

# Rapid Transit

MONTGOMERY COUNTY, MARYLAND

Concept Plans and Cost Estimates for the Envisioned System



JANUARY 8, 2011

Prepared by:



Montgomery County  
Transit Task Force



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**FIELD OFFICE LOCATIONS**

Arkansas  
Maryland  
New York  
Texas  
Virginia

## **EXECUTIVE SUMMARY**

The Traffic Group has designed Montgomery County's Rapid Transit Vehicle System with the following goals and attributes.

- Rapid
- Efficient
- Cost-effective – 10 different cross section typicals
- Expandable
- Quickly constructed
- Little or no environmental impact
- Creative and Innovative
- Rapid Transit Technology
- Traffic Engineering Problem Solving Techniques
- Limited R.O.W. required – only for stations
- Limited utility pole relocations required

There will likely be options that are favored by TTF and not by SHA or MCDOT and vice-versa.

### **NOT STUDIED**

This binder includes a copy of the cost estimates for each of the routes studied and does not include concepts or cost estimates for the following:

1. CCT (Corridor City Transitway) – by others (15 miles)
2. Observation Drive – minimal amount of road built north + south of MD 27
3. Mid-County Highway – not built
4. ICC (Inter County Connector) – uses existing auto lanes (22.9 miles)
5. MD 355, North of Milestone Manor Way – only two lanes along MD 355 at this time (MD 27 to MD 121 in Clarksburg is 3.26 miles)

### **SPECIAL NOTES**

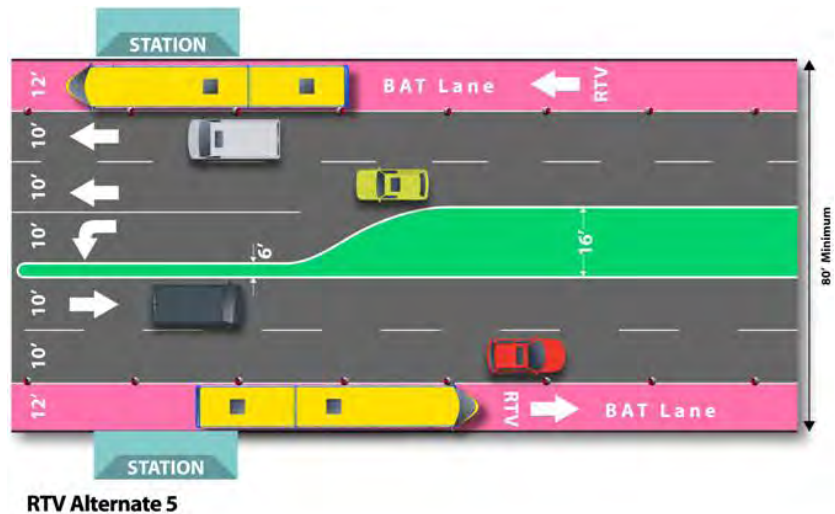
Where a median and dedicated left turn lanes exist, the area can be used for median transitways with left turns handled the same way as they are in a reversible lane system. (See Alternate I as an example.)

In this study, BAT lanes are for RTVs only. All other vehicles are prohibited entirely.

White Flint Partnership (WFP) – MD 355 in the White Flint area – WFP cost estimates are in Tab #3. (1.3 miles = \$61,622,000).

**BAT Lanes** – Where it was impractical to create median-based guideways, we have provided an option to use exclusive BAT lanes (RTVs only – no autos) on the outside of the divided roadway (curb lanes).

**Mixed Traffic** – Where it was impractical to build dedicated guideways or BAT lanes, the transit vehicles were assumed to travel in mixed traffic.



**MD 355** – in its entirety ( $\pm 20$  miles), is the most challenging of all the routes. (from D.C. line to MD 27-Germantown). This is due to limited ROW, utilities, existing traffic and CBD's.

**Traffic Counts** – Where practical, from a link traffic volume point of view, we have provided an Option to eliminate an auto thru lane in favor of dual dedicated transit guideways. (This will likely need further traffic capacity analyses at the 30% design level for a final decision.) We also have a large binder of turning movement counts.

**Cherry Hill Road** – from US 29, (easterly to the entrance to FDA), we have not designed a double dedicated guideway system (at this time). When preparing the 30% design plans, only a single guideway will be built initially, but the ultimate R.O.W. should be set for a dual guideway, from US 29 to FDA.

**Bridges** – We have avoided the construction of any bridge for the RTV system to eliminate the environmental and time impact of building bridges. RTVs will run in mixed traffic for short distances to avoid building bridges, or lane shifts using shoulders.

**Stations** – We have shown station locations or station areas. The 30% design plans (that will follow these Conceptual Plans) will "drill down" in more detail on where stations may need to be located and how operations may be interfaced with the current Montgomery County Ride-On System. At the future stages of planning, we will need to focus on pedestrian activity and station locations. Exact station locations at intersections are dependent on the selected option. (Following this letter is a design for a median-based

station for a dual guideway without the need for additional widening.) Stations will also be located at the end points of a route. BAT lanes allow for "curb side" stations. To accommodate median-based guideways with medians less than 22 ft – 25 ft in width requires widening of the roads and possible R.O.W. and large utility pole relocations.

**MPOT** – The M-NCPPC Master Plan of Transportation (MPOT) should assume 12 ft to 15 ft additional R.O.W. along each side of a road where we assumed BAT lanes or where we eliminated auto lanes in favor of BAT lanes or where dedicated left turn lanes are eliminated or reversible lane systems are built.

**Left Turn Lanes** – In areas where dedicated left turn lanes are being removed in favor of a dedicated transitway, consideration should be given to install dynamic No Left Turn signs during peak periods in the peak direction. Left turns could be permitted in the non-peak direction without dedicated left turn lanes.

**Bike Compatible** – When a 16 ft wide median is removed and replaced with a 10 ft – 11 ft wide transitway or guideway, there will be 5 ft – 6 ft extra space between curb lines. This 5 ft – 6 ft can be split and 2.5 ft – 3 ft added to each curb lane to assist with bicycle compatibility, if required.

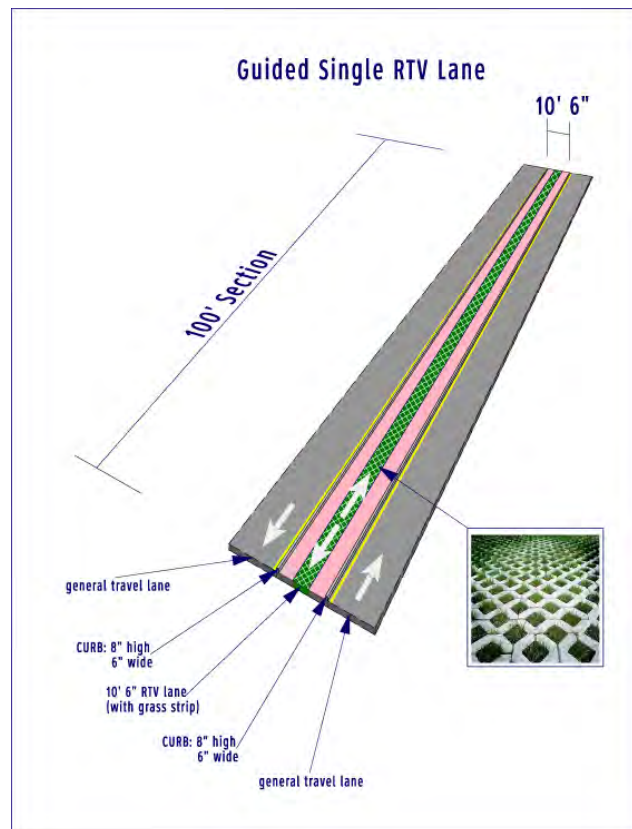
**Auto Lane Widths** – Both MCDOT and SHA have indicated a willingness to accept 10 ft and 11 ft wide lanes, due to safety research.

**Cross Section Typical** – Each route has some unique/different characteristics. The typical are just that – typical – and the next phase of design will drill down to precise design details for each route. As shown to the right, we also have designed a dedicated, curbed, guideway with grass pavers in the middle for water runoff and absorption.

**Traffic Signal Design Plans** – We have assembled a comprehensive set of plans showing existing conditions, geometry and designs.

## CHALLENGES

The principal challenge in designing this RTV System stems from trying to meet the goals/objectives of dedicated median based transitways while limiting R.O.W. acquisition that is costly, time consuming and detrimental to property owners.





Thus, (as part of our recommendations) we eliminated recommending R.O.W. purchases for the transitways themselves.

Secondly, widening (beyond existing curb lines) to accommodate transitways results in a substantial amount of utility pole relocations (typically located behind sidewalks on or near the property lines). To relocate utility poles cost \$100,000 to \$200,000 average per pole, plus purchase of additional R.O.W. for those pole relocations behind relocated sidewalks.

## RESULTS

We believe that all RTV routes in our report can be built by:

- a) Using existing medians – either replace or eliminate dedicated left turn lanes
- b) Using reversible lane systems with BAT lanes and eliminating dedicated left turn lanes
- c) Using auto lanes for RTVs instead of mixed traffic
- d) Removal of auto thru lanes, if appropriate
- e) No right-of-way needed at all for transitways; only for stations at some intersections

## SUMMARY

- Our unit prices are worst case, based on unit prices from July 2011 SHA cost estimates for recent Montgomery County contracts on SHA roads. When a median guideway is shown, the cost estimate reflects curbed guideway with grass pavers between the concrete ribbons.
- We have priced all guideways – BAT or median-based as concrete.
- Overall, the transitway system (without vehicles or O&M facilities) is estimated at \$578million for 95 miles studied in this report.
- Overall, the cost/mile including the WFP section from Strathmore to Montrose Parkway(1.3 miles) is \$62 million/mile (see Clark Construction estimate – 2009 – in Tab 3)
- Using a typical alternate with dual guideway and left turn lanes, the cost is estimated at \$38 million/mile in the city.

## NEXT STEPS

- a. Review the plans, cost estimates and options.
- b. Determine which Option for each route will be selected. (Alternates/options decision needs to be made by TTF in concert with SHA and MCDOT).
- c. Acquire funding for routes, vehicles, and O&M facilities.
- d. Begin detailed civil/traffic engineering study of 30% plans for Phase I routes ( $\pm$  46 miles) after options areselected.



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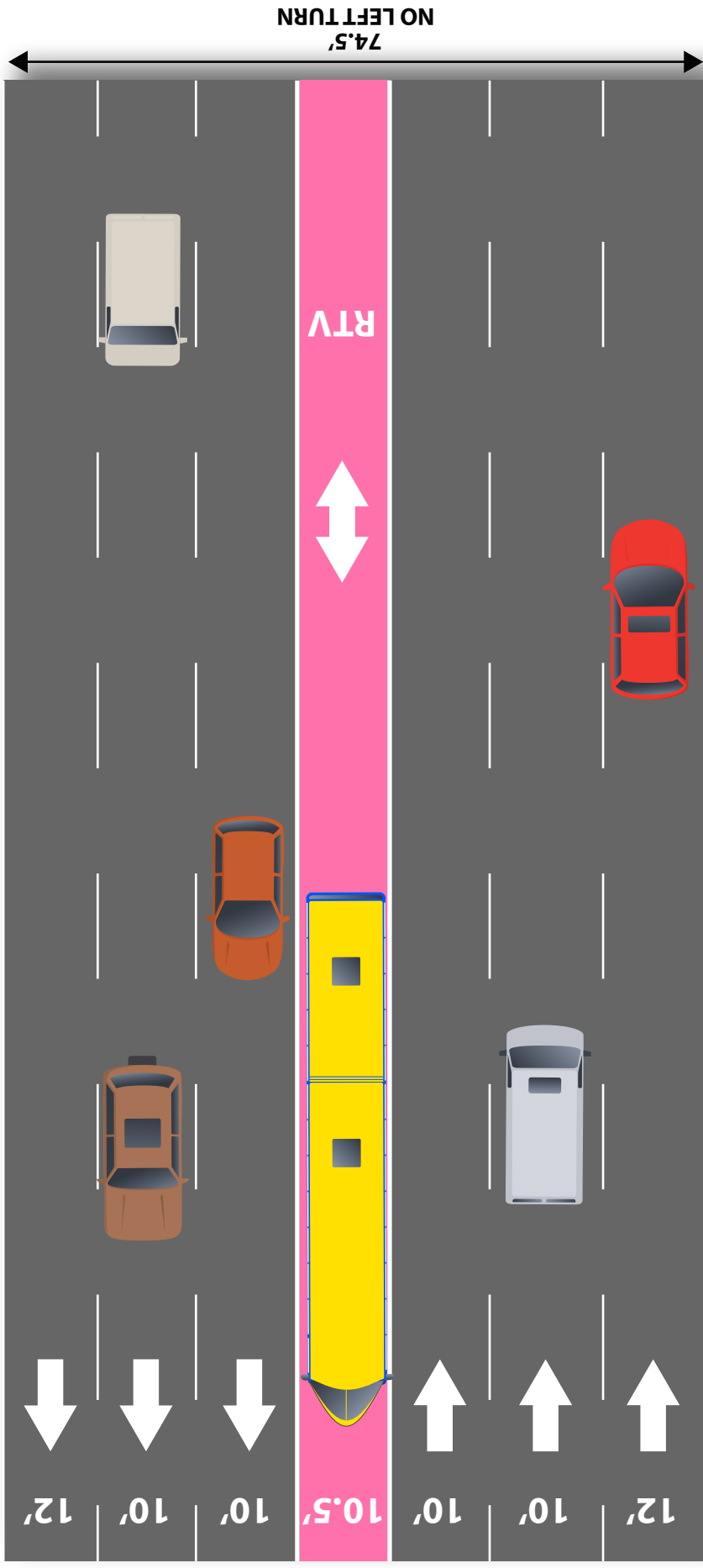
## **HOW THIS REPORT IS ORGANIZED**

1. A set of 1" = 100' scale plans were prepared for each route. The plans are 11x17 aerial photo sheets, with the transit way or guide way superimposed on each aerial with cross section typicals and options (located on CDs in this report). Where reasonable at this time, intermediate stations are noted.
2. Definitions/acronym list.
3. Route Maps for Phases 1, 2, 3 from TTF Work Group (before Table of Contents).
4. Each route has a tab/section containing the following:
  - a) Route description
  - b) Route length
  - c) Cost
  - d) Recommended Option(s) to build transit way
  - e) Other options for route
  - f) Peak hour link volumes for route if available
  - g) Typicals for cross sections and options for route
  - h) Cost estimates for recommended design and for options

(F:\2011\2011-0812P\Wp\Organization.docx)

## ACRONYMS AND DEFINITIONS

<b>APTA</b>	American Public Transportation Association
<b>Auto Lane</b>	Lane within a road used for mixed traffic: cars, trucks, buses
<b>BAT Lane</b>	Business Access and Transit - dedicated RTV lane not intended to be used by autos - RTVs only
<b>BRT</b>	Bus Rapid Transit
<b>CCT</b>	Corridor Cities Transit Way
<b>CLRP</b>	Constrained Long-Range Transportation Plan
<b>FTA</b>	Federal Transit Administration
<b>GIS</b>	Geographic Information System
<b>Guideway</b>	A dedicated lane for RTVs typically 8.5 ft wide with curbing that accommodates RTVs with side guide wheels to assist with horizontal sway
<b>ICC</b>	InterCounty Connector - MD 200
<b>LOS</b>	Level of Service
<b>MCDOT</b>	Montgomery County Department of Transportation
<b>Mixed Traffic</b>	RTVs travel in auto lanes without dedicated transit way or guide way.
<b>M-NCPPC</b>	Maryland-National Capital Park & Planning Commission
<b>MTA</b>	Maryland Transit Administration
<b>MWCOG</b>	Metropolitan Washington Council of Governments
<b>NCHRP</b>	National Cooperative Highway Research Program
<b>O&amp;M</b>	Operations and Maintenance
<b>Peak Hour</b>	The 60-min. interval with the highest volume of traffic from 6:30-9:30 AM and from 4-7 PM
<b>PID</b>	Passenger Information Display
<b>R.O.W.</b>	Right-of-Way; land owned by Gov't. avail. for public purposes.
<b>RTV</b>	Rapid Transit Vehicle - with or without articulation
<b>SHA</b>	Maryland State Highway Administration
<b>Station</b>	Closed area 10 ft - 12 ft wide, with amenities
<b>TAZ</b>	Traffic Analysis Zone
<b>TCRP</b>	Transit Cooperative Research Program
<b>Transitway</b>	A dedicated lane for RTVs
<b>TSP</b>	Traffic Signal Priority
<b>TTF</b>	Transit Task Force
<b>WFP</b>	White Flint Partnership
<b>WMATA</b>	Washington Metropolitan Area Transit Authority

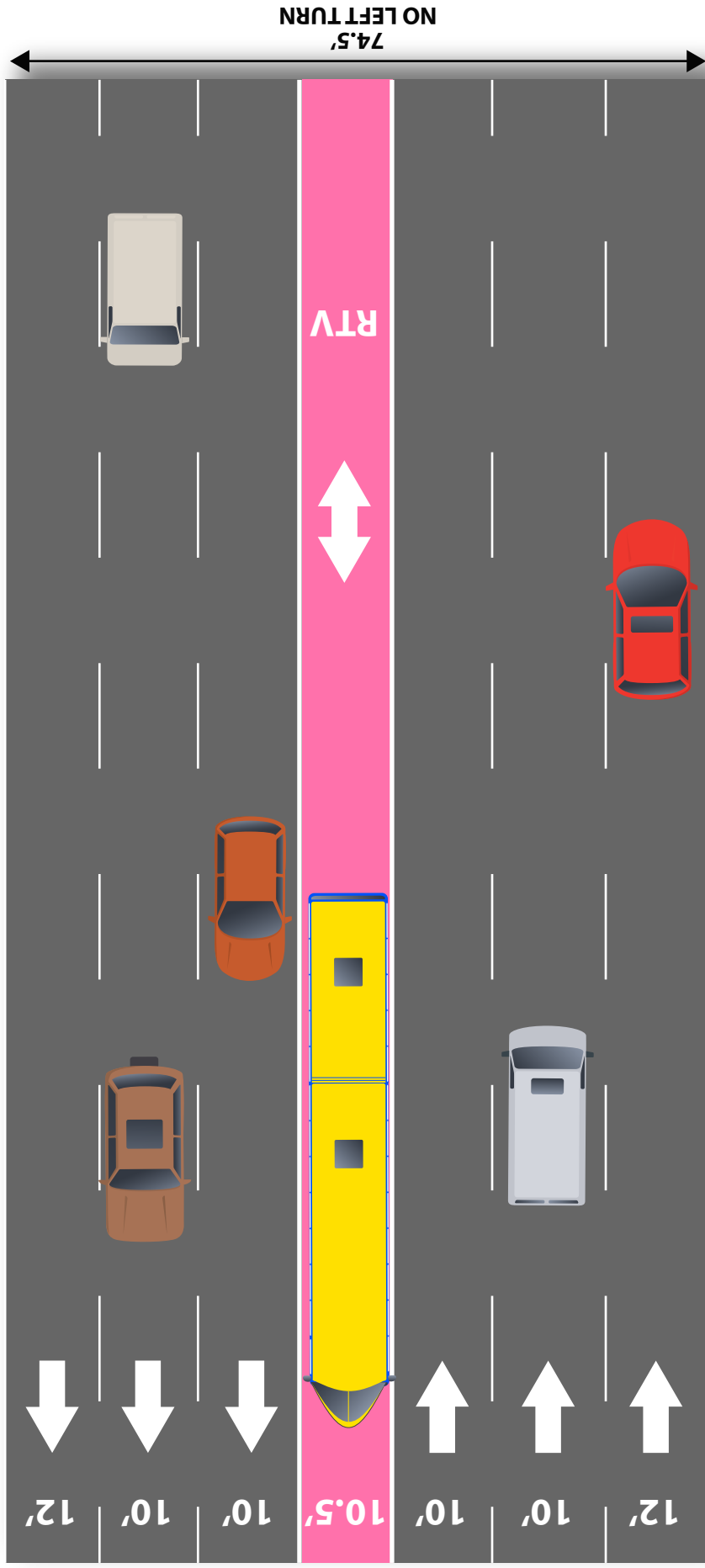


NOTE: Not to Scale

## RTV Alternate 1



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**NOTE:** Not to Scale

## RTV Alternate 1

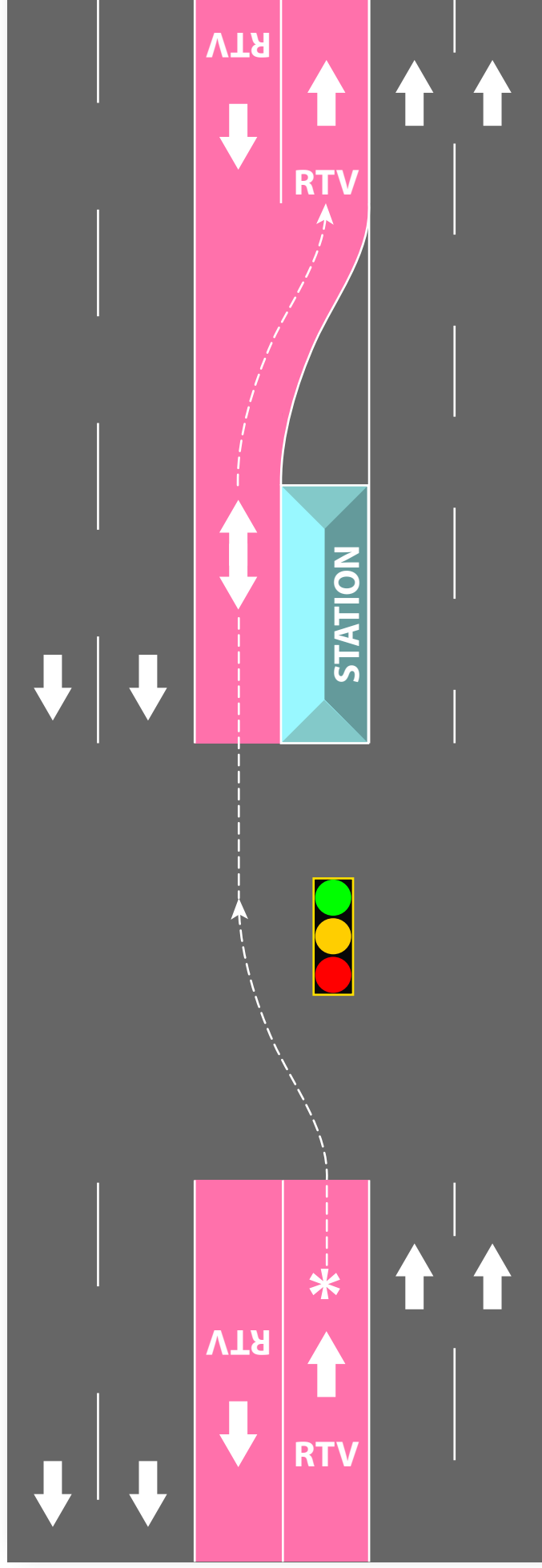


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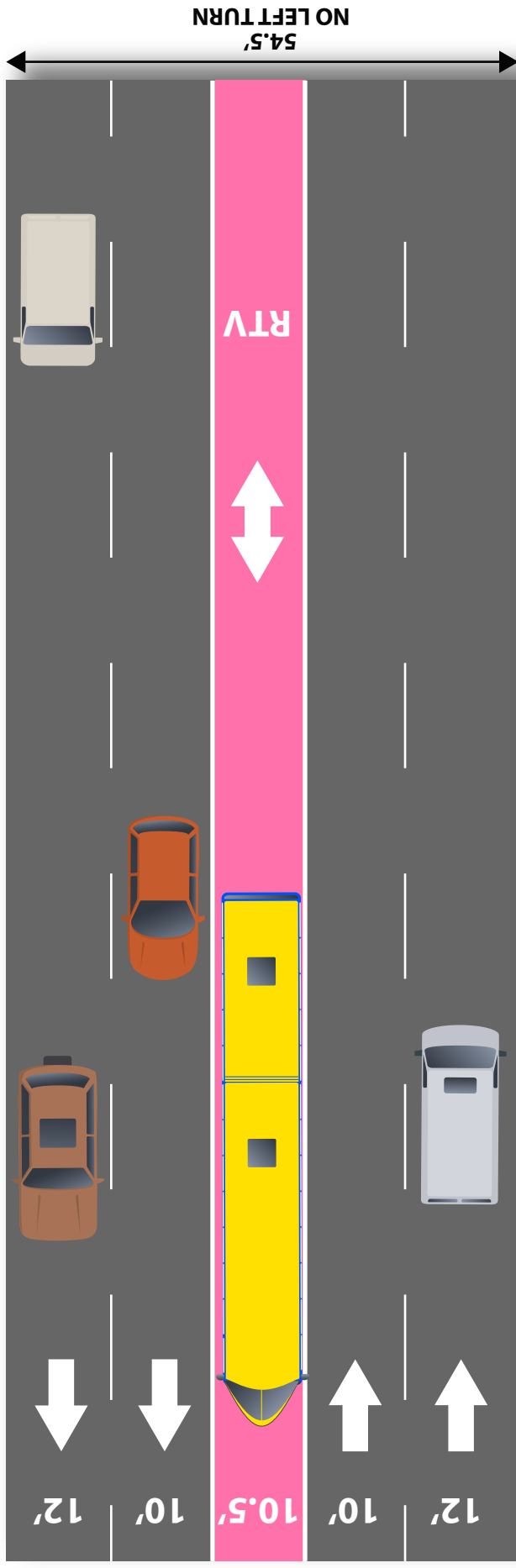
\* RTV "Held" Until Station Empty

