bus routes. These datasets include transit boarding data and alighting information derived from NJ Transit farebox records, regional planning data provided by the South Jersey Transportation Planning Organization (SJTPO), and travel time estimates obtained through the Google Maps Travel Time API. By integrating these data sources, the team estimated passenger flows between bus stops, TAZs, and transit routes. We obtained bus stop and route information from NJ Transit Bus Service Planning team and bus stop locations from NJ Transit GIS team. Each stop includes boarding and alighting data. The ridership data contains the average passenger counts at each bus stop during the month of September 2025.

The OD matrices provide insight into spatial travel patterns across the study area and study bus routes. They help identify key trip generators, major destinations, and high-demand travel corridors. Understanding these patterns is essential for evaluating how existing transit services align with observed travel demand and for identifying potential opportunities to improve connectivity, route coverage, and service efficiency.

Three complementary levels of OD analysis were conducted in this study. First, a stop-based OD matrix was developed to examine passenger movement between individual bus stops within the network. Second, a TAZ-based OD matrix was constructed to analyze regional travel demand between broader geographic zones. Finally, route-based OD matrices were estimated to evaluate passenger movement patterns along individual bus routes and understand corridor-level demand distribution.

The resulting OD datasets were integrated with geographic visualization tools to produce spatial flow maps that illustrate the distribution and intensity of transit travel demand across South Jersey and the Shore region. These visualizations support the identification of major travel corridors, key transit activity centers, and areas where service improvements may enhance accessibility and ridership.

### *Data Sources*

The OD analysis integrates multiple transportation datasets to estimate passenger movement patterns within the study area.

NJ Transit Farebox Data

NJ Transit farebox data provides detailed information on passenger boarding and alightings at the stop level, along with bus route direction and operating time periods. The data are aggregated separately for weekdays, Saturdays, and Sundays to capture differences in passenger demand patterns and service schedules across days of the week. These data enable the estimation of passenger production and attraction at each bus stop, support the construction of stop-level OD flows, and allow the calculation of travel times between consecutive stops.

NJ Transit GTFS Feed

The NJ Transit GTFS feed provides standardized transit schedule and network information in a set of structured text files. The feed includes route definitions, trip patterns, stop locations, stop sequences, and service calendars for the NJ Transit bus system. Key files include routes.txt, which lists route identifiers and route attributes; trips.txt, which defines individual trips associated with each route and service pattern; stops.txt, which contains stop identifiers, stop names, and geographic coordinates; and stop_times.txt, which records the ordered sequence of stops for each trip along with the corresponding arrival and departure times. Additional files, such as calendar.txt and calendar_dates.txt, describe the days of operation and service exceptions. Together, these files describe the scheduled structure of bus routes, their stop locations, and the temporal schedule of service.

Bus Stops of NJ Transit by Line Data

The Bus Stops of NJ Transit by Line dataset is derived from a Geographic Information System (GIS) dataset of NJ Transit bus stops and routes within the defined research area. The dataset contains the bus lines included in the study area along with their corresponding stop information. Each record includes the bus route identifier, stop identifier, stop name, direction of travel, and the geographic coordinates of the stop location. The dataset represents the spatial distribution of NJ Transit bus stops within the research area and organizes the stops by route and direction to reflect the operational structure of the bus network in the study corridor.

SJTPO Planning Data

Regional planning datasets from the SJTPO were used to support the aggregation of travel flows at the TAZ level. These datasets provide geographic and demographic context for interpreting regional travel demand patterns.

Regional planning datasets provided by the SJTPO include both the spatial definition of TAZs and associated OD matrices. The TAZ dataset contains geographic boundaries and identifiers for zones across the study area, enabling spatial analysis and visualization of regional travel patterns. The OD matrices describe estimated travel flows between TAZs

and are categorized by different trip purposes and travel modes. Trip purposes include categories such as home-based work, home-based non-work, and shore-related trips, while travel modes include categories such as walk-to-bus and drive-to-bus transit access. These datasets provide a regional representation of travel demand and serve as the foundation for the TAZ-based OD analysis conducted in this study.

Google Maps Travel Time API

Travel time information between transit stops was obtained using the Google Maps Routes API, a web service provided through the Google Maps Platform for route computation and travel time estimation between geographic locations. The API accepts origin and destination inputs specified by latitude and longitude coordinates, allowing routing queries between individual bus stop locations. Request parameters allow specification of the departure date and time, enabling route calculations corresponding to different times of day and day of the week. The service also supports transit-based routing, and the transit mode parameter can be configured to return results specifically for bus services, providing travel time estimates associated with scheduled bus operations.

***Methodology***

Data Preparation

Prior to OD estimation, multiple datasets were processed and integrated to establish a consistent analytical framework. The primary datasets included NJ Transit farebox boarding records, regional planning data from the SJTPO, and travel time estimates obtained from the Google Maps Travel Time API.

Stop-Level Passenger Production and Attraction Aggregation Method

To estimate the spatial distribution of passenger boarding and alighting activities within the study area, a stop-level travel demand aggregation was applied to the NJ Transit farebox dataset. The objective of this process is to derive two key indicators for each transit stop: passenger production (boarding activity) and passenger attraction (alighting activity). These indicators represent the total passenger demand associated with each stop and serve as the origin and destination inputs for subsequent trip distribution analysis.

The raw farebox dataset contains records of passenger boarding and alighting counts summarized for individual route segments and time periods. Each record includes the bus route identifier, stop identifier, and average passenger counts. Since the dataset may contain operational records not representing actual boarding locations, a data cleaning step was first applied. First, each record is mapped to verified bus stop positions by matching Farebox data to Bus Stops of NJ Transit by Line Data using the unique bus stop ID from both datasets, which ensures the passenger production and attraction will be correctly aggregated to each bus stop.

After the cleaning process, the remaining records were grouped by unique bus stop ID. For each stop, the passenger boarding and alighting values were aggregated across all routes, directions, and time periods present in the dataset. The aggregation was performed using a summation operator, ensuring that the final values represent the total passenger activity observed at that stop within the dataset.
The resulting indicators are defined as follows:

$$P_i = \sum_{r \in R_i} ON_r$$
$$A_i = \sum_{r \in R_i} OFF_r$$

Where:
$i$ represents a specific transit stop, $R_i$ represents the set of all farebox records associated with stop $i$, and $ON_r$ and $OFF_r$ are the average numbers of passengers boarding and alighting recorded in record $r$

Therefore, $P_i$ represents the total passenger boardings occurring at a stop, and $A_i$represents the total passenger alightings occurring at a stop.

These two metrics correspond to the origin and destination components commonly used in transportation demand modeling and gravity-based trip distribution frameworks. By aggregating passenger activity across all operational records associated with each stop, the method produces a concise stop-level representation of transit demand while preserving the cumulative passenger volumes observed in the farebox data.

Bus Stop Order Extraction and Match with Farebox Data

GTFS provides a standardized dataset describing scheduled transit services. Several GTFS tables are used to derive the stop order for each bus route and travel direction.

The process begins by identifying the bus routes that operate within the research area. The list of routes is obtained from the Bus_Line_Study_Area dataset, which contains the route identifiers used in the analysis. For each route listed in this dataset, the corresponding GTFS route identifier (route_id) is identified from the routes.txt table.

The matching process first compares the research route number with the route_short_name field in GTFS. If no direct match is found, the procedure attempts to match using the route_id field. This step ensures that each research area route is correctly associated with its GTFS route identifier.

Once the GTFS route identifier is determined, the trips.txt table is queried to retrieve all scheduled trips associated with that route. The route_id field is used as the matching key between routes.txt and trips.txt. Each trip record contains a direction_id attribute that distinguishes inbound and outbound services.

For each direction, a representative trip is selected to determine the stop order. The representative trip is identified by counting the number of stop records associated with each trip in the stop_times.txt table and selecting the trip with the largest number of stops. This ensures that the chosen trip captures the full stop sequence along the route.
The ordered stop list is then extracted from the stop_times.txt table using the trip_id of the representative trip. The stop_sequence field specifies the scheduled order in which stops are served along that trip.

Finally, the stop sequence is joined with the stops.txt table using the stop_id identifier to retrieve additional stop information, including stop code, stop name, and geographic coordinates. The resulting dataset contains the ordered stop sequence for each route and travel direction.

The following diagram in Figure 42 summarizes the data relationships and matching identifiers used in the stop order reconstruction process.

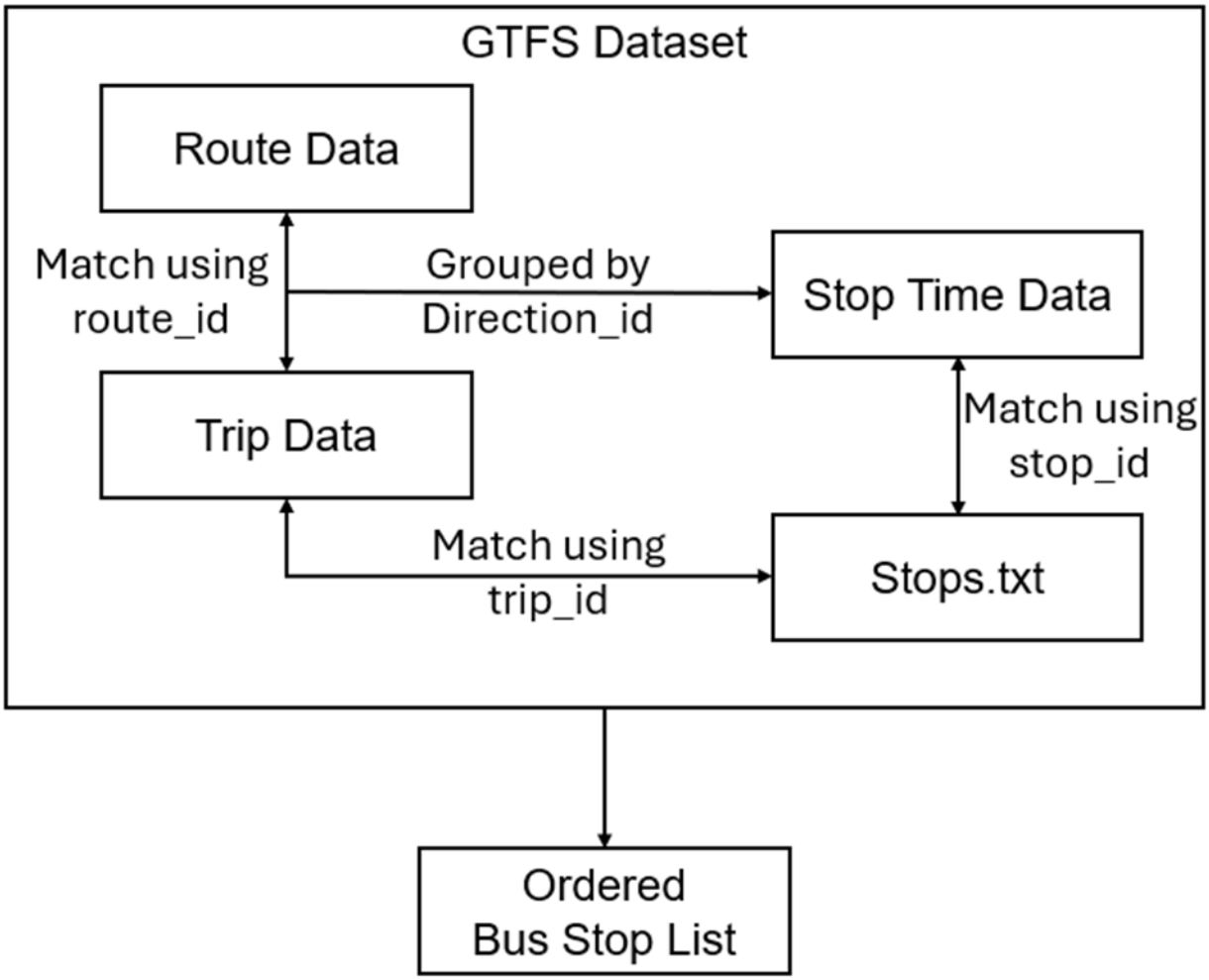



Figure 42. Bus Stops Order Extraction from GTFS

Farebox Data Alignment with Stop Sequences

To reconstruct the operational stop order observed in service, farebox records are matched with the ordered stop list derived from the GTFS dataset. The matching process associates each farebox stop record with its corresponding stop in the GTFS stop list. Once matched, the stop sequence number from the GTFS dataset is assigned to the farebox record. This sequence number represents the relative position of the stop along the route.

After assigning sequence numbers, the farebox records for each route and direction are sorted by stop sequence. This produces the operational order in which passenger activity was recorded along the route. The difference in sequence numbers between consecutive records is then evaluated. If the difference exceeds one, this indicates that one or more intermediate stops were not observed in the farebox dataset. These occurrences are identified as stop jumps.

Stop jumps may arise from several operational conditions, including:

- passenger inactivity at intermediate stops
- express service patterns on different days of the week

Travel Impedance Estimation

Travel impedance between origins and destinations was estimated using travel time information obtained from the Google Maps Travel Time API. For each OD pair, the estimated travel time was calculated based on the roadway network.

Travel time was selected as the primary impedance measure because it reflects the generalized cost of travel experienced by transit users. These travel times were incorporated into the OD estimation process to represent the relative accessibility between locations. Shorter travel times correspond to stronger interaction between origins and destinations, while longer travel times reduce the likelihood of trips occurring between those locations.

After reconstructing the ordered sequence of stops from farebox observations, the next step is to estimate the travel time between consecutive stops. For each pair of consecutive stops, the geographic coordinates of the stops are used as origin and destination inputs for routing queries. Travel time is estimated using the Google Maps Routes API, which provides transit routing functionality based on the public transit network. The routing request specifies transit mode with bus service, ensuring that the travel time estimates reflect transit network operations rather than general road travel.
Since transit performance varies by time of day and day of week, routing queries are categorized according to the time and service day type recorded in the farebox dataset. The departure time parameter in the API request is set accordingly so that the estimated travel time reflects representative operating conditions.

The processing of the travel impedance estimation can be summarized in the following pseudo-algorithm:

**Algorithm 1 Stop-to-Stop Travel Time Estimation**

**Input:**
- **Ordered Farebox Stop Records**
- **Stop Coordinate Dataset**
- **Day-of-Week Category**
- **Time-of-Day Category**

**Output:**
- **Stop-to-Stop Travel Time Dataset**

**For each route** $R$
- **For each direction** $D$ **(Inbound or Outbound)**
  - **Sort farebox records by stop sequence**
  - **For each consecutive stop pair** $(S_i, S_j)$

    **If** $S_i == S_j$
    - **Assign** $travel\_time = SAME\_STOP$

    **Continue**

    **Retrieve coordinates**
    - $origin = (lat_i, lon_i)$
    - $destination = (lat_j, lon_j)$

    **Determine departure time based on day_of_week and time_of_day**

    **Send routing request to Google Maps Routes API**
    - $mode = transit$
    - $transit\_mode = bus$

      **If API response is valid**
      - **Extract** $travel\_time$
      - **Extract** $travel\_distance$

      **Else**
      - **Record API status code for further exploration**

Gravity Model for Trip Distribution

A gravity model was used to estimate travel flows between origins and destinations. Gravity models are widely used in transportation planning to represent spatial interaction patterns between locations. The model assumes that trip flows between two locations are proportional to the magnitude of activity at each location and inversely related to the travel impedance between them.

In this study, the production and attraction values derived from farebox data were used as measures of trip generation and attraction at each stop. Travel time between locations

served as the impedance variable. The resulting OD flow between an origin $i$ and a destination $j$ was estimated using the following equation:

$$T_{ij} = P_i \frac{A_i f(c_{ij})}{\sum_k A_k f(c_{ik})}$$

Where:
$T_{ij}$ is the estimated number of trips from the origin $i$ to destination $j$. $P_i$ is the production at origin $i$. $A_i$ is the attraction at the destination $j$. $c_{ij}$ is travel impedance between $i$ and $j$. $f(c_{ij})$ is the impedance delay function. This approach ensures that estimated flows are consistent with observed production and attraction totals while reflecting the influence of travel time on trip distribution.

OD Matrix Generation

Based on the data preparation and modeling procedures described above, OD matrices were generated and organized at three spatial levels in order to capture different aspects of travel demand within the study area and study corridors.

Stop-Based OD Matrix

A stop-level OD matrix was generated to represent passenger movement between individual bus stops within the transit network. This dataset captures localized travel interactions and provides insight into how passengers move along specific transit corridors and between nearby activity centers.

TAZ-Based OD Matrix

To examine regional travel patterns, a TAZ-based OD matrix provides a regional perspective on travel demand between different parts of the study area and helps identify major origin and destination zones associated with transit travel.

Route-Level OD Matrix

In addition to systemwide analysis, route-level OD matrices were generated by organizing stop-level data according to their associated bus routes. This route-based representation enables examination of travel demand within individual transit corridors and supports the identification of routes and segments with higher passenger volumes.

Together, these three OD representations provide complementary perspectives on transit travel demand. The stop-based matrix highlights localized movement patterns, the TAZ-based matrix illustrates regional travel interactions, and the route-level matrix provides insight into demand distribution along studied bus routes. These OD datasets form the basis for spatial analysis and visualizations.

### *Results*

The gravity-model-based OD estimation was conducted separately for weekday, Saturday, and Sunday conditions, and all model runs achieved successful convergence. For the weekday analysis, the model included 1,614 stops and converged in 97 iterations, with total productions and attractions balanced at 4,233.97 trips. For Saturday, the model included 1,574 stops and converged in 96 iterations, with a total of 3,849.14 trips. For Sunday, the model included 1,467 stops and converged in 53 iterations, with a total of 3,463.64 trips. Across all three cases, the maximum relative row and column errors weron the ord of $10^{-6}$ and $10^{-10}$, respectively, indicating that the estimated OD matrices closely satisfy the production and attraction constraints. These results demonstrate that the gravity model provides stable and consistent trip distribution estimates across different service periods, with slightly lower total demand and faster convergence observed for weekend conditions compared to weekdays. The OD analysis provides an overview of travel demand patterns across the study area at multiple spatial scales. Three types of OD representations were developed to capture different aspects of transit travel behavior: stop-based OD flows, route-based OD flows, and TAZ-based OD flows. Together, these visualizations illustrate how transit trips are distributed across the network, highlighting areas with concentrated demand as well as major travel connections between locations.

### *Origin-Destination Visualization Maps*

Stop based Origin-Destination Patterns

Stop-based OD maps illustrate estimated passenger movements between individual bus stops across the study area for weekday, Saturday, and Sunday conditions. The thickness of each line represents the estimated number of trips between origin and destination stops, with thicker lines indicating higher passenger flows. These maps highlight localized travel patterns and areas where passenger movements are concentrated within the transit network.

