



An Onboard Survey of GoTriangle Customers

2018

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Executive Summary

Introduction

In early October 2018, CJI Research conducted an onboard survey of GoTriangle customers. The GoTriangle survey includes 810 responses and has a margin of error of +/-3.3% at the 95% level of confidence.

PERCEPTION OF MAJOR SERVICE IMPROVEMENTS

- The survey obtained customer ratings of overall GoTriangle service and nineteen specific elements of service. A seven-point scale was used on which a score of 1 means very poor and 7 means excellent. The percent rating GoTriangle service overall as 7 is 26%. Another 34% rated service as 6 on the same scale, meaning that the total rating service as excellent or very good is 68%.
- Top rated elements with scores of 6 or 7 include three aspects of service that help define the environment in which customers travel:
 - Sense of safety on the bus (74%)
 - Bus operator helpfulness (73%)
 - Cleanliness of the interior of the buses (70%)
- Operational aspects of service used by almost all customers all had 50% or more ratings of 6 or 7.
- Of widely used operational elements, two elements deserve note:
 - For weekday service frequency 60% gave a score of 6 or 7, and yet many riders stated a preference for greater frequency.
 - For ease of transfers within the GoTriangle system 62% gave a score of 6 or 7
- When asked to rank areas for improvement:
 - "Buses running on time" is by far the most frequently cited aspect of service to improve. It was cited by 55% of customers as first, second, or third most important to improve among the nineteen specific aspects of service examined.
 - Second most important in this sense is "Weekday Service frequency" (34%), unexpected given that this was among the highest satisfaction scores. This is a good example of a relatively prosperous ridership satisfied with service but wanting still more.
 - Third most important: Average time for the total trip (26%).
 - Fourth most important to improve was the quality of WiFi (24%)
- Another way to consider service improvement priorities is to examine the correlation of each aspect of service with the overall service rating. That technique identified five priorities that are currently rated approximately at an average quality score, but that would have would have a significant impact on the overall quality of service rating. They are, in ascending order of the impact on the overall satisfaction score: Total average time to make a trip, service to all destination desired (coverage), Weekday Service Hours, Buses running on time, and the Usefulness of telephone operators.
- Trip purpose is primarily oriented to employment (72%) and school or college (17%), but some customers (totaling 10%) also use GoTriangle for shopping, medical/dental visits or recreation.

DEMOGRAPHICS

- GoTriangle provides a key support for employment and education. Of all GoTriangle customers, 65% are employed full time and another 14% part time, for a total of 79% being employed. Another 26% are students, among whom 14% are students only, while 12% are students who are also employed.

- 41% of GoTriangle customers identify themselves as Caucasian/White, 33% identify themselves as African-American, 13% Asian, 6% Hispanic, 2% Native American, and 4% “Other.”
- Like most U.S. bus systems, the ridership of GoTriangle is young, with 53% younger than thirty-five.
- Unlike the customer base of most transit systems in the United States, an approximately equal proportion of women (50%) as men (48%) use GoTriangle. (2% preferred not to answer.)
- Similar to the ridership of many bus systems, many GoTriangle customer households report that they have low household incomes. In this survey, 42% report income of less than \$25,000. However, incomes of GoTriangle rider households are somewhat higher than bus riders nationally. Nationally 30% of bus rider households have incomes of less than \$15,000, while the comparable figure from GoTriangle is 18%. Nationally, 31% report incomes of \$50,000 or more, the comparable GoTriangle figure is 44%.
- GoTriangle customers are less transit dependent than customers of many bus systems. Nationally, 61% of bus riders say they lacked a vehicle to use for the trip they were making when surveyed. Conversely 39% had a vehicle. The GoTriangle survey shows how different GoTriangle customers are. GoTriangle reverses the national pattern: 66% have vehicles available, while 34% do not.

TRAVEL CHARACTERISTICS

- 29% of GoTriangle customers say they are using GoTriangle more often than in the previous year and 23% say they began riding only in 2018. Only 5% say they are riding less often now.
- 71% of GoTriangle customers say they use GoTriangle during what for them is a typical week. When using other systems in the Triangle Region, GoTriangle customers are more likely to use GoRaleigh (24%), GoDurham (21%), or Chapel Hill Transit (19%) than they are to also use GoCary (6%), Wolfline (3%), or Duke Transit (3%).

RIDESHARING

- 43% have used Uber or Lyft at least once in the thirty days prior to the survey.
 - Of the 43% using Uber or Lyft in the previous thirty days, 59% (25% of all GoTriangle customers) used Uber or Lyft to replace a GoTriangle trip.
 - Of that same 43% who have used Uber or Lyft at least once in the past thirty days, 39% (or 17% of all customers) have used them as part of a GoTriangle trip.

FARE MEDIA

- The largest percentage of GoTriangle customers boarded with a GoPass (46%) or University ID (10%). Many (16%) used a day-pass purchased either on the bus (9%) or ahead of time (7%), while 10% used a 7 or 31 day pass, and 19% used a single trip cash fare.
 - Combining the cash fare and the day-pass purchase on the bus, a total of 28% make a fare transaction on the bus
 - Conversely, 72% make a prior pass purchase or use a free pass such as GoPass or a university ID, thus avoiding the delay of conducting a transaction while boarding.

MOBILE COMMUNICATION

- A transit app has been downloaded by 62% of GoTriangle customers.
- While the use of transit apps is still very much inversely related to age, the use of basic cellphones is not. For example, 91% of customers over the age of sixty-five use a cell phone, but only 35% of that group uses a transit app. Yet, it is interesting that even in this oldest group in the survey, one-third of the customers use a transit app.

Introduction and Methodology

Background

As part of a regional customer satisfaction measurement program, CJI Research, LLC conducted a survey of customers onboard GoTriangle buses in two phases. First, surveys were conducted from the GoTriangle facility in Morrisville between October 9 through 16, 2018. Subsequently during the survey conducted for GoRaleigh, surveys were conducted between October 26 and November 3 on the GoTriangle routes operated by GoRaleigh. Similar surveys were conducted during the preceding weeks with customers of GoDurham and GoCary.

The questionnaire used in the survey was initially developed by Hugh Clark of CJI Research refined a coordinating committee from GoTriangle and CAMPO led by Elizabeth Raskopf of GoTriangle, the agency coordinating the multi-system project. The committee included representatives of all four transit agencies and CAMPO.

Methods: How the Survey Was Conducted

SAMPLE

A random sample of runs was drawn from a list of all GoTriangle runs. This initial sample was examined to determine whether the randomization process had omitted any significant portion of the GoTriangle system's overall route structure. The sample was adjusted slightly to take any such omissions into account.

Survey data collection occurred onboard the buses. On the bus, survey staff approached all customers rather than a sample. The only exception was that customers who appeared younger than sixteen were not approached, both for reasons of propriety and because children are typically unable to provide meaningful answers to several of the questions.

Because all customers were asked to participate rather than a sample of customers on the bus, there was little or no opportunity for a survey staff member to introduce bias in selection of persons to survey. In effect, a bus operating within a specified window of time became a sample cluster point in a sample of such clusters throughout the total system.

The GoTriangle survey includes 810 respondents and has a margin of error of +/-3.3% at the 95% level of confidence. When the distribution of responses is other than 50:50 on a specific question, the sample error for a given sample size decreases somewhat. If a sub-sample is used, sample error increases somewhat. However, with such a large overall sample this would affect the findings only in a few circumstances in which only small sub-segments of the ridership were being examined separately.

DATA COLLECTION

Temporary workers from the Greer Group Inc. of Cary, NC were trained to administer the surveys under the supervision of CJI Research staff. Surveyors wore smocks identifying them in large print as "Transit Survey" workers. This uniform helps customers visually understand the purpose of why an interviewer would be approaching them, thus increasing cooperation rate.

In most cases, the survey personnel met the bus operators at pull-out, and accompanied them at the beginning of their shifts and rode the buses throughout the driver's assignment, or they took a shuttle to Cary Station to catch their assignments. In some instances, in order to assure broader coverage of certain routes, surveyors rode partial runs and then transferred to another route or run.

The questionnaire was self-administered. Survey personnel handed surveys and a pen to customers and asked them to complete the survey.

At the end of each sampled trip on a given run, the survey personnel placed the completed surveys in an envelope marked with the route, the run, the time, and the day and reported to the survey supervisors who completed a log form detailing the assignment. A total of 141 trips were sampled and recorded in this manner.

PARTICIPATION RATES

Completion Rates on GoTriangle Onboard Survey, 2018

A total of 1,280 persons were riding during the surveyed trips and had a chance to participate if of age and able to speak English or Spanish			
Of those on the bus during the surveyed trips:			
	(11)	appeared to be younger than 16 and were not asked to participate	1%
and	(30)	customers spoke a language other than English or Spanish	2%
and	247	refused outright	19%
and	151	said they had already completed the survey (possibly on another system)	12%
and	832	accepted the survey form with the apparent intention of completing it	65%
<hr/>			
Thus,	832	customers represent, the total "effective distribution," i.e., the raw sample	% of the effective distribution
Of the effective distribution	22	Failed to return the survey they had accepted	3%
and	808	Completed the survey on the GoTriangle bus	97%
and	2	completed the survey and returned it by mail or to an operator on another bus	0.2%
Thus, finally	810	Completed the survey and constitute the final sample	97%
<hr/>			
Key summary statistics		Of all persons on board the sampled trips, this represents:	63%
		Of all English or Spanish speaking adults riding on a surveyed vehicle, this represents:	68%
		Of all the customers on sampled trips who accepted a questionnaire, this represents:	97%

Of the 810 GoTriangle respondents:

- 683, or 86% completed all questions in the survey.
- Another 96, or 12% completed all but the final question, household income. Income questions always have a high refusal rate.
- Therefore, 789 completed all questions or all but the income question.
- This means that 97% of the sample answered at least thirty five of the thirty seven questions
- 99.5% of the sample completed all twenty customer satisfaction questions. One rider who turned in a questionnaire without having completed the customer satisfaction questions was dropped from the analysis.

In the analysis, those who did not respond to a question are eliminated from the computation of percentages and means unless there was a way to infer the response. For example, if a rider gave as a trip purpose *getting to or from school*, it was apparent that this was a student, and that employment could be coded as "student," even if the respondent had not responded to the employment question.

QUESTIONNAIRE

The questionnaire was self-administered. It is reproduced in Appendix A.

The questionnaires were serial numbered so that records could be kept for the route and day of the week on which the questionnaire was completed. This is a more accurate method than asking customers which route they are riding when completing the survey.

The survey is printed in English on one side and in Spanish on the other. In the survey of GoTriangle customers, 46 customers, or 6% of the effective final unweighted sample identified themselves as Hispanic, but only 11, or 1.4% of the completed questionnaires were completed in Spanish.

ANALYSIS

Analysis consists primarily of crosstabulations and frequency distributions. Tables were prepared in SPSS, version 26 and charts in Excel 2016. The GoTriangle survey will be archived by CJI Research so that it will be available for further analysis as needed.

With a few exceptions, all percentages are rounded to the nearest whole number. In a few cases, when this could have caused important categories to round to zero, or when comparisons between charts would appear inconstant if tenths were not included, percentages are carried to tenths. Rounding causes some percentage columns to total 99% or 101%. These are not errors and should be ignored.

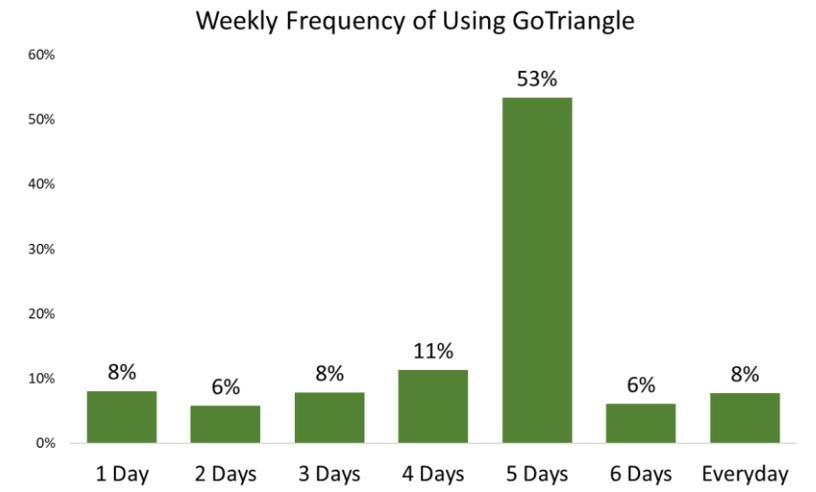
Rider Profile

Frequency of Using GoTriangle

Riders were asked on how many days in a typical week they use GoTriangle. For purposes of further analysis, the customers are grouped into three sets, or "segments," depending upon how frequently they use GoTriangle. We refer to them as:

- One-to-three-day: Those who use GoTriangle one, two, or three-days a week (22%)
- Four-to-five-day: Those who use GoTriangle four or five days a week (65%)
- Six-to-seven-day: Those who use GoTriangle six or seven days a week (14%)

Figure 1 Frequency of Using GoTriangle



Why segment the sample in this manner? Understanding the ridership in groups rather than as a monolith is generally useful to those involved with planning or marketing. The frequency of using public transit is the most basic differentiating characteristic within the ridership.

Other breakdowns may also be of interest, and by request such breakdowns can be provided quickly

because the survey data is maintained live to meet such requests. Such breakdowns might include level of dependency on transit, trip purpose, or demographics such as age or income. All are easily available on request.

Figure 2 Compressed Measure of Frequency of Using GoTriangle

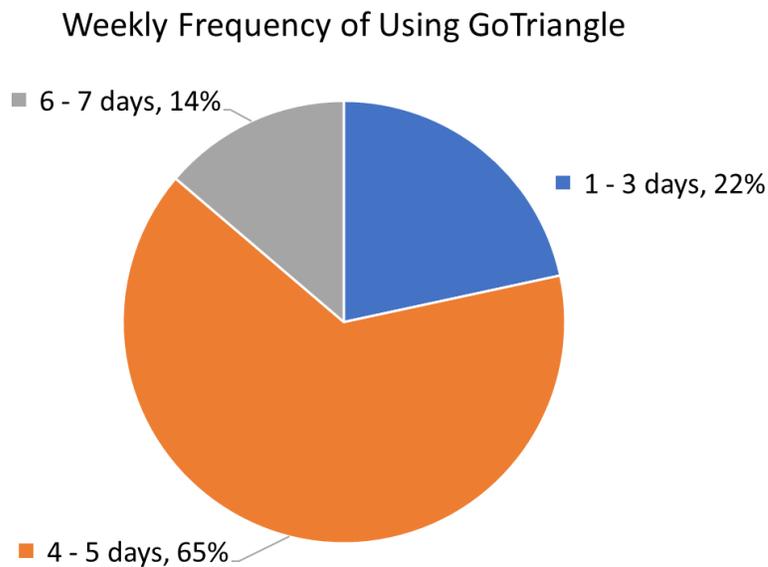
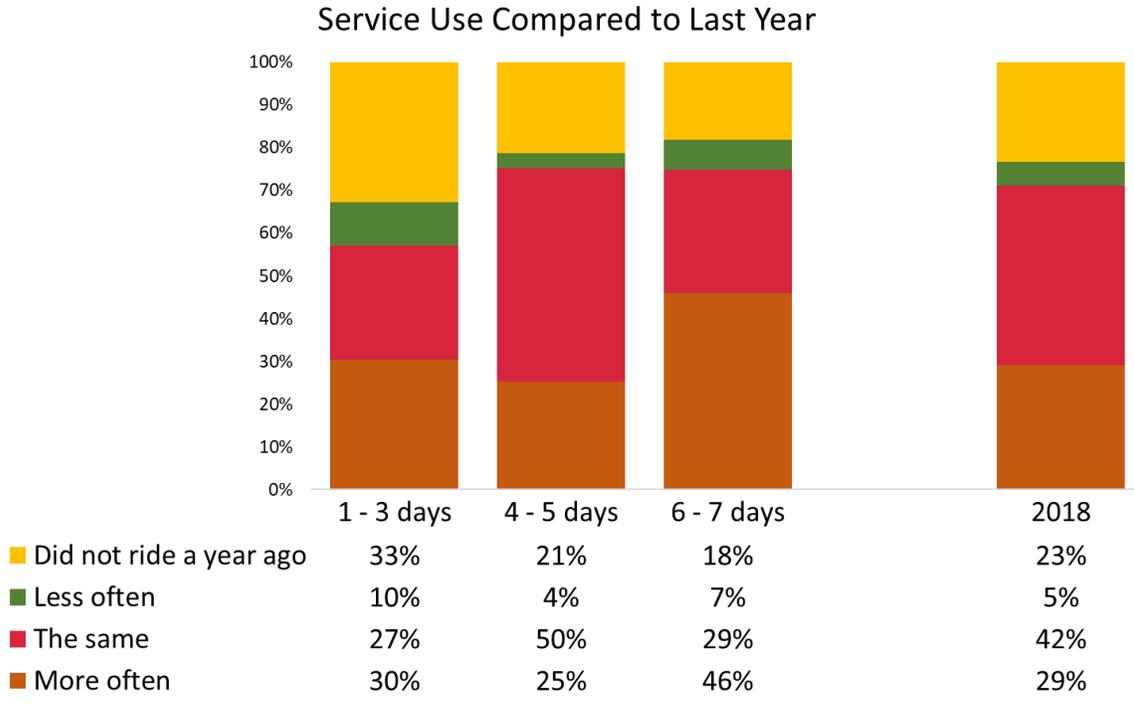


Figure 3 Compared to a Year Ago, Do You Ride More Often, Less Often or the Same?

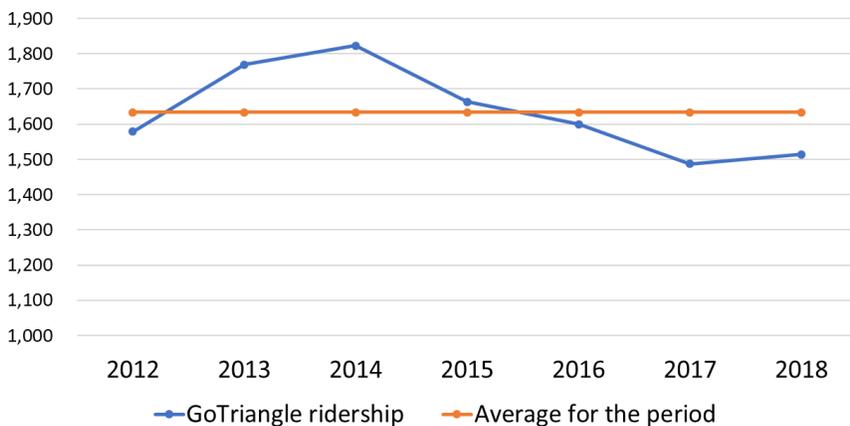


Compared to a Year Ago, Do You Ride More Often, Less Often or the Same?

Overwhelmingly, respondents say that they are riding either with same frequency (42%) or more often (29%) than a year ago, and 23% say they are new riders. Only 5% say they are riding less often. The one-to-three-day riders are the most likely to be new riders (33%), while the most frequent riders are more likely (46%) than the other segments to say they are riding more often. It is speculation, but this increase may be related to the tightening of the labor market and resulting increases in hours worked.

Figure 4 GoTriangle Ridership, 2012 to 2018

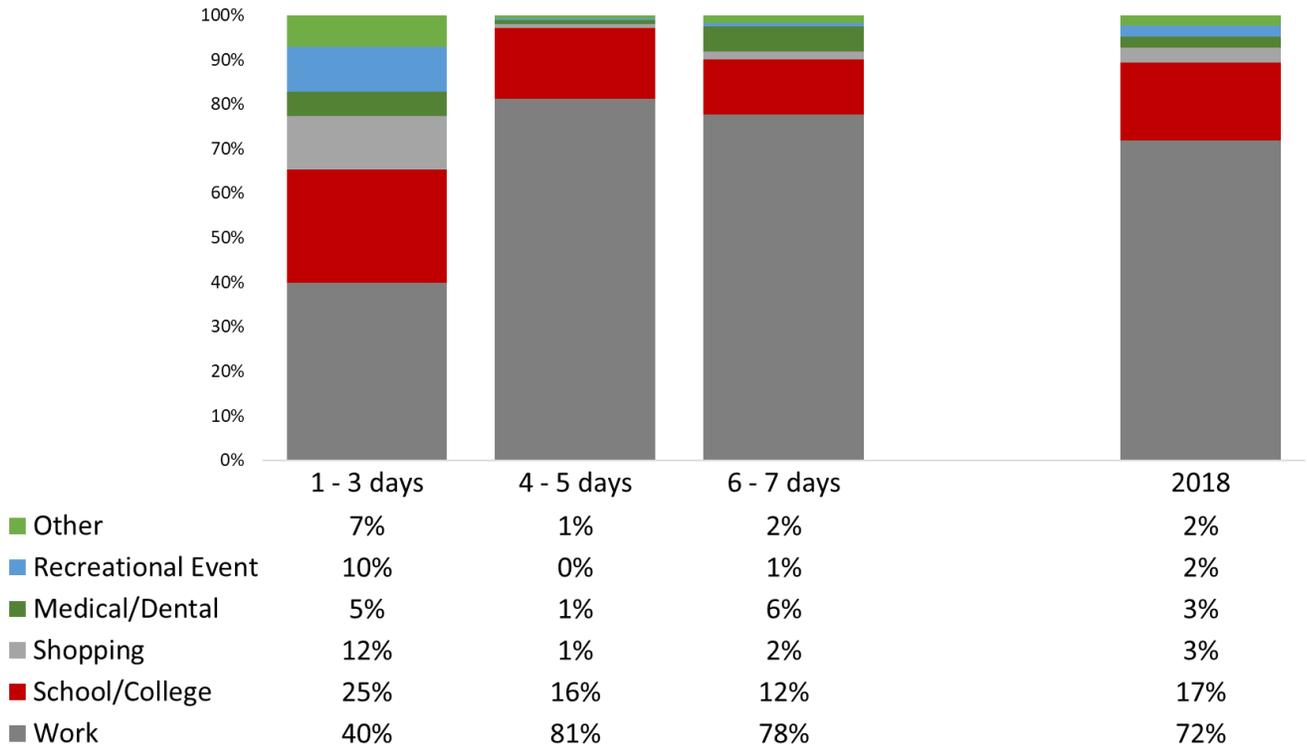
Trips per year (in thousands) on GoTriangle in Relation to Average for the Seven Year Period, 2012 through 2018
 (Source: GoTriangle internal records from Planning Department)



Ridership and survey figures are not strictly comparable. Thus, the finding that 29% say they are riding more often may or may not be entirely consistent with the ridership data which show only a small growth (2%) although it was growth that reversed the trend in long term loss of 11% from 2014 through 2017. We do not know how much they may have increased their riding, for example. Their increased use may have been minimal.