Double Track w/Station No Need to "Bubble Out" for Station



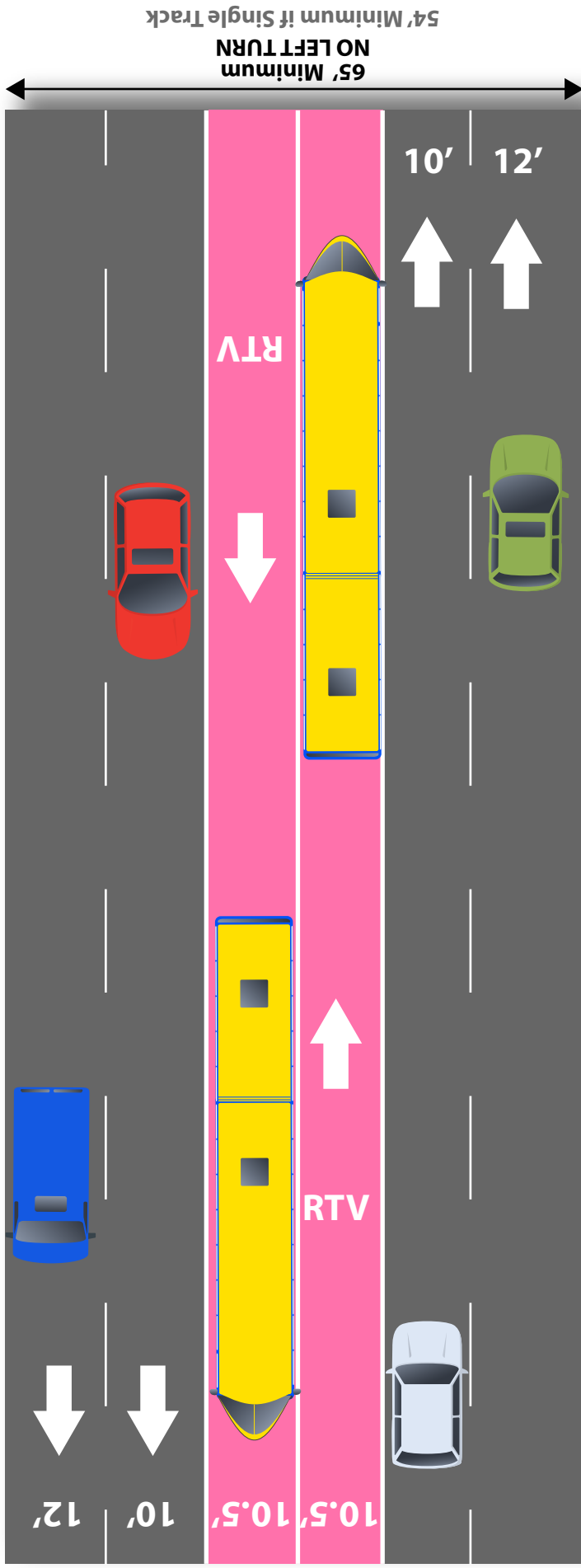
RTV Alternate 10

NOTE: Not to Scale



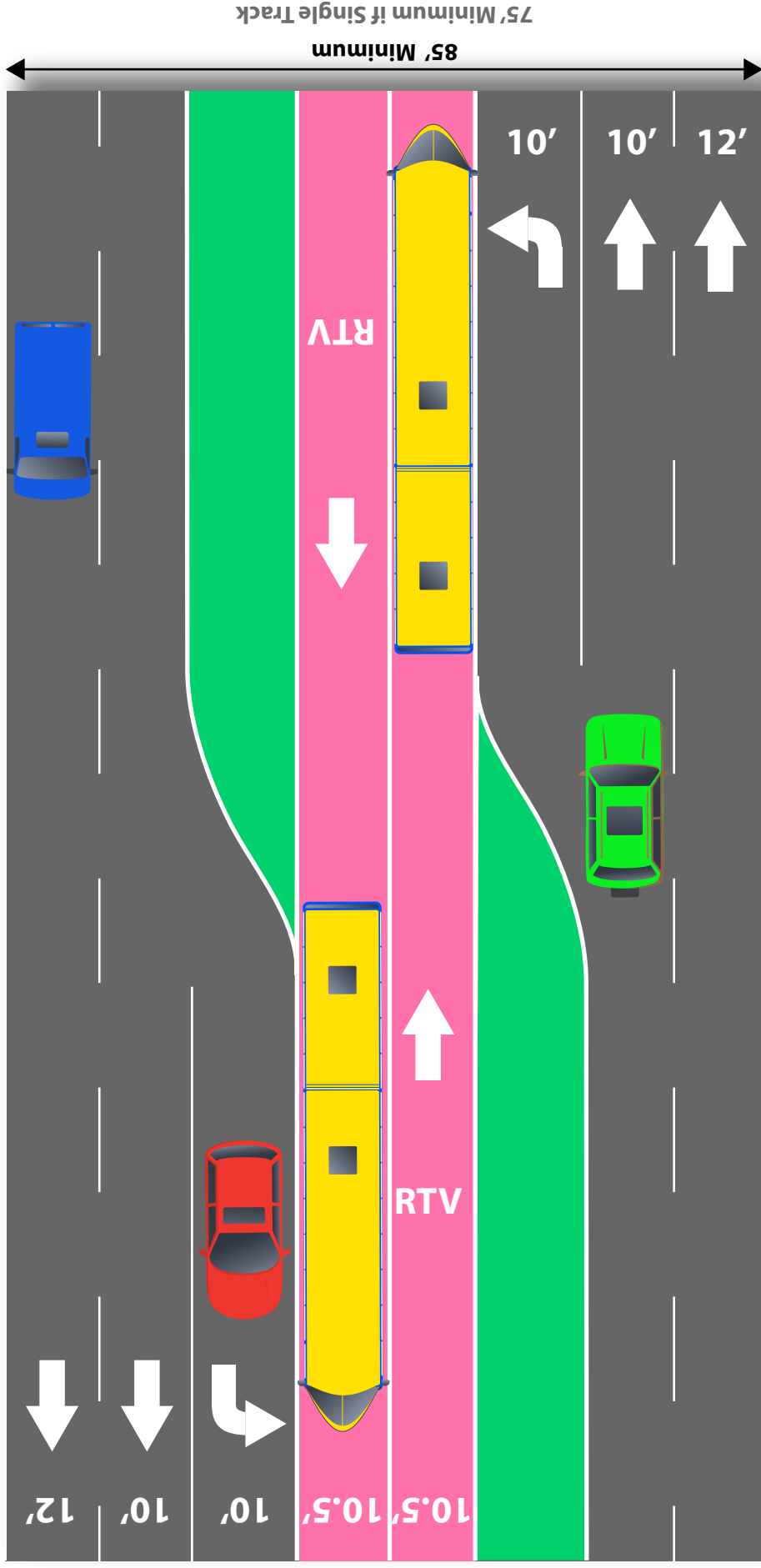
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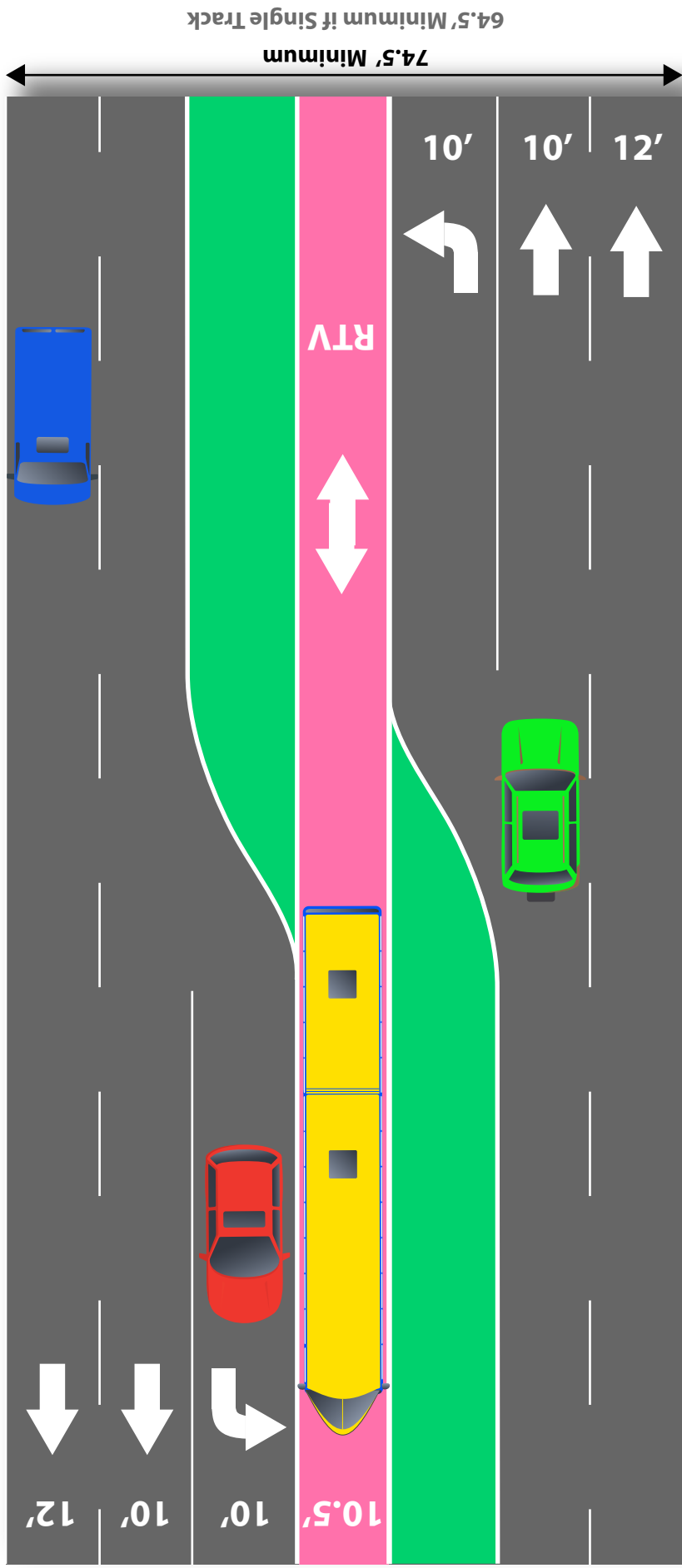
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## RTV Alternate 2



NOTE: Not to Scale

### RTV Alternate 3



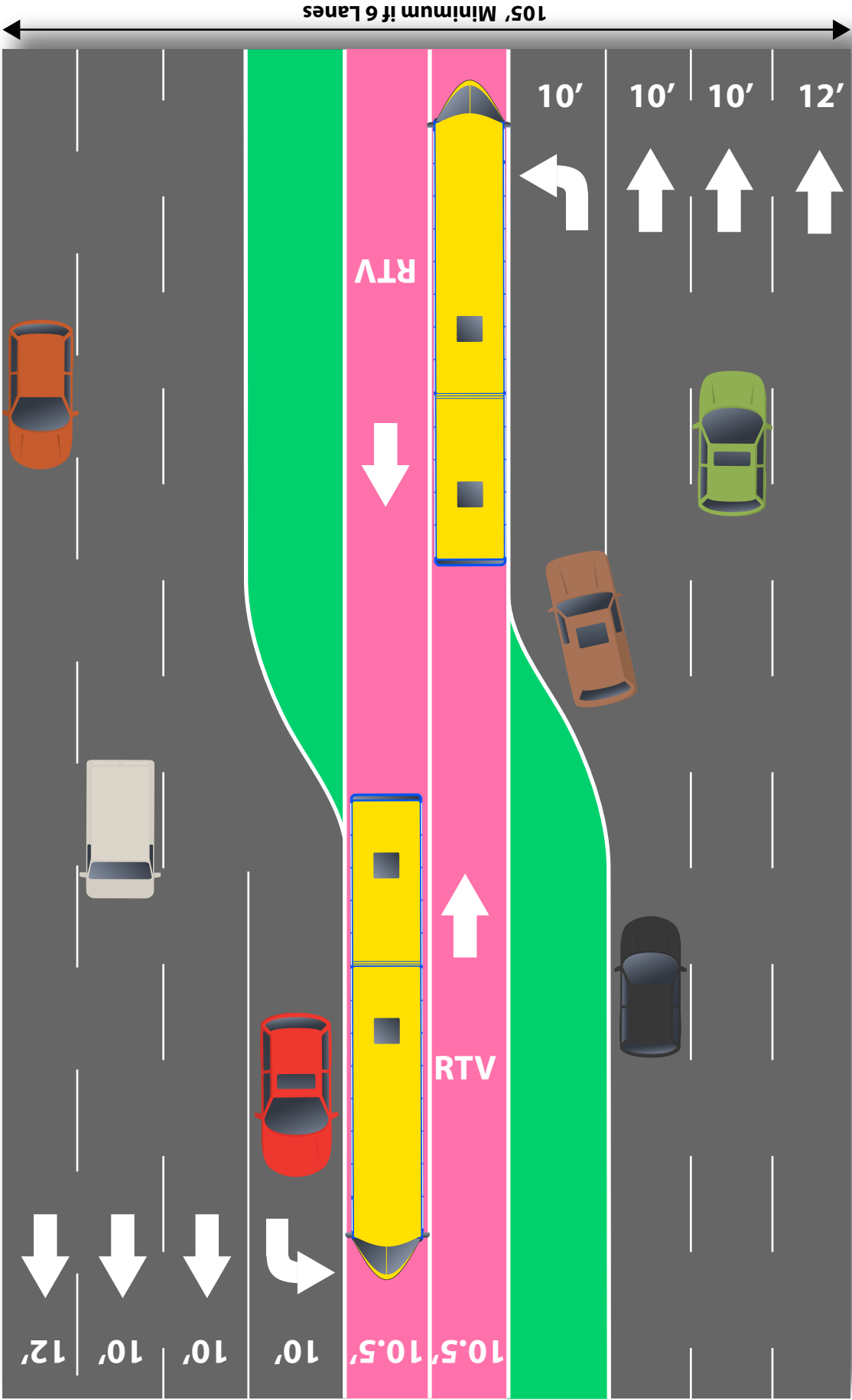
NOTE: Not to Scale

## RTV Alternate 3a



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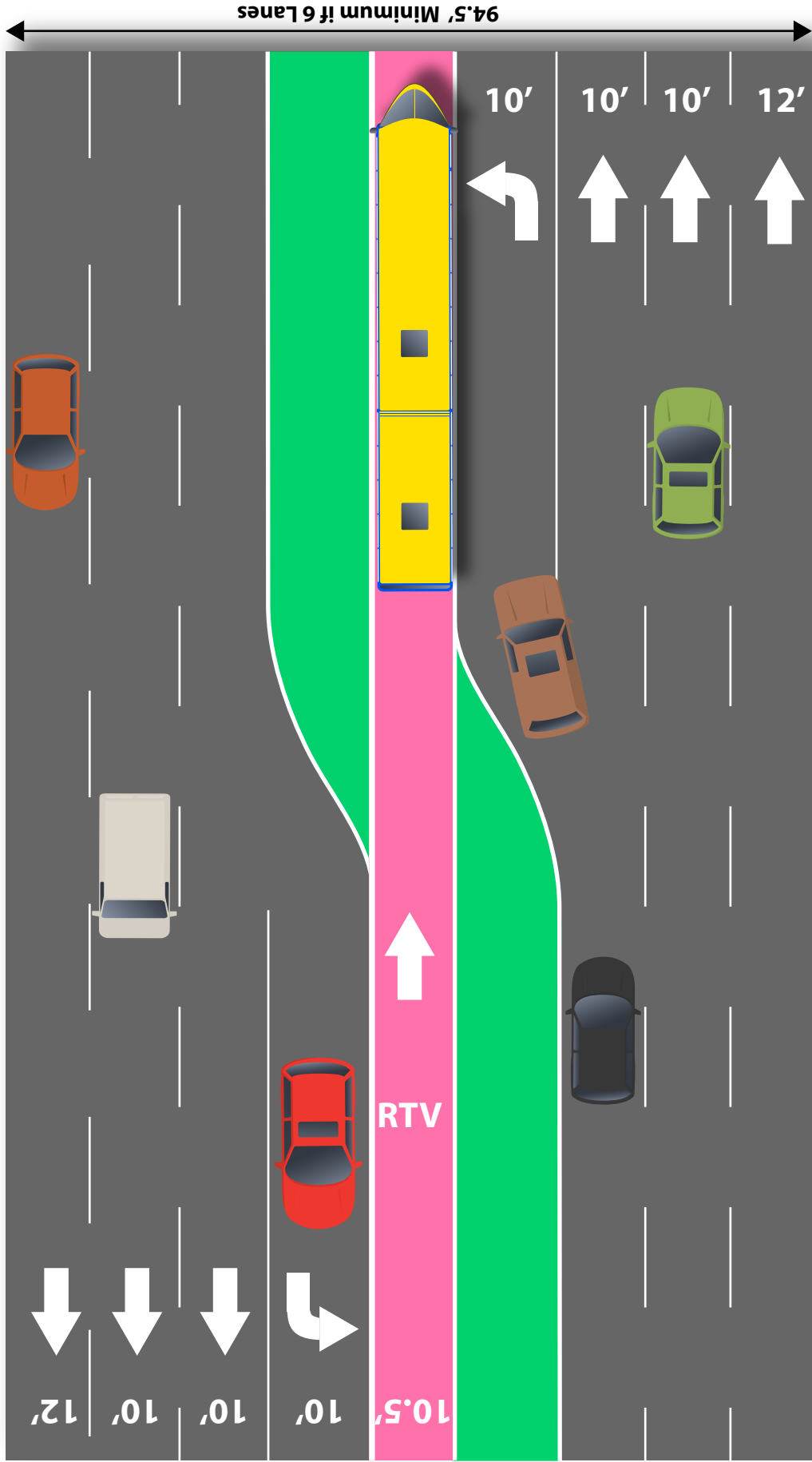


NOTE: Not to Scale

### RTV Alternate 4



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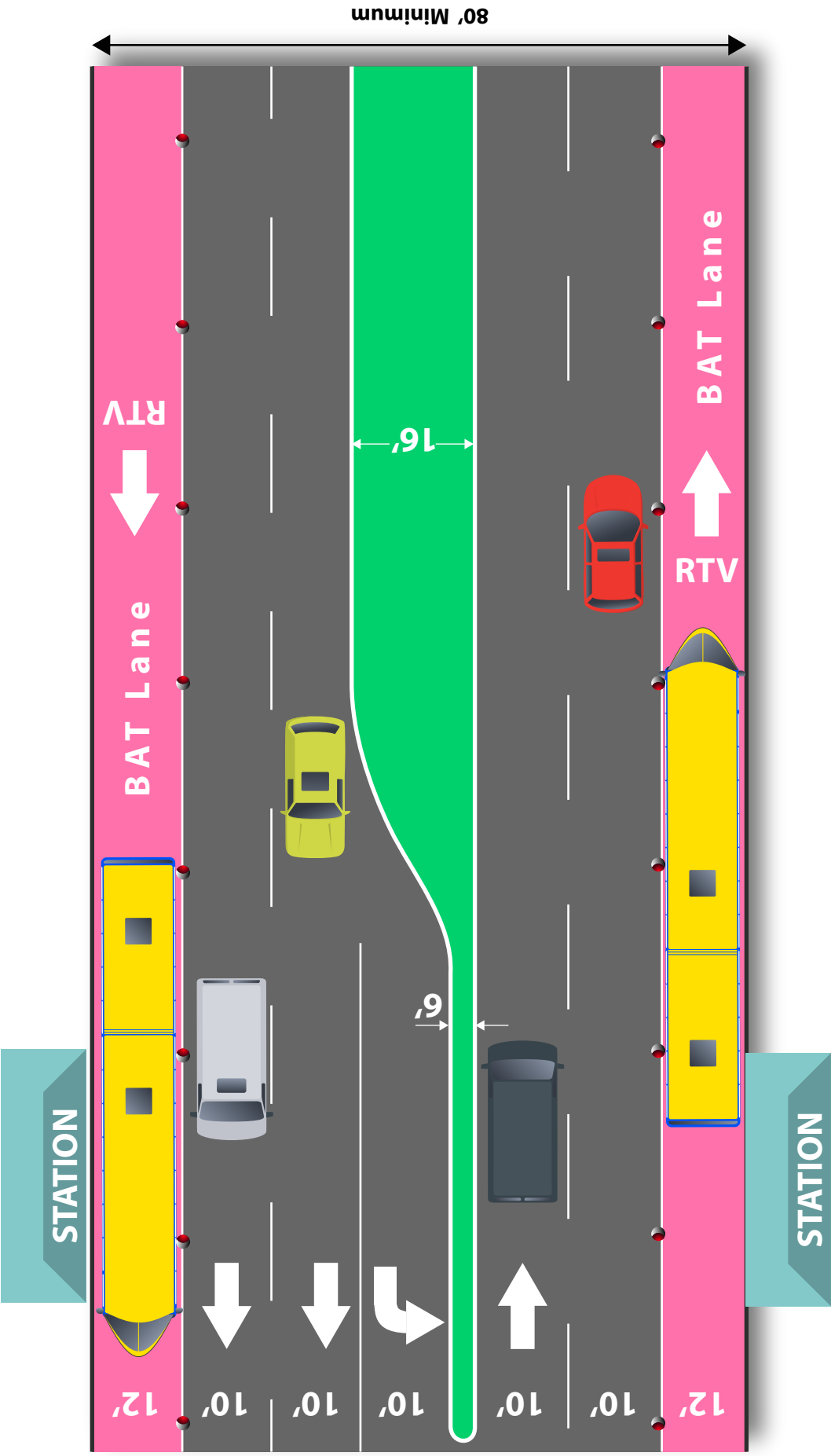


NOTE: Not to Scale

## RTV Alternate 4a



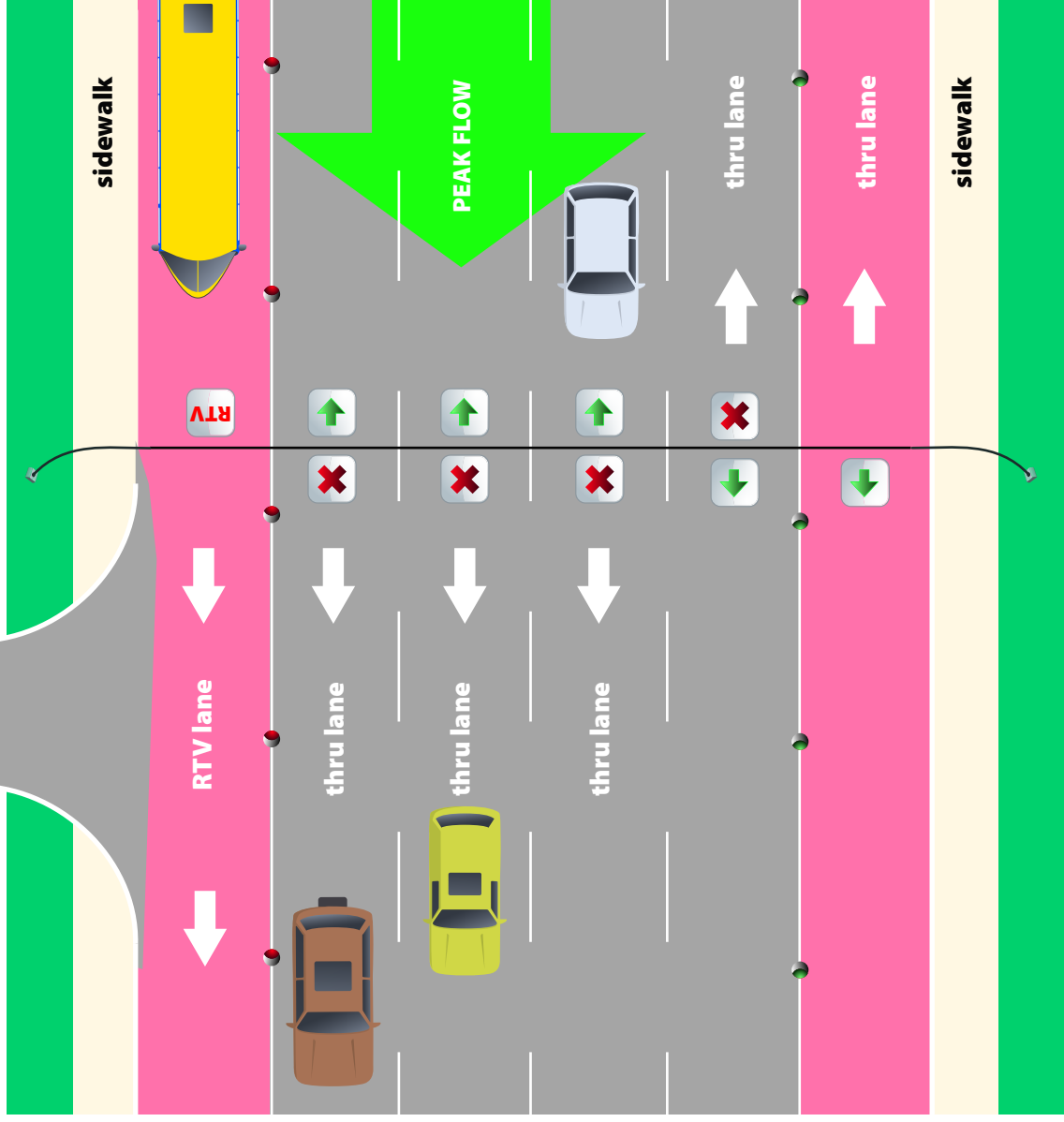
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**NOTE:** Not to Scale