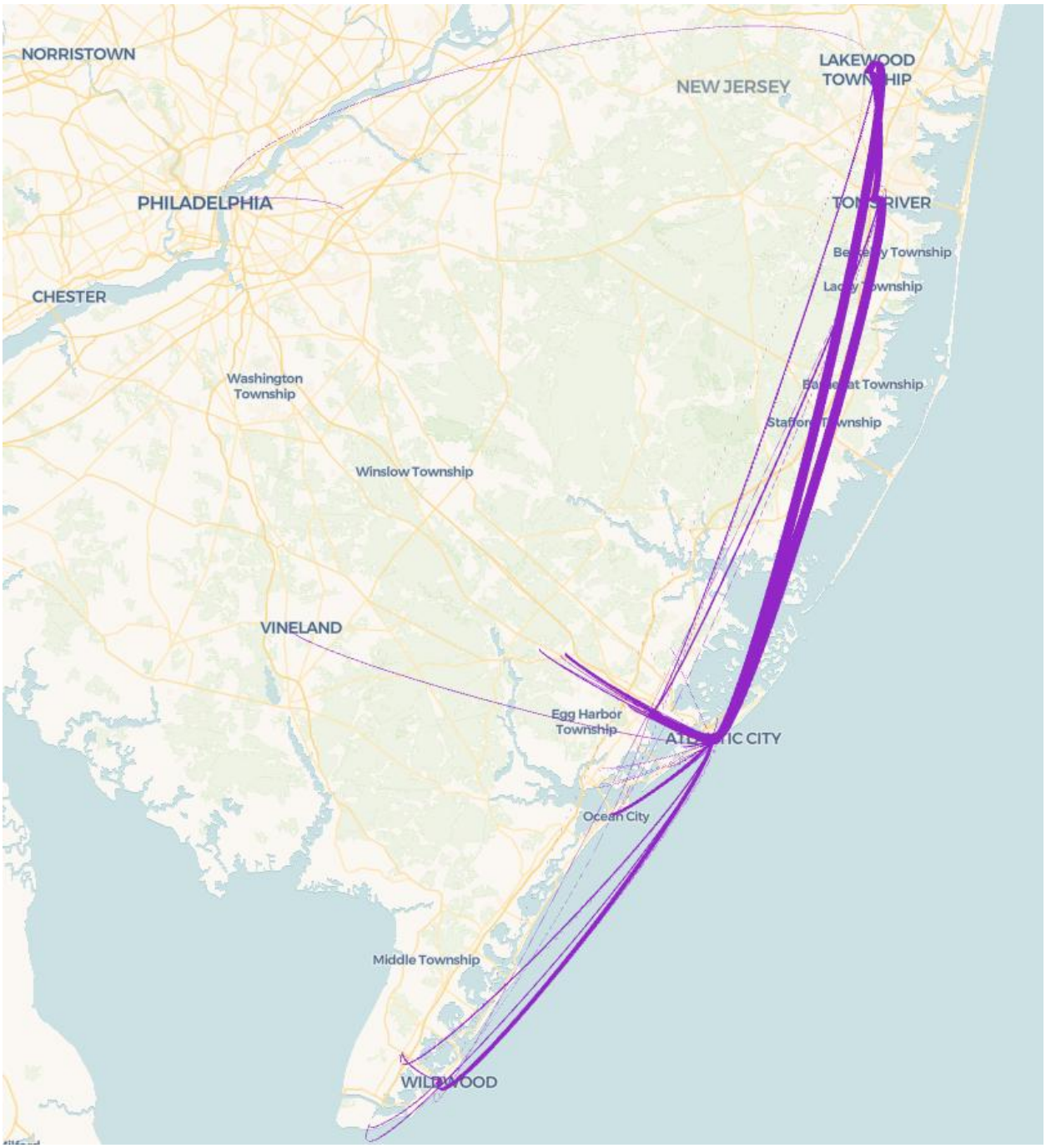


Figure 43. Stop-Based Origin-Destination Flows - Weekday

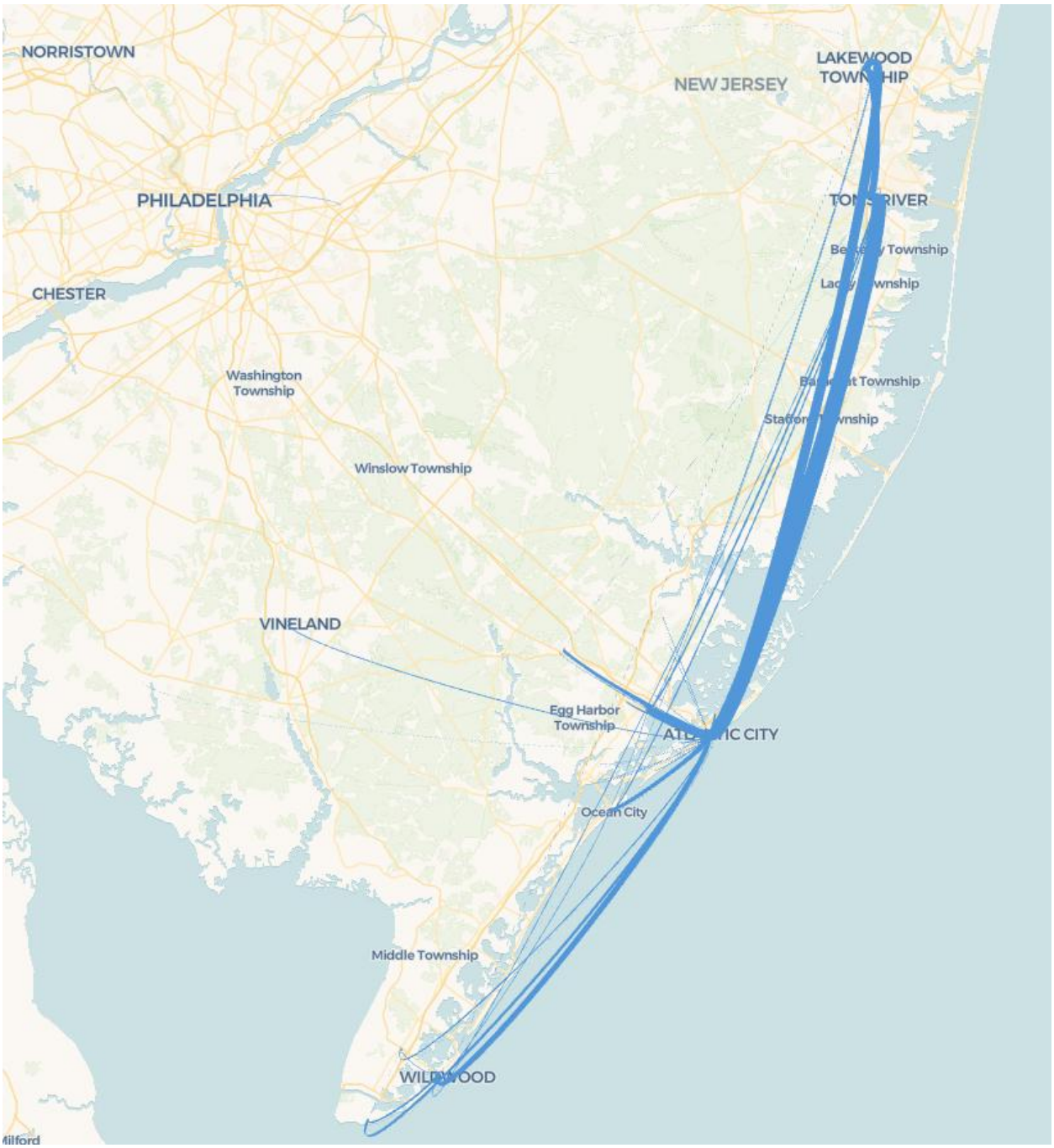


Figure 44. Stop-Based Origin-Destination Flows - Saturday

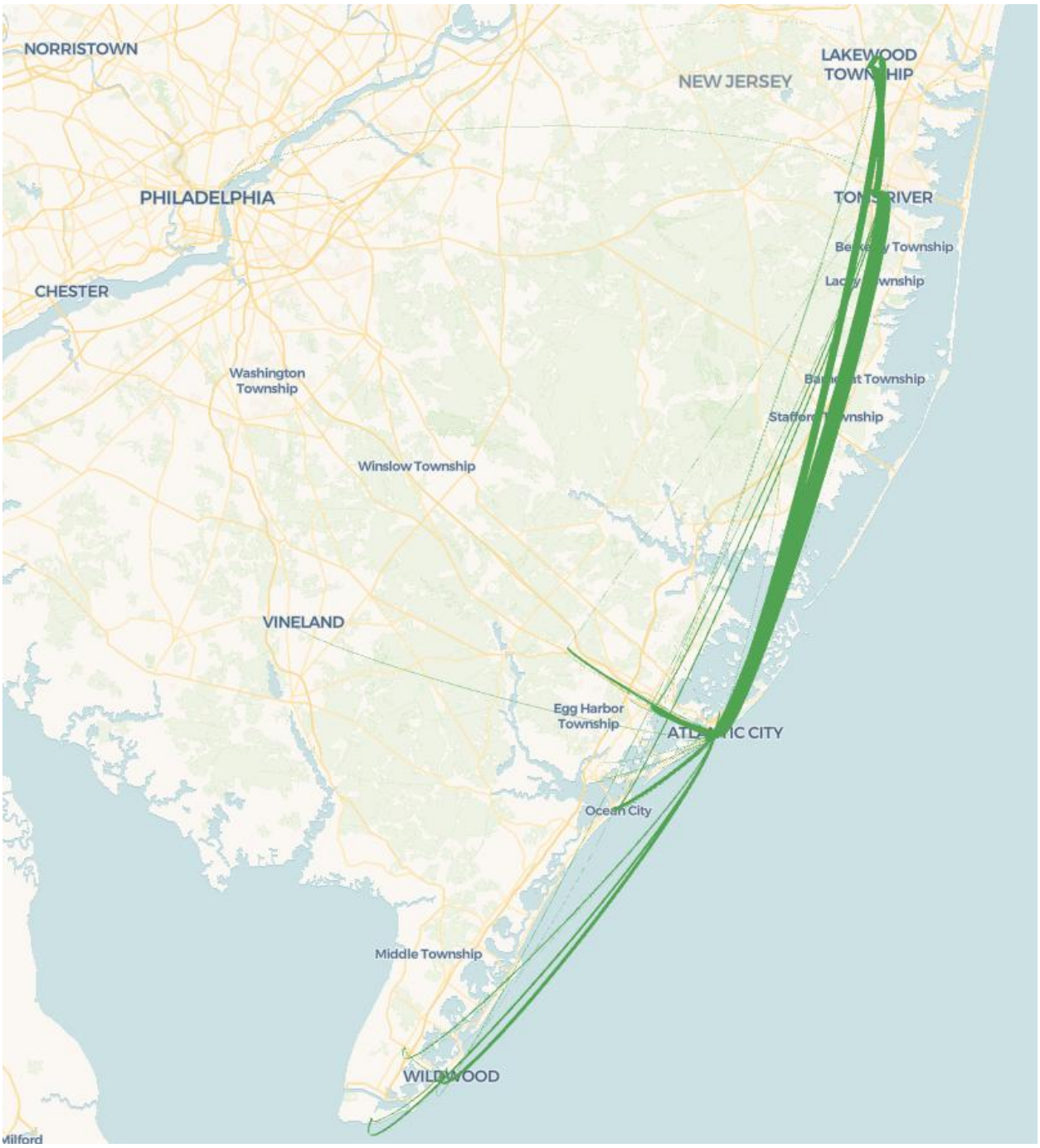



Figure 45. Stop-Based Origin-Destination Flows - Sunday

Route-based ODs

Route-based OD maps represent stop-to-stop passenger flows estimated separately for each bus route. For each route, a stop-level OD matrix was generated based on route-specific boarding, alighting, and travel time information. The OD flows from all routes were then combined and displayed on a single map to provide a comprehensive view of passenger movement across transit corridors.

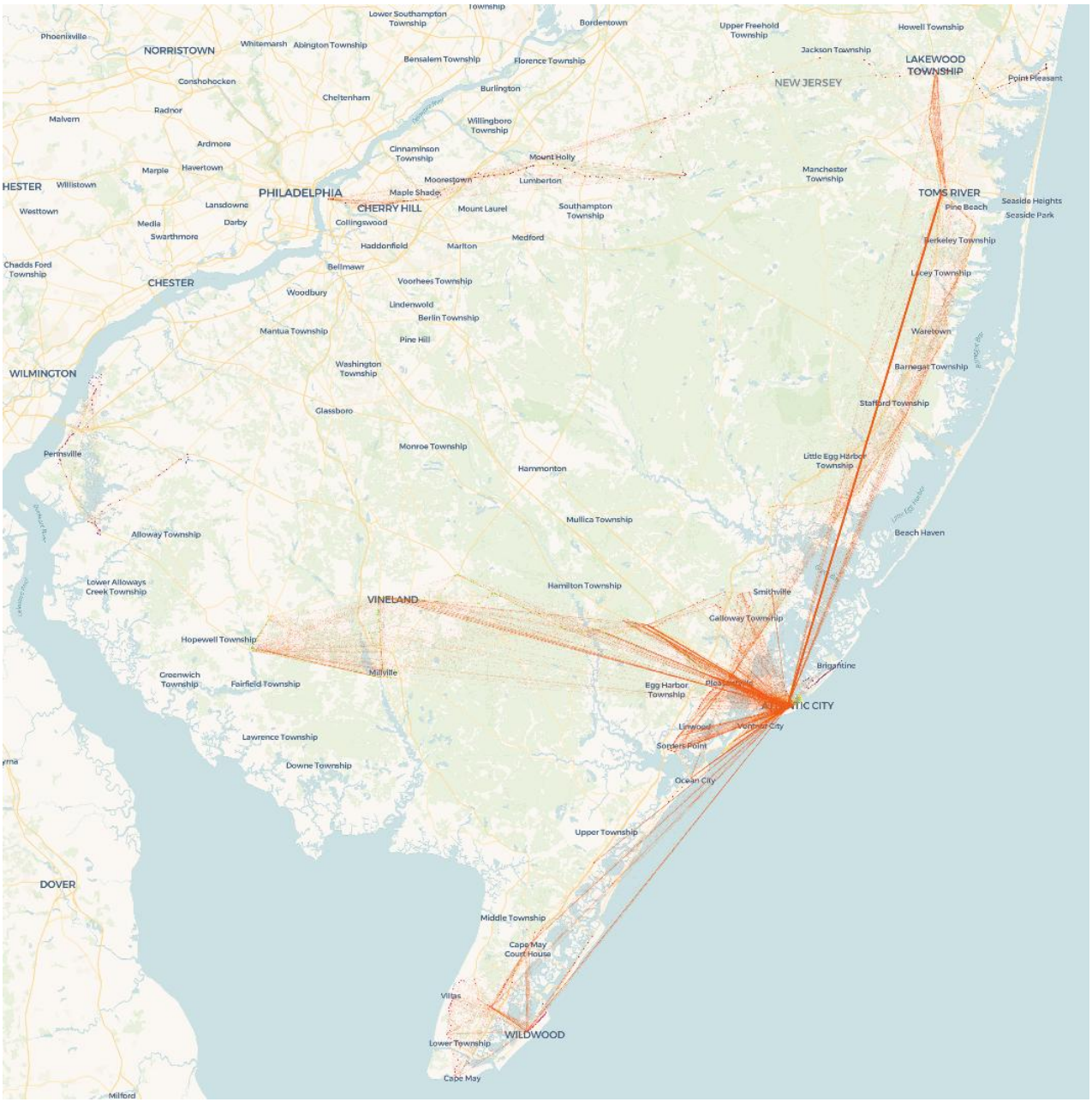



Figure 46. Route-Based Origin-Destination Flows - Weekday

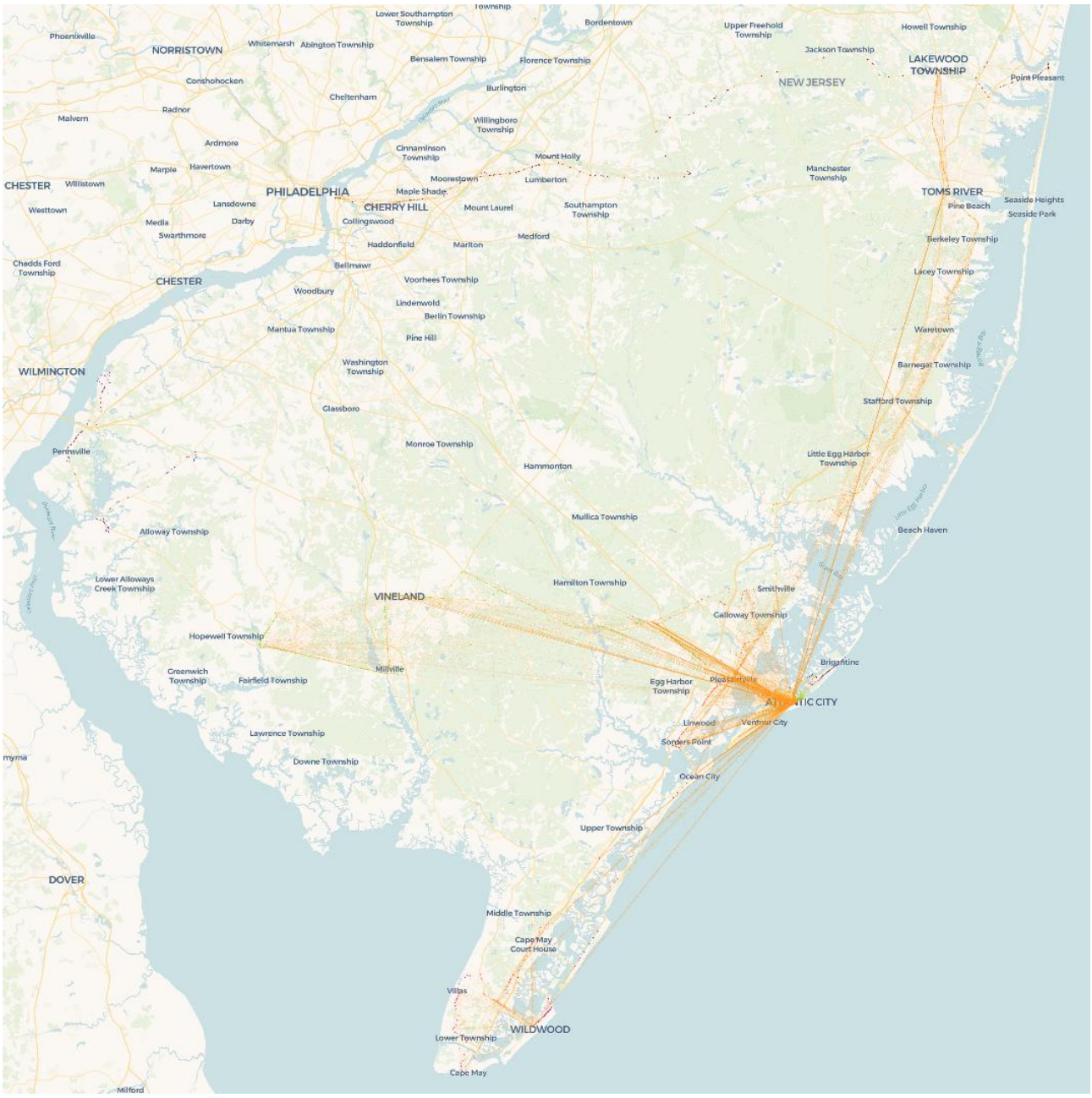



Figure 47. Route-Based Origin-Destination Flows - Saturday

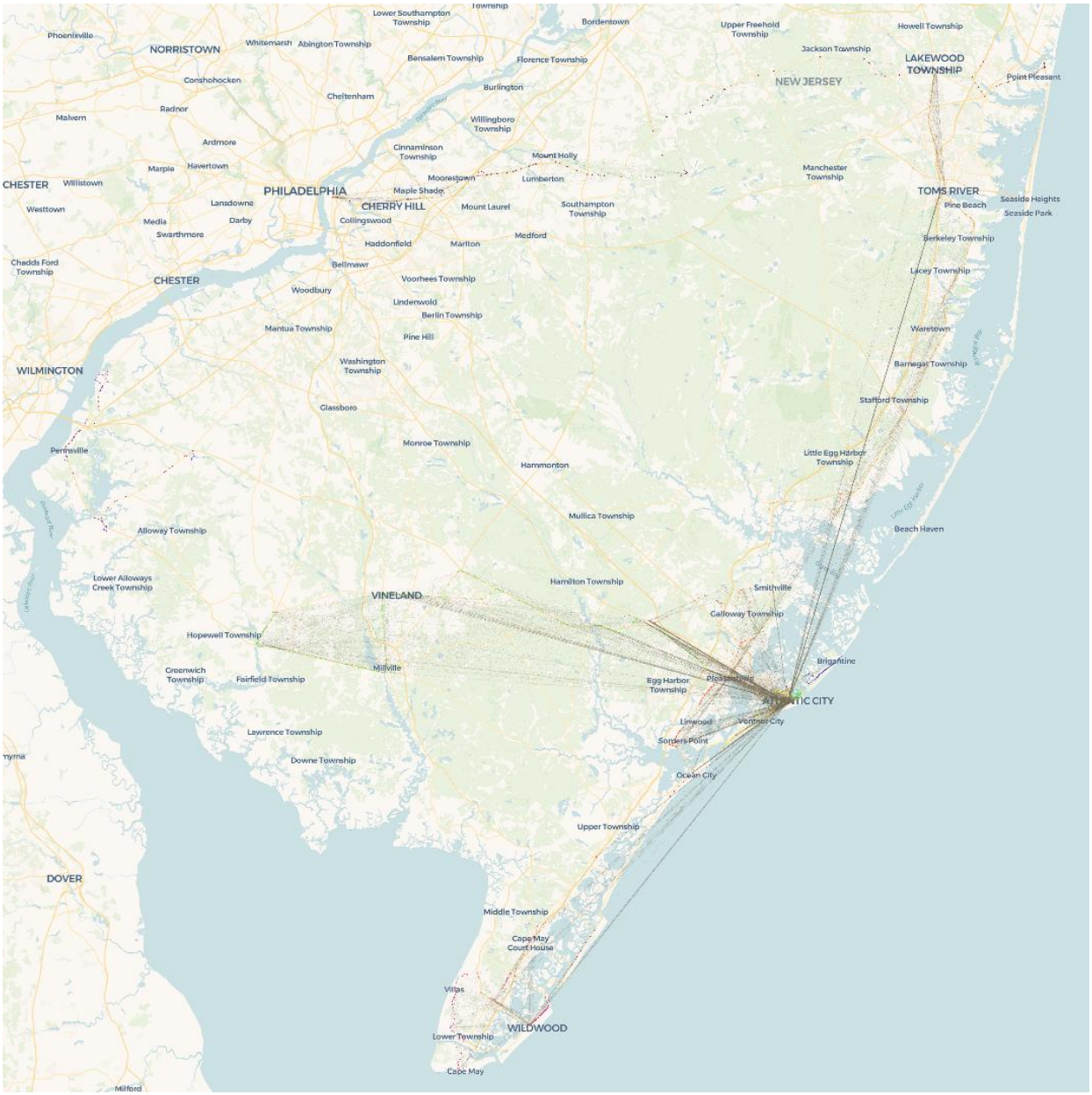



Figure 48. Route-Based Origin-Destination Flows - Sunday

## TAZ-Based Regional Travel Patterns

To examine regional travel demand patterns, OD matrices from the SJTPO were used to visualize flows between TAZs. This representation provides a broader view of travel demand and highlights regional travel corridors that influence transit usage. Figures 49 to 53 show TAZ-based OD flows for different trip purposes, including non-home-based work, non-home-based non-work, home-based work, shore visit, and home-based shopping trips, allowing regional travel patterns to be compared across different types of activities. These trip purposes are presented because they account for the largest share of trips in the dataset and are representative of major travel activities within the study area.

