

Westchester County Department of Public Works and Transportation

# The Bee-Line System On-Board Survey-2010

FINAL REPORT



April 2011

**AJM Consulting, Inc. and  
Nelson\Nygaard Consulting Associates**



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This project was funded through a matching grant from the Federal Transit Administration under grant number NY-90-X601.

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1. Report No.	2. Government Accession No. N/A	3. Recipient's Catalog No. N/A	
4. Title and Subtitle Bee-Line System 2010 On-Board Passenger Survey		5. Report Date April 2011	
		6. Performing Organization Code N/A	
7. Author(s) Thomas Wittmann, Nelson\Nygaard Consulting		8. Performing Organization Report No. N/A	
9. Performing Organization Name and Address AJM Consulting 3549 Saddlebrook Taylor Mill, Kentucky 41015		10. Work Unit No. (TRAIS) N/A	
		11. Contract or Grant No. NY-90-X601	
12. Sponsoring Agency Name and Address Westchester County Department of Public Works and Transportation 100 East First Street Mount Vernon, New York 10550		13. Type of Report and Period Covered On-board survey, data collection	
		14. Sponsoring Agency Code 1803	
15. Supplementary Notes N/A			
16. Abstract  A survey was conducted on-board Bee-Line buses during the period October 16-23, 2010. Temporary workers were trained and then used for data collection under the direction of AJM Consulting. The survey sample was 10,040. A similar survey was conducted in 2007 and the results are used in this report for comparison purposes.			
17. Key Word On-board bus passenger survey, data collection		18. Distribution Statement Westchester County Department of Public Works and Transportation 100 East First Street Mount Vernon, New York 10550	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 86	22. Price Free

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## Key Findings

- Customers are generally satisfied with Bee-Line service. In addition, customer satisfaction among Bee-Line riders is moving in the right direction, with survey respondents giving the Bee-Line higher marks (compared to 2007) in every category of service quality.
- Bee-Line riders are largely transit dependent. 62 percent of riders do not have a motor vehicle available to them. Statistically, this is virtually equivalent to the 2007 numbers.
- Bee-Line ridership continues to be diverse. Most riders identified themselves as Hispanic (34 percent) or Black (38 percent).
- The income distribution of riders has changed significantly since 2007. Thirty-two percent (up from 23 percent in 2007) of riders earn less than \$10,000 annually. The number of persons earning between \$10,000 and \$25,000 has dropped from 31 percent in 2007 to 15 percent in 2010. This is likely due to the impacts of the current economic downturn.
- The Bee-Line's ridership is aging. The average age of passengers is now 37 - compared to 34 in 2007.
- The proportion of new riders on Bee-Line has decreased. In 2010, 15 percent of riders had been riding less than one year, a drop of 2 percentage points from 2007.
- Work trips were the predominant trip purpose, with 67 percent of respondents travelling to or from work. This is an increase from 2007's figure of 63 percent.
- MetroCard usage has continued to increase. Sixty-four percent of users now use MetroCard on a regular basis. This has increased by 3 percent since 2007. Cash usage decreased by 3 percent during this same time period.
- Yonkers continues to be the largest location of trip origins and destinations. The number of origins and destinations to New York City has remained identical to 2007.
- More than two-thirds of riders have access to the internet, up from 63 percent in 2007. Internet usage increased in all income categories compared to 2007.

## The Survey Process

AJM Consulting conducted a self-administered, on-board survey of all Bee-Line routes between October 16, 2010 and October 23, 2010. A total of 10,040 responses were received, which compares to 9,243 responses collected in a similar survey conducted in 2007. Riders had the option of completing the survey in either English or Spanish. Of the 10,040 responses, 1,653, or 16% were completed in Spanish.

## Data Collection Details

The data collection effort was initiated on Saturday, October 16, 2010 on bus runs dispatched from the Central Maintenance Facility (CMF) on Saw Mill River Road in Yonkers. Two field supervisors were utilized to coordinate the surveyors with the dispatchers and operators. The survey continued at the CMF through Saturday, October 23rd. One field supervisor was utilized at the CMF for the remaining days after the initial Saturday.

The survey was also conducted from the Cerrato Satellite Bus Garage in Valhalla from Monday, October 18th through Friday, October 22nd. One field supervisor administered the survey.

Tal & Associates, located in Mt. Kisco, New York were contracted to assist in the hiring and training of the surveyors. About 45 surveyors were screened, trained and hired. AJM supervisors conducted formal training on October 15th at the Saw Mill garage.

The sampling plan was based on the desired number of responses for each route developed by Westchester County. AJM Consulting created a sampling plan that was designed to meet these goals. An assumed response rate of 25 percent was projected in the development of the sampling plan. For some routes, every trip was sampled, whereas for other routes, only selected trips were surveyed. The resulting sample was 10,040 responses, which represents an overall sample error level of  $\pm 1$  percent.

Bee-Line System annual ridership in 2010 was 32.3 million riders, which is a record high. As a comparison, total annual ridership in 2007 was 30.8 million. Therefore, in comparing the 2010 responses with the 2007 survey results, it is important to understand that the changes in the three year period reflect proportionate ridership changes in a growing market.

## Data Processing

All completed survey forms were batched and shipped to AJM Consulting offices. After an initial Quality Assurance/Quality Control (QA/QC) review, the forms were keyed into an Excel spreadsheet by CDPS, Inc. A total of 10,040 records were entered.

Each piece of work (or batch) had a front sheet defining the day of week, run number, route, direction, trip start time, beginning survey sequence number and ending survey sequence number. These data were entered into a database for each individual survey record. Sequence number, route, direction, and time period were inserted in each record. The time periods were:

- 2 Weekday before 9:00 am;
- 3 Weekday between 9:01 am and 2:59 pm;
- 4 Weekday between 3:00 pm and 6:00 pm;
- 5 Weekday after 6:00 pm;
- 6 Saturday; and
- 7 Sunday.

In questions 35 and 36 respondents were asked boarding and alighting locations. There were nine specific response categories and four general categories with an area for script. Mr. Vincent Pasquale, Associate Planner with the Westchester County Department of Public Works and Transportation, utilizing his local knowledge, converted many of the script responses to specific communities or areas. Mr. Pasquale similarly assisted with cleaning location responses for questions 31 and 33, which asked the ZIP code and municipality of the origin and destination of the entire trip. These were converted by AJM to numeric codes. Two fields were added to the database to capture this information.

The database is maintained as an Excel Workbook with two worksheets. The first worksheet contains the various fields for each of the 10,040 records. The second worksheet is a Dictionary defining each field and response codes.

## Rider Profile

For the Bee-Line system to be most effective, its services must be well matched with the market it aims to serve. The following sections aim to establish who is using the system, how they are using it, and how these characteristics have changed over the past three years.

## Demographics

The demographic profile of Bee-Line users was compiled from those survey questions which have US Census equivalents. These include age, race or ethnicity, sex, disability status, vehicle ownership, household income, and occupation. The demographic profile provides a basis for both historical comparison and regional context, as the characteristics are examined against previous survey results and census data for Westchester County.

**Figure 1 What is your age?**

(Source: Survey Question 27)

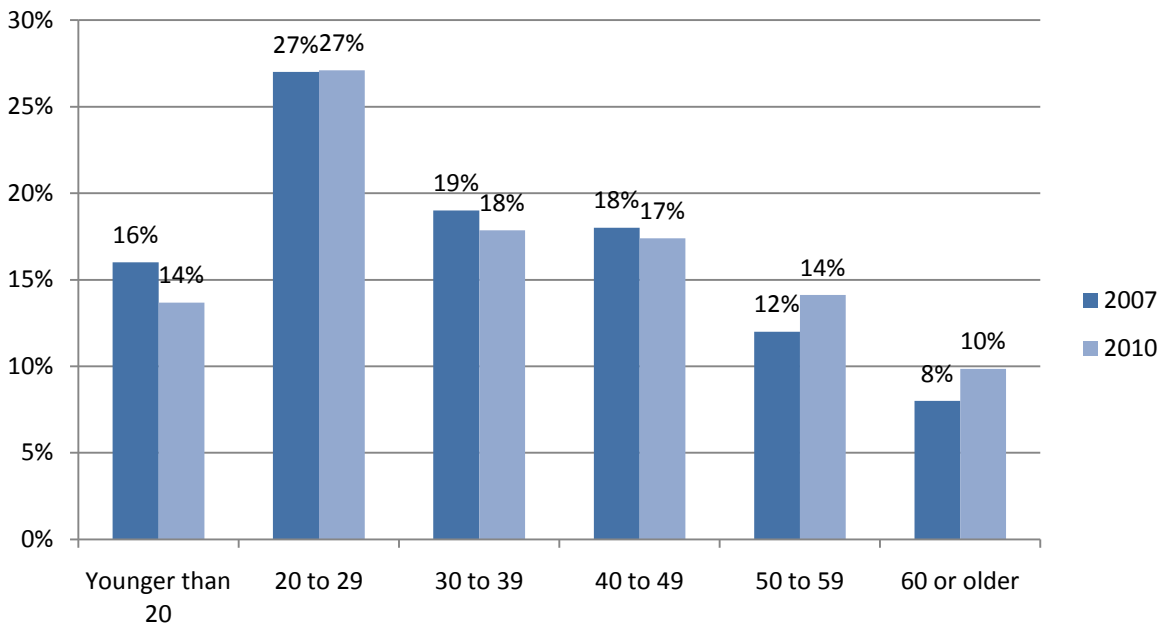
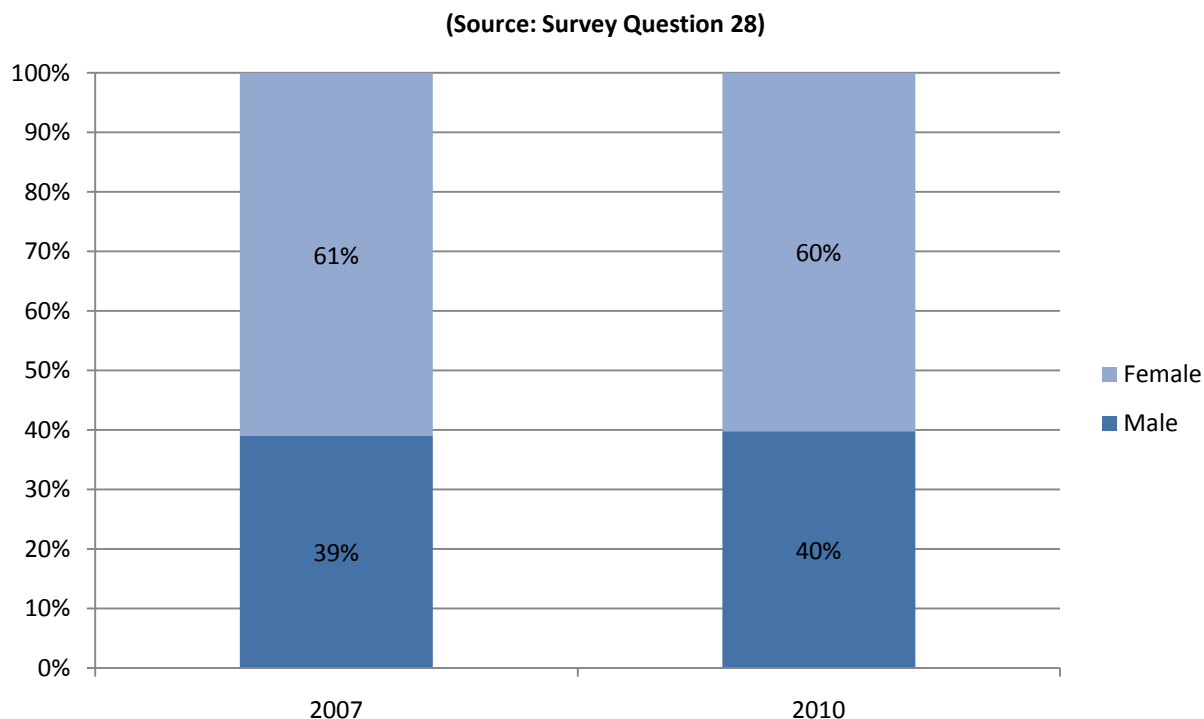


Figure 1 shows the age distribution of Bee-Line riders. According to the survey results, the average age of Bee-Line users is 37 years old. This is 3 years older than the average age of 34 reported three years ago. As in 2007, the largest segment of Bee-Line users is in the 20-29 year-old range, but the median age is now 34 compared to 30 in 2007. The population of riders is aging along with the overall population of the county. According to the US Census Bureau, the median age of Westchester County residents in 2008 was 39.9, up from 39.1 in 2006. The increase in trips among people over age 60 could be due to the County’s success in promoting reduced fare MetroCards among the senior population.

The age distribution of Bee-Line passengers is consistent with national statistics. According to the American Public Transportation Association’s (APTA) 2007 Profile of Public Transportation Passenger Demographics and Travel Characteristics Reported in On-Board Surveys, more than 45% of transit users in the United States are under the age of 35. The same report shows that 55.5% of national transit users are female. As seen in Figure 2, Bee-Line ridership appears to be moving toward this figure as well, with females making up 60% of riders in 2010, down slightly from 61% in 2007.

**Figure 2 Are you male or female?**



The past three years have seen some slight, but not insignificant, shifts in distribution of ethnic and racial groups among Bee-Line riders (Figure 3). The largest percentage growth of any subgroup was among those who identify themselves as “Other.” This group increased from 3% of all riders in 2007 to 5% in 2010. At the same time the percentage of Hispanic riders held steady at 34%, while Whites and Asians increased to 18% and 5% respectively. Passengers identifying themselves as Native American dropped from 2% to 1% and the percentage of African American passengers declined by 4 percentage points to 38% of all riders.

By comparison, the US Census Bureau's 2009 American Community Survey (ACS) estimates that the overall make-up of Westchester County is 69.4% White, 19.8% Hispanic, 14% Black, 5.8% Asian, and .1% Native American (Hispanic is not mutually-exclusive with any race in ACS).

Figure 3 Which do you consider yourself?

(Source: Survey Question 29)

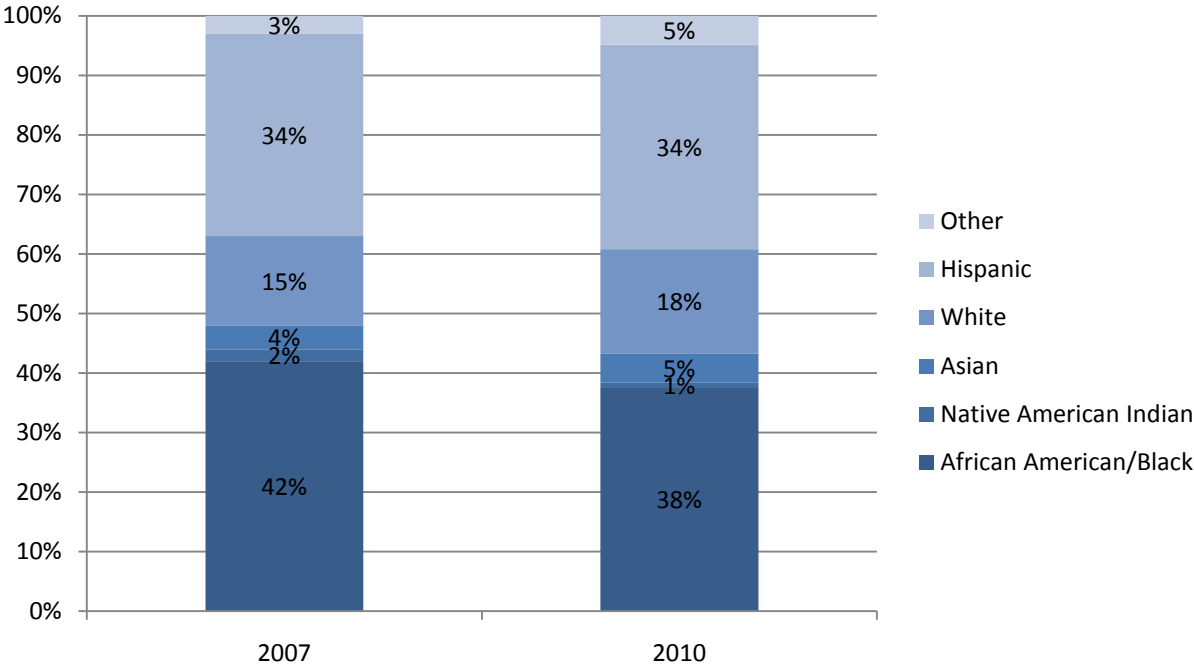
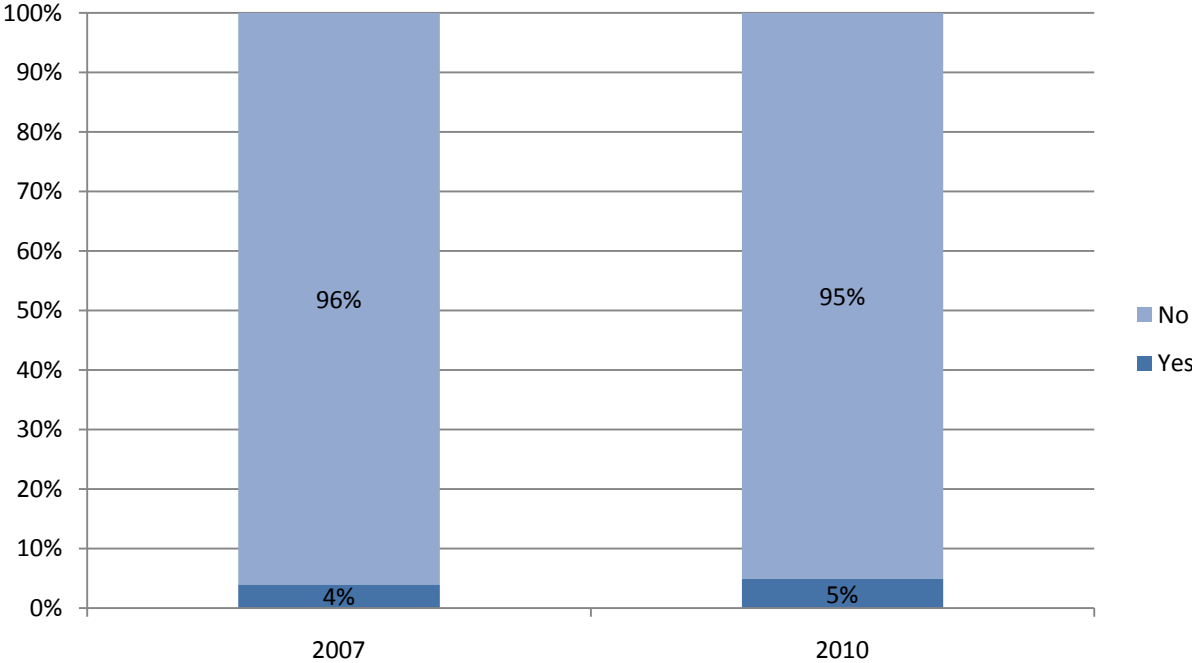


Figure 4 Do you have a disability that makes transit use difficult?

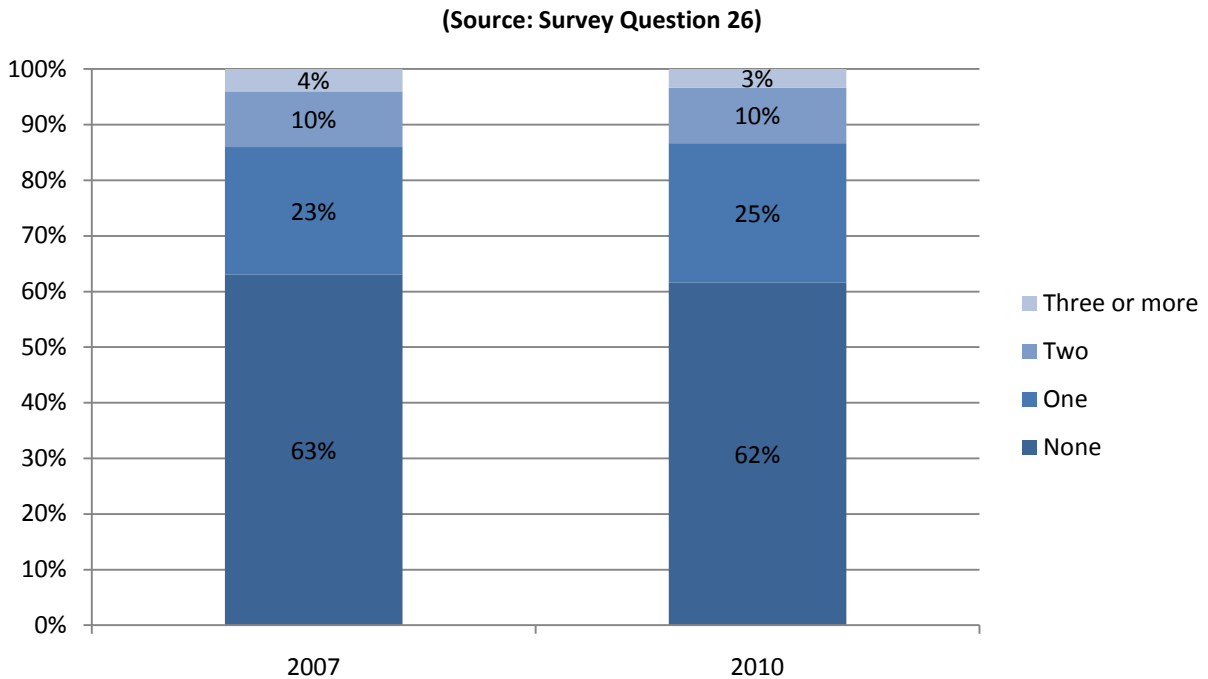
(Source: Survey Question 25)



As seen in Figure 4, 5% of survey respondents indicated that they have some sort of disability that makes it difficult for them to use transit. This is slightly higher than in 2007. This increase could reflect efforts by Bee-Line to encourage the disabled to use fixed-route bus service.

For a variety of reasons ranging from physical disability, to economic means, to lifestyle choice, many Westchester County residents live car-free. According to the 2000 Census, 15% of Westchester County households do not have any automobiles available for their use, while 36% have only one automobile in the household.

**Figure 5 How many motor vehicles are available for you to use?**

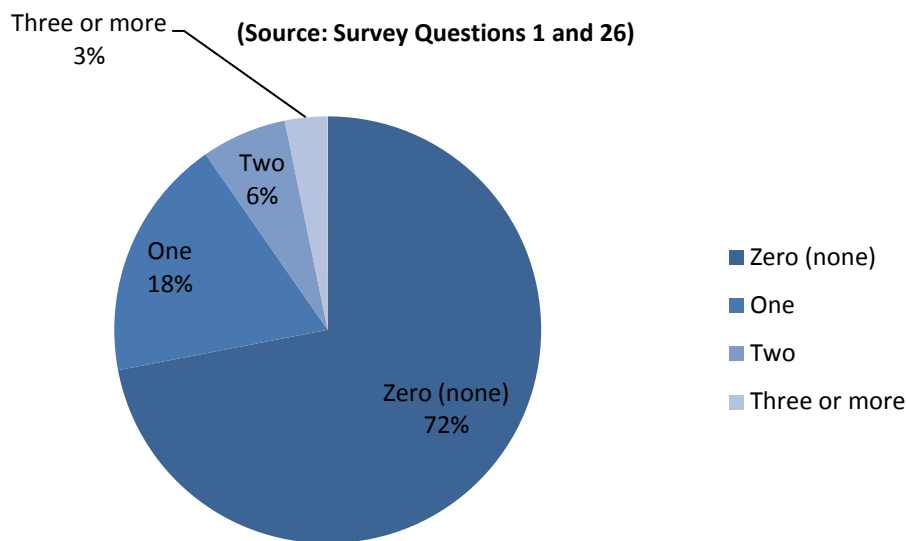


By comparison, 62% of Bee-Line users reported in 2010 that they have no access to a motor vehicle, and an additional 25% have access to just one vehicle (Figure 5). However, this one vehicle may be shared by one or more other members of the household so actual availability may be more limited.

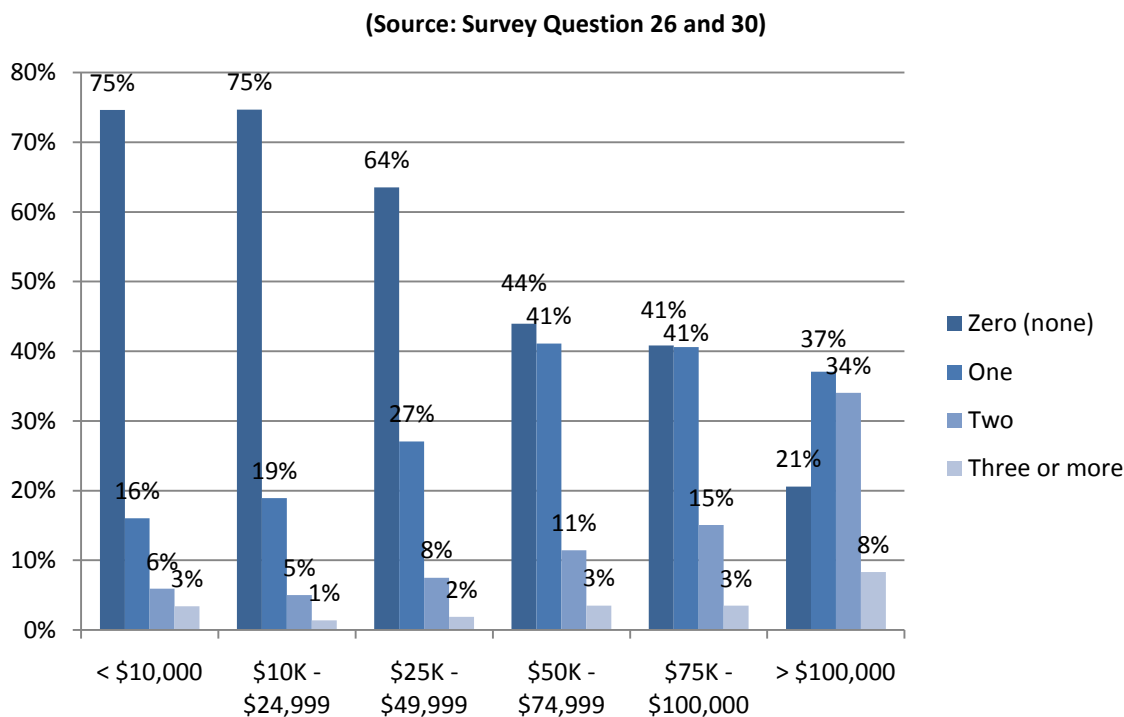
There is a strong correlation between lack of a vehicle and frequent ridership on Bee-Line. Among the most frequent Bee-Line riders (those riding more than 5 days a week), more than 90% have either one vehicle or no vehicles available to them (Figure 6).

Clearly, there is a sizable segment of Westchester County’s population (and work force) that is dependent on Bee-Line service for their mobility needs. This population is transit-dependent in the traditional sense. But, of the survey respondents in the highest income bracket (> \$100,000 annual household income), a full 58% reported having zero or one vehicle as well (Figure 7). In most cases, these people have made a deliberate choice to rely on Bee-Line service and to reduce or eliminate their personal driving. Thus, the Bee-Line can be viewed as both a lifeline and a lifestyle choice for Westchester County residents and commuters.

**Figure 6 Vehicle Availability Among Most Frequent Bee-Line Users (Riding More Than 5 Days per Week)**



**Figure 7 Vehicle Availability by Income**

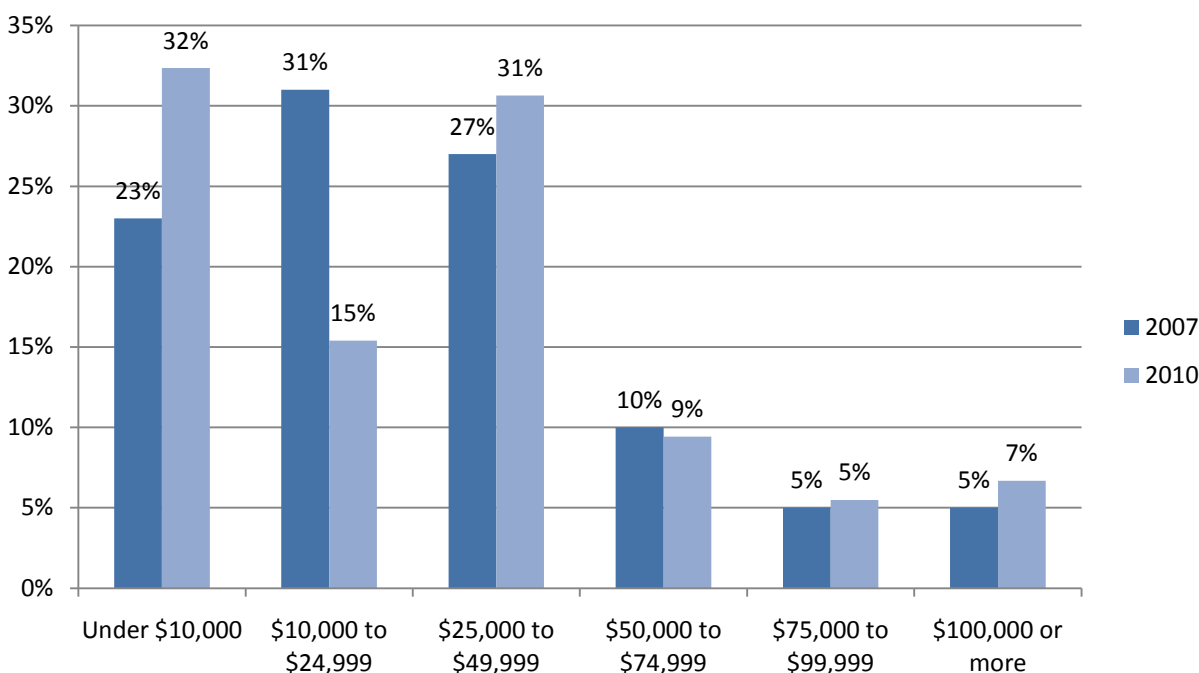


Vehicle availability among Bee-Line users has not changed significantly since 2007. What has changed, however, is the reported salaries of survey respondents, especially among lower-wage earners.

As seen in Figure 8, the most frequently reported annual household income range among Bee-Line users in 2007 was \$10,000 to \$24,999. In 2010, more people reported an annual household income of under \$10,000 than any other income range. The three-year period between the two surveys coincided with a major economic recession, during which unemployment rates for the County jumped from 3.3% in December 2006 to 7.8% in February 2010. It is likely that these difficult economic conditions are reflected in the responses of Bee-Line passengers seen below.

**Figure 8 What is your total annual household income?**

(Source: Survey Question 30)



But while some Bee-Line passengers appear to be earning less than in previous years, they also seem to be working more, or at least a higher percentage of respondents reported having jobs. When asked to describe their employment or occupational status, 72% of respondents in 2010 indicated that they were employed (either inside or outside of the house) compared to 69% in 2007 (Figure 9). A higher percentage also selected multiple occupational categories than they did in 2007. As these categories are not mutually exclusive, a higher occurrence of each category except “Homemaker” was reported in 2010. The reported unemployment rate among Bee-Line users was about the same as the County-wide unemployment rate at the time of the survey.

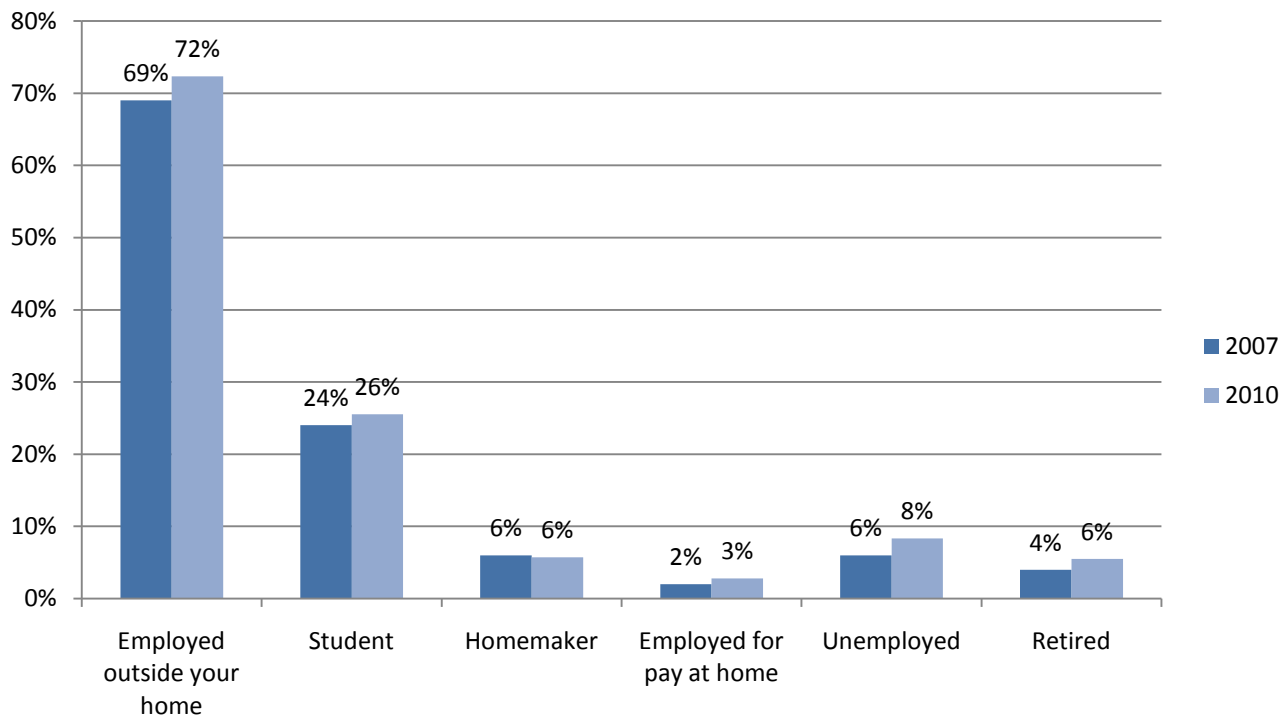
According to the American Council on Education, about 78% of undergraduate students work while they are enrolled. This figure has remained mostly unchanged since the mid-1990s when the federal government began tracking the statistic, but in recent years a relatively new phenomenon known as “retirement jobs” has also emerged. Based on studies by the Families and Work Institute, it is estimated that 20% of retirees aged 50 and older are currently working for pay in a new role. This is reflected in the multiple categories selected in response to the question regarding unemployment and occupational status.