Figure 5 Trip Purpose

Main Trip Purpose for Using GoTriangle Buses



Trip Purpose: Use of GoTriangle for Various Purposes, by Segment

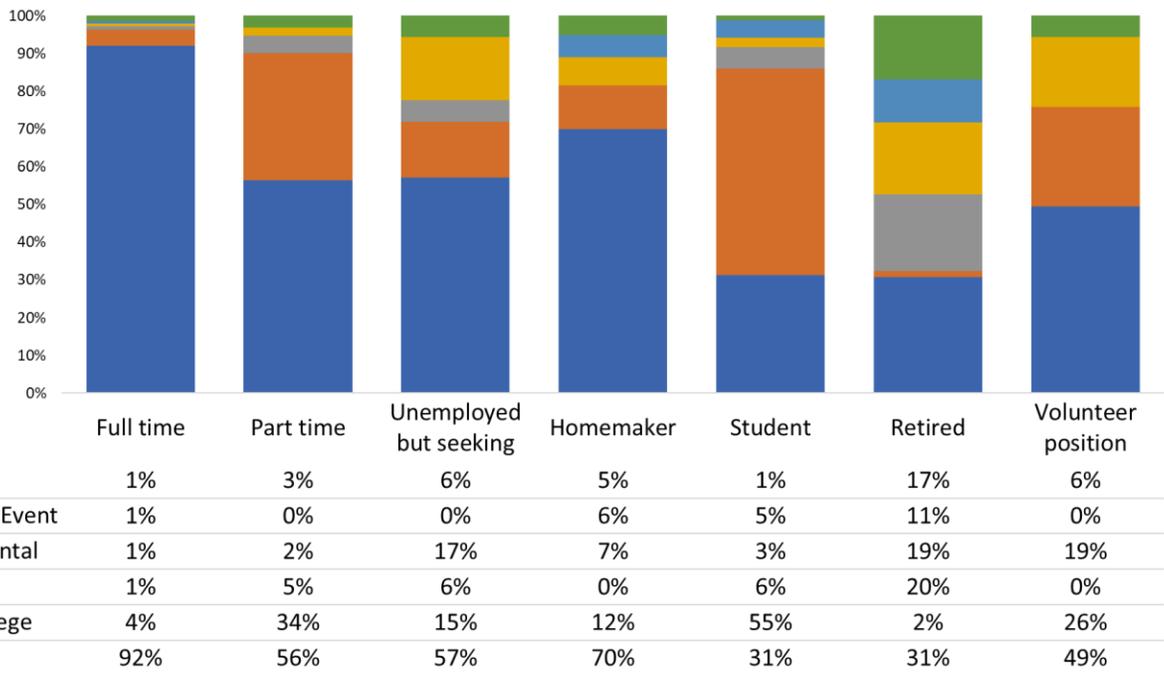
Customers were asked to name the single main purpose for which they use GoTriangle.

- Getting to or from work is the primary trip-purpose, with 72% of customers citing work as their most frequent trip purpose.
- School and college trips make up another 17% of trips. Thus, GoTriangle is carrying a large proportion of its customers (89%) either for work trips or for school trips, an indication of its economic impact through the labor force.
- Another 3% of the customers indicate that they use GoTriangle to make shopping trips, a set of trips with immediate economic impact.
- Medical (3%) and recreational (2%) trips account for 7%.

A substantial majority of the four-to-five-day riders (81%) and six-to-seven-day riders (78%), but fewer of the one to three day riders (40%) had made work-trips. The one-to-three-day a week riders are more likely than the other segments to have used GoTriangle for each of the non-work purposes with the exception of Medical/Dental purposes. This is especially true for school/college trips (25%), shopping (12%), and recreation (10%).

Figure 6 Employment and Trip Purpose

Trip Purpose by Employment, GoTriangle



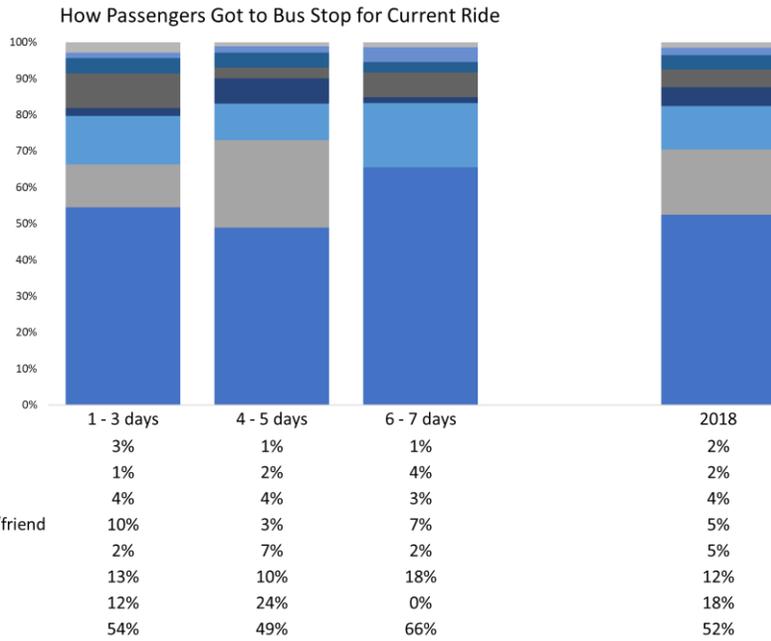
Employment and Trip Purpose

That employment would be closely related to trip purpose would appear self-evident. However, there are some variations. As expected, 92% of those employed full time use GoTriangle to go to or from work, while 56% of part-time workers are headed for work, and another 34% of those part-time workers are headed for school. These are as anticipated.

Less expected is that 57% of those who say they are unemployed say they are going to or coming from, work. One possibility is that they are in temporary jobs of some sort while looking for work and therefore consider themselves to be unemployed according to those conditions. Similarly, 31% of retirees say they are making a work trip, probably working part time but still considering themselves to be primarily retired. Nearly three-fourths of homemakers (70%) say they too are going to work. These individuals could be working part time but consider homemaker to be their main occupation. Students, as expected, are going either to school (55%) or to work (31%).

In short, a customer’s employment circumstances strongly influence, but do not determine trip purpose.

Figure 7 Mode to the GoTriangle Bus Stop



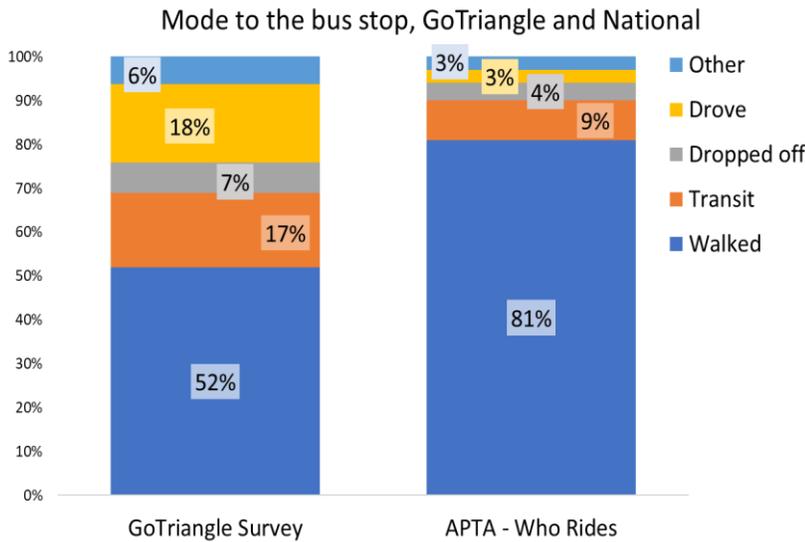
Mode to the Bus Stop

About half of users (52%), most often simply walk to the nearest bus stop.

There are differences among the three rider segments in this respect, with six-to-seven-day riders having the most customers who walked to the nearest GoTriangle

bus stop (66%), and the other two segments, one-to-three-day (54%) and four-to-five-day (49%) riders having a smaller proportion who walk, and more who bike or get a ride. All three segments have a significant percentage who drive to their stop, with the most frequent riders having the highest percentage in that respect (18%).

Figure 8 Access Mode – GoTriangle and Nationally (GoTriangle Survey and APTA, “Who Rides Public Transportation”)



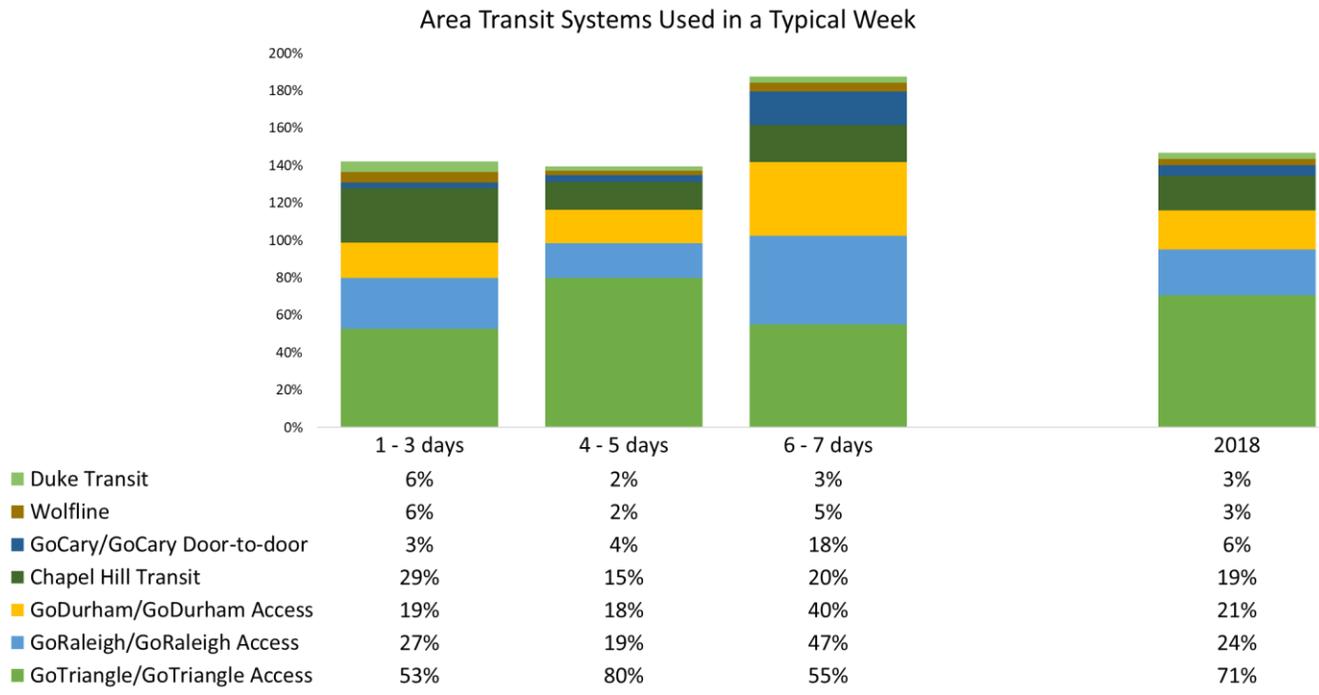
GoTriangle is performing very differently from national norms with respect to the mode to the bus stop. Nationally, 81% of bus system riders walk to their stops, while 52% of GoTriangle riders do so¹. While 9% of bus riders nationally use public transit to access the stop they used for the trip on which they were surveyed, the same is true for 17% of GoTriangle riders. As a regional system, within a service area in which more than three other bus systems operate, GoTriangle is inherently more likely than many bus systems nationally to have a relatively high proportion of

customers who access its service by other transit services.

Another interesting finding between how GoTriangle and national users access stops is that 18% of GoTriangle users drove to their stops, while nationally only 3% did so.

¹ See APTA , Who Rides Public Transportation, CJI Research, 1016.

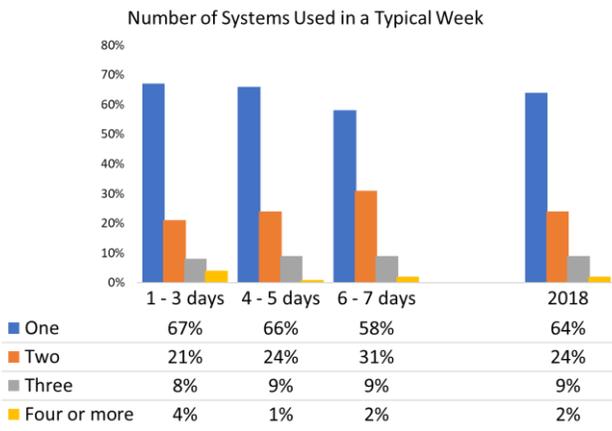
Figure 9 Bus Systems Used in a Typical Week



Use of Area Bus Systems

Respondents were asked which of the transit systems in the region they use in a typical week. Since they can use multiple systems, the sums of the percentages exceed 100% in Figure 9.

Figure 10 Number of Transit Systems Used in a Typical Week



As expected, most, but not all, GoTriangle customers (71%) use GoTriangle during what for them is a typical week. However, given that it provides the regional connectivity among the several systems, many people also use GoRaleigh (24%), GoDurham (21%), or Chapel Hill Transit (19%). Some use GoCary (6%) or one of the university systems, Duke Transit or Wolfline (3% each).

The most frequent GoTriangle riders are somewhat more likely than others to use more than one system in the typical week. While 66% or 67% of the four to five day and one to three day riders

(respectively) use one transit system, fewer (58%) of the six to seven day riders use only one, presumably most often GoTriangle.

Figure 11 GoTriangle Fares at the Time of the Survey

GoTriangle Fares		
	Full Fare	Discount Fare
Single Ride Fare	Regional Routes: \$2.25 Express Routes: \$3.00	Regional Routes: \$1.00 Express Routes: \$1.25
GoTriangle Express Day Pass	\$ 6.00	\$ 2.50
GoTriangle Express 7-Day Pass	\$ 22.00	\$ 9.25
GoTriangle Express 31-Day Pass	\$ 102.00	\$ 42.50
\$50.00 Value Card	\$ -	\$ 40.00
\$25.00 Value Card	\$ -	\$ 20.00
\$13.50 Value Card	\$ -	\$ 12.00
Regional Day Pass	\$ 4.50	\$ 2.00
Regional 7-Day Pass	\$ 16.50	\$ 7.50
Regional 31-Day Pass	\$ 76.50	\$ 34.00
GoTriangle Access 11 Ride Card	\$ 45.00	\$ -
GoTriangle Access Monthly Pass	\$ 153.00	\$ -

GoTriangle Fares at the Time of the Survey

The table in Figure 11, developed from fare listings on the GoTriangle website², displays the several types of pass media and special fares available at the time of the survey in 2018.

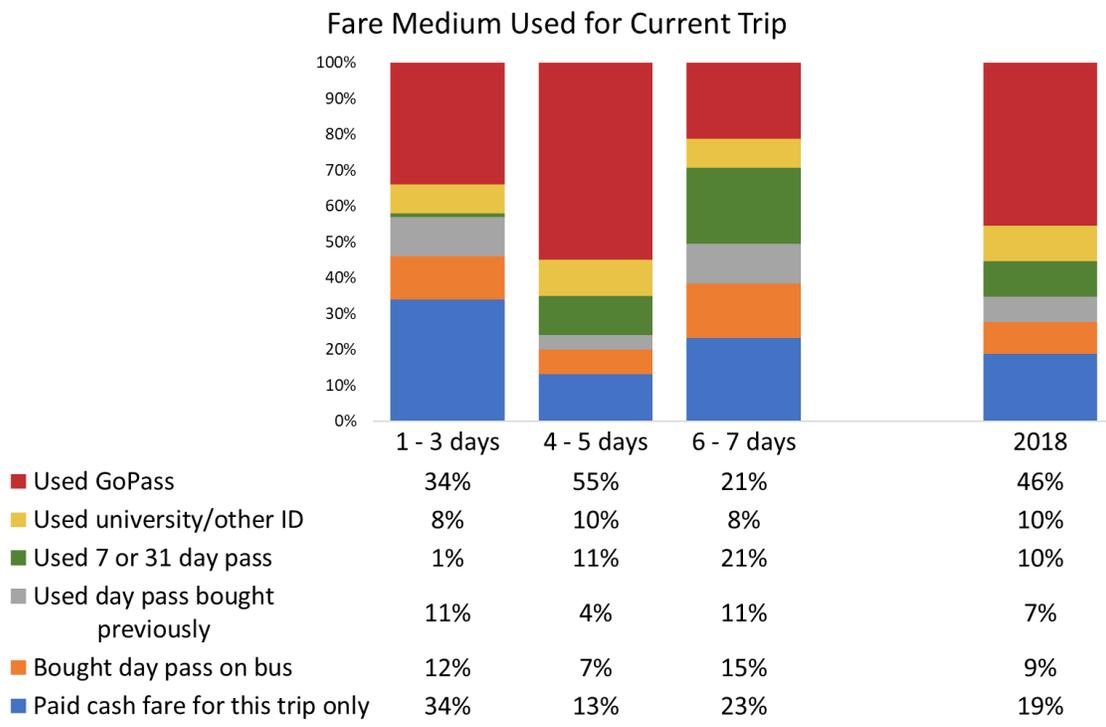
Type of Fare Used

The largest percentage of GoTriangle customers, 46%, used a GoPass for their trip, and another 10% a university ID. This means that 56% boarded with free fare.

Paid passes were used by 16% who used a day-pass purchased either prior to the trip or onboard their bus, and by another 10% who

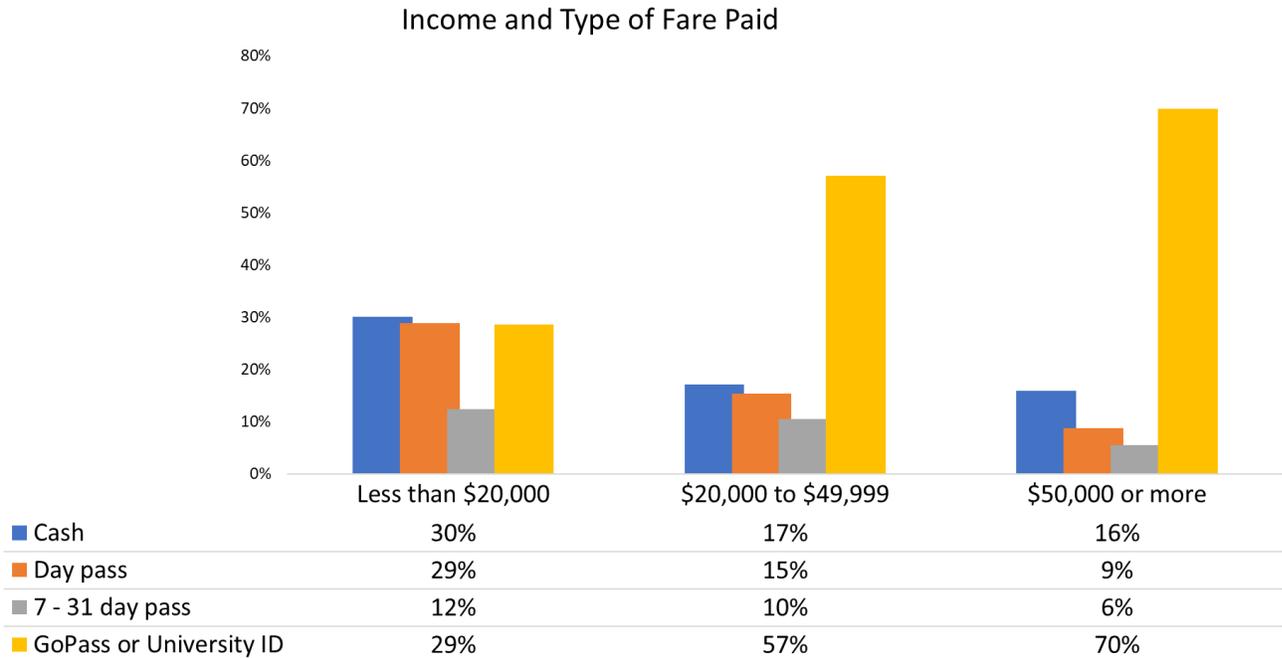
used a seven or thirty one day pass. Finally, 19% paid a single trip cash fare. The tendency to use an employer-provided GoPass is greatest among the four to five day commuters. It seems likely that they tend to hold jobs with a regular five-day-a-week schedule.

Figure 12 Fare Medium Used



² Source of fare information: <https://gotriangle.org/fares-passes>

Figure 13 Income and Type of Fare Paid



Income and Fare Medium Used

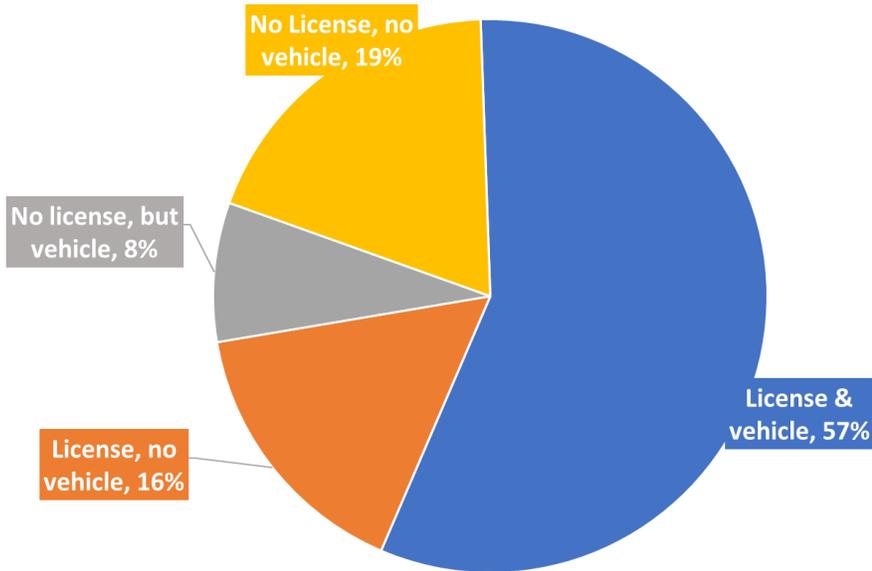
In many systems a decade or more ago, when the day-pass was not yet widely offered, the primary discounted pass option was often a monthly pass and sometimes a seven-day pass. Lower income riders rarely could afford to utilize the fare discount offered by such passes because of the challenge posed by their very limited cash flow, and the risk of committing cash in advance for a month’s or even a week’s transportation. Thus, there was a strong tendency for lower income riders to pay full cash fares, and for discounted passes to be used primarily by those with higher incomes. With the advent of the day pass, however, that inverse relationship that years ago often appeared in passenger surveys between the use of discounted multi-trip pass fare media and income has weakened to the point of almost disappearing.

The day pass rarely offers as deep a discount as a longer term pass, but it imposes little risk, no substantial cash flow problem, and does save money for the user. Also, if pre-purchased before boarding, or at the second and subsequent uses if purchased on the bus, it also saves boarding time for the system, thus providing both a social and an operational benefit.

On GoTriangle, 30% of those with household income of less than \$20,000 use cash, while only about half that many of those with incomes of \$50,000 or more use cash (16%). Thus there is still an inverse relationship. There is also a second inverse relationship between income and fare type, however. Those with incomes of \$50,000 or more are about two and a half times more likely (70%) as those with incomes less than \$20,000 (29%) to use a GoPass or a university ID to use GoTriangle services at no cost to themselves.

