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Analysis of Local Bus Markets, Phase III
FINAL REPORT

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Submitted by:

Devajyoti Deka, Ph.D.
Assistant Director for Research

Jon Carnegie
Executive Director

Alan M. Voorhees Transportation Center
Rutgers, The State University of New Jersey

NJDOT Research Project Manager
Priscilla Ukpah

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16.Abstract

This research is a follow-up of the Analysis of Local Markets Phase I and Phase II studies conducted by the Alan M. Voorhees Transportation Center during 2015-18. Whereas the primary objectives of the Phase I study were to examine both traffic (i.e., congestion) and air quality (i.e., emission) impacts of local buses, the primary objective of the Phase II and this Phase III study were to examine rider characteristics, trip characteristics, and air quality impacts. The analysis of air quality impacts from transportation in New Jersey is important because of the high level of air pollution in most parts of the state.

While the primary objective of this research is to estimate the greenhouse gas (GHG) impacts of local buses, its secondary objective is to examine the socioeconomic and travel characteristics of bus riders. To fulfill these objectives, a survey of bus riders was necessary. The survey was conducted between 6 AM and 4 PM onboard buses. A total of 40 routes were surveyed in the greater Newark, New Jersey area.

The analysis of survey data revealed that a large proportion of riders would use app-based services, drive their own cars, carpool with others, or use taxis to travel to their destinations in the absence of buses. Such diversions to the automobile would generate a significant amount of vehicle miles traveled, which in turn would generate a significant amount of GHG.

The analysis of rider and trip characteristics showed that the surveyed buses mostly serve riders from households without cars who have limited options to travel. Survey data analysis also showed that the buses serve a large number of low-income and minority populations. Most riders use buses to travel to and from work, but many also use them for personal business and other purposes. Based on the results, recommendations have been made.

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The authors would also like to thank research team members, Andrea Lubin Stephanie Kose-Crozier and James Kenah from the Alan M. Voorhees Transportation Center. Each of these individuals contributed significantly to this study. All three assisted with hiring and training of surveyors and setting up the survey operations center and data-entry program. In addition, Andrea Lubin assisted with obtaining Rutgers Institutional Review Board approval for the study. Stephanie Kose-Crozier and James Kenah assisted with surveyor field operations and other project administration activities, such as processing time sheets and travel reimbursements.

The contribution of Rutgers students from various programs to this study was immense. Edward J. Bloustein School students Tianrun Jiang assisted with scheduling and monitoring of the survey and other important logistical work, as well as data entry. Tianrun Jiang. Ziwei Liu, and Sharon Chen all assisted with survey data cleaning and weighting as well as GIS analysis. Approximately 40 graduate and undergraduate students from various programs at Rutgers University undertook the difficult task of conducting onboard surveys. Without the contributions of all of the above, the study could not have been successfully completed.

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EXECUTIVE SUMMARY

Background

Compared to other states, a larger share of people in New Jersey use public transportation. Yet, transportation-related air pollution, especially greenhouse gas (GHG) emissions, is a significant concern in New Jersey because of high traffic volumes on its road network. The air quality concerns in the state could be much greater in the absence of public transit. With that background, this study examines the GHG impacts of local buses.

In order to assess the GHG impacts of local buses, it is necessary to analyze the travel patterns of riders, especially to comprehend how they would have traveled in the absence of buses. Such information cannot be obtained without a large-scale survey of bus riders. While NJ TRANSIT regularly conducts online customer satisfaction surveys via email recruitment, onboard customer intercept surveys to assess riders' personal and household characteristics, and travel patterns have not been conducted in more than ten years for many of its bus routes. For this study, NJ TRANSIT selected 40 bus routes in the greater Newark, New Jersey area for survey and analysis. Eight of the routes were surveyed in fall of 2019, prior to the COVID-19 global pandemic, while 32 routes were surveyed between September 2021 and December 2022, after COVID-19 public health precautions were relaxed.

Research Objectives

The specific objectives of this research are the following:

(a) Assess the GHG impacts of local buses.

(b) Assess the characteristics of riders and their travel patterns.

(c) Generate a dataset of rider's travel characteristics through a survey that can be used to answer the research questions of this study and assist NJ TRANSIT with future service planning and modeling.

Key Findings

The following are the key findings of this research:

- The rider survey for the 40 routes, conducted between 6 AM and 4 PM on weekdays in the fall of 2019, fall of 2021, and the spring and fall of 2022, generated data from 8,663 riders.

- The analysis of the emissions impact of buses showed that the diversion of riders from buses to automobile would generate a large amount of GHG, composed mostly of carbon dioxide (CO_2). The analysis showed, based on one-way trip alone,

approximately 33,175 metric tons of CO_2 would be generated annually from automobiles if the riders diverted to that mode. It would take almost 7,211automobiles to operate for a full year to generate that amount of emission.

- The bus routes predominantly serve low-income populations. For almost all routes, the share of low-income riders was significantly larger than the share of low-income persons in New Jersey. The low income of bus riders is evident from the fact that the share of riders with annual income less than $25,000 is greater than 50 percent for nearly half of the surveyed bus routes, 18 out of the 40 routes. For all but two routes, the share of such riders is greater than 30 percent.

- The bus routes surveyed predominantly serve racial and ethnic minority populations. The share of white riders on all of the surveyed routes is substantially below the share of white residents in the state. The share of white riders is less than one third on all but four of the surveyed routes, while the share of Black or African American riders is significantly greater than the state average of 13.5 percent on all routes. On three-quarters of the routes surveyed, the share of Black or African American riders makes up greater than 50 percent of ridership. The share of Hispanic, Latino or Spanish riders exceeds the proportion of Hispanic, Latino or Spanish New Jersey residents on more than half the routes surveyed, 24 of 40 routes.

- Local buses serve a large number of riders with no vehicles available in their household. For all the routes surveyed, the share of riders with no vehicles in the household is higher than the share of households with no vehicle in the state. Whereas only 11.3 percent of all households in New Jersey do not have a vehicle, for 25 of the routes, the share of riders with no vehicles in their household is greater than 40 percent. For ten of the routes, the share of riders with no vehicles in the household is greater than 50 percent.

- For a large number of riders, buses are their only means of travel. More than 50 percent of the riders on 29 of the 40 routes surveyed stated that they had no other means of travel.

- A large proportion of the bus trips are made to go to work. The proportion of riders going to work by buses varied between 25 percent and 88 percent for the routes surveyed. For 18 of the 40 routes surveyed, more than 40 percent of riders stated that their trip destination was work.

- Bus riders often use transfer between bus routes to access their desired destinations. This is evidenced by the number of riders that reported using another bus as their access or egress mode. At least 15 percent of riders on 14 of the surveyed bus routes reported another bus as their access mode. Similarly, at least 15 percent of riders on 15 of the surveyed routes reported another bus as their egress mode. This indicates that many riders depend on the network of NJ TRANSIT buses instead of depending on just the single route where they were surveyed.

- A large proportion of bus riders also use app-based services such as Uber and Lyft. Seventy-eight percent used an app-based services at least one time in the last 30 days. One in five reported using an app-based service 20 or more times in the last 30 days.

- Given this high level of familiarity using app-based services, not surprisingly, a large proportion of riders stated they would use app-based services in the absence of buses. Thirty-four percent of riders stated they would travel using app-based services if the bus was not available. This proportion is significantly higher than any other mode.

- When asked how use of app-based services had changed use of NJ TRANSIT services, a large proportion (62 percent) of bus riders stated that that they use NJ TRANSIT more. Twenty-seven percent of riders stated that their use had not changed, while 12 percent reported using NJ TRANSIT less.

- Interestingly, less than one percent of riders reported using app-based services as their access or egress mode. This would seem to indicate that very few are using app-based services to address first- and last-mile access to bus stops.

Recommendations

Consistent with past recommendations and based on the experience with the current Phase III survey and data analysis, the following recommendations are reiterated:

- Promote local buses since they can potentially help to reduce GHG emissions and facilitate travel for a large number of riders who have no other option to travel.

- In the future, consider conducting surveys during off-peak hours and on weekends to collect data from potentially more diverse riders and to examine how riders are using buses for non-work trips.

- Examine through statistical methods whether surveys on selected bus trips instead of all bus trips would generate unbiased results to reduce the cost of surveys.

- Promote future research to understand how app-based services provided by transportation network companies can be integrated with transit services.

- Promote future research to investigate the potential and actual negative effects of app-based services on bus transit.

INTRODUCTION

As noted in the final reports for the Analysis of Local Bus Markets Phase I and Phase II studies by the Alan M. Vorhees Transportation Center [1,2], examining the impact of public transit on air quality is very important in New Jersey because of a high level of pollution caused by cars driven by people on congested roads. As noted in that report, more than 80% of the trips in New Jersey are made by cars. As a result, the share of GHG emitted by transportation in New Jersey is significantly higher than the national average (37% versus 28%).

Due to the significant contribution of the transportation sector to overall GHG emissions, public transportation is often perceived as a potential solution. Although New Jersey roads are highly congested, transit usage in the state is also one of the highest in the nation. In addition to several commuter lines and three light rail lines, NJ TRANSIT operates over 250 bus routes throughout the state, some connecting places in neighboring states of New York and Pennsylvania. According to data submitted by NJ TRANSIT to the Federal Transit Administration National Transit Database, more than 151 million unlinked passenger trips were made on the agency's buses in 2019, the last full year data was available prior to the COVID-19 global pandemic. These trips accounting for approximately 58 percent of total annual trips by all transit modes operated by the agency. In 2022, there were approximately 113 million bus trips, accounting for 64 percent of all trips taken on NJ TRANSIT services. [3]

The first objective of this research was to conduct an onboard survey of riders traveling by buses on selected routes and use the data to examine the air quality impacts of local buses. The second objective of this research was to use the survey data to analyze the characteristics of the riders and their travel patterns. The 40 bus routes for which onboard rider surveys were conducted through this study are listed in Table 1. These routes span the greater Newark area of northern New Jersey.

It has been many years since onboard rider surveys were last conducted for the 40 bus routes listed in Table 1. As a result, no recent data are available regarding the riders or their travel patterns involving these routes.

The rider surveys onboard these 40 routes were conducted in multiple rounds. The first round of surveys was conducted on eight routes in the fall of 2019, just prior to the COVID-19 global pandemic. Survey operations were halted in March of 2020 for 18 months. When public health precautions were relaxed and bus ridership had begun to recover pandemic losses, survey operations were resumed. The remaining 32 routes were surveyed in the fall of 2021, spring of 2022, and fall of 2022. For context, Figure 1 shows ridership changes from 2019 to 2022. When surveying resumed in 2021, bus ridership was at approximately 60 percent of pre-pandemic levels. By 2022, ridership on buses was approximately 75 percent of pre-pandemic levels. [3]

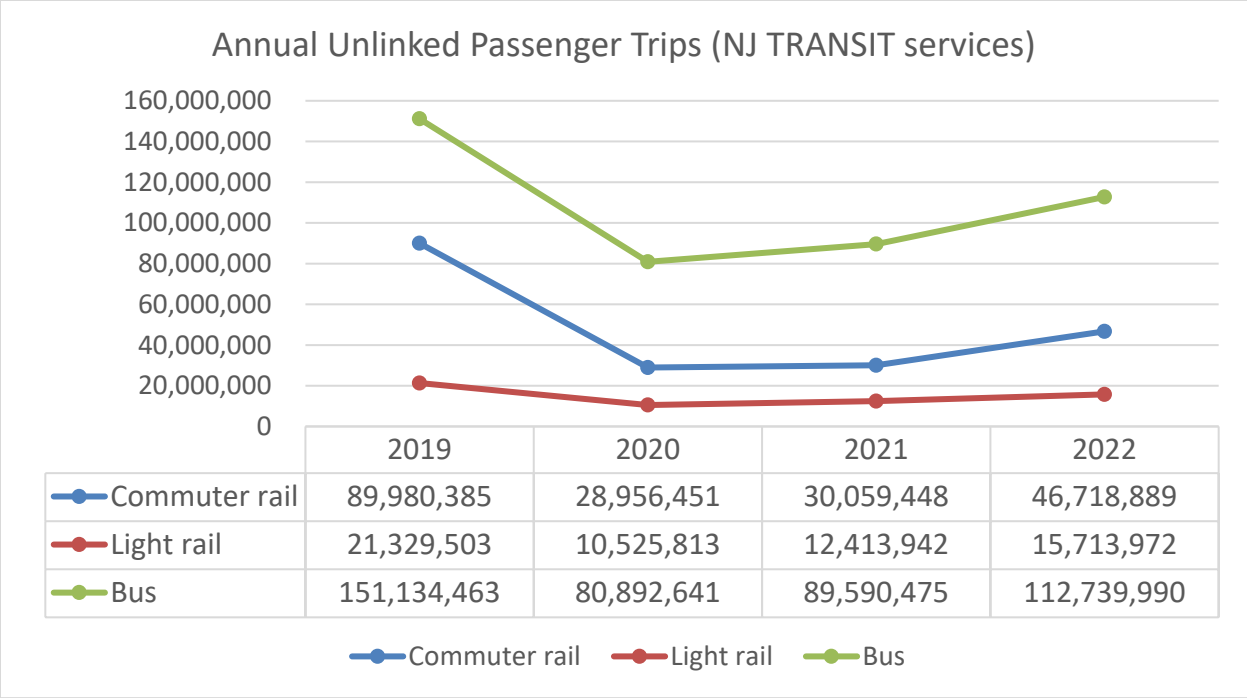

Figure 1. NJ TRANSIT Ridership before and after COVID-19 pandemic

Following NJ TRANSIT convention, with very few exceptions, surveys were conducted on Tuesdays, Wednesdays, and Thursdays, excluding holidays. The survey period on each day was from 6 AM to 4 PM. Riders on all buses leaving the origin stop between those two time periods were asked to complete the survey.

This report contains only summary of findings for the entire study. Results of route-by-route analysis of rider characteristics and travel patterns have been provided to the research sponsor in the form of a Microsoft Excel spreadsheet workbook. In addition, the raw survey data generated through this research was provided to the research sponsor in electronic format.

The first column of Table 1 references when the surveys were conducted. In all of the data tables presented in this report, surveys conducted pre-pandemic are reports above the dotted line. Surveys conducted post-pandemic are reported below the dotted line.

Table 1 – Surveyed Bus Routes

Season	Bus Route #	Location/Service Area	Average Weekday Riders (Trips)*
Fall 2019	1	Newark	15,414
Fall 2019	13	Broad Street - Clinton Avenue	12,527
Fall 2019	25	Springfield Avenue	12,144
Fall 2019	Go25	Springfield Avenue	775
Fall 2019	34	Market Street	9,037
Fall 2019	62	Newark - Elizabeth	5,757
Fall 2019	94	Stuyvesant Crosstown	11,966
Fall 2019	99	Clifton Avenue Crosstown	5,539
Fall 2021	11	Newark - Willowbrook - Montclair State (Combined)	1,631
Fall 2021	21	Main Street	6,075
Fall 2021/Fall 2022	26	Irvington – Springfield – Union - Elizabeth	1,835
Spring 2022	27	Mt. Prospect	6,453
Fall 2021	28	Newark - Willowbrook - Montclair State (Combined)	1,450
Fall 2021	29	Bloomfield Avenue	2,828
Fall 2022	361	Newark Express	181
Spring 2020/Fall 2021	37	Lyons Avenue	1,984
Fall 2021/Spring 2022	39	Irvington – Newark	8,612
Fall 2021/Fall 2022	40	Kearny – Jersey Gardens	2,942
Spring/Fall 2022	41	Park Avenue	4,069
Fall 2021/Fall 2022	5	Kinney – Newark Penn – Raymond Blvd. – East Orange	1,790
Fall 2021/Fall 2022	52	Irvington – Springfield – Union – Elizabeth (Combined)	1,594
Fall 2021/Fall 2022	56	Elizabeth – Winfield (Combined)	268
Fall 2021/Fall 2022	57	Elizabeth – Tremley (Combined)	591
Spring/Fall 2022	58	Elizabeth - Kenilworth	1,833
Spring 2020/Fall 2021	59	Plainfield - Newark	5,693
Spring/Fall 2022	65	Newark – Mountainside – Somerville (Combined)	604
Fall 2021/Fall 2022	66	Newark – Mountainside – Somerville (Combined)	2,501
Fall 2021	70	Newark - Livingston	4,138
Fall 2021/Fall 2022	71	Newark – West Caldwell	3,108
Fall 2021	72	Paterson – Bloomfield - Newark	2,760
Spring/Fall 2022	73	Newark – Orange – Livingston Mall	3,458
Spring 2022	76	Newark – Hackensack	2,781
Fall 2021/Fall 2022	78	Newark – Secaucus	846
Spring/Fall 2022	79	Newark – Parsippany Express	516
Spring/Fall 2022	90	Grove Street Crosstown	3,359
Spring/Fall 2022	92	Orange Crosstown	3,201
Spring/Fall 2022	96	18th Street Crosstown	981
Spring/Fall 2022	97	East Orange – Montclair	203
Fall 2022	Go25/250	Springfield Avenue	344
Fall/Spring 2022	Go28/258	Bloomfield – Newark – Newark Airport	3,338

* Estimated based on rider counts from assignment sheets and/or counts provided by NJ TRANSIT.

CONDUCT RIDER SURVEY AND ANALYZE DATA

Survey Preparation

The survey questionnaire used for this survey was the same as that used by the research team for the Analysis of Local Bus Markets Phase II study, completed in 2018. The survey questionnaire and research protocol were approved by Rutgers University's Institutional Review Board (IRB) prior to administration.

Approximately 4-6 weeks were needed to prepare for each round of surveying. Surveyor positions were advertised using various online outlets at Rutgers University's New Brunswick campus. For each round, between 25 and 30 students were hired as surveyors through a two-step interview process. Three additional students were hired to schedule and monitor survey operations on a daily basis.

Mandatory training sessions were organized for the surveyors before each round of survey. The training included topics such as preparation, responsibility, role, safety, and courtesy. Staff from VTC and NJ TRANSIT provided instruction at each session. All surveyors also completed human subject research training administered by the Collaborative Institutional Training Initiative (CITI). NJ TRANSIT notified bus garage personnel and NJ TRANSIT police about the survey and provided an authorization letter which was carried by the surveyors when conducting the onboard survey. Each surveyor was also provided an apron bearing the Rutgers University logo to be worn when conducting the survey.

NJ TRANSIT determined the number of surveys to be printed (both Spanish and English). Each survey questionnaire (and the envelope) had a unique serial number. Before the commencement of each round of survey, NJ TRANSIT provided the driver paddles for the pertinent routes to the research team. The bus driver paddles are the schedules for each bus driver showing the daily trips, including arrival and departure times. The paddles are used by drivers to maintain their schedule. The research team used the paddles to prepare assignment sheets for each bus trip surveyed. A sample of an assignment sheet is shown in Figure 1. As shown in the figure, the assignment sheets had all bus stops for the route listed, in addition to the trip start time and end time and beginning stop and ending stop. They also had spaces for the surveyors to write down the number of boarding and alighting riders at each stop.

