

2010 Service Evaluation Study



Final Report

July 22, 2011

Study Purpose and Goal

Evaluate the overall performance of selected bus lines to improve:

- Service reliability
- Efficiency
- Capacity
- Travel time
- Bus stop amenities
- Customer communications



Routes Selected

The following routes are selected based on information obtained from customers, jurisdictions, and Metro Service Planners assessment.

- | | |
|---------------------------------------|---------------|
| 1. Bladensburg Road – Anacostia Line | B2 |
| 2. Oxon Hill – Suitland Line | D12, D13, D14 |
| 3. McLean – Crystal City Line | 23A, 23C |
| 4. Ballston – Bradley – Pentagon Line | 25A, 25C, 25D |

Study Methodology

1. Collect and analyze data
2. Develop public outreach plan
3. Conduct 10 public outreach meetings
4. Develop recommendations and implementation strategy

Major Summary Findings

- On-time performance generally highest during the early AM/AM peak, lowest during the PM peak
 - Traffic and long route lengths contribute to on-time performance issues
- Ridership stable or declining over past 2 years.
- Most frequent customer comments:
 - Operator behavior, stop amenities, service hours and frequency, traffic, and bus crowding and bunching
- Most frequent Metrobus operator comments:
 - Delays, recovery time, layover space, and crowding

Proposal: Add Running Time

- For time periods with less than 80% on-time performance (OTP).
- Based on observations from NextBus – difference between scheduled time and actual run time.
- Time added is prorated to reach 80% OTP.
- Created cost-neutral options by using headway expansion.

Running Time Added (Weekday)

Route	Early AM (minutes)	AM Peak (minutes)	Midday (minutes)	PM Peak (minutes)	Evening (minutes)
B2	-	-	5	5	-
D12	-	-	-	5	5
D13	-	-	-	5	-
D14	-	-	-	8	10
23A	-	-	11	5	-
23C	-	-	-	5	-
25A				5	

Running Time Added (Weekday, Cost-Neutral)

Route	Early AM (minutes)	AM Peak (minutes)	Midday (minutes)	PM Peak (minutes)	Evening (minutes)
B2	-	-	5	2	-
D12	-	-	-	5	5
D13	-	-	-	5	-
D14	-	-	-	8	8
23A	-	-	11	5	-
23C	-	-	-	5	-
25A	-	-	-	5	-

Running Time Added (Saturday)

Route	Early AM (minutes)	AM Peak (minutes)	Midday (minutes)	PM Peak (minutes)	Evening (minutes)
B2	-	-	-	5	5
23A	-	-	-	7	8

Running Time Added (Saturday, Cost-Neutral)

Route	Early AM (minutes)	AM Peak (minutes)	Midday (minutes)	PM Peak (minutes)	Evening (minutes)
B2	-	-	-	5	2
23A	-	-	-	2	8

Running Time Added (Sunday)

Route	Early AM (minutes)	AM Peak (minutes)	Midday (minutes)	PM Peak (minutes)	Evening (minutes)
B2	-	-	-	5	-
D14	-	-	7	5	-
23A	-	-	10	5	7

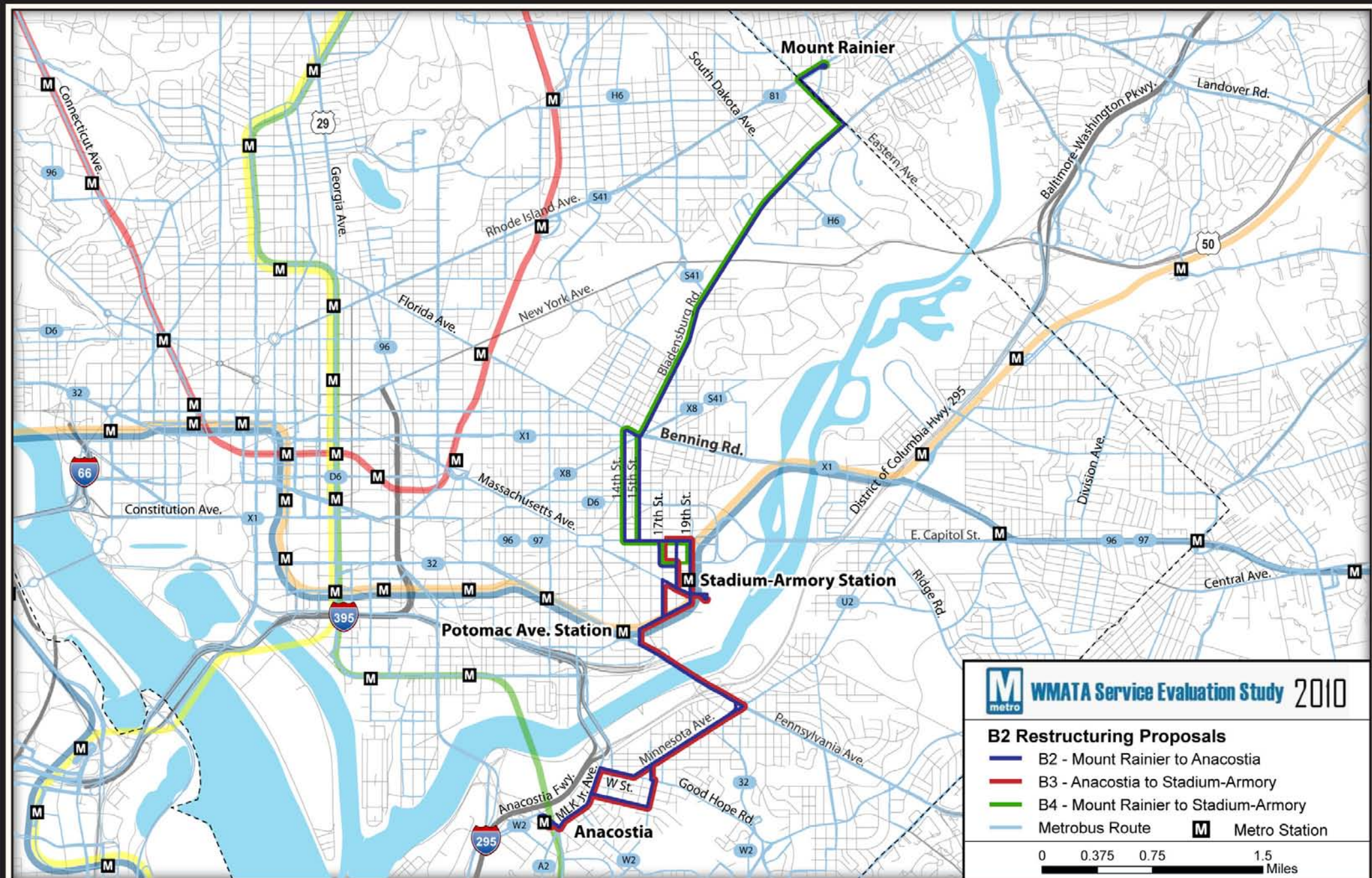
Running Time Added (Sunday, Cost-Neutral)

Route	Early AM (minutes)	AM Peak (minutes)	Midday (minutes)	PM Peak (minutes)	Evening (minutes)
B2	-	-	-	2	-
D14	-	-	7	5	-
23A	-	-	10	-	7

Proposal: Short-turns for B2

- Proposed variations:
 - B2: Mount Rainier to Anacostia Station
 - B3: Anacostia Station to Stadium Armory Station
 - B4: Mount Rainier to Stadium Armory Station
- Length of B2 causing delays, loss of reliability.
- Overlay shorter routes, B3 and B4, on top of existing B2 route.
- B2,3,4 results in at least as frequent service as existing B2 configuration, but may necessitate more transfers.