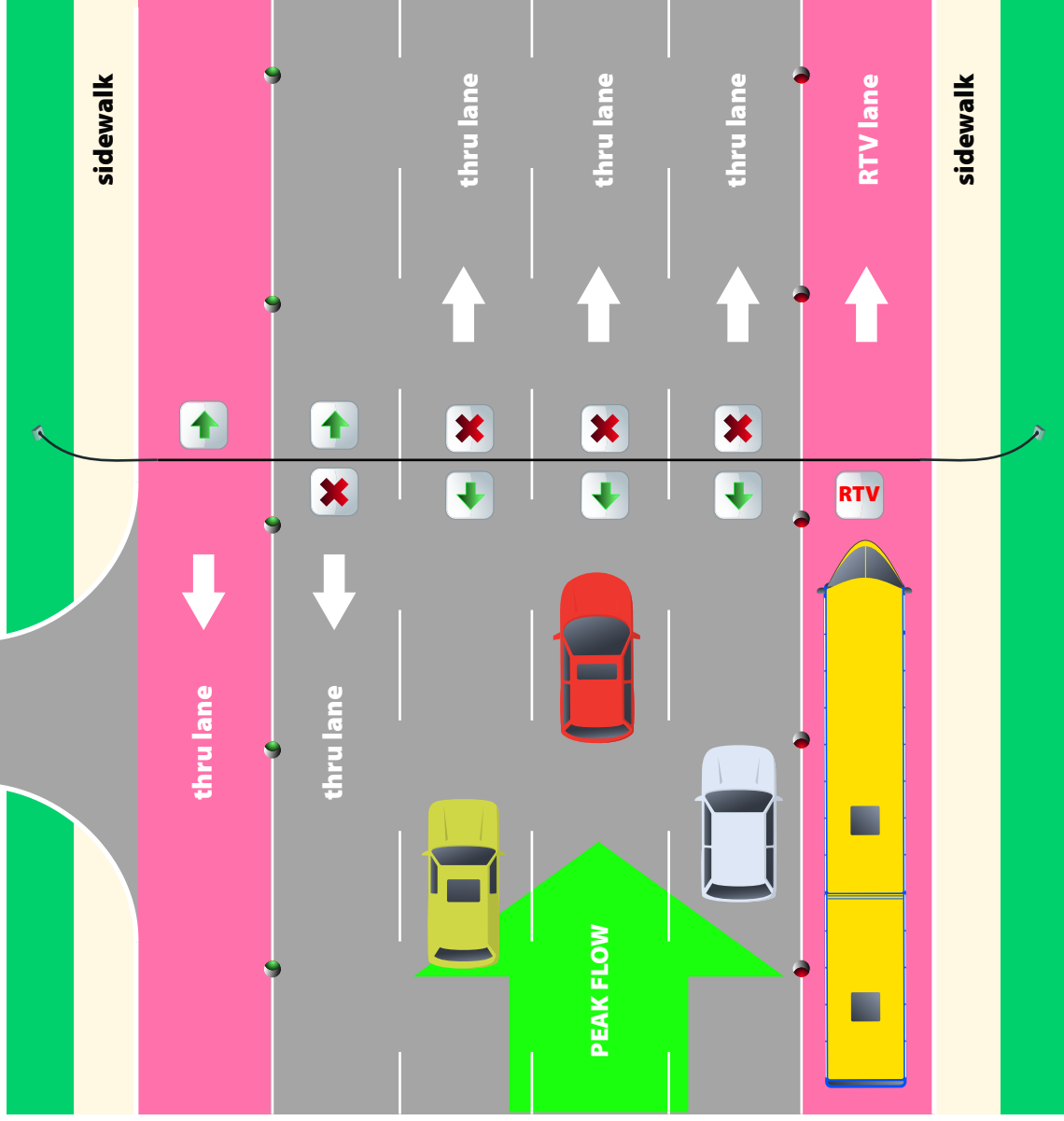
**RTV Alternate 5**





**NOTE:** Not to Scale

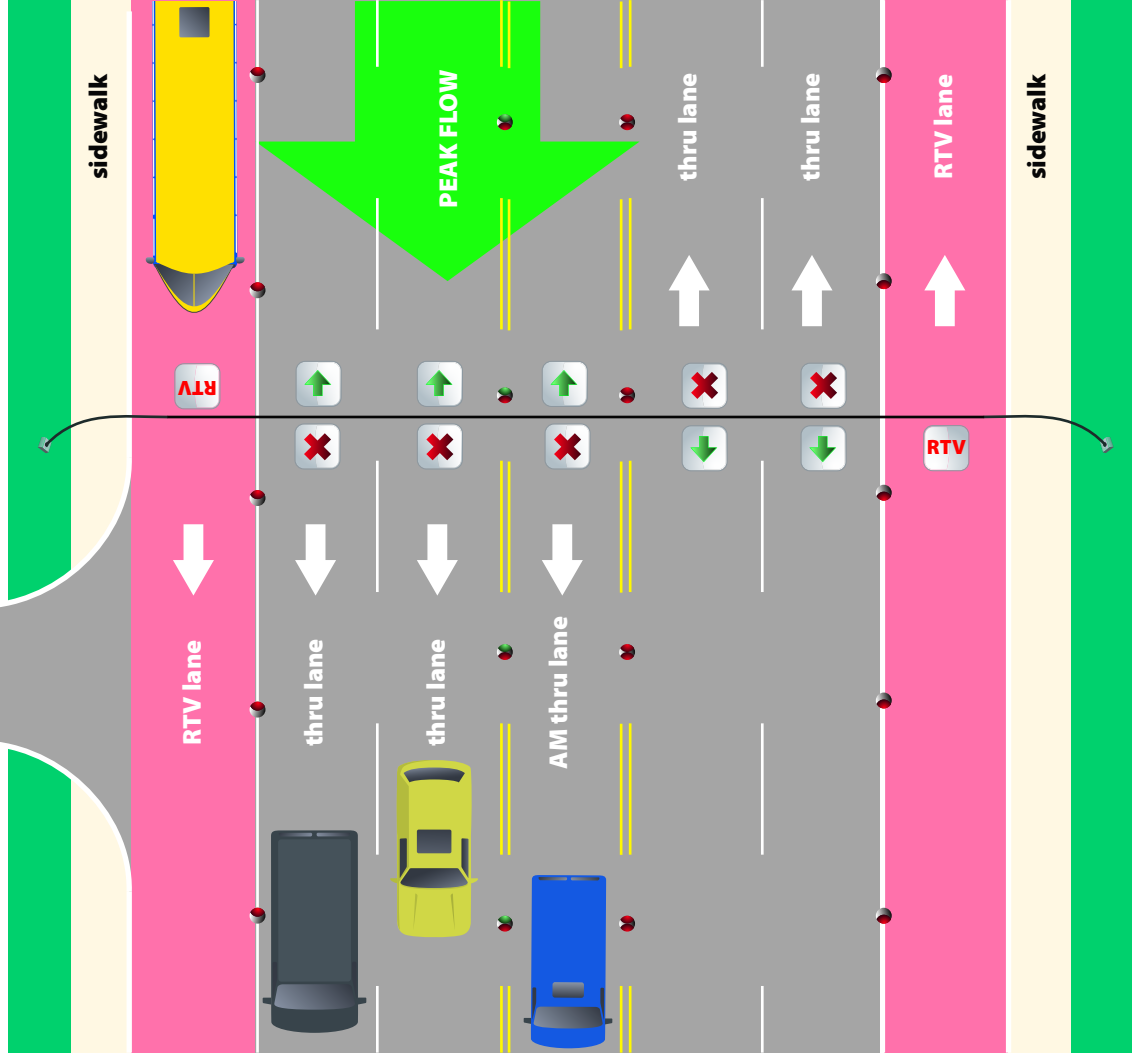
RTV Alternate 6  
A.M. OPTION



**NOTE:** Not to Scale

RTV Alternate 7  
P.M. OPTION

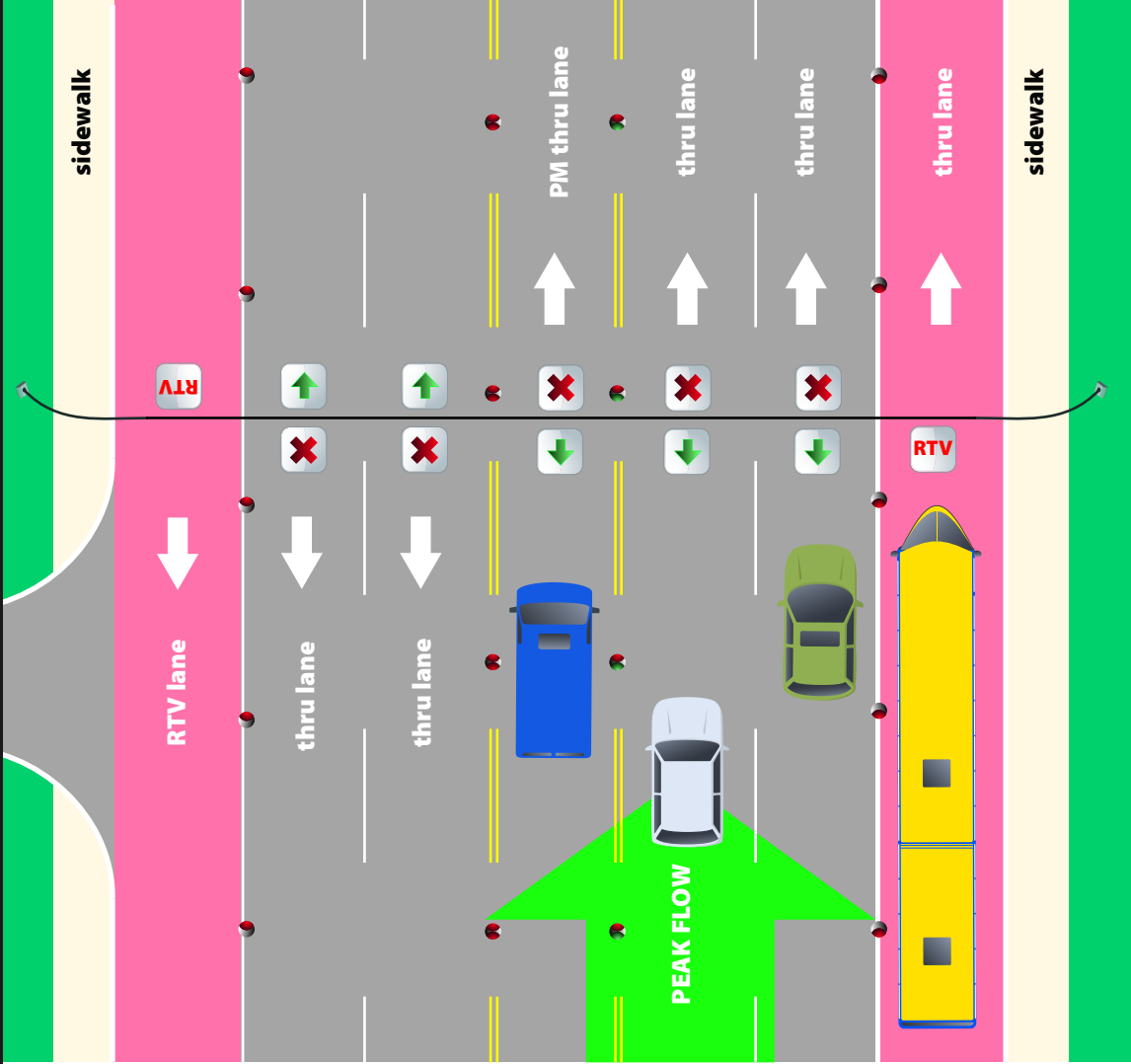




**NOTE:** Not to Scale

RTV Alternate 8  
A.M. OPTION



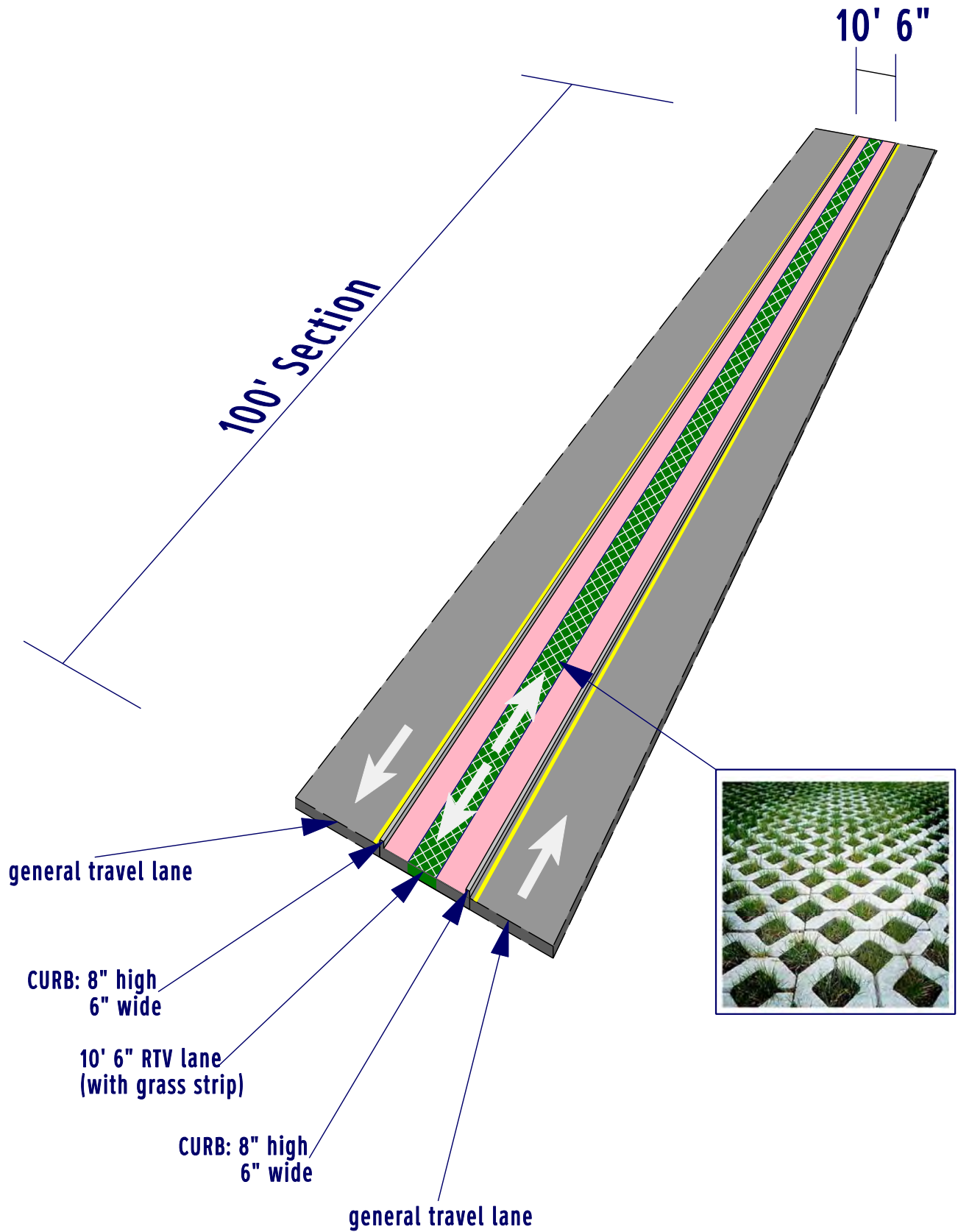


**NOTE:** Not to Scale

RTV Alternate 9  
 P.M. OPTION



# Guided Single RTV Lane

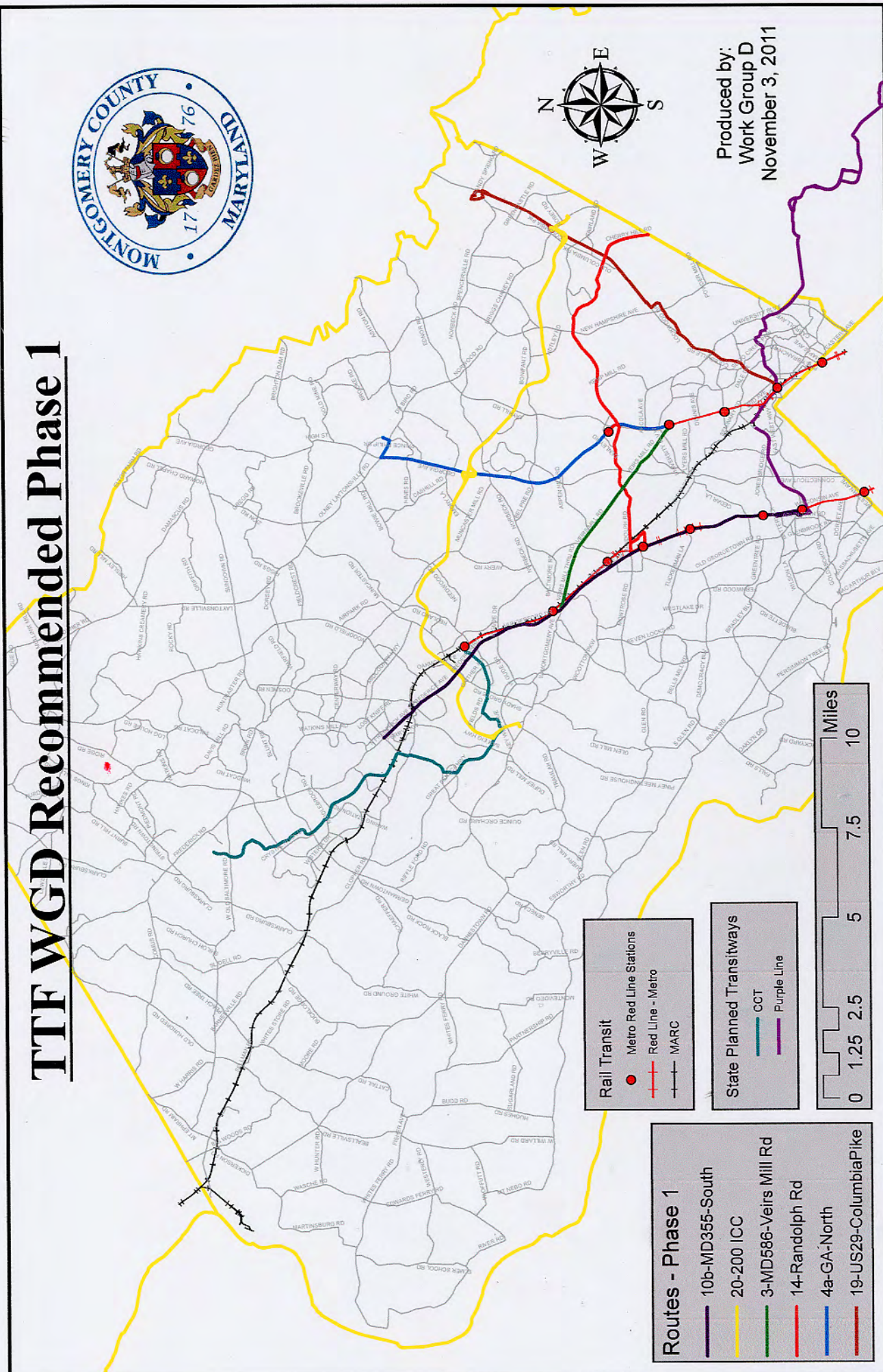




# TTF WGD Recommended Phase 1



Produced by:  
Work Group D  
November 3, 2011

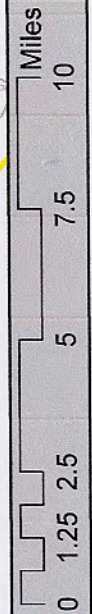


**Rail Transit**

- Metro Red Line Stations
- Red Line - Metro
- MARC

**State Planned Transitways**

- CCT
- Purple Line



**Routes - Phase 1**

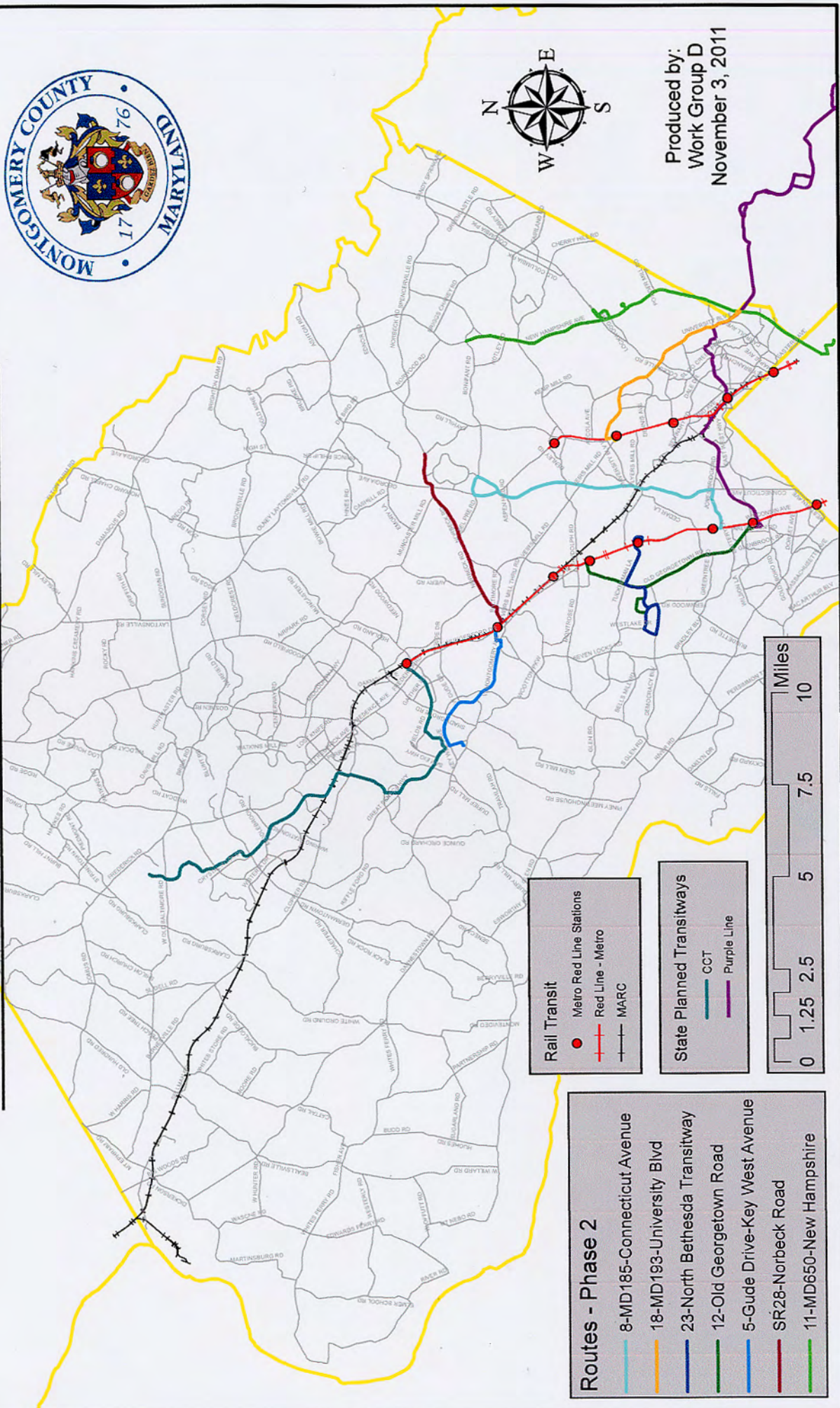
- 10b-MD355-South
- 20-200 ICC
- 3-MD586-Veirs Mill Rd
- 14-Randolph Rd
- 4a-GA-North
- 19-US29-ColumbiaPike



# TTF WGD Recommended Phase 2



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Work Group D  
November 3, 2011

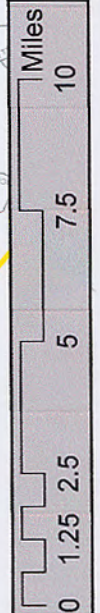


**Rail Transit**

- Metro Red Line Stations
- Red Line - Metro
- MARC

**State Planned Transitways**

- CCT
- Purple Line



**Routes - Phase 2**

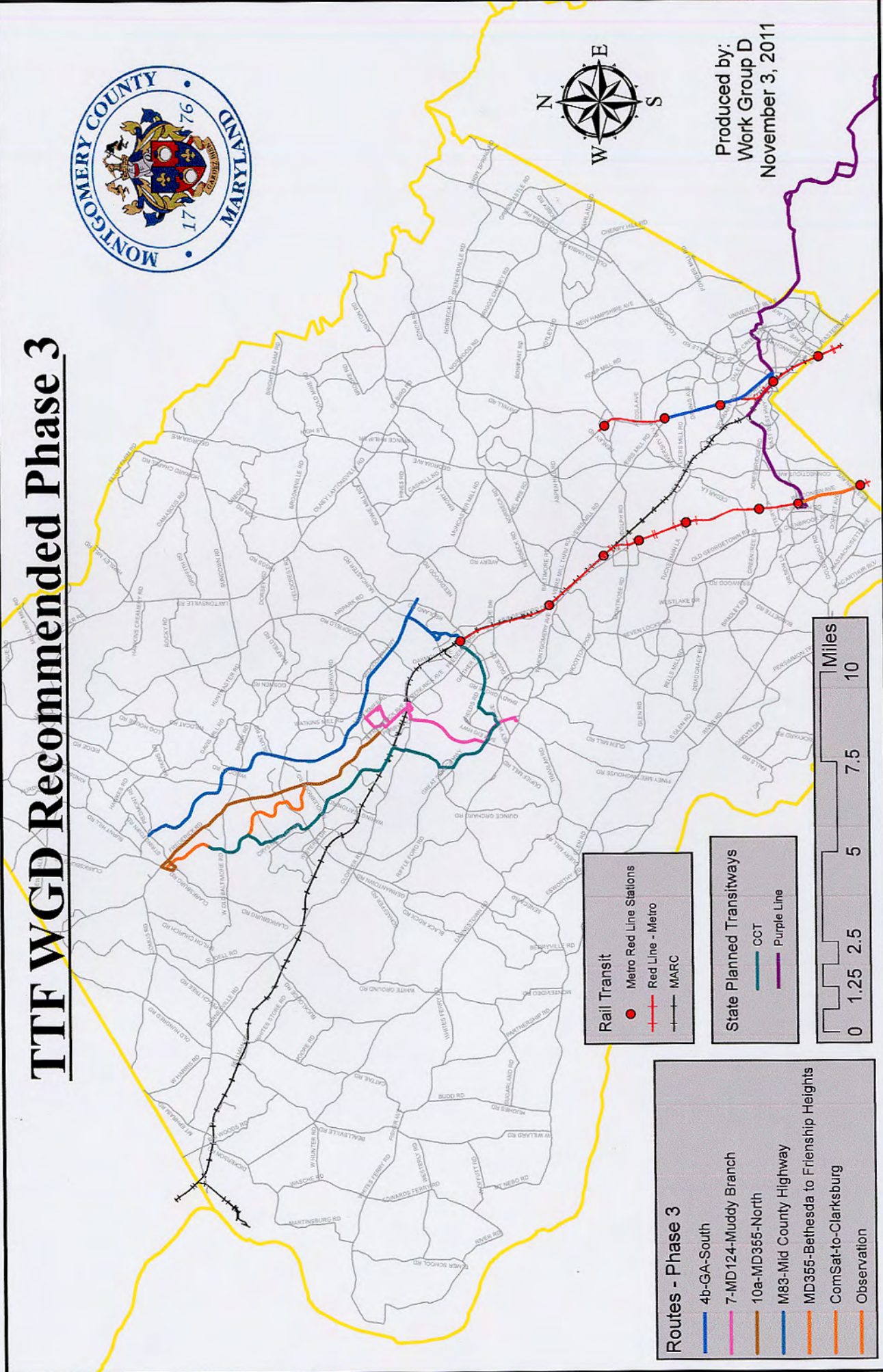
- 8-MD185-Connecticut Avenue
- 18-MD193-University Blvd
- 23-North Bethesda Transitway
- 12-Old Georgetown Road
- 5-Gude Drive-Key West Avenue
- SR28-Norbeck Road
- 11-MD650-New Hampshire



# TTF WGD Recommended Phase 3



Produced by:  
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**Routes - Phase 3**

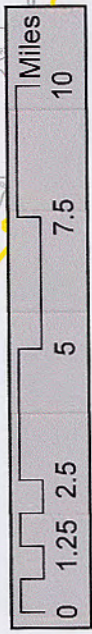
- 4b-GA-South
- 7-MD124-Muddy Branch
- 10a-MD355-North
- M83-Mid County Highway
- MD355-Bethesda to Friendship Heights
- ComSat-to-Clarksburg
- Observation

**Rail Transit**

- Metro Red Line Stations
- Red Line - Metro
- MARC

**State Planned Transitways**

- CCT
- Purple Line

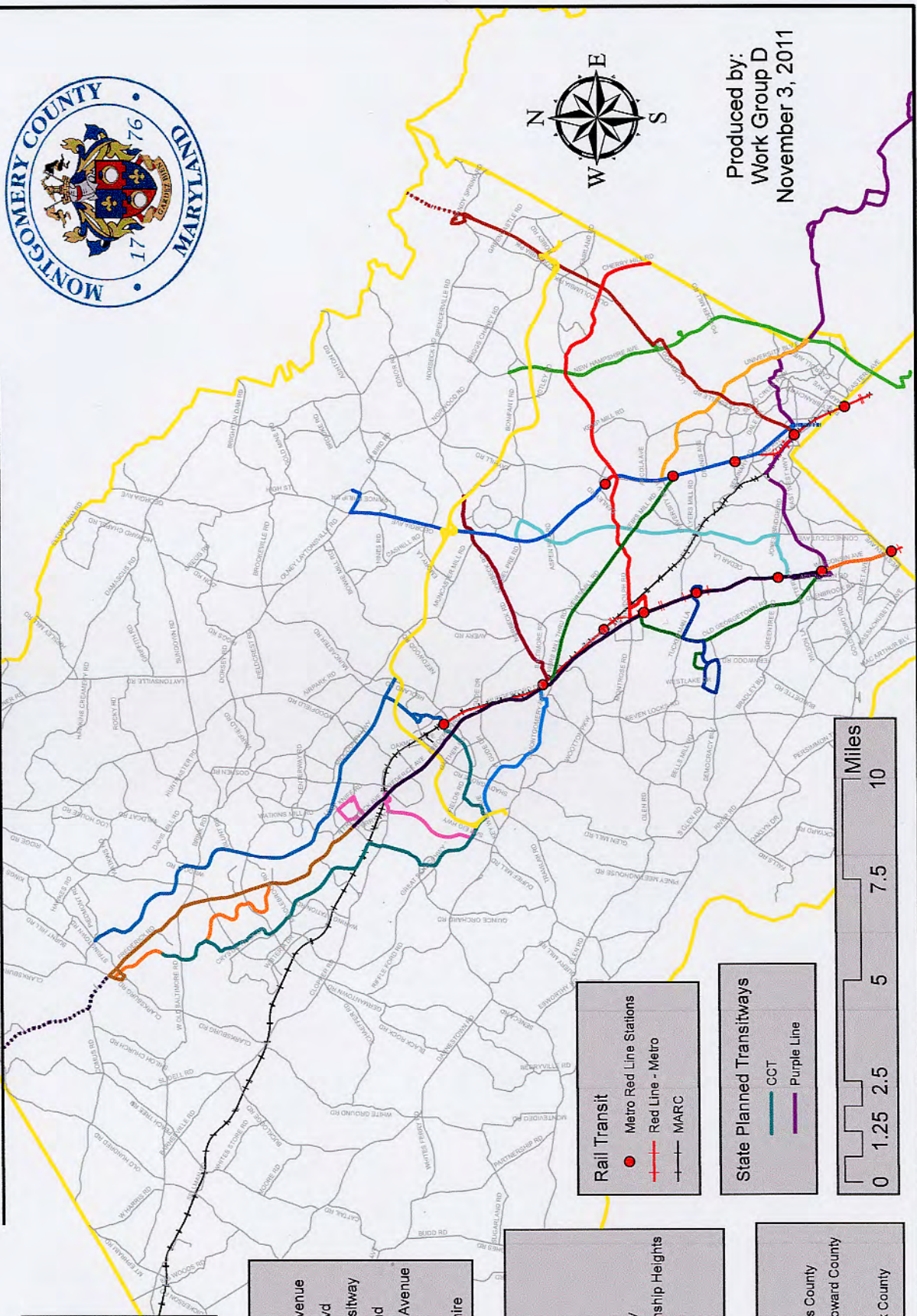




# TTF WGD All Phases & Extensions



Produced by:  
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November 3, 2011



- Routes - Phase 1**
- 10b-MD355-South
  - 20-200 ICC
  - 3-MD566-Veirs Mill Rd
  - 14-Randolph Rd
  - 4a-GA-North
  - 19-US29-ColumbiaPike

- Routes - Phase 2**
- 8-MD185-Connecticut Avenue
  - 18-MD183-University Blvd
  - 23-North Bethesda Transitway
  - 12-Old Georgetown Road
  - 5-Gude Drive-Key West Avenue
  - SR28-Norbeck Road
  - 11-MD650-New Hampshire

- Routes - Phase 3**
- 4b-GA-South
  - 7-MD124-Muddy Branch
  - 10a-MD355-North
  - M83-Mid County Highway
  - MD355-Bethesda to Friendship Heights
  - ComSat-to-Clarksburg
  - Observation

- County Line Extensions**
- FDA Blvd to Prince Georges County
  - 19-US29 - Burtonsville to Howard County
  - 4a-Silver Spring to DC Line
  - 10a-Clarksburg to Frederick County

- Rail Transit**
- Metro Red Line Stations
  - Red Line - Metro
  - MARC

- State Planned Transitways**
- GCT
  - Purple Line

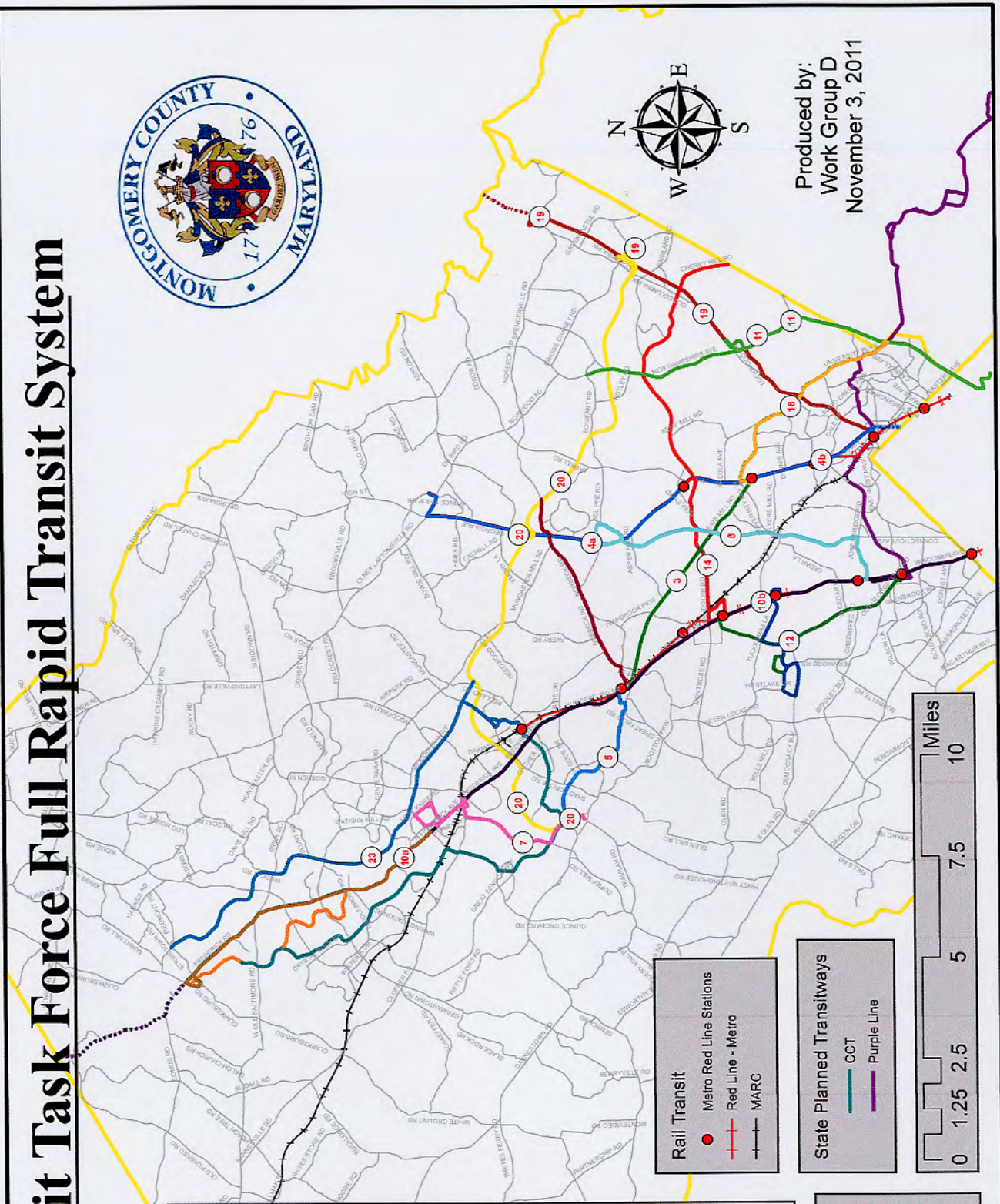




# Transit Task Force Full Rapid Transit System



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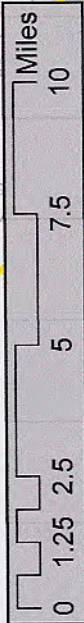


RTV System	
	3-MD586-Veirs Mill Rd
	4a-GA-North
	4b-GA-South
	5-Gude Drive-Key West Avenue
	7-MD124-Muddy Branch
	8-MD185-Connecticut Avenue
	10a-MD355-North
	10b-MD355-South
	11-MD650-New Hampshire
	12-Old Georgetown Road
	14-Randolph Rd
	18-MD193-University Blvd
	19-US29-ColumbiaPike
	20-200 ICC
	23-North Bethesda Transitway
	SR28-Norbeck Road
	M83-Mid County Highway

County Line Extensions	
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	10a-Clarksburg to Frederick County
	19-US29 - Burtonsville to Howard County
	FDA Blvd to Prince George's County