ROUTE Number: **871**		
BUS Number (Painted No.):		
RUN Number: **001**	**TRIP** Number: 1	Ptn. **11**
Direction: **OUTBOUND**	From: **SPEEDWELL AVE AT**	To: WILLOWBROOK MALL
Date:	**CATTANO AVE 10:30 AM**	**11:38 AM**
Agent Names:		

ENGLISH Questionnaires		**SPANISH Questionnaires**
First Serial ID:		First Serial ID:
Last Serial ID:		Last Serial ID:

	Bus Stop	Passengers		# of Refusals	Top Survey Serial ID
		ON	OFF		
1	SPEEDWELL AVE AT CATTANO AVE				
2	SPRING ST AT WATER ST				
3	MORRIS ST AT ELM ST				
4	RIDGEDALE AVE 525' N OF ABBETT AVE				
5	RIDGEDALE AVE AT JOHN ST				
6	RIDGEDALE AVE AT EVERGREEN PL				
7	RIDGEDALE AVE AT EAST HANOVER AVE				
8	RIDGEDALE AVE 1000'N OF EAST HANOVER AVE				
9	RIDGEDALE AVE AT EAST FREDERICK PL				
10	RIDGEDALE AVE AT HORSE HILL RD				
11	RIDGEDALE AVE AT CEDAR KNOLLS RD				
12	RIDGEDALE AVE AT ELM PL				
13	RIDGEDALE AVE AT GLENN DR				
14	RIDGEDALE AVE AT MALAPARDIS RD				
15	RIDGEDALE AVE AT WING DR				
16	RIDGEDALE AVE AT RT-10				
17	N JEFFERSON RD 157'S OF PAPER MILL DRIVE				
18	N JEFFERSON RD 170'S OF FANOK RD				
19	PARSIPPANY RD AT EASTMANS RD				
20	PARSIPPANY RD AT CARLSTADT RD				
	TOTAL				

Number of Surveys Returned:	**CONTACT INFO:**
Number of Spanish Surveys Distributed:	**PI Phone # | Field op. Phone #**

Comments:

Figure 2. Sample assignment sheet

The schedulers at the survey center prepared a contact list of all surveyors, indicating which surveyors had personal automobiles to drive themselves and other surveyors to the survey site. They also prepared a document indicating each surveyor's availability on Tuesdays, Wednesdays, and Thursdays. Using this document and the driver list, VTC staff prepared the survey schedule for each week. The schedule was emailed to all surveyors a week prior to the actual survey for confirmation. Once confirmation was received, survey bags, containing survey instruments, pencils, assignment sheets, etc., were prepared for each day. Drivers for each shift were instructed to collect the bags the evening before the survey date.

At the survey center, VTC staff and students prepared a "Masterfile" containing information on each scheduled trip, including the names of the surveyors and the drivers carrying surveyors to the site as well as start and end time of shifts. The Masterfile was used to monitor the progress of the survey each day. When trips were missed for any reason (e.g., late arrival of bus, buses posting a run number different from assignment sheet, surveyor failing to find bus stop, etc.), the information was recorded in the Masterfile so that surveys for the missed trips could be rescheduled on a future date.

Conducting the Onboard Survey

Designated drivers carried one to three other surveyors to the site, depending on the schedule for that day. The surveyors arrived at the beginning bus stop 15-20 minutes before the departure time of the bus. They introduced themselves to the bus operators and presented their Rutgers ID card and the NJ TRANSIT authorization letter. When bus runs included a large number of trips (e.g., eight or ten trips), the surveyors continued to stay on the same bus conducting surveys for a maximum of eight hours per shift. When runs contained only two or three trips, the surveyors often transferred to another run on the same route or to another route operating in the same area.

Two surveyors boarded each bus to conduct surveys and record the number of riders. One surveyor distributed and collected completed surveys, whereas the other surveyor filled out the assignment sheets, including the number of boarding and alighting riders at each stop. At the conclusion of each trip, the surveyors bundled the completed surveys together with the assignment sheet for the trip and prepared for the next trip. At the conclusion of the entire shift, they organized the completed and unused surveys into separate bundles and brought them back to the survey center, where completed surveys from each trip were filed separately in locked filing cabinets. Approximately 90% of the completed surveys were collected onboard by the surveyors onboard while the remaining surveys were mailed back by the respondents in postage-paid envelopes given to them.

Data Entry, Cleaning, Geocoding, and Weighting

For each survey round, three students were hired for entering data from the paper surveys into a computer. Prior to the task, English and Spanish data-entry templates

were set up in Qualtrics survey software and the data-entry personnel were familiarized with each bus route surveyed. The electronic data were checked for anomalies such as duplicate entry and implausible serial number. Whenever possible, the erroneous data were corrected.

The trip origins and destinations of the riders were subsequently geocoded using ArcGIS. When the respondents provided detailed addresses, it was possible to geocode the origins and destinations to exact location. When respondents provided only partial addresses such as only the street name or the zip code, their origins and destinations were geocoded to an approximate location.

In the final step of the process, a weight variable was created following a methodology provided by NJ TRANSIT. The methodology uses average weekday ridership data for each route together with directional number of respondents for peak and off-peak periods. Application of the weight variable expands the survey responses to represent the full universe of weekday riders on each route.

Data Analysis

The analysis of survey data is divided into three broad sections: (a) rider characteristics, (b) trip characteristics, and (c) environmental impacts of buses. Results of the analysis are presented in the three following sections in that order. The rider characteristics pertain to demographic and socioeconomic variables. The trip characteristics include trip origins and destinations, access and egress modes, trip frequency, return trip mode, ticket type, the availability of alternative modes, et cetera. The environmental impact section presents results showing how much GHG would be generated if bus riders were to drive instead of taking buses.

The results of the analysis are presented in this report in summary form. Detailed tables containing route-by-route analysis have been provided to the study sponsor in the form of a Microsoft Excel spreadsheet workbook.

NJ TRANSIT conventionally estimates response rates for onboard rider surveys by assuming that most riders travel in both directions during a day but take the survey only once. With that assumption, the average response rate for all the surveyed routes combined was 19 percent. For the routes surveyed in fall 2019, the response rate was 26 percent, whereas the response rate for the routes surveyed in fall 2021, spring 2022 and fall 2022 was 17 percent.

The margins of error (MOE) at 95% confidence level for the surveyed routes are shown in Table 2. One of the reasons for the high MOE for some routes is that the rider volumes are very low. Since number of total riders is used as a denominator when estimating MOE, a small number of riders for a route lowers the estimate even when the response rate is reasonable.

Table 2 – Margin of error for surveyed routes at the 95% confidence level

Bus Route #	Survey Responses	Estimated Average Weekday Riders (Trips)	Estimated Margin of Error*
1	1,125	15,192	1.4%
13	866	12,527	1.9%
25	753	12,144	1.7%
Go25	74	775	4.7%
34	791	9,037	1.0%
62	385	5,757	2.9%
94	743	11,966	0.9%
99	390	5,539	2.8%
11	121	1,631	2.7%
21	285	6,075	1.1%
26	79	1,835	3.7%
27	233	6,453	1.0%
28	132	1,450	3.1%
29	144	2,828	1.7%
361	4	181	4.7%
37	202	1,984	3.5%
39	198	8,612	1.4%
40	95	2,942	2.7%
41	42	4,069	1.3%
5	65	1,790	3.8%
52	79	1,594	4.9%
56	45	268	11.2%
57	28	591	7.0%
58	54	1,833	3.7%
59	519	5,693	2.1%
65	33	604	7.7%
66	132	2,501	3.6%
70	235	4,138	1.5%
71	60	3,108	2.3%
72	232	2,760	2.2%
73	86	3,458	1.8%
76	87	2,781	1.4%
78	52	846	6.8%
79	26	516	11.0%
90	88	3,359	2.5%
92	67	3,201	2.3%
96	30	981	5.4%
97	25	203	13.0%
Go25/250	6	344	2.9%
Go28/258		3,338	1.7%

* Estimated on the basis of rider counts from assignment sheets and/or counts provided by NJ TRANSIT

RIDER CHARACTERISTICS

Introduction

This broad section presents a description of the demographic and socioeconomic characteristics of the surveyed riders. The demographic characteristics include gender and age. The socioeconomic characteristics include race, ethnicity, occupation, income, household size, number or vehicles in household, et cetera. In all figures, the total number of riders (N) represents weighted survey respondents who answered the question.

Gender

According to the 2021 U.S. Census Bureau American Community Survey, the shares of male and female population in New Jersey are 50.8 percent female and 49.2 percent male. Table 3 shows the share of female/male riders by route. When compared to the state population, the share of female riders on the bus routes surveyed is higher than the state's population for all but seven of the forty routes surveyed. These results are consistent with the results of both previous Analysis of Local Bus Markets studies [1,2], which also found a higher share of female riders for most bus routes.

Age

The age distribution of the riders for each surveyed route is shown in Table 4. For reference, 22.1 percent of New Jersey's population is under age 18 and 16.2 percent is age 65 or over. For all but two bus routes surveyed, the proportion of riders under age 18 is smaller than the state population. This makes intuitive sense because young children do not generally travel alone. Surveyors in the field reported that the riders under age 18 appeared to be mostly school children going to and coming home from school.

The share of riders age 65 and over is lower than the share of older adults in the general population on all but two routes. This could be true because older adults generally are less likely to take fixed-route transit than younger adults. Also, many older adults have retired from work so they are not riding buses to commute.

Table 3 – Male-female split of riders for surveyed routes

Route #	Percent			Riders (N)
	Male	Female	Total	
1	41.6	58.4	100.0	12,304
13	38.7	61.3	100.0	10,039
25	40.8	59.2	100.0	9,358
Go25	37.7	62.3	100.0	705
34	38.4	61.6	100.0	7,163
62	49.0	51.0	100.0	4,405
94	36.2	63.8	100.0	9,116
99	43.4	56.6	100.0	4,201
11	32.4	67.6	100.0	1,298
21	37.3	62.7	100.0	4,635
26	44.6	55.4	100.0	1,633
27	53.2	46.8	100.0	4,640
28	31.4	68.6	100.0	1,206
29	43.4	56.6	100.0	2,382
361	75.1	24.9	100.0	181
37	37.7	62.3	100.0	1,696
39	39.8	60.2	100.0	6,608
40	50.9	49.1	100.0	2,473
41	62.5	37.5	100.0	3,065
5	27.9	72.1	100.0	1,429
52	58.3	41.7	100.0	1,479
56	42.9	57.1	100.0	226
57	47.2	52.8	100.0	591
58	52.1	47.9	100.0	1,389
59	43.2	56.8	100.0	4,736
65	45.4	54.6	100.0	548
66	50.3	49.7	100.0	2,327
70	38.1	61.9	100.0	3,429
71	44.7	55.3	100.0	2,862
72	46.9	53.1	100.0	2,377
73	25.9	74.1	100.0	2,825
76	54.6	45.4	100.0	2,516
78	43.0	57.0	100.0	739
79	70.0	30.0	100.0	480
90	32.1	67.9	100.0	2,912
92	31.4	68.6	100.0	2,883
96	35.0	65.0	100.0	615
97	18.1	81.9	100.0	182
Go25/250	27.4	72.6	100.0	299
Go28/258	47.8	52.2	100.0	3,078

Table 4 – Age distribution of riders for surveyed routes

Route #	Percent									Riders (N)
	Under 18	18-24	25-34	35-44	45-54	55-61	62-64	65+	Total	
1	14.6	20.3	17.5	15.9	14.7	10.9	2.4	3.6	100.0	12,883
13	6.7	18.3	20.1	19.0	16.8	12.6	3.9	2.6	100.0	10,582
25	11.1	17.0	19.9	15.9	15.5	12.7	3.0	4.9	100.0	9,816
Go25	14.1	3.4	17.1	27.3	18.1	16.0	2.4	1.7	100.0	708
34	12.8	18.6	20.8	14.8	15.0	9.2	3.6	5.3	100.0	7,454
62	1.0	16.7	25.1	20.7	16.9	13.3	2.4	3.8	100.0	4,573
94	7.9	18.8	19.2	16.0	16.7	11.3	4.5	5.6	100.0	9,375
99	16.5	11.5	20.6	16.1	14.9	10.6	4.1	5.7	100.0	4,462
11	2.8	28.6	27.6	7.2	11.9	11.7	5.3	5.0	100.0	1,367
21	7.5	20.2	22.9	14.1	10.7	15.1	4.0	5.5	100.0	5,210
26	7.4	31.1	17.4	9.7	15.8	13.1	2.0	3.5	100.0	1,641
27	18.8	13.6	16.3	13.1	13.5	13.8	5.4	5.7	100.0	5,040
28	9.7	47.6	5.1	14.6	7.5	9.5	3.4	2.6	100.0	1,278
29	2.9	24.4	21.3	11.2	9.5	15.2	4.6	10.9	100.0	2,455
361	25.0	25.0	0.0	25.0	0.0	25.0	0.0	0.0	100.0	180
37	2.1	23.5	15.9	20.3	14.3	16.2	6.0	1.7	100.0	1,727
39	7.1	13.5	22.6	13.1	15.5	16.7	3.9	7.6	100.0	7,389
40	0.0	32.1	20.9	9.5	21.9	6.8	7.6	1.2	100.0	2,542
41	9.7	6.7	7.2	27.3	20.9	19.4	0.0	8.9	100.0	3,463
5	28.0	16.0	7.7	18.8	8.9	10.6	3.8	6.0	100.0	1,576
52	1.1	30.9	8.5	25.3	23.3	3.7	3.3	4.1	100.0	1,473
56	2.1	5.0	32.6	10.5	15.5	16.7	6.3	11.3	100.0	239
57	0.0	23.6	2.3	35.8	15.0	6.6	9.2	7.5	100.0	573
58	5.9	48.5	18.3	2.9	5.5	13.8	2.7	2.5	100.0	1,422
59	8.3	18.8	17.3	17.3	17.5	12.4	4.5	3.9	100.0	4,905
65	0.0	8.2	16.0	30.9	18.5	10.7	8.0	7.8	100.0	563
66	2.2	45.8	15.3	12.4	14.2	3.5	4.2	2.4	100.0	2,341
70	4.1	18.4	22.7	14.4	19.1	10.3	4.3	6.7	100.0	3,617
71	5.3	18.4	10.4	12.4	25.5	9.1	2.4	16.5	100.0	2,966
72	7.3	24.5	11.4	21.4	15.2	8.1	5.5	6.6	100.0	2,475
73	0.9	35.2	12.5	15.4	15.8	8.8	10.4	0.9	100.0	2,881
76	3.9	21.5	20.9	19.3	10.6	10.3	3.3	10.2	100.0	2,644
78	2.1	14.6	16.3	8.2	18.3	30.3	2.1	8.2	100.0	756
79	3.7	10.6	23.9	37.0	0.0	16.4	8.3	0.0	100.0	481
90	3.3	13.9	18.3	12.8	14.9	25.8	1.9	9.0	100.0	3,130
92	3.4	31.2	15.4	12.0	16.2	4.7	0.9	16.2	100.0	2,811
96	21.1	9.9	33.5	23.2	7.9	0.0	0.0	4.4	100.0	707
97	0.0	2.9	33.7	9.9	16.9	14.0	7.0	15.7	100.0	172
Go25/250	15.1	0.0	42.5	0.0	15.1	27.4	0.0	0.0	100.0	299
Go28/258	0.0	14.0	25.6	27.0	23.3	8.1	0.0	2.0	100.0	2,941

Race and Ethnicity

The share of riders belonging to different races is shown in Table 5. For reference, one may note that the share of white, African American, and Asian persons in the state of New Jersey, according to the 2016 American Community survey, are 62.7 percent, 13.3 percent, and 9.8 percent, respectively.

The share of white riders on all of the surveyed routes is substantially below the share of white residents in the state. The share of white riders is less than one third on all but four of the surveyed routes. The share of Asian riders is greater than the share of Asian riders in the state population on only ten of the surveyed routes. The share of Black or African American riders is significantly greater than the state average of 13.5 percent on all routes. On three-quarters of the routes surveyed, the share of Black or African American riders makes up greater than 50 percent of ridership. The survey results clearly show that NJ TRANSIT bus routes operating in the greater Newark area serve mostly non-white customers and that Black or African American riders comprise the largest share of greater Newark area customers overall.

According to U.S. Census ACS data, in 2021, 20.8 percent of New Jersey residents reported being of Hispanic, Latino or Spanish heritage. As shown in Table 6, the share of Hispanic, Latino or Spanish riders exceeds the proportion of New Jersey residents reporting Hispanic, Latino or Spanish ethnicity on more than half the routes surveyed, 24 of 40 routes.