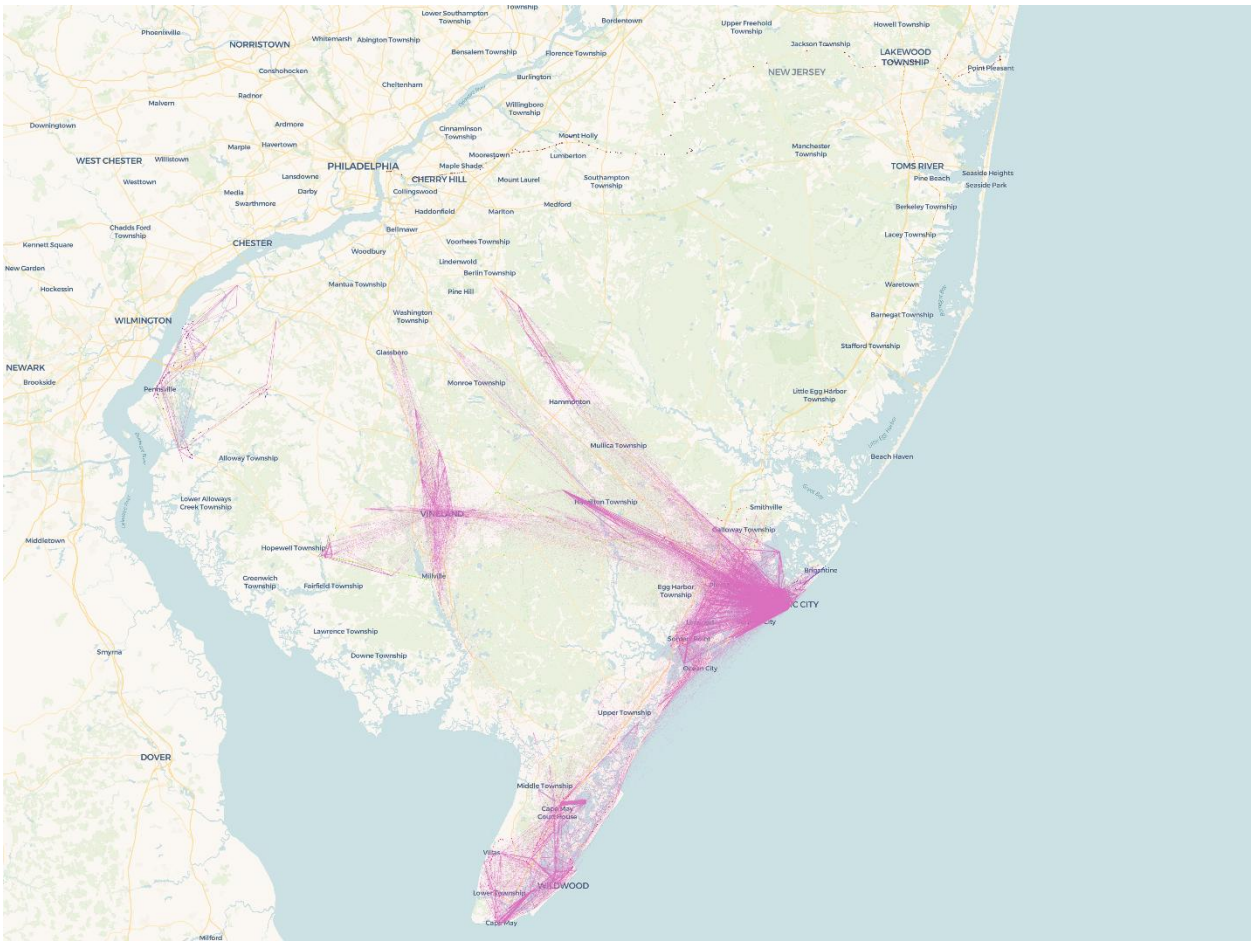


Figure 49. TAZ-based OD flows for Non-Home-Based Work trips

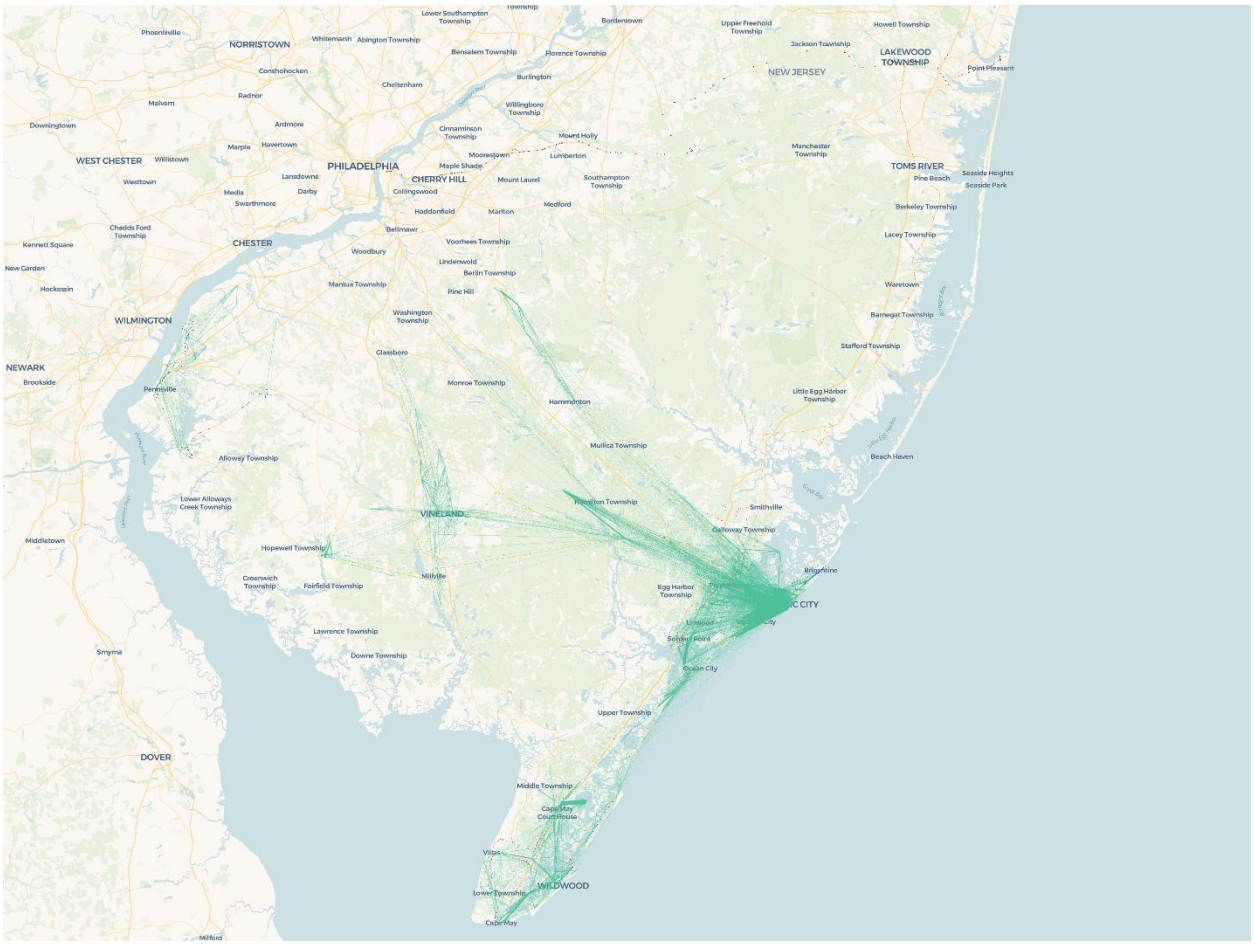


Figure 50. TAZ-based OD flows for Non-Home-Based Non-Work trips

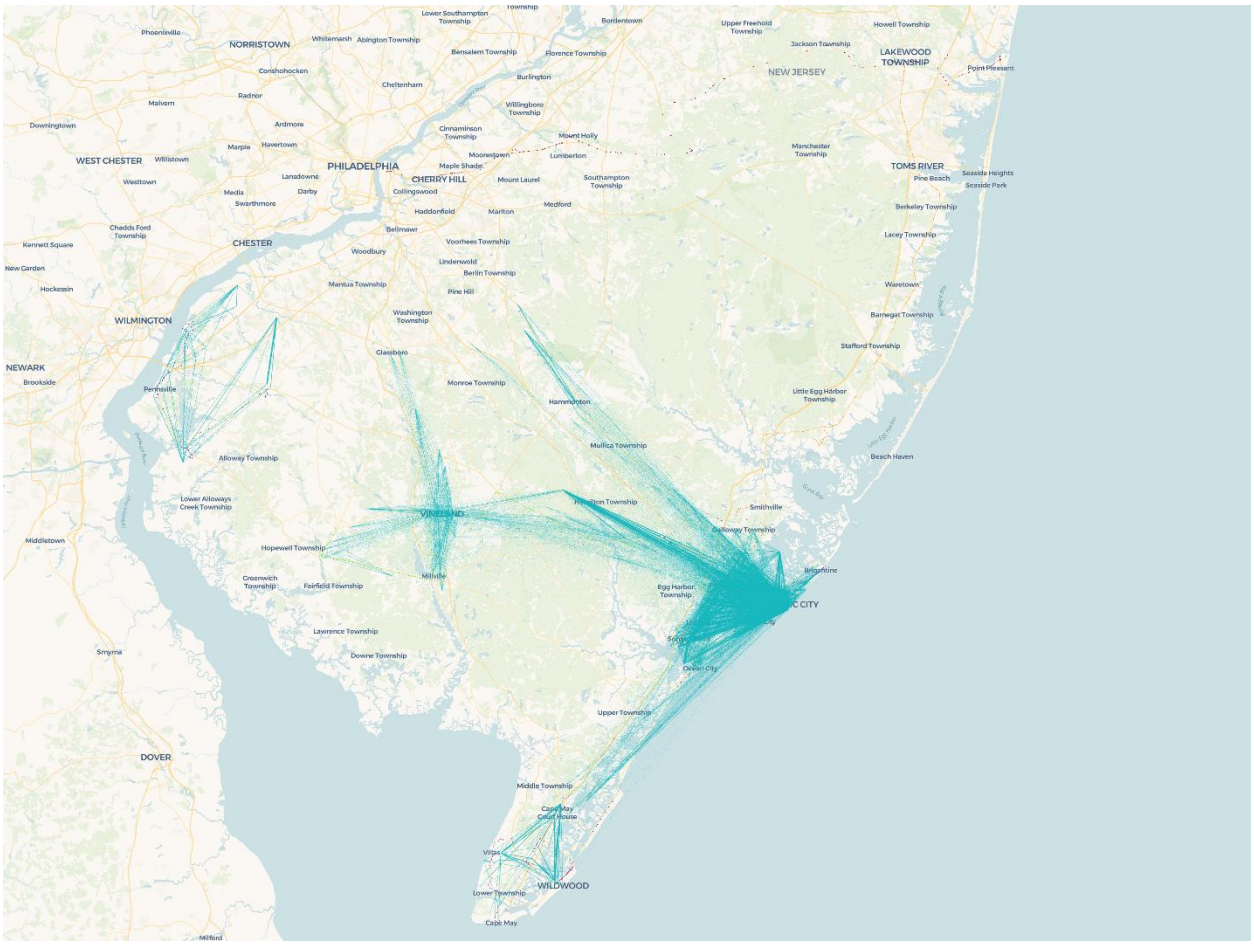


Figure 51. TAZ-based OD flows for Home-Based Work trips

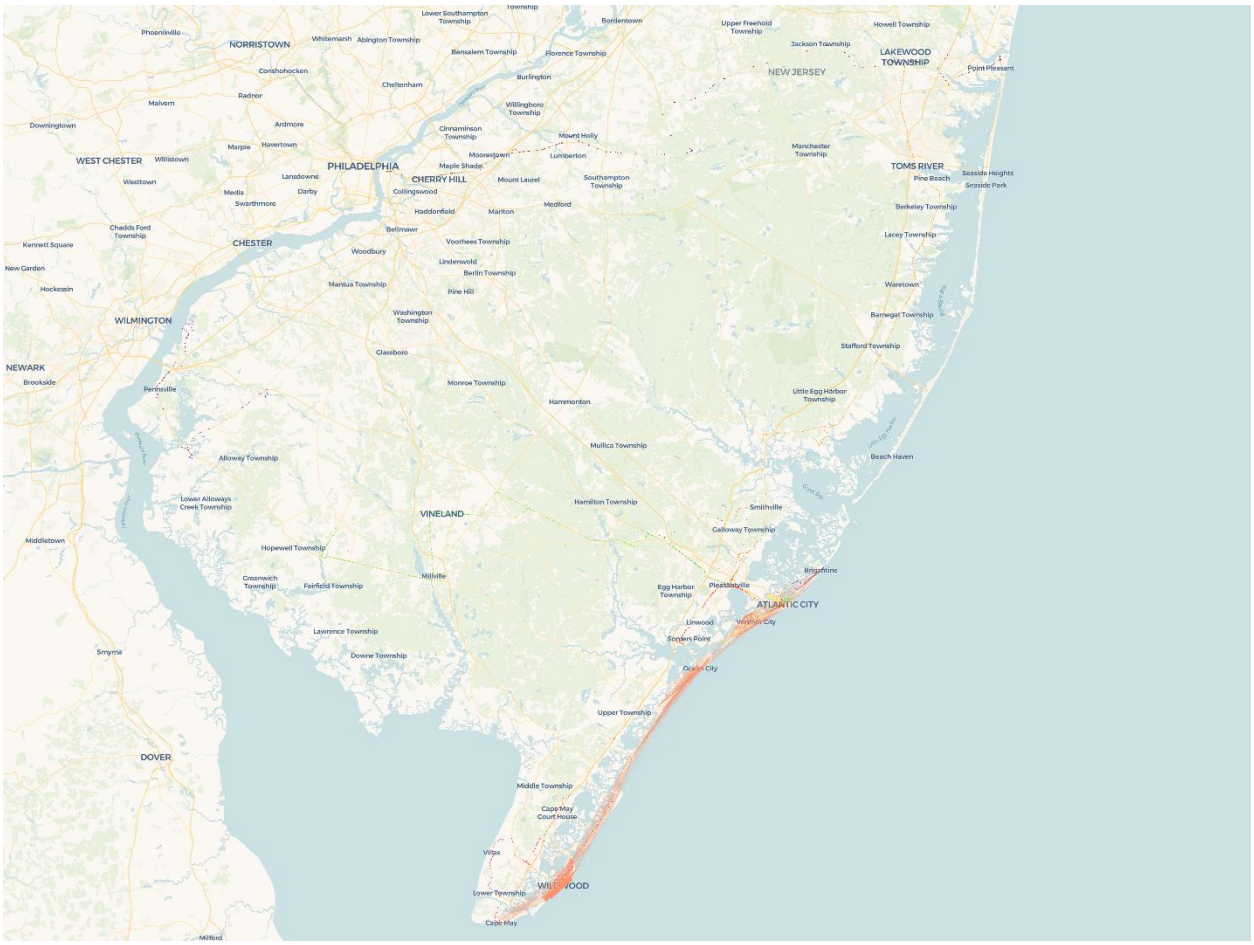


Figure 52. TAZ-based OD flows for Shore Visit trips

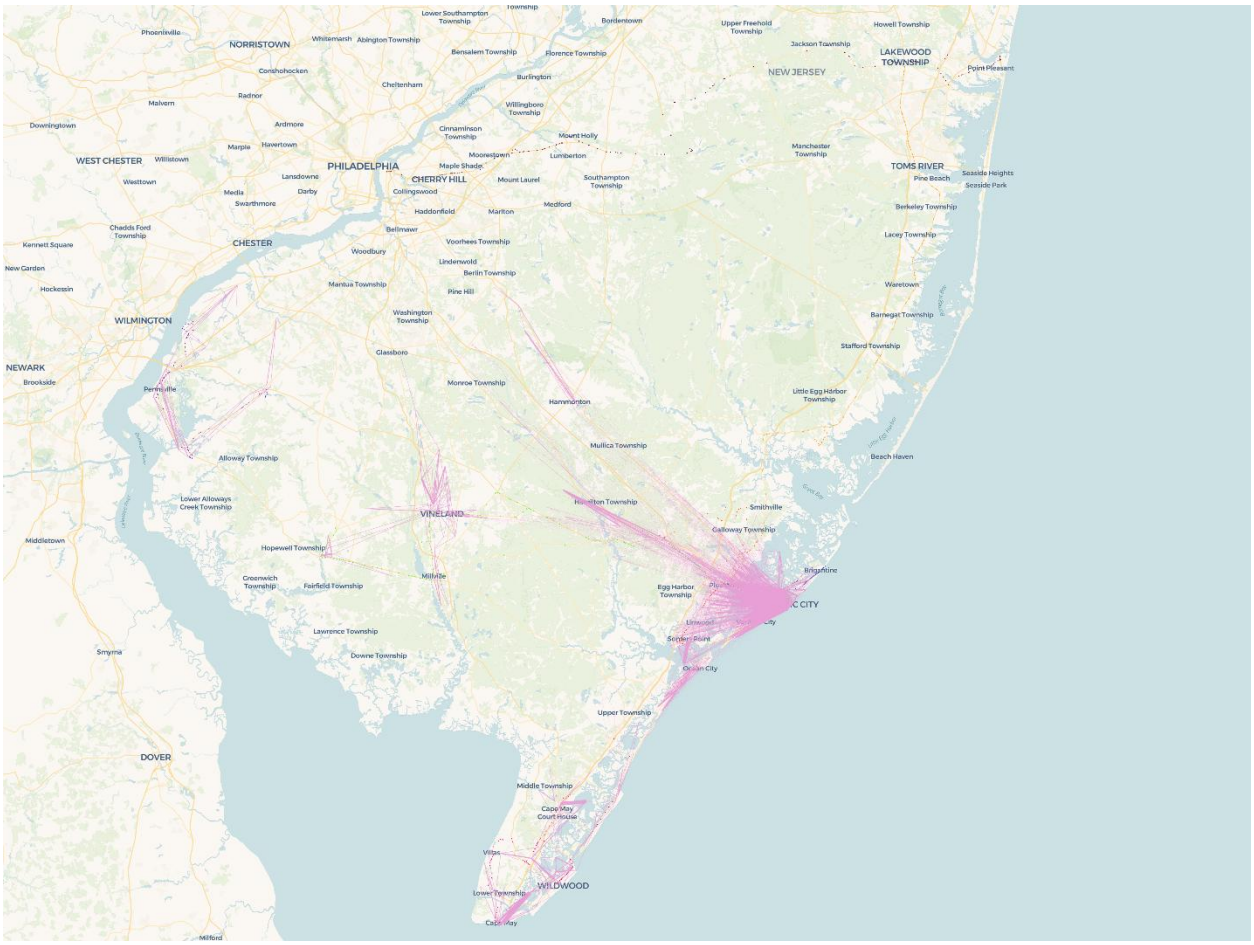



Figure 53. TAZ-based OD flows Home-Based Shopping trips

***Transit Activity Hotspots***

The OD analysis was used to identify locations that generate or attract large numbers of transit trips. These locations represent transit activity hotspots where passenger boarding or alighting activity is concentrated. Stops with high production values indicate locations where many trips originate, while stops with high attraction values represent destinations receiving significant passenger flows. Identifying these hotspots provides insights into areas where transit demand is strongest and helps highlight locations that play an important role within the transit network. Figures 54 and 55 show the bus stop with the highest production and attractions on weekdays. Tables 12 to 17 provide insights about the bus stop with the highest productions and attractions for weekdays, Saturdays, and Sundays.

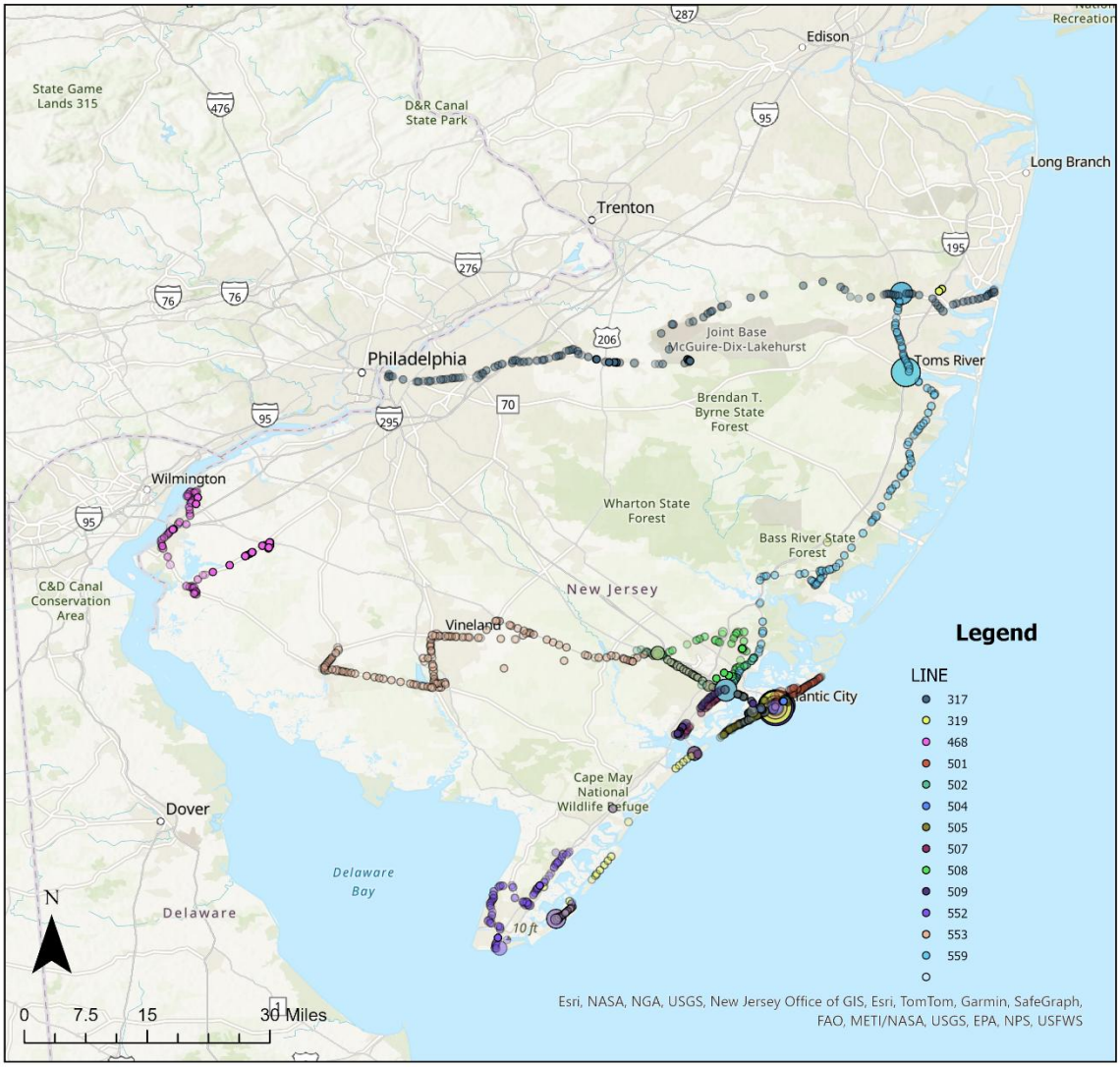



Figure 54. Bus Stops by Productions

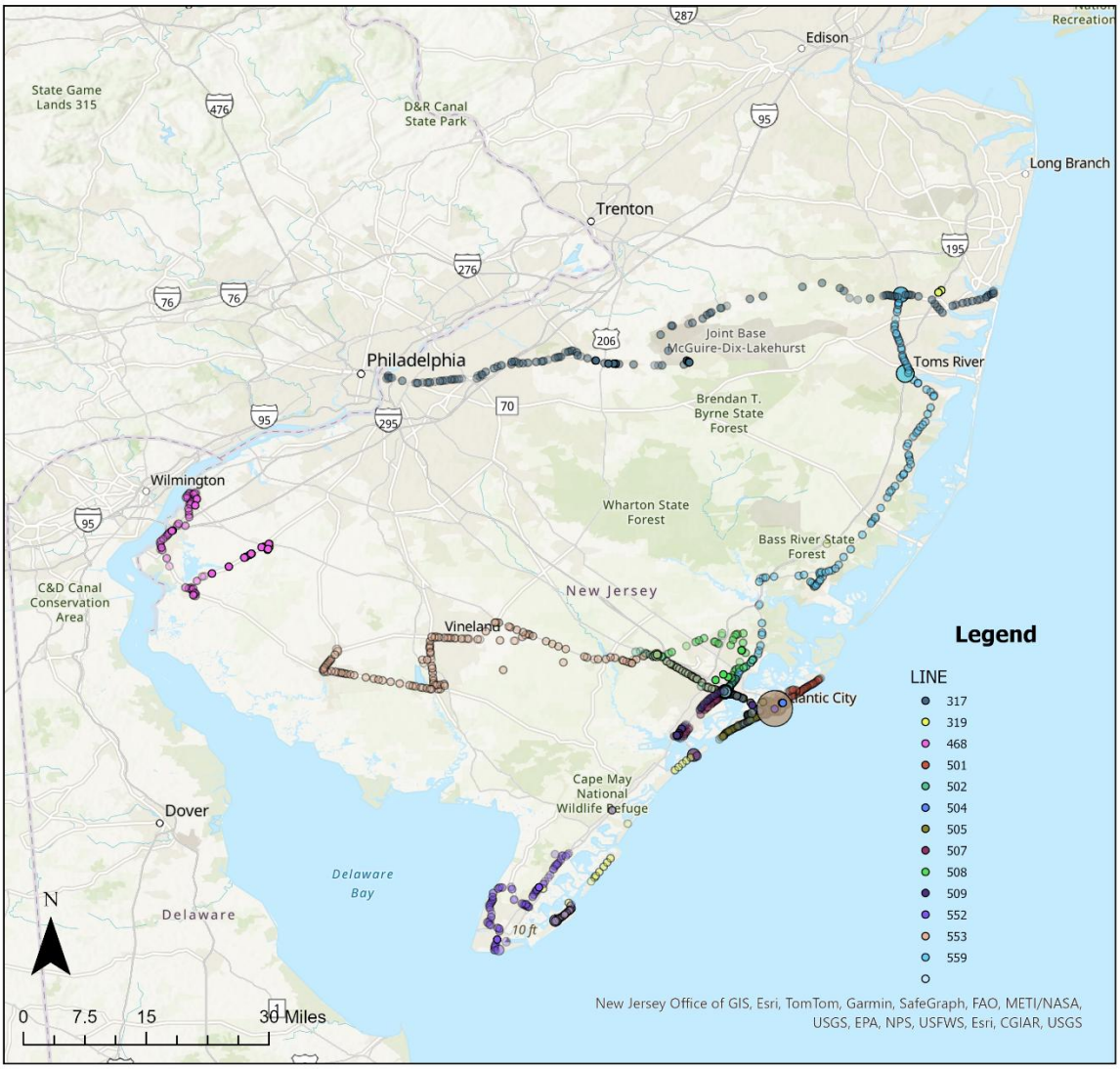



Figure 55. Bus Stops by Attractions

Table 12 - Bus Stops with the Highest Trip Production - Weekday

| Rank | Stop ID | Stop Name | Production |
|---|---|---|---|
| **1** | 10090 | ON ATLANTIC AVE AT OHIO AVE | 199.17 |
| **2** | 10186 | AC BUS TERMINAL | 150.54 |
| **3** | 10085 | ATLANTIC AVE AT S CAROLINA AVE | 134.89 |
| **4** | 26412 | LAKEWOOD BUS TERMINAL | 101.42 |
| **5** | 10853 | W JERSEY AVE AT MAIN ST | 99.75 |

Table 13 - Bus Stops with the Highest Trip Attraction - Weekday

| Rank | Stop ID | Stop Name | Attraction |
|---|---|---|---|
| 1 | 31064 | ARRIVAL AREA INSIDE AC BUS TERMINAL | 320.29 |
| 2 | 26606 | TOMS RIVER PARK/RIDE | 119.62 |
| 3 | 26412 | LAKEWOOD BUS TERMINAL | 110.46 |
| 4 | 10070 | ATLANTIC AVE AT NEW YORK AVE | 110.22 |
| 5 | 10852 | W JERSEY AVE AT MAIN ST | 97.78 |

Table 14 - Bus Stops with the Highest Trip Production - Saturday

| Rank | Stop ID | Stop Name | Production |
|---|---|---|---|
| 1 | 10090 | ON ATLANTIC AVE AT OHIO AVE | 174.35 |
| 2 | 10186 | AC BUS TERMINAL | 153.28 |
| 3 | 31859 | PABT NORTH WING WHEN ASSIGNED | 134.57 |
| 4 | 26606 | TOMS RIVER PARK/RIDE | 130.98 |
| 5 | 10085 | ATLANTIC AVE AT S CAROLINA AVE | 130.75 |

Table 15 - Bus Stops with the Highest Trip Attraction - Saturday

| Rank | Stop ID | Stop Name | Attraction |
|---|---|---|---|
| 1 | 31064 | ARRIVAL AREA INSIDE AC BUS TERMINAL | 370.04 |
| 2 | 26606 | TOMS RIVER PARK/RIDE | 136.02 |
| 3 | 26412 | LAKEWOOD BUS TERMINAL | 100.82 |
| 4 | 10070 | ATLANTIC AVE AT NEW YORK AVE | 99.00 |
| 5 | 10852 | W JERSEY AVE AT MAIN ST | 92.17 |

Table 16 - Bus Stops with the Highest Trip Production - Sunday

| Rank | Stop ID | Stop Name | Production |
|---|---|---|---|
| 1 | 10186 | AC BUS TERMINAL | 193.33 |
| 2 | 26606 | TOMS RIVER PARK/RIDE | 161.04 |
| 3 | 10090 | ON ATLANTIC AVE AT OHIO AVE | 159.47 |
| 4 | 10085 | ATLANTIC AVE AT S CAROLINA AVE | 119.35 |
| 5 | 31859 | PABT NORTH WING WHEN ASSIGNED | 117.12 |

Table 17 - Bus Stops with the Highest Trip Attraction - Sunday

| Rank | Stop ID | Stop Name | Attraction |
|---|---|---|---|
| 1 | 31064 | AC BUS TERMINAL | 351.46 |
| 2 | 31858 | PORT AUTHORITY BUS TERMINAL | 155.09 |
| 3 | 26606 | TOMS RIVER PARK/RIDE | 140.00 |
| 4 | 26412 | LAKEWOOD BUS TERMINAL | 97.35 |

| Rank | Stop ID | Stop Name | Attraction |
|---|---|---|---|
| **5** | 31899 | PORT AUTHORITY DROP OFF | 94.49 |

Major Origin-Destination Connections

In addition to identifying high-activity stops, the OD analysis highlights several origin-destination pairs that account for a large share of estimated transit trips. These OD pairs represent the strongest travel connections within the transit network and provide insights into the most frequently used travel paths between locations. Examining these connections helps reveal important travel corridors and the spatial relationships between key origins and destinations.

