

Y5, 7, 8, 9 Metrobus Georgia Avenue- Maryland Line Study

Preliminary Modifications and Improvements

October 2011



Table of Contents

	Page
Introduction	1
Service Modifications	2
Add Time to Scheduled Run Time	3
Provide More Frequent Headways Throughout Day	5
Run Two Route Patterns to Supplement Current Service	7
Implement Limited Stop Service in Corridor	12
Split Y Line Service	14
Extend the S9 Beyond Silver Spring	16
Bus Stop Consolidation Candidates	17
Operational and Traffic/Running Way Improvements	23
Appendices	26

List of Tables

Table 1 – Capacity Comparison – Current Headway with Articulated Vehicles versus Proposed Headway with 40' Coaches	6
Table 2 – Service Level and Routing Options – Implementation of Two Route Patterns	9
Table 3 – Headway and Capacity Changes – Implement Two Route Patterns	10
Table 4 – Limited Stop Service Options	12
Table 5 – Average Peak Headway Changes – Limited Stop Service	13

Table 6 – Ridership Impacted by Reduced Level of Service n/o Norbeck	15
Table 7 – Southbound Through Riders at Wheaton and Northbound Through Riders at Norbeck	15
Table 8 – Estimated Operating Cost – S9 Extension	16
Table 9 – Bus Stop Consolidation Candidates	19

List of Figures

Figure 1 – Location of Northbound Stop Consolidation Candidates	21
Figure 2 – Location of Southbound Stop Consolidation Candidates	22

Introduction

Outlined in this document are the proposed preliminary service and physical modification and improvement recommendations resulting from the first phase of the Y Line – Metrobus Georgia Avenue – MD Study (Y Line Study). The source of these preliminary recommendations is the project “Transit Service Assessment”, the project “Traffic Assessment”, additional ridership and bus stop analyses, driver interviews, public feedback received at the first project public meeting, and feedback received from the Project Management team (PMT) throughout the planning process.

This document includes a subset of the potential feasible improvements incorporated in earlier preliminary documents outlining potential modifications and improvements on the Line. This earlier documentation included detailed backup and analysis to provide assistance in the decision making process. Some of the potential improvements included in that document were removed from the universe of preliminary recommendations evaluated in this document based on feedback from the Project Management Team and further data analysis. The final set of preliminary recommendations included in this document reflects a pared down set of improvements relative to what was documented in earlier reports. This document also identifies those potential improvements from earlier documentation that have not been recommended for carrying forward into Phase 2.

The next steps in the planning process are to bring the recommendations included in this document forward into Phase 2 of the project. Phase 2 will include presentation of the recommendations to the public, finalization of the recommendations, and recommendation implementation. Phase 2 is anticipated to begin in fall, 2011.

Service Modifications

1. Add Time to Scheduled Run Time to Address On-Time Performance Issues on Line

- a. **Preliminary Recommendations** - Add additional time to the Y Line scheduled run time to reflect inadequate run time. This inadequate scheduled run time leads to on-time performance issues. For cost estimating purposes, an assumption of an additional 10% of current run time is assumed for all Y Line trips between 6:00 AM and 7:00 PM on weekdays and 10:00 AM to 6:00 PM on Saturdays and Sundays.
- b. **Issues Addressed** – Significant current on-time performance issues on the Y Line, as identified in the project “Transit Service Assessment”.
- c. **Ridership Impacts** – Ridership may increase if the reliability issues associated with inadequate run-time are addressed. However, no direct ridership impacts will occur because of this modification (this modification would not result in any changes in level of service).
- d. **Additional Analysis to be Completed in Implementation Phase of Study** – Identify the specific amount of additional run time required to address on-time performance issues. This analysis would be based on actual versus scheduled run time data from the NextBus system.
- e. **Operating Cost Impacts** – Estimated operating cost detail for this improvement is provided in Appendix 1 (for weekday, Saturday, and Sunday). The cost estimates in Appendix 1 shows that the estimated increase in annual operating costs from adding run time to the current scheduled run times on weekdays, Saturdays, and Sundays is approximately **\$445,000**.

Multiple Alternatives for Improving Service Frequency on the Y Line

There are four preliminary recommendations that are focused on providing more frequent service on the heaviest ridership portions of the Y line. Each preliminary recommendation presented below represents a different alternative for providing this improved service frequency. One of these alternatives, standing alone, or a combination of two alternatives will be selected for implementation in the second phase of the project. The other alternatives will be dropped as recommendations.

The first preliminary recommendation, outlined below under Section #2, provides additional service frequency by providing improved headways along the **entire** Y Line throughout the day.

The second preliminary recommendation, outlined below under Section #3 below, provides additional service frequency only on the heaviest portions of the Y Line. This would be done by running two trip patterns on the line, one running along the entire line at current or reduced frequency and one running only on the heaviest portion of the line between Norbeck Park and Ride and Silver Spring. The combination of the two trip patterns south of Norbeck Park and Ride would result in improved service frequency along this portion of the line. Three options within this alternative exist. The service characteristics that differ between options include the service frequency on the different route patterns and the hours of service on the different route patterns.

The third preliminary recommendation for improving service frequency would be to overlay a peak period limited stop service over existing local service, thus providing an improved combined headway on the line. This alternative also has six different options, with the differences between options based on different potential headways on the limited stop overlay service and where the limited stop portion of the overall service configuration would begin and end.

The final preliminary recommendation for improving service frequency would be to split the Y Line, with one route pattern running between Olney and Wheaton and the second route pattern running between Norbeck Park and Ride and Silver Spring. The two route patterns would have differing headways, with the pattern south of Norbeck, where the highest ridership demand is located, having higher frequencies than what is currently in place.

Each of the alternatives is discussed in greater detail below.

2. Provide More Frequent Headways Throughout Day – Weekday Service (Potentially Remove Articulated Buses in Order to Provide Additional Frequency)

- a. **Preliminary Recommendation** – Currently, the Y line is equipped with articulated buses. The additional capacity on these buses relative to 40' coaches allows for required Y Line capacity to be met with relatively infrequent headways (15 minutes in the peak and 20 minutes in the off-peak). While these infrequent headways utilizing articulated buses do provide sufficient capacity on the line they are not attractive from a customer convenience point of view. This is especially true given the high ridership on the line and the importance of the line to Montgomery County. This preliminary recommendation is to re-locate the articulated buses assigned to the line to another high-ridership line, utilize 40 foot coaches on the line and improve weekday headways. The new proposed weekday headways would be 10 minutes in the two peak periods (6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM) and 15 minutes in the mid-day.

Two alternative costs were generated for evening service. One would have 15 minute service to 10:00 PM and 30 minutes after 10:00 PM. The other would have 15 minute service to 11:00 PM, 20 minutes between 11:00 PM and 12:30 AM and 30 minute service after 12:30 AM. The difference between the two evening service alternatives is outlined below in sub-section E.

- b. **Issues Addressed** – Inadequate and inconvenient headways, especially during the peak periods.
- c. **Ridership Impacts** – More convenient headways will likely result in increased ridership. More detailed ridership estimates will be completed as part of the second phase of the project.
- d. **Additional Analysis in Implementation Phase of Study** – As noted, more detailed ridership estimates will be completed as part of the implementation stage
- e. **Operating Cost Impacts** – Estimated operating cost detail related to improving headways are outlined below in Appendix 2. (Note: Cost estimates assume existing scheduled run times).

The estimated incremental cost of the weekday headway improvement option with evening service configured to have 15 minute headways to 10:00 PM and 30 minute headways after 10:00 PM is estimated to be **\$1.64 million** on an annual basis.

The estimated incremental cost of the weekday headway improvement option with evening service configured to have 15 minute to 11:00 PM, 20 minutes between 11:00 PM and 12:30 AM and 30 minutes after 12:30 AM is **\$1.77 million** on an annual basis. The difference in cost between the two evening options is approximately \$130,000.

- f. **Additional Backup Analysis** – Outlined below in Table 1 is an assessment of the changes in capacity resulting from the change in headway to 10 minutes with 40 foot coaches.

Table 1 – Capacity Comparison – Current Headway with Articulated Vehicles versus Proposed Headway with 40’ Coaches

Time Period	Current			Future		
	Trips/ Hour	Seated Capacity	Total Hourly Capacity	Trips/ Hour	Seated Capacity	Total Hourly Capacity
Peak	4	60	240	6	40	240
Mid-Day	3	60	180	4	40	160

The data in Table 1 shows that hourly capacity will decrease slightly in the mid-day based on a change in headways and a switch to 40 foot coaches.

A review of per trip loads at the line’s max load point indicate that there will be standing loads in the PM peak hour (peak of the peak in both directions), but that the load factor will be less than 1.2. These standing loads occur under the current service structure. This is not the result of the change in headway or bus type.

3. Run Two Route Patterns to Supplement Current Service South of Norbeck Park and Ride – Weekday Service

- a. **Preliminary Recommendation** – Run two route patterns to provide more frequent service where greatest demand occurs on the line, south of the Norbeck Park and Ride Lot. Three route pattern options were identified as part of this recommendation and are summarized below in Table 2. The options reflect different levels of financial resources that would be required to implement. In every option one pattern runs as a backbone route pattern between Olney and Silver Spring. This backbone pattern runs all day in all options. The headways on this backbone pattern vary between different options.

In addition to this backbone pattern there is a second route pattern running between the Norbeck Park and Ride and Silver Spring. Hours of service and headways on this second pattern vary across options.

Note: The preliminary analysis documented in the earlier report also evaluated running the second trip pattern from Glenmont rather than the Norbeck Park and Ride. This potential modification was dropped as a preliminary recommendation because of the large number of riders directly north of Glenmont that would not benefit from the improved headways and might actually see a decline in service in one of the options. The analysis below, therefore, is provided just for a pattern between the Norbeck Park and Ride and Silver Spring.

b. Issues Addressed

- i. *Inconvenient Headway* – The current peak period headway on the Y Line is 15 minutes along the entire line. Because of the use of articulated buses, this headway provides sufficient capacity to handle loads, as identified in the on-board ridecheck. However, from a passenger convenience stand point, a 15 minute headway is insufficient relative to the line’s ridership and its ranking relative to other Montgomery County routes. Under this change, the heaviest ridership portion of the line, south of the Norbeck P&R would have higher combined headways than exist today, at least in the peak. A headway and capacity comparison for each option is outlined below in Table 3.
- ii. *Balance Between Service Levels and Demand* – 86% of boardings in the AM peak direction occur south of the Norbeck Park and Ride in the peak direction. 88% of alightings in the PM peak direction occur south of the Norbeck Park and Ride. Currently these riders receive the same level of service as the portion of the route north of Norbeck. This change would result in a better balance in service relative to the geographic distribution of demand on the line.

- iii. *Potential for Improved Reliability* – The shorter route pattern between the Norbeck Park and Ride and Silver Spring could result in greater reliability, though it would still run through the most congested portion of the line.
- c. **Ridership Impacts** – More frequent headways south of the Norbeck Park and Ride will likely result in increased ridership. More detailed ridership estimates will be completed as part of the second phase of the project.
- d. **Additional Analysis in Implementation Phase of Study** – As noted, more detailed ridership estimates will be completed as part of the second phase of the project.
- e. **Operating Cost Impacts** – Estimated operating cost impacts related to running two route pattern options are outlined below in Table 2. (Note: Cost estimates assume existing scheduled run times). The estimated incremental cost of running two route patterns to improve service frequency along the heaviest ridership portions of the Line range between **\$1.42 million and \$2.98 million** on an annual basis.
- f. **Additional Backup Analysis** – Outlined below in Table 3 is an assessment of the changes in headway and capacity north and south of Norbeck Road resulting from the two route pattern service structure (capacity calculations assume the second pattern would utilize 40' coaches).