Reconfigured B2



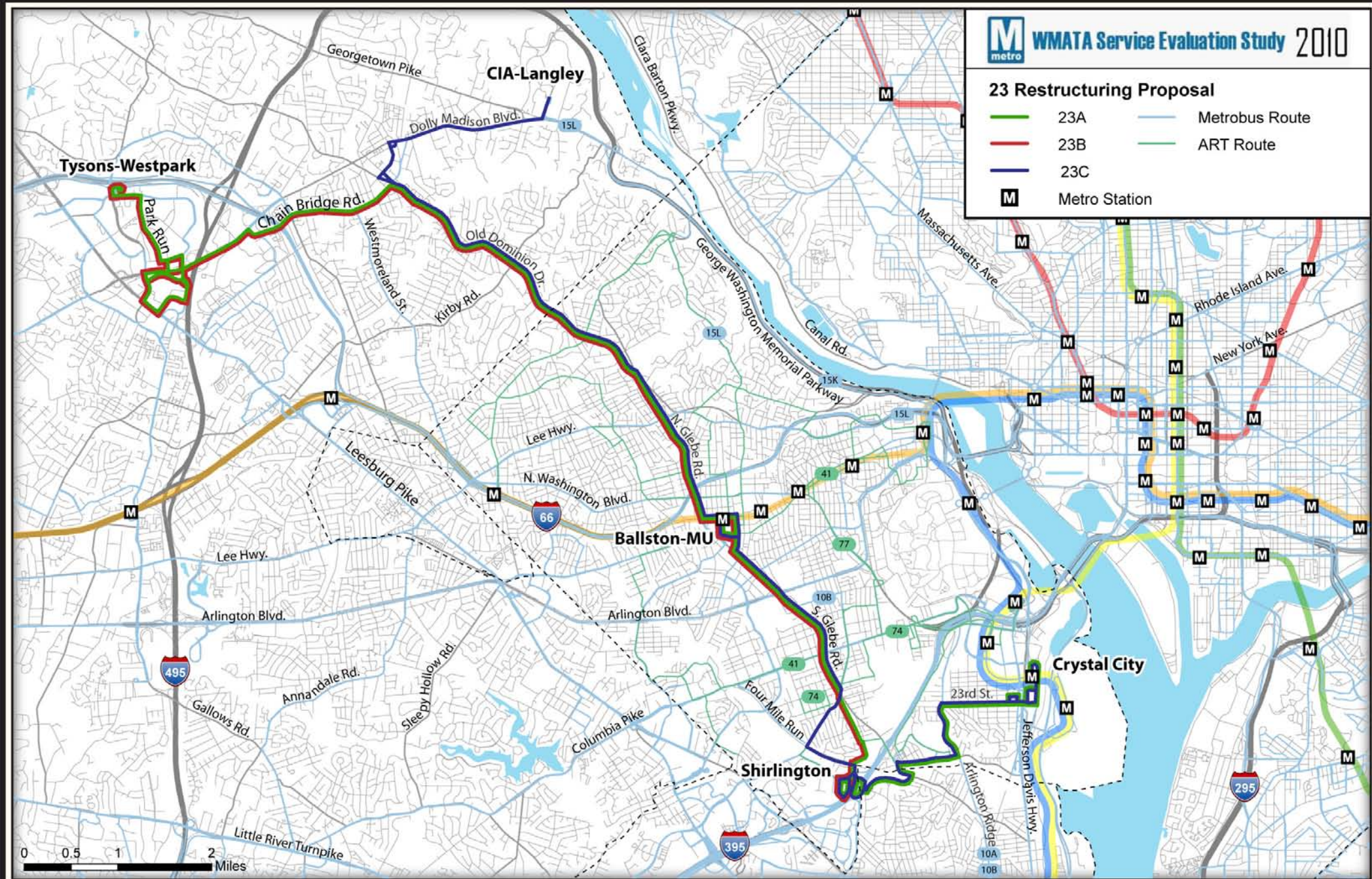
Proposal: B2,3,4 Frequencies

Route	Existing Service	Proposal B	Proposal B (cost neutral)	Proposals A+B	Proposals A+B (cost neutral)
AM Peak					
B2	10	20	20	20	20
B3		20	25	20	25
B4		20	25	20	25
Midday					
B2	15	30	30	30	30
B3		30	35	30	35
B4		30	35	30	35
PM Peak					
B2	10	20	20	20	20
B3		20	25	20	25
B4		20	25	20	25

Proposal: Peak Period Short-turns for 23A,C

- Proposed variations:
 - 23A: Tysons-Westpark to Crystal City Station
 - 23B: Tysons-Westpark to Shirlington Transit Center (peak period only)
 - 23C: CIA Langley to Shirlington Transit Center (peak period only)
- Length of 23A causing delays, loss of reliability.
- 23B,C results in at least as frequent service as existing 23A,C configuration, but may necessitate more transfers.
- 23A would run off-peak weekdays, and full day Saturday and Sunday.

Reconfigured 23A,C (Make description of the legend similar to B2)



Proposal: 23A,B,C Frequencies

Route	Existing Service	Proposal B	Proposal B (cost neutral)	Proposals A+B	Proposals A+B (cost neutral)
AM Peak					
23A	30				
23B		27	27	27	27
23C	25	27	27	27	27
PM Peak					
23A	25				
23B		25	28	25	28
23C	28	25	28	25	28