Among Bee-Line users, 49% of survey respondents who identified themselves as students also marked that they were employed. Additionally, 11% of those who said they were retired also

marked that they were employed or studying. Thus, it is increasingly common for transit users, as well as the population in general, to be both studying and working or working and retired at the same time.

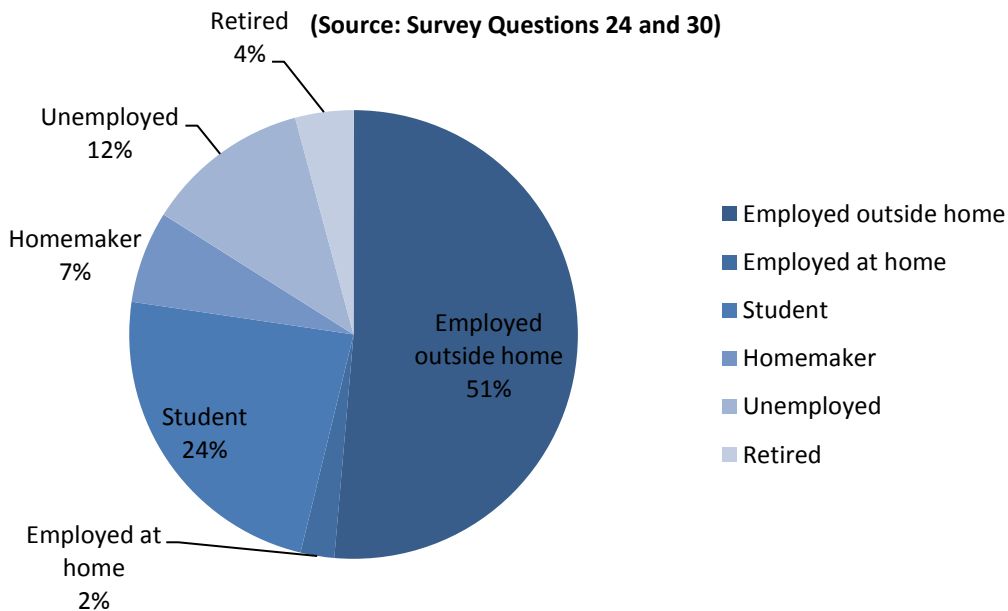
**Figure 9 Employment or Occupational Status**

(Source: Survey Question 24)



Part-time workers tend to have lower annual incomes than those who identify themselves only as employed, and indeed among Bee-Line passengers who stated that their annual income was below \$10,000 a year, 28% were students or retired (Figure 10).

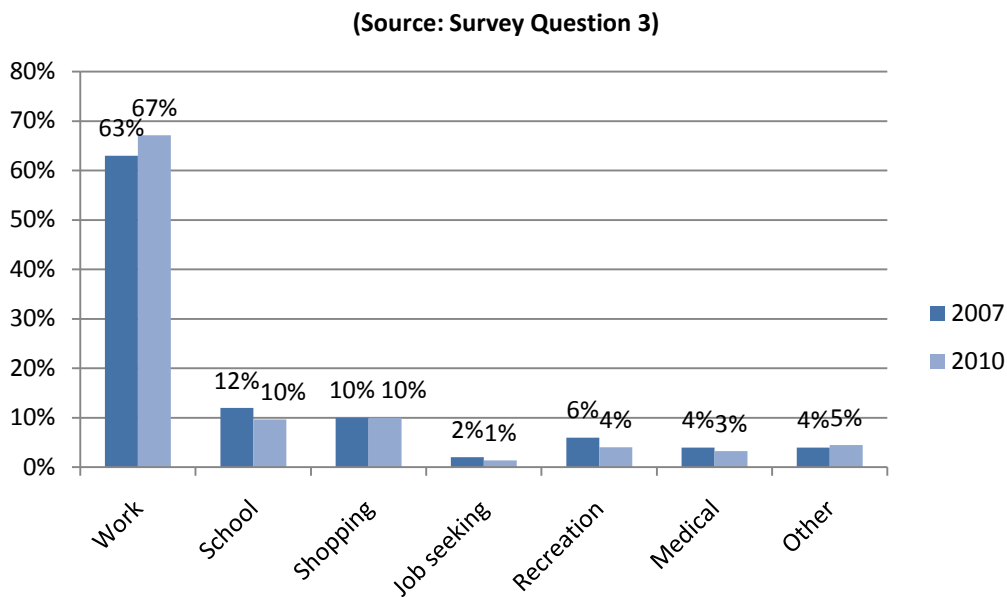
**Figure 10 Occupational Status of Riders Making Less than \$10,000 a Year**



## Trip and Fare Characteristics

While the demographic profile of Bee-Line users provides insight into who is using the system, the trip and fare characteristics show how the system is being used. This information is key to maintaining a relevant and responsive transit system that meets the mobility needs of Westchester County residents and commuters.

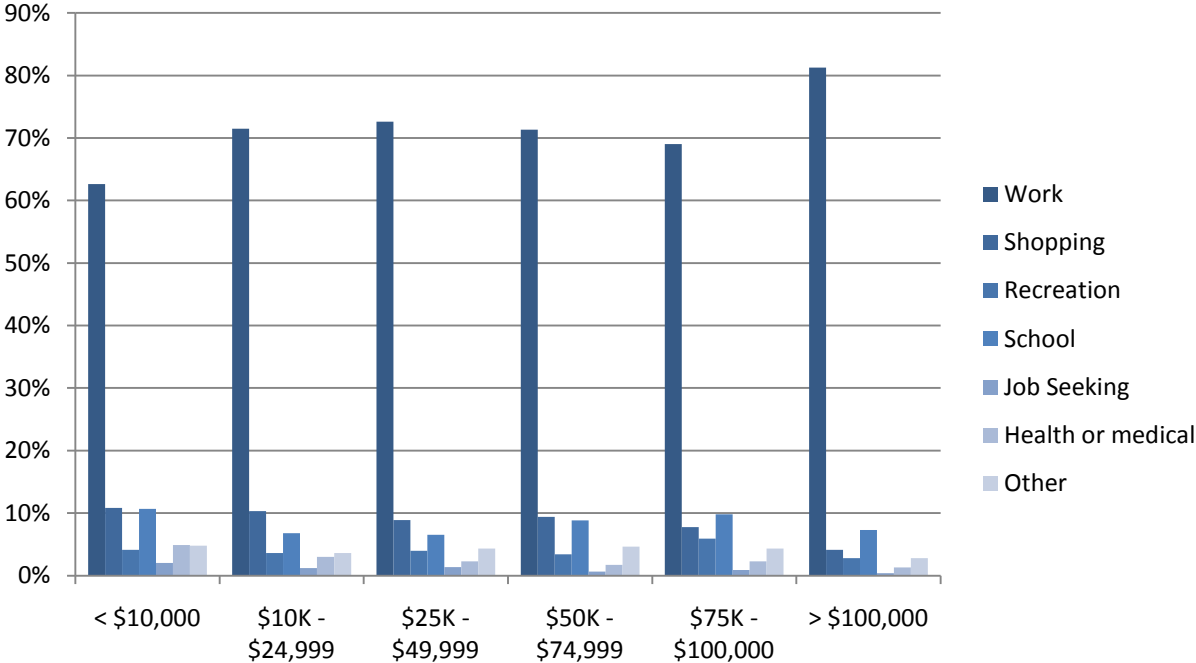
**Figure 11 What is the main purpose of your bus trip today?**



As seen in Figure 11, non-work trips made up a smaller component of total Bee-Line trips in 2010 than in 2007, as more respondents reported that “Work” was the main purpose of the trip they were taking. In other words, more than anything else, the Bee-Line’s role in Westchester County can be described as facilitating employment. This is true across the economic spectrum, as seen in Figure 12.

Figure 12 Trip Purpose by Income

(Source: Survey Questions 3 and 30)



As shown in Figure 13, in 2010, a full 73 percent of riders used Bee-Line services five days a week or more. This is a slight drop from 2007. The reduction in the number of persons using the system seven days a week was the key cause of this drop. One third of passengers use Bee-Line service five days a week (a typical work-commute).

In 2010 only 3% of survey respondents identified themselves as “Not Regular Riders” – down from 5% in 2007.

**Figure 13 How many days do you usually use the Bee-Line System?**

(Source: Survey Question 1)

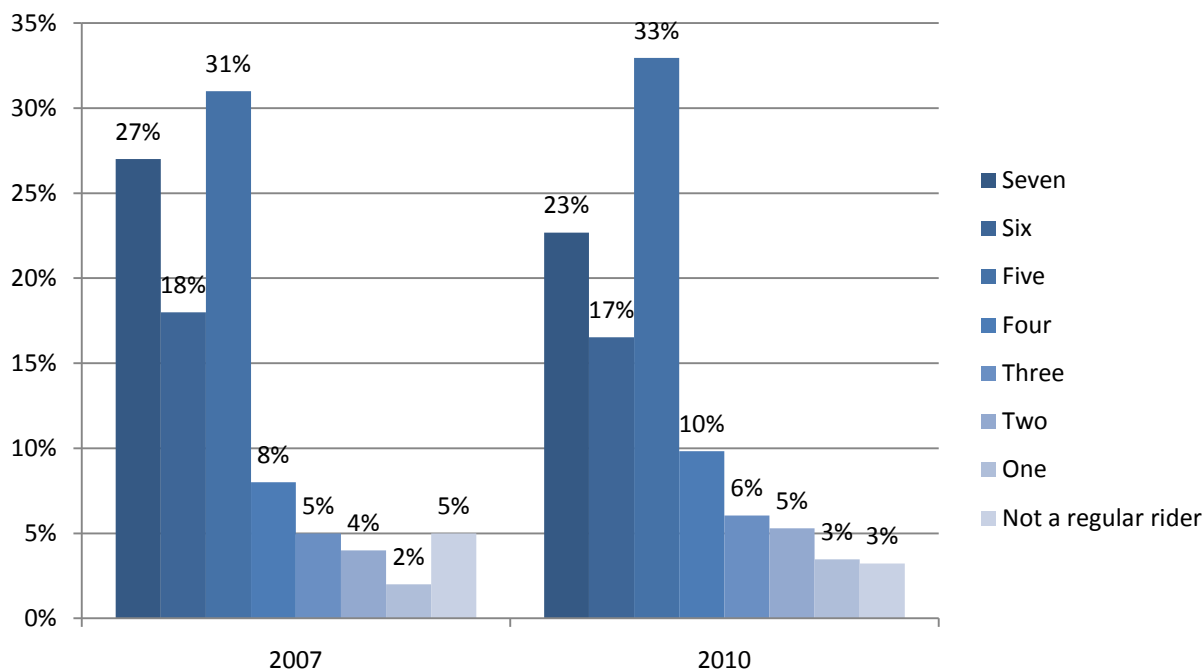


Figure 14 shows that the greatest variety of trip types is found among the least frequent riders. These riders are most likely to use transit for occasional shopping, recreational, or healthcare related trips. For regular riders – those using the service 4-5 or 6-7 days a week, work trips predominated.

**Figure 14 Trip Purpose by Frequency of Bee-Line Use**

(Source: Survey Questions 1 and 3)

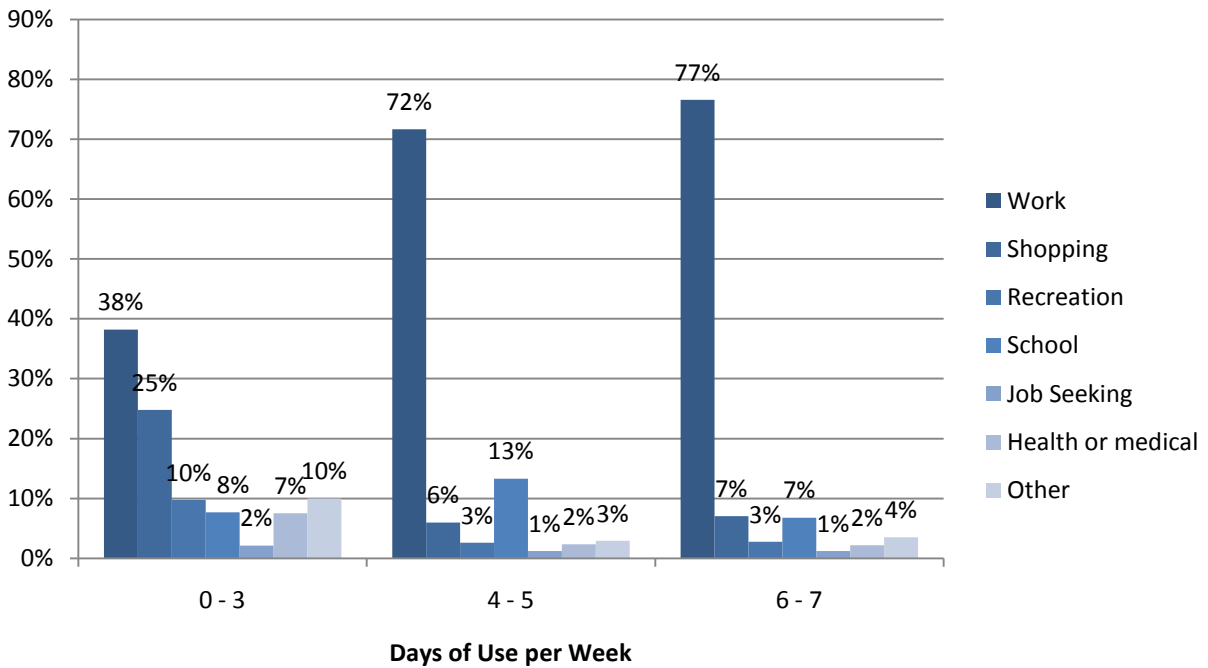


Figure 15 shows that among Bee-Line users, ridership frequency increases with years of ridership. It is possible that many formerly occasional users have transitioned to more regular riders over time. For example, whereas teenagers often use transit for school, part time jobs, and occasional social and recreational outings, their ridership habits generally become more regular when they join the workforce.

**Figure 15 Years of Bee-Line Use by Frequency of Use**

(Source: Survey Questions 1 and 2)

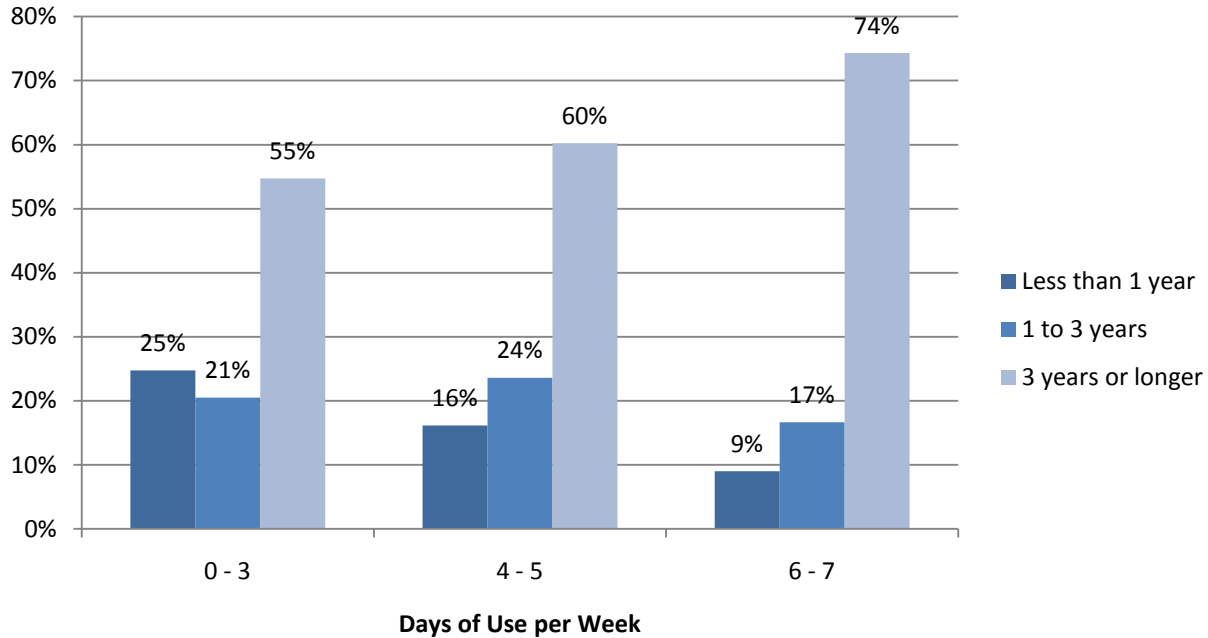
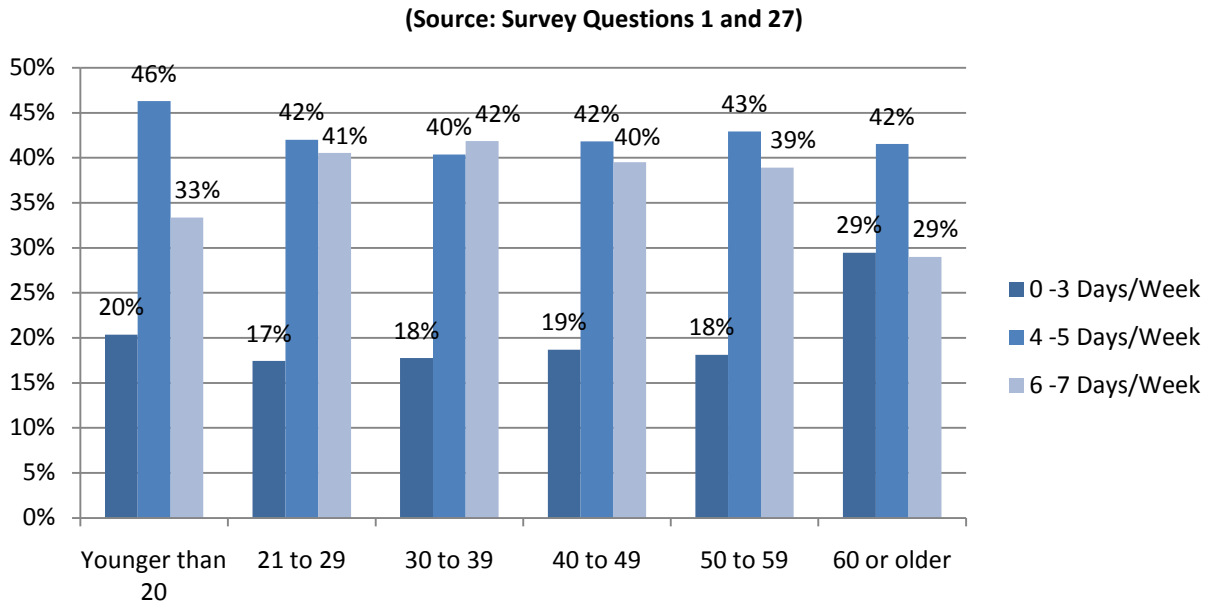


Figure 16 Frequency of Use by Age



As seen in Figure 16, the ridership habits of Bee-Line users remain remarkably steady between the ages of 21 and 60 (prime working years). After age 60 (which includes many retirees), there is a substantial increase in the percentage of respondents who ride less than 4 days per week. This is typical of older riders that use service to access medical appointments and shopping instead of a regular workplace.

This corresponds to the data seen in Figure 17, which shows a significantly lower rate of employment among passengers who use the Bee-Line less than 4 times per week, compared to more frequent riders.

**Figure 17 Occupational Status by Frequency of Use**

(Source: Survey Questions 1 and 24)

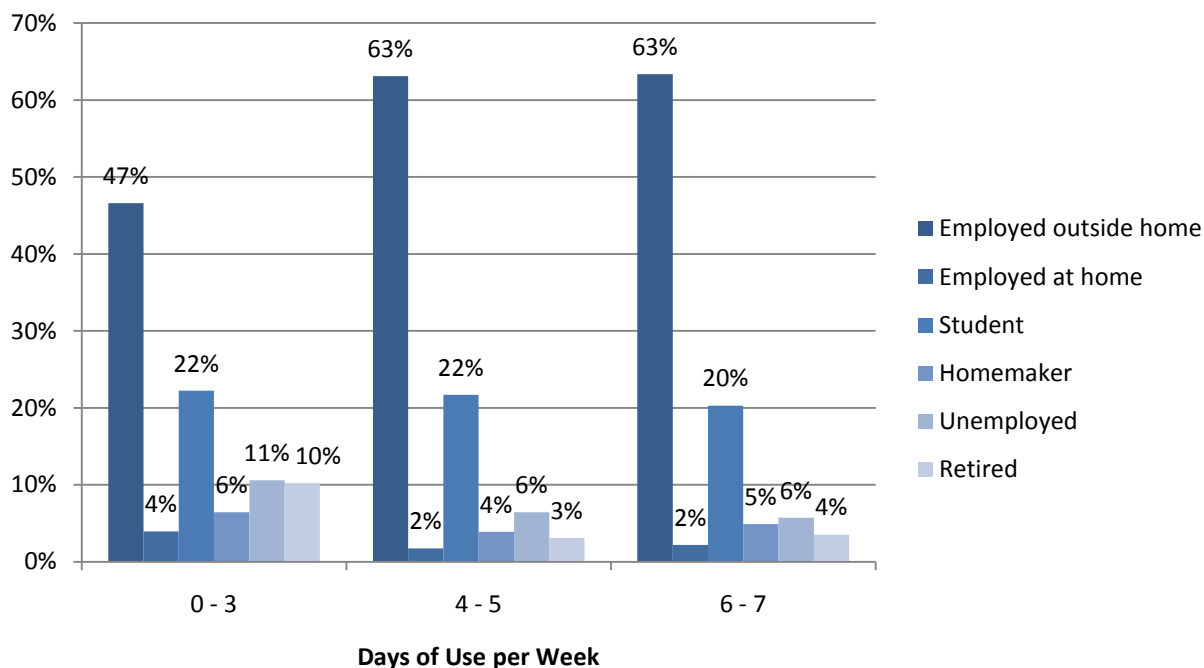


Figure 18 shows ridership frequency varies by race. African American and Hispanic respondents typically ride Bee-Line more often (6 to 7 days a week) than any other ethnic group. This is likely an indication of transit dependency. On the other hand, the majority of white and Asian riders appear to be weekday commuters, who find the Bee Line as the best option for weekday work or school trips, but may rely on other forms of transportation for other trip purposes.

**Figure 18 Frequency of Use by Race**

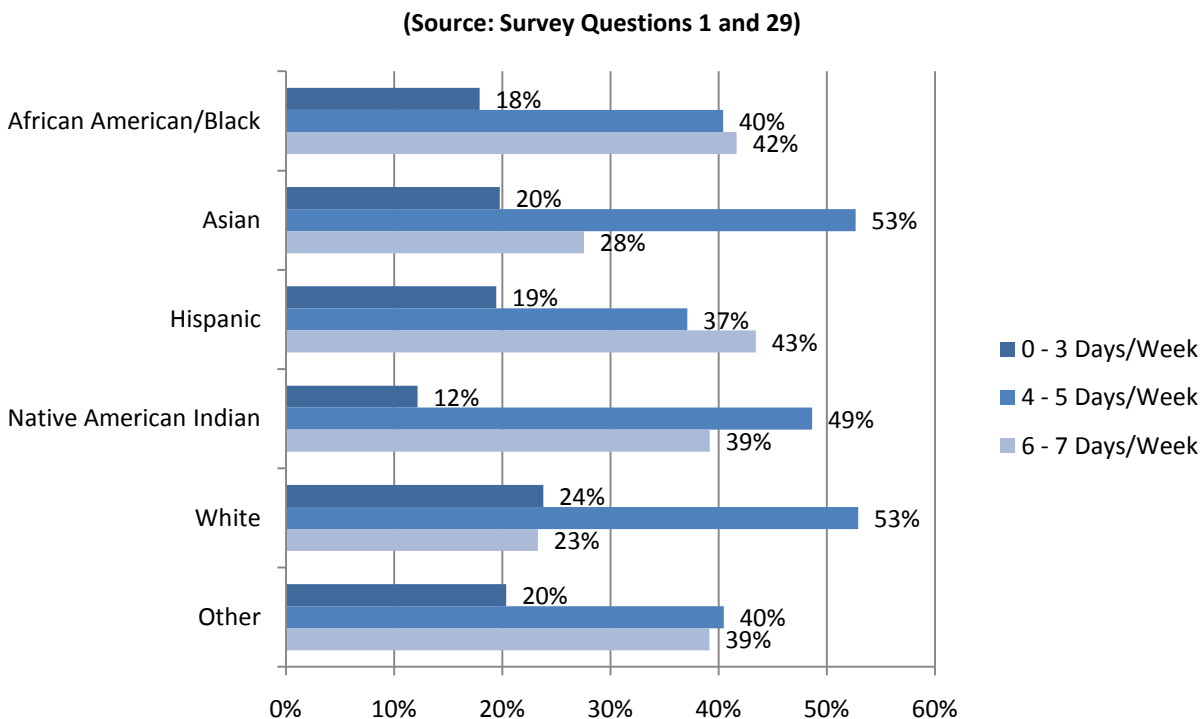
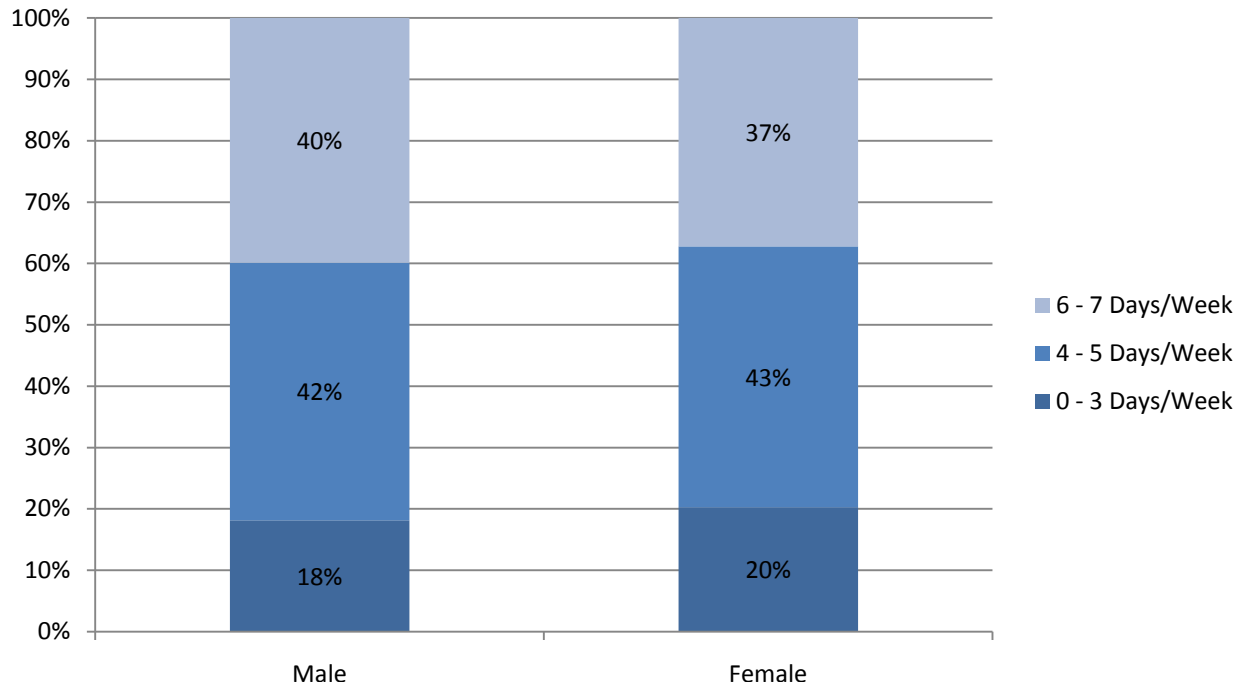


Figure 19 shows that males are slightly more likely to use Bee-Line services 6 or 7 days a week, and females are slightly more likely to be occasional riders, but the largest segment for both males and females is the 4 to 5 days per week segment, which represents the typical work commute.

**Figure 19 Frequency of Use by Gender**

(Source: Survey Questions 1 and 28)



The Bee-Line routes serve as key links in the larger metropolitan transportation network; providing both intra-County trips and facilitating crucial “last mile” connections to and from other regional services.

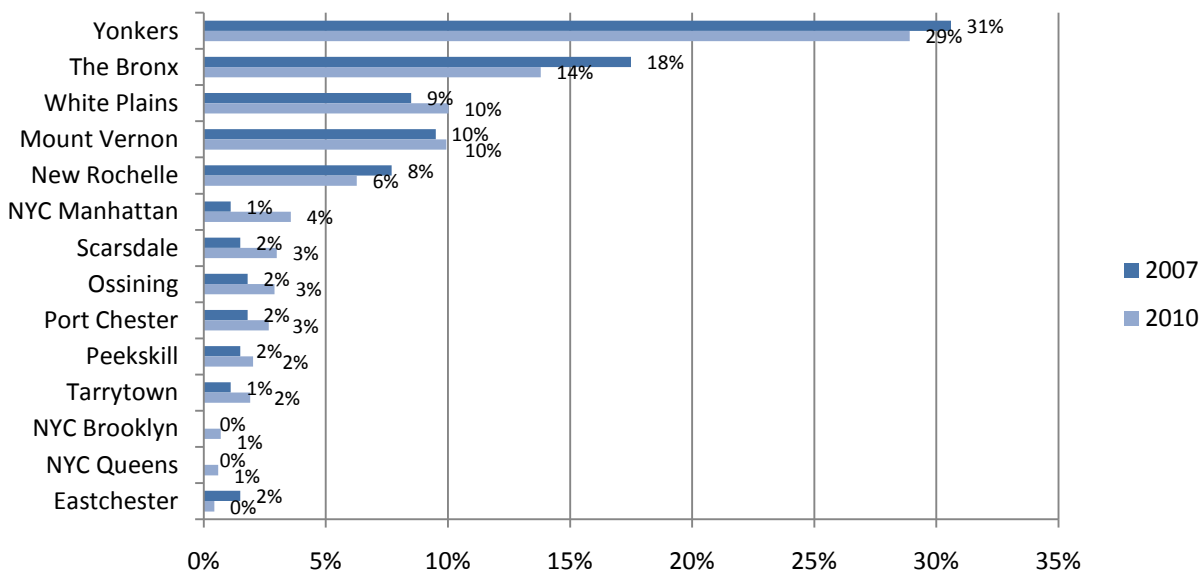
Questions 31 and 33 asked respondents the ZIP code and municipality of the origin and destination of their entire trip. Questions 35 and 36 asked the location of where respondents got on and off the bus. This data required extensive cleaning because people often refer to their points of origin, destination, boarding and alighting in different ways. Locations in Westchester have multiple identities. An area might be known by a name different from the municipality in which it is located, and ZIP codes often do not conform to municipal boundaries. Also, many respondents did not know specific ZIP codes, misspelled names, used abbreviations or had writing that was barely legible.

Given these limitations, to the extent possible, Mr. Vincent Pasquale, Associate Planner with the Westchester County Department of Public Works and Transportation, reconstructed surveyed trips from the available information, including the self-reported data and the parameters of each route, such as direction of travel and the ability to make the connections and reach the destinations cited. However, this process also revealed incompatible combinations, resulting in the rejection of a significant amount of data. This is why the responses to these questions in Figures 20-23 reflect a relatively lower proportion of responses than other questions.

Survey questions 31 and 33 also gave survey takers an opportunity to list the names of municipalities where they began and ended their particular trip. The top responses in each category are summarized in Figures 20 and 21.

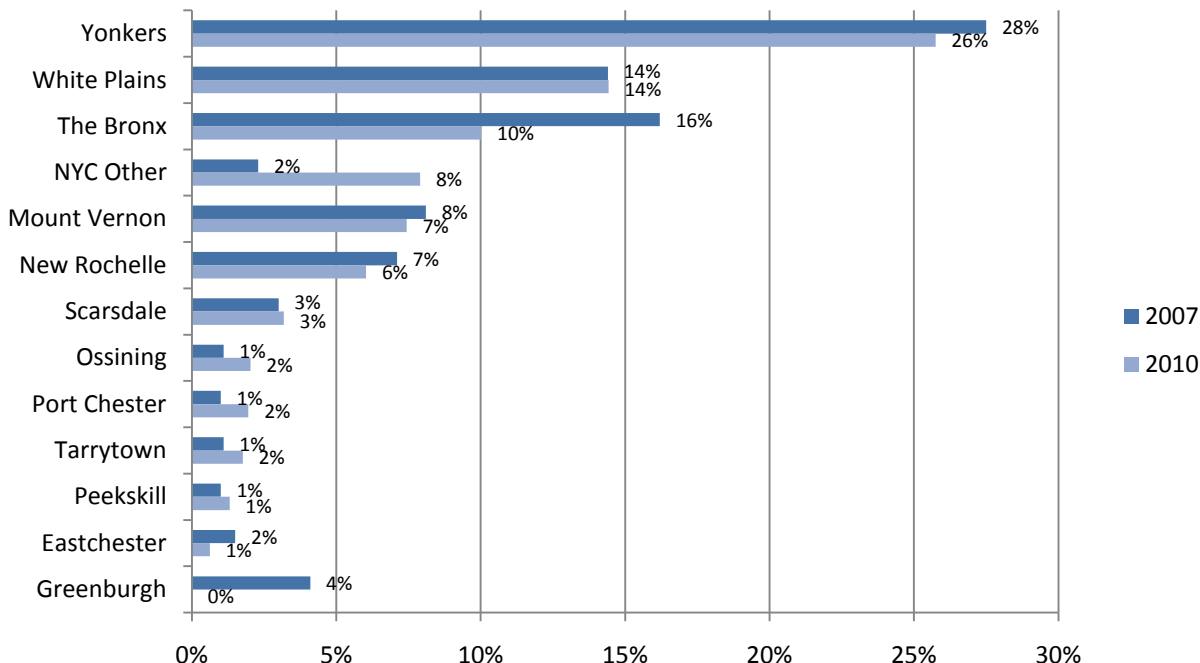
**Figure 20 In what municipality did you begin this trip?**

(Source: Survey Question 31)



**Figure 21 In what municipality will you end this trip?**

(Source: Survey Question 33)



While Figures 21 and 22 show that Yonkers was the top origin and destination of Bee-Line trips in 2010 at 29% and 26% of responses, respectively, the combined boroughs of New York City made up 19% of trip origins and 18% of destinations. Other significant trip generators include White Plains (10% of origins, 14% of destinations), Mt. Vernon (10% of origins, 7% of destinations), and New Rochelle (6% of origins, 6% of destinations).

