

**Appendix A**  
**Parking Demand Analysis**

## **A. INTRODUCTION**

This appendix provides an overview of parking at the Metro-North Railroad North White Plains station. Based mostly on analysis reported on in 2005, this appendix presents the following:

- Existing parking demand and capacity at North White Plains station;
- Future parking demand at North White Plains; and
- The ability of alternative parking demand management strategies to reduce the need to provide additional parking at North White Plains.

## **B. EXISTING PARKING DEMAND AND CAPACITY**

Existing parking capacity at the station is 1,355 spaces (**Figure A-1**); the majority of these parking spaces are owned by Metro-North and Westchester County and do not have residency restrictions. However, several spaces operated by others are restricted based on residency. Based on 2005 data, Westchester County, White Plains, and North Castle had waiting lists for permits at three of the station's four lots.

Parking utilization surveys were conducted on November 18 and 19, 2003; September 27, 2006; and October 29, 2008. The results of these studies are summarized in Table A-1. The results of the September 2006 study indicate higher utilization in Lot 1 than was observed in 2003. However, utilization of residency restricted lots (e.g., White Plains resident permit spaces and Lot 3) was lower in 2006 compared to overall non-residency restricted utilization. Low percent utilization in Lot 3 may represent: a) permit holders who do not park on a regular basis but wish to retain the privilege of using the North Castle lot due to permit fee differential; and/or b) limited permit oversell based on Town policy. Since many of the unused spaces have residency restrictions, parking demand cannot be met by greater utilization of existing spaces. Metro-North experience suggests that drivers perceive a lot as full when the utilization exceeds 85 percent.

The "Parking Demand Projection Process" ("Demand Model") completed by Metro-North in 2005 indicated an existing parking demand of 1,560 spaces at the North White Plains railroad station, which represented a deficiency of 205 spaces over existing capacity of 1,355 spaces.

Even in the largest lot, Lot 1, supply does not always equal potential daily demand. The capacity in Lot 1 is 892 spaces and up to 200 spaces can be utilized by daily permit holders depending on actual utilization by monthly permit holders. Given the number of monthly permits issued and as 200 of the spaces may be occupied by daily permit holders, it is possible for monthly permit holders to be denied a parking space on any given day. Daily permits may be sold out early in the morning, making the lot generally unavailable to afternoon or other discretionary travelers.

**Table A-1**  
**North White Plains Railroad Station Parking Summary<sup>1</sup>**

| Lot             | Owner/Lessee       | Capacity | Percent Utilized (11/03) <sup>5</sup> | Percent Utilized (9/06) | Percent Utilized (10/08) |
|-----------------|--------------------|----------|---------------------------------------|-------------------------|--------------------------|
| Lot 1           | Westchester County | 892      | 94 <sup>2</sup>                       | 98 <sup>2</sup>         | 87                       |
| Lot 2           | White Plains       | 254      | 86 <sup>3</sup>                       | 86 <sup>3,4</sup>       | 62                       |
| Lot 3           | North Castle       | 100      | 70                                    | 64                      | 58                       |
| Lot 4           | Metro-North        | 109      | NA                                    | NA                      | 82                       |
| <b>All Lots</b> |                    | 1,355    | 91                                    | 93                      | 79                       |

**Notes:**

- 1 Metro-North customers who do not have a monthly commutation pass, do not have a monthly parking permit, or are not on a parking permit waiting list are not included in these totals and may represent additional demand.
- 2 Includes vacant handicapped parking spaces.
- 3 Includes vacant parking space reserved for vanpool.
- 4 During the September 2006 survey, it was noted that the 171 City metered spaces (12 hour & 19 hour) were 98.2 percent occupied. The 86 City permit spaces were 60.4 percent occupied.
- 5 Original study data from report: *Parking Demand Analysis for North White Plains Station* (February 24, 2005), Gannett Fleming.

## C. FUTURE PARKING CAPACITY AND DEMAND

### INTRODUCTION

The assessment of future ridership and parking demand at the North White Plains railroad station included an evaluation of the current geographical extent of customers using the North White Plains railroad station, and ridership growth trends on the Harlem Line.