Figure 14 Aspects of Mode Choice: Having a License and Having a Vehicle

Having Valid Driver's License and Vehicle Available

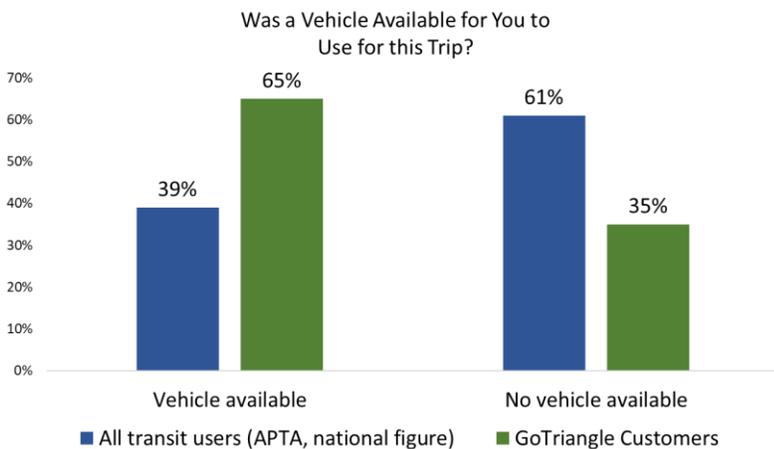


Three Aspects of Mode Choice

Having a choice of local transportation mode typically depends not only on the availability of a vehicle but also on having a valid driver's license. Figure 14 above indicates that a majority of GoTriangle customers (57%) hold a valid license and have a vehicle available for their use. Some have a license but no vehicle (16%). Only 27% have no valid license. Some of these (8%) say they have a vehicle but no valid license. Only 19% have neither a license nor a vehicle.

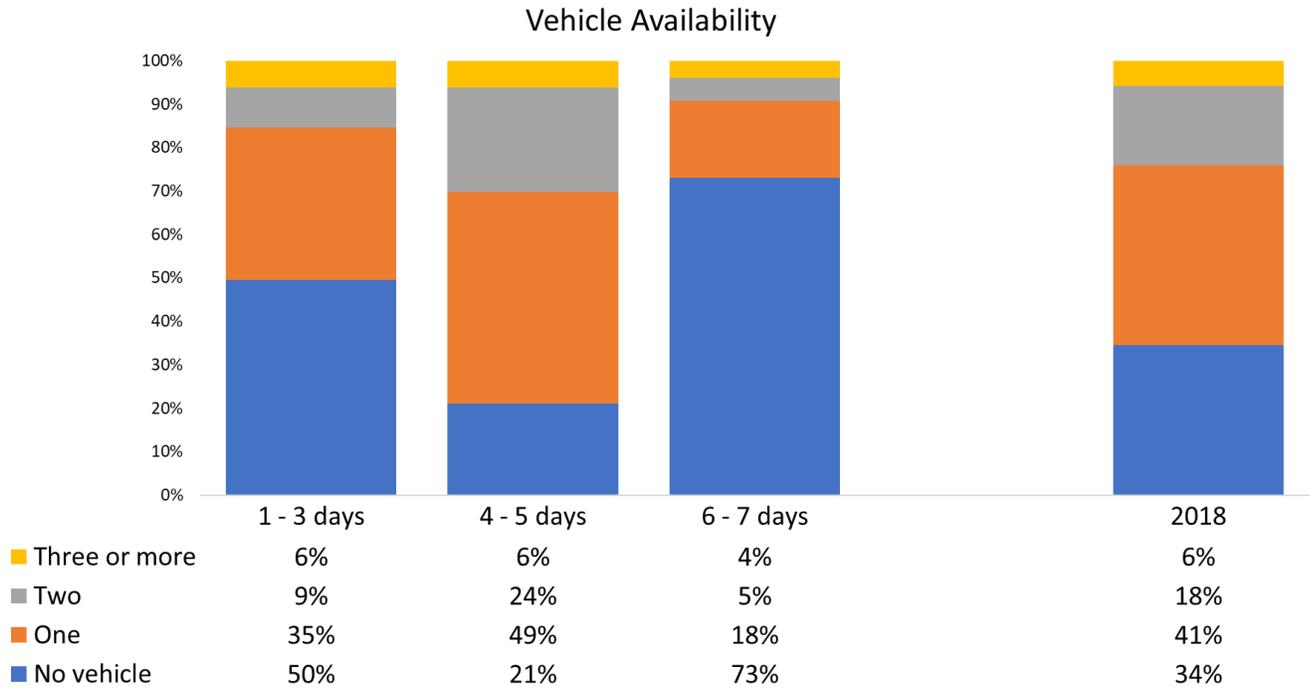
Nationally, the meta analysis conducted by CJI Research for APTA of more than 200 onboard surveys indicated that among bus riders, 61% lacked a vehicle for the trip they were making when surveyed. Conversely 39% had a vehicle. GoTriangle shows a reversal of this pattern: 65% have vehicles available, while 35% do not.

Figure 15 Vehicle Availability (APTA, *op cit*)



GoTriangle is quite different not only from the national norm and from other systems in the Triangle region in this respect. This will be apparent in a further report comparing the four systems surveyed in the Triangle Region.

Figure 16 Availability of a Vehicle



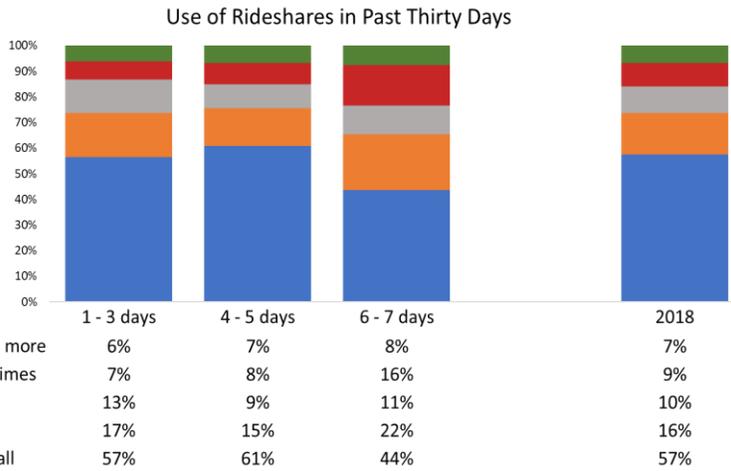
Availability of a Vehicle

Figure 15 demonstrated that 65% of the GoTriangle customers have a vehicle available. Is the availability of a vehicle related to the frequency with which customers use GoTriangle? As indicated by Figure 15, there are variations between user segments in this respect, but no linear relationship between vehicle availability and frequency of using GoTriangle.

Customers who use GoTriangle four or five days a week are substantially more likely than either of the other segments to have a vehicle available (79%). Those who use GoTriangle most frequently six or seven days a week are least likely to have a vehicle available (27%). Those using GoTriangle least often (one to three days a week) fall in between those segments, with 50% having a vehicle available.

The lack of a vehicle is not “causing” people to ride GoTriangle more or less often. The mixed relationship between frequency of riding GoTriangle and vehicle availability is caused by varied income levels and the ability to afford a vehicle.

Figure 17 Use of Uber or Lyft in Past Thirty Days



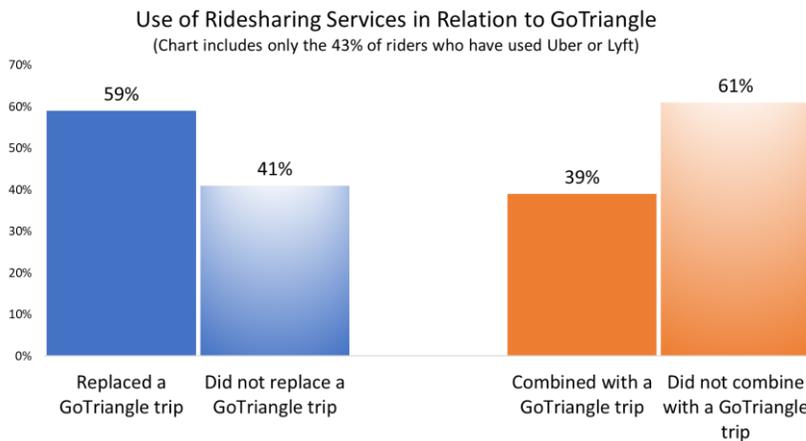
Use of Uber or Lyft in past thirty days

Mode choice is no longer simply about owning or leasing a personal vehicle. Since 2015, car sharing has become mainstream. Of all GoTriangle customers, 57% say they have not used car sharing services in the past thirty days. Conversely, this means that 43% have used one of the car-sharing services. This includes 10% who have used them only once, 9% twice, 7% three times and 16% four or more times³.

Use of Uber and/or Lyft to Supplement or Replace a Trip on GoTriangle

Figure 17 indicated that 43% of GoTriangle customers had used Uber or Lyft in the past thirty days. How have those trips interacted with GoTriangle? Figure 18 provides basic answers.

Figure 18 Use of Uber and/or Lyft to Supplement or Replace a Trip on GoTriangle



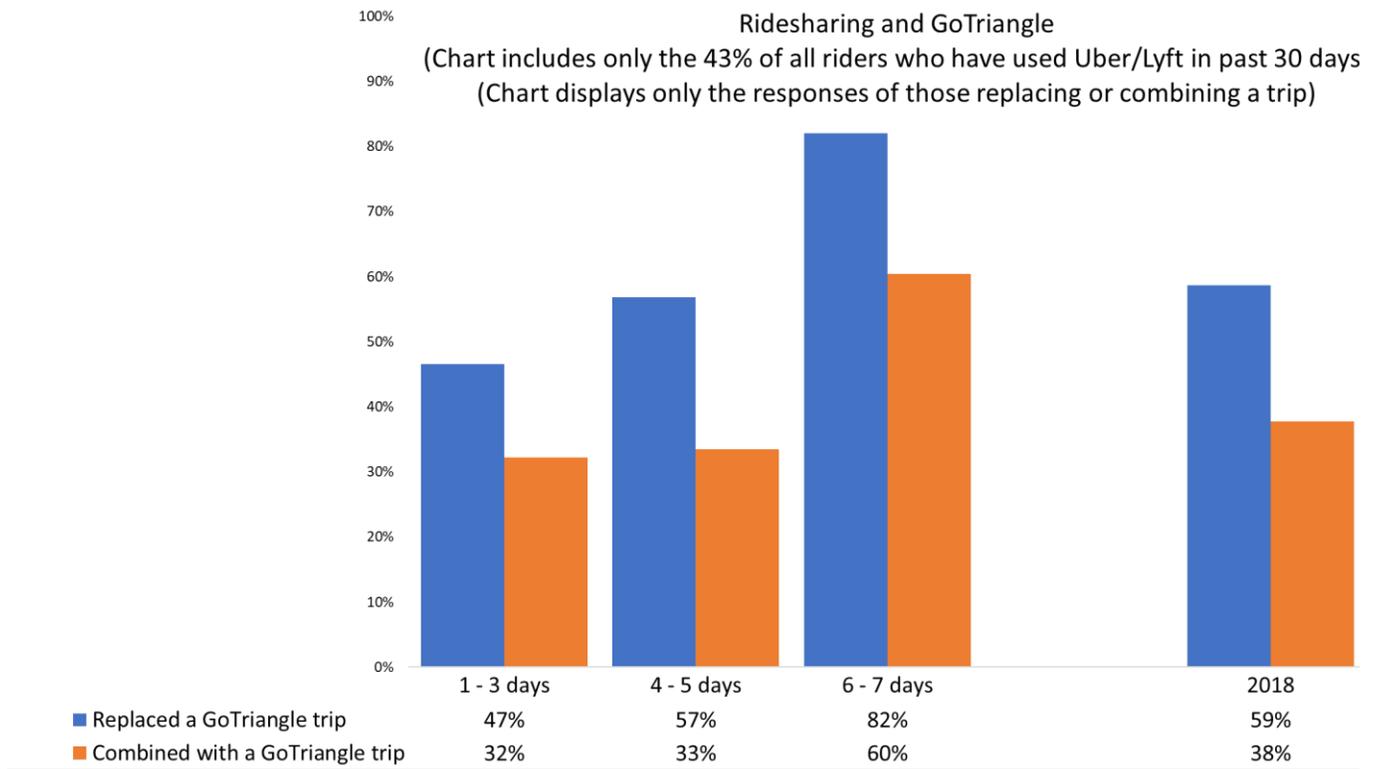
Of the 43% of GoTriangle customers who have used Uber or Lyft, 59% say they replaced a GoTriangle trip with a ridesharing trip. This amounts to 25% of all GoTriangle customers (i.e. 59% of 43% = 25%).

Of the 43% of customers who have used Uber or Lyft, more than one-third, 39%, say they combined a ridesharing trip with a GoTriangle trip. This amounts to 17% of the ridership (i.e., 39% of 43% = 17% of the ridership) who have used a ridesharing service, say that they have used it as part of a bus trip.

We do not know for what purpose some Uber/Lyft riders have combined a rideshare trip with a GoTriangle trip. However, in Figure 7 (Mode to the GoTriangle Bus Stop) only 5% said they used Uber/Lyft to get to the bus stop for their current trip. Other customers must have used ridesharing for other purposes. This issue will be worth exploring in some manner in the coming years, assuming that ridesharing continues to grow. One question that would be helpful to understand is whether use of ridesharing is filling gaps in coverage, span, or in weekend service.

³ In future surveys it may be useful to determine if customers using shared rides are doing so with dependents because that may be no more costly than multiple cash bus fares.

Figure 19 Replacing or Supplementing a GoTriangle Trip, by Segment



Replacing or Supplementing a Trip, by Segment

As we saw in previous charts, 43% of GoTriangle customers say they have used Uber or Lyft in the past thirty days. Of this 43% set of riders, 59% (i.e. 25% of all riders) say they replaced a GoTriangle trip with a trip on a rideshare service, while 39% (i.e., 17% of all riders) have combined a rideshare trip with a GoTriangle trip.

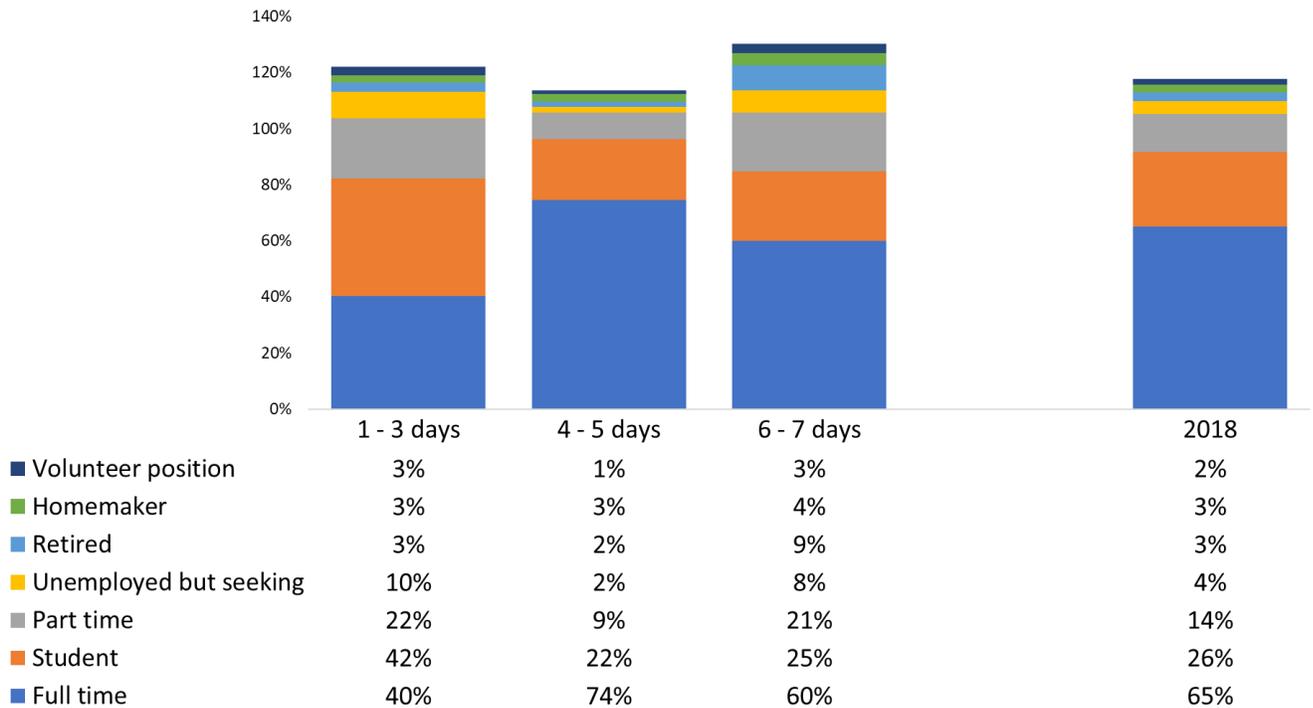
The practice of using rideshare either to replace or supplement a GoTriangle trip varies considerably among the rider segments. The more frequently customers ride in a typical week, the more likely they are to replace a GoTriangle trip with a ridesharing trip. Notice that the six-or-seven-day (82%) and the four-to-five-day (57%) riders are more likely than the one-to-three-day riders (47%) to replace a trip in that way. The six-to-seven-day riders (59%) are also more likely than others (32% and 33%) to say they combine a rideshare with a GoTriangle trip. Both results suggest that there is some type of unmet transportation need among the GoTriangle customers, especially the most frequent users.

Although there are some differences among the rider segments, the differences should not obscure the main finding, that a significant proportion of riders are supplementing and even replacing some GoTriangle trips with ridesharing trips. It is also important to remember that the percentages cited here are percentages of riders, not of the trips they make. Riders were not asked to estimate the number or proportion of their trips replaced in this manner. This may be a useful question to include in a future survey.

Demographics

Figure 20 Employment of Customers

Employment - Multiple responses included



Employment of Customers

Respondents were asked about their employment. In 2018, a total of 65% of GoTriangle customers reported being employed full time, while another 14% said they were employed part time, and 26% said they are students. Although it is not displayed in the chart, students who are also employed full or part time comprise 12% of all riders while students not also employed account for 14%. Full time employment is considerably more frequent among the four-to-five-day riders (74%) than among the six-to-seven-day riders (60%), and the one-to-three-day riders (40%).

Figure 21 Unemployment Rates in NC, Wake, Durham, and Orange Counties



Source: U.S. Bureau of Labor Statistics, Unemployment Rates in North Carolina [NCUR], and selected NC counties, retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/NCUR>, February 15, 2019.

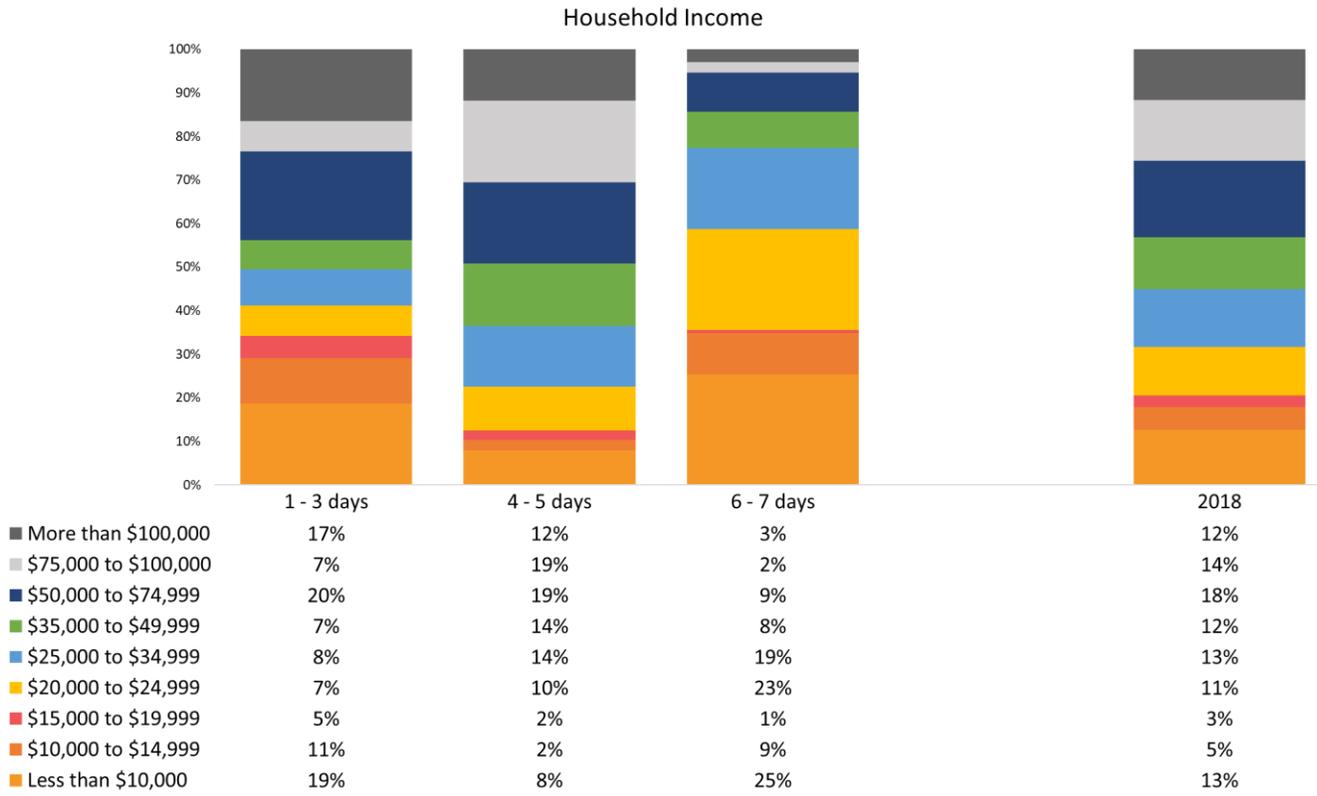
Unemployment Rates in NC, Wake, Durham, and Orange Counties

In the survey, 4% indicated that they consider themselves unemployed. We also saw in Figure 6 that 57% of these “unemployed” riders said that their trip purpose was getting to or from work. Thus, they are employed in terms used by the Department of Labor, although their employment may be only an interim tactic while seeking a new job. This would amount to about 2.3% of the GoTriangle ridership, leaving 1.7% unemployed and not working in the interim. How do these figures compare to the official unemployment figures in the region?

The substantial decrease in unemployment in the Triangle Region since the Great Recession is shown clearly in Figure 21. At the time of the survey, the rate of unemployment was 3.7% statewide and 3.3%, 3.1%, and 3.0% in Durham, Wake, and Orange Counties respectively. Thus the 4% rate for GoTriangle customers would be more or less within the same range as the three county area, though slightly higher. However, since 2.3% said they were using GoTriangle to get to or from work, most or all of them would be counted by the BLS as employed, leaving the “unemployment rate” as defined by the BLS among GoTriangle riders at only 1.7%.

However, the data are interpreted, it is clear that the vast majority of GoTriangle customers are gainfully employed or are students (or both).