One difference between survey respondents' answers in 2007 and 2010 was the shift away from the Bronx and toward "Other Boroughs" as the choice for where they began or ended their trip. However, the overall percentage of respondents heading to or from New York City remained relatively the same between 2007 and 2010. A possible explanation is that with the advent of MetroCard, more riders from the outer boroughs started traveling to Westchester County and more Westchester County residents found it increasingly appealing to travel to the outer boroughs by transit due to the ease of the transfer.

Figures 22 and 23 show that downtown White Plains and Getty Square in Yonkers made up approximately a third of boarding and alighting locations among 2010 survey respondents. Both of these locations are significant employment and retail nodes for Westchester County, but both also serve as important transit hubs for the region. Getty Square is near the Yonkers Station served by the Metro-North Railroad. Metro-North also serves the White Plains Transit Center in downtown White Plains which is the central hub of the Bee-Line System. It should be noted that six locations shown in Figures 22 and 23 (downtown White Plains, Getty Square, downtown Mt. Vernon, the Bronx, Yonkers, and downtown New Rochelle), represent 61 % of boardings and 56% of alightings.

**Figure 22 Where did you board this bus?**

(Source: Survey Question 35)

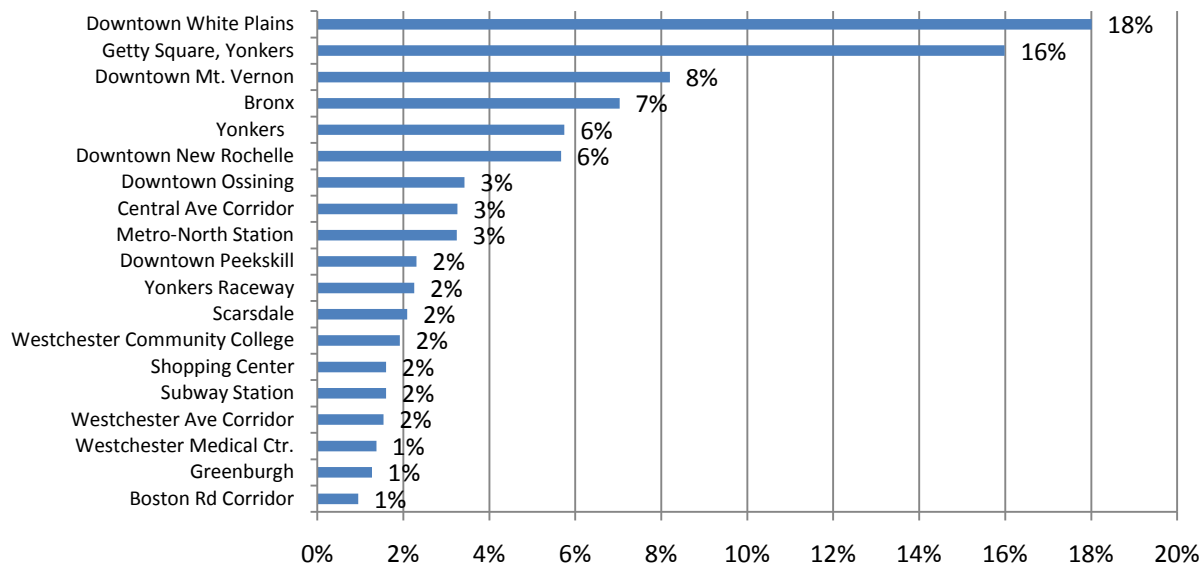
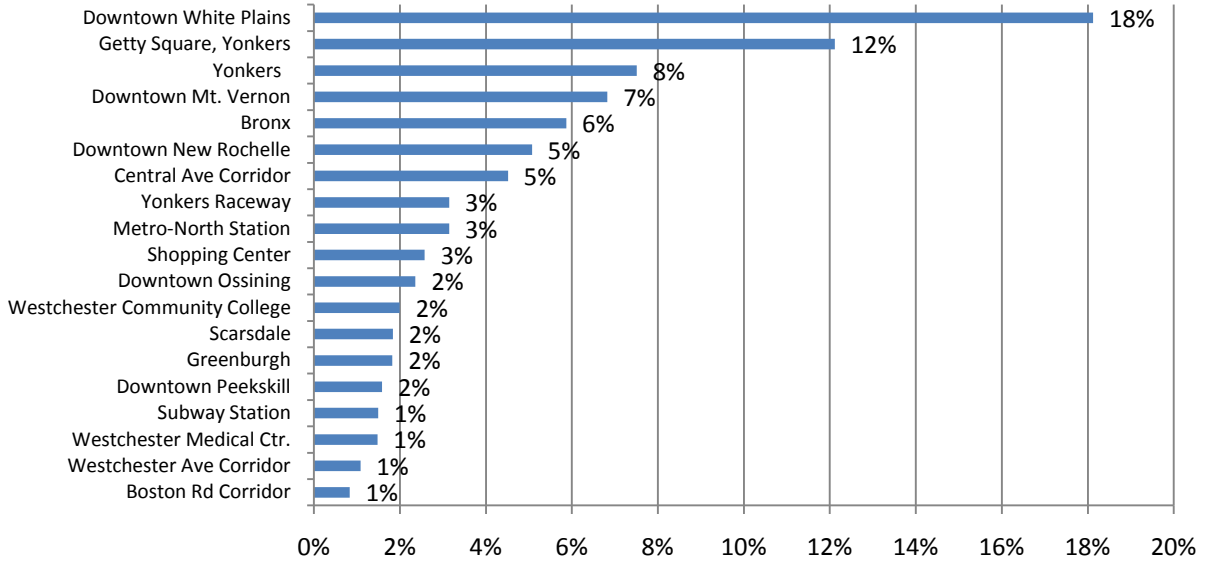


Figure 23 Where will you get off this bus?

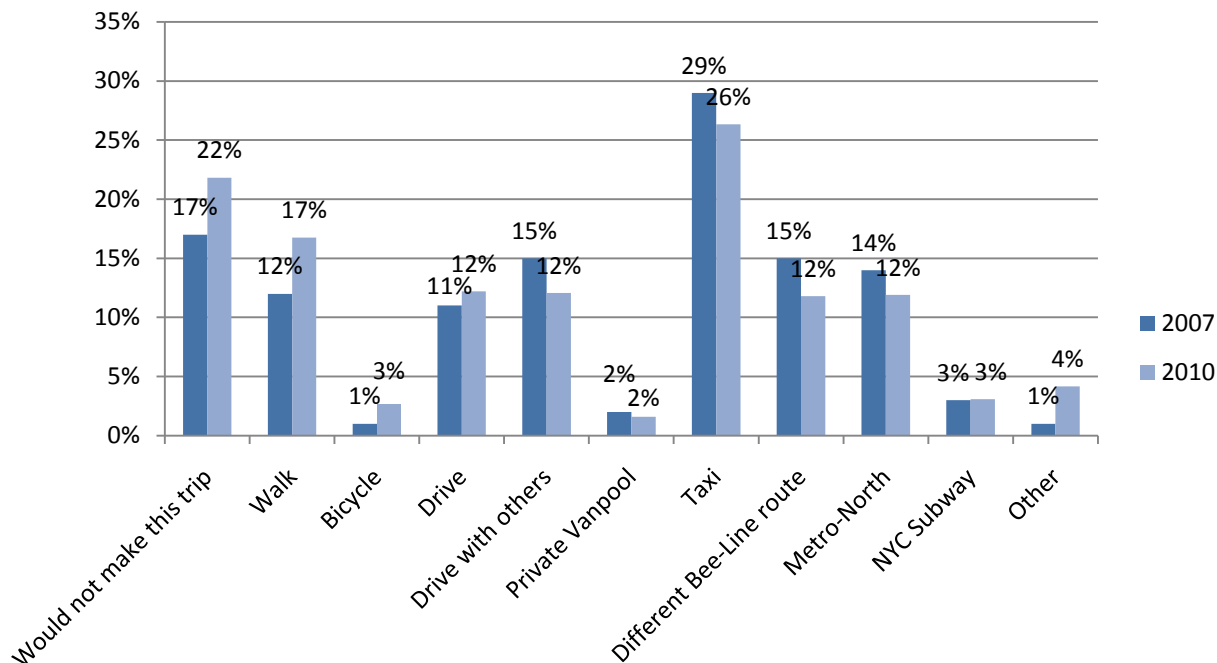
(Source: Survey Question 36)



Without the availability of Bee-Line service, many survey respondents indicated that trips would either not be possible, or would cost significantly more to make. In 2010, 22% of survey respondents said that without their Bee-Line route, they would not have made the trip that they were making at the time of the survey (Figure 24).

**Figure 24 If this route were not available how would you make this trip?**

(Source: Survey Question 34)

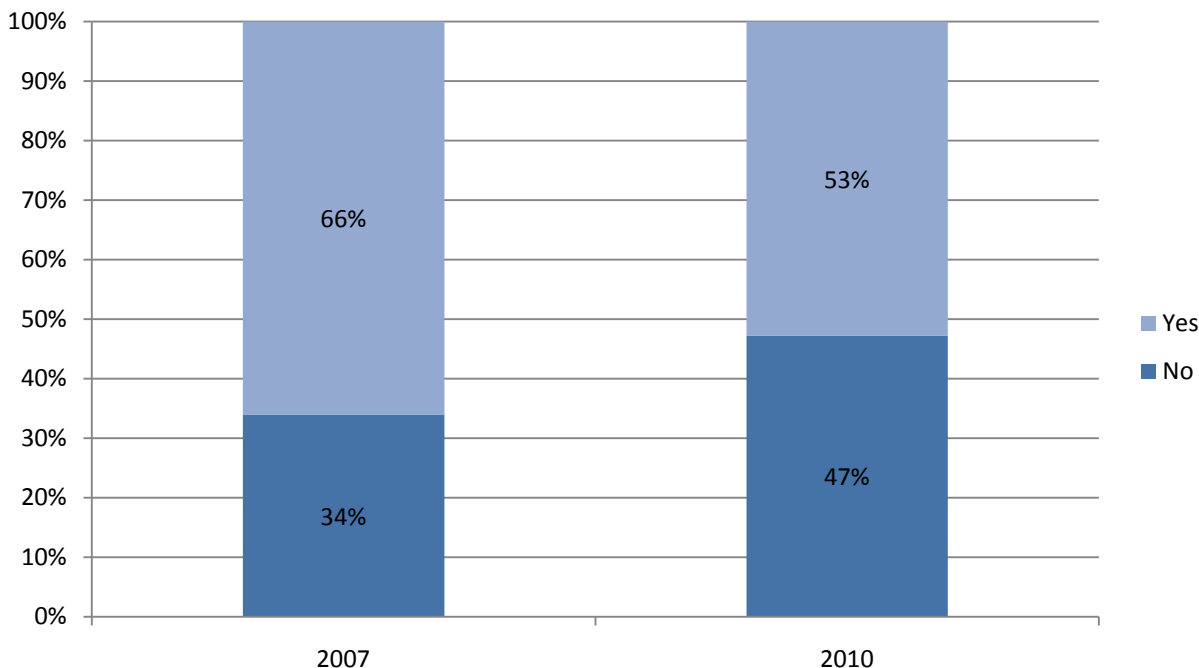


Another 26% of respondents said that they would have instead taken a taxi. However, compared to 2007, a smaller percentage of riders indicated that they could have taken a different Bee-Line route or the Metro-North railroad as an alternative. This illustrates the unique niche that each Bee-Line route fills in the local and regional transit markets and in the minds of passengers.

As seen in Figure 25, a far lower percentage of respondents indicated that they transferred between routes during their trip in 2010 (53%) than was the case in 2007 (66%). This is a surprising figure, as the Bee-Line is linked with a multitude of other transit providers and transfers are made simple and free using the MetroCard fare media. The lower number of reported transfers could reflect a change in respondent's interpretation of the meaning of a transfer. For example, if someone used a MetroCard to transfer from one bus to another bus, or between a bus and a subway, they may not have reported it as a transfer because there was no actual paper transfer, as had been needed before the introduction of MetroCard.

**Figure 25 Do you or will you transfer to or from another service during this trip?**

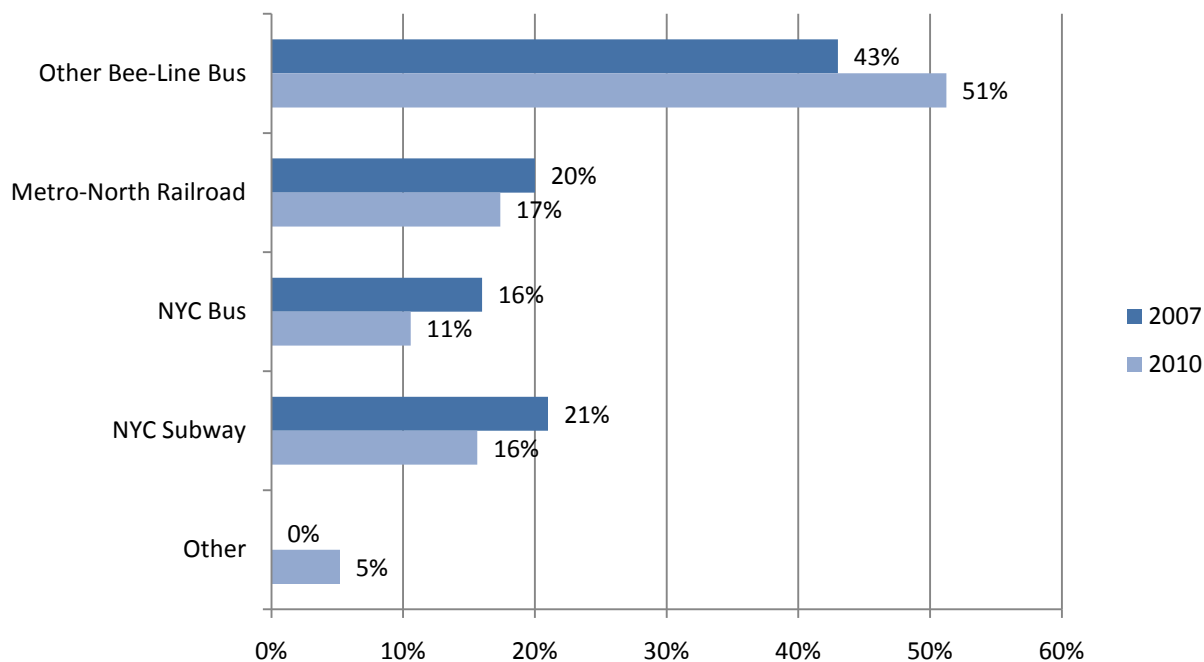
(Source: Survey Question 32)



Of the commuters who do make transfers (Figure 26), the majority in 2010 transfer to or from another Bee-Line Route. In fact, the proportion of transfers among Bee-Line routes actually increased from 43% in 2007 to 51% of all transfers in 2010. The proportion of transfers to New York City based services (NYC Subway, NYC Bus, and Metro-North) all declined between 2007 and 2010. While the transfer patterns are similar in the two surveys, the magnitudes are different. One reason that the transfers to Metro-North may have declined slightly could be due to the current economic downturn which has increased parking availability at Metro-North stations, resulting in more people accessing Metro-North stations by car rather than taking the bus. This would result in overall fewer riders on the Bee-Line routes connecting to Metro-North. Another factor influencing the number of transfers could be changes in employment patterns as a result of the current economic downturn.

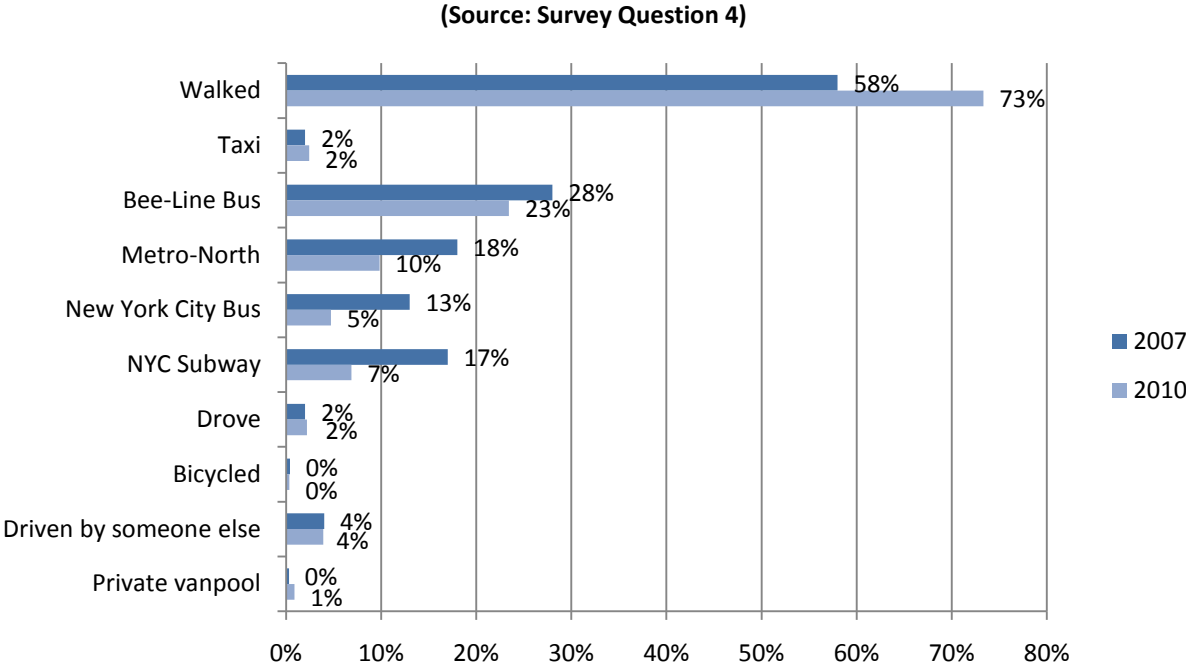
**Figure 26 If you transfer, what service do you transfer to or from?**

(Source: Survey Question 32)



The declining transfer rate could be tied to the data shown in Figure 27 which shows that the number of riders who walked to their bus stop increased from 58% to 73% in 2010.

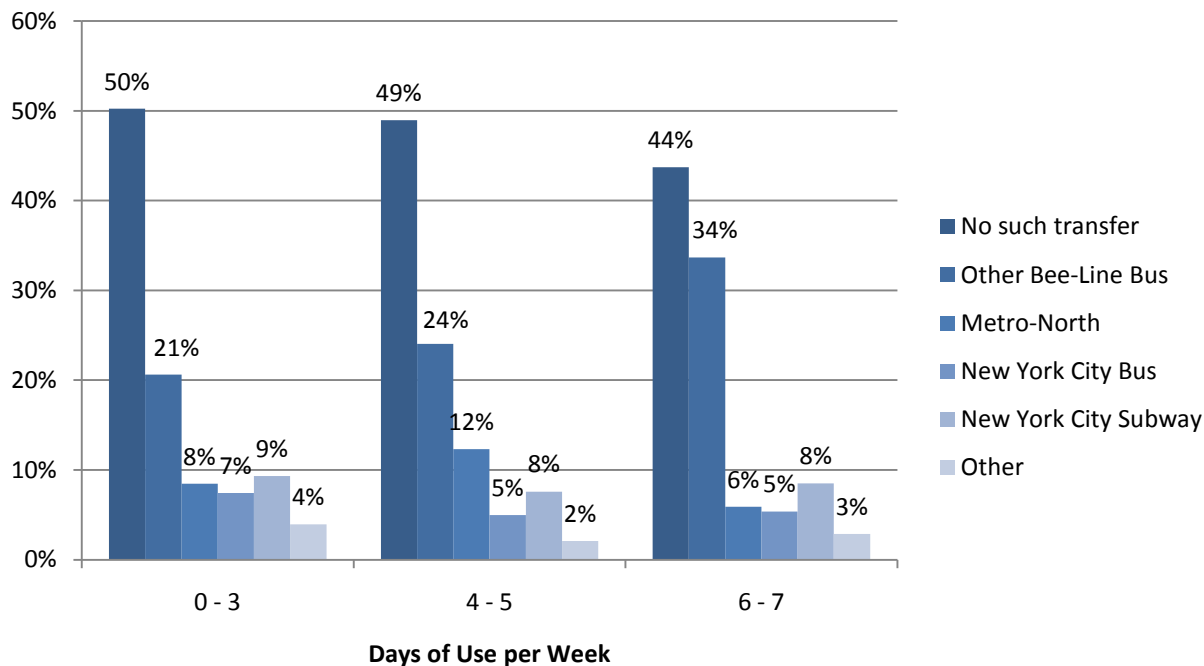
Figure 27 How did you get to the stop where you boarded this bus?



Overall, infrequent riders appear to transfer less often than regular riders (Figure 28). This is likely the result of the fact that a significant portion of the work-related commutes are to New York City, which usually requires a transfer.

**Figure 28 Transfer Rate by Frequency of Bee-Line Use**

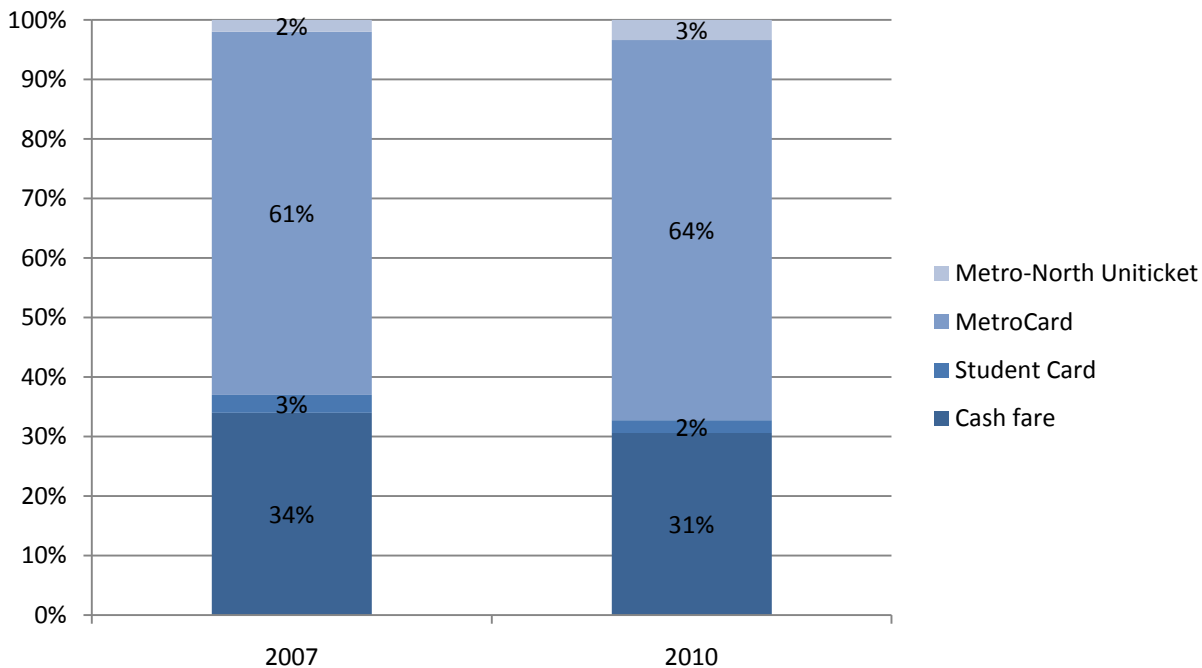
(Source: Survey Question 1 and 32)



Fare types are another indicator of the commitment of the ridership base to the transit service. In the case of the Bee-Line, a growing number of passengers are using more long-term fare methods such as the MetroCard, while cash fares have declined by 3 percentage points since 2007 (Figure 29). Even among the most occasional riders, MetroCard use has grown (Figure 30).

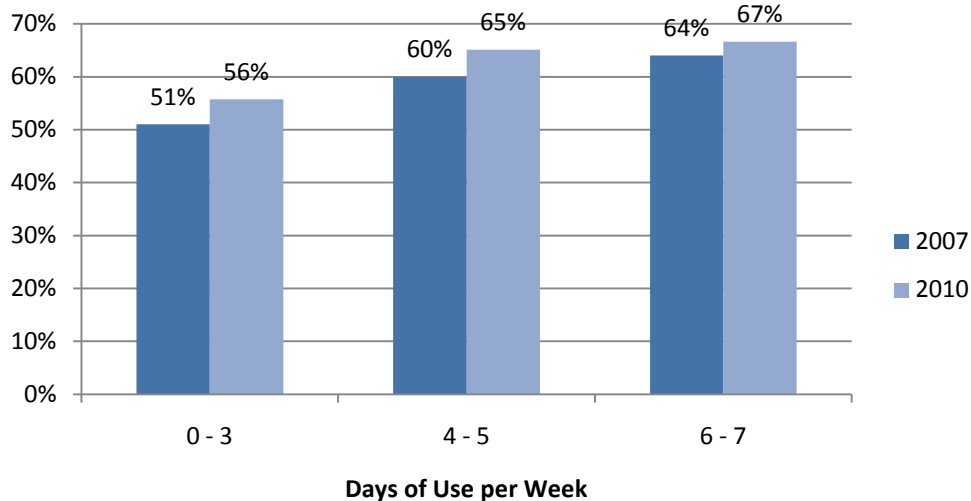
**Figure 29 How did you pay for your bus fare?**

(Source: Survey Question 5)



**Figure 30 MetroCard Use by Ridership Frequency**

(Source: Survey Questions 1 and 5)



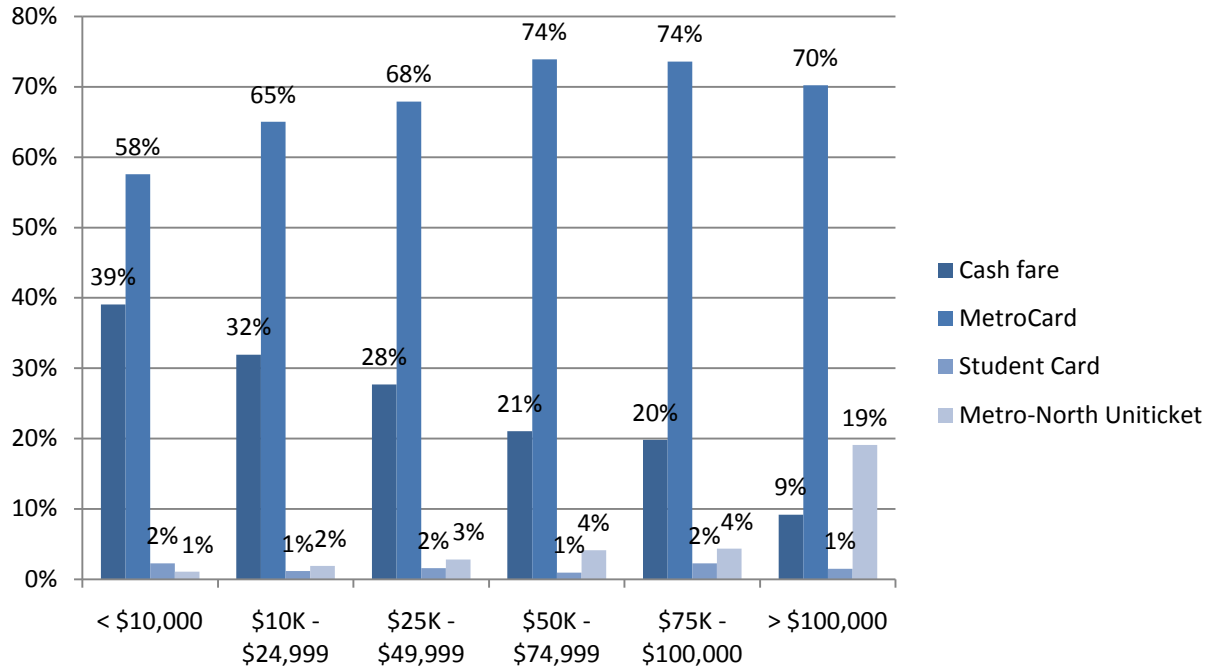
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As seen in Figure 31 below, cash still constitutes a sizable, but shrinking, portion of Bee-Line fares, especially among lower income brackets. In 2010, 39% of Bee-Line users with a household income of less than \$10,000 used cash as their form of payment. This figure was 42% in 2007.

Figure 31 Fare Type by Income

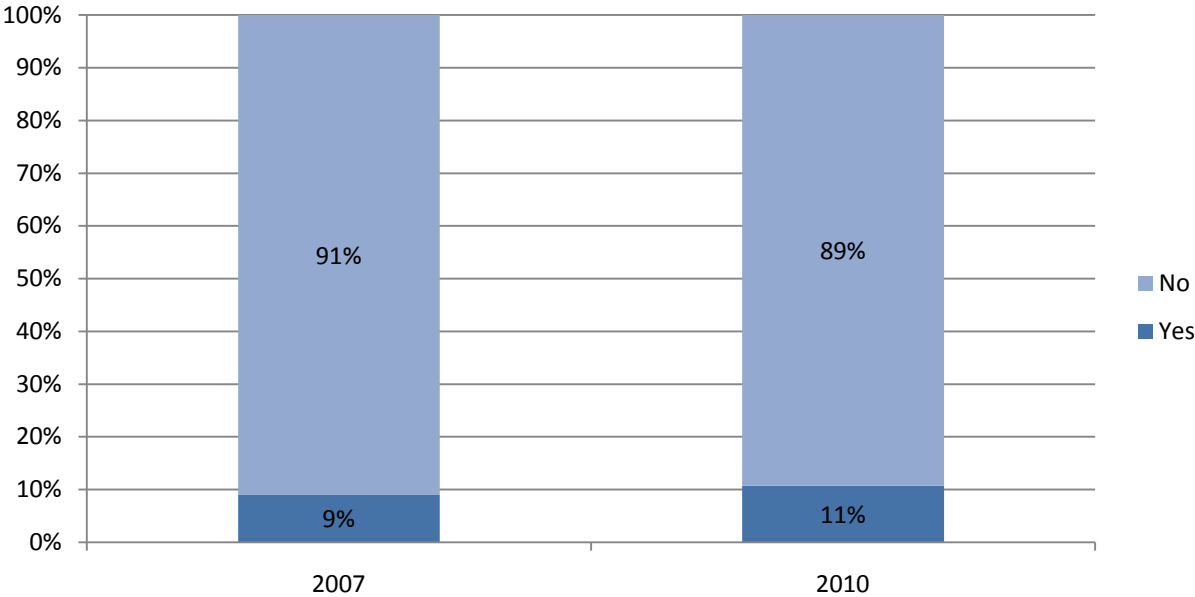
(Source: Survey Questions 5 and 30)



Not surprisingly, given the demographic trends (the aging of population in particular) of the Bee-Line and Westchester County, a growing number of passengers reported receiving a senior citizen or disability discount in 2010 compared to 2007 (Figure 32).

Figure 32 Did you use a senior or disabled discount?

(Source: Survey Question 8)

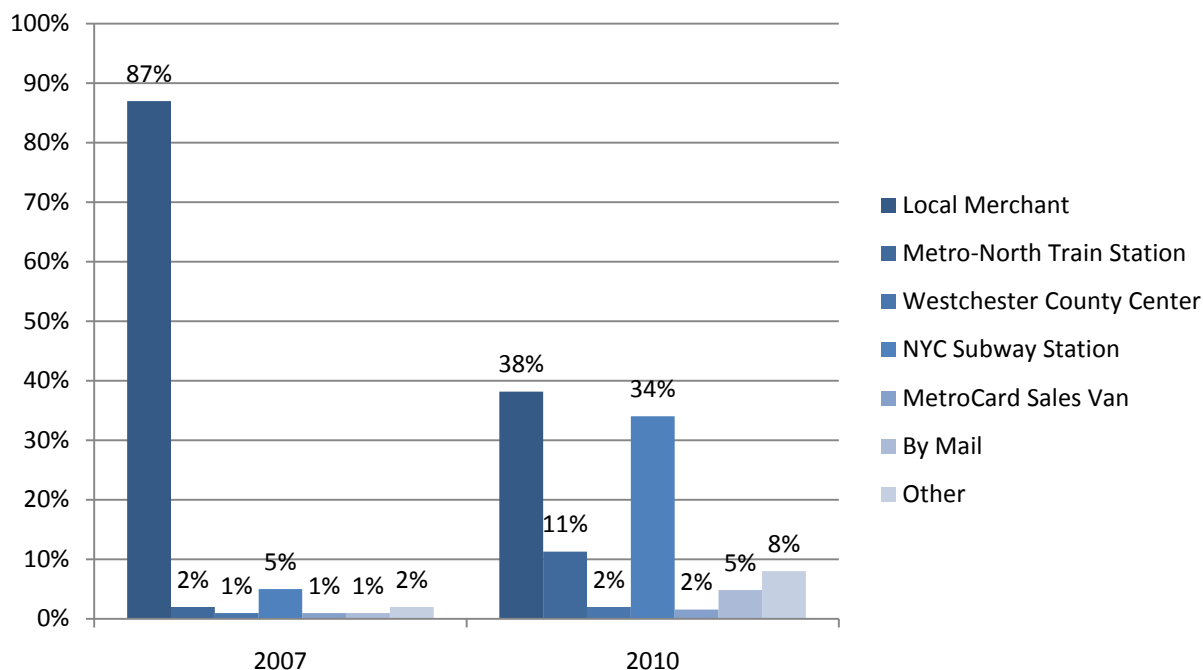


While the use of MetroCards was already quite high in 2007, the locations where Bee-Line passengers are reportedly acquiring the cards has changed dramatically since then. As seen in Figure 33 below, 87% of survey respondents said that they purchased their cards at a local merchant in 2007. In 2010, that figure dropped to only 38%, and train stations (both commuter and subway) accounted for 45% of MetroCard purchases.