Table 5 – Racial composition of riders for surveyed routes

	Percent							
Route #	White	Black or African American	Asian	American Indian or Alaska Native	Multi-racial	Other	Total	Riders (N)
1	9.1	69.6	5.0	1.0	6.3	9.0	100.0	12,033
13	13.4	65.8	1.6	0.6	6.5	12.1	100.0	9,802
25	9.7	75.8	0.7	0.5	4.4	8.9	100.0	9,264
Go25	0.0	79.9	5.1	0.0	9.1	5.9	100.0	661
34	11.2	68.3	3.1	1.1	6.2	10.2	100.0	6,693
62	16.7	56.1	7.7	0.7	4.9	13.9	100.0	4,248
94	6.0	79.8	1.1	1.4	6.6	5.1	100.0	8,848
99	6.6	76.9	1.9	2.0	6.7	5.9	100.0	4,150
11	27.2	35.0	6.4	1.2	12.9	17.3	100.0	1,275
21	7.1	71.8	1.3	0.0	6.8	12.8	100.0	4,864
26	7.0	69.4	0.0	7.3	4.4	11.9	100.0	1,622
27	10.6	72.5	0.6	2.2	2.0	12.0	100.0	4,624
28	19.3	52.9	8.8	1.2	7.0	10.8	100.0	1,210
29	27.9	38.0	6.3	0.6	8.4	18.8	100.0	2,321
361	24.9	50.3	24.9	0.0	0.0	0.0	100.0	181
37	4.1	80.3	6.9	0.0	3.4	5.3	100.0	1,671
39	1.1	81.0	4.9	2.1	6.1	4.8	100.0	7,129
40	39.2	39.6	2.4	0.0	6.6	12.2	100.0	1,896
41	1.5	78.5	1.5	1.5	3.0	14.0	100.0	3,300
5	2.4	91.7	0.0	0.0	2.0	3.9	100.0	1,523
52	12.2	28.0	50.7	0.4	1.4	7.3	100.0	1,419
56	46.8	27.1	10.6	0.0	2.3	13.3	100.0	218
57	23.8	50.0	10.3	0.0	5.5	10.5	100.0	526
58	38.3	18.9	5.7	0.0	13.5	23.5	100.0	1,377
59	20.0	53.4	3.7	2.6	5.5	14.8	100.0	4,513
65	14.3	52.6	5.6	2.6	6.0	18.8	100.0	532
66	7.0	61.9	11.8	0.0	7.2	12.1	100.0	2,256
70	11.9	65.2	2.6	1.8	8.1	10.3	100.0	3,547
71	16.9	59.6	17.7	0.9	3.0	1.9	100.0	2,791
72	15.3	43.5	9.1	2.6	11.5	18.0	100.0	2,306
73	8.1	58.6	25.2	0.0	2.7	5.4	100.0	2,618
76	36.6	24.5	4.6	0.0	11.4	22.9	100.0	2,378
78	13.4	57.5	3.9	2.2	8.7	14.3	100.0	715
79	9.2	46.6	15.1	8.2	8.2	12.7	100.0	498
90	11.2	75.8	0.0	0.0	4.0	9.0	100.0	3,063
92	7.8	67.1	3.3	0.0	11.1	10.7	100.0	2,681
96	0.0	67.2	0.0	6.4	5.2	21.3	100.0	676
97	2.9	80.1	0.0	0.0	13.5	3.5	100.0	171
Go25/250	0.0	72.6	0.0	0.0	27.4	0.0	100.0	299
Go28/258	9.7	39.3	22.9	3.2	4.1	20.8	100.0	2,661

Table 6 – Ethnicity of riders for surveyed routes

Route #	Percent			Riders (N)
	Hispanic, Latino, or Spanish	Not Hispanic, Latino, or Spanish	Total	
1	26.4	73.6	100.0	11,002
13	36.1	63.9	100.0	8,435
25	19.9	80.1	100.0	8,196
Go25	16.7	83.3	100.0	671
34	29.6	70.4	100.0	6,119
62	34.0	66.0	100.0	3,854
94	10.9	89.1	100.0	7,835
99	23.5	76.5	100.0	3,853
11	46.2	53.8	100.0	1,183
21	22.2	77.8	100.0	4,148
26	36.3	63.7	100.0	1,415
27	34.0	66.0	100.0	4,121
28	38.1	61.9	100.0	1,150
29	47.4	52.6	100.0	2,185
361	0.0	100.0	100.0	181
37	10.0	90.0	100.0	1,517
39	9.2	90.8	100.0	5,971
40	55.0	45.0	100.0	1,997
41	17.6	82.4	100.0	2,987
5	18.6	81.4	100.0	1,336
52	19.9	80.1	100.0	1,418
56	52.7	47.3	100.0	220
57	29.2	70.8	100.0	506
58	71.3	28.7	100.0	1,343
59	43.1	56.9	100.0	4,221
65	25.3	74.7	100.0	518
66	21.0	79.0	100.0	2,128
70	22.0	78.0	100.0	3,005
71	12.7	87.3	100.0	2,739
72	40.0	60.0	100.0	2,231
73	21.0	79.0	100.0	2,294
76	53.8	46.2	100.0	2,355
78	30.4	69.6	100.0	648
79	15.3	84.7	100.0	452
90	18.5	81.5	100.0	2,503
92	19.0	81.0	100.0	2,470
96	7.1	92.9	100.0	649
97	14.4	85.6	100.0	160
Go25/250	15.1	84.9	100.0	299
Go28/258	41.3	58.7	100.0	2,478

Household Income

According to U.S. Census ACS data, in 2021, the median household income for New Jersey residents is $89,296. Only 8.1 percent of New Jersey residents report earning less than $15,000. Fourteen percent report household income less than $25,000. As shown in Table 7, many of the greater Newark area bus routes serve a significant proportion of lower-income residents. In fact, the majority of riders on 17 of the 40 routes surveyed have household incomes less than $25,000. On most of these routes (14 out of 17) more than one third of riders reported incomes less than $15,000. While just 14 percent of New Jersey residents report earning less than $25,000, an estimated 24 percent of greater Newark area bus riders earn less than $25,000. At the same time, just over 45 percent of New Jersey residents report household income in excess of $100,000, while only about five percent of riders surveyed on the 40 greater Newark area bus routes reported household income in excess of $100,000.

Vehicles in Household

According to U.S. Census Bureau data, 11.3 percent of households in New Jersey have no access to a personal vehicle for travel. Those with no access to a vehicle at home must rely on other modes to meet their travel needs, including public transit. The distribution of surveyed bus route customers by number of personal vehicles available in their household is shown in Table 8. As can be seen in the table, the share of riders with no access to a personal vehicle exceeds the share of New Jersey residents with no access to a vehicle on all of the surveyed bus routes. In most cases, the share of zero-vehicle households is substantially higher than the state as a whole.

Occupation

Table 9 shows selected rider occupations from the survey data analysis. In addition to the occupations shown in the table, a few other occupations, including “not currently employed,” “home maker,” “non-office worker” and “other” were included in the survey questionnaire as response categories. Due to space limitations, these categories have been combined into the “Other” category in Table 9.

Overall, 18 percent of riders surveyed identified as having office-related occupations, including, management/professional, technical/skilled and clerical/secretarial occupations. Another 21 percent identified themselves as students, while a full 46 percent claimed other occupations. The seemingly high number of riders identifying as students is in part due to the fact that many high school-age students in the area served by the surveyed routes utilize NJ TRANSIT buses to travel to and from school. In addition, a number of the surveyed routes also serve universities, including Rutgers University, Montclair State University, Seton Hall University and others.

Table 7 – Annual household income of riders for surveyed routes

Route #	Under $15K	$15K-$24K	$25K-$49K	$50K-$74K	$75K-$99K	$100K-$199K	$200K+	Total	Riders (N)
1	35.0	17.5	30.0	8.9	4.5	3.1	1.1	100.0	10,647
13	34.2	16.8	28.8	12.2	3.6	4.0	0.3	100.0	8,545
25	29.7	15.9	31.9	11.0	5.6	4.7	1.3	100.0	7,476
Go25	19.3	6.6	36.7	18.1	11.1	4.9	3.3	100.0	548
34	29.8	14.5	30.0	13.4	5.9	5.8	0.6	100.0	5,873
62	19.7	21.0	34.9	9.5	9.1	4.3	1.5	100.0	3,892
94	30.7	20.6	29.7	10.1	5.3	1.9	1.7	100.0	7,721
99	35.3	18.9	25.3	9.8	7.3	2.9	0.4	100.0	3,502
11	37.2	9.5	37.6	9.1	2.5	4.1	0.0	100.0	1,100
21	25.8	20.9	34.7	8.1	6.5	4.1	0.0	100.0	4,255
26	42.8	19.7	28.5	3.9	3.4	0.0	1.8	100.0	1,416
27	29.8	18.9	27.9	14.3	3.4	4.2	1.6	100.0	4,361
28	34.4	16.8	30.4	9.0	5.2	3.4	0.9	100.0	1,027
29	30.4	21.7	32.9	7.0	4.5	2.1	1.5	100.0	2,000
361	0.0	0.0	50.0	0.0	50.0	0.0	0.0	100.0	90
37	18.6	27.9	34.6	13.5	2.6	2.8	0.0	100.0	1,553
39	18.8	16.5	36.6	16.1	9.0	2.7	0.4	100.0	6,428
40	55.7	15.4	14.4	3.4	0.8	10.3	0.0	100.0	2,353
41	34.2	22.2	30.0	7.2	1.7	3.2	1.6	100.0	2,968
5	22.6	12.4	28.2	11.4	24.0	1.3	0.0	100.0	1,360
52	34.2	4.9	32.0	1.4	26.4	1.1	0.0	100.0	1,438
56	29.9	15.2	40.6	2.2	4.5	7.6	0.0	100.0	224
57	27.8	32.6	32.4	5.0	0.0	0.0	2.2	100.0	580
58	30.1	21.8	27.0	10.4	6.0	4.7	0.0	100.0	1,262
59	36.8	19.7	27.1	8.2	5.9	1.8	0.5	100.0	4,073
65	36.1	19.7	38.4	3.0	0.0	2.8	0.0	100.0	463
66	20.1	22.0	35.6	7.4	6.9	6.9	1.2	100.0	2,244
70	29.2	19.8	31.8	8.4	6.3	3.5	1.1	100.0	2,885
71	20.1	10.7	26.4	17.6	14.3	5.8	5.1	100.0	2,507
72	29.4	17.8	33.5	10.4	3.9	4.4	0.6	100.0	2,185
73	26.3	7.6	35.1	6.6	20.5	3.1	0.9	100.0	2,822
76	29.8	15.3	35.9	10.3	6.5	2.2	0.0	100.0	2,160
78	24.3	8.1	29.2	27.3	4.3	4.0	2.7	100.0	692
79	23.8	10.6	42.3	5.7	4.4	4.4	8.8	100.0	407
90	44.9	10.0	25.8	8.6	10.7	0.0	0.0	100.0	2,548
92	50.1	5.1	29.2	10.0	4.8	0.8	0.0	100.0	2,683
96	45.5	27.8	14.2	12.5	0.0	0.0	0.0	100.0	670
97	46.3	18.8	18.8	12.1	0.0	4.0	0.0	100.0	149
Go25/250	13.1	13.1	36.9	23.8	0.0	13.1	0.0	100.0	344
Go28/258	22.7	13.1	37.7	0.0	6.6	9.4	10.5	100.0	2,849

Table 8 – Distribution of riders by number of vehicles in household

Route #	Percent: No car	One car	Two cars	Three or more cars	Total	Riders (N)
1	44.7	34.6	14.9	5.8	100.0	11,110
13	44.3	31.8	18.1	5.8	100.0	8,843
25	37.4	35.4	19.9	7.2	100.0	8,420
Go25	43.3	33.0	18.3	5.4	100.0	649
34	35.5	37.9	19.0	7.5	100.0	6,272
62	44.8	30.8	18.6	5.8	100.0	3,932
94	40.0	31.7	20.2	8.2	100.0	8,307
99	45.5	30.2	19.6	4.7	100.0	3,769
11	45.7	31.2	15.5	7.6	100.0	1,180
21	43.3	32.4	15.7	8.6	100.0	4,316
26	50.4	27.7	14.2	7.7	100.0	1,509
27	50.5	28.0	16.7	4.8	100.0	4,759
28	39.1	29.9	20.3	10.7	100.0	1,188
29	46.0	36.1	13.4	4.6	100.0	2,260
361	25.0	25.0	25.0	25.0	100.0	180
37	39.9	34.6	15.4	10.1	100.0	1,554
39	44.6	28.4	12.8	14.2	100.0	6,101
40	37.9	39.4	12.9	9.8	100.0	2,448
41	67.0	20.5	9.5	3.1	100.0	3,233
5	30.4	48.9	17.7	3.1	100.0	1,495
52	76.2	10.0	11.2	2.7	100.0	1,468
56	37.0	50.0	13.0	0.0	100.0	184
57	66.5	15.2	18.3	0.0	100.0	486
58	38.7	21.9	37.1	2.2	100.0	1,481
59	43.2	32.3	18.5	5.9	100.0	4,287
65	57.0	26.9	13.7	2.4	100.0	547
66	23.2	46.2	15.2	15.3	100.0	2,137
70	44.7	30.3	17.8	7.2	100.0	3,129
71	35.9	42.5	17.9	3.7	100.0	2,871
72	37.3	34.0	20.8	7.9	100.0	2,316
73	30.5	36.4	18.8	14.4	100.0	2,729
76	40.7	31.7	24.4	3.3	100.0	2,180
78	48.0	34.5	7.8	9.7	100.0	719
79	49.9	24.9	20.4	4.8	100.0	377
90	54.7	30.6	11.4	3.4	100.0	2,369
92	54.6	26.8	5.4	13.3	100.0	2,856
96	38.8	43.3	15.8	2.1	100.0	727
97	60.0	32.0	8.0	0.0	100.0	150
Go25/250	23.8	39.2	36.9	0.0	100.0	344
Go28/258	30.9	31.9	24.4	12.8	100.0	2,734

Table 9 – Occupation of riders

Route #	Percent								Riders (N)
	Management/ Professional	Technical/ Skilled	Clerical/ Secretarial	Sales/ Retail	Retired	Student	Other	Total	
1	6.3	6.1	4.7	11.0	3.7	24.5	43.6	100.0	12,539
13	8.6	9.1	5.3	8.7	4.6	17.1	46.5	100.0	10,105
25	8.3	8.6	3.5	9.0	5.6	23.3	41.8	100.0	9,297
Go25	24.3	4.8	8.6	1.3	0.0	25.5	35.5	100.0	707
34	9.7	7.0	4.7	9.6	5.3	26.3	37.5	100.0	7,036
62	11.2	11.5	5.5	14.8	2.2	8.9	45.8	100.0	4,405
94	6.3	8.5	4.8	11.2	7.4	19.7	42.1	100.0	8,927
99	4.0	5.9	5.4	7.1	8.6	24.6	44.3	100.0	4,266
11	6.6	3.6	1.7	16.9	3.0	16.7	51.5	100.0	1,434
21	5.5	8.7	4.4	9.6	2.7	19.8	49.3	100.0	5,271
26	4.1	4.9	1.5	8.3	3.5	31.7	46.1	100.0	1,722
27	2.7	7.8	1.8	7.2	5.7	24.7	50.2	100.0	5,032
28	1.0	6.1	4.6	10.4	1.4	49.1	27.3	100.0	1,364
29	4.2	3.6	4.7	9.8	8.5	23.5	45.6	100.0	2,507
361	0.0	24.9	0.0	0.0	0.0	50.3	24.9	100.0	181
37	6.5	7.7	3.0	11.0	2.0	9.3	60.5	100.0	1,762
39	6.2	13.5	4.2	8.2	5.5	13.4	49.0	100.0	7,586
40	2.5	3.0	1.3	8.9	8.1	14.1	62.0	100.0	2,749
41	1.4	5.7	13.5	6.3	0.0	15.9	57.2	100.0	3,424
5	5.9	0.9	5.4	6.3	3.0	30.8	47.6	100.0	1,476
52	22.7	23.2	0.8	17.5	3.8	11.4	20.6	100.0	1,571
56	12.6	2.0	8.9	4.9	8.5	6.9	56.1	100.0	246
57	4.4	12.0	1.1	6.2	9.9	17.8	48.6	100.0	566
58	5.4	0.0	5.4	10.5	2.5	40.2	36.1	100.0	1,469
59	7.2	5.3	3.3	10.1	4.8	20.9	48.4	100.0	5,001
65	0.0	7.6	2.4	20.8	2.8	10.2	56.1	100.0	576
66	1.6	4.6	3.8	20.3	1.9	37.6	30.2	100.0	2,580
70	9.2	4.3	3.5	17.5	6.5	13.6	45.5	100.0	3,552
71	13.8	4.2	2.5	8.1	11.7	19.0	40.8	100.0	2,844
72	3.6	5.8	4.6	7.6	6.0	28.0	44.5	100.0	2,503
73	12.7	1.2	6.0	10.1	1.6	23.6	44.7	100.0	3,066
76	6.6	6.0	6.0	7.2	1.6	13.9	58.9	100.0	2,503
78	12.3	4.6	11.1	0.0	1.6	6.9	63.6	100.0	741
79	12.0	10.2	0.0	0.0	0.0	20.0	57.7	100.0	449
90	2.1	8.9	4.2	15.5	13.9	8.1	47.3	100.0	2,774
92	9.4	3.0	3.7	3.0	11.4	22.7	46.8	100.0	2,915
96	6.6	1.9	4.5	0.0	4.0	38.4	44.6	100.0	783
97	6.6	0.0	42.6	6.6	12.0	6.0	26.2	100.0	183
Go25/250	23.8	0.0	0.0	13.1	0.0	13.1	50.0	100.0	344
Go28/258	3.9	5.1	0.0	16.8	0.0	10.9	63.3	100.0	2,994

Household Size

The distribution of riders by household size (i.e., number of persons in household), is shown in Table 10. Of particular interest are the proportions of riders in single-person and 4+ person households since existing literature generally shows that persons from single-person households typically use more transit and persons from large households typically use less transit. One reason is that single persons often live in apartments in urban areas where transit is readily available, whereas larger households often locate in suburban areas where transit is less readily available. Larger households often have children and the presence of children often induces households to acquire cars.

Data from the 2021 American Community Survey show that 26.2 percent of persons in New Jersey as a whole live in single-person households and 25.5 percent live in households with four or more persons. The share of riders with four or more persons in household is greater for nearly all routes surveyed than the state average of 26 percent. Only three routes, namely, Rt. 78 Newark to Secaucus, Rt. 79 Newark to Parsippany Express and Rt. 90 Grove Street Cross-town have a smaller share of riders from households with four or more persons. On the whole, the theory that people from smaller households are more likely to take transit and people from larger households are less likely to take transit does not hold for the surveyed routes. A reason for many riders from large households taking buses may be that economic constraints prohibit them from acquiring and using cars.

Disability

The proportion of riders with disability for the surveyed bus routes is shown in Table 11. For reference, according to the 2021 American Community Survey, the proportion of civilian noninstitutionalized population with various disabilities statewide include: 2.6 percent with a hearing difficulty, 2.1 percent with a vision difficulty, 3.9 percent with a cognitive difficulty, 5.5 percent with an ambulatory difficulty, 2.3 percent with a self-care difficulty, and 5.1 percent with an independent living difficulty. The proportion of New Jersey's population reporting one or more disabilities was 26.1 percent in 2021.

Table 11 shows that the proportion of riders with disability is significantly smaller than the state average for all surveyed bus routes. A potential reason for the low share of riders with disability is the small share of older adult customers using the surveyed routes. There is often a strong relationship between age and disability status. As adults age, they are more likely to report having a difficulty of some type. Another potential reason for the low share of bus riders with disability is that many persons with disability use Access Link, NJ TRANSIT's ADA-complementary paratransit service.