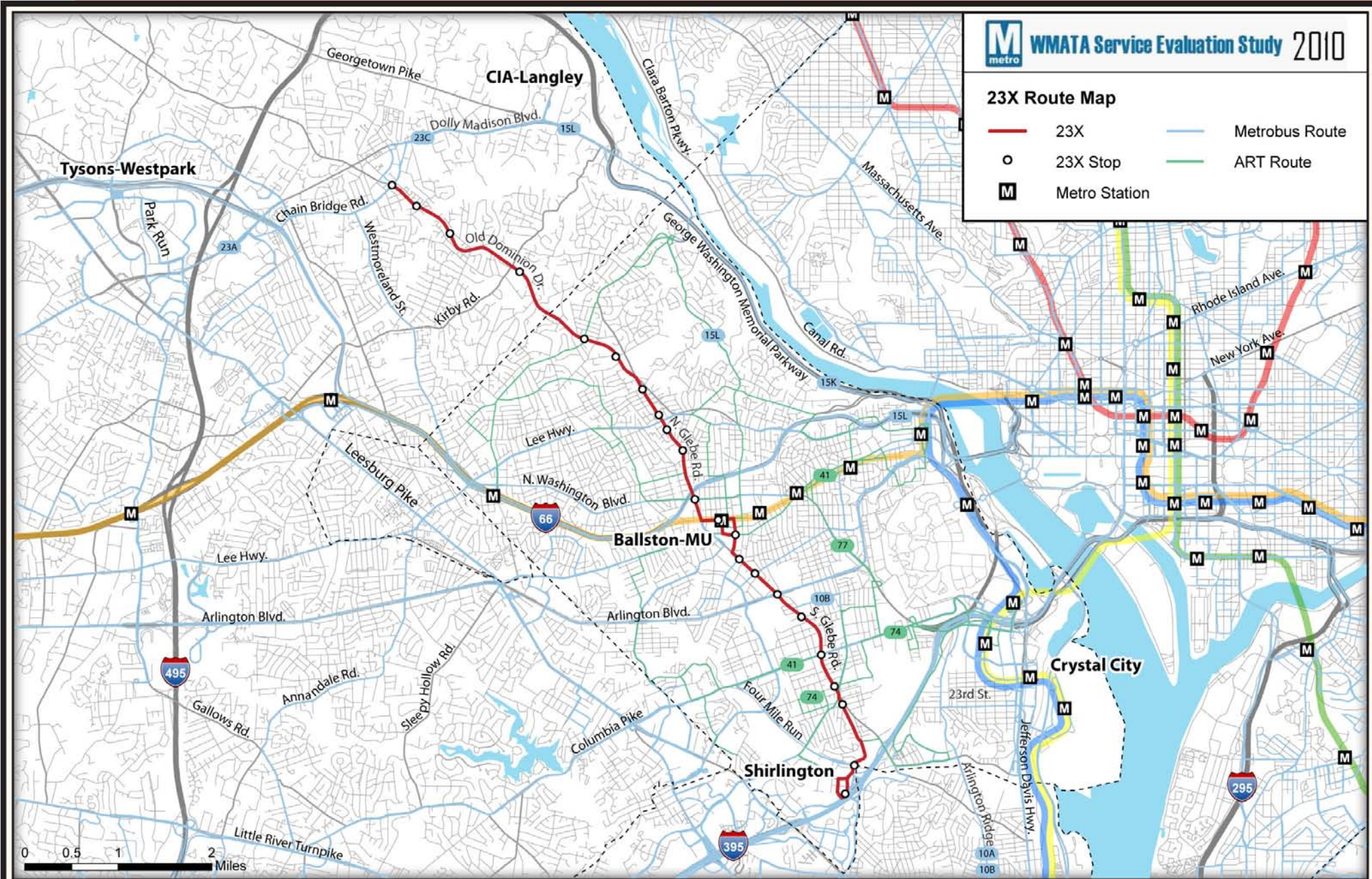
Limited-Stop Variation of 23 During Peaks

- Limited stop 23X would operate during weekday peak periods in the peak direction (eastbound in AM, westbound in PM).

Service	Service Span	Direction	Frequency	Days of Operation
23X AM Peak	06:00 – 09:00	EB only	Every 30 minutes	Mon-Fri
23X PM Peak	16:00 – 19:00	WB only	Every 30 minutes	Mon-Fri

- 35 minute end-to-end trip
- 16 mph average operating speed (23A,C operates at 12-13 mph on average)

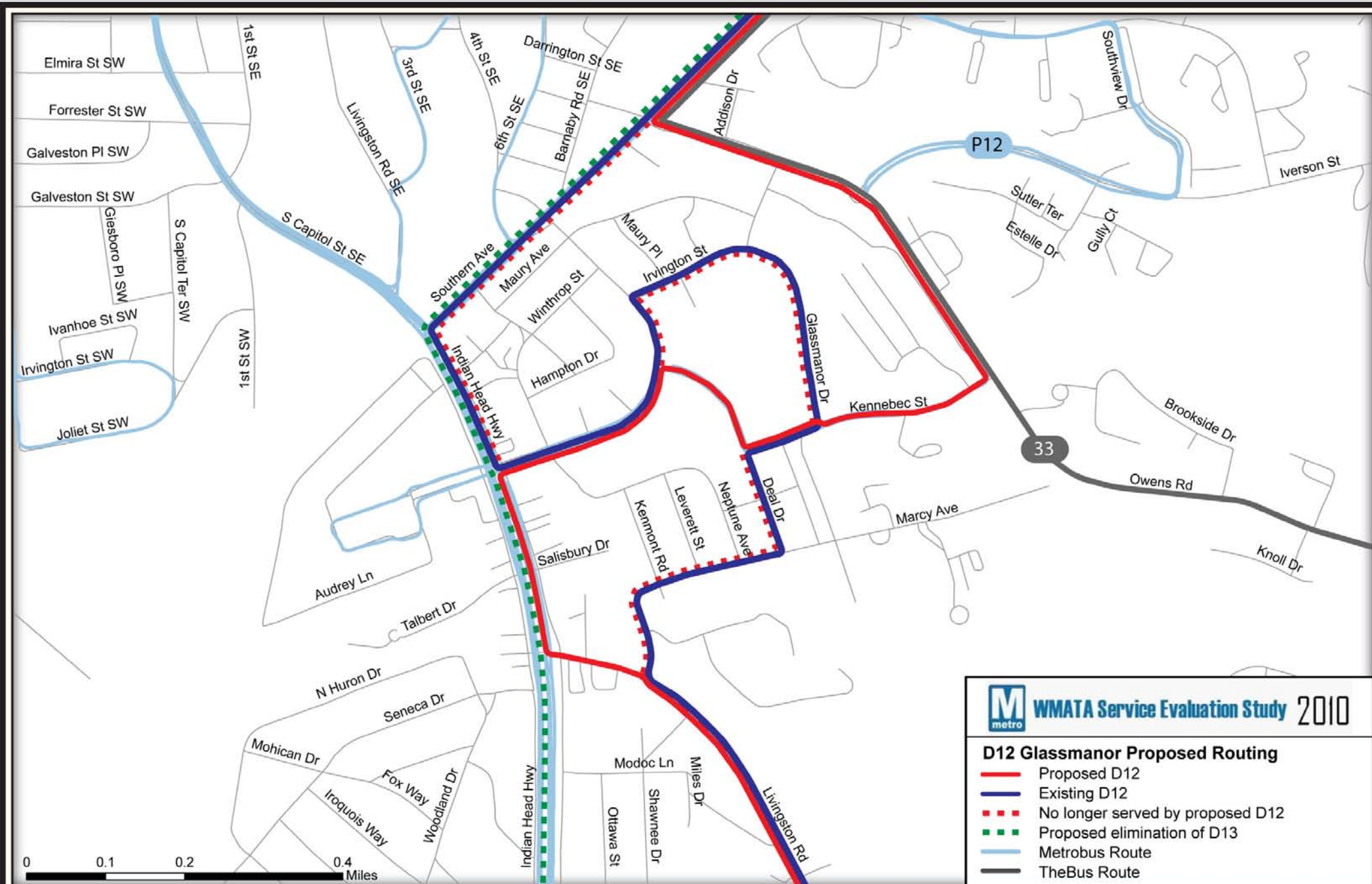
Limited-Stop Variation of 23 During Peaks