One possible explanation is that patrons in 2007 bought their first MetroCard locally in Westchester County when the card became available. When MetroCard was first introduced in 2007, Westchester County also significantly publicized the locations of MetroCard vendors, likely causing users to buy their first cards at local merchants. As patrons embraced MetroCard, the location of the card purchases diversified. The 2010 MetroCard purchase distribution reflects that of a mature system.

**Figure 33 Where did you get your MetroCard?**

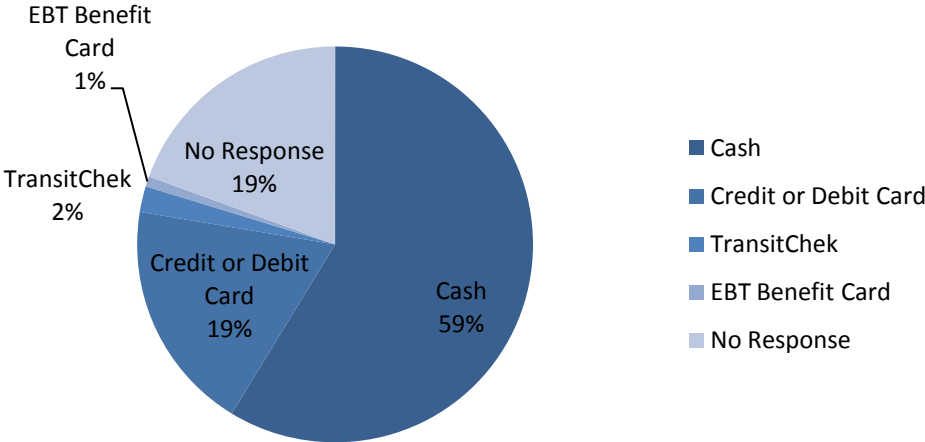
(Source: Survey Question 6)



Seventy-eight percent of survey respondents use cash or credit/debit cards to purchase or replenish their MetroCards (Figure 34), but it is noteworthy that 19% of survey takers gave no response to this question. This may indicate other methods of acquiring the MetroCard not offered as choices on the survey. One possibility is employer-supplied MetroCards purchased outside of the Transit Check system. MetroCards may also be distributed by social service agencies or charities outside of the EBT system, as this answer (or lack of answer) increased as the income of the survey takers decreased. One reason for the no response could be that people may have paid for the card with a check at a local merchant. It could also be that the respondent did not purchase the card themselves, but was sharing it with another family member who bought it and used it at a different time of day or day of week.

Figure 34 How did you pay for your MetroCard?

(Source: Survey Question 7)

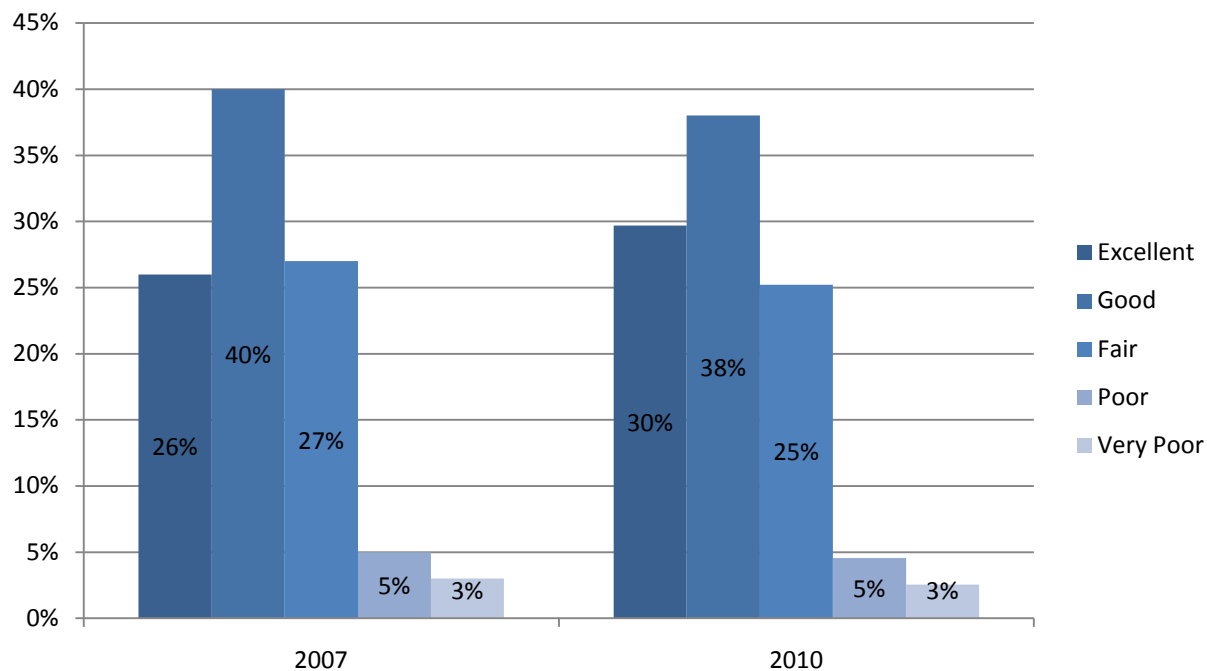


## Customer Satisfaction

By most measures, customer satisfaction among Bee-Line riders is moving in the right direction. In 2010, 68% of respondents chose “Good” or “Excellent” to describe the overall quality of Bee-Line service, compared to 66% in 2007 (Figure 35).

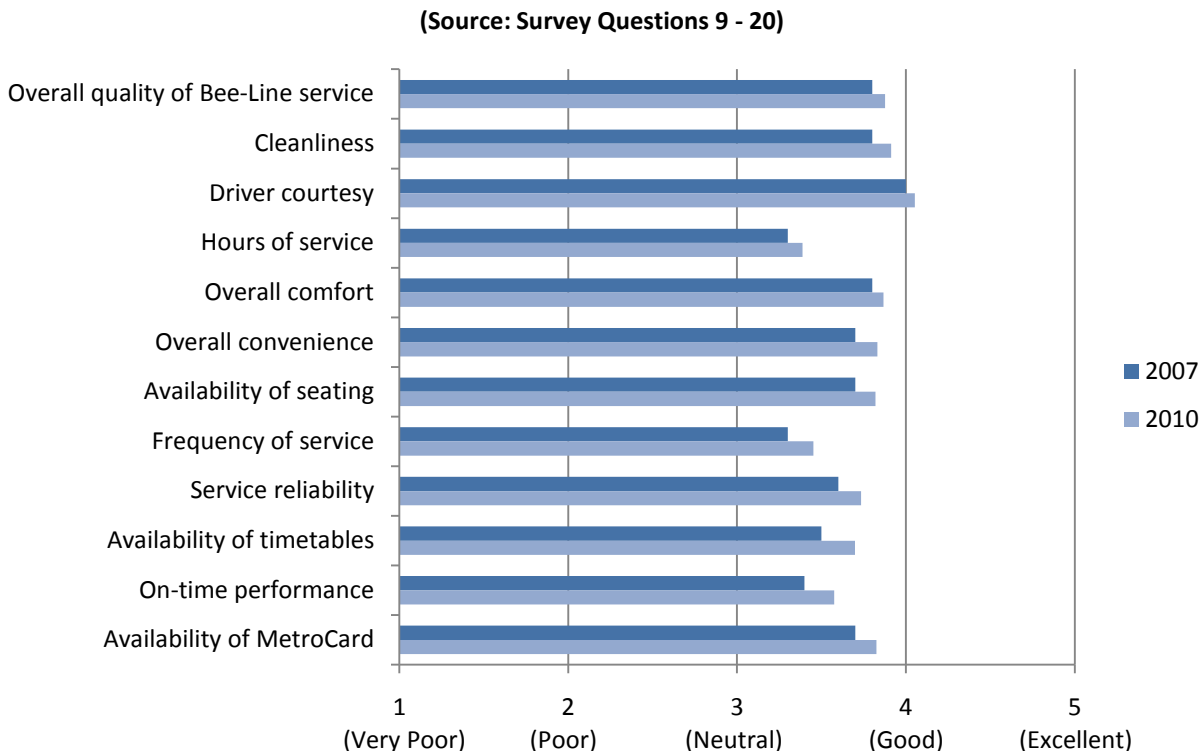
**Figure 35 Overall Quality of Bee-Line Service**

(Source: Survey Question 9)



As Figure 36 below shows, survey respondents gave the Bee-Line higher marks in every single category of service quality, as compared to 2007. The scores in this figure are a numerical representation of a qualitative scale from “Very Poor” (1) to “Excellent” (5). The average “score” for each service quality characteristic is determined by the percentage of respondents that selected each qualitative ranking (1 to 5) for that characteristic (i.e. 10% chose “Excellent,” 20% chose “Good” etc.).

**Figure 36 Bee-Line Service Ratings**



The service characteristics that are viewed most negatively by Bee-Line passengers are service frequency and span of service. 24% of respondents rated Hours of Service as “Poor” or “Very Poor”, while Frequency of Service was described as “Poor” or “Very Poor” by 22% of survey takers. These are among the most common complaints throughout the transit industry, and users’ expectations may be particularly high in the New York metropolitan region where 24-hour service is not uncommon. Nevertheless, both of these service characteristics were rated higher than in 2007. As in the previous survey, the highest level of satisfaction was reserved for Driver Courtesy, which was rated “Good” or “Excellent” by 74% of survey respondents.

Some differences in the perception of Bee-Line service do exist among various demographic groups. Of all groups, African Americans have the lowest opinion of the overall quality of Bee-Line service, while whites have the highest. However, the difference between the groups (and among all groups) is quite small for this category, with average ratings ranging from 3.8 to 4.0. The differences in opinions are very likely influenced more by the frequency of ridership, and route used than by race itself. For example, as seen in Figure 37, customers that tend to be most critical of the Bee-Line’s service quality are the ones who ride most often. As a group, African Americans do ride Bee-Line service more frequently than any other group, so it is not unexpected that they are more critical of the service than other groups.

**Figure 37 Service Quality Rating by Ethnicity**

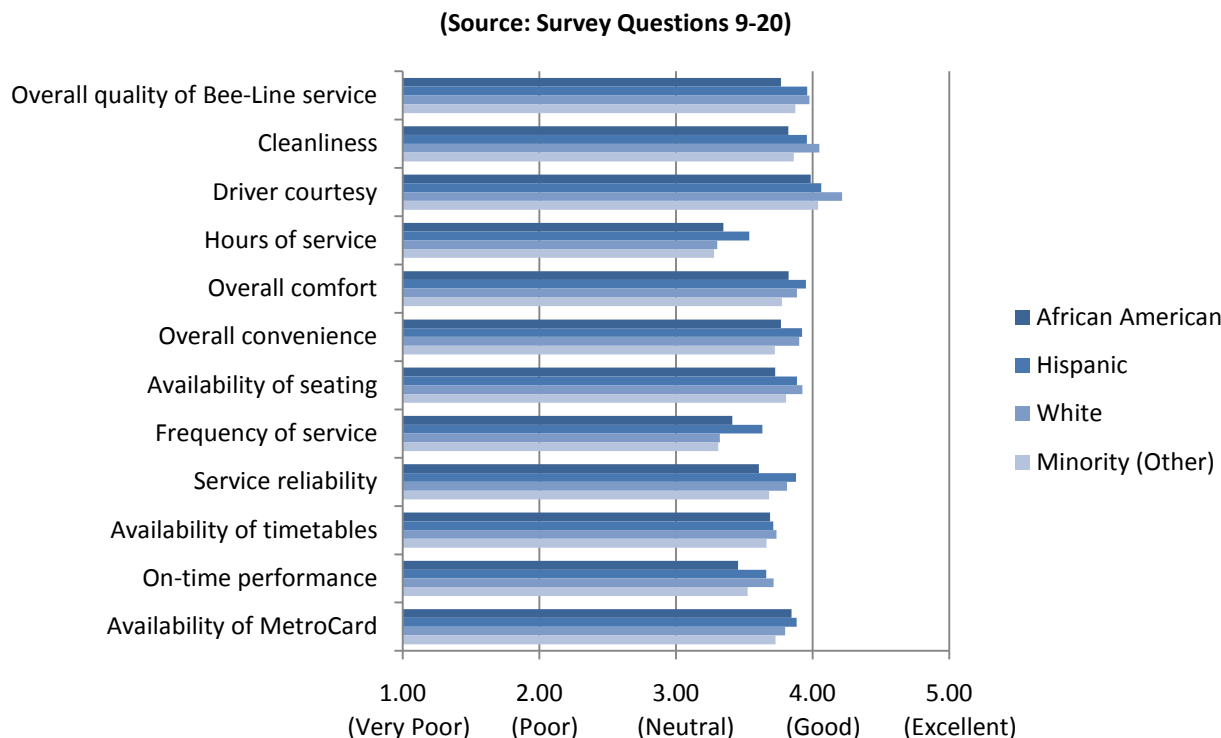


Figure 38 Service Quality Ranking by Ridership Frequency

(Source: Survey Questions 1 and 9)

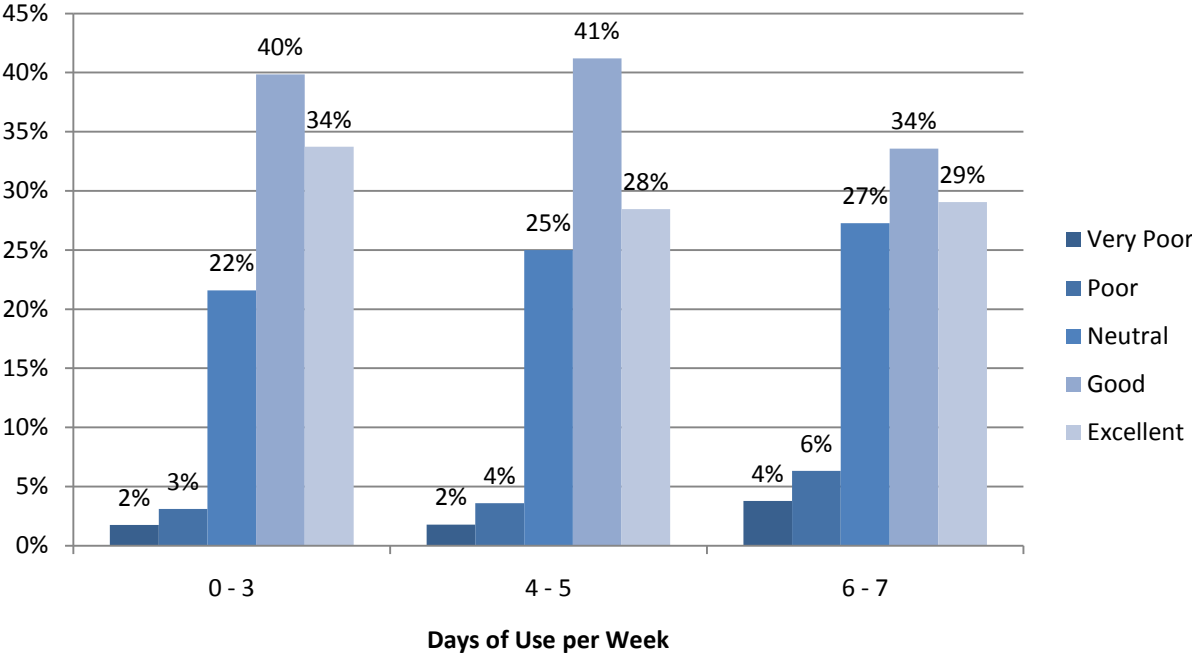


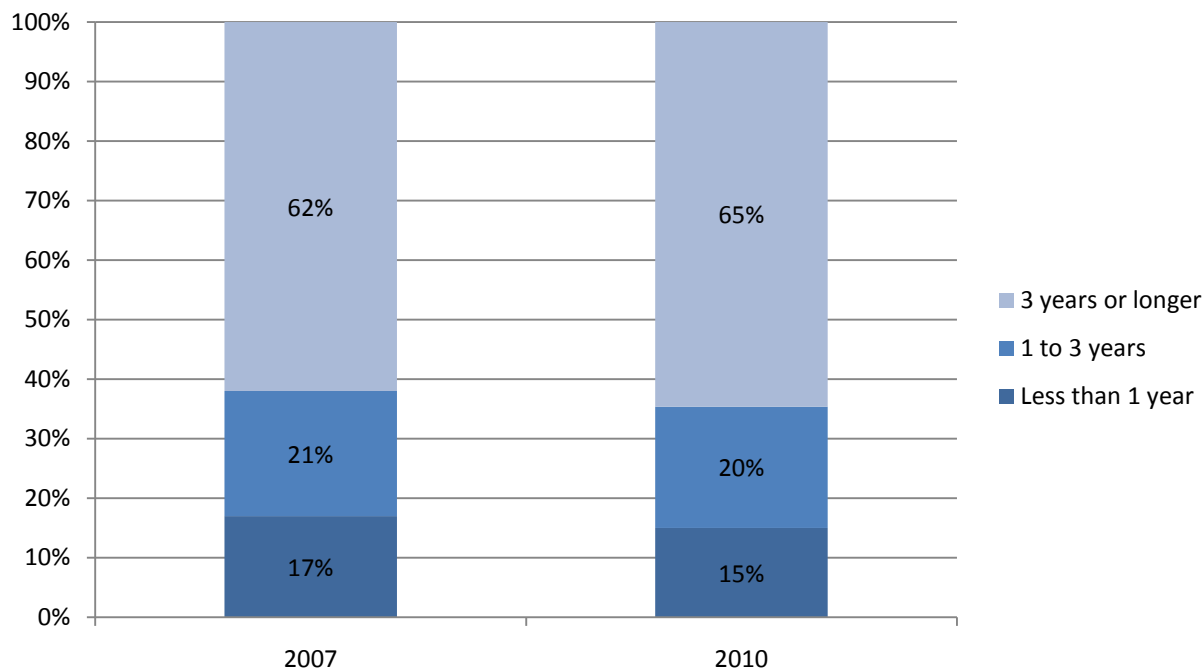
Figure 38 shows that customers who tend to be most critical of the Bee-Line’s service quality are the ones who ride most often. The number of “Very Poor” and “Poor” rankings is significantly higher for those who ride 6-7 days a week. This could be a reflection of shorter spans and less frequency on weekend service.

Figure 39 shows that the number of Bee-Line riders who have been riding more than 3 years is increasing. This trend may show that rider retention efforts have been successful and that service quality is keeping customers. On the other hand, the number of Bee-Line riders who have been riding for less than a year is decreasing, and this may be a cause for concern.

Transit agencies nationwide typically see a large amount of rider turnover over time. Long-time riders leave the system and new riders come to the system. Transit systems need a continual influx of new customers to replace those lost.

**Figure 39 How long have you been riding the Bee-Line?**

(Source: Survey Question 2)

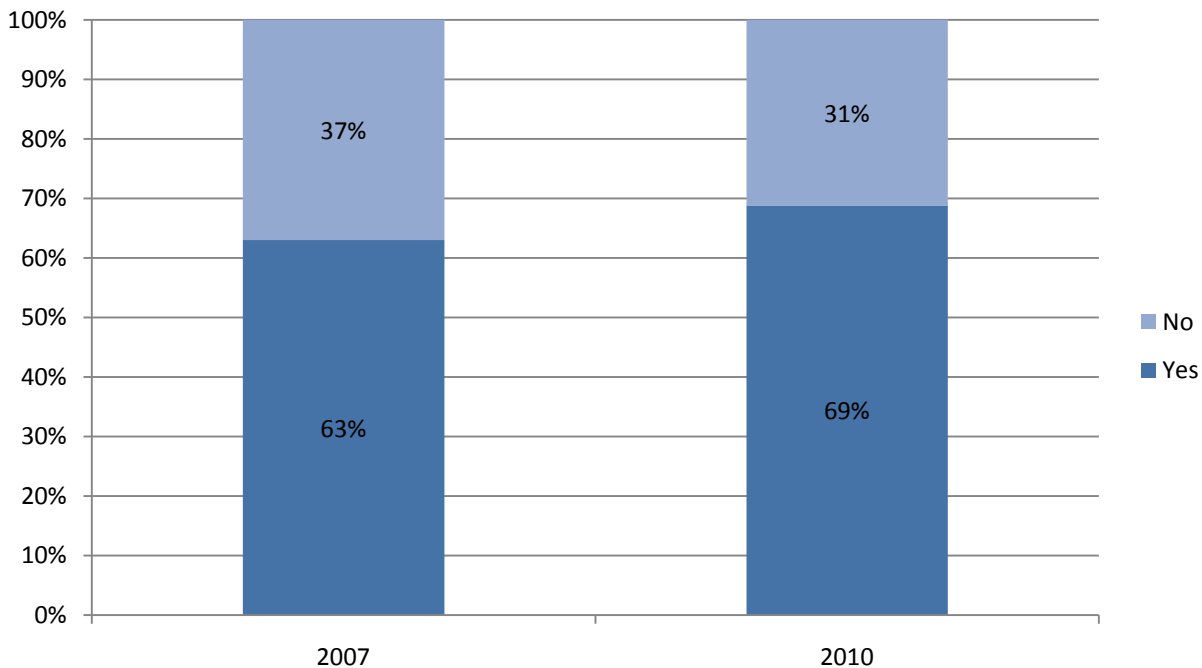


A major challenge for any transit agency is figuring out how to engage their customers, both to provide them with relevant information and to elicit useful feedback. Technology has made this process somewhat easier, and more than 69% of Bee-Line users now have access to the internet on a regular basis (Figure 40) - up from 63% in 2007.

Internet availability varies both by age and income. Higher income individuals tend to have greater access to the internet (Figure 41). One key finding is that the largest gain in internet availability has been among the lowest income group – those making less than \$25,000.

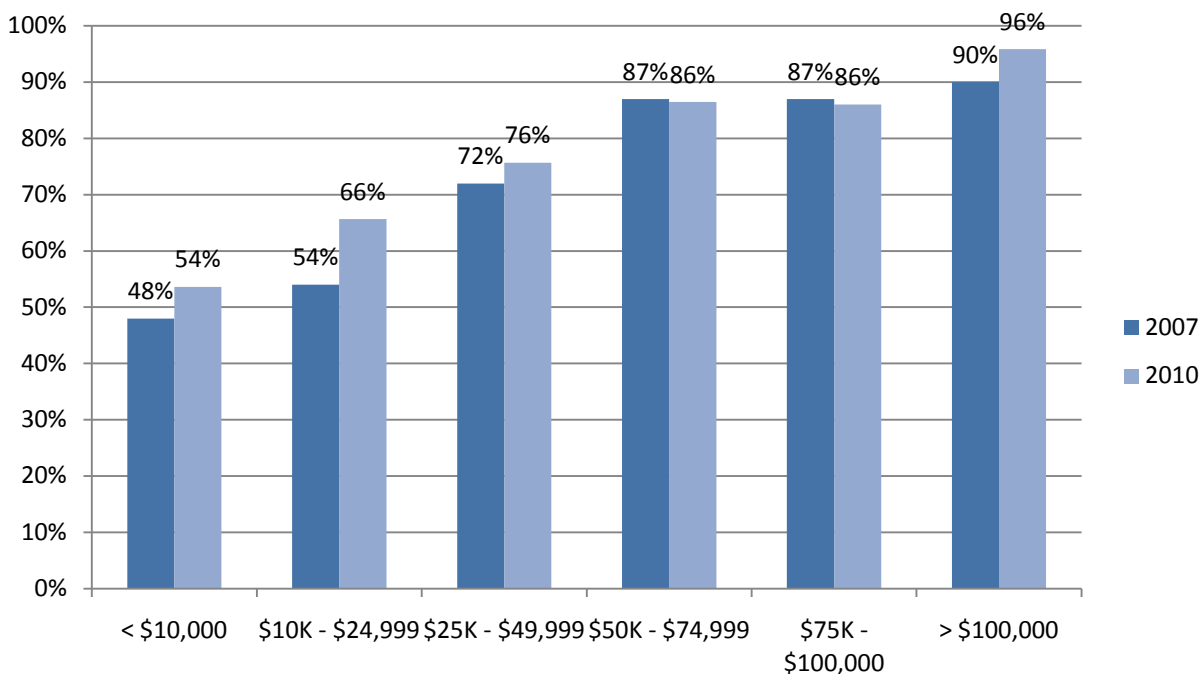
**Figure 40 Do you have access to the Internet on a regular basis?**

(Source: Survey Question 21)



**Figure 41 Internet Access by Income**

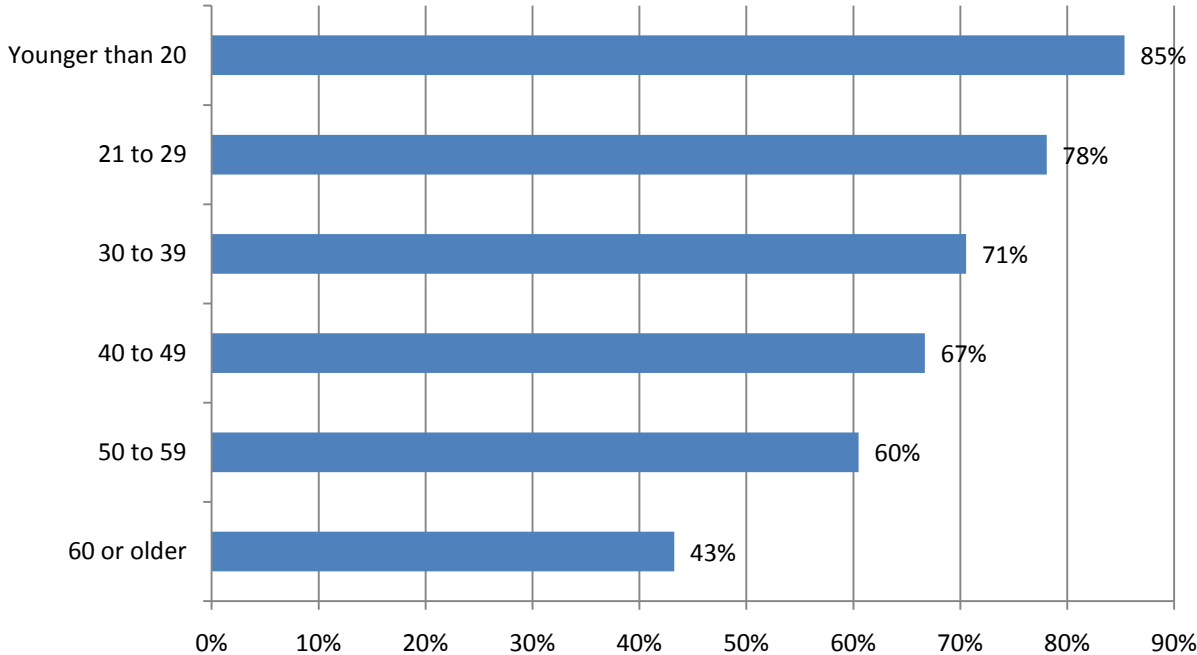
(Source: Survey Questions 21 and 30)



The vast majority of respondents under 30 years of age have internet access, while less than half of the respondents over 60 years of age do (Figure 42). This suggests that the internet is an appropriate tool to market to younger riders, but older riders may need different outreach methods. These results are typical when compared to national trends.

Figure 42 Access to Internet by Age

(Source: Survey Questions 21 and 27)



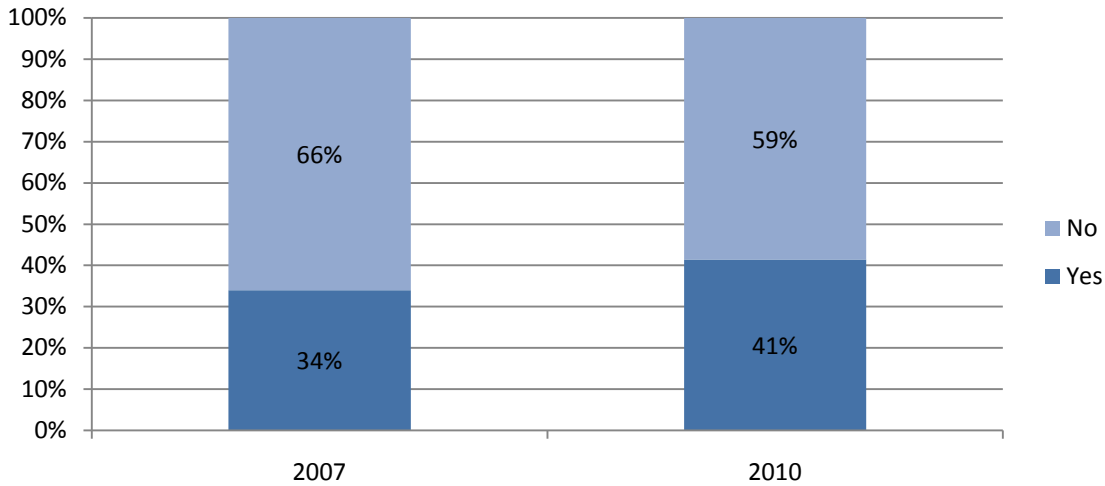
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The Bee-Line’s adoption of on-line communication methods has been met with slow but steady acceptance by passengers. In 2010, 41% of survey respondents had visited the Bee-Line website, compared to 34% in 2007 (Figure 43). Perhaps most encouragingly, visits to the website have increased in every income bracket (Figure 44).