Table 10 – Distribution of riders by household size

Route #	Percent					Riders (N)
	One person	Two person	Three person	Four or more person	Total	
1	13.5	20.5	19.0	47.1	100.0	12,056
13	14.5	20.1	20.0	45.4	100.0	9,635
25	18.3	18.4	18.4	44.9	100.0	8,817
Go25	26.2	26.3	15.2	32.3	100.0	684
34	15.8	16.1	18.9	49.2	100.0	6,722
62	20.4	24.8	17.6	37.1	100.0	4,216
94	14.7	20.6	20.8	43.9	100.0	8,846
99	17.1	20.6	15.9	46.3	100.0	4,181
11	5.7	23.7	27.8	42.8	100.0	1,322
21	21.0	26.0	17.0	36.1	100.0	4,904
26	20.1	17.8	20.6	41.5	100.0	1,579
27	21.8	18.3	23.0	36.9	100.0	4,976
28	16.7	18.0	17.8	47.5	100.0	1,252
29	22.1	21.3	15.5	41.2	100.0	2,412
361	0.0	24.9	24.9	50.3	100.0	181
37	16.7	23.2	18.9	41.3	100.0	1,723
39	21.4	22.5	22.8	33.3	100.0	6,872
40	21.2	18.6	18.8	41.4	100.0	2,579
41	20.7	28.2	19.1	32.0	100.0	3,030
5	3.8	25.6	34.9	35.7	100.0	1,556
52	31.2	13.4	8.2	47.2	100.0	1,152
56	26.1	27.0	12.2	34.7	100.0	222
57	23.0	18.8	8.0	50.2	100.0	512
58	15.8	19.5	16.7	48.0	100.0	1,447
59	17.0	26.4	18.7	37.9	100.0	4,625
65	27.7	16.3	27.7	28.3	100.0	541
66	16.6	16.4	22.2	44.8	100.0	2,099
70	20.7	20.1	16.1	43.1	100.0	3,360
71	19.7	27.9	9.6	42.8	100.0	2,905
72	14.6	18.0	20.2	47.2	100.0	2,457
73	14.5	23.7	17.0	44.8	100.0	2,988
76	16.5	23.9	18.1	41.6	100.0	2,454
78	29.3	19.9	27.0	23.8	100.0	760
79	34.7	26.9	16.7	21.8	100.0	450
90	15.7	39.7	20.4	24.2	100.0	2,856
92	19.5	12.9	15.7	51.9	100.0	2,889
96	2.0	16.7	32.9	48.4	100.0	738
97	38.5	12.3	3.2	46.0	100.0	187
Go25/250	13.1	0.0	50.0	36.9	100.0	344
Go28/258	5.7	17.2	14.8	47.9	100.0	2,926

Table 11 – Proportion of riders with disability

Route #	Percent			Riders (N)
	Has disability	Does not have	Total	
1	5.0	95.0	100.0	12,605
13	6.1	93.9	100.0	10,045
25	6.0	94.0	100.0	9,328
Go25	4.8	95.2	100.0	713
34	5.5	94.5	100.0	7,157
62	4.4	95.6	100.0	4,457
94	5.9	94.1	100.0	9,255
99	6.8	93.2	100.0	4,229
11	1.1	98.9	100.0	1,366
21	3.8	96.2	100.0	5,169
26	0.5	99.5	100.0	1,596
27	7.4	92.6	100.0	5,401
28	3.3	96.7	100.0	1,327
29	5.9	94.1	100.0	2,458
361	0.0	100.0	100.0	181
37	2.3	97.7	100.0	1,786
39	8.8	91.2	100.0	7,480
40	0.0	100.0	100.0	2,536
41	1.9	98.1	100.0	3,440
5	2.8	97.2	100.0	1,624
52	4.9	95.1	100.0	1,545
56	2.4	97.6	100.0	246
57	2.2	97.8	100.0	591
58	7.1	92.9	100.0	1,519
59	6.9	93.1	100.0	4,992
65	0.0	100.0	100.0	591
66	0.8	99.2	100.0	2,397
70	6.3	93.7	100.0	3,673
71	0.0	100.0	100.0	2,932
72	5.3	94.7	100.0	2,563
73	0.8	99.2	100.0	3,101
76	1.4	98.6	100.0	2,610
78	0.0	100.0	100.0	767
79	0.0	100.0	100.0	493
90	8.7	91.3	100.0	2,860
92	1.4	98.6	100.0	3,066
96	0.0	100.0	100.0	843
97	0.0	100.0	100.0	187
Go25/250	0.0	100.0	100.0	344
Go28/258	0.0	100.0	100.0	3,015

TRAVEL CHARACTERISTICS

This broad section describes how the riders use buses on the surveyed routes. It includes discussions on origin and destination places, access and egress modes, trip frequency, travel mode for return trips, and type of tickets purchased. Once again, in all figures, the total number of riders (N) represents weighted survey respondents who answered the question.

Origin and Destination Places

For the purpose of this study, origin and destination places were identified in general categories such as work, school, home, etc. They do not pertain to any specific geographic locations such as cities, city blocks, or neighborhoods. As such, the analyses show trip purposes rather than actual locations where trips started or ended. The origin places of the bus trips (i.e., the trips where the riders were intercepted by the surveyors) are presented in Table 12. The destination places for the routes are shown in Table 13.

Table 12 shows that for all but three of the surveyed bus routes, the most frequently cited trip origin was home. Home-based trips made up more than fifty percent of trip origins for the majority of the surveyed bus routes, Overall, the analysis estimates that approximately two-thirds (64 percent) of weighted rider trips originate at home.

One reason for such a high proportion of trips originating at home for all routes is that the survey was conducted between 6 AM and 4 PM and thus likely captured many customers traveling to work locations. If the survey continued beyond 4 PM, the proportion of trips from home would have been lower since many more workers' return trips from work would have been accounted for. Another reason for the large share of home origins is that most riders returning home in the afternoon did not respond to the survey because they completed the survey in the morning, when they were leaving from home.

Although less substantial than trips originating at home, the share of trips originating at work is also large for almost all routes. The share of trips originating at work would have been potentially larger if the survey continued beyond 4 PM. On the whole, the large share of work origins suggests that the surveyed buses play a significant role in connecting workplaces to homes for the riders.

As might be expected given the time surveys were taken, Table 13 shows that the largest share of trip destinations is work. For most routes surveyed, an estimated 38.7 percent of riders reported work as their trip destination. indicating that the buses play an important role in providing access to work locations. However, Table 13 also shows that the buses provide access to other types of activities as well to many riders. For example, the share of trips for personal business, shopping, medical/dental visits, and schools are also not insignificant for most routes.

Table 12 – Rider origin places for surveyed routes

	Percent										
Route #	Home	Work	Shop	Personal business	Medical/ dental	Social/ recreation	School (K-12)	Tech., college or university	Other	Total	Riders (N)
1	62.9	14.3	2.4	4.2	1.7	0.4	7.6	2.9	3.5	100.0	14,906
13	70.8	10.6	3.1	4.2	1.6	0.8	4.5	1.6	2.9	100.0	12,161
25	59.5	15.3	4.2	6.2	2.5	0.4	5.3	2.3	4.2	100.0	11,300
Go25	70.0	17.8	0.0	0.0	0.0	0.0	3.4	2.8	6.1	100.0	759
34	66.3	13.8	2.1	4.3	1.5	0.3	4.5	4.2	3.0	100.0	8,829
62	58.7	27.2	1.2	3.5	0.5	0.0	0.5	1.5	6.9	100.0	5,534
94	56.1	17.3	2.6	7.2	2.9	0.7	5.4	4.8	3.0	100.0	11,100
99	69.0	12.6	2.9	3.0	3.6	0.6	4.4	0.4	3.6	100.0	5,180
11	73.3	13.4	5.0	1.1	2.5	0.0	0.0	2.2	2.4	100.0	1,586
21	53.0	16.3	5.6	5.7	3.0	0.4	8.9	4.4	2.7	100.0	5,902
26	80.2	2.5	4.6	3.8	0.0	0.4	0.0	7.0	1.4	100.0	1,795
27	60.0	17.1	4.1	4.3	1.8	1.5	6.8	1.1	3.2	100.0	6,074
28	42.3	9.2	0.0	0.7	1.4	2.1	3.8	35.2	5.2	100.0	1,431
29	60.2	21.6	2.8	6.8	2.1	0.5	2.8	1.6	1.7	100.0	2,750
361	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	181
37	55.4	34.6	1.1	2.6	2.2	0.0	2.1	0.8	1.3	100.0	1,950
39	63.1	17.3	1.4	3.8	3.5	0.3	4.2	1.2	5.1	100.0	8,243
40	86.3	8.1	1.7	1.5	0.6	0.0	0.0	1.4	0.4	100.0	2,940
41	53.2	20.9	8.6	4.1	0.0	0.0	2.9	0.0	10.2	100.0	4,068
5	74.9	11.3	0.0	0.0	1.0	0.0	12.1	0.0	0.7	100.0	1,790
52	68.6	23.8	1.1	1.9	2.1	0.0	0.6	1.5	0.3	100.0	1,590
56	92.1	5.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	100.0	253
57	49.3	13.8	7.4	17.6	0.0	0.0	0.0	11.8	0.0	100.0	578
58	70.4	13.2	3.8	0.0	1.9	0.0	1.9	8.8	0.0	100.0	1,754
59	65.7	15.1	1.8	3.9	1.5	0.1	4.5	4.3	3.1	100.0	5,527
65	81.5	8.1	2.2	5.4	2.7	0.0	0.0	0.0	0.0	100.0	590
66	72.8	5.4	1.1	2.7	2.0	0.0	1.3	14.3	0.4	100.0	2,480
70	61.3	17.8	6.9	4.2	3.2	0.8	3.8	1.6	0.4	100.0	4,025
71	59.2	16.8	6.5	1.1	0.0	0.0	14.4	0.0	2.1	100.0	3,108
72	64.5	13.9	2.3	5.0	3.3	0.0	3.5	4.0	3.5	100.0	2,709
73	66.6	17.9	1.5	6.2	6.4	0.7	0.0	0.0	0.8	100.0	3,381
76	73.6	16.8	0.0	1.1	0.0	1.1	2.6	4.7	0.0	100.0	2,781
78	84.7	12.0	0.0	0.0	0.0	0.0	0.0	1.4	1.9	100.0	834
79	63.8	25.0	3.5	0.0	0.0	0.0	0.0	3.5	4.3	100.0	516
90	56.5	13.3	3.6	6.3	2.6	5.6	3.6	1.2	7.4	100.0	3,342
92	74.1	4.5	4.2	8.2	5.1	0.0	0.8	0.0	3.0	100.0	3,071
96	90.9	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	935
97	79.4	15.2	5.4	0.0	0.0	0.0	0.0	0.0	0.0	100.0	204
Go25/250	76.2	23.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	344
Go28/258	47.4	39.7	0.0	2.5	0.0	2.5	0.7	0.0	7.1	100.0	3,308

Table 13 – Rider destination places for surveyed routes

	Percent										
Route #	Home	Work	Shop	Personal business	Medical /dental	Social/ recreation	School (K-12)	Tech., college or university	Other	Total	Riders (N)
1	30.6	35.3	3.6	5.6	2.6	0.7	9.1	7.0	5.4	100.0	14,545
13	22.4	43.2	3.8	8.7	3.4	1.1	6.9	3.8	6.7	100.0	11,781
25	27.5	31.6	4.9	8.1	4.2	1.3	9.7	7.2	5.5	100.0	10,829
Go25	22.3	48.6	0.0	0.0	4.5	0.0	15.8	4.7	4.1	100.0	749
34	24.7	38.0	3.1	5.9	4.1	1.1	11.5	7.9	3.7	100.0	8,618
62	30.0	53.0	1.9	3.3	1.1	1.1	0.9	1.3	7.4	100.0	5,369
94	33.8	31.7	4.4	9.4	3.6	1.3	6.6	4.0	5.2	100.0	10,829
99	23.8	34.6	4.5	5.4	7.3	1.1	19.8	1.0	2.6	100.0	5,045
11	23.2	47.6	4.5	4.6	6.7	0.0	3.2	8.6	1.6	100.0	1,564
21	35.0	30.4	2.7	10.8	2.2	1.9	4.3	5.9	6.9	100.0	5,791
26	9.8	39.5	1.3	8.4	5.3	0.5	14.8	13.6	6.7	100.0	1,803
27	29.4	31.0	5.0	6.0	2.9	1.7	18.4	1.3	4.3	100.0	5,773
28	43.1	26.0	4.5	2.8	2.5	2.1	3.1	12.7	3.2	100.0	1,407
29	30.1	33.8	5.2	3.1	7.2	0.5	7.7	10.6	1.8	100.0	2,692
361	0.0	25.0	25.0	0.0	0.0	0.0	25.0	25.0	0.0	100.0	180
37	38.9	39.5	3.5	4.9	2.3	0.0	6.8	0.0	4.1	100.0	1,909
39	28.3	40.8	2.7	7.4	4.9	0.0	5.8	3.3	6.8	100.0	8,312
40	15.0	41.5	17.5	10.0	2.4	1.1	1.1	8.9	2.5	100.0	2,923
41	24.4	40.5	1.3	10.6	2.5	4.0	9.3	4.7	2.8	100.0	4,069
5	22.5	31.7	3.0	8.6	1.0	0.0	30.0	0.7	2.5	100.0	1,776
52	5.3	36.0	3.7	1.5	20.2	1.3	1.4	6.1	24.5	100.0	1,558
56	5.8	81.3	0.0	0.0	1.9	6.2	1.9	0.0	2.7	100.0	257
57	33.7	39.9	4.8	8.7	1.1	0.0	0.0	0.0	11.8	100.0	566
58	23.0	30.9	2.5	4.1	0.0	2.6	7.1	26.5	3.3	100.0	1,721
59	22.7	34.6	5.9	12.4	3.0	1.3	7.2	6.7	6.2	100.0	5,426
65	15.9	64.2	2.7	0.0	7.8	0.0	0.0	4.6	4.7	100.0	590
66	16.2	32.9	1.9	8.4	0.4	7.4	2.8	25.7	4.1	100.0	2,470
70	28.2	42.5	7.8	9.2	5.8	0.0	0.4	3.7	2.5	100.0	3,962
71	21.1	57.4	3.8	1.8	9.7	0.0	3.6	0.7	1.8	100.0	2,918
72	24.7	34.3	1.3	7.6	8.4	0.9	3.1	14.1	5.6	100.0	2,661
73	24.4	53.4	1.5	0.0	2.3	0.0	0.0	18.4	0.0	100.0	3,351
76	22.1	49.3	1.8	4.9	1.5	0.0	3.6	11.0	5.8	100.0	2,674
78	5.0	87.5	1.4	1.7	0.8	0.0	0.0	2.7	0.8	100.0	839
79	28.5	64.5	3.5	0.0	3.5	0.0	0.0	0.0	0.0	100.0	515
90	41.3	27.0	4.6	5.7	8.5	5.6	3.2	1.5	2.5	100.0	3,340
92	16.4	46.4	6.3	1.8	0.9	0.0	8.7	15.9	3.7	100.0	3,072
96	7.5	23.4	14.9	5.6	0.0	3.3	37.7	0.0	7.6	100.0	934
97	20.1	66.2	5.4	0.0	0.0	0.0	0.0	5.4	2.9	100.0	204
Go25/250	23.8	50.0	0.0	0.0	0.0	0.0	13.1	13.1	0.0	100.0	344
Go28/258	43.7	48.4	0.0	2.6	0.0	0.0	0.0	2.6	2.8	100.0	3,285

Access and Egress Mode

The travel modes used by the riders to access boarding bus stops for the 40 surveyed routes are shown in Table 14. As was true in previous rounds of bus surveys, walking to boarding bus stops is the most common access mode for bus riders. More than 78 percent of riders walk to their boarding stop. The share of riders that access their boarding stop by walking was greater than 60 percent for all but one route.

The second most common access mode was by using another bus. Approximately 14 percent of riders access their boarding stop using another bus. On eight of the forty routes surveyed, one in five riders reported accessing their boarding bus stop from another bus. This would indicate that these routes in particular are well-connected with other bus routes. As might be expected, routes such as the Go25, 39, 40, 71, 79, and others that originate or stop at Newark Penn Station, which is well served by NJ TRANSIT rail and or PATH, have a higher share of riders that access their bus stop via these rail modes.

Egress modes from the rider's alighting stop are shown in Table 15. Like access mode, walking is the most common egress mode for most routes, followed by the use of another bus. As was the case with access mode, routes that connect to Newark Penn have a higher share of riders using bus to access NJ TRANSIT rail or PATH service.

Trip Frequency

Riders were asked how frequently they take the bus. The results for all surveyed routes are shown in Table 16. Nearly 70 percent or riders using the surveyed routes reported using bus five or more days per week. More than one third (35 percent) use the bus six or seven days per week. These *very frequent* riders likely use the bus for commuting to work as well as other activities such as shopping and errands. Some of them may also work more than five days a week. Riders who made trips five times a week can be considered *commuters*, who are highly likely to take the bus to work or school/college. Riders who made trips more than one time but less than five times a week can be considered regular but *infrequent users*. Riders who made 1-3 trips a month can be considered *occasional users*, while riders who made less than one trip a month can be considered *sporadic* users.

Based on the above categorization, all but six routes have a large share (greater than 25 percent) of *very frequent* riders. On about half of the surveyed bus routes (21 out of 40), the share of *very frequent* riders exceeds the share of *commuters* on the routes surveyed routes. In addition, on four of the surveyed routes (the Go25, 73, 78, and 79), *commuters* make up more than 50 percent of ridership. On 15 of the surveyed routes, *infrequent riders* that use the bus 1-4 days per week also make up a sizeable share of riders (greater than 25 percent) on the surveyed routes. With a few exceptions, *sporadic* riders make up less than five percent of ridership.