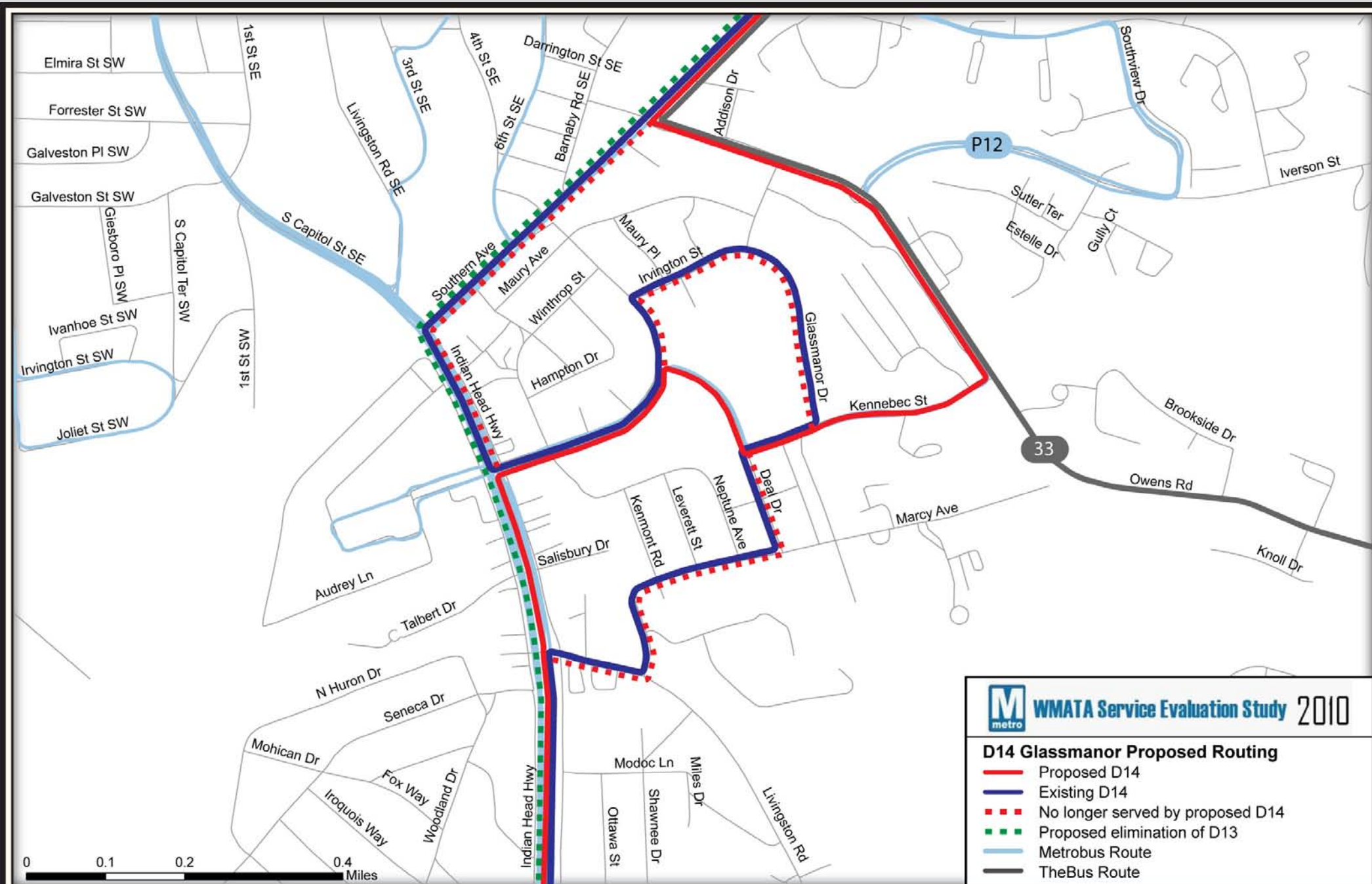
Proposal: Routing Changes for D12,13,14

- Consolidate all three route variations into one routing through Glassmanor.
 - Improve reliability by avoiding congestion at Indian Head Highway and Southern Avenue.
 - Old route: Indian Head Highway, Audrey Ln, Irvington St, Glassmanor Dr, Kennebec St, Deal Dr, Marcy Ave, Livingston Ter, and Livingston Rd (D12) or Indian Head Highway (D14)
 - Proposed route: Southern Ave, Owens Rd, Kennebec St, Deal Dr, Audrey Ln, and Livingston Rd (D12) or Indian Head Highway (D14)
 - Southern Ave/Indian Head Highway alternative services: A6, A7, P18, W15

Routing Changes for D12 (Glassmanor)