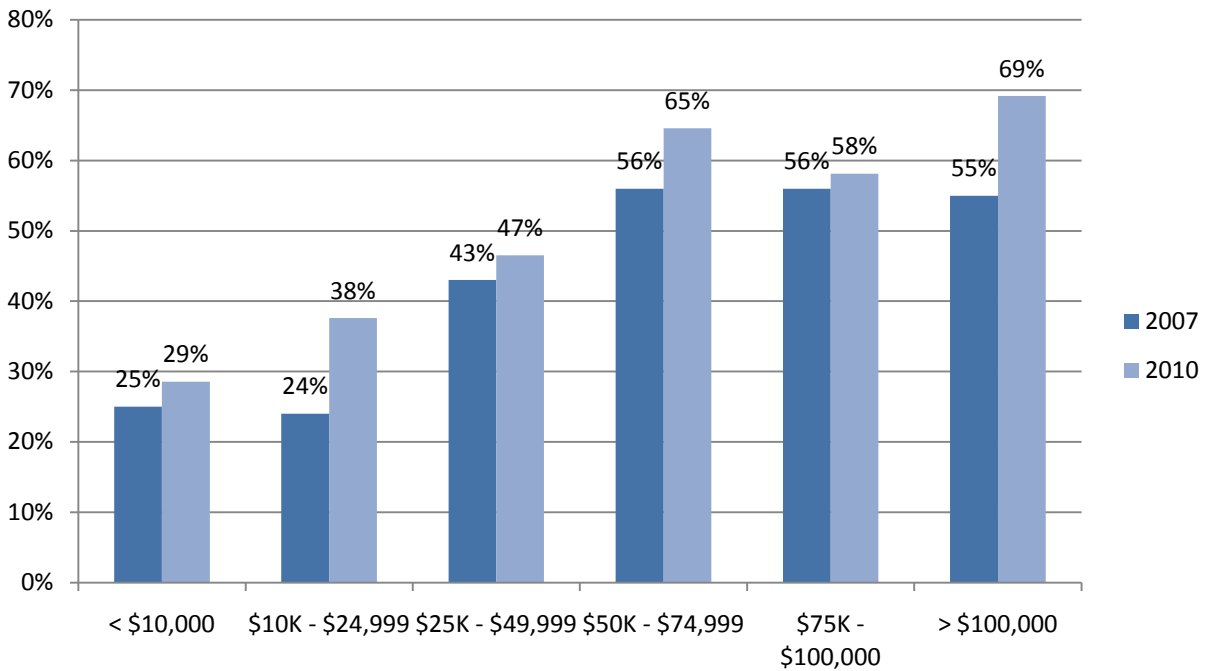
**Figure 43 Have you used the Bee-Line website?**

(Source: Survey Question 22)



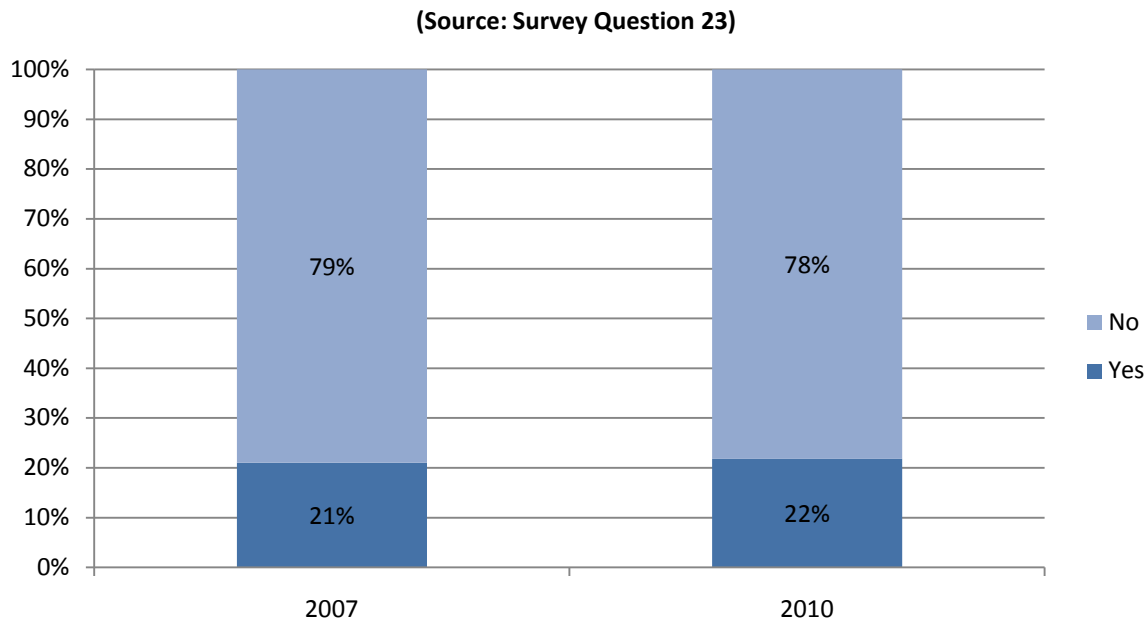
**Figure 44 Bee-Line Website Use by Income**

(Source: Survey Questions 22 and 30)

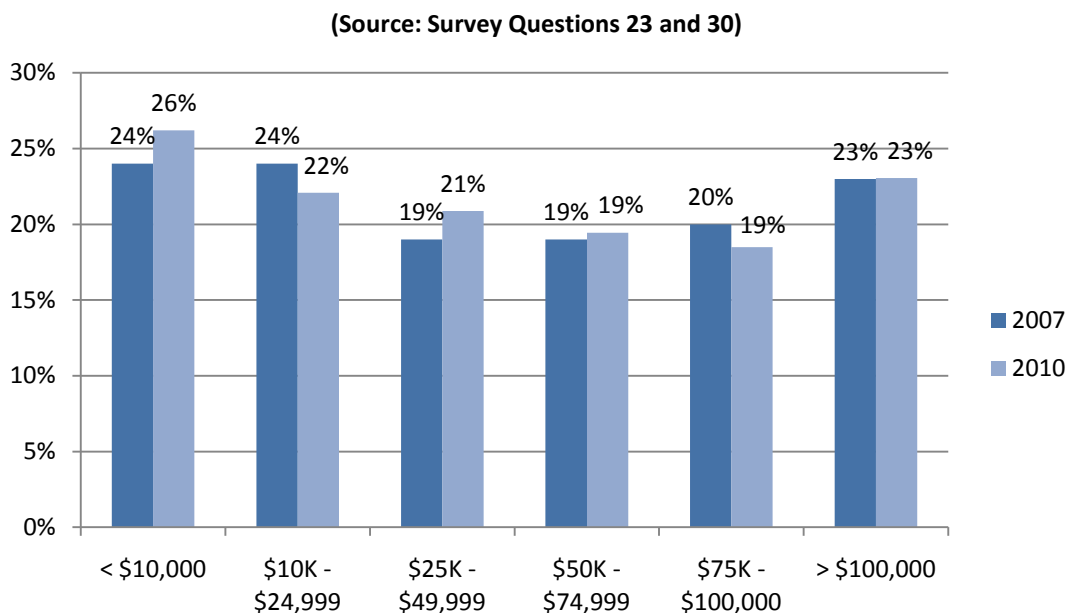


While Bee-Line passengers are steadily embracing new media and communications methods, it appears that they prefer to remain in control of the information flow. Thus, the interest in receiving e-mail notices from the Bee-Line (Figure 45) is not nearly as strong as the interest in the Bee-Line website. As seen in Figure 46, the interest in e-mail notifications has actually decreased in some income brackets since 2007. This phenomenon has been observed in other industries as well, as consumers react to an over-bombardment of e-mail marketing.

**Figure 45 Do you wish to receive e-mail notices on Bee-Line service changes?**



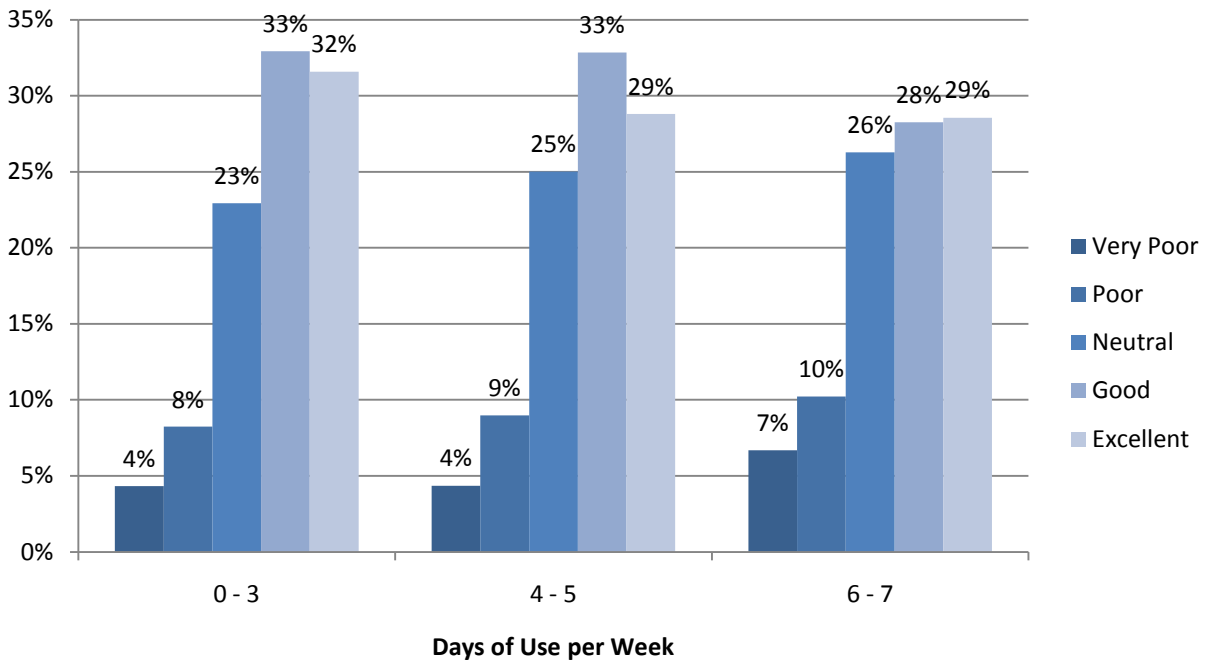
**Figure 46 E-mail Notice Interest by Income**



While the use and acceptance of on-line media and communications techniques will certainly continue to evolve, the effects of the new technology are already evident. For example, as seen previously in Figure 37 the service characteristic that experienced the greatest ratings increase between 2007 and 2010 was “Availability of Timetables”. The ability for customers to access timetables online undoubtedly contributed to this positive perception. Of particular note, is the fact that occasional riders, who are often least familiar with the system, appear to have the most positive view of timetable availability (Figure 47). The same pattern exists for all service quality characteristics – least frequent riders have the most positive perception and daily riders are most critical (but still generally positive).

**Figure 47 Perception of Timetable Availability by Ridership Frequency**

(Source: Survey Questions 1 and 18)





# **APPENDIX A**

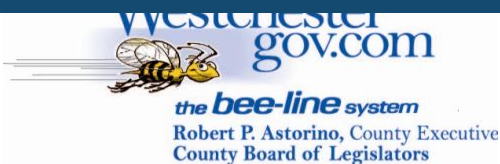
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## **SURVEY QUESTIONNAIRE**



check box or write in your answers. All information is anonymous. Please do not put your name on this form.

lado para español



1) In a typical week, how many days do you usually use the Bee-Line System?

- 7 6 5 4 3 2 1 0 (Not a regular rider)

2) How long have you been riding the Bee-Line?

- Less than 1 year 1 to 3 years 3 years or longer

3) What is the main purpose of your bus trip today?

- Work Shopping Recreation or Entertainment School Job seeking Health or medical Other:

4) How did you get to the Bee-Line stop where you boarded this bus? (Check all that apply)

- Walked Drove Driven by someone else Taxi Bicycled Private vanpool Bee-Line Bus - Which route number? Metro-North - Which station? New York City Bus - Which route number? NYC Subway - Which station? Other:

5) How did you pay your bus fare?

- Cash fare MetroCard Student Card Metro-North Uniticket

6) Where did you get your MetroCard? (If you have a MetroCard)

- Local Merchant NYC Subway Station Metro-North Train Station MetroCard Sales Van Westchester County Center By Mail Other:

7) How did you pay for your MetroCard? (If you have a MetroCard)

- Cash Credit or Debit Card TransitChek EBT Benefit Card

8) Did you use a Senior Citizen or Disabled Passenger discount for this trip?

- Yes No

Please rate Bee-Line service: Excellent Very Poor

- 9) Overall quality of Bee-Line service 5 4 3 2 1
10) Cleanliness 5 4 3 2 1
11) Driver courtesy 5 4 3 2 1
12) Hours of service 5 4 3 2 1
13) Overall comfort 5 4 3 2 1
14) Overall convenience 5 4 3 2 1
15) Availability of seating 5 4 3 2 1
16) Frequency of service 5 4 3 2 1
17) Service reliability 5 4 3 2 1
18) Availability of timetables 5 4 3 2 1
19) On-time performance 5 4 3 2 1
20) Availability of MetroCard 5 4 3 2 1

21) Do you have access to the Internet on a regular basis?

- Yes No

22) Have you used Bee-Line's website?

(www.westchestergov.com/beelinebus)

- Yes No

23) Do you wish to receive e-mail notices on Bee-Line service changes?

- Yes No

e-mail address:

24) Please check all of the following that apply to you.

- Employed outside your home Employed for pay at home Student Homemaker Unemployed Retired

25) Do you have a disability that makes it difficult for you to use public transportation?

- Yes No

26) How many cars or other motor vehicles are available for you to use?

- 0 (none) 1 2 3 or more

27) How old are you? years of age

28) Are you male or female?

- Male Female

29) Which do you consider yourself?

- African American/Black Asian Hispanic Native American Indian White Other:

30) What is your total annual household income?

- under \$10,000 \$10,000 to \$24,999 \$25,000 to \$49,999 \$50,000 to \$74,999 \$75,000 to \$99,999 \$100,000 or more

31) In what Municipality and ZIP code did you begin this entire trip?

(Where you started, even if you have transferred)

Municipality: Zip Code:

32) Did you, or will you, transfer to or from another service during this trip? (Check all that apply)

- No such transfer on this trip. Other Bee-Line Bus - Which route number? # Metro-North - Which Station? New York City Bus - Which route number? # New York City Subway - Which station? Other:

33) In what Municipality and ZIP code will you end this trip?

Municipality: Zip Code:

34) If this Bee-Line route were not available, how would you make this trip? (Check all that apply)

- Would not make this trip Walk Bicycle Drive Drive with others Private Vanpool Taxi Different Bee-Line route - Which Route? Metro-North - Which Station? NYC Subway - Which Station? Other:

35) Where did you board this bus?

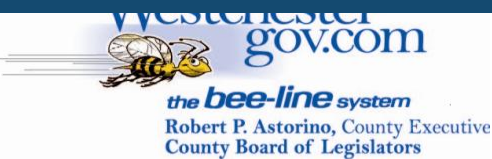
- Downtown White Plains Downtown New Rochelle Downtown Mount Vernon Getty Square, Yonkers Downtown Peekskill Yonkers Raceway Downtown Ossining Westchester Community College Westchester Medical Ctr (Grasslands) Shopping Center (specify): Metro-North Station (specify): Subway station (specify): Other:

36) Where will you get off this bus?

- Downtown White Plains Downtown New Rochelle Downtown Mount Vernon Getty Square, Yonkers Downtown Peekskill Yonkers Raceway Downtown Ossining Westchester Community College Westchester Medical Ctr (Grasslands) Shopping Center (specify): Metro-North Station (specify): Subway station (specify): Other:

37) COMMENTS:

Please return this form to the survey personnel on this bus. Thank you!



marque la casilla o escriba su respuesta. Toda la información es anónima. Por favor no ponga su nombre en este formulario.

for English

1) En una semana típica ¿cuántos días usa usted el Sistema Bee-Line?  
 7  6  5  4  3  2  1  0 *(No es pasajero regular)*

2) ¿Desde hace cuánto tiempo ha sido pasajero de Bee-Line?  
 Menos de 1 año  de 1 a 3 años  3 o más

3) ¿Cuál es el motivo principal de este viaje en autobús hoy?  
 Trabajo  Compras  Recreación o entretenimiento.  
 Escuela  Búsqueda de empleo  Salud o médico  
 Otro: \_\_\_\_\_

4) ¿Cómo llegó a esta parada de Bee-Line en donde abordó este autobús? *(marque todas la que apliquen)*  
 Caminó  Condujo  Otra persona le llevó  
 Taxi  En bicicleta  Transporte colectivo privado  
 Autobús Bee-Line - ¿Qué número de ruta? \_\_\_\_\_  
 Metro-North - ¿Cuál estación? \_\_\_\_\_  
 Autobús de New York City- ¿Cuál número? \_\_\_\_\_  
 Subway de la Ciudad de NY- ¿Cuál estación? \_\_\_\_\_  
 Otro: \_\_\_\_\_

5) ¿Cómo pagó la tarifa de este autobús?  
 Tarifa en efectivo  MetroCard  
 Tarjeta de estudiante.  Uniticket Metro-North

6) ¿Dónde compro la tarjeta MetroCard? *(Si tiene MetroCard)*  
 Comerciante local  Estación de Subway de la Ciudad de NY  
 Estación de tren Metro-North  Ventas en camioneta de MetroCard  
 Westchester County Center  Por Correo  
 Otro: \_\_\_\_\_

7) ¿Cómo pagó por la tarjeta MetroCard? *(Si tiene MetroCard)*  
 Efectivo  Tarjeta de crédito o débito  
 TransitChek  Tarjeta de beneficios EBT

8) ¿Utilizó el descuento para personas mayores o para pasajeros incapacitados en este viaje?  Sí  No

Evalúe el servicio de Bee-Line:

	Excelente	Muy malo
9) Calidad general del servicio	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
10) Limpieza	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
11) Cortesía del conductor	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
12) Horas de servicio	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
13) Comodidad general	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
14) Conveniencia en general	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
15) Disponibilidad de asientos	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
16) Frecuencia del servicio	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
17) Confiabilidad del servicio	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
18) Disponibilidad de horarios	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
19) Desempeño en horario	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	
20) Disponibilidad de MetroCard	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	

21) ¿Tiene acceso al Internet regularmente?  Sí  No

22) ¿Ha usado la página web de Bee-Line? *(www.westchestergov.com/beelinebus)*  
 Sí  No

23) ¿Desea recibir notificaciones por e-mail sobre cambios en el servicio Bee-Line?  Sí  No  
 dirección de correo electrónico (e-mail): \_\_\_\_\_

24) Por favor marque todas las siguientes que aplican a usted.  
 Empleado/a fuera del hogar.  Retirado/a  
 Estudiante  Ama/o de casa.  Desempleado/a  
 Empleado/a con pago dentro del hogar.

25) ¿Tiene alguna discapacidad que le dificulte para usar el transporte público?  Sí  No

26) ¿Cuántos autos o vehiculos de algún otro tipo tiene a su disposición?  0(ninguno)  1  2  3 or más

27) ¿Qué edad tiene? \_\_\_\_\_ años

28) ¿Es usted hombre o mujer?  Hombre  Mujer

29) ¿Cuál se considerará usted?  
 Hispano  Asiático  
 Africano Americano/Negro  Blanco  
 Indio native Americano  Otro \_\_\_\_\_

30) ¿Cuál es el ingreso total anual de su hogar?  
 menos de \$10,000  de \$10,000 a \$24,999  
 de \$25,000 a \$49,999  de \$50,000 a \$74,999  
 de \$75,000 a \$99,000  \$100,000 o más

31) ¿En qué municipalidad y código postal comenzó usted este viaje?  
*(En donde comenzó, aunque se haya transferido)*  
 Municipalidad: \_\_\_\_\_ Código postal: \_\_\_\_\_

32) Se transferió o transferirá de otro servicio durante este viaje? *(marque todas la que apliquen)*  
 No hay transferencia en este viaje.  
 Otro autobús Bee-Line - ¿Qué número de ruta? # \_\_\_\_\_  
 Metro-North - ¿Cuál estación? \_\_\_\_\_  
 Autobús de New York City- ¿Cuál número? # \_\_\_\_\_  
 Subway de la Ciudad de NY- ¿Cuál estación? \_\_\_\_\_  
 Otro: \_\_\_\_\_

33) ¿En qué municipalidad y código postal terminará usted este viaje?  
 Municipalidad: \_\_\_\_\_ Código postal: \_\_\_\_\_

34) ¿Si esta ruta Bee-Line no estuviese disponible como haría este viaje? *(marque todas la que apliquen)*  
 No haría este viaje  Caminaría  En bicicleta  
 Conducir  Conducir con otros  Transporte colecti  Taxi  
 Una ruta diferente de Bee-Line - ¿Cuál ruta? \_\_\_\_\_  
 Metro-North - ¿Cuál estación? \_\_\_\_\_  
 Subway de la Ciudad de NY- ¿Cuál estación? \_\_\_\_\_  
 Otro \_\_\_\_\_

35) ¿En dónde abordó este autobús?  
 En el centro en White Plains  En el centro en New Rochelle  
 En el centro en Mount Vernon  Getty Square, Yonkers  
 En el centro en Peekskill  Yonkers Raceway  
 En el centro en Ossining  Westchester Community College  
 Westchester Medical Ctr(Grasslands)  
 Centro comercial *(especifique):* \_\_\_\_\_  
 Estación Metro-North *(especifique):* \_\_\_\_\_  
 Estación de subterráneo *(especifique):* \_\_\_\_\_  
 Otro: \_\_\_\_\_

36) ¿En dónde se bajará de este autobús?  
 En el centro en White Plains  En el centro en New Rochelle  
 En el centro en Mount Vernon  Getty Square, Yonkers  
 En el centro en Peekskill  Yonkers Raceway  
 En el centro en Ossining  Westchester Community College  
 Westchester Medical Ctr(Grasslands)  
 Centro comercial *(especifique):* \_\_\_\_\_  
 Estación Metro-North *(especifique):* \_\_\_\_\_  
 Estación de subterráneo *(especifique):* \_\_\_\_\_  
 Otro: \_\_\_\_\_

37) COMENTARIOS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Por favor devuelva este formulario al personal de la encuesta en este autobús. ¡Gracias!

## **APPENDIX B**

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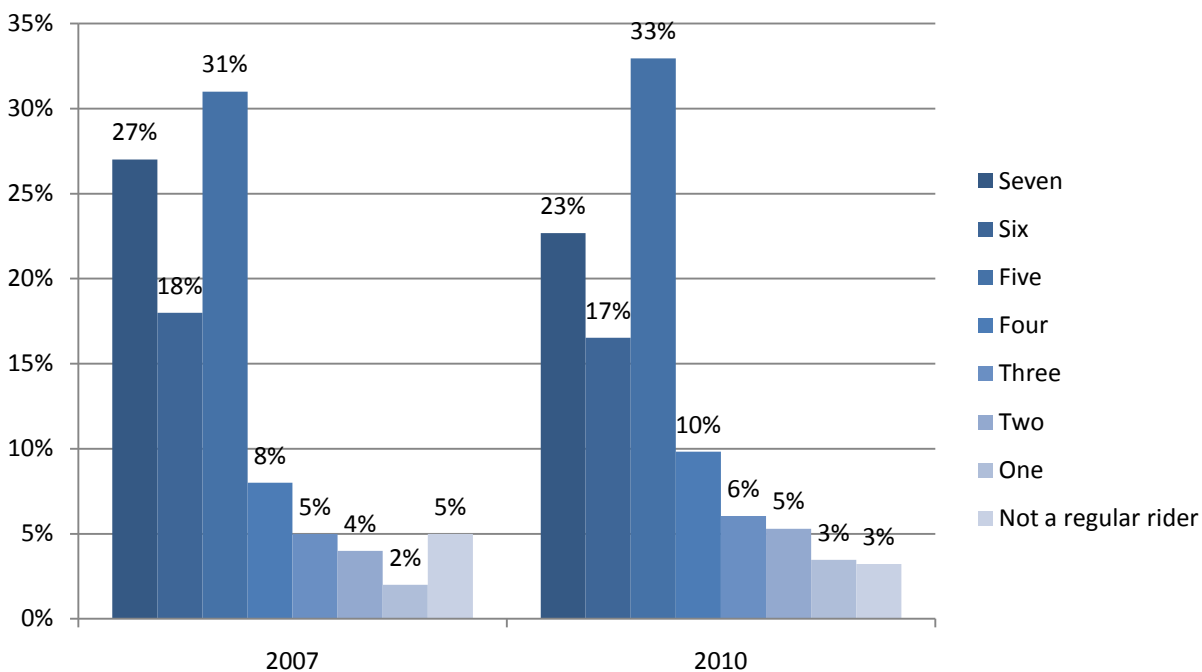
### LIST OF FIGURES IN ORDER OF QUESTION



The figures below are organized in the order that the questions that they refer to were asked in the 2010 Bee-Line passenger survey, while the figure numbers refer to the order that they appear in the narrative portion of this report. Figures that are based on cross-tabulated data, derived from multiple survey questions are shown in Appendix C.

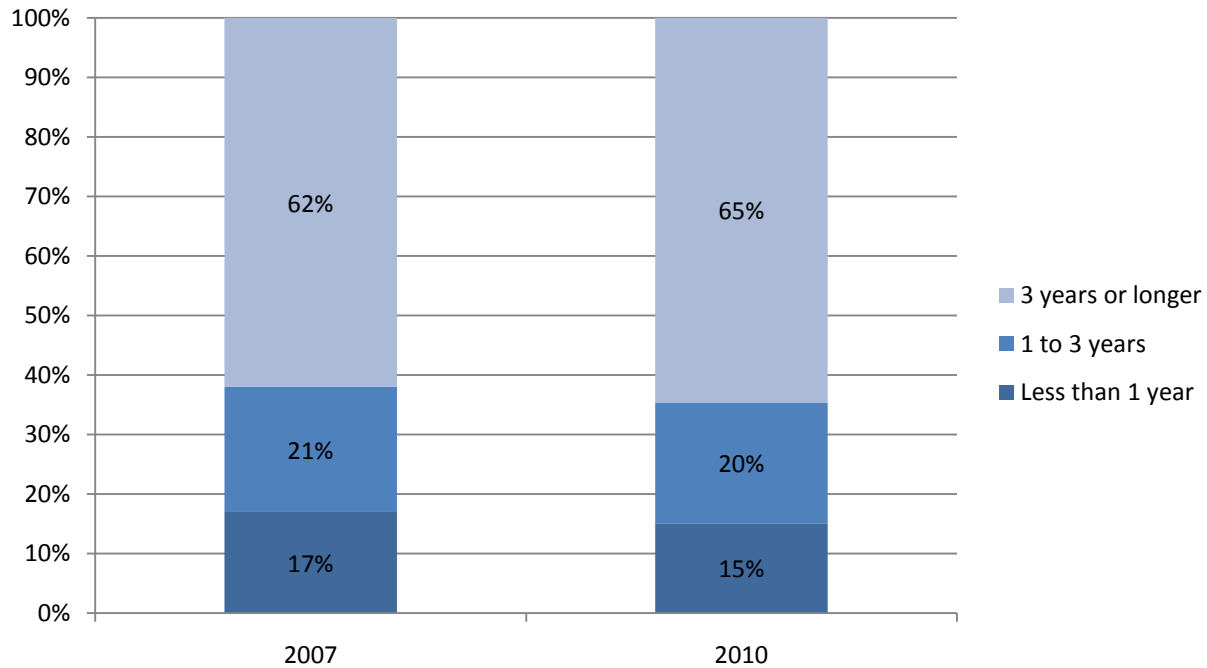
**Figure 13 How many days do you usually use the Bee-Line System?**

(Source: Survey Question 1)



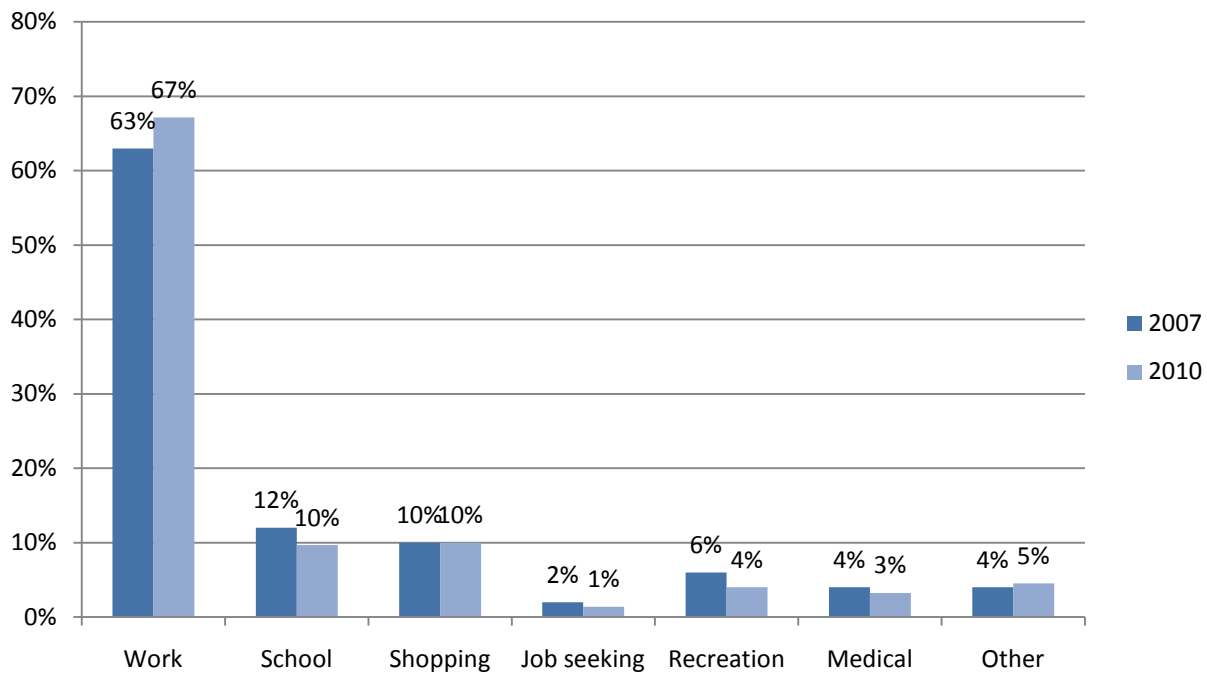
**Figure 39 How long have you been riding the Bee-Line?**

(Source: Survey Question 2)



**Figure 11 What is the main purpose of your bus trip today?**

(Source: Survey Question 3)



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Figure 27 How did you get to the stop where you boarded this bus?

(Source: Survey Question 4)

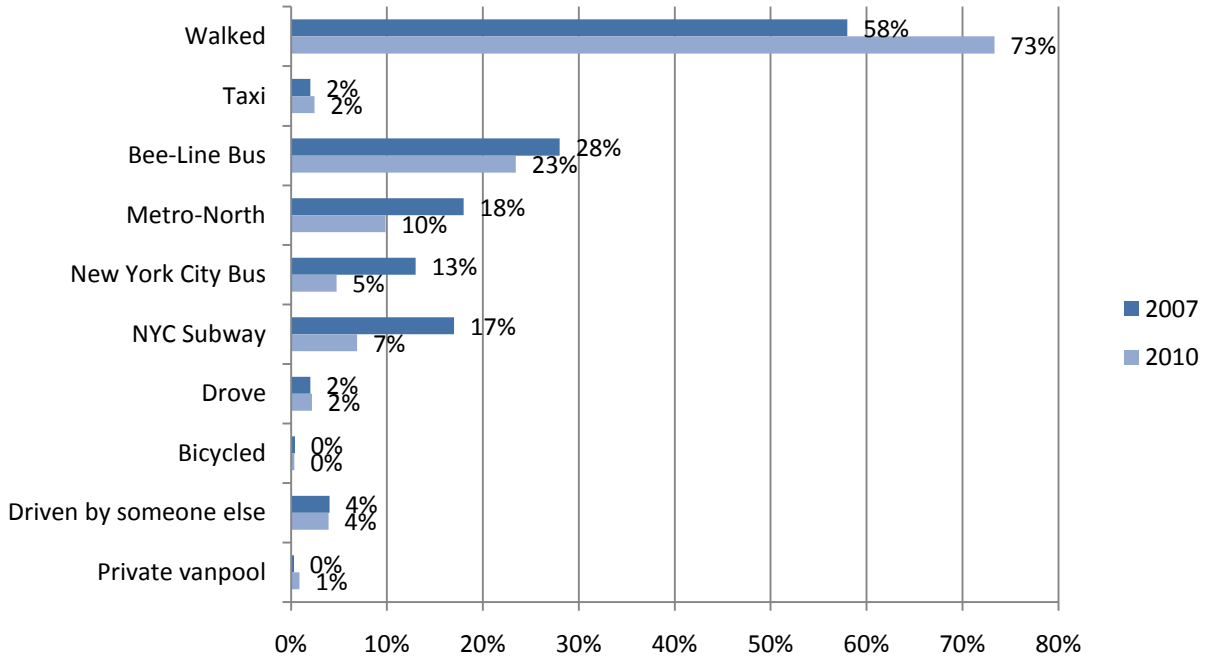
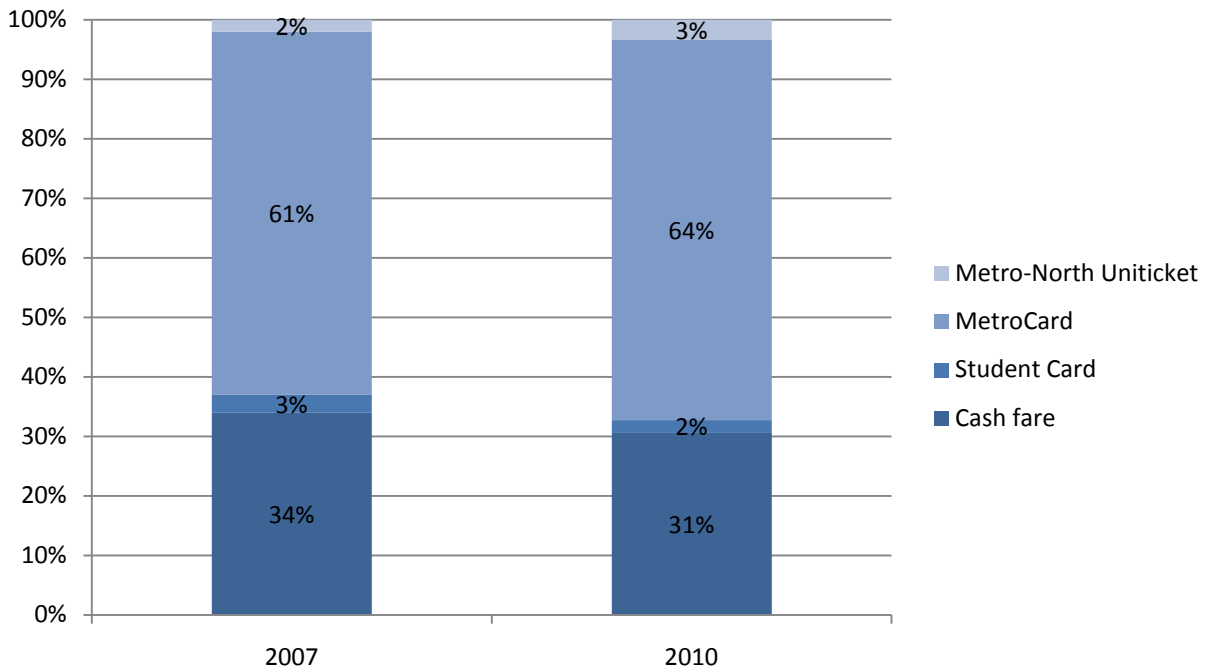


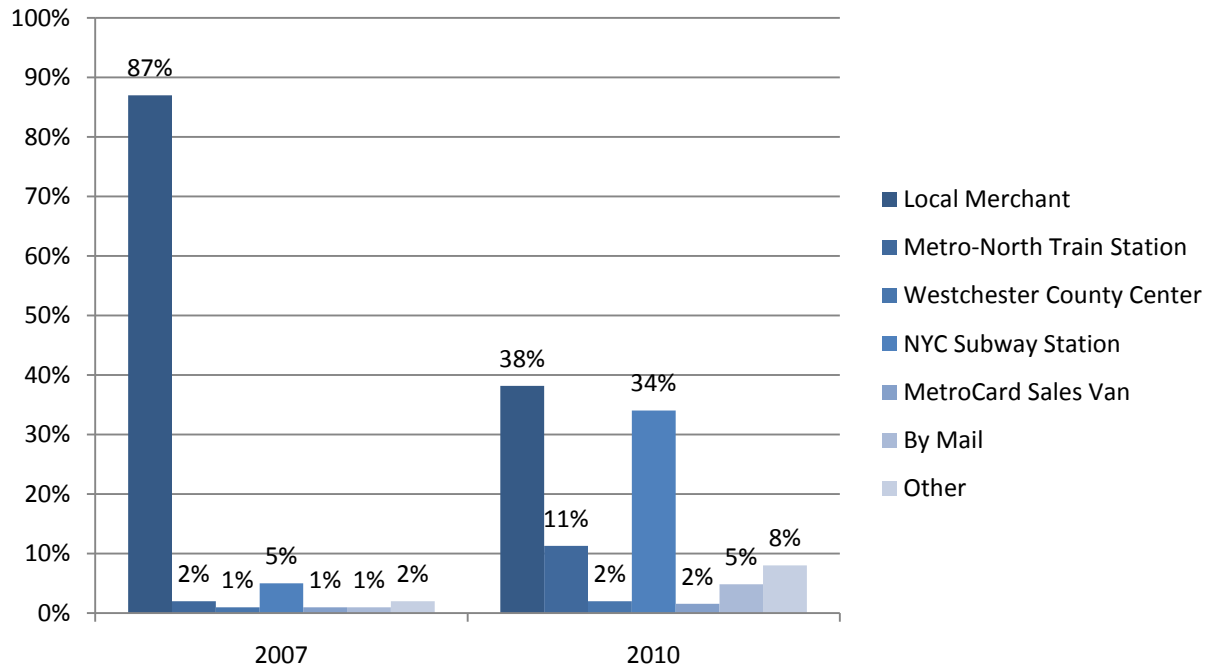
Figure 29 How did you pay for your bus fare?

