

The Bee-Line System Onboard Survey -2007

Final Report

A CJI RESEARCH CORPORATION REPORT



Prepared for
Westchester County Department of Transportation

Submitted by
CJI Research Corporation

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A survey was conducted onboard Bee-Line buses during the period November 28 through December 15, 2007. Temporary workers were trained and then used for data collection under the direction of CII Research Corporation. The total "effective distribution," defined as a rider accepting the survey materials and agreeing to complete a survey form was 12,823. Of these, 9,243 returned a survey form sufficiently complete it could be included in the analysis for an effective return rate of 72%. A similar survey was conducted in 2003, and is used here for comparison.

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The Report

Introduction

A survey was conducted onboard Bee-Line buses from November 28 through December 15, 2007. Temporary workers were trained and then used for data collection under the direction of CJI Research Corporation. The total “effective questionnaire distribution,” defined as riders accepting the survey questionnaire and agreeing to complete it, was 12,823. Of these riders, 9,243 returned a survey form that was sufficiently complete to be included in the analysis—resulting in an effective return rate of 72%. A similar survey was conducted with 9,781 riders in 2003 and is used here for comparison.

Survey Data Collection

Survey data collection occurred onboard the buses. Temporary workers were used for this purpose under the supervision of CJI Research Corporation staff. Surveyors wore both ID badges and smocks identifying them in large print as “Transit Survey” workers. This uniform helps riders visually understand the purpose of the interviewers approaching them.

Survey personnel accompanied drivers at the beginning of the shifts, and rode the buses for an entire run. They approached all riders. On articulated buses, two survey personnel were used. Survey personnel handed surveys to riders and asked them to complete the survey. They also provided pencils to the potential respondents.

At the end of the run, the survey personnel placed the completed surveys in an envelope marked with the route and the run and reported to the survey supervisors who completed a log form detailing the run.

Questionnaire

The questionnaire was self-administered. It was printed on card stock, with an English version on one side and Spanish on the other. The questionnaire 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 riders which route they are riding when completing the survey.

Sample

A random sample of runs was drawn from a list of all Bee-Line runs. This initial sample was examined to determine whether the randomization process in the relatively small universe of all runs had omitted any significant portion of the Bee-Line System's overall route structure. The sample was adjusted slightly to take any such omissions into account.

The resulting total sample size is 9,243 useable responses. When all respondents were included, this sample had a sample error level of $\pm 1\%$. If a sub-sample were used, sample error would increase somewhat, though with such a large overall sample, this would affect the findings only in very rare circumstances in which only very small sub-segments of the ridership were being examined separately. This does not occur in the report presented here.

Participation Rates

A total of 25,549 Bee-Line riders were approached and asked to participate in the survey. Of these, 2,719 said they had already completed a survey. Another 10,007 were unwilling to participate. Thus the total "effective distribution," defined as a rider accepting the survey materials and agreeing to complete a survey form, was 12,823 persons. Of these, 9,243 returned a survey form, for a return rate of 72%.

Weighting

Weighting of the 2007 survey data was based on annual ridership by route as reported to CJI Research by Westchester County Department of Transportation. Weighting of the 2003 data, some of which is reported here again, was based on boarding and alighting counts taken independently of the survey in 2003.

Data Cleaning and coding of origin and destination data

Riders were asked the location of the bus stop at which they boarded the bus on which they were surveyed and the location of the bus stop where they would alight. They were also asked other geographic information such as the city where their entire trip originated and would terminate. Mr. Vincent J. Pasquale, Associate Planner with the Westchester County Department of Transportation, personally performed all of the cleaning and geocoding of points of origin and destination and the transfer routes used -- an enormous task when we consider that there were more than 9,000 responses and 2 to 10 geographic references per response.

While it might seem a simple matter to analyze such data, it is complicated by the fact that people referred to their points of origin and destination and their transit routes in various ways. Many misspelled the names or used generic names rather than specific city names. Some abbreviated. Often the writing was barely legible and was thus difficult to enter into the data file. Others spelled out the names. The lack of uniformity is always impossible to regulate during data collection in an onboard survey without individual interviewing techniques, which would dramatically reduce sample size because of increased costs in terms of both time and money.

Additional “cleaning” was conducted during the data analysis for this report when logical inconsistencies were found. In a self-administered survey, people sometimes do not follow response patterns precisely, especially in an environment such as a crowded, moving bus. For example, riders were asked both how they got to their bus stop, and, in a later question, whether they had transferred or expected to transfer during their trip. Most riders answered consistently. However, some riders who said they had taken Bee-Line or Metro-North Railroad to their bus stop, said later in the survey, when asked if

they made a transfer during their trip, that they did not transfer on that trip, apparently misunderstanding the second question. They were reclassified as persons who did transfer.

Analysis

Weighting and statistical analysis were conducted using the statistical package SPSS (versions 13 and 16). Charts were prepared in Microsoft Excel.

Charts

In each major section of the report an overview chart introduces the section. It is followed by a chart that breaks the same data into travel market segments based on frequency of using Bee-Line. We refer to these as “Rider Frequency Segments.”

The sums of percentages within charts do not always equal 100%. In some cases, this is caused by the fact that the questionnaire encouraged multiple responses to a single question. In other cases, it is caused by rounding off of the percentages, which might result in a deviation of approximately 1% more or less than 100%.

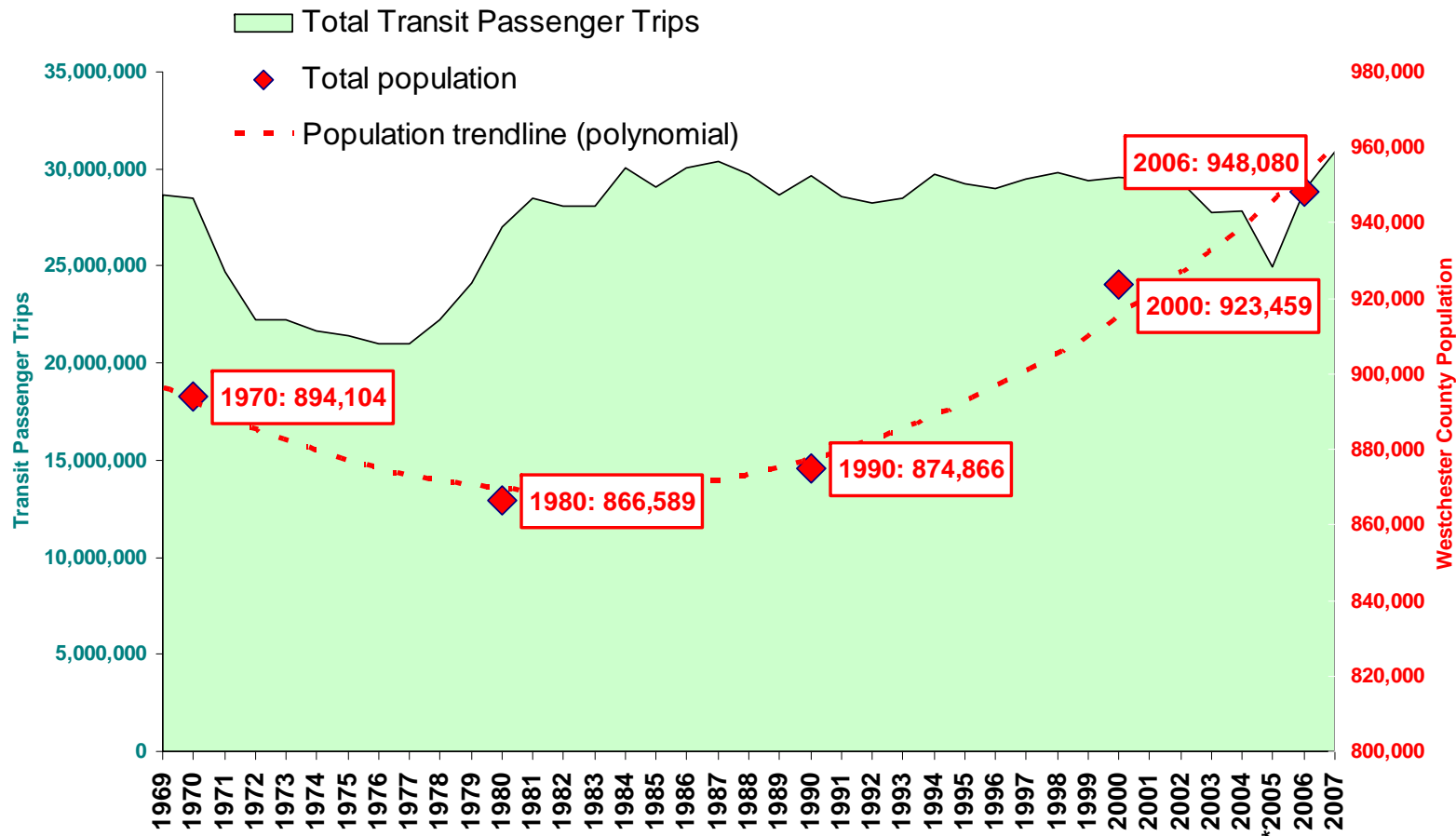
Key Findings

- ◆ Bee-Line is used intensively. In 2007, 76% of riders used the bus five or more days each week. This is statistically unchanged from 2003, when 75% of riders used Bee-Line that frequently. (See Figure 2, page 24.)
- ◆ Almost two-thirds of Bee-Line riders (63%) have no vehicle and are dependent upon transit. Conversely, 37% have a vehicle but choose to use the bus. This is statistically unchanged from 64% in 2003. (See Figure 4, page 28.)
- ◆ Sixty-three percent (63%) use Bee-Line for work-trips. This is slightly higher than the 2003 result (61%) and is similar to the percentages of work-trips reported in comparable transit systems. (See Figure 8, page 36.)
- ◆ The greatest change in the survey results between 2003 and 2007 relates to fare payment. In 2003, 61% paid the fare in cash, while 39% used a prepaid fare medium. In 2007, only 34% used cash while 66% used a prepaid fare medium. This was a result of Bee-Line's acceptance of MetroCard beginning in April, 2007. (See Figure 20, page 64.)
- ◆ More riders in 2007 (66%) compared to 2003 (61%) said they transferred, whether within the Bee-Line system or between Bee-Line and another system. (See Figure 27, page 76.) One consequence of the introduction of the MetroCard to Bee-Line has been an increase from 10% to 21% of riders who said that they had transferred to their Bee-Line bus from the New York City Subway.
- ◆ More than half of Bee-Line trips originate in Yonkers (30.6%) or in New York City (18.6%). Most of the New York City trips originate in the Bronx (specifically, 17.5% of all riders). (See Figure 12, page 46.)
- ◆ Bee-Line riders, like those of most transit systems in the United States, tend to be young. In 2003, 67%, and in 2007, 62% were 39 or younger. (See Figure 38, page 104.)
- ◆ In 2007, most riders identified themselves as either African-American (42%) or Hispanic (34%). While the percentages of other ethnic/cultural groups decreased only slightly, the offsetting increase of 4% was concentrated among Hispanic riders, whose percentage rose from 30% in 2003 to 34% in 2007. (See Figure 41, page 110.)
- ◆ The income distribution of rider households is fairly typical of transit ridership nationally. In 2007, almost one-fourth (23%) of riders reported household incomes of less than \$10,000. However, many other riders are of middle income households and have sufficient resources to have transportation options. For example, 32% have household incomes of \$35,000 or more. Figure 43, page 114.)
- ◆ Bee-Line riders continue to give the service high marks for quality. A total of 66% rated service as good or excellent in 2007, up somewhat from the 63% who rated it similarly in 2003. (See Figure 33, page 92.)

Perspective on Ridership and Local Population

Figure 1 Ridership History and Westchester County Population 1969 - 2007

(Sources: Westchester Department of Transportation and US Census)



*In 2005, there was an operators' strike during March and April.

Ridership history and Westchester County Population 1969 – 2007

A history of ridership drawn from WCDOT records and population records drawn from Census Bureau studies, both expressed in the form of the chart above, may help put the survey data in perspective.

A prolonged slump in ridership began after 1970 when there were 28,480,572 Bee-Line trips and reached its lowest point in 1977 with 21,018,378 trips (a decline of 26%). Ridership began rising again in 1978, rising to a high point of 30,409,014 by 1987, an increase of 45% from the lowest point in 1977. Since that time ridership has in general varied within only a narrow range between approximately 27,000,000 and 30,000,000.

An exception occurred in 2005 when there was an operators' strike in March and April. This caused a substantial dip in ridership that year to just under 25,000,000. Since then, however, growth has been robust, reaching 30,880,594 in 2007, a new ridership high mark, and one that preceded the extreme rate of price increase in gasoline experienced in 2008.

Population, as measured by the Decennial Census (and by the American Community Survey in 2006) was also fluctuating during this thirty-eight year period. Short term-changes do not appear in populations measured every ten years, of course. Thus we do not know what fluctuations may have occurred between-census periods. However, it is clear that there was a 3% decline in population from 1970 to 1980, followed by a long growth period that continued through the most recent period when data were available (2006)¹. By 2006, the American Community Survey (ACS) estimated the Westchester County population at 948,080 persons, a growth of more than 9% since 1980.

During that same sixteen year period, Bee-Line ridership came close to keeping pace with the growth rate of the population, growing by 7%.

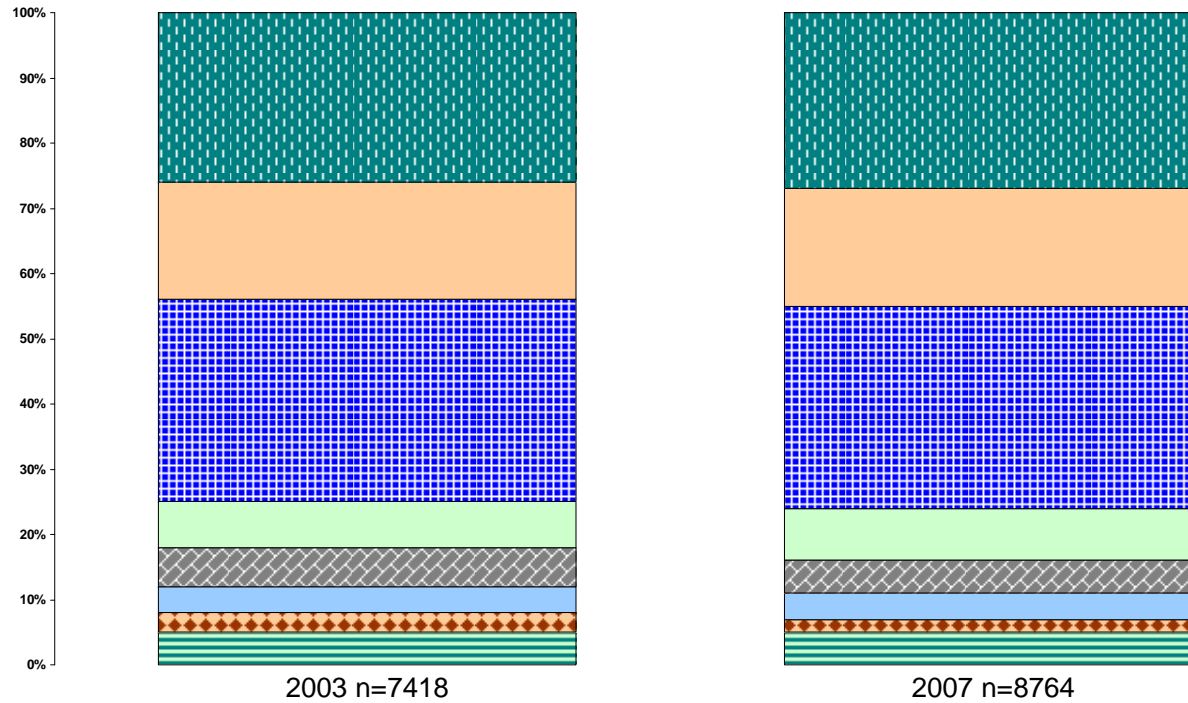
¹ Because the Decennial Census does not occur again until 2010, data from the American Community Survey was used for 2006.

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Rider Profile: How Riders Use Bee-Line

Figure 2 Weekly Frequency of Riding Bee-Line, 2003 and 2007

(Source: Question #1. In a typical week, how many days do you usually use the Bee-Line System?)



■ Seven days	26%	27%
■ Six days	18%	18%
■ Five days	31%	31%
■ Four days	7%	8%
■ Three days	6%	5%
■ Two days	4%	4%
■ One day	3%	2%
■ Not a regular rider	5%	5%

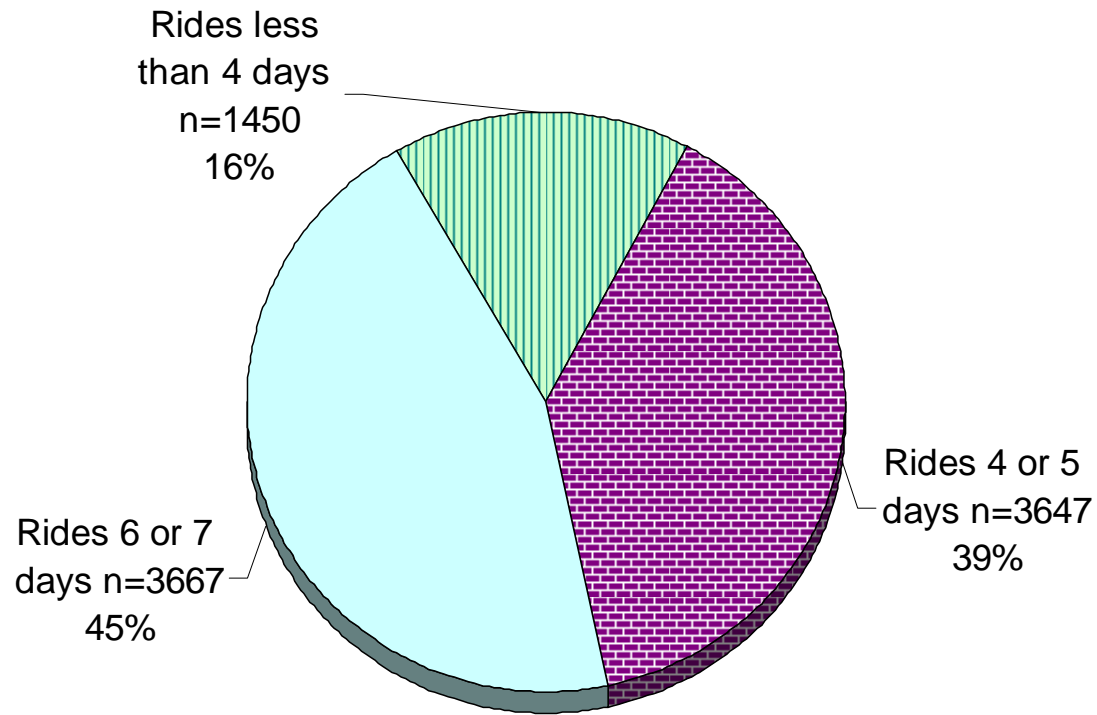
Frequency of using Bee-Line

Bee-Line is used intensively, with most riders (76%) using it five or more days each week. In 2007, only 24% said that they use Bee-Line four days a week or fewer. The frequency distribution of riders using Bee-Line has not changed significantly since 2003. For example, in 2003, 75% of riders said they use Bee-Line five or more days per week. In 2007, the total was 76%, not a statistically significant change.

It is also interesting to note that only 5% in both 2003 and 2007 indicated that they are not regular riders of Bee-Line. In other words, the vast majority of Bee-Line users riding the bus on a given day could be called “regulars.”

Figure 3 How Rider Frequency Categories Were Combined for Further Analysis in 2007

(Source: Summary of question #1. In a typical week, how many days do you usually use the Bee-Line System?)



Combined categories of ridership frequency

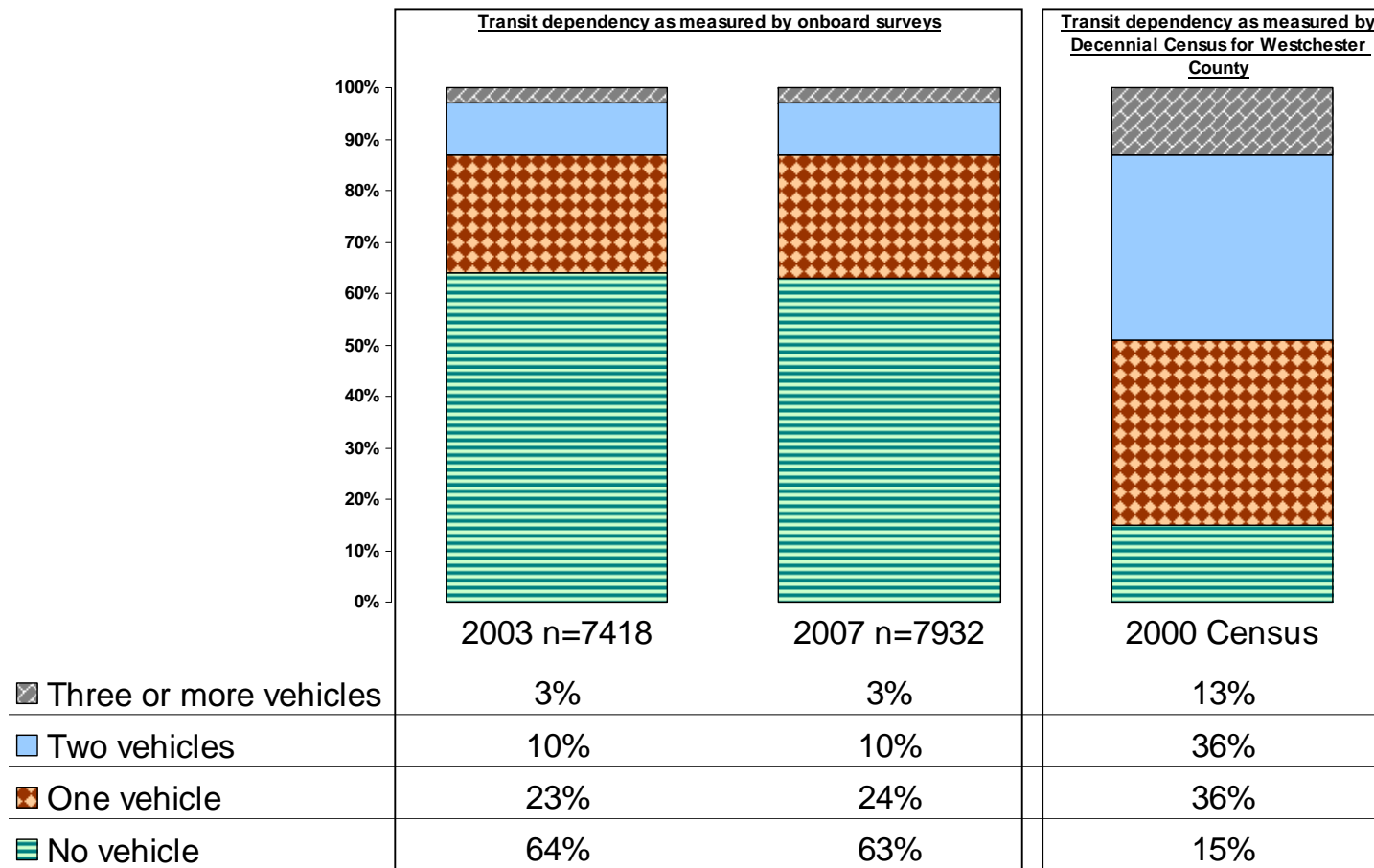
For further analysis, ridership frequency categories or “segments” (to use a marketing term) have been combined into three sets:

1. Infrequent riders, who use Bee-Line fewer than four days a week, 16%.
2. Regular riders, who use Bee-Line four or five days a week, 39%.
3. Frequent riders, who use Bee-Line six or seven days a week, 45%.

The purpose of combining categories in this manner is to simplify subsequent tables and charts.

Figure 4 Transit Dependence, 2003 and 2007 and 2000 Census

(Source: Question #28. How many cars or other motor vehicles are available for you to use?)



Transit dependence, 2003 and 2007

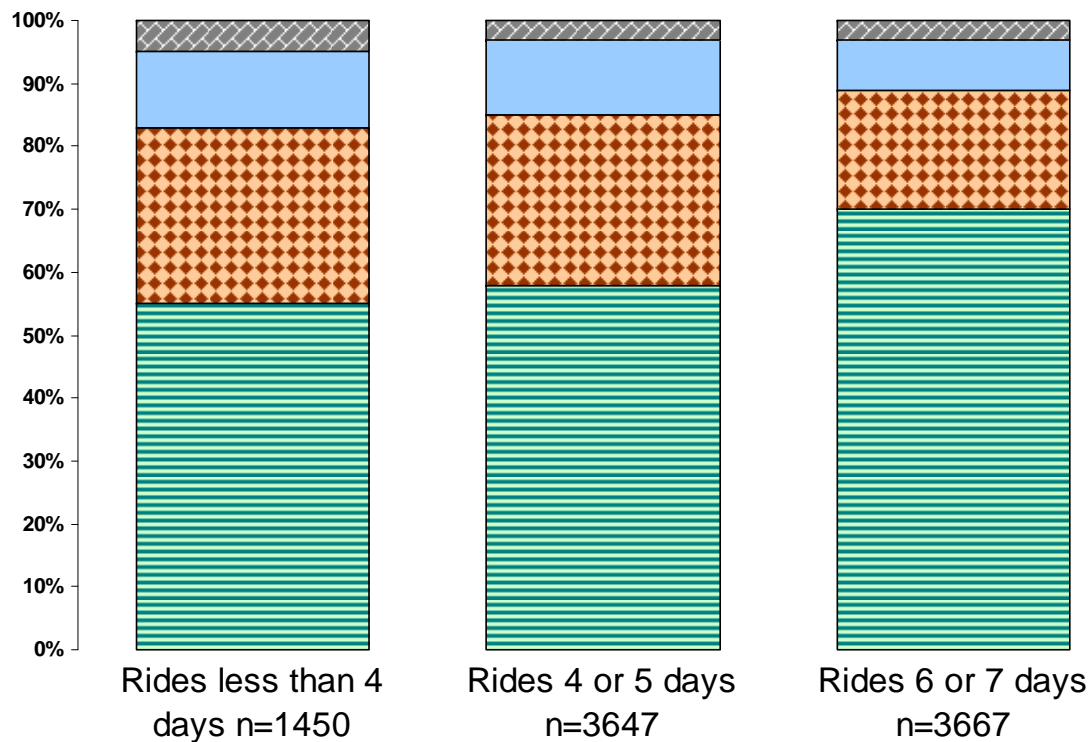
Riders can be thought of as transit-dependent if they lack a vehicle with which they could have made their trip. Conversely, a rider who has a vehicle available can be said to have “modal choice.” In 2003, 36% of Bee-Line riders had modal choice -- a vehicle was available to them -- but they chose to use transit. Among Bee-Line riders in 2007, 37% indicated they had a vehicle available, while the balance of 63% did not have a vehicle available. The minor change is not significant.

Apparently, in 2007 as in 2003, slightly more than one-third of Bee-Line riders were choosing to use Bee-Line rather than using it out of dependency. Some riders we are calling “dependent” might also have chosen not to own a vehicle, of course, in spite of having the resources to own one. For example, 12% of those with no vehicle reported household incomes of \$50,000 or more. However, experience teaches that there is a close relationship between income and vehicle ownership, and clearly dependency is primarily a matter of lack of resources, not a matter of choice.

The chart above compares not only the 2007 and 2003 surveys, but also compares them to the 2000 Census. Unlike the Bee-Line service area (which does not include all of Westchester County and does include some areas outside of Westchester County), the Census covers all of Westchester County, a fact that makes the comparison somewhat inexact. Nevertheless, the comparison is useful to provide perspective. Only 15% of the public in Westchester County in 2000 reported to the Census that they had no vehicle, but in 2007, 63% of Bee-Line riders reported that they lacked a vehicle. This tendency toward dependence on transit characterizes the ridership of most all-bus transit systems in the United States.

Figure 5 Transit Dependence in 2007, by Frequency of Using Bee-Line

(Source: question #28. How many cars or other motor vehicles are available for you to use?)



Three or more vehicles	5%	3%	3%
Two	12%	12%	8%
One	28%	27%	19%
No vehicle	55%	58%	70%

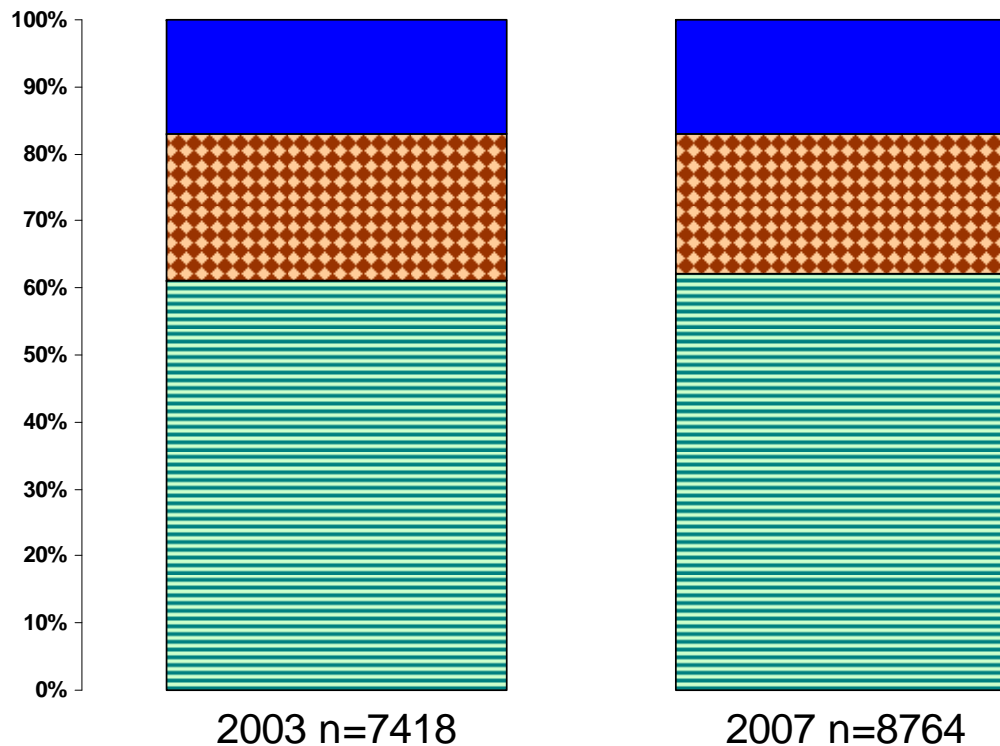
Transit dependence by rider frequency segment

As one would expect, transit dependence is related to frequency of using Bee-Line. The most intensive users of Bee-Line (i.e., the six or seven day users) were more likely (70%) than those who use Bee-Line four or five days a week (58%) to say that they have no vehicle.

Conversely, while 30% of the most intensive users have modal choice, those who ride less often are more likely to have modal choice. Forty-two percent (42%) of the regular, four or five day riders and 45% of the infrequent, less than four day riders said they choose to use Bee-Line, although they do have a vehicle available. In short, riders who use Bee-Line more intensively tend to do so because they have no choice.

Figure 6 Duration of Riding Bee-Line, 2003 and 2007

(Source: question #2. How long have you been riding the Bee-Line?)



■ Less than one year	17%	17%
■ One to three years	22%	21%
■ More than three years	61%	62%

Duration of riding Bee-Line

Among all-bus transit systems in the United States, there is a great deal of turnover among riders. This tendency is generally age-related. For many people, using transit is a life stage, i.e., part of the economic maturation process. Many people use transit as they begin careers. As earnings rise and household needs change, they buy a vehicle, cease using transit, and are lost as riders. Of course, that is not the only source of lost ridership. For example, some people are geographically rather than socially mobile, and cease using a given transit system when they move. Others change jobs and no longer can access their place of employment using transit.

For Bee-Line, there has been no significant change in the rate of turnover since 2003. In 2003, 61% said they have used Bee-Line for more than three years. In 2007, 62% said they have used Bee-Line for more than three years. Conversely, 39% in 2003 and 38% 2007 said they have used Bee-Line for three or fewer years.

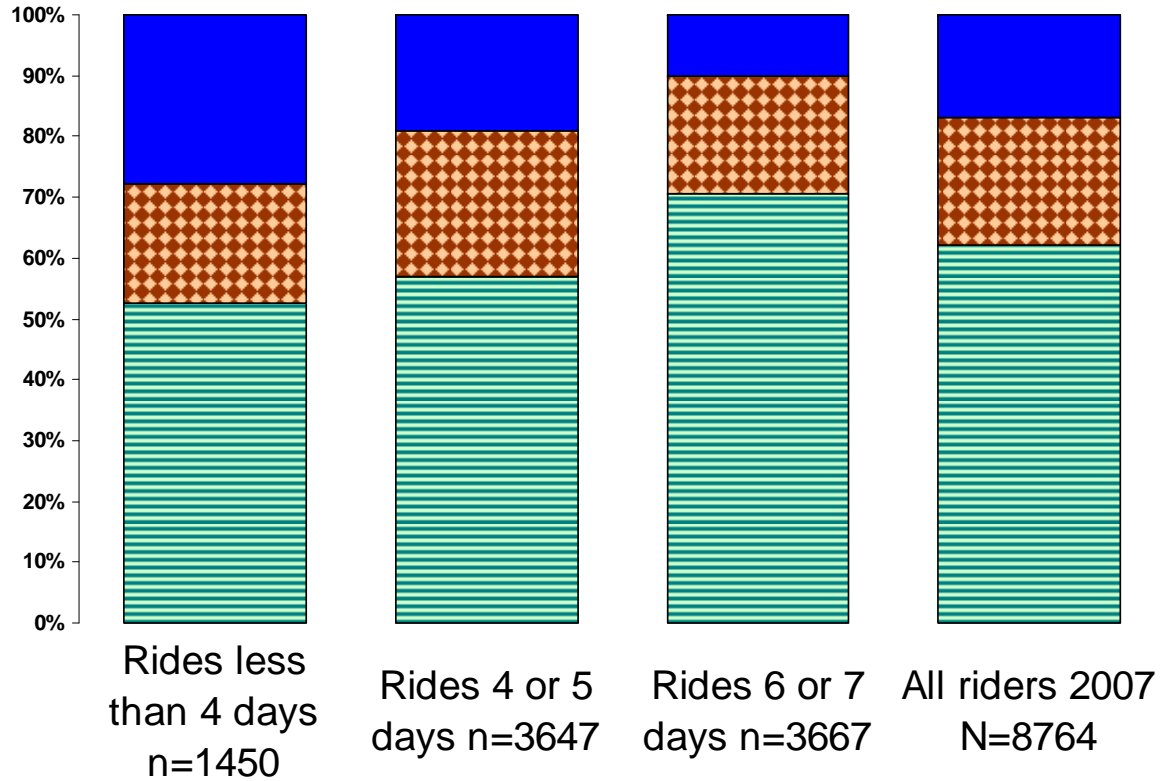
Of all Bee-Line riders in 2007, 17% have ridden for less than one year and another 21% for one to three years. Thus, a total of 38% of current Bee-Line riders are relatively new to the system. Yet the ridership has not grown by 38% in that same three-year timeframe, but only by 11.3%. Consequently, we know that more riders have left the system than have become riders. This high customer turnover is characteristic of most all-bus transit systems in the United States. The fact of high turnover suggests that rider retention should be as much of a service and marketing priority as attracting new riders for Bee-Line and other bus transit systems

For comparison, consider other systems. Among Kansas City's KCATA riders, 32% in 2005 had begun riding only in the past three years, and in 2007, 41% had begun riding in the past three years when ridership had grown by approximately 7%. The reason for the increased percent of new riders was the introduction of the popular bus rapid transit (BRT) service. But in both Bee-Line and KCATA, there is evidence of considerable turnover.

In Sacramento, where there is both rail and bus service, 31% had begun using Regional Transit in only the past three years. The Montgomery County (MD) system, Ride On, is perhaps most similar to Bee-Line in that it carries riders to and from Washington DC and its METRO system, as well as within Montgomery County itself. CJI's most recent Montgomery County study took place in 2004. At that time, 43% had begun using Ride-On in only the previous three years.

Figure 7 Duration of Using Bee-Line, by Rider Frequency, 2007

(Source: question #2. How long have you been riding the Bee-Line?)



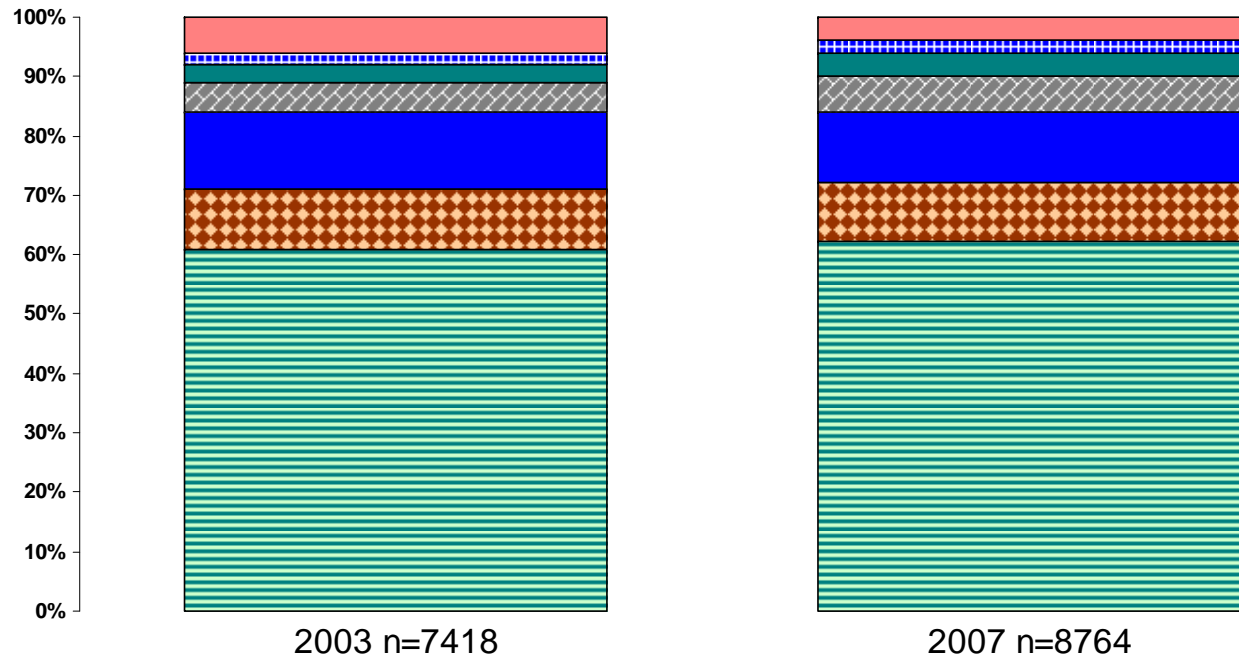
■ Less than one year	28%	19%	10%	17%
■ One to three years	20%	24%	19%	21%
■ More than three years	53%	57%	70%	62%

Duration of using Bee-Line, by rider frequency

As one might expect, duration of Bee-Line ridership is related to frequency of riding. Those who use Bee-Line six or seven days a week are more transit-dependent, and thus more likely (70%) than those who use Bee-Line four or five days a week (57%) or less frequently (53%) to be long-term (more than three year) riders.

Figure 8 Trip Purpose, 2003 and 2007

(Source: Question #3. What is the main purpose of your bus trip today?)



Other	6%	4%
Job seeking	2%	2%
Health or medical	3%	4%
Recreation	5%	6%
School	13%	12%
Shopping	10%	10%
Work	61%	63%

Trip purpose

In both 2003 and 2007, getting to and from work was the dominant trip purpose. Sixty-one percent (61%) of respondents in 2003 and 63% in 2007 indicated that work was the purpose of the trip on the day when they were surveyed. Other aspects of trip purpose have also changed very little, if at all.

It is important to note that the trip purpose is an important indicator of the economic impact of Bee-Line. Consider a “thought experiment.” We emphasize that this is *only* a thought experiment intended to stimulate discussion.