Table 2 – Service Level and Routing Options – Implementation of Two Route Patterns

Group	Option	Terminals/Route Patterns	Headway	Cost Increment	Option Summary
2nd route pattern Norbeck to Silver Spring Peak Only	1	Olney to Silver Spring	15 minute peak, 20 minute off-peak (current headway)	\$1,426,188	a. Olney to Silver Spring Pattern - current service level
		Norbeck to Silver Spring - Peak Only	15 minutes - peak only service		b. 2nd pattern Norbeck to Silver Spring -peak only (15 minutes)
Current Headways - Olney to Silver Spring	2	Olney to Silver Spring	15 minute peak, 20 minute off-peak (current headway)	\$2,183,566	a. Olney to Silver Spring Pattern - current service Level
		Norbeck to Silver Spring - Peak Only	10 minutes – peak only service		b. 2nd pattern Norbeck to Silver Spring - peak only (10 minutes)
2nd route pattern Norbeck to Silver Spring - All Day Reduced Headways Olney to Silver Spring	3	Olney to Silver Spring	20 minutes peak, 30 minutes off peak	\$2,984,094	a. Olney to Silver Spring Pattern - Headways reduced
		Norbeck to Silver Spring - All Day	10 minutes peak, 20 minutes off-peak		b. 2nd pattern Norbeck to Silver Spring - 2nd pattern runs all day

Table 3 – Headway and Capacity Changes – Implement Two Route Patterns

South of Norbeck								
Current					Future			
Option	Time Period	Trips Per Hour	Average Headway	Total Hourly Capacity	Trips Per Hour	Average Headway	Total Hourly Capacity	Capacity Change
1	Peak	4	15	240	8	7-8	400	160
	Mid-Day	3	20	180	3	20	180	0
2	Peak	4	15	240	10	6	480	240
	Mid-Day	3	20	180	3	20	180	0
3	Peak	4	15	240	9	6-7	420	180
	Mid-Day	3	20	180	6	10	280	100

North of Norbeck								
Option	Time Period	Trips Per Hour	Average Headway	Total Hourly Capacity	Trips Per Hour	Average Headway	Total Hourly Capacity	Capacity Change
1	Peak	4	15	240	4	15	240	0
	Mid-Day	3	20	180	3	20	180	0
2	Peak	4	15	240	4	15	240	0
	Mid-Day	3	20	180	3	30	180	0
3	Peak	4	15	240	3	20	180	-60
	Mid-Day	3	20	180	2	30	120	-60

Note: For capacity calculations, assume Olney to Silver Spring Pattern utilizes 60' coaches while second pattern utilizes 40' coaches

4. Implement Limited Stop Service in Corridor

- a. **Preliminary Recommendation** – This service modification would entail implementation of bi-directional peak period limited stop service in the corridor, to be overlaid on the current service structure. Six options for this preliminary recommendation are evaluated for cost estimating purposes. The differences between the options relate to the limited stop service routing, operations, terminal locations, and limited stop service frequencies. The six options are summarized below in Table 4.

Table 4 – Limited Stop Service Options

Option Description	Limited Stop Frequency	Incremental Cost – Relative to Existing
1. Limited Stop – Entire Length of Route from Olney to Silver Spring	10 minutes	\$2,470,965
2. Limited Stop – Entire Length of Route from Olney to Silver Spring	15 minutes	\$1,585,158
3. Limited Stop – Norbeck Park and Ride to Wheaton	10 minutes	\$1,274,220
4. Limited Stop – Norbeck Park and Ride to Wheaton	15 minutes	\$844,846
5. Local/Limited Stop Hybrid Local – Olney to Glenmont Limited Stop – Glenmont to Silver Spring (Local service would start at Norbeck Park and Ride during hours when Limited Stop hybrid runs (peak period))	10 minutes	\$2,078,419
6. Local/Limited Stop Hybrid Local – Olney to Glenmont Limited Stop – Glenmont to Silver Spring (Local service would start at Norbeck Park and Ride during hours when Limited Stop hybrid runs (peak period))	15 minutes	\$1,243,827

- b. **Issues Addressed** – This preliminary service recommendation addresses inconvenient headways and slow service.
- c. **Ridership Impacts** – More convenient service will likely result in increased ridership. More detailed ridership estimates will be completed as part of the second phase of the project.
- d. **Additional Analysis in Implementation Phase of Study** – More detailed ridership estimates will be completed as part of the implementation phase.

- e. **Operating Cost Impacts** – Estimated operating cost impacts related to implementation of limited stop service are outlined below in Appendices six through 11. The estimated incremental cost change relative to current service is summarized above in Table 4.
- f. **Additional Backup Analysis** – Outlined below in Table 5 is a summary of headway changes in the Georgia Avenue Corridor as a result of implementation of peak period limited stop service.

Table 5 – Average Peak Headway Changes – Limited Stop Service

Option	Route Segment	Current Trips/Hour	Current Avg. Headway	Future Trips/Hour	Future Avg. Headway
Limited Stop – Entire Length of Route – 10 minute headway	North of Norbeck	4	15	10	6
	Glenmont to Wheaton	4	15	10	6
	South of Wheaton	4	15	10	6
Limited Stop – Entire Length of Route – 15 minute headway	North of Norbeck	4	15	8	7-8
	Glenmont to Wheaton	4	15	8	7-8
	South of Wheaton	4	15	8	7-8
Limited Stop – Norbeck P&R to Wheaton – 10 minute headway	North of Norbeck	4	15	4	15
	Glenmont to Wheaton	4	15	10	6
	South of Wheaton	4	15	4	15
Limited Stop – Norbeck P&R to Wheaton – 15 minute headway	North of Norbeck	4	15	4	15
	Glenmont to Wheaton	4	15	8	7-8
	South of Wheaton	4	15	4	15
Local – Limited Stop Hybrid – 10 Minute headway	North of Norbeck	4	15	4	15
	Glenmont to Wheaton	4	15	10	6
	South of Wheaton	4	15	10	6
Local – Limited Stop Hybrid – 10 Minute headway	North of Norbeck	4	15	4	15
	Glenmont to Wheaton	4	15	8	7-8
	South of Wheaton	4	15	8	7-8

5. Split Y Line Service, With One Route Pattern Running Between Olney and Wheaton and One Pattern Running Between Glenmont or Norbeck and Silver Spring

- a. **Potential Modification** – This modification would be a split in the Y Line, with two overlapping route patterns, one running between Olney and Wheaton and one running between Norbeck and Silver Spring. In order to reflect ridership demand differences between the northern and southern portion of the line, the two route patterns would have differing headways. The headways would be as follows:

i. Olney to Wheaton	Peak	20 minutes
	Off-Peak	30 minutes
ii. Norbeck to Silver Spring	Peak	10 minutes
	Off-Peak	15 minutes

It is also assumed that this service structure would be run with 40' coaches on the northern route pattern.

- b. **Issues Addressed** - This service modification would address inconvenient headways, though only for riders south of Norbeck Park and Ride. It would also potentially address the imbalance between ridership demand and level of service. This also has the potential to address reliability issues, especially for riders on the northern route pattern who won't get caught in congestion south of Wheaton.
- c. **Ridership Impacts** – More convenient headways south of Norbeck would likely result in increased ridership.
- d. **Additional Analysis in Implementation Phase of Study** – Complete ridership impacts analysis as well as complete a more detailed analysis of impacts of the Q Line split, in conjunction with this preliminary recommendation, on schedule and available capacity south of Wheaton on Georgia Avenue.
- e. **Operating Cost Impacts** – Estimated operating cost impacts related to implementation of a split service are outlined below in Appendix 12. The estimated incremental cost of implementing the option with the southern route pattern starting at Norbeck is **\$1.75 million** on an annual basis.
- f. **Additional Backup Analysis** – Outlined below in Table 6 is an assessment of the number of riders who would be impacted by the lower levels of service on the northern loop. Table 7 shows the number of through riders at Wheaton for riders on the northern route pattern going southbound and through riders at Norbeck going northbound.

These riders would be forced to transfer at Wheaton or Norbeck to continue their trip if the split occurred.

Table 6 – Ridership Impacted by Reduced Level of Service n/o Norbeck

Northern Terminal	SB Boardings Impacted by Reduced Frequency		SB Alightings Impacted by Reduced Frequency		NB Boardings Impacted by Reduced Frequency		NB Alightings Impacted by Reduced Frequency	
	Actual	% of total	Actual	% of total	Actual	% of total	Actual	% of total
Norbeck	306	14.07%	16	.74%	13	.55%	286	12.19%

Table 7 – Southbound Through Riders at Wheaton and Northbound Through Riders at Norbeck

Direction	Load Arriving at Station/Park and Ride	Alightings at Station/Park and Ride	Riders Still on Board (through riders forced to transfer)
Southbound	736	273	463
Northbound	292	19	273

6. Extend the S9 Beyond Silver Spring to the Wheaton Metro Station – Run Straight Up 16th Street Rather than Accessing Silver Spring Metro Station

- a. **Preliminary Recommendation** – This recommendation would involve extending the S9 service that currently runs between Silver Spring and downtown Washington DC up Georgia Avenue to Wheaton. Under this change, service would remain on 16th Street in Silver Spring until it reached Georgia Avenue. This routing would avoid the extensive congestion in the heart of Silver Spring. Service levels would remain the same as they are on the current S9 service.
- b. **Issues Addressed** – A review of transfer data shows fairly large transfers between the Y Line and the S9 in Silver Spring. This extension would be an added convenience for riders who currently make this transfer. It would also be an alternative to Metro and might be more convenient for riders going to the portions of downtown DC served by the S9.
- c. **Ridership Impacts** – More detailed analysis of ridership impacts will be completed during the second phase of the project.
- d. **Operating Cost Impacts** – Operating cost estimates are shown below in Table 7.

Table 8 – Estimated Operating Cost – S9 Extension

Current									
Round Trip Cycle Time	Headway	# of Buses In Service	Daily Hours of Service	Daily Revenue Hours	Platform Hour Factor	Daily Platform Hours	Cost Per Platform Hr	Daily Cost	Annual Cost
76	10	8	7.5	57	1.1	62.7	\$107.43	\$6,736	\$1,731,116
Future									
Round Trip Cycle Time	Headway	# of Buses In Service	Daily Hours of Service	Daily Revenue Hours	Platform Hour Factor	Daily Platform Hours	Cost Per Platform Hr	Daily Cost	Annual Cost
109	10	11	7.5	81.75	1.1	89.925	\$107.43	\$9,661	\$2,482,785
Incremental Cost from Service Change - Annual									\$751,669

Bus Stop Consolidation Candidates

The analysis and findings presented in this section are based on WMATA guidelines for the most effective distance between bus stops. These guidelines state that stops should ideally be spaced between .2 and .25 miles apart. The data in Table 8 below identify bus stops on the Y Line that are **candidates** for bus stop consolidation based on their proximity to the previous and next stop on the line and how these distances relate to the distances outlined in the guidelines. Also included in Table 7 are the daily boardings and alightings at each stop to provide an understanding of how busy the candidate stops are.

It should be noted that at this point in the analysis these stops are only candidates for consolidation. The next step in the process will be the detailed evaluation and public outreach process that WMATA follows for all bus stop consolidations. Included in this evaluation for each candidate will be total daily boarding and alighting activity, proximity to facilities such as elderly housing or medical facilities, and the extent of passenger amenities and improvements at each stop. Based on this detailed evaluation, final decisions on consolidation will be made.

The evaluation to identify candidates for consolidation was done for every stop on the line. The data in Table 7 shows the candidate stop for consolidation, the stop previous to the candidate stop, the distance to the previous stop, the next stop after the candidate stop, the distance to the next stop, and daily boarding and alighting activity at the candidate stop.

The identification of candidates for consolidation also takes into account the distance between the previous and next stop if a stop was eliminated. If the distance between the two stops that would remain if a stop was eliminated exceeds the WMATA guideline of .25, then the stop was not identified as a candidate for consolidation (as noted every stop on the line was evaluated in this manner).

A map showing the location of the consolidation candidates are shown in Figures 1 and 2 below.