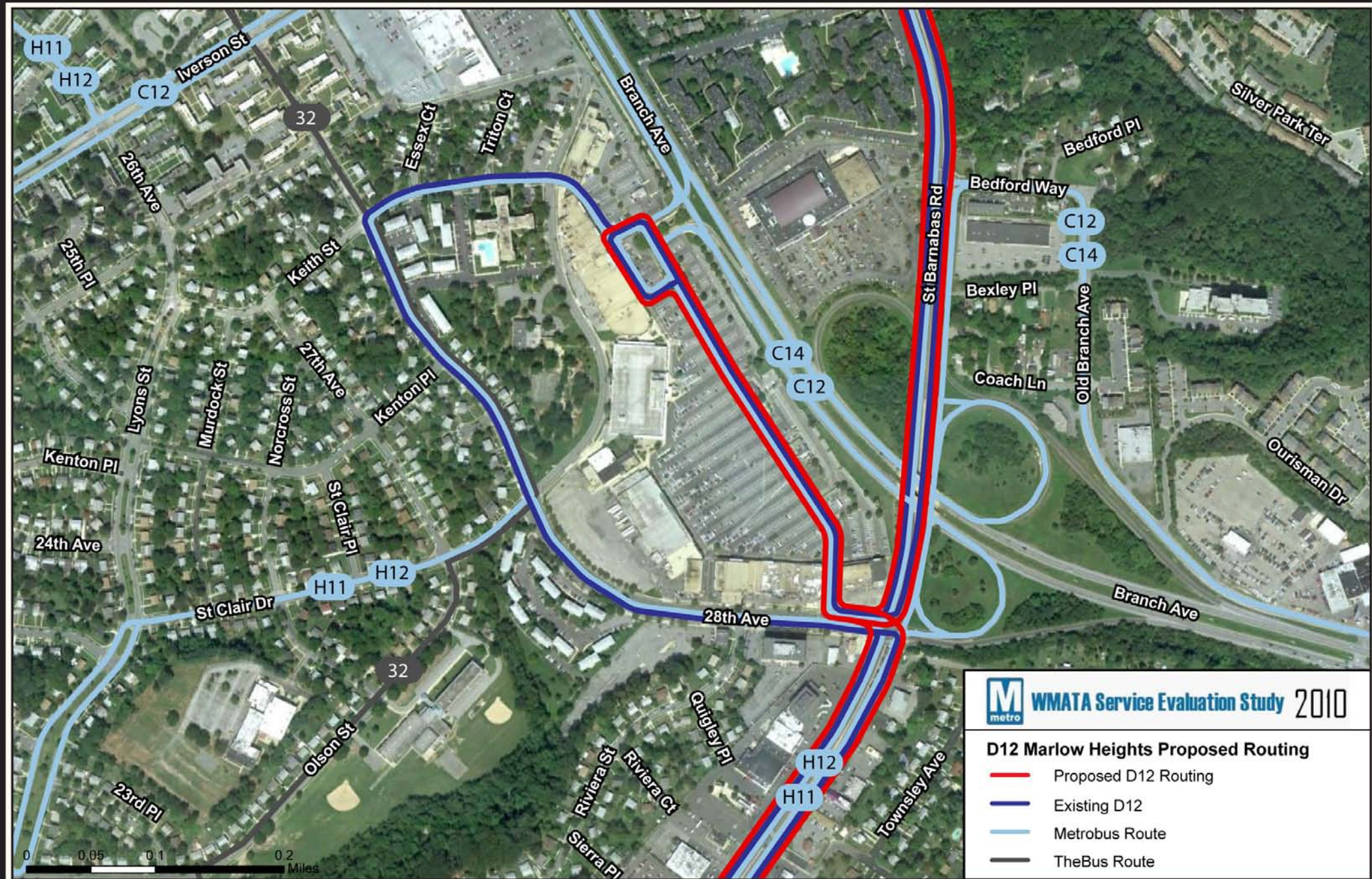
Routing Changes for D14 (Glassmanor)



Proposal: Routing Changes for D12,13,14

- Simplify routing at Marlow Heights Shopping Center.
 - Old route: 28th Ave, Keith St, Marlow Heights Shopping Center (EB clockwise, WB counterclockwise)
 - Proposed route: Marlow Heights Shopping Center only (EB/WB same pattern)
 - Reduce route by about 0.75 miles (3 minutes of travel time)
 - 28th Ave/Keith St alternative services: H11, H12