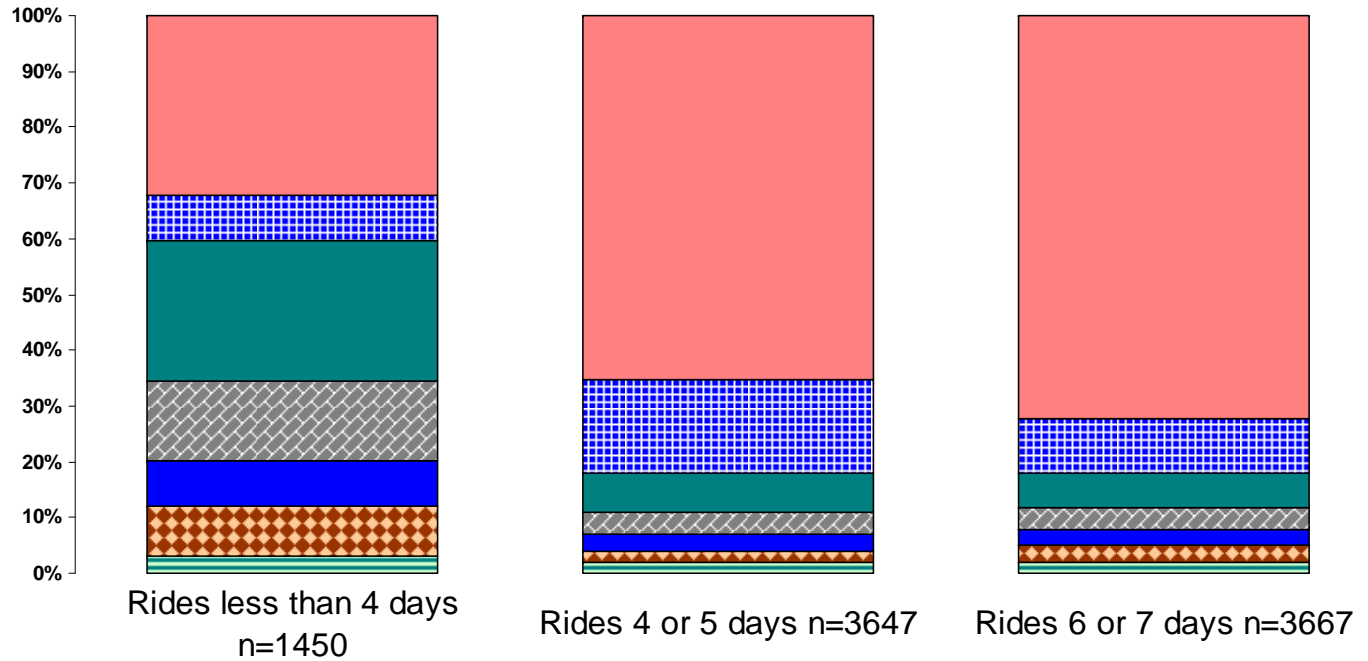
- ◆ In 2007, there were 30,543,276 annual passengers on Bee-Line or approximately 83,700 (rounded off) passengers per day in a 365 day year. (Of course, more riders ride on weekdays than on weekends, so the ridership is not equally distributed over 365 days. But that is unimportant for this thought experiment.)
- ◆ If the average rider makes 2.3 trips per day (which is characteristic of most systems but was not measured for Bee-Line), then there are roughly 36,400 individuals making trips per day, with 63%, or about 22,900, making work trips.
- ◆ If they all earn the New York minimum wage of \$7.15 (and many earn more than that, and some less) and work full time eight hours a day (some would work less than that; others would work overtime), then their collective daily earnings would be approximately \$1,310,000 per day (i.e., 22,900 x 8 x \$7.15, again, rounded off).
- ◆ If they were all employed for the full 2,000-hour work year (some would not be employed for the full year, but most probably would be) then collectively they would earn \$327,470,000 per year in wages pumped into the local economy.
- ◆ We might wish to “discount” this rough figure by attributing economic impact to only those who are transit-dependent (70% in 2007). That would reduce the total to \$229,229,000.
- ◆ With or without whatever additional “multiplier effect” factor one chooses to use as the money increases its effects as it trickles through the economy, the economic impact of those wage earners is substantial.

The point of this “thought experiment” is not to make an actual estimate, but to offer a perspective on the possible economic and revenue impacts of the Bee-Line system. It is possible to compute estimates like these more precisely with additional data², but the point being made here is simply that whatever the final number might be – and it is certainly not what is speculated in the thought exercise here, but would be in the range of many millions of dollars -- the economic impact of Bee-Line through the workers it carries goes far beyond what is usually considered in economic impact studies of transit systems.

² The additional data would include such things as actual trips per day, adjusted for weekend and weekday, actual hourly wage earned, hours worked per week, weeks worked per year, the alternatives that would be used in the absence of transit, etc.

Figure 9 Trip Purpose, by Frequency of Using Bee-Line, 2007

(Source: Question #3. What is the main purpose of your bus trip today?)



Work	32%	66%	73%
School	8%	17%	10%
Shop	25%	7%	6%
Recreation	14%	4%	4%
Other	8%	3%	3%
Health or medical	9%	2%	3%
Job seeking	3%	2%	2%

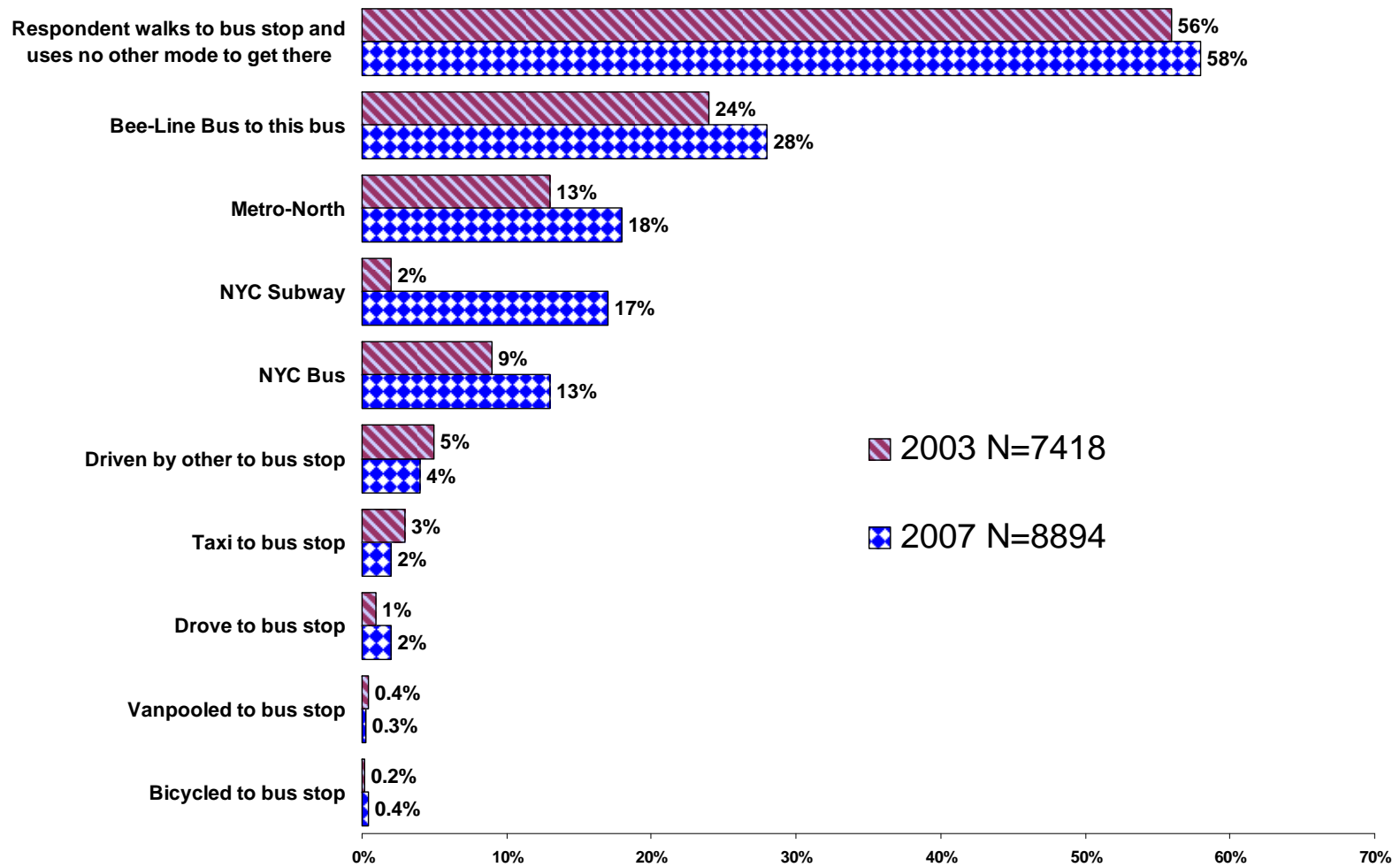
Trip purpose among rider frequency segments

As one would expect, the tendency to use Bee-Line for work trips was greater among those who ride more frequently. For example, among the least frequent riders 32% said they were making work trips, while of the most frequent riders, 73% said they were making work trips.

Conversely, the less frequent riders who use Bee-Line four or fewer days said they are more likely to use it for shopping (25%) or recreation (14%), and for health or medical reasons (9%) than are the more frequent riders. This distribution is very typical of bus ridership nationally.

Figure 10 Mode to Bee-Line Stop, 2003 and 2007

(Source: Question #4. How did you get to the Bee-Line stop where you boarded this bus?)



How riders get to their Bee-Line stops

In both 2003 and 2007, a majority of Bee-Line riders said that they had walked to the bus stop where they boarded the bus on which they were surveyed. There were small increases in the percentage of riders who transferred from one Bee-Line bus to another (+4%) or from Metro-North to a Bee-Line bus (+5%) or from a New York City bus to their Bee-Line bus (+4%)³.

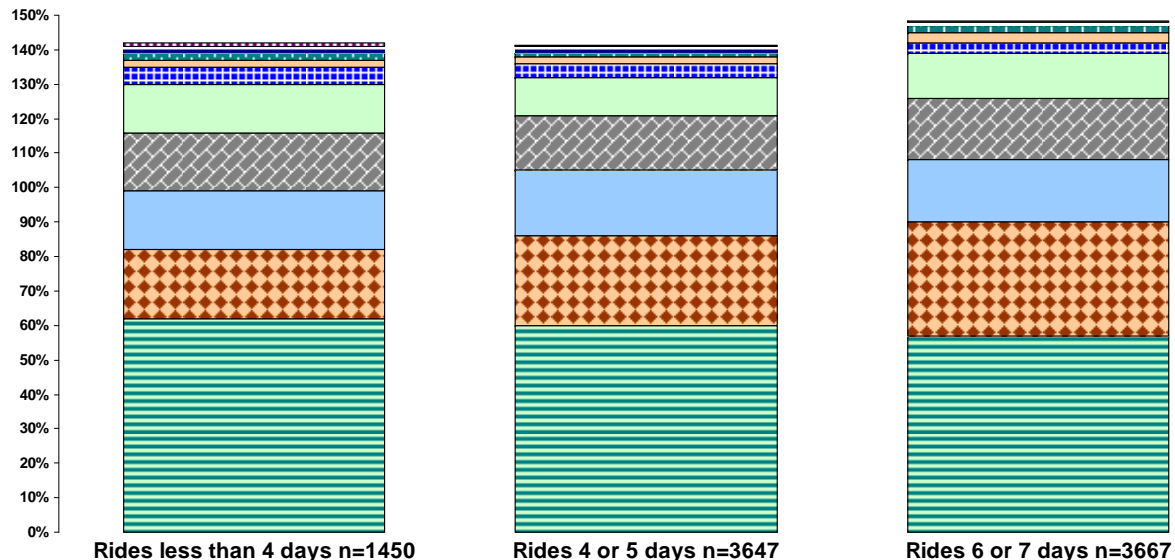
The major change, however, was in the percentage who said they had arrived at their Bee-Line bus via the New York City Subway. That percentage rose from only 2% in 2003 to 17% in 2007. The apparent reason for the change was the introduction of a new policy of accepting MetroCard as fare payment (including a free transfer) on Bee-Line as of April, 2007.

The MetroCard provides a convenient fare payment mechanism, making it more seamless to move between the Subway and Bee-Line. MetroCard helps link Bee-Line to the region, making Bee-Line a more effective part of a comprehensive regional transit system. In addition, it provides a discount. We will discuss this further in a later section dealing with fares.

³ WCDOT planning personnel point out that while most riders reported their transfer accurately, some of them indicated they transferred from Metro-North when they actually appear (based on other responses in the survey) to have transferred from the New York City Subway. The reverse situation also may have occurred. The specific system from which transfers occurred should therefore be regarded as reasonable, but approximate.

Figure 11 Mode to Bee-Line Stop, by Rider Frequency Segment, 2007

(Source: Question #4. How did you get to the Bee-Line stop where you boarded this bus?
The sums of percentages exceeds 100% because multiple modes to the stop were used by many riders.)



■ Bicycled to bus stop	.2%	.3%	.3%
■ Vanpooled to bus stop	.9%	.1%	.1%
■ Drove to bus stop	2%	2%	1%
■ Other means to bus stop	2%	1%	2%
■ Taxi to bus stop	2%	2%	3%
■ Driven by other to bus stop	5%	4%	3%
■ NYC Bus	14%	11%	13%
■ NYC Subway	17%	16%	18%
■ Metro-North	17%	19%	18%
■ Bee-Line Bus to this bus	20%	26%	33%
■ Respondent walks to stop using no other mode	62%	60%	57%

How the mode taken to get to the bus stop varies among rider frequency segments

While the differences are not great among the several rider frequency segments in terms of how they get to their Bee-Line bus stop, there are some subtle differences. For example, while 62% of those who ride less than four days a week said they walk to their Bee-Line bus, 60% of those who ride four or five days, and 57% of those who ride six or seven days also walk to the bus stops.

Conversely, more of the relatively frequent riders than the less frequent riders said they had taken a different Bee-Line bus and had transferred to get to the Bee-Line bus on which they were surveyed. While only 20% of those who ride less than four days a week transferred from Bee-Line to Bee-Line, 33% of those who ride six or seven days a week did so.

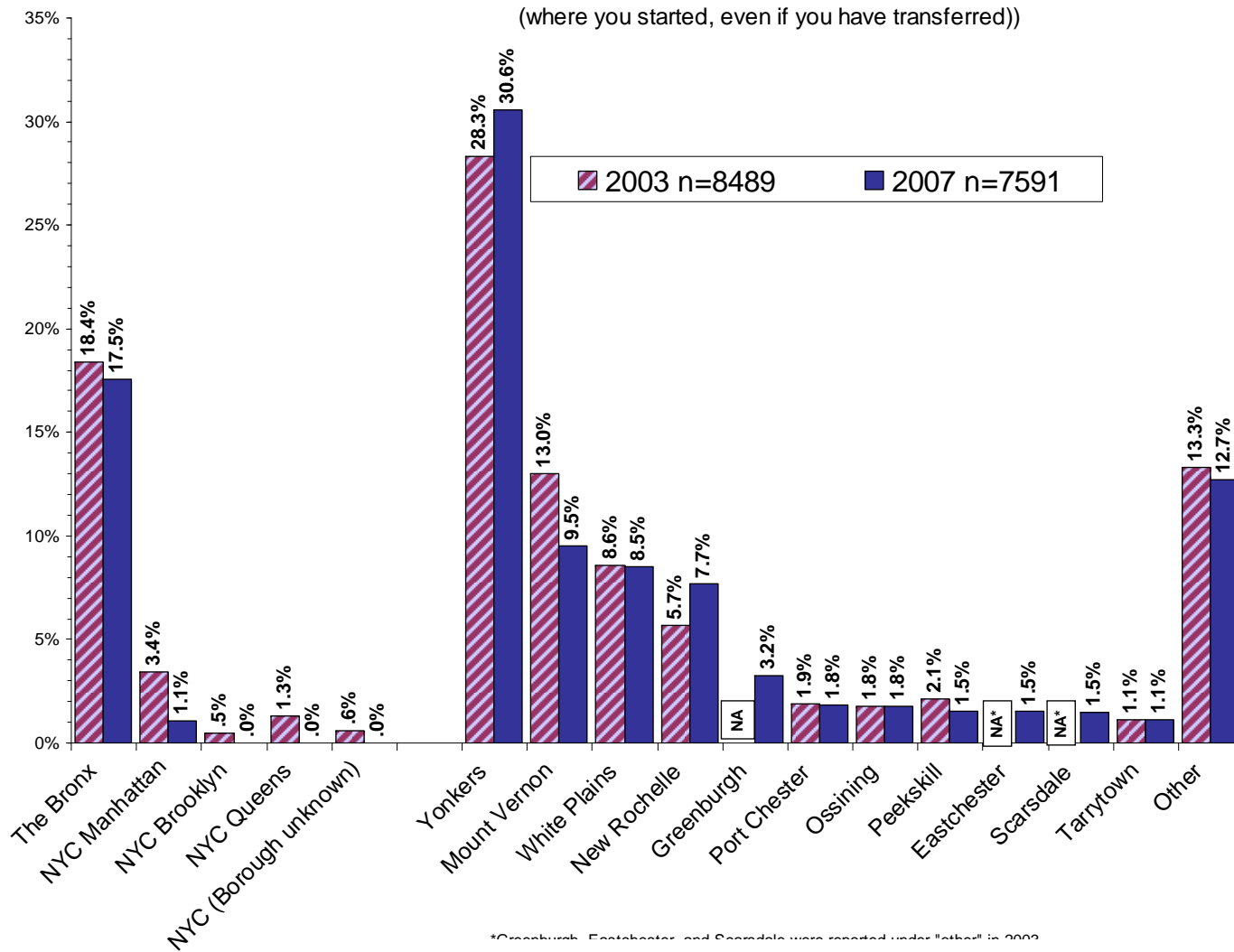
Other tendencies were very similar among the three rider frequency segments. Relatively few take what might be considered “alternative modes,” such as bicycling or van-pooling to the bus stop. Also, only 1% drove to the bus stop.

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Origins and Destinations

Figure 12 Origin of Entire Trip, 2007

(Sources: Question #32. In what city and Zip code did you begin this entire trip?
(where you started, even if you have transferred))



Origin of entire trip

In this section we provide an overview of the points of origin and destination of the entire trip⁴.

In both 2003 and 2007, The Bronx and Yonkers accounted for the majority of initial points of origin in the trips studied. There was little change between 2003 and 2007 in this respect. The Bronx totaled 18.4% in 2003 and 17.5% in 2007. Yonkers, the point of origin for more trips than any other single location, totaled 28.3% in 2003 and 30.6% in 2007.

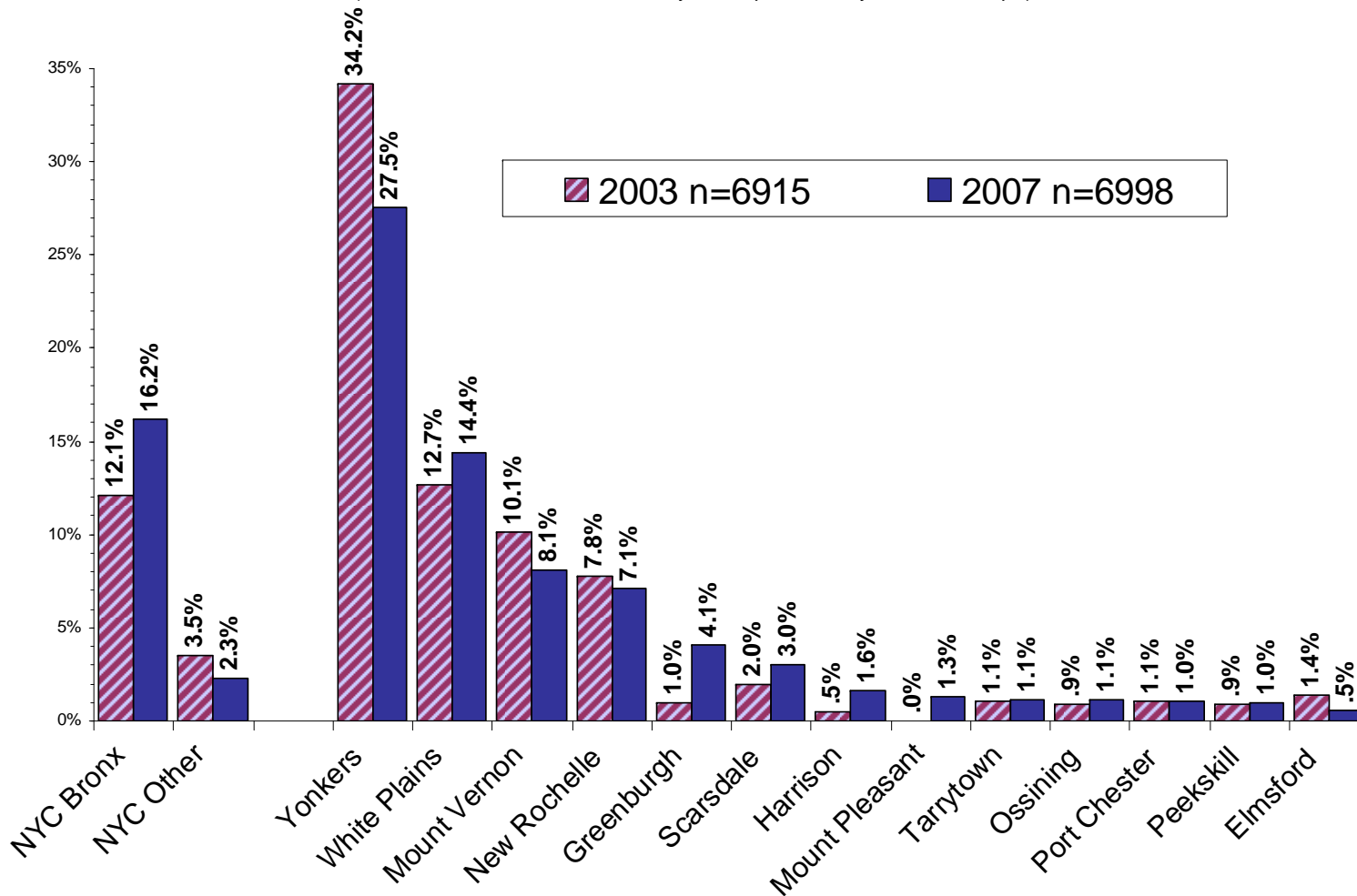
Various Westchester locations comprise an additional major group of origins. Taken together, the primary Westchester origins of Mount Vernon (9.5%), White Plains (8.5%), and New Rochelle (7.7%) accounted for more trips than The Bronx (25.7%).

Five areas, The Bronx, Yonkers, Mount Vernon, White Plains, and New Rochelle accounted for 74% of trip origins in 2003 and 73.8% of trip origins in 2007.

⁴ Appendix B (Page 148) contains detailed tables of origin and destination prepared from the survey data by staff of WCDOT.

Figure 13 Destination, 2003 and 2007

(Source: Question #36. In what city and Zip code will you end this trip?)



Destinations of the entire trip

The major differences between 2003 and 2007 in terms of destinations include an increase of 4.1% in trips with The Bronx as the destination, and a decrease of 6.7% in trips to Yonkers⁵.

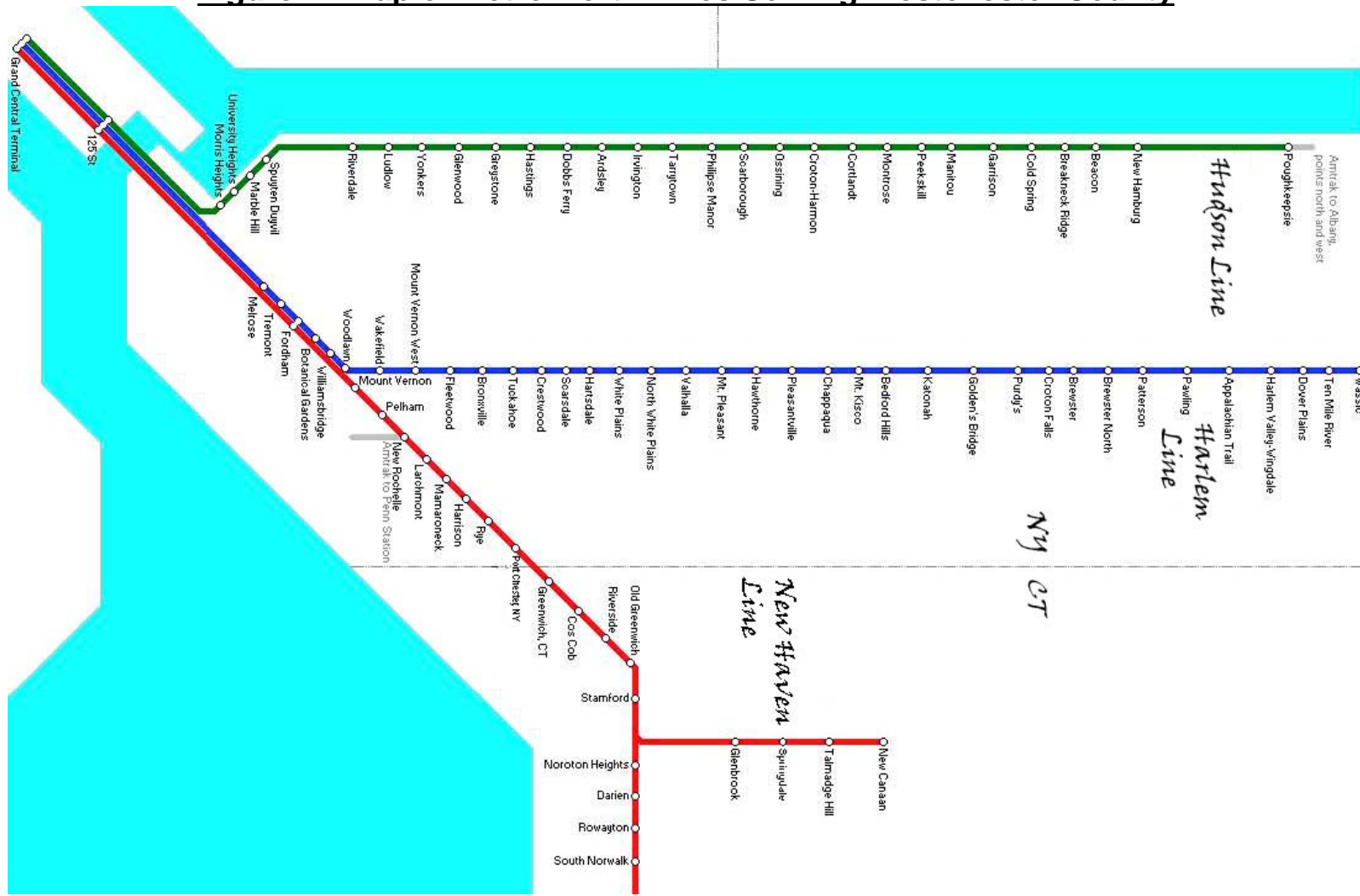
Destination cities followed essentially the same concentrated pattern as cities of origin in both 2003 and 2007. In 2003, the Bronx accounted for 12.1% of destinations and in 2007, 16.2%. Yonkers accounted for 34.2% of destinations in 2003 and 27.5% in 2007. White Plains, Mount Vernon, and New Rochelle together accounted for 30.6% of destinations in 2003, and 29.6% in 2007.

⁵ There was an apparent increase in trips to Greenburgh, but this apparent change may have been due more to a change in the way respondents' written descriptions of their destinations were coded than to a major change in the status of Greenburgh as a destination. In 2007, Greenburgh was treated as an entity unto itself, whereas in 2003 its component cities or towns were described separately.

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Using Metro-North and the New York City Subway in Conjunction with Bee-Line

Figure 14 Map of Metro-North Lines Serving Westchester County

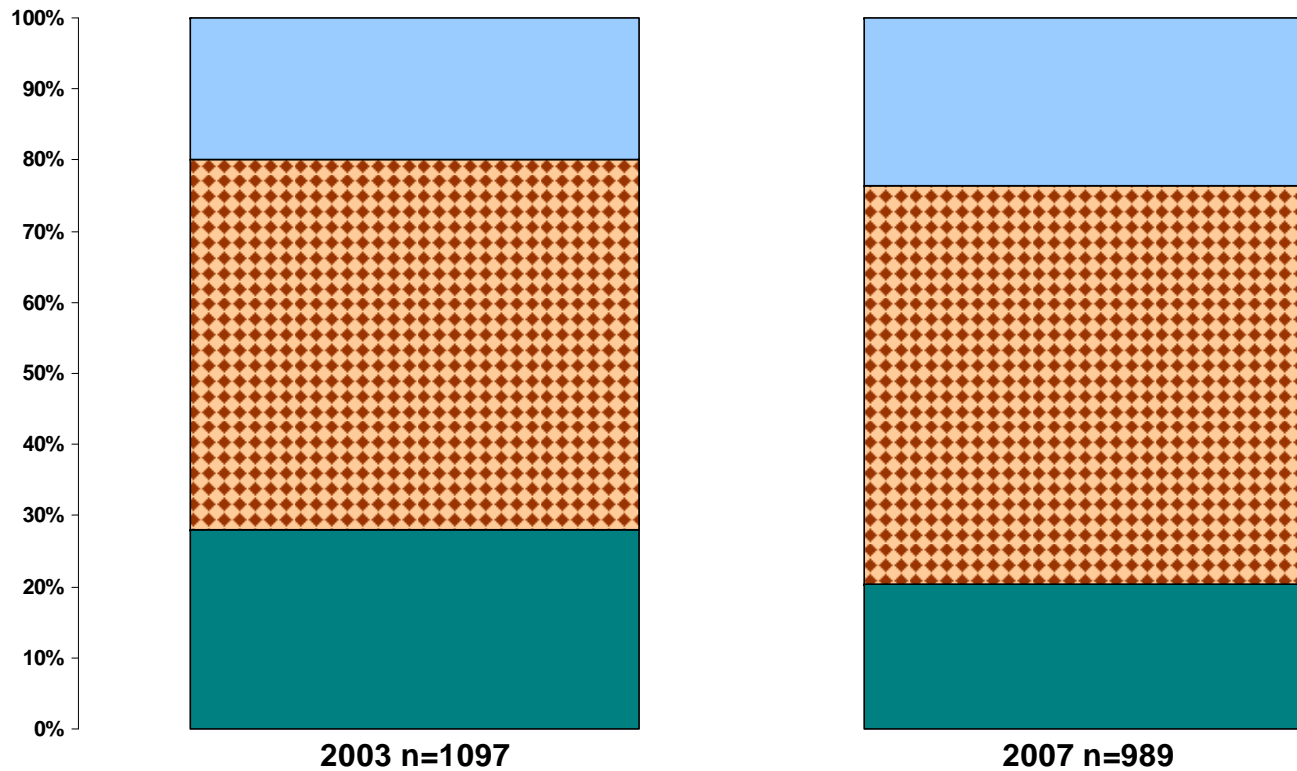




Metro-North routes

Metro-North operates three lines as shown in the map above. We have already seen in Figure 10 (page 40) that in 2003 13% of Bee-Line riders said they had taken Metro-North to their Bee-Line bus, and that in 2007 that percentage had increased somewhat to 18%. In this section of the report, we will present data, developed by Vincent Pasquale of the Westchester County Department of Transportation (WCDOT) planning staff, which describes the way Bee-Line riders connect with Metro-North.

Figure 15 Which Metro-North Line Was Used? (2003 and 2007)

(Source: Question #4. How did you get to the Bee-Line stop where you boarded this bus? If by Metro-North, which station?)



 New Haven Line	20%	24%
 Harlem Line	52%	56%
 Hudson Line	28%	20%

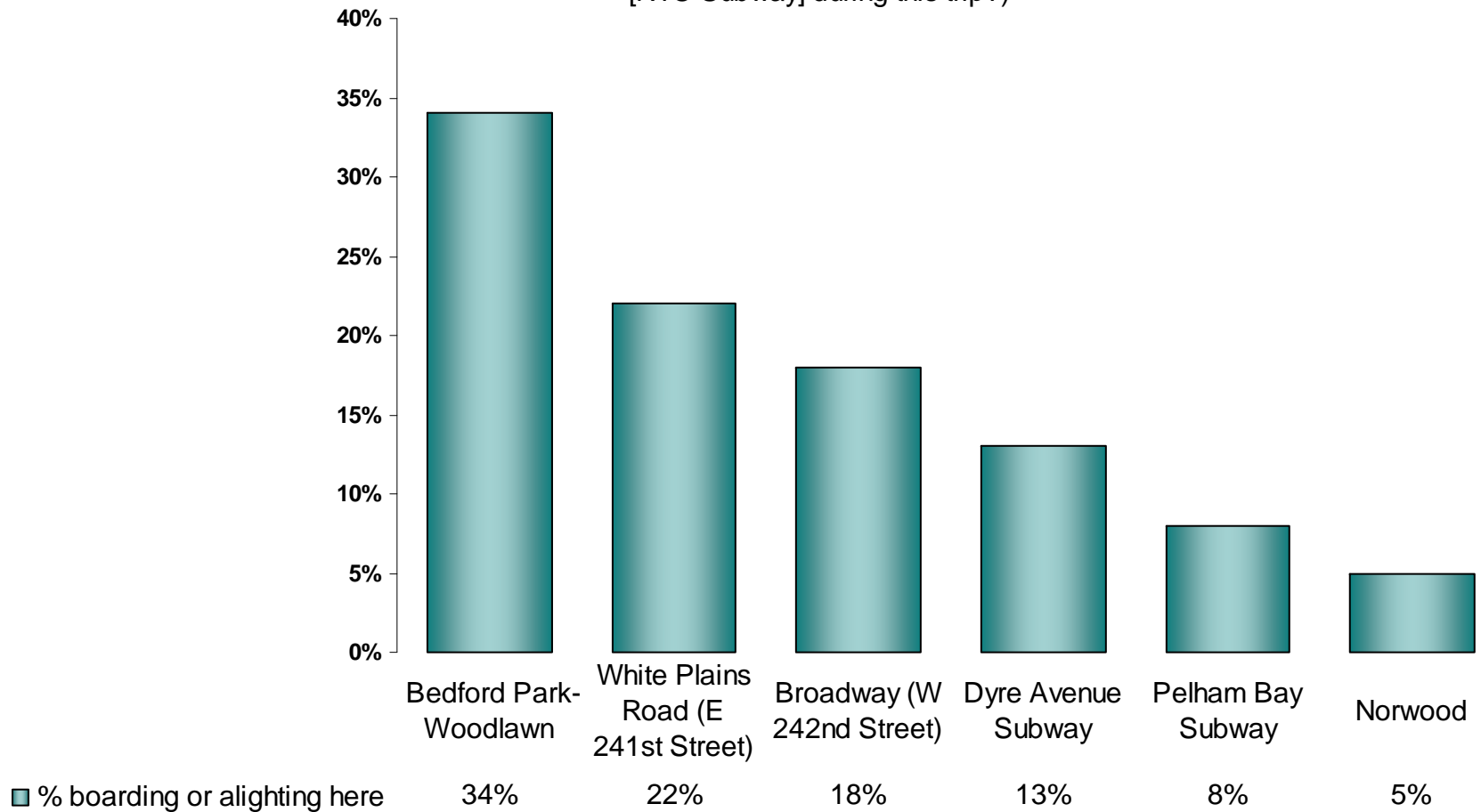
Using Metro-North

The chart above shows the distribution of Bee-Line riders who use each of the Metro-North lines. Of those who used Metro-North, most riders used the Harlem Line (52% in 2003 and 56% in 2007), while the balance were divided between the Hudson and New Haven Lines⁶. The reason for the predominance of the Harlem Line is that it captures riders from both east and west of the line, unlike the shoreline divisions. In effect it has a larger market area population.

⁶ Responses for which specific line was used could be obtained from 989 respondents in 2007. This was slightly fewer than the 1097 obtained in 2003.

Figure 16 Stations Used When Transferring Between Bee-line and the New York City Subway

(Source: Question #4.10 How did you get to your Bee-Line bus stop?
 Also Question #34.5 Did you or will you transfer to or from another service
 [NYC Subway] during this trip?)



New York City Subway stations used to transfer between Bee-Line and the Subway

The chart above is based on a sub-set of the survey data that includes only those riders who said they had transferred or would transfer between Bee-Line and the New York City Subway during their trip. The chart also includes only those riders whose responses were closely examined for reasonableness by WCDOT staff⁷.

Figure 17 New York City Subways (partial station map)



As a percent of all riders who were boarding or alighting from Bee-Line at a subway station, the Bedford-Park Woodlawn series of stations (See inset map, area circled in red) were the most heavily used, accounting for 34% of the ridership transfers between Bee-Line and the subway system. White Plains Road was next with 22%. Each other station accounts for less than 20% of the transfers.

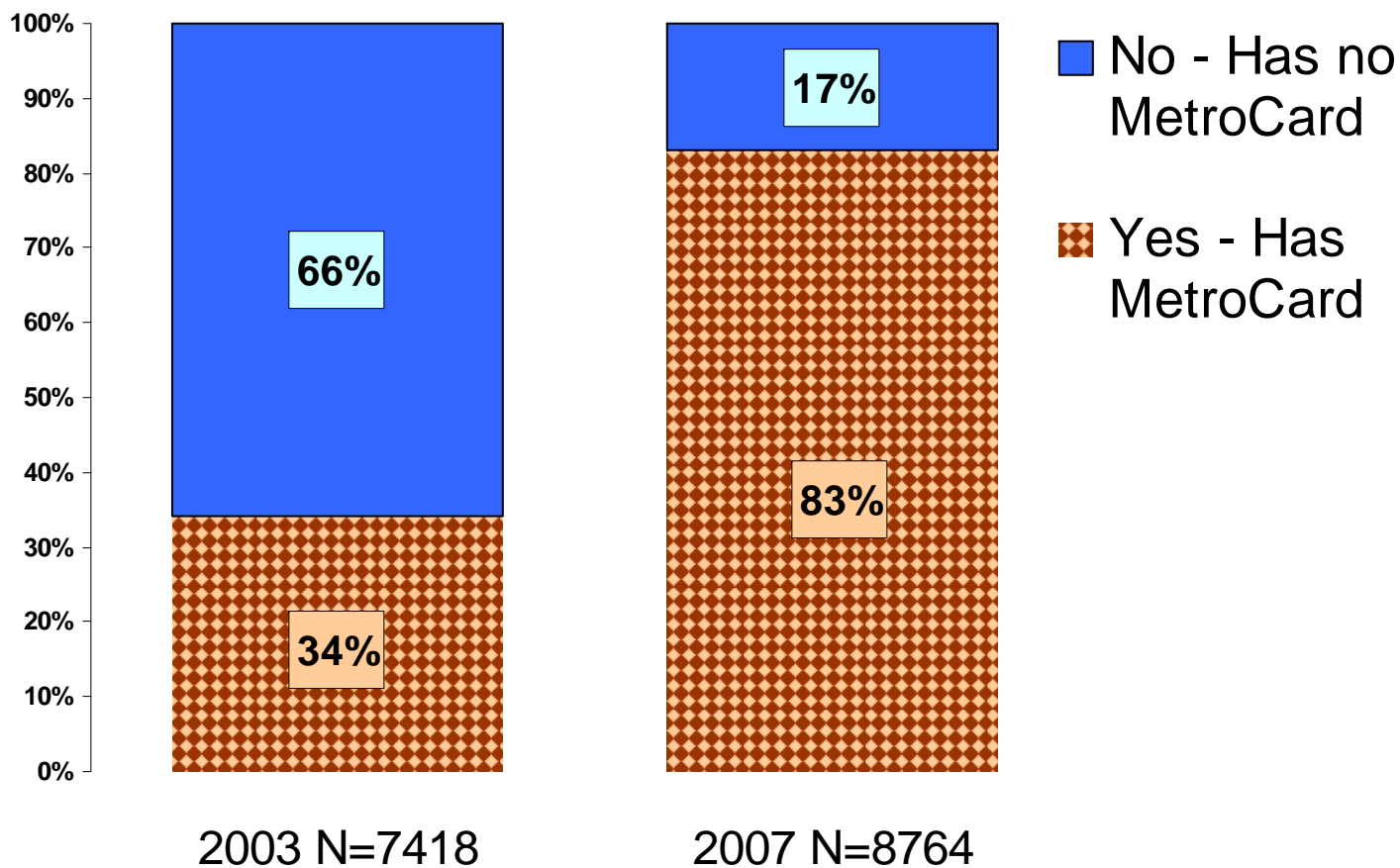
⁷ See also discussion by WCDOT staff (page 156) of ways in which some respondents mischaracterized and thus under-reported their transfers.