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	Red Line - Metro
	MARC

State Planned Transitways	
	CCT
	Purple Line

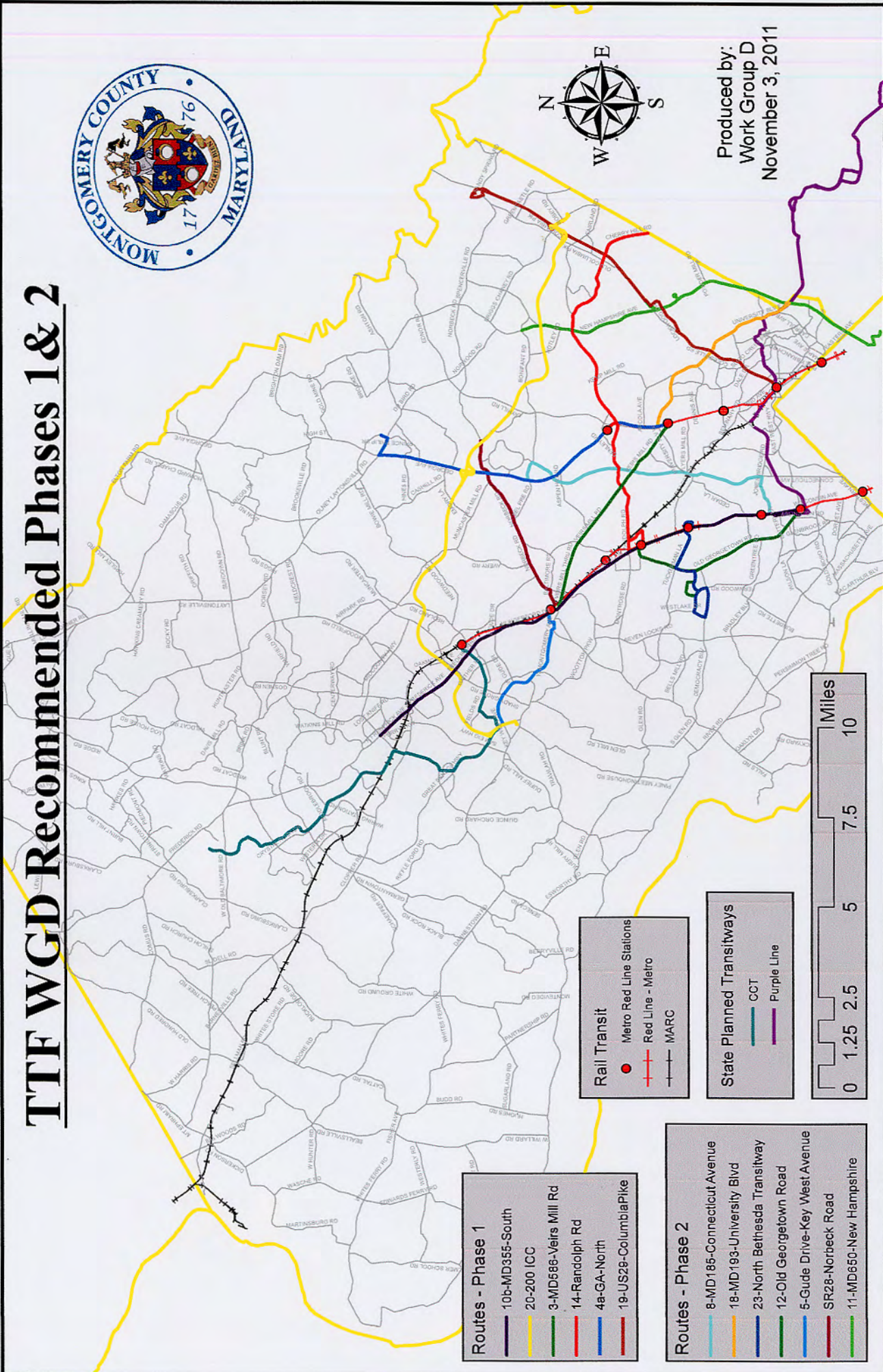




# TTF WGD Recommended Phases 1 & 2



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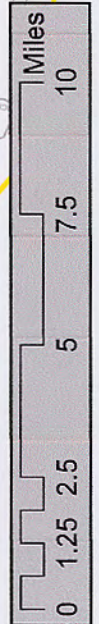


- Routes - Phase 1**
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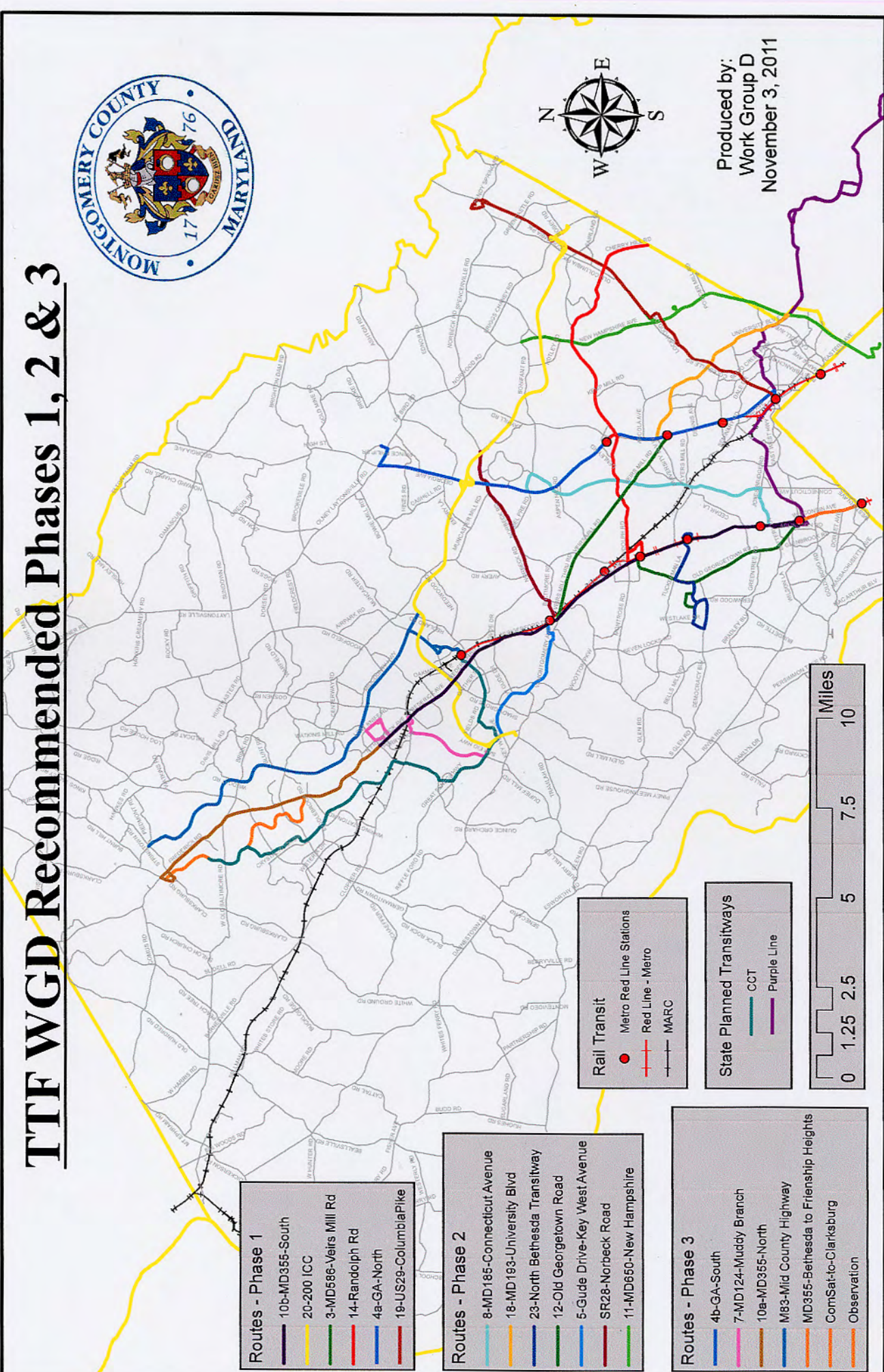




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# **TABLE OF CONTENTS**

## **PHASE 1**

1. MD 586/Veirs Mill Road (Wheaton Metro Station North to Rockville Metro Station)
  2. Georgia Avenue North (from Wheaton Metro Station North to Montgomery General Hospital)
  3. MD 355 South (Bethesda Metro Station North to Rockville Station)
  4. Randolph Road – Cherry Hill Road (White Flint Metro Station East to FDA)
  5. US 29/Columbia Pike/Colesville Road (from Silver Spring Transit Center North to Burtonsville Park & Ride)
- 

## **PHASE 2**

6. MD 185/Connecticut Avenue (from Jones Bridge North to Rossmoor Boulevard)
  7. MD 650/New Hampshire Avenue (from Adelphi Road North to ICC)
  8. MD 187/Old Georgetown Road (from Bethesda Metro Station to White Flint Metro Station)
  9. MD 193/University Boulevard (from Langley Park North to Wheaton Metro Station)
  10. North Bethesda Transit Way (from Montgomery Mall East to Grosvenor Metro Station)
  11. Key West Avenue (from Life Science Center to Rockville Metro Station)
  12. MD 28/Norbeck Road (from Rockville Metro Station North to Rossmoor Boulevard)
- 

## **PHASE 3**

13. Georgia Avenue South (Silver Spring Transit Center North to Wheaton Metro Station)
  14. Muddy Branch (MD 119 at Muddy Branch North to Lake Forest Mall)
  15. MD 355 North (Rockville Metro Station North to Milestone Manor Road)
  16. MD 355 South (from DC Line [Friendship Heights Metro Station] North to Bethesda Metro Station)
  17. Sam Eij Highway (from MD 119 North to I-270)
- 

18. DVDs with Concept designs for all routes and this report in binder pocket.



## COST ESTIMATE

<b>PHASE 1</b>		<b>Cost</b>	<b># of Miles</b>	<b>Cost/Mile</b>
1	MD 586/Veirs Mill Road (Wheaton Metro Station North to Rockville Metro Station)	\$25,437,702	6.54	\$3,889,557
2	Georgia Avenue North (from Wheaton Metro Station North to Montgomery General Hospital)	\$44,638,993	9.57	\$4,664,472
3	MD 355 South (Bethesda Metro Station North to Rockville Station)	\$133,136,675	7.93	\$16,788,988
4	Randolph Road – Cherry Hill Road (White Flint Metro Station East to FDA)	\$49,534,450	11.19	\$4,426,671
5	US 29/Columbia Pike/Colesville Road (from Silver Spring Transit Center North to Burtonsville Park)	\$55,890,457	10.27	\$5,442,109
<b>Totals - Phase 1</b>		<b>\$308,638,277</b>	<b>45.5</b>	<b>\$6,783,259</b>

<b>PHASE 2</b>				
6	MD 185/Connecticut Avenue (from Jones Bridge North to Rossmoor Boulevard)	\$27,721,830	6.92	\$4,006,045
7	MD 650/New Hampshire Avenue (from Adelphi Road North to ICC)	\$30,200,380	5.57	\$5,421,971
8	MD 187/Old Georgetown Road (from Bethesda Metro Station to White Flint Metro Station)	\$26,117,224	5.53	\$4,722,825
9	MD 193/University Boulevard (from Langley Park North to Wheaton Metro Station)	\$24,865,876	4.9	\$5,074,669
9a	MD 193 from MD 97 to MD 185	\$8,068,025	1.24	\$6,506,472
10	North Bethesda Transit Way (from Montgomery Mall East to Grosvenor Metro Station)	\$11,738,954	4.58	\$2,563,090
11	Key West Avenue (from Life Science Center to Rockville Metro Station)	\$11,158,788	4.85	\$2,300,781
12	MD 28/Norbeck Road (from Rockville Metro Station North to Rossmoor Boulevard)	\$13,454,700	5.54	\$2,428,646
<b>Totals - Phase 2</b>		<b>\$153,325,777</b>	<b>39.13</b>	<b>\$3,918,369</b>

<b>PHASE 3</b>		<b>Cost</b>	<b># of Miles</b>	<b>Cost/Mile</b>
13	Georgia Avenue South (Silver Spring Transit Center North to Wheaton Metro Station)	\$33,221,202	3.52	\$9,437,841
14	Muddy Branch (MD 119 CCT North to Lake Forest Mall)	\$14,297,850	5.16	\$2,770,901
15	MD 355 North (Rockville Metro Station North to Milestone Manor Road)	\$54,188,575	8.08	\$6,706,507
16	MD 355 South (from DC Line [Friendship Heights Metro Station] North to Bethesda Metro Station)	\$9,705,892	1.71	\$5,675,960
17	Sam Eig Highway (from MD 119 North to I-270)	\$4,073,825	1.03	\$3,955,170
<b>Totals - Phase 3</b>		<b>\$115,487,344</b>	<b>19.5</b>	<b>\$5,922,428</b>

**GRAND TOTAL:<sup>1/</sup>**

<b>\$577,451,398</b>	<b>104.13</b>	<b>\$5,545,485.43</b>
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<b>Suggested Routes to be Deferred</b>		<b>Cost</b>	<b># of Miles</b>	<b>Cost/Mile</b>
#10	North Bethesda Transit Way (from Montgomery Mall East to Grosvenor Metro Station)	\$11,738,954	4.58	\$2,563,090
#11	Key West Avenue (from Life Science Center to Rockville Metro Station)	\$11,158,788	4.85	\$2,300,781
<b>Deferred Total</b>		<b>\$22,897,742</b>	<b>9.43</b>	<b>\$2,428,180</b>

**NET GRAND TOTAL:**

<b>\$554,553,656</b>	<b>94.70</b>	<b>\$5,855,899</b>
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<sup>1/</sup> Does not include maintenance/storage facilities or vehicles



# Route 3

## MD 586/Viers Mill Road

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**PHASE 1**

**6.54miles**

**\$ 25,437,702**

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**Cost/Mile**

**\$ 3,889,557**

### OVERALL DESCRIPTION

#### Wheaton Metro Station North to Rockville Metro Station

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option – No R.O.W. Needed

1. From Wheaton Station to MD 193 – in traffic.
2. Use Right Turn Lane (RTL) area for guideway+ where available near MD 193.
3. At MD 185, stay in median, eliminate RTL, put guideway in median.
4. Past Randolph, remove SB third thru lane.
5. At Randolph, keep all Left Turn Lanes (LTL) and add station in the middle.
6. At Harford Street, take 1 thru lane in each direction for guideway.
7. At Aspen Hill, start using RTL and shoulder.
8. At Twinbrook, remove median to build guideway.
9. At Atlantic Avenue, use RTL to build guideway.
10. Remove median and remove some grass from Service Road; Rebuild as 4-lane road with LTL and guideway.

#### Option 2 – No R.O.W. Needed (see Alternate 5)

11. Take right lane as a BAT lane and eliminate one auto lane.

#### Option 3 (see Alternate 4)

12. Widen road by 12 ft each side, buy R.O.W. and build dual guideway in median while maintaining left turn lane.



**MD 586 Veirs Mill Road - Wheaton Metro Station to Rockville Metro Station**

Location: Montgomery County Maryland

Miles:	6.54
Cost Per Mile:	<b>\$3,889,557</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
10,100	CY	Earthwork	\$25.00	\$252,500.00
6,500	CY	Removal of Existing Grass Area	\$30.00	\$195,000.00
45,500	LF	Removal of Existing Curb & Gutter	\$15.00	\$682,500.00
45,000	LF	Saw-Cut Existing Pavement	\$10.00	\$450,000.00
18,000	SY	Removal of Existing Paving	\$35.00	\$630,000.00
22,700	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,724,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
46,000	LF	Curb & Gutter	\$30.00	\$1,380,000.00
1,000	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$45,000.00
68,200	SF	Grass Pavers	\$5.00	\$341,000.00
46,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$138,000.00
36,300	LF	5" Solid White Pavement Marking Line	\$3.00	\$108,900.00
3,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$9,000.00
115	EA	Ground Mounted Sign	\$350.00	\$40,250.00
0	SF	Topsoil and Hydro seed	\$1.00	\$0.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
2,400	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$19,200.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
127,200	SF	Mill and Overlay	\$7.00	\$890,400.00
5	EA	RTV Station (inc. install)	\$250,000.00	\$1,250,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
6,000	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$55,080.00
Subtotal:				<b>\$14,535,830.00</b>
Utilities (20%)				\$2,907,166.00
M.O.T. (10%)				\$1,453,583.00
Design Fees (10%)				\$1,453,583.00
Contingency (35%)				\$5,087,540.50
<b>Total:</b>				<b>\$25,437,702.50</b>

**Opinion of Probable Construction Costs**

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**MD 586 Veirs Mill Road - Wheaton Metro Station to Rockville Metro Station**

Location: Montgomery County Maryland

Miles:	6.54
Cost Per Mile:	<b>\$5,751,880</b>
	<b>Option 2</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
32,000	CY	Earthwork	\$25.00	\$800,000.00
1,500	CY	Removal of Existing Grass Area	\$30.00	\$45,000.00
2,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$30,000.00
140,000	LF	Saw-Cut Existing Pavement	\$10.00	\$1,400,000.00
93,000	SY	Removal of Existing Paving	\$35.00	\$3,255,000.00
70,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$8,400,000.00
1,000	CY	Concrete for raised Station Plat form	\$100.00	\$100,000.00
1,500	LF	Curb & Gutter	\$30.00	\$45,000.00
1,200	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$54,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
46,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$138,000.00
100,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$300,000.00
1,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$3,000.00
350	EA	Ground Mounted Sign	\$350.00	\$122,500.00
8,000	SF	Topsoil and Hydro seed	\$1.00	\$8,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$24,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
6	EA	RTV Station (inc. install)	\$250,000.00	\$1,500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
7,200	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$66,096.00
			Subtotal:	<b>\$21,495,596.00</b>
			Utilities (20%)	\$4,299,119.20
			M.O.T. (10%)	\$2,149,559.60
			Design Fees (10%)	\$2,149,559.60
			Contingency (35%)	\$7,523,458.60
			<b>Total:</b>	<b>\$37,617,293.00</b>

**Opinion of Probable Construction Costs**

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**MD 586 Veirs Mill Road - Wheaton Metro Station to Rockville Metro Station**

Location: Montgomery County Maryland

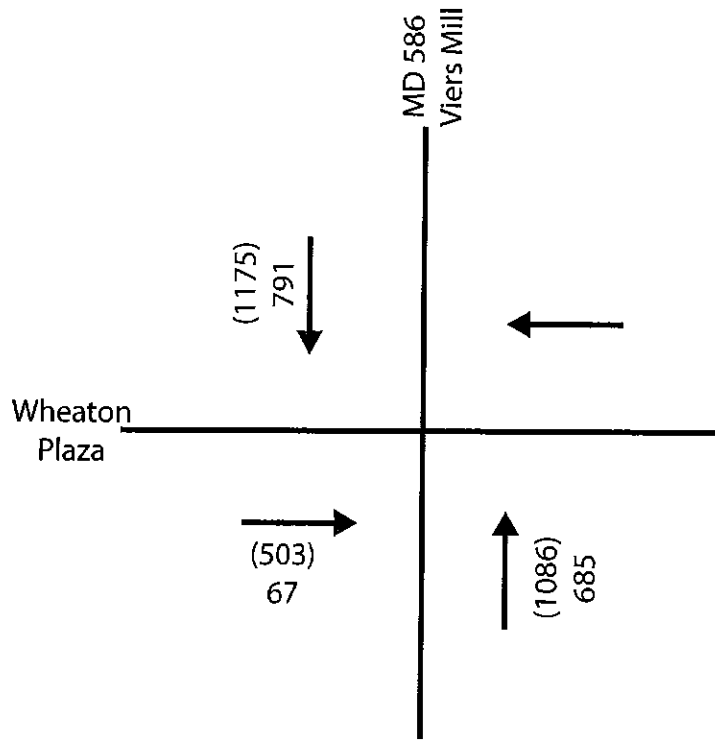
Miles:	6.54
<b>Cost Per Mile:</b>	<b>\$9,884,690</b>
	<b>Option 3</b>

**Preliminary Cost Estimate**

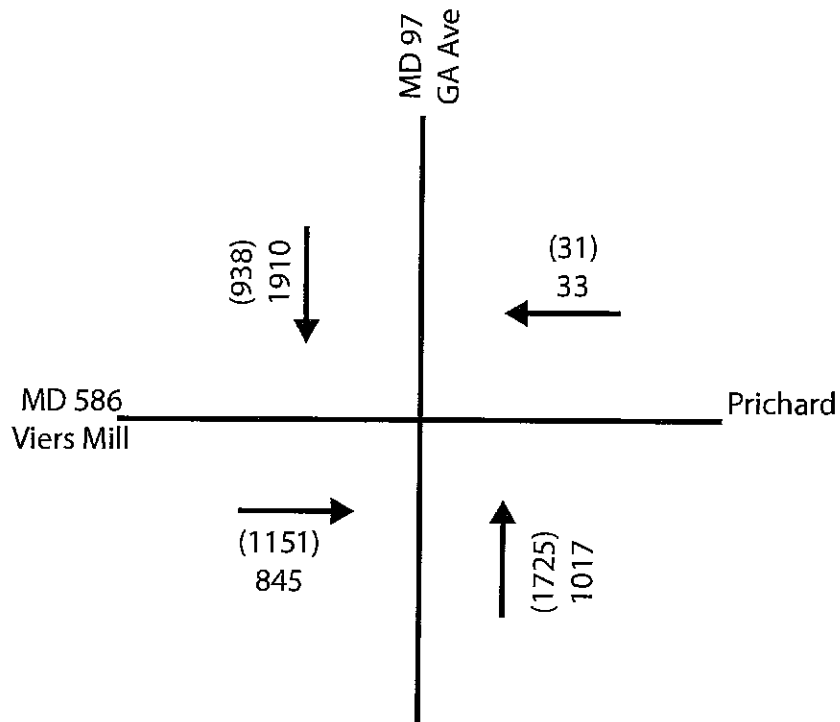
Quantity	Unit	Description	Unit Price	Total Price
32,000	CY	Earthwork	\$25.00	\$800,000.00
11,000	CY	Removal of Existing Grass Area	\$30.00	\$330,000.00
70,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,050,000.00
70,000	LF	Saw-Cut Existing Pavement	\$10.00	\$700,000.00
3,000	SY	Removal of Existing Paving	\$35.00	\$105,000.00
70,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$8,400,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
70,000	LF	Curb & Gutter	\$30.00	\$2,100,000.00
1,200	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$54,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
4,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$12,000.00
72,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$216,000.00
4,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$12,000.00
350	EA	Ground Mounted Sign	\$350.00	\$122,500.00
440,000	SF	Topsoil and Hydro seed	\$1.00	\$440,000.00
30	EA	Utility Pole Relocation	\$25,000.00	\$750,000.00
40	EA	Utility Pole Relocation	\$50,000.00	\$2,000,000.00
20	EA	Utility Pole Relocation	\$100,000.00	\$2,000,000.00
1,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$8,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
6	EA	RTV Station (inc. install)	\$250,000.00	\$1,500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
1,200,000	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$11,016,000.00
			<b>Subtotal:</b>	<b>\$36,940,500.00</b>
			Utilities (20%)	\$7,388,100.00
			M.O.T. (10%)	\$3,694,050.00
			Design Fees (10%)	\$3,694,050.00
			Contingency (35%)	\$12,929,175.00
			<b>Total:</b>	<b>\$64,645,875.00</b>

**Opinion of Probable Construction Costs**

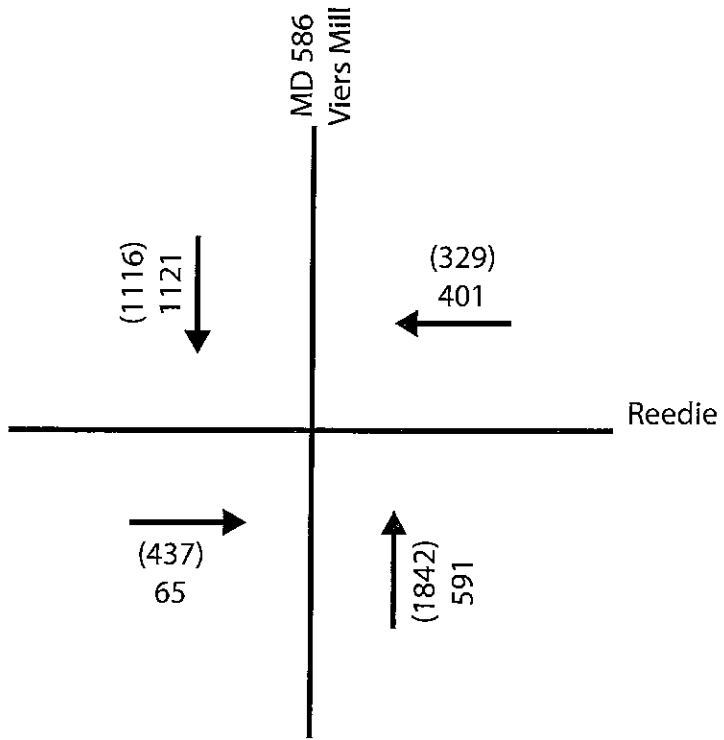
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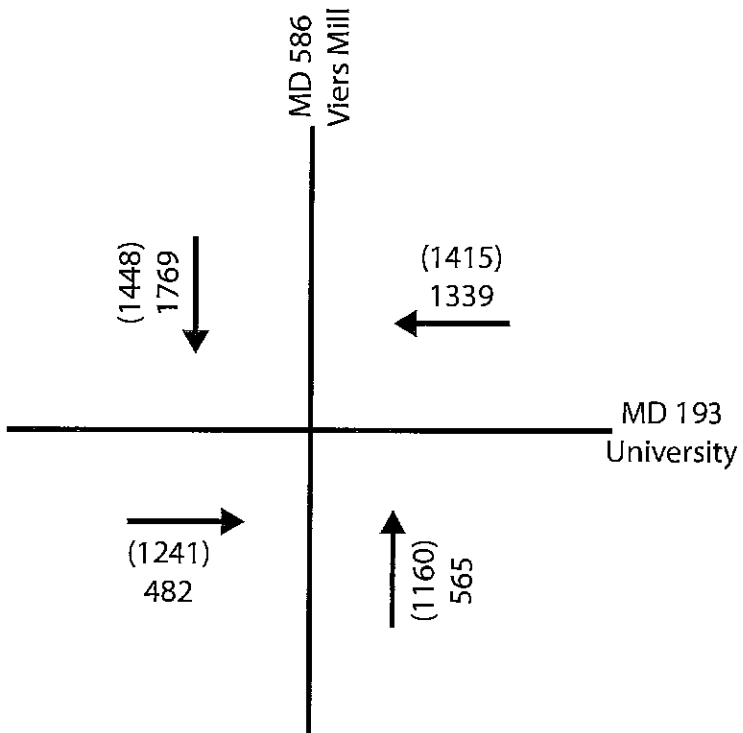
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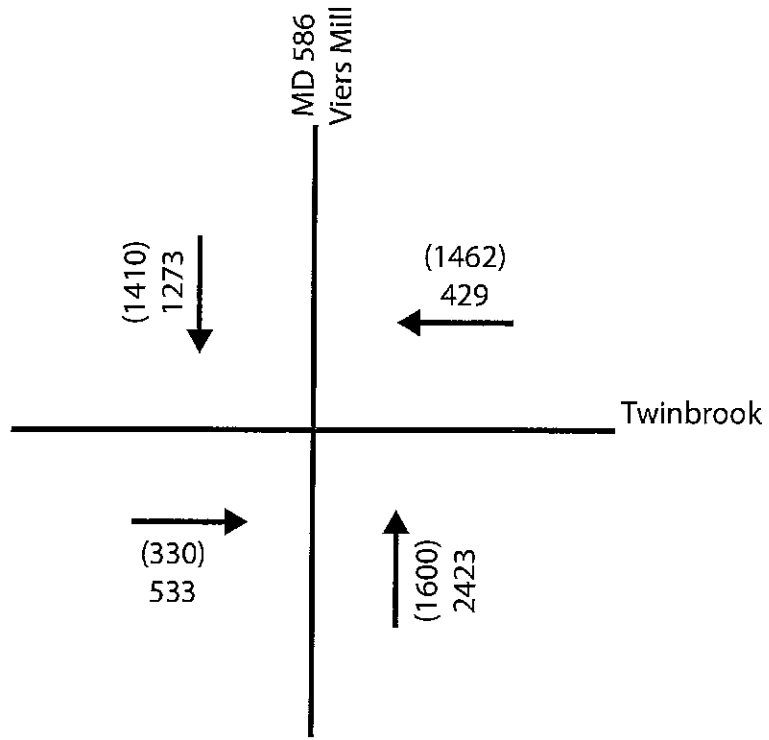
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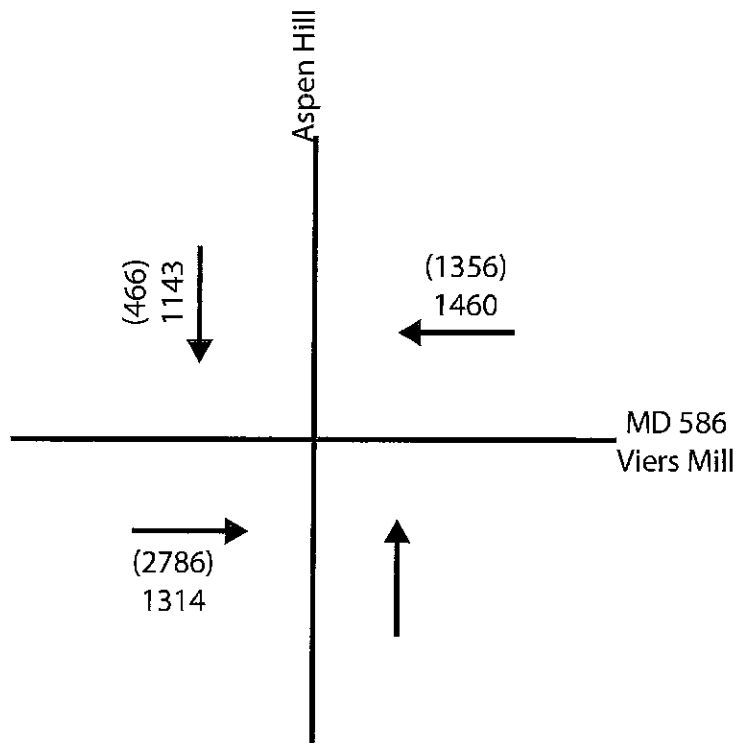
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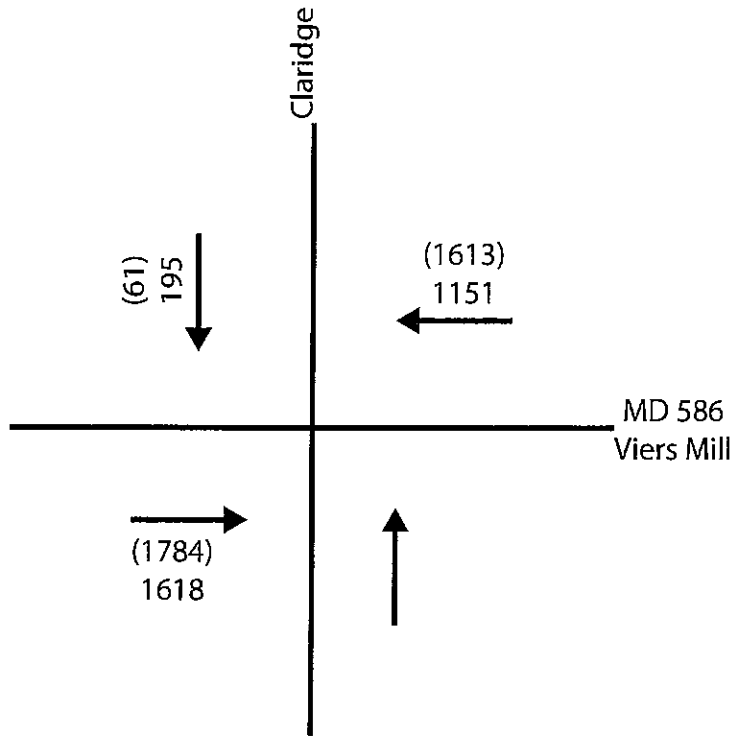
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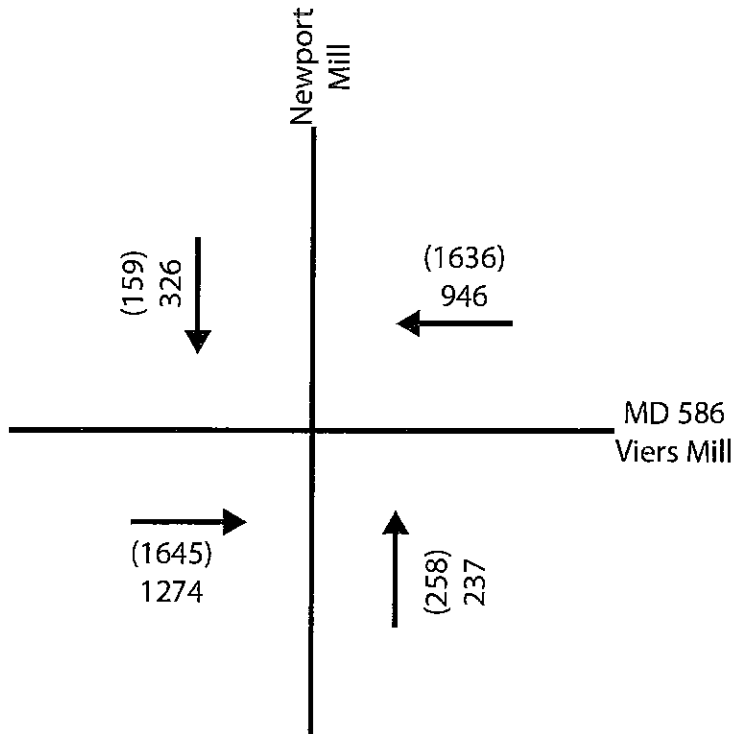
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Date of Count  
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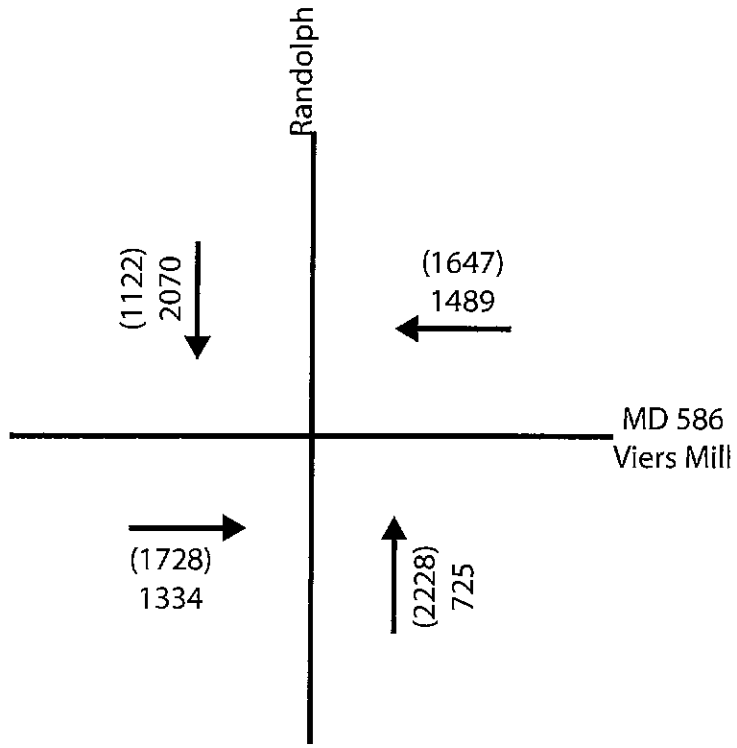