### CUSTOMER GEOGRAPHY

Information collected in 2005 from Metro-North’s “Mail & Ride” program along with parking permit data collected from Westchester County, the City of White Plains Department of Parking, and the Town of North Castle were compiled to create a commutershed map of approximately 1,400 North White Plains railroad station railroad customers. **Figure A-2** depicts the large concentrations of North White Plains railroad station customers in the immediate proximity of the station in the City of White Plains and the Towns of North Castle (North White Plains) and Greenburgh. Figure A-2 and Table A-2 show there is also substantial use of the station from areas north and east of the station, including Armonk, Bedford, and Pleasantville, and north and west in Yorktown. Many of these latter customers live in communities that do not have rail service or are likely to choose to use North White Plains for the convenience of express train service to Grand Central Terminal and local service to Westchester County and the Bronx. Such service is available from North White Plains at a higher frequency throughout the peak and off-peak periods. The station is also attractive to these customers due to its accessibility from the regional roadway network, and the abundance of non-resident parking compared to other Harlem Line stations.

**Table A-2**

**Geographical Distribution of North White Plains Railroad Station Customers**

| Municipalities   | Approximate Travel Distance (miles) to NWP | Percent of North White Plains Customers |
|--|--|---|
| Town of North Castle (Armonk)  | 11   | 32                                      |
| Portions of City of White Plains, Town of Greenburgh, Town of Harrison (West Harrison), and Town of North Castle   | 3  | 31                                      |
| Town of Bedford  | 19   | 9                                       |
| Town of Yorktown (Yorktown Heights)  | 23   | 6                                       |
| Town of Mount Pleasant (Pleasantville), (Village of Pleasantville)   | 9.5  | 4                                       |
| Town of Pound Ridge  | 22   | 3                                       |
| Town of Mount Pleasant (Valhalla)  | 3  | 2                                       |
| Town of Harrison (Purchase)  | 4  | 2                                       |
| Putnam County-Town of Carmel (Mahopac)   | 13   | 1                                       |
| Village of Mount Kisco   | 17   | 1                                       |
| Town of New Castle (Chappaqua)   | 13   | 1                                       |
| Other Locations (41 total) with less than 1% of overall North White Plains railroad station commutershed           | -  | 8                                       |
| <b>TOTAL</b>   | -  | 100                                     |
| <b>Source:</b> <i>Parking Demand Analysis for North White Plains Station</i> (February 24, 2005), Gannett Fleming. |  |   |

## HARLEM LINE RIDERSHIP GROWTH TRENDS

### OVERVIEW

Ridership statistics for 2005 showed that there were approximately 1,677 inbound boardings at North White Plains during the weekday AM peak period from 5:30 AM to 10:00 AM and 863 inbound boardings during the weekday off-peak period. The station experienced an approximately 24 percent increase in AM peak inbound boardings between 1993 and 2005.

### POPULATION GROWTH AND HARLEM LINE RIDERSHIP TRENDS

New York Metropolitan Transportation Council (NYMTC) develops population projections for the metropolitan region, including Westchester County. NYMTC projections prior to 2005 indicate that the Westchester County population will increase from a baseline of 923,500 residents in 2000 to 956,800 residents in 2025 (3.6 percent growth; 0.14 percent annual growth).

Although the Parking Demand Analysis was completed in 2005 (which reflects growing ridership and the most conservative estimate of parking demand), and even though there has been a recent downturn in the economy, Metro-North still projects an increase in ridership on the Harlem Line for both the Lower Harlem (Westchester) segment (which includes the North White Plains railroad station) and Upper Harlem segment. Ridership on both the Lower Harlem (Westchester) and Upper Harlem segments of the Harlem Line is expected to steadily increase with the Lower Harlem (Westchester) segment expected to experience 26.1 percent growth from 2004 to 2025 and the Upper Harlem segment expected to experience 72.7 percent growth from 2004 to 2025. Table A-3 summarizes 2004, 2005, and projected (2025) ridership within these segments of the Harlem Line. The 2004 boarding data and 2004 projections for 2025 were used to derive future parking demand. The 2005 boarding data and 2005 projections for 2025 are shown for comparison.