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Paying the Fare

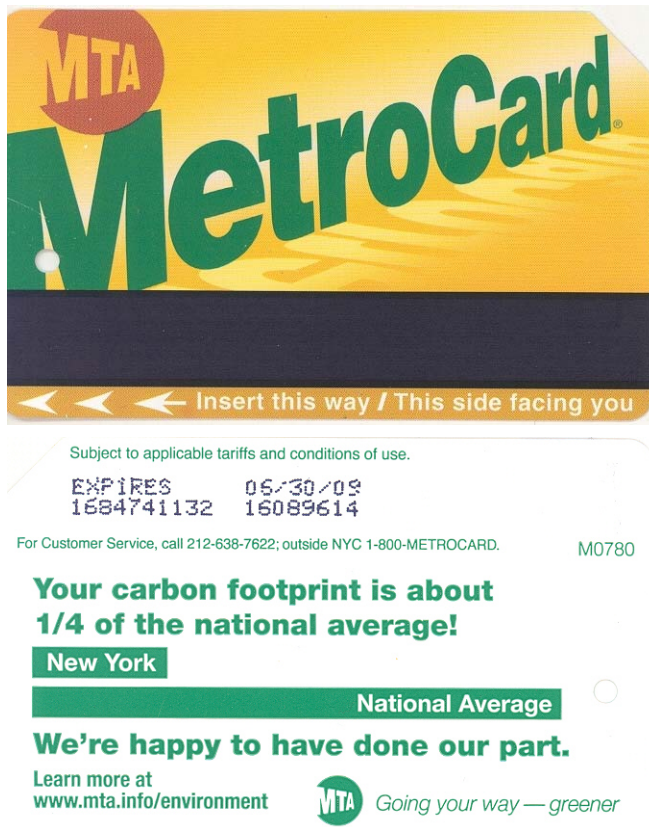
Figure 18 Possessing a MetroCard? (2003 and 2007)

(Source: Question #6. Do you have a MetroCard?)



MetroCard

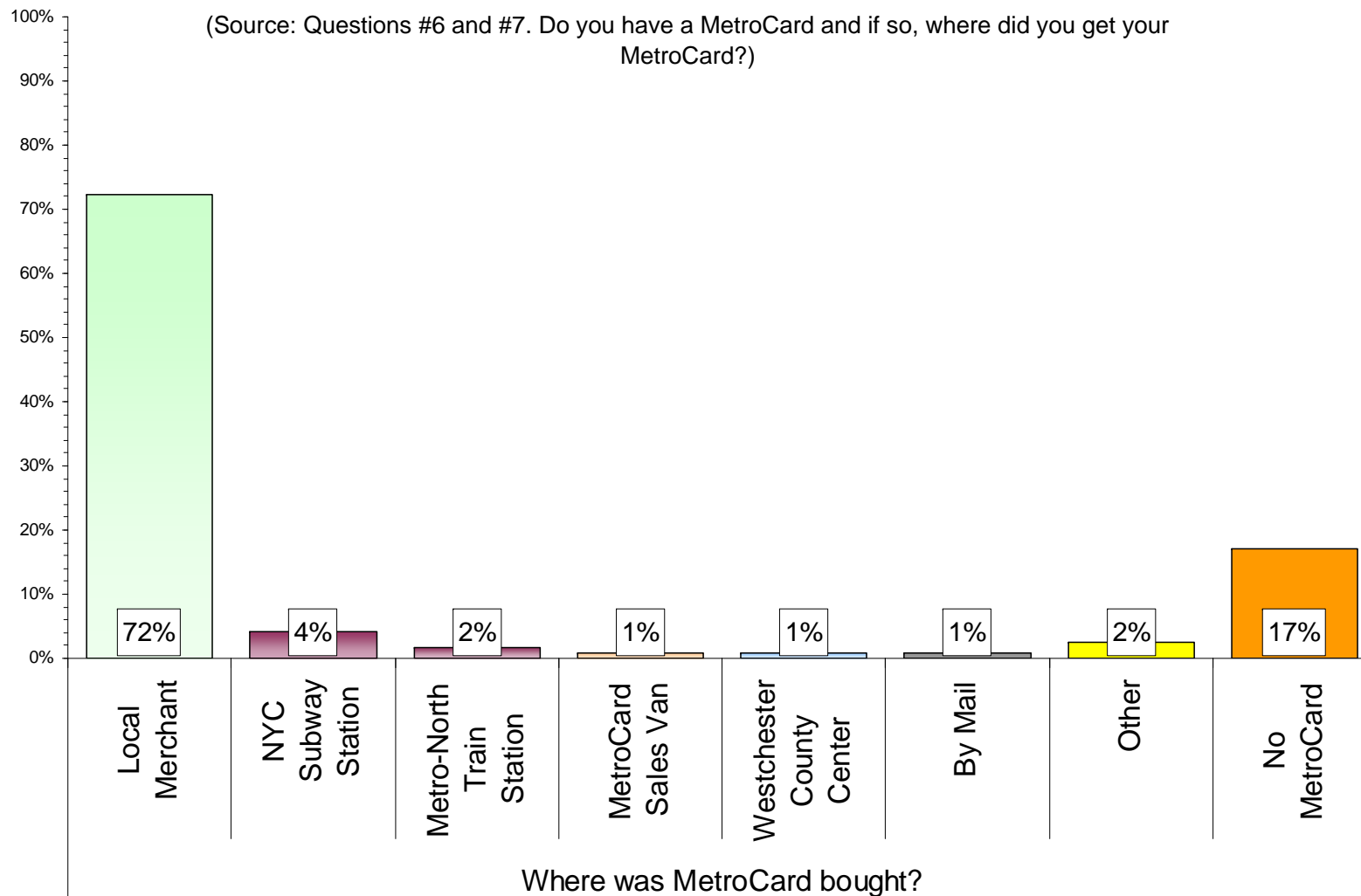
In 2003, well before Bee-Line began to accept the MetroCard in April, 2007, only 34% of Bee-Line riders owned a MetroCard. By November, 2007 when the survey was conducted and acceptance of MetroCard had been implemented by Bee-Line, that percentage had jumped to 83%.



Besides the discount inherent in the MetroCard, a major advantage to the consumer is that it makes the Bee-Line system, in effect, a part of a larger regional entity within which riders can travel with free transfers between transit systems. Thus, regional travel, while still requiring changes of vehicle, comes closer to the ideal of seamless travel among systems.

Figure 19 Where MetroCard Was Purchased, 2007

(Source: Questions #6 and #7. Do you have a MetroCard and if so, where did you get your MetroCard?)



Where MetroCard was purchased

Among all Bee-Line riders, 72% have a MetroCard that they purchased at a local merchant. Given that such a high proportion of all Bee-Line riders originate in The Bronx and Yonkers, it is likely that the bulk of the purchases have occurred in local stores in those areas. Only 4% were purchased at a New York City Subway station and smaller percentages at other stations.

Save Time and Money Buy a MetroCard

Yonkers

Ned & Nelia's Deli & Grocery
349 Saw Mill River Rd.
Neperha's Gourmet Deli
205 Nepperhan Ave.
Ojas Stationery
600 Tuckahoe Rd.
Park Hill Deli Grocery
6 Mt. Carmel Pl.
Perfect Tax Service
33 South Broadway
R. & J Food Corp /
Yonkers Food Plaza
274 S. Broadway
Raceway
Convenience Store
579 Central Park Ave.
Rasmia Discount Store /
Tom Thum
347 S. Broadway
Regina Check Cashing
40 Larkin Plaza
Regina Check Cashing
13 1/2 Palisades Ave.
Rivendale Food Center
352 Rivendale Ave.
Riverside Stationery
786 Palisades Ave.
Roma Grocery
422 Rivendale Ave.
Samaras Check Cashing
95 Rivendale Ave.
Shah Inc. /
Centuck Deli
1581 Central Park Ave.

Square Two
2 S. Broadway
Stop and Shop
111 Vredenburg Ave.
Tanglewood Stationery
2264 Central Park Ave.
Westchester Check Cashing
1 Saw Mill River Rd.
Wink Check Cashing
499-A S. Broadway
Wink Check Cashing
266-A S. Broadway
Wink Check Cashing
2235 Central Park Ave.
Yonkers Grocery
795 Yonkers Ave.

MetroCard Choices
What's best for you?
Unlimited Rides or
Pay-Per-Ride

Unlimited Rides:

- The more you ride, the less each ride costs
- All transfers included
- No refills. Get a new card every time you need more rides
- Can only be used by one person at a time
- Cannot be used again at the same bus route or same station for 15 minutes

If your Unlimited Rides MetroCard expires, you should mail it to MTA Customer Service and request a replacement card. Pre-addressed postage paid envelopes are available at station booths.

MetroCard Customer Claims
2 Broadway
Room D11.03
New York, NY 10004


Pay-Per-Ride:

- Earn free rides. Pay for 5 rides and get 6. Pay for 10, get 12
- Free bus-to-bus, bus-to-subway, or subway-to-bus transfer within 2 hours of paying fare (some exceptions apply)
- Refill as often as you like until card expires (cards usually expire in one year from the date of purchase).
- Can be used to pay for up to 4 people at a time

If your Pay-Per-Ride MetroCard expires, you have one year from the expiration date to transfer any remaining money to a new card. Bring your expired card to any subway station and ask the agent to make the transfer.

For more information on MetroCard, call the Bee-Line hotline at (914) 813-7777 or go to www.westchestergov.com.

MetroCard Merchants
As of August 2007



Sold Here

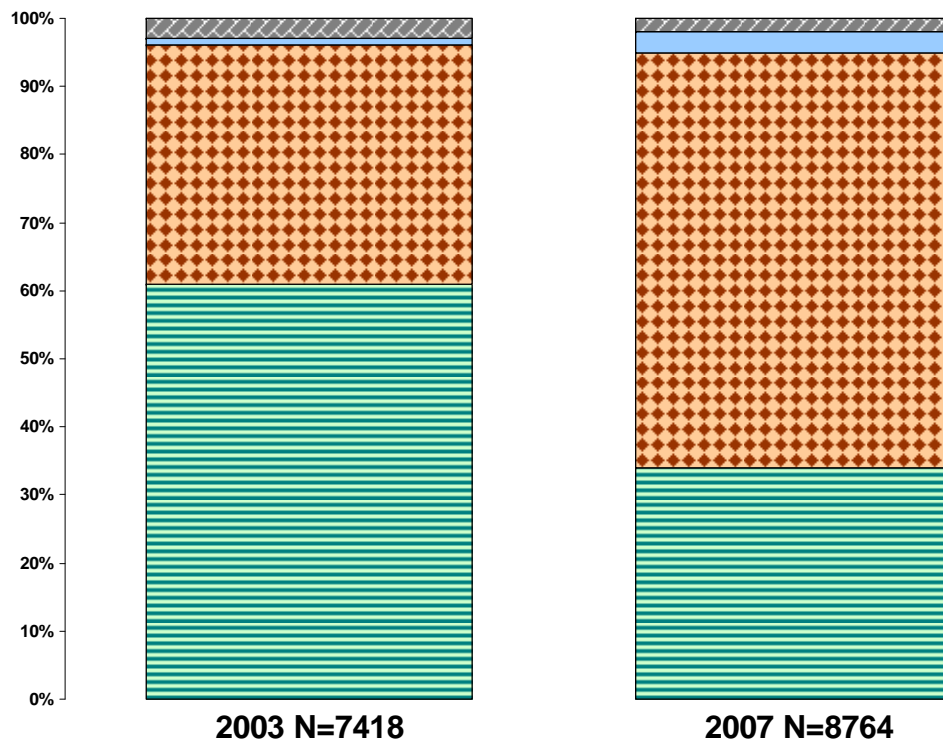
Ask your neighborhood store owners about MetroCard.

Westchester gov.com
Andrew J. Spano, Westchester County Executive
Christine Rivera, Regional Administrator
Lorraine C. Selley, County Commissioner

Given the fact that MetroCard is so often used in conjunction with the NYC Subway, it might have been expected that more of the cards would have been purchased at subway stations. However, for Bee-Line riders, as distinct from NYC Subway riders, purchasing MetroCards from local merchants is common. Merchants may find it useful to sell the MetroCards as a means of bringing potential customer traffic into their shops.

Figure 20 How Bee-Line Fare Was Paid, 2003 and 2007

(Source: Question #5 How did you pay your bus fare today?)



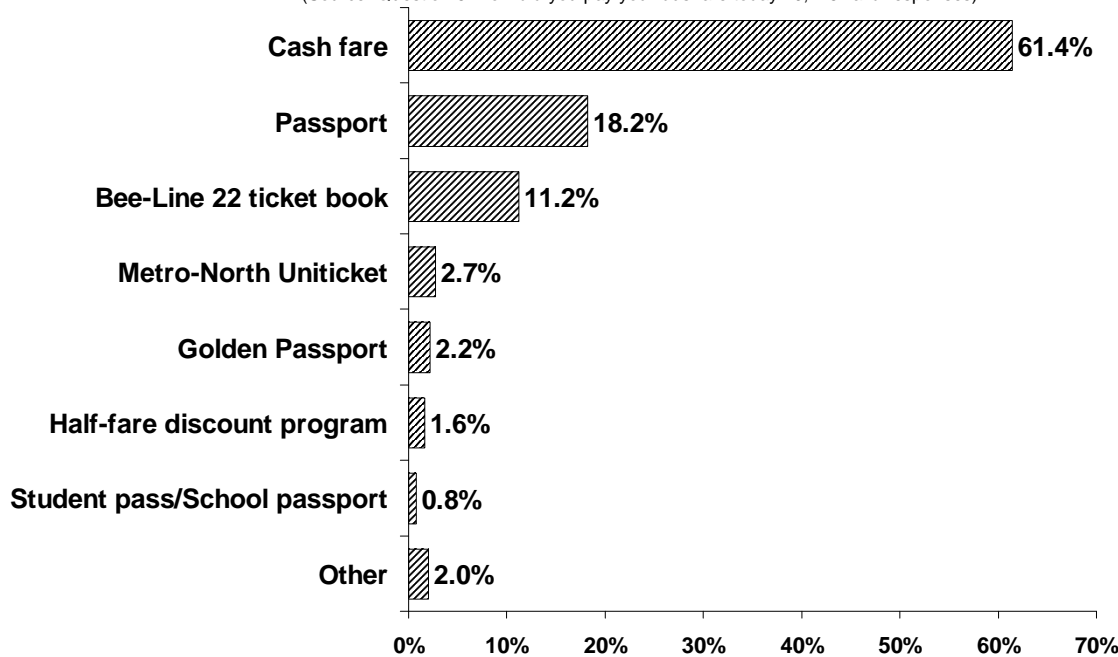
☒ Metro-North Uniticket	3%	2%
☒ Student Card	1%	3%
☒ 2007-MetroCard / 2003-all passes	35%	61%
☒ Cash fare	61%	34%

How the Bee-Line fare was paid

A major shift occurred in fare payment between 2003 and 2007. In 2003, 61% paid their fare with cash, but in 2007, only 34% paid with cash. Conversely in 2003, 35% paid with a pass medium of some type, but in 2007, 61% used a MetroCard. From the customer's point of view, the advent of MetroCard greatly simplified the previously complex pass structure (shown in the figure below), and facilitated regional travel by using a single pass.

Figure 21 How Fares Were Paid In 2003

(Source: Question 6. How did you pay your bus fare today? 9,225 valid responses)



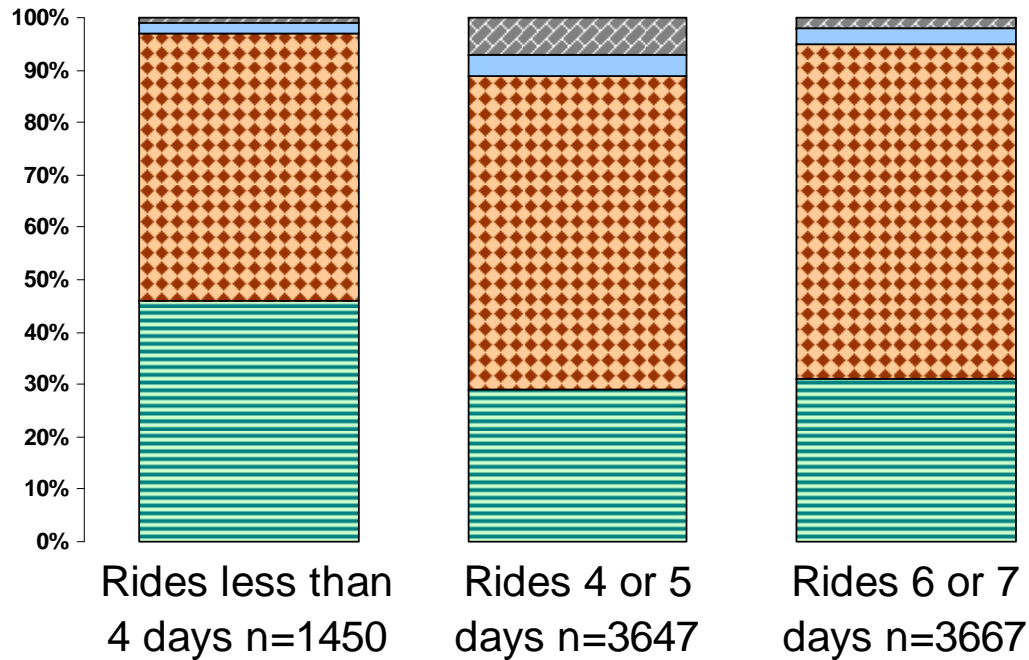
Although 83% of Bee-Line riders have a MetroCard, fewer than that (61%) said that on the day of the survey they had paid their fare with a MetroCard. This raises the question of why a rider might not have used the MetroCard.

At the time of the survey, the Bee-Line fare was \$1.75 plus a 25¢ transfer payable only if the rider were transferring. However, if a rider used the MetroCard, a flat fare \$2.00 was deducted from the stored value on the card, regardless of the rider's intention to transfer. Thus, for a rider who was not transferring, paying a cash fare cost \$1.75 while using a MetroCard cost \$2.00 for the same trip.

In March, 2008, the flat cash fare of Bee-Line was raised to \$2.00 and includes a free transfer. As a result, the fare differential no longer exists, and the differential between possession and use of a MetroCard should diminish or disappear.

Figure 22 How Bee-Line Fare Was Paid, by Rider Frequency Segments, 2007

(Source: Question #5. How did you pay your bus fare today?)



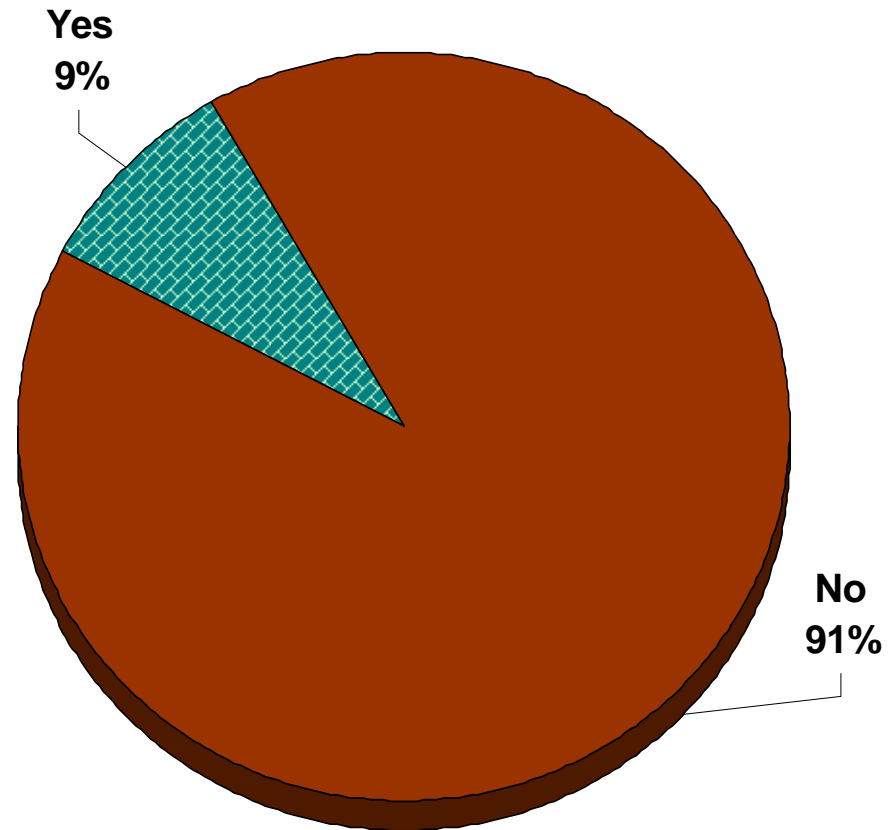
▣ Metro-North Uniticket	1%	7%	2%
▣ Student Card	2%	4%	3%
▣ MetroCard	51%	60%	64%
▣ Cash fare	46%	29%	31%

How fare payment differs among rider frequency segments

Not surprisingly, more of the infrequent riders (46%) who use Bee-Line less than four days a week than those who ride for four or five days (29%) or those who ride six or seven days (31%) used cash to pay their fare on the day they were surveyed. For the infrequent rider, purchase of a MetroCard, especially a card with unlimited rides available during a finite time would not be a wise purchase.

Figure 23 Using a Discounted Pass for This Trip, 2007

(Source: Question #9. Did you use a Senior Citizen or Disabled Passenger discount for this trip?
Valid responses = 8764)



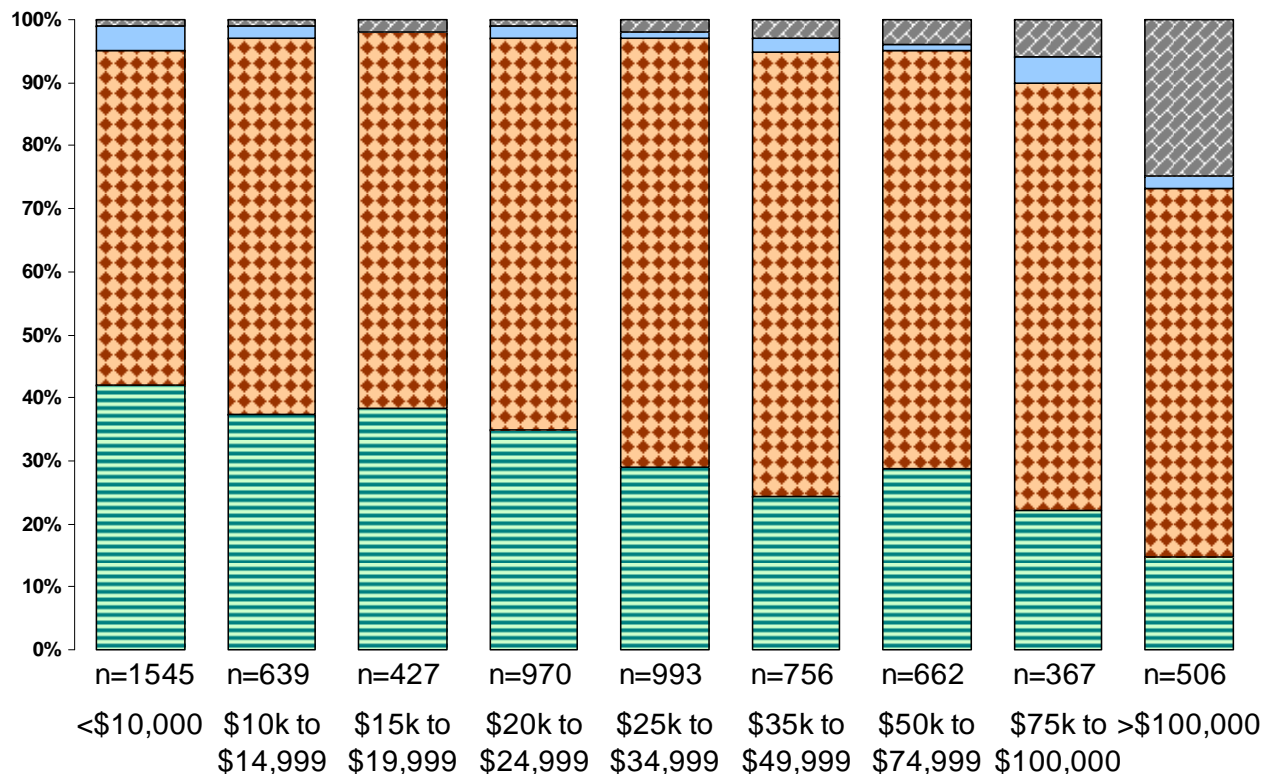
The use of discount fares

In 2007, 9% of the riders said they had used a senior citizen or disabled passenger discount for their trips. The question related to use of discount fares was asked in a different manner in the 2003 survey. In the 2003 survey, the use of the discounted fare was determined only by the question, "How did you pay your bus fare today?" In 2007, respondents were explicitly asked, "Did you use a senior citizen or a disabled passenger discount for this trip?"

Because of the differences in questioning approach, the results drawn from the two surveys are not strictly comparable. However, we should note (see the inset [Figure 21](#), page 65) that in 2003 only 1.6% said they had used a discounted pass available to seniors and disabled persons. It is likely that at least some of the apparently substantial increase in the use of the discount resulted from the concerted effort by the Bee-Line system to promote the use of the discount.

Figure 24 Differences in Types of Fare Media Used by Income Groups, 2007

(Source: Question #5. How did you pay your bus fare today?
And Question #31. What is your total annual household income?)

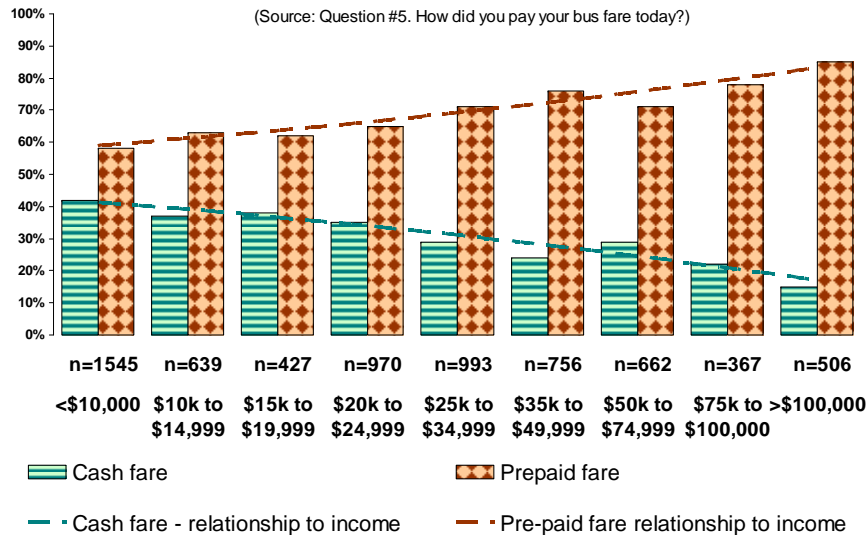


■ Metro-North Uniticket	1%	1%	2%	1%	2%	3%	4%	6%	25%
■ Student Card	4%	2%	0%	2%	1%	2%	1%	4%	2%
■ MetroCard	53%	59%	59%	62%	68%	70%	67%	68%	59%
■ Cash fare	42%	37%	38%	35%	29%	24%	29%	22%	15%

Relationship between household income and using MetroCard

Among Bee-Line riders, as with riders in other transit systems in the United States, the lower a person's household income, the more likely he or she is to pay bus fare using cash rather than a pass medium. As the figures above and below in the inset chart show, there is a direct and inverse relationship between household income level and the likelihood that one used cash to pay the bus fare⁸. Conversely, of course, the reverse is true for the use of discounted passes such as the MetroCard.

Figure 25 Relationship of Income to Fare Media Used, 2007

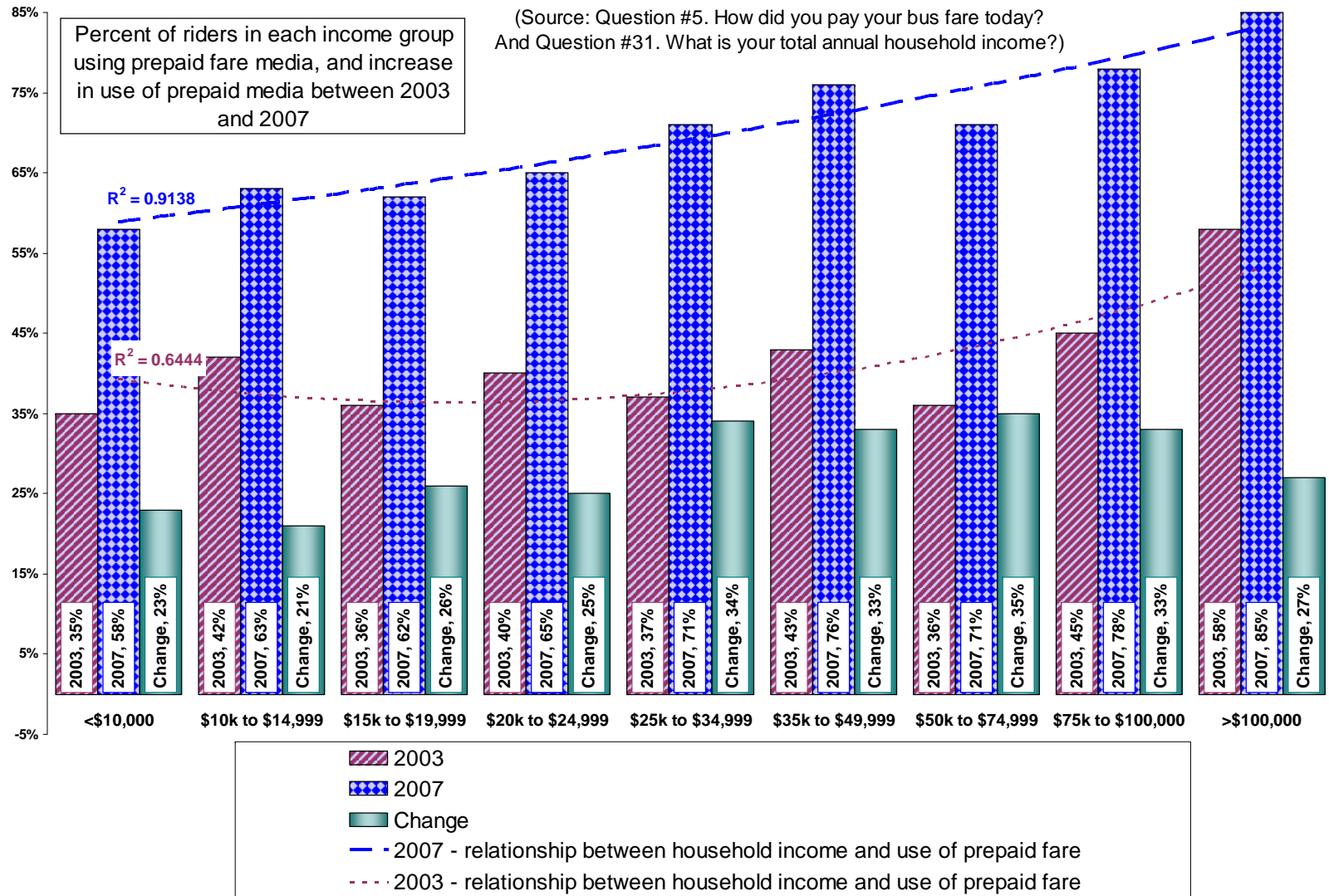


This relationship occurs for a number of reasons. The primary reason, as shown by focus groups conducted in other transit systems, is that at low-income levels, purchasing a pre-paid pass requires considerable cash from people whose budgets are marginal. Also, such a purchase might place that money at considerable risk because jobs at low income levels are often short-term and might be subject to lay-off.

The inset chart shows the relationship interpreted statistically. It shows graphically what we have already described above: The use of cash decreases and the use of prepaid fares increases as household income increases.

⁸ Most of the pass-use discussed here involves the MetroCard. However, notice one exception: 25% of the highest income riders use a Metro-North Uniticket. These riders tend to be commuters to and from New York city who have substantial incomes.

Figure 26 Change from 2003 and 2007 in Relationship of Income to Fare Media Used



Changing relationship between income and the use of prepaid fares

The relationship between household income and the use of prepaid fare media on Bee-Line has changed substantially since 2003. The use of prepaid fares has increased dramatically as previous charts have already shown and as the green bar labeled “Change” shows again in the chart above. The chart displays the degree to which the use of prepaid fare media has increased since 2003.

At a glance, we can see that all income groups, including even the lowest income levels, have increased 21% or more in their use of prepaid passes. That the increase is no less than 21% even among the low-income riders is a significant social service accomplishment for Bee-Line because lower income transit riders throughout the United States often do not take advantage of discounted passes. The reason is that such passes require a prior cash commitment that low-income households are often unable to make or unwilling to risk. Yet even for those riders with household incomes of \$10,000 or less, 23% more used prepaid fare media in 2007 than in 2003. Similar changes of up to 25% occurred among those with incomes up to \$25,000 a year. These kinds of increases are both socially beneficial and very difficult for a transit system to achieve.

Somewhat larger increases have occurred in middle-to-upper income groups ranging from \$25,000 a year to \$100,000 a year in household income. The use of prepaid fare media among those income groups has increased by between 33% and 35%. That their increases would be somewhat greater is not surprising, given that they have more cash to make the advance purchase.

There has thus been a dual effect of the introduction of the MetroCard to Bee-Line. The use of prepaid, discounted fares among low-income riders has increased while at the same time the tendency for more of the middle and higher-income riders to take advantage of the discounts has grown even more. Thus, in spite of the gains in lower income pass-use between 2003 and 2007, the relationship between use of prepaid passes and household income has become stronger. In other words, it was true in 2003 that the higher the income, the more likely one was to use a pre-paid pass. That relationship is stronger now in spite of the gains among low-income riders.

This strengthening of the relationship is shown by the trend lines (polynomial regression lines) in the chart. The red dotted line in the chart shows the relationship in 2003 between income and the use of prepaid passes. Notice that the use of passes in 2003 varied up and down throughout the income range until reaching the middle levels of income. Thus, the

line representing the relationship is curved first downward then upward. The relationship was positive, but not very strong. In 2007, on the other hand, the relationship between income and the use of the MetroCard is almost linear, rising directly throughout the range of income with only minor fluctuations.

Thus, the 2007 results show an even stronger relationship between income and the use of prepaid fare media than the 2003 survey showed. In 2003, in this statistical sense, income “explained,” or “accounted for,” about 64% of the variance in the use of prepaid fare media. In 2007, it accounted for 91%⁹.

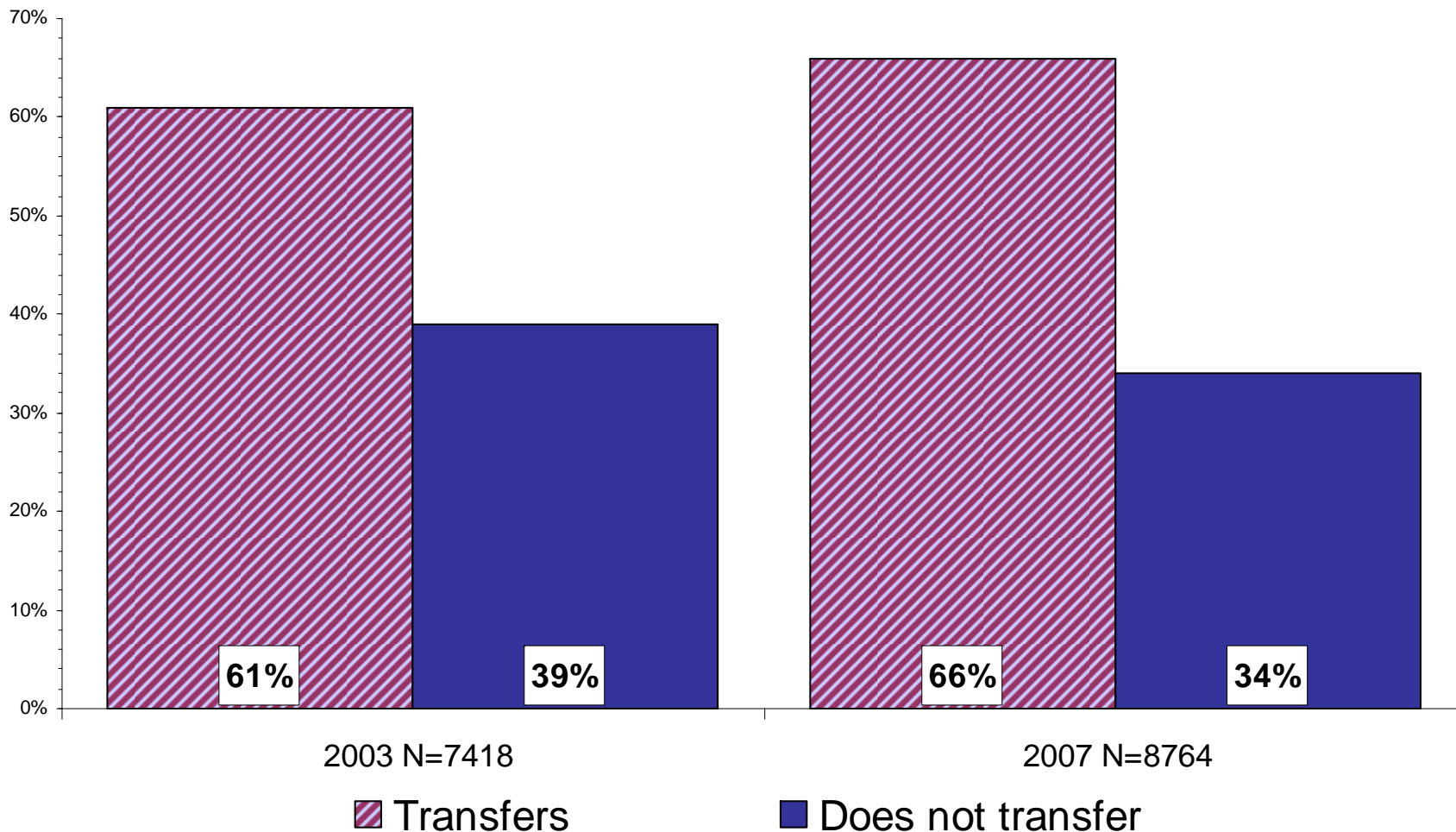
In summary, Bee-Line accomplished a significant social service by making the use of pre-paid passes both accessible and worthwhile to lower income households. At the same time, those riders with greater financial resources also benefited, and even to a greater degree. This too, may represent a significant social gain, however. In a time of rising energy costs and a societal need to save energy and reduce traffic, the latter trend may serve to attract new riders, thus possibly opening the door to making progress on the objective of SOV commute trip reduction.

⁹ This statistic is based on the “R²” which is the square of the Pearson Product Moment coefficient of correlation between the two variables and provides an estimate of the degree to which one variable (in this case, household income) statistically accounts for differences in the other variable (in this case, use of prepaid fare media).