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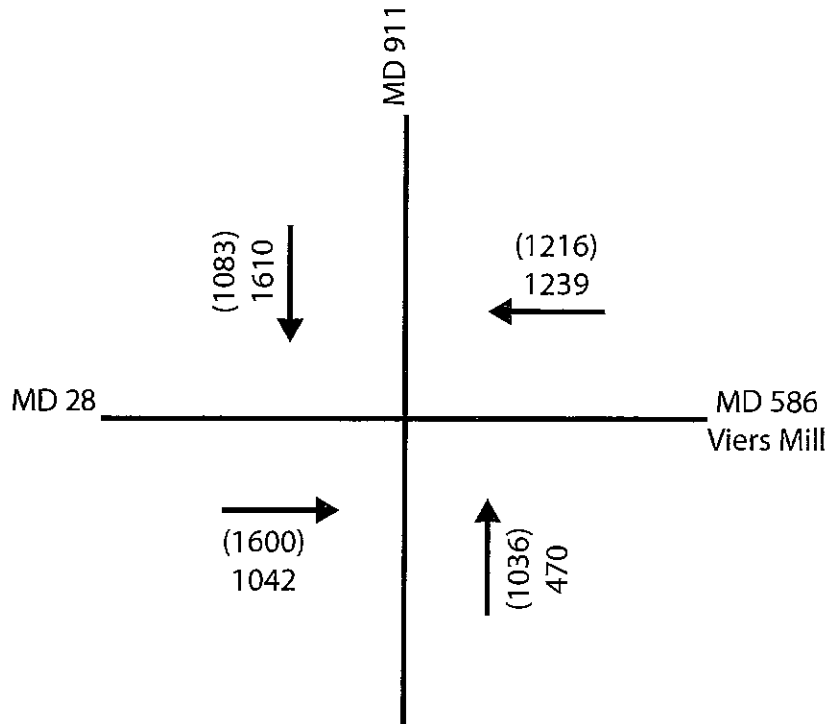


Date of Count  
6.11.2011





Date of Count  
6.2.2011



Date of Count  
6.1.2011

# Route 4a

## Georgia Avenue North

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**PHASE 1**

**9.57miles**

**\$ 44,638,993**

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**Cost/Mile**

**\$ 4,664,472**

### OVERALL DESCRIPTION

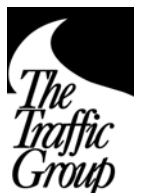
#### **From Wheaton Metro Station North to Montgomery General Hospital**

It is important to recognize that the MD 97/Randolph Road intersection is being reconstructed as a grade separated interchange and will need future study for how/where stations can/should be provided.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### **Recommended Option – No R.O.W. Needed (see Alternates 8 and 9)**

1. MD 586 (Viers Mill Road) to May Street, 7 lane reversible.
2. Install traffic signal at May Street.
3. Guideway in median past Bel Pre Road.
4. Guideway in median to MD 28.
5. Guideway from south of ICC in median.
6. In-road (mixed traffic) from Queen Mary Drive @ MD 97 to Hospital.



**Georgia Avenue North - Wheaton Metro Station north to Montgomery General Hospital**

Miles:	9.57
Cost Per Mile:	\$4,664,472
	<b>Recommended Option</b>

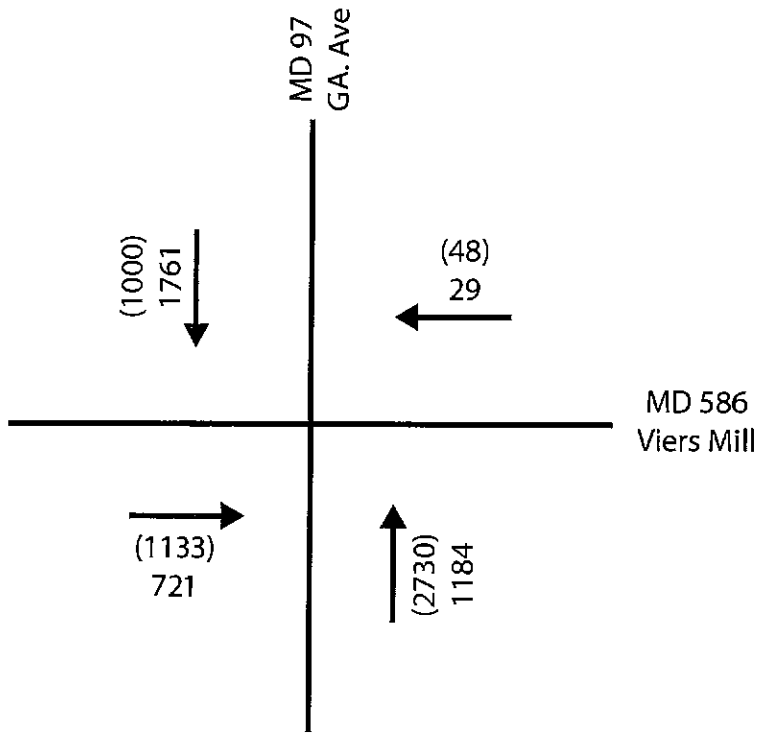
Location: Montgomery County Maryland

**Preliminary Cost Estimate**

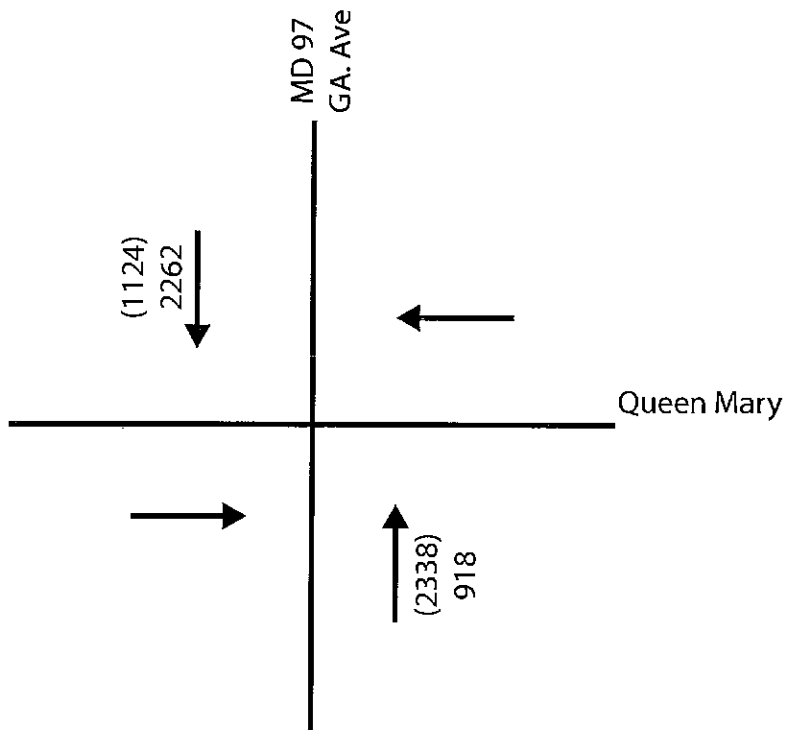
Quantity	Unit	Description	Unit Price	Total Price
23,000	CY	Earthwork	\$25.00	\$575,000.00
20,000	CY	Removal of Existing Grass Area	\$30.00	\$600,000.00
50,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$750,000.00
50,000	LF	Saw-Cut Existing Pavement	\$10.00	\$500,000.00
14,000	SY	Removal of Existing Paving	\$35.00	\$490,000.00
52,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$6,240,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
600	LF	Curb & Gutter	\$30.00	\$18,000.00
1,200	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$54,000.00
50,000	SF	Grass Pavers	\$5.00	\$250,000.00
50,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$150,000.00
100,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$300,000.00
400	LF	5" Broken White Pavement Marking Line	\$3.00	\$1,200.00
260	EA	Ground Mounted Sign	\$350.00	\$91,000.00
2,500	SF	Topsoil and Hydro seed	\$1.00	\$2,500.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
6,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$48,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
2,000	SF	Mill and Overlay	\$7.00	\$14,000.00
6	EA	RTV Station (inc. install)	\$250,000.00	\$1,500,000.00
26,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$148,200.00
33	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$2,970,000.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
36	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$900,000.00
36	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$9,360,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
7,200	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$66,096.00
Subtotal:				<b>\$25,507,996.00</b>
Utilities (20%)				\$5,101,599.20
M.O.T. (10%)				\$2,550,799.60
Design Fees (10%)				\$2,550,799.60
Contingency (35%)				\$8,927,798.60
<b>Total:</b>				<b>\$44,638,993.00</b>

**Opinion of Probable Construction Costs**

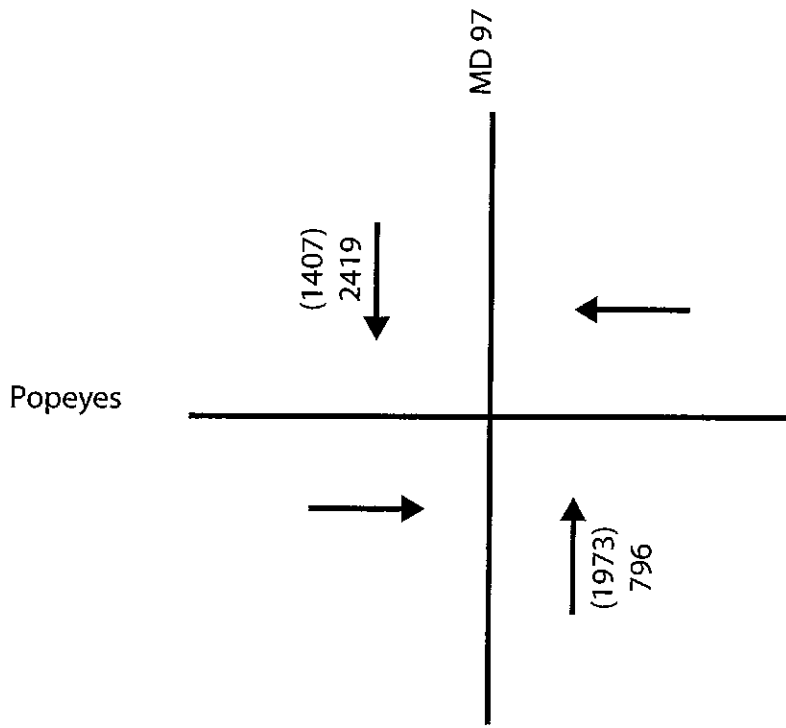
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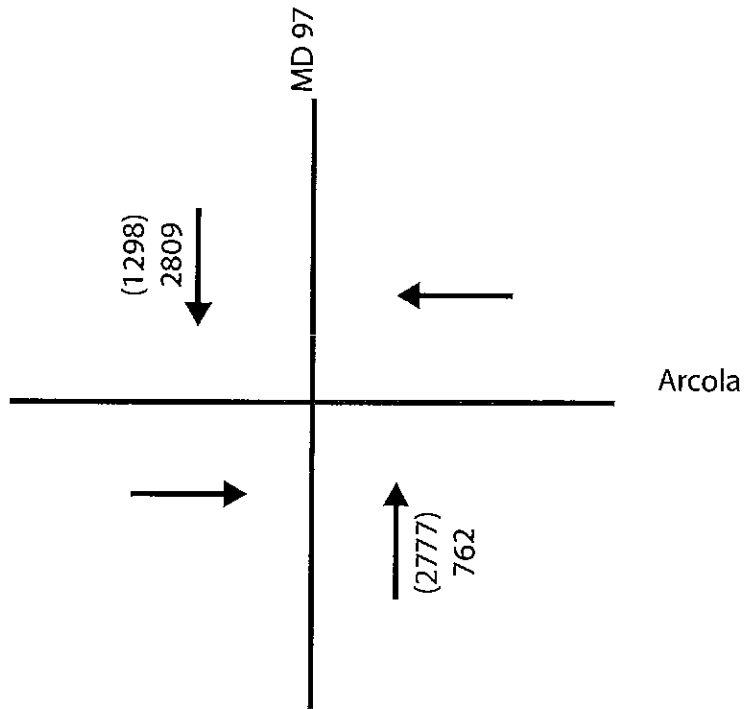
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4.6.2010



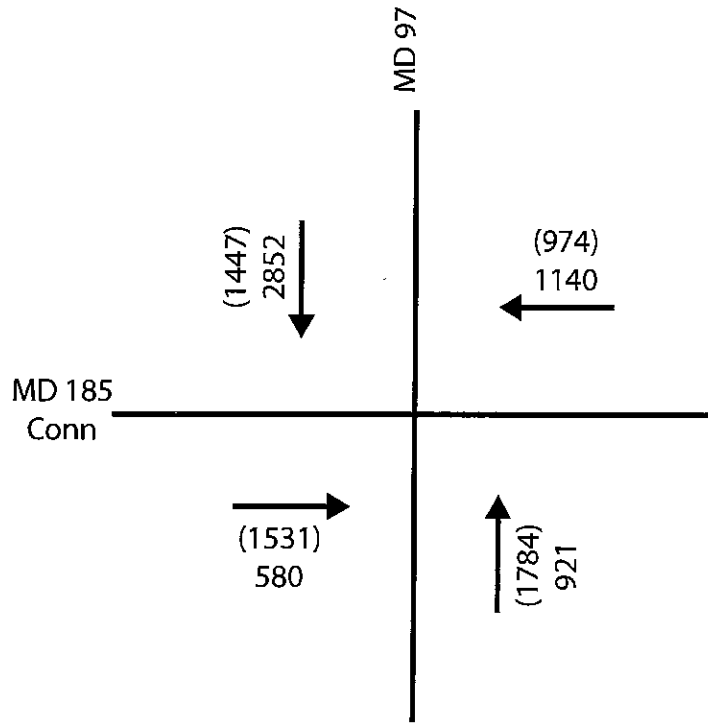
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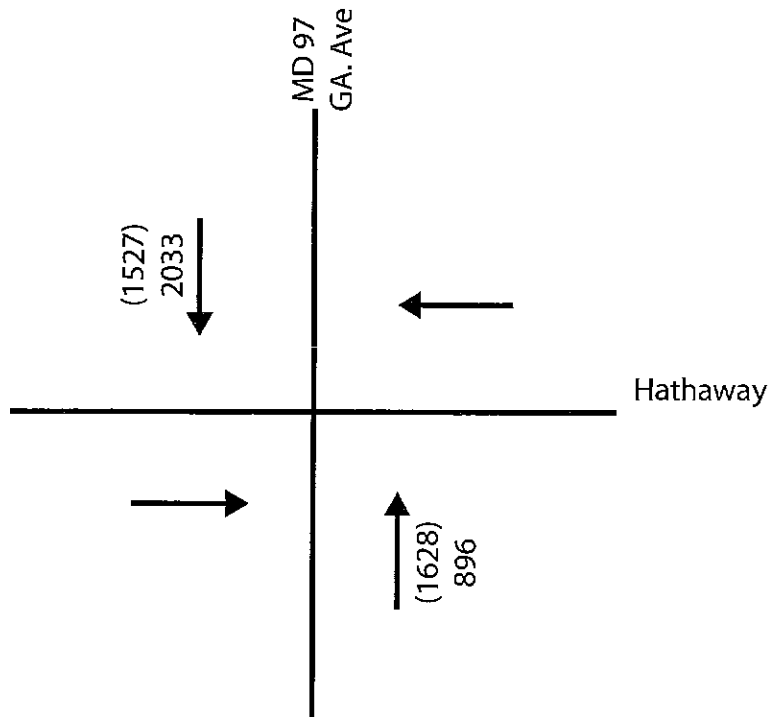
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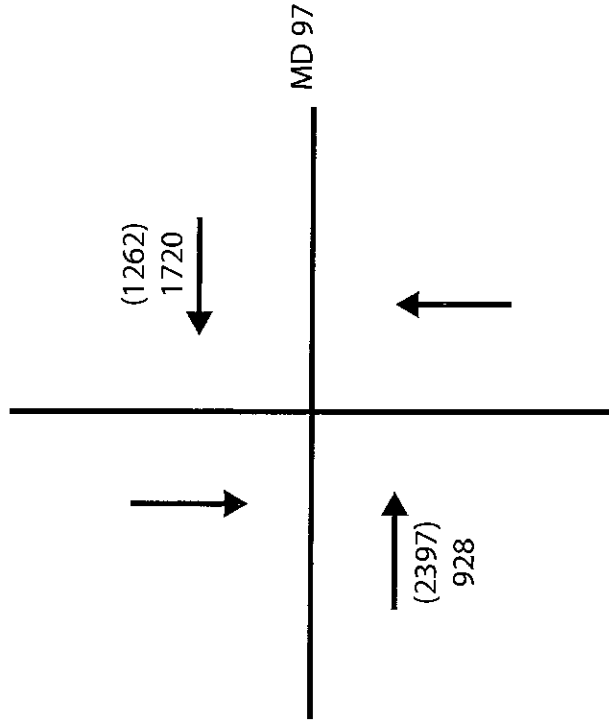
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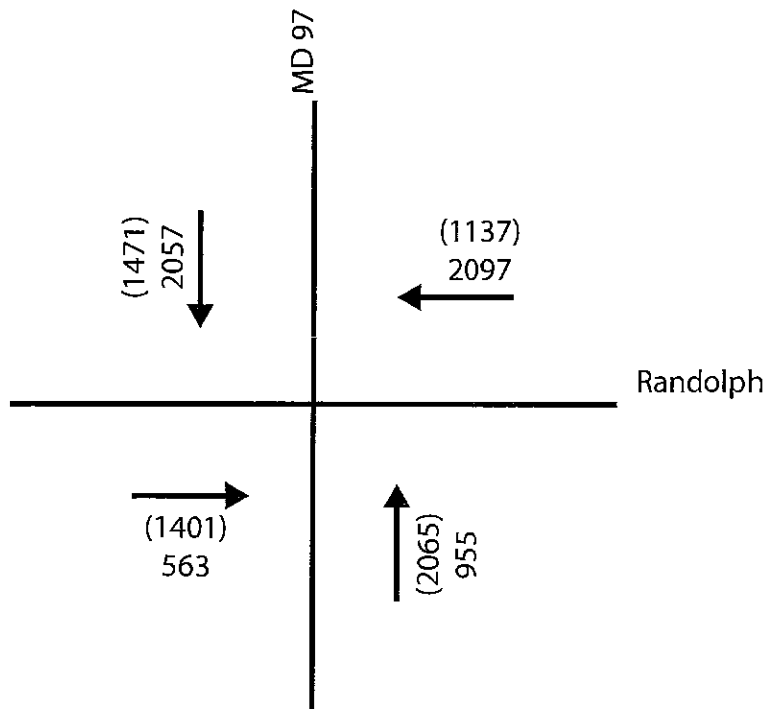
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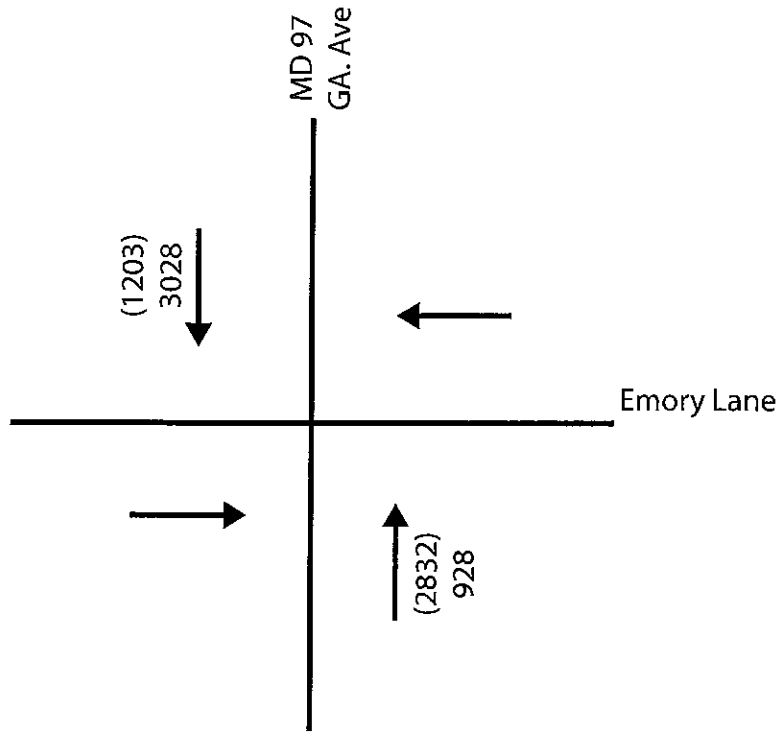
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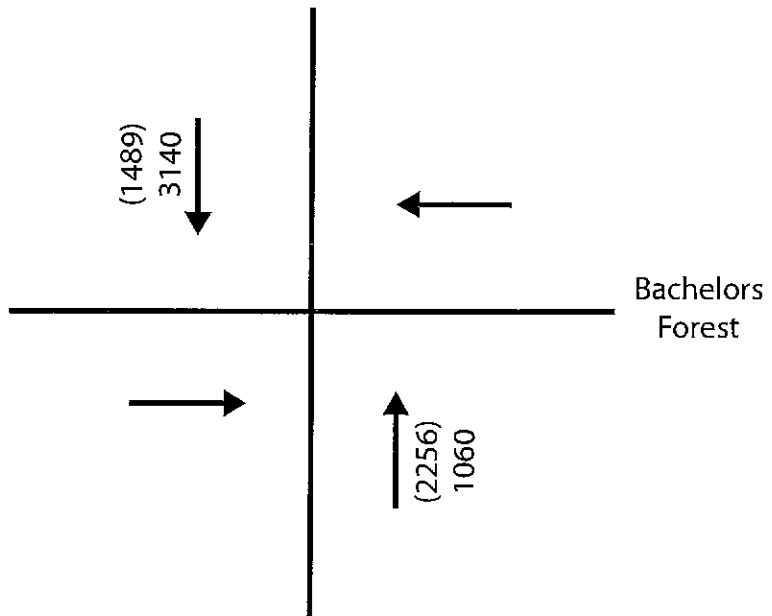
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Date of Count  
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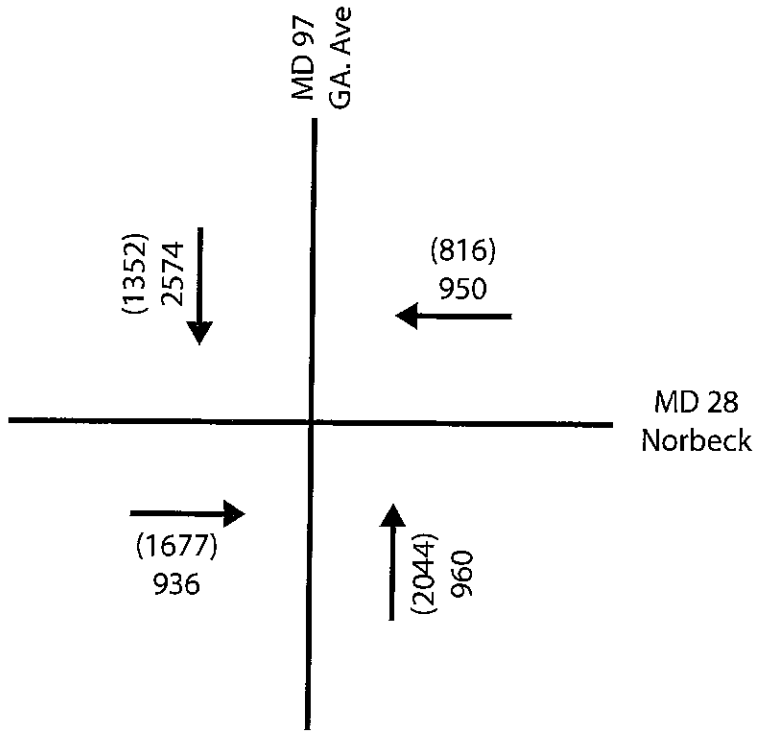


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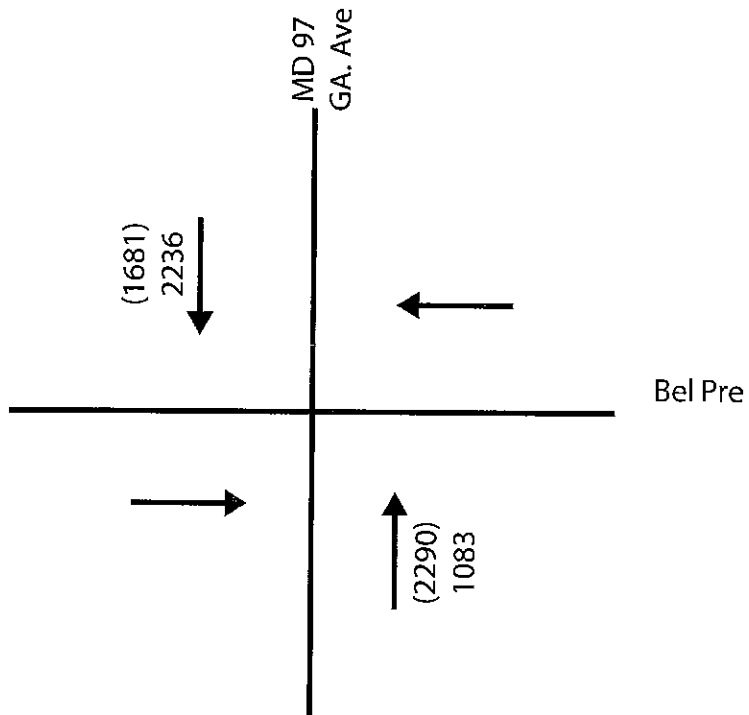