**Table A-3  
Ridership Projections**

|   | Lower Harlem<br>(Westchester) |        | Upper Harlem |        |
|---|-------------------------------|--------|--------------|--------|
|   | 2004                          | 2025   | 2004         | 2025   |
| <b>Ridership</b>  | 15,736                        | 19,850 | 7,508        | 12,963 |
| <b>Growth</b>   | 26.1%                         |        | 72.7%        |        |
| <b>Average Annual Growth</b>                            | 1.1%                          |        | 2.6%         |        |
|   | 2005                          | 2025   | 2005         | 2025   |
| <b>Ridership</b>  | 17,829                        | 22,056 | 8,619        | 13,763 |
| <b>Growth</b>   | 23.7%                         |        | 59.7%        |        |
| <b>Average Annual Growth</b>                            | 1.1%                          |        | 2.4%         |        |
| <b>Note:</b> 2005 boarding data is shown for comparison |                               |        |              |        |
| <b>Source:</b> MTA Metro-North Railroad                 |                               |        |              |        |

From the demand model it was possible to derive projections for future “base parking demand” at the North White Plains railroad station. Table A-4 summarizes those values for the 2015, 2020, and the 2025 analysis years.

**Table A-4  
Future Parking Demand**

| Year   | Demand <sup>1</sup> (spaces) |
|--|------------------------------|
| 2015   | 2,024                        |
| 2020   | 2,271                        |
| 2025   | 2,544                        |
| <b>Note:</b> <sup>1</sup> Inclusive of existing parking supply (1,355 spaces).   |                              |
| <b>Source:</b> <i>Parking Demand Analysis for North White Plains Station</i> (February 24, 2005), Gannett Fleming, Table VI. |                              |

As the above discussion indicates, potential future parking demand at the North White Plains Station is substantially beyond that which can be accommodated by existing facilities. Although there has been a recent decline in ridership due to the current economic situation, Metro-North expects this is a short-term situation and the growth trends of the previous 25 years will reoccur.

#### **D. PARKING DEMAND MANAGEMENT STRATEGIES**

An assessment was conducted early in the planning process to determine if alternative modes of transporting Metro-North customers to the North White Plains railroad station have the potential to reduce parking demand at a sufficient level to negate the need for a new garage. Parking demand strategies that were considered included feeder bus and jitney services supported by park-and-ride lots, carpool and vanpool arrangements, and bicycling and walking. They were subjected to a screening designed to assess their viability and effectiveness in potentially reducing parking demand. The analysis, which was presented in the May, 2005 Planning Report entitled “Improved Station Access and Additional Parking at North White Plains Station”, showed that parking demand may be reduced modestly through these alternative modes, but parking demand management strategies would not be sufficient to accommodate the projected

boardings at North White Plains resulting from projected increases in ridership. This information is summarized below.

### **BUS ROUTES**

The Bee-Line is the Westchester County bus system which provides fixed route bus service throughout Westchester County. The Bee-Line Route 6 provides service in the North White Plains railroad station area.

The Bee-Line Route 6 bus travels along Route 22 and stops at the Fisher Lane and Glenn Street intersections with Route 22, one block east of the North White Plains railroad station. There are 20 daily southbound trips each weekday and 20 daily northbound trips each weekday that pass the Glenn Street and Fisher Lane intersections with Route 22. Route 6 is a significant County-wide bus route traveling between Pleasantville and Yonkers, not a railroad feeder service. As such, its schedule is not developed to coincide with train arrivals and/or departures.