For the most significant OD pairs, travel time information was also examined to better understand the accessibility and travel conditions associated with these trips. Travel time between origin and destination stops was obtained using travel time data. Combining trip volume and travel time information provides a more comprehensive understanding of transit travel patterns and helps identify corridors where transit demand is particularly strong.

Table 18 - Major Origin-Destination connections

| Rank | Origin Stop | Origi Stop Name | Destination Stop | Destination Stop Name | Trips | Travel Time (min) |
|---|---|---|---|---|---|---|
| **1** | 10186 | AC BUS TERMINAL | 31064 | ARRIVAL AREA INSIDE AC BUS TERMINAL | 53.83 | 115 |
| **2** | 10090 | ON ATLANTIC AVE AT OHIO AVE | 31064 | ARRIVAL AREA INSIDE AC BUS TERMINAL | 41.13 | 3 |
| **3** | 10186 | AC BUS TERMINAL | 26606 | TOMS RIVER PARK/RIDE | 27.78 | 60 |
| **4** | 10085 | ATLANTIC AVE AT S CAROLINA AVE | 31064 | ARRIVAL AREA INSIDE AC BUS TERMINAL | 25.45 | 8 |
| **5** | 10853 | W JERSEY AVE AT MAIN ST | 31064 | ARRIVAL AREA INSIDE AC BUS TERMINAL | 20.77 | 20 |

***Potential Ridership Opportunities***

To identify potential gaps in transit usage relative to overall travel demand, bus-related OD patterns were compared with total OD patterns from SJTPO model. Both datasets originate from the same regional planning framework but represent different travel modes. While the total OD matrix captures overall travel demand across all modes, the transit OD matrix reflects only trips made using public transportation. This comparison enables the identification of areas where transit usage is low relative to total travel demand. Since the

OD data from SJTPO focuses on the South Jersey region, Ocean County isn't included in this section.

Figure 56 compares transit OD flows with overall OD flows from the SJTPO dataset. The green rectangles highlight regions where the bus services are provided by the bus routes and corridors studied. These areas indicate locations where transit mode share is low relative to total demand, suggesting potential gaps in transit service coverage or competitiveness.

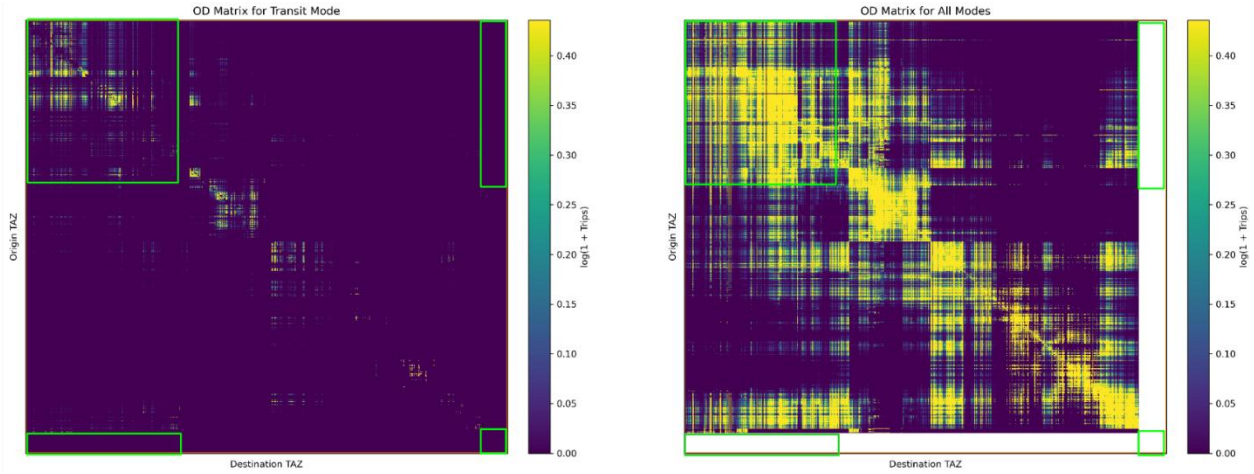


Figure 56. Comparison between Transit OD and All Mode OD

Several municipalities in Burlington County exhibit this pattern, including Pemberton Township, Bass River Township, Wrightstown Borough, Southampton Township, and New Hanover Township. Despite generating significant overall OD flows, these areas show limited transit OD activity. This indicates significant ridership potential for transit service expansion to increase transit access to those regions. Given there are existing bus services, the potential expansion strategies may include adding and improving bus stops, adding and expanding routes, increasing service frequency, and improving transfer opportunities to other routes and modes.

Additionally, these findings provide a data-driven basis for prioritizing further analysis, including evaluation of demographic characteristics, land-use patterns, and connectivity to key destinations.

# CHAPTER 7: KEY FINDINGS, CHALLENGES, AND POTENTIAL SOLUTIONS

## Introduction

This chapter summarizes the major findings derived from the on-board rider, employee, and employer surveys conducted across the South Jersey and Shore region. The findings highlight important patterns in rider demographics, travel behavior, and transit usage, as well as the key challenges faced by transit users and employers. Based on these insights, the chapter also outlines potential strategies and solutions that may help improve transit accessibility, reliability, and overall service quality in the study area.

## Major Findings

### *Transit Use and Accessibility Among Lower- and Moderate-Income Riders*

To further examine the relationship between income and transit use, a comparison was made between income distribution and vehicle ownership among survey respondents. The results show that a majority of respondents fall within lower- to moderate-income categories, with approximately 48% reporting household incomes below $50,000 and about 57% below $75,000 annually. In addition, approximately 42.7% of respondents reported having no vehicle available in their household. This combination of lower income levels and limited vehicle access suggests that many riders may rely on NJ TRANSIT bus services as an important mobility option. While a full cross-tabulation was not performed, the observed patterns indicate a clear association between income level, vehicle availability, and transit use within the study population.

### *Transit Use Among Households with Limited Vehicle Ownership*

Vehicle ownership data indicate a strong association between limited vehicle availability and transit use among survey respondents. Approximately 42.7% of respondents reported having no vehicle in their household, while an additional 31.1% reported having only one vehicle, indicating that nearly three-quarters of respondents have limited access to private transportation. In terms of driver availability, about 25.3% of respondents reported having no licensed drivers, and 34.9% reported having only one licensed driver, further reinforcing constraints in private mobility options. These findings suggest that transit serves as an important mobility option for individuals with limited access to private transportation, rather than establishing a direct measure of dependency. For many riders, transit supports access to employment, healthcare, and other daily activities. As a result, service reliability and availability remain important factors influencing mobility for these populations.

### *Walking as the Primary First- and Last-Mile Connection*

The survey results show that walking is the dominant mode used by riders to access bus stops and reach their final destinations after alighting. A large majority of respondents reported walking or using a wheelchair to travel between their origin or destination and the nearest transit stop. This finding highlights the critical role of pedestrian infrastructure in supporting effective transit systems. Safe and accessible sidewalks, crosswalks, and well-located bus stops are essential for ensuring that transit services remain convenient and accessible to riders. Improvements in pedestrian connectivity near transit stops could significantly enhance the usability of bus services.

***Frequent Transit Use Among Riders***

Transit use frequency data indicate that many respondents use bus services on a regular basis. A large portion of riders reported using transit three to five days per week, while another significant group reported using bus services six or seven days per week. These patterns suggest that transit services function primarily as a commuting system for many riders, supporting routine trips to work, school, and other daily destinations. Because riders use these services regularly, maintaining consistent service performance and schedule reliability becomes particularly important for ensuring rider satisfaction and system usability.

***Private Vehicle Availability Influences Transit Use***

Among employees who reported not using NJ TRANSIT bus services, the most frequently cited reason was access to a personal vehicle or a ride from someone else. This finding suggests that transit services often compete with the convenience and flexibility provided by private automobiles. While transit may offer cost advantages or accessibility benefits, many potential riders may prefer driving due to shorter travel times, flexible schedules, or perceived convenience. Consider reviewing service reliability, travel times, and route coverage to make transit a more competitive alternative to private vehicles.

***Service Reliability as the Most Cited Operational Concern***

One of the most consistent themes identified in the open-ended survey responses relates to concerns about service reliability. Many riders reported experiences with delayed buses, missed trips, or inconsistencies between scheduled and actual arrival times. These issues may create uncertainty for riders and make it difficult to plan trips effectively. When riders cannot rely on transit schedules, the system becomes less attractive for time-sensitive activities such as commuting to work or attending appointments. Improving service reliability may therefore represent one of the most impactful strategies to examine for improving rider satisfaction and encouraging increased transit use.

***Service Frequency as a Determinant of Transit Attractiveness***

Many respondents indicated that limited-service frequency reduces the practicality of using bus transit for daily travel. Riders frequently requested additional buses on existing routes, shorter headways, and expanded service during evening and weekend hours. Infrequent service can result in long waiting times, making transit less convenient compared to private vehicles. Additionally, when buses operate at longer intervals, the impact of service delays becomes more significant, as missing a single trip can require riders to wait extended periods for the next bus. Increasing service frequency in high-demand corridors could therefore improve the usability of the transit network.

***Importance of Atlantic City as a Regional Transit Hub***

The origin–destination analysis of survey responses indicates that Atlantic City functions as a major transit hub within the study region. A substantial portion of trips either originate from or terminate in Atlantic City, reflecting its role as a major employment center and regional destination. This pattern is consistent with the city's economic structure, which includes significant employment in tourism, hospitality, and retail sectors. Many

surrounding communities rely on transit connections to access employment opportunities in Atlantic City, highlighting the importance of maintaining strong transit connectivity between regional municipalities and this central hub.

### *Route-Level Service Issues Identified Through Rider Feedback*

Route-specific feedback collected through open-ended survey responses reveals localized service challenges along several corridors. Routes such as 317, 502, 508, and 553 were frequently mentioned by respondents when describing concerns related to service frequency, reliability, and stop accessibility. These route-level insights help identify specific corridors where riders experience service limitations more acutely. Addressing operational issues along these routes may therefore yield improvements in rider satisfaction and system performance.

### *Transit as a Critical Mobility Option for Essential Trips*

Survey responses indicate that a meaningful share of riders would not make certain trips at all if bus services were unavailable. This finding highlights the essential role that public transit plays in enabling access to employment, healthcare, shopping, and other daily activities. For many riders, transit provides mobility that might otherwise be unavailable due to financial constraints or lack of access to private vehicles. Ensuring the reliability and accessibility of transit services is therefore critical for maintaining equitable access to opportunities within the region.

## Key Challenges and Strategic Recommendations

### *Operational Reliability Constraints Affecting Time-Sensitive Trips*

While survey results indicate frequent transit use, reliability issues create operational challenges for riders who depend on buses for time-sensitive trips such as commuting and medical appointments. Delays, missed trips, and inconsistencies between scheduled and actual arrival times reduce the predictability of the system, making it difficult for riders to plan travel with confidence. This challenge is particularly critical for routes such as 317, 502, and 508, where reliability concerns were frequently reported. Addressing these issues requires improved schedule adherence, real-time monitoring, and operational adjustments to reduce service variability.

### *Service Frequency Limitations Reducing System Flexibility*

Although transit is used regularly, limited service frequency, particularly during evenings and weekends, reduces the flexibility of the system. Long headways increase waiting times and amplify the impact of delays, as missing a single bus can result in significant disruptions. This constraint limits the ability of riders to adjust travel plans and reduces the practicality of transit for non-commute trips. Increasing service frequency in high-demand corridors would improve system responsiveness and usability.

### *Limited Transportation Alternatives Increasing System Sensitivity to Disruptions*

A substantial portion of riders have limited access to private vehicles, which reduces their ability to switch to alternative modes when transit service is disrupted. This creates a system-level challenge where service gaps, delays, or missed trips can directly affect

access to employment and essential services. Improving service coverage and reliability is therefore critical to maintaining consistent mobility for these users.

***Transit Competitiveness Relative to Private Vehicles***
Survey results indicate that access to private vehicles remains the primary reason for non-use of transit. This presents a challenge in attracting and retaining riders, as transit must compete with the convenience, flexibility, and travel time advantages of personal vehicles. Enhancing service reliability, reducing travel times, and improving route directness are key strategies to improve transit competitiveness.

***Cost Sensitivity Among Frequent Riders***
Given that many riders fall within lower- to moderate-income groups, fare costs represent a recurring burden, particularly for those who rely on transit frequently. This creates a challenge in balancing fare structures with affordability, as higher costs may discourage consistent use. Expanding discounted fare programs or employer-supported transit benefits could help reduce this barrier.

***Gaps in Service Coverage and Regional Connectivity***
Survey responses highlight areas where existing routes do not adequately connect residential areas with employment centers or key destinations. Limited coverage and indirect routing reduce accessibility and increase travel times, making transit less attractive. Addressing these gaps through route adjustments or expanded service can improve connectivity across the region.

***First- and Last-Mile Infrastructure Limitations***
Because a majority of riders walk to and from transit stops, the quality of pedestrian infrastructure directly affects accessibility. Inadequate sidewalks, lack of shelters, poor lighting, and limited seating create barriers to comfortable and safe access. This challenge is especially important in areas with high walking dependence, where improvements in stop infrastructure could significantly enhance the overall transit experience.

***Rising Expectations for Service Quality and Information Systems***
Riders increasingly expect modern amenities such as real-time tracking, mobile applications, Wi-Fi, and onboard comfort features. Limitations in these areas reduce overall user satisfaction and may discourage potential riders. Improving passenger information systems and onboard amenities can enhance the perceived quality and usability of transit services.

**Policy and Planning Recommendations**

Based on the survey findings and data analysis, several key challenges and opportunities for improving transit services in the South Jersey and Shore region were identified by the Rowan study team. Responses from bus riders, employers, and employees highlight issues related to service reliability, service frequency, accessibility, affordability, and overall rider experience. Addressing these concerns may improve mobility, support workforce access, and encourage greater use of NJ TRANSIT services. The following

policy and planning recommendations are informed by these findings and are intended to enhance transit service efficiency, improve rider satisfaction, and strengthen regional connectivity across the study area.

- **Improve Service Reliability Through Operational Monitoring and Schedule Adjustments:** Improving service reliability should be a priority for NJ TRANSIT and regional transit planners, as survey responses indicate that delays and schedule inconsistencies remain one of the most frequently reported concerns among riders. Reliability improvements can be achieved through enhanced operational monitoring, schedule adjustments based on actual travel times, and the use of real-time vehicle tracking systems. Transit agencies in many regions have adopted Automatic Vehicle Location (AVL) systems and real-time performance monitoring to reduce delays and improve schedule adherence. Studies have shown that improving schedule reliability can significantly increase rider satisfaction and retention, particularly for frequent transit users who depend on transit for work trips. [(2)] Implementing regular schedule reviews and adjusting service headways based on observed travel times could help address reliability challenges identified in the survey results.

- **Increase Service Frequency on High-Demand Corridors:** The survey results indicate that limited-service frequency is another key challenge affecting transit usability in the South Jersey and Shore region. Increasing service frequency on routes with higher ridership demand, such as Routes 317, 319, and 553, could significantly reduce waiting times and improve the overall attractiveness of transit. Transportation research consistently shows that shorter headways increase ridership by reducing the perceived inconvenience of waiting and making transit more flexible for users. [(14)] Implementing targeted service improvements during peak hours and expanding evening or weekend service on high-demand corridors could encourage more riders to use transit and reduce reliance on private vehicles.

- **Expand First- and Last-Mile Connectivity Through Pedestrian and Micro-Mobility Improvements:** Because the survey results indicate that a majority of riders access bus stops by walking, improvements in pedestrian infrastructure are essential for enhancing transit accessibility. Investments in sidewalks, crosswalks, lighting, and ADA-compliant infrastructure near transit stops can significantly improve safety and convenience for riders. In addition, integrating micro-mobility options such as bike-share or scooter-share programs near major transit stops may help address first- and last-mile connectivity challenges. Research from the National Association of City Transportation Officials. [(15)] highlights that improved pedestrian access and micro-mobility integration can expand transit catchment areas and improve system accessibility for a broader population.

- **Strengthen Employer Partnerships to Encourage Transit Use:** The employer survey results indicate that workplace policies and transportation benefits can significantly influence commuting choices. Transit agencies and regional planners could collaborate with employers to expand programs such as subsidized transit

passes, employer-sponsored shuttle services, and flexible work schedules that align with transit availability. Employer transit benefit programs have been shown to increase transit usage while reducing commuting costs for employees. [15] Establishing partnerships with large employment centers in the South Jersey and Shore region, including hospitality, healthcare, and retail sectors, could help promote transit as a viable commuting option for workers.

- **Improve Bus Stop Infrastructure and Passenger Amenities:** Survey responses also highlight the need for improved bus stop infrastructure, including shelters, seating, lighting, and clear signage. These amenities are particularly important in regions where riders frequently wait outdoors for extended periods due to longer service headways. According to research by the Transportation Research Board, investments in transit stop amenities can significantly improve passenger comfort and encourage greater transit usage. Local governments determine where bus stops and shelters are located, and NJ TRANSIT staff installs these amenities as the localities agree to maintain them. Working in tandem to enhance bus stop facilities along major routes could therefore improve both rider experience and the perceived quality of the transit system.

Table 19 summarizes the key findings, associated challenges, and potential solutions/recommendations for improving the transit system.

Table 19 - Summary of Key Findings, Associated Challenges, and Potential Solutions/Recommendations for Improving the Transit System

| Key Finding | Associated Challenge | Potential Solution / Recommendation |
|---|---|---|
| **High transit dependence among riders** | Service disruptions can significantly impact mobility for transit-dependent populations. | Improve service reliability and maintain consistent service levels on key routes serving employment centers. |
| **Frequent transit use for commuting** | Delays and missed buses strongly affect daily commuters. | Strengthen operational monitoring and update schedules based on actual travel time data. |
| **Walking as the main access mode to bus stops** | Poor pedestrian infrastructure can discourage transit use. | Improve municipal sidewalks, crosswalks, lighting, and ADA-compliant access near transit stops. |
| **Service reliability concerns reported by riders** | Unpredictable bus arrival times reduce rider confidence. | Implement real-time performance monitoring and adjust schedules to improve reliability. |

| | | |
|---|---|---|
| **Long waiting times due to low service frequency** | Infrequent buses reduce convenience and flexibility. | Increase service frequency on high-demand routes such as 317, 319, and 553. |
| **Inadequate bus stop infrastructure** | Lack of shelters, seating, and lighting reduces rider comfort and safety. | With localities, install shelters, seating, lighting, and clear signage at high-use stops. |
| **Fare affordability concerns among riders** | Transit costs can be a barrier for lower-income riders. | Expand reduced-fare programs and employer-supported transit benefits. |
| **Low transit use among many employees** | Private vehicles offer greater convenience and flexibility. | Improve transit travel time competitiveness and promote employer transit programs. |
| **Atlantic City as a major regional transit hub** | High demand creates pressure on certain transit corridors. | Prioritize service improvements and capacity adjustments on routes connecting to Atlantic City. |
| **Growing demand for modern transit amenities** | Lack of onboard amenities reduces service attractiveness. | Introduce Wi-Fi, charging ports, and improve mobile apps and real-time rider information systems. |

Figure 57 presents an alluvial diagram illustrating the relationships between the key findings from the survey analysis, the associated challenges identified by respondents, and the recommended actions for improving transit services in the South Jersey and Shore region. The diagram visually connects the three components, findings, challenges, and recommendations, allowing multiple relationships to be represented simultaneously. This structure highlights how individual findings can contribute to multiple challenges and how those challenges can be addressed through different policies and operational strategies. The thickness of the connecting chords reflects the relative frequency of relationships identified between these components based on survey responses and qualitative feedback, while color is used only to distinguish categories and does not indicate importance or frequency.

On the left side of the diagram, the key findings summarize the major themes identified from the survey analysis, including high transit dependence among riders, frequent commuter use of bus services, reliance on walking to access bus stops, low transit usage among certain employees, fare affordability concerns, the role of Atlantic City as a major regional transit hub, and increasing demand for modern transit amenities. These findings represent the most important insights derived from both quantitative survey responses and open-ended feedback from riders and employees.

The middle column presents the associated challenges that arise from these findings. These challenges include limited-service frequency, schedule delays, service reliability

issues, inadequate pedestrian infrastructure, unsafe bus stop conditions, private vehicle preference among some commuters, limited route coverage in certain areas, high travel costs for frequent riders, limited employer support for transit commuting, peak-hour congestion on major corridors, outdated passenger facilities, and insufficient real-time information systems. The flows connecting the findings to these challenges illustrate how a single issue identified in the survey can contribute to multiple operational or infrastructure-related barriers to transit use.

The right column of the diagram presents the recommended actions developed to address identified challenges. These recommendations include improving operational monitoring, increasing bus service frequency, improving schedule adherence, implementing real-time performance monitoring systems, improving pedestrian access to transit stops, installing shelters and lighting at bus stops, promoting employer-based transit incentive programs, expanding service coverage, introducing discounted fare programs, increasing corridor service capacity, adjusting peak-hour scheduling, adding passenger amenities such as Wi-Fi and charging ports, and improving mobile applications and rider information systems.

Overall, the alluvial diagram provides an integrated view of how survey findings translate into specific transit challenges and how targeted policy and operational interventions can address these issues. By visualizing these relationships, the diagram helps identify priority areas for improving transit accessibility, service quality, and rider satisfaction across the South Jersey and Shore transit network.

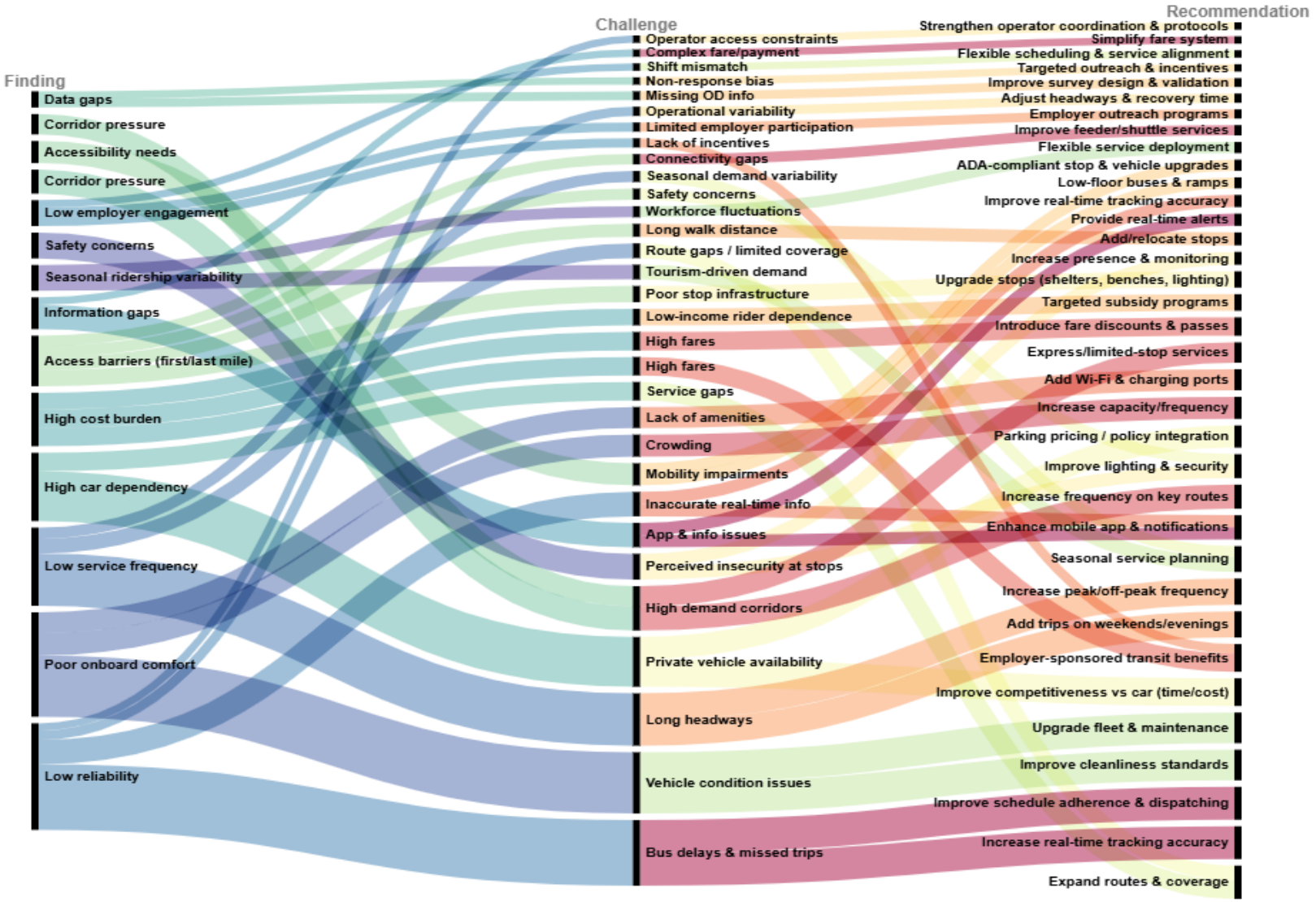



Figure 57. Alluvial Diagram Showing Relationships Between Key Findings, Associated Challenges, and Recommended Transit Improvement Strategies Derived from the Survey Analysis

Figure 58 presents a chord diagram illustrating the relationships between key findings, associated challenges, and corresponding recommendations derived from the survey analysis. Each segment along the circular boundary represents a category, with findings and challenges representing identified issues and conditions, and recommendations representing proposed strategies to address those issues. The connecting arcs (chords) indicate how specific findings are linked to one or more recommended actions. The thickness of each chord reflects the relative frequency of connections identified between findings, challenges, and recommendations based on survey responses and qualitative feedback, while color is used solely to distinguish categories and does not indicate importance or priority.