Figure 22 Income of Rider Households



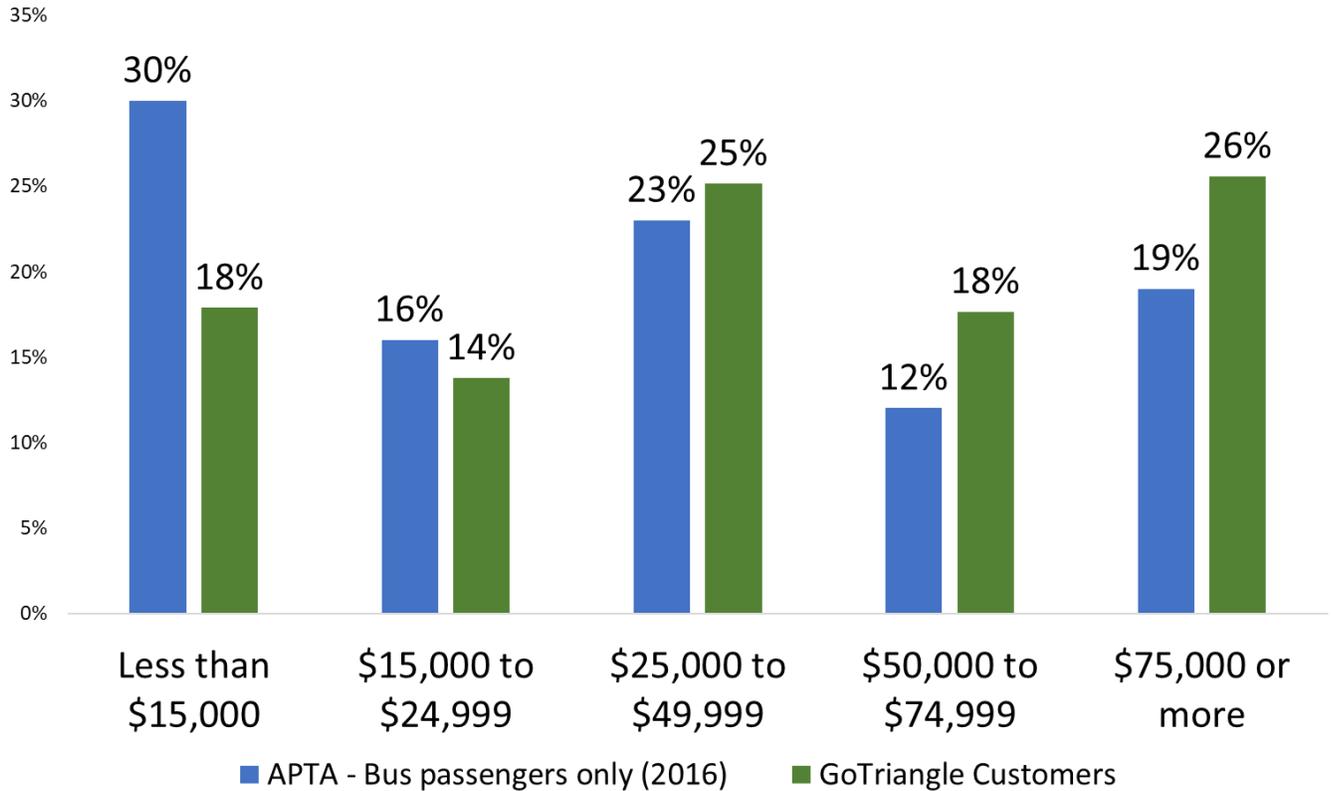
Income of Rider Households

As is true of riders in many passenger transit surveys of other systems in the United States, quite a few GoTriangle riders have low household incomes. In 2018, 32% report household incomes of less than \$25,000. However, as will be seen in the follow-up regional survey report comparing the results system by system, the GoTriangle riders have substantially higher household incomes than the riders on the other systems.

The income distribution varies rather noticeably among the three levels of riding frequency. Among the four-to-five-day riders, only 8% report incomes below \$10,000, a considerably smaller percentage of low-income users than for the other segments (19% for the one-to-three-day riders, and 25% for the six-to-seven-day riders). Conversely, the percent reporting incomes of \$20,000 or more is larger among this segment (88%, compared to 66% for the one-to-three-day riders, and 64% for the six-to-seven-day riders).

Figure 23 Comparison of Bus Rider Income Data Nationally and among GoTriangle Customers

Household Income (Sources: APTA, Who Rides (2016), and 2018 GoTriangle Rider Survey)

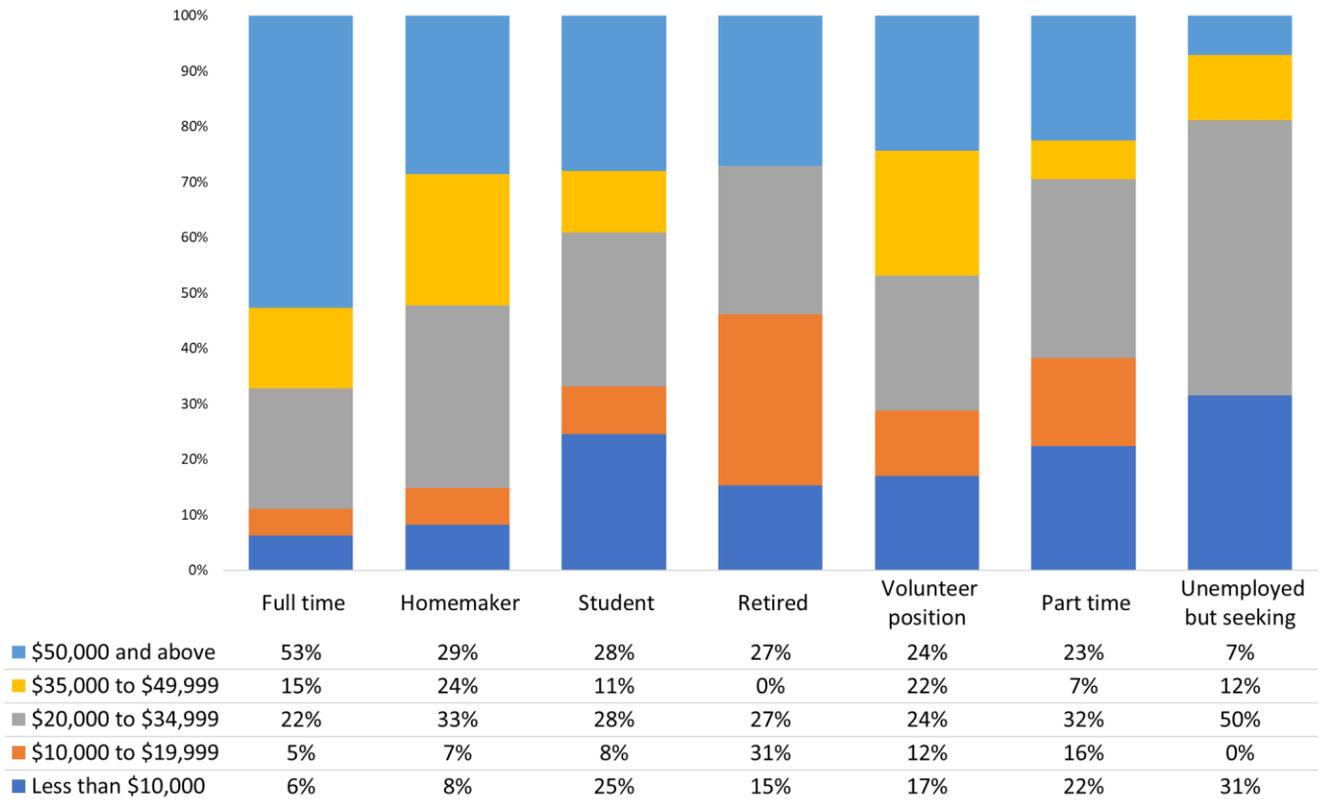


Comparison of Bus Rider Income Data Nationally and among GoTriangle Customers

In comparison to national data on bus rider households, GoTriangle rider households are more likely to have somewhat higher incomes. For example, while nationally, 30% of rider households have incomes below \$15,000, that is true of only 18% of GoTriangle rider households. Conversely, while only 19% of rider households nationally have incomes of \$75,000 or more 26% of GoTriangle rider households have income of that level.

Figure 24 Employment and Income

Household Income by Customer Employment

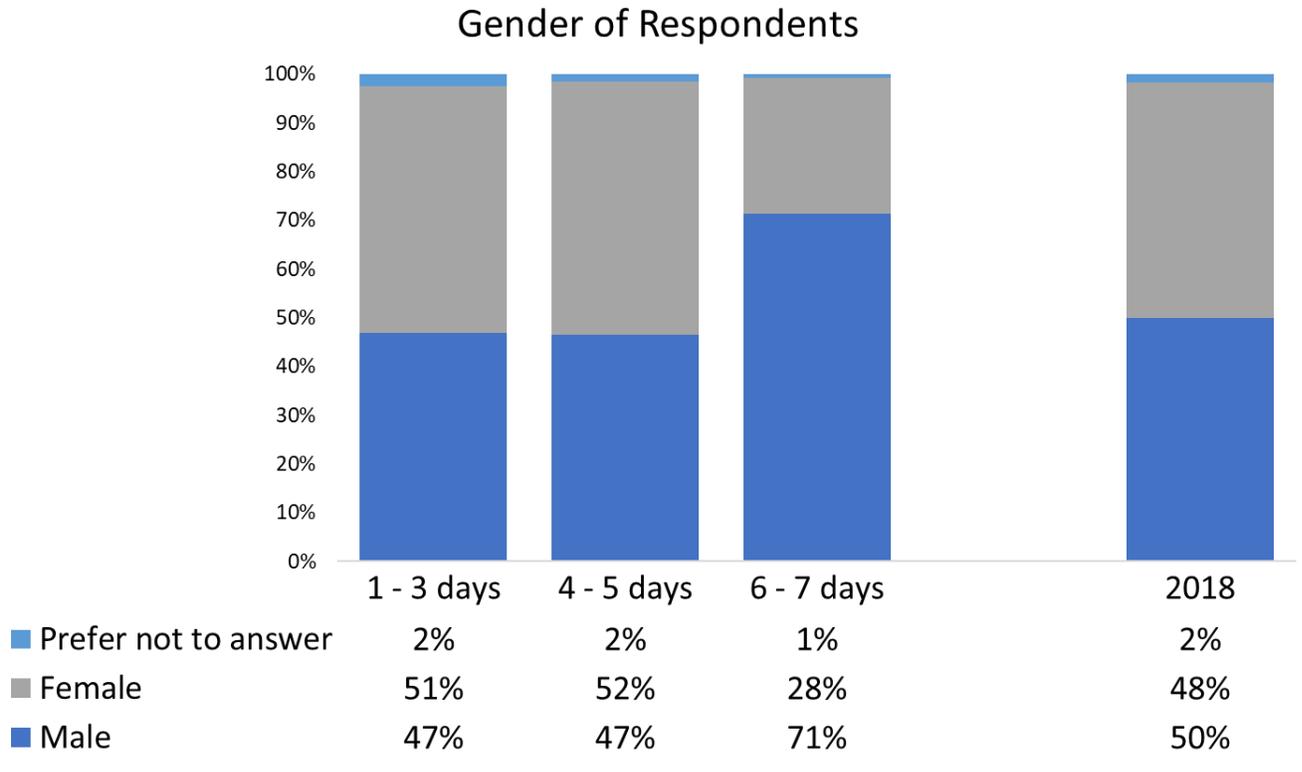


Employment and Income

In 2018, household incomes below \$10,000 seem unlikely. However, in a minimum wage job (\$7.25 in NC), even if a person worked full time for 2,000 hours a year, the income would be only \$14,500. Frequently such low wage jobs do not provide a full 2,000 hours of work with the result that incomes can fall below that level. It is important to remember that responses to the income question in surveys are approximations. For example, the real income of a household with earned income under \$10,000 is likely to be supplemented by such programs as SNAP and Medicaid. And the real incomes of those who are employed and have fully paid health insurance, and those who are sixty-five or older and on Medicare, or students on scholarships (etc.) have income supplements that are unlikely to be accounted for in a quick survey response about household income. Thus, the actual income levels may be understated. The point remains, however, that the income levels of GoTriangle users are low.

As one would expect, income is related to the employment circumstances of customers. Of those who are unemployed and seeking work, 31% report incomes of less than \$10,000. Students are next with 25% in that category, and part time workers third, with 22%. Volunteers are next with 17%, while retired persons and homemakers follow with 15% and 8% respectively. For obvious reasons, full time workers report the highest levels of income (90% of workers make above \$20,000) with only 6% making less than \$10,000.

Figure 25 Rider Segment by Gender



Gender of the Customers

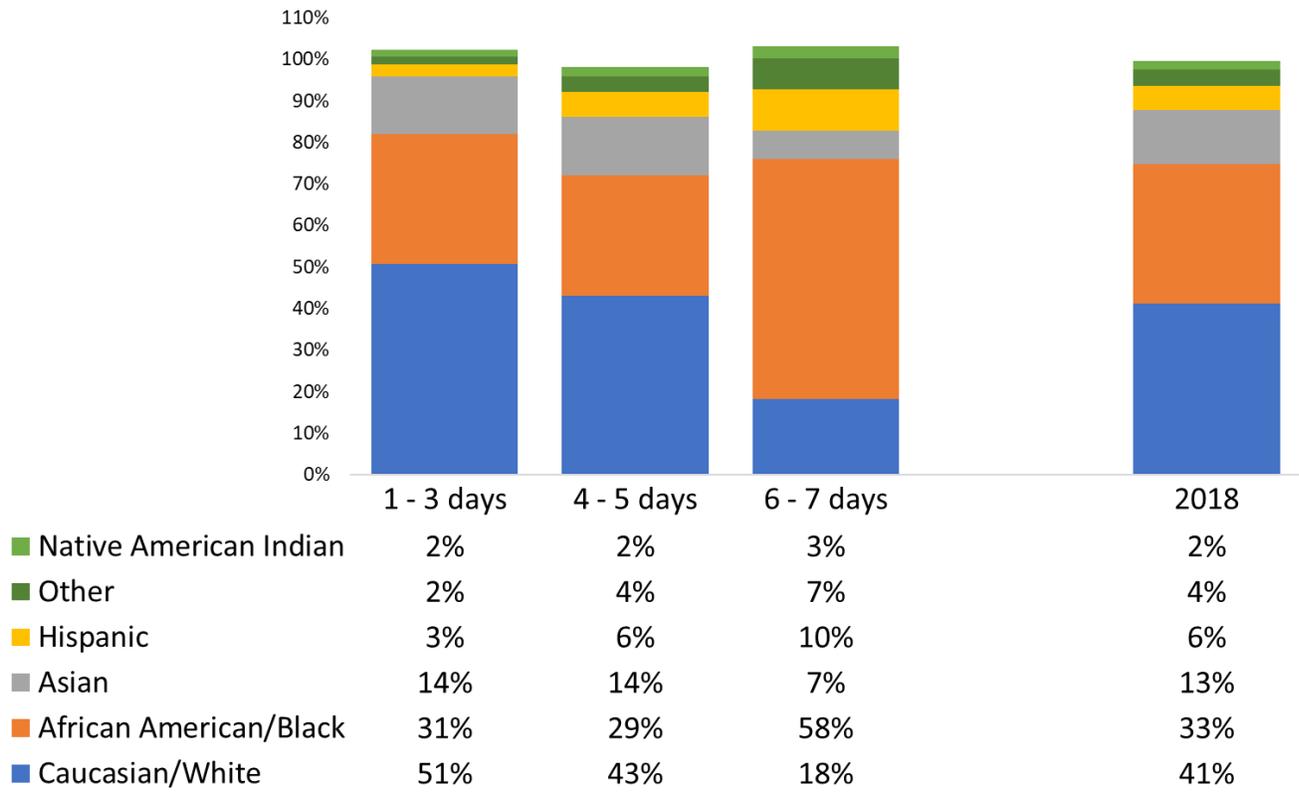
GoTriangle customers are nearly equally split by gender, 50% male and 48% female, with 2% preferring not to state a gender identity.

The gender balance differs significantly among rider segments with the six-to-seven-day rider segment having a much higher percentage of male riders (71%) than the other segments.

Nationally, according to the CJI APTA report cited earlier, among bus customers, 56% are women. However, recent surveys by CJI and others have found a majority of males among the riders in several rider surveys. A recent joint study by CJI with EMC Research Inc in Columbus, Ohio, for example, found a 56% male ridership. Whether or not this represents a significant change in the transit market will not be known until additional studies are conducted.

Figure 26 Ethnicity of Customers

Ethnic Background of Respondents



Ethnicity of Customers

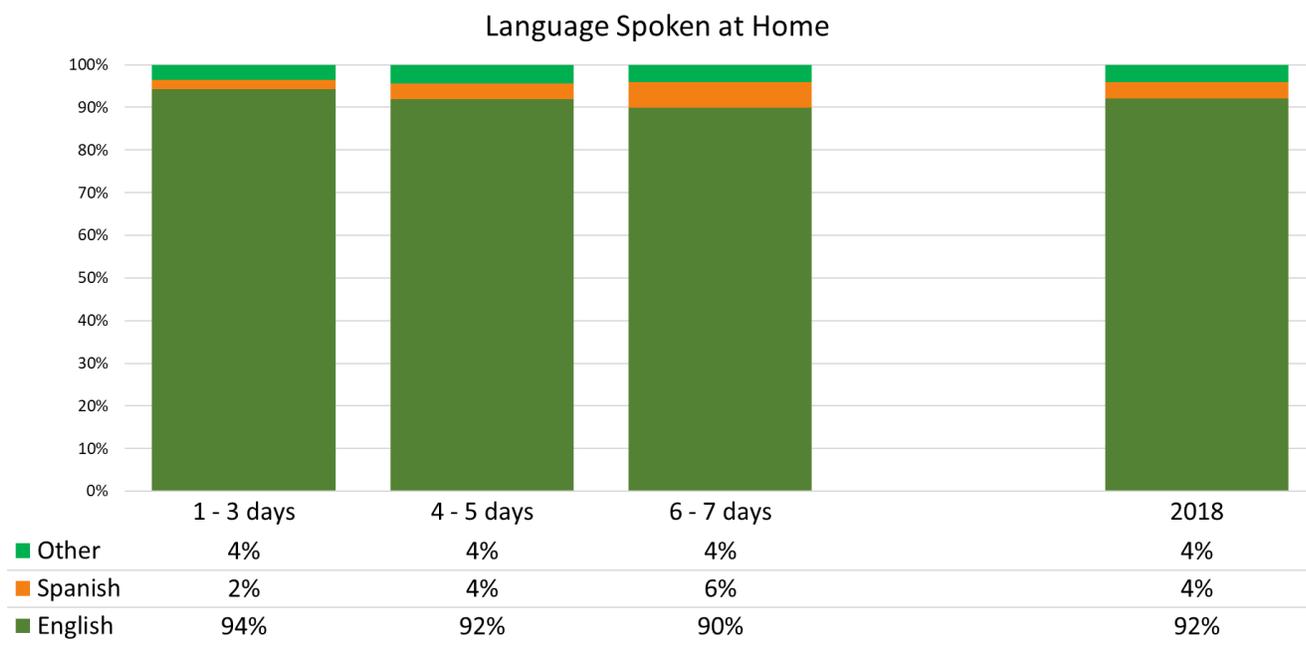
In measuring ethnicity, it is important to focus on self-identification by asking "Which do you consider yourself...?" and asking that respondents note all descriptions that apply to them. In this way surveys usually capture some overlap among the several groups. In the case of GoTriangle customer, the overlap among ethnic identities is very small.

In 2018, 41% of the respondents identified themselves as Caucasian/White. Another 33% identified as African American/Black, 13% as Asian, 6% Hispanic and 2% Native American, for a total of 54% minority ridership.

The "Other" category (4%) allowed for a handwritten response. But the write-ins were predominantly expressions of nationality or cultural groups (Hawaiian, African, Middle Eastern, Turkish, Black Hebrew, etc.) or notations such as "biracial," or sardonic (e.g. Human) and in this context are not at all helpful.

The distribution of ethnicity differs somewhat among the rider segments, with one-to-three-day customers more likely (51%) to identify as Caucasian/White compared to four-to-five-day customers (43%) or six-to-seven-day customers (18%). The more frequently a customer uses GoTriangle in a typical week, the more likely he or she is to identify with a minority ethnic group. Of the one to three day riders, 47% identify as members of a minority racial / ethnic group (excluding "other"), while of the four to five day riders, the comparable percent is 57%, and for six to seven day riders, 75%.

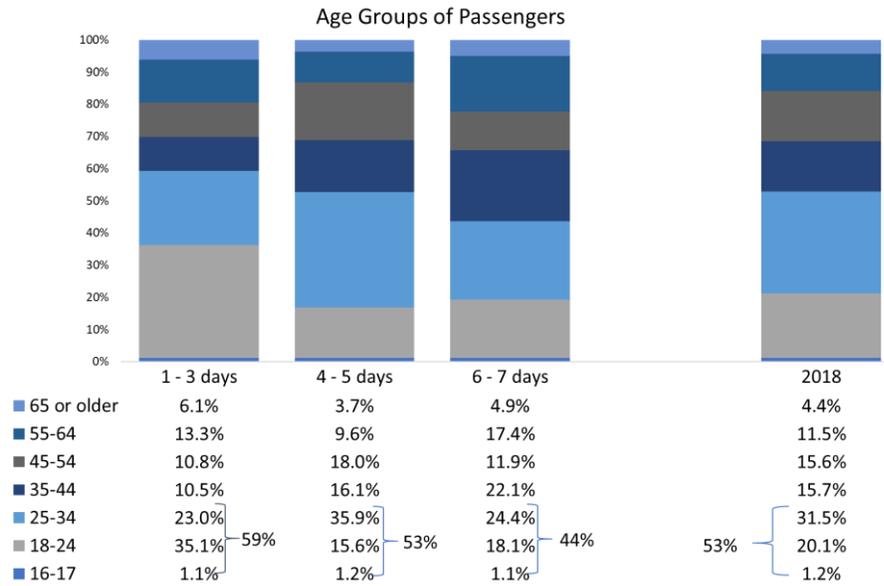
Figure 27 Language Spoken Most Often at Home



Language Spoken Most Often at Home

The overwhelming majority (92%) of GoTriangle customers most often speak English at home while only 4% speak Spanish and 4% another language. The rider frequency segments do not vary significantly in this respect.

Figure 28 Age of Customers



Age of Customers

Like most bus transit systems in the United States, GoTriangle has a young ridership. Of all GoTriangle riders, over half (53%) are under the age of 35. This percentage may actually underestimate the youth somewhat because for reasons of data validity and ethical practice, we did not attempt to survey anyone who appeared to be younger than 16.

The age distributions differ somewhat among the three

rider segments. The most notable variation is in the total percentage of the ridership under or over the age of thirty-five. Among the six-to-seven-day customers the percentage younger than thirty-five is 44%. Among the four-to-five-day customers, the percentage is 53%. The one-to-three-day customers fall above with 59% in that age group. This youthful age characteristic reflects the greater proportion of students (42%) in the one-to-three-day category that we saw earlier in Figure 20.

Age Profile of Transit Customers Nationally

Figure 29 demonstrates that nationally, the age distribution among GoTriangle customers has some similarities to the age distribution among bus system customers in general, but GoTriangle is also rather different in some respects.

- Nationally, and at GoTriangle, 22% of bus customers are under the age of twenty-five.
- The major difference between the national and GoTriangle figures is in the 25 to 34 year old range. Nationally, 21% are between twenty-five and thirty-four, but among GoTriangle riders 31% are in this age range.
- In all age ranges above 34, the national bus ridership has a slightly larger percentage of the ridership.