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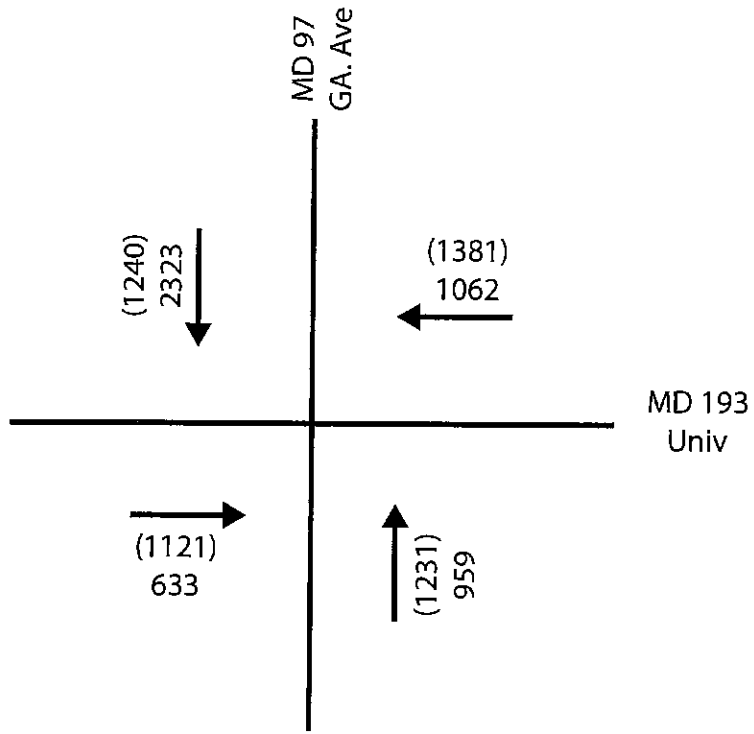




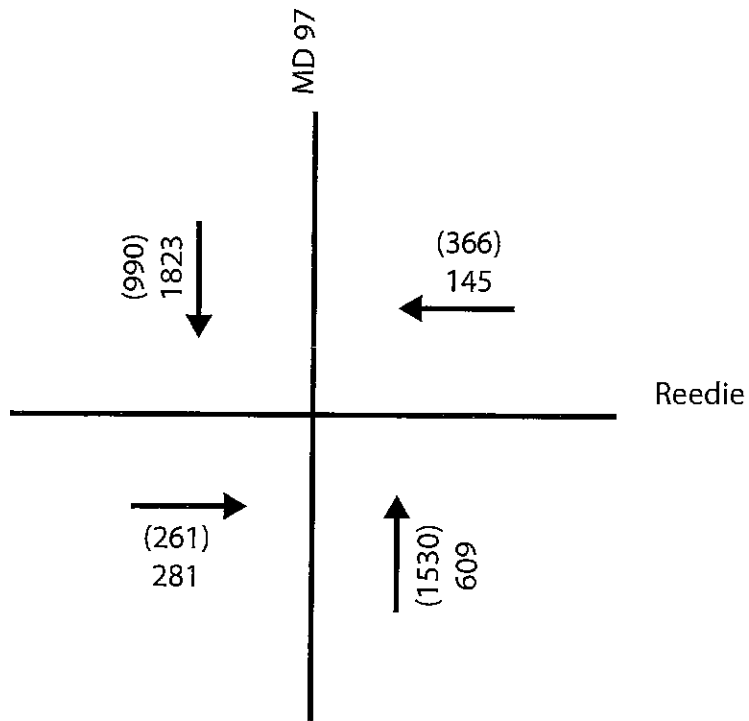
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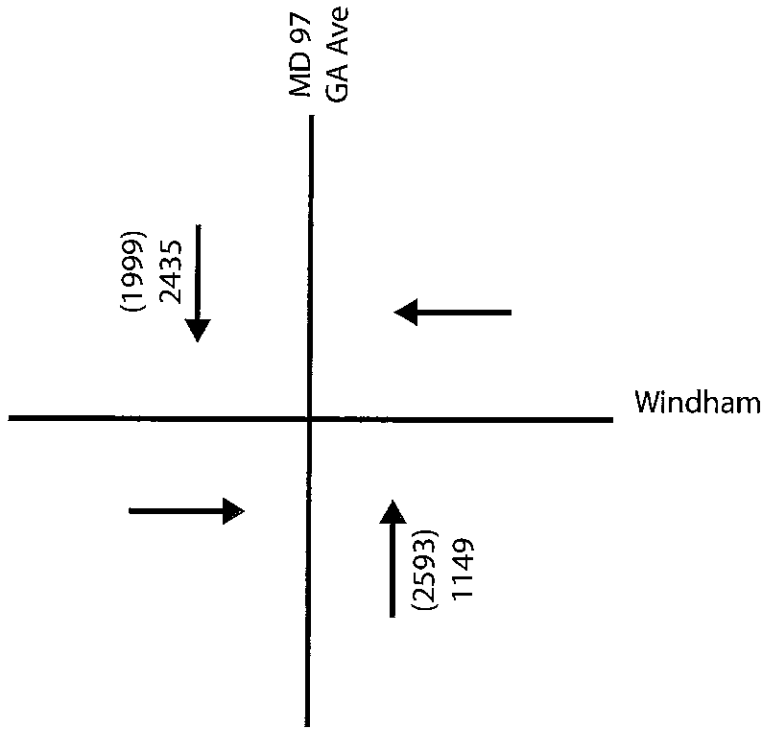
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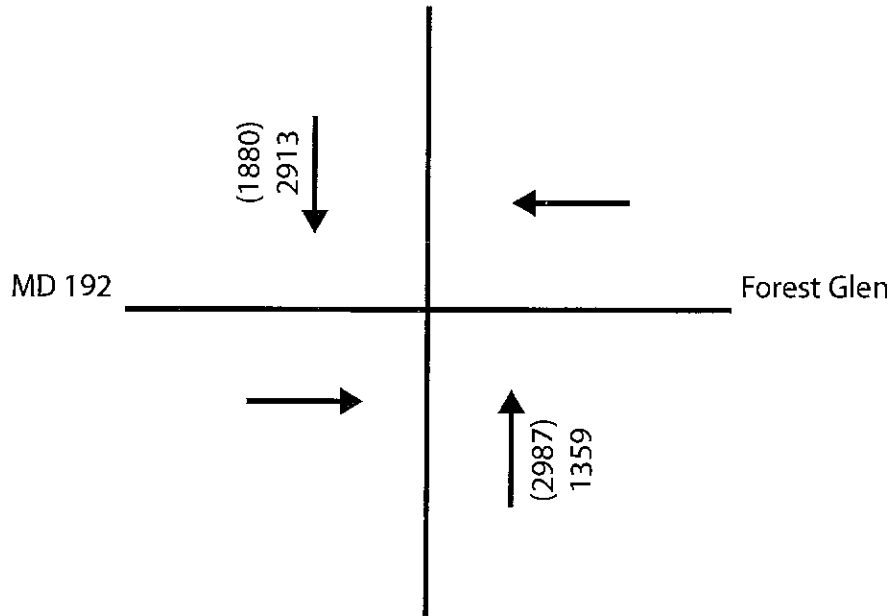
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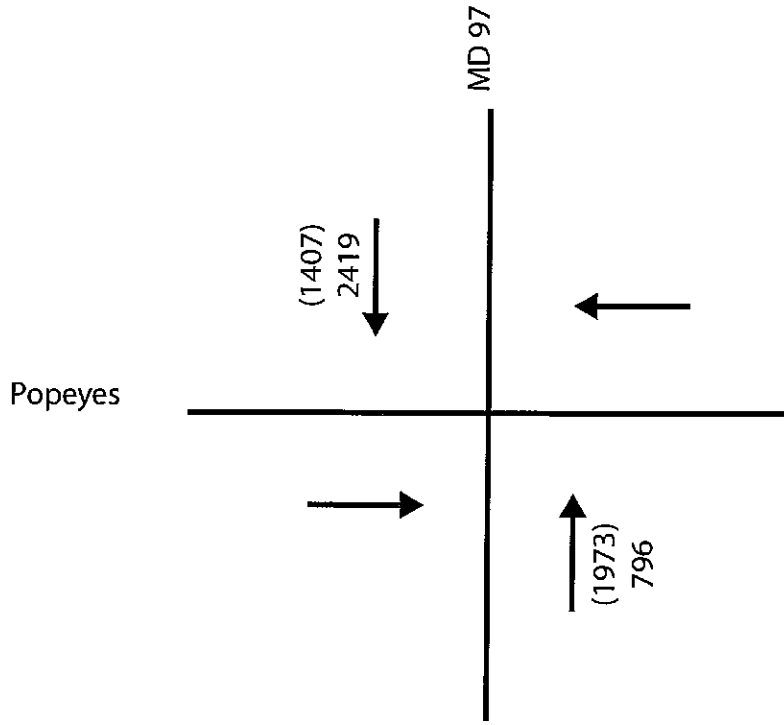
Date of Count  
4.7.2010



Date of Count  
9.23.2010



Date of Count  
6.2.2011



Date of Count  
1.19.2011

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# Route 10b

## MD 355 South

---

<b>PHASE 1</b>
<b>7.93miles</b>
<b>\$133,136,675</b>
<hr/>
<b>Cost/Mile</b>
<b>\$ 16,788,988</b>

### OVERALL DESCRIPTION

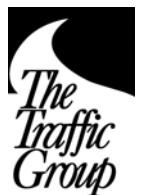
#### Bethesda Metro Station North to Rockville Station

The cost estimate prepared by TTG is based on a dual guideway system while maintaining 3 thru lanes and left turn lanes from Strathmore Road to Montgomery Drive – Dodge Street.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option – No R.O.W. Needed

1. BAT lanes from MD 410 to Jones Bridge Road eliminate 1 auto lane both directions, eliminates parking during peak periods.
2. Mixed traffic from Jones Bridge Road to Strathmore Road.
3. At Strathmore Road, begin White Flint Partnership (WFP) cross section with double guideways with stations in median and left turn lanes. R.O.W. to be dedicated by property owners as part of redevelopment. Continue WFP section to Montrose Parkway – Randolph Road.
4. From Montrose Parkway to Richard Montgomery Road (City of Rockville) – continue same basic design as WFP, but with service roads.
5. From Richard Montgomery Road to MD 124 – build BAT lanes.



**(A) MD 355 South - Bethesda Metro Station to Strathmore Avenue**

Location: Montgomery County Maryland

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
14500	CY	Earthwork	\$25.00	\$362,500.00
3200	CY	Removal of Existing Grass Area	\$30.00	\$96,000.00
4,700	LF	Removal of Existing Curb & Gutter	\$15.00	\$70,500.00
8,200	LF	Saw-Cut Existing Pavement	\$10.00	\$82,000.00
3,800	SY	Removal of Existing Paving	\$35.00	\$133,000.00
3,800	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$456,000.00
810	CY	Concrete for Raised Station Plat form	\$100.00	\$81,000.00
7,800	LF	Curb & Gutter	\$30.00	\$234,000.00
600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$27,000.00
11,000	SF	Grass Pavers	\$5.00	\$55,000.00
7,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$21,000.00
4,200	LF	5" Solid White Pavement Marking Line	\$3.00	\$12,600.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
22	EA	Ground Mounted Sign	\$350.00	\$7,700.00
7,000	SF	Topsoil and Hydro seed	\$1.00	\$7,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation (west side)	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation (east side)	\$100,000.00	\$0.00
2,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$22,400.00
0	SF	Retaining Wall (west side)	\$30.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
3	EA	RTV Station (inc. install)	\$250,000.00	\$750,000.00
5,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$28,500.00
0	EA	Overhead Lane Control Signage w/wiring and controller. (inc design)	\$90,000.00	\$0.00
6	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$180,000.00
16	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$400,000.00
3	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$780,000.00
0	LF	6 Ft concrete sidewalk	\$40.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
Subtotal:				<b>\$3,812,200.00</b>
Utilities (20%)				\$762,440.00
M.O.T. (10%)				\$381,220.00
Design Fees (10%)				\$381,220.00
Contingency (35%)				\$1,334,270.00
<b>Total:</b>				<b>\$6,671,350.00</b>

**Opinion of Probable Construction Costs**

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**(B) MD 355 South - Strathmore Avenue to Montrose Parkway**

Location: Montgomery County Maryland

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
12,000	CY	Earthwork	\$25.00	\$300,000.00
11,000	CY	Removal of Existing Grass Area	\$30.00	\$330,000.00
32,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$480,000.00
32,000	LF	Saw-Cut Existing Pavement	\$10.00	\$320,000.00
128,000	SY	Removal of Existing Paving	\$35.00	\$4,480,000.00
0	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$0.00
8,000	LF	Continuous Pour Concrete Paving - 22 Ft. wide	\$220.00	\$1,760,000.00
56,000	LF	Curb & Gutter	\$30.00	\$1,680,000.00
900	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$40,500.00
50,000	SF	Grass Pavers	\$5.00	\$250,000.00
32,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$96,000.00
24,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$72,000.00
16,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$48,000.00
320	EA	Ground Mounted Sign	\$350.00	\$112,000.00
600,000	SF	Topsoil and Hydro seed	\$1.00	\$600,000.00
12	EA	Utility Pole Relocation	\$25,000.00	\$300,000.00
12	EA	Utility Pole Relocation (west side)	\$50,000.00	\$600,000.00
16	EA	Utility Pole Relocation (east side)	\$100,000.00	\$1,600,000.00
0	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$0.00
6,000	SF	Retaining Wall (west side)	\$30.00	\$180,000.00
92,000	SY	Asphalt Paving Surface	\$45.00	\$4,140,000.00
6	EA	RTV Station (inc. install)	\$250,000.00	\$1,500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller. (inc design)	\$90,000.00	\$0.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
8	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$200,000.00
8	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$2,080,000.00
22,000	LF	6 Ft concrete sidewalk	\$4.00	\$88,000.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00

Subtotal:	\$21,616,500.00
Utilities (20%)	\$4,323,300.00
M.O.T. (10%)	\$2,161,650.00
Design Fees (10%)	\$2,161,650.00
Contingency (35%)	\$7,565,775.00
<b>Total:</b>	<b>\$37,828,875.00</b>

**Opinion of Probable Construction Costs**

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**(C) MD 355 South - Montrose Parkway to Rockville Metro Station**

Location: Montgomery County Maryland

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
23,000	CY	Earthwork	\$25.00	\$575,000.00
20,000	CY	Removal of Existing Grass Area	\$30.00	\$600,000.00
61,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$915,000.00
85,000	LF	Saw-Cut Existing Pavement	\$10.00	\$850,000.00
250,000	SY	Removal of Existing Paving	\$35.00	\$8,750,000.00
1,900	CY	Concrete Raised Station Plat form	\$100.00	\$190,000.00
15,000	LF	Continuous Pour Concrete Paving - 22 Ft. wide	\$220.00	\$3,300,000.00
101,000	LF	Curb & Gutter	\$30.00	\$3,030,000.00
1,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$81,000.00
101,000	SF	Grass Pavers	\$5.00	\$505,000.00
65,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$195,000.00
49,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$147,000.00
32,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$96,000.00
640	EA	Ground Mounted Sign	\$350.00	\$224,000.00
900,000	SF	Topsoil and Hydro seed	\$1.00	\$900,000.00
60	EA	Utility Pole Relocation	\$25,000.00	\$1,500,000.00
75	EA	Utility Pole Relocation (west side)	\$50,000.00	\$3,750,000.00
45	EA	Utility Pole Relocation (east side)	\$100,000.00	\$4,500,000.00
0	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$0.00
12,000	SF	Retaining Wall (west side)	\$30.00	\$360,000.00
170,000	SY	Asphalt Paving Surface	\$45.00	\$7,650,000.00
7	EA	RTV Station (inc. install)	\$250,000.00	\$1,750,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller. (inc design)	\$90,000.00	\$0.00
14	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$420,000.00
15	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$375,000.00
15	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$3,900,000.00
42,000	LF	6 Ft concrete sidewalk	\$40.00	\$1,680,000.00
480,000	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$4,406,400.00
			Subtotal:	\$50,649,400.00
			Utilities (20%)	\$10,129,880.00
			M.O.T. (10%)	\$5,064,940.00
			Design Fees (10%)	\$5,064,940.00
			Contingency (35%)	\$17,727,290.00
			<b>Total:</b>	<b>\$88,636,450.00</b>

**Opinion of Probable Construction Costs**

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**(Total - Summary) MD 355 South - Bethesda Metro Station to Rockville Station**

Location: Montgomery County Maryland

**Preliminary Cost Estimate**

Section	Description	Cost
A	MD 355 South - Bethesda Metro Station to Strathmore Avenue	\$6,671,350
B	MD 355 South - Strathmore Avenue to Montrose Parkway	\$37,828,875
C	MD 355 South - Montrose Parkway to Rockville Metro Station	\$88,636,450
Total:		\$133,136,675

# of Miles: 

7.93
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Cost / Mile: 

\$16,788,988
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**Opinion of Probable Construction Costs**

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# (B) MD 355 South - Strathmore Avenue to Montrose Parkway



Rockville Pike Transportation Project  
 Estimate Summary  
 May 15, 2009

## P6 Rockville Pike Conversion to 8 Lane Blvd

Interim Condition - curb to curb + 6' sidewalk on each side

Length of Road	lf	5,634
Width of Road	lf	86
ROW Width	lf	162

Description	Unit	Quantity	Unit Price	Amount	notes & assumptions
<b>Work inside the continuous length of Road</b>					
Demolition/Earthwork	cy	101,412	35.00	3,549,420	ROW 3 ft depth average lf of lanes
Temporary Traffic Control	lf	45,072	50.00	2,253,600	
Utility Relocation	lf			Exclude	
Underground overhead Utilities	lf			see allowance	
Water, Sewer & Storm mains	lf	5,634	600.00	3,380,400	
Electric empty ductbank - cable by utility co.	lf	5,634	300.00	1,690,200	
Telecom empty ductbank - cable by utility co.	lf	5,634	125.00	704,250	
Gas main	lf			Exclude	
Traffic Road Light pole - 1 at 40' ea median	ea	282	10,000	2,817,000	
Pedestrian Street Lights - 1 at 40' ea side	ea	282	8,000	2,253,600	
Intersection traffic & Transit way signals	ls	9	400,000	3,600,000	
Traffic signage	lf	45,072	4.00	180,288	lf of lanes
Cross Walks at road intersections - paint	ea	36	10,000	360,000	number of road crossings
Drive Apron/Entrance	ea	75	3,000	225,360	one per 150 ft of road, each side
Concrete pavements	sf	11,268	10.00	112,680	bus stop pads, aprons, medians
parking Meters/Parking Control	ea			Exclude	
Prime Grade subgrade	sf	912,708	0.50	456,354	ROW
Proof Rolling	sf	912,708	0.20	182,542	ROW
Soil Cement - 4"	cy	4,486	65.00	291,612	
Aggregate - 11"	cy	16,450	65.00	1,069,243	
Base Coarse Asphalt - 6.5"	cy	9,720	140.00	1,360,854	
Intermediate Coarse - 3"	cy	4,486	140.00	628,087	
Surface Asphalt - 3"	cy	4,486	140.00	628,087	
Transit way pavement	sf	112,680	20.00	2,253,600	
Striping & lane markings	lf	45,072	6.00	270,432	lf of lanes
Concrete Curb & Gutter	lf	22,536	20.00	450,720	side & center median
Granite Curb	lf			Exclude	
Concrete Sidewalk	sf	67,608	6.00	405,648	6 ft wide sidewalk on each side
Brick Pavers with concrete subslab	lf	22,536	16.00	360,576	boarder at curb
Landscape planting beds & grass	sf	360,576	6.00	2,163,456	
Landscape trees - 1 per 20 ft. each side & median	ea	1,127	1,000	1,126,800	
Site amenities (benches, planters, trash recep)	lf	5,634	100	563,400	
Transit shelter canopy	ea	6	90,000	540,000	
Metro tunnel, escalator, stairs, entrance modifications				Exclude	
Sound barrier walls	sf			Exclude	
Culverts / Crossings	lf	5,634	35.00	197,190	
Retaining Walls / grade changes	lf	5,634	45.00	253,530	
<b>Work outside the continuous length of Road</b>					
3 intersections (complete scope as above)	sf	66,000	100.00	6,600,000	
Transit shelter canopy	ea	4	90,000	360,000	
<b>Subtotal</b>				<b>41,289,000</b>	



Rockville Pike Transportation Project  
Estimate Summary  
 May 15, 2009

Insurance/Bond/General Requirements/mark-ups				8,258,000	20%
Contingency				4,955,000	10%
<b>TOTAL</b>	<b>lf</b>	<b>5,634</b>	<b>\$9,674</b>	<b>\$54,502,000</b>	

<b>P6 Rockville Pike Conversion to 8 Lane Blvd</b>					
Interim to final Condition - curb to building line (182 total width)					
Length of Road	lf	5,634			
Width behind curb	lf	50			
BRL Width	lf	182			
Description	Unit	Quantity	Unit Price	Amount	
<b>Work inside the continuous length of Road</b>					
Demolition/Earthwork	cy	31,300	35.00	1,095,500	
Fine Grade subgrade	sf	281,700	0.50	140,850	
Proof Rolling	sf	281,700	0.20	56,340	
Concrete Sidewalk (deduct for Interim 6' width)	sf	67,608	(6.00)	(405,648)	
Brick Pavers with concrete subslab	lf	281,700	16.00	4,507,200	
Subtotal				5,394,000	
Insurance/Bond/General Requirements/mark-ups				1,079,000	20%
Contingency				647,000	10%
<b>TOTAL</b>	<b>lf</b>	<b>5,634</b>	<b>\$1,264</b>	<b>\$7,120,000</b>	

notes & assumptions

**\$61,622,000**





# UTILITY ALLOWANCE SUMMARY

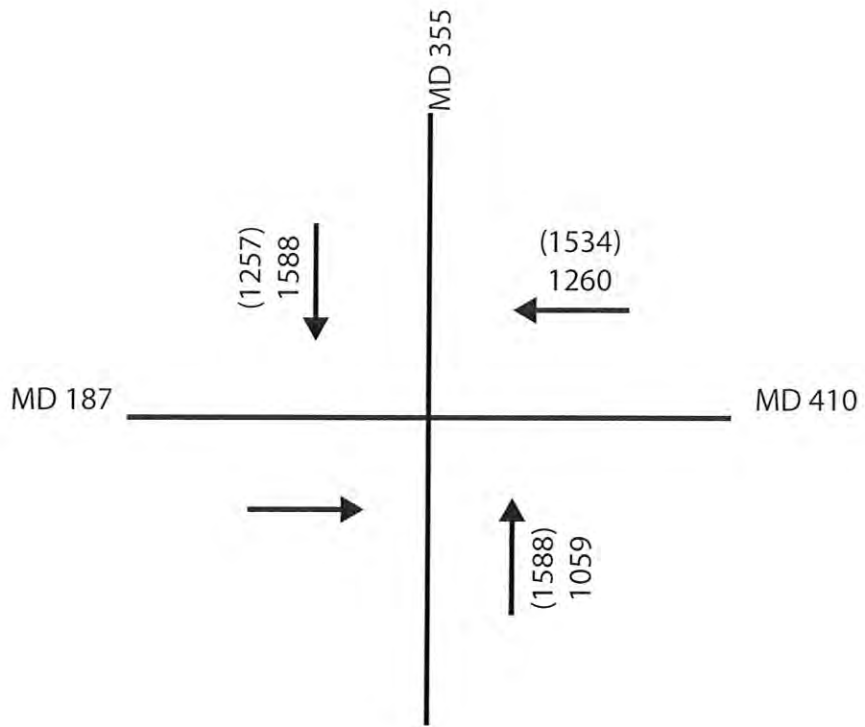
Utility Description	Approx. Quantity	Units	Estimated Prorate %	Estimated Unit Price	Estimated Total Amount
Electric: Overhead Electric to Underground Service to Buildings	6,800 30	Lft Each	100% 100%	\$ 2,500 \$ 10,000	\$ 17,000,000 \$ 300,000
Telephone: Overhead Telephone to Underground Service to Buildings	6,800 30	Lft Each	100% 100%	\$ 1,600 \$ 2,000	\$ 10,880,000 \$ 60,000
Fiber Optic: Overhead Fiber Optic to Underground	6,800	Lft	100%	\$ 400	\$ 2,720,000
Water: Waterline (Assume 16" for Budget)	6,800	Lft	100%	\$ 300	\$ 2,040,000
Sanitary Sewer: Sanitary Sewer (Assume 12" for Budget)	6,800	Lft	100%	\$ 300	\$ 2,040,000
Gas:	---	Lft	100%	\$ ---	\$ - --

TOTAL ALLOWANCE BUDGET: \$ 35,040,000  
Roadway Length (Lft) \$ 6,800

Utility Budget Unit Price (per Lft): \$ 5,153

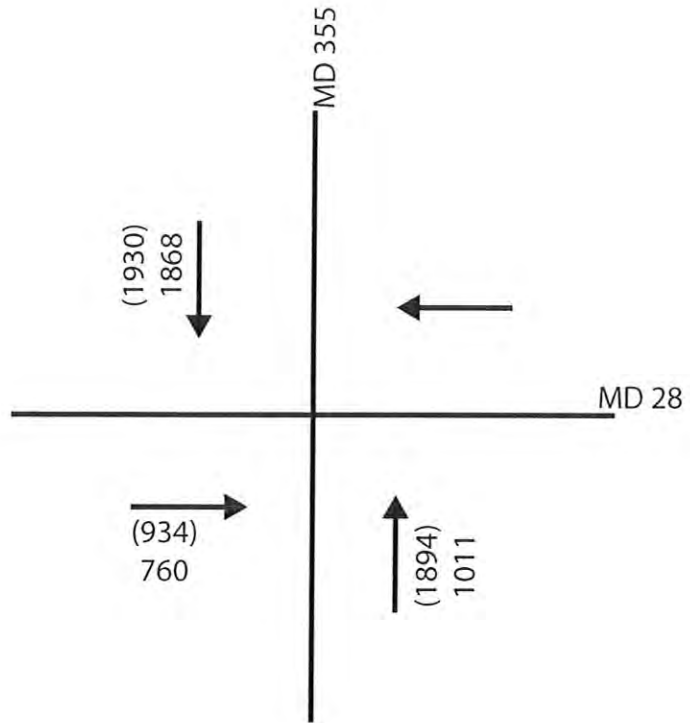
**Notes:**

Utility Developer Surcharge not included.



Date of Count  
3.16.2006

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Date of Count  
6.1.2011

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# Route 14

## Randolph Road – Cherry Hill Road

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**PHASE 1**

**11.19miles**

**\$ 49,534,450**

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**Cost/Mile**

**\$ 4,426,671**

### OVERALL DESCRIPTION

#### White Flint Metro Station East to FDA

It is important to recognize that the MD 97/Randolph Road intersection is in the process of being reconstructed as a grade separated interchange and will need future study for how/where stations can/should be provided.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option – 4/6 lane section – No R.O.W. Needed

1. Single reversible guideway in median within the 4 lane section.

#### Recommended Option 1 – 6 lane section – No R.O.W. Needed

2. Remove median, construct dual way guideway in median area, rebuild left turn lanes, remove 1 auto lane in each direction, resulting in a 4 lane divided road with dual median-based guideway.