(Source: Survey Question 5)



**Figure 33 Where did you get your MetroCard?**

(Source: Survey Question 6)



**Figure 34 How did you pay for your MetroCard?**

(Source: Survey Question 7)

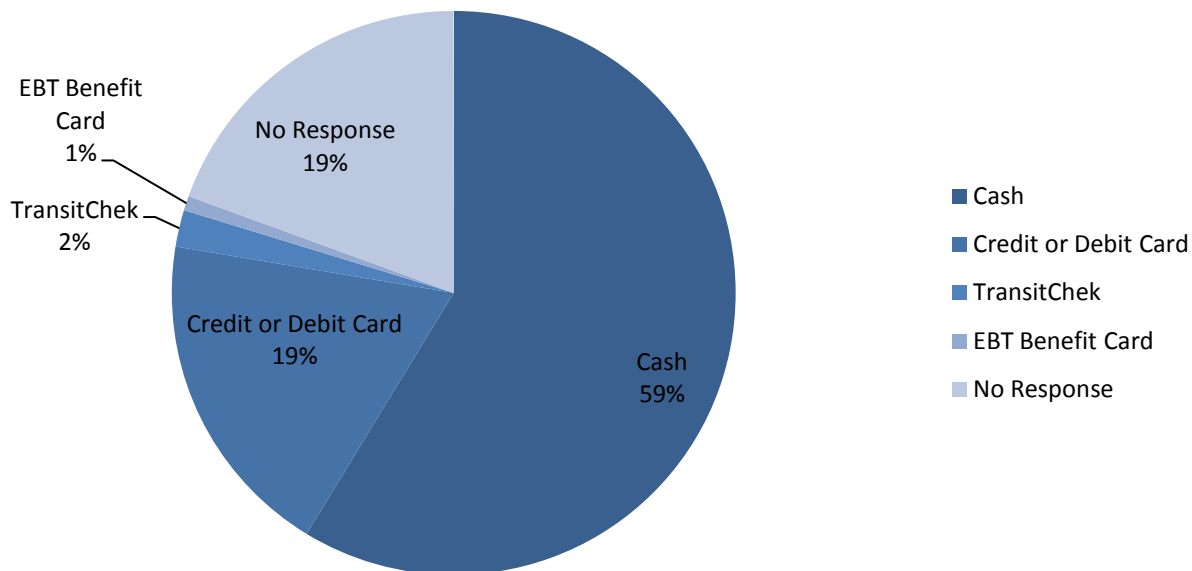
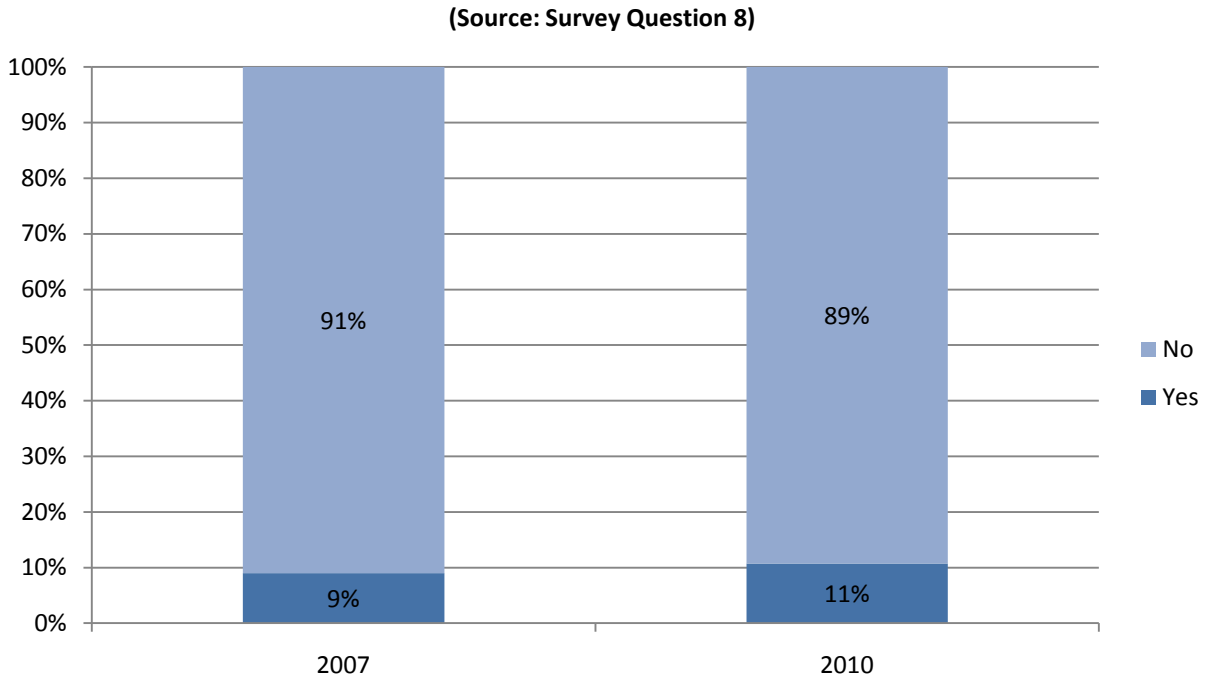


Figure 32 Did you use a senior or disabled discount?



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Figure 35 Overall Quality of Bee-Line Service

(Source: Survey Question 9)

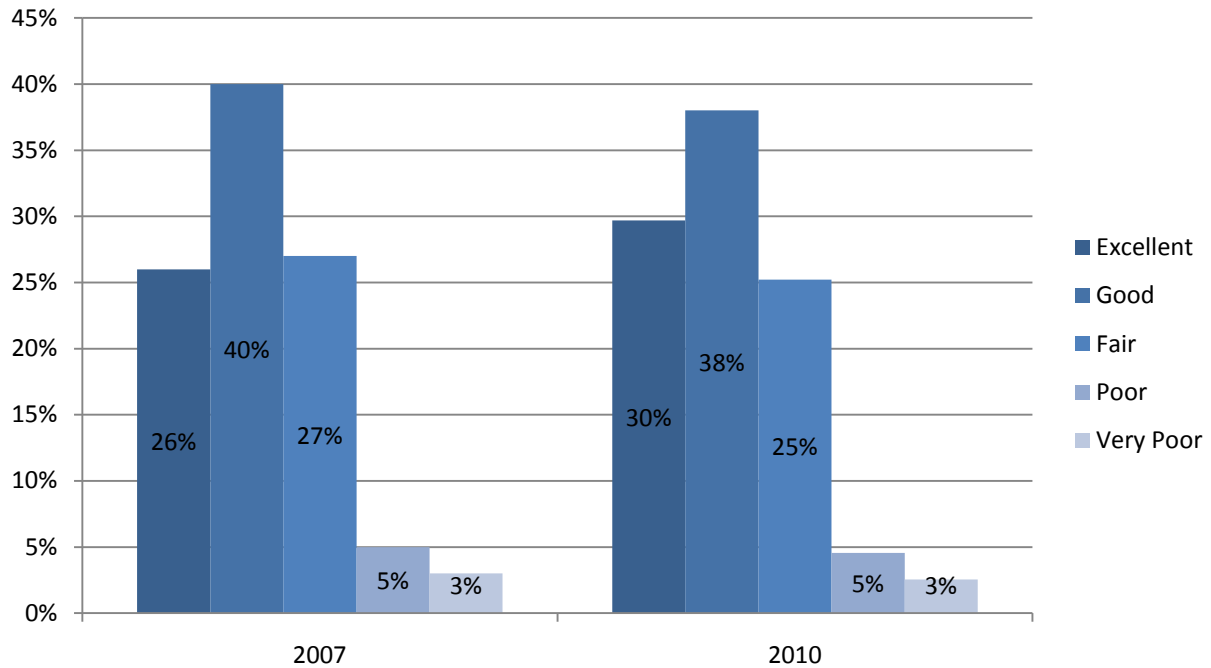
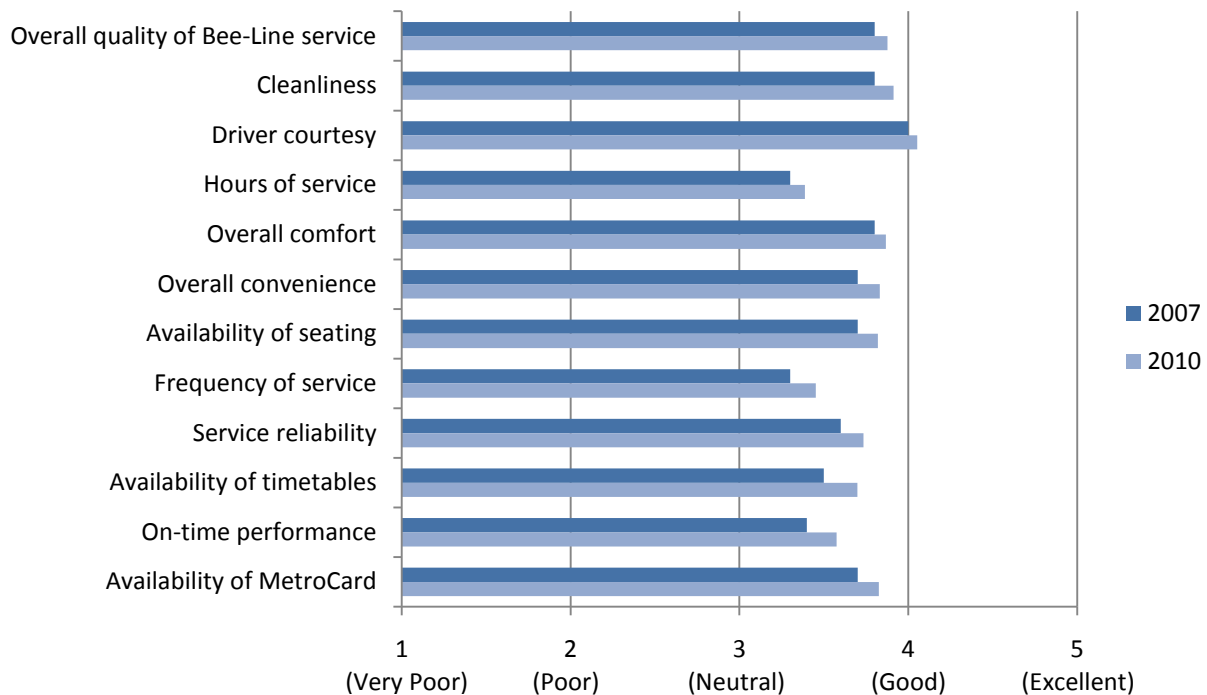


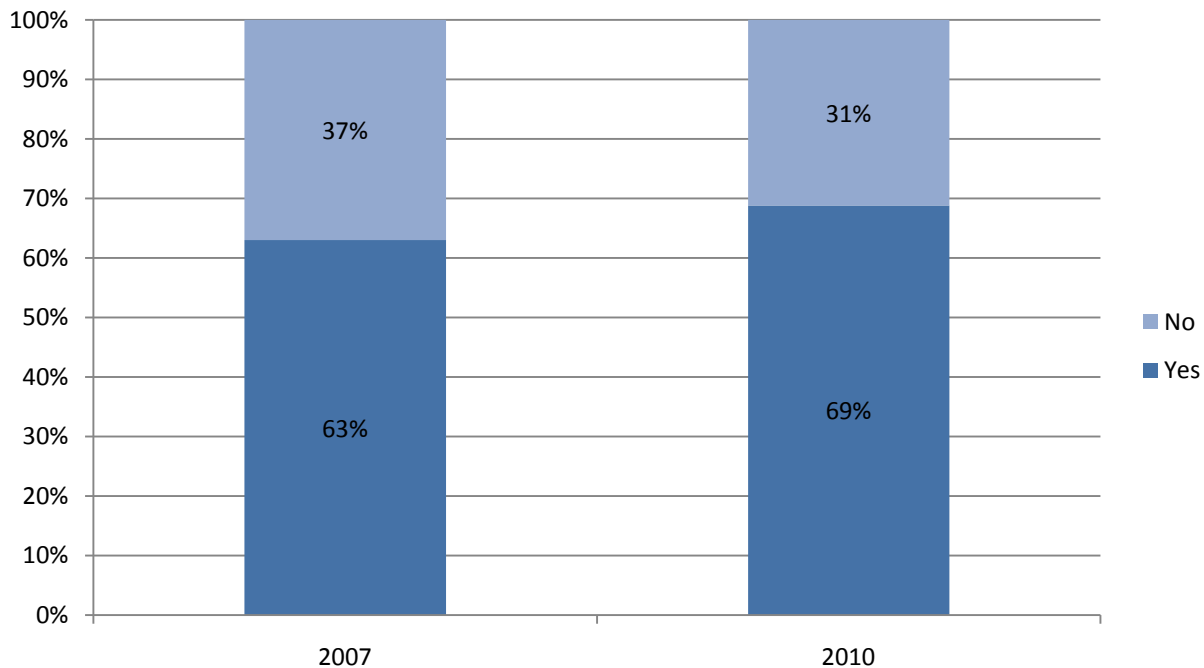
Figure 36 Bee-Line Service Ratings

(Source: Survey Questions 9 - 20)



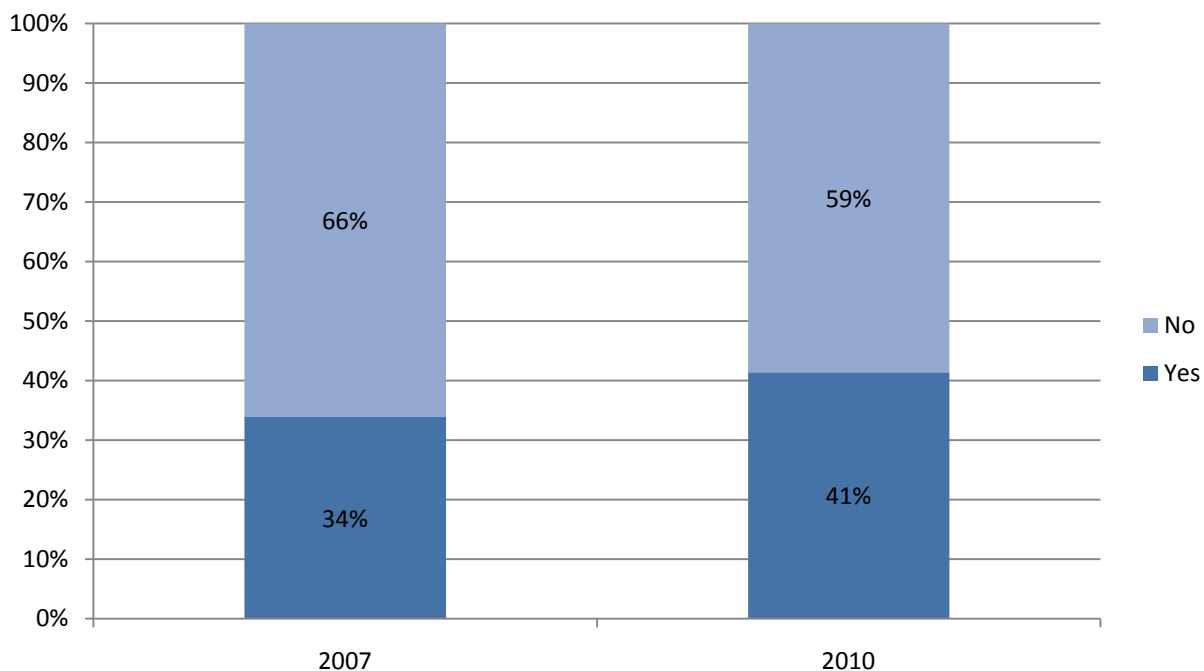
**Figure 40 Do you have access to the Internet on a regular basis?**

(Source: Survey Question 21)



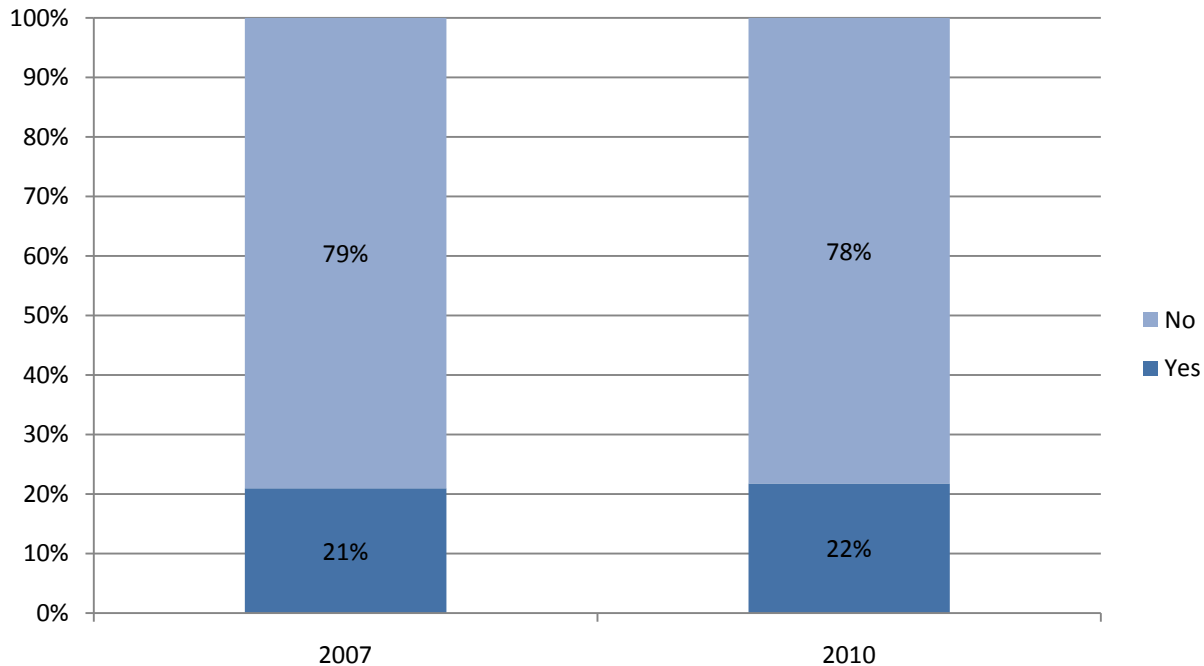
**Figure 43 Have you used the Bee-Line website?**

(Source: Survey Question 22)



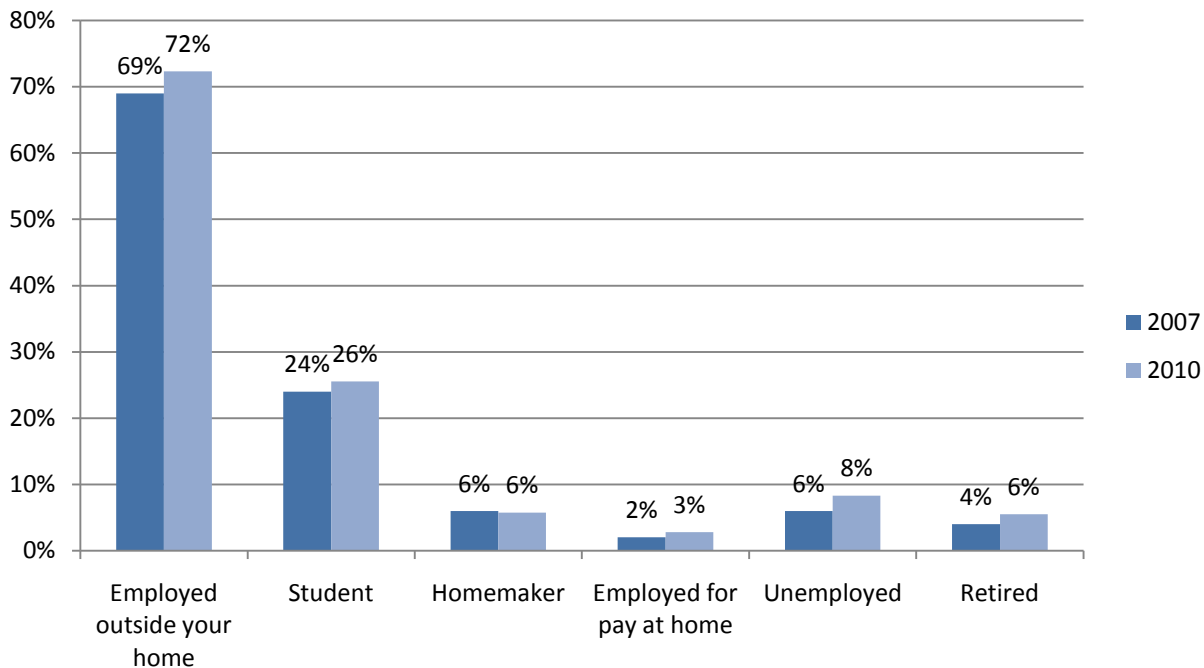
**Figure 45 Do you wish to receive e-mail notices on Bee-Line service changes?**

(Source: Survey Question 23)



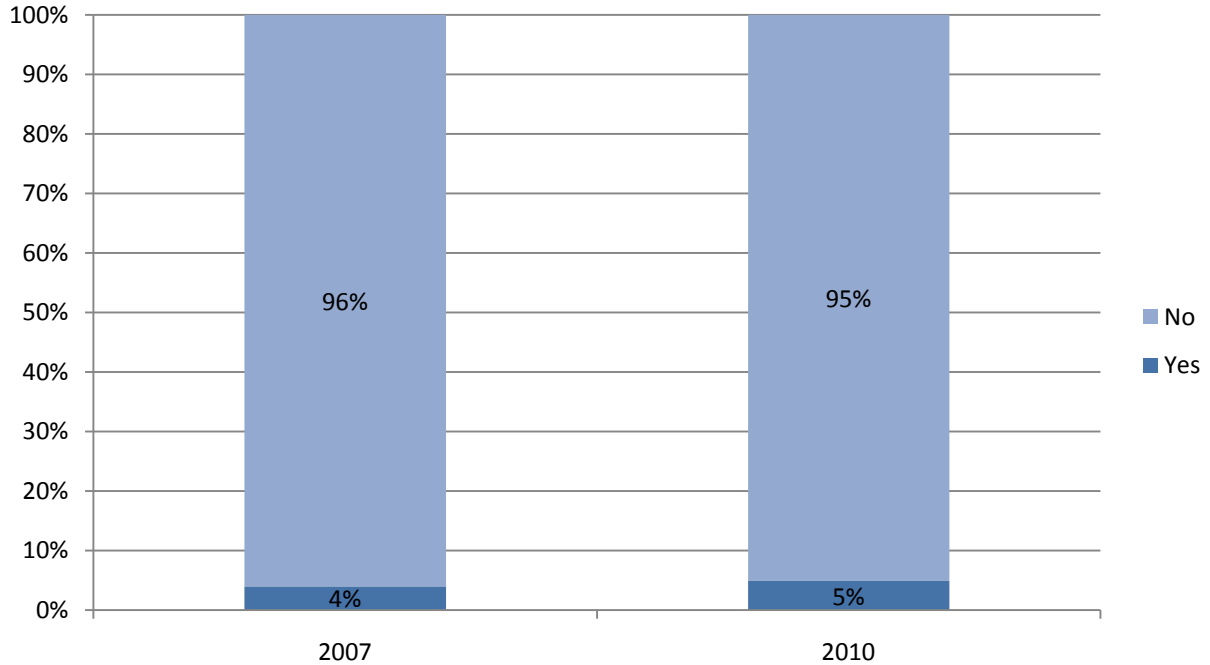
**Figure 9 Employment or Occupational Status**

(Source: Survey Question 24)



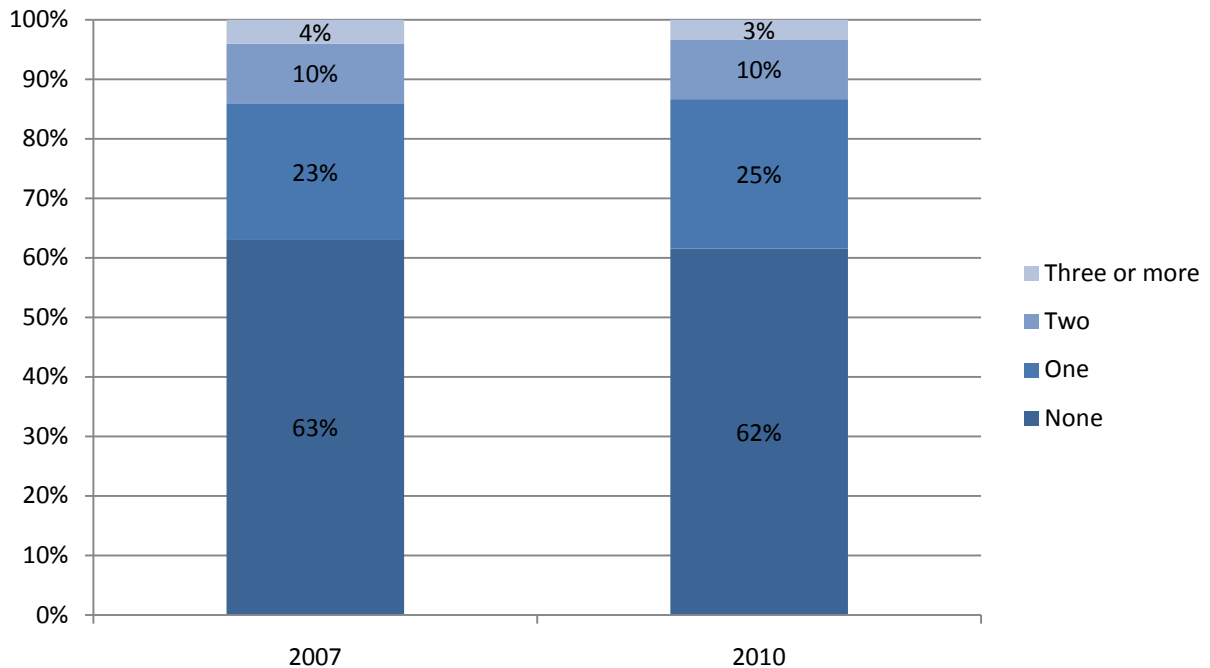
**Figure 4 Do you have a disability that makes transit use difficult?**

(Source: Survey Question 25)



**Figure 5 How many motor vehicles are available for you to use?**

(Source: Survey Question 26)



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Figure 1 What is your age?

(Source: Survey Question 27)

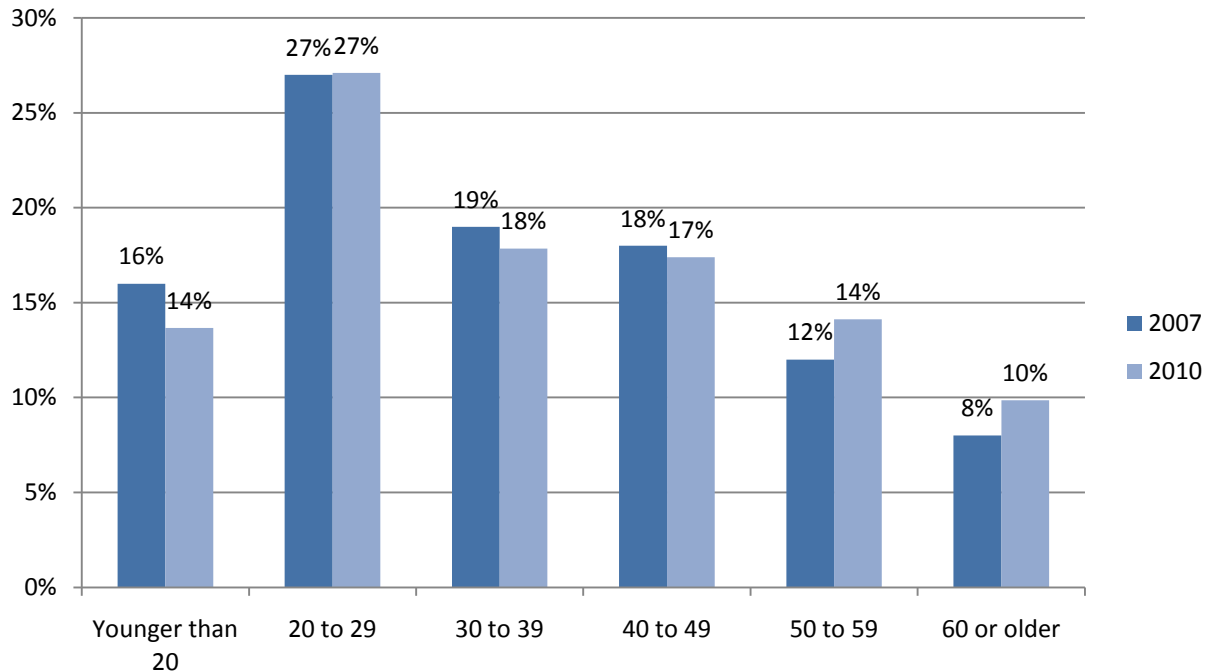
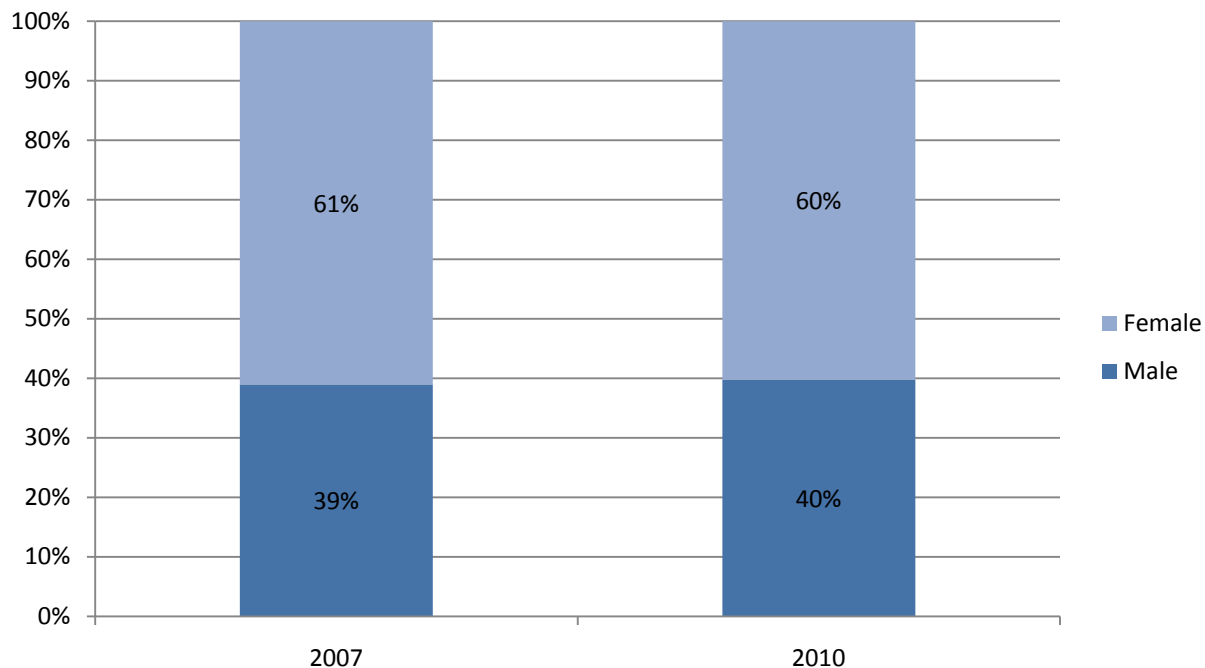


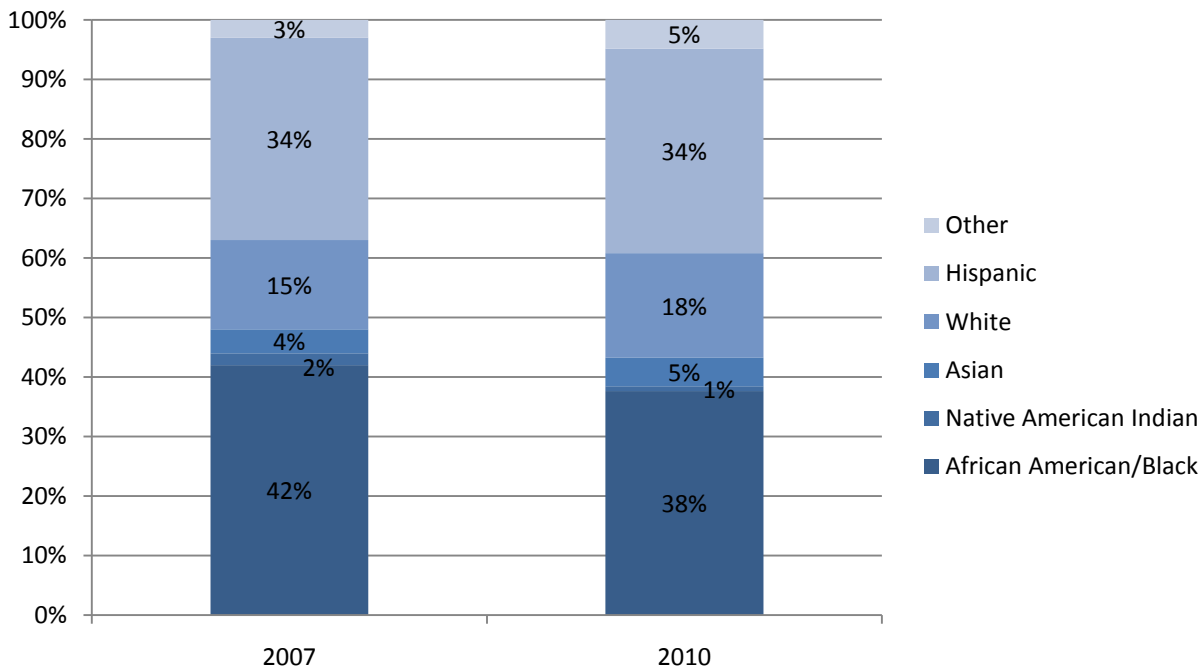
Figure 2 Are you male or female?