Figure 29 Age Profile of Transit Customers Nationally (APTA, op cit)

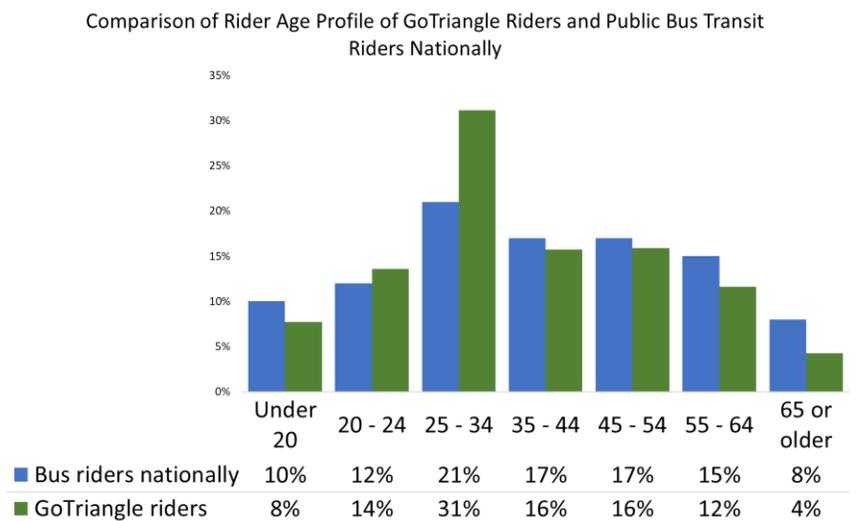
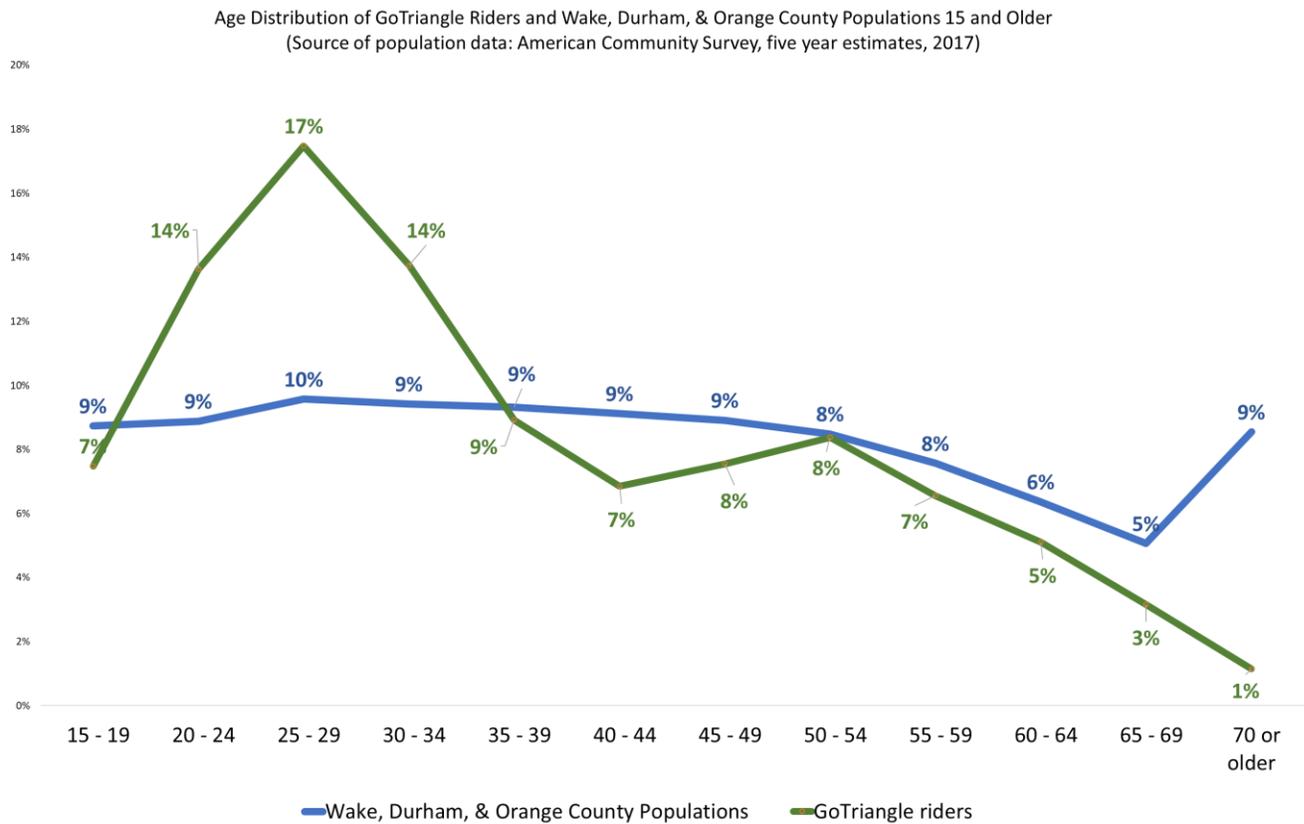


Figure 30 Age of GoTriangle Customers and the Wake, Durham, & Orange County Populations

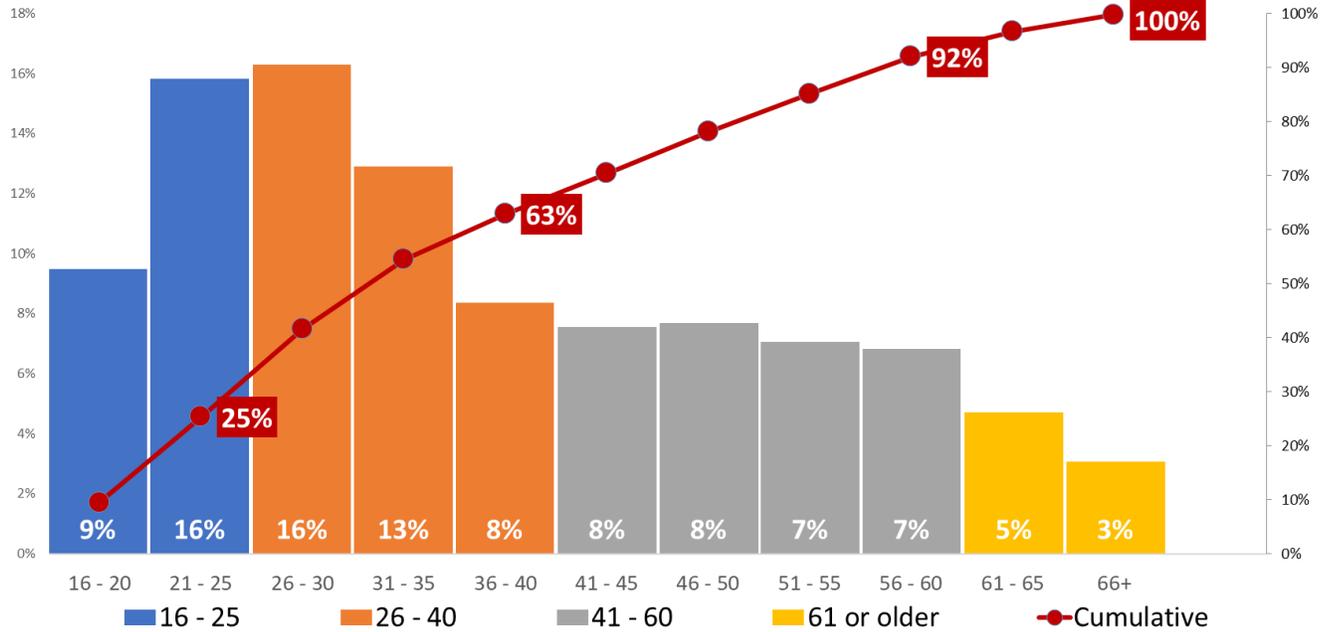


Age of GoTriangle Customers and the Wake, Durham, & Orange County Populations

Relative to the percentages in each age group among the Wake, Durham, & Orange County Populations fifteen and older, GoTriangle ridership diverges most in the age ranges from twenty-five to twenty-nine, and above fifty-five. The population in the twenty-five to twenty-nine year old age cohort accounts for 10%, while in the ridership it accounts for 17%. And at the age of seventy and older, the percentage of the population is 9% while among riders it is 1%. The percentages converge between the ages of thirty-five and thirty-nine, and once again between ages fifty and fifty-four. but once the age curves cross between the ages of thirty-five to thirty-nine, the percent in each age range among the GoTriangle ridership is never higher than the general population.

After the age of fifty, the two populations follow similar gradual downward trajectories until the age of 65 (Baby Boom) when the percentage of the general population above 65 rises to 9% while the percentage among riders in that age-range falls sharply to 1%.

Figure 31 Age Profile of GoTriangle Customers



An Age Profile of GoTriangle Customers

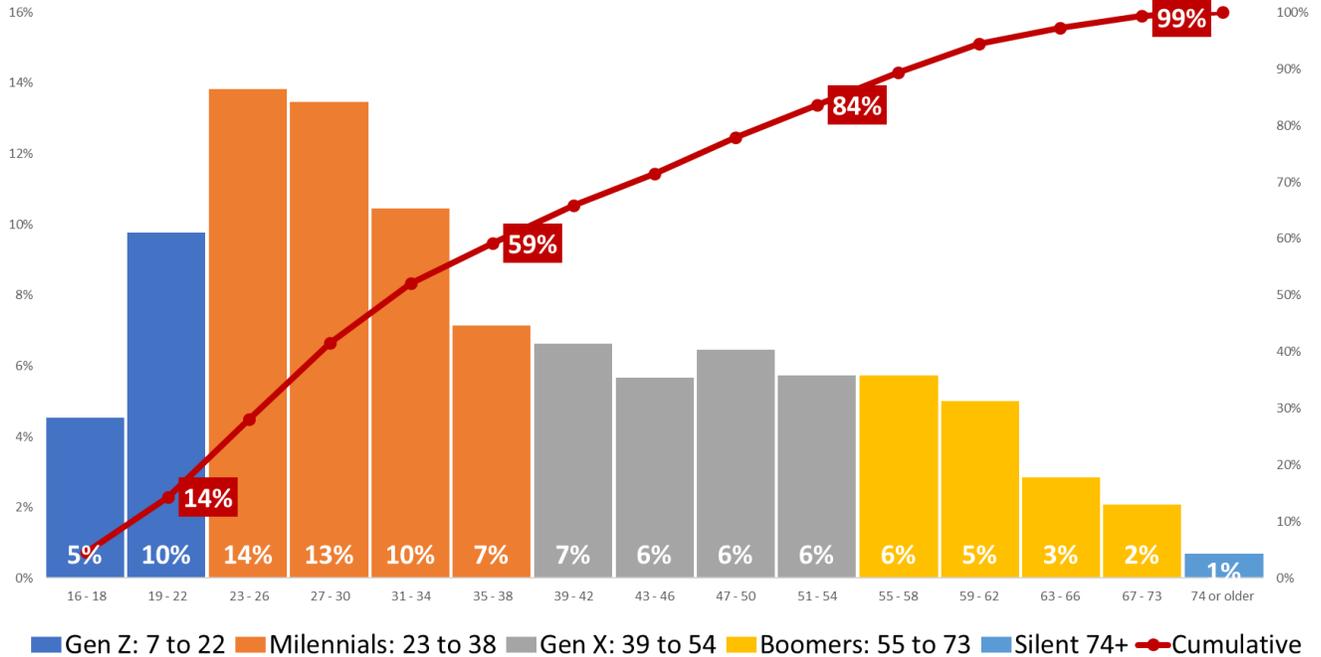
A quick glance at the chart above tells an important story about the age of GoTriangle ridership: Riders tend to be young. One-fourth (25%) of GoTriangle riders are twenty-five or younger. Sixty-three percent (63%) are forty or younger.

In several studies of transit customers in other cities, CJR has found that the age profile of any given system’s bus ridership tends to follow an age progression similar, in very general terms, to that shown above in Figure 31, but with one major exception. Generally, about one-fourth to one-third of ridership falls into a youthful cohort that is often in school or college preparing for work-life and ranging in age from sixteen to approximately twenty-five. Among customers of most systems, after the age of twenty-five the percentage of transit customers in the next five year age span tends to drop off quickly. Among GoTriangle riders, however, the drop-off does not occur until the age of thirty.

After the age of twenty-five or in the case of GoTriangle, the age of thirty, the percentage of riders in each age group tends to decrease, a decline that suggests that with increasing age, more and more customers are ceasing to use transit, probably because they are entering a career phase of life, earning more and often buying a vehicle.

After a decline between the mid to late twenties until about the age of forty, the percent in each age group tends to stabilize. Then, after the age of 60, the percent of ridership again tends to fall off and stabilize at a low level as people retire.

Figure 32 Generations and Ridership



Generations and Ridership

For purposes of visualizing the age characteristics of the GoTriangle customer base, another way to think about the age distribution of the ridership is to apply the age-ranges popularly used to describe generational groups. We have used definitions proposed by Pew Research Center⁴. The age cohorts used by PEW and those in Figure 32 do not entirely correspond because while Pew defines Gen Z as between the ages of seven and twenty-two, the GoTriangle survey interviewed no one below the age of sixteen. Also, while Baby Boomers are said to be no older than seventy-three, there are too few riders in the survey above that age to create a separate group for the older generation (“The Silent Generation”) and they are grouped with the Boomers for purposes of the chart. However, the PEW definitions provide an adequate guide.

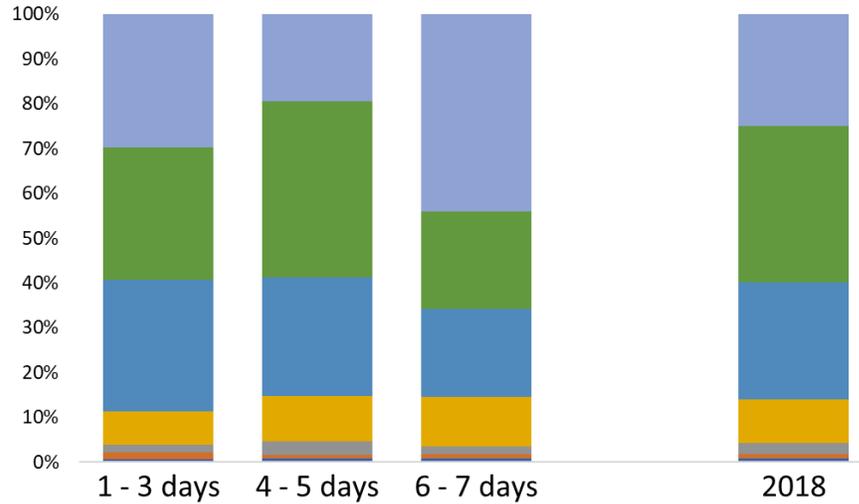
In Figure 32, we see a pattern very similar to that presented in Figure 31. Both charts make the point that a disproportionately large proportion of the ridership is young. In the case of generations, the youthful Gen Z and Millennial generations account for more than half of the total ridership (59%).

⁴ See <http://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/>

Customer Satisfaction

Figure 33 Overall Service Rating by Rider Segment

Rating of GoTriangle Service overall
on a scale from 1 - 7



7 Excellent	30%	19%	44%	25%
6	30%	39%	22%	35%
5	29%	26%	20%	26%
4 Neutral	7%	10%	11%	10%
3	2%	3%	2%	3%
2	2%	1%	1%	1%
1 Very poor	1%	1%	1%	1%

Overall System Rating Score by Rider Segment

Customers were asked to rate nineteen aspects of GoTriangle service using a scale from 1 to 7 on which a score of 7 means “Excellent,” and 1 means “Very poor.” They were then asked to rate the service overall (See questionnaire page 63). We begin this section of the report with the overall rating of service.

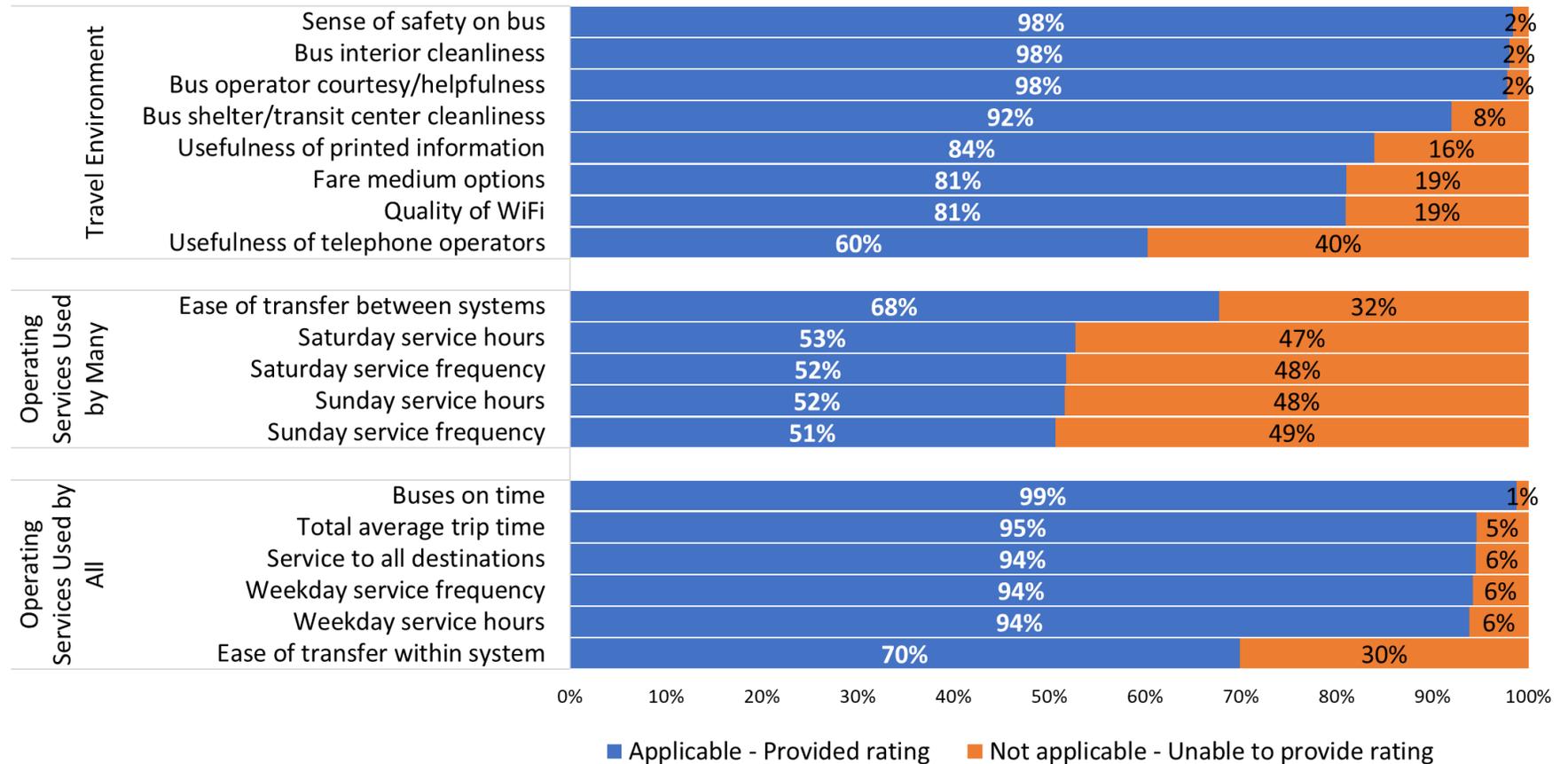
One quarter (25%) rate service overall as 7, or excellent. Another 35% score it 6, giving a total of 60% with high satisfaction scores.

The six-to-seven-day riders, offer the highest score on overall service quality, with a total of 66% scoring service overall as 6 or 7 on the seven-point scale, while fewer (60%) of the one-to-three-day riders, and 58% of the four-to-five-day riders assign that score. The four-to-five-day riders, who typically have the most routine commutes, offer a lower “excellent” percentages than the other segments, with 19%. This apparent reluctance to assign a perfect score for transit service is not uncommon for this segment, probably because they are likely to rely on the service to provide an unbroken commuting routine, and in addition have slightly more income which allows them the freedom to be a bit more critical.

The relatively higher scores given by the most frequent riders are unusual. The more common pattern is for them to have more opportunity to have things go wrong, and thus to offer lower scores.

Figure 34 Services Included in the Survey, Grouped by Type and Showing Percentage Unable to Provide a Rating

Percent of riders providing a rating vs those saying that this aspect of service was "Not applicable" to them



Services Included in the Survey, Grouped by Type and Showing Percentage Stating that the Service was not Applicable to Them

Two interacting parameters help shape the distributions of the rating scores.

- (1) One parameter is simply the proportion of all customers who can provide a rating, thus presumably indicating that they use the service at least occasionally. We refer to this as utilization. Figure 34 displays in blue bars the percent able to provide any rating whether positive, neutral or negative. It displays in the orange portion of the bars the percent who answered that the service was not applicable to them.
- (2) The second parameter is the type of service being rated. These types are explained below, but the essence is that some are operational and used by all customers while others are operational, but are used by fewer customers, and, finally, some are simply static aspects of the travel experience.

UTILIZATION

Some aspects of service such as weekend service, were given ratings by fewer customers than others. We consider the extent to which customers can provide ratings a proxy for *utilization* of the service. To illustrate this, Figure 34 displays the percent of all respondents who offered any rating, whether positive or negative, and the percent who said that the service did not apply to them. Ratings for services with fewer users than others have a different denominator when percentages are computed for the ratings and they are thus reflective of only those who use them. The computation of the percentages in the charts which follow and show service ratings are based on only those who answered the rating question, not on the total sample.