Table 14 – Access mode to boarding bus stop

	Percent											
Route #	Walked only	Drove and parked	Carpool / Drop-off	Another bus	Light Rail	NJT Train	PATH	Bike	Taxi or App-based service	Other	Total	Riders (N)
1	78.3	1.4	1.6	13.6	2.1	0.8	1.3	0.1	0.3	0.6	100.0	13,266
13	86.5	1.0	0.8	8.8	0.7	1.2	0.1	0.3	0.2	0.5	100.0	10,888
25	84.3	1.9	0.3	8.8	0.7	1.9	2.0	0.0	0.2	0.0	100.0	10,244
Go25	67.6	1.2	1.2	13.9	1.2	8.6	6.3	0.0	0.0	0.0	100.0	735
34	84.5	0.7	1.1	6.3	0.5	3.4	2.8	0.2	0.0	0.5	100.0	7,617
62	59.8	2.7	1.9	23.8	1.8	2.9	5.1	0.0	0.0	2.0	100.0	4,662
94	80.0	0.8	1.0	16.6	0.0	0.6	0.2	0.2	0.3	0.2	100.0	9,818
99	89.0	0.9	0.9	6.5	1.8	0.8	0.0	0.0	0.0	0.0	100.0	4,435
11	74.5	2.9	1.1	19.6	0.9	0.0	0.0	0.0	0.0	1.1	100.0	1,394
21	73.6	1.0	1.7	14.3	1.4	3.0	3.9	0.0	0.0	1.0	100.0	5,303
26	78.2	0.0	0.0	16.4	0.5	4.9	0.0	0.0	0.0	0.0	100.0	1,657
27	84.3	0.5	1.5	10.8	0.7	1.0	0.0	0.0	0.7	0.5	100.0	5,143
28	74.5	2.0	1.5	15.1	4.6	1.2	1.2	0.0	0.0	0.0	100.0	1,273
29	71.6	0.0	3.4	17.3	1.3	2.8	3.0	0.0	0.0	0.4	100.0	2,498
361	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	136
37	82.9	0.0	0.0	14.7	0.0	0.3	0.3	0.0	0.3	1.4	100.0	1,759
39	71.1	0.6	4.2	14.1	0.3	8.4	1.0	0.0	0.0	0.3	100.0	7,807
40	67.6	0.0	1.2	23.5	0.7	0.0	7.0	0.0	0.0	0.0	100.0	2,680
41	84.2	0.0	1.7	14.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0	3,859
5	86.8	0.0	0.0	12.1	0.0	0.0	0.0	0.0	1.1	0.0	100.0	1,640
52	68.5	1.1	2.2	24.5	0.8	1.3	0.0	0.0	0.0	1.6	100.0	1,462
56	94.4	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	100.0	232
57	79.9	0.0	0.0	20.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0	591
58	89.7	0.0	0.0	7.9	0.0	0.0	2.4	0.0	0.0	0.0	100.0	1,399
59	81.3	0.9	1.6	12.1	1.2	1.5	0.0	0.2	0.7	0.5	100.0	4,982
65	69.1	0.0	5.6	17.8	5.2	0.0	0.0	0.0	0.0	2.3	100.0	572
66	79.7	0.4	0.4	12.0	0.4	3.4	2.4	0.5	0.4	0.4	100.0	2,414
70	73.7	1.4	1.3	16.8	0.7	2.7	2.4	0.0	0.5	0.4	100.0	3,662
71	66.1	6.7	0.0	12.5	0.0	11.4	0.9	0.0	2.3	0.0	100.0	2,993
72	64.4	3.2	2.9	22.4	0.5	3.1	2.1	0.0	1.0	0.4	100.0	2,477
73	78.6	0.0	1.9	14.0	2.8	0.9	0.0	0.0	1.0	0.8	100.0	2,897
76	71.3	1.5	1.4	21.2	1.2	1.4	0.0	2.1	0.0	0.0	100.0	2,643
78	42.2	0.0	0.0	48.9	6.9	2.0	0.0	0.0	0.0	0.0	100.0	806
79	60.1	0.0	0.0	21.4	4.6	0.0	9.4	0.0	0.0	4.6	100.0	481
90	84.5	0.0	0.6	12.5	2.4	0.0	0.0	0.0	0.0	0.0	100.0	3,209
92	79.9	0.0	0.0	14.8	5.3	0.0	0.0	0.0	0.0	0.0	100.0	2,951
96	82.0	0.0	1.9	16.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	774
97	89.6	0.0	0.0	6.9	0.0	3.5	0.0	0.0	0.0	0.0	100.0	173
Go25/250	69.9	15.1	0.0	15.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0	299
Go28/258	83.5	3.9	0.0	7.8	0.0	0.0	0.0	0.0	0.0	4.8	100.0	2,932

Table 15 – Egress mode from alighting bus stop

	Percent											
Rt. #	Walked only	Drove and parked	Carpool/ Drop-off	Another bus	Light Rail	NJT Train	PATH	Bike	Taxi or App-based service	Other	Total	Riders (N)
1	66.7	0.8	0.4	20.8	1.2	2.7	5.3	0.1	0.5	1.4	100.0	12,713
13	70.9	1.6	1.3	17.4	1.5	4.7	2.3	0.0	0.1	0.2	100.0	10,238
25	67.4	0.8	1.2	17.8	1.0	4.7	5.9	0.0	0.7	0.5	100.0	9,714
Go25	61.6	0.0	1.3	10.9	0.0	6.3	19.9	0.0	0.0	0.0	100.0	704
34	75.4	1.3	0.9	11.3	1.1	5.0	4.0	0.0	0.4	0.6	100.0	7,249
62	66.8	2.6	0.8	18.1	1.6	4.6	3.7	0.0	0.0	1.8	100.0	4,353
94	75.5	1.4	0.3	19.5	0.1	1.5	0.3	0.0	0.3	0.7	100.0	9,246
99	80.1	1.8	2.3	13.6	0.8	0.8	0.0	0.0	0.0	0.6	100.0	4,079
11	76.8	0.0	1.0	21.1	0.8	0.4	0.0	0.0	0.0	0.0	100.0	1,319
21	68.2	1.0	1.0	19.2	0.0	1.6	8.1	0.0	0.0	1.0	100.0	4,958
26	85.3	0.0	0.6	11.2	0.0	3.0	0.0	0.0	0.0	0.0	100.0	1,609
27	72.0	1.3	1.2	21.2	1.2	1.2	1.2	0.0	0.8	0.0	100.0	4,511
28	70.7	0.0	3.2	22.5	2.4	0.0	1.2	0.0	0.0	0.0	100.0	1,258
29	83.8	0.0	0.5	12.4	0.6	1.2	0.0	0.0	0.5	1.0	100.0	2,290
361	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	136
37	84.1	0.0	0.6	11.6	0.0	0.4	1.0	0.0	0.4	1.9	100.0	1,659
39	69.9	0.3	0.4	9.3	0.0	9.5	9.8	0.0	0.4	0.4	100.0	7,418
40	71.8	0.5	1.5	4.0	2.0	0.7	19.4	0.0	0.0	0.0	100.0	2,499
41	81.5	0.0	3.1	5.3	1.8	0.0	8.3	0.0	0.0	0.0	100.0	3,698
5	69.4	0.0	0.0	19.2	0.0	0.8	10.5	0.0	0.0	0.0	100.0	1,613
52	91.5	0.3	0.0	5.8	0.0	1.8	0.0	0.0	0.0	0.5	100.0	1,463
56	76.2	2.2	0.0	6.3	0.0	12.6	0.0	0.0	0.0	2.7	100.0	223
57	83.1	1.1	0.0	15.8	0.0	0.0	0.0	0.0	0.0	0.0	100.0	526
58	88.7	0.0	0.0	8.2	0.0	3.1	0.0	0.0	0.0	0.0	100.0	1,366
59	79.1	1.2	1.2	12.9	0.7	2.9	0.0	0.2	0.5	1.3	100.0	4,705
65	71.0	0.0	0.0	16.1	0.0	5.7	0.0	2.3	2.3	2.5	100.0	558
66	78.8	0.0	0.4	18.0	0.0	1.3	1.1	0.5	0.0	0.0	100.0	2,397
70	77.4	0.9	0.0	14.8	0.0	2.1	3.6	0.0	0.7	0.5	100.0	3,404
71	74.9	3.9	0.0	18.0	0.0	3.2	0.0	0.0	0.0	0.0	100.0	2,951
72	67.1	1.6	2.4	20.6	0.5	3.7	2.6	0.5	0.0	0.9	100.0	2,376
73	85.0	0.0	0.8	6.2	0.8	1.5	1.3	0.0	2.7	1.7	100.0	2,827
76	69.7	0.0	0.0	21.0	0.0	1.6	2.4	1.3	1.6	2.4	100.0	2,469
78	79.2	0.0	0.0	17.8	0.0	2.1	0.0	0.0	0.0	0.9	100.0	764
79	56.8	0.0	0.0	30.3	0.0	0.0	7.9	0.0	5.0	0.0	100.0	458
90	78.7	1.9	0.0	14.8	0.6	2.5	0.0	0.0	0.9	0.6	100.0	3,103
92	59.2	6.2	0.0	21.2	6.0	6.5	0.0	0.0	0.0	0.9	100.0	2,788
96	72.8	0.0	0.0	27.2	0.0	0.0	0.0	0.0	0.0	0.0	100.0	731
97	68.6	0.0	0.0	27.9	0.0	3.5	0.0	0.0	0.0	0.0	100.0	172
Go25/250	57.5	0.0	0.0	27.4	0.0	15.1	0.0	0.0	0.0	0.0	100.0	299
Go28/258	69.7	7.9	0.0	18.8	0.0	0.0	0.0	0.0	0.0	3.6	100.0	3,001

Table 16 – Trip frequency for surveyed routes

	Percent										
Route #	7 days/ week	6 days/ week	5 days/ week	3-4 days/ week	1-2 days/ week	1-3 days/ month	<one day/ month	<one day/ year	First time user	Total	Riders (N)
1	29.2	10.3	35.6	14.2	5.2	2.8	1.6	0.2	1.0	100.0	13,281
13	31.0	11.6	31.9	14.5	5.7	2.3	1.7	0.6	0.7	100.0	10,625
25	28.5	8.9	32.5	13.7	7.3	4.9	2.2	0.2	1.9	100.0	10,199
GO25	29.0	12.8	49.5	5.2	0.0	3.5	0.0	0.0	0.0	100.0	734
34	22.0	12.6	37.1	16.3	6.3	3.8	1.5	0.1	0.2	100.0	7,632
62	15.6	15.7	40.6	10.6	4.7	4.6	3.7	0.9	3.6	100.0	4,684
94	27.2	8.9	29.5	17.1	7.1	6.1	2.5	0.6	1.0	100.0	9,796
99	28.3	12.0	34.1	12.6	5.1	5.3	1.7	0.7	0.3	100.0	4,524
11	15.5	19.1	30.7	14.5	6.6	6.0	7.6	0.0	0.0	100.0	1,364
21	25.3	9.1	28.7	18.1	7.3	4.5	4.1	1.5	1.3	100.0	5,390
26	22.5	12.4	20.6	22.3	9.0	8.1	4.2	1.0	0.0	100.0	1,657
27	30.8	10.8	35.3	11.5	3.3	4.5	1.1	1.2	1.6	100.0	5,226
28	13.1	7.3	33.3	26.0	9.9	6.1	1.5	0.8	1.9	100.0	1,308
29	19.7	22.4	25.6	18.0	7.2	2.3	3.4	1.4	0.0	100.0	2,505
361	0.0	0.0	0.0	33.1	66.9	0.0	0.0	0.0	0.0	100.0	136
37	26.5	13.1	43.9	7.7	0.6	3.8	3.5	0.0	0.9	100.0	1,750
39	24.8	9.0	36.3	13.1	3.8	7.8	1.9	1.3	2.0	100.0	7,677
40	36.4	4.0	25.1	15.1	3.6	1.8	14.0	0.0	0.0	100.0	2,709
41	32.4	11.6	19.9	31.3	1.5	3.4	0.0	0.0	0.0	100.0	3,462
5	14.9	16.8	45.5	13.5	4.4	1.9	3.0	0.0	0.0	100.0	1,655
52	3.6	4.2	30.9	49.6	3.7	2.6	3.4	1.9	0.0	100.0	1,485
56	19.0	2.6	47.4	26.7	0.0	2.2	0.0	2.2	0.0	100.0	232
57	7.8	27.9	10.0	45.1	9.3	0.0	0.0	0.0	0.0	100.0	592
58	21.4	11.6	27.3	32.1	6.0	1.6	0.0	0.0	0.0	100.0	1,478
59	27.7	14.1	29.7	14.6	7.0	2.7	1.4	0.6	2.1	100.0	5,092
65	0.0	15.4	48.8	16.5	11.0	2.6	0.0	5.9	0.0	100.0	547
66	23.1	6.1	29.0	22.7	9.9	1.7	5.1	1.3	1.2	100.0	2,415
70	26.7	13.4	25.1	14.8	6.9	2.2	6.9	1.8	2.3	100.0	3,633
71	14.4	8.0	36.6	18.5	9.8	11.6	0.0	1.2	0.0	100.0	2,949
72	16.7	7.5	35.7	23.9	6.0	3.8	2.4	2.0	1.9	100.0	2,522
73	19.4	8.5	51.7	6.6	5.4	4.2	0.9	0.0	3.3	100.0	2,937
76	18.4	12.5	43.2	13.6	7.0	0.9	1.5	0.0	2.8	100.0	2,581
78	8.0	4.9	62.4	17.2	3.7	1.5	0.9	0.0	1.5	100.0	803
79	9.2	0.0	55.6	15.1	4.6	11.8	0.0	0.0	3.6	100.0	498
90	27.6	9.1	32.0	12.3	8.1	2.4	6.0	0.0	2.5	100.0	3,151
92	15.9	9.9	38.3	23.5	2.9	4.1	0.0	4.4	0.9	100.0	2,922
96	14.6	15.4	45.8	11.0	2.1	6.1	5.0	0.0	0.0	100.0	701
97	31.7	18.0	31.7	12.6	2.7	3.3	0.0	0.0	0.0	100.0	183
Go25/250	0.0	0.0	69.9	30.1	0.0	0.0	0.0	0.0	0.0	100.0	299
Go28/258	13.4	11.2	39.8	17.1	4.2	11.5	0.0	0.0	2.9	100.0	2,931

Return Trip

Bus riders were asked how they would travel when making their return trip. Based on survey responses, an estimated 64 percent of riders on the surveyed routes would take the same bus home for their return trip. As shown in Table 17, on all but seven routes, more than half of the riders would take the same bus for their return trip. The large share of riders who would take the same bus in the opposite direction for their return trip indicates that many riders are dependent on the bus routes for their daily travel. The large share may also reflect a large share of commuting trips because commuters are more likely to commute both ways by the same mode along the same route. Table 17 also indicates that when riders do not return by buses on the same route, they are more likely to return by buses on other routes than returning by some other mode.

The share of riders that would return by NJ TRANSIT train is comparatively high for several routes that serve communities also served by nearby NJ TRANSIT rail stations. This indicate it riders might be able to substitute between modes for some trips if necessary. Finally, it is noteworthy that the share of riders who would make the return trip by car was greater than 10 percent on four routes, including Routes 39, 5, 57, and 73. One reason for this might be that these routes serve communities adjacent to Newark, so, getting a ride from a friend or family member might be convenient.

Ticket Type

The survey respondents were asked about the type of tickets they used for the rides where they were intercepted by surveyors. The results are summarized in Table 18. The two most common forms of fare payment are one-way tickets/cash and monthly passes. Riders were nearly evenly split between these two methods of payment–39 percent one-way fare or cash vs. 40 percent monthly pass. This was true of the routes surveyed as well. On half the routes, a greater share or riders used a one-way fare ticket or paid cash, while on the other half of the routes, a greater share of riders used a monthly pass. On all but one route, less than 10 percent of riders use discounted fare tickets for seniors, persons with disability, and children. On six routes, student fares were used by more than 10 percent of riders.

Table 17 – Stated mode for return trip by bus riders on surveyed routes

	Percent						
Route #	Same bus route	Another bus	Train	Car	Other	Total	Riders (N)
1	65.5	18.1	5.1	4.8	6.5	100.0	12,301
13	70.5	18.0	4.1	3.9	3.6	100.0	9,592
25	64.3	21.4	5.0	4.5	4.7	100.0	9,287
GO25	65.9	20.0	9.0	2.5	2.5	100.0	709
34	65.1	19.9	5.0	5.9	4.1	100.0	6,839
62	63.3	21.3	3.8	6.0	5.6	100.0	3,943
94	63.6	22.9	1.8	6.3	5.4	100.0	8,641
99	73.6	19.2	2.3	3.6	1.3	100.0	3,820
11	60.8	29.6	0.0	7.0	2.7	100.0	1,218
21	61.4	21.9	4.1	4.3	8.3	100.0	5,108
26	60.5	21.4	2.2	0.5	15.3	100.0	1,475
27	63.0	28.0	1.7	2.4	4.8	100.0	4,475
28	57.4	23.8	2.0	8.7	8.1	100.0	1,229
29	74.1	15.5	3.8	1.1	5.4	100.0	2,435
361	50.3	24.9	0.0	0.0	24.9	100.0	181
37	64.5	24.1	1.3	4.6	5.5	100.0	1,667
39	49.9	23.7	11.9	10.4	4.0	100.0	7,258
40	52.2	13.4	4.6	9.6	20.2	100.0	2,693
41	73.6	18.1	2.1	0.0	6.2	100.0	3,121
5	54.5	30.1	3.0	10.3	2.0	100.0	1,537
52	42.9	25.3	2.3	1.9	27.5	100.0	1,458
56	67.6	10.5	8.2	5.0	8.7	100.0	219
57	64.7	5.0	0.0	21.7	8.6	100.0	498
58	67.9	13.9	0.6	6.2	11.4	100.0	1,276
59	69.8	17.4	3.3	5.3	4.2	100.0	4,721
65	62.5	15.8	16.4	5.3	0.0	100.0	549
66	72.2	20.5	1.3	3.3	2.6	100.0	2,239
70	68.4	14.5	6.4	6.7	4.1	100.0	3,376
71	49.8	33.1	15.1	2.0	0.0	100.0	2,655
72	65.4	22.0	3.2	8.0	1.5	100.0	2,409
73	56.6	10.2	1.8	27.9	3.4	100.0	2,832
76	71.3	17.5	0.0	5.6	5.6	100.0	2,421
78	43.8	29.6	16.0	6.0	4.6	100.0	754
79	58.0	20.9	0.0	17.0	4.1	100.0	440
90	73.3	15.8	3.4	1.4	6.1	100.0	2,912
92	45.8	42.1	3.2	5.0	4.0	100.0	2,773
96	56.3	24.9	0.0	5.3	13.4	100.0	655
97	47.6	39.2	10.2	0.0	3.0	100.0	166
Go25/250	42.5	42.5	15.1	0.0	0.0	100.0	299
Go28/258	64.1	23.8	0.0	4.5	7.5	100.0	2,725