Table 9 – Bus Stop Consolidation Candidates

Y Line Northbound Bus Stop Consolidation Candidates						
Candidate Stop	Previous Stop	Distance to Previous Stop – Miles	Next Stop	Distance to Next Stop Miles	Candidate Stop Daily Boardings	Candidate Stop Daily Alightings
#17020	Entrance to #16910	.13	Old Baltimore Road	.11	1	0
August Drive	Belvedere Blvd.	.12	Dexter Avenue	.09	18	15
Belvedere Blvd.	Tilton Drive	.09	August Drive	.12	7	7
Blueridge Avenue	Hickerson Drive	.05	Dawson Avenue (Leesborough Rd)	.13	53	18
Chesterwood Drive	Connecticut Ave.	.09	Post Gate Terrace	.15	2	30
Connecticut Ave.	Gate of Heaven	.15	Chesterwood Drive	.09	48	117
Dawson Avenue (Leesborough Rd.)	Blueridge Avenue	.13	Arcola Avenue	.1	8	7
Dayton Street	Evans Parkway	.13	Plyers Mill Road	.11	2	10
Dennis Avenue	Medical Park Drive	.07	Evans Parkway	.13	29	19
Dexter Avenue	August Drive	.09	Medical Park Drive	.07	12	6
Grace Church Rd.	Highland Drive	.08	Luzerne Avenue	.16	0	3
Hathaway Drive	Weller Road	.1	Janet Road	.14	2	17
Hickerson Drive	Price Avenue	.14	Blueridge Avenue	.05	40	8
Highland Drive	Noyes Drive	.16	Grace Church Road	.08	0	4
Medical Park Drive	Dexter Avenue	.06	Dennis Avenue	.07	9	8
Old Baltimore Road	#17020	.11	Cherry Valley Drive	.11	1	3
Price Avenue	Reedie Drive	.09	Hickerson Drive	.14	46	22
Regina Drive	May Street	.1	Verona Drive	.12	5	8
May Street	Kayson Street	.13	Regina Drive	.1	2	10
Tilton Drive	Forest Glen Rd.	.15	Belvedere Blvd.	.09	1	10
Weller Road	Epping Road	.13	Hathaway Drive	.1	4	28
Georgia Avenue	Club House	.06	International Drive	.17	0	3

Y Line Southbound Bus Stop Consolidation Candidates						
Candidate Stop	Previous Stop	Distance to Previous Stop – Miles	Next Stop	Distance to Next Stop Miles	Candidate Stop Daily Boardings	Candidate Stop Daily Alightings
#10835	Veirs Mill Road	.09	Windham Lane	.1	15	9
Americana Finn.	Belvedere Blvd.	.1	Forest Glen Road	.13	5	5
Belvedere Blvd.	Hildarose Drive	.1	Americana Finn.	.1	6	7
Ennalls Avenue	University Blvd.	.09	Reedie Drive	.1	0	52
Evans Drive	Predella Drive	.11	Dennis Avenue	.11	6	13
Grace Church Rd.	Luzerne Avenue	.1	Highland Drive	.11	3	1
Hathaway Drive	Janet Drive	.1	Weller Road	.02	10	5
Henderson Avenue	Weisman Rd.	.14	Parker Avenue	.08	14	2
Hildarose Drive	Dexter Avenue	.09	Belvedere Blvd.	.1	12	12
Janet Road	Kayson Street	.13	Hathaway Drive	.1	17	3
Luzerne Avenue	Seminary Road	.15	Grace Church Road	.03	4	1
May Street	Regina Drive	.09	Kayson Street	.13	10	5
Regina Drive (Niles Street)	Verona Drive	.13	May Street	.09	7	5
Old Baltimore Road	Cherry Valley Drive	.15	#17020	.07	5	0
Parker Avenue	Henderson Avenue	.08	Arcola Avenue	.16	8	5
Predella Drive	Plyers Mill Road	.07	Evans Drive	.11	4	2
Reedie Drive	Ennalls Avenue	.1	Veirs Mill Road	.14	10	91
University Blvd.	Blueridge Avenue	.11	Ennalls Avenue	.09	14	83
Trinity Place	Colesville Road	.12	Dixon Avenue	.09	0	91
#17020	Old Baltimore Road	.08	#16910	.09	0	0

Figure 1 – Location of Northbound Stop Consolidation Candidates

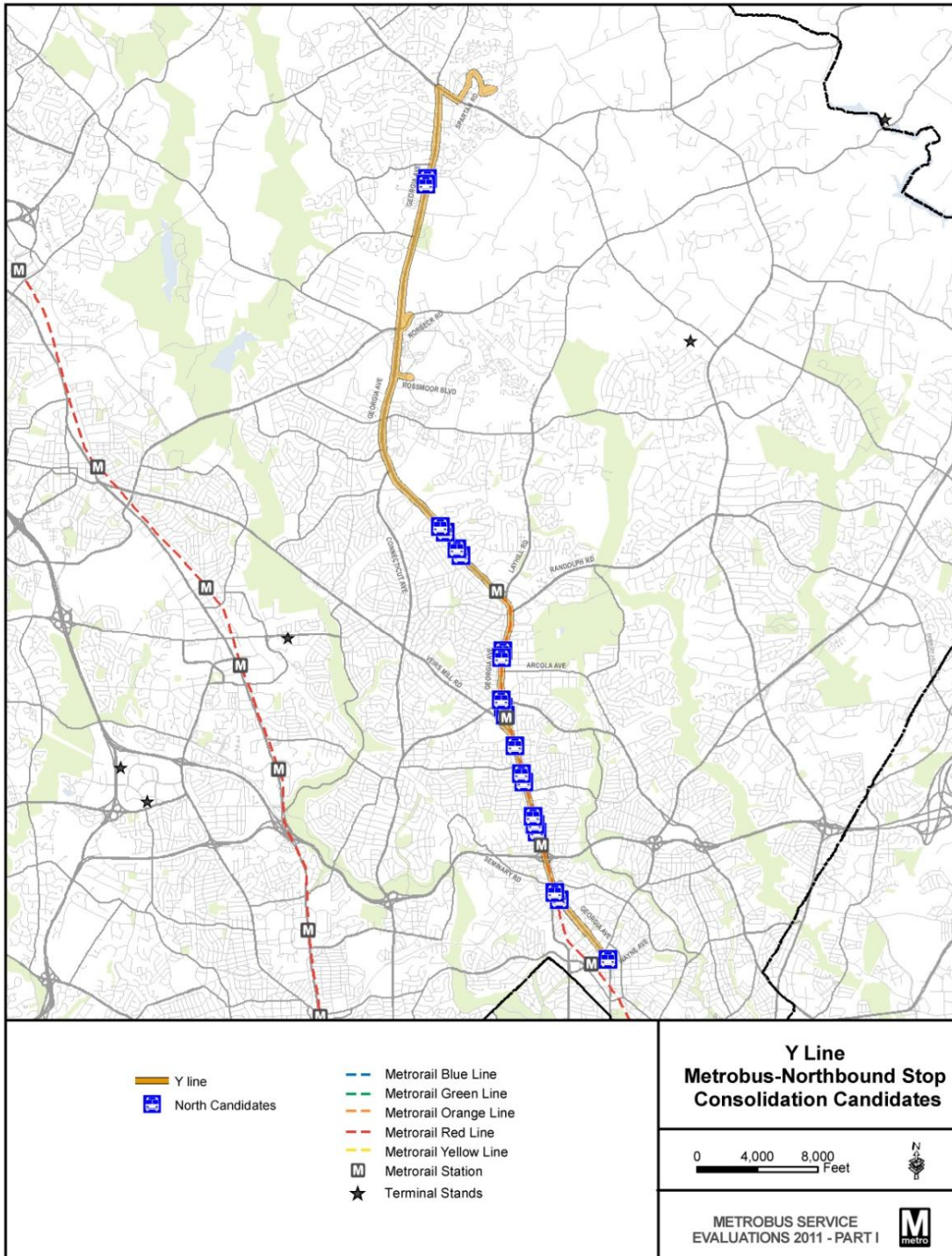
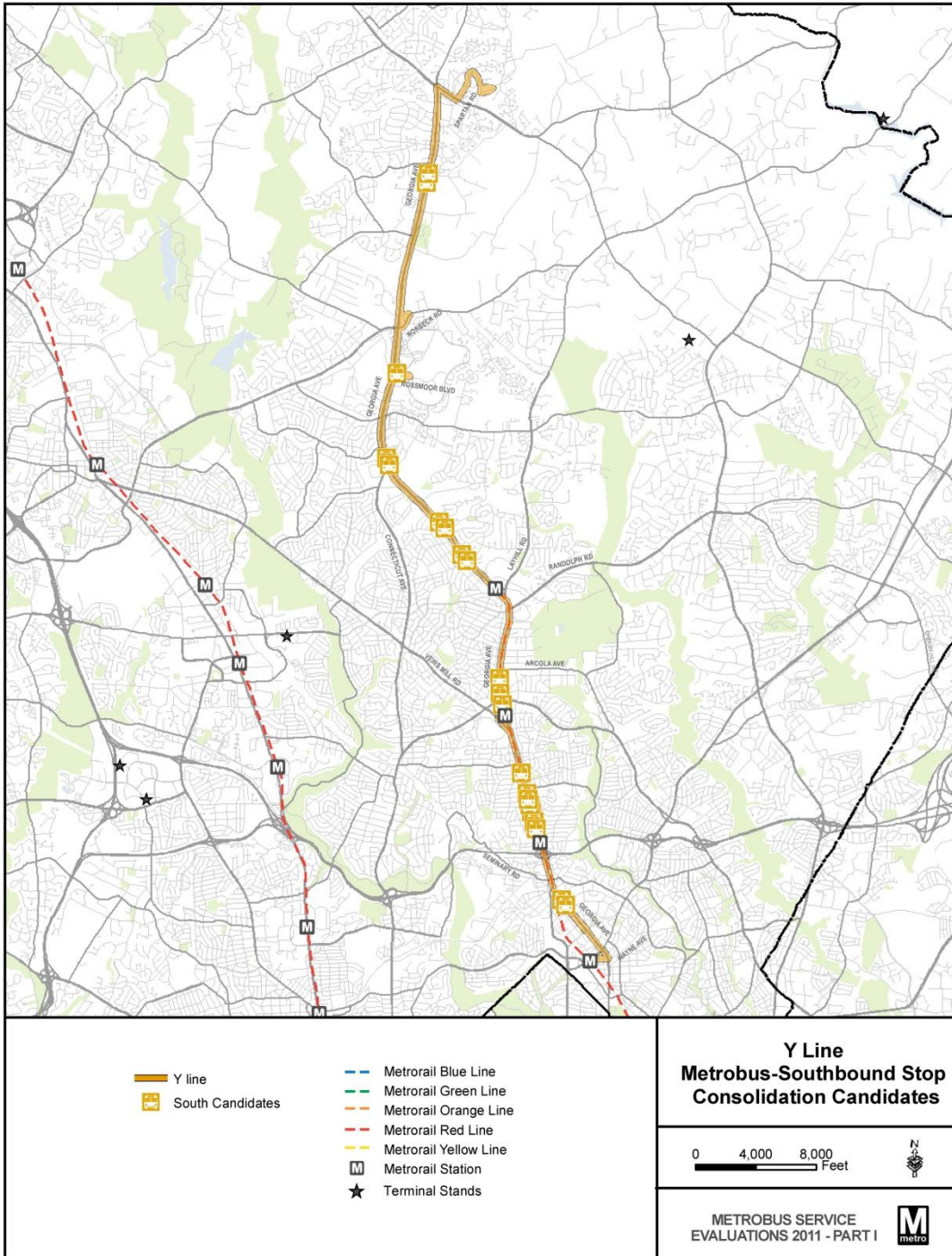


Figure 2 – Location of Southbound Stop Consolidation Candidates



Operational and Traffic/Running Way Improvements

This section contains a list of proposed physical improvements to support faster and more efficient service, with a primary focus on a more convenient trip for passengers.

1. Traffic – Running Way Improvements

- a. **Preliminary Recommendation** – A number of traffic and running way recommendations were identified based on the project “Traffic Assessment”. The next step in implementing these improvements will be to complete more detailed analysis, including traffic counts, intersection capacity analysis, and signal timing and phase length analysis. The proposed areas of improvement are outlined below, including the proposed analysis. These next steps would require coordination with Montgomery County and the State Highway Administration.
 - i. Georgia Avenue and Maryland Rout 108
 1. Check signal timing for inconsistent timing
 2. Conduct turning movement counts and optimize signal timing based on demand in all movements
 - ii. Georgia Avenue at Bell Pre and Georgia Avenue at Connecticut Avenue
 1. Increase enforcement to discourage jay-walking
 2. Complete study to determine feasibility of a protected mid-block pedestrian crossing
- b. Glenmont Station – Southbound Left into Station
 1. Check functionality of in-street vehicle detector – does not appear to work consistently
 2. Increase enforcement of kiss and riders waiting in the curb lane to pick up rail passengers – blocks smooth operations of bus
 3. Increase the permissive window that releases the green phase for the side street (currently, window is too short)
- ii. Layhill Rod and Georgia Avenue
 1. Determine feasibility of moving northbound stop back from Layhill Road – NB Georgia Avenue to EB Layhill channelized right turn is too close to bus stop and vehicles and buses pulling out from stop conflict
- iii. Georgia Avenue – Between Spring Street and Colesville Road
 1. Increase enforcement of parking regulations – prevent parked and idling vehicles from blocking buses

- b. **Issues Addressed** - The locations outlined above that were identified during the project traffic assessment result in significant disruptions to Y Line service. Improvements to enhance operational effectiveness at these bottlenecks can help improve Y Line run times and reliability.