**Randolph Road / Cherry Hill Road - White Flint Station to FDA**

Location: Montgomery County Maryland

Miles:	11.19
Cost Per Mile:	\$4,426,671
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
30,000	CY	Earthwork	\$25.00	\$750,000.00
18,000	CY	Removal of Existing Grass Area	\$30.00	\$540,000.00
70,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,050,000.00
90,000	LF	Saw-Cut Existing Pavement	\$10.00	\$900,000.00
40,000	SY	Removal of Existing Paving	\$35.00	\$1,400,000.00
46,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$5,520,000.00
2,400	CY	Concrete for raised Station Plat form	\$100.00	\$240,000.00
90,000	LF	Curb & Gutter	\$30.00	\$2,700,000.00
1,600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$72,000.00
138,000	SF	Grass Pavers	\$5.00	\$690,000.00
90,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$270,000.00
14,500	LF	5" Solid White Pavement Marking Line	\$3.00	\$43,500.00
1,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$4,500.00
200	EA	Ground Mounted Sign	\$350.00	\$70,000.00
138,000	SF	Topsoil and Hydro seed	\$1.00	\$138,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
7,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$62,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
200,000	SF	Mill and Overlay	\$7.00	\$1,400,000.00
8	EA	RTV Station (inc. install)	\$250,000.00	\$2,000,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
16	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$480,000.00
35	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$875,000.00
35	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$9,100,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00

Subtotal:	\$28,305,400.00
Utilities (20%)	\$5,661,080.00
M.O.T. (10%)	\$2,830,540.00
Design Fees (10%)	\$2,830,540.00
Contingency (35%)	\$9,906,890.00
<b>Total:</b>	<b>\$49,534,450.00</b>

**Opinion of Probable Construction Costs**

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**Randolph Road / Cherry Hill Road - White Flint Station to FDA**

Location: Montgomery County Maryland

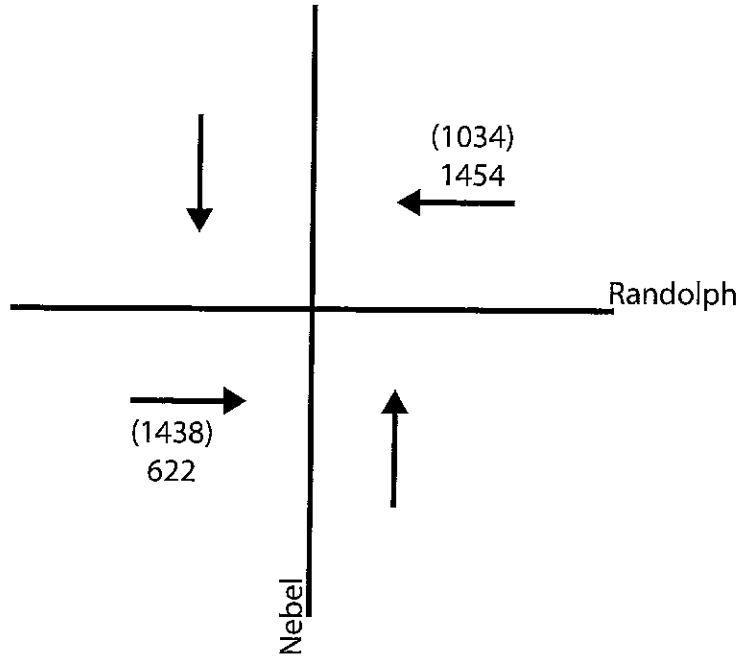
Miles:	11.19
Cost Per Mile:	<b>\$8,363,389</b>
	<b>Option 1</b>

**Preliminary Cost Estimate**

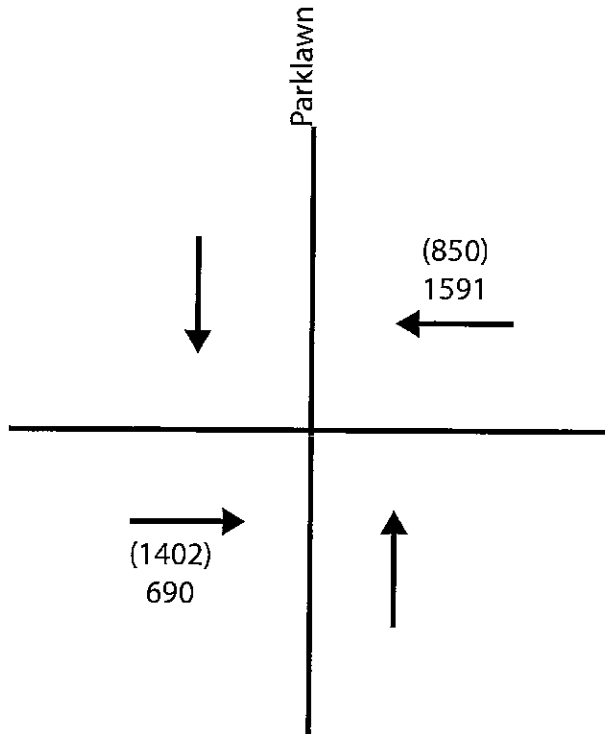
Quantity	Unit	Description	Unit Price	Total Price
95,000	CY	Earthwork	\$25.00	\$2,375,000.00
18,000	CY	Removal of Existing Grass Area	\$30.00	\$540,000.00
70,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,050,000.00
90,000	LF	Saw-Cut Existing Pavement	\$10.00	\$900,000.00
127,000	SY	Removal of Existing Paving	\$35.00	\$4,445,000.00
111,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$13,320,000.00
2,400	CY	Concrete for raised Station Plat form	\$100.00	\$240,000.00
180,000	LF	Curb & Gutter	\$30.00	\$5,400,000.00
236,000	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$10,620,000.00
138,000	SF	Grass Pavers	\$5.00	\$690,000.00
90,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$270,000.00
24,500	LF	5" Solid White Pavement Marking Line	\$3.00	\$73,500.00
4,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$13,500.00
250	EA	Ground Mounted Sign	\$350.00	\$87,500.00
236,000	SF	Topsoil and Hydro seed	\$1.00	\$236,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
7,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$62,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
100,000	SF	Mill and Overlay	\$7.00	\$700,000.00
8	EA	RTV Station (inc. install)	\$250,000.00	\$2,000,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
16	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$480,000.00
35	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$875,000.00
35	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$9,100,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
		Subtotal:		<b>\$53,477,900.00</b>
		Utilities (20%)		<b>\$10,695,580.00</b>
		M.O.T. (10%)		<b>\$5,347,790.00</b>
		Design Fees (10%)		<b>\$5,347,790.00</b>
		Contingency (35%)		<b>\$18,717,265.00</b>
		<b>Total:</b>		<b>\$93,586,325.00</b>

**Opinion of Probable Construction Costs**

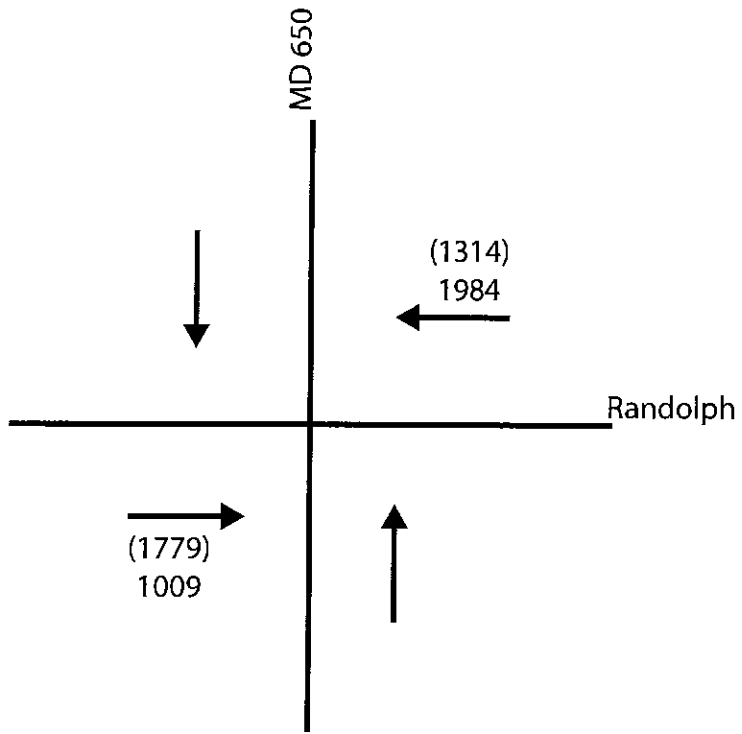
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Date of Count  
6.15.2010

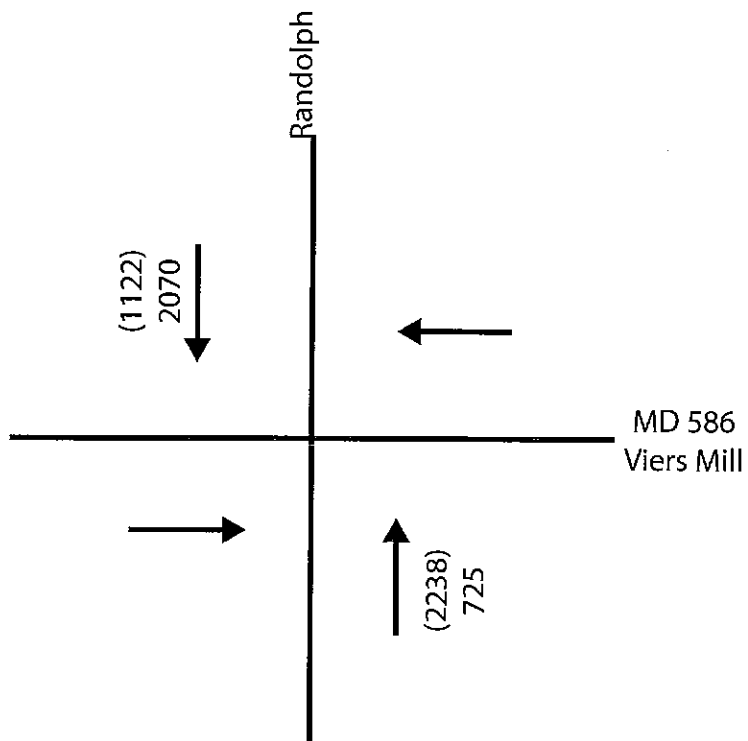


Date of Count  
10.21.2010



Date of Count  
1.20.2011

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Date of Count  
6.2.2011

# Route 19

## US 29/Columbia Pike/Colesville Road

---

**PHASE 1**

**10.27 miles**

**\$ 55,890,457**

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**Cost/Mile**

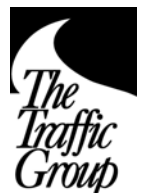
**\$ 5,442,109**

### OVERALL DESCRIPTION

**From Silver Spring Transit Center North to Burtonsville Park & Ride**

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

1. BAT lanes from Transit Center to Sligo Creek Parkway.
2. Reduce 1 auto lane for  $\pm$  700 ft southbound to allow station to be built @ MD 193.
3. Build LTL for Trader Joe's Shopping Center.
4. From MD 650 to MD 193 – remove LTL build single guideway.
5. Median is wide enough for double guideway from MD 198 to Tech Road. This could be built initially if desired. Four large overhead sign structures would need to be relocated if double guideway is built in this area ( $\pm$ \$800,000).
6. Run single guideway in median from MD 650 to MD 198, keep LTL.



**US 29 - Silver Spring Transit Center north to Burtonsville Park and Ride**

Location: Montgomery County Maryland

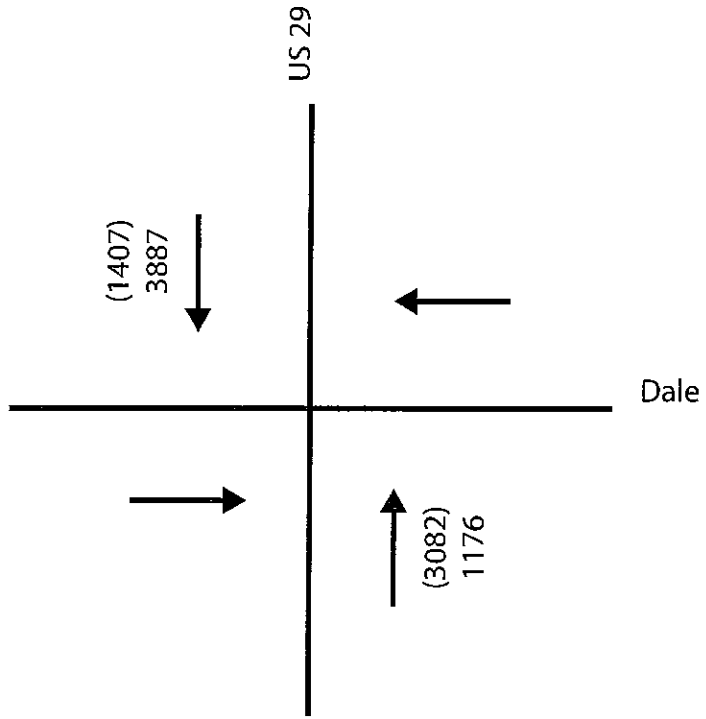
Miles:	10.27
Cost Per Mile:	<b>\$5,442,109</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

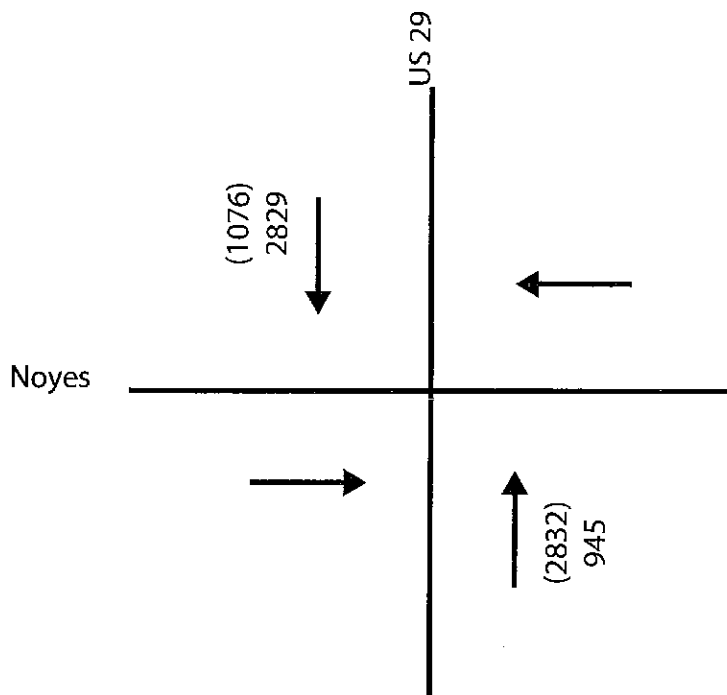
Quantity	Unit	Description	Unit Price	Total Price
32,000	CY	Earthwork	\$25.00	\$800,000.00
16,100	CY	Removal of Existing Grass Area	\$30.00	\$483,000.00
13,950	LF	Removal of Existing Curb & Gutter	\$15.00	\$209,250.00
56,000	LF	Saw-Cut Existing Pavement	\$10.00	\$560,000.00
24,300	SY	Removal of Existing Paving	\$35.00	\$850,500.00
46,700	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$5,604,000.00
5,000	CY	Concrete for Raised Station Plat form.	\$220.00	\$1,100,000.00
107,300	LF	Curb & Gutter	\$30.00	\$3,219,000.00
2,000	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$90,000.00
163,500	SF	Grass Pavers	\$5.00	\$817,500.00
170,600	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$511,800.00
13,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$39,000.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
300	EA	Ground Mounted Sign	\$350.00	\$105,000.00
700,000	SF	Topsoil and Hydro seed	\$1.00	\$700,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
8	EA	Utility Pole Relocation	\$50,000.00	\$400,000.00
1,150	LF	6 Ft. wide Sidewalk	\$40.00	\$46,000.00
800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$6,400.00
2,400	SF	Retaining Wall	\$30.00	\$72,000.00
261,672	SF	Mill and Overlay	\$7.00	\$1,831,704.00
7	EA	RTV Station (inc. install)	\$250,000.00	\$1,750,000.00
13,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$74,100.00
24	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$2,160,000.00
14	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$420,000.00
4	EA	Elevators at Briggs Chaney Road Station	\$100,000.00	\$400,000.00
4	EA	Escalator at Briggs Chaney Road Station	\$400,000.00	\$1,600,000.00
23	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$575,000.00
23	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$5,980,000.00
10,000	SF	Right-of-Way Sidewalk Easements	\$4.00	\$40,000.00
3	EA	Overhead Sign Structure Relocation	\$200,000.00	\$600,000.00
			Subtotal:	<b>\$31,050,254.00</b>
			Utilities (25%)	\$7,762,563.50
			M.O.T. (10%)	\$3,105,025.40
			Design Fees (10%)	\$3,105,025.40
			Contingency (35%)	\$10,867,588.90
			<b>Total:</b>	<b>\$55,890,457.20</b>

**Opinion of Probable Construction Costs**

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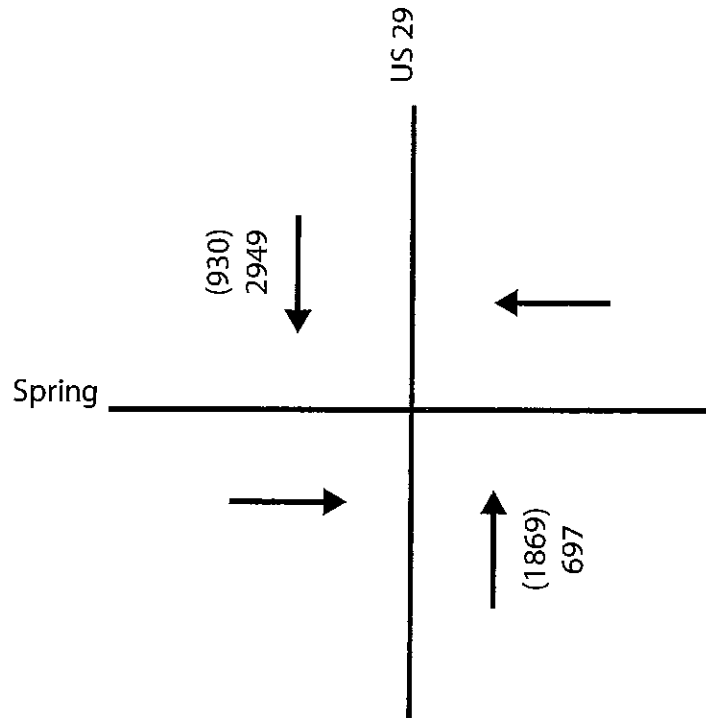


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10.9.2017

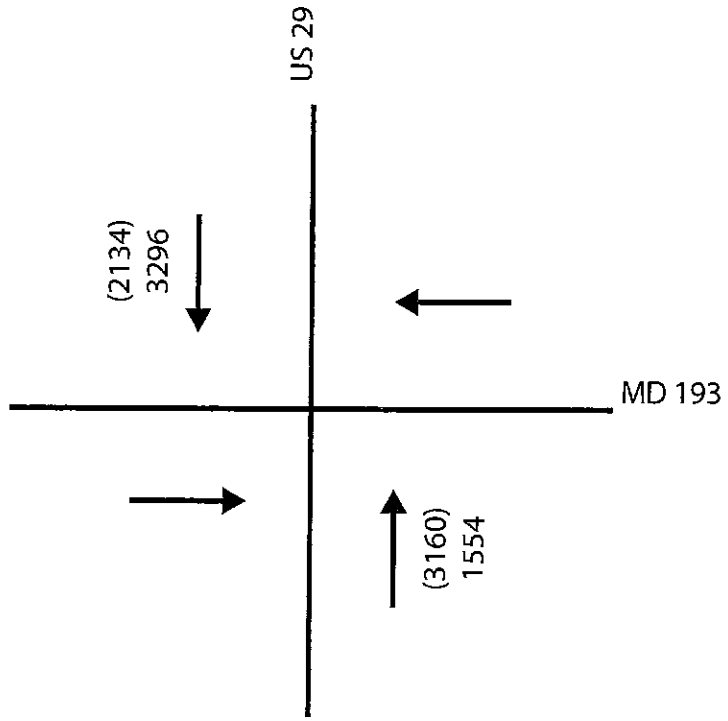


Date of Count  
6.7.2011

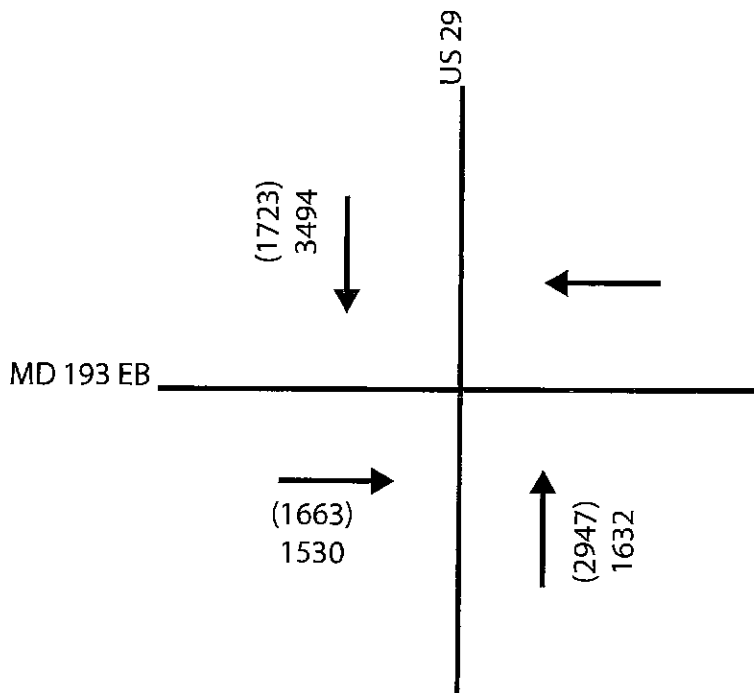




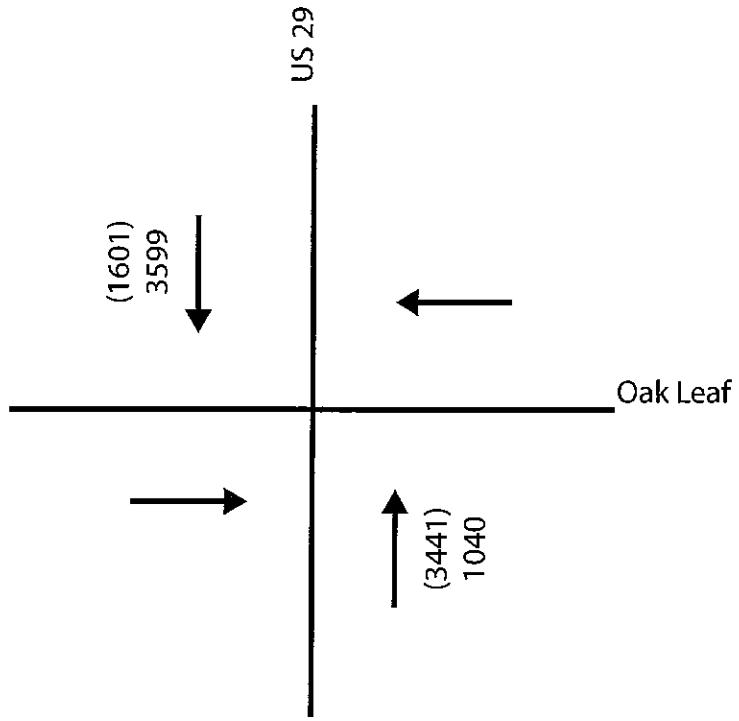
Date of Count  
1.25.2011



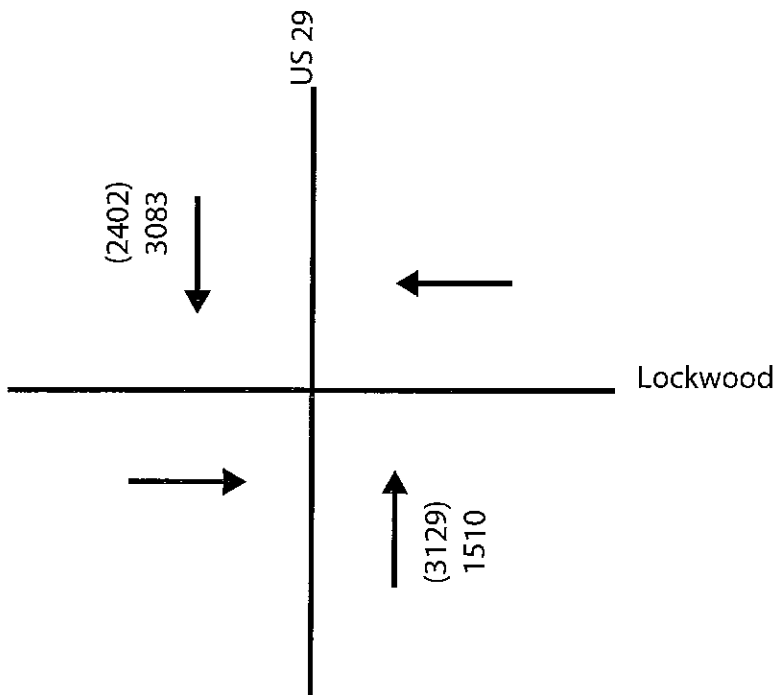
Date of Count  
6.2.2011



Date of Count  
6.1.2011



Date of Count  
1.9.2003



Date of Count  
5.25.2010

# Route 8

## MD 185/Connecticut Avenue

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**PHASE 2**

**6.92miles**

**\$ 27,721,830**

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**Cost/Mile**

**\$ 4,006,045**

### OVERALL DESCRIPTION

#### From Jones Bridge North to Rossmoor Boulevard

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option

1. Jones Bridge Road – in mixed traffic, east to MD 185 to MD 185 North.
2. BAT lanes north to MD 193.
3. At MD 193 – single guideway in median, remove left turn lanes to Carey Street.
4. South of Randolph Road – mixed traffic, then back in median to Aspen Hill Road.
5. At Aspen Hill Road – move to BAT lanes thru MD 97, remove service road for transitway down to Randolph Road.
6. Then, BAT lanes in shoulders to Bel Pre Road.

#### Option 1 – in 6 lane section – No R.O.W. Needed (see Alternate 3a)

7. Remove median and 1 auto lane each direction. Then build dedicated single guideway and new left turn lanes (results in 4 auto lanes).

**MD 185 / Connecticut Avenue - Jones Bridge North to Rossmoor Boulevard**

Location: Montgomery County Maryland

Miles:	6.92
Cost Per Mile:	<b>\$4,006,045</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
23,000	CY	Earthwork	\$25.00	\$575,000.00
9,000	CY	Removal of Existing Grass Area	\$30.00	\$270,000.00
24,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$360,000.00
48,000	LF	Saw-Cut Existing Pavement	\$10.00	\$480,000.00
38,000	SY	Removal of Existing Paving	\$35.00	\$1,330,000.00
34,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,080,000.00
1,800	CY	Concrete for raised Station Plat form	\$100.00	\$180,000.00
24,000	LF	Curb & Gutter	\$30.00	\$720,000.00
2,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$126,000.00
34,000	SF	Grass Pavers	\$5.00	\$170,000.00
28,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$84,000.00
48,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$144,000.00
300	LF	5" Broken White Pavement Marking Line	\$3.00	\$900.00
184	EA	Ground Mounted Sign	\$350.00	\$64,400.00
34,000	SF	Topsoil and Hydro seed	\$1.00	\$34,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
4,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$38,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
6	EA	RTV Station (inc. install)	\$250,000.00	\$1,500,000.00
22,500	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$128,250.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
18	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$450,000.00
18	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,680,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
7,200	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$66,096.00
Subtotal:				<b>\$15,841,046.00</b>
Utilities (20%)				<b>\$3,168,209.20</b>
M.O.T. (10%)				<b>\$1,584,104.60</b>
Design Fees (10%)				<b>\$1,584,104.60</b>
Contingency (35%)				<b>\$5,544,366.10</b>
<b>Total:</b>				<b>\$27,721,830.50</b>

**Opinion of Probable Construction Costs**

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**MD 185 / Connecticut Avenue - Jones Bridge North to Rossmoor Boulevard**

Location: Montgomery County Maryland

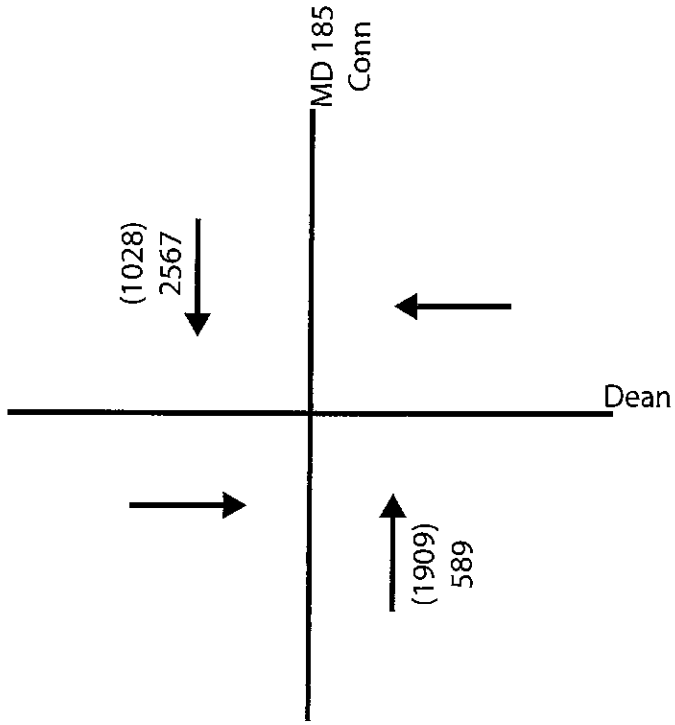
Miles:	6.92
Cost Per Mile:	<b>\$4,366,097</b>
	<b>Option 1</b>

**Preliminary Cost Estimate**

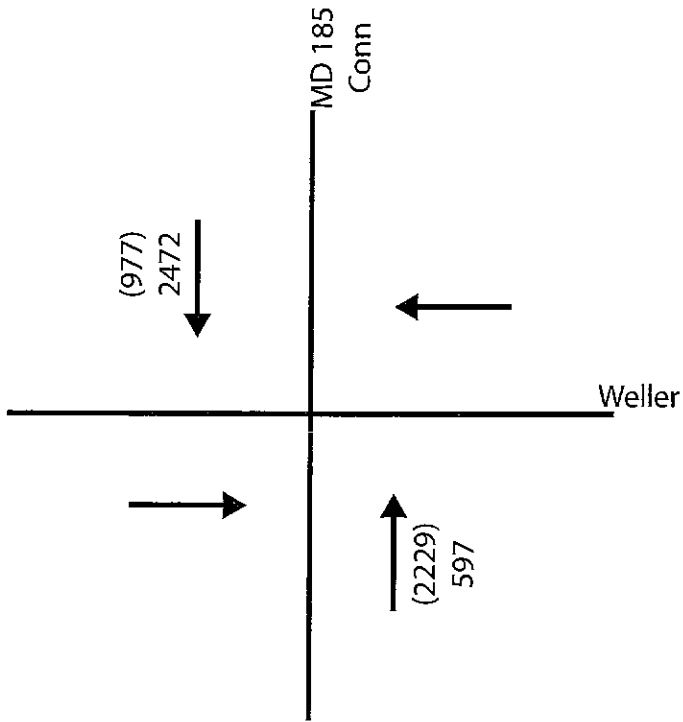
Quantity	Unit	Description	Unit Price	Total Price
29,000	CY	Earthwork	\$25.00	\$725,000.00
9,000	CY	Removal of Existing Grass Area	\$30.00	\$270,000.00
24,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$360,000.00
48,000	LF	Saw-Cut Existing Pavement	\$10.00	\$480,000.00
54,000	SY	Removal of Existing Paving	\$35.00	\$1,890,000.00
34,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,080,000.00
1,800	CY	Concrete for raised Station Plat form	\$100.00	\$180,000.00
45,000	LF	Curb & Gutter	\$30.00	\$1,350,000.00
2,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$126,000.00
67,000	SF	Grass Pavers	\$5.00	\$335,000.00
28,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$84,000.00
48,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$144,000.00
300	LF	5" Broken White Pavement Marking Line	\$3.00	\$900.00
184	EA	Ground Mounted Sign	\$350.00	\$64,400.00
67,000	SF	Topsoil and Hydro seed	\$1.00	\$67,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
4,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$38,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
2,000	SF	Mill and Overlay	\$7.00	\$14,000.00
6	EA	RTV Station (inc. install)	\$250,000.00	\$1,500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
12	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$360,000.00
18	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$450,000.00
18	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,680,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
7,200	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$66,096.00
		Subtotal:		<b>\$17,264,796.00</b>
		Utilities (20%)		<b>\$3,452,959.20</b>
		M.O.T. (10%)		<b>\$1,726,479.60</b>
		Design Fees (10%)		<b>\$1,726,479.60</b>
		Contingency (35%)		<b>\$6,042,678.60</b>
		<b>Total:</b>		<b>\$30,213,393.00</b>