Transferring

Figure 27 Transfer rates, 2003 and 2007

(Sources: Question #34. Did you or will you transfer to or from another service during this trip?*)

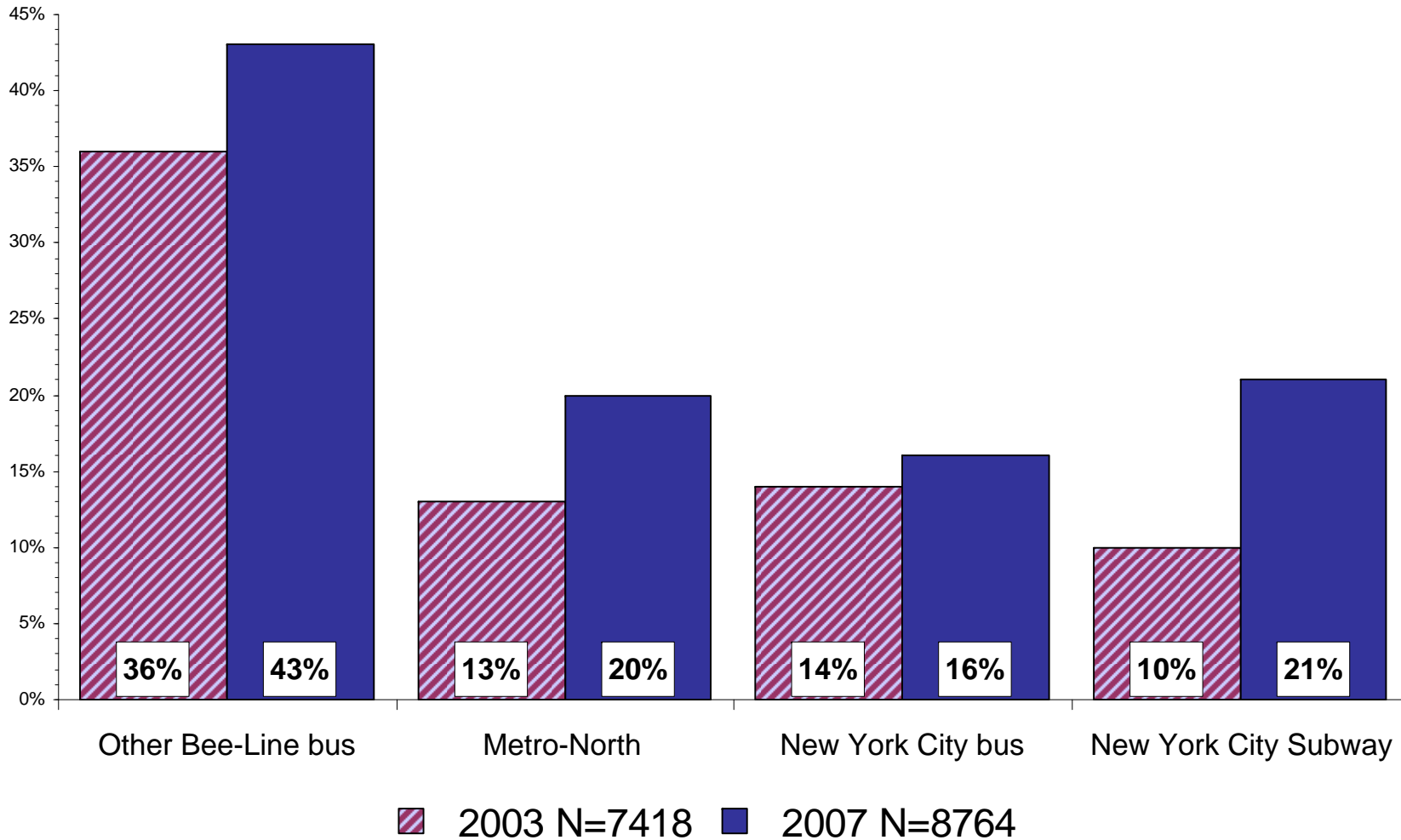


Transfer rates

In both 2003 and 2007, most Bee-Line riders transferred at some point in their trips. In 2003, 61% transferred, while in 2007 the transfer rate had risen to 66%. We cannot be sure why the rate of transferring increased, but the advent of MetroCard in April, 2007 and the related tendency to connect with Bee-Line from the New York City Subways certainly influenced the increase.

Figure 28 Which Systems Were Involved in the Transfers? (2003 and 2007)

(Sources: Question #34. Did you or will you transfer to or from another service during this trip?*)



* The sum of percentages exceeds 100% because some riders transfer more than once.

Transferring among systems

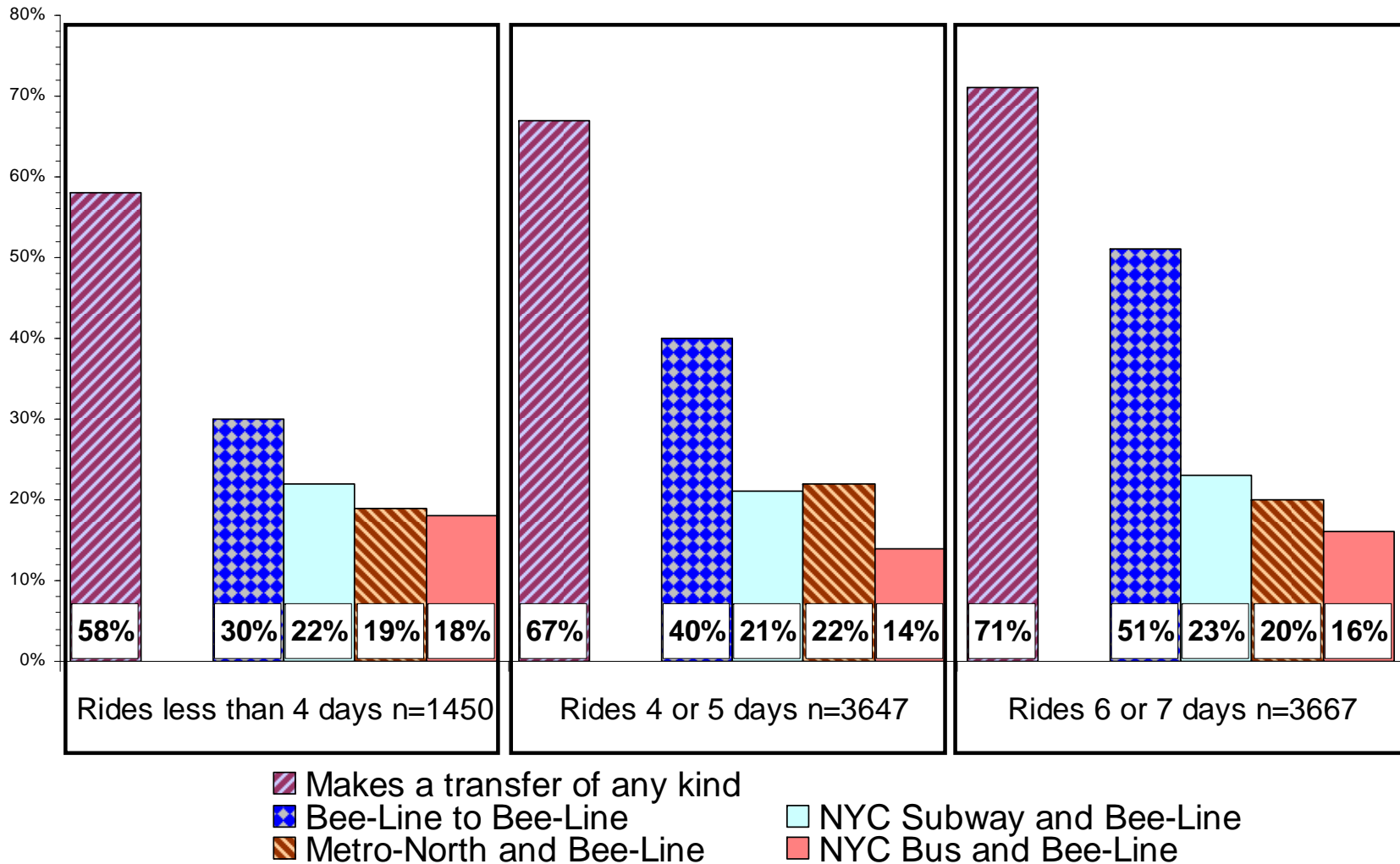
In 2007, the most common type of transfer (43%) was from one Bee-Line bus to another. This tendency increased by 7% from 36% in 2003. Other transfers also increased substantially. Metro-North transfers increased from 13% to 20%. The greatest increase was between New York City Subway and Bee-Line, which went from 10% in 2003 to 21% in 2007.

The increase in transfers from the Subway can be explained at least in part by the advent of acceptance of the MetroCard by Bee-Line. However, the increase in passengers transferring from Metro-North to Bee-Line cannot be explained by the analogous pass used on Metro-North, "The Metro-North UniTicket," because that ticket was also accepted in 2003 at the time of the previous survey. Consequently, there must be some other factor beyond the ticket, perhaps an economic or social change, which caused a change in the transfer behavior of the Metro-North riders. The implication by analogy is that there also might be factors beyond MetroCard, such as the opening of the new casino in Yonkers, that might have influenced the increase in transfers from the Subway as well¹⁰.

¹⁰ It should also be pointed out that some riders appear to have used station names of Metro-North stations when actually referring to MTA Subway stations, and vice versa. This makes it necessary to regard the distribution of transfers between Metro-North and the Subway as only approximate.

Figure 29 Transfers, by Rider Frequency Segment, 2007

(Sources: Question #34. Did you or will you transfer to or from another service during this trip?)



The varied tendency among rider frequency segments to make a transfer

The chart above shows two things: (1) The tendency to make any transfer at all (first bar in each segment's four bar set), and (2) the type of transfer being made (other bars). Note that because some people transfer multiple times, the sum of the percentages making specific types of transfers exceeds the percent of riders making a transfer.

The tendency to make a transfer varies with the frequency of using Bee-Line. Of those who ride six or seven days a week, 71% reported making some type of transfer during their trip, but only 67% of the four or five day riders, and 58% of the less than four day riders said they make such transfers.

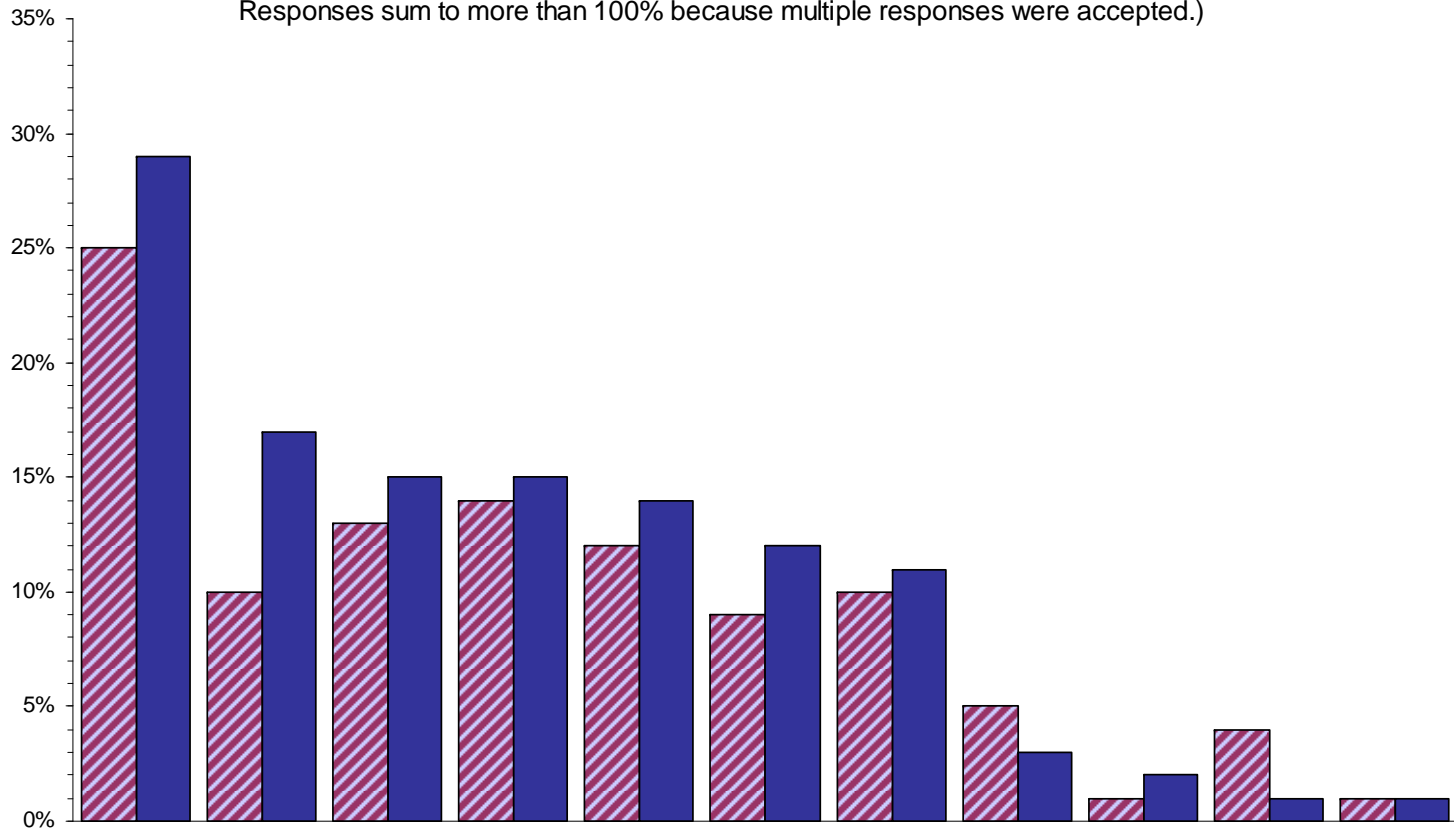
The difference in these transfer rates occurs primarily because those making Bee-Line to Bee-Line transfers varies substantially among the three segments. There is no relationship between transferring from the New York City Subway, Metro-North, or New York City buses and the frequency of using Bee-Line.

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If the Bee-Line Route Were Not Available

Figure 30 Alternate Modes if the Bee-Line Route Were Unavailable, 2003 and 2007

(Sources: Questions #37-1 through 37-12. If this Bee-Line route were not available, how would you make this trip?
Responses sum to more than 100% because multiple responses were accepted.)



	Taxi	Would not make	Drive with others	Other Bee-Line	Metro-North	Walk	Drive	NYC Subway	Van-pool	NYC Bus	Bi-cycle
2003 N=7418	25%	10%	13%	14%	12%	9%	10%	5%	1%	4%	1%
2007 N=8764	29%	17%	15%	15%	14%	12%	11%	3%	2%	1%	1%

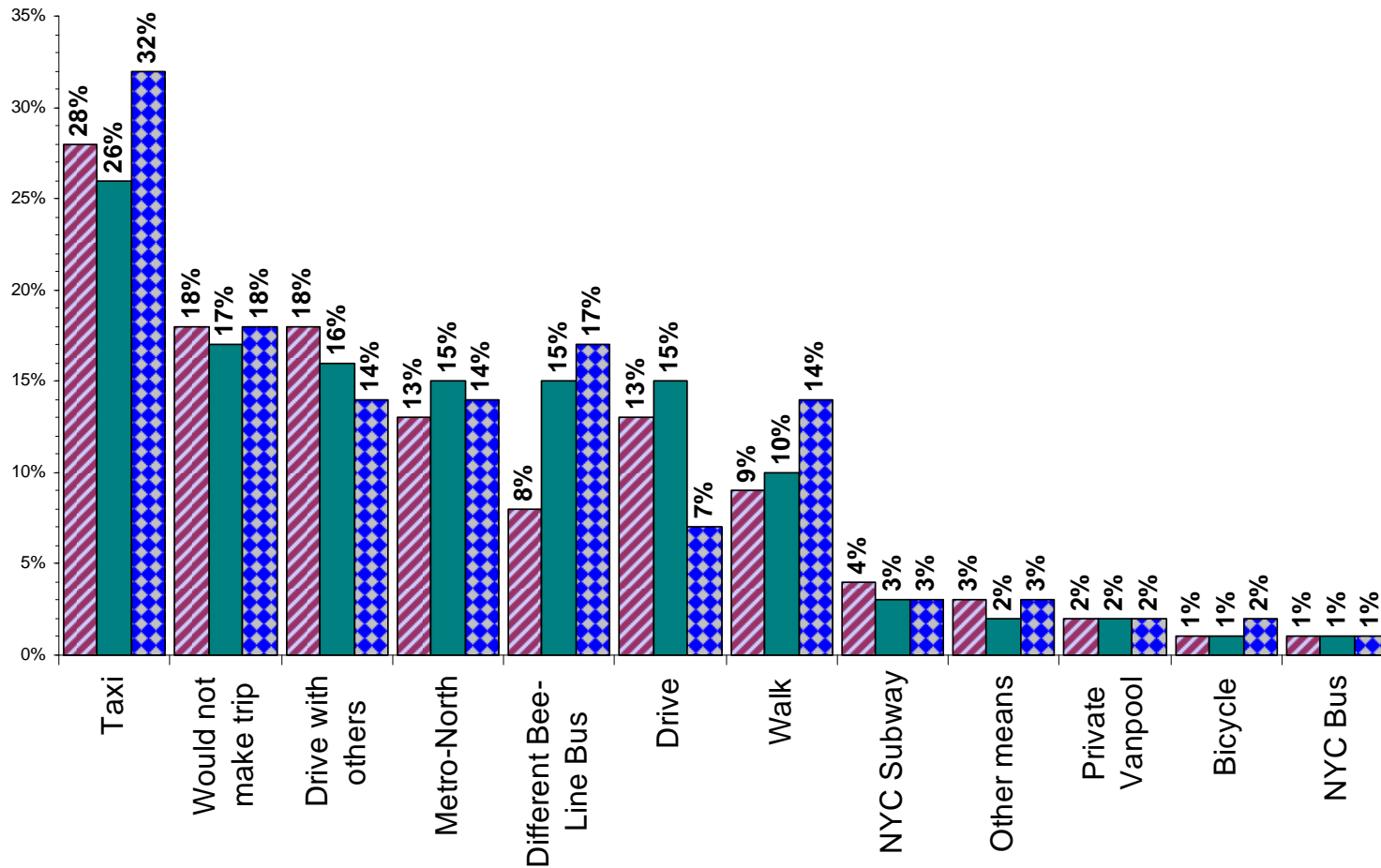
What alternate mode would riders use if their Bee-Line routes were not available?

Riders were asked how they would make the trip if the Bee-Line route on which they were riding when surveyed were not available. More riders answered that they would take a taxi (25% in 2003 and 29% in 2007) than that they would take any other mode. However, the percentage who said they would not make the trip rose by 7%, from 10% in 2003 to 17% in 2007. Although this is interesting, unfortunately the survey contains no explanation for why this might have changed. Perhaps there has been a change in perceived level of traffic congestion, or other types of economic or social costs of making these trips. Or perhaps, the growth of telecommuting has made it increasingly possible simply not to make a trip. Planning personnel at WCDOT report that recent economic development in Mount Vernon, Port Chester and New Rochelle may be making it possible for people to work, shop, and enjoy other activities closer to home.

Other tendencies remained reasonably consistent with the 2003 results for most modes, rising by 1% or 2% or in the case of walking, by 3%. The tendency to use a New York City bus as an alternate declined from 4% to 1%. Given that more than one-third of Bee-Line riders have a vehicle available, it is interesting that only 11% in 2007 (10% in 2003) said they would drive.

Figure 31 Alternate Modes if Bee-Line Were Unavailable, by Rider Frequency Segments, 2007

(Sources: Question #37. If this Bee-Line route were not available, how would you make this trip?
Responses sum to more than 100% because multiple responses were accepted.)



Rides less than 4 days n=1450
 Rides 4 or 5 days n=3647
 Rides 6 or 7 days

Variation among rider frequency segments in choice of alternate modes

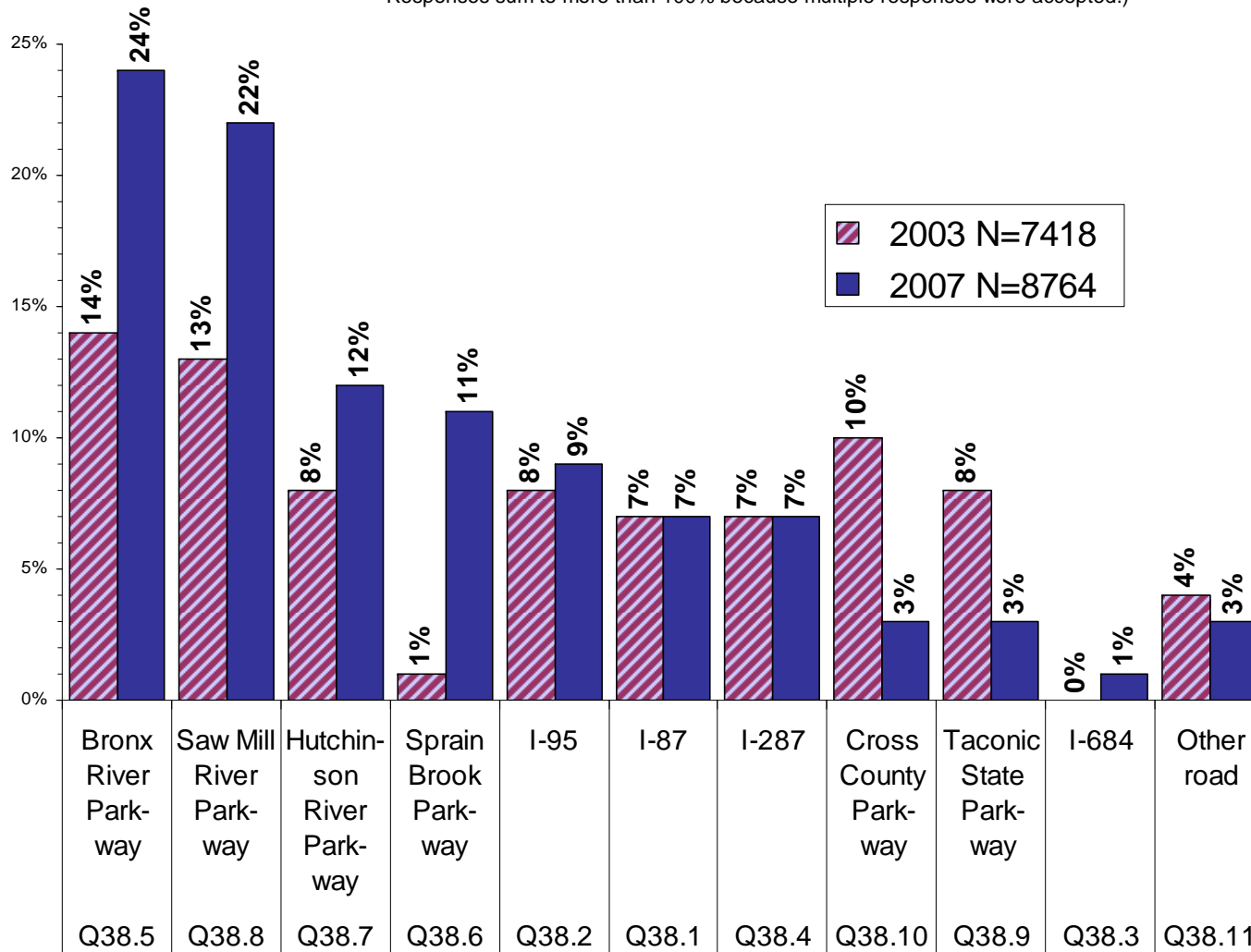
Those who ride Bee-Line buses most frequently were somewhat more likely than the other rider segments to say that they would take a taxi, a different Bee-Line route, or walk, but were less likely to say they would drive (probably because they are less likely to have a vehicle at their disposal). For example, 32% of the six or seven day riders but only 26% of four or five day riders indicated they would take a taxi. Similarly, 17% of the most frequent riders said they would use a different Bee-Line bus, but only 8% of the least frequent riders said they would do so. This may indicate a greater familiarity of the more frequent riders with the Bee-Line System. It also reflects a greater tendency of the less frequent riders to say they would drive. Less frequent riders who have a vehicle available, tend to use only the most convenient transit routes, and generally are reluctant to substitute less convenient routes in the even of service reductions.

While 14% of the most frequent riders said they would walk, only 9% of the least frequent riders said they would walk.

The other major difference was in the tendency to drive as an alternate mode. The most frequent riders tend to be most transit dependent, and only 7% of that group said they would drive if their usual Bee-Line bus were not available. However, roughly twice as many (15%) of the four or five day riders and 13% of the less than four-day riders, said they would drive.

Figure 32 Highways to Be Used if Trip Had Been Made by Car, 2003 and 2007

(Source: Question #38. If you were to have made this trip by car, which highways (if any) would you have used?
Responses sum to more than 100% because multiple responses were accepted.)



What highways would Bee-Line riders use if they drove to make their trips?

Since 2003, the tendency to cite particular highways as alternate routes -- if people drove -- has changed considerably. For example, the Bronx River Parkway was cited as an alternative route by only 14% in 2003, and by 24% at 2007. Similarly, the Saw Mill River Parkway was cited by only 13% in 2003, but 22% in 2007.

The greatest single change was for the Sprain Brook Parkway, which went from 1% to 11%. One reason for this change is that Bee-Line route #43 has been added since 2003, and the passengers it carries would be likely to use the Sprain Brook Parkway if they drove. In addition, ridership has grown on other Bee-Line routes using the Sprain Brook Parkway (3, and 77).

Two other major changes were decreases in the tendency to mention the Cross County Parkway and the Taconic State Parkway, which went from 10% to 3% and 8% to 3% respectively.

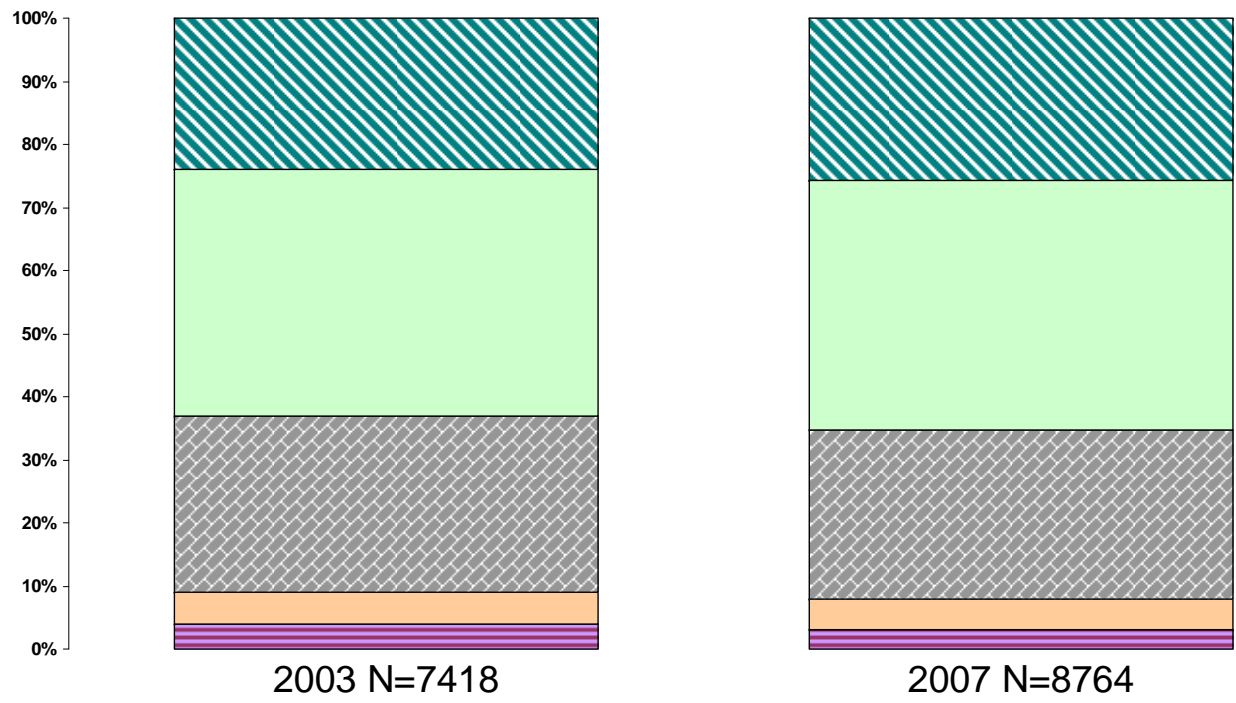
In the intervening years between 2003 and 2007, no doubt traffic patterns changed somewhat, and those kinds of changes probably account for the changed responses noted here. However, without further examination of how the roadways changed or what particular circumstances might have prevailed in 2003 and in 2007 that would affect traffic flow, we cannot really be certain why these changes occurred.

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Ratings of Service Quality

Figure 33 Rate Overall Quality of Bee-Line Service, 2003 and 2007

(Source: Question #10. Rate overall quality of Bee-Line service)



Excellent	24%	26%
Good	39%	40%
Neutral	28%	27%
Poor	5%	5%
Very Poor	4%	3%

Rating the overall quality of Bee-Line service

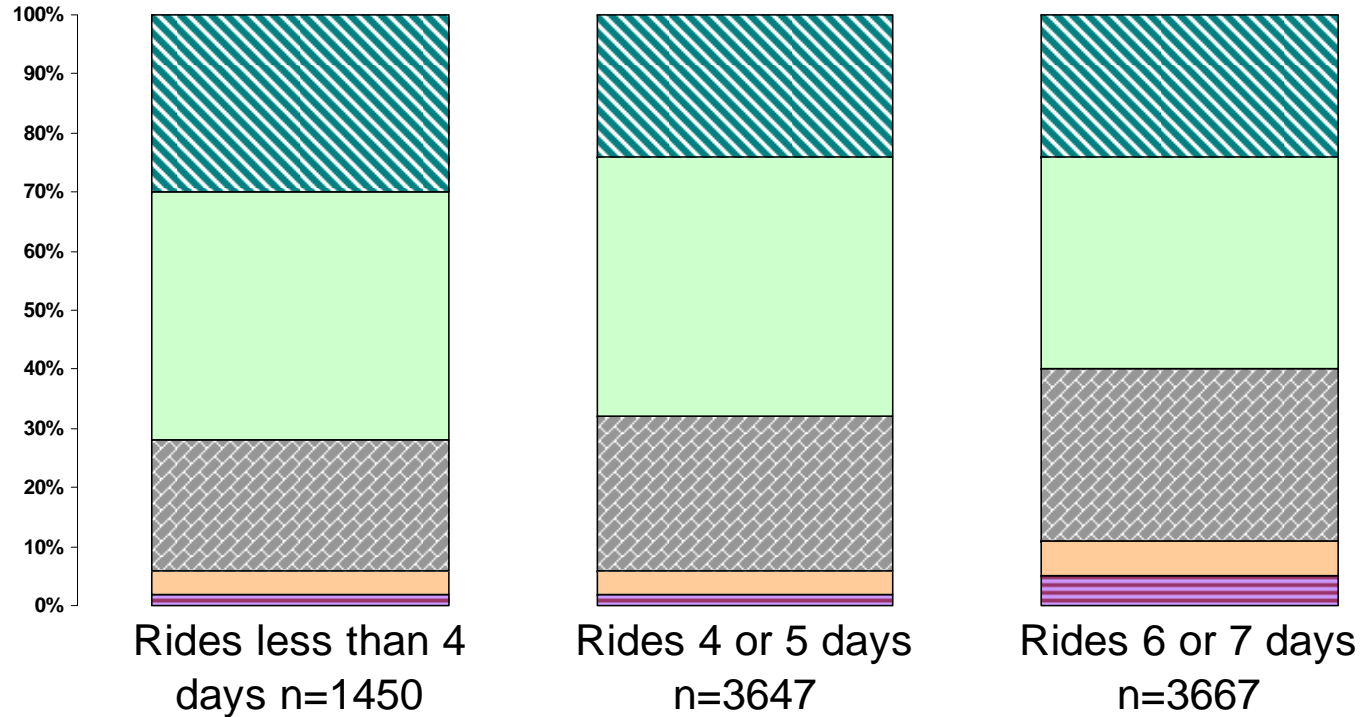
In both 2003 and 2007, riders were asked to rate Bee-Line service on a five-point scale ranging from very poor to excellent. There was a slight (3%) increase between 2003 and 2007 in the percentage giving the rating of excellent or good.

Typically, very few people who regularly use a service will give that service a rating of poor. To do so would imply that they are irrational or impoverished consumers who dislike the service but continue to use it. Consequently, unless there are exceptional circumstances, such as a strike or other service disruption, they rarely give such a rating. As a result, the real ratings variation tends to occur in the range from neutral to most positive.

The service objective, therefore, of Bee-Line should be to strive not to reduce the poor and very poor results, but rather to move people from the neutral to good and from the good to excellent categories. In marketing terms, this is the approach of, "We're doing okay and we know we can do better."

Figure 34 Rate Overall Quality of Bee-Line Service, by Rider Frequency Segments, 2007

(Source: Question #10. Please rate overall quality of Bee-Line service.)



Excellent	30%	24%	24%
Good	42%	44%	36%
Neutral	22%	26%	29%
Poor	4%	4%	6%
Very Poor	2%	2%	5%

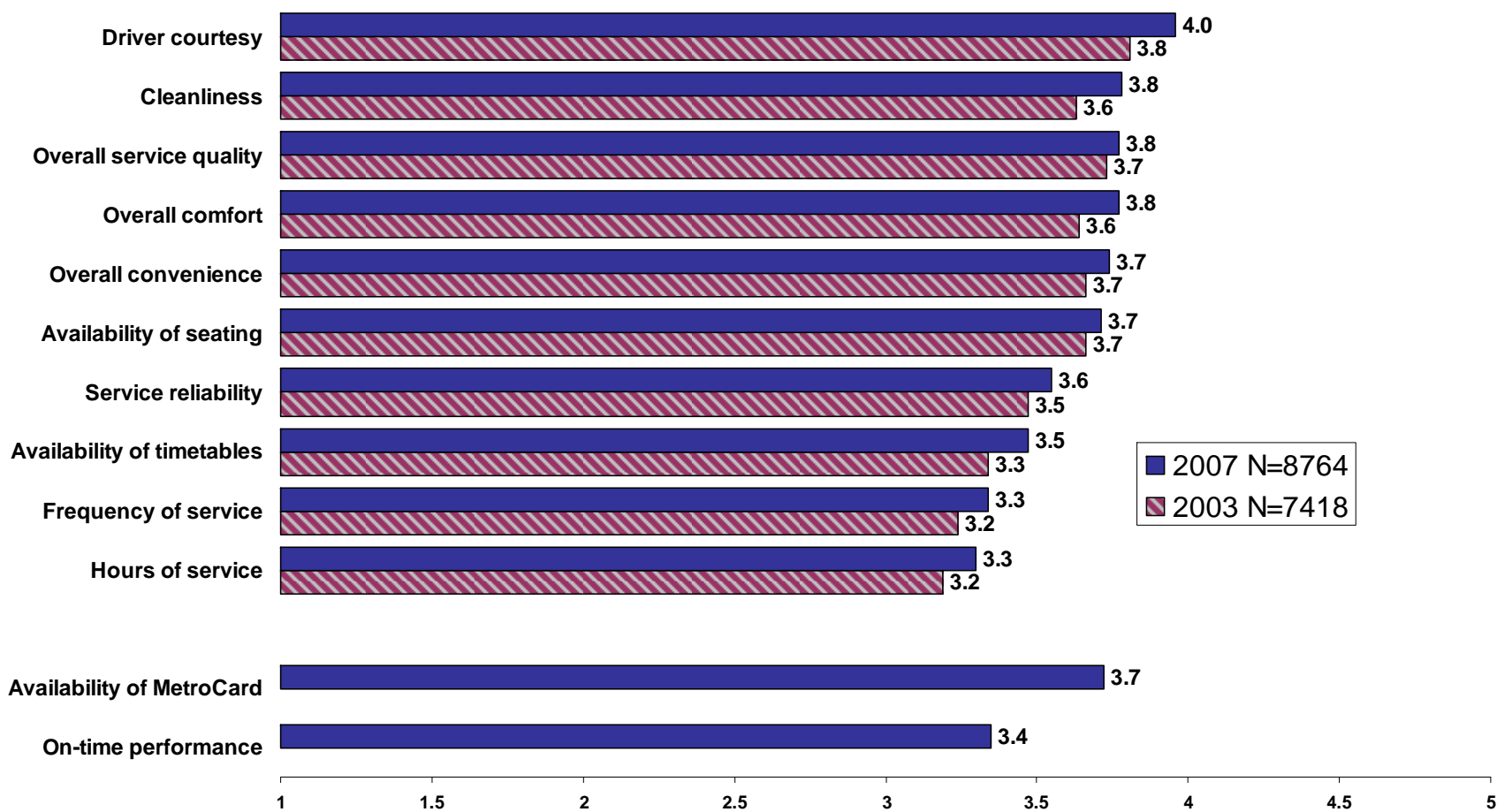
How the rider frequency segments rate Bee-Line service

There is a relationship between frequency of using Bee-Line and the rating of Bee-Line services. The more often riders use Bee-Line, the more opportunities they have to experience a service problem that may temper their ratings of overall service. For example, a total of 60% of the most frequent riders rate service as good or excellent, but 68% of the four or five day riders and 72% of the least frequent riders rated the service as good or excellent. Similarly, some of the most frequent riders (11%) who use Bee-Line six or seven days a week rated it poor or very poor for overall service. This contrasts with only 6% of the other rider segments.

Of course, those who use Bee-Line most often tend to be more transit dependent, and thus vulnerable to any service problems. Moreover, their frequency of use gives them more frequent opportunity to encounter such difficulties as missed transfers or other problems. Using public transit six or seven days a week means that a rider is using transit on at least one weekend day when service tends to be minimized compared to weekday service, and is thus less convenient to use. An increasingly common complaint of working transit riders who are frequent users of transit is that service on the weekend does not give them sufficient flexibility to both get to work and home from work. We have no concrete or specific evidence that this is the problem with these particular riders of Bee-Line services, but this is the type of complaint that should be investigated to reduce the neutral and small negative numbers among the most frequent riders.

Figure 35 Ratings of Service Quality in 2003 and 2007 Expressed as Mean Scores

(Source: Questions #10 through #21. Rate quality of of Bee-Line service in these respects)



	On-Time performance	Availability of MetroCard	Hours of service	Frequency of service	Availability of Timetables	Service reliability	Availability of seating	Overall convenience	Overall comfort	Overall service quality	Cleanliness	Driver courtesy
2007 n=	8236	7591	8119	8045	8041	7970	8232	7977	8149	8241	8399	8352
2003 n=	na	na	7719	7660	7746	7629	7717	7560	7687	7841	7905	7862

Comparing ratings of specific aspects of services between 2003 and 2007

Riders were asked to rate not only overall service quality, but also eleven specific aspects of service on the five-point scale ranging from very poor (1) to excellent (5). With the exception of two aspects of service (availability of MetroCard and on-time performance) all of these were asked in both 2003 and 2007.

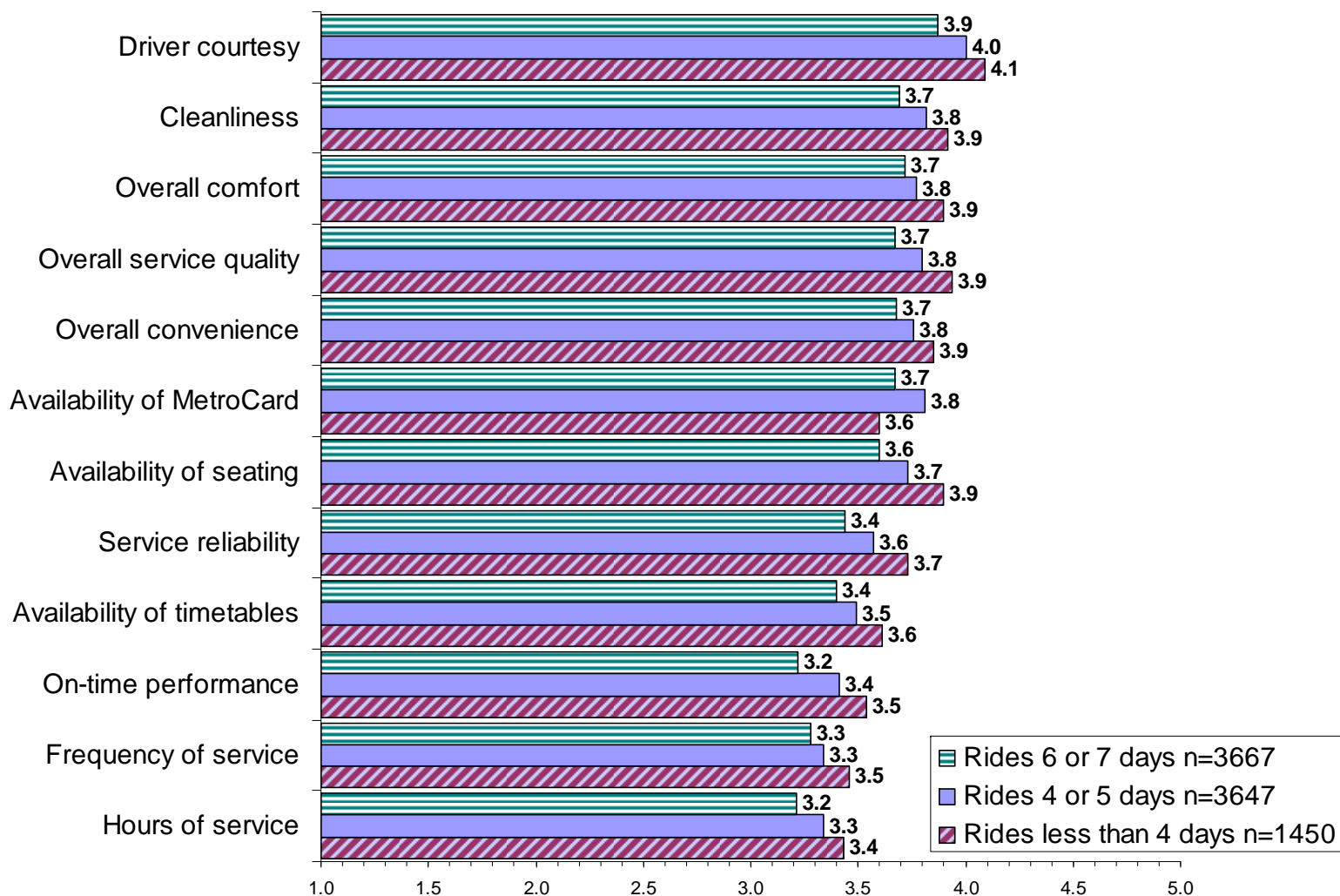
Notice the following about the chart above.