Table 18 – Type of tickets used by riders

Route #	Percent											Riders (N)
	One-way Ticket/ Cash	Monthly Pass	Senior/ Person with disability /Children	Round Trip	10-Trip/ Multi-trip	Weekly Pass	Student Monthly Pass	Student One-way	Student 10-Trip	Other	Total	
1	34.2	43.4	3.2	5.5	1.0	1.4	2.1	6.3	0.0	2.8	100.0	12,635
13	38.1	43.3	4.1	3.3	0.6	1.1	1.9	3.5	0.4	3.6	100.0	10,443
25	40.3	39.0	6.0	3.8	0.7	1.6	1.5	3.8	0.2	3.1	100.0	9,763
GO25	18.2	54.8	2.4	1.3	1.7	0.0	3.0	6.0	0.0	12.6	100.0	704
34	36.5	40.8	6.5	3.9	0.5	1.0	2.3	5.4	1.0	2.1	100.0	7,508
62	34.7	50.7	2.7	6.7	0.7	0.3	0.0	0.6	0.3	3.4	100.0	4,601
94	37.2	43.4	6.2	3.4	0.9	0.6	1.6	2.7	0.5	3.4	100.0	9,424
99	34.7	44.4	5.4	2.0	1.6	0.7	1.7	8.3	0.0	1.2	100.0	4,484
11	48.1	36.1	3.7	6.1	0.0	0.0	2.1	1.3	0.0	2.7	100.0	1,306
21	38.7	35.1	7.6	6.1	1.1	1.4	2.9	2.4	0.0	4.8	100.0	5,014
26	46.6	31.4	6.2	3.8	0.0	0.0	7.3	1.6	1.0	2.0	100.0	1,610
27	33.5	37.3	6.7	4.5	0.5	0.0	5.5	7.5	0.6	4.0	100.0	4,765
28	45.3	32.3	0.7	4.3	0.0	0.0	11.4	3.5	0.6	2.0	100.0	1,266
29	28.7	48.7	7.3	5.5	0.5	0.6	6.3	2.0	0.0	0.5	100.0	2,343
361	24.9	24.9	0.0	0.0	0.0	0.0	50.3	0.0	0.0	0.0	100.0	181
37	39.5	49.0	0.7	5.3	0.0	0.0	2.0	2.0	0.0	1.5	100.0	1,650
39	36.7	36.8	3.9	6.3	0.8	2.7	3.4	5.8	0.0	3.6	100.0	6,866
40	69.0	24.7	1.3	0.7	0.0	0.0	1.1	0.7	0.0	2.5	100.0	2,477
41	33.5	36.8	9.0	4.3	0.0	0.0	2.8	1.5	0.0	12.2	100.0	3,415
5	47.1	23.0	5.5	9.4	8.5	1.2	0.9	1.2	0.9	2.1	100.0	1,450
52	60.0	29.5	3.6	2.8	0.0	0.7	1.9	0.0	0.0	1.6	100.0	1,482
56	29.5	40.6	17.1	2.3	2.3	6.0	0.0	0.0	0.0	2.3	100.0	217
57	42.8	48.1	6.8	0.0	0.0	0.0	0.0	0.0	0.0	2.2	100.0	586
58	59.9	28.2	2.8	5.7	0.0	0.6	0.6	2.3	0.0	0.0	100.0	1,454
59	41.3	38.5	5.4	3.7	1.2	0.5	2.4	2.8	0.3	3.7	100.0	4,919
65	29.5	45.5	14.0	8.5	2.6	0.0	0.0	0.0	0.0	0.0	100.0	543
66	44.3	33.0	2.2	10.7	0.8	0.0	7.4	0.0	0.4	1.3	100.0	2,318
70	46.5	37.9	3.3	3.3	1.8	0.5	1.9	1.2	0.0	3.6	100.0	3,386
71	39.7	36.7	4.9	2.7	11.6	2.9	0.4	1.2	0.0	0.0	100.0	2,949
72	40.3	36.3	4.7	3.4	0.4	2.1	8.5	1.6	0.0	2.7	100.0	2,382
73	27.3	40.4	5.3	3.8	3.6	0.0	17.8	0.0	0.0	1.9	100.0	2,701
76	41.5	35.2	7.4	2.0	3.1	0.0	3.6	0.0	0.0	7.3	100.0	2,473
78	17.2	60.2	6.2	8.0	0.0	0.0	2.3	0.0	0.0	6.2	100.0	698
79	20.8	55.8	0.0	6.5	8.3	0.0	3.8	0.0	0.0	4.8	100.0	480
90	25.7	57.8	5.7	8.7	0.0	0.0	0.7	0.7	0.0	0.7	100.0	2,867
92	53.6	33.5	0.0	7.0	0.0	0.0	1.0	3.4	0.0	1.5	100.0	2,840
96	25.0	57.5	0.0	0.0	0.0	0.0	0.0	9.4	6.0	2.1	100.0	713
97	16.9	77.1	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	100.0	166
Go25/250	57.5	15.1	0.0	27.4	0.0	0.0	0.0	0.0	0.0	0.0	100.0	299
Go28/258	45.6	43.5	2.1	5.9	0.0	2.8	0.0	0.0	0.0	0.0	100.0	2,812

Reason for Using Bus

One reason people rely on public transit to meet their travel needs is that they have few or no viable alternatives. Survey respondents were asked about the reason why they use the bus. Responses options included: (a) I have no other way to travel, so I use the bus; (b) I use the bus because it is the best choice for me, even though there are other ways I could travel; and (c) I usually use another type of transportation, but I occasionally take the bus. Results are summarized in Table 21.

Approximately 57 percent of riders reported that they have no other way to travel except by bus. A third reported that bus is the best choice for them, even though they have another way to travel to make their trip. As shown in Table 21, on all but two routes, more than 40 percent of riders rely on the bus because they have no other means for making their trip. At the same time, choice riders, those that take bus because it is their best option, make up more than 25 percent of riders on all but 3 routes.

Travel Alternatives

Bus riders were asked how they would have traveled if the bus service was not available. In addition to various travel modes they could use, they were also given an option to state that they would not make the trip. Responses to the question are summarized in Table 22.

The first column of Table 22 shows the share of riders in each route that would not make the trip if the bus service did not exist. Overall, approximately 15 percent of riders on the surveyed routes would not have made the trip if their bus did not exist. The share of riders that would not make their trip exceeded 15 percent on more than half (22 out of 40) of the routes surveyed. This is a sizeable share of riders that demonstrates the importance of NJ TRANSIT bus services to bus customers.

The most common travel alternative reported by survey respondents was app-based rideshare services such as Uber or Lyft. Approximately one third of riders across all routes would make their trip via an app-based rideshare services. The next most common alternative was walking, followed by drive a car, taxi and carpool. Approximately 12 percent of riders would take a jitney, bike, or use some other means to make their trip. In total, 58 percent of bus riders would utilize an auto-based travel option such as driving alone, carpooling, or taking a taxi or app-based rideshare service.

Table 19 – Reasons for using NJ TRANSIT bus

Route #	Percent: No other way	Best choice	Atypical rider	Total	Riders (N)
1	59.5	31.1	9.4	100.0	12,875
13	61.7	28.9	9.3	100.0	10,553
25	57.0	30.6	12.4	100.0	10,049
GO25	46.5	46.2	7.3	100.0	708
34	53.7	38.1	8.2	100.0	7,460
62	48.3	39.2	12.5	100.0	4,646
94	55.2	32.3	12.5	100.0	9,452
99	58.9	32.4	8.7	100.0	4,443
11	72.3	19.6	8.1	100.0	1,268
21	52.2	33.7	14.1	100.0	5,091
26	50.4	28.7	20.9	100.0	1,584
27	62.5	29.4	8.1	100.0	4,900
28	51.5	35.9	12.6	100.0	1,257
29	66.4	28.2	5.5	100.0	2,293
361	0.0	75.1	24.9	100.0	181
37	48.5	40.4	11.1	100.0	1,751
39	59.9	29.5	10.6	100.0	7,130
40	63.8	34.2	2.0	100.0	2,696
41	49.1	45.4	5.5	100.0	3,859
5	48.5	37.6	13.9	100.0	1,598
52	80.4	11.6	8.0	100.0	1,482
56	62.3	30.9	6.8	100.0	220
57	65.1	25.1	9.8	100.0	498
58	63.1	33.0	3.9	100.0	1,445
59	57.4	33.3	9.3	100.0	4,761
65	59.8	32.5	7.7	100.0	547
66	46.2	44.6	9.2	100.0	2,244
70	58.3	30.1	11.6	100.0	3,489
71	61.5	27.4	11.2	100.0	2,985
72	62.0	29.0	9.0	100.0	2,413
73	43.4	49.4	7.2	100.0	2,800
76	70.2	27.0	2.8	100.0	2,589
78	59.7	36.7	3.6	100.0	807
79	53.4	29.9	16.7	100.0	479
90	59.7	36.0	4.2	100.0	3,030
92	74.0	18.2	7.8	100.0	2,913
96	48.9	43.4	7.7	100.0	742
97	73.8	26.2	0.0	100.0	172
Go25/250	15.1	84.9	0.0	100.0	299
Go28/258	41.8	54.3	3.9	100.0	2,922

Table 20 – How riders would have traveled if the bus was not available

Route #	Percent										Riders (N)
	Would not make this trip	Drive a car	Car-pool	Taxi	App-based service	Jitney	Walk	Bike	Other	Total	
1	14.3	10.4	4.6	8.2	31.4	1.2	17.0	2.5	10.4	100.0	15,082
13	16.1	14.1	3.9	9.2	29.6	0.5	16.4	2.4	7.7	100.0	12,310
25	14.5	13.9	5.1	8.6	32.1	0.6	16.2	2.4	6.6	100.0	11,325
GO25	10.3	13.7	8.0	10.0	28.8	0.0	8.8	3.8	16.6	100.0	1,010
34	16.1	13.2	5.9	7.8	27.9	0.5	15.7	2.2	10.7	100.0	8,465
62	14.2	16.8	8.4	6.7	37.2	0.0	5.9	1.0	9.7	100.0	5,015
94	18.2	12.4	6.0	8.0	27.8	0.2	16.6	1.3	9.5	100.0	10,952
99	17.0	14.1	6.0	8.6	21.4	0.0	22.7	1.2	9.1	100.0	5,085
11	21.7	8.6	4.2	10.9	36.9	2.1	8.1	1.6	5.9	100.0	1,548
21	11.8	13.2	5.1	8.8	33.5	1.2	13.8	2.4	10.1	100.0	6,304
26	16.9	4.8	1.8	10.1	33.5	0.0	14.3	3.4	15.2	100.0	1,748
27	14.1	11.7	2.8	16.7	25.0	0.0	19.4	1.0	9.3	100.0	5,548
28	15.9	10.8	1.9	6.3	43.0	0.0	7.4	2.3	12.4	100.0	1,511
29	21.5	10.5	4.3	7.1	35.9	1.1	10.1	0.8	8.8	100.0	2,775
361	0.0	75.1	0.0	0.0	24.9	0.0	0.0	0.0	0.0	100.0	181
37	8.7	16.0	2.3	11.6	43.6	1.0	6.0	0.0	10.8	100.0	2,045
39	17.1	18.0	3.6	7.6	27.6	0.0	14.7	1.5	9.9	100.0	8,289
40	15.2	1.9	1.7	6.0	42.7	0.0	20.9	1.3	10.3	100.0	2,910
41	4.1	3.4	6.5	29.1	30.3	1.4	16.1	0.0	9.0	100.0	4,718
5	9.1	14.5	1.3	10.6	23.2	0.0	32.2	1.8	7.3	100.0	2,108
52	31.0	6.2	1.9	1.1	50.2	0.0	6.3	1.1	2.2	100.0	1,546
56	22.2	9.3	0.0	4.4	35.9	0.0	17.7	4.0	6.5	100.0	248
57	9.8	9.0	12.6	1.6	30.8	0.0	15.1	0.0	21.2	100.0	747
58	17.5	8.6	8.2	5.8	37.0	3.3	10.5	3.9	5.2	100.0	1,677
59	13.8	10.8	4.9	8.9	29.3	0.6	13.9	4.3	13.4	100.0	5,683
65	19.8	14.8	0.0	6.8	19.8	0.0	7.6	7.1	24.2	100.0	607
66	15.4	5.9	6.1	3.9	46.7	0.0	11.2	0.4	10.4	100.0	2,624
70	19.3	7.5	3.8	8.2	39.0	0.6	8.8	4.1	8.7	100.0	4,136
71	19.5	15.3	2.0	10.2	44.2	3.7	2.7	0.0	2.3	100.0	3,101
72	23.2	10.2	1.7	10.6	32.3	0.9	7.9	2.8	10.4	100.0	2,648
73	16.7	11.1	11.0	7.8	44.4	0.0	2.6	0.0	6.3	100.0	3,269
76	14.3	8.0	5.8	3.9	48.4	0.8	5.6	3.2	10.0	100.0	2,856
78	26.0	7.1	0.0	0.9	29.6	0.0	0.0	0.9	35.5	100.0	788
79	31.2	7.2	3.2	7.2	32.6	0.0	7.3	0.0	11.3	100.0	558
90	12.2	2.4	0.6	8.8	41.6	6.8	9.9	3.6	14.1	100.0	3,347
92	11.9	5.6	0.7	14.6	37.4	0.0	21.4	2.6	5.7	100.0	3,403
96	5.9	6.7	4.6	13.1	40.3	0.0	19.8	1.8	7.9	100.0	853
97	21.0	2.5	0.0	3.0	28.0	0.0	20.0	3.0	22.5	100.0	200
Go25/250	11.6	11.6	0.0	32.6	32.6	0.0	0.0	0.0	11.6	100.0	389
Go28/258	18.1	14.0	0.9	3.7	37.0	0.7	9.1	6.2	10.3	100.0	3,289

Impact of App-based Rideshare Services

Transportation Network Companies (TNC), often referred to ride-sharing or ride-hailing companies, began operating in the U.S. in 2009, the year Uber was founded. Since then, numerous other companies have started up with a few such as Lyft retaining a sizeable market share alongside Uber. From 2010 to 2019, TNCs captured an increasing share of trips in many metropolitan regions. For example, in 2019, TNCs operating in New York City completed 248 million revenue trips, compared to 85 million trips completed by traditional yellow cabs. [4]

Research regarding the impact of TNC use on public transit ridership has generally found a substitution effect, where transit riders use TNCs instead of transit for at least some trips. [4,5] For example, a 2021 study that examined the net impacts of TNC use on urban mobility in the U.S. found that entry of TNCs in the urban mobility markets coincided with an 8.9 percent reduction in transit ridership across the 174 metropolitan statistical areas (MSAs) analyzed. According to the authors, "the magnitude of this effect increased overtime in the first three years following TNC entry and stabilized at approximately 16% thereafter." [5] A 2022 study that utilized data scraped from Application Programming Interfaces of two TNCs, combined with Automated Passenger Count data on transit, found that between 2010 and 2015, TNCs were "responsible for a net ridership decline of about 10 percent" in the San Francisco metropolitan region. [6]

At the same time, some researchers have uncovered nuance in the effect TNCs have on ridership. For example, the same study that found that TNCs reduced transit ridership in 174 MSAs in the U.S. also found that "users in smaller MSAs utilize Uber to complement limited routes and schedules." [5,7] A study that looked at trip making in Boston and Philadelphia found that travelers consider both wait time and overall trip time when deciding between TNCs and transit, opting for TNCs when either or both of these parameters is important. However, the same study found that these effects were more pronounced among higher income travelers. [4] So, it is likely that substitution occurs more among choice riders, and likely more among rail riders which tend to be more affluent.

As noted in the previous section, TNCs or app-based rideshare services were the most commonly cited alternative for making bus trips, if bus service did not exist. To explore the potential impact of app-based services on NJ TRANSIT services, survey respondents were asked the following two questions:

1. "How many one-way trips, to anywhere, have you taken in the last 30 days with an app-based ride services like Uber or Lyft?" The question was multiple choice with answer options range from zero trips to 20 trips or more.
2. "How, if at all, has your use of app-based ride services like Uber or Lyft changed your use of NJ TRANSIT services?" The question allowed for a matrix response with two answer options: a) I use NJ TRANSIT more or b) I use NJ TRANSIT less for each mode (bus, light rail, rail). Respondents could also choose c) My use of NJ TRANSIT services has not changed.

Data from these questions is summarized in tables 21 to 24. As shown in Table 21, the vast majority of bus riders (78 percent) on the surveyed routes have used app-based services in the 30 days prior to taking the survey. About 20 percent report taking more than 20 trips in the last 30 days. While the share of bus riders using app-based services on specific routes varied somewhat, the general pattern of use was similar across routes.

Regarding the impact of TNCs on ridership, the results of the survey were mixed. Among riders that reported using an app-based service in the last 30 days, a clear majority (61 percent) of bus riders reported using transit more because of TNCs, while far fewer riders reported that TNCs either did not change their use of transit (27 percent) or that they use transit less because of TNCs (12 percent).

Overall, among the bus riders reporting that TNCs increased their use of transit, not surprisingly, the vast majority (80 percent) reported using bus more. This would seem to indicate that riders are using TNCs to complement rather than substitute for bus use. A much smaller share (20 percent) reported that TNCs increased their use of rail and/or light rail.

This result, which is based on self-reported survey data, seems to contradict the findings of studies conducted elsewhere that concluded that TNCs reduce ridership on the whole. However, given the nature of the bus routes and riders surveyed, it may in fact provide evidence that TNC impacts in New Jersey are nuanced and may vary by mode, route and rider characteristics.

In addition, a word of caution is warranted in terms of interpreting the results. Readers should remember that this analysis is based on survey responses for only those customers that reported using TNC’s at least one time in the past 30 days. Respondents that reported using an app-based service in the past 30 days were then asked whether they used NJ TRANSIT bus, light rail, and/or rail services more or less or if TNC use did not change how they used these services. The way the question was structured results in a nine by nine response matrix, where the sample size in each of the response cells (i.e., more or less use of bus, light rail, and rail or no change) was small or even zero from some routes. Consequently, for any given route, the results may be strongly influenced by the small sample size, especially among riders that reported a negative impact associated with app-based services.

Table 21 – One-way app-based ride service trips taken by bus riders in last 30 days

Route #	Percent							N
	0 Trips	1-2 Trips	3-4 Trips	5-9 Trips	10-19 Trips	20 Trips or more	Total	
1	20.8	16.5	18.7	10.9	10.0	23.1	100.0	12,470
13	24.0	17.7	17.9	10.1	8.5	21.8	100.0	10,165
25	23.5	15.9	17.2	10.9	10.4	22.0	100.0	9,289
GO25	26.9	14.8	20.7	11.4	3.3	22.9	100.0	752
34	27.0	15.8	18.8	9.6	9.7	19.1	100.0	7,219
62	24.7	20.9	17.1	10.4	10.6	16.3	100.0	4,401
94	22.5	18.6	17.5	9.8	8.2	23.4	100.0	9,125
99	26.8	19.5	17.7	11.1	7.4	17.4	100.0	4,287
11	17.6	31.0	19.5	9.1	10.6	12.2	100.0	1,321
21	21.0	17.9	20.9	12.1	8.2	19.8	100.0	5,050
26	23.1	19.1	17.9	9.3	17.5	13.1	100.0	1,600
27	25.4	17.1	12.5	13.3	12.4	19.2	100.0	4,840
28	20.8	21.5	23.8	10.3	6.0	17.7	100.0	1,258
29	23.4	24.0	14.7	7.0	7.8	23.2	100.0	2,318
361	25.0	25.0	0.0	25.0	0.0	25.0	100.0	180
37	14.2	21.1	16.4	8.1	12.5	27.8	100.0	1,748
39	18.8	21.7	18.9	11.7	6.2	22.7	100.0	7,254
40	8.8	9.0	38.5	15.6	13.2	14.9	100.0	2,479
41	25.0	22.8	5.2	20.0	8.3	18.6	100.0	3,462
5	18.3	4.7	42.0	6.8	2.7	25.5	100.0	1,532
52	27.1	10.0	32.2	1.7	4.0	24.9	100.0	1,456
56	24.4	12.0	14.7	20.0	9.3	19.6	100.0	225
57	12.5	16.9	16.9	17.6	3.3	32.8	100.0	551
58	16.2	30.3	10.5	5.1	9.4	28.6	100.0	1,502
59	28.0	19.3	15.5	10.4	8.3	18.5	100.0	4,721
65	21.0	10.1	13.1	13.1	13.0	29.7	100.0	563
66	19.0	25.9	18.9	9.9	7.1	19.2	100.0	2,347
70	17.0	19.2	20.7	13.5	7.6	22.0	100.0	3,402
71	22.2	10.5	29.8	10.3	10.0	17.2	100.0	2,862
72	23.4	14.4	16.1	10.8	11.9	23.3	100.0	2,425
73	28.0	12.8	7.7	31.6	8.8	11.2	100.0	2,843
76	23.9	13.8	19.8	10.6	16.2	15.6	100.0	2,487
78	29.3	21.7	17.3	5.5	9.0	17.3	100.0	747
79	42.9	8.5	12.3	17.5	6.9	11.9	100.0	480
90	16.1	20.8	15.8	14.6	13.6	19.2	100.0	2,905
92	28.5	15.3	15.2	11.7	10.7	18.6	100.0	2,755
96	7.9	11.4	3.5	8.4	27.7	41.1	100.0	722
97	45.5	14.4	3.6	3.6	12.6	20.4	100.0	167
Go25/250	15.1	15.1	54.7	0.0	15.1	0.0	100.0	298
Go28/258	13.3	22.1	24.4	9.2	13.2	17.8	100.0	2,960