Given the number of relationships represented, the diagram is intended to provide a comprehensive overview of the interconnections among findings, challenges, and recommendations rather than a direct ranking of importance. To support interpretation, findings, and challenges shown in the diagram represent observed issues identified through the survey, while the corresponding elements on the opposite side represent recommended strategies to address those issues. Key priorities and the most frequently observed relationships are summarized in Table 19, which provides a more structured view of the most critical issues and recommended actions.

To interpret the figure, one can begin at a specific finding (e.g., “Low reliability”) and trace the connecting bands across the diagram to the associated recommendations (e.g., “Improve scheduling” or “Improve real-time information”). Likewise, a recommendation can be traced back to multiple findings, demonstrating how a single strategy may address multiple issues identified in the survey results.

For example, the finding “Low reliability” is connected to recommendations such as “Improve scheduling” and “Improve real-time information,” indicating that these strategies are commonly associated with addressing service inconsistency concerns. Similarly, “High-cost burden” is linked to recommendations such as “Fare discounts” and “Employer incentives,” reflecting the relationship between affordability concerns and potential financial support strategies. In another example, “Access barriers” connects to “Upgrade stops,” highlighting the role of infrastructure improvements in enhancing accessibility. Overall, Figure 57 is intended to complement the tabular summaries by visually illustrating the interconnected nature of transit challenges and demonstrating how individual recommendations may address multiple findings, supporting a coordinated and system-level approach to transit improvement planning.

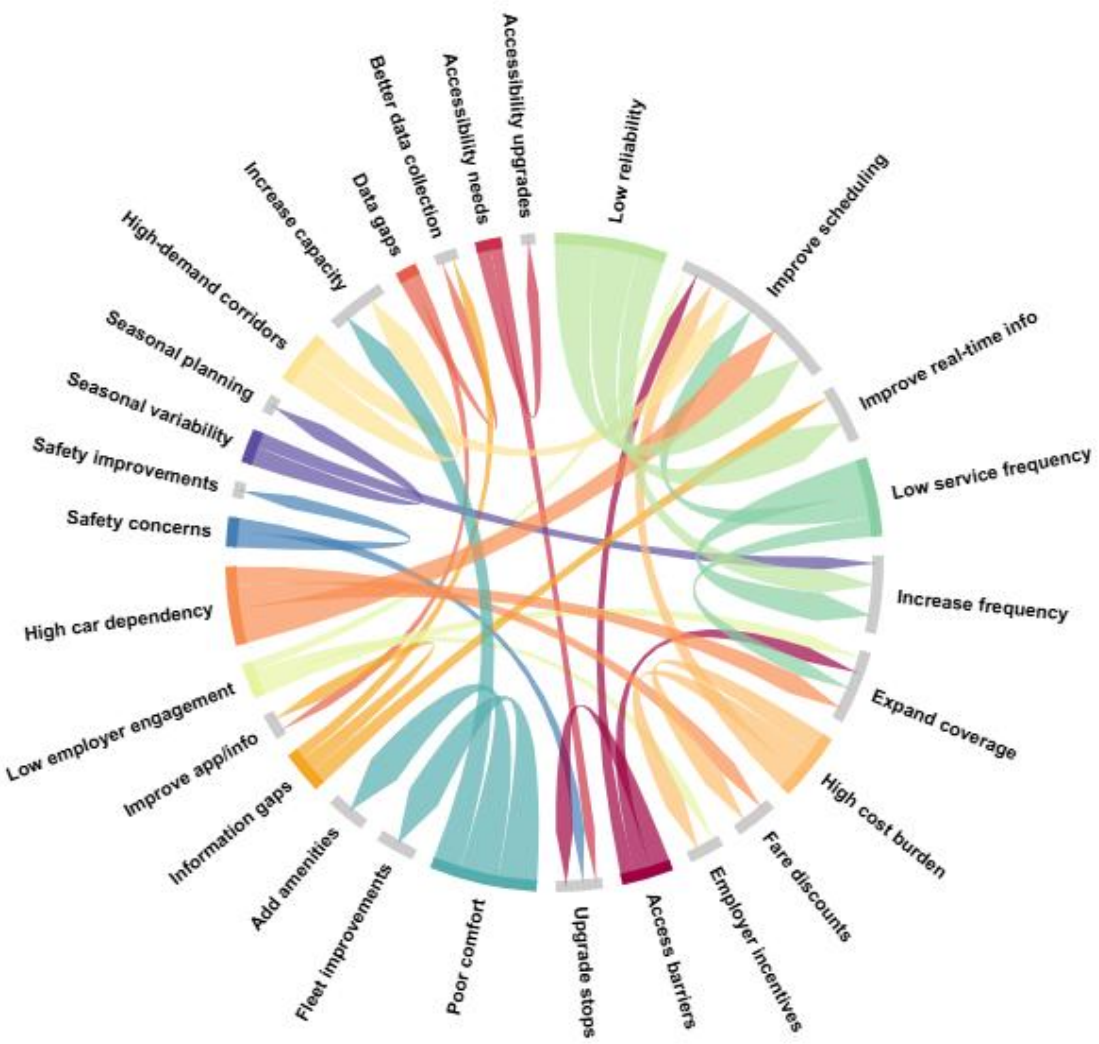



Figure 58. Chord Diagram Showing Relationships Between Key Findings and Recommended Transit Improvement Strategies

## CHAPTER 8: CONCLUSION

Public transit plays an essential role in supporting mobility, economic activity, and access to opportunities across the South Jersey and Shore regions. NJ TRANSIT bus services connect residential communities with major employment centers, healthcare facilities, educational institutions, and commercial areas. However, changing travel patterns, workforce needs, and regional growth have created new challenges for transit planning and service delivery. Recognizing the importance of understanding these evolving needs, this study was conducted to evaluate transit use and travel behavior from data collected from bus riders, employees, and employers across key corridors in the region. The goal of the project was to gather reliable, data-driven insights that could help improve transit accessibility, service efficiency, and workforce mobility while supporting the long-term sustainability of the regional transit network.

The scope of the study focused on evaluating travel patterns, transit use, and service challenges across fourteen NJ TRANSIT bus routes serving South Jersey and the Shore area. To capture a comprehensive view of transit use, the research incorporated three different survey components: an on-board rider survey, an employer survey, and an employee survey. These surveys were designed through a structured process that included a review of relevant literature, multiple rounds of internal refinement, and consultation with NJ TRANSIT and NJDOT representatives. The surveys were then implemented using both paper-based and digital formats to maximize participation and ensure accessibility to a diverse group of respondents. Data collection was conducted across three seasonal periods, spring, summer, and fall, to capture variations in travel behavior and transit demand over time. This seasonal approach helped ensure that the results reflect both routine commuting patterns and seasonal travel dynamics that are characteristic of the South Jersey and Shore region.

Significant effort was devoted to planning and implementing the survey program. The research team expanded field operations by recruiting and training additional surveyors, coordinating on-board data collection across multiple routes, and strengthening outreach efforts to employers and employees. Survey distribution strategies included in-person data collection on buses, targeted employer outreach through the New Jersey Department of Labor and regional Chambers of Commerce, and digital promotion through social media platforms. These combined efforts helped the study reach a broad range of transit users and stakeholders across the region. In total, the on-board rider survey collected 983 responses across the fourteen bus routes, providing a substantial dataset for analyzing ridership characteristics and travel patterns.

After the surveys were completed, all collected responses were carefully transferred to the Qualtrics platform to ensure a consistent and secure data management process. The dataset then underwent a detailed data cleaning and preparation process to remove incomplete entries, standardize variables, and ensure accuracy across all records. Weighting methods were also developed to address potential sampling imbalances and ensure that the results reflect the broader population of transit users. This systematic data preparation process created a reliable dataset that could support meaningful statistical and spatial analysis.

The analysis of the survey data revealed several important insights about transit use in the South Jersey and Shore region. The findings indicate that many riders rely heavily on public transit due to limited access to private vehicles, highlighting the essential role of bus services in supporting daily mobility. Frequent transit use among many respondents suggests that bus services are a critical component of the regional commuting system, particularly for individuals traveling to work. The results also show that walking is the primary method of accessing bus stops, emphasizing the importance of municipally-provided pedestrian infrastructure and safe transit stop environments. At the same time, the survey responses identified several challenges that affect the usability and attractiveness of transit services. Riders frequently reported concerns related to service reliability, limited-service frequency, and long waiting times. In addition, respondents highlighted issues related to bus stop infrastructure, fare affordability, and the availability of real-time service information.

Employer and employee surveys provided additional insights into commuting patterns and transit use within the regional workforce. While some employees rely on bus services for commuting, a significant share of workers reported using private vehicles due to convenience, travel time, or limited transit coverage near their workplaces. These findings suggest that improving transit connectivity to major employment centers could help encourage greater transit use. The survey responses also emphasized the importance of employer-supported transportation programs, such as subsidized transit passes or flexible work schedules, which can influence commuting choices and support workforce mobility.

Based on the findings of the study, several opportunities for improving transit services in the South Jersey and Shore region have been identified by the study team. Addressing service reliability and increasing service frequency on high-demand corridors should be a priority for enhancing rider confidence and reducing travel delays. Investments in municipal pedestrian infrastructure and bus stop amenities can improve first- and last-mile connectivity and make transit more accessible and comfortable for riders. Expanding partnerships with employers and exploring fare assistance programs could also help increase transit ridership while supporting workers who rely on public transportation. Additionally, improvements in passenger information systems, including more accurate real-time tracking and enhanced mobile applications, could improve the overall rider experience and reduce uncertainty during travel.

Overall, this study provides a comprehensive assessment of transit use and travel behavior across the South Jersey and Shore region. By combining rider feedback, employer perspectives, and detailed data analysis, the project offers valuable insights into the challenges and opportunities facing the regional transit system. The findings and recommendations presented in this report can help guide future planning efforts, support targeted service improvements, and contribute to the development of a more accessible, reliable, and efficient transit network that meets the evolving mobility needs of communities throughout the region.

## REFERENCES


1. APTA. Ridership Report. American Public Transportation Association. 2016. Available from: https://www.apta.com/research-technical-resources/transit-statistics/ridership-report/

2. FTA. Performance Management. 2022. Available from: https://www.transit.dot.gov/PerformanceManagement?utm_source=chatgpt.com

3. Kittelson & Associates, National Research Council (U.S.), Transit Cooperative Research Program, United States, Transit Development Corporation, editors. Transit capacity and quality of service manual. 3rd ed. Washington, D.C: Transportation Research Board; 2013. 1 p. (TCRP report; no. 165).

4. Transit Asset Management Guide, Focusing on the Management of Our Transit Investments. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/57411/transitassetmanagementguideftareportno0098.pdf

5. DialNet. Revista Española de Investigaciones Sociológicas (REIS). 2016 Jul 1;154(1):161–90.https://dialnet.unirioja.es/ejemplar/422177

6. Fu L, Xin Y. A New Performance Index for Evaluating Transit Quality of Service. Journal of Public Transportation. 2007 Sep 1;10(3). doi:http://doi.org/10.5038/2375-0901.10.3.4

7. Porter. Multiple surveys of students and survey fatigue. 2004 - New Directions for Institutional Research - Wiley Online Library. Available from: https://onlinelibrary.wiley.com/doi/10.1002/ir.101

8. Mitra A, Schwartz RL. From Cyber Space to Cybernetic Space: Rethinking the Relationship between Real and Virtual Spaces. Available from: 2019 https://dx.doi.org/10.1111/j.1083-6101.2001.tb00134.x

9. Seiss M, Hall R, Vance E. The Importance of Cleaning Data During Fieldwork: Evidence from Mozambique. Survey Practice. 2014 Aug 1;7(4). doi:10.29115/SP-2014-0017

10. NJTransit. Bus stop locations and signs. https://www.njtransit.com/first-run/bus-stops-here

11. Soltani A, Tanko M, Burke MI, Farid R. Travel Patterns of Urban Linear Ferry Passengers: Analysis of Smart card Fare Data for Brisbane, Queensland, Australia. Transportation Research Record. 2015 Jan 1;2535(1):79–87. doi:10.3141/2535-09

12. National Transit Institute. Project Surveys. Available from: https://www.ntionline.com/

13. Porter. Multiple surveys of students and survey fatigue. New Directions for Institutional Research - Wiley Online Library. 2006. Available from: https://onlinelibrary.wiley.com/doi/10.1002/ir.101

14. National Academics. Transit Capacity and Quality of Service Manual. https://www.nationalacademies.org/publications/24766

15. National Academies of Sciences, Engineering, and Medicine. 2013. Transit Capacity and Quality of Service Manual, Third Edition. Washington, DC: The National Academies Press. https://doi.org/10.17226/6346. Available from: https://www.nationalacademies.org/read/24766/chapter/1

16. NATCO. Transit Street Design Guide. Available from: https://nacto.org/publication/transit-street-design-guide/

17. USDOT. Transit Asset Management Guide, Focusing on the Management of Our Transit Investments. 2016. Available from: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/57411/transitassetmanagementguideftareportno0098.pdf

18. US Business Data. *USBizData.com*. (2021). https://usbizdata.com/

19. LEHD Origin-Destination Employment Statistics. (2021). Retrieved from https://lehd.ces.census.gov/data/lodes/

## APPENDIX A: SURVEY QUESTIONNAIRES: ON-BOARD SURVEY

### 2025 South Jersey and Shore Areas Bus Customer Survey

You are invited to participate in a research survey by Rowan University and New Jersey Transit titled **"Identifying Travel Needs for South Jersey and Shore Customers"** that will help to improve the NJ TRANSIT bus system in the South Jersey and Shore areas.

Your participation is completely voluntary with no risks to you. You may skip any questions you are not comfortable answering and stop participating at any time you wish with no penalty to you. This survey is strictly confidential. All data will be stored in a secure computer file and will be destroyed after the data is published. The research team at Rowan University is the only party that will be allowed to see the full set of data, except as may be required by law. If a report of this study is published or results are presented at a professional conference, only aggregate responses will be presented, and therefore, confidentiality will be maintained. **By completing the survey, you are providing your voluntary consent to participate.**

**If you complete the survey and provide your contact information, you will be entered into a drawing for either a monthly pass or a $100 gift card.** There are no known risks or discomforts associated with participating in this survey. While there may be no direct benefit to you, your participation can help identify transportation challenges and inform solutions to improve the safety and efficiency of the bus transit system in the study area.

If you have any questions about the survey, you can contact Mohammad Jalayer, Ph.D., at the address provided below, but you do not have to give your personal identification.

Email: jalayer@rowan.edu, phone: (856) 256-5397.

If you have any questions about your rights as a research subject, please contact the Office of Research Compliance at (856) 256-4078– Glassboro/CMSRU.

This study has been approved by the Rowan IRB, PRO-2024-313.

Please complete the checkbox below.

☐ I am 18 years or older

☐ I am voluntarily giving consent to participate in the survey

Rowan University, along with NJ TRANSIT, is conducting this survey to better understand your travel needs. Please help us by filling out and returning your completed survey to the distributor onboard the bus. Your responses will be kept confidential. To show our appreciation for your help, we will enter your name into a drawing to
**WIN either a Monthly Pass or a $100 gift card**.

You may also take this survey online by scanning the following QR code,

QR Code

1. On what bus route did you receive this survey?_____
2. What time did you board this bus? _____ **:** _____ AM/PM (*Circle one*.)

**3A.** The place you **CAME FROM** is…? (Choose One)

- ☐01FROM Home
- ☐02FROM Work
- ☐03FROM Recreation/Social
- ☐04FROM School/College (student only)
- ☐05FROM Doctor, medical service, or hospital (non-work only)
- ☐06FROM Shopping/Restaurant
- ☐07FROM Religious/Community
- ☐08FROM Sporting or special event
- ☐09FROM Personal Business
- ☐95FROM somewhere else **(specify):**_____

**3B.** The place you are **GOING TO** is…? (Choose One – not the same as Question 3A)

- ☐01GOING TO Home
- ☐02GOING TO Work
- ☐03GOING TO Recreation/Social
- ☐04GOING TO School/College (student only)
- ☐05GOING TO Doctor, medical service, or hospital (non-work only)
- ☐06GOING TO Shopping/Restaurant
- ☐07GOING TO Religious/Community
- ☐08GOING TO Sporting or special event
- ☐09GOING TO Personal Business
- ☐95GOING TO Or somewhere else **(specify):** _____

**4A.** What is the **EXACT ADDRESS** or nearest intersection of the place you **CAME FROM**? (NOT YOUR BUS STOP) **(Example:** Intersection of Shore Rd. and E. Mill Rd, Northfield, Atlantic City**)**

_____
_____

**4B.** What is the **EXACT ADDRESS** or nearest intersection of the place you are going to– that is, **YOUR FINAL DESTINATION**? (NOT YOUR BUS STOP) **(Example:** Intersection of N. New Rd. and W Adams Ave., Pleasantville, Atlantic City**)**

_____
_____

**5A.** Where did you **get ON this bus**? (TERMINAL /BUS STOP /BUS STOP ID)

_____

**5B.** Where will you **get OFF this bus**? (TERMINAL/ BUS STOP /BUS STOP ID)?

_____

**6A.**

How did you get **TO THIS BUS WHERE YOU RECEIVED THIS SURVEY** on this ONE-WAY trip?

- ☐01 Walked/Wheelchaired only
- ☐02 Personal bicycle or scooter
- ☐03 Bikeshare or scooter-share
- ☐04 Drove a parked car
- ☐05 Carpooled
- ☐06 Car drop off
- ☐07 Bus/Shuttle
- ☐08 Another NJ TRANSIT Bus
- ☐09 NJ TRANSIT Rail
- ☐10 Light Rail
- ☐11 Ferry
- ☐12 Taxi
- ☐13 Rideshare services such as Uber or Lyft
- ☐14 Carshare services such as Turo or Zip Car
- ☐15 NYC Subway
- ☐16 PATCO
- ☐17 SEPTA
- ☐95 Some other way **(specify):** _____

**6B.**

How will you get to your **FINAL DESTINATION** after you **GET OFF THIS BUS**?

- ☐01 Walk/Wheelchair only
- ☐02 Personal bicycle or scooter
- ☐03 Bikeshare or scooter-share
- ☐04 Drive a parked car
- ☐05 Carpool
- ☐06 Car pick up
- ☐07 Bus/Shuttle
- ☐08 Another NJ TRANSIT Bus
- ☐09 NJ TRANSIT Rail
- ☐10 Light Rail
- ☐11 Ferry
- ☐12 Taxi
- ☐13 Rideshare service such as Uber or Lyft
- ☐14 Carshare services such as Turo or Zip Car
- ☐15 NYC Subway
- ☐16 PATCO
- ☐17 SEPTA
- ☐95 Some other way **(specify):** _____

**7.** Including this bus, **LIST ALL** the **BUS ROUTES OR TRAINS** in the **EXACT ORDER** you will use them to make THIS ONE-WAY TRIP:

**Starting Place** ⇒ _____ 1st Bus/ ⇒ _____ 2nd Bus/ ⇒ _____ 3rd Bus/ ⇒ _____ 4th Bus/ ⇒ _____ 5th Bus/ ⇒ **Final Destination**

| Train route | Train route | Train route | Train route | Train route |
|---|---|---|---|---|
| _____ | _____ | _____ | _____ | _____ |

**8.** Did you/will you make **THIS TRIP** in the other direction today?
□01 Yes **GO TO Q9** □02 No **GO TO Q10**

**9.** How did you/will you make this trip in the opposite direction today?
□01 Using the same routes in reverse order
□02 Using different NJ Transit Bus routes
**(specify):**_____
□03 Using NJ TRANSIT Rail
**(specify):**_____
□95 Some other way
**(specify):**_____
_

**10.** How often do you use this bus route? ***(Please select only one response)***
□01 6 to 7 days a week
□02 5 days a week
□03 3 to 4 days a week
□04 1 to 2 days a week
□05 1 to 3 days a month
□06 6 to 11 days a year
□07 1 to 5 days a year
□08 Less than once a year
□09 First time customer

**11.** What type of ticket are you using to ride THIS BUS?
***(Please select only one response)***
□01 Cash Fare/Transfer
□02 One-way Ticket
□03 Bus Monthly Pass
□04 Rail Monthly Pass
□05 Ten-Trip
□06 College Student Monthly Pass
□07 Student Ticket (one-way and transfers)
□08 Reduced Fares for Senior Citizens & Customers with Disabilities
□95 Some other means
**(specify):**_____

**12.** Where did you buy your ticket or monthly pass for this trip?
***(Please select only one response)***

□01 Onboard
□02 NJ TRANSIT Mobile App
□03 NJ TRANSIT ticket agent
□04 Ticket vending machines
□05 Independent ticket agents (e.g., a newsstand)
□95 Somewhere else
**(specify):**_____

**13.** How do you typically pay for your ticket or pass?
***(Please select only one response)***

□01 Cash
□02 Cash from MyTransit Wallet
□03 Credit card
□04 Debit card
□05 Check
□06 Apple Pay
□07 Google Pay
□08 PayPal
□95 Some other means **(specify):**_____

**14.** If this bus service was not available, how would you make this trip?
***(Select all that apply)***

□01 Would not make this trip
□02 Drive a car
□03 Ride with a friend or family member
□04 Carpool
□05 Taxi
□06 Uber, Lyft or other app-based service
□07 Walk the entire way
□08 Bike/Scooter
□09 Use another bus route/train **(specify)**:_____
□95 Some other means **(specify):**_____
_____

**15.** What is your home ZIP code/Address? ____ ____ ____ ____ ____
□97 I do not have a home address
□96 Prefer not to answer

**16.** What is your gender? ***(Select all that apply)***

□01 Female or woman
□02 Male or man
□03 Non-binary or gender fluid
□04 Prefer to self-describe **(specify):**_____
_____
□96 Prefer not to answer

**17.** What is your age?

□01 18 to 24 years
□02 25 to 34 years
□03 35 to 44 years
□04 45 to 54 years
□05 55 to 64 years
□06 65 years and over
□96 Prefer not to answer

**18.** Are you of Spanish/Hispanic/Latino origin?

□01 **No**, not of Hispanic, Latino, or Spanish origin
□02 **Yes**, Mexican, Mexican American, or Chicano
□03 **Yes**, Puerto Rican
□04 **Yes**, Cuban
□05 **Yes**, another Hispanic, Latino, or Spanish origin (e.g., Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard)
□96 Prefer not to answer

**19.** What is your race? ***(Select all that apply)***

□01 African American or Black
□02 American Indian or Alaska Native
□03 Asian or Pacific Islander
□05 Caucasian or white
□95 Something else **(specify):**_____
□96 Prefer not to answer

**20.** Do you have a disability that makes it difficult for you to use the bus? ***(Select all that apply)***

□01 **No**
□02 **Yes**, a disability affecting my vision (blindness or low vision)
□03 **Yes**, a disability affecting my hearing (deafness or difficulty hearing)
□04 **Yes**, a disability affecting my mobility (difficulty walking or using stairs)
□05 **Yes**, a disability not listed above **(specify):**_____
_____
□96 Prefer not to answer