Routing Changes at Marlow Heights

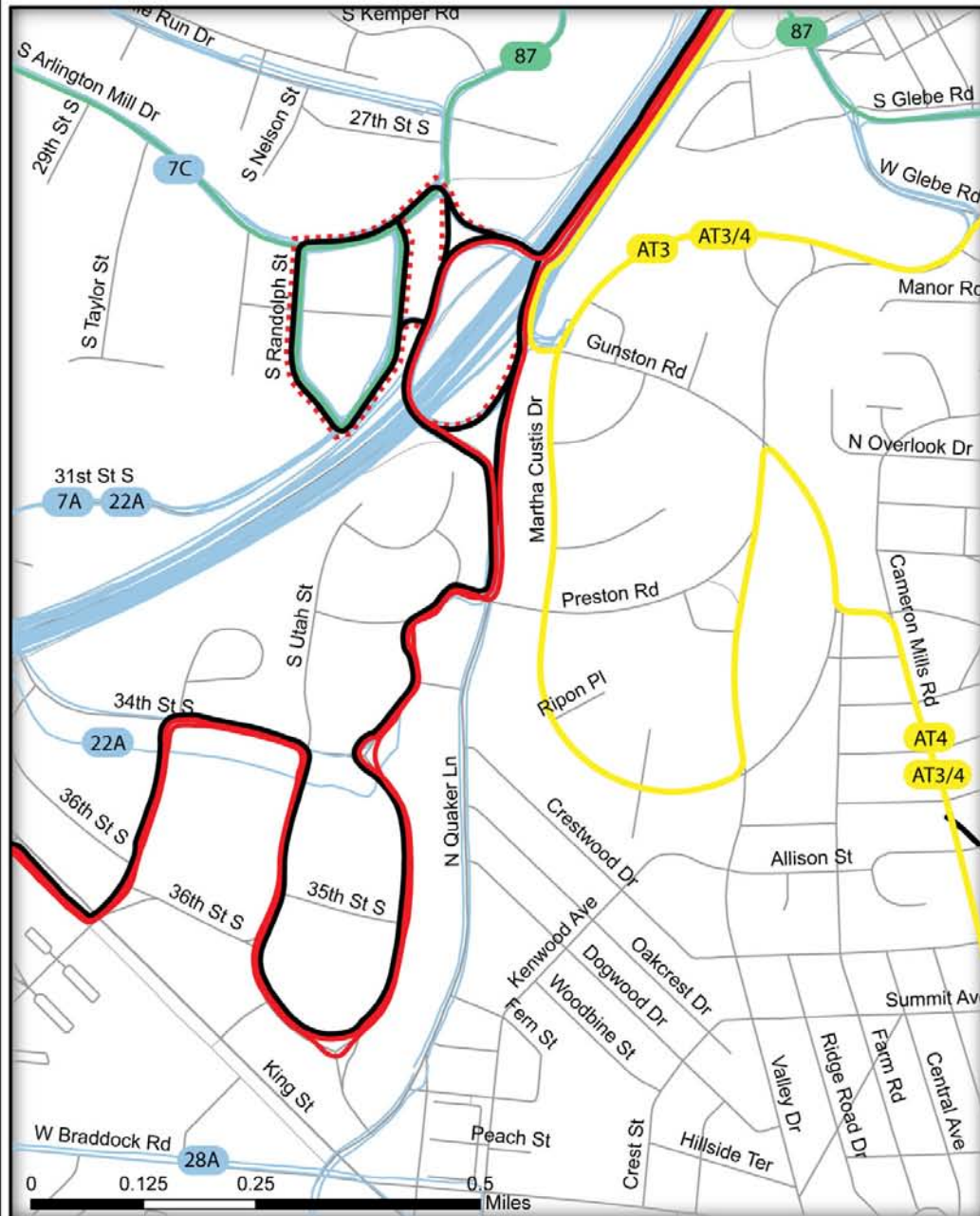


Proposal: Routing Changes for 25A,C,D

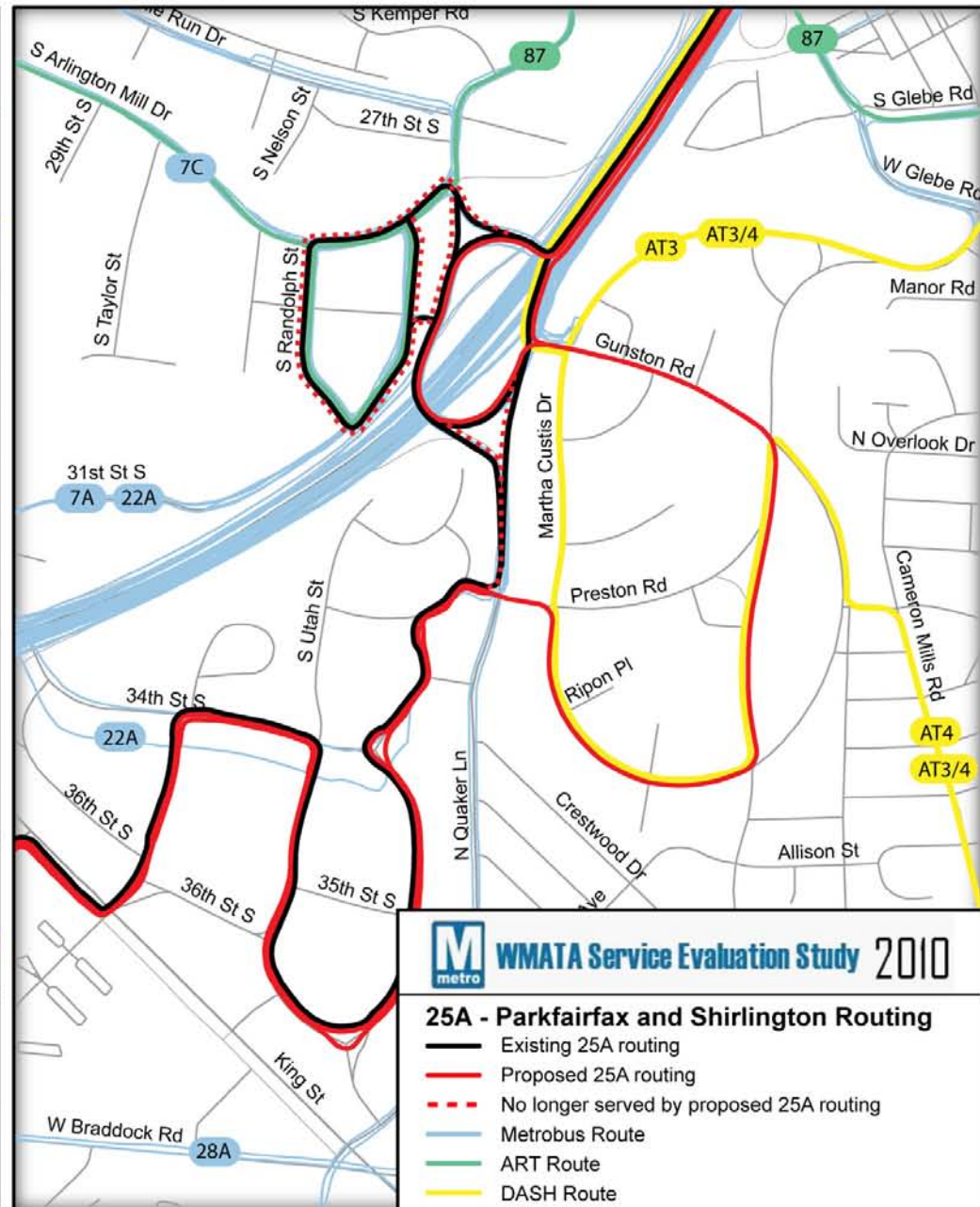
- Re-route the 25A to Parkfairfax and Withdraw from Shirlington
 - Public demand for restoration of midday service to Parkfairfax
 - Bus Congestion at Shirlington Transit Center
 - Proposed Change is Running-time and Cost Neutral
- Layover at Virginia Square instead of Ballston
- Bus Congestion at Ballston

Routing Changes for 25A (Parkfairfax)

RECOMMENDED PEAK ROUTING



RECOMMENDED MIDDAY ROUTING

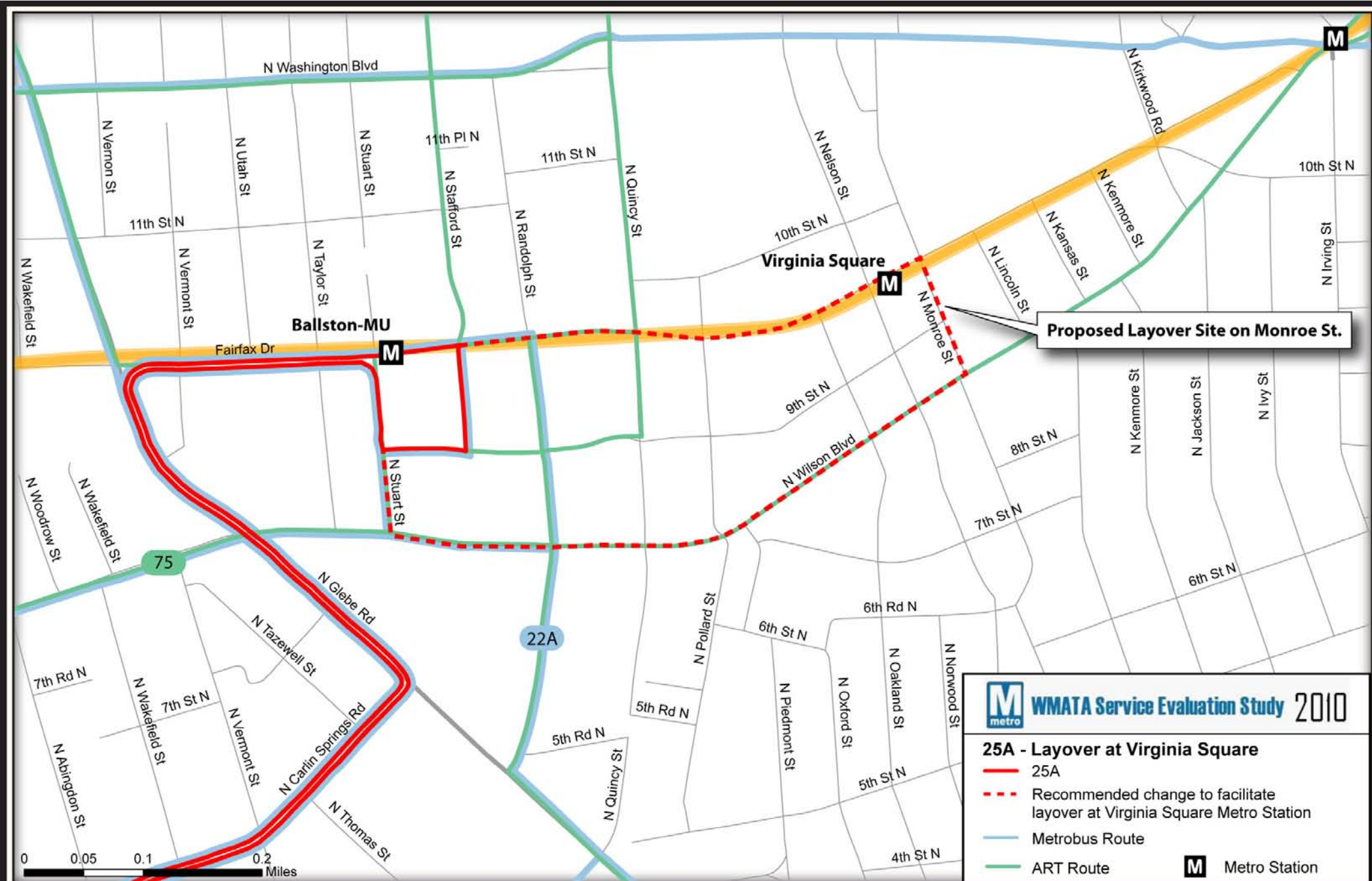


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25A - Parkfairfax and Shirlington Routing