(Source: Survey Question 28)



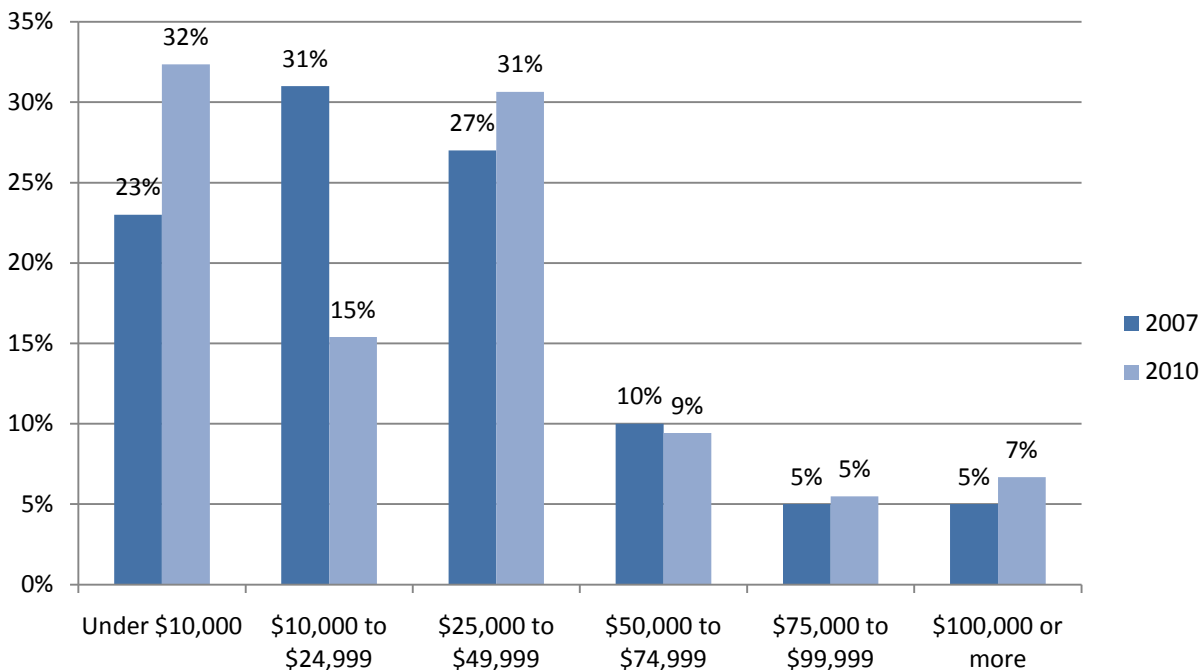
**Figure 3 Which do you consider yourself?**

(Source: Survey Question 29)



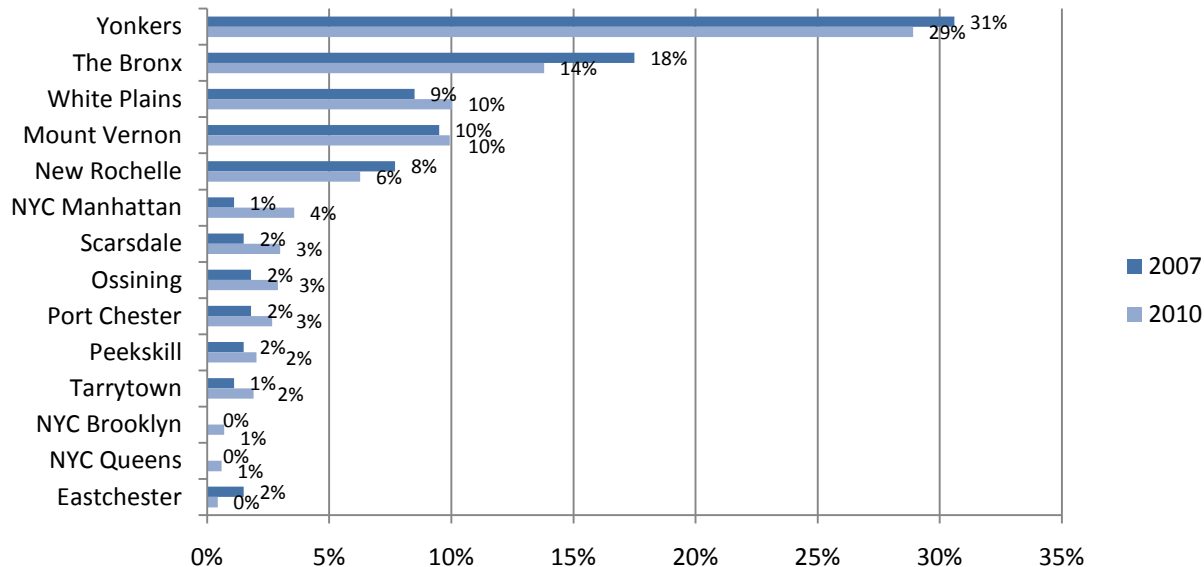
**Figure 8 What is your total annual household income?**

(Source: Survey Question 30)



**Figure 20 In what municipality did you begin this trip?**

(Source: Survey Question 31)



**Figure 25 Do you or will you transfer to or from another service during this trip?**

(Source: Survey Question 32)

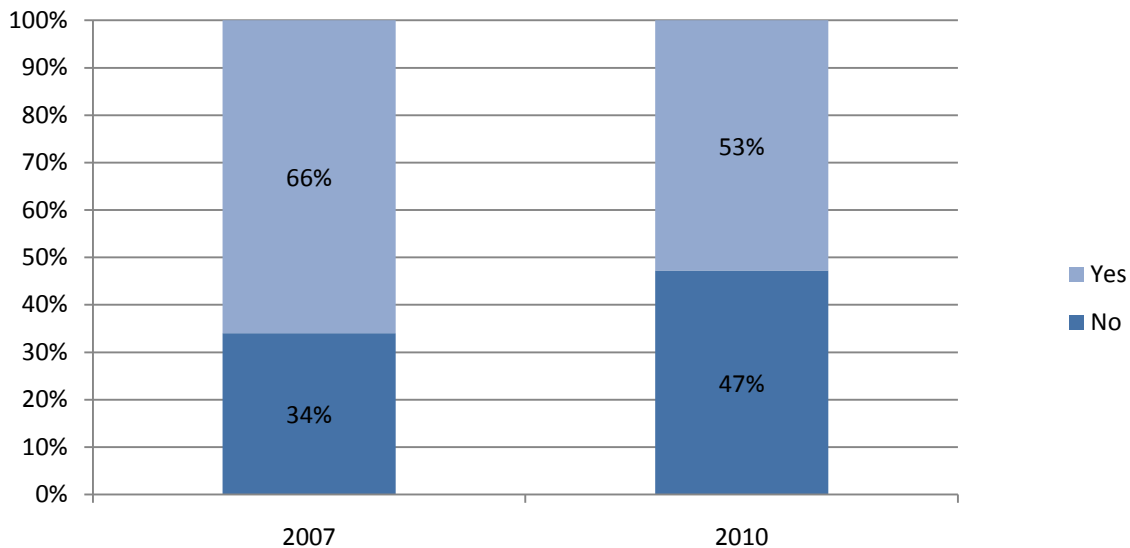


Figure 26 If you transfer, what service do you transfer to or from?

(Source: Survey Question 32)

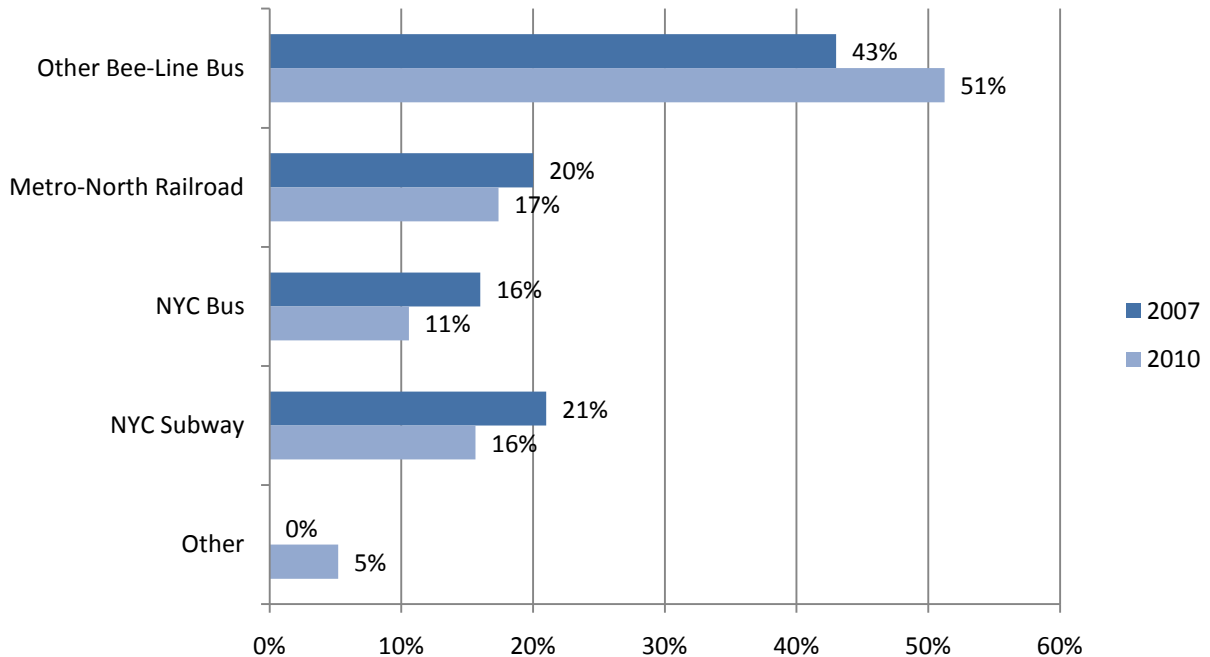
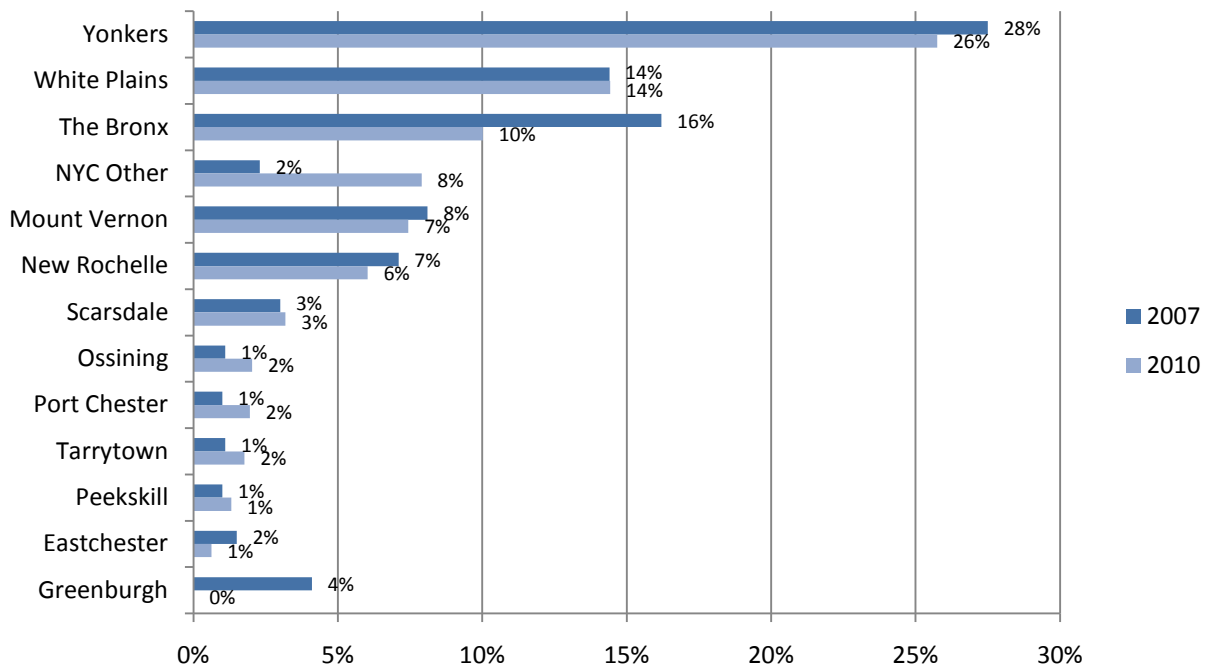


Figure 21 In what municipality will you end this trip?

(Source: Survey Question 33)



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Figure 24 If this route were not available how would you make this trip?

(Source: Survey Question 34)

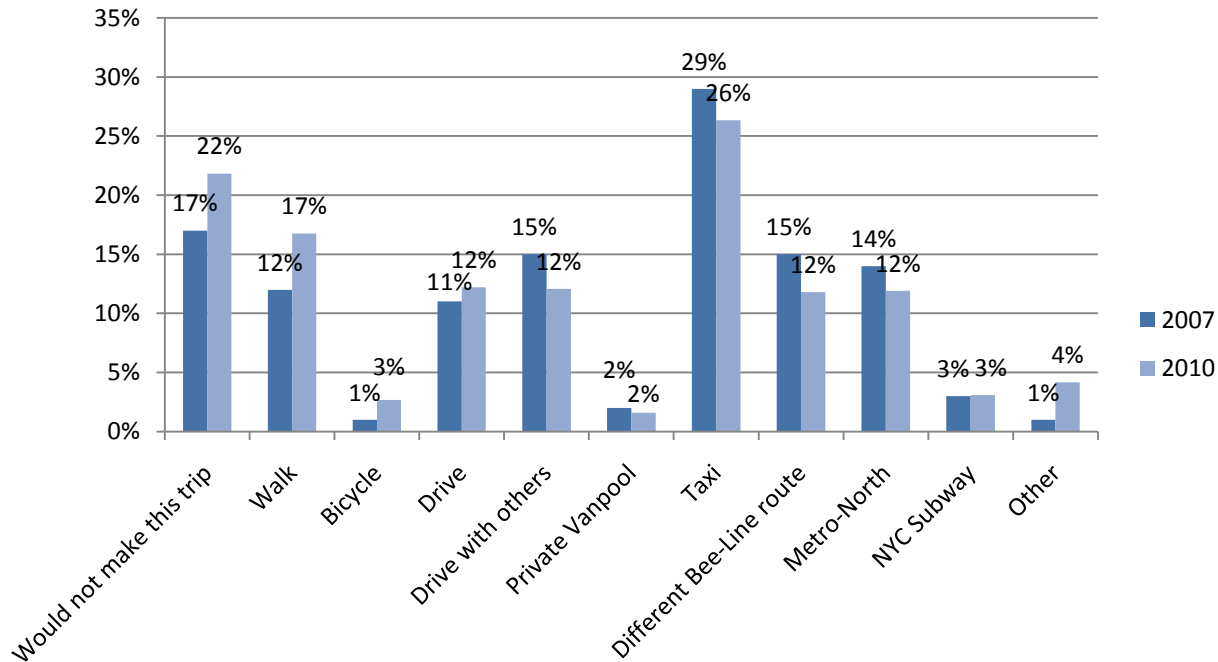


Figure 22 Where did you board this bus?

(Source: Survey Question 35)

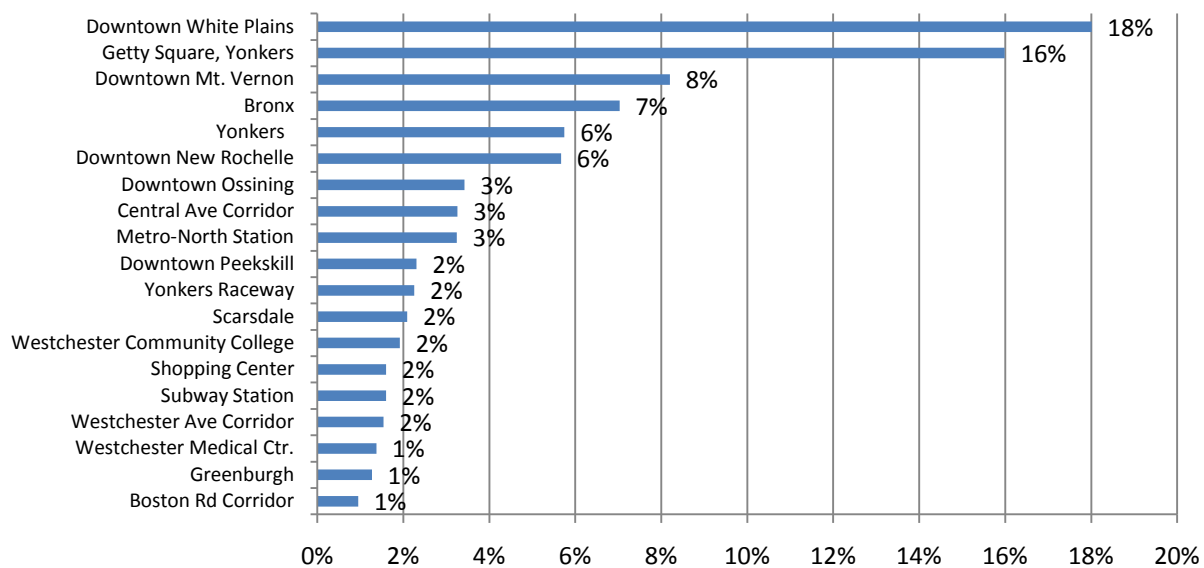
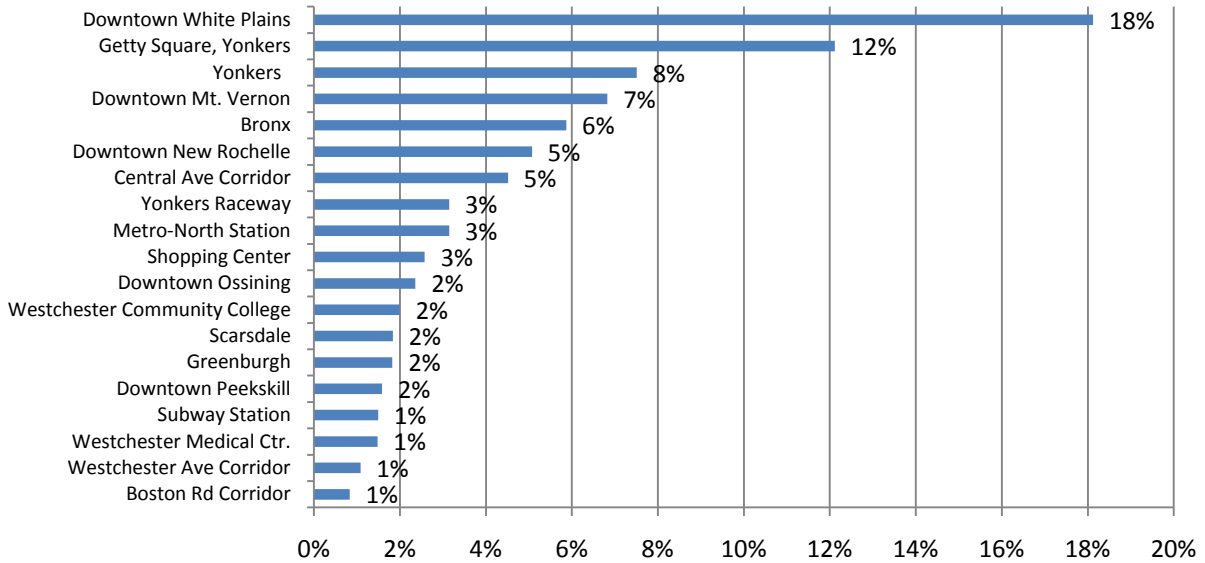


Figure 23 Where will you get off this bus?

(Source: Survey Question 36)





## **APPENDIX C**

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### **LIST OF SELECT CROSS-TABS**



The figures below are based on cross-tabulated data, derived from multiple survey questions. The order of the figures are determined by the order of the input questions.

**Figure 15 Years of Bee-Line Use by Frequency of Use**

(Source: Survey Questions 1 and 2)

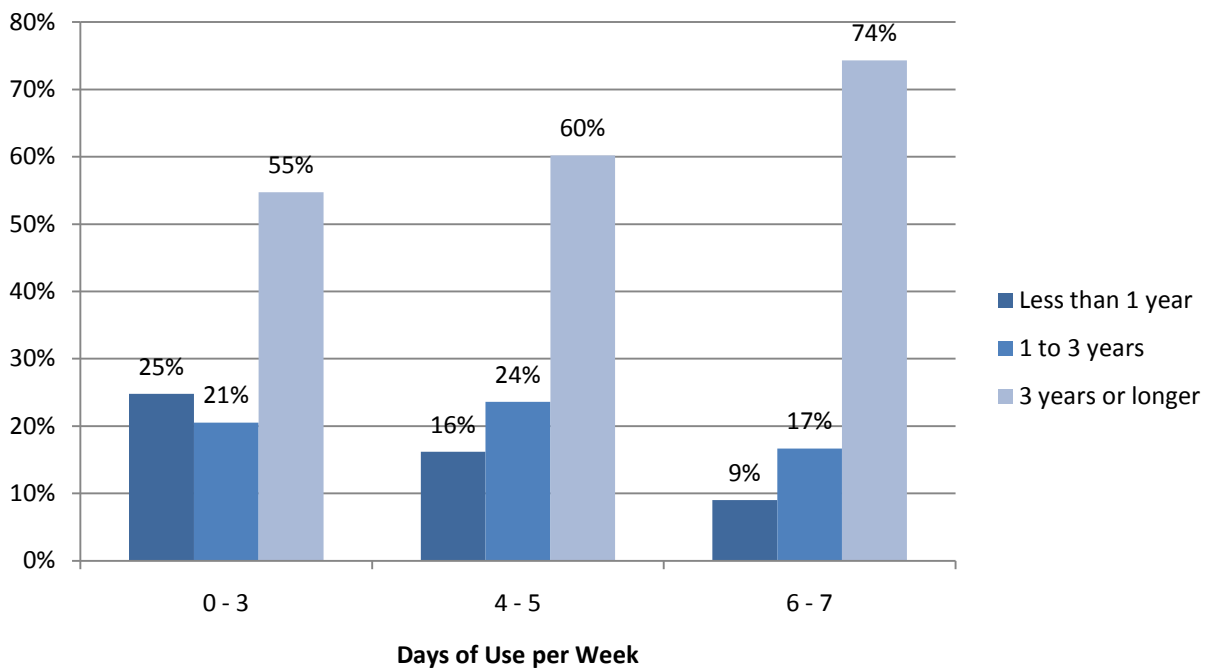


Figure 14 Trip Purpose by Frequency of Bee-Line Use

(Source: Survey Questions 1 and 3)

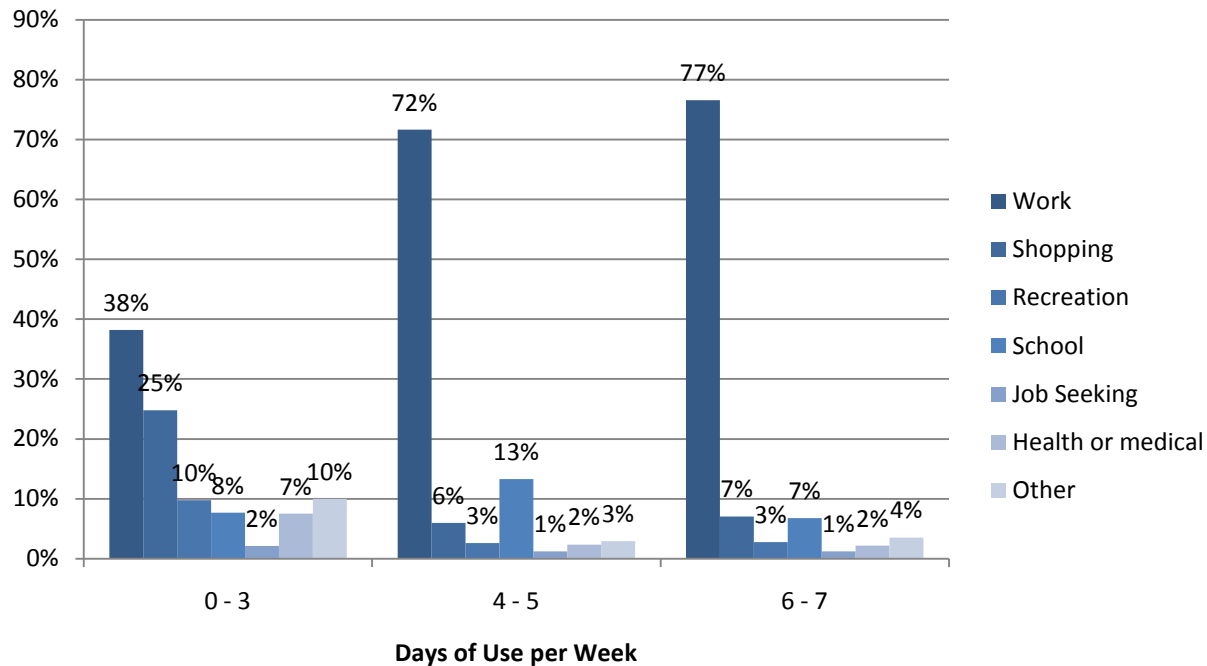
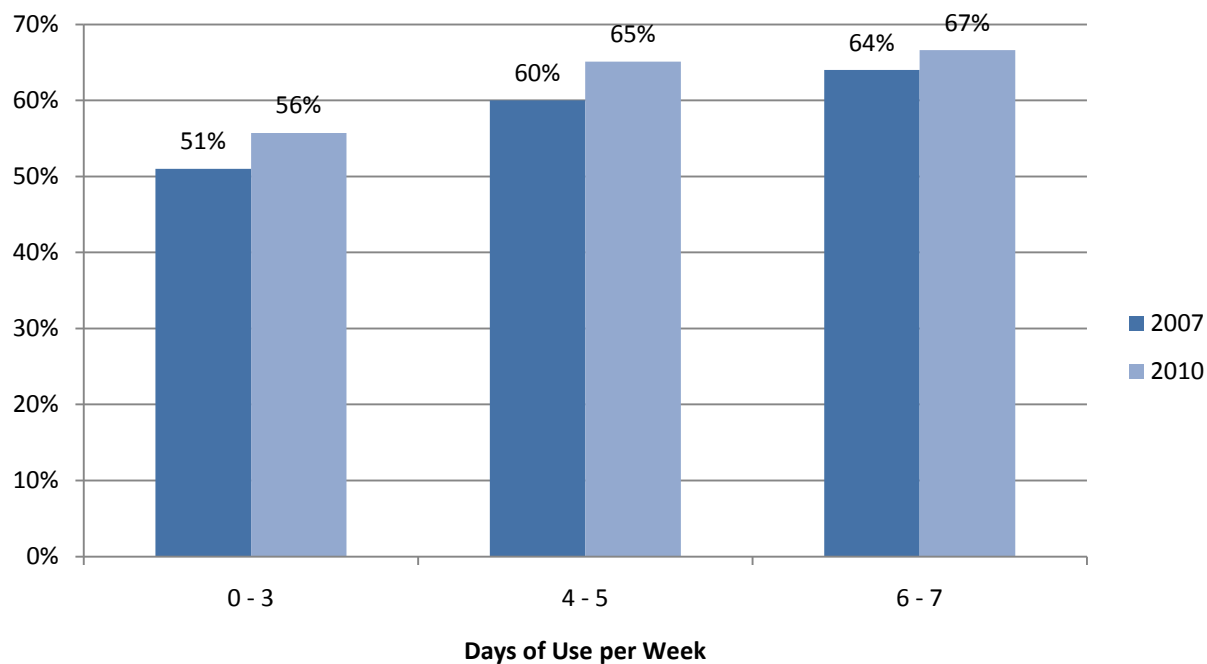


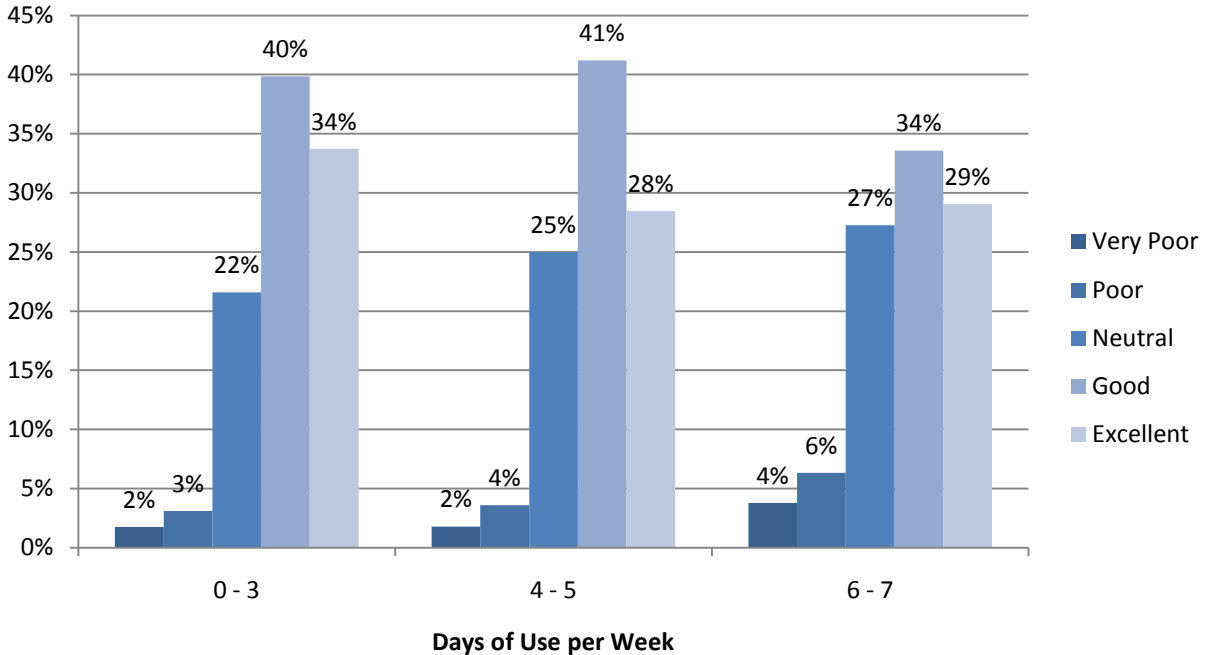
Figure 30 MetroCard Use by Ridership Frequency

(Source: Survey Questions 1 and 5)



**Figure 38 Service Quality Ranking by Ridership Frequency**

(Source: Survey Questions 1 and 9)



**Figure 47 Perception of Timetable Availability by Ridership Frequency**

(Source: Survey Questions 1 and 18)

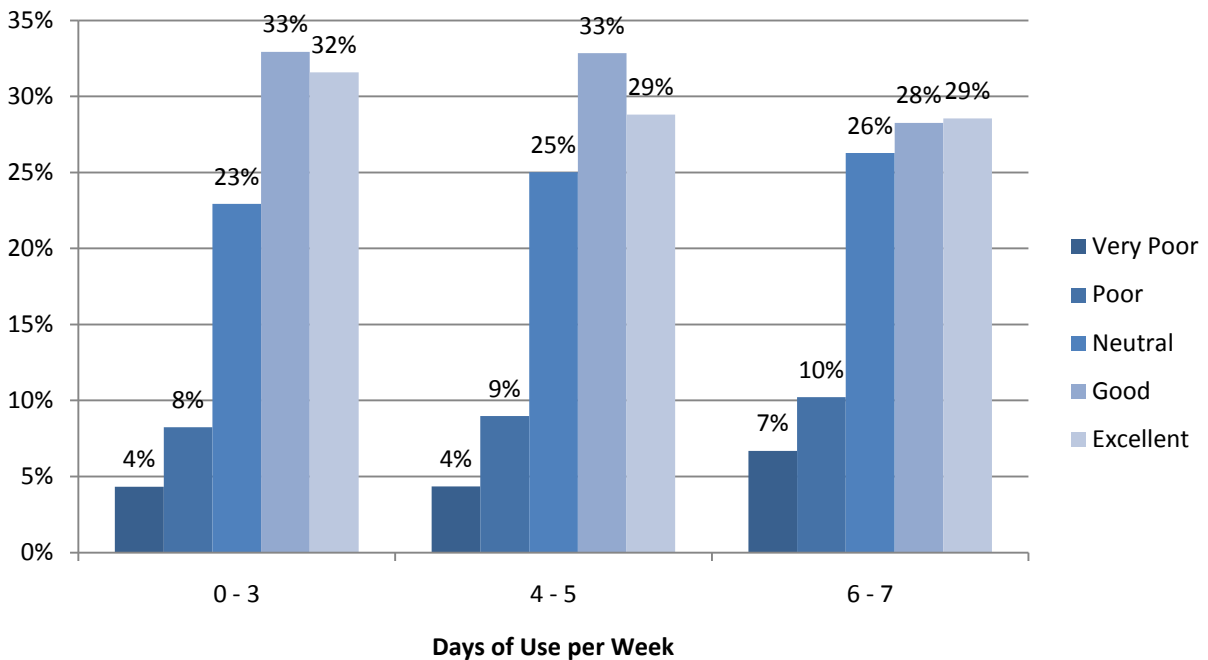


Figure 17 Occupational Status by Frequency of Use

(Source: Survey Questions 1 and 24)