Table 22 – Impact of app-based ride service on the use of NJ TRANSIT services

	Percent				
Route #	Use more	Use less	Has not changed	Total	Riders (N)
1	54.7	14.1	31.2	100.0	8,026
13	65.3	9.6	25.1	100.0	6,994
25	57.2	13.2	29.6	100.0	6,597
GO25	51.6	7.0	41.4	100.0	502
34	58.9	14.2	26.9	100.0	4,838
62	64.6	13.4	22.0	100.0	2,958
94	55.3	15.1	29.6	100.0	6,466
99	55.8	15.1	29.1	100.0	2,730
11	76.3	3.7	20.1	100.0	1,012
21	60.0	15.1	24.9	100.0	3,555
26	67.0	7.8	25.2	100.0	1,205
27	70.5	8.1	21.4	100.0	3,476
28	59.9	8.0	32.1	100.0	936
29	64.5	10.2	25.3	100.0	1,660
361	33.1	66.9	0.0	100.0	136
37	61.3	12.5	26.2	100.0	1,360
39	58.8	19.8	21.5	100.0	5,473
40	60.6	3.8	35.6	100.0	2,161
41	71.6	9.5	19.0	100.0	2,496
5	60.0	21.5	18.5	100.0	1,252
52	80.9	9.1	10.0	100.0	691
56	58.9	0.0	41.1	100.0	151
57	71.5	1.4	27.1	100.0	442
58	55.7	8.4	35.9	100.0	1,148
59	62.1	12.4	25.4	100.0	3,145
65	60.2	6.7	33.1	100.0	402
66	52.4	8.7	38.9	100.0	1,864
70	59.7	12.8	27.6	100.0	2,632
71	72.5	5.5	22.0	100.0	2,183
72	59.2	11.0	29.8	100.0	1,722
73	39.7	13.4	46.9	100.0	1,992
76	66.5	7.9	25.6	100.0	1,713
78	52.8	12.6	34.5	100.0	443
79	72.6	16.3	11.1	100.0	252
90	70.4	13.3	16.3	100.0	2,371
92	65.4	12.1	22.6	100.0	1,946
96	62.6	23.4	14.0	100.0	530
97	68.1	0.0	31.9	100.0	72
Go25/250	50.0	0.0	50.0	100.0	254
Go28/258	72.0	7.5	20.4	100.0	2,535

Note: Estimated for only those who used app-based service at least once in last 30 days

Table 23 – Positive impact of app-based ride service use on NJ TRANSIT services

	Percent				
Route #	More bus	More light rail	More rail	Total	Riders (N)
1	72.6	16.0	11.5	100.0	5,833
13	79.1	13.7	7.2	100.0	3,017
25	82.0	6.9	11.0	100.0	2,064
GO25	81.8	4.7	13.5	100.0	192
34	77.1	13.9	9.1	100.0	1,789
62	82.6	10.0	7.5	100.0	1,175
94	88.1	3.8	8.0	100.0	1,880
99	75.0	17.3	7.7	100.0	1,120
11	89.5	3.1	7.4	100.0	541
21	78.1	6.8	15.2	100.0	1,404
26	64.4	17.8	17.8	100.0	618
27	90.2	5.7	4.0	100.0	1,393
28	67.6	16.2	16.2	100.0	426
29	80.3	13.2	6.5	100.0	756
361	100.0	0.0	0.0	100.0	45
37	92.7	5.9	1.4	100.0	440
39	82.2	13.0	4.8	100.0	2,271
40	95.2	4.8	0.0	100.0	791
41	92.7	7.3	0.0	100.0	1,596
5	95.9	0.0	4.1	100.0	440
52	55.6	40.2	4.2	100.0	816
56	67.2	0.0	32.8	100.0	67
57	92.0	8.0	0.0	100.0	162
58	100.0	0.0	0.0	100.0	516
59	84.6	6.3	9.1	100.0	1,153
65	71.5	11.6	17.0	100.0	277
66	81.6	6.3	12.1	100.0	651
70	83.7	10.7	5.6	100.0	1,164
71	61.3	8.8	29.9	100.0	1,730
72	87.0	5.6	7.4	100.0	679
73	70.1	16.8	13.1	100.0	458
76	94.8	0.0	5.2	100.0	687
78	69.8	27.1	3.1	100.0	225
79	55.6	21.1	23.4	100.0	171
90	83.6	4.0	12.4	100.0	531
92	76.1	11.6	12.3	100.0	1,232
96	75.1	13.2	11.7	100.0	265
97	78.6	0.0	21.4	100.0	28
Go25/250	100.0	0.0	0.0	100.0	82
Go28/258	79.3	8.8	11.9	100.0	987

Note: Estimated for only those who used app-based service at least once in last 30 days

Table 24 – Negative impact of app-based ride service use on NJ TRANSIT services

	Percent				
Route #	Less bus	Less light rail	Less rail	Total	Riders (N)
1	52.7	25.7	21.5	100.0	1,710
13	86.8	8.7	4.5	100.0	265
25	95.2	4.8	0.0	100.0	336
GO25	0.0	0.0	100.0	100.0	9
34	64.7	19.0	16.3	100.0	300
62	67.3	16.4	16.4	100.0	165
94	66.8	12.7	20.5	100.0	623
99	65.2	27.5	7.3	100.0	178
11	---	---	---	---	---
21	63.4	18.8	17.8	100.0	202
26	100.0	0.0	0.0	100.0	9
27	80.9	19.1	0.0	100.0	131
28	50.0	0.0	50.0	100.0	20
29	100.0	0.0	0.0	100.0	68
361	100.0	0.0	0.0	100.0	45
37	39.2	25.5	35.3	100.0	102
39	92.3	7.7	0.0	100.0	339
40	100.0	0.0	0.0	100.0	18
41	59.7	20.2	20.2	100.0	238
5	100.0	0.0	0.0	100.0	13
52	100.0	0.0	0.0	100.0	36
56	---	---	---	---	---
57	0.0	50.0	50.0	100.0	12
58	---	---	---	---	---
59	59.2	14.0	26.8	100.0	157
65	---	---	---	---	---
66	76.9	23.1	0.0	100.0	39
70	52.4	19.0	28.6	100.0	168
71	---	---	---	---	---
72	79.6	20.4	0.0	100.0	49
73	100.0	0.0	0.0	100.0	56
76	100.0	0.0	0.0	100.0	40
78	50.0	50.0	0.0	100.0	56
79	---	---	---	---	---
90	100.0	0.0	0.0	100.0	19
92	0.0	100.0	0.0	100.0	22
96	---	---	---	---	---
97	---	---	---	---	---
Go25/250	---	---	---	---	---
Go28/258	---	---	---	---	---

Note: Estimated for only those who used app-based service at least once in last 30 days

ENVIRONMENTAL IMPACT

Introduction

An important objective of this research is to estimate the environmental impacts of buses. Toward this end, analyses were undertaken to estimate CO_2 emissions that would have been generated if the bus riders were to use alternative transportation modes such as cars, taxis, or app-based services. The CO_2 estimates were obtained for the 40 bus routes surveyed.

The air quality impact of transit is often estimated by examining how the transit riders would have traveled between their trip origins and destinations if the transit service did not exist. Adopting that approach, this study uses responses from a survey question that inquired what alternative travel mode the respondents would have used in the absence of the bus service they were using. Although many riders selected other modes such as walk, bike, train, another bus, etc., the relevant trips for the analysis here are only those that would have been made by an automobile, including driving alone, carpool, taxi, or app-based service such as Uber and Lyft. The riders who said they would not make the trips they were making in the absence of buses were also excluded from analysis because they would not generate any VMT by giving up their trips.

The following sequential steps were involved in estimating the CO_2 emissions that would have been generated from the diversion of bus riders to the automobile.

(a) Geocode the trip origins and destinations of the survey respondents.
(b) Using GIS, estimate network distances (miles) between the origins and destinations of each trip in the survey data.
(c) Select the trips for which the rider stated that he or she would have traveled by an automobile mode in the absence of the bus.
(d) Apply appropriate vehicle occupancy rate for those who said they would carpool in the absence of buses.
(e) Estimate vehicle miles traveled (VMT) for each potential automobile user by applying respective vehicle occupancy rates.
(f) Make a realistic assumption about miles per gallon (MPG) for automobile and CO_2 emission per gallon of gasoline.
(g) Use MPG, emissions per gallon, and VMT to estimate CO_2 emissions that would have been generated if riders diverted to automobile as stated in the survey.

Impact Estimation

The distances between bus trip origins and destinations were estimated using ArcGIS Network Analyst. Vehicle occupancy rate for those who said they would carpool was obtained from responses to a specific survey question. For those who said they would carpool but did not mention the number of people they would carpool with, the average occupancy rate for all carpool riders was used. This average was 2.4 persons per car

for those who stated the number of carpool riders. For those who said they would drive alone, take a taxi, or take an app-based service, the vehicle occupancy rate was assumed to be one since potential taxi users and app-based service users were not asked about sharing vehicles with others.

Table 25 shows the estimated route-specific vehicle miles traveled (VMT) for the riders who stated that they would use an automobile mode in the absence of buses. The VMT estimates are based on one-way trip only. They would be twice as much if all riders returned by the same bus. The estimates are shown separately for those who would drive or carpool and those who would use app-based service or taxi, in addition to the total VMT obtained by aggregating the two. In addition to the estimates of VMT, the table shows the number of riders in each route that would use the specific modes.

The United States Environmental Protection Agency (EPA) uses a formula to estimate CO_2 emissions from gasoline consumption by automobiles [8]. The formula can be stated as:

$$Total\ CO_2 emissions = \frac{CO_2 emissions\ per\ gallon}{MPG} X\ VMT$$

By assuming 8,887 grams of emissions per gallon of gasoline, 25.4 MPG, and 11,500 annual VMT, it estimated that the average annual emission per car is approximately 4.6 metric tons. The same assumptions have been made here to estimate CO_2 reduction for each bus route. Instead of annual VMT for a car, the VMT estimates from Table 25 were used for each route. The average weekday and annual estimates of CO_2 for the routes are shown in Table 26. The figures in the table show how much CO_2 would have been emitted if the bus riders who said they would travel by automobile in the absence of buses made their trips by automobile. Thus the figures indicate how much additional CO_2 would have been generated by additional automobile trips due to diversion from buses. While the weekday emissions were obtained by the EPA formula, to obtain the annual estimates, it was assumed that there are 260 working days in a year. Hence the annual estimates are 260 times larger than the weekday estimates.

Table 26 shows that emissions from driver, carpool, and taxi are generally lower than emissions from app-based service. This is because a larger number of riders stated that they would use app-based service than driving alone, carpooling or taking a taxi. The factors that affected the estimated emissions for each route were (a) distance between trip origins and destinations, and the (b) number of riders who stated that they would use an automobile mode.

Using the EPA's estimate of CO_2 generated per car per year, from the annual emissions figures in Table 27, one can estimate the number of cars that would have to be removed in order to achieve the estimated reduction in emissions. The estimated number of reduced cars from roads for each bus route is shown in Table 28. The number of cars reduced as shown in Table 28 is not for one weekday but for the whole year. The figures in the table indicate, based on one-way trips alone, the total emission reductions

attributable to riders using the 40 surveyed routes instead of traveling by automobile is equivalent to taking away 7,211 cars from roads for one full year.

One may note that buses also contribute to CO_2 emissions. To accurately estimate emissions generated from buses, information is needed about type of fuel used by buses. Additionally, assumptions have to be made about vehicle speed, traffic conditions, et cetera. Due to the unavailability of related information, efforts were not made to estimate emissions generated from the buses. Thus the CO_2 emissions shown here should not be interpreted as net savings. They only represent emissions that would be generated from cars if the riders who said they would use a car in the absence of buses used cars instead of buses for their trips.

These finding are consistent with the previous two phases of the that Analysis of Local Bus Markets studies. [1,2] All three phases show that the presence of bus service provides significant benefits in terms of GHG reductions. Further, all three phases found that most of the GHG savings occur from riders who would use an app-based service instead of driving alone.

Table 25 – Estimated vehicle miles to be traveled in the absence of buses on average weekdays

Bus Route	Drive alone		App-based		Taxi		Carpool			Total Miles
	Riders (N)	Miles	Riders (N)	Miles	Riders (N)	Miles	Riders (N)	Miles	Riders (N)	
1	1,570	9,113	4,050	22,921	879	4,398	395	1,040	6,894	37,472
13	1,738	10,042	3,046	14,233	799	3,011	347	733	5,930	28,019
25	1,576	9,350	2,994	15,849	600	2,892	303	457	5,473	28,548
GO25	138	936	202	2,070	47	385	18	74	405	3,465
34	1,118	6,157	1,985	11,274	515	2,577	315	581	3,933	20,589
62	845	4,158	1,554	10,401	180	1,001	206	848	2,785	16,408
94	1,361	7,566	2,545	14,989	639	1,878	372	672	4,917	25,105
99	718	3,139	816	2,681	345	857	153	128	2,032	6,805
11	45	820	425	3,522	109	772	53	183	632	5,297
21	269	3,616	1,421	8,183	361	1,854	182	367	2,233	14,020
26	534	108	475	2,185	169	1,177	8	13	1,186	3,483
27	55	1,915	1,067	5,595	687	2,977	52	52	1,861	10,539
28	162	1,035	502	3,535	79	348	9	27	752	4,945
29	273	654	745	5,185	157	795	107	370	1,282	7,004
361	61	200	0	0	0	0	0	0	61	200
37	19	1,094	680	3,158	237	773	43	112	979	5,137
39	14	2,149	1,375	8,301	429	1,585	153	235	1,971	12,270
40	144	177	1,165	8,235	129	1,021	49	115	1,487	9,548
41	250	2,029	1,192	4,945	1,378	4,693	242	532	3,062	12,199
5	89	729	415	2,016	205	533	28	15	737	3,293
52	136	395	408	2,475	13	77	25	58	582	3,005
56	160	162	70	392	0	0	0	0	230	554
57	410	17	191	1,244	12	45	0	0	613	1,306
58	216	836	531	2,846	97	389	102	227	946	4,298
59	299	1,342	1,127	6,154	350	1,997	110	397	1,886	9,890
65	227	1,109	105	1,097	14	144	0	0	346	2,350
66	16	562	994	5,304	90	447	30	54	1,130	6,367
70	40	877	1,060	7,163	176	1,016	80	163	1,356	9,219
71	60	4,905	552	3,518	35	274	61	225	708	8,922
72	122	2,089	658	5,682	175	1,723	22	65	977	9,559
73	0	2,808	1,134	7,395	203	1,865	259	679	1,596	12,747
76	5	3,896	725	6,733	36	236	55	772	821	11,637
78	45	213	158	1,638	7	70	0	0	210	1,921
79	227	738	118	1,516	18	452	18	188	381	2,894
90	45	472	774	6,454	196	1,014	0	0	1,015	7,940
92	269	442	780	3,390	306	1,135	0	0	1,355	4,967
96	534	0	314	1,266	98	286	0	0	946	1,552
97	55	28	57	185	6	13	0	0	118	226
Go25/250	162	452	127	925	127	1,558	0	0	416	2,935
Go28/258	273	1,035	1,104	6,901	30	110	0	0	1,407	8,046

Table 26 – Annual per weekday CO_2 emissions (metric ton) from trip diversion to automobile

Bus Route	Drive alone	App-based	Taxi	Carpool	Total
1	3.19	8.02	1.54	0.36	13.11
13	3.51	4.98	1.05	0.26	9.80
25	3.27	5.55	1.01	0.16	9.99
GO25	0.33	0.72	0.13	0.03	1.21
34	2.15	3.94	0.90	0.20	7.20
62	1.45	3.64	0.35	0.30	5.74
94	2.65	5.24	0.66	0.24	8.78
99	1.10	0.94	0.30	0.04	2.38
11	0.29	1.23	0.27	0.06	1.85
21	1.27	2.86	0.65	0.13	4.91
26	0.04	0.76	0.41	0.00	1.22
27	0.67	1.96	1.04	0.02	3.69
28	0.36	1.24	0.12	0.01	1.73
29	0.23	1.81	0.28	0.13	2.45
361	0.07	0.00	0.00	0.00	0.07
37	0.38	1.10	0.27	0.04	1.80
39	0.75	2.90	0.55	0.08	4.29
40	0.06	2.88	0.36	0.04	3.34
41	0.71	1.73	1.64	0.19	4.27
5	0.26	0.71	0.19	0.01	1.15
52	0.14	0.87	0.03	0.02	1.05
56	0.06	0.14	0.00	0.00	0.19
57	0.01	0.44	0.02	0.00	0.46
58	0.29	1.00	0.14	0.08	1.50
59	0.47	2.15	0.70	0.14	3.46
65	0.39	0.38	0.05	0.00	0.82
66	0.20	1.86	0.16	0.02	2.23
70	0.31	2.51	0.36	0.06	3.23
71	1.72	1.23	0.10	0.08	3.12
72	0.73	1.99	0.60	0.02	3.34
73	0.98	2.59	0.65	0.24	4.46
76	1.36	2.36	0.08	0.27	4.07
78	0.07	0.57	0.02	0.00	0.67
79	0.26	0.53	0.16	0.07	1.01
90	0.17	2.26	0.35	0.00	2.78
92	0.15	1.19	0.40	0.00	1.74
96	0.00	0.44	0.10	0.00	0.54
97	0.01	0.06	0.00	0.00	0.08
Go25/250	0.16	0.32	0.55	0.00	1.03
Go28/258	0.36	2.41	0.04	0.00	2.82
Total	**30.57**	**77.52**	**16.23**	**3.28**	**127.60**

Table 27 – Annual CO_2 emissions (metric ton) from diversion to automobile (Daily x 260)