- Existing 25A routing
- Proposed 25A routing
- No longer served by proposed 25A routing
- Metrobus Route
- ART Route
- DASH Route

Routing Changes for 25A (Virginia Square)



Proposal: Expand Span of Service to Sync with Metrorail (D12,14)

Route and Day	Additional Trips Needed			
	Early AM		Late Evening	
	EB	WB	EB	WB
D12 M-F	2	1	1	1
D12 Sat	1	-	2	2
D12 Sun	3	2	-	-
D14 M-F	1	1	1	1
D14 Sat	-	-	2	2
D14 Sun	3	-	-	-

Proposal: Expand Span of Service to Sync with Metrorail (25A)

Sunday Eastbound

Ballston	Carlin Springs/ Columbia	Leesburg/ Jefferson	Fillmore	E. Campus Dr. @ Bisdorf Building (NVCC)	King/ Menokin	Stafford/ 32nd	Pentagon
-	-	-	8:11	-	8:17	8:22	8:29
8:42	8:53	8:57	9:06	-	9:12	9:17	9:24
9:42	9:53	9:57	-	10:05	10:12	10:17	10:24
10:42	10:53	10:57	-	11:05	11:12	11:17	11:24

Added trip segments

Proposal: Expand Span of Service to Sync with Metrorail (25A)

Sunday Westbound

Pentagon	Stafford/ 32nd	King/ Menokin	E. Campus Dr. @ Bisdorf Building (NVCC)	Fillmore	Leesburg/ Jefferson	Carlin Springs/ Columbia	Ballston
-	-	-	-	8:06	8:14	8:18	8:29
8:40	8:44	8:48	8:54	-	9:02	9:06	9:17
9:40	9:44	9:48	9:54	-	10:02	10:06	10:17

Added trip segments

Proposal: Add More Street Supervisors

- Provide more dedicated supervision to these lines
None of these lines has a dedicated supervisor (only a few Metrobus routes in the entire network do).
Some are part of groupings of up to 16 routes that are the responsibility of a single supervisor.
- Station more supervisors at key locations
Some key locations have dedicated supervisors (Anacostia, Pentagon, Ballston)

Note: Supervisory responsibilities were just revised in December 2010, WMATA should allow up to 12 months to assess effectiveness.

Proposal: Eliminate, Consolidate, and Relocate Bus Stops

- Stops chosen primarily due to non-conformance with WMATA's criteria for bus stop spacing.
- Others chosen for safety considerations.

Proposal: Eliminate, Consolidate, and Relocate Bus Stops (B2)

Direction	Eliminate	Consolidate	Relocate
Northbound	<ul style="list-style-type: none"> • T St/16th St SE • E. Capitol St/19th St • Bladensburg Rd/35th St NE 	-	<ul style="list-style-type: none"> • 15th Street/Potomac Ave SE to Kentucky Avenue SE 360 feet to the northeast
Southbound	-	<ul style="list-style-type: none"> • 14th St @ C St/D St NE into one stop at C St NE 	<ul style="list-style-type: none"> • 15th Street/Pennsylvania Ave SE to farther north along 15th Street SE or farther south onto EB Pennsylvania Ave SE

Proposal: Eliminate and Consolidate Bus Stops (D12,13,14)

D12

Direction	Eliminate	Consolidate
Eastbound	<ul style="list-style-type: none"> • Southern Ave SE/Indian Head Hwy • St. Barnabas Rd/Arts Dr 	-
Westbound	-	-
Both Directions	<ul style="list-style-type: none"> • Helmont Dr/Fenwood Ave • Birchwood Dr/Galloway Dr • Silver Hill Rd before ramp to/from Suitland Pkwy • 28th Ave/Riviera St (east of Riviera St) 	<ul style="list-style-type: none"> • St. Barnabas Rd/Bedford Way by removing the near-side stops • Southern Ave/Wheeler Rd SE by removing near-side stop

Proposal: Eliminate and Consolidate Bus Stops (D12,13,14)

D13,14

Direction	Eliminate	Consolidate
Eastbound	• Southern Ave SE/Indian Head Hwy	-
Westbound	-	-
Both Directions	-	• Southern Ave/Wheeler Rd SE by removing near-side stop

Proposal: Eliminate, Consolidate, and Relocate Bus Stops (23A,C)

Direction	Eliminate	Consolidate	Relocate
Eastbound*	<ul style="list-style-type: none"> • Dolley Madison Blvd/Lynwood Hill Rd • Old Dominion Dr/Valley Ave • 23rd St and 26th St/ Hayes St/Ives St (3 stops) 	<ul style="list-style-type: none"> • Old Dominion Dr and Park Rd/Valley Wood Rd to across Clover Lawn Ct 	<ul style="list-style-type: none"> • Glebe Rd/Arlington Blvd to 150 feet farther south on Glebe Rd
<ul style="list-style-type: none"> • Also add an eastbound stop at Arlington Ridge Rd/Meade St 			
Westbound	<ul style="list-style-type: none"> • 23rd St and 26th St/ Hayes St/Ives St (3 stops) • Glebe Rd/S 14th St • Glebe Rd/S 6th St • Glebe Rd/N 3rd Rd 	<ul style="list-style-type: none"> • Glebe Rd and Lee Highway (near side)/21st St closer to MB&T Bank (closer to Lee Highway) 	<ul style="list-style-type: none"> • Arlington Ridge Rd/ Glebe Rd to Glebe Road 500 west of Arlington Ridge Rd • Chain Bridge Rd/Buena Vista Ave to Chain Bridge Rd/Cedar Ave

Proposal: Eliminate, Consolidate, and Relocate Bus Stops (25A,C,D)

Direction	Eliminate	Add	Relocate
Eastbound	<ul style="list-style-type: none"> N Carlin Springs Rd/ Frederick St 	<ul style="list-style-type: none"> S Carlin Springs Rd/ Columbia Pike (near side) 	-
Westbound	-	<ul style="list-style-type: none"> S Carlin Springs Rd/ Columbia Pike (near side) 	<ul style="list-style-type: none"> S Carlin Springs Rd/7th Rd S