TYPE OF SERVICE

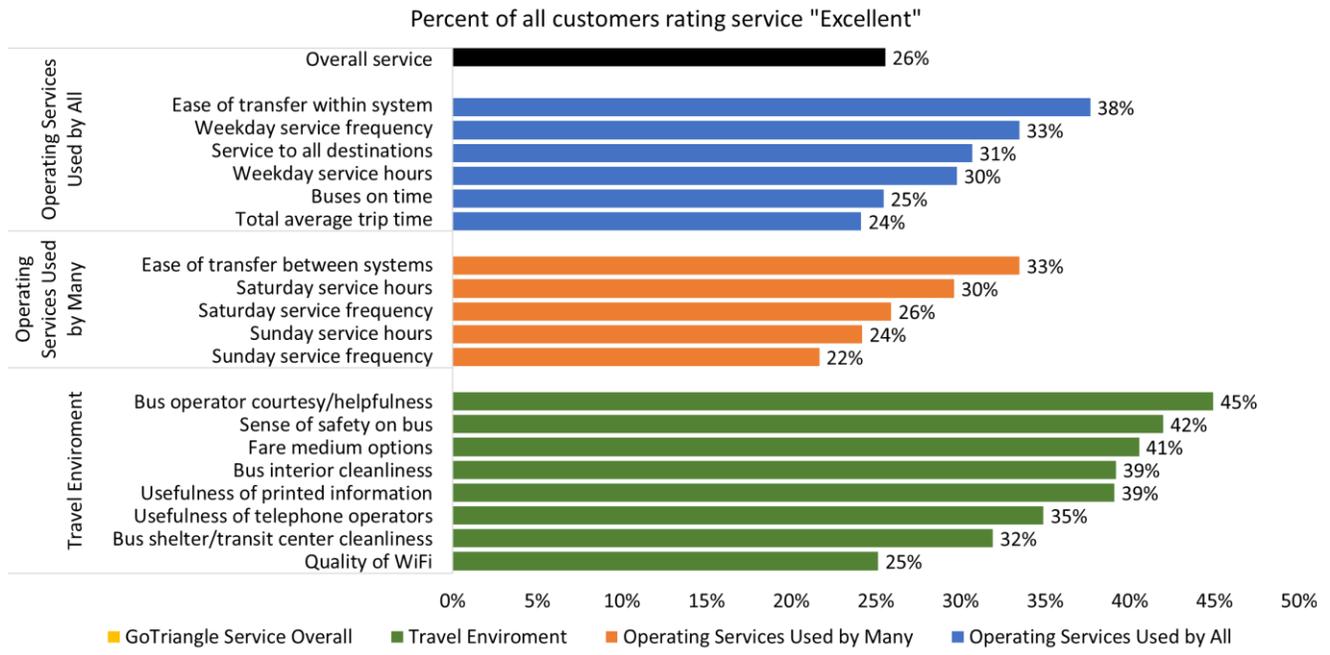
The second parameter involves the type of service. The typology is intended to put comparisons of ratings among the various services on an apples-to-apples basis. One major factor differentiating the nineteen services included in the survey is whether the service element is *operational* in the sense that it involves some combination of system design and the ongoing process of keeping the vehicles moving and serving passengers on a daily basis or is the type of service that sets the general environment in which the customer experiences GoTriangle services. To take an example, clearly the “Quality of Wi-Fi” and “Fare medium options” are service elements that help set a general environment, while “service to all destinations” and “Buses running on time” are operational matters.

In Figure 34, we apply this reasoning to differentiate three types of service elements based on two criteria: (1) the type of service (operational or travel environment) and (2) the extent to which operational services service are utilized, using the “not applicable” response as a proxy for not utilizing the service.

One can obviously debate the categorizations. For example, is interior cleanliness of the buses an operational factor or a factor that affects the customer’s perception of the travel environment? It certainly involves operational activity by GoTriangle, but on the other hand, it does not impact such things as the time customers wait for a bus or their ability to get to various locations. Thus, it is categorized with other factors affecting the environment in which people travel, rather than with operations.

No specific conclusion is to be drawn from Figure 34. It is provided only to give the reader a perspective on the differences among the elements in terms of service type and the proportion of customers using the service, as scores are compared in the several figures that follow.

Figure 35 Scores of "Excellent" in 2018 on Individual Components of GoTriangle Service



Rating Scores: Scores of "Excellent" in 2018 on Individual Components of GoTriangle Service

Figure 35 above presents a first look at customer rating scores for individual elements of service. This chart includes only the top score of seven, or “Excellent,” on the seven-point scale.

Like Figure 34, Figure 35 is organized by the type of service being rated. At the top of the chart are the operational services fundamental to all customers. Each of these has more than 30% scoring it as excellent. Ease of transferring within the system, Weekday service frequency, and coverage (“Service to all destinations you want to get to”) have the highest percent excellent in the high utilization operational group, with 38%, 33%, and 31% excellent, respectively. Weekday service hours finds nearly one third of customers rating it as excellent (30%). On time performance and total time required for a trip lag right behind coverage at 25% and 24%, respectively.

Operational aspects of service that are used by fewer customers than other services, tend to have somewhat fewer ratings of excellent than the more nearly universally used service elements⁵. This is particularly true for weekend service. Transferring between systems (33% excellent) is the one element included in this set that does not involve weekend service. It is in this set because 32% said the question did not apply to them, implying that they do not make such inter-system transfers in a “typical week.” Saturday service hours also received excellent ratings by nearly one third (30%). Saturday service frequency falls slightly below that level at 26%. The two other service elements in this set both involve Sunday service, and both get scores of excellent by fewer than one quarter of the customers, 24% and 22% for both service span and frequency respectively.

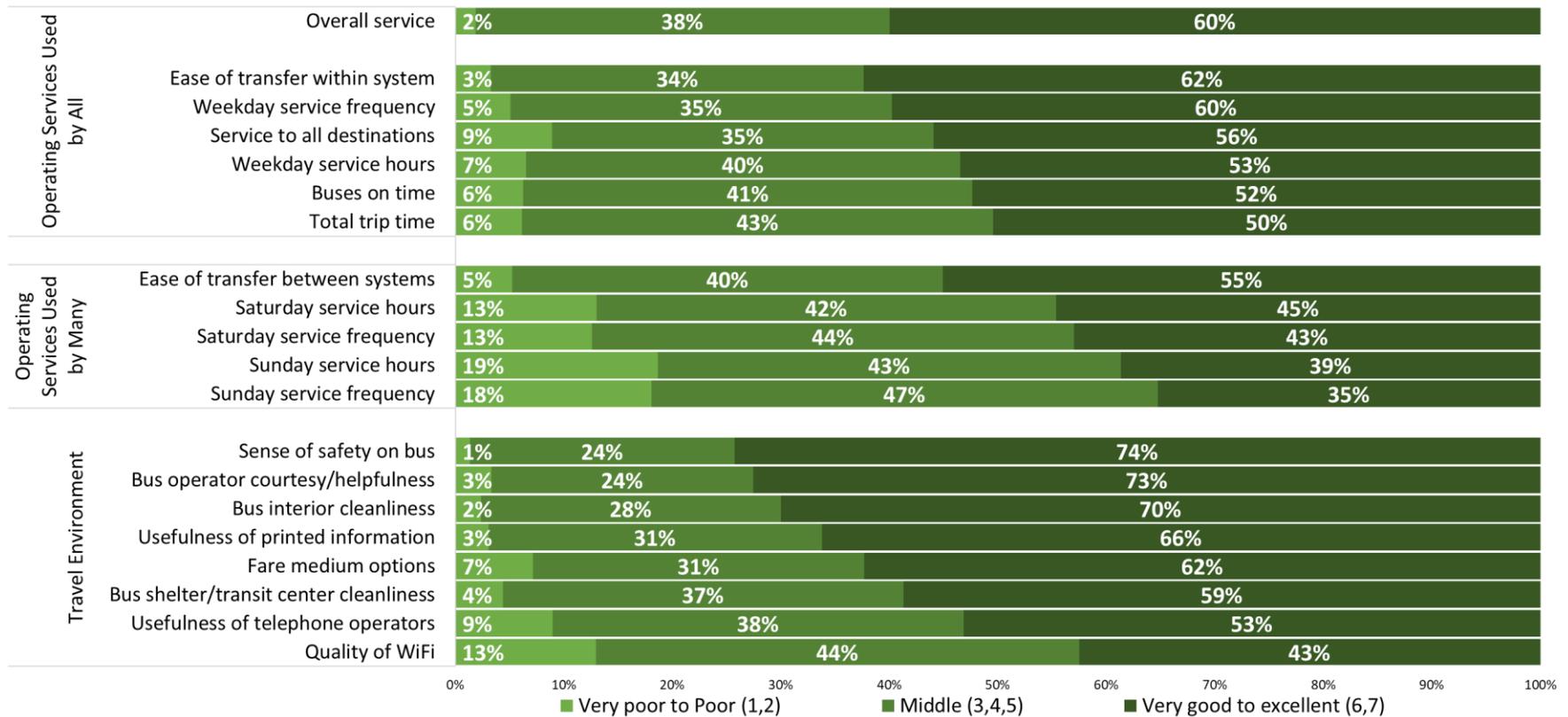
The third set of services involve the environment in which GoTriangle customers travel. Of the eight services included in this set, three get excellent scores by more than 40% of the respondents. The

⁵ Note that the percentage is based on only those who were able to provide a rating, not the total sample so that the percent “excellent” is not falsely reduced by inclusion of those who answered “not applicable” in the denominator.

courtesy and helpfulness of the bus operators, with 45%, is at the top of this list, with sense of safety (42%) and fare medium options (41%) ranking 2nd and 3rd. It is typical for personnel to receive very good ratings. Occasional complaints notwithstanding, customers generally like the interaction with the transit personnel with whom they come in contact and give personnel high scores as a result.

Bus interior cleanliness, usefulness of printed information, usefulness of telephone operators, and bus shelter/transit center cleanliness all exceed the 30% mark (39%, 39%, 35% and 32% respectively). The final item, which falls below that mark and should be of concern is Quality of WiFi. Quality of WiFi at 25% suggests that there is less than unanimous feeling about internet accessibility. The sense of safety, cleanliness of bus shelters and transit center, and cleanliness of bus interior items are related. The degree of cleanliness often implies a degree of order and official attentiveness which, though unrelated to safety, can be reassuring.

Figure 36 Distribution of Grouped Service Rating Scores



Service Rating Distributions

The previous chart, Figure 35, showed the top percentages on the seven-point scale. However, so that we can see what the balance is between positive and negative ratings, it is important to also consider the distribution of scores within the full 1 – 7 range.

To simplify the chart showing the distributions, the scores of 1 to 7 have been combined into three sets as shown in Figure 36 above. The top two positive scores (6 and 7) are combined as are the bottom two scores (1 and 2). The combined middle scores of 3, 4, and 5 can be considered

neither extremely positive nor extremely negative. The scores of six or seven represent either excellent or nearly excellent scores. This is simply a way to summarize the results that also allows us to visualize the distribution of the scores.

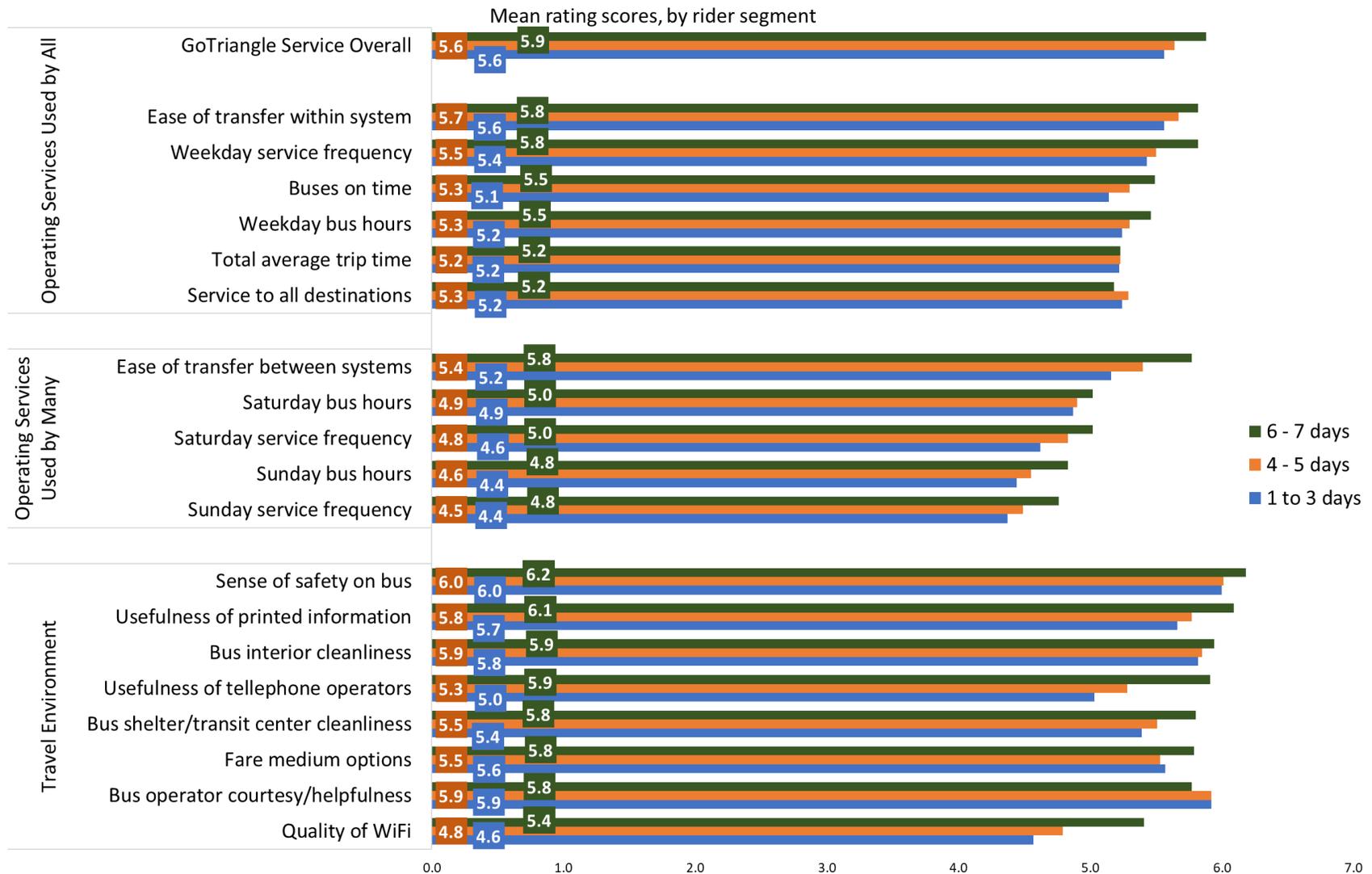
RESULTS TEND TO BE POSITIVE

The basic story of this chart is that, as with most similar surveys for other transit systems, the ratings differ primarily in the degrees of positive ratings, not in stark differences between positive and negative ratings. The percentages in the lowest rating categories of 1 and 2 tend to be less than 10%. The percentages giving positive scores of six and seven on the scale in contrast, tend to be much greater. For example, of the six operational high utilization characteristics, each of them has a high six/seven rating of at least 50% (total trip time) and as high as 62% (ease of transfer within system).

There are exceptions which have percentages greater than 10% in the low scores. The percentages in the lowest score category represent Sunday service hours (19%), Sunday service frequency (18%), Saturday service hours (13%), Saturday service frequency (13%). Quality of WiFi which also has a rating of 13% on the low score category is another aspect of service that causes some dissatisfaction and was also previously indicated in Figure 32 as a lower ranking member (25%) among the excellence ratings.

These service elements are worth mentioning only because when low ratings significantly exceed 10% of the customer base in any industry, it is a clear signal that a significant proportion of the customer base is pushing at the limits of what the system as structured can currently provide.

Figure 37 Comparing Ratings among the Segments Using Mean Scores



Comparing Ratings among the Segments Using Mean Scores

As measured by the mean score, the rating scores of three segments tend to be in general agreement. This tendency for the rider frequency segments to agree in their ratings is indicated by two characteristics of this chart. First, within each of the three service types, the rank-order of

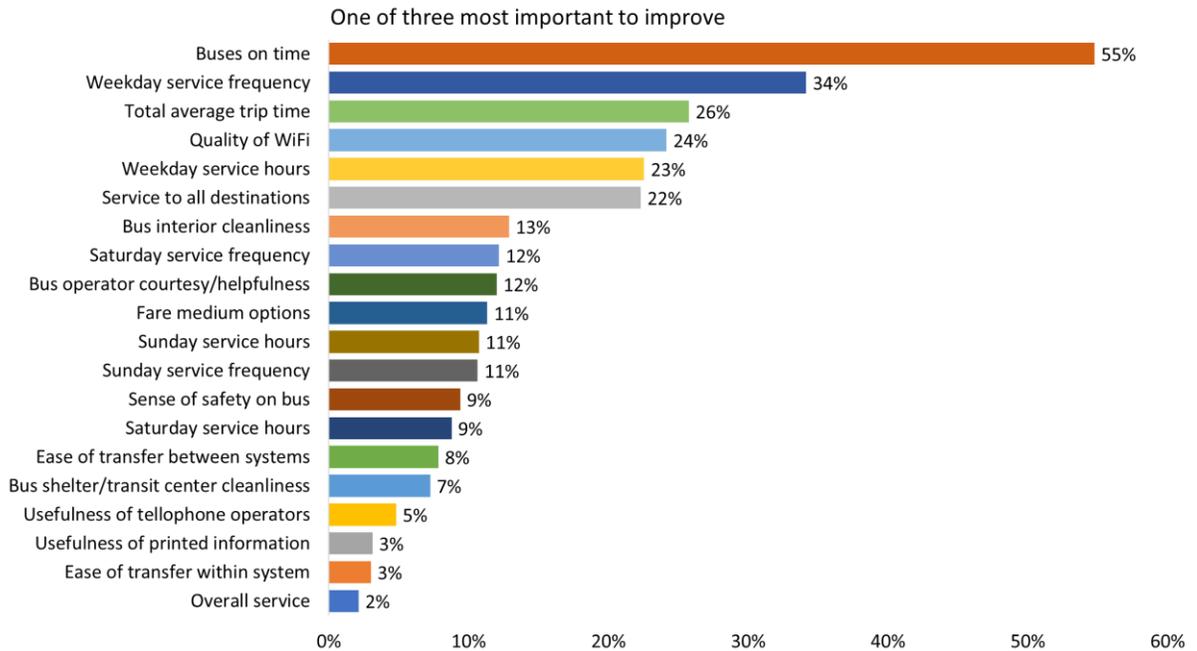
their scores is similar. Second, the maximum difference among the segments (.9 on the seven-point scale) is small. It separates the low and high means for the three segments on the dimension of usefulness of telephone operators. These two observations suggest that regardless of how often one uses GoTriangle services, the experience will tend to be perceived in generally similar ways.

Determining Customer Priorities for Service Improvement

In the charts from Figure 33 through Figure 37 we have seen the opinions of GoTriangle customers about service overall and of nineteen separate elements that make up GoTriangle service. While these charts give us considerable information about how customers perceive GoTriangle service (quite positively), it is static information – it does not tell us how to prioritize service improvements. Two methods of prioritizing are presented in Figure 38 and Figure 39:

- The first method (Figure 38) is very straightforward. It is based on customer response to the simple request: “Of the services in questions 1 – 19 above, please list the three most important to improve.”
- The second method (Figure 39) involves a combination of two statistical analyses. First it compares each service rating to the average rating of all services: Is the rating above or below the average score for all nineteen elements of GoTriangle services? Second, it correlates the rating of each element of service with the rating of GoTriangle service overall so that we can infer its influence on that overall score.

Figure 38 Most Important Element to Improve



One way to prioritize: Ask Customers “What Are the Three Most Important Services to Improve?”

Fifty-five percent (55%) of GoTriangle customers indicate that having the buses run on-time is one of their top three improvement priorities.

It is important to keep in mind that the customer belief that on-time performance must be improved is a customer *perception*, not a measurement-based observation. Customers themselves will often arrive at their stop early, marginally on time, or a bit late for their bus and perceive that it is the bus that is off schedule. They may also not know the relationship of their stop to a time point. Thus, their perception and the reality can be quite different.

To the extent that more people begin to use real-time transit apps for bus arrival information, as 62% now do (see Figure 40), that information will decrease the anxiety of waiting and will help reduce the perception of a lack of on time performance. This assumes, of course, that the “real-time” information tends to be accurate. In addition, greater frequency will have a similar effect because even in the absence of real time information, frequent service creates certainty that the next bus will be coming soon.

The next closest priority, “Weekday service frequency” is rated in the top three by 34%. This is a bit odd because weekday service frequency was among the highest rated aspects of GoTriangle service. This is a good illustration of a situation in which the high ratings indicate satisfaction, but not an endorsement of service as it is, since – especially with the kind of middle-class clientele that used GoTriangle – there is always a perception that there is room for improvement.

The third and fourth in the rank order of customer service improvement priorities, are “Total average trip time” (26%) and “Quality of WiFi” (24%)

A second way to prioritize: Determine Which Service Elements Would Move the Needle of the Overall GoTriangle Service Rating if They Were to Be Improved

Using survey data to prioritize elements of service that customers feel need improvements is a challenge. Figure 38 presented one way to do it. Figure 39 on page 58 presents a second way to accomplish it. This approach takes the pool of nineteen services and answers the question: Which of these are more important and which are less important in determining the customers' rating of GoTriangle service overall? This question is answered in a matrix. The matrix itself (Figure 39, page 58) is actually less complex than it may seem, but it does require some explanation.

- The concept of the matrix in Figure 39 is as follows: Respondents rated nineteen separate aspects of GoTriangle service as shown in Figure 38 on the previous page. They also rated "The quality of GoTriangle services overall." We can assume that customers' ratings of the quality of services overall sum up their ratings of quality of the nineteen specific elements of service. Assuming this, we can answer the key question which is: Which elements of GoTriangle services would, if improved, move the needle of the rating of GoTriangle service overall?
- Two basic statistics are involved in this analysis, first the average or "mean" rating of service quality on the scale from 1 – 7 and, second, a correlation statistic that measures the strength of the relationship (i.e., the *correlation*) between each element of service and the overall service rating for GoTriangle. These statistics, when used together, answer two questions: How do customers rate each of the nineteen elements of service? And how closely related is each of those ratings to the overall rating?
- To visually display the results of this kind of analysis means using a simple graph with the 1-7 rating on one axis and the correlation on the other axis. However, there are two challenges to doing this.
 - First, the numbers are of different types. The rating scale uses whole numbers specified in the questionnaire from 1 – 7. The correlation coefficients are decimal numbers ranging from -1 to +1. A perfectly negative relationship is -1 and a perfectly positive relationship is +1. As a practical matter, the correlation is always a decimal since perfect positive or negative relationships just do not exist. Rather than trying to represent whole numbers on one axis and decimals on the other, it helps to have common measurement units.
 - The second and more important challenge for the analysis is that the ratings tend to skew positive and to vary more between scores of 4 through 7 than between 1 and 3 (see Figure 33). There are very few poor ratings. This only makes sense, since if many riders rated service negatively, it would be odd if they continued to use the service. But for analysis of how to "move the needle" on the overall GoTriangle service rating, the positive tilt of the ratings means that if we are to use the ratings to prioritize service improvements, we have to examine how the best scores differ from the good scores, not how the best scores differ from the worst scores.

One way to solve both of these challenges is to *standardize* the scores. This simply means to convert them statistically to comparable scores based on how each rating and each correlation differs from the average of such ratings and correlations. This procedure enables us to construct a matrix that shows the services which, if improved, would have the most powerful effect on the rating of GoTriangle service overall.