2. Make Southbound Stop at Glenmont Metro On-Street

- a. **Preliminary Recommendation** – Currently southbound Y Line trips enter the Glenmont Station bus bays by making a left turn into the bays (located on the east side of Georgia Avenue) and then a left out of the bays onto southbound Georgia. This diversion adds time to the trip for through riders and is a general inconvenience. This proposal is to make the southbound stop at Glenmont an on-street stop adjacent to the west side Metro entrance in order to eliminate this diversion. It is important to note that even when the move into and out of the station can be made relatively quickly, which is not always the case when traffic levels are high, passengers are required to make a diversion from a direct trip to their destination, which heightens the feeling of inconvenience.

Items that would have to be addressed in order to allow for an on-street stop include the installation of a bus pad on the west side of Georgia Avenue, a bus pull out (optional) and the removal of the fence that is currently located between the curb and the station entrance. Of note is that this potential improvement is also being evaluated as part of the Glenmont Station Improvement Study.

- b. **Issues Addressed** – This diversion through the bus bays for through riders is an inconvenience that passengers noted in the public meeting. On a line with reliability issues and long trips, this additional inconvenience exacerbates existing unhappiness with the line.

3. Make Southbound Stop at Wheaton Metro Station On-Street

- a. **Proposed Modification** – This modification would be comparable to the recommendation for the southbound stop at Glenmont. The same benefits would accrue from this improvement. Requirements to implement this on-street stop would include the addition of trailblazing signs to Wheaton Station, a new arrangement with Ride-On, whose buses lay over at this stop, and additional passenger information and bus stop amenities. This on-street stop will be precluded once redevelopment of the bus bay area occurs, though no defined schedule for this redevelopment is in place.

Appendix 1

Detailed Cost Estimate

Additional Run Time in Schedule

Southbound Current Cost – Weekday											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	Y9	1	0.87	0.09	0.95	0.95	1.19	1.13	\$103.68	\$117.62	\$29,523
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	Total	65									\$2,016,080

Northbound Current Cost - Weekday											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
3:00 PM - 7:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130

		Northbound Current Cost - Weekday – cont.									
7:00 PM - to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
	Total	66									
Total - Both Directions - Current Weekday											\$3,964,598

Southbound Future Cost - Weekday												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	4	0.68	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.94	0.09	1.03	1.03	1.19	1.22	\$103.68	\$126.90	\$31,851
	Y7	4	1.20	1.32	0.13	1.45	5.81	1.19	6.91	\$103.68	\$716.59	\$179,863
	Y5	5	1.15	1.27	0.13	1.39	6.96	1.19	8.28	\$103.68	\$858.41	\$215,461
	Y8	1	0.95	1.05	0.10	1.15	1.15	1.19	1.37	\$103.68	\$141.82	\$35,598
	Y9	1	0.87	0.95	0.10	1.05	1.05	1.19	1.25	\$103.68	\$129.38	\$32,475
9:00 AM - 3:00 PM	Y9	9	0.87	0.95	0.10	1.05	9.44	1.19	11.23	\$103.68	\$1,164.45	\$292,278
	Y8	8	0.97	1.06	0.11	1.17	9.36	1.19	11.14	\$103.68	\$1,154.50	\$289,780
	Y8	2	1.03	1.14	0.11	1.25	2.50	1.19	2.98	\$103.68	\$308.53	\$77,441
	Y7	1	0.73	0.81	0.08	0.89	0.89	1.19	1.06	\$103.68	\$109.48	\$27,479
3:00 PM - 7:00 PM	Y8	7	1.03	1.14	0.11	1.25	8.75	1.19	10.42	\$103.68	\$1,079.86	\$271,044
	Y9	6	0.98	1.08	0.11	1.19	7.14	1.19	8.50	\$103.68	\$880.80	\$221,082
	Y9	2	0.92	1.01	0.10	1.11	2.22	1.19	2.64	\$103.68	\$273.70	\$68,698
7:00 PM - to Service Close	Y8	3	0.80	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	Total	65										\$2,174,539

Northbound Future Cost - Weekday												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.72	0.79	0.08	0.87	1.73	1.19	2.06	\$103.68	\$213.98	\$53,709
	Y8	1	0.75	0.83	0.08	0.91	0.91	1.19	1.08	\$103.68	\$111.97	\$28,104
	Y8	2	0.83	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y8	2	0.92	1.01	0.10	1.11	2.22	1.19	2.64	\$103.68	\$273.70	\$68,698
	Y9	1	0.80	0.88	0.09	0.97	0.97	1.19	1.15	\$103.68	\$119.43	\$29,977
	Y9	3	0.88	0.97	0.10	1.07	3.21	1.19	3.82	\$103.68	\$395.62	\$99,299
9:00 AM - 3:00 PM	Y8	9	0.92	1.01	0.10	1.11	9.98	1.19	11.88	\$103.68	\$1,231.63	\$309,140
	Y9	9	0.88	0.97	0.10	1.07	9.62	1.19	11.45	\$103.68	\$1,186.85	\$297,898
3:00 PM - 7:00 PM	Y8	3	1.03	1.14	0.11	1.25	3.75	1.19	4.46	\$103.68	\$462.80	\$116,162
	Y9	2	0.97	1.06	0.11	1.17	2.34	1.19	2.78	\$103.68	\$288.63	\$72,445
	Y7	1	1.02	1.12	0.11	1.23	1.23	1.19	1.46	\$103.68	\$151.78	\$38,096
	Y7	3	1.03	1.14	0.11	1.25	3.75	1.19	4.46	\$103.68	\$462.80	\$116,162
	Y7	2	0.93	1.03	0.10	1.13	2.26	1.19	2.69	\$103.68	\$278.67	\$69,947
	Y5	1	1.08	1.19	0.12	1.31	1.31	1.19	1.56	\$103.68	\$161.73	\$40,594
	Y5	2	1.10	1.21	0.12	1.33	2.66	1.19	3.17	\$103.68	\$328.44	\$82,437
	Y5	2	1.00	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943

Northbound Future Cost – Weekday – cont.												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM - to Service Close	Y5/	1	0.80	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
	Total	66										\$2,090,342
	Total - Both Directions - Future - Weekday											\$4,264,881
	Weekday Difference - Current vs. Future											\$300,283

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Southbound Current Cost - Saturday												
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost	
5:00 AM - 10:00 AM	Y9	3	0.75	0.08	0.83	2.48	1.17	2.90	\$103.68	\$300.23	\$17,113	
	Y9	3	0.82	0.08	0.90	2.70	1.17	3.15	\$103.68	\$326.92	\$18,634	
	Y9	4	0.97	0.10	1.06	4.25	1.17	4.98	\$103.68	\$515.95	\$29,409	
	Y8	2	0.78	0.08	0.86	1.72	1.17	2.02	\$103.68	\$209.05	\$11,916	
	Y8	1	0.88	0.09	0.97	0.97	1.17	1.14	\$103.68	\$117.87	\$6,719	
	Y8	5	0.67	0.07	0.73	3.67	1.17	4.29	\$103.68	\$444.79	\$25,353	
10:00 AM - 6:00 PM	Y9	15	0.97	0.10	1.06	15.95	1.17	18.66	\$103.68	\$1,934.82	\$110,285	
	Y9	1	0.92	0.09	1.01	1.01	1.17	1.18	\$103.68	\$122.32	\$6,972	
	Y8	15	0.77	0.08	0.84	12.65	1.17	14.80	\$103.68	\$1,534.52	\$87,467	
	Y8	1	0.73	0.07	0.81	0.81	1.17	0.94	\$103.68	\$97.85	\$5,578	
6:00 PM to Service Close	Y9	3	0.92	0.09	1.01	3.03	1.17	3.54	\$103.68	\$366.95	\$20,916	
	Y9	7	0.78	0.08	0.86	6.03	1.17	7.06	\$103.68	\$731.67	\$41,705	
	Y8	1	0.73	0.07	0.81	0.81	1.17	0.94	\$103.68	\$97.85	\$5,578	
	Y8	3	1.00	0.10	1.10	3.30	1.17	3.86	\$103.68	\$400.31	\$22,818	
Total		64										\$410,463

Northbound Current Cost - Saturday											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y9	2	0.77	0.08	0.84	1.69	1.17	1.97	\$103.68	\$204.60	\$11,662
	Y9	7	0.83	0.08	0.92	6.42	1.17	7.51	\$103.68	\$778.38	\$44,368
	Y8	1	0.80	0.08	0.88	0.88	1.17	1.03	\$103.68	\$106.75	\$6,085
	Y8	1	0.87	0.09	0.95	0.95	1.17	1.12	\$103.68	\$115.64	\$6,592
	Y8/	6	0.67	0.07	0.73	4.40	1.17	5.15	\$103.68	\$533.74	\$30,423
10:00 AM - 6:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.17	10.04	\$103.68	\$1,040.80	\$59,326
	Y9	7	0.98	0.10	1.08	7.57	1.17	8.86	\$103.68	\$918.49	\$52,354
	Y8/	9	0.68	0.07	0.75	6.77	1.17	7.92	\$103.68	\$820.63	\$46,776
	Y8/	6	0.80	0.08	0.88	5.28	1.17	6.18	\$103.68	\$640.49	\$36,508
	Y8	1	1.02	0.10	1.12	1.12	1.17	1.31	\$103.68	\$135.66	\$7,733
6:00 PM to Service Close	Y8	4	1.02	0.10	1.12	4.47	1.17	5.23	\$103.68	\$542.64	\$30,931
	Y9	7	0.98	0.10	1.08	7.57	1.17	8.86	\$103.68	\$918.49	\$52,354
	Y9	5	0.80	0.08	0.88	4.40	1.17	5.15	\$103.68	\$533.74	\$30,423
	Y9	1	0.73	0.07	0.81	0.81	1.17	0.94	\$103.68	\$97.85	\$5,578
	Y7/	2	0.57	0.06	0.62	1.25	1.17	1.46	\$103.68	\$151.23	\$8,620
	Y7/	3	0.35	0.04	0.39	1.16	1.17	1.35	\$103.68	\$140.11	\$7,986
	Total	71									\$421,111
Total Both Directions - Current Saturday											\$831,574

Southbound Future Cost - Saturday												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y9	3	0.75	0.75	0.08	0.83	2.48	1.17	2.90	\$103.68	\$300.23	\$17,113
	Y9	3	0.82	0.82	0.08	0.90	2.70	1.17	3.15	\$103.68	\$326.92	\$18,634
	Y9	4	0.97	0.97	0.10	1.06	4.25	1.17	4.98	\$103.68	\$515.95	\$29,409
	Y8	2	0.78	0.78	0.08	0.86	1.72	1.17	2.02	\$103.68	\$209.05	\$11,916
	Y8	1	0.88	0.88	0.09	0.97	0.97	1.17	1.14	\$103.68	\$117.87	\$6,719
	Y8	5	0.67	0.67	0.07	0.73	3.67	1.17	4.29	\$103.68	\$444.79	\$25,353
10:00 AM - 6:00 PM	Y9	15	0.97	1.06	0.11	1.17	17.55	1.17	20.53	\$103.68	\$2,128.31	\$121,313
	Y9	1	0.92	1.01	0.10	1.11	1.11	1.17	1.30	\$103.68	\$134.55	\$7,669
	Y8	15	0.77	0.84	0.08	0.93	13.92	1.17	16.28	\$103.68	\$1,687.97	\$96,214
	Y8	1	0.73	0.81	0.08	0.89	0.89	1.17	1.04	\$103.68	\$107.64	\$6,135
6:00 PM to Service Close	Y9	3	0.92	0.92	0.09	1.01	3.03	1.17	3.54	\$103.68	\$366.95	\$20,916
	Y9	7	0.78	0.78	0.08	0.86	6.03	1.17	7.06	\$103.68	\$731.67	\$41,705
	Y8	1	0.73	0.73	0.07	0.81	0.81	1.17	0.94	\$103.68	\$97.85	\$5,578
	Y8	3	1.00	1.00	0.10	1.10	3.30	1.17	3.86	\$103.68	\$400.31	\$22,818
	Total	64										\$431,493