Route #	Drive alone	App-based	Taxi	Carpool	Total
1	829.00	2,085.11	400.08	94.61	3,408.80
13	913.51	1,294.77	273.91	66.68	2,548.87
25	850.56	1,441.77	263.08	41.57	2,596.99
GO25	85.15	188.31	35.02	6.73	315.21
34	560.10	1,025.59	234.43	52.85	1,872.97
62	378.25	946.17	91.06	77.14	1,492.62
94	688.27	1,363.54	170.84	61.13	2,283.78
99	285.55	243.89	77.96	11.64	619.05
11	74.59	320.39	70.23	16.65	481.86
21	328.94	744.40	168.66	33.39	1,275.39
26	9.82	198.77	107.07	1.18	316.85
27	174.21	508.97	270.82	4.73	958.73
28	94.15	321.58	31.66	2.46	449.84
29	59.49	471.68	72.32	33.66	637.15
361	18.19	0.00	0.00	0.00	18.19
37	99.52	287.28	70.32	10.19	467.31
39	195.49	755.14	144.19	21.38	1,116.19
40	16.10	749.13	92.88	10.46	868.57
41	184.58	449.84	426.92	48.40	1,109.73
5	66.32	183.39	48.49	1.36	299.56
52	35.93	225.15	7.00	5.28	273.36
56	14.74	35.66	0.00	0.00	50.40
57	1.55	113.17	4.09	0.00	118.81
58	76.05	258.90	35.39	20.65	390.99
59	122.08	559.83	181.67	36.11	899.69
65	100.88	99.79	13.10	0.00	213.78
66	51.12	482.50	40.66	4.91	579.20
70	79.78	651.61	92.42	14.83	838.65
71	446.20	320.03	24.93	20.47	811.63
72	190.03	516.89	156.74	5.91	869.58
73	255.44	672.72	169.66	61.77	1,159.59
76	354.42	612.50	21.47	70.23	1,058.61
78	19.38	149.01	6.37	0.00	174.75
79	67.14	137.91	41.12	17.10	263.27
90	42.94	587.12	92.24	0.00	722.30
92	40.21	308.39	103.25	0.00	451.84
96	0.00	115.17	26.02	0.00	141.18
97	2.55	16.83	1.18	0.00	20.56
Go25/250	41.12	84.15	141.73	0.00	266.99
Go28/258	94.15	627.78	10.01	0.00	731.94
Total	7,947.53	20,154.79	4,218.97	853.47	33,174.77

Table 28 – Number of cars that would be removed from roads to achieve the estimated reduction in CO_2

Route #	Drive alone	App-based	Taxi	Carpool	Total
1	180	453	87	21	741
13	199	281	60	14	554
25	185	313	57	9	565
GO25	19	41	8	1	69
34	122	223	51	11	407
62	82	206	20	17	324
94	150	296	37	13	496
99	62	53	17	3	135
11	16	70	15	4	105
21	72	162	37	7	277
26	2	43	23	0	69
27	38	111	59	1	208
28	20	70	7	1	98
29	13	103	16	7	139
361	4	0	0	0	4
37	22	62	15	2	102
39	42	164	31	5	243
40	4	163	20	2	189
41	40	98	93	11	241
5	14	40	11	0	65
52	8	49	2	1	59
56	3	8	0	0	11
57	0	25	1	0	26
58	17	56	8	4	85
59	27	122	39	8	196
65	22	22	3	0	46
66	11	105	9	1	126
70	17	142	20	3	182
71	97	70	5	4	176
72	41	112	34	1	189
73	56	146	37	13	252
76	77	133	5	15	230
78	4	32	1	0	38
79	15	30	9	4	57
90	9	128	20	0	157
92	9	67	22	0	98
96	0	25	6	0	31
97	1	4	0	0	4
Go25/250	9	18	31	0	58
Go28/258	20	136	2	0	159
Total	1,729	4,382	918	183	7,211

CONCLUSSIONS AND RECOMMENDATIONS

Summary of Findings

This research was based on a survey of riders on 40 NJ TRANSIT bus routes operating in the greater Newark service area. The analysis included analyses of (a) riders' demographic and socioeconomic characteristics, (b) riders' travel characteristics, and (c) CO_2 emissions from cars for riders who said they would use cars, taxis, or app-based services in the absence of buses.

The analysis of riders' demographic characteristics showed that the proportion of riders below age 18 and riders age 65+ is lower than state average. The share of riders below age 18 is lower because a large proportion of them are too young to be using buses and the survey was targeted to adults age 18 and over. The lower share of riders age 65+ is also consistent with other transit surveys which have found that many older adults do not regularly use buses due to physical limitations and lower levels of trip making overall.

A large proportion of riders on most routes are from low-income households. For many routes, riders with less than $25,000 annual household income constitute half or more of all riders. Further, many riders live in households without vehicles. The share of riders with no access to a personal vehicle exceeds the share of New Jersey residents with no access to a vehicle on all of the surveyed bus routes. In most cases, the share of zero-vehicle households is substantially higher than the statewide average of 11 percent. The data collected through the survey shows that the local buses provide mobility for a large number of less-privileged riders.

Analysis of the socioeconomic data also showed that a large proportion of riders are racial or ethnic minorities. The share of Black or African American riders is significantly greater than the state average of 13.5 percent on all routes. On three-quarters of the routes surveyed, the share of Black or African American riders makes up greater than 50 percent of ridership. The survey results clearly show that NJ TRANSIT bus routes operating in the greater Newark area serve mostly non-white customers and that Black or African American riders comprise the largest share of greater Newark area customers overall. Further, the share of Hispanic, Latino or Spanish riders exceeds the proportion of New Jersey residents reporting Hispanic, Latino or Spanish ethnicity on more than half the routes surveyed, 24 of 40 routes.

A number of key observations can be made from the analysis of riders' travel patterns. First, because of the duration of the survey (6 AM to 4 PM), a large proportion of the trips were made from home for all routes. This result is similar in Analysis of Bus Markets Phase I and Phase II studies. [1,2] The largest proportion of riders for most routes stated that they were going to work. For several routes, the share of riders going to colleges or technical institutions for education was also high. The high proportion of work and school trips by the buses shows their importance in facilitating non-discretionary trips. Although the most common destination of the bus riders is work places, many riders also use the buses for personal business and shopping trips.

Like the two previous phases of the bus survey, analysis of access and egress modes showed that most riders walk to and from the bus stops. The second most common access mode was using another bus. On eight of the forty routes surveyed, one in five riders reported accessing their boarding bus stop from another bus. This would indicate that these routes in particular are well-connected with other bus routes. As might be expected, routes that originate or stop at Newark Penn Station, which is well served by NJ TRANSIT rail and or PATH, had a higher share of riders that access their bus stop via these rail modes.

A large proportion (57 percent) of riders reported that they use the bus because they have no other way to travel. This indicates that the bus service is highly important for most bus riders to meet their travel needs. At the same time, a third reported that bus is the best choice for them, even though they have another way to travel to make their trip. These choice riders still make up a sizable portion of greater Newark area bus ridership.

When asked how they would make their trip if their bus service was not available, approximately 15 percent of riders on the surveyed routes said they would not make their trip. The share of riders that would not make their trip exceeded 15 percent on more than half (22 out of 40) of the routes surveyed. This finding demonstrates the importance of NJ TRANSIT bus services to greater Newark area bus customers.

The most common travel alternative reported by survey respondents was app-based rideshare services such as Uber or Lyft. Approximately one third of riders across all routes would make their trip via an app-based rideshare services. The next most common alternative was walking, followed by driving alone, taxi and carpool. In total, 58 percent of bus riders would utilize an auto-based travel option such as driving alone, carpooling, or taking a taxi or app-based rideshare service.

The vast majority of bus riders (78 percent) on the surveyed routes have used app-based services in the 30 days prior to taking the survey. About 20 percent report taking more than 20 trips in the last 30 days. Similar to Analysis of Local Bus Markets Phase I and Phase II, [1,2] this study shows that a large share of riders would use app-based services in the absence of buses. This high level of use would seem to indicate that app-based services may compete with buses. However, regarding the impact of app-based services on ridership, the results of the survey were mixed. Among riders that reported using an app-based service in the last 30 days, a clear majority (61 percent) of bus riders reported using transit more because of app-based services, while far fewer riders reported that TNCs either did not change their use of transit (27 percent) or that they use transit less because of TNCs (12 percent).

The analysis of emissions impact of buses once again confirmed that the use of buses versus alternative automobile modes generates a large reduction in amount of CO_2 emissions. The analysis showed, based on one-way trips alone, 33,174 metric tons of CO_2 would be generated annually from automobiles if the riders traveled by automobile instead of bus. It would take almost 7,211 automobiles to operate for a full year to generate that much emissions. Considering that the vast majority of riders surveyed

stated that they take the bus in both directions for their trips, the total CO_2 emissions saved by the buses is likely to be much higher than the estimate provided above.

Recommendations

The primary objective of this research was to examine the emissions impact of local bus riders potentially deviating to cars, taxis, or app-based services in the absence of buses. A secondary objective was to examine the socioeconomic characteristics of the riders and their travel patterns. The results show that buses provide significant positive environmental benefit. They also serve a large proportion of riders who have no other means of travel, including large proportions of low-income and minority riders. In this sense, NJ TRANSIT bus services provide equity benefits by providing mobility and accessibility, especially for non-discretionary trip made by in disadvantaged communities. Finally, this study provides further evidence that buses function as an interconnected network of services, providing useful feeder service to other buses as well as NJ TRANSIT rail and light rail and other services, thereby helping to increase overall transit ridership. Given these finding, NJ TRANSIT should continue to take steps to promote and encourage bus ridership growth in the greater Newark area and statewide.

Regarding the actual conduct of the bus survey, NJ TRANSIT should consider implementing several enhancements. First, NJ TRANSIT should consider extending the survey period to include off-peak, evening hours and weekend operations. Surveys during these periods could generate data from a more diverse set of riders and could shed light on what the agency might do to encourage ridership for non-work trips. Third, because of the high cost of conducting surveys onboard every bus trip, NJ TRANSIT should consider conducting surveys on selected trips instead of all trips. If this recommendation is implemented, further research would be needed to determine the best way to weight the survey responses to represent full ridership.

Finally, given the number of bus riders that report regularly using app-based services and the high proportion of riders that stated that they would use an app-based service in the absence of buses, further research should be undertaken to understand the true impact of app-based services on mode choice decisions across modes and in different parts of the state. Attention should be given to investigating how rider, transit service, and built environment characteristics affect riders' decisions about when, where and how to use app-based services in the context of the transit options available to them.

REFERENCES

(1) Deka, D. Analysis of Local Bus Markets, Volume I. New Jersey Department of Transportation, Trenton, NJ. 2017. FHWA-NJ-2017-013-1.

(2) Deka, D. Analysis of Local Bus Markets, Phase II Final Report, New Jersey Department of Transportation, Trenton, NJ. 2018. FHWA-NJ-2018-010.

(3) Federal Transit Administration. National Transit Database. April 2023 Complete Monthly Ridership (with adjustments and estimates). Accessed online in June 2023: https://www.transit.dot.gov/ntd/data-product/monthly-module-adjusted-data-release

(4) Dong X, Guerra E, Daziano RA. Impact of TNC on travel behavior and mode choice: a comparative analysis of Boston and Philadelphia. Transportation (Amst). 2022;49(6):1577-1597. doi: 10.1007/s11116-021-10220-5. Epub 2021 Aug 9. PMID: 34393285; PMCID: PMC8351222.

(5) Diao, M., Kong, H. & Zhao, J. Impacts of transportation network companies on urban mobility. Nat Sustain 4, 494–500 (2021). https://doi.org/10.1038/s41893-020-00678-z.

(6) Erhardt, G.D., Mucci, R.A., Cooper, D. *et al.* Do transportation network companies increase or decrease transit ridership? Empirical evidence from San Francisco. *Transportation* 49, 313–342 (2022). https://doi.org/10.1007/s11116-021-10178-4.

(7) Dwayne Marshall Baker, Transportation Network Companies (TNCs) and public transit: Examining relationships between TNCs, transit ridership, and neighborhood qualities in San Francisco, Case Studies on Transport Policy, Volume 8, Issue 4, 2020, Pages 1233-1246, ISSN 2213-624X, https://doi.org/10.1016/j.cstp.2020.08.004.

(8) United States Environmental Protection Agency. Greenhouse Gas Emissions from a Typical Passenger Vehicle. Office of Transportation and Air Quality, EPA-420-F-14-040a. Washington, DC, 2014. https://www.epa.gov/sites/production/files/2016-02/documents/420f14040a.pdf. Accessed on April 20, 2017.

APPENDIX 1 – SURVEY QUESTIONNAIRE

NJTRANSIT
The Way To Go.

Serial # XXXXXX

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 agent onboard the bus or at the terminal, or drop in any US Mailbox (postage-free). Your responses will be kept confidential. To show our appreciation for your help we will enter your name in a drawing to **WIN ONE OF FIVE $100 GIFT CARDS.**

For This Bus Trip...

1. On what bus route did you receive this survey? **Route #** ☐☐☐

2. What time did you board this bus?

☐☐ : ☐☐ ○ AM ○ PM

Hour Minute

3. The place you **CAME FROM** is... (CHOOSE ONE)	4. The place you are **GOING TO** is... (CHOOSE ONE - NOT THE SAME AS QUESTION 3)
○ Home ○ Work ○ Shopping ○ Personal Business ○ Medical/Dental ○ Social/Recreational ○ School (K-12) ○ Technical, College or University ○ Other	○ Home ○ Work ○ Shopping ○ Personal Business ○ Medical/Dental ○ Social/Recreational ○ School (K-12) ○ Technical, College or University ○ Other

5. What is the address of the place you **CAME FROM?** (NOT YOUR BUS STOP)	6. What is the address of the place you are **GOING TO? - YOUR FINAL DESTINATION** (NOT YOUR BUS STOP OR STARTING ADDRESS)
Address or Intersection_____ City/Town_____ State_____ Zip Code_____ ☐☐☐☐☐	Address or Intersection_____ City/Town_____ State_____ Zip Code_____ ☐☐☐☐☐

7. Where did you get **ON this bus?** (TERMINAL/BUS STOP)	8. Where will you get **OFF this bus?** (TERMINAL/BUS STOP)
Address or Intersection_____	Address or Intersection_____
City/Town_____	City/Town_____
State_____	State_____
Zip Code_____ ☐☐☐☐☐	Zip Code_____ ☐☐☐☐☐

9. How did you **get to the bus stop?** (CHOOSE PRIMARY METHOD ONLY)	10. After getting off the bus, how will you **get to your final destination?** (CHOOSE PRIMARY METHOD ONLY)
O Walk Only	O Walk Only
O Drive Only	O Drive Only
O Carpool/Drop Off	O Carpool/Drop Off
O Another Bus_____ *(Please Specify Route/Carrier)*	O Another Bus_____ *(Please Specify Route/Carrier)*
O Light Rail_____ *(Please Specify Boarding Station)*	O Light Rail_____ *(Please Specify Boarding Station)*
O NJT Train_____ *(Please Specify Boarding Station)*	O NJT Train_____ *(Please Specify Boarding Station)*
O PATH_____ *(Please Specify Boarding Station)*	O PATH_____ *(Please Specify Boarding Station)*
O Bike	O Bike
O Taxi	O Taxi
O Uber/Lyft/Other App-Based Service _____ *(Please Specify)*	O Uber/Lyft/Other App-Based Service _____ *(Please Specify)*
O Other _____ *(Please Specify)*	O Other _____ *(Please Specify)*

11. Which of the following statements best applies to you?

O I have no other way to travel, so I use the bus
O I use the bus because it is the best choice for me, even though there are other ways I could Travel
O I usually use another type of transportation, but I occasionally take the bus

12. What type of ticket are you using for this trip? **(CHOOSE ONE ONLY)**

O One-way Ticket/Cash	O Round Trip (2 One-way)	O Student One-Way
O Monthly Pass	O 10-Trip/Multi-trip	O Student 10-Trip
O Sr. Citizen/Customer with disability/Children	O Weekly Pass	O Other_____ *(Please Specify)*
	O Student Monthly Pass	

13. How often do you use this bus route? **(CHOOSE ONE ONLY)**

O 7 days/week	O 3-4 days/week	O Less than one day/month
O 6 days/week	O 1-2 days/week	O Less than one day/year
O 5 days/week	O 1-3 days/month	O First time customer

14. For the other half of your trip (return trip), how will/did you travel? **(CHOOSE ONE ONLY)**

O Same bus route_____ *(Please specify departure time)*
O Another bus_____ *(Please specify Route/Carrier)*
O Train_____ *(Please specify Line/Boarding Station)*
O Car
O Other_____ *(Please specify)*

15. If this bus service was not available, how would you make this trip?

O Would not make this trip
O Drive a car
O Carpool_____ *(Specify # in carpool)*
O Taxi
O Uber/Lyft/Other App-Based Service_____ *(Please specify)*
O Jitney
O Walk
O Bike
O Other_____ *(Please specify)*

16. How many one-way trips, to anywhere, have you taken in the last **30 days** with an app-based ride service like Uber or Lyft?

O 0 Trips	O 3-4 Trips	O 10-19 Trips
O 1-2 Trips	O 5-9 Trips	O 20 Trips or more

17. How, if at all, has your use of app-based ride services like Uber or Lyft changed your use of NJ TRANSIT services?

O I use NJ TRANSIT **MORE** (Select: Bus____ Light Rail____ Rail____)
O I use NJ TRANSIT **LESS** (Select: Bus____ Light Rail____ Rail____)
O My use of NJ TRANSIT services **HAS NOT CHANGED**

18. Are you...? O Male O Female

19. What is your age?

O Under 18 years	O 25-34 years	O 45-54 years	O 62-64 years
O 18-24 years	O 35-44 years	O 55-61 years	O 65 or over

20. Are you of Spanish/Hispanic/Latino Origin? O Yes O No

21. Are you...? **(CHOOSE ONE ONLY)**

O White	O American Indian or Alaska Native
O Black or African American	O Multi-Racial
O Asian or Pacific Islander	O Other (*Please specify*)_____

22. Please tell us:

How many **people (including yourself)** are in your household?

____ *people*

How many **licensed drivers (including yourself)** are in your household?

____ *licensed drivers*

How many **vehicles** (cars, motorcycles, trucks, SUVs, vans, etc.) are in your household?

____ *vehicles*

23. Do you have a physical condition that makes it difficult for you to use the bus?

O No O Yes ⟶ Do you use a...? O Wheelchair O Other Mobility Device

24. How well do you speak English?

O Very Well O Not Well
O Well O Not at all

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

O Yes (*Please specify*)_____ O No

26. What is your Annual Household Income?

O Under $15,000 O $35,000 - $49,999 O $100,000 - $149,999
O $15,000 - $24,999 O $50,000 - $74,999 O $150,000 - $199,999
O $25,000 - $34,999 O $75,000 - $99,999 O $200,000 or over

27. What is your current occupation?

O Management/Professional O Sales/Retail
O Technical/Skilled O Retired
O Clerical/Secretarial O Student
O Not currently employed O Homemaker
O Non-Office Worker O Other_____
(Please specify)

*Please be assured your responses will be kept confidential. To enter our drawing to **WIN ONE OF FIVE $100 GIFT CARDS,** please provide your…*

Name_____

Street Address_____

City/Town_____ State_____

Zip Code_____ Phone #_____

Email Address_____

Your comments are important to us. If you have specific comments, please…
Call Customer Service: 1-973-275-5555 or Visit our Website: www.njtransit.com