- ◆ First, all of the scores increased from 2003 to 2007.
- ◆ Second, with the exception of the 4.0 rating of driver courtesy, all of the scores are in a range between 3.2 and 3.8. This suggests that riders regard the services adequate but not excellent. The percent equivalent of a 3.8 score is 76% (i.e., 3.8 divided by 5), which in academic circles would probably constitute a grade of C+ or B-. The scores are not atypical of other transit systems that rely on fixed route local buses. Truly superior scores tend to be achieved either by rail service, bus rapid transit, or in some cases, regular express service. Local, fixed route bus service tends to be perceived as a relatively slow form of local transportation and is rarely rated in a superlative way.
- ◆ Third, notice that of the top six elements of service scored in the chart (excluding “overall service”), four of the six are such non-operational elements as driver courtesy, cleanliness of vehicles, overall comfort, and availability of seating. The only operational elements included in those top scores are the overall convenience of service and the availability of MetroCard. On the other hand, of the five items with relatively lower scores between 3.2 and 3.6, four deal with operational elements that are very important to riders. These include service reliability, frequency of service, hours of service, and on-time performance. None of the scores is very negative, and all are mildly positive. However, they are at or near the bottom of the list in terms of customer satisfaction.

One final note in this regard is the relatively low score of availability of timetables. In most transit systems, this is among the high-scoring items, and consequently it was unexpected to find it in the lower tier of customer satisfaction scores.

Figure 36 Ratings of Service Quality, by Rider Frequency Segments, 2007

(Source: Questions #10 through #21. Rate quality of of Bee-Line service in these respects)



How do service ratings vary among rider frequency segments?

We saw in Figure 34 that those who use Bee-Line more frequently are somewhat more likely to give neutral or negative scores on overall system performance. The same tendency holds true when specific elements of service shown in the chart above are rated. Throughout the range of the eleven specific elements of service plus overall service quality, in every case the less frequent riders are more likely to give higher scores.

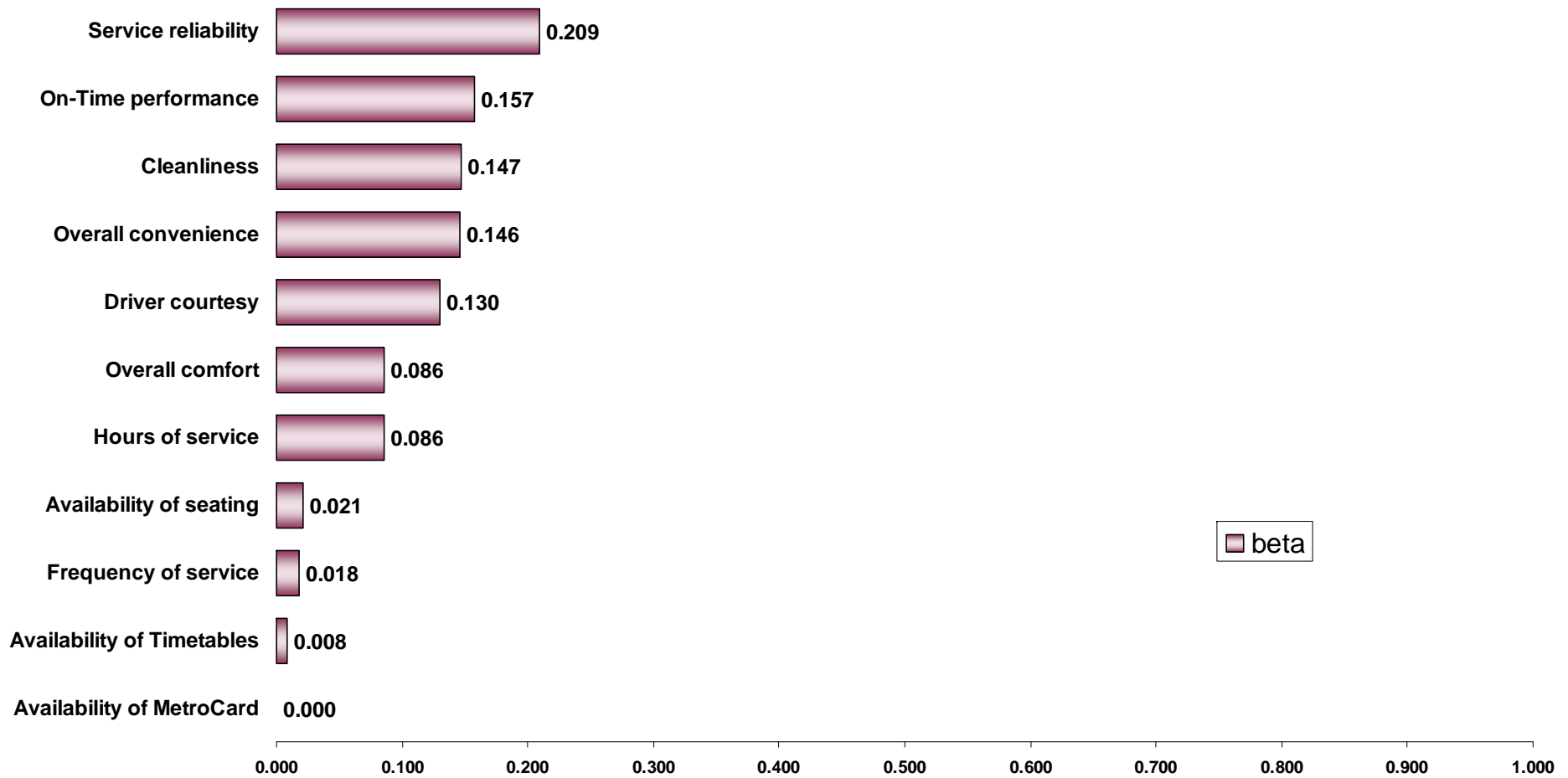
However, the rank order of the mean scores is very similar among the three frequency segments. Consequently, while they differ in specifics, they differ very little in terms of their general perspective about what is more positive and what is less positive about Bee-Line service.

The rating of hours of service deserves special mention because hours of service are increasingly a source of dissatisfaction among transit riders. Hours of service are especially difficult for a transit system to deal with in what is universally referred to as the “24/7 economy.” Many of the work hours required of service workers do not conform to the usual 9-to-5 pattern. Often workers will be required to work at hours when only skeletal transit service is available. Such workers might have to close a fast food restaurant late at night, or to work a night shift, or to work odd hours on weekends when service is running, but is too limited to be useful on any but the major corridors. All of these factors lead transit users, especially those most dependent on transit, to be most concerned about having transportation available when they need it. Of course, to satisfy this need with standard fixed route service especially is very costly because while it is very important to the relatively few whose low ratings drag down the overall satisfaction score, such service is likely to be lightly used and non-productive in traditional terms.

On the other hand, adding hours of service at these times is the type of incremental service that has a potential to reduce rider turnover in the Bee-Line system as a whole by making it possible for more riders to rely on transit consistently – i.e. from the rider’s perspective to make it more “reliable.” We have conducted no studies that directly demonstrate that adding such service would reduce turnover. However, riders in focus groups we have conducted in other cities have consistently told us that their need to purchase a vehicle and become less dependent upon transit is directly related to the unavailability of service during marginal hours. Moreover, in recent onboard surveys we have found that the *intention* to cease using transit has been related to a desire for additional hours of service.

Figure 37 Regression Analysis of Service Quality Components, 2007

(Source: Questions #10 through #21. Rate quality of of Bee-Line service in these respects. 6,277 respondents responded to all questions and are included in the regression)



Factors associated with overall service satisfaction

What service factors were most closely associated with overall satisfaction? To say it another way, what should Bee-Line's service improvement priorities be to achieve maximum improvement measured by overall customer satisfaction?

Table 1 Bivariate Correlations, 2007

Bivariate correlations* between each aspect of service rated and the rating of service overall	
Service reliability	0.68
Overall convenience	0.62
Overall comfort	0.61
Frequency of service	0.60
Hours of service	0.58
Driver courtesy	0.54
Cleanliness	0.53
Availability of Timetables	0.52
Availability of seating	0.50
*Pearson's r	

One way to judge this is to consider the correlation coefficients shown in the table at the left. The table shows the bivariate relationship between each element of service taken separately, and the rating of overall service satisfaction. It answers the question (for example): "How strongly is a perception that service is *reliable* related to the perception that *service overall* is very good?"

A correlation of this type can vary from -1 to +1. A correlation of -1 means there is a perfect inverse correlation (i.e. the higher one score, the lower the other score). A zero correlation means there is no relationship at all. A correlation of +1 means that there is a perfect positive relationship (i.e., the higher one score, the higher the other score). Realistically, one never sees these extremes in the real world of survey research. More frequently a "moderate" to "strong" relationship would have a correlation coefficient ranging from .3 to .6.

Notice that all of the correlations in the table are 0.5 or above, indicating that taken separately, each aspect of service has a strong relationship with overall satisfaction.

However, people do not think of transit service in a series of separate dimensions. They consider everything together in forming their overall impression. Thus, for example, a positive rating for driver courtesy might be offset by a negative perception of vehicle cleanliness. Therefore, how should one sort out priorities if all of the individual, separate relationships are as strong as they are in the inset table on this page, for example?

The statistical technique of regression analysis provides a method of determining the independent contribution each individual element of service makes to overall satisfaction when they are considered altogether – much as consumers consider not only one, but a whole host of factors when judging any service. In studies like this, one does not expect that

such relationships will be extremely powerful statistically. However, the relationships shown in Figure 37, while not strong, are meaningful, and all are statistically significant.

Scores (called “betas”) shown in the chart can vary from -1 to +1 in the circumstances portrayed in the chart in Figure 37. A score of one (whether positive or negative) would indicate a perfect 1-to-1 association and a zero would indicate a complete absence of association. The beta is not a simple measure of bivariate correlation, but a measure of how strongly change in each service element is associated with change in the rating of overall service *when all other elements are held constant*.

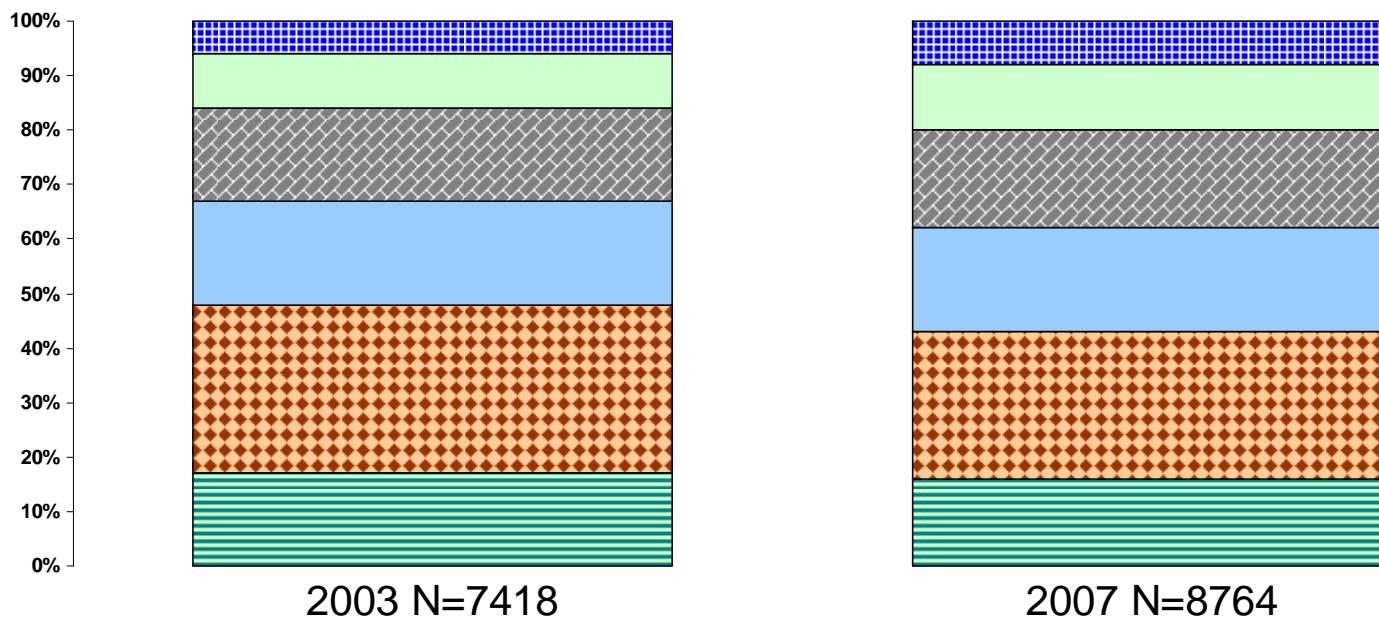
The three factors most strongly related to overall satisfaction were service reliability, cleanliness of the vehicles, and on-time performance, followed closely by driver courtesy and overall convenience. This means that if, for example, satisfaction with service reliability increased, overall satisfaction would also change, and by a predictable amount.







For those interested in the technical aspect of the prediction: The increase in the overall quality of service score resulting from the increased perception of quality of one element such as service reliability is determined by treating the beta as a percentage and working with the standard deviation of the dependent variable, in this case, the overall quality of service. Thus, if one could increase the perception of service reliability by one standard deviation from its 2007 mean of 3.6 to a mean of 4.8 (which is the mean of 3.6 for reliability plus its standard deviation of 1.2), then the overall satisfaction score would rise by the beta of .216 (or 21.6%) of one standard deviation in the overall satisfaction score, in this case, from a mean of 3.6 to 3.9 [i.e., $(3.6 + (21.6\% * 1.16))$]. Of course, it would require a substantial effort in both system performance and marketing to accomplish this seemingly modest change.

Demographics

Figure 38 Age, 2003 and 2007

(Source: Question #25. How old are you?)



 60 or older	6%	8%
 50 - 59	10%	12%
 40 - 49	17%	18%
 30 - 39	19%	19%
 20 - 29	31%	27%
 Under 20	17%	16%

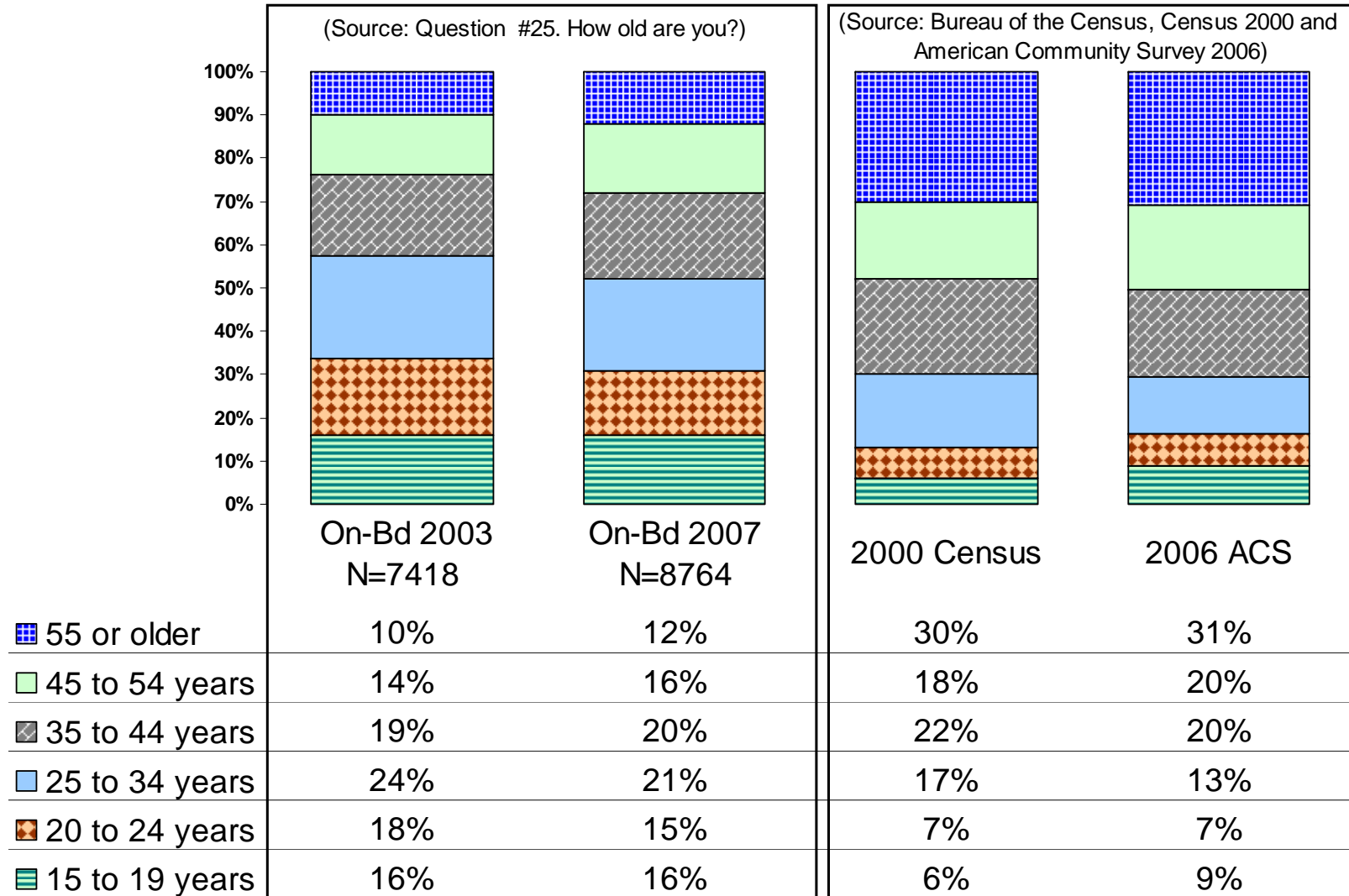
Age of the ridership

The typical Bee-Line rider in 2007 is slightly older than was true in 2003. In 2003, the mean age of the Bee-Line rider was 34 years old and the median age was 30. In 2007, the mean age had risen to 35 and the median age to 32. While a total of 16% of the riders in 2003 were 50 years old or older, that had risen to 20% in 2007. Of course, we do not know whether that means that riders in the older range below 50 were retained longer between 2003 and 2007 than they were in the comparable period preceding 2003 or whether more riders in that age group were being attracted to begin using Bee-Line. Nevertheless, the effect is that the ridership is somewhat older now. Conversely, while 48% were under the age of 30 in 2003, 43% were under the age of 30 in 2007.

One reason for the somewhat older ridership is surely the strong efforts of Bee-Line staff to promote service to the older population. This activity has taken the form of revision of route #9 to better serve the older population, and heavy promotion of the use of the senior discounted fares.

Two observations are important here. First, as we have pointed out, the ridership is somewhat older now than it was in 2003. Second, in spite of that fact, the ridership is predominantly young with over 40% under the age of 30 and 62% under the age of 40. With respect to the youth of its ridership, Bee-Line is very much in line with other transit systems. The use of public transit tends to be a life stage in the United States for many people rather than a lifetime practice. In other words, young people tend to use public transit for a period of time, gain in income level, purchase a vehicle, and cease using transit as household needs change and income increases.

Figure 39 Ages of Bee-Line Riders and of the Westchester County Population Fifteen Years Old or Older, 2000, 2003, 2006, 2007



Age groups among Bee-Line riders and among the Westchester County population

The chart above displays four different sources of data in two sets. Two include the onboard surveys of Bee-Line riders in 2003 and 2007. The other two sources are from the Bureau of the Census, and include the Census of 2000 and the 2006 American Community Survey (ACS)¹¹. The onboard surveys, by definition, include only Bee-Line riders. The Census sources include all of Westchester County, some of which is not served by Bee-Line. Nevertheless, the comparative data are useful to offer perspective.

These comparisons of the survey data to the Census reinforce the point that the ridership tends to be young relative to the general population. There are several reasons that help explain why transit ridership is typically younger than the general population. Four important factors are:

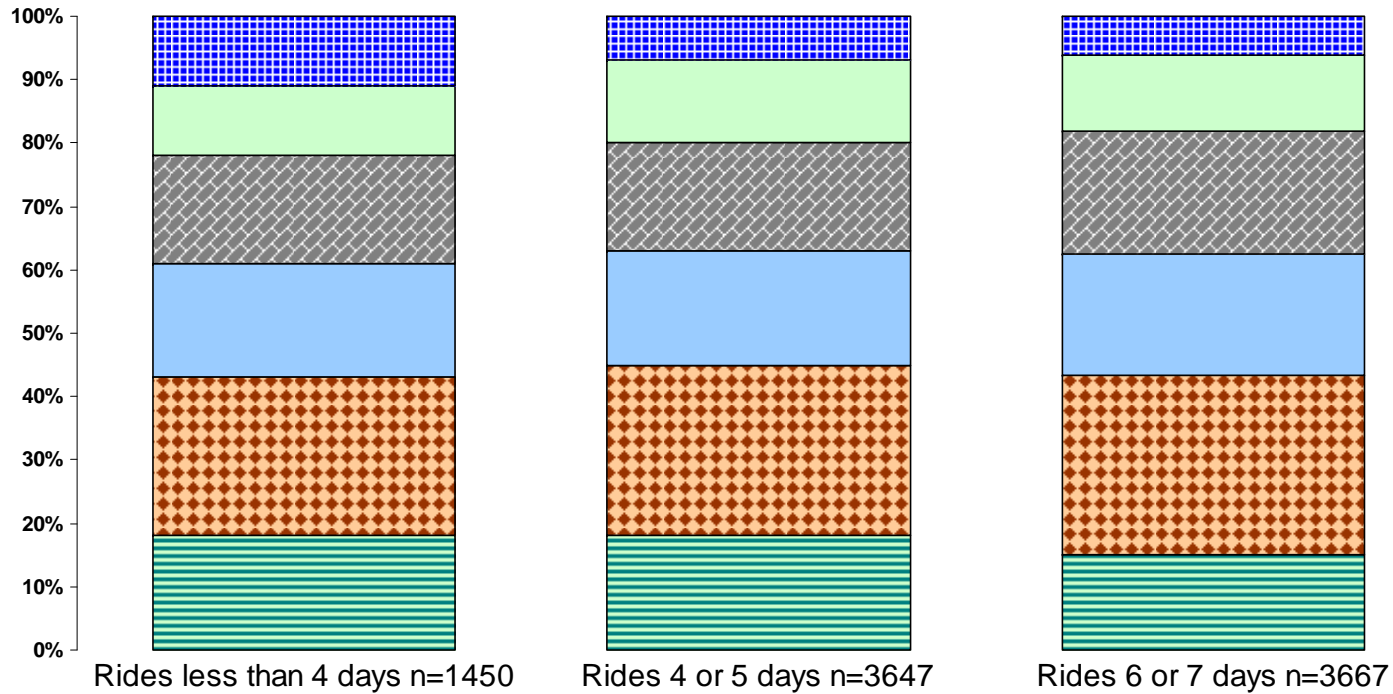
1. Many riders are high school or college students using transit for school trips.
2. A person's transportation needs during early years of employment are more limited than they tend to become at a later point in life when for many people marriage and family create new and very different needs for both housing and mobility.
3. Earnings are age-related. Earnings for most employed persons rise with age (until retirement) especially for people on a career path that includes advancement through ranks with a commensurate rise in earnings. Thus at a younger age, income for many people is not adequate to support a vehicle.
4. Economically active persons (including students) typically have greater needs for mobility than do retired persons. Thus, although they make up a substantial proportion of the general population, persons at or near retirement tend to account for a relatively small proportion of trips.

In effect, outside of a limited number of cities such as New York City proper which combine high density and extensive transit service (especially rail), people whose incomes rise with age tend to treat the use of public transit as part of a life-stage to be abandoned when need and resources combine to make private transportation both desirable and available.

¹¹ The ACS is an interim survey to supplement the Census mid-decade. It is conducted by the Bureau of the Census, using mail, telephone and personal visits to achieve a reliable sample of housing units. Results are used to adjust allocations of Federal funds based on population. Methodology is available at this link: <http://www.2010census.biz/acs/www/Downloads/tp67.pdf>.

Figure 40 Ages of the Rider Frequency Segments, 2007

(Source: question #25. How old are you?)



60 or older	11%	7%	6%
50 - 59	11%	13%	12%
40 - 49	17%	17%	19%
30 - 39	18%	18%	19%
20 - 29	25%	27%	28%
Under 20	18%	18%	15%

Ages of the rider frequency segments

Table 2 Mean Ages of the Rider Segments, 2007

Age characteristics of rider frequency segments

Q25. Age

Frequency of using Bee-Line in a typical week	Mean	Median
Rides less than 4 days n=1450	36.45	33.00
Rides 4 or 5 days n=3647	34.77	32.00
Rides 6 or 7 days n=3667	34.88	32.00
Total	35.09	32.00

The age distributions of the three rider frequency segments differ very little from each other. From a marketing standpoint, the differences are trivial. The inset table indicates that the extent of the differences is very small, with a range of less than two years separating the mean age of the oldest segment (less than four day riders, mean age = 36.45 years) and that of the youngest (4 or 5 day riders, mean age 34.77 years),

If we reverse the numerator and denominator (see inset table below) when computing the percentages shown in Figure 40 above, we can see that the riding frequencies of the age groups are quite consistent from age 20 to age 59. Those older than 59 are more likely (26%) than the age groups from 20 to 29 (15%) to use Bee-Line less than four days a week, but less likely to use it six or seven days a week.

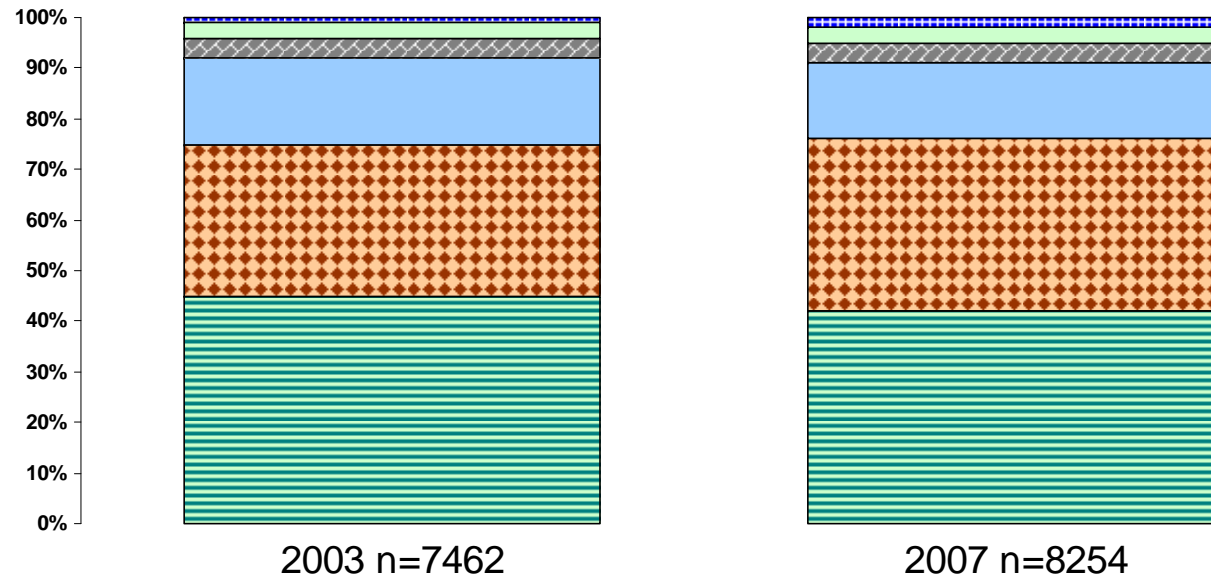
Table 3 Rider Segments Within Age Groups, 2007

		Age groups						All riders
		Under 20	20 - 29	30 - 39	40 - 49	50 - 59	60 or older	
		%	%	%	%	%	%	
Frequency of using Bee-Line in a typical week	Rides less than 4 days n=1450	18%	15%	15%	15%	15%	26%	
	Rides 4 or 5 days n=3647	42%	38%	38%	37%	40%	38%	
	Rides 6 or 7 days n=3667	40%	47%	47%	48%	45%	36%	
All riders		100%	100%	100%	100%	100%	100%	

Those under 20 are slightly less likely than others to use Bee-Line six or seven days a week (40% as contrasted with 45% to 48% among ages up to 59) and are slightly more likely to use it four or five days a week.

Figure 41 Ethnic/Racial Self-Identification, 2003 and 2007

(Source: Question #30. Which do you consider yourself?)



 Native American Indian	1%	2%
 Other	3%	3%
 Asian	4%	4%
 White	17%	15%
 Hispanic	30%	34%
 African-American	45%	42%

Ethnic/racial self-identification

The distribution of ethnic and racial groups has been reasonably stable since 2003. Though there has been some change, the general pattern remains the same. In 2007 as in 2003, African-American riders constitute the largest single group (42%), Hispanics (of any race) the second largest (34%), and “Whites” the third largest group with 15%.

The primary change since 2003 has been the 4% increase in the percentage of Hispanic riders offset by slight declines (in percentage terms, not necessarily in numbers) of African-American and White riders.

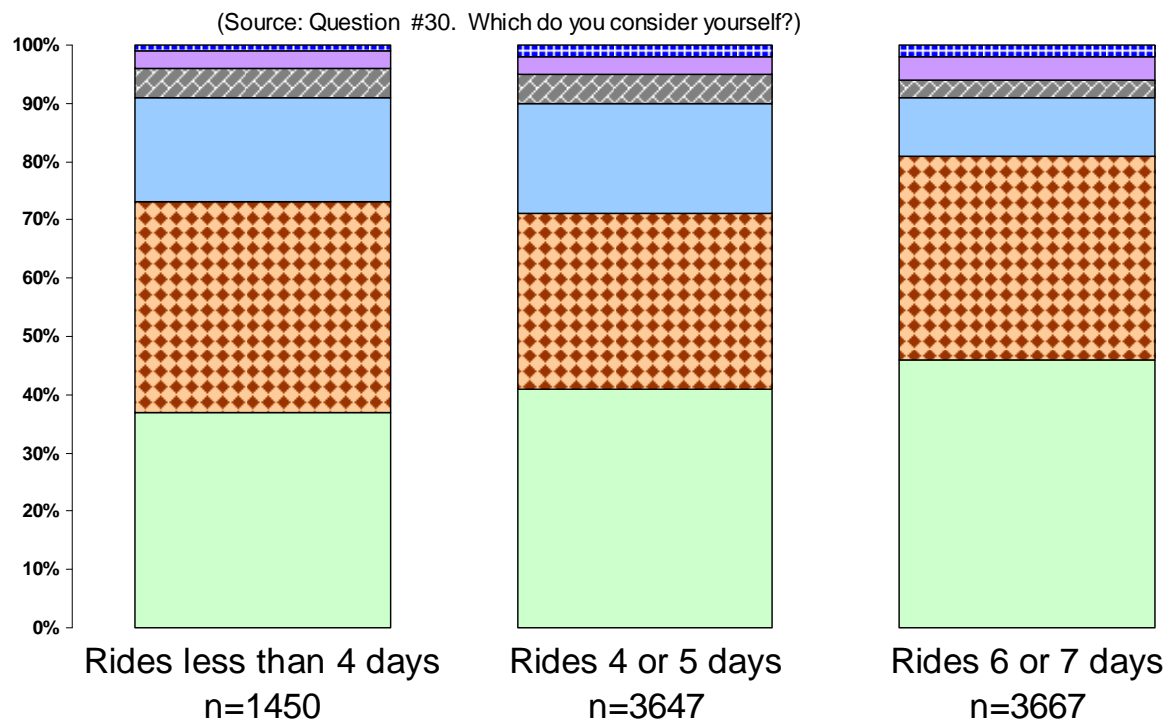
Table 4 Language used to Complete the Survey, by Age Group, 2007

		Self-identified Ethnic/Racial background						All Hispanic riders
		Hispanic						
		Age groups						
		Under 20	20 - 29	30 - 39	40 - 49	50 - 59	60 or older	
		%	%	%	%	%	%	%
Language	ENGLISH	91%	63%	48%	47%	55%	48%	58%
	SPANISH	9%	37%	52%	53%	45%	52%	42%
All riders		100%	100%	100%	100%	100%	100%	100%

With Hispanic ridership now constituting approximately one-third of Bee-Line riders, it is important to note that 58% of Hispanics completed the survey in English and 42% (i.e., 14% of all Bee-Line riders) completed the survey in Spanish. In other words, although Spanish is widely used among Bee-Line riders, most use English comfortably. The tendency among

Hispanic riders to use English or Spanish is age-related. To a large extent, the older the Hispanic rider is, the more likely he or she is to have completed the survey in Spanish.

Figure 42 Ethnic/Racial Self-Identification of Rider Frequency Segments, 2007



Native American Indian	1%	2%	2%
Other	3%	3%	4%
Asian	5%	5%	3%
White	18%	19%	10%
Hispanic	36%	30%	35%
African-American	37%	41%	46%

Ethnic/racial self-identification of rider frequency segments

Although there is not a great deal of difference in the cultural groups based on ethnicity and race that make up the rider segments, slightly more of the six or seven day riders identified themselves as African-American than did riders in the four or five day a week segment (41%) and the less than four day segment (37%). Those identifying themselves as “White” comprise a smaller portion (10%) of the most frequent riders than of the four or five day riders (19%) or the less than four day riders (18%).

When we reverse the numerator and denominator (see inset table), we find that of the “White” riders, only 31% use Bee-Line six or seven days a week, while 49% use it four or five days a week.

Table 5 Rider Frequency Segments Within Ethnic/Racial Groups, 2007

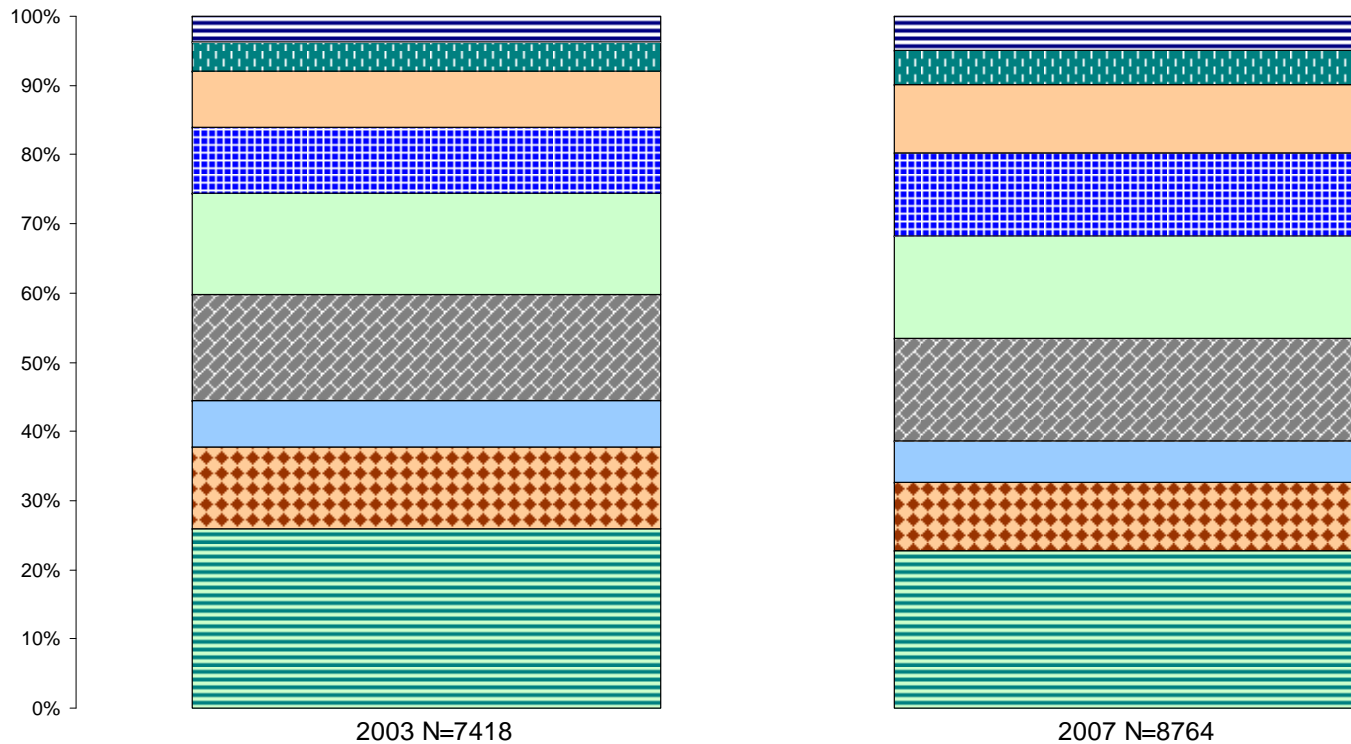
		Self-identified Ethnic/Racial background			All riders	
		African-American	Hispanic	White	All other minority groups	
		%	%	%	%	%
Frequency of using Bee-Line in a typical week	Rides less than 4 days n=1450	14%	18%	20%	17%	17%
	Rides 4 or 5 days n=3647	37%	35%	49%	43%	38%
	Rides 6 or 7 days n=3667	49%	48%	31%	40%	45%
All riders		100%	100%	100%	100%	100%

On the other hand, African-American and Hispanic riders, 49% and 48% respectively -- essentially half of each of these groups -- use Bee-Line six or seven days a week. In other words, African-American and Hispanic riders are more likely to be intensive users

of Bee-Line services than “White” riders. Conversely, “White” riders are more likely than African-American and Hispanic riders to use Bee-Line four of five days a week.

Figure 43 Household Income, 2003 and 2007

(Source: Question #31. What is your total annual household income?)