Proposal: Improve Bus Stop Amenities (B2)

Amenity	Priority	Stops Qualifying for New Amenities or with Deficient Existing Amenities
Bus Stop Sign	Short term	12
5'x8' Pedestrian Pad	Short term	22
Information Case	Short term	32
System Map	Short term	42
Sidewalk at Least 4' Wide	Medium Term	33
Lighting	Medium Term	33
Shelter	Medium Term	38
Seating	Medium Term	35
Rear Pedestrian Pad	Medium Term	42
NextBus LED	Long Term	8

Proposal: Improve Bus Stop Amenities (D12,13,14)

Amenity	Stops Qualifying for New Amenities or with Deficient Existing Amenities
Bus Stop Sign	46
5'x8' Pedestrian Pad	208
Sidewalk at Least 4' Wide	102
Lighting	192
Information Case	35
System Map	19
Trash Can	5
Shelter	27
Seating	22
Rear Pedestrian Pad	21
NextBus LED	3

Proposal: Improve Bus Stop Amenities (23A,C)

Amenity	Stops Qualifying for New Amenities or with Deficient Existing Amenities
Bus Stop Sign	14
5'x8' Pedestrian Pad	147
Sidewalk at Least 4' Wide	88
Lighting	117
Information Case	3
System Map	8
Shelter	13
Seating	7
Rear Pedestrian Pad	10
NextBus LED	2

Proposal: Improve Bus Stop Amenities (25A,C,D)

Amenity	Stops Qualifying for New Amenities or with Deficient Existing Amenities
Bus Stop Sign	9
5'x8' Pedestrian Pad	37
Sidewalk at Least 4' Wide	20
Lighting	40
Information Case	1
Shelter	9
Seating	3
Rear Pedestrian Pad	2
NextBus LED	2

Traffic Signal Prioritization

- Traffic Signal Prioritization at one location on the B2 and 7 locations on the D12,13,14:

B2	D12,13,14
Eastern Avenue/Bladensburg Road	Southern Avenue/Wheeler Road
	Southern Avenue/Owens Road
	Southern Avenue/Indian Head Highway
	Indian Head Highway/Livingston Road
	Oxon Hill Road/Virginia Lane
	Suitland Road/Allentown Road
	St. Barnabas Road/Bock Road

Other Proposals

- Safety improvements on Indian Head Highway and Brinkley Road (D12,13,14)
- Operate D13 on shoulder of Indian Head Highway during AM and PM peak periods.

B2 Maximum Cost Summary

Proposal	Cost	Cost Neutral Option?	Type of Cost
Annual Operating Costs			
A – Additional running time	\$197,059	Yes	Annual operating cost
B – Short-turn route variations	\$580,291	Yes	Annual operating cost
<i>Proposals A+B</i>	<i>\$1,099,734</i>	<i>Yes</i>	<i>Annual operating cost</i>
Maximum Operating Cost of Proposals	\$1,099,734		

Proposal	Cost	Cost Neutral Option?	Type of Cost
Capital Cost			
A – Additional running time	\$572,000	Yes	Capital, one-time
B – Short-turn route variations	\$1,144,000	Yes	Capital, one-time
<i>Proposals A+B</i>	<i>\$1,716,000</i>	<i>Yes</i>	<i>Capital, one-time</i>
D – Traffic signal priority	\$10,000	No	Capital, one-time
E – Eliminate, consolidate and relocate bus stops	\$83,743	No	Capital, one-time
F – Improvements to stop amenities	\$1,566,068	No	Capital, one time plus maintenance
Maximum Capital Cost of Proposals	\$3,375,811		

D12,13,14 Maximum Cost Summary

Proposal	Cost	Cost Neutral Option?	Type of Cost
Annual Operating Costs			
A – Additional running time	\$168,421	Yes	Annual operating cost
B – Reroute at Marlow Heights Shopping Center	(\$78,065)	N/A	Annual operating cost
C – Reroute via Glassmanor	(\$236,292)	N/A	Annual operating cost
D – Extend the span of service	\$254,710	No	Annual operating cost
I – Operate D13 on Indian Head Highway shoulder	\$0	N/A	Annual operating cost
Maximum Operating Cost of Proposals	\$423,131		

Proposal	Cost	Cost Neutral Option?	Type of Cost
Capital Cost			
F – Traffic signal priority	\$70,000	No	Capital, one-time
G – Eliminate and consolidate bus stops	\$112,654	No	Capital, one-time
H – Indian Head Highway safety improvements	\$40,000	No	Capital, one-time
J – Improvements to stop amenities	\$5,432,470	No	Capital, one time plus maintenance
Maximum Capital Cost of Proposals	\$5,585,124		

23A,C Maximum Cost Summary

Proposal	Cost	Cost Neutral Option?	Type of Cost
Annual Operating Costs			
A – Additional running time	\$51,654	Yes	Annual operating cost
B – Short-turn route variations	\$117,606	Yes	Annual operating cost
<i>Proposals A+B</i>	<i>\$169,260</i>	<i>Yes</i>	<i>Annual operating cost</i>
C – Limited-stop peak service	\$353,000	No	Annual operating cost
G– Eliminate McLean to CIA segment	(\$117,525)	N/A	Annual operating cost
H – Eliminate Four Mile Run Drive to Walter Reed Drive segment	\$0	N/A	Annual operating cost
Maximum Operating Cost of Proposals	\$522,260		

Proposal	Cost	Cost Neutral Option?	Type of Cost
Capital Cost			
C – Limited-stop peak service	\$2,288,000	No	Capital, one-time
E – Eliminate, consolidate, relocate and add bus stops	\$168,136	No	Capital, one-time
F – Improvements to stop amenities	\$3,341,422	No	Capital, one time plus maintenance
Maximum Capital Cost of Proposals	\$5,797,588		

25A,C,D Maximum Cost Summary

Proposal	Cost	Cost Neutral Option?	Type of Cost
Annual Operating Costs			
A – Additional running time	\$0	N/A	Annual operating cost
B 1 – Remove 25A from Shirlington, Serve Parkfairfax	(\$186,157)	N/A	Annual operating cost
B2 – Layover at Virginia Square	\$0	N/A	Annual operating cost
<i>Combined Proposal B</i>	<i>(\$62,052)</i>	<i>N/A</i>	<i>Annual operating cost</i>
C – Sunday morning 25A trips	\$26,288	No	Annual operating cost
D – Serve Mark Center transit center with 25D	\$124,105	No	Annual operating cost
Maximum Operating Cost of Proposals	\$150,393		

Proposal	Cost	Cost Neutral Option?	Type of Cost
Capital Cost			
F – Eliminate, relocate and add bus stops	\$83,093	No	Capital, one-time
G – Improvements to stop amenities	\$1,135,989	No	Capital, one time plus maintenance
Maximum Capital Cost of Proposals	\$1,219,082		