**21.** How many **people (including yourself)** live in your household?

□01 1 □02 2 □03 3 □04 4 □05 5 or more □96 Prefer not to answer

**22.** How many **licensed drivers (including yourself)** live in your household?

□01 0 □02 1 □03 2 □04 3 □05 4 □05 5 or more □96 Prefer not to answer

**23.** How many **working vehicles** (cars, motorcycles, pickup trucks, etc.) are in your household?

□01 0 □02 1 □03 2 □04 3 □05 4 □05 5 or more □96 Prefer not to answer

**24.** What is your approximate annual household income?

□01 $14,999 and under
□02 $15,000 to less than $24,999
□03 $25,000 to less than $34,999
□04 $35,000 to less than $49,999
□05 $50,000 to less than $74,999
□06 $75,000 to less than $99,999
□07 $100,000 to less than $149,999
□08 $150,000 to less than $199,999
□09 $200,000 to less than $249,999
□10 $250,000 and over
□96 Prefer not to answer

**25.** Do you speak a language other than English at home?

□01 No Yes **(Specify which language):**

□02 Spanish □04 Chinese □06 Korean □08 Portuguese □10 Polish
□03 Tagalog □05 Hindi □07 Gujarathi □09 Arabic □10 Russian
□12 Another Language **(specify):**_____
____
□96 Prefer not to answer

**26.** How well do you speak English?

□01 Very Well
□02 Well
□03 Not well
□04 Not at all
□96 Prefer not to answer

**27.** Are you a seasonal worker?

□01 Yes
□02 No

**28.** What is your employment type? (Select multiple if applicable)

□01 Employed Full-time
□02 Employed part-time

□03Self-Employed
□04Gig Workers (Uber, DoorDash, Fiverr)
□05Retired
□06Student (Working Part-time)
□07Student (Working Full-time)
□08Homemaker
□09Disabled (Not Able to Work)
□10Military (Active Duty)
□11Not employed **Go to Q 32**
□95Other (please specify)

**29.** What industry do you work in?
□01Healthcare
□02Education
□03Technology
□04Finance
□05Manufacturing
□06Retail
□07Government
□08Transportation & logistics
□09Construction
□10Agriculture & farming
□11Hospitality & tourism
□12Energy & Utilities
□13Media & Communications
□14Arts & Entertainment
□15 Retired/Not employed
□16 Casino
□17 Boardwalk & Retail
□95Other Please specify
_____

**30.** How far is your workplace from your residence?
□01Less than 1 mile
□021-5 miles
□036-10 miles
□0411-20 miles
□05More than 20 miles
□06Not applicable

**31.** Are you connected with an educational institution?
□01No
□02Yes, I'm a Student at (name School/University)
_____
□03Yes, I'm a Faculty Member at (name School/Univ
_____

□04 Yes, I'm an Employee at (name School/University) _____

□95 Something else (please specify) _____

**32.** Thinking about this bus trip on NJ TRANSIT, what is <u>one thing that we could do to improve your travel experience?</u>

_____

_____

_____

**33.** For a chance to win either a monthly pass or a $100 gift card, please enter your contact information. All information is kept strictly confidential and will not be shared with any third parties. Only winners will be contacted. If you do not wish to enter the contest, do not enter any information below. (*Participation in drawing is completely optional)*

_____
Name

_____
Phone Number Email

□99 I do not wish to enter the drawing

## APPENDIX B: SURVEY QUESTIONNAIRES: EMPLOYEE SURVEY

### 2025 South Jersey and Shore Areas NJ Transit Bus Survey for Employees

You are invited to participate in a research survey by Rowan University and New Jersey Transit titled **"Identifying Travel Needs for South Jersey and Shore Customers"** that will help to improve the NJ TRANSIT bus system in the South Jersey and Shore areas.

Your participation is completely voluntary, with no risks to you. You may skip any questions you are not comfortable answering and stop participating at any time you wish with no penalty to you. This survey is strictly confidential. All data will be stored in a secure computer file and will be destroyed after the data is published. The research team at Rowan University is the only party that will be allowed to see the full set of data, except as may be required by law. If a report of this study is published or results are presented at a professional conference, only aggregate responses will be presented, and therefore, confidentiality will be maintained. **By completing the survey, you are providing your voluntary consent to participate.**

**If you complete the survey and provide your contact information, you will be entered into a drawing for either a monthly pass or a $100 gift card.** There are no known risks or discomforts associated with participating in this survey. While there may be no direct benefit to you, your participation can help identify transportation challenges and inform solutions to improve the safety and efficiency of the bus transit system in the study area.

If you have any questions about the survey, you can contact Mohammad Jalayer, Ph.D., at the address provided below, but you do not have to give your personal identification. Email: jalayer@rowan.edu, phone: (856) 256-5397.

If you have any questions about your rights as a research subject, please contact the Office of Research Compliance at (856) 256-4078– Glassboro/CMSRU.

This study has been approved by the Rowan IRB, PRO-2024-313.

Please complete the checkbox below.

☐ I am 18 years or older

☐ I am voluntarily giving consent to participate in the survey

Rowan University, along with NJ TRANSIT, is conducting this survey to better understand your travel needs. Please help us by filling out and returning your completed survey to the distributor. Your responses will be kept confidential. To show our appreciation for your help, we will enter your name in a drawing to **WIN either a monthly pass or a $100 gift card**.

You may also take this survey online by scanning the following QR code,

QR Code

## A. Trip Details

**1. Do you use NJ TRANSIT bus service?**

- Yes **GO TO Q 3**
- No **GO TO Q2 THEN SKIP TO SECTION C**

**2. What is/are the reason/s for not using NJ TRANSIT bus service?** ***(Select all that apply)***

- I do not feel safe riding the bus or waiting at the bus stop
- I have a car or have someone who can give me a ride
- The bus is not comfortable
- The bus ticket is too expensive
- Physically unable to ride the bus
- The bus stop is too far from my home
- The bus does not go where I need to go
- The bus does not run on time
- The bus hours of operation do not meet my needs
- Other reason, please specify_____
- **SKIP TO SECTION C**

**3. How often do you use the NJ TRANSIT bus service?**

- 6 to 7 days a week
- 5 days a week
- 3 to 4 days a week
- 1 to 2 days a week
- 1 to 3 days a month
- 6 to 11 days a year
- 1 to 5 days a year
- Less than once a year
- First-time customer

**4. For each of the following bus routes, please indicate whether you ride them and for what trip purposes.** ***(Select all that apply)***

| | I don't ride the bus | Work | Company Business (not commuting) | School | Shopping | Entertainment/ Recreation | Medical | Social/ Visiting Family or Friends | Personal Business |
|---|---|---|---|---|---|---|---|---|---|
| 317 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 319 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 468 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 501 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 502 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 504 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 505 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 507 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 508 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 509 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 510 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 552 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 553 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 559 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

***"IF YOU DO NOT USE NJ TRANSIT BUS SERVICE FOR WORK TRIPS GO TO Q10"***

## Your Work Commute by Bus

**5. Which bus stop do you typically use to get on the bus when going to work?**

- [Specify the name or intersection of the stop bus stop ID]
- Not sure

**6. What is the ZIP code/address of your workplace?**

- Zip Code/Address of Company: _____

**7. Which bus stop do you typically use to get on the bus when returning home?**

- [Specify the name or intersection of the stop/bus stop ID]
- Not sure

**8. How did you get to the bus stop from your residence?**

- Walked/Wheelchaired only
- Personal bicycle or scooter
- Bikeshare or scooter-share
- Drove a parked car
- Carpooled
- Car drop off
- Bus/Shuttle
- Another NJ TRANSIT Bus

- NJ TRANSIT Rail
- Light Rail
- Ferry
- Taxi
- Rideshare services such as Uber or Lyft
- Carshare services such as Turo or Zip Car
- NYC Subway
- PATCO
- SEPTA
- Some other way (specify):_____

**9. How do you get to work after getting off the bus?**

- Walked/Wheelchaired only
- Personal bicycle or scooter
- Bikeshare or scooter-share
- Drove a parked car
- Carpooled
- Car drop off
- Bus/Shuttle
- Another NJ TRANSIT Bus
- NJ TRANSIT Rail
- Light Rail
- Ferry
- Taxi
- Rideshare services such as Uber or Lyft
- Carshare services such as Turo or Zip Car
- NYC Subway
- PATCO
- SEPTA
- Some other way (specify):_____

## Your Bus Travel for any Trip Purpose

**10. On which days of the week do you usually ride the NJ TRANSIT bus? *(Select all that apply)***

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday

- Sunday

**11. Do you typically travel with children under 12?**
- Yes
- No

**12. How do you typically pay the bus fare? *(Select all that apply)***
- Cash Fare/Transfer
- One-way Ticket
- Bus Monthly Pass
- Rail Monthly Pass
- Ten-Trip
- College Student Monthly Pass
- Student Ticket (one-way and transfers)
- Reduced Fares for Senior Citizens & Customers with Disabilities
- Some other means (specify):_____

**13. Where did you buy your ticket or monthly pass for this trip? *(Please select only one response)***
- Onboard
- NJ TRANSIT Mobile App
- NJ TRANSIT ticket agent
- Ticket vending machine
- Independent ticket agent (e.g., a newsstand)
- Somewhere else **(specify):**_____

**14. How do you typically pay for your ticket or pass? *(Please select only one response)***
- Cash
- Cash from MyTransit Wallet
- Credit card
- Debit card
- Check
- Apple Pay
- Google Pay
- PayPal
- Some other means (specify):_____

**15. If the bus was not available, how would you make your trip? *(Select all that apply)***
- Would not make this trip

- Drive a car
- Ride with a friend or family member
- Carpool
- Taxi
- Uber, Lyft or other app-based service
- Walk the entire way
- Bike/Scooter
- Use another bus route/train (specify)_____
- Some other means (specify):_____

## B. Service Improvements

**16. What would you most like to improve about NJ TRANSIT bus service? *Select your top 3***

- ☐ **Travel Speed:** The amount of time it takes to get somewhere on the bus.
- ☐ **Service Reliability:** How often the bus is on time.
- ☐ **Getting to the Bus:** How easily you can get to or from a bus stop.
- ☐ **Mobility/Accessibility:** How easily you can get on or off a bus.
- ☐ **Schedules:** The times and days that buses run.
- ☐ **Destinations:** The places buses go.
- ☐ **Ease of Use:** How easy it is to understand and use the bus.
- ☐ **Cost:** How much the fare costs.
- ☐ **Fare Collection:** The different ways to pay for the bus (Tap & Ride with credit card, cash, NJ TRANSIT app, ticket vending machines).
- ☐ **Service Notifications:** How to get information about bus arrival times or service changes and disruptions.
- ☐ Other (please describe) _____

## C. Employment Status

**17. Are you a seasonal worker?**

- Yes
- No

**18. What is your employment type?**

- Full-time employment
- Part-time employment
- Self-Employed

- Gig Worker (Uber, DoorDash, Fiverr)
- Retired
- Student (Working Part-time)
- Student (Working Full-time)
- Homemaker
- Disabled (Not Able to Work)
- Military (Active Duty)
- Not employed **GO TO Q26**
- Other (please specify)

**19. What industry do you work in?**

- Healthcare
- Education
- Technology
- Finance
- Manufacturing
- Retail
- Government
- Transportation & logistics
- Construction
- Agriculture & farming
- Hospitality & tourism
- Energy & Utilities
- Media & Communications
- Arts & Entertainment
- Student
- Retired/Not employed
- Casino
- Boardwalk & Retail
- Other (Please specify)

**20. What is the name of your company? _____**

**21. How far is your workplace from your residence?**

- Less than 1 mile
- 1-5 miles
- 6-10 miles
- 11-20 miles
- More than 20 miles

- Not Applicable

## D. Employer Support for Transportation

**22. Does your employer offer any types of transportation support, as shown below? *(Select all that apply)***

- Subsidized transit passes
- Carpool/vanpool programs
- Shuttle service
- Bike share programs
- Parking benefits
- Flexible work hours
- Work-from-home options
- None
- Other (please specify)

**23. How effective are these transportation support initiatives in meeting your commuting needs?**

- Very effective
- Somewhat effective
- Neutral
- Ineffective
- Very ineffective
- My employer does not offer any transportation support

**24. Are there any transportation support programs or initiatives you would like to see introduced or expanded?**

- Yes (please specify)_____
- No

## E. Information Sources

**25. Where do you get your primary source of information about riding the bus?**

- NJ TRANSIT website
- Mobile app
- Social media
- Friends/Family
- Bus station information boards
- Newspapers/Local media
- Customer service
- Other (please specify)

## F. Personal and Household Characteristics

**26. What is your age group?**

- o 18 to 24 years
- o 25 to 34 years
- o 35 to 44 years
- o 45 to 54 years
- o 55 to 64 years
- o 65 years and over
- o Prefer not to answer

**27. What is your gender?** ***(Select all that apply)***

- o Female or woman
- o Male or man
- o Non-binary or gender fluid
- o Prefer to self-describe (specify):_____
- o Prefer not to answer

**28. Are you of Spanish/Hispanic/Latino origin?**

- o **No**, not of Hispanic, Latino, or Spanish origin
- o **Yes**, Mexican, Mexican American, or Chicano
- o **Yes**, Puerto Rican
- o **Yes**, Cuban
- o **Yes**, another Hispanic, Latino, or Spanish origin (e.g., Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard)
- o Prefer not to answer

**29. What is your race?** ***(Select all that apply)***

- o African American or Black
- o American Indian or Alaska Native
- o Asian or Pacific Islander
- o Caucasian or white
- o Something else (specify):_____
- o Prefer not to answer

**30. Do you have a disability that makes it difficult for you to use the bus?** ***(Select all that apply)***

- o No
- o Yes, a disability affecting my vision (blindness or low vision)
- o Yes, a disability affecting my hearing (deafness or difficulty hearing)
- o Yes, a disability affecting my mobility (difficulty walking or using stairs)
- o Yes, a disability not listed above (specify):_____
- o Prefer not to answer

**31. Are you connected to an educational institution?**

- No
- Yes, I'm a Student at (name School/University) _____
- Yes, I'm a Faculty Member at (name School/University) _____
- Yes, I'm an Employee at (name School/University) _____
- Something else (please specify) _____
- Prefer not to answer

**32. How many people (including yourself) live in your household?**

- 1
- 2
- 3
- 4
- 5 or more people
- Prefer not to answer

**33. How many licensed drivers (including yourself) live in your household?**

- 0
- 1
- 2
- 3
- 4
- 5 or more people
- Prefer not to answer

**34. How many working vehicles (cars, motorcycles, pickup trucks, etc.) are in your household?**

- 0
- 1
- 2
- 3
- 4
- 5 or more
- Prefer not to answer

**35. What is your home ZIP code/address?**

- Zip Code/Address: _____
- Prefer not to answer

**36. What is your approximate annual household income?**

- $14,999 and under
- $15,000 to less than $24,999

- o $25,000 to less than $34,999
- o $35,000 to less than $49,999
- o $50,000 to less than $74,999
- o $75,000 to less than $99,999
- o $100,000 to less than $149,999
- o $150,000 to less than $199,999
- o $200,000 to less than $249,999
- o $250,000 and over
- o Prefer not to answer

**37. Do you speak a language other than English at home?**

- o No
- o Yes **(Specify which language):**
- o Spanish
- o Chinese
- o Korean
- o Portuguese
- o Polish
- o Tagalog
- o Hindi
- o Gujarati
- o Arabic
- o Russian
- o Another Language **(specify):**_____
- o Prefer not to answer

**38. How well do you speak English?**

- o Very Well
- o Well
- o Not well
- o Not at all
- o Prefer not to answer

## G. Raffle

**39. For a chance to win either a monthly pass or a $100 gift card, please enter your contact information. All information is kept strictly confidential and will not be shared with any third parties. Only winners will be contacted. If you do not wish to enter the contest, do not enter any information below. *(Participation in drawing is completely optional)***

_____
Name

_____
Phone Number Email

- o I do not wish to enter the drawing

## APPENDIX C: SURVEY QUESTIONNAIRES: EMPLOYER SURVEY

### 2025 South Jersey and Shore Areas NJ Transit Bus Survey for Employers

You are invited to participate in a research survey by Rowan University and New Jersey Transit titled **"Identifying Travel Needs for South Jersey and Shore Customers"** that will help to improve the NJ TRANSIT bus system in the South Jersey and Shore areas.

Your participation is completely voluntary with no risks to you. You may skip any questions you are not comfortable answering and stop participating at any time you wish with no penalty to you. This survey is strictly confidential. All data will be stored in a secure computer file and will be destroyed after the data is published. The research team at Rowan University is the only party that will be allowed to see the full set of data, except as may be required by law. If a report of this study is published or results are presented at a professional conference, only aggregate responses will be presented, and therefore, confidentiality will be maintained. **By completing the survey, you are providing your voluntary consent to participate.**

**If you complete the survey and provide your contact information, you will be entered into a drawing for either a monthly pass or a $100 gift card.** There are no known risks or discomforts associated with participating in this survey. While there may be no direct benefit to you, your participation can help identify transportation challenges and inform solutions to improve the safety and efficiency of the bus transit system in the study area.

If you have any questions about the survey, you can contact Mohammad Jalayer, Ph.D., at the address provided below, but you do not have to give your personal identification.

Email: jalayer@rowan.edu, phone: (856) 256-5397.

If you have any questions about your rights as a research subject, please contact the Office of Research Compliance at (856) 256-4078– Glassboro/CMSRU.

This study has been approved by the Rowan IRB, PRO-2024-313.

Please complete the checkbox below.

☐ I am 18 years or older

☐ I am voluntarily giving consent to participate in the survey

Rowan University, along with NJ TRANSIT, is conducting this survey to better understand your travel needs. Please help us by filling out and returning your completed survey to the distributor. Your responses will be kept confidential. To show our appreciation for your help, we will enter your name in a drawing to **WIN either a monthly pass or a $100 gift card**.

You may also take this survey online by scanning the following QR code,

QR Code

**Section 1: Employer Information**

1. What is the name of your company/agency?
   - Please specify_____
2. Which sector does your company/agency work in?
   - Healthcare
   - Education
   - Technology
   - Finance
   - Manufacturing
   - Retail
   - Government
   - Transportation & logistics
   - Construction
   - Agriculture & farming
   - Hospitality & tourism
   - Energy & Utilities
   - Media & Communications
   - Arts & Entertainment
   - Student
   - Retired/Not employed
   - Casino
   - Broadwalk & Retail
   - Other (Please specify)
3. What is the size of your organization in terms of the number of employees?
   - Less than 50
   - 50-200
   - 200-500
   - 500-1000
   - More than 1000
   - Prefer not to say

4. What is the zip code of your business operations in New Jersey?
   - Please specify_____

5. What are the work shifts of your business operation? (select all that apply)
   - Day shift (e.g., 7:00 AM - 3:00 PM)
   - Evening shift (e.g., 3:00 PM - 11:00 PM)
   - Night shift (e.g., 11:00 PM - 7:00 AM)
   - Weekend shift
   - No typical shift

**Section 2: Your Employee's Current Use of NJ TRANSIT Services**

6. Approximately what percentage of your current employees use NJ TRANSIT bus services?
   _____%

7. Please share any specific challenges or issues your employees experience when using NJ TRANSIT buses to travel to/from work. Please be as detailed as possible.

**Section 3: Impact on Business Operations**

8. How do the current transit services impact your business operations and employee productivity?
   - Please specify_____

9. How could improving transit services impact your business?
   - Please specify_____

**Section 4: Gaps in Travel Needs and Recommendations for Improvements**

10. Are there specific areas or routes where you believe there is a lack of transit service?
    - Yes (please specify)
    - No

11. What would you most like to improve about NJ TRANSIT bus service to better serve your employees? (pick top 3)

    □ **Travel Speed:** The amount of time it takes to get somewhere on the bus.

    □ **Service Reliability:** How often the bus is on time.

- ☐ **Getting to the Bus:** How easily you can get to or from a bus stop.
- ☐ **Mobility/Accessibility:** How easily you can get on or off a bus.
- ☐ **Schedules:** The times and days that buses run.
- ☐ **Destinations:** The places buses go.
- ☐ **Ease of Use:** How easy it is to understand and use the bus.
- ☐ **Cost:** How much the fare costs.
- ☐ **Fare Collection:** The different ways to pay for the bus (Tap & Ride with credit card, cash, NJ TRANSIT app, ticket vending machines).
- ☐ **Service Notifications:** How to get information about bus arrival times or service changes and disruptions.
- ☐ Other (please describe) _____

12. Are there any best practices or lessons learned from other transit agencies that you believe could be beneficial for the transit services for South Jersey and the shore area?
    - Please specify_____
13. What strategies could be implemented that would encourage your employees in the region to use NJ TRANSIT bus services?
    - Please specify_____

**Section 5: Employer Support for Transportation**

14. Does your organization offer any transportation support or benefits below for your employees (select all that apply)?
    - Subsidized transit passes
    - Carpool/vanpool programs
    - Shuttle service
    - Bike share programs
    - Parking benefits
    - Flexible work hours
    - Work-from-home options
    - None
    - Other (please specify)
15. How effective have these transportation support initiatives been in meeting your employees' commuting needs?
    - Very effective
    - Somewhat effective
    - Neutral
    - Ineffective

- Very ineffective

16. Are there any transportation support programs or initiatives that you would like to see introduced or expanded?

    - Yes (please specify)
    - No

**Section 6: Additional Insights**

17. Are there any other feedback or insights you would like to share about NJ TRANSIT bus services?
    - Please specify_____

## Raffle

**For a chance to win either a monthly pass or a $100 gift card, please enter your contact information. All information is kept strictly confidential and will not be shared with any third parties. Only winners will be contacted. If you do not wish to enter the contest, do not enter any information below.** ***(Participation in drawing is completely optional)***

_____

Name

_____

Phone Number Email

- I do not wish to enter the drawing

## APPENDIX D: ON-BOARD SURVEY ANALYSIS BY ROUTE

*Route 317*

Route 317 accounted for 111 of the 886[3] total survey responses collected across all routes, representing approximately 12.5 percent of all responses, the second-highest share among surveyed routes. The route serves central New Jersey, connecting Center City Philadelphia and Camden to communities further east toward the Jersey Shore in Ocean County. Among respondents, work was by far the most common trip purpose at 41 percent, followed by social or family visits (19 percent), personal business (14 percent), medical trips (10 percent), shopping (9 percent), school (5 percent), and entertainment or recreation (less than 1 percent).

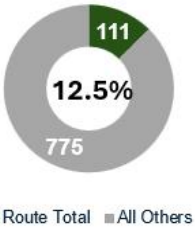
Survey comments for Route 317 were concentrated around several recurring themes. Riders most frequently requested increased service frequency and cited concerns related to reliability and on-time performance. Stop signage and accessibility were also identified as areas for improvement. Additionally, some riders expressed interest in enhanced onboard amenities, including Wi-Fi and charging ports.

Context Map of Route 317

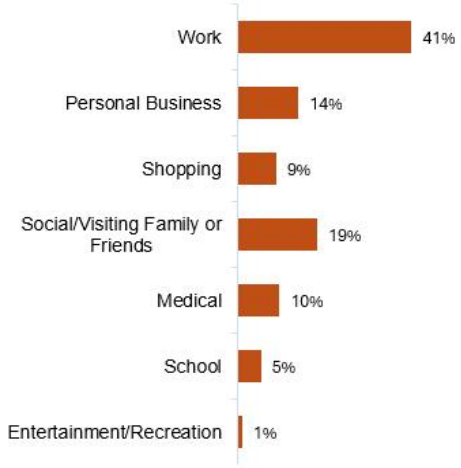

Survey responses included the following comments:

- More frequent service
- Reliability concerns
- Stop signage and access issues
- Onboard amenities (WiFi, charging ports)

Share of Route 317 Survey Responses




Distribution of Trip Purposes




[3] The resulting records total 886, compared to 983 total surveys. The discrepancy arises from appendix processing, where origin and destination were reclassified into new categories for trip purpose analysis; surveys missing responses to those questions and route-level variation further reduce the usable total to 886 records instead of the full 983.

*Route 319*

Route 319 accounted for 75 of the 886 total survey responses, representing approximately 8.5 percent of all responses. The route runs along a north–south corridor on the New Jersey coastline, connecting the Newark/New York metropolitan area in the north to Wildwood in the south. For much of its length, it follows U.S. Route 9 before branching east to serve Atlantic City, Ocean City, Avalon, and Wildwood.