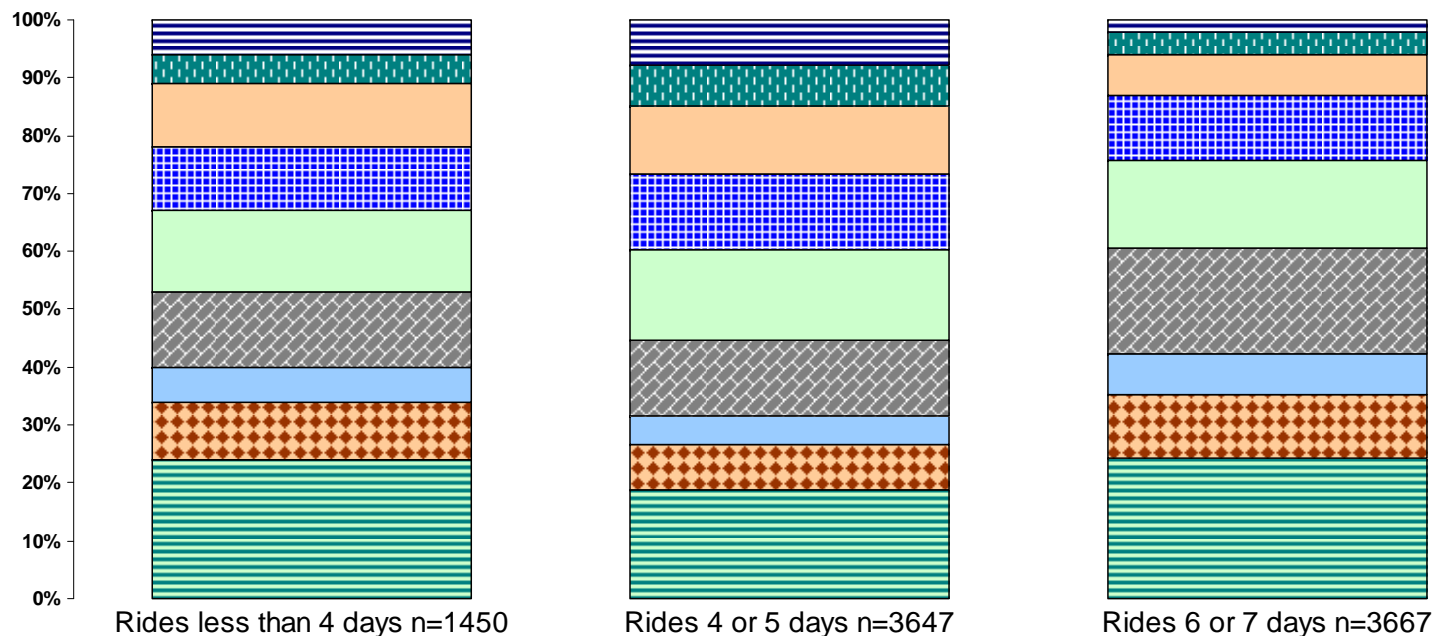
More than \$100,000	4%	5%
\$75,000 to \$100,000	4%	5%
\$50,000 to \$74,999	8%	10%
\$35,000 to \$49,999	10%	12%
\$25,000 to \$34,999	15%	15%
\$20,000 to \$24,999	15%	15%
\$15,000 to \$19,999	7%	6%
\$10,000 to 14,999	12%	10%
less than \$10,000	26%	23%

Household income

Household income has crept up between 2003 and 2007. However, the change is probably due as much to wage inflation as to attracting new riders with higher incomes. Unfortunately, the fact that income groupings (rather than absolute income) are the only practical way to collect the survey data makes it both unfeasible and inaccurate to apply a factor to compensate for inflation. Thus, the most we can say is that, given that there has been wage inflation during the period, the income *distributions* within the ridership have remained reasonably constant. For example in both surveys, most riders reported household incomes of less than \$25,000 although somewhat more (60%) reported incomes of this level in 2003 than in 2007 (54%). Also, relatively few riders in each survey (2003 and 2007) reported incomes of \$50,000 or more (16% in 2003 and 20% in 2007). Thus, the system as a whole continues to carry a somewhat lower income demographic, as most all-bus systems do.

Figure 44 Household Incomes of Rider Frequency Segments, 2007

(Source: Question #31. What is your total annual household income?)



Income Bracket	Rides less than 4 days n=1450	Rides 4 or 5 days n=3647	Rides 6 or 7 days n=3667
>\$100,000	6%	8%	2%
\$75k to \$100,000	5%	7%	4%
\$50k to \$74,999	11%	12%	7%
\$35k to \$49,999	11%	13%	11%
\$25k to \$34,999	14%	16%	15%
\$20k to \$24,999	13%	13%	18%
\$15k to \$19,999	6%	5%	7%
\$10k to \$14,999	10%	8%	11%
<\$10,000	24%	19%	24%

Household incomes of the rider frequency segments

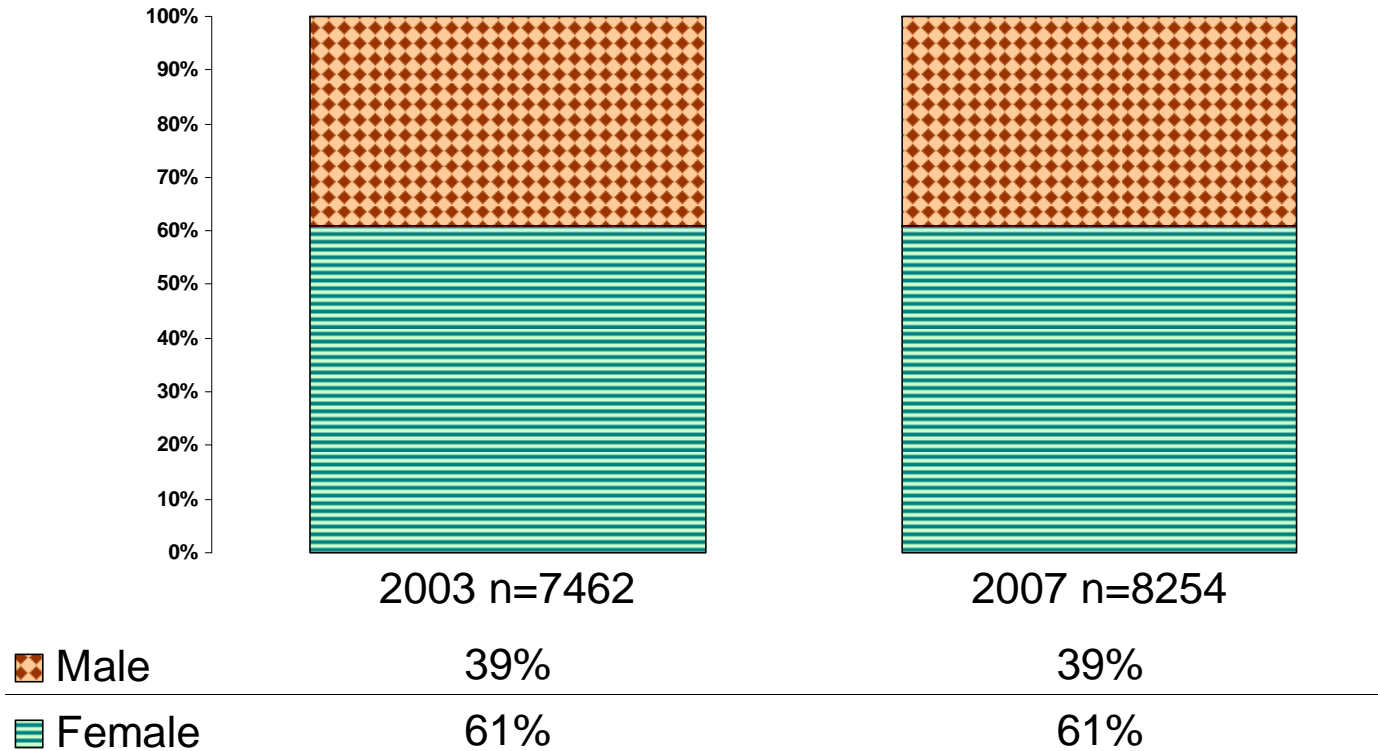
Those who ride four or five days a week have incomes somewhat higher than the other ridership segments. For example, a total of 40% of that segment reported household incomes of \$35,000 or more, whereas for those who ride six or seven days each week the total is 24% in that set of income categories. Because so many of the four and five day riders are commuting to work (i.e they are wage-earners), this is not surprising.

Conversely, among those who use Bee-Line six or seven days a week, a total of 60% reported household incomes of less than \$25,000, while only 45% of the four or five day riders reported incomes this low. In terms of household income, the least frequent riders are more like the four and five day riders than like the most intensive users.

The reason for this relationship between income and frequency of using Bee-Line is quite simply that the lower income population tends to be more dependent on public transit and therefore use it more often and for more purposes.

Figure 45 Gender, 2003 and 2007

(Source: Question #29. Are you female or male?)



Gender

Table 6 Income And Transit Dependence, By Gender, 2007

		Q29. Gender		All riders
		Female	Male	
		%	%	%
Q31.	Less than \$10,000	23%	22%	23%
Household income	\$10,000 to \$14,999	10%	9%	10%
	\$15,000 to \$19,999	6%	7%	6%
	\$20,000 to \$24,999	15%	15%	15%
	\$25,000 to \$34,999	16%	13%	15%
	\$35,000 to \$49,999	11%	12%	11%
	\$50,000 to \$74,999	9%	10%	9%
	\$75,000 to \$100,000	5%	6%	5%
	More than \$100,000	4%	7%	5%
All riders		100%	100%	100%

		Q29. Gender		All riders
		Female	Male	
		%	%	%
Q28. How many vehicles available?	None	64%	62%	63%
	One	24%	23%	23%
	Two	9%	12%	10%
	Three or more	3%	4%	4%
All riders		100%	100%	100%

Most Bee-Line riders are women. In both 2003 and 2007, 61% of the riders were women. In Westchester County as a whole, according to the 2006 ACS, women made up 53% of the population eighteen years old and older. Thus, at 61%, their percentage of the ridership is disproportionate. One might assume that because women continue to earn less than men in the society at large, the household income of women riders might also be less than that of male riders. However, that is not the case as the top crosstabulation in the top of the inset table at the left shows. Incomes of female rider households are about the same as those of male rider households. Therefore, gender-related income differences at the household level does not explain the disproportionate number of women riders.

Perhaps women are less likely to have a vehicle for their own use. However, the second crosstabulation in the inset table suggests that this too is not an adequate explanation. Female riders were only 2% more likely than male riders to have no vehicle available. However, women were less likely to report having multiple vehicles available, and perhaps this limits their access to a vehicle.

Table 7 Gender and Age, 2007

		Age groups						All riders
		Under 20	20 - 29	30 - 39	40 - 49	50 - 59	60 or older	
		%	%	%	%	%	%	%
Q29. Gender	Female	60%	59%	60%	61%	60%	62%	61%
	Male	40%	41%	40%	39%	40%	38%	39%
All riders		100%	100%	100%	100%	100%	100%	100%

It is widely known that women in the United States tend to live longer than men. Consequently, one might suppose that the probability that the rider is female increases with age. However, as the inset table shows, that is not true.

There is a minor variation by age, but across the age-groups, the differences are too small and irregular to achieve statistical significance. Instead, women dominate the ridership across all age groups.

Table 8 Gender Makeup Of The Ethnic/Racial Groups, 2007

		Self-identified Ethnic/Racial background				All riders
		African-American	Hispanic	White	All other minority groups	
		%	%	%	%	%
Q29. Gender	Female	67%	58%	55%	57%	61%
	Male	33%	42%	45%	43%	39%
All riders		100%	100%	100%	100%	100%

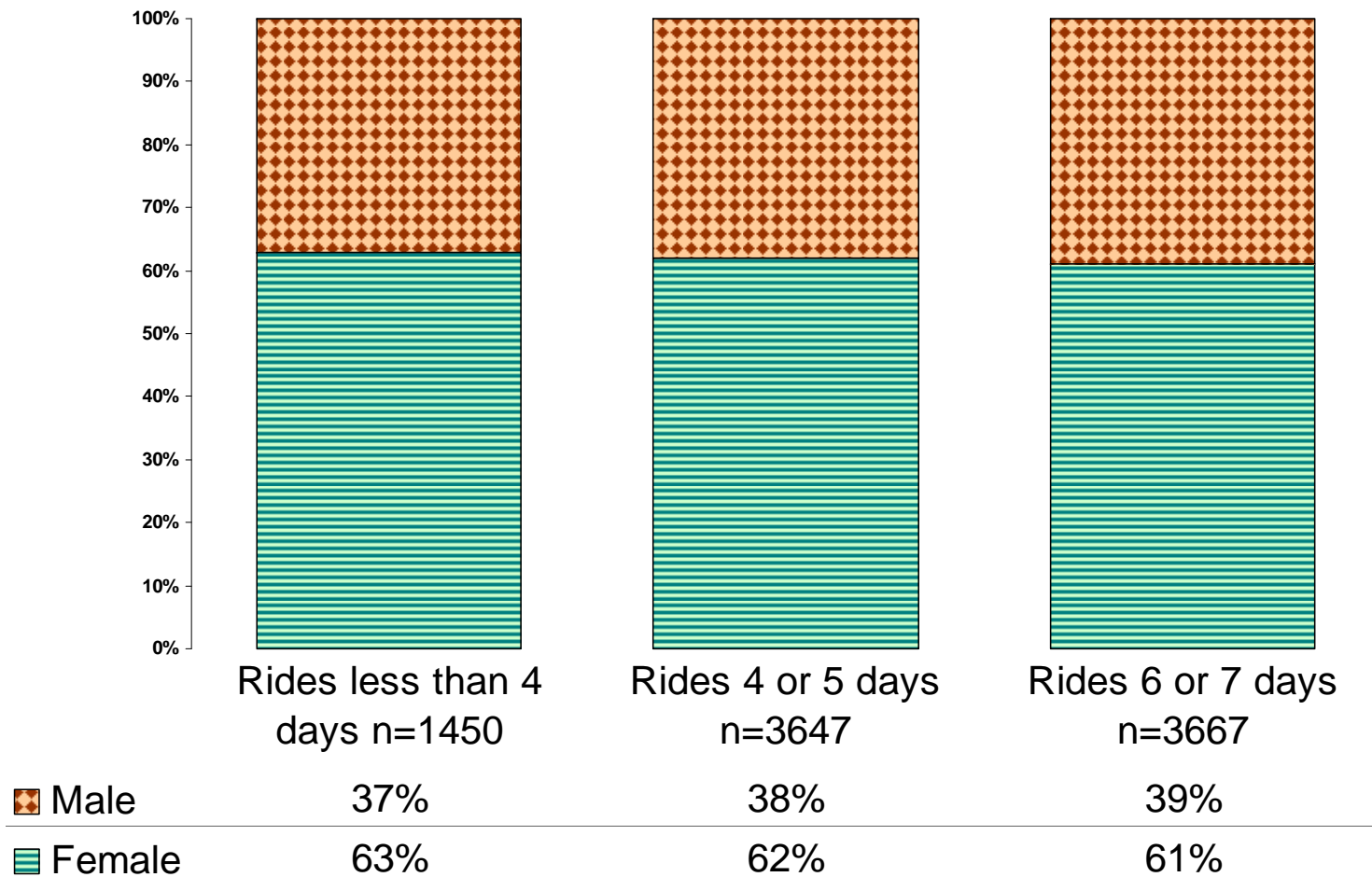
The second inset table indicates that among Bee-Line riders, there is relationship for unknown reasons between race/ethnicity and gender. Specifically, although Hispanic and “White” riders are also disproportionately female, they are not as gender-skewed as the African-American riders among whom 67% are female to only 33% male.

This odd finding invites speculation as to its cause. It might, for example, be a lack of men among riders, not an abundance of women that causes the skew. If so, could this be related to high rates of unemployment among young African-American men? For whatever reason, it appears that the disproportionate share of women among Bee-Line riders is related to a greater tendency for riders to be African-American women than African-American men.

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Figure 46 Gender of Rider Frequency Segments, 2007

(Source: Question #29. Are you female or male?)

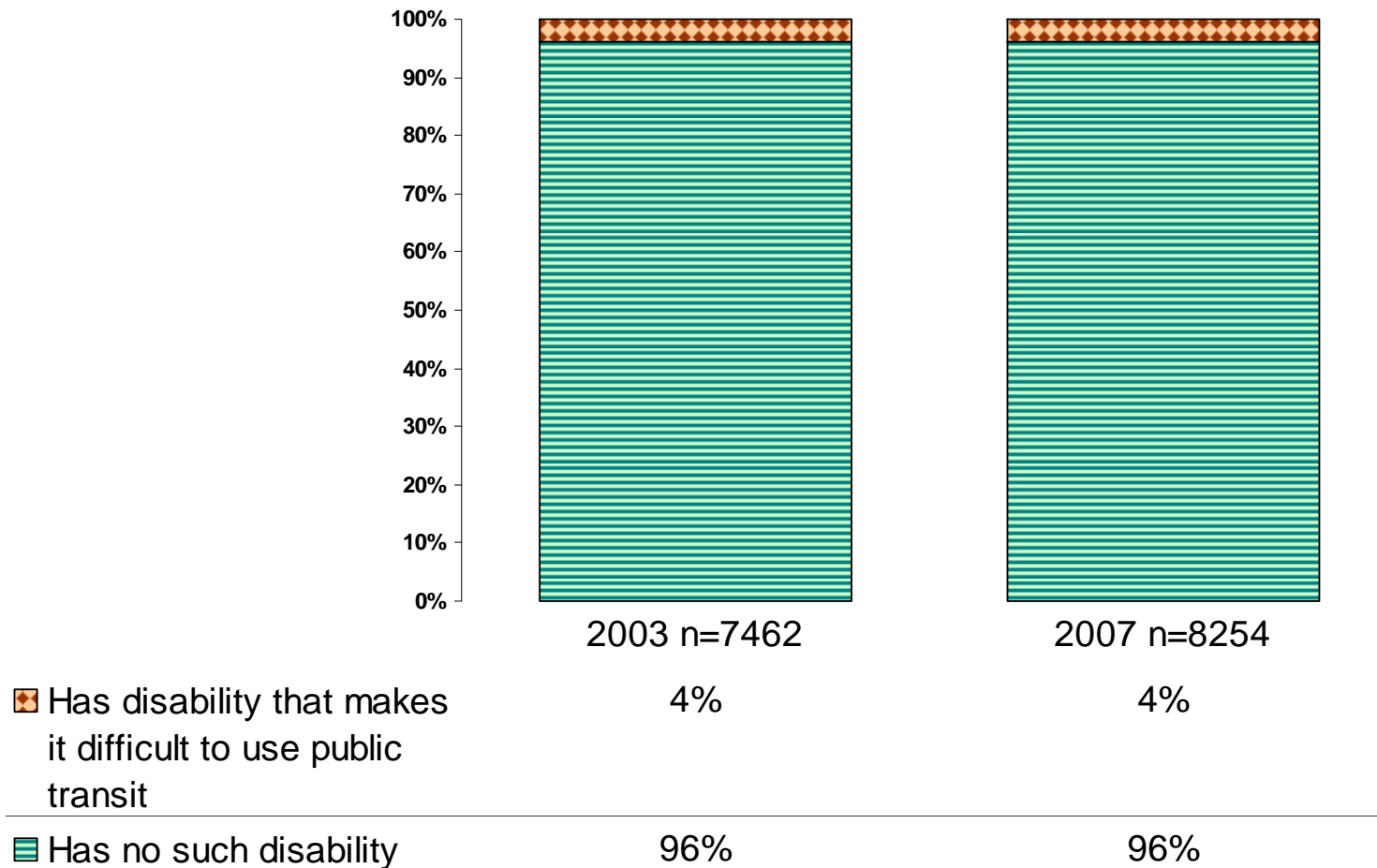


Gender of the rider frequency segments

The tendency for women to comprise a disproportionate share of the ridership is consistent among the three rider frequency segments. This is consistent with the fact that, as we have seen in the tables on the previous page, female riders are not substantially more transit dependent than male riders. Thus, there is no reason to expect that the percent of females would differ according to the frequency with which they use Bee-Line.

Figure 47 Having a Transit-Related Disability, 2003 and 2007

(Source: Question #27. Do you have a disability that makes it difficult for you to use public transportation?)

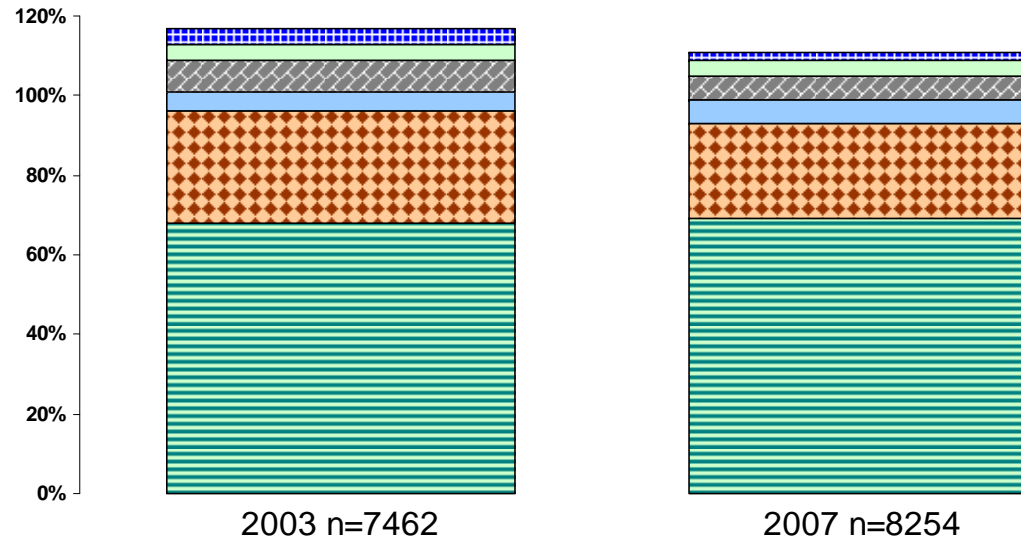


Having a transit-related disability

In both 2003 and 2007, 4% of the riders reported that they have a disability that makes it difficult for them to use public transportation. This tendency does not vary among the rider frequency segments. Of course, paratransit service is available for those with a disability, and many riders are probably attracted from fixed route service by that alternative.

Figure 48 Employment and Other Social Roles, 2003 and 2007

(Source: Question #26. Circle all of the following that apply to you (a list of employment and other social roles was provided))



Employed at Home	4%	2%
Retired	4%	4%
Unemployed	8%	6%
Homemaker	5%	6%
Student	28%	24%
Employed Outside Home	68%	69%

Employment and other social roles

In considering the data on employment and other social roles it is important to keep in mind that the roles are not mutually exclusive. For this reason the categories sum to more than 100%. Thus, for example, one can be a student and homemaker or perhaps a student and employed.

Of all Bee-Line riders, 68% in 2003 and 69% in 2007 reported that they are employed outside the home.

Table 9 Student Status and Employment, 2007

		Q26_3. Respondent is		
		Student		All riders
		Student	Not a student	
		%	%	%
Q26_1. Respondent is Employed Outside Home	Employed Outside Home	49%	76%	69%
	Not employed outside the home	51%	24%	31%
All riders		100%	100%	100%

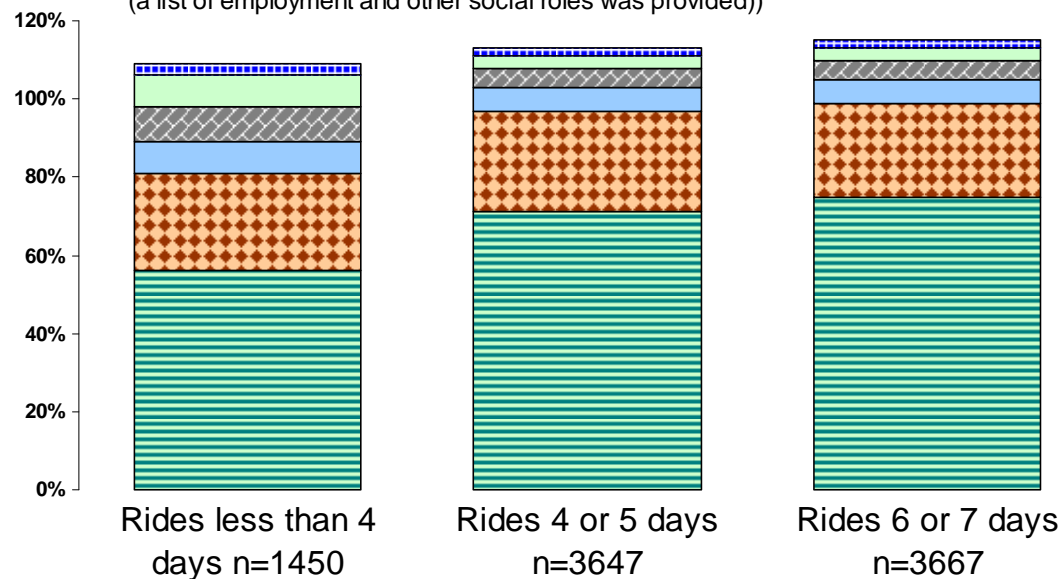
The category “student” is somewhat ambiguous, because many students are also employed¹². The inset table shows that approximately half (49%) of student riders are employed as well as being students. The average age of the students who are employed is 24, while the average age of those who are not employed is 19. Thus the employed students are likely to be college students and the others a mix of high school and some college students.

The extent of student ridership and the fact that half of the students are employed is another aspect of the vital role that transit in general and Bee-Line in particular play in the economic and cultural life of the community. For many people, using transit is clearly an aspect of the life-cycle, and part of maturation and preparing for a career.

¹² In constructing the survey sample, service intended primarily for student riders was intentionally not sampled. Beside the concerns about the appearance of having adult surveyors approach children on the bus, the primary reason is that younger students tend to be unreliable reporters, and that furthermore the information gleaned from their surveys, is not very informative since their ridership motives and practices are unique to their temporary student status. Nevertheless, the survey did capture some students of college age or older high school students.

Figure 49 Employment and Other Social Roles Among Rider Frequency Groups, 2007

(Source: Question #26. Circle all of the following that apply to you
(a list of employment and other social roles was provided))



Employed at Home	3%	2%	2%
Retired	8%	3%	3%
Homemaker	9%	5%	5%
Unemployed	8%	6%	6%
Student	25%	26%	24%
Employed Outside Home	56%	71%	75%

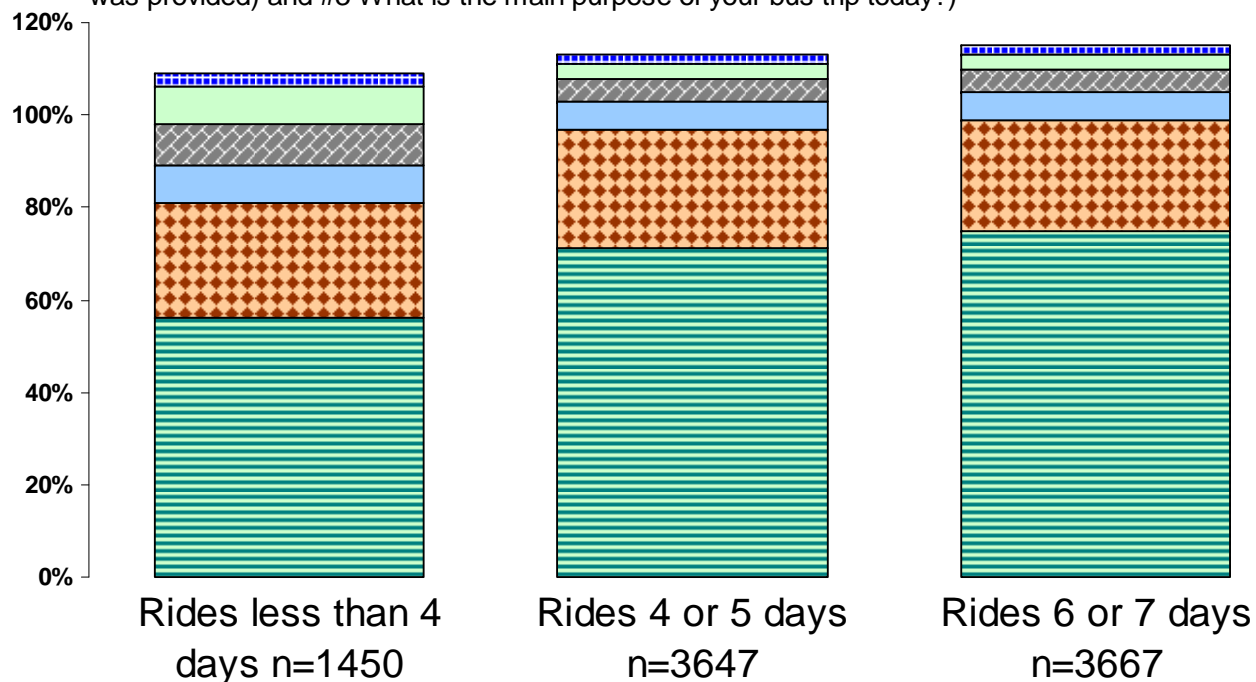
Employment and other social roles among rider frequency segments

As one would expect, employment is greatest (75%) among the most frequent riders, next among those who use Bee-Line four or five days a week (71%), and least among those using Bee-Line less than four days a week (56%). The percentage of students does not vary in any important way among the frequency segments, ranging only from 24% among the most frequent riders to 26% among the four or five day riders.

Riders who are retired, unemployed, or homemakers comprise a larger percentage of the least frequent riders, as is to be expected.

Figure 50 Employment and Trip Purpose, 2007

(Source: Questions #26. Circle all of the following that apply to you (a list of employment and other social roles was provided) and #3 What is the main purpose of your bus trip today?)



Employed at Home	3%	2%	2%
Retired	8%	3%	3%
Homemaker	9%	5%	5%
Unemployed	8%	6%	6%
Student	25%	26%	24%
Employed Outside Home	56%	71%	75%

Employment and trip purpose

In reviewing the chart above, keep in mind that each row represents a separate, but non-exclusive occupational or life-style category, which can overlap with the other categories. For example, a rider included in one category (e.g., employed persons) might also be contained in another (e.g., student, homemaker). For this reason the graphic columns that include all categories sum to more than 100%.

- ◆ Of those riders who are employed, 79% were using Bee-Line to get to or from work when they were surveyed, a fact that suggests the large share of work-trips Bee-Line provides for its employed riders.
- ◆ Of homemakers, 52% were making work-trips, while 20% were shopping. This finding is a reminder that we must be aware of the multiple roles played by homemakers, and to be wary of the assumption that a homemaker stays at home except when visiting or shopping.
- ◆ Almost half (49%) of those who described themselves as employed at home said they were making work-trips. Presumably this did not involve commuting *per se*, but trip for the purpose of work.
- ◆ Of students, 43% were making trips to or from school, but 39% were making work-trips.
- ◆ Of those who said they were unemployed, 28% said they were making a school-trip. Another 17%, paradoxically, said they were making a work-trip. Presumably such trips were made for purposes of part-time or temporary jobs the respondent did not consider regular employment.

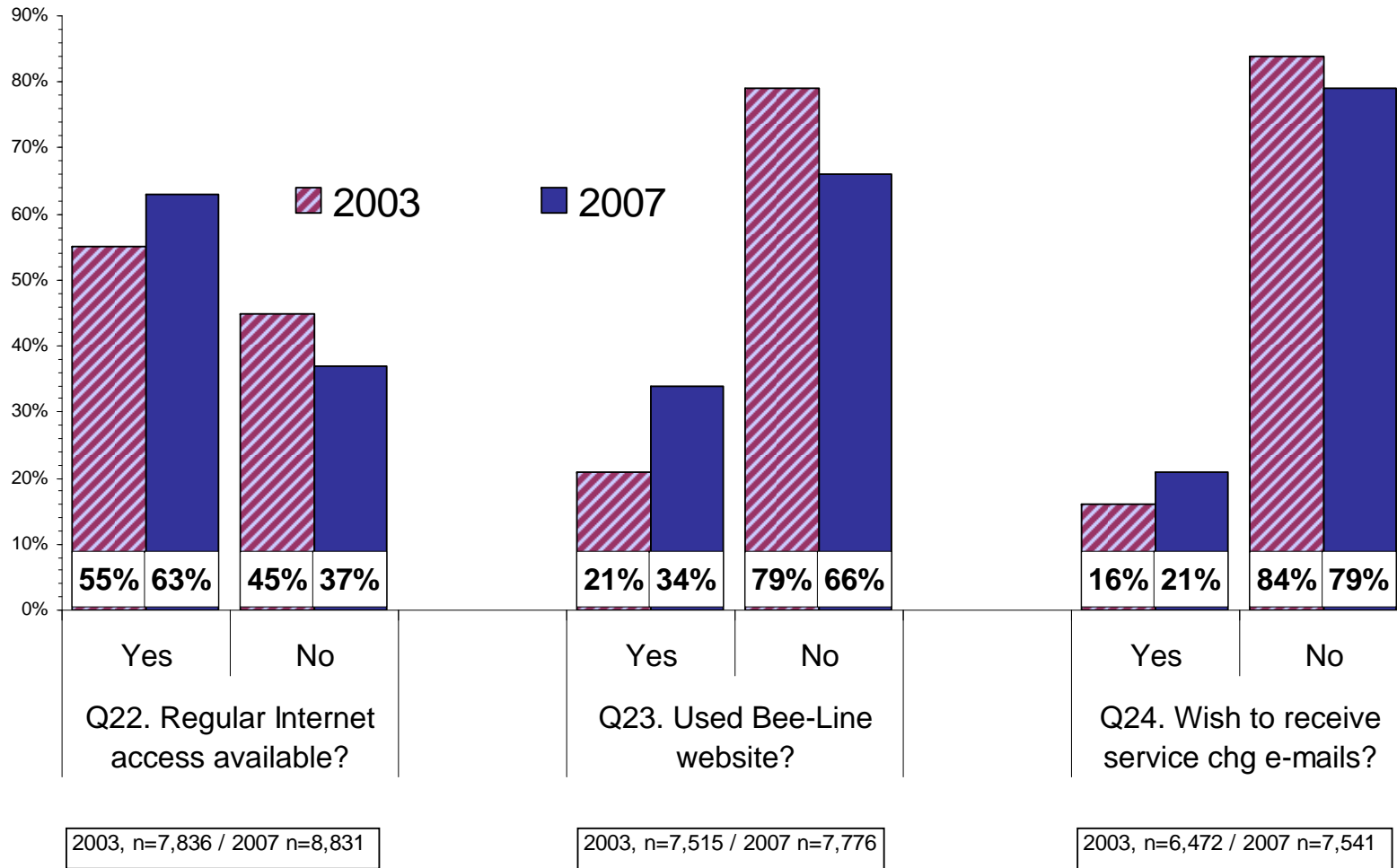
Retired persons were the group most likely to be making shopping trips (37%) or recreation trips (17%) when surveyed. Interestingly, 17% said they were making work-trips. Presumably, they have retired from a job, but continue to work in some other capacity.

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Use of the Internet

Figure 51 Internet Availability and Use, 2003 and 2007

(Sources: Questions 22, 23, 24 as shown)



Access to and use of the Internet

In 2003, 55% of Bee-Line riders said that they had regular Internet access available. By 2007, that had risen to 63%. Thus almost two-thirds of Bee-Line riders had regular Internet access at the time of the 2007 survey.

Table 10 Using the Internet, 2007

		Q22. Regular internet access available?		
		Yes	No	Table Total
Q23. Used Bee-Line website?	Yes	49%	8%	34%
	No	51%	92%	66%
Table Total		100%	100%	100%

		Q22. Regular internet access available?		
		Yes	No	Table Total
Q24. Wish to receive service chg emails?	Yes	24%	16%	21%
	No	76%	84%	79%
Table Total		100%	100%	100%

Of all Bee-Line riders, 34% said they have used the Bee-Line website (www.westchestergov.com/beelinebus). The first inset table shows that of those with regular Internet service, 49% said they had used the Bee-Line website. Of those without “regular Internet service,” 8% also said they had used the website. Apparently they do not consider whatever service they use (a friend’s, service at a library, etc.) as “regular,” but have accessed the website nevertheless.

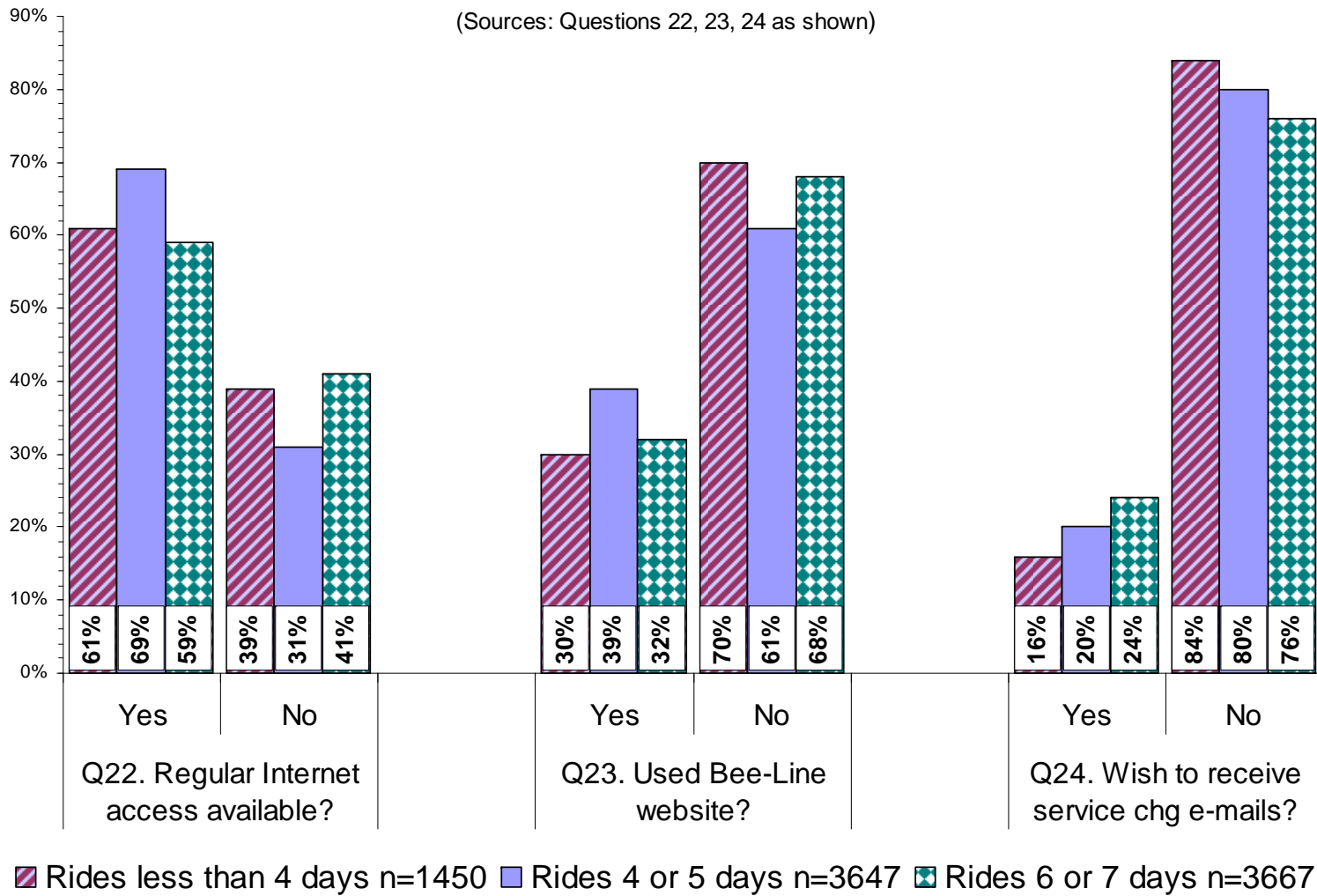
A similar tendency holds true for a desire to have e-mail updates. Of those who said they have no “access to the Internet on a regular basis,” 16% nevertheless expressed a desire for e-mail updates. We suspect that the term “access to the Internet on a regular basis” had varied definitions among respondents, and that some with

irregular access or e-mail-only devices would still like to receive e-mail notices.

It is interesting to note that although 63% said they have regular access to the Internet, only 34% said they had visited the website, and only 21% desired to receive service change e-mail messages. This suggests that for many riders, trips are sufficiently routine and reliable that they see no need for the kinds of updates that the Web and e-mail would provide.