Northbound Future Cost - Saturday												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y9	2	0.77	0.77	0.08	0.84	1.69	1.17	1.97	\$103.68	\$204.60	\$11,662
	Y9	7	0.83	0.83	0.08	0.92	6.42	1.17	7.51	\$103.68	\$778.38	\$44,368
	Y8	1	0.80	0.80	0.08	0.88	0.88	1.17	1.03	\$103.68	\$106.75	\$6,085
	Y8	1	0.87	0.87	0.09	0.95	0.95	1.17	1.12	\$103.68	\$115.64	\$6,592
	Y8/	6	0.67	0.67	0.07	0.73	4.40	1.17	5.15	\$103.68	\$533.74	\$30,423
10:00 AM - 6:00 PM	Y9	9	0.87	0.95	0.10	1.05	9.44	1.17	11.04	\$103.68	\$1,144.88	\$65,258
	Y9	7	0.98	1.08	0.11	1.19	8.33	1.17	9.74	\$103.68	\$1,010.33	\$57,589
	Y8/	9	0.68	0.75	0.08	0.83	7.44	1.17	8.71	\$103.68	\$902.70	\$51,454
	Y8/	6	0.80	0.88	0.09	0.97	5.81	1.17	6.80	\$103.68	\$704.54	\$40,159
	Y8	1	1.02	1.12	0.11	1.23	1.23	1.17	1.44	\$103.68	\$149.23	\$8,506
6:00 PM to Service Close	Y8	4	1.02	1.02	0.10	1.12	4.47	1.17	5.23	\$103.68	\$542.64	\$30,931
	Y9	7	0.98	0.98	0.10	1.08	7.57	1.17	8.86	\$103.68	\$918.49	\$52,354
	Y9	5	0.80	0.80	0.08	0.88	4.40	1.17	5.15	\$103.68	\$533.74	\$30,423
	Y9	1	0.73	0.73	0.07	0.81	0.81	1.17	0.94	\$103.68	\$97.85	\$5,578
	Y7/	2	0.57	0.57	0.06	0.62	1.25	1.17	1.46	\$103.68	\$151.23	\$8,620
	Y7/	3	0.35	0.35	0.04	0.39	1.16	1.17	1.35	\$103.68	\$140.11	\$7,986
	Total	71										\$457,987
Total - Both Directions - Future - Saturday												\$889,480
Saturday Difference - Current vs. Future												\$57,906

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Southbound Current Cost - Sunday											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.24	3.73	\$103.68	\$386.55	\$22,033
	Y9	3	0.90	0.09	0.99	2.97	1.24	3.68	\$103.68	\$381.83	\$21,764
	Y8	5	0.73	0.07	0.81	4.03	1.24	5.00	\$103.68	\$518.54	\$29,557
	Y8	1	0.80	0.08	0.88	0.88	1.24	1.09	\$103.68	\$113.14	\$6,449
	Y8	1	0.97	0.10	1.06	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
10:00 AM - 6:00 PM	Y9	1	0.90	0.09	0.99	0.99	1.24	1.23	\$103.68	\$127.28	\$7,255
	Y9/	14	0.62	0.06	0.68	9.50	1.24	11.78	\$103.68	\$1,220.92	\$69,593
	Y8	1	0.97	0.10	1.06	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
	Y5	15	0.82	0.08	0.90	13.48	1.24	16.71	\$103.68	\$1,732.39	\$98,746
6:00 PM to Service Close	Y9/	1	0.38	0.04	0.42	0.42	1.24	0.52	\$103.68	\$54.21	\$3,090
	Y9	1	0.78	0.08	0.86	0.86	1.24	1.07	\$103.68	\$110.78	\$6,314
	Y9	4	0.73	0.07	0.81	3.23	1.24	4.00	\$103.68	\$414.83	\$23,645
	Y9	4	0.67	0.07	0.73	2.93	1.24	3.64	\$103.68	\$377.12	\$21,496
	Y8	2	0.85	0.09	0.94	1.87	1.24	2.32	\$103.68	\$240.41	\$13,704
	Y8	2	0.78	0.08	0.86	1.72	1.24	2.14	\$103.68	\$221.56	\$12,629
	Y9/	2	0.48	0.05	0.53	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
	Total	61									\$325,527

Northbound Current Cost - Sunday											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y8	4	0.65	0.07	0.72	2.86	1.24	3.55	\$103.68	\$367.69	\$20,958
	Y8	4	0.80	0.08	0.88	3.52	1.24	4.36	\$103.68	\$452.54	\$25,795
	Y9	4	0.75	0.08	0.83	3.30	1.24	4.09	\$103.68	\$424.26	\$24,183
10:00 AM - 6:00 PM	Y9	3	0.75	0.08	0.83	2.48	1.24	3.07	\$103.68	\$318.19	\$18,137
	Y9	12	0.62	0.06	0.68	8.14	1.24	10.09	\$103.68	\$1,046.50	\$59,651
	Y8	2	0.80	0.08	0.88	1.76	1.24	2.18	\$103.68	\$226.27	\$12,897
	Y5/	2	0.65	0.07	0.72	1.43	1.24	1.77	\$103.68	\$183.85	\$10,479
	Y5/	11	0.82	0.08	0.90	9.88	1.24	12.25	\$103.68	\$1,270.42	\$72,414
6:00 PM to Service Close	Y9	2	0.62	0.06	0.68	1.36	1.24	1.68	\$103.68	\$174.42	\$9,942
	Y9	1	0.92	0.09	1.01	1.01	1.24	1.25	\$103.68	\$129.63	\$7,389
	Y9	3	0.80	0.08	0.88	2.64	1.24	3.27	\$103.68	\$339.41	\$19,346
	Y9	7	0.72	0.07	0.79	5.52	1.24	6.84	\$103.68	\$709.45	\$40,439
	Y9	2	0.48	0.05	0.53	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
	Y8	3	0.95	0.10	1.05	3.14	1.24	3.89	\$103.68	\$403.05	\$22,974
	Y8	1	0.83	0.08	0.92	0.92	1.24	1.14	\$103.68	\$117.85	\$6,717
	Total	61									\$321,630
Total Both Directions - Current Sunday											\$647,157

Southbound Future Cost - Sunday												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y9	4	0.68	0.68	0.07	0.75	3.01	1.24	3.73	\$103.68	\$386.55	\$22,033
	Y9	3	0.90	0.90	0.09	0.99	2.97	1.24	3.68	\$103.68	\$381.83	\$21,764
	Y8	5	0.73	0.73	0.07	0.81	4.03	1.24	5.00	\$103.68	\$518.54	\$29,557
	Y8	1	0.80	0.80	0.08	0.88	0.88	1.24	1.09	\$103.68	\$113.14	\$6,449
	Y8	1	0.97	0.97	0.10	1.06	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
10:00 AM - 6:00 PM	Y9	1	0.90	0.99	0.10	1.09	1.09	1.24	1.35	\$103.68	\$140.01	\$7,980
	Y9/	14	0.62	0.68	0.07	0.75	10.45	1.24	12.95	\$103.68	\$1,343.01	\$76,552
	Y8	1	0.97	1.06	0.11	1.17	1.17	1.24	1.45	\$103.68	\$150.38	\$8,571
	Y5	15	0.82	0.90	0.09	0.99	14.82	1.24	18.38	\$103.68	\$1,905.63	\$108,621
6:00 PM to Service Close	Y9/	1	0.38	0.38	0.04	0.42	0.42	1.24	0.52	\$103.68	\$54.21	\$3,090
	Y9	1	0.78	0.78	0.08	0.86	0.86	1.24	1.07	\$103.68	\$110.78	\$6,314
	Y9	4	0.73	0.73	0.07	0.81	3.23	1.24	4.00	\$103.68	\$414.83	\$23,645
	Y9	4	0.67	0.67	0.07	0.73	2.93	1.24	3.64	\$103.68	\$377.12	\$21,496
	Y8	2	0.85	0.85	0.09	0.94	1.87	1.24	2.32	\$103.68	\$240.41	\$13,704
	Y8	2	0.78	0.78	0.08	0.86	1.72	1.24	2.14	\$103.68	\$221.56	\$12,629
	Y9/	2	0.48	0.48	0.05	0.53	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
	Total	61										\$357,569

Northbound Future Cost - Sunday												
Time Period	Route	# of Trips	Current Run Time Hours	Future Run Time Hours	Layover	Future Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost per Platform Hour	Daily Total Cost	Annual Cost
5:00 AM - 10:00 AM	Y8	4	0.65	0.65	0.07	0.72	2.86	1.24	3.55	\$103.68	\$367.69	\$20,958
	Y8	4	0.80	0.80	0.08	0.88	3.52	1.24	4.36	\$103.68	\$452.54	\$25,795
	Y9	4	0.75	0.75	0.08	0.83	3.30	1.24	4.09	\$103.68	\$424.26	\$24,183
10:00 AM - 6:00 PM	Y9	3	0.75	0.83	0.08	0.91	2.72	1.24	3.38	\$103.68	\$350.01	\$19,951
	Y9	12	0.62	0.68	0.07	0.75	8.95	1.24	11.10	\$103.68	\$1,151.15	\$65,616
	Y8	2	0.80	0.88	0.09	0.97	1.94	1.24	2.40	\$103.68	\$248.90	\$14,187
	Y5/	2	0.65	0.72	0.07	0.79	1.57	1.24	1.95	\$103.68	\$202.23	\$11,527
	Y5/	11	0.82	0.90	0.09	0.99	10.87	1.24	13.48	\$103.68	\$1,397.46	\$79,655
6:00 PM to Service Close	Y9	2	0.62	0.62	0.06	0.68	1.36	1.24	1.68	\$103.68	\$174.42	\$9,942
	Y9	1	0.92	0.92	0.09	1.01	1.01	1.24	1.25	\$103.68	\$129.63	\$7,389
	Y9	3	0.80	0.80	0.08	0.88	2.64	1.24	3.27	\$103.68	\$339.41	\$19,346
	Y9	7	0.72	0.72	0.07	0.79	5.52	1.24	6.84	\$103.68	\$709.45	\$40,439
	Y9	2	0.48	0.48	0.05	0.53	1.06	1.24	1.32	\$103.68	\$136.71	\$7,792
	Y8	3	0.95	0.95	0.10	1.05	3.14	1.24	3.89	\$103.68	\$403.05	\$22,974
	Y8	1	0.83	0.83	0.08	0.92	0.92	1.24	1.14	\$103.68	\$117.85	\$6,717
	Total	61										\$376,471
Total - Both Directions - Future - Sunday												\$734,040
Sunday Difference - Current vs. Future												\$86,883

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 2
Detailed Cost Estimates
Change Headways – Entire Line
Weekday Service
Alternative Evening Services

Estimated New Costs - Headway Improvement - Southbound - Weekday - 15 Minutes to 10:00 PM, 30 Minutes After 10:00 PM												
Time Period	Overall Headway	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	20	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
		Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 - 9:00 AM	10	Y5	9	1.15	0.12	1.27	11.39	1.19	13.55	\$103.68	\$1,404.67	\$352,573
		Y7	9	1.20	0.12	1.32	11.88	1.19	14.14	\$103.68	\$1,465.74	\$367,902
9:00 AM - 3:00 PM	15	Y8	12	0.97	0.10	1.06	12.76	1.19	15.18	\$103.68	\$1,574.32	\$395,154
		Y9	12	0.92	0.09	1.01	12.10	1.19	14.40	\$103.68	\$1,492.89	\$374,715
3:00 PM - 7:00 PM	10	Y8	12	1.03	0.10	1.14	13.64	1.19	16.23	\$103.68	\$1,682.89	\$422,406
		Y9	12	0.97	0.10	1.06	12.76	1.19	15.18	\$103.68	\$1,574.32	\$395,154
7:00 PM - 8:30 PM	15	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
		Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
8:30 PM - 10:00 PM	15	Y9	6	0.65	0.07	0.72	4.29	1.19	5.11	\$103.68	\$529.30	\$132,853
10:00 pm - 12:00 AM	30	Y9	4	0.65	0.07	0.72	2.86	1.19	3.40	\$103.68	\$352.86	\$88,569
Total Southbound - Cost - Improved Headway												\$2,814,904