**Opinion of Probable Construction Costs**

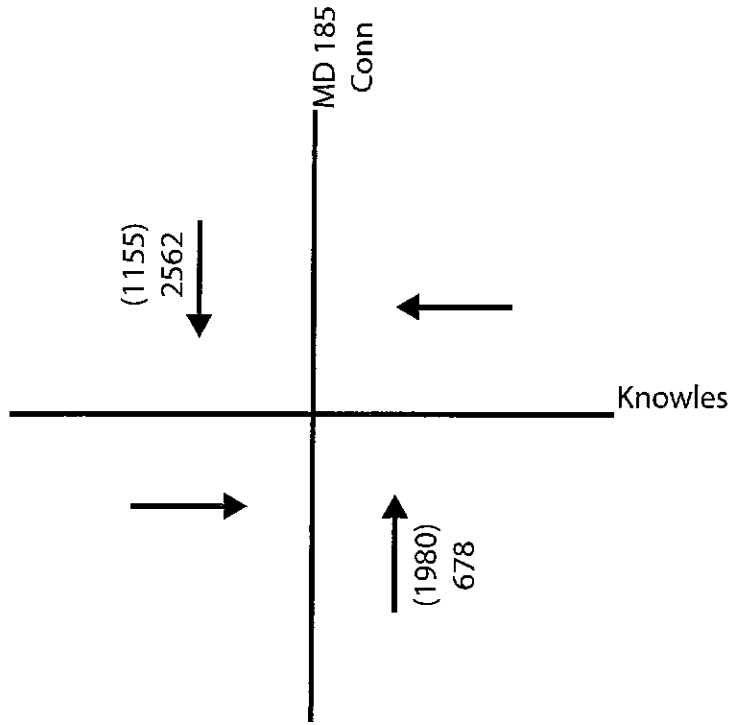
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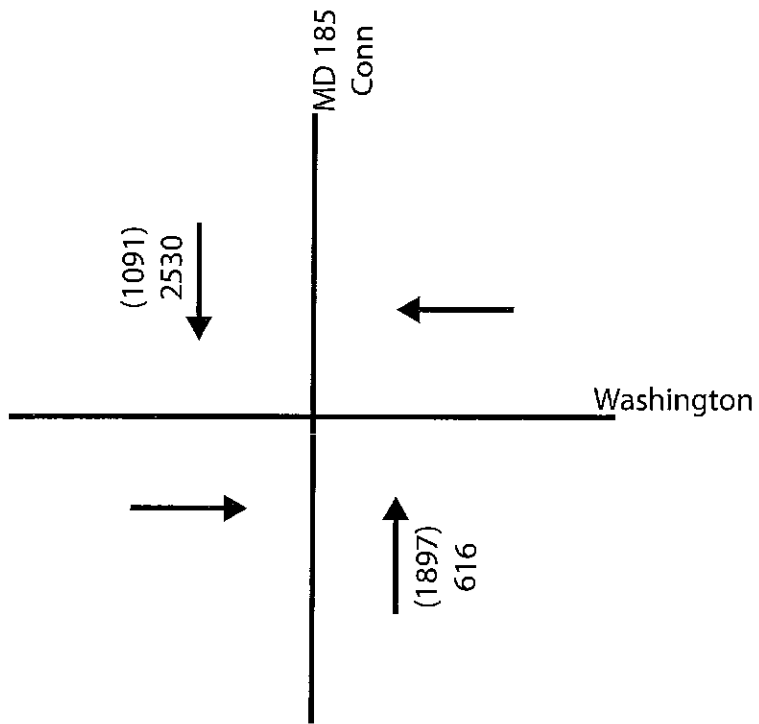
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Date of Count  
9.8.2010

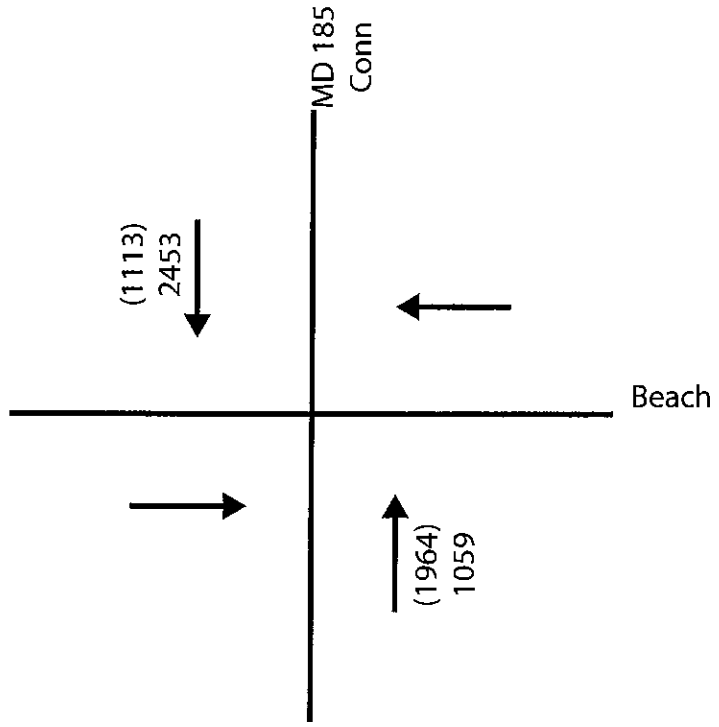


Date of Count  
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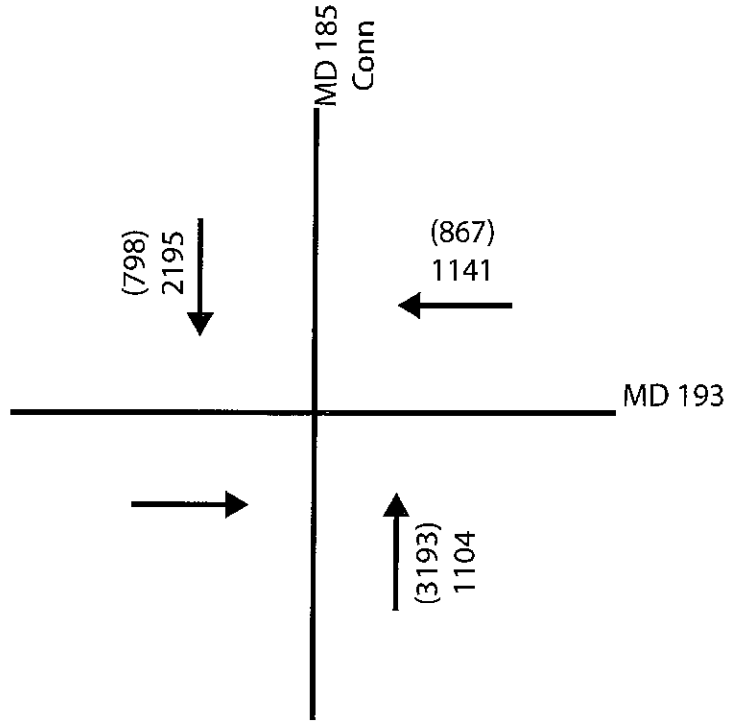
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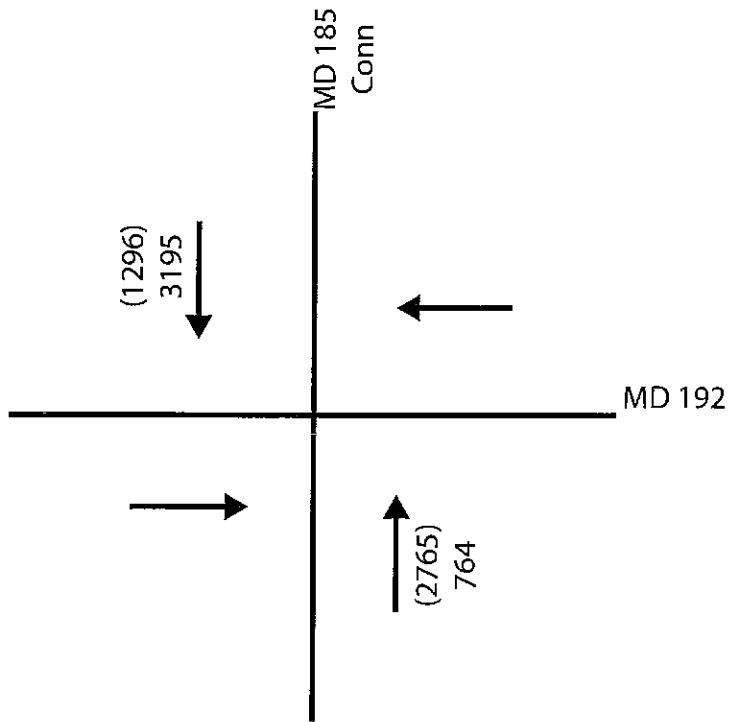


Date of Count  
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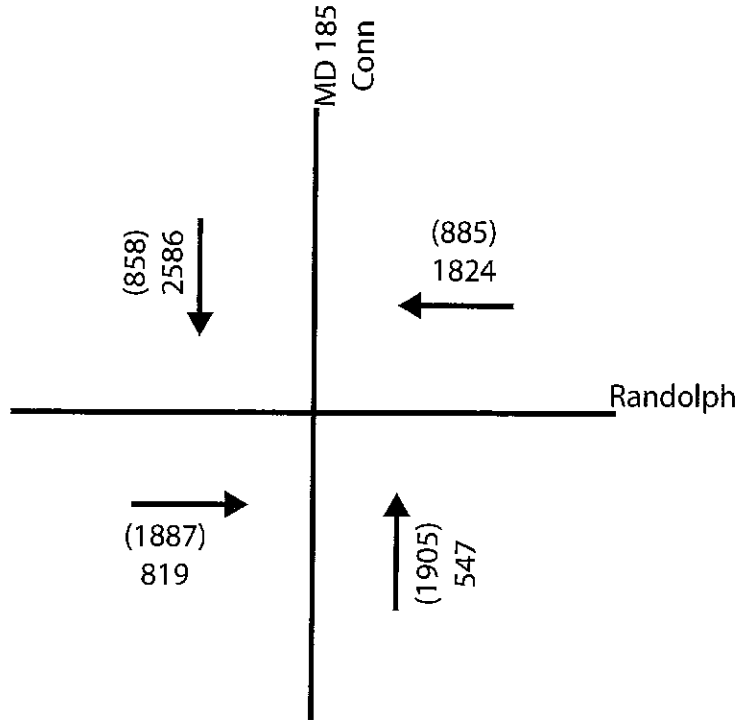
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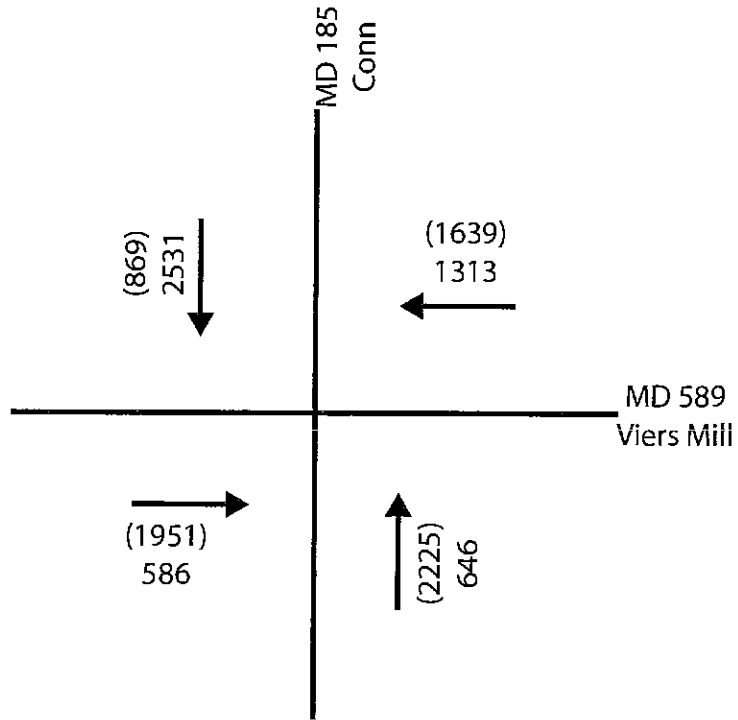
Date of Count  
5.11.2011



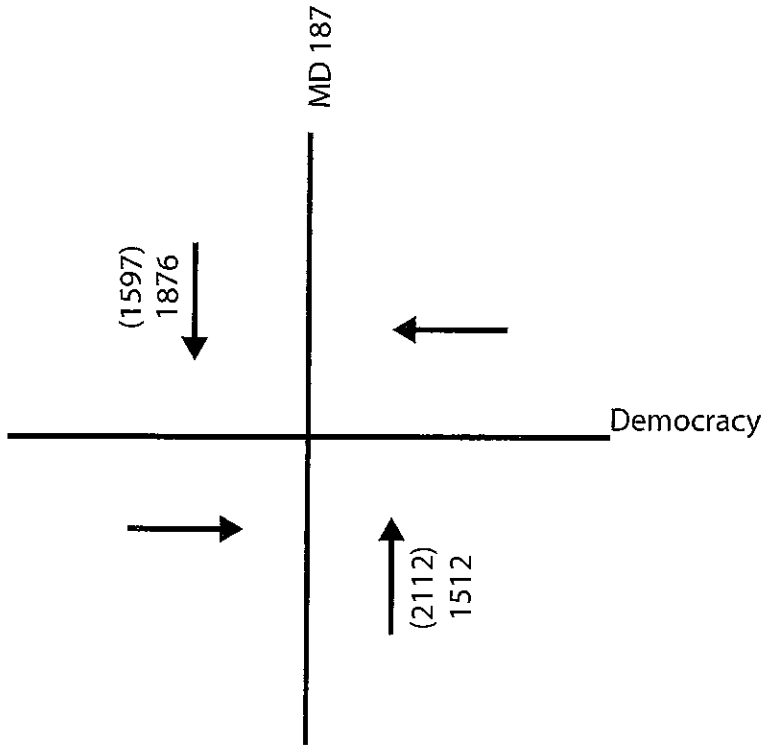
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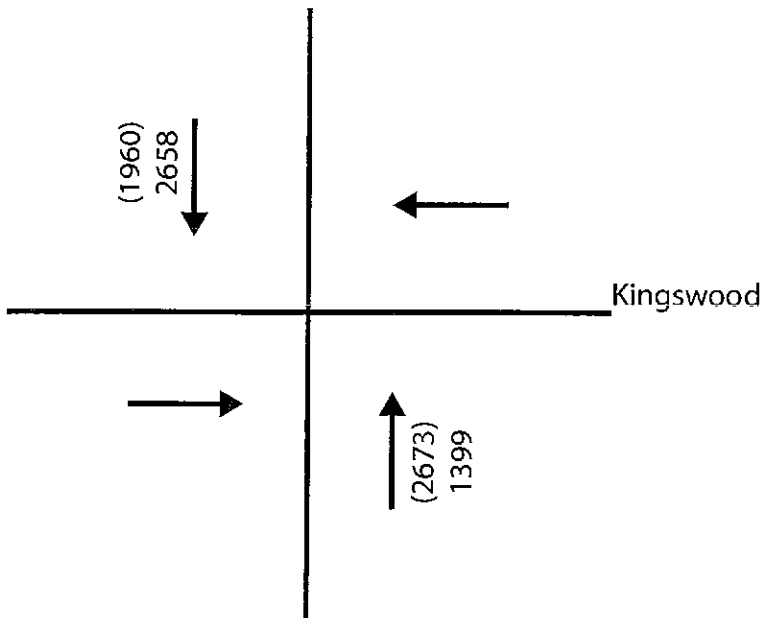
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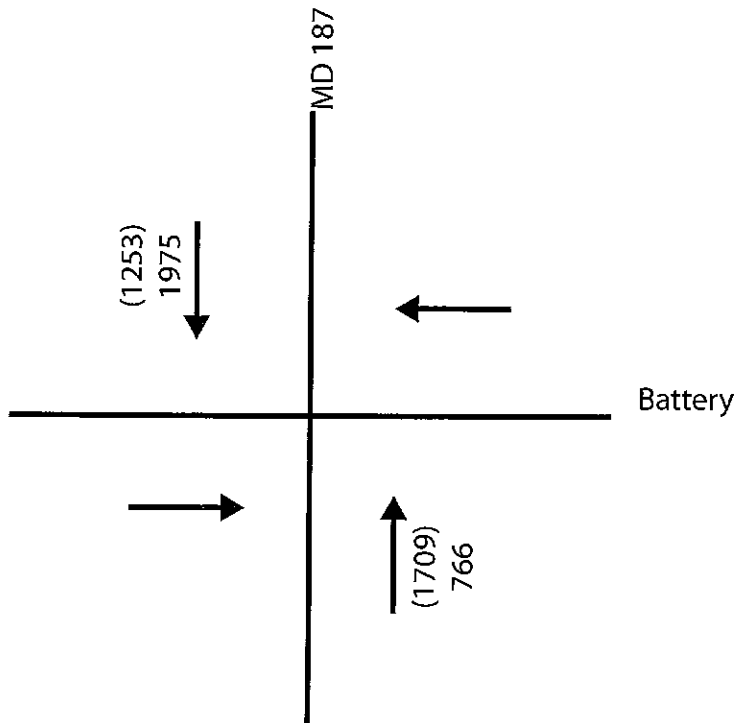
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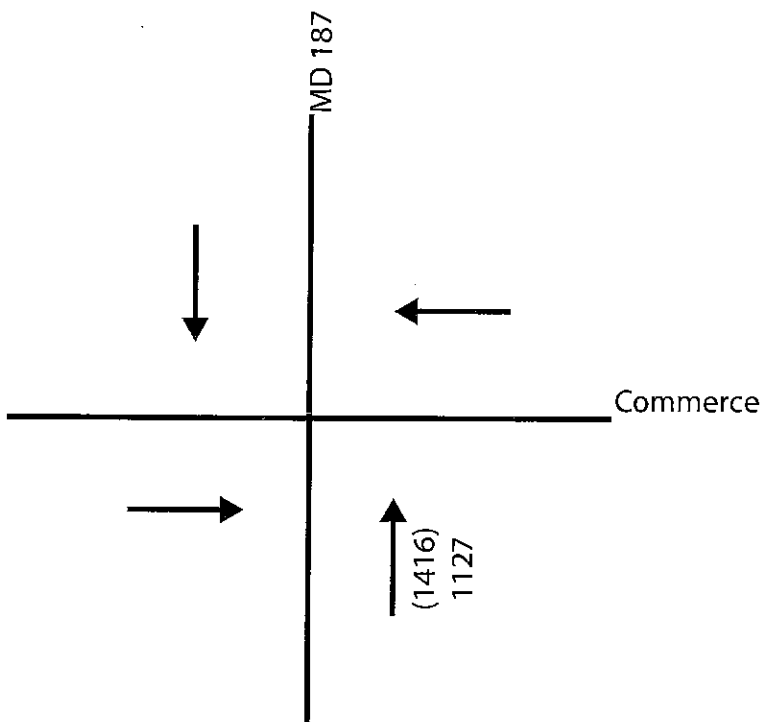
Date of Count  
3.15.2006



Date of Count  
3.29.2001



Date of Count  
3.16.2006



Date of Count  
6.30.2009

# Route 11

## MD 650/New Hampshire Avenue

---

**PHASE 2**  
**5.57miles**  
**\$ 30,200,380**

### OVERALL DESCRIPTION

#### From Adelphi Road North to ICC

This route – “stops” at Adelphi Road – the vicinity of the Prince Georges County Line.

If desired, the route can start at MD 193 in Langley Park. This route could eventually extend easterly along Adelphi Road to University of Maryland @ College Park.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option

1. At Adelphi Road – go to BAT lanes to Lockwood Road, remove 1 auto lane or in mixed traffic.
2. Lockwood Drive to Heartfield Road – Quaint Acres Drive, in mixed traffic.
3. From Heartfield Road to south of Randolph Road – remove median, reduce lanes and single transitway.
4. Single transitway in median from Midland Road to ICC.

**Cost/Mile**  
**\$ 5,421,971**

**MD 650 / New Hampshire Avenue - Adelphi Road north to ICC**

Location: Montgomery County Maryland

Miles:	5.57
Cost Per Mile:	<b>\$5,421,971</b>
	<b>Recommended Option</b>

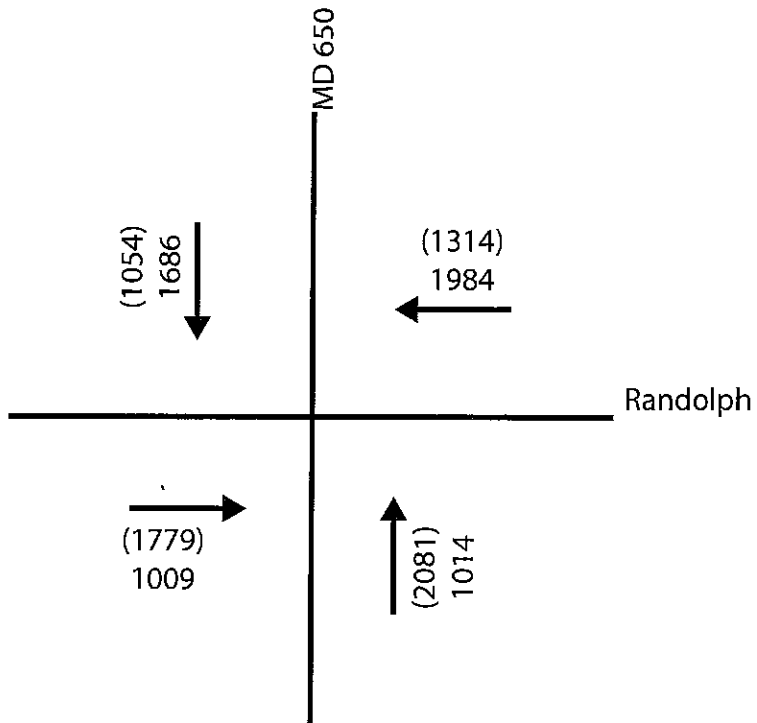
**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
17,000	CY	Earthwork	\$25.00	\$425,000.00
4,000	CY	Removal of Existing Grass Area	\$30.00	\$120,000.00
27,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$405,000.00
54,000	LF	Saw-Cut Existing Pavement	\$10.00	\$540,000.00
34,000	SY	Removal of Existing Paving	\$35.00	\$1,190,000.00
42,500	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$5,100,000.00
2,000	CY	Concrete for raised Station Plat form	\$100.00	\$200,000.00
31,000	LF	Curb & Gutter	\$30.00	\$930,000.00
2,000	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$90,000.00
47,000	SF	Grass Pavers	\$5.00	\$235,000.00
27,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$81,000.00
42,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$126,000.00
1,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$3,000.00
210	EA	Ground Mounted Sign	\$350.00	\$73,500.00
40,000	SF	Topsoil and Hydro seed	\$1.00	\$40,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
5,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$40,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
1,200	SF	Mill and Overlay	\$7.00	\$8,400.00
10	EA	RTV Station (inc. install)	\$250,000.00	\$2,500,000.00
29,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$165,300.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
20	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$600,000.00
15	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$375,000.00
15	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$3,900,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
12,000	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$110,160.00

Subtotal:	\$17,257,360.00
Utilities (20%)	\$3,451,472.00
M.O.T. (10%)	\$1,725,736.00
Design Fees (10%)	\$1,725,736.00
Contingency (35%)	\$6,040,076.00
<b>Total:</b>	<b>\$30,200,380.00</b>

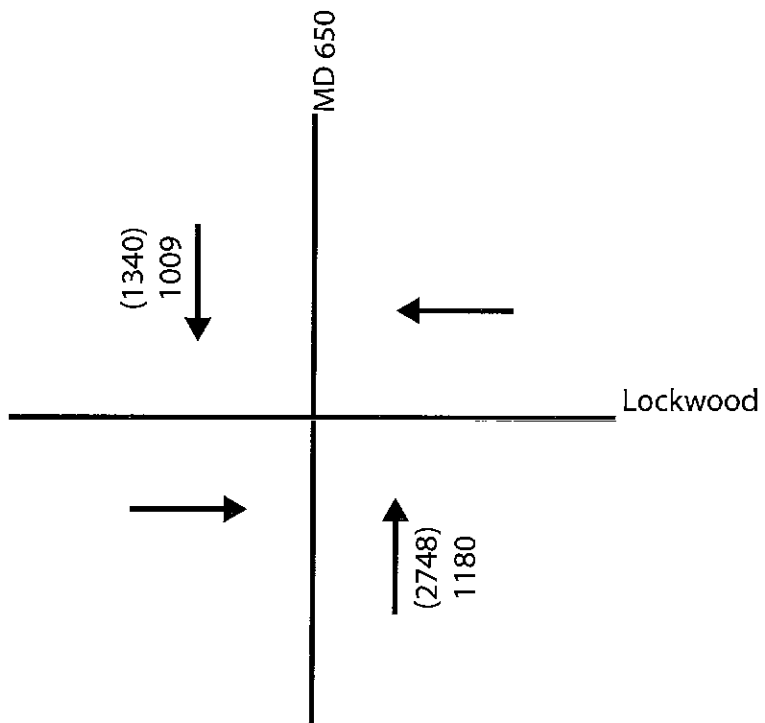
**Opinion of Probable Construction Costs**

This form is The Traffic Group's OPINION OF PROBABLE COSTS. The Traffic Group, Inc. is not a construction cost estimator or construction contractor, nor should The Traffic Group's rendering an opinion of probable construction costs be considered equivalent. This is based solely upon The Traffic Group's experience with construction and requires The Traffic Group, Inc. to make a number of assumptions of factors over which The Traffic Group, Inc. has no control. The Traffic Group, Inc. cannot guarantee the accuracy of this opinion, and in recognition of this, and by using this opinion, the Client waives any claim against The Traffic Group, Inc. relative to the accuracy of The Traffic Group's opinion of probable cost.



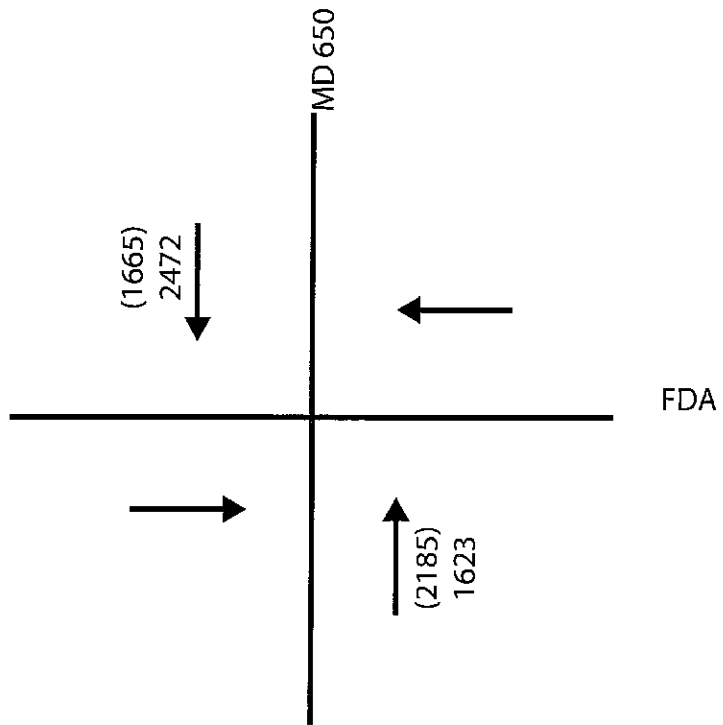
Date of Count  
1.20.2011

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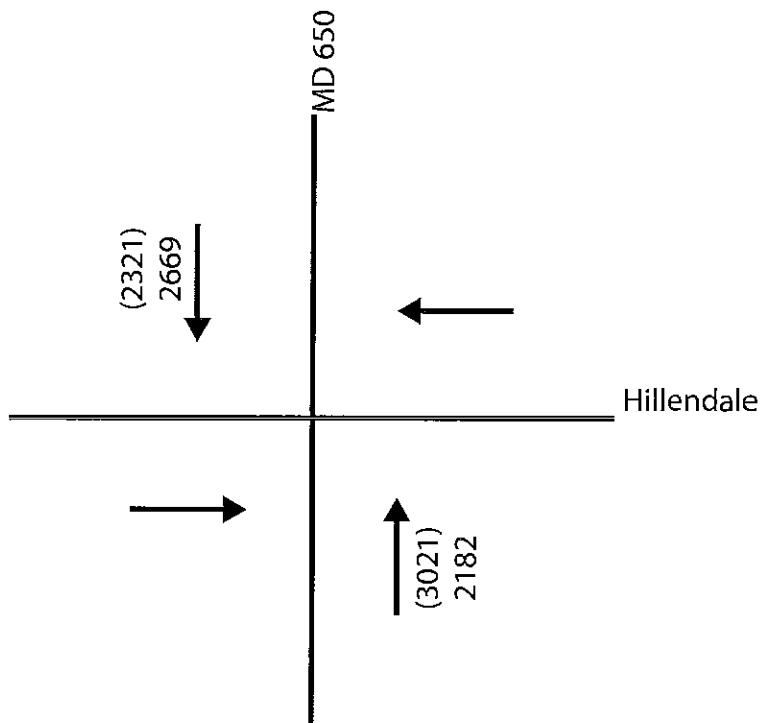


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