Figure 52 Internet Availability and Use, by Rider Frequency Segments, 2007

(Sources: Questions 22, 23, 24 as shown)



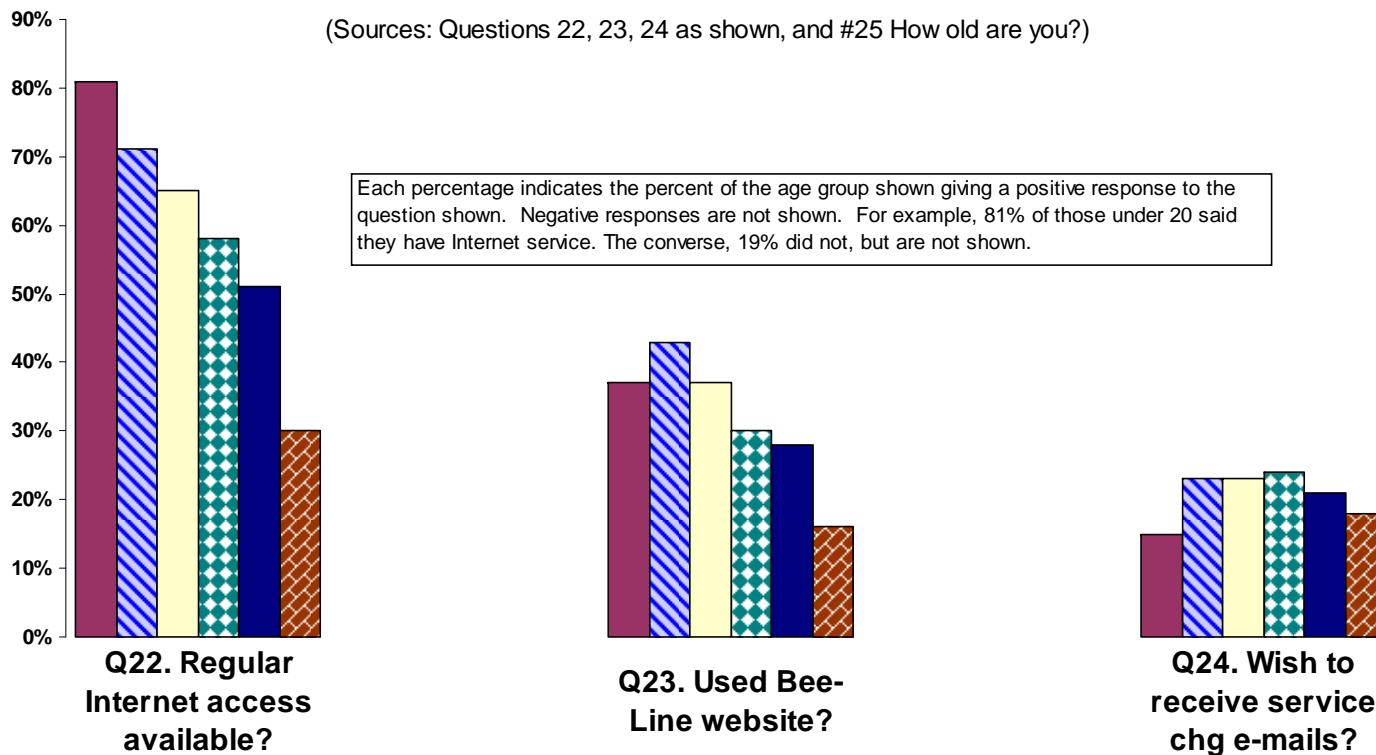
Access to and use of the Internet among rider frequency segments

There are some differences among the rider frequency segments in terms of having regular Internet access available. Specifically, those who use Bee-Line four or five days a week are more likely (69%) than the other two segments to say they have regular Internet access available. Those riders are somewhat more likely than the other segments to include students, and this may explain their somewhat greater degree of access. Similarly, the four and five day riders are somewhat more likely to say they have used the Bee-Line website (39%).

The segment most likely to say they wish to receive e-mails concerning service changes are those who use the system most intensively, six or seven days a week (24%). We may assume that their greater interest results from their consistent use of the system and their resulting greater need for timely information about service.

Figure 53 Internet Availability and Use, by Age, 2007

(Sources: Questions 22, 23, 24 as shown, and #25 How old are you?)



■ Under 20	81%	37%	15%
■ 20 - 29	71%	43%	23%
■ 30 - 39	65%	37%	23%
■ 40 - 49	58%	30%	24%
■ 50 - 59	51%	28%	21%
■ 60 or older	30%	16%	18%

Age, access, and use of the Internet

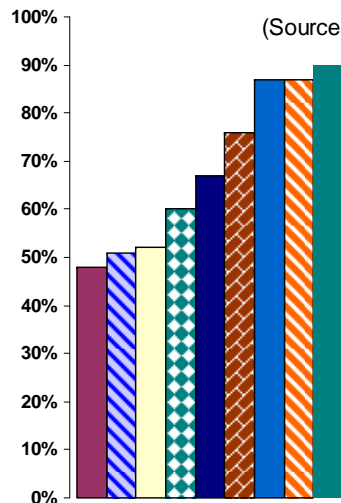
It comes as no surprise to see in the chart above that age is directly related to having regular Internet access. Of those under the age of 20, 81% said they have regular Internet access available. That percentage declines in an almost linear fashion with the increase in age such that only 30% of the group of riders who are 60 years old or older said that they have regular Internet access available.

Almost the same relationship occurs in having used the Bee-Line website. Essentially, with the exception of a slight deviation among those under twenty, the older the rider, the less likely he or she is to have used the Bee-Line website. There is, however, no relationship between age and a desire to receive service change e-mails from Bee-Line.

The relationship between age and Internet access means that not only is marketing and technological change driving the spread of access to and use of the Internet, but age itself is creating expanded use as young people age, displacing less web-savvy people older than they.

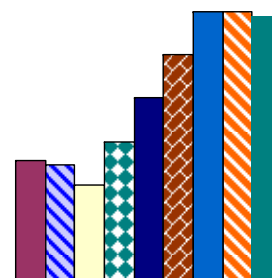
Figure 54 Internet Availability and Use, by Income, 2007

(Sources: Questions 22, 23, 24 as shown and #31 What is your annual household income?)

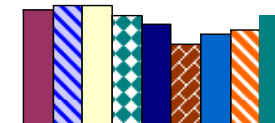


Q22. Regular Internet access available?

Each percentage indicates the percent of the income group shown giving a positive response to the question shown. Negative responses are not shown. For example, 48% of those with household incomes of less than \$10,000 said they have Internet access. The converse, 52% did not, but are not shown.



Q23. Used Bee-Line website?



Q24. Wish to receive service change emails?

■ Less than \$10,000	48%	25%	24%
■ \$10,000 to \$14,999	51%	24%	25%
■ \$15,000 to \$19,999	52%	20%	25%
■ \$20,000 to \$24,999	60%	29%	23%
■ \$25,000 to \$34,999	67%	38%	21%
■ \$35,000 to \$49,999	76%	47%	17%
■ \$50,000 to \$74,999	87%	56%	19%
■ \$75,000 to \$100,000	87%	56%	20%
■ More than \$100,000	90%	55%	23%

Income, access, and use of the Internet

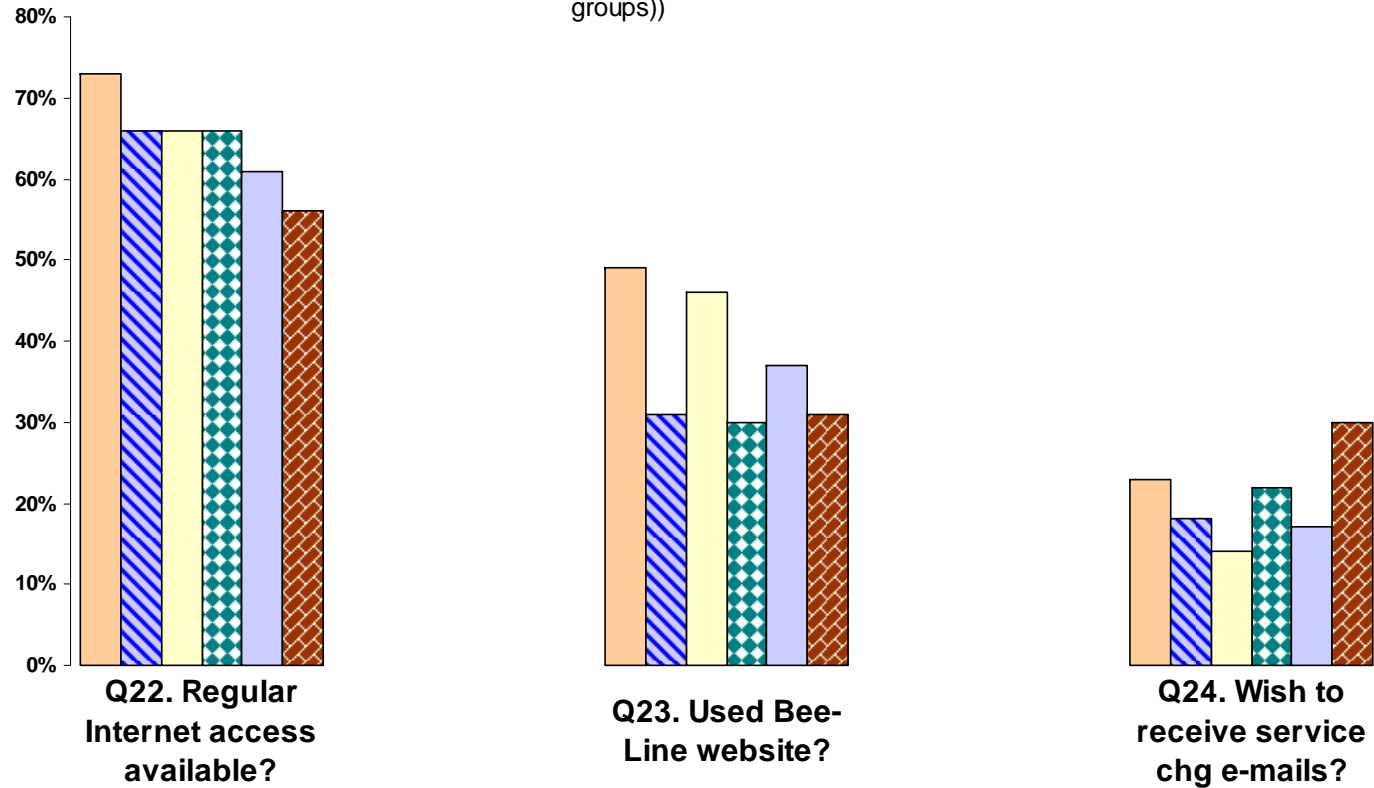
There is a direct relationship between income and access to the Internet. This is seen in the chart above in the first set of bars which show an almost linear relationship between the two factors of income and access. In short, the higher the income the more likely one is to have regular Internet access. At the high end, of those reporting household incomes of more than \$100,000, 90% indicated they have regular access. In contrast, only 48% of those reporting household incomes of less than \$10,000 reported having regular access. On the other hand, it is truly remarkable, given that the Internet is only about fifteen years old, that almost half of the population with very low incomes would already indicate they have regular access. Whether they are using public access such as libraries, or have a home account, in one way or another, even with low incomes they are finding a way to have access.

Having used the Bee-Line website is related to income in a complex way. At the lower income levels between the lowest level (less than \$10,000 a year for the household) through an income level of \$19,999 for the year, from 20 to 25% indicated that they had used the Bee-Line website. Above that income level, the higher the income the more likely a rider was to have used the website. However, at an income level of \$50,000, there is no longer an increase in the utilization of the website which stabilizes at 55% or 56%.

It is not surprising but it is interesting that the website is especially effective in reaching the population of riders with incomes exceeding \$50,000. Of course, having used the website does not mean that they use the website consistently but only that they have used it. In communication strategy, Bee-Line should consider that in spite of the remarkable spread of the Internet through all social classes, the reach of the website remains heavily skewed by income.

Figure 55 Internet Availability and Use, by Ethnic/Racial Groups, 2007

(Sources: Questions 22, 23, 24 as shown and #30 Which do you consider yourself? (i.e. referring to list of racial/ethnic groups))



Asian	73%	49%	23%
African-American	66%	31%	18%
White	66%	46%	14%
Other	66%	30%	22%
Native American Indian	61%	37%	17%
Hispanic	56%	31%	30%

Ethnic/racial self-identification, access, and use of the Internet

In the chart above, the self-identified racial and ethnic categories are presented in descending order of the percent who said they have regular Internet access available. Highest on the list were the Asian riders, with 73% saying they have regular access to the Internet. Following them were African-American riders (66%), and, also at 66%) those riders identifying themselves as White, or "Other." ("Other" is a miscellaneous group that was essentially not possible to categorize.)

The small sample of Native American Indians was next with 61% saying they have regular access to the Internet. The least likely to say they have regular Internet access available were the Hispanic riders (56%). Notice that although this group is less likely than others to say they have regular Internet access, a majority (56%) nevertheless said they have access.

The tendency to use the Bee-Line website varies considerably by ethnic/racial group, with those identifying themselves as Asian or White being more likely than others to say they have accessed the website. The desire to receive service change e-mails is unrelated to the use of the Bee-Line website. For example, although those identifying themselves as White were the second most likely to say they have used the Bee-Line website (46%), only 14% of that group said they wanted to receive service change e-mails. Also, although Hispanics were among the least likely (31%) to say they have used the Bee-Line website, they were the most likely to say they wanted to receive service change e-mails (30%).

The use of electronic communication in the transit industry is too new to reach any long-term conclusions based on the data. For now, the chart above does give us a snapshot of how these various cultural groups use the Internet, but we know that these tendencies, the capacity of the technology, and cost reductions of access to the technology, are all changing rapidly. For this reason, while the chart does give us a one-time picture, it does not predict what might be true next year or three years from now. The only conclusion we could reach for the future is that access to the Internet is likely to be even more widespread among all populations in several years than it is today. However, we do not know how that will translate into a desire for website information or constant communication via e-mail, text messages, or whatever other text-based communications might emerge.



Appendices

Appendix A: Survey Questionnaire



Westchester County Executive
Andrew J. Spano, Westchester County Executive
County Board of Legislators
Lawrence C. Selby, Commissioner

El cuestionario es imprimido en español del otro lado.

To improve service, the Bee-Line system would like to know about you and how you use the bus. Please circle or write in your answers. All information is anonymous. Please **do not** put your name on this form.

Please tell us how you use Bee-Line.

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?
 - (1) Less than 1 year (2) 1–3 years (3) More than 3 years
3. What is the main purpose of your bus trip today? (Choose one)
 - (1) Work (2) Shopping (3) Recreation or entertainment
 - (4) School (5) Job seeking (6) Health or medical
 - (7) Other _____
4. How did you get to the Bee-Line stop where you boarded this bus? (Circle all that apply)
 - (1) Walked (2) Drove (3) Driven by someone else
 - (4) Taxi (5) Bicycled (6) Private vanpool
 - (7) Bee-Line Bus - Which route number? # _____
 - (8) Metro-North - Which station? _____
 - (9) New York City Bus - Which route number? # _____
 - (10) New York City Subway - Which station? _____
 - (11) Other: _____
5. How did you pay your bus fare today?
 - (1) Cash fare (2) MetroCard (3) Student Card (4) Metro-North Uniticket
6. Do you have a MetroCard? (1) Yes (2) No → (If "No," Please skip to #9)
7. Where did you get your MetroCard?
 - (1) Local Merchant (2) NYC Subway Station
 - (3) Metro-North Train Station (4) MetroCard Sales Van
 - (5) Westchester County Center (6) By Mail
 - (7) Other _____
8. How did you pay for your MetroCard?
 - (1) Cash (2) Credit or Debit Card
 - (3) TransitChek (4) EBT Benefit Card
 - (5) Other _____
9. Did you use a Senior Citizen or Disabled Passenger discount for this trip? (1) Yes (2) No

Please rate Bee-Line service

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

22. Do you have access to the Internet on a regular basis? (1) Yes (2) No
23. Have you used Bee-Line's website (www.westchestergov.com/beeinebus)? (1) Yes (2) No
24. Do you wish to receive e-mail notices on Bee-Line service changes? (1) Yes (2) No
e-mail address _____
25. How old are you? _____ Years old
26. Please circle all of the following that apply to you.
 - (1) Employed outside your home (2) Employed for pay at home
 - (3) Student (4) Homemaker (5) Unemployed (6) Retired
27. Do you have a disability that makes it difficult for you to use public transportation? (1) Yes (2) No
28. How many cars or other motor vehicles are available for you to use? 0 (None) 1 2 3 or more
29. Are you female or male? (1) Female (2) Male
30. Which do you consider yourself? (Circle all that apply)
 - (1) African American/Black (2) Asian (3) Hispanic
 - (4) White (5) Native American Indian (6) Other: _____
31. What is your total annual household income?
 - (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

32. In what city and ZIP code did you begin this entire trip (where you started, even if you have transferred)?
City: _____ ZIP code: _____

33. What is the street intersection nearest to the stop where you got on this bus, and the name of a major landmark there?

Major street: _____
Cross street: _____
Landmark: _____

34. Did you, or will you, transfer to or from another service during this trip? (Circle all that apply) (1) No such transfer on this trip
 - (2) Other Bee-Line Bus - Which route number? # _____
 - (3) Metro-North - Which station? _____
 - (4) New York City Bus - Which route number? # _____
 - (5) New York City Subway - Connect at which station? _____
 - (6) Other: _____

35. What is the street intersection nearest to the bus stop where you will get off this bus and the name of a major landmark there?

Major street: _____
Cross street: _____
Landmark: _____

36. In what city and ZIP code will you end this trip?

City: _____ ZIP code: _____

37. If this Bee-Line route were not available, how would you make this trip? (Circle all that apply) (1) Would not make this trip (2) Walk

(3) Drive (4) Drive with others (5) Taxi (6) Bicycle (7) Private vanpool
(8) Different Bee-Line route - Which route? # _____
(9) Metro-North - Which station? _____
(10) New York City Bus - Which route number? # _____
(11) New York City Subway - Which station? _____
(12) Other: _____

38. If you were to have made this trip by car, which highways (if any) would you have used? (Circle all that apply) (1) I-87 (2) I-95 (3) I-684 (4) I-287

(5) Bronx River Parkway (6) Sprain Brook Parkway (7) Hutchinson River Parkway
(8) Saw Mill River Parkway (9) Taconic State Parkway (10) Cross County Parkway
(11) Other: _____

Comments: _____

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



Westchester County Executive
Andrew J. Spano, Westchester County Executive
County Board of Legislators
Lawrence C. Selby, Commissioner



Westchester gov.com
 Bee-Line System
 Andrew J. Sparo, Westchester County Executive
 County Board of Legislators
 Lawrence C. Salley, Commissioner

The questionnaire is printed in English on the other side.

Para mejorar nuestro servicio, a Bee-Line le gustaría saber cómo usted utiliza el autobús. Por favor, marque su respuesta con un círculo

o escribala. Toda esta información permanecerá anónima. Por favor, no escriba su nombre en este formulario.

Díganos cómo utiliza el sistema Bee-Line.

- En una semana típica, ¿usualmente cuántos días utiliza el sistema Bee-Line? 7 6 5 4 3 2 1 0—No soy un pasajero frecuente
- ¿Desde hace cuánto tiempo ha sido pasajero de Bee-Line?
 (1) Menos de un año (2) 1 – 3 años (3) Más de 3 años
- ¿Cuál es el motivo principal de su viaje en autobús hoy? (Marque una opción)
 (1) Trabajo (2) De Compras (3) Recreación o entretenimiento
 (4) Escuela (5) Búsqueda de trabajo (6) Salud o médico
 (7) Otro _____
- ¿Cómo llegó a la parada de Bee-Line donde abordó este autobús? (Marque con un círculo todas las que aplican)
 (1) Caminé (2) Manejé (3) Otra persona me dejó en la parada de autobús
 (4) En taxi (5) En bicicleta (6) En transporte privado en grupo
 (7) Autobús de Bee-Line - ¿Cuál número de ruta? # _____
 (8) Metro-North - ¿Cuál estación? _____
 (9) Autobús de la Ciudad de NY - ¿Cuál número de ruta? # _____
 (10) Subway de la Ciudad de NY - ¿Cuál estación? _____
 (11) Otro: _____
- ¿Cómo pagó el pasaje de autobús hoy?
 (1) En efectivo (2) MetroCard (3) Tarjeta de estudiante (4) Uniticket de Metro-North
- ¿Tiene una tarjeta MetroCard? (1) Sí (2) No →(Por favor, vaya a la pregunta #9)
- ¿Dónde compró su tarjeta MetroCard?
 (1) Tienda local (2) Estación de subway de la Ciudad de NY
 (3) Estación de tren Metro-North (4) Camioneta de venta de MetroCard
 (5) Westchester County Center (6) Por correo
 (7) Otro _____
- ¿Cómo pagó su tarjeta MetroCard?
 (1) En efectivo (2) Tarjeta de crédito o débito
 (3) TransitChek (4) Tarjeta de beneficios EBT
 (5) Otro _____
- ¿Utilizó el descuento para personas mayores o para pasajeros incapacitados en este viaje? (1) Sí (2) No

¿Cómo calificaría usted el servicio de Bee-Line?

	Excelente				Inferior
10. Calidad total del servicio de Bee-Line	5	4	3	2	1
11. Limpieza	5	4	3	2	1
12. Amabilidad del conductor	5	4	3	2	1
13. Horas de servicio	5	4	3	2	1
14. Comodidad total	5	4	3	2	1
15. Conveniencia total	5	4	3	2	1
16. Suficiencia de asientos	5	4	3	2	1
17. Frecuencia del servicio	5	4	3	2	1
18. Eficiencia del servicio	5	4	3	2	1
19. Disponibilidad de horarios	5	4	3	2	1
20. Puntualidad	5	4	3	2	1
21. Disponibilidad de tarjetas MetroCard	5	4	3	2	1
22. ¿Tiene acceso al Internet con frecuencia?				(1) Sí	(2) No
23. ¿Ha utilizado el sitio web de Bee-Line (www.westchestergov.com/beelinebus)?				(1) Sí	(2) No
24. ¿Le gustaría recibir notificaciones por correo electrónico acerca de cambios en el servicio de Bee-Line?				(1) Sí	(2) No
Dirección de correo electrónico _____					
25. ¿Cuántos años tiene?	_____ años				
26. Marque con un círculo todas las opciones que aplican a usted.					
	(1) Empleado fuera de su casa	(2) Empleado con paga en su casa			
	(3) Estudiante	(4) Ama de casa	(5) Desempleado	(6) Retirado	
27. ¿Padece de alguna incapacidad que le impida utilizar el transporte público?	(1) Sí (2) No				
28. ¿Cuántos autos o vehículos de algún otro tipo tiene a su disposición?	0 (Ninguno) 1 2 3 o más				
29. ¿Es usted hombre o mujer?	(1) Mujer (2) Hombre				
30. ¿Cómo se considera usted? (Marque con un círculo todas las que aplican)					
	(1) Afro-americano/Negro	(2) Asiático	(3) Hispano		
	(4) Blanco	(5) Indio nativo americano	(6) Otro: _____		
31. ¿Cuál es el ingreso anual total del hogar?					
	(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		

32. ¿En cuál ciudad y código postal inició este viaje (donde usted comenzó, aunque haya realizado un trasbordo)?

Ciudad: _____ Código postal: _____

33. ¿Cuál es la intersección más cercana a la parada de autobús donde abordó este autobús y cuál es el lugar o edificio más sobresaliente allí?

Calle principal: _____

Calle que cruza: _____

Edificio o lugar más sobresaliente: _____

34. ¿Hizo, o va a hacer, un trasbordo a otro o desde otro servicio durante este viaje? (Marque con un círculo todas las que aplican)

- (1) No hay un trasbordo en este viaje
- (2) Otro autobús de Bee-Line - ¿Cuál número de ruta? _____
- (3) Metro-North - ¿Cuál estación? _____
- (4) Autobús de la Ciudad de NY - ¿Cuál número de ruta? _____
- (5) Subway de la Ciudad de NY - ¿Cuál estación? _____
- (6) Otro: _____

35. ¿Cuál es la intersección más cercana a la parada de autobús donde bajará de este autobús y cuál es el lugar o edificio más sobresaliente allí?

Calle principal: _____

Calle que cruza: _____

Edificio o lugar más sobresaliente: _____

36. ¿En cuál ciudad o código postal terminará este viaje?

Ciudad: _____ Código postal: _____

37. Si esta ruta de Bee-Line no estuviera disponible, ¿cómo haría este viaje?

- (1) No haría este viaje (2) Caminaría
- (3) Manejaría (4) Viajaría con otras personas (5) En taxi (6) En bicicleta
- (7) En transporte privado en grupo
- (8) Otra ruta de Bee-Line - ¿Cuál ruta? _____
- (9) Metro-North - ¿Cuál estación? _____
- (10) Autobús de la Ciudad de NY - ¿Cuál número de ruta? _____
- (11) Subway de la Ciudad de NY - ¿Cuál estación? _____
- (12) Otro: _____

38. Si tuviera que hacer este viaje en auto, ¿cuál carretera utilizaría (si utilizara alguna)? (Marque todas las que aplican) (1) I-87 (2) I-95 (3) I-684 (4) I-287

- (5) Bronx River Parkway (6) Sprain Brook Parkway (7) Hutchinson River Pkwy
- (8) Saw Mill River Parkway (9) Taconic State Parkway (10) Cross County Parkway
- (11) Otra: _____

Comentarios: _____

Por favor entregue el formulario al personal de inspección que se encuentra en este autobús. ¡Muchas gracias!



Appendix B: Understanding the Origin and Destination Locations

The data used in this appendix and the text of the appendix were prepared by Mr. Vincent J. Pasquale, Westchester Department of Transportation using the 2007 Onboard Survey data as the source. The text in this section refers to the tables and maps that begin on page 160 with Table 11 Origins and Destinations of Bee-Line Passengers.

Although origin and destination studies often gather data at the very detailed level of bus stops, it is useful in this study to report data regarding boarding and alighting from the perspective of general areas defined by *clusters of bus stops*, rather than from the perspective of individual bus stops.

There are several reasons this report describes origin and destination in general terms rather than at the detailed level of bus stop. First, the scope of this study did not include the collection of detailed passenger on/off counts by bus stop. Also, boarding and alighting locations were self-reported. For example, boarding and alighting locations were often recorded by respondents, not as specific intersections or addresses, but by landmark or neighborhood, each of which might include several bus stops. Typically, these locations were central business districts (CBDs) of major cities, shopping centers, office parks, college campuses, or hospitals. Thus, it is difficult to infer origin and destination at the bus stop level of detail from passenger responses.

Another limitation to the bus stop level of detail involves the fact that stations on the three divisions of the Metro-North commuter railroad and subway stations in the north Bronx were also frequently cited. Many of the Bee-Line riders traveling to and from these stations transferred to these other transit services and therefore they cited the stations as their boarding or alighting points. Many other riders used only Bee-Line. They might live and/or work in these densely developed communities in which the stations are located and therefore they, too, might cite the stations as their point of boarding or alighting.

For all of these reasons, establishing geographic parameters around general points of origin (boarding) and destination (alighting), thus defining these bus stop clusters, helps define and isolate them from one another and provides a greater understanding of the dynamics of the assembly and dissolution of passenger loads throughout the Bee-Line system.

This section of the report contains a description of the CBDs and other areas in which concentrations of boardings and alightings were tabulated, as well as a description of the commuter railroad system serving Westchester County and the New York City MTA subway system, which connects with Bee-Line service in The Bronx. This section of the report

serves as a companion and guide to the table listing passenger boardings and alightings by municipality and locations of special interest.

These descriptions will serve as an introduction to the charts, tables, and maps that follow.

Central Business Districts

Westchester County contains four larger cities in which most Bee-Line riders board, alight, or transfer. These include Yonkers, with a population of approximately 200,000, New Rochelle (70,000), Mount Vernon (70,000), and White Plains (55,000). The first three are located along or near the New York City border, while White Plains is roughly in the center of the county and is the seat of Westchester County government as well as having the highest density of commercial development of the group.

Yonkers

The Yonkers CBD is known as Getty Square. It includes the Yonkers station on the Hudson division of Metro-North commuter railroad, which also provides Amtrak service, Yonkers city hall, County, State and Federal offices, one hospital, the city's main library, and a large post office that serves not only the city but several adjoining municipalities. While there is considerable retail development in the CBD, there are relatively few private commercial offices and no hotels, theaters, or other recreation or entertainment venues and minimal residential development.

For purposes of this study, its boundaries are defined as extending from Park Hill Avenue on the south, north to Manor House Square, and between New Main Street and the railroad, which runs parallel to the Hudson River at the city's western border.

The City of Yonkers includes four other areas for which data have been isolated. These include Central Park Avenue, described in greater detail below, the Cross County Shopping Center, the Yonkers Raceway, and the Empire City Casino, and the shopping center on Stew Leonard Drive, served by a single route (78), but drawing employees and shoppers to an enclave of major retailers.

Yonkers borders The Bronx, and the Bee-Line provides direct connections to three subway lines, on Jerome Avenue primarily Woodlawn and Bedford Park, at Van Cortlandt Park (Broadway at W 242nd Street) and at White Plains Road and E 238th Street.

Mount Vernon

Downtown Mount Vernon hosts the city's administrative offices as well as offices of other levels of government. Like Yonkers, there is a hospital, a post office, and a library, as well significant retail development, but no hotels, theaters, or other recreational facilities. The boundaries of the CBD extend from Sidney Avenue on the north to 5th Avenue on the west along 2nd Street to 1st Avenue/Park Avenue and the Mount Vernon East railroad station, on Metro-North's New Haven division. The CBD also includes Petrillo Plaza, the primary transfer point for Bee-Line routes traveling through the city. The city also contains two stations on the Harlem division of Metro-North, Fleetwood in the northeastern corner of the city and Mount Vernon West in the southeast.

Mount Vernon borders The Bronx, and its southern boundary is within three blocks of New York City's two northernmost subway stations, at White Plains Road at E 241st Street and at Dyre Avenue.

White Plains

Unlike Yonkers and Mount Vernon, downtown White Plains contains a core of very high density development, including commercial office and retail space (including several malls), residential buildings, hotels, theaters, colleges, a major hospital, and offices of all four levels of government. It also includes a Metro-North Harlem division rail station adjacent to the White Plains Transcenter, the central hub of the Bee-Line bus system, where dozens of routes converge. The Transcenter has the county's highest boarding and alighting counts and is the primary transfer point for the system.

The White Plains CBD is quite large and extends from the railroad station east to Bloomingdale Rd, and from Hamilton Avenue to Maple Avenue. There is a second Metro-North station, North White Plains, on the city's northeastern border.

New Rochelle

Like White Plains, downtown New Rochelle also contains an intermodal transportation hub, the New Rochelle Transit Center, adjacent to a Metro-North rail station on the New Haven division, which, like Yonkers, incorporates an Amtrak station. It also includes Federal and County offices, an extensive retail base, a large recreation complex, theaters, hotels and moderate-to-high density residential development, although the city's administrative offices and large college campuses are located elsewhere.

New Rochelle is bounded by I-95 on the north, Main Street on the south, and extends east and west between the two junctions of Main and Huguenot Streets, which are one-way corridors of US 1, and encapsulate much of the downtown.

New Rochelle also includes two heavily traveled corridors feeding the downtown, North Avenue, on which City Hall and Iona College are located, and Pelham Road, which runs parallel to US 1 along Long Island Sound and serves a high-density residential community and the College of New Rochelle, while providing a conduit into The Bronx along its eastern border. The city's primary subway connection is to the Pelham Bay station in the east Bronx via Pelham Road.

Corridors And Other Major Destinations

Greenburgh

Westchester's largest town, Greenburgh, contains six villages, and two primary corridors, Central Avenue and Tarrytown Road. Data are reported separately for all of these. Also reported separately is Westchester Community College, the county's largest educational facility, whose data is reported with the nearby Grasslands Reservation as Valhalla. Rail service is provided in Hartsdale at the Harlem division Metro-North station, and three Bee-Line routes operate between residential neighborhoods in the town and the Hartsdale station. With retail and office development located primarily along Central Avenue and Tarrytown Road, and government facilities and residential population dispersed throughout the town, there really is no CBD as established in the cities. The town contains six villages, with bus connections to 3 Metro-North stations on the Hudson division in Hastings on Hudson, Dobbs Ferry, and Tarrytown.

A large portion of southern Greenburgh is served by the Scarsdale post office, and there are two bus routes that operate in this area and connect to the Scarsdale railroad station, also on Metro-North's Harlem division. One of these routes also connects with the Hudson division in Dobbs Ferry and the New Haven division in New Rochelle.

Greenburgh was not separately identified in the 2003 survey but is in the 2007 survey. The reason was that most of Greenburgh and its population are typically identified as belonging to one of its component villages or neighborhoods or even an adjoining municipality rather than to the larger entity, "Greenburgh." In 2007, however, WCDOT succeeded in assigning the respondents to Greenburgh to provide a level of generalization equivalent to the other clustered entities. Therefore, the charts comparing 2003 and 2007 data do not place these current data in historical context. However, we hope that this study provides a baseline for future comparison.

Scarsdale

The Village of Scarsdale is comparatively small, yet its post office is much larger, serving areas of five other municipalities, and thus is often used by local residents as nomenclature to describe the entire area. As a result, as it is

also true of Greenburgh, data for Scarsdale are often misrepresented, usually inflated at the town's expense. Figures compiled from these survey responses are allocated to these municipalities only when verifiable.

Although a large number of Bee-Line riders reported Scarsdale as destination or trip origin location, most of these were in fact traveling to or from the areas of Eastchester, Greenburgh, New Rochelle and Yonkers bordering the village and sharing its ZIP code. Several Bee-Line commuter routes connect these primarily residential areas with downtown Scarsdale and account for a significant volume of riders transferring to Metro-North at the Scarsdale station.

Valhalla

This area includes portions of several towns, but is largely associated with two major transit destinations, Westchester Community College in the Town of Greenburgh, and the Grasslands Reservation in the Town of Mount Pleasant. The Reservation includes the Westchester County Corrections complex, the New York Medical College and the Westchester Medical Center, which contains several different hospital and nursing care facilities. Each town is served by several bus routes connecting directly to White Plains, Yonkers, Mount Vernon and points north, including express service from The Bronx and Mount Vernon.

Central Avenue

Also known as Central Park Avenue (in Yonkers and southern Greenburgh) and North and South Central Avenues (in the Hartsdale section of Greenburgh) Central Avenue is both a collection of origin and destination points and the primary north-south conduit for Bee-Line riders traveling between White Plains, Yonkers, The Bronx, and Manhattan. It includes extensive residential and retail development, including the Cross County Shopping Center, the county's largest retail mall, and Yonkers Raceway and Empire City Casino, the largest recreation/entertainment venue in Westchester County. It is primarily served by Route 20 (with limited stop express service as Route 21) and the BxM4C express to Manhattan, and also hosts short sections of other routes. It intersects several major east-west corridors upon which other high-volume Bee-Line routes operate, such as Route 7, which also serves the raceway/casino complex, and connects the downtowns of Yonkers, Mount Vernon, and New Rochelle, and Route 25, which provides service directly between Cross County shopping center and the White Plains Road subway in The Bronx at E 238th Street.

Tarrytown/White Plains Road (New York State Route 119)

Beginning as White Plains Road in Tarrytown, becoming East and West Main Street in Elmsford and Tarrytown Road in Greenburgh and White Plains, it is NYS Route 119 for its entire extent. This corridor includes several office parks, retail malls, and limited residential development. Many Bee-Line routes operate on NYS Route 119. Along with I-287, which it parallels, Tarrytown/White Plains Road is the primary east-west corridor in the central portion of the county.

Westchester Avenue

Westchester Avenue parallels I-287 through the eastern portion of the county from the City of White Plains through the Town of Harrison and the Village of Rye Brook before ending in downtown Port Chester, near the Port Chester Railroad Station. It is known as the “platinum mile” due to the extensive office development that has emerged along the entire corridor. This area includes several corporate headquarters and numerous office parks as well as the sectional center of the U.S. Post Office.

In addition to regular local Bee-Line service, there are several peak hour shuttle routes connecting clusters of employment generators with the White Plains Transcenter and Metro-North station. Due to the nature of the assignment of mailing addresses, many buildings have White Plains addresses although they are located in the Town of Harrison. Most respondents who cited locations along Westchester Avenue as their boarding or alighting point did not make a distinction, and typically simply cited Westchester Avenue as the origin or destination of their trip. These were not allocated to either municipality unless further information was supplied and thus do not appear in the tables.

The Bronx

Information regarding boardings and alightings in The Bronx is more difficult to analyze than data collected within Westchester. There are 12 Bee-Line routes that connect directly to subway stations in The Bronx. Two of these stations are very close to the county border in densely populated neighborhoods; others are further south in areas with lower

population density, though including Lehman College of CUNY, Fordham University, and Manhattan College. Bee-Line routes also provide access to the Bronx Zoo and Botanical gardens.

Most respondents with origins or destinations (or both) in The Bronx cited subway stations or the street intersections at which stations are located as the point at which they boarded or alighted.

Although many of these respondents did not indicate that they had ridden a subway or New York City bus before boarding their Bee-Line bus or planned to do so after alighting, many cited areas in Manhattan, Brooklyn, Queens, or elsewhere in The Bronx as the ultimate origin or destination of their trip. From this information, we can infer that there might be substantial under-reporting of the extent to which riders transferred between Bee-Line and MTA services.

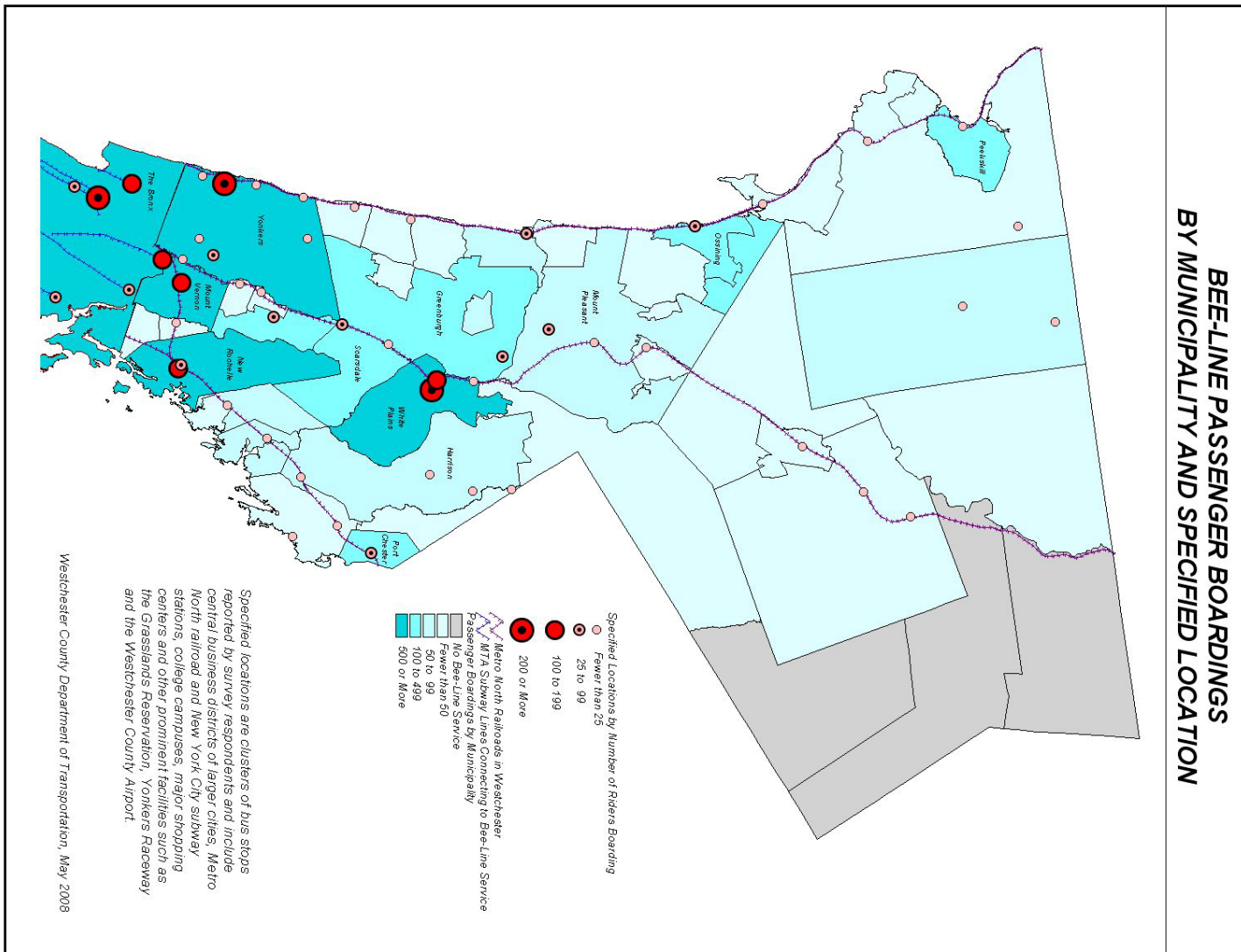
Unless specific locations elsewhere along the Bee-Line routes operating in The Bronx were cited, the subway stations are reported as the reference points for boarding and alighting. There is also an area in the east Bronx where the Bee-Line provides the primary local east-west transit service and significant intra-Bronx ridership uses this service. These data are reported separately.