Estimated New Costs - Headway Improvement - Northbound - Weekday - 15 Minutes to 10:00 PM, 30 Minutes After 10:00 PM												
4:30 - 6:00 AM	20	Y9	4	0.72	0.07	0.79	3.15	1.19	3.75	\$103.68	\$389.06	\$97,653
		Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 - 9:00 AM	10	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
		Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
9:00 AM - 3:00 PM	15	Y8	12	0.92	0.09	1.01	12.10	1.19	14.40	\$103.68	\$1,492.89	\$374,715
		Y9	12	0.88	0.09	0.97	11.66	1.19	13.88	\$103.68	\$1,438.60	\$361,089
3:00 PM - 4:00 PM	10	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
		Y9	3	0.97	0.10	1.06	3.19	1.19	3.80	\$103.68	\$393.58	\$98,788
4:00 PM - 7:00 PM	10	Y7	9	1.02	0.10	1.12	10.07	1.19	11.98	\$103.68	\$1,241.81	\$311,695
		Y5	9	1.08	0.11	1.19	10.73	1.19	12.76	\$103.68	\$1,323.24	\$332,134
7:00 PM - 8:30 PM	15	Y8	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
		Y9	3	0.83	0.08	0.92	2.75	1.19	3.27	\$103.68	\$339.29	\$85,162
8:30 PM - 10:00 PM	15	Y9	6	0.83	0.08	0.92	5.50	1.19	6.55	\$103.68	\$678.59	\$170,325
10:00 PM 10:30 PM	30	Y9	1	0.83	0.08	0.92	0.92	1.19	1.09	\$103.68	\$113.10	\$28,387
10:30 PM - 12:30 AM	30	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
12:30 AM - 2:30 AM	30	Y9	4	0.45	0.05	0.50	1.98	1.19	2.36	\$103.68	\$244.29	\$61,317
Total Northbound - Cost - Improved Headway												\$2,787,652
Total New Headway - Both Directions												\$5,602,557
Current Service Cost												\$3,964,598
Incremental Cost - Headway Change												\$1,637,959

- Notes:
- 1) Cost per platform hour – WMATA cost for service changes
 - 2) Existing service cost estimates based on current Y Line timetable

Estimated New Costs - Headway Improvement - Southbound - Weekday - 15 Minutes to 11:00 PM, 20 Minutes 11:00 PM - 12:30 AM

Time Period	Overall Headway	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	20	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
		Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 - 9:00 AM	10	Y5	9	1.15	0.12	1.27	11.39	1.19	13.55	\$103.68	\$1,404.67	\$352,573
		Y7	9	1.20	0.12	1.32	11.88	1.19	14.14	\$103.68	\$1,465.74	\$367,902
9:00 AM - 3:00 PM	15	Y8	12	0.97	0.10	1.06	12.76	1.19	15.18	\$103.68	\$1,574.32	\$395,154
		Y9	12	0.92	0.09	1.01	12.10	1.19	14.40	\$103.68	\$1,492.89	\$374,715
3:00 PM - 7:00 PM	10	Y8	12	1.03	0.10	1.14	13.64	1.19	16.23	\$103.68	\$1,682.89	\$422,406
		Y9	12	0.97	0.10	1.06	12.76	1.19	15.18	\$103.68	\$1,574.32	\$395,154
7:00 PM - 8:30 PM	15	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
		Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
8:30 PM - 11:00 PM	15	Y9	10	0.65	0.07	0.72	7.15	1.19	8.51	\$103.68	\$882.16	\$221,422
11:00 PM - 12:00 AM	30	Y9	2	0.65	0.07	0.72	1.43	1.19	1.70	\$103.68	\$176.43	\$44,284
Total Southbound - Cost - Improved Headway												\$2,859,189

Estimated New Costs - Headway Improvement - Northbound - Weekday - 15 Minutes to 11:00 PM, 20 Minutes 11:00 PM - 12:30 AM												
4:30 - 6:00 AM	20	Y9	4	0.72	0.07	0.79	3.15	1.19	3.75	\$103.68	\$389.06	\$97,653
		Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 - 9:00 AM	10	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
		Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
9:00 AM - 3:00 PM	15	Y8	12	0.92	0.09	1.01	12.10	1.19	14.40	\$103.68	\$1,492.89	\$374,715
		Y9	12	0.88	0.09	0.97	11.66	1.19	13.88	\$103.68	\$1,438.60	\$361,089
3:00 PM - 4:00 PM	10	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
		Y9	3	0.97	0.10	1.06	3.19	1.19	3.80	\$103.68	\$393.58	\$98,788
4:00 PM - 7:00 PM	10	Y7	9	1.02	0.10	1.12	10.07	1.19	11.98	\$103.68	\$1,241.81	\$311,695
		Y5	9	1.08	0.11	1.19	10.73	1.19	12.76	\$103.68	\$1,323.24	\$332,134
7:00 PM - 8:30 PM	15	Y8	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
		Y9	3	0.83	0.08	0.92	2.75	1.19	3.27	\$103.68	\$339.29	\$85,162
8:30 PM - 11:00 PM	15	Y9	10	0.83	0.08	0.92	9.17	1.19	10.91	\$103.68	\$1,130.98	\$283,875
11:00 PM - 12:30 AM	20	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
12:30 AM - 2:30 AM	30	Y9	4	0.45	0.05	0.50	1.98	1.19	2.36	\$103.68	\$244.29	\$61,317
Total Northbound - Cost - Improved Headway												\$2,872,815
Total New Headway - Both Directions												\$5,732,004
Current Service Cost												\$3,964,598
Incremental Cost - Headway Change												\$1,767,406

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 3
Detailed Cost Estimates
Two Route Patterns – Option 1
Current Service Structure
Supplemental Service – Norbeck to Silver Spring (15
minute headway – Peak Period Only)
Weekday Service

Estimated New Cost - Option 1 - Current Service Structure - Supplemental Peak Period Service - Norbeck to Silver Spring (15 minute headway) Southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	New	12	0.8	0.08	0.88	10.56	1.19	12.57	\$103.68	\$1,302.88	\$327,024
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	New	16	0.73	0.07	0.81	12.91	1.19	15.36	\$103.68	\$1,592.41	\$399,696
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
Total Southbound - Two Route Patterns - Option 1											\$2,713,277

Estimated New Cost - Option 1 - Current Service Structure - Supplemental Peak Period Service - Norbeck to Silver Spring (15 minute headway) Northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
	New	12	0.72	0.07	0.79	9.46	1.19	11.26	\$103.68	\$1,167.17	\$292,959
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130
	New	16	0.80	0.08	0.88	14.08	1.19	16.76	\$103.68	\$1,737.18	\$436,032

Estimated New Cost - Option 1 - Current Service Structure - Supplemental Peak Period Service - Norbeck to Silver Spring (15 minute headway) Northbound – cont.											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM - to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Two Route Patterns - Option 1											\$2,677,509
Total - Both Directions - Two Route Patterns - Option 1											\$5,390,786
Current Service Cost											\$3,964,598
Incremental Cost - Headway Change											\$1,426,188

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 4
Detailed Cost Estimates
Two Route Patterns – Option 2
Current Service Structure
Supplemental Service – Norbeck to Silver Spring (10
minute headway – Peak Period Only)
Weekday Service

Estimated New Cost - Option 2 - Current Service Structure - Supplemental Peak Period Service - Norbeck to Silver Spring (10 minute headway) Southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	Y9	1	0.87	0.09	0.95	0.95	1.19	1.13	\$103.68	\$117.62	\$29,523
	New	18	0.8	0.08	0.88	15.84	1.19	18.85	\$103.68	\$1,954.33	\$490,536
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	New	24	0.73	0.07	0.81	19.36	1.19	23.04	\$103.68	\$2,388.62	\$599,544
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	New	0	0.45	0.05	0.50	0.00	1.19	0.00	\$103.68	\$0.00	\$0
Total Southbound - Two Route Patterns - Option 2											\$3,106,160

Estimated New Cost - Option 2 - Current Service Structure - Supplemental Peak Period Service - Norbeck to Silver Spring (10 minute headway) Northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
	New	18	0.72	0.07	0.79	14.19	1.19	16.89	\$103.68	\$1,750.75	\$439,438
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130
	New	24	0.80	0.08	0.88	21.12	1.19	25.13	\$103.68	\$2,605.77	\$654,048

Estimated New Cost - Option 2 - Current Service Structure - Supplemental Peak Period Service - Norbeck to Silver Spring (10 minute headway) Northbound – cont.											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM - to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Two Route Patterns - Option 2											\$3,042,004
Total - Both Directions - Two Route Patterns - Option 2											\$6,148,164
Current Service Cost											\$3,964,598
Incremental Cost - Headway Change											\$2,183,566

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 5
Detailed Cost Estimates
Two Route Patterns – Option 3
Reduced Headways – Norbeck to Silver Spring
2nd Pattern – All Day Service
(10 Minutes Peak, 15 Minutes Off-Peak)
Weekday Service

Estimated New Cost - Option 3 - Reduced Headway - Olney to Silver Spring (20 minutes Peak, 30 Minutes Off-Peak)
 Supplemental All Day Service - Norbeck to Silver Spring (10 Minutes Peak, 20 Minutes Off-Peak)
 Southbound

Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y5	3	1.15	0.12	1.27	3.80	1.19	4.52	\$103.68	\$468.22	\$117,524
	Y7	6	1.2	0.12	1.32	7.92	1.19	9.42	\$103.68	\$977.16	\$245,268
	New	18	0.8	0.08	0.88	15.84	1.19	18.85	\$103.68	\$1,954.33	\$490,536
9:00 AM - 3:00 PM	Y8	6	0.97	0.10	1.06	6.38	1.19	7.59	\$103.68	\$787.16	\$197,577
	Y9	6	0.92	0.09	1.01	6.05	1.19	7.20	\$103.68	\$746.44	\$187,357
	New	24	0.70	0.07	0.77	18.48	1.19	21.99	\$103.68	\$2,280.05	\$572,292
3:00 PM - 7:00 PM	Y8	4	1.03	0.10	1.14	4.55	1.19	5.41	\$103.68	\$560.96	\$140,802
	Y9	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	New	24	0.73	0.07	0.81	19.36	1.19	23.04	\$103.68	\$2,388.62	\$599,544
7:00 PM - 8:30 PM	Y8	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	2	0.77	0.08	0.84	1.69	1.19	2.01	\$103.68	\$208.10	\$52,233
	New	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
8:30 PM - 12:00 AM	Y9	7	0.58	0.06	0.64	4.49	1.19	5.35	\$103.68	\$554.18	\$139,099
	New	10	0.45	0.05	0.50	4.95	1.19	5.89	\$103.68	\$610.73	\$153,292
Total Southbound - Two Route Patterns - Option 3											\$3,391,170

Estimated New Cost - Option 3 - Reduced Headway - Olney to Silver Spring (20 minutes Peak, 30 Minutes Off-Peak Supplemental All Day Service - Norbeck to Silver Spring (10 Minutes Peak, 20 Minutes Off-Peak) Northbound											
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y8	3	0.92	0.09	1.01	3.03	1.19	3.60	\$103.68	\$373.22	\$93,679
	Y9	6	0.88	0.09	0.97	5.83	1.19	6.94	\$103.68	\$719.30	\$180,544
	New	18	0.72	0.07	0.79	14.19	1.19	16.89	\$103.68	\$1,750.75	\$439,438
9:00 AM - 3:00 PM	Y8	6	0.92	0.09	1.01	6.05	1.19	7.20	\$103.68	\$746.44	\$187,357
	Y9	6	0.88	0.09	0.97	5.83	1.19	6.94	\$103.68	\$719.30	\$180,544
	New	24	0.73	0.07	0.81	19.36	1.19	23.04	\$103.68	\$2,388.62	\$599,544
3:00 PM - 4:00 PM	Y8	1	1.03	0.10	1.14	1.14	1.19	1.35	\$103.68	\$140.24	\$35,200
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	New	6	0.80	0.08	0.88	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
4:00 PM - 7:00 PM	Y5	3	1.08	0.11	1.19	3.58	1.19	4.25	\$103.68	\$441.08	\$110,711
	Y7	6	1.03	0.10	1.14	6.82	1.19	8.12	\$103.68	\$841.45	\$211,203
	New	18	0.80	0.08	0.88	15.84	1.19	18.85	\$103.68	\$1,954.33	\$490,536
7:00 PM - 8:30 PM	Y8	1	0.88	0.09	0.97	0.97	1.19	1.16	\$103.68	\$119.88	\$30,091
	Y9	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	New	4	0.80	0.08	0.88	3.52	1.19	4.19	\$103.68	\$434.29	\$109,008
8:30 PM - 12:30 AM	Y9	8	0.83	0.08	0.92	7.33	1.19	8.73	\$103.68	\$904.78	\$227,100
	New	10	0.68	0.07	0.75	7.52	1.19	8.94	\$103.68	\$927.40	\$232,777
12:30 AM - 2:30 AM	Y9 Full	1	0.68	0.07	0.75	0.75	1.19	0.89	\$103.68	\$92.74	\$23,278
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Two Route Patterns - Option 3											\$3,557,521
Total - Both Directions - Two Route Patterns - Option 3											\$6,948,692
Current Service Cost											\$3,964,598
Incremental Cost - Headway Change											\$2,984,094