Fixed-route bus service could provide bus trips along a regularly scheduled route between the station and areas that are not in close proximity to the station. Any proposals for bus service would have to provide frequent and timely service to the North White Plains railroad station during the peak morning and evening commuter periods and would have to serve areas with high concentrations of North White Plains railroad station customers. Due to the low density of development surrounding the areas that supply North White Plains customers (Armonk, Bedford, Yorktown), a fixed-route bus service, if operated in the context of Bee-Line bus service, is not expected to be an effective and economical alternative for reducing parking demand at the North White Plains railroad station.

Park-and-ride lots could provide Metro-North customers with opportunities to leave their vehicles in a remote parking area in order to carpool/vanpool or board a bus/jitney to the North White Plains railroad station. A park-and-ride lot may be attractive to Metro-North customers if the lot is situated in a safe, convenient, and easily accessible location. Park-and-ride lots can be shared facilities located in an existing parking lot with available capacity during the typical weekday commuter period. Examples of uses include religious institutions, movie theaters, and shopping centers. The biggest impediment to a park-and-ride lot strategy's success is that it would introduce a third "seat" (i.e., change in mode of transport) in the overall commute, which would likely be viewed as a negative aspect to customers.

An evaluation of the North White Plains commutershed data found that 41 percent of customers originate from the Town of North Castle (Armonk) and the Town of Bedford, with 32 and 9 percent of the customers, respectively. These areas are located north of the station area along the Route 22 corridor approximately 11 to 19 miles, respectively, from the North White Plains railroad station. These areas were assumed to represent a potential market area for bus service to the North White Plains railroad station due to the high proportion of Metro-North Railroad customers. The potential parking demand reduction for bus service in this market area using a 15 percent ridership share (based on Metro-North's experience with three similar bus services) is approximately 175, 220, and 280 for 2015, 2020, and 2025, respectively.

In general, the densities of residential areas served by the North White Plains station (especially those north and east of the station) would not support new bus service; and the introduction of a "third seat" to a commute is generally unattractive to Metro-North customers. Therefore, bus service expansions would not be expected to attract Metro North customers who drive to the station to instead ride the bus for station access. Therefore, bus service expansion is not a

## **MTA Metro-North Railroad North White Plains Parking Garage**

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feasible travel demand strategy that would eliminate the need for additional parking at North White Plains station.

### **JITNEY SERVICE**

A jitney service is also a possible method for reducing parking demand. Typically, successful jitneys serve customers within a five-mile radius of a transit station. Approximately 37 percent of existing North White Plains customers live within a five-mile radius of the North White Plains railroad station. Jitney service to these neighborhoods may be one of the best ways to accommodate parking demand as it does not introduce another “seat” into the customers’ daily commute. If six percent of customers were to use the jitney service (based on an evaluation of jitney service that operates in Maplewood, NJ), parking demand would be reduced by approximately 60, 80, and 100 for 2015, 2020, and 2025, respectively.

Challenges to establishing an efficient and effective jitney service are similar to those of bus routes and would require public capital and operating funding. The service must offer customers timely and frequent trips and would require multiple routes to sufficiently serve all customers within the five-mile radius.

### **CARPOOL AND VANPOOL**

Ride-sharing programs like carpools and vanpools can also be used to reduce parking demand at the North White Plains railroad station. Incentives can be used to encourage customers to ride together, but ultimately participation in a carpool is dependent on finding fellow Metro-North customers who share similar work schedules. Provisions must also be made to provide customers with rides in the event of unforeseen absences of partners. Currently, only 2.5 percent of customers to the North White Plains railroad station use carpools or vanpools.<sup>1</sup> Using this percentage, this strategy could reduce parking demand by approximately 55, 70, and 90 vehicles for 2015, 2020, and 2025, respectively.

### **BICYCLE TRAVEL**

The typical individual is generally willing to travel approximately two miles by bicycle to a primary destination.<sup>2</sup> A review of the North White Plains railroad station commutershed indicates that 27 percent of customers live within a two-mile radius of the station. However, existing observation indicates that bicycle activity is minimal at the North White Plains railroad station, with up to five bicycles observed at the bicycle rack at any given time. The Pathway in the Bronx River Parkway Reservation is the only bicycle facility that exists within the two-mile potential bicycle market radius of the station. Although it connects directly to Lot 1, it does not offer direct connections to nearby residential areas. A secondary bicycle travel route was identified by Westchester County and bicycle advocates along Route 22; however, heavy traffic activity during commuter peak travel periods may be a disincentive to the majority of Metro-North customers.