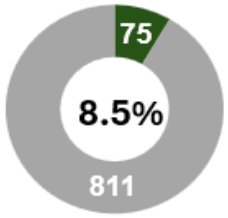
Work was the most common trip purpose (41 percent), followed by social or family visits (19 percent), personal business (14 percent), medical trips (10 percent), shopping (9 percent), school (5 percent), and entertainment or recreation (less than 1 percent).
Survey comments from Route 319 riders most frequently emphasized the need for increased service frequency. Concerns related to on-board cleanliness and comfort were also noted, while a smaller number of respondents raised issues related to reliability and schedule adherence.

Context Map of Route 319

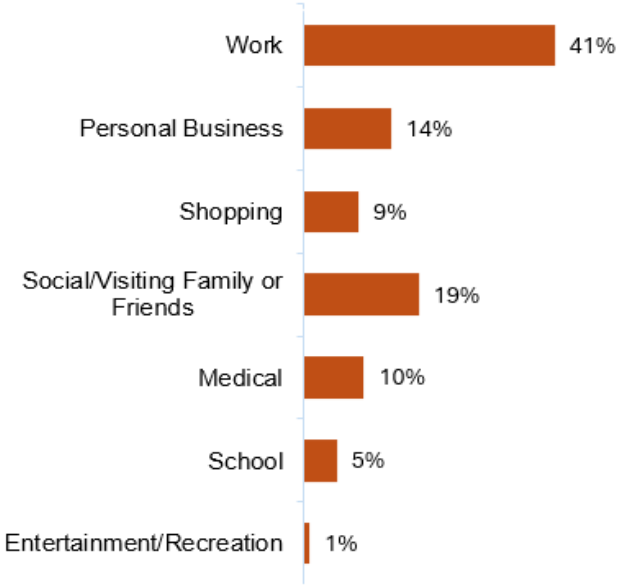

Survey responses included the following comments:

- More frequent service
- Cleanliness and comfort concerns
- Some reliability issues

Share of Route 319 Survey Responses




Distribution of Trip Purposes




*Route 468*

Route 468 accounted for 59 of the 886 total survey responses, representing approximately 6.7 percent of all responses. The route operates in an arc that connects Penns Grove, Pennsville, Salem, and Woodstown.

Work was the dominant trip purpose at 41 percent, followed by shopping (27 percent), personal business (12 percent), medical trips (10 percent), and social or family visits (10 percent). No respondents reported using this route for school or entertainment purposes.

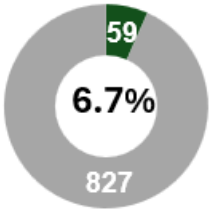
Riders commenting on Route 468 focused primarily on requests for increased frequency and improved reliability. Affordability was also raised as a concern, along with comments about cleanliness and on-board comfort.

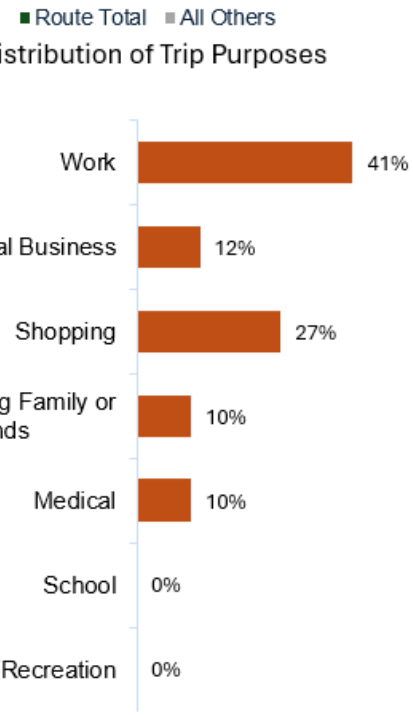
Context Map of Route 468


Survey responses included the following comments:

- Increased frequency and reliability
- Affordability concerns
- Cleanliness and comfort

Share of Route 468 Survey Responses



*Route 501*

Route 501 accounted for 53 of the 886 total survey responses, representing approximately 6.0 percent of all responses. The route serves a compact corridor on the Atlantic City and Brigantine barrier islands, operating from the Atlantic City Bus Terminal through the length of Brigantine, primarily along West Brigantine Avenue.

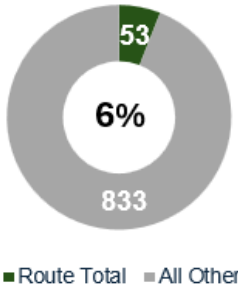
Work was by far the most common trip purpose (66 percent), followed by social or family visits (21 percent), shopping (6 percent), medical trips (4 percent), and personal business (4 percent). No respondents reported using this route for school or entertainment purposes.
Survey comments from Route 501 riders most frequently emphasized the need for improved service frequency and reliability. A smaller number of respondents also noted concerns related to stop accessibility and comfort, including the availability of shelters and seating.

Context Map of Route 501

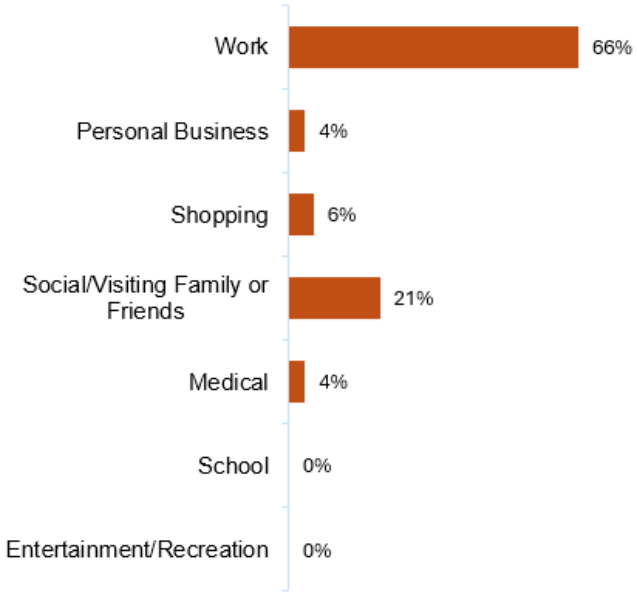

Survey responses included the following comments:

- Frequency and reliability concerns
- Some stop accessibility and comfort-related comments

Share of Route 501 Survey Responses




Distribution of Trip Purposes



*Route 502*

Route 502 accounted for 62 of the 886 total survey responses, representing approximately 7.0 percent of all responses. The route runs along a northwest–southeast corridor through Atlantic County, connecting inland communities to Atlantic City. It operates between Atlantic Cape Community College, McKee City, Pleasantville, and Atlantic City, primarily along U.S. Route 322.

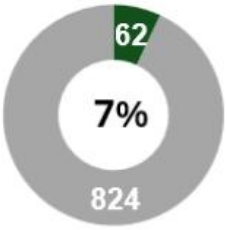
Work was the most common trip purpose (39 percent), followed by shopping (32 percent), social or family visits (10 percent), personal business (8 percent), school (5 percent), and both entertainment and medical trips (3 percent each). Survey comments from Route 502 riders most frequently cited reliability and schedule adherence as key concerns. Riders also expressed a need for increased service frequency. Additional feedback highlighted affordability and stop access issues, including the availability of shelters and clear signage.

Context Map of Route 502


Survey responses included the following comments:

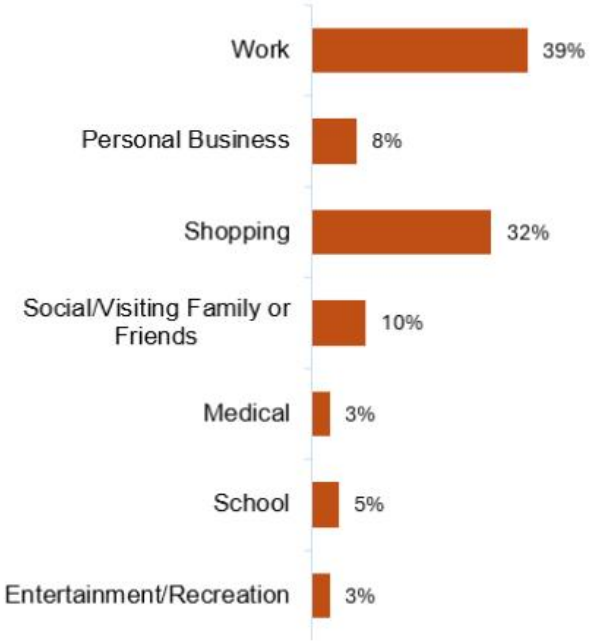
- Reliability and schedule adherence concerns
- Requests for increased service
- Affordability and stop access issues.

Share of Route 502 Survey Responses





Distribution of Trip Purposes



*Route 504*

Route 504 accounted for 60 of the 886 total survey responses, representing approximately 6.8 percent of all responses. Work was the most common trip purpose (37 percent), followed by shopping (33 percent), social or family visits (13 percent), personal business (10 percent), and medical trips (7 percent). No respondents reported using this route for school or entertainment purposes. The route operates along a compact corridor between Atlantic City and eastern Margate City, serving both the casino and resort areas of Atlantic City and the more residential communities along Ventnor Avenue.

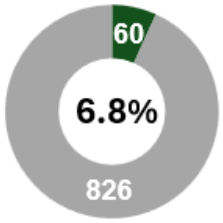
Survey comments from Route 504 riders were primarily related to stop infrastructure, including concerns about the availability and condition of shelters, as well as stop placement and signage. A smaller number of respondents also raised issues related to affordability and on-board cleanliness.

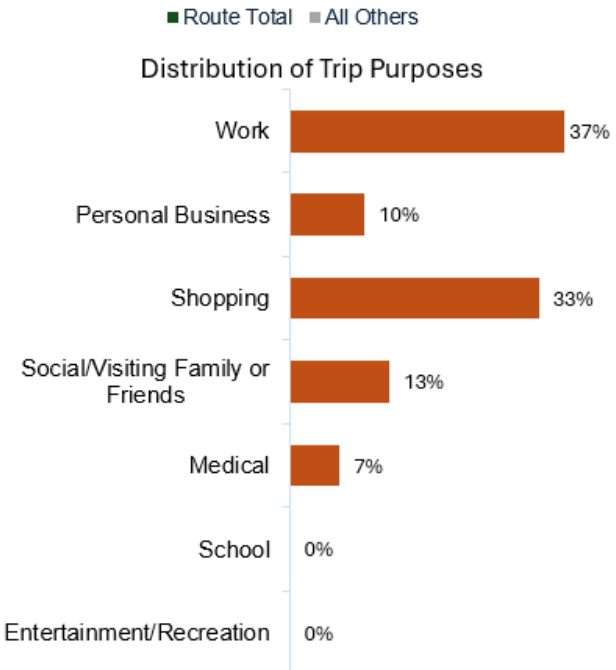
Context Map of Route 504


Survey responses included the following comments:

- Stop infrastructure (shelters) and stop placement concerns (signage)
- Some affordability and cleanliness issues.

Share of Route 504 Survey Responses



*Route 505*

Route 505 accounted for 55 of the 886 total survey responses, representing approximately 6.2 percent of all responses. The route runs from Longport to Atlantic City, serving Margate City and Ventnor City along a southwest–northeast alignment that parallels the beachfront and follows Ventnor Avenue. Service also extends westward through Atlantic City.

Work was the most common trip purpose (44 percent), followed by shopping (16 percent), medical trips (15 percent), social or family visits (13 percent), personal business (11 percent), and school (2 percent). No respondents reported using this route for entertainment purposes.

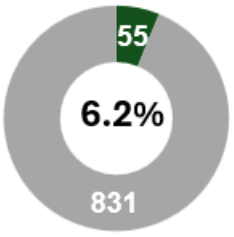
Survey feedback from Route 505 riders primarily focused on stop access and infrastructure, including concerns about stop placement and the availability of shelters. Reliability and affordability were also mentioned, though less frequently, as secondary issues.

Context Map of Route 505

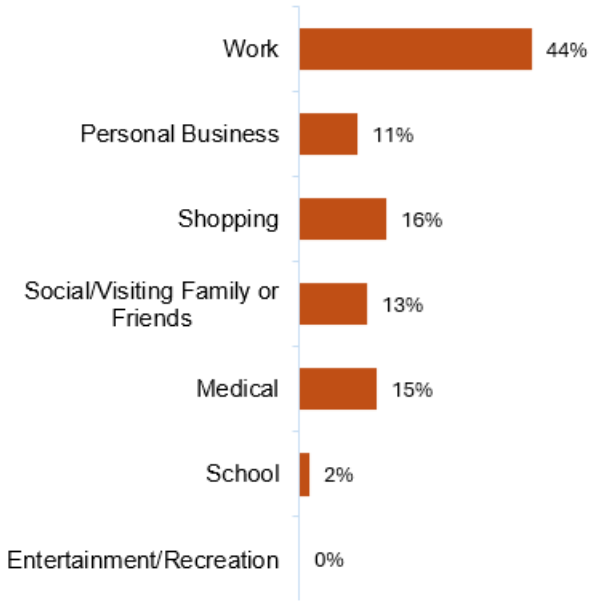

Survey responses included the following comments:

- Stop access and infrastructure concerns
- Some reliability and affordability comments.

Share of Route 505 Survey Responses




Distribution of Trip Purposes

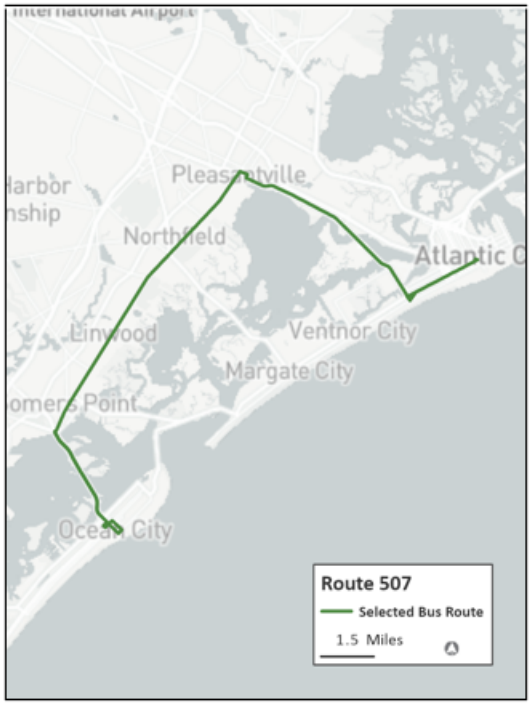


*Route 507*

Route 507 accounted for 50 of the 886 total survey responses, representing approximately 5.6 percent of all responses. The route follows an arc through eastern Atlantic County, connecting Atlantic City to Ocean City and serving communities such as Pleasantville, Linwood, and Somers Point, with stops distributed throughout the corridor. Work was by far the most common trip purpose (60 percent), followed by shopping (14 percent), personal business (12 percent), social or family visits (8 percent), and medical trips (6 percent). No respondents reported using this route for school or entertainment purposes.

Survey comments from Route 507 riders most frequently cited concerns related to reliability and schedule consistency, particularly issues with on-time performance. Several respondents also noted challenges with the transit app and accessing accurate service information. A smaller number of riders mentioned customer service as an area for improvement.

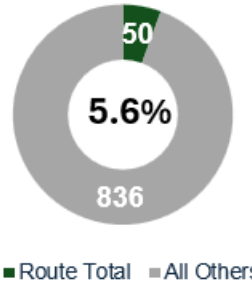
Context Map of Route 507



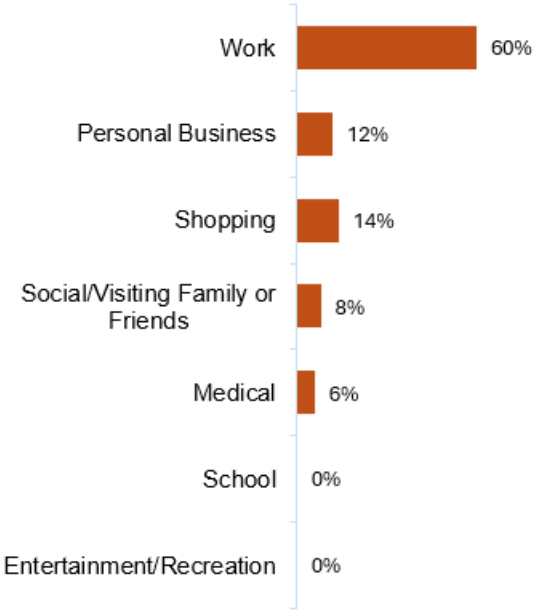

Survey responses included the following comments:

- Reliability and schedule consistency concerns
- Issues with app and service information
- Customer service

Share of Route 507 Survey Responses




Distribution of Trip Purposes



*Route 508*

Route 508 accounted for 44 of the 886 total survey responses, representing approximately 5.0 percent of all responses. The route operates along a winding alignment between Atlantic City and McKee City, with service to Pleasantville and Absecon.

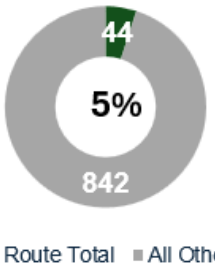
Work was the dominant trip purpose (70 percent), followed by shopping (14 percent), medical trips (7 percent), school (5 percent), and social or family visits and personal business (about 2 percent each). No respondents reported using this route for entertainment purposes.

Comments specifically referencing Route 508 were relatively limited and varied in scope. The feedback that was provided most often related to service frequency and stop conditions, though no single issue emerged as a dominant concern.

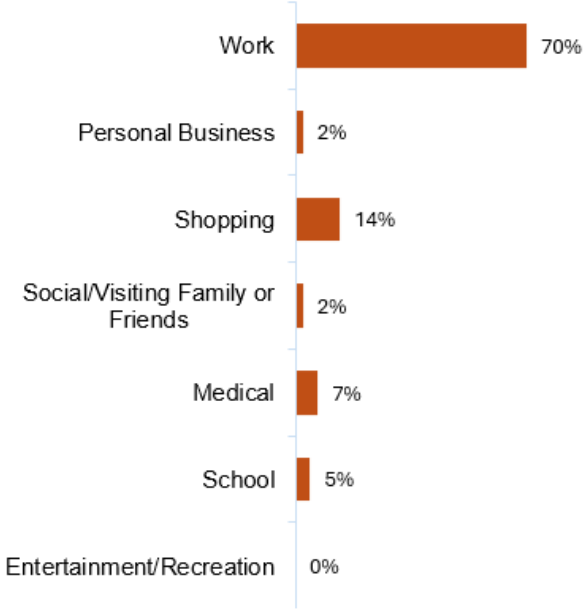
Context Map of Route 508


The survey responses specifically mentioning Route 508 were fairly broad in their focus with a handful of comments focused on frequency or stop related concerns.

Share of Route 508 Survey Responses




Distribution of Trip Purposes



*Route 509*

Route 509 accounted for 43 of the 886 total survey responses, representing approximately 4.9 percent of all responses. The route operates along an arc between Atlantic City and Ocean City, serving stops along U.S. Route 9 through the Pleasantville–Linwood–Somers Point corridor.

Work was the most common trip purpose (56 percent), followed by personal business (21 percent), medical trips (9 percent), social or family visits (7 percent), and entertainment, school, and shopping (about 2 percent each).

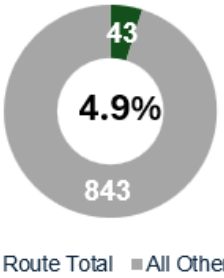
Survey comments from Route 509 riders most frequently cited service frequency as a key concern. Several respondents also noted issues related to driver behavior. In addition, riders mentioned challenges with the reliability of schedules and service information, suggesting a need for clearer and more consistent communication.

Context Map of Route 509

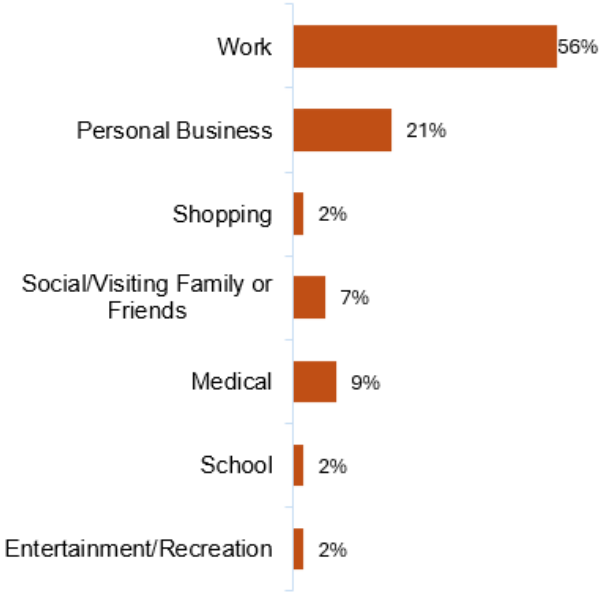

Survey responses included the following comments:

- Service frequency concerns
- Driver behavior
- Information reliability issues

Share of Route 509 Survey Responses




Distribution of Trip Purposes



*Route 510*

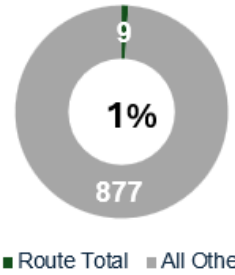
Route 510 is a seasonal commuter line and accounted for 9 of the 886 total survey responses, representing approximately 1.0 percent of all responses—the smallest sample among the surveyed routes. The route operates along a short corridor connecting Wildwood to the Rio Grande community in Cape May County, primarily via Wildwood Boulevard.

Given the limited number of responses, results should be interpreted with caution. Among those who responded, shopping accounted for 56 percent of trips and work for 44 percent, with no other trip purposes reported. Due to the very small sample size, it is difficult to draw detailed conclusions about rider priorities. The general feedback received referenced service frequency and stop-related concerns; however, the limited data does not support broader findings for this route.

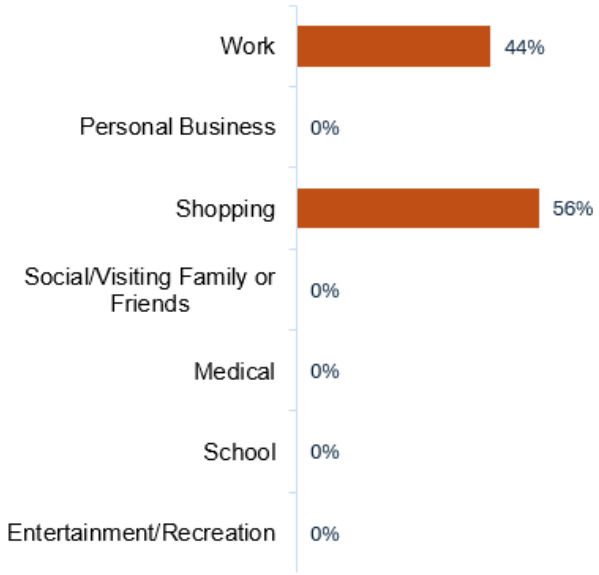
Context Map of Route 510


The survey responses specifically mentioning Route 510 were fairly broad in their focus with a significant handful of comments focused on frequency or stop related concerns.

Share of Route 510 Survey Responses




Distribution of Trip Purposes

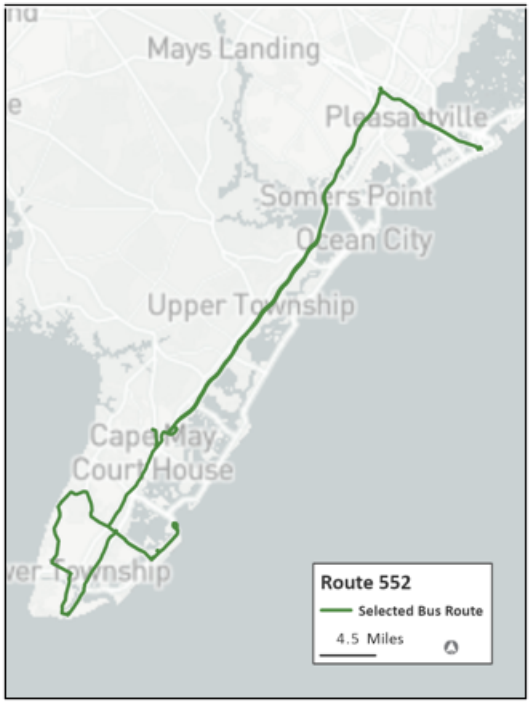


*Route 552*

Route 552 accounted for 60 of the 886 total survey responses, representing approximately 6.8 percent of all responses. The route operates along a northeast–southwest corridor through Atlantic and Cape May Counties, connecting Atlantic City to Cape Island. Route 552 does not serve Ocean City and primarily travels via the Garden State Parkway and U.S. Route 9, with stops in communities such as Middle Township, Wildwood, Villas, and Cape Island. Work was the most common trip purpose (43 percent), followed by social or family visits (22 percent), personal business (18 percent), shopping (7 percent), medical trips (5 percent), entertainment (3 percent), and school (2 percent).