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 6
Detailed Cost Estimate
Limited Stop Service Overlay
Peak Periods – Entire Length of Line
15 Minute Headway
Weekday

Estimated New Cost - Limited Stop- 15 minute Headway - Southbound (current service from timetable)											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	Y9	1	0.87	0.09	0.95	0.95	1.19	1.13	\$103.68	\$117.62	\$29,523
	New	12	0.95	0.10	1.05	12.54	1.19	14.92	\$103.68	\$1,547.18	\$388,341
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	New	16	0.80	0.08	0.88	14.08	1.19	16.76	\$103.68	\$1,737.18	\$436,032
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	New	0	0.45	0.05	0.50	0.00	1.19	0.00	\$103.68	\$0.00	\$0
Total Southbound - Limited Stop Entire Length of Line - 15 minute headway											\$2,840,453

Estimated New Cost - Limited Stop - 15 Minute Headway - Peak Northbound (current service from timetable)

Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
	New	12	0.68	0.07	0.75	9.02	1.19	10.73	\$103.68	\$1,112.88	\$279,333
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130
	New	16	0.88	0.09	0.97	15.55	1.19	18.50	\$103.68	\$1,918.14	\$481,452

Estimated New Cost - Limited Stop - 15 Minute Headway - Peak Northbound (current service from timetable) – cont.											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM - to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Limited Stop Entire Length of Line - 15 minute headway											\$2,709,303
Total - Both Directions - Limited Stop - Entire Length of Line - 15 minute headway											\$5,549,756
Current Service Cost											\$3,964,598
Incremental Cost - Limited Stop Service											\$1,585,158

Note: Limited Stop Service Assumed to Have a 15% Faster Running Time than Local Service at Same Time of Day

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 7
Detailed Cost Estimate
Limited Stop Service Overlay
Peak Periods – Entire Length of Line
10 Minute Headway
Weekday

Estimated New Cost - Limited Stop- 10 minute Headway - Southbound (current service from timetable)											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$107.43	\$384.38	\$96,479
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$107.43	\$133.59	\$33,532
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	Y9	1	0.87	0.09	0.95	0.95	1.19	1.13	\$103.68	\$117.62	\$29,523
	New	18	0.95	0.10	1.05	18.81	1.19	22.38	\$107.43	\$2,404.70	\$603,580
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$107.43	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	New	24	0.80	0.08	0.88	21.12	1.19	25.13	\$107.43	\$2,700.02	\$677,704
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
Total Southbound - Limited Stop Entire Length of Line - 10 Minute Headway											\$3,301,903

Estimated New Cost - Limited Stop - 10 Minute Headway - Peak Northbound

Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$107.43	\$201.56	\$50,593
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$107.43	\$105.47	\$26,473
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
	New	18	0.68	0.07	0.75	13.53	1.19	16.10	\$107.43	\$1,729.70	\$434,154
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$107.43	\$0.00	\$0
3:00 PM - 4:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
4:00 PM - 7:00 PM	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130
	New	24	0.88	0.09	0.97	23.32	1.19	27.75	\$107.43	\$2,981.27	\$748,298

Estimated New Cost - Limited Stop - 10 Minute Headway - Peak Northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM – to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Limited Stop Entire Length of Line - 10 Minute Headway											\$3,133,661
Total - Both Directions - Limited Stop - Entire Length of Line - 10 Minute Headway											\$6,435,563
Current Service Cost											\$3,964,598
Incremental Cost – Limited Stop Service											\$2,470,965

Note: Limited Stop Service Assumed to Have a 15% Faster Running Time than Local Service at Same Time of Day

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 8
Detailed Cost Estimate
Limited Stop Service Overlay
Peak Periods – Norbeck Park and Ride to Wheaton
15 Minute Headway
Weekday

Estimated New Cost - Norbeck to Wheaton Limited Stop - 15 Minutes - Southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$107.43	\$384.38	\$96,479
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$107.43	\$133.59	\$33,532
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	Y9	1	0.87	0.09	0.95	0.95	1.19	1.13	\$103.68	\$117.62	\$29,523
	New	12	0.43	0.04	0.48	5.72	1.19	6.81	\$107.43	\$731.25	\$183,545
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$107.43	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	New	16	0.48	0.05	0.53	8.51	1.19	10.12	\$107.43	\$1,087.51	\$272,964
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	New	0	0.45	0.05	0.50	0.00	1.19	0.00	\$107.43	\$0.00	\$0
Total Southbound - Limited Stop Service - Norbeck to Wheaton - 15 Minutes											\$2,477,127

Estimated New Cost - Norbeck to Wheaton Limited Stop - 15 Minutes - Northbound

Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
	New	12	0.38	0.04	0.42	5.06	1.19	6.02	\$103.68	\$624.30	\$156,699
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130
	New	16	0.42	0.04	0.46	7.33	1.19	8.73	\$103.68	\$904.78	\$227,100

Estimated New Cost - Norbeck to Wheaton Limited Stop - 15 Minutes - Northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM - to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Norbeck to Wheaton - 15 Minutes											\$2,332,317
Total - Both Directions - Norbeck to Wheaton - 15 Minutes											\$4,809,444
Current Service Cost											\$3,964,598
Incremental Cost - Limited Stop Service											\$844,846

Note: Limited Stop Service Assumed to Have a 15% Faster Running Time than Local Service at Same Time of Day

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 9
Detailed Cost Estimate
Limited Stop Service Overlay
Peak Periods – Norbeck Park and Ride to Wheaton
10 Minute Headway
Weekday

Estimated New Cost - Norbeck to Wheaton Limited Stop - 10 Minute Headway - Southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$107.43	\$384.38	\$96,479
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$107.43	\$133.59	\$33,532
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	1.20	0.12	1.32	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Y5	5	1.15	0.115	1.265	6.33	1.19	7.53	\$103.68	\$780.37	\$195,874
	Y8	1	0.95	0.095	1.045	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
	Y9	1	0.87	0.09	0.95	0.95	1.19	1.13	\$103.68	\$117.62	\$29,523
	New	18	0.43	0.04	0.48	8.58	1.19	10.21	\$107.43	\$1,096.88	\$275,317
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	1.03	0.10	1.14	7.96	1.19	9.47	\$103.68	\$981.69	\$246,403
	Y9	6	0.98	0.10	1.08	6.49	1.19	7.72	\$103.68	\$800.73	\$200,983
	Y9	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	New	24	0.48	0.05	0.53	12.76	1.19	15.18	\$103.68	\$1,574.32	\$395,154
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	New	0	0.45	0.05	0.50	0.00	1.19	0.00	\$103.68	\$0.00	\$0
Total Southbound - Limited Stop Service - Norbeck to Wheaton - 10 Minutes											\$2,691,090

Estimated New Cost - Norbeck to Wheaton Limited Stop - 10 Minute Headway - Northbound

Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$107.43	\$201.56	\$50,593
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$107.43	\$105.47	\$26,473
6:00 AM - 9:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
	Y8	2	0.83	0.08	0.92	1.83	1.19	2.18	\$103.68	\$226.20	\$56,775
	Y8	2	0.92	0.09	1.01	2.02	1.19	2.40	\$103.68	\$248.81	\$62,452
	Y9	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y9	3	0.88	0.09	0.97	2.92	1.19	3.47	\$103.68	\$359.65	\$90,272
	New	18	0.38	0.04	0.42	7.59	1.19	9.03	\$107.43	\$970.32	\$243,550
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$107.43	\$0.00	\$0
4:00 PM - 7:00 PM	Y8	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y9	2	0.97	0.10	1.06	2.13	1.19	2.53	\$103.68	\$262.39	\$65,859
	Y7	1	1.02	0.10	1.12	1.12	1.19	1.33	\$103.68	\$137.98	\$34,633
	Y7	3	1.03	0.10	1.14	3.41	1.19	4.06	\$103.68	\$420.72	\$105,601
	Y7	2	0.93	0.09	1.03	2.05	1.19	2.44	\$103.68	\$253.34	\$63,588
	Y5	1	1.08	0.11	1.19	1.19	1.19	1.42	\$103.68	\$147.03	\$36,904
	Y5	2	1.10	0.11	1.21	2.42	1.19	2.88	\$103.68	\$298.58	\$74,943
	Y5	2	1.00	0.10	1.10	2.20	1.19	2.62	\$103.68	\$271.43	\$68,130
	New	24	0.42	0.04	0.46	11.00	1.19	13.09	\$107.43	\$1,406.26	\$352,971

Estimated New Cost - Norbeck to Wheaton Limited Stop - 10 Minute Headway - Northbound – cont.											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM – to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Limited Stop Service - Norbeck to Wheaton - 10 Minutes											\$2,547,729
Total - Both Directions - Norbeck to Wheaton - 10 Minutes											\$5,238,818
Current Service Cost											\$3,964,598
Incremental Cost - Limited Stop Service											\$1,274,220

Note: Limited Stop Service Assumed to Have a 15% Faster Running Time than Local Service at Same Time of Day

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 10
Detailed Cost Estimate
Local/Limited Stop Hybrid
Peak Periods – Local to Norbeck Park and Ride – Limited
Stop to Silver Spring
15 Minute Headway
Weekday

Estimated New Cost - Local/Limited Stop Hybrid - 15 minute headway - southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	0.85	0.09	0.94	3.74	1.19	4.45	\$103.68	\$461.44	\$115,821
	Y5	5	0.80	0.08	0.88	4.40	1.19	5.24	\$103.68	\$542.87	\$136,260
	Y8	1	0.78	0.078	0.858	0.86	1.19	1.02	\$103.68	\$105.86	\$26,571
	Y9	1	0.70	0.07	0.77	0.77	1.19	0.92	\$103.68	\$95.00	\$23,845
	New	12	1.07	0.11	1.17	14.08	1.19	16.76	\$103.68	\$1,737.18	\$436,032
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	0.85	0.09	0.94	6.55	1.19	7.79	\$103.68	\$807.52	\$202,687
	Y9	6	0.78	0.08	0.86	5.15	1.19	6.13	\$103.68	\$635.16	\$159,424
	Y9	2	0.78	0.08	0.86	1.72	1.19	2.04	\$103.68	\$211.72	\$53,141
	New	16	0.90	0.09	0.99	15.84	1.19	18.85	\$103.68	\$1,954.33	\$490,536
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	New	0	0.45	0.05	0.50	0.00	1.19	0.00	\$103.68	\$0.00	\$0
Total Southbound - Local/Limited Stop Hybrid - 15 Minutes											\$2,729,288

Estimated New Cost - Local/Limited Stop Hybrid - 15 minute headway - northbound

Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.67	0.07	0.74	1.47	1.19	1.75	\$103.68	\$181.86	\$45,647
	Y8	1	0.70	0.07	0.77	0.77	1.19	0.92	\$103.68	\$95.00	\$23,845
	Y8	2	0.70	0.07	0.77	1.54	1.19	1.83	\$103.68	\$190.00	\$47,691
	Y8	2	0.70	0.07	0.77	1.54	1.19	1.83	\$103.68	\$190.00	\$47,691
	Y9	1	0.67	0.07	0.74	0.74	1.19	0.88	\$103.68	\$90.93	\$22,824
	Y9	3	0.67	0.07	0.74	2.21	1.19	2.63	\$103.68	\$272.79	\$68,471
	New	12	0.75	0.08	0.83	9.90	1.19	11.78	\$103.68	\$1,221.45	\$306,585
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$103.68	\$0.00	\$0
4:00 PM - 7:00 PM	Y8	3	0.88	0.09	0.97	2.90	1.19	3.46	\$103.68	\$358.29	\$89,932
	Y9	2	0.82	0.08	0.90	1.80	1.19	2.15	\$103.68	\$222.58	\$55,867
	Y7	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y7	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y7	2	0.80	0.08	0.88	1.76	1.19	2.09	\$103.68	\$217.15	\$54,504
	Y5	1	0.87	0.09	0.96	0.96	1.19	1.14	\$103.68	\$118.07	\$29,637
	Y5	2	0.87	0.09	0.96	1.91	1.19	2.28	\$103.68	\$236.15	\$59,273
	New	16	0.80	0.08	0.88	14.08	1.19	16.76	\$103.68	\$1,737.18	\$436,032