In general, numerous limitations exist to implementing a successful bicycle program for Metro-North customers in the study area. These limitations include many factors that are outside

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<sup>1</sup> Metro-North Railroad Customer Satisfaction Survey, 2004.

<sup>2</sup> U.S. Department of Transportation. Federal Highway Administration, “Case Study No. 9- Linking Bicycle/Pedestrian Facilities with Transit,” October 1992.

Metro-North’s and Westchester County’s control, such as the study area’s terrain, traffic conditions on the roadway network, and lack of connecting bike routes. Other limiting factors may include weather, age and physical health of customers, comfort level with this mode, perceptions of safety, income, auto ownership, parking fees, and availability of parking.

Given the minimal activity that now occurs and all the factors that influence the Metro-North customer decision to use a bicycle to access the station, it is unlikely that improved bicycle facilities would result in significant parking demand reductions at the North White Plains railroad station.

**WALKING**

Walking offers customers within a limited radius of the North White Plains railroad station an alternative to driving to the station and could therefore be considered among the parking demand management strategies. Approximately 7.9 percent of the existing customers at the North White Plains railroad station walk to the station.<sup>3</sup> From 2005 ridership statistics, there are approximately 1,677 inbound boardings at the North White Plains railroad station during the morning peak period. This yields an existing pedestrian market of approximately 125 customers who walk to the station.

Improved or new sidewalks, roadway crossing features and select links to the Pathway in the BRPR may foster some additional walking to the station. These facilities are of importance to current Metro-North customers who live in the North White Plains area. It should be noted that Metro-North and Westchester County do not have jurisdiction over infrastructure outside of the immediate station area. It is unlikely that improved pedestrian facilities would result in significant parking demand reductions at the North White Plains railroad station.

**SUMMARY OF PARKING DEMAND REDUCTION STRATEGIES**

Given all of the parking demand management strategies discussed above, potential reduction in demand for parking spaces can be approximately 415, 495, and 595 for the years 2015, 2020, and 2025, respectively (see Table A-5). However, it is possible that not all of the alternative modes would be implemented, or that any combination of two or more reduction strategies could result in significant parking demand reduction.

**Table A-5**  
**Potential Parking Demand Reduction Summary:North White Plains Station**

| <b>Year</b> | <b>Regional Bus Service<sup>1</sup></b> | <b>Local Jitney Service (spaces)</b> | <b>Carpool/ Vanpool (spaces)</b> | <b>Bicycle Users (spaces)</b> | <b>Walking (spaces)</b> | <b>Total Potential Demand Reduction (spaces)</b> |
|-------------|---|--------------------------------------|----------------------------------|-------------------------------|-------------------------|--|
| 2015        | 175                                     | 60                                   | 55                               | <sup>2</sup>                  | 125                     | 415  |
| 2020        | 220                                     | 80                                   | 70                               | <sup>2</sup>                  | 125                     | 495  |
| 2025        | 280                                     | 100                                  | 90                               | <sup>2</sup>                  | 125                     | 595  |

**Notes:**  
<sup>1</sup> In conjunction with park-and-ride lots.  
<sup>2</sup> Negligible parking demand reduction.  
**Source:** *Parking Demand Analysis for North White Plains Station*, (February 24, 2005), Gannett Fleming.

<sup>3</sup> Metro-North Railroad Customer Satisfaction Survey, 2004.

**CONCLUSION**

Results of this parking demand analysis reveal: 1) The expected future demand for parking will be substantially greater than can be accommodated by the existing facilities; and 2) Although a variety of parking demand management strategies could complement the construction of additional parking at the North White Plains station, they could not alone obviate the need for additional parking to accommodate the anticipated future demand.

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