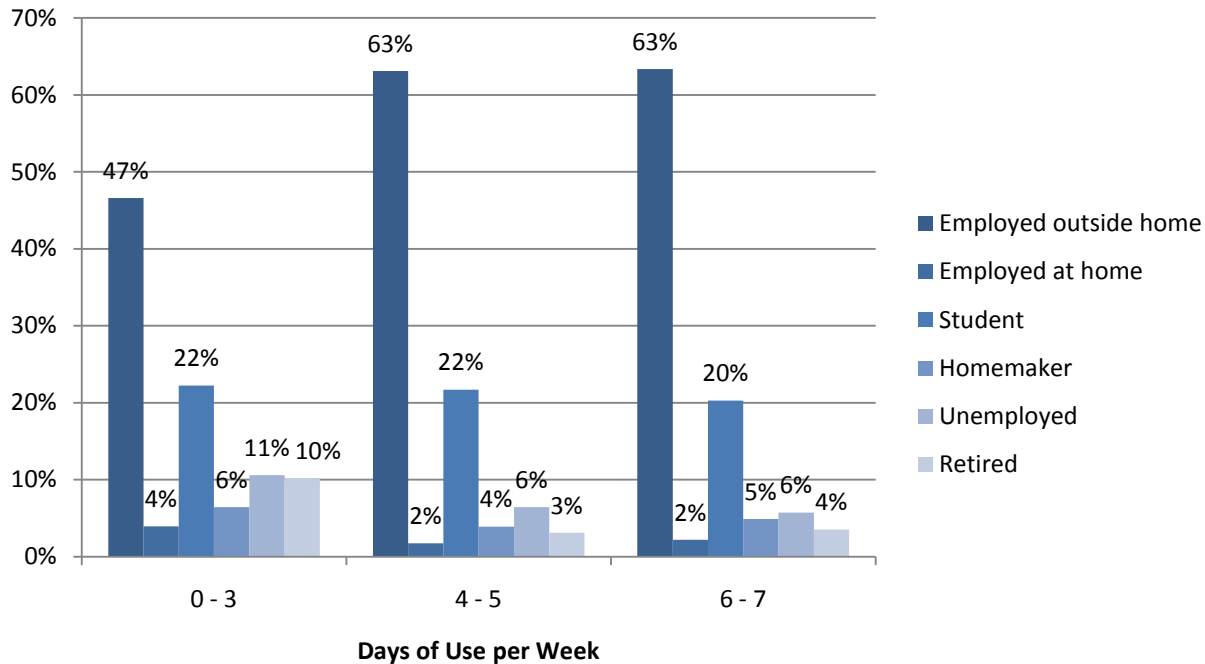
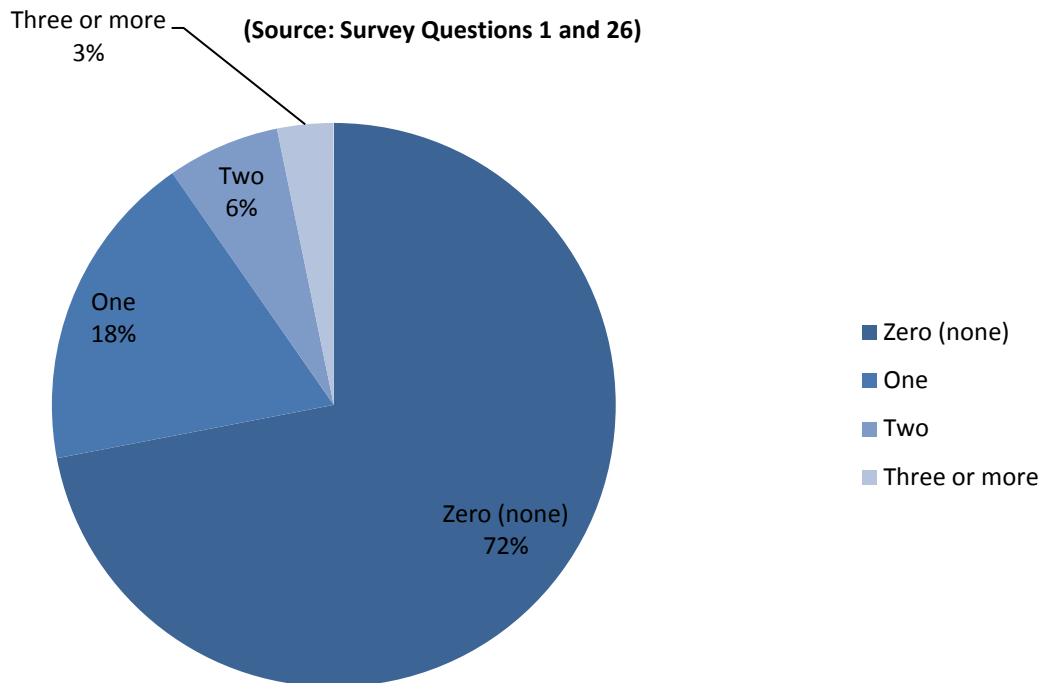


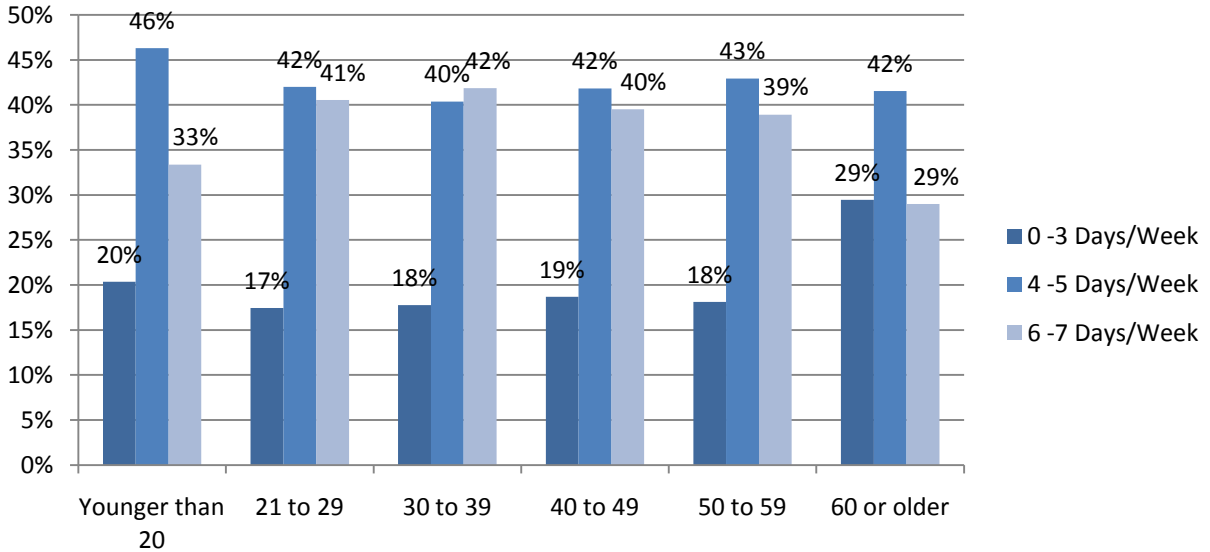
Figure 6 Vehicle Availability Among Most Frequent Bee-Line Users

(Source: Survey Questions 1 and 26)



**Figure 16 Frequency of Use by Age**

(Source: Survey Questions 1 and 27)



**Figure 19 Frequency of Use by Gender**

(Source: Survey Questions 1 and 28)

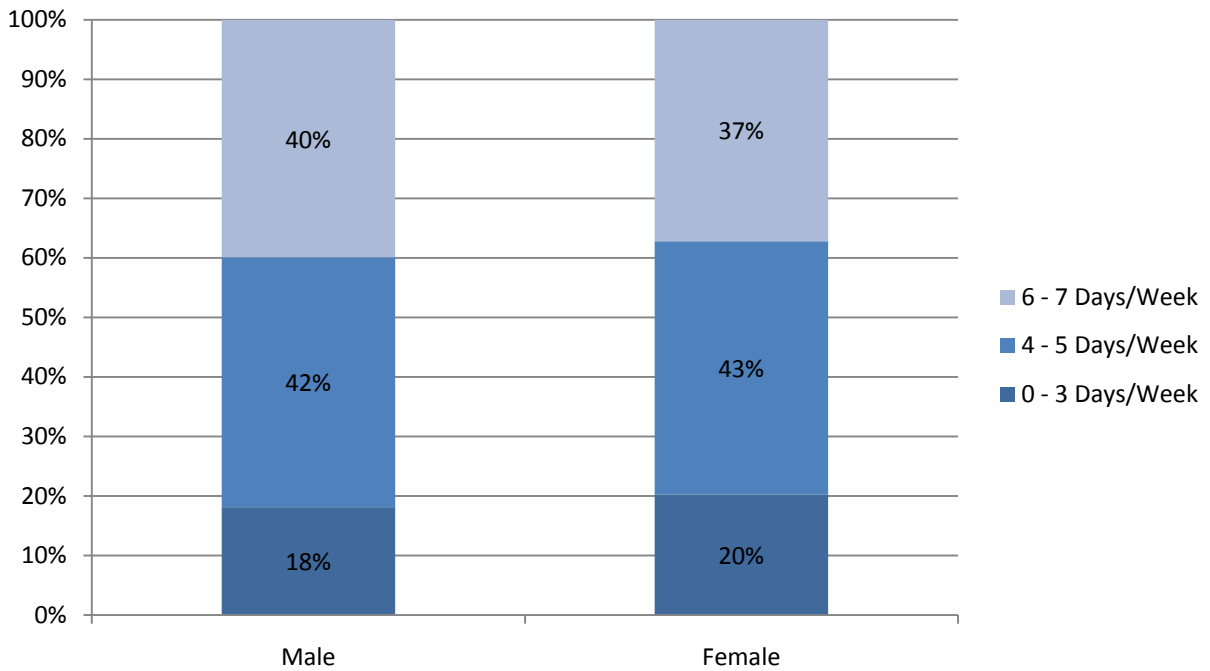


Figure 18 Frequency of Use by Race

(Source: Survey Questions 1 and 29)

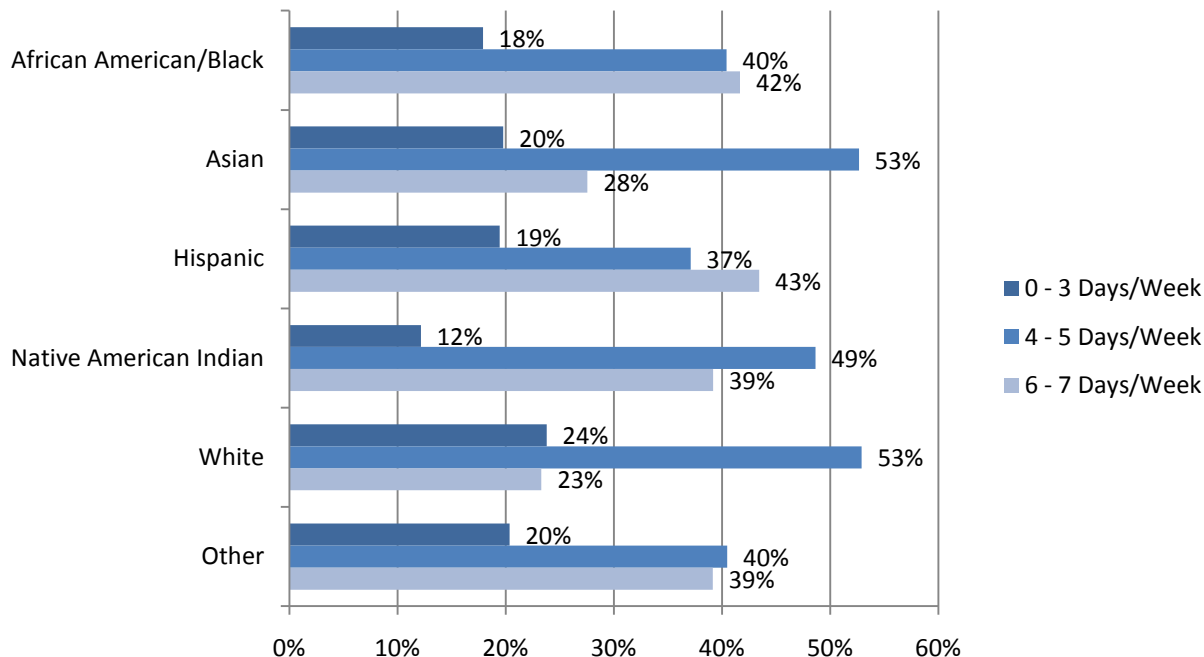


Figure 28 Transfer Rate by Frequency of Bee-Line Use

(Source: Survey Question 1 and 32)

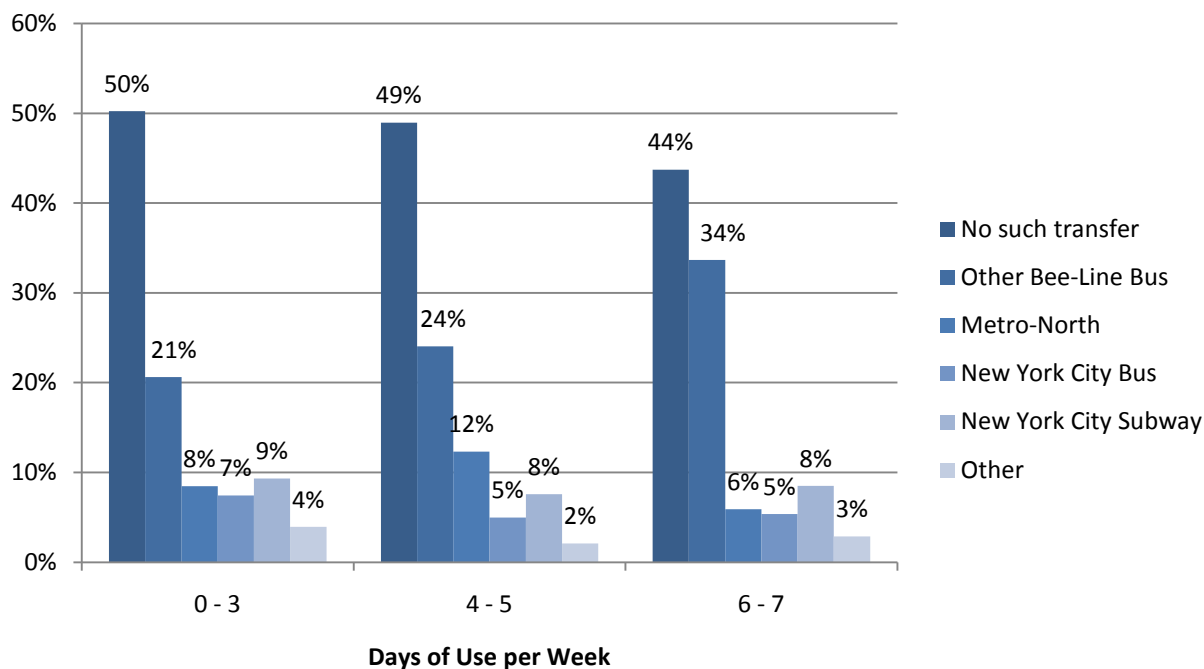


Figure 12 Trip Purpose by Income

(Source: Survey Questions 3 and 30)

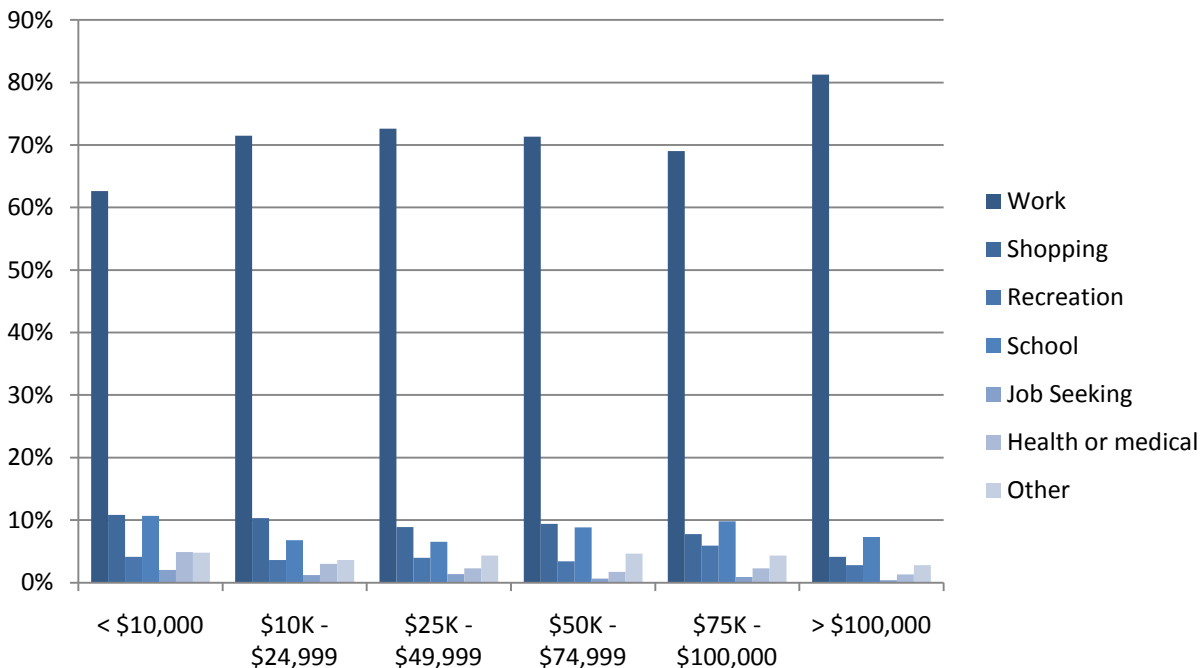
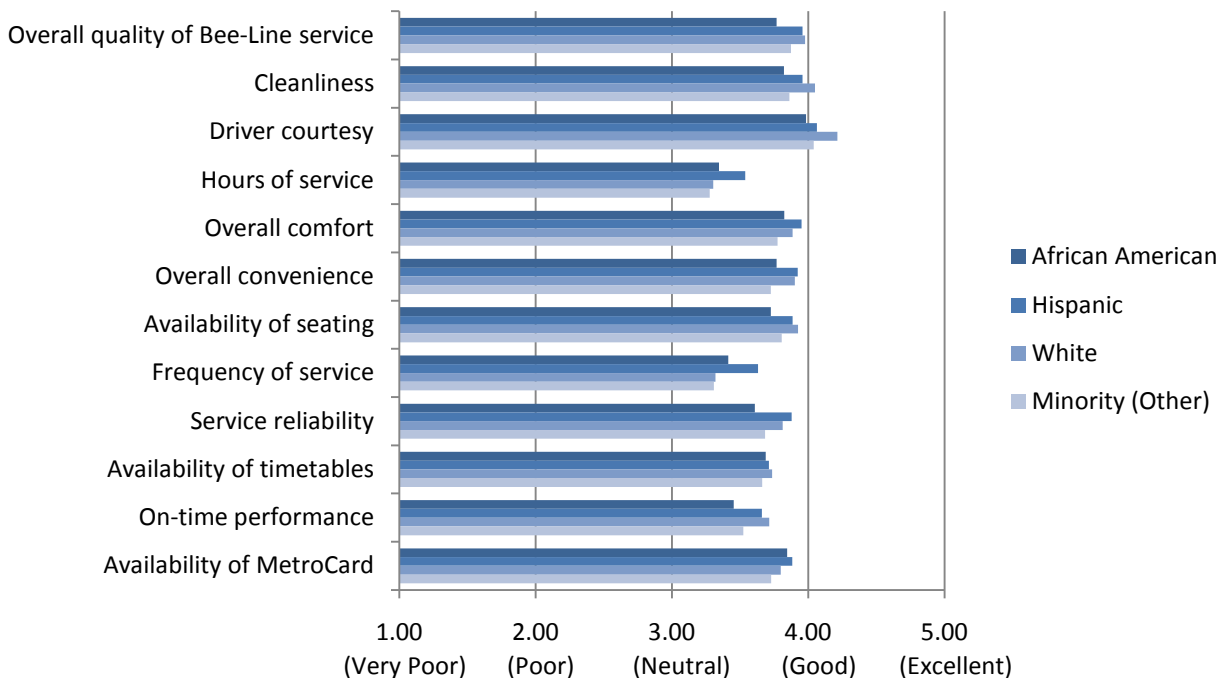


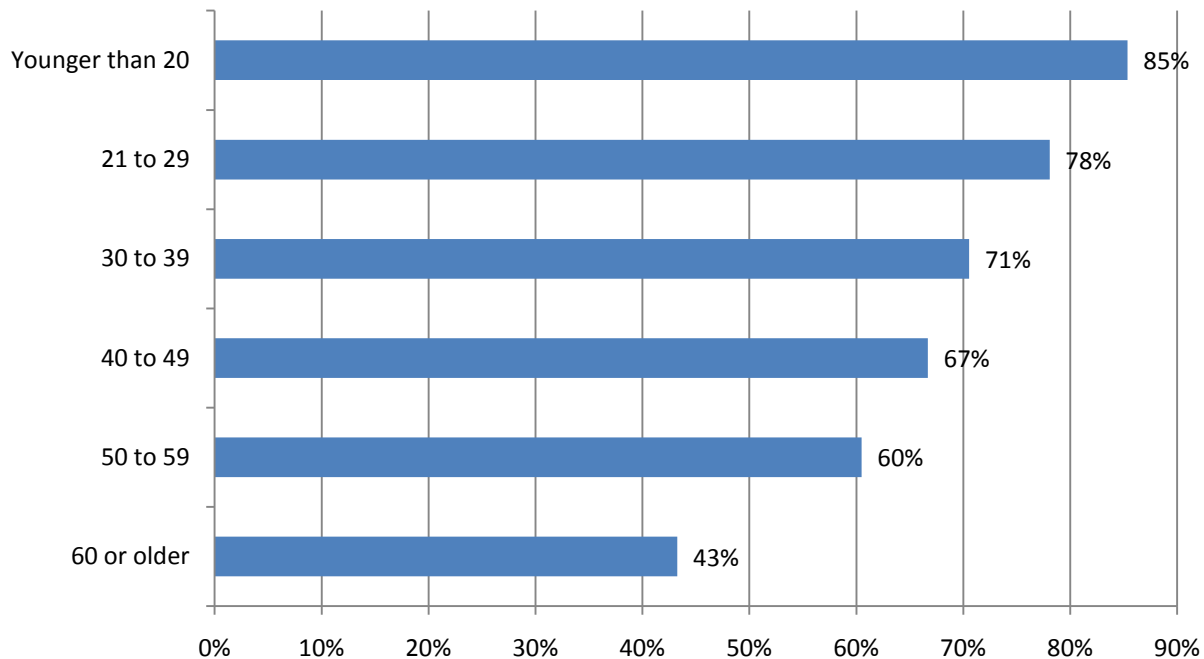
Figure 37 Bee-Line Service Ratings by Ethnicity

(Source: Survey Questions 9-20)



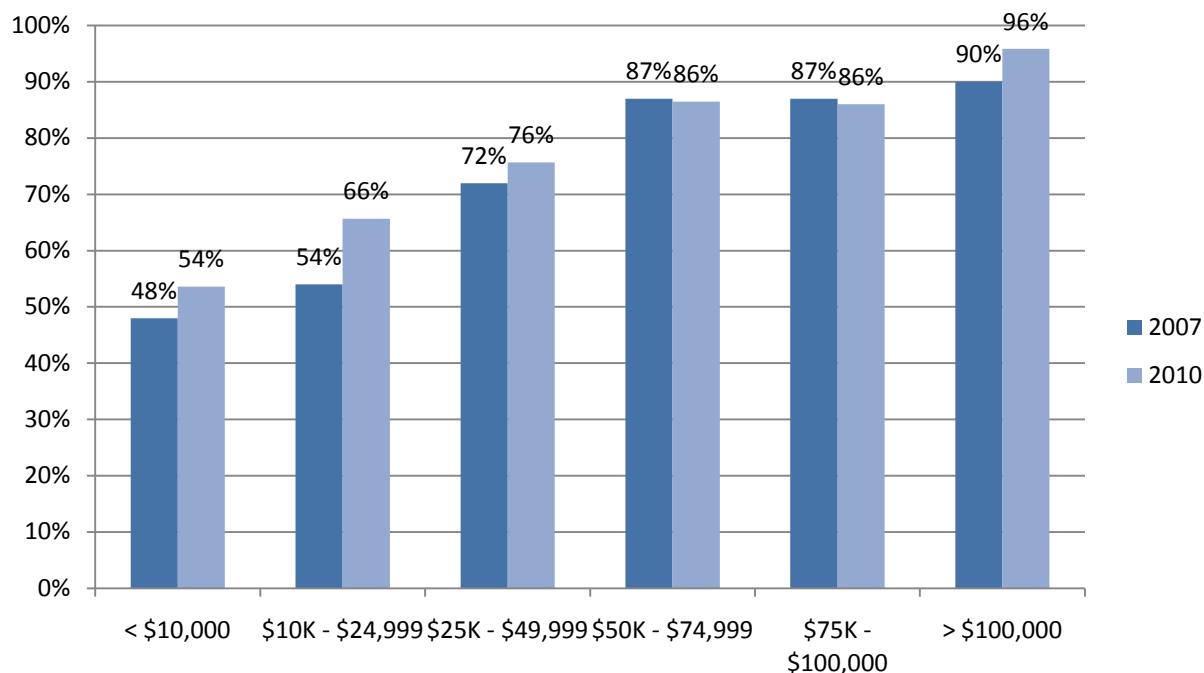
**Figure 42 Access to Internet by Age**

(Source: Survey Questions 21 and 27)



**Figure 41 Internet Access by Income**

(Source: Survey Questions 21 and 30)



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Figure 44 Bee-Line Website Use by Income

(Source: Survey Questions 22 and 30)

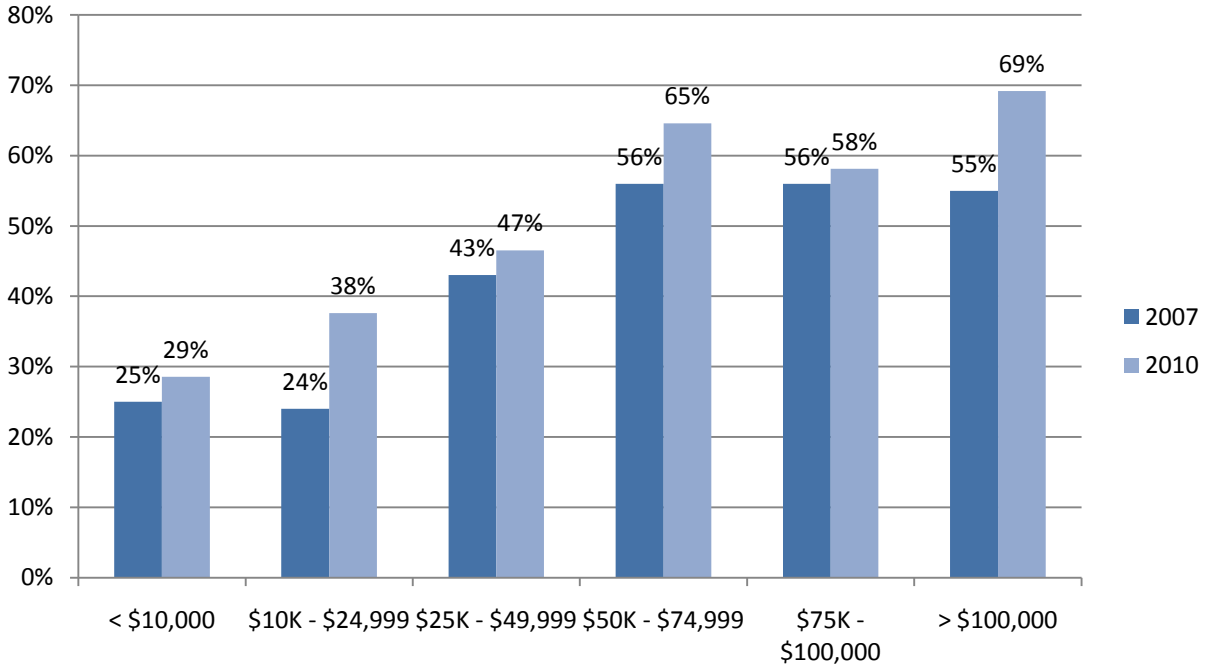
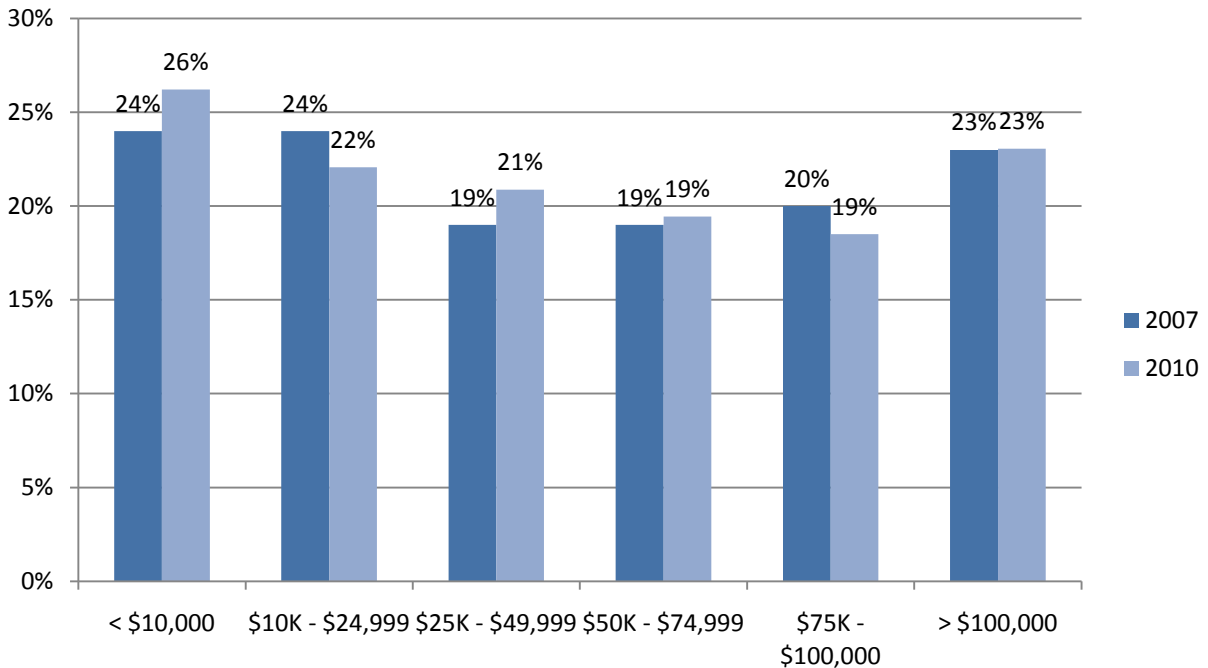


Figure 46 E-mail Notice Interest by Income

(Source: Survey Questions 23 and 30)



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Figure 10 Occupational Status of Riders Making Less than \$10,000 a Year

(Source: Survey Questions 24 and 30)

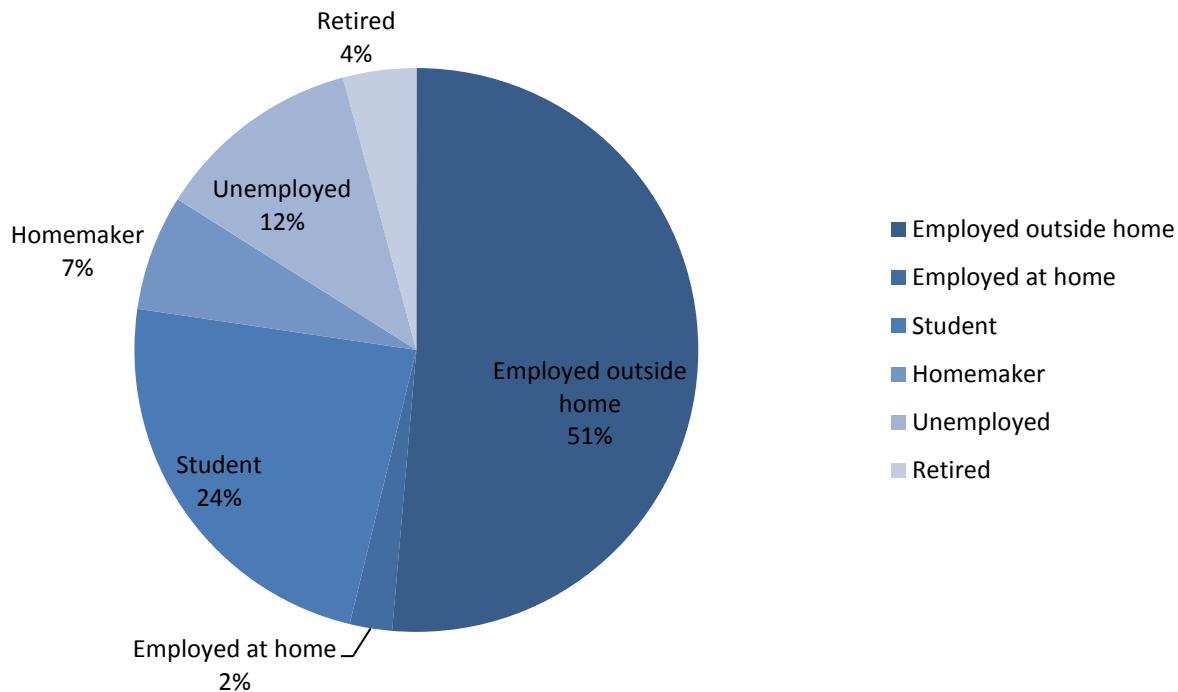


Figure 7 Vehicle Availability by Income

(Source: Survey Question 26 and 30)