Survey comments from Route 552 riders highlighted several recurring themes. Riders expressed interest in improved on-board amenities, particularly Wi-Fi and charging ports. Concerns related to cleanliness and overall comfort were also noted. Additional feedback referenced reliability and driver behavior, rounding out the key issues identified for this route.

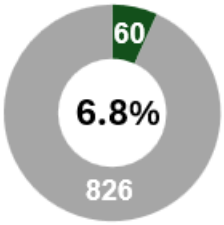
Context Map of Route 552

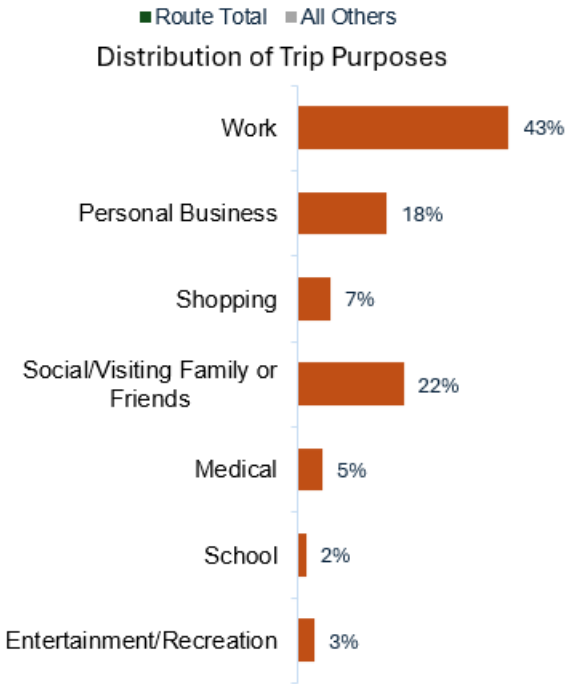



Survey responses included the following comments:

- Requests for amenities (Wi-Fi, charging ports)
- Cleanliness and comfort concerns
- Reliability
- Driver behavior

Share of Route 552 Survey Responses



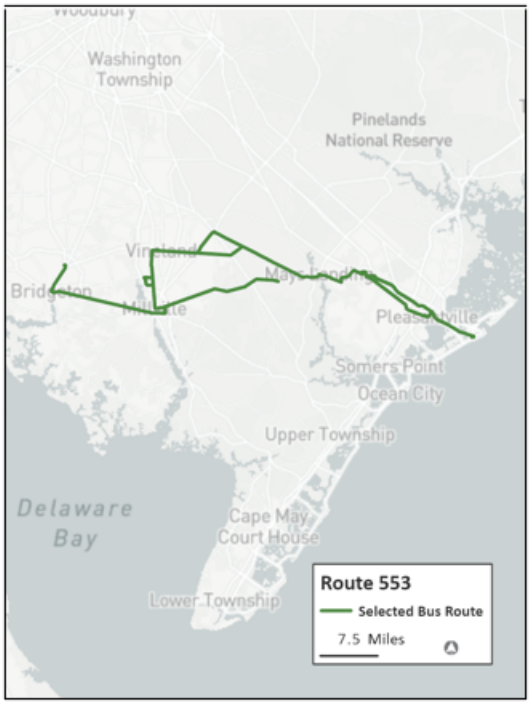



*Route 553*

Route 553 accounted for 141 of the 886 total survey responses, representing approximately 15.9 percent of all responses, the highest share among all surveyed routes. The route operates along an east–west corridor from Atlantic City to Upper Deerfield Township in Cumberland County, serving communities including McKee City, Vineland, Millville, Bridgeton, and Upper Deerfield  Work was the most common trip purpose (50 percent), followed by personal business (21 percent), social or family visits (11 percent), medical trips (8 percent), shopping (7 percent), and both entertainment and school (about 1 percent each). .

Survey comments from Route 553 riders most frequently emphasized affordability, with several respondents specifically requesting lower fares. Riders also highlighted the need for additional stops and expanded service coverage. Concerns related to reliability and service frequency were also raised, reflecting a broader desire for more accessible and dependable service along this high-ridership route.

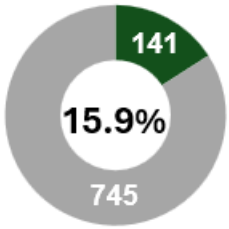
Context Map of Route 553

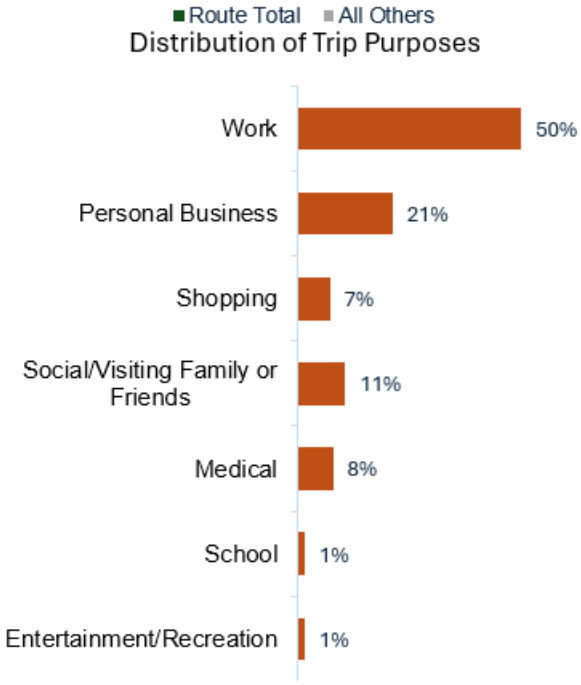



Survey responses included the following comments:

- Strong affordability concerns (requests for reduced fares)
- Requests for additional stops and expanded service coverage
- Reliability and frequency issues

Share of Route 553 Survey Responses



*Route 559*

Route 559 accounted for 54 of the 886 total survey responses, representing approximately 6.1 percent of all responses. The route operates along a north–south corridor through Ocean, Burlington, and Atlantic Counties via U.S. Route 9, connecting coastal and inland communities including Toms River, Tuckerton, Bass River, Smithville, Pleasantville, and Atlantic City.

Work was the most common trip purpose (48 percent), followed by personal business (19 percent), social or family visits (17 percent), shopping (7 percent), and both medical trips and entertainment (about 4 percent each). School-related trips accounted for approximately 2 percent.

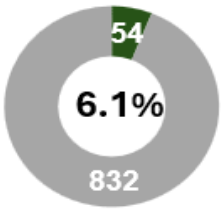
Survey comments from Route 559 riders most frequently emphasized the need for increased service frequency and improved reliability. Riders also expressed interest in enhanced on-board amenities. Concerns related to stop infrastructure—including the availability of shelters, access to restroom facilities, and cleanliness—were also noted. Several respondents requested bilingual services, reflecting the diverse ridership served by this route.

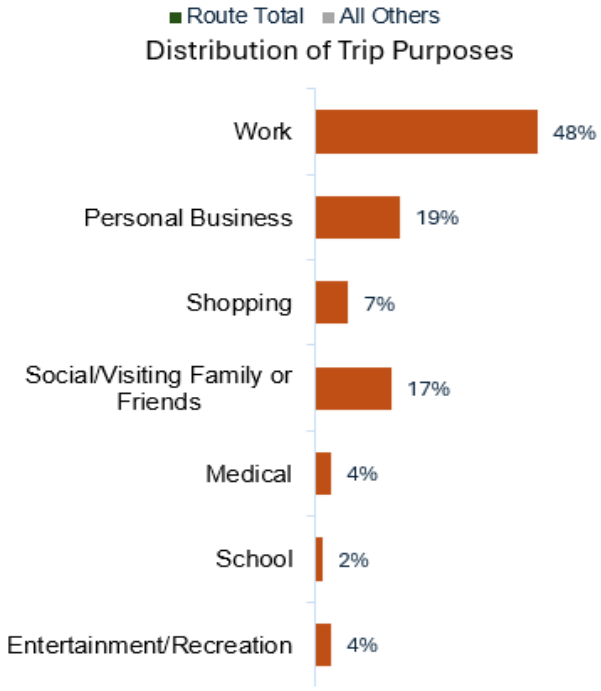
Context Map of Route 559


Survey responses included the following comments:

- Increased frequency and reliability
- Onboard amenities
- Stop infrastructure (shelters and bathrooms) and cleanliness
- Bilingual services

Share of Route 559 Survey Responses



## APPENDIX E: SURVEY RESPONSES: ROUTE LEVEL SEASONAL ANALYSIS

### Introduction / Background

Initial analysis on the route level was conducted using the first available survey batches for the spring and summer seasons received between October and November 2025, while fall survey collection was still underway. Due to limited spring responses, the analysis focused on summer data, which showed uneven sample distribution across routes. To address this, route consolidation and weighting by route were proposed to improve sample balance and support interim analysis, as well as to inform survey approach adjustments during the fall data collection.

The route consolidation approach and summer analysis were submitted to NJDOT following the January 2026 quarterly meeting. NJDOT then requested additional analysis of spring and fall data, focusing on weekday and weekend trip patterns and comparable results before and after route consolidation. With fall data collection completed at that point, the analysis incorporated the full set of spring and fall surveys.

Upon combining survey responses from all seasons, the under-sampling concern that initially prompted route consolidation proved to be less pronounced in the full dataset, and is better interpreted as one input, particularly for the summer surveys, within the broader route analysis rather than a standalone concern. As a result, route consolidation is retained as a reference to the earlier analysis but is not carried forward as a primary focus in the main analysis.

### Route Level Analysis Effort

On-board surveys across 14 bus routes were conducted using flyers, tablets, and paper forms and organized into three seasonal batches: spring, summer, and fall. Route consolidation and weighting were initially applied to address the summer under-sampling issue by grouping routes with low responses and improving overall sample balance (see Figure 59).

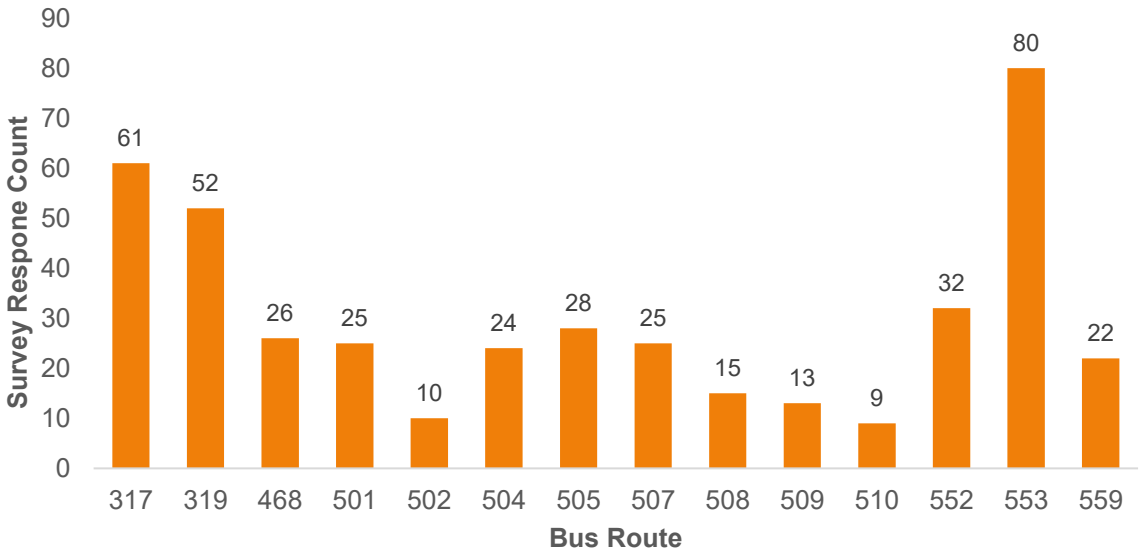



Figure 59. Summer Survey Responses by Bus Route

A consolidation approach was considered to group routes with limited route-level survey samples and overlapping geographic service areas, such as the following routes:

- Atlantic City South Cluster (504, 505)
- Near Atlantic City Cluster (507, 509)
- Far Atlantic City Suburbs Cluster (502, 508)
- Cape May County Cluster (510, 552)

Overall, these four consolidated clusters saw improved survey counts following the summer season, and a final determination on consolidation will be contingent upon the cumulative totals collected across the remaining survey seasons (See Table 20).

Table 20 - Summer survey count after route consolidation

| Cluster | Route | Survey Count | Survey Count % |
|---|---|---|---|
| Philadelphia | 317 | 61 | 14% |
| New York | 319 | 52 | 12% |
| Salem County | 468 | 26 | 6% |
| Upper Deerfield | 553 | 80 | 19% |
| Atlantic City South | 504, 505 | 52 | 12% |
| Atlantic City North | 501 | 25 | 6% |
| Near Atlantic City Cluster | 507, 509 | 38 | 9% |
| Far Atlantic City Suburbs | 502, 508 | 25 | 6% |
| Cape May County | 510, 552 | 41 | 10% |
| Lakewood | 559 | 22 | 5% |
| **Total** | | **422** | **100%** |

### Weekend and Peak/Off-Peak Analysis

Survey data was also examined by boarding time to assess ridership variation throughout the day. However, there are limitations to this analysis. Surveys were collected primarily between 8:00 a.m. and 5:30 p.m., reflecting practical fieldwork hours, and therefore do not capture the full range of service periods. In addition, boarding time entries are incomplete or inconsistent in some cases, making time-based route analysis less reliable.

| Aggregated Time Category | Time Period | Time Range |
|---|---|---|
| ***Peak*** | AM Peak | 6:00–8:59 a.m. |
| | PM Peak | 3:00–5:59 p.m. |
| ***Off-Peak*** | AM Early | 3:00–5:59 a.m. |
| | Midday | 9:00 a.m.–2:59 p.m. |
| | Evening | 6:00–8:59 p.m. |
| | PM Night | 9:00–11:59 p.m. |
| | Overnight | 12:00–2:59 a.m. |

Weekend and weekday split analysis were also conducted. While general patterns can be observed, sample sizes are not sufficient to support more detailed breakdowns of the data into more granular views for analysis.

### All-Season Combined Analysis

After all survey collections are finished, combining survey responses across all seasons provides a more balanced sample across routes compared to analyzing spring, summer, and fall individually (see Figures 60 to 63). Given this improved distribution, route consolidation used to address the summer sample imbalance is no longer necessary for the combined all-season survey data.

While summer and fall have higher response counts, analyzing surveys by individual season or by weekday and weekend is less robust due to limited sample sizes within each subset. The combined dataset provides greater statistical power and a more stable basis for analysis. Although fall data offer relatively better weekday and weekend coverage, sample sizes remain insufficient to support more detailed breakdowns, even after combining all seasons.

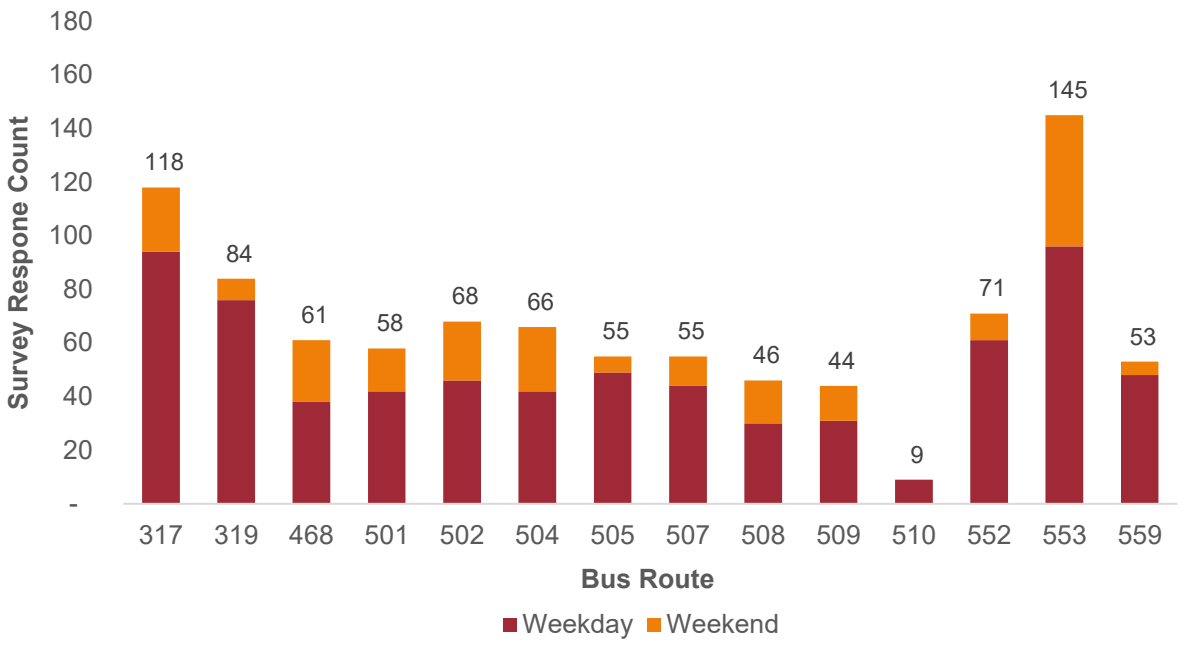



Figure 60. All Seasons Survey Responses per Route

At the individual season level, spring yielded notably low response rates across routes (Figure 61), while summer saw improved counts overall (Figure 62), though a limited number of routes remained underrepresented. Fall produced the most substantial responses of the three seasons, providing the strongest seasonal dataset (Figure 63). The combined results across all three seasons are reflected in the analysis above.

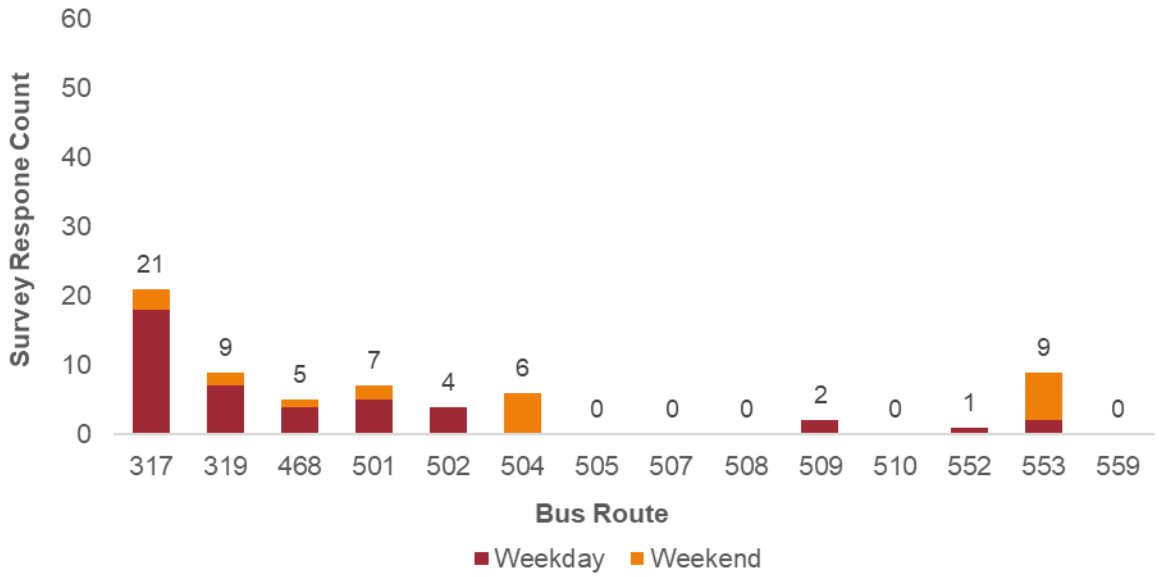



Figure 61. Spring Survey Responses by Bus Route, Weekday, and Weekend

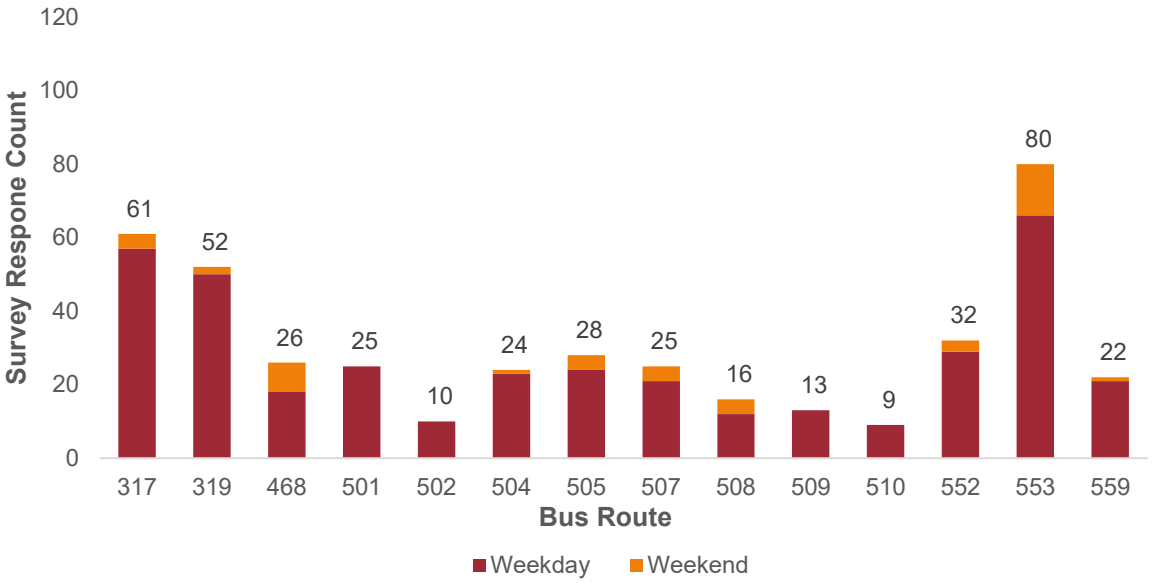



Figure 62. Summer Survey Responses by Bus Route, Weekday, and Weekend

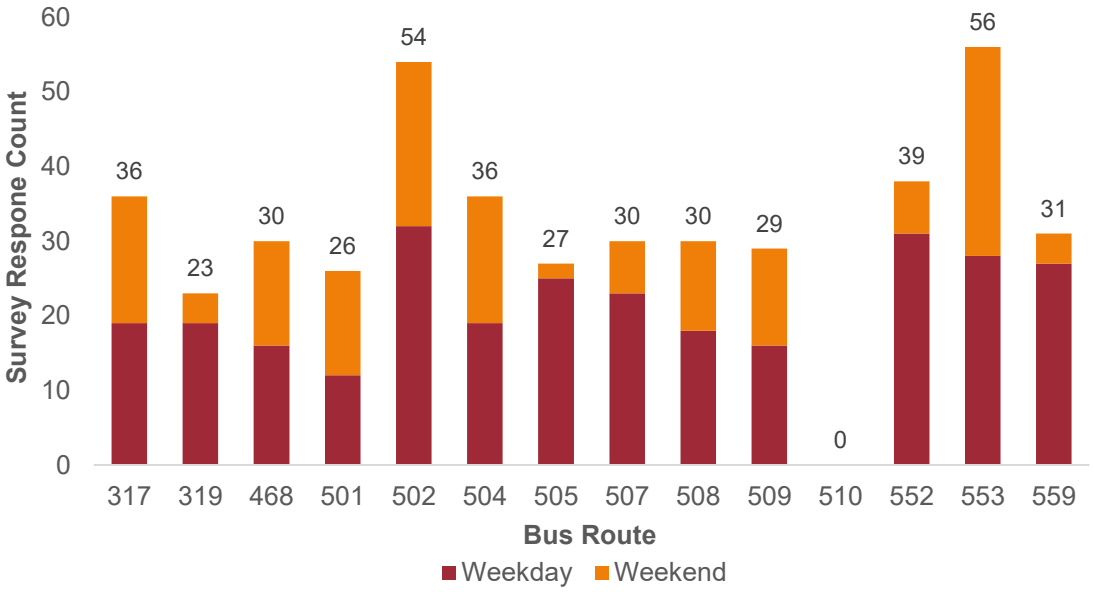



Figure 63. Fall Survey Responses by Bus Route, Weekday, and Weekend