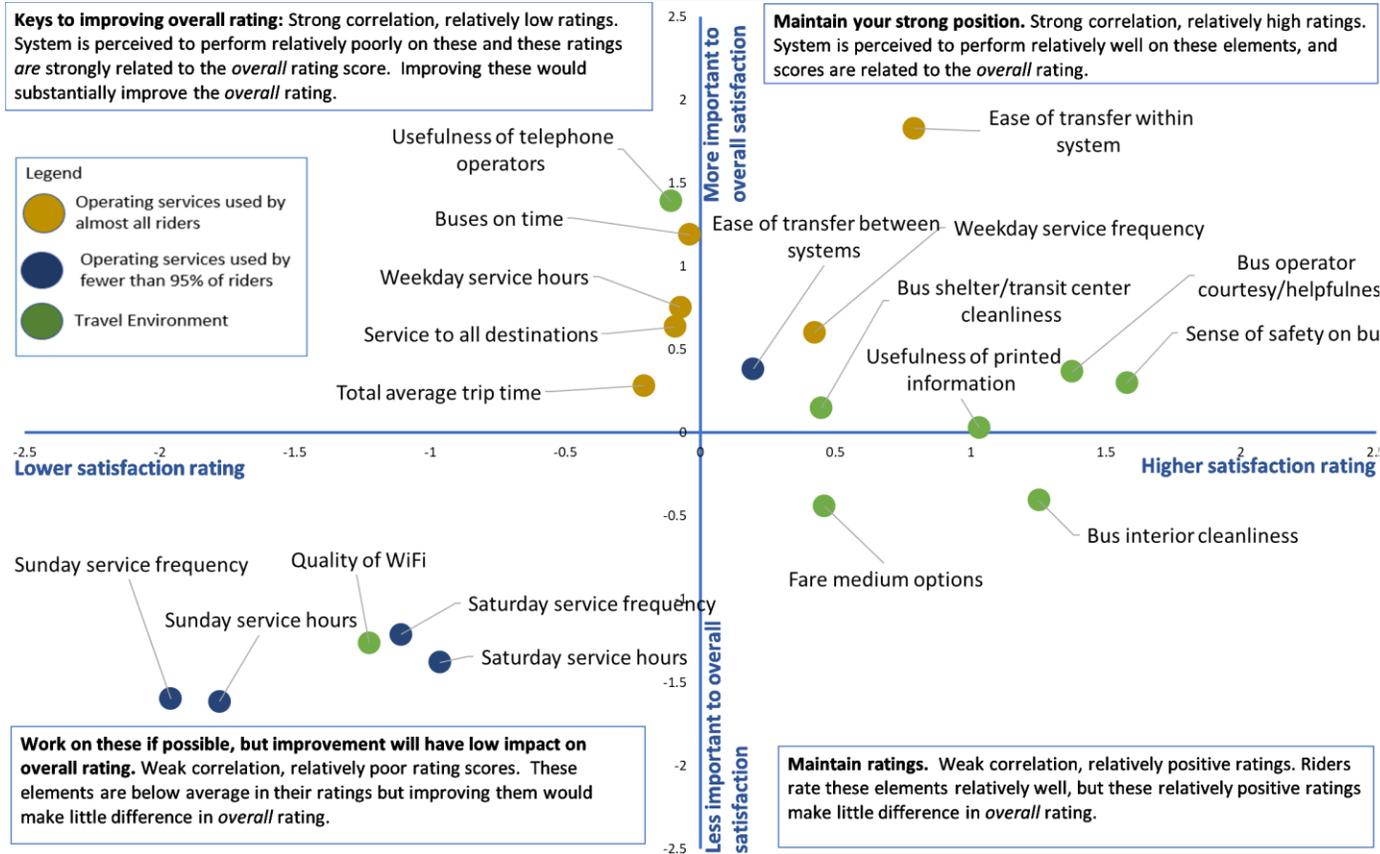
The matrix will help answer the question: What service improvements would move the needle on the rating of GoTriangle service overall? To do this we look at the ratings and at the correlation of each of those ratings with the rating of GoTriangle service overall. The results can be charted in a matrix like this:

When we add the actual survey statistics to fill out the matrix, it will show service improvement action priorities as shown below:

High correlation	Correlation of each service rating with the rating of overall service	<p>Relatively low ratings but relatively important to the overall rating, dragging it down</p> <p><i>Improvement here moves the needle most, but these tend to be structural and the most difficult to change</i></p>	<p>Relatively high ratings and relatively important to the overall rating</p> <p><i>Service already good and core to the overall system score. Important to maintain it or risk losing the overall rating</i></p>
		<p>Relatively low ratings but relatively unimportant to the overall rating</p> <p><i>Improvement desirable, but unlikely to move the overall quality needle much</i></p>	<p>Relatively high ratings and relatively unimportant to the overall rating</p> <p><i>Service good. Further improvement unlikely to move the overall quality needle, but deterioration may reduce the rating.</i></p>
		Service ratings	
		Low rating	High rating

Figure 39 on the following page displays how the nineteen elements of service are positioned within this priority matrix.

Figure 39 Relationship between Overall Performance Rating and Ratings of Individual Service Elements



Relationship between Overall Performance and Individual Service Elements

In the chart, the location of a service vertically, up or down along the vertical axis indicates the strength of its correlation with, and presumably influence on, the overall rating for GoTriangle service. The higher on that axis, the more important we can assume that element is in influencing the score for service overall. The lower on the line, the weaker it is. The horizontal axis indicates the rating score for the individual element of service relative to the rating of all rating scores. The farther to the left, the poorer the rating compared to the average of all ratings, and the farther to the right, the better the rating compared to the average of all ratings. The two lines cross at the mid-points of the scores.

In considering Figure 39, keep in mind that the position of a service element in the matrix is based on its rating *relative to the average for all scores*. For example, a service element appearing at the right means that it is rated *better than the average of all service elements*. If, for example, the average score for all nineteen service elements were, say, 3.0, and the score for a specific element were 4, it would have a *relatively* positive score in spite of the fact that in absolute terms on a scale from 1 – 7, a 4 would be a neutral score, not a highly positive score. It would be, in short, better than average⁶.

TOP, BOTTOM, LEFT, RIGHT

- Services appearing above the horizontal line are more important to the overall rating of GoTriangle service than those that appear below the line, those that appear below the line are less important.

⁶ The statistic is called the Z-score in statistics jargon and is based on the number of standard deviations from the mean for both the correlation and the satisfaction score. The scores from -2.5 to +2.5 shown on the axes are counts of the number of standard deviations from the mean.

- Services appearing at the right of the vertical line are rated better in quality than the services as the left of the line. The closer to the far right, the better the rating; the closer to the far left, the worse the rating.

Elements in the upper right of the chart are currently helping to boost the overall GoTriangle service rating by being better rated than the average of all nineteen elements of GoTriangle service, while others (top left quadrant) are currently detracting from it. It is elements in the latter group that require particular attention given that the objective is to improve overall customer ratings, a proxy for customer satisfaction. Elements in the lower left of the chart receive relatively poor performance scores but have relatively little influence on the overall score. Similarly, elements in the lower right quadrant have relatively high rating scores, but they too have little statistical relationship to the overall score and can be assumed to have little influence on it.

COLOR CODING SHOWS THE LOCATION OF THE SERVICE TYPES IN THE MATRIX

Notice the color coding of the service elements:

- All the aspects of service we have labeled “Operating services used by almost all riders” are *above* the horizontal line that indicates average importance to the overall service rating. This means that they are above average in their importance to the overall score.
- Of the five elements we have labeled “Operating services used by fewer than 95% of riders,” four are *below* the line of average importance to the overall score, and one, Ease of transferring among area systems, is above the line.

THE UPPER LEFT QUADRANT: IMPROVING THESE WOULD MOVE THE OVERALL RATING NEEDLE THE MOST

Improving service and thus, presumably, the ratings of the five elements in the upper left quadrant would have the greatest positive impact on the rating of GoTriangle service overall. Service coverage (“Service to all destinations”), Buses running on time, the availability of better weekday service hours, the usefulness of telephone operators, and length of trip all are fundamental aspects of service, and all appear in this quadrant. Buses running on time is a perennial desire of transit customers and is often found in this position in the matrix. In addition, it was clearly the top priority (55%) when respondents were asked to name the top three aspects to improve.

It is important to note how close these service elements are to the vertical line that divides the quality rating at the average between higher and lower – i.e., they are all roughly average, and not dramatically below average.

Of course, none of these five services in the upper left quadrant can be easily changed.

THE UPPER RIGHT QUADRANT: MAINTAIN THIS RELATIVELY STRONG POSITION

At the upper right are seven elements of service that represent relative strengths among all GoTriangle services because they score relatively well and they are important to the overall GoTriangle rating. Compared to all other aspects of GoTriangle service, these services are relatively strong and support the current overall positive rating. One of these, Ease of transfer between systems, is an operational service used by somewhat fewer riders than other services. Two of the elements in this quadrant are operational services used by almost all customers: Ease of transferring within the GoTriangle system, and Weekday service hours. Four relate to the travel environment: Bus operators’ courtesy/helpfulness, the Sense of safety on the bus, the Usefulness of the printed information provided by GoTriangle, and the Cleanliness of bus shelter and transit centers. This is an interesting mix of relative strengths, combining the perennial strength of interactions with the bus operators (almost always in this quadrant in such surveys), information services, bus shelter cleanliness, and a sense of

personal safety with operational elements, including transferring within or between systems, and weekday service hours.

The high importance and positive score of “Bus operator courtesy/helpfulness” illustrates the power of interpersonal interactions in the overall rating of a service.

THE LOWER RIGHT QUADRANT: THIS SERVICE IS GOOD, BUT IMPROVEMENT WOULD BE WELCOME

At the lower right are two service elements with high favorable ratings relative to other services, but that under current service configurations are relatively unimportant in influencing overall satisfaction. GoTriangle does well on these and needs to maintain that level of satisfaction, but efforts to improve all or any one of these would have minimal impact on the rating of GoTriangle service *overall*.

Bus interior cleanliness lies in this quadrant to the right side of the matrix indicating a positive rating, but it also lies below the line of average importance to the overall satisfaction score. We saw earlier that it earns 70% ratings of 6 or 7 (see Figure 36), which is a positive sign.

In other words, riders are apparently satisfied with this service, but it has little impact on variation in the overall rating (assuming that current levels of service are maintained). Moreover, it is rated in the top three elements to improve by only 13%, placing #7 in the listing of 19 service elements named as important to improve. This a key aspect of service, yet customers are not telling us that they want improvement and instead are indicating that they are satisfied with the status quo. The converse of this, however, is that if bus interior cleanliness were to fall below current satisfaction levels, it would be likely to lead to rapid disappointment and could indeed have a significant, and negative, impact on the overall rating. Steady as she goes is the message here. The same is true of Fare medium options. Customers are satisfied. The task in both cases is to maintain the ratings.

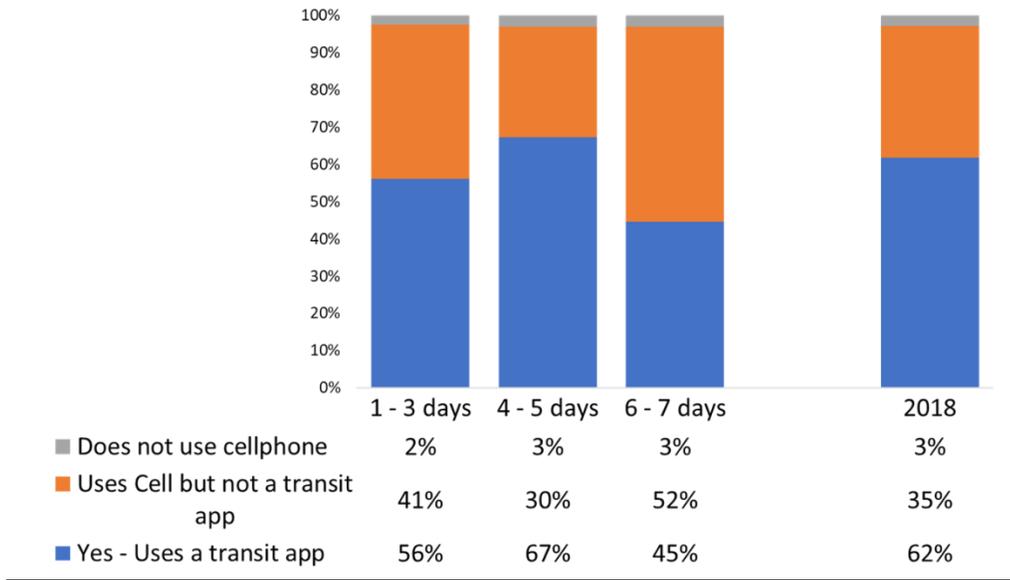
LOWER LEFT QUADRANT: IT WOULD BE NICE TO IMPROVE THESE ELEMENTS, BUT DOING SO WOULD NOT AFFECT THE RATING OF GO TRIANGLE SERVICE OVERALL BY MUCH

Five elements of service appear in this quadrant. The four service elements that represent almost all (95% at most) riders include Sunday service hours and frequency, Saturday service hours and frequency, and the final element, which is an aspect of the overall travel environment, is the quality of WiFi service.

Mobile Communication

Figure 40 Use of Cell and Smart Phones

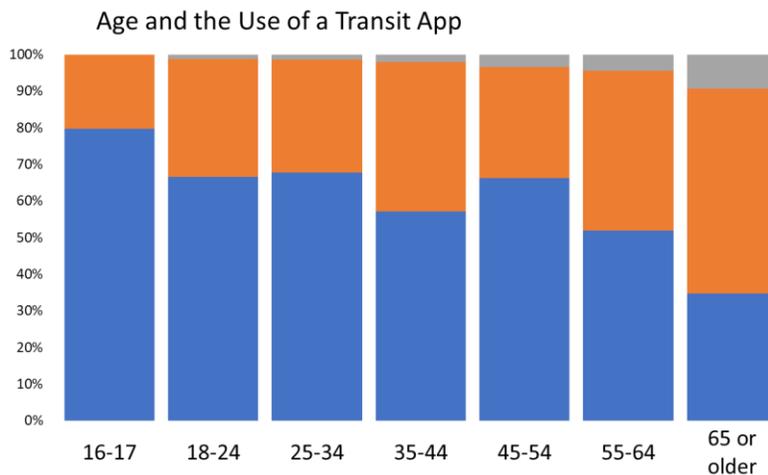
Riders that Use a Local Transit Mobile Application



Use of Cell and Smart Phones

Among GoTriangle customers, cell phone ownership is high, but not quite universal, with 97% of customers indicating they use a cell phone. Sixty-two percent (62%) of customers use a transit app on their phones.

Figure 41 Age and the Use of Mobile Transit App



The number of customers using a transit app indicates that while nearly two thirds of GoTriangle customers are now using their smartphones as transit information sources, that practice is not yet universal. Other communication modes continue to be necessary.

That mobile apps cannot (yet) be relied on to provide the only

communications channel to the GoTriangle ridership is illustrated by the results shown in Figure 41. That figure demonstrates that the use of such apps is related to age with a general downward trend in utilization as age increases. This means that unless something occurs to change this relationship between age and the use of mobile technology for transit, it will take at least several years for transit apps to become the primary source of information for a substantial majority of GoTriangle customers.

Appendix A: Questionnaire

Please tell us about how you use GoTriangle

El cuestionario en español se encuentra en la parte posterior

In the past 30 days, how would you rate GoTriangle on the following services...

(Circle a rating for each question or check the box indicating that it does not apply to you)



	Excellent			Neutral			Very poor	Not applicable to me
1. Buses running on-time	7	6	5	4	3	2	1	<input type="checkbox"/>
2. Frequency of service on weekdays (Mon-Fri)	7	6	5	4	3	2	1	<input type="checkbox"/>
3. Frequency of service on Saturday	7	6	5	4	3	2	1	<input type="checkbox"/>
4. Frequency of service on Sunday	7	6	5	4	3	2	1	<input type="checkbox"/>
5. Hours the buses operate weekdays (Mon-Fri)	7	6	5	4	3	2	1	<input type="checkbox"/>
6. Hours the buses operate Saturday	7	6	5	4	3	2	1	<input type="checkbox"/>
7. Hours the buses operate Sunday	7	6	5	4	3	2	1	<input type="checkbox"/>
8. Total time required to make your usual trip	7	6	5	4	3	2	1	<input type="checkbox"/>
9. Availability of service to all destinations you want to get to	7	6	5	4	3	2	1	<input type="checkbox"/>
10. Ease of transferring within GoTriangle system	7	6	5	4	3	2	1	<input type="checkbox"/>
11. Ease of transferring between GoTriangle and other area bus transit systems	7	6	5	4	3	2	1	<input type="checkbox"/>
12. Cleanliness of the bus interiors	7	6	5	4	3	2	1	<input type="checkbox"/>
13. Cleanliness of the bus shelters and transit center	7	6	5	4	3	2	1	<input type="checkbox"/>
14. Your sense of personal safety from other passengers on the buses	7	6	5	4	3	2	1	<input type="checkbox"/>
15. Courtesy and helpfulness of bus operators	7	6	5	4	3	2	1	<input type="checkbox"/>
16. Usefulness of information from 485-RIDE telephone operators	7	6	5	4	3	2	1	<input type="checkbox"/>
17. Usefulness of printed information such as schedules or brochures	7	6	5	4	3	2	1	<input type="checkbox"/>
18. Available ways for you to pay your bus fare	7	6	5	4	3	2	1	<input type="checkbox"/>
19. Quality of wireless internet (WiFi) service	7	6	5	4	3	2	1	<input type="checkbox"/>
20. The quality of GoTriangle services overall	7	6	5	4	3	2	1	<input type="checkbox"/>

21. Of the services in questions 1 – 19 above, please list the three most important to improve?
 ___ Most important ___ 2nd most ___ 3rd most

22. On how many days in a typical week do you use GoTriangle? (Circle only one)
 1 2 3 4 5 6 7

23. What is the ONE main purpose for which you most often use the GoTriangle buses? Is it to go to or from... (Check only one)

- 1 Work 2 School/college 3 Shopping
 4 Medical/dental 5 Recreation/event 6 Other _____

24. Compared to one year ago, do you currently ride GoTriangle... (Check only one)
 1 More often 2 The same 3 Less often 4 Did not ride a year ago

25. For your fare on the first GoTriangle bus you boarded during this trip, did you... (Check only one)
 1 ...pay cash fare for this trip only 2 ...buy a day pass on the bus
 3 ...use a day pass bought ahead of time 4 ...use a 7 or 31 day pass
 5 ...use a university or other ID 6 ...use a GoPass

26. How did you get to the stop where you got on this GoTriangle bus? (Check only one)

- 1 Walked 2 Biked 3 Drove
 4 Uber or Lyft 5 Was dropped off by family/friend 6 Other GoTriangle bus
 7 Bus other than GoTriangle 8 Other: _____

27. In a typical week, which bus systems do you usually use? (Check all that apply)

- 1 GoRaleigh/GoRaleigh Access 2 GoTriangle/GoTriangle Access
 3 GoDurham/GoDurham Access 4 GoCary/GoCary Door-to-Door
 5 Chapel Hill Transit 6 Duke Transit 7 Wolfline

28. If you use a cell-phone, do you use a mobile app for local transit on it? (Check only one)

- 1 Yes 2 No 3 Do not use a cell phone

29. In the past 30 days, how often have you used Uber or Lyft or a similar ridesharing company? (Check only one) 0 times 1 time 2 times 3 times 4 or more times

If you used Uber, Lyft, or a similar ridesharing service... (Check only one)

- Did you use it in combination with a bus trip on GoTriangle? 1 Yes 2 No 3 Not applicable
 Did you use it to replace a bus trip on GoTriangle? 1 Yes 2 No 3 Not applicable

30. How old are you? _____ Years old

31. Please mark all of the following that apply to you. Are you: (Check all that apply)

- 1 Employed full time 2 Employed part time 3 Unemployed and seeking work
 4 Homemaker 5 Student 6 Retired
 7 Volunteer position

32. Do you have a valid driver's license? (Check only one) 1 Yes 2 No

33. How many cars or other vehicles are available for your use? (Circle only one)

- 0 1 2 3 or more

34. Do you identify as... 1 Male 2 Female 3 Prefer not to answer

35. Do you consider yourself to be... (Please Check all that apply to you)

- 1 African American/Black 2 Asian 3 Caucasian/White
 4 Hispanic 5 Native American Indian 6 Other: _____

36. What language do you most often speak at home? (Check only one)

- 1 English 2 Spanish 3 Other: _____

37. What is your total annual household income? (Check only one)

- 1 Less than \$10,000 2 \$10,000 to \$14,999 3 \$15,000 to \$19,999
 4 \$20,000 to \$24,999 5 \$25,000 to \$34,999 6 \$35,000 to \$49,999
 7 \$50,000 to \$74,999 8 \$75,000 to \$100,000 9 More than \$100,000

Comments: _____

Por favor, díganos sobre cómo utiliza GoTriangle

En los últimos 30 días, cómo calificaría a GoTriangle en los siguientes servicios...