Manhattan

Boarding or alighting a Bee-Line bus in Manhattan is limited to Route 28 (BxM4C), which provides express commuter service from White Plains, with stops in Greenburgh and Yonkers, through the Bronx (with no stops) to points in Manhattan ranging from 98th Street south to Wall Street and on to Bowling Green at the southern tip of Manhattan. As mentioned in the description of The Bronx service, there were additional respondents whose trips originated in Manhattan but utilized buses or subways within the city to connect with Bee-Line buses in The Bronx.

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Figure 56 Map of Boardings (Prepared by WCDOT, 2007)



BEE-LINE PASSENGER BOARDINGS BY MUNICIPALITY AND SPECIFIED LOCATION

Figure 57 Map of Alightings (Prepared by WCDOT, 2007)

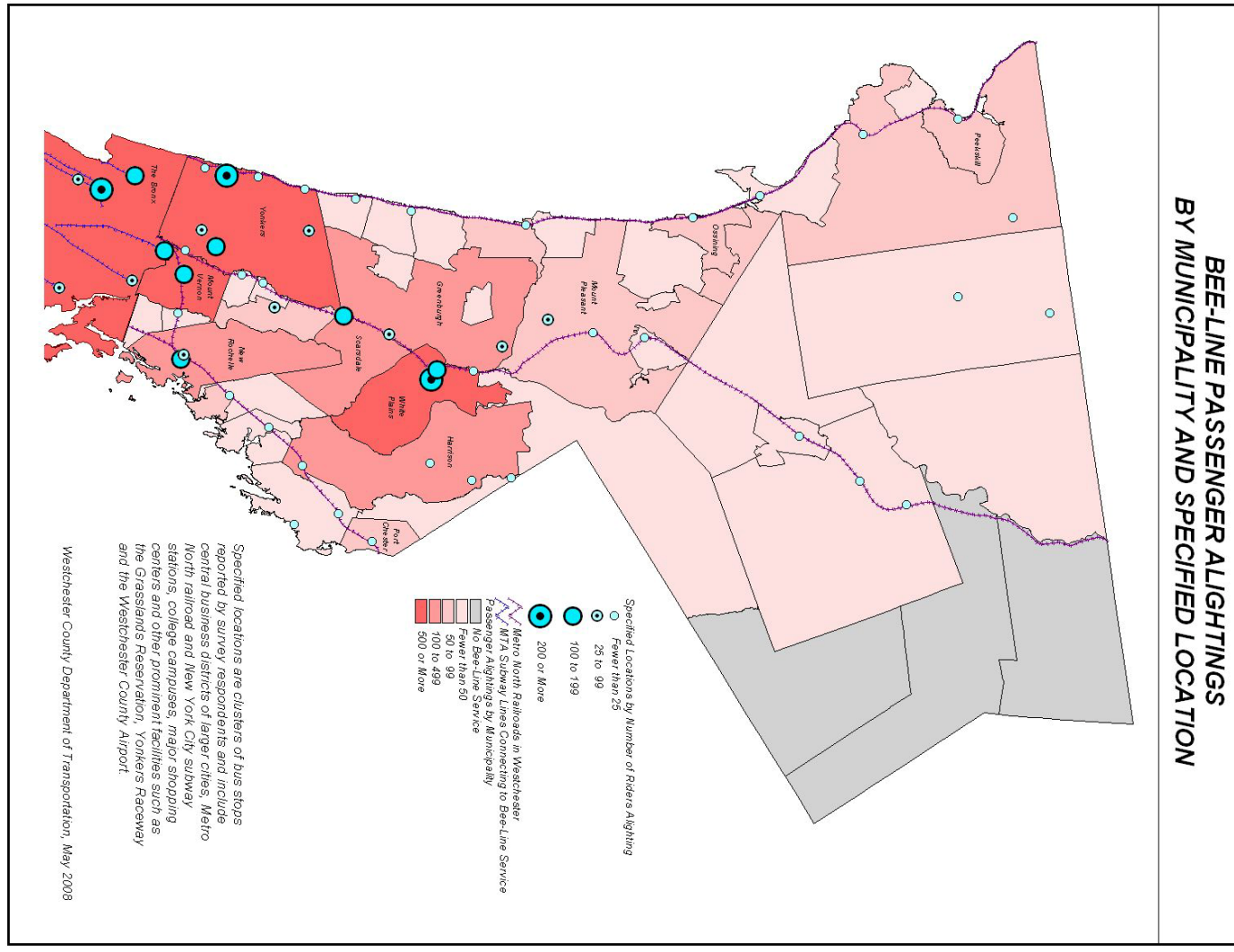


Table 11 Origins and Destinations of Bee-Line Passengers in Municipalities with More Than 1.0% of Total Boardings and Alightings, 2007

PASSENGERS SURVEYED BY LOCATION OF BOARDING AND ALIGHTING: MUNICIPALITIES WITH MORE THAN 1.0% OF TOTAL BOARDINGS AND ALIGHTINGS

MUNICIPALITY	SURVEYED TRIP ORIGIN LOCATION	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
YONKERS	TOTAL	2,323	30.73%	1,926	27.66%	4,249	29.26%
	YONKERS CENTRAL BUSINESS DISTRICT	471	6.23%	333	4.78%	804	5.54%
	CBD: YONKERS RAILROAD STATION	18	0.24%	7	0.10%	25	0.17%
	CBD: GETTY SQUARE (REMAINDER)	453	5.99%	326	4.68%	779	5.36%
	CENTRAL (PARK) AVENUE	415	5.49%	510	7.32%	925	6.37%
	CENTRAL PARK AVENUE: CROSS COUNTY SHOPPING CENTER	67	0.89%	173	2.48%	240	1.65%
	CENTRAL PARK AVENUE: YONKERS RACEWAY & CASINO	20	0.26%	33	0.47%	53	0.36%
	CENTRAL PARK AVENUE: (REMAINDER)	328	4.34%	304	4.37%	632	4.35%
	STEW LEONARD DRIVE SHOPPING CENTER	3	0.04%	39	0.56%	42	0.29%
	LUDLOW RAILROAD STATION	1	0.01%	0	0.00%	1	0.01%
	GLENWOOD RAILROAD STATION	0	0.00%	1	0.01%	1	0.01%
	GREYSTONE RAILROAD STATION	0	0.00%	2	0.03%	2	0.01%
	YONKERS (REMAINDER)	1,433	18.96%	1,041	14.95%	2,474	17.03%
WHITE PLAINS	TOTAL	853	11.28%	1,009	14.49%	1,862	12.82%
	WHITE PLAINS CENTRAL BUSINESS DISTRICT	528	6.98%	635	9.12%	1,163	8.01%
	CBD: WHITE PLAINS TRANSCENTER	148	1.96%	174	2.50%	322	2.22%
	CBD: RAILROAD STATION	145	1.92%	97	1.39%	242	1.67%
	CBD: WHITE PLAINS CBD REMAINDER	235	3.11%	364	5.23%	599	4.12%
	NORTH WHITE PLAINS RAILROAD STATION	16	0.21%	1	0.01%	17	0.12%
	CENTRAL AVENUE	20	0.26%	19	0.27%	39	0.27%
	TARRYTOWN ROAD	19	0.25%	25	0.36%	44	0.30%
	WESTCHESTER AVENUE	6	0.08%	39	0.56%	45	0.31%
	WHITE PLAINS (REMAINDER)	264	3.49%	290	4.16%	554	3.81%
MOUNT VERNON	TOTAL	723	9.56%	566	8.13%	1,289	8.87%
	MOUNT VERNON CENTRAL BUSINESS DISTRICT	187	2.47%	126	1.81%	313	2.16%
	CBD: PETRILLO PLAZA	114	1.51%	56	0.80%	170	1.17%
	CBD: MOUNT VERNON EAST RAILROAD STATION	15	0.20%	20	0.29%	35	0.24%
	CBD: MOUNT VERNON CBD REMAINDER	58	0.77%	50	0.72%	108	0.74%
	MOUNT VERNON WEST RAILROAD STATION	8	0.11%	9	0.13%	17	0.12%
	FLEETWOOD RAILROAD STATION	4	0.05%	2	0.03%	6	0.04%
	MOUNT VERNON (REMAINDER)	524	6.93%	429	6.16%	953	6.56%

(Table continues)

MUNICIPALITY	SURVEYED TRIP ORIGIN LOCATION	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
NEW ROCHELLE	TOTAL	581	7.69%	497	7.14%	1,078	7.42%
	NEW ROCHELLE CENTRAL BUSINESS DISTRICT	184	2.43%	175	2.51%	359	2.47%
	CBD: NEW ROCHELLE TRANSIT CENTER	39	0.52%	47	0.67%	86	0.59%
	CBD: NEW ROCHELLE RAILROAD STATION	28	0.37%	23	0.33%	51	0.35%
	CBD: NEW ROCHELLE CBD REMAINDER	117	1.55%	105	1.51%	222	1.53%
	IONA COLLEGE	9	0.12%	4	0.06%	13	0.09%
	NEW ROCHELLE (REMAINDER)	388	5.13%	318	4.57%	706	4.86%
GREENBURGH	TOTAL	245	3.24%	286	4.11%	531	3.66%
	CENTRAL (PARK) AVENUE	61	0.81%	55	0.79%	116	0.80%
	TARRYTOWN/WHITE PLAINS RD	46	0.61%	51	0.73%	97	0.67%
	HARTSDALE RAILROAD STATION	22	0.29%	55	0.79%	77	0.53%
	VALHALLA: WESTCHESTER COMMUNITY COLLEGE	29	0.38%	43	0.62%	72	0.50%
	GREENBURGH (REMAINDER)	87	1.15%	82	1.18%	169	1.16%
SCARSDALE	TOTAL	112	1.48%	210	3.02%	322	2.22%
	SCARSDALE RAILROAD STATION	40	0.53%	162	2.33%	202	1.39%
	SCARSDALE (REMAINDER)	72	0.95%	48	0.69%	120	0.83%
OSSINING	TOTAL	134	1.77%	79	1.13%	213	1.47%
	OSSINING RAILROAD STATION	25	0.33%	3	0.04%	28	0.19%
	OSSINING (REMAINDER)	109	1.44%	76	1.09%	185	1.27%
PORT CHESTER	TOTAL	137	1.81%	73	1.05%	210	1.45%
	WESTCHESTER AVENUE TOTAL	79	1.04%	33	0.47%	112	0.77%
	PORT CHESTER RAILROAD STATION	33	0.44%	11	0.16%	44	0.30%
	WESTCHESTER AVENUE REMAINDER	57	0.75%	22	0.32%	79	0.54%
	PORT CHESTER (REMAINDER)	47	0.62%	40	0.57%	87	0.60%
HARRISON	TOTAL	74	0.98%	115	1.65%	189	1.30%
	WESTCHESTER AVENUE	21	0.28%	28	0.40%	49	0.34%
	MANHATTANVILLE COLLEGE	5	0.07%	20	0.29%	25	0.17%
	SUNY PURCHASE	10	0.13%	13	0.19%	23	0.16%
	HARRISON RAILROAD STATION	6	0.08%	2	0.03%	8	0.06%
	HARRISON (REMAINDER)	32	0.42%	52	0.75%	84	0.58%
PEEKSKILL	TOTAL	116	1.53%	67	0.96%	183	1.26%
	PEEKSKILL RAILROAD STATION	15	0.20%	7	0.10%	22	0.15%
	PEEKSKILL (REMAINDER)	101	1.34%	60	0.86%	161	1.11%
EASTCHESTER	TOTAL	116	1.53%	59	0.85%	175	1.20%
	EASTCHESTER SQUARE	25	0.33%	31	0.45%	56	0.39%
	EASTCHESTER (REMAINDER)	91	1.20%	28	0.40%	119	0.82%
TARRYTOWN	TOTAL	80	1.06%	73	1.05%	153	1.05%
	TARRYTOWN RAILROAD STATION	27	0.36%	24	0.34%	51	0.35%
	TARRYTOWN/WHITE PLAINS RD	7	0.09%	12	0.17%	19	0.13%
	TARRYTOWN (REMAINDER)	46	0.61%	37	0.53%	83	0.57%
TOTAL MUNICIPALITIES WITH MORE THAN 1.0% OF PASSENGER MOVEMENTS		5,494	72.67%	4,960	71.22%	10,454	71.98%
WESTCHESTER COUNTY TOTAL		6,141	81.23%	5,667	81.38%	11,808	81.30%
VALID TOTAL BOARDINGS AND ALIGHTINGS		7,560	100.00%	6,964	100.00%	14,524	100.00%

Table 12 Origins and Destinations of Bee-Line Passengers in Municipalities with Less Than 1.0% of Total Boardings and Alightings, 2007

PASSENGERS SURVEYED BY TRIP ORIGIN AND DESTINATION: MUNICIPALITIES WITH LESS THAN 1.0% OF TOTAL BOARDINGS AND ALIGHTINGS

MUNICIPALITY	SURVEY RESPONSE REGARDING BOARDING OR ALIGHTING	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
ARDSLEY	TOTAL	43	0.57%	18	0.26%	61	0.42%
	ARDSLEY SQUARE	9	0.12%	11	0.16%	20	0.14%
	ARDSLEY (REMAINDER)	34	0.45%	7	0.10%	41	0.28%
BEDFORD	TOTAL	19	0.25%	21	0.30%	40	0.28%
	BEDFORD HILLS RAILROAD STATION	3	0.04%	2	0.03%	5	0.03%
	KATONAH RAILROAD STATION	1	0.01%	3	0.04%	4	0.03%
	BEDFORD (REMAINDER)	15	0.20%	16	0.23%	31	0.21%
BRIARCLIFF MANOR	TOTAL	4	0.05%	5	0.07%	9	0.06%
BRONXVILLE	TOTAL	34	0.45%	26	0.37%	60	0.41%
	BRONXVILLE RAILROAD STATION	9	0.12%	9	0.13%	18	0.12%
	BRONXVILLE (REMAINDER)	25	0.33%	17	0.24%	42	0.29%
BUCHANAN	TOTAL	6	0.08%	2	0.03%	8	0.06%
CORTLANDT	TOTAL	39	0.52%	50	0.72%	89	0.61%
	CORTLANDT TOWN CENTER	9	0.12%	16	0.23%	25	0.17%
	FDR VA HOSPITAL	0	0.00%	9	0.13%	9	0.06%
	CORTLANDT MANOR RAILROAD STATION	1	0.01%	2	0.03%	3	0.02%
	CORTLANDT (REMAINDER)	29	0.38%	23	0.33%	52	0.36%
CROTON ON HUDSON	TOTAL	17	0.22%	31	0.45%	48	0.33%
	CROTON HARMON RAILROAD STATION	9	0.12%	20	0.29%	29	0.20%
	CROTON ON HUDSON (REMAINDER)	8	0.11%	11	0.16%	19	0.13%
DOBBS FERRY	TOTAL	21	0.28%	31	0.45%	52	0.36%
	MERCY COLLEGE	2	0.03%	9	0.13%	11	0.08%
	DOBBS FERRY (REMAINDER)	19	0.25%	22	0.32%	41	0.28%
ELMSFORD	TOTAL	51	0.67%	38	0.55%	89	0.61%
	TARRYTOWN/WHITE PLAINS RD (EAST & WEST MAIN STREET)	35	0.46%	7	0.10%	42	0.29%
	ELMSFORD (REMAINDER)	16	0.21%	31	0.45%	47	0.32%
HASTINGS ON HUDSON	TOTAL	10	0.13%	13	0.19%	23	0.16%
	HASTINGS ON HUDSON RAILROAD STATION	1	0.01%	0	0.00%	1	0.01%
	HASTINGS ON HUDSON (REMAINDER)	9	0.12%	13	0.19%	22	0.15%
IRVINGTON	TOTAL	1	0.01%	5	0.07%	6	0.04%
LARCHMONT	TOTAL	41	0.54%	52	0.75%	93	0.64%
	LARCHMONT RAILROAD STATION	13	0.17%	18	0.26%	31	0.21%
	LARCHMONT (REMAINDER)	28	0.37%	34	0.49%	62	0.43%

(Table continues)							
MUNICIPALITY	SURVEY RESPONSE REGARDING BOARDING OR ALIGHTING	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
MAMARONECK	TOTAL	59	0.78%	46	0.66%	105	0.72%
	MAMARONECK RAILROAD STATION	5	0.07%	1	0.01%	6	0.04%
	MAMARONECK (REMAINDER)	54	0.71%	45	0.65%	99	0.68%
MOUNT KISCO	TOTAL	30	0.40%	43	0.62%	73	0.50%
	MOUNT KISCO RAILROAD STATION	7	0.09%	6	0.09%	13	0.09%
	MOUNT KISCO (REMAINDER)	23	0.30%	37	0.53%	60	0.41%
MOUNT PLEASANT	TOTAL	51	0.67%	91	1.31%	142	0.98%
	VALHALLA: GRASSLANDS RESERVATION	32	0.42%	66	0.95%	98	0.67%
	HAWTHORNE RAILROAD STATION	0	0.00%	1	0.01%	1	0.01%
	MOUNT PLEASANT (REMAINDER)	19	0.25%	24	0.34%	43	0.30%
NEW CASTLE	TOTAL	2	0.03%	9	0.13%	11	0.08%
NORTH CASTLE	TOTAL	2	0.03%	19	0.27%	21	0.14%
PELHAM	TOTAL	9	0.12%	16	0.23%	25	0.17%
	PELHAM RAILROAD STATION	4	0.05%	1	0.01%	5	0.03%
	PELHAM (REMAINDER)	5	0.07%	15	0.22%	20	0.14%
PELHAM MANOR	TOTAL	5	0.07%	13	0.19%	18	0.12%
PLEASANTVILLE	TOTAL	12	0.16%	16	0.23%	28	0.19%
	PLEASANTVILLE RAILROAD STATION	3	0.04%	2	0.03%	5	0.03%
	PLEASANTVILLE (REMAINDER)	9	0.12%	14	0.20%	23	0.16%
RYE	TOTAL	26	0.34%	31	0.45%	57	0.39%
	RYE RAILROAD STATION	9	0.12%	6	0.09%	15	0.10%
	PLAYLAND	1	0.01%	1	0.01%	2	0.01%
	RYE (REMAINDER)	16	0.21%	24	0.34%	40	0.28%
RYE BROOK	TOTAL	11	0.15%	13	0.19%	24	0.17%
	WESTCHESTER COUNTY AIRPORT	6	0.08%	9	0.13%	15	0.10%
	WESTCHESTER AVENUE	2	0.03%	1	0.01%	3	0.02%
	RYE BROOK (REMAINDER)	3	0.04%	3	0.04%	6	0.04%
SLEEPY HOLLOW	TOTAL	42	0.56%	14	0.20%	56	0.39%
SOMERS	TOTAL	1	0.01%	2	0.03%	3	0.02%
TUCKAHOE	TOTAL	17	0.22%	17	0.24%	34	0.23%
	TUCKAHOE RAILROAD STATION	4	0.05%	12	0.17%	16	0.11%
	TUCKAHOE (REMAINDER)	13	0.17%	5	0.07%	18	0.12%
YORKTOWN	TOTAL	71	0.94%	28	0.40%	99	0.68%
	JEFFERSON VALLEY MALL	11	0.15%	13	0.19%	24	0.17%
	FDR PARK AND RIDE	13	0.17%	0	0.00%	13	0.09%
	YORKTOWN (REMAINDER)	47	0.62%	15	0.22%	62	0.43%
TOTAL MUNICIPALITIES WITH LESS THAN 1.0% OF PASSENGER MOVEMENTS		624	8.25%	650	9.33%	1,274	8.77%
WESTCHESTER COUNTY TOTAL		6,141	81.23%	5,667	81.38%	11,808	81.30%
VALID TOTAL BOARDINGS AND ALIGHTINGS		7,560	100.00%	6,964	100.00%	14,524	100.00%

Table 13 Origins and Destinations of Bee-Line Passengers in Areas of Special Interest, 2007

PASSENGERS SURVEYED BY TRIP ORIGIN AND DESTINATION: SPECIAL INTEREST AREAS

MUNICIPALITY	SURVEY RESPONSE REGARDING BOARDING OR ALIGHTING	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
CENTRAL (PARK) AVENUE (TOTAL)		497	6.57%	582	8.36%	1,079	7.43%
	YONKERS TOTAL	415	5.49%	210	3.02%	625	4.30%
	CENTRAL AVE: CROSS COUNTY SHOPPING CENTER	67	0.89%	173	2.48%	240	1.65%
	CENTRAL AVE: YONKERS RACEWAY & EMPIRE CITY CASINO	20	0.26%	33	0.47%	53	0.36%
	CENTRAL AVE: YONKERS REMAINDER	328	4.34%	304	4.37%	632	4.35%
	GREENBURGH	61	0.81%	55	0.79%	116	0.80%
	WHITE PLAINS	20	0.26%	20	0.29%	40	0.28%
	MUNICIPALITY UNKNOWN	1	0.01%	2	0.03%	3	0.02%
TARRYTOWN/WHITE PLAINS ROAD (ROUTE 119): TOTAL		108	1.43%	103	1.48%	211	1.45%
	TARRYTOWN	7	0.09%	9	0.13%	16	0.11%
	ELMSFORD	35	0.46%	18	0.26%	53	0.36%
	GREENBURGH	46	0.61%	51	0.73%	97	0.67%
	WHITE PLAINS	19	0.25%	25	0.36%	44	0.30%
	MUNICIPALITY UNKNOWN	1	0.01%	7	0.10%	8	0.06%
WESTCHESTER AVENUE (TOTAL)		115	1.52%	122	1.75%	237	1.63%
	WHITE PLAINS	6	0.08%	39	0.56%	45	0.31%
	HARRISON	21	0.28%	28	0.40%	49	0.34%
	RYE BROOK	2	0.03%	1	0.01%	3	0.02%
	PORT CHESTER (INCLUDING RAILROAD STATION)	79	1.04%	33	0.47%	112	0.77%
	MUNICIPALITY UNKNOWN	7	0.09%	25	0.36%	32	0.22%
VALHALLA (TOTAL)		75	0.99%	132	1.90%	207	1.43%
	MOUNT PLEASANT: GRASSLANDS RESERVATION	32	0.42%	66	0.95%	98	0.67%
	GREENBURGH: WESTCHESTER COMMUNITY COLLEGE	29	0.38%	43	0.62%	72	0.50%
	MUNICIPALITY UNKNOWN	14	0.19%	23	0.33%	37	0.25%
WESTCHESTER COUNTY TOTAL		6,141	81.23%	5,667	81.38%	11,808	81.30%

Table 14 Origins and Destinations of Bee-Line Passengers in New York City, 2007

PASSENGERS SURVEYED BY TRIP ORIGIN AND DESTINATION: NEW YORK CITY

SURVEY RESPONSE REGARDING BOARDING OR ALIGHTING	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
NEW YORK CITY: BRONX TOTAL	1,331	17.61%	1,133	16.27%	2,464	16.97%
JEROME AVENUE CORRIDOR	311	4.11%	312	4.48%	623	4.29%
BRONX: BEDFORD PARK-WOODLAWN SUBWAY	205	2.71%	224	3.22%	429	2.95%
BRONX: WOODLAWN	46	0.61%	24	0.34%	70	0.48%
BRONX: BEDFORD PARK	42	0.56%	27	0.39%	69	0.48%
BRONX: JEROME AVE	18	0.24%	37	0.53%	55	0.38%
BROADWAY	131	1.73%	138	1.98%	269	1.85%
BRONX: BROADWAY SUBWAY	107	1.42%	129	1.85%	236	1.62%
BRONX: BROADWAY	24	0.32%	9	0.13%	33	0.23%
DYRE AVENUE	131	1.73%	115	1.65%	246	1.69%
BRONX: DYRE AVENUE SUBWAY	83	1.10%	87	1.25%	170	1.17%
BRONX: DYRE AVENUE	48	0.63%	28	0.40%	76	0.52%
FORDHAM	95	1.26%	73	1.05%	168	1.16%
BRONX: FORDHAM	90	1.19%	66	0.95%	156	1.07%
BRONX: FORDHAM RAILROAD STATION	5	0.07%	7	0.10%	12	0.08%
NYC BRONX NORWOOD (205TH ST) SUBWAY	40	0.53%	24	0.34%	64	0.44%
PELHAM BAY	75	0.99%	68	0.98%	143	0.98%
BRONX: PELHAM BAY SUBWAY	46	0.61%	58	0.83%	104	0.72%
BRONX: PELHAM BAY	29	0.38%	10	0.14%	39	0.27%
WHITE PLAINS ROAD	265	3.51%	200	2.87%	465	3.20%
BRONX: WHITE PLAINS ROAD SUBWAY	147	1.94%	130	1.87%	277	1.91%
BRONX: WHITE PLAINS ROAD	118	1.56%	70	1.01%	188	1.29%
NYC BRONX WAKEFIELD RAILROAD STATION	0	0.00%	1	0.01%	1	0.01%
NYC BRONX (REMAINDER)	283	3.74%	202	2.90%	485	3.34%
NEW YORK CITY: MANHATTAN	83	1.10%	161	2.31%	244	1.68%
NEW YORK CITY TOTAL	1,414	18.70%	1,294	18.58%	2,708	18.65%

Table 15 Origins and Destinations of Bee-Line Passengers – Remainders and Totals, 2007

PASSENGERS SURVEYED BY TRIP ORIGIN AND DESTINATION: REMAINDERS AND TOTALS

SURVEY RESPONSE REGARDING BOARDING OR ALIGHTING	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
WESTCHESTER MUNICIPALITIES WITH MORE THAN 1.0% OF PASSENGER MOVEMENTS	5,494	72.67%	4,960	71.22%	10,454	71.98%
WESTCHESTER MUNICIPALITIES WITH LESS THAN 1.0% OF PASSENGER MOVEMENTS	624	8.25%	650	9.33%	1,274	8.77%
SPECIAL INTEREST AREAS, UNKNOWN MUNICIPALITY	23	0.30%	57	0.82%	80	0.55%
WESTCHESTER COUNTY TOTAL	6,141	81.23%	5,667	81.38%	11,808	81.30%
NEW YORK CITY: BRONX TOTAL	1,331	17.61%	1,133	16.27%	2,464	16.97%
NYC MANHATTAN	83	1.10%	161	2.31%	244	1.68%
PUTNAM COUNTY: CARMEL (MAHOPAC)	5	0.07%	2	0.03%	7	0.05%
CONNECTICUT: GREENWICH	0	0.00%	1	0.01%	1	0.01%
VALID TOTAL BOARDINGS AND ALIGHTINGS	7,560	100.00%	6,964	100.00%	14,524	100.00%
SCHOOL TRIPS (UNCLASSIFIED)	31	-	34	-	65	-
UNKNOWN ORIGIN OR DESTINATION	1,655	-	2,248	-	3,903	-
GRAND TOTAL RIDERS SURVEYED	9,246	-	9,246	-	18,492	-

Table 16 Busiest Locations, 2007

BUSIEST LOCATIONS RANKED BY TOTAL PASSENGER MOVEMENTS

SURVEYED TRIP ORIGIN OR DESTINATION LOCATION	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
WHITE PLAINS CENTRAL BUSINESS DISTRICT, INCLUDING TRANSCENTER & RAILROAD STATION	528	6.98%	635	9.12%	1163	8.01%
WHITE PLAINS TRANSCENTER	148	1.96%	174	2.50%	322	2.22%
WHITE PLAINS RAILROAD STATION	145	1.92%	97	1.39%	242	1.67%
CENTRAL (PARK) AVENUE, INCLUDING CROSS COUNTY SHOPPING CENTER & YONKERS RACEWAY & CASINO	497	6.57%	582	8.36%	1,079	7.43%
CROSS COUNTY SHOPPING CENTER	67	0.89%	173	2.48%	240	1.65%
YONKERS RACEWAY & EMPIRE CITY CASINO	20	0.26%	33	0.47%	53	0.36%
YONKERS CENTRAL BUSINESS DISTRICT (GETTY SQUARE), INCLUDING RAILROAD STATION	471	6.23%	333	4.78%	804	5.54%
YONKERS RAILROAD STATION	18	0.24%	7	0.10%	25	0.17%
BRONX: JEROME AVENUE CORRIDOR, INCLUDING WOODLAWN, MOSHULU & BEDFORD PARK SUBWAY STATIONS	311	4.11%	312	4.48%	623	4.29%
BRONX: WHITE PLAINS ROAD, INCLUDING E 233RD, E 238TH & E 241ST STREET SUBWAY STATIONS	265	3.51%	200	2.87%	465	3.20%
NEW ROCHELLE CENTRAL BUSINESS DISTRICT, INCLUDING TRANSIT CENTER & RAILROAD STATION	184	2.43%	175	2.51%	359	2.47%
NEW ROCHELLE TRANSIT CENTER	39	0.52%	47	0.67%	86	0.59%
NEW ROCHELLE RAILROAD STATION	28	0.37%	23	0.33%	51	0.35%
MOUNT VERNON CENTRAL BUSINESS DISTRICT, INCLUDING PETRILLO PLAZA & MOUNT VERNON EAST RAILROAD STATION	187	2.47%	126	1.81%	313	2.16%
PETRILLO PLAZA	114	1.51%	56	0.80%	170	1.17%
MOUNT VERNON EAST RAILROAD STATION	15	0.20%	20	0.29%	35	0.24%
BRONX: BROADWAY, INCLUDING W 242ND STREET SUBWAY STATION	131	1.73%	138	1.98%	269	1.85%
MANHATTAN (ALL STOPS ON ROUTE BxM4C)	83	1.10%	161	2.31%	244	1.68%
BRONX: DYRE AVENUE, INCLUDING DYRE AVENUE SUBWAY STATION	131	1.73%	115	1.65%	246	1.69%
WESTCHESTER AVENUE (TOTAL)	115	1.52%	122	1.75%	237	1.63%
TARRYTOWN/WHITE PLAINS ROAD (ROUTE 119): TOTAL	108	1.43%	103	1.48%	211	1.45%
VALHALLA	75	0.99%	132	1.90%	207	1.43%
MOUNT PLEASANT: GRASSLANDS RESERVATION INCLUDING WESTCHESTER MEDICAL CENTER & OTHER FACILITIES	32	0.42%	66	0.95%	98	0.67%
GREENBURGH: WESTCHESTER COMMUNITY COLLEGE	29	0.38%	43	0.62%	72	0.50%
SCARSDALE RAILROAD STATION	40	0.53%	162	2.33%	202	1.39%
BRONX: FORDHAM, INCLUDING FORDHAM (METRO NORTH) RAILROAD STATION	95	1.26%	73	1.05%	168	1.16%
BRONX: PELHAM BAY, INCLUDING PELHAM BAY SUBWAY STATION	75	0.99%	68	0.98%	143	0.98%

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Appendix C: Transfers between Bee-Line and Metro-North, and between Bee-Line and the New York City Subways

Table 17 Transfers between Bee-Line and Metro-North at Trip Origin and Destination
 (Prepared by WCDOT, 2007)

PASSENGERS SURVEYED BY LOCATION OF BOARDING AND ALIGHTING BEE-LINE BUSES AT METRO-NORTH RAILROAD STATIONS								
STATIONS SORTED BY DISTANCE FROM MANHATTAN								
METRO-NORTH DIVISION	MUNICIPALITY	RAILROAD STATION CITED AS POINT OF BOARDING OR ALIGHTING BEE-LINE BUS	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
HARLEM	NYC: THE BRONX	FORDHAM RAILROAD STATION	5	0.07%	7	0.10%	12	0.08%
HARLEM	NYC: THE BRONX	WAKEFIELD RAILROAD STATION	0	0.00%	1	0.01%	1	0.01%
HARLEM	MOUNT VERNON	MOUNT VERNON WEST RAILROAD STATION	8	0.11%	9	0.13%	17	0.12%
HARLEM	MOUNT VERNON	FLEETWOOD RAILROAD STATION	4	0.05%	2	0.03%	6	0.04%
HARLEM	BRONXVILLE	BRONXVILLE RAILROAD STATION	9	0.12%	9	0.13%	18	0.12%
HARLEM	TUCKAHOE	TUCKAHOE RAILROAD STATION	4	0.05%	12	0.17%	16	0.11%
HARLEM	SCARSDALE	SCARSDALE RAILROAD STATION	40	0.53%	162	2.33%	202	1.39%
HARLEM	GREENBURGH	HARTSDALE RAILROAD STATION	22	0.29%	55	0.79%	77	0.53%
HARLEM	WHITE PLAINS	WHITE PLAINS RAILROAD STATION	145	1.92%	97	1.39%	242	1.67%
HARLEM	WHITE PLAINS	NORTH WHITE PLAINS RAILROAD STATION	16	0.21%	1	0.01%	17	0.12%
HARLEM	MOUNT PLEASANT	HAWTHORNE RAILROAD STATION	0	0.00%	1	0.01%	1	0.01%
HARLEM	PLEASANTVILLE	PLEASANTVILLE RAILROAD STATION	3	0.04%	2	0.03%	5	0.03%
HARLEM	MOUNT KISCO	MOUNT KISCO RAILROAD STATION	7	0.09%	6	0.09%	13	0.09%
HARLEM	BEDFORD	BEDFORD HILLS RAILROAD STATION	3	0.04%	2	0.03%	5	0.03%
HARLEM	BEDFORD	KATONAH RAILROAD STATION	1	0.01%	3	0.04%	4	0.03%
TOTAL HARLEM DIVISION STATIONS			267	3.53%	369	5.30%	636	4.38%
HUDSON	YONKERS	LUDLOW RAILROAD STATION	1	0.01%	0	0.00%	1	0.01%
HUDSON	YONKERS	YONKERS RAILROAD STATION	18	0.24%	7	0.10%	25	0.17%
HUDSON	YONKERS	GLENWOOD RAILROAD STATION	0	0.00%	1	0.01%	1	0.01%
HUDSON	YONKERS	GREYSTONE RAILROAD STATION	0	0.00%	2	0.03%	2	0.01%
HUDSON	HASTINGS ON HUDSON	HASTINGS ON HUDSON RAILROAD STATION	1	0.01%	0	0.00%	1	0.01%
HUDSON	TARRYTOWN	TARRYTOWN RAILROAD STATION	27	0.36%	24	0.34%	51	0.35%
HUDSON	OSSINING	OSSINING RAILROAD STATION	25	0.33%	3	0.04%	28	0.19%
HUDSON	CROTON ON HUDSON	CROTON HARMON RAILROAD STATION	9	0.12%	20	0.29%	29	0.20%
HUDSON	CORTLANDT	CORTLANDT MANOR RAILROAD STATION	1	0.01%	2	0.03%	3	0.02%
HUDSON	PEEKSKILL	PEEKSKILL RAILROAD STATION	15	0.20%	7	0.10%	22	0.15%
TOTAL HUDSON DIVISION STATIONS			97	1.28%	66	0.95%	163	1.12%
NEW HAVEN	MOUNT VERNON	MOUNT VERNON EAST RAILROAD STATION	15	0.20%	20	0.29%	35	0.24%
NEW HAVEN	PELHAM	PELHAM RAILROAD STATION	4	0.05%	1	0.01%	5	0.03%
NEW HAVEN	NEW ROCHELLE	NEW ROCHELLE RAILROAD STATION	28	0.37%	23	0.33%	51	0.35%
NEW HAVEN	LARCHMONT	LARCHMONT RAILROAD STATION	13	0.17%	18	0.26%	31	0.21%
NEW HAVEN	MAMARONECK	MAMARONECK RAILROAD STATION	5	0.07%	1	0.01%	6	0.04%
NEW HAVEN	HARRISON	HARRISON RAILROAD STATION	6	0.08%	2	0.03%	8	0.06%
NEW HAVEN	RYE	RYE RAILROAD STATION	9	0.12%	6	0.09%	15	0.10%
NEW HAVEN	PORT CHESTER	PORT CHESTER RAILROAD STATION	33	0.44%	11	0.16%	44	0.30%
TOTAL NEW HAVEN DIVISION STATIONS			113	1.49%	82	1.18%	195	1.34%
TOTAL METRO NORTH STATIONS, ALL DIVISIONS COMBINED			477	2.79%	517	2.07%	994	2.44%

Transfers between Metro-North Railroad and Bee-Line

Table 17 above was prepared by WCDOT based on the survey data. It displays information about riders' use of the three Metro-North lines. It requires some explanation:

- ◆ Only Bee-Line riders making connections with Metro-North are shown here.
- ◆ The table shows connections between Bee-Line and Metro-North at points of both origin and destination.
- ◆ The table shows the stations within each line in order of their distance from New York City.
- ◆ The table contains two columns that refer to the “number of trips” originating and ending at given stations. This “number” refers to the sample size – i.e., the number of passengers whose trips were captured in the survey data.

Since the data analyzed by DOT were based only on responses for which origin and destination could be definitively determined, they represent a smaller group of survey responses than the larger sample upon which this entire report is based. Both this table (Table 17) which shows Metro-North connections with Bee-Line, and Table 18 on page 174 which shows connections between NYC Subways and Bee-Line, are included to provide information regarding the distribution of Bee-Line riders among the different commuter rail services to and from which riders may transfer. They do not correspond with data regarding the total number of riders who transfer. However, they may provide insight as to the relative proportions of riders who transfer to and from rail services at specified locations within each of these systems.

Two basic findings are implicit in Table 17. First, ridership tends to be concentrated in terms of origins and destinations at only one or two stations on each line. Second, each station contributes only a small proportion to the total Bee-Line ridership.

One or two stations account for more than 50% of the origins or destinations of passengers using each line in conjunction with Bee-Line. For example, in the Harlem Division, the White Plains Railroad Station alone accounts for 54.3% of all Bee-Line riders originating on the Harlem Line. Similarly, in the Hudson Division, 27.8% of trips originated at the Tarrytown Railroad Station and another 25.8% at the Ossining Railroad Station, for a total of 53.6% of the trips accounted for by two of the ten stations on that line.

Although these stations show a high concentration of the Metro-North passengers connecting with Bee-Line, they constitute only a small percentage of all Bee-Line riders. For example, the White Plains Railroad station on the Harlem Line accounts for 54.3% of the Harlem Line passengers who connect with Bee-Line. But this constitutes only 1.92% of all Bee-Line riders.

The table includes a column describing “total passenger movements.” This refers to the total number of transfers among systems or between Bee-Line vehicles. The percentage represents the share of all these movements represented by each transfer point, in this case, Metro-North stations. Notice that all of the Metro-North stations, combined, account for only 2.44% of all passenger movements.

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Table 18 Transfers between New York City Subway and Bee-Line at Trip Origin and Destination

(Prepared by WCDOT, 2007)

PASSENGERS SURVEYED BY LOCATION OF BOARDING AND ALIGHTING BEE-LINE BUSES AT NYC MTA SUBWAYS

MTA SUBWAY STATION	MUNICIPALITY	RAILROAD STATION CITED AS POINT OF BOARDING OR ALIGHTING BEE-LINE BUS	TOTAL RIDERS BOARDING	% OF TOTAL RIDERS BOARDING	TOTAL RIDERS ALIGHTING	% OF TOTAL RIDERS ALIGHTING	TOTAL PASSENGER MOVEMENTS	% OF TOTAL PASSENGER MOVEMENTS
MTA SUBWAY # 1 & 9	NYC: THE BRONX	BROADWAY (W 242ND STREET) SUBWAY	107	1.42%	129	1.85%	236	1.62%
MTA SUBWAY # 4	NYC: THE BRONX	BEDFORD PARK-WOODLAWN SUBWAY	205	2.71%	224	3.22%	429	2.95%
MTA SUBWAY D	NYC: THE BRONX	NORWOOD (205TH STREET) SUBWAY	40	0.53%	24	0.34%	64	0.44%
MTA SUBWAY # 2	NYC: THE BRONX	WHITE PLAINS ROAD (E 241ST STREET) SUBWAY	147	1.94%	130	1.87%	277	1.91%
MTA SUBWAY # 5	NYC: THE BRONX	DYRE AVENUE SUBWAY	83	1.10%	87	1.25%	170	1.17%
MTA SUBWAY # 6	NYC: THE BRONX	PELHAM BAY SUBWAY	46	0.61%	58	0.83%	104	0.72%
TOTAL MTA SUBWAYS			628	8.31%	652	9.36%	1280	8.81%