Estimated New Cost - Local/Limited Stop Hybrid - 15 minute headway – northbound – cont.											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM – to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Local/Limited Stop Hybrid - 15 Minutes											\$2,479,137
Total - Both Directions - Local/Limited Stop Hybrid - 15 Minutes											\$5,208,425
Current Service Cost											\$3,964,598
Incremental Cost - Local/Limited Stop Hybrid - 15 Minutes											\$1,243,827

Note: Limited Stop Service Assumed to Have a 15% Faster Running Time than Local Service at Same Time of Day

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 11
Detailed Cost Estimate
Local/Limited Stop Hybrid
Peak Periods – Local to Norbeck Park and Ride – Limited
Stop to Silver Spring
10 Minute Headway
Weekday

Estimated New Cost - Local/Limited Stop Hybrid - 10 minute headway - southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y8	1	0.95	0.10	1.05	1.05	1.19	1.24	\$103.68	\$128.93	\$32,362
6:00 AM - 9:00 AM	Y7	1	0.85	0.09	0.94	0.94	1.19	1.11	\$103.68	\$115.36	\$28,955
	Y7	4	0.85	0.09	0.94	3.74	1.19	4.45	\$103.68	\$461.44	\$115,821
	Y5	5	0.80	0.08	0.88	4.40	1.19	5.24	\$103.68	\$542.87	\$136,260
	Y8	1	0.78	0.078	0.858	0.86	1.19	1.02	\$103.68	\$105.86	\$26,571
	Y9	1	0.70	0.07	0.77	0.77	1.19	0.92	\$103.68	\$95.00	\$23,845
	New	18	1.07	0.11	1.17	21.12	1.19	25.13	\$103.68	\$2,605.77	\$654,048
9:00 AM - 3:00 PM	Y9	9	0.87	0.09	0.95	8.58	1.19	10.21	\$103.68	\$1,058.59	\$265,707
	Y8	8	0.97	0.10	1.06	8.51	1.19	10.12	\$103.68	\$1,049.55	\$263,436
	Y8	2	1.03	0.10	1.14	2.27	1.19	2.71	\$103.68	\$280.48	\$70,401
	Y7	1	0.73	0.07	0.81	0.81	1.19	0.96	\$103.68	\$99.53	\$24,981
	New	0	0.70	0.07	0.77	0.00	1.19	0.00	\$103.68	\$0.00	\$0
3:00 PM - 7:00 PM	Y8	7	0.85	0.09	0.94	6.55	1.19	7.79	\$103.68	\$807.52	\$202,687
	Y9	6	0.78	0.08	0.86	5.15	1.19	6.13	\$103.68	\$635.16	\$159,424
	Y9	2	0.78	0.08	0.86	1.72	1.19	2.04	\$103.68	\$211.72	\$53,141
	New	24	0.90	0.09	0.99	23.76	1.19	28.27	\$103.68	\$2,931.49	\$735,804
7:00 PM - to Service Close	Y8	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y9	3	0.77	0.08	0.84	2.53	1.19	3.01	\$103.68	\$312.15	\$78,349
	Y9	3	0.65	0.07	0.72	2.15	1.19	2.55	\$103.68	\$264.65	\$66,427
	Y9	4	0.58	0.06	0.64	2.57	1.19	3.05	\$103.68	\$316.67	\$79,485
	New	0	0.45	0.05	0.50	0.00	1.19	0.00	\$103.68	\$0.00	\$0
Total Southbound - Local/Limited Stop Hybrid - 10 Minutes											\$3,192,572

Estimated New Cost - Local/Limited Stop Hybrid - 10 minute headway - northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Y9	2	0.72	0.07	0.79	1.58	1.19	1.88	\$103.68	\$194.53	\$48,826
	Y8	1	0.75	0.08	0.83	0.83	1.19	0.98	\$103.68	\$101.79	\$25,549
6:00 AM - 9:00 AM	Y9	2	0.67	0.07	0.74	1.47	1.19	1.75	\$103.68	\$181.86	\$45,647
	Y8	1	0.70	0.07	0.77	0.77	1.19	0.92	\$103.68	\$95.00	\$23,845
	Y8	2	0.70	0.07	0.77	1.54	1.19	1.83	\$103.68	\$190.00	\$47,691
	Y8	2	0.70	0.07	0.77	1.54	1.19	1.83	\$103.68	\$190.00	\$47,691
	Y9	1	0.67	0.07	0.74	0.74	1.19	0.88	\$103.68	\$90.93	\$22,824
	Y9	3	0.67	0.07	0.74	2.21	1.19	2.63	\$103.68	\$272.79	\$68,471
	New	18	0.75	0.08	0.83	14.85	1.19	17.67	\$103.68	\$1,832.18	\$459,877
9:00 AM - 3:00 PM	Y8	9	0.92	0.09	1.01	9.08	1.19	10.80	\$103.68	\$1,119.67	\$281,036
	Y9	9	0.88	0.09	0.97	8.75	1.19	10.41	\$103.68	\$1,078.95	\$270,817
	New	0	0.73	0.07	0.81	0.00	1.19	0.00	\$103.68	\$0.00	\$0
4:00 PM - 7:00 PM	Y8	3	0.88	0.09	0.97	2.90	1.19	3.46	\$103.68	\$358.29	\$89,932
	Y9	2	0.82	0.08	0.90	1.80	1.19	2.15	\$103.68	\$222.58	\$55,867
	Y7	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y7	3	0.80	0.08	0.88	2.64	1.19	3.14	\$103.68	\$325.72	\$81,756
	Y7	2	0.80	0.08	0.88	1.76	1.19	2.09	\$103.68	\$217.15	\$54,504
	Y5	1	0.87	0.09	0.96	0.96	1.19	1.14	\$103.68	\$118.07	\$29,637
	Y5	2	0.87	0.09	0.96	1.91	1.19	2.28	\$103.68	\$236.15	\$59,273
	New	24	0.80	0.08	0.88	21.12	1.19	25.13	\$103.68	\$2,605.77	\$654,048

Estimated New Cost - Local/Limited Stop Hybrid - 10 minute headway - northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
7:00 PM – to Service Close	Y5/	1	0.80	0.08	0.88	0.88	1.19	1.05	\$103.68	\$108.57	\$27,252
	Y8	2	0.88	0.09	0.97	1.94	1.19	2.31	\$103.68	\$239.77	\$60,181
	Y9	1	0.90	0.09	0.99	0.99	1.19	1.18	\$103.68	\$122.15	\$30,658
	Y9	7	0.83	0.08	0.92	6.42	1.19	7.64	\$103.68	\$791.68	\$198,712
	Y9	4	0.68	0.07	0.75	3.01	1.19	3.58	\$103.68	\$370.96	\$93,111
	Y9	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Local/Limited Stop Hybrid - 10 Minutes											\$2,850,445
Total - Both Directions - Local/Limited Stop Hybrid - 10 Minutes											\$6,043,017
Current Service Cost											\$3,964,598
Incremental Cost - Local/Limited Stop Hybrid - 10 Minutes											\$2,078,419

Note: Limited Stop Service Assumed to Have a 15% Faster Running Time than Local Service at Same Time of Day

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable

Appendix 12 – Detailed Cost Estimates

Line Split at Norbeck P&R

Estimated New Cost - Line Split - Norbeck - Southbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 - 6:00 AM	Northern	3	0.38	0.04	0.42	1.27	1.19	1.51	\$103.68	\$156.07	\$39,175
	Southern	5	0.52	0.05	0.57	2.84	1.19	3.38	\$103.68	\$350.60	\$88,001
6:00 AM - 9:00 AM	Northern	6	0.65	0.07	0.72	4.29	1.19	5.11	\$103.68	\$529.30	\$132,853
	Southern	18	0.75	0.08	0.83	14.85	1.19	17.67	\$103.68	\$1,832.18	\$459,877
9:00 AM - 3:00 PM	Northern	12	0.48	0.05	0.53	6.38	1.19	7.59	\$103.68	\$787.16	\$197,577
	Southern	24	0.75	0.08	0.83	19.80	1.19	23.56	\$103.68	\$2,442.91	\$613,170
3:00 PM - 7:00 PM	Northern	12	0.52	0.05	0.57	6.82	1.19	8.12	\$103.68	\$841.45	\$211,203
	Southern	24	0.87	0.09	0.95	22.88	1.19	27.23	\$103.68	\$2,822.92	\$708,552
7:00 PM - 8:30 PM	Northern	3	0.40	0.04	0.44	1.32	1.19	1.57	\$103.68	\$162.86	\$40,878
	Southern	6	0.60	0.06	0.66	3.96	1.19	4.71	\$103.68	\$488.58	\$122,634
8:30 PM - 12:00 AM	Northern	7	0.32	0.03	0.35	2.44	1.19	2.90	\$103.68	\$300.84	\$75,511
	Southern	11	0.50	0.05	0.55	6.05	1.19	7.20	\$103.68	\$746.44	\$187,357
Total Southbound - Line Split											\$2,876,789

Estimated New Cost - Line Split - Norbeck - Northbound											
Time Period	Route	# of Trips	Run Time Hours	Layover	Total One Way	Revenue Hours	Platform Hour Factor	Total Platform Hours	Cost Per Platform Hour	Daily Total Cost	Annual Cost
4:30 AM - 6:00 AM	Northern	3	0.35	0.04	0.39	1.16	1.19	1.37	\$103.68	\$142.50	\$35,768
	Southern	5	0.55	0.06	0.61	3.03	1.19	3.60	\$103.68	\$373.22	\$93,679
6:00 AM - 9:00 AM	Northern	6	0.42	0.04	0.46	2.75	1.19	3.27	\$103.68	\$339.29	\$85,162
	Southern	18	0.65	0.07	0.72	12.87	1.19	15.32	\$103.68	\$1,587.89	\$398,560
9:00 AM - 3:00 PM	Northern	12	0.40	0.04	0.44	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Southern	24	0.73	0.07	0.81	19.36	1.19	23.04	\$103.68	\$2,388.62	\$599,544
3:00 PM - 4:00 PM	Northern	3	0.48	0.05	0.53	1.60	1.19	1.90	\$103.68	\$196.79	\$49,394
	Southern	6	0.83	0.08	0.92	5.50	1.19	6.55	\$103.68	\$678.59	\$170,325
4:00 PM - 7:00 PM	Northern	9	0.53	0.05	0.59	5.28	1.19	6.28	\$103.68	\$651.44	\$163,512
	Southern	18	0.83	0.08	0.92	16.50	1.19	19.64	\$103.68	\$2,035.76	\$510,975
7:00 PM - 8:30 PM	Northern	3	0.38	0.04	0.42	1.27	1.19	1.51	\$103.68	\$156.07	\$39,175
	Southern	6	0.72	0.07	0.79	4.73	1.19	5.63	\$103.68	\$583.58	\$146,479
8:30 PM - 12:30 AM	Northern	7	0.38	0.04	0.42	2.95	1.19	3.51	\$103.68	\$364.17	\$91,408
	Southern	11	0.65	0.07	0.72	7.87	1.19	9.36	\$103.68	\$970.38	\$243,565
12:30 AM - 2:30 AM	Current	3	0.45	0.05	0.50	1.49	1.19	1.77	\$103.68	\$183.22	\$45,988
Total Northbound - Line Split											\$2,837,047
Total - Both Directions - Line Split											\$5,713,836
Current Service Cost											\$3,964,598
Incremental Cost - Headway Change											\$1,749,238

- Notes:
- 1) Cost per platform hour – from WMATA – utilized by WMATA for service change costing exercises
 - 2) Existing service cost estimates based on current Y Line timetable