(Circule una calificación para cada pregunta o marque la casilla que indica que no se aplica a usted)



	Excelente	Neutral	My mal	No se aplica a mí				
1. Autobuses transitan a tiempo	7	6	5	4	3	2	1	<input type="checkbox"/>
2. Frecuencia de servicio entre semana (Lun-Vie)	7	6	5	4	3	2	1	<input type="checkbox"/>
3. Frecuencia de servicio el sábado	7	6	5	4	3	2	1	<input type="checkbox"/>
4. Frecuencia de servicio el domingo	7	6	5	4	3	2	1	<input type="checkbox"/>
5. Horas que autobuses operan entre semana (Lun-Vie)	7	6	5	4	3	2	1	<input type="checkbox"/>
6. Horas que autobuses operan el sábado	7	6	5	4	3	2	1	<input type="checkbox"/>
7. Horas que autobuses operan el domingo	7	6	5	4	3	2	1	<input type="checkbox"/>
8. Tiempo total requerido para hacer su viaje regular	7	6	5	4	3	2	1	<input type="checkbox"/>
9. Disponibilidad del servicio a todos los destinos que desea llegar	7	6	5	4	3	2	1	<input type="checkbox"/>
10. Facilidad de transferir dentro del sistema GoTriangle	7	6	5	4	3	2	1	<input type="checkbox"/>
11. Facilidad de transferir entre GoTriangle y otros sistemas de tránsito de autobuses del área	7	6	5	4	3	2	1	<input type="checkbox"/>
12. Limpieza del interior del autobús	7	6	5	4	3	2	1	<input type="checkbox"/>
13. Limpieza de los albergues de autobús y de centros de tránsito	7	6	5	4	3	2	1	<input type="checkbox"/>
14. Su seguridad personal de otros pasajeros en los autobuses	7	6	5	4	3	2	1	<input type="checkbox"/>
15. Cortesía y amabilidad de operadores de autobús	7	6	5	4	3	2	1	<input type="checkbox"/>
16. Utilidad de la información de los operadores de 485-RIDE	7	6	5	4	3	2	1	<input type="checkbox"/>
17. Utilidad de la información impresa tal como horarios o folletos	7	6	5	4	3	2	1	<input type="checkbox"/>
18. Formas disponibles para que pague su tarifa de autobús	7	6	5	4	3	2	1	<input type="checkbox"/>
19. Calidad del servicio de internet inalámbrico (WIFI)	7	6	5	4	3	2	1	<input type="checkbox"/>
20. Calidad de los servicios de GoTriangle en general	7	6	5	4	3	2	1	<input type="checkbox"/>

21. De los servicios en las preguntas 1 a 19 anteriores, ¿por favor enumera los tres más importantes para mejorar? ___ Lo más importante ___ 2º más ___ 3º más

22. ¿Cuántos días en una semana típica usas GoTriangle? (Circule sólo una)

1 2 3 4 5 6 7

23. ¿Cuál es el ÚNICO propósito principal para el que usas los autobuses de GoTriangle más seguido? Es ir hacia o desde... (Marque sólo una)

- 1 Trabajo 2 Escuela/colegio 3 Compras
4 Médico/dental 5 Recreación/evento 6 Otro _____

24. Comparado con hace un año, ¿actualmente usas GoTriangle... (Marque sólo una)

- 1 Más a menudo 2 Lo mismo 3 Menos 4 No lo usaba hace un año

25. Para su tarifa en el primer autobús GoTriangle que abordó en este viaje, usted... (Marque sólo una)

- 1 ... pago tarifa en efectivo solo por este viaje 2 ... compro el pase de 1-Día en el autobús
3 ... compro el pase de 1-Día con anticipación 4 ... uso un pase de 7 o 31-Días
5 ... uso identificación de universidad u otra 6 ... uso un GoPass

26. ¿Cómo llegaste a la parada donde subiste a este autobús de GoTriangle? (Marque sólo una)

- 1 Caminado 2 Bicicleta 3 Condujo
4 Uber o Lyft 5 Lo llevo familia/amistad 6 Otro autobús de GoTriangle
7 Autobús que no sea de GoTriangle 8 Otro: _____

27. En una semana típica, ¿que sistemas de autobús sueles usar? (Marque todo lo que corresponda)

- 1 GoRaleigh/GoRaleigh Access 2 GoTriangle/GoTriangle Access
3 GoDurham/GoDurham Access 4 GoCary/GoCary Door-to-Door
5 Chapel Hill Transit 6 Duke Transit 7 Wolfline

28. Si usa un teléfono celular, ¿usa una aplicación móvil de tránsito local en él? (Marque sólo una)

- 1 Sí 2 No 3 No uso teléfono celular

29. En los últimos 30 días, ¿con qué frecuencia usó Uber o Lyft o una compañía de viaje compartido similar? (Marque sólo una) 0 veces 1 vez 2 veces 3 veces 4 o más veces

Si usó Uber, Lyft o un servicio de viaje compartido similar... (Marque sólo una)

¿Lo usaste en combinación con un viaje en autobús en GoTriangle? 1 Sí 2 No 3 No aplica

¿Lo usaste para reemplazar un viaje en autobús en GoTriangle? 1 Sí 2 No 3 No aplica

30. ¿Cuántos años tienes? _____ Años

31. Marque todo lo siguiente que se aplique a usted. Eres tú: (Marque todo lo que corresponda)

- 1 Empleado tiempo completo 2 Empleado medio tiempo 3 Desempleado y buscando trabajo
4 Ama/o de casa 5 Estudiante 6 Jubilado
7 Puesto de voluntario

32. ¿Tiene una licencia de conducir válida? (Marque sólo una) 1 Sí 2 No

33. ¿Cuántos automóviles u otros vehículos hay disponibles para su uso? (Circule sólo uno)

- 0 1 2 3 o más

34. ¿Te identificas como... 1 Masculino 2 Femenino 3 Prefiero no responder

35. ¿Te consideras ser... (Por favor marque todo lo que aplica a usted)

- 1 Afroamericano/Negro 2 Asiático 3 Caucásico/Blanco
4 Hispano 5 Indio Nativo Americano 6 Otro: _____

36. ¿Qué idioma habla más a menudo en casa? (Marque sólo una)

- 1 Inglés 2 Español 3 Otro: _____

37. ¿Cuál es su ingreso familiar anual en total? (Marque sólo una)

- 1 Menos de \$10,000 2 \$10,000 a \$14,999 3 \$15,000 a \$19,999
4 \$20,000 a \$24,999 5 \$25,000 a \$34,999 6 \$35,000 a \$49,999
7 \$50,000 a \$74,999 8 \$75,000 a \$100,000 9 Más de \$100,000

Comentario: _____

Appendix B: Rider Comments

GoTriangle

Route	Comments
100	Three times this week the bus has driven right past me in the middle lane, 5-10 minutes late (8:00-8:05 AM).
100	Bus drivers and transit operators deserve the right to unionize and collectively bargain. Also, decrease the bus fare because the bus passes are too expensive!!!
100	First time rider to airport. Will use again!
100	GoTriangle is the best!
100	Good service and pretty dependable.
100	I have to rely on the bus for getting to and from school, but I wish I could use it more besides commute trips, like the grocery store or to visit friends. At this time, it doesn't have the frequency or destinations for this.
100	I ride the 100 bus to RDU airport. for some reason the driver on bus #2115 on 10/12/18 does not let me swipe my 31-day pass. Other passengers do, but I don't know why he wouldn't let swipe mine. He just tells me to go sit down.
100	Just have your buses on time.
100	More comfortable buses, improve waiting areas.
100	On-demand system needs work.
100	There needs to be service on weekend early mornings and late nights after midnight for the weekend party crowd.
100	What shelters? Nonexistent. Not shocked.
102	#10102 needs to run on weekends.
102	Bus #3 could use attitude adjustment on 7:15 route. Need a new way of training bus drivers instead of using printouts.
102	Bus #10102 is late to station, causing me to frequently miss connection to bus #3 or bus #1102. The current drivers of #3 and #1102 are hateful and rude and often pull out as soon as #10102 pulls in.
102	Buses need to operate more frequently and be more convenient. Consistent driver for #10102.
102	GoRaleigh needs to take a new direction in overall service. It's very poor.
102	Why doesn't the #10102 Garner bus run on weekends?

105	I live in West Raleigh and connect from the #12 to #105. It's ok but difficult to catch sometimes. I also see a lot of people connect from #12 to #4, which could also vast improvement. Generally, the transfers between West Raleigh services could use improvement so travel times are more efficient.
105	It is a refreshing service that has been very helpful for me.
105	On time buses are a challenge, if you miss your connection. Operators should always smile!
105	Route is needed on Sunnybrook road and Rock Quarry near Costal Union amphitheater.
105	Thank you. GoPass was a good idea.
105	The buses need to be on time and the bus drivers need to be more helpful and more respectful.
201	Bus #300 is never really on time in afternoon. Last bus to North Raleigh is at 6 PM. That's a little early. GoTriangle doesn't really cover Morrisville. #300 doesn't run throughout the day.
201	Es un servicio excelente. Y necesario
201	GoTriangle is fine for the most part, although would like to see some type of service from Glendower and Leesville to a stop to connect to service. The on-demand service needs major improvement.
201	Good job. Could not get to work or any other place without the service.
201	I am satisfied with what I have seen. It's just if one bus is late, they're by no way obligated to hold a specific bus which makes me late and really frustrated.
201	On-demand service is horrible.
201	On-demand short service is not reliable. I have been left at work twice because the shuttle did not come.
201	The service is good. I read on the #201 bus. I wish in the morning you would avoid unnecessary stops at empty bus stops or in order for the driver to meet the time sequence. It's annoying and a waste of time.
201	The triangle bus #100 should stay on later for people who need to get to Raleigh after work.
300	Better weekend service.
300	Everything is fine.
300	Hard to reach help when trying to figure out which bus to use. Learning the app for Android.
300	I would like to see extended hours of service and early AM hours from 5 AM to 1 AM, five days a week. Also, more bus shelters with maps.
300	It takes 2.5 hours to get from Cary to Durham, which isn't that far away. Four hours to Hillsborough. I'd like to see the towns and cities of the triangle better connected.
300	Light rail or train between Raleigh and Durham would be great.
300	Not enough service to and from Apex and buses stop running to Cary too early.

300	The buses need to run late on the weekend and run outside of peak hours.
301	#300 through Perimeter Park was a bad idea. Use on-demand #50, #30 via to Cary can be obtained.
301	Buses should never leave a stop until the stop time!
301	Gets the job done.
301	I would like to be able to pay via Samsung pay/Apple pay, or to use a card on the bus. Also, they should see 7-day passes on the buses.
301	Just want to say I really like riding the bus. Clean and quiet.
301	Please keep the #301 Raleigh route. Rename the other #301 RTC - needs a different number.
301	Thanks for doing the survey.
301	The floors and seats need to be disinfected more often, especially on buses that carry healthcare workers from hospitals. They could be transporting MRSA, Vre or Cdiff. Look it up.
301	Triangle needs improved expanded service yesterday and light rail from Raleigh to CH now! Or at least BRT or FOV ones. Cars are ruining our lungs and environment and development needs to be only around transit from now on!
305	Bus drivers should wear nametags. Route #305 should offer a few bus rides in the middle of the day in case people need to go home early for some reason.
305	I'm from up north. I think if our bus system was similar to that system there it would help a lot of people.
305	My route, #305, has no middle-of-the-day service, and only runs once per hour on commute times.
305	Often bus drivers keep bus way too cold!
305	Service with GoTriangle is way better than service with GoRaleigh.
305	Some buses leak very bad from the emergency escape door in the roof and occasionally a seat is full of water, or water may come from a window left open. This is very discouraging. Please resolve leaky roofs. Thanks!
305	Some buses should run more often.
311	I think there should be Wi-Fi at the RTC.
311	They need bus shelters at every bus stop because some of the stops have no overhead shelter to protect people in bad weather conditions like rain and snow while waiting on the bus.
400	Call 336-552-9023 mechanic working on my 2001 Chevy Lumina
400	Cash fare because nowhere to buy tickets in orange is a HUGE problem. Forces OC residents and LI to pay more for fare or spend time to get tickets. Boo!
400	Do not take away the stops by Patterson Place, the ones in South West Durham.

400	Extend peak service for loop on the #400 to all-day. Lots of students live off South West Durham Drive. Please!
400	I appreciate the convenience of GoTriangle between Durham and Chapel Hill, but the routes from North Durham downtown and Durham Raleigh are prohibitively long. A single midnight bus along each express route would also be nice.
400	I like it but the price should be less for my age and run on Sundays.
400	I love riding the TTA. Durham bus...not so much.
400	I use Park and Ride from Patterson Place in the AM. Buses are always on time. On my way home I've noticed buses between 6-7 PM never come on time. I have waited for over an hour on multiple occasions. On my way home I catch the #400 from in front of Health Sciences in Library. Stop #3222.
400	I would like more hours or frequency of service during the week. There are some spots near to Durham Drive that the bus just stops few times (#400 bus).
400	If you cancel the route on South West Durham Drive, I will stop riding the bus. So, I probably will not be riding next year. Where are all the people going to park at the Park and Ride on Witherspoon? Poor planning in my opinion.
400	I'm fortunate enough to use my partners university ID. I couldn't afford a pass otherwise.
400	Increase the number of buses on route (busy). Drivers should come to slower stops. Online surveys.
400	Lights out #405 needs Sunday service.
400	Love it. Wish it ran more frequently to Patterson Place Park and Ride (route #400) to UNC.
400	More frequent #406/405 on weekdays.
400	My main concern is availability. I ride route #400 which goes down University Drive during peak time. This might change although I have a way to get somewhere to get on there, that stop is usually crowded and getting rid of that peak hour route would result in it being even more crowded.
400	Need better method for real time updates on delays. I've missed many meetings or events due to late buses and would appreciate you being able to provide ETA vs. guessing if a bus will come.
400	Operators are not very helpful.
400	Overall its fine and I'm fine with waiting longer. Just wish buses didn't just randomly not show up at the end of work. Today's 4:33 PM #400 at UNC hospital not appearing, as an example.
400	Overall the service is really good. There have been a few drivers who drive too fast today. The bus driver that usually picks up on Morning Drive at 4:35 PM did not show up.
400	Please make bus #400 full path or stops. At least some on Saturday for the Lenox apartments.
400	Service on Sundays could be improved.

400	The drivers on #5 in the AM hours. 75% are rude. They need to understand the riders are the reason they have a job.
400	Very unacceptable-my bus (4:35, #400) consistently runs late. I will likely be quitting the bus because of this. Please improve.
400	Would like direct service to RDU from Durham/CIP. Extend route #405 to Jones Ferry or Carrbero Plaza Park and Ride.
405	Too much smoking at bus stops. Need express service in North Durham. Takes an hour to travel 16 miles. Speakers on buses are too loud.
405	#405 should skip Erwin Road stops and service Witherspoon Park and Ride. Too many passengers on #400.
405	Better travel times like 15 minutes apart for all buses.
405	Get an App. ASAP!! Better Wi-Fi.
405	I enjoy the extended service option on Sundays. And I also like how frequent the Saturday schedule is.
405	I wish the 6 PM #400 from Chapel Hill would go all the way to Durham.
405	Is there no other way to get to downtown Durham but 147 when it is backed up? Delays are too frequent on the #400/405 and many seem avoidable.
405	It would be great if the #405 came up to the Jones Ferry Road Park and Ride lot.
405	Make GoPass available to buy for the public.
405	More frequent #405.
405	Please create a route that travels 54 to Duke. My ride takes at least an hour each way- Chapel Hill #405-Duke-Hard transfer. Often miss #405.
405	The transit 10c app information is unreliable, often showing buses miles away from their actual location.
405	There are some areas between Durham and Chapel Hill that are dead spots with no public transit so there should be stops to at least connect to CH Transit.
405	There is a redundancy of stops on certain routes that's unnecessary and wasteful of time.
405	Would be helpful if buses actually stopped inside Duke Mess campus.
405	Would like complete access to shuttle for 1st #400 route. Would like to connect to #420 1st run. Frequent rider points would be a plus...
11	#420
420	For the purposed route change for bus #420 - using I-40 is not a good option. Adjust local route.
420	Have a nice day.

420	Have concerns about the #420 route in the 2019 plan.
420	I like the buses at the access to them. Some of the drivers can be a little reckless while driving.
420	I wish the #420 ran on weekends.
420	Please keep Hwy 86 on #420 route. Please keep Home Depot stop. Please consider last bus leaving UNC hospital at 6:20 PM.
420	Very satisfied.
420	Would be nice to have more buses run throughout the day.
570DX	Add more connections to part.
570DX	Try to reach out to towns like Henderson, Louisburg, Oxford, Roxboro, Spring Hope in the triangle region.
58CRX	Combination of Eubanks Park and Ride lot and CRX bus make my long commute so much better than driving.
58CRX	Generally, pretty good about being on time although AM val time normally depends on traffic. They're for a certain time never showed up (specifically at UNC in the afternoons).
58CRX	Great job with bus service. It would be very helpful to me if a CRX bus left CH rail around 9:00- 9:15 AM and if once returned RAL Ch around 1:30 PM.
58CRX	I like to have earlier bus at CRX from Chapel Hill to Raleigh on afternoons.
58CRX	I wish there was more service so that I could go from neighborhood to Eubanks. I wish all the bus stops were covered from the elements.
58CRX	I would like to see frequency of services extended during the week.
58CRX	If you want to compare your survey results to census data, q35 will give you a headache. Try 2 questions for race and ethnicity. Also-buses are too cold often.
58CRX	I'm glad the CRX is available. It gets at least a few cars off the interstate.
58CRX	More CRX buses and more hours.
58CRX	Need larger buses to accommodate growing ridership; like to see move to electric, other enviro-friendly buses.
58CRX	Newer, hard plastic chairs/seat buses should not be used for express buses. Express drivers should be strongly encouraged to make it to transit centers on time for passengers with connecting bus schedules.
58CRX	One more bus at 7:20 AM would be great on weekdays, and one more at 5 PM on weekdays, sometimes it is so crowded.
58CRX	The CRX is getting popular and crowded. It would be helpful if more buses/times were added. Like a bus every 15 minutes instead of 30.

58CRX	There needs to be one mid-day bus to travel to the Park and Ride. If I'm sick and want to leave at lunch, I can't get back to my car. So, I suffer until the 3:30 bus.
58CRX	Wish there was one late CRX run so I could stay later on campus on busy days.
58CRX	Work with drivers and stress importance of getting to first stop of the day a little early. For early morning round, traffic is not a problem. Get to stop early 5 minutes to help newbies figure out the system. Then able to start on time.
58CRX	Would love to see just a few more options for the CRX, particularly in the afternoon. Overall though I'm very happy this is an option for more commute and I've noticed an increase in ridership over the past 6 years.
58CRX	Your bus service has made my commute to college possible for almost 4 years, thanks!
59DRX	It would be nice for the bus to go back to 4:30 PM. Also, more routes on Thursday and Friday. Those are the days they are mostly late.
59DRX	Occasionally the bus doesn't show up. Most of the drivers are great! Most of the time it's a good experience. The drivers have a very hard job.
59DRX	24 Hour buses.
59DRX	All DRX drivers are nice, especially the young guy with long braids. He masters his driving skills. I feel safe when I am on his bus. We get off at Emergency Drive (DRX). Is there any way you can create a stop on the Hwy to Robinson at Erwin road and Trent Drive intersection, thanks.
59DRX	Better time coordination with GoRaleigh. Wolfine would be helpful for DRX.
59DRX	Buses running on time is extremely important. It is extremely frustrating to race to get to a bus in the morning or afternoon for it to not be on time especially when it is the first stop in the morning or it is just sitting at the GoRaleigh station.
59DRX	Change the Trent bus stop for DRX back to 4:30 PM. Thank you! Need updated DRX schedule on the bus. Bus is not showing up on the mobile app.
59DRX	Could you consider a DRX route along 540?
59DRX	Drivers are very helpful and I really like taking the bus.
59DRX	DRX buses late, no show with no explanation, 4:30, 5:00 and 5:30 buses are still crowded. Bus drivers smoke right outside door of bus, cigarette smoke fills bus and we have bridge whole way inhaling it. Wi-Fi rarely works. Not working now!
59DRX	DRX operative hours end to early in the evening. Moving one extra ride at 2000/2400 would be great.
59DRX	DRX route could be every 15 minutes. The 4:25 bus should go back to 4:30 (at Duke South). Your bus drivers wait at VA for 5 minutes (huh). Drivers should use the toll road at all times to lower their frustration and customers'.

59DRX	First route for a bus must turn on transponder both AM/PM. Some are broken e.g. 2610 if bus does not reliably report its location the service is useless.
59DRX	I enjoy using TTA. Like to commute. Like the sociability. Like the TTA bus drivers.
59DRX	I love having the option to ride the bus- it makes my Durham-Raleigh commute so much more bearable. The Wi-Fi can be really spotty/intermittent, and it would be awesome if that could be improved.
59DRX	I used to use the Transloc app, but it stopped working when I updated my phone - having that app functioning again would be very useful.
59DRX	I wish there was a 7:50 AM DRX bus (7:35-8:05 is 30 minutes).
59DRX	I would love more comfortable buses. More times every 15 minutes at 8 AM and 5 PM.
59DRX	It would be nice to be able to use a credit card to pay the fare (referring to #18).
59DRX	Latasha always shows her professional way. She keeps her calm and smiles when emergencies happened two days in a row. Her driving skills are the top #1 request: stop across Emergency Drive. Operator needs to actively listen to ride. They gave me the wrong info on 10/420 morning at 9:00 AM.
59DRX	Please get all of the 7:00 buses to leave Durham station at 5 after the hour. GoDurham is always late and even with help they can get to the transit center in less than 20 minutes and waiting a half hour in the Durham station is unpleasant.
59DRX	Please set Wi-Fi routers so they are discovered sooner. My computer sees 30 other networks first. Also please work with wireless provider to fix two dead spots (1) Duke St. after leaving Durham station and (2) 147 to I-40 on-ramp. Thanks.
59DRX	Provide more convenient ways to purchase bus passes. Need more creative TV monitor service to increase ridership.
59DRX	The buses frequently do not have the locator on thus making the app useless. All drivers should use shoulders. All drivers should use the proper routes.
59DRX	The DRX drivers are wonderful.
60(WRX)	Need weekend service from Wake Forest to Raleigh.
60(WRX)	The PM #1 (Capital) is awful. It is always late and packed! Sometimes it doesn't ever run every 15 minutes like it is supposed to.
60(WRX)	Would like to have more trips on WRX. Example: mid-day WF to Raleigh and vice versa.
63(KRX)	Enjoy taking the bus. Less stressed than when driving to work.
63(KRX)	I am legally blind and depend on the buses. There are some improvements needed but each year it has gotten better.
63(KRX)	I am very grateful for the Zebulon Werdas bus. Without it I wouldn't be able to get to work! Thank you!

63(KRX)	I ride the Knightdale Express bus Monday - Friday. On the days the state workers are off I have to drive because the bus does not run. Which it should because everyone that catches the Express bus are state workers.
63(KRX)	The staff are great and easy going very nice drivers. Enjoy the ride.
63(KRX)	This bus/transportation services reduces stress and most operators are very pleasant and punctual.
64(ZWX)	My job pays for our Go-Pass!! Love the Zeb/Wendell express 2014. I left from Zeb/-2018 leave Wendell at 7 AM at 8:10 for 9 AM work head out at 6 PM for 6:20 PM.
64(ZWX)	The buses have gotten better over the years.
700	Second trip ever to Durham. Used it last time to get to the airport. Same today and trip to/from Duke Gardens. When will bus arrive texting was easy with my flip phone.
700	31-day pass should be cheaper than 4 weekly passes, why is it \$10.50 more expensive.
700	Bus #700 on Monday morning usually late at Durham station at 6 AM.
700	Fred and Eric who drive for GoDurham BCC are the best drivers of all time ever!
700	GoTriangle buses connect well to GoDurham and are punctual. Travel times on connecting buses is much longer than express and express buses are slowed down by Hillsborough street. More travel options would be awesome!! The busses with stops playing on screen is great! More options that connect Durham with Hillsborough would work for many people. Bus route maps could include more stops/time- tables but online apps fill this gap pretty well.
700	I will only ride TTA. Safest bus around. Comfortable and reliable
700	I would love if the bus operated later so I can work 3-420 PM. Also on Sundays.
700	It was a great idea for buses to go town to town. Thanks.
800	App should combine schedules with GPS.
800	Bus leaks when it rains.
800	GoTriangle has been great. Buses are usually at least 5 minutes behind. Chapel Hill transit is great (not the J).
800	It would be better if the 800/s would be every 10 minutes in rush hour times, especially with the increase delays due to 40/59 traffic.
800	I've been riding for over 6 years.
800	Sometimes the bus doesn't come and I have to take a later or different one. This is pretty rare though!! Bus drivers are safe.
800	The estimated arrival times on the Transloc app tend not to be accurate after 5 PM on the weekday.
800	The regular #800 buses are usually late coming from Manning,

800	The temperature of the bus is so cold sometimes.
800	There has been a large number of route cancellations/changes to routes. Also, the time could be extended on weekends shifts to assist people with less usual schedules.
800	When the app doesn't work & buses are really late. Don't usually have any more lighting at some bus stops. When dark I've been passed before Hwy 54 stops.
805	#805 should run mid-day Monday through Friday.
805	Compared to other bus systems I would say that this company could use help with knowledge of other bus services and bus availability!
805	Excellent services. Always on time at the hospital.
805	I just moved from out of state and I've been riding. What I appreciate in the triangle is the combo of Park and Rides all bus stops.
805	I really appreciate the GoTriangle buses - they run on time and the drivers are always so kind.
805	I ride #805. Catch the bus at Dresden. Would like hourly service between 10 AM & 3 PM. Would use bus on weekends if it traveled Hwy 54 between Hope Valley and Farrington.
805	I wish the #805 ran more frequently throughout the day and had longer hours. It is difficult as a commuter student to have reliable transportation on the #805.
805	I'm happy with GoTriangle overall, the Wi-Fi is awful, however, making it difficult to work while on the bus.
805	More bicycle access on buses.
805	Overall good thanks
RSX	Consider making charge for cash or have ability to pay with card.
RSX	I ride a bike to the bus, and taking my bike with me on the bus is very important too. Occasionally both bike racks are filled when I come to the bus.
RSX	I take RSX. It could be good if it runs over the summer vacation.
RSX	Last week I waited for RSX bus at West Campus Duke, but it didn't come and we paid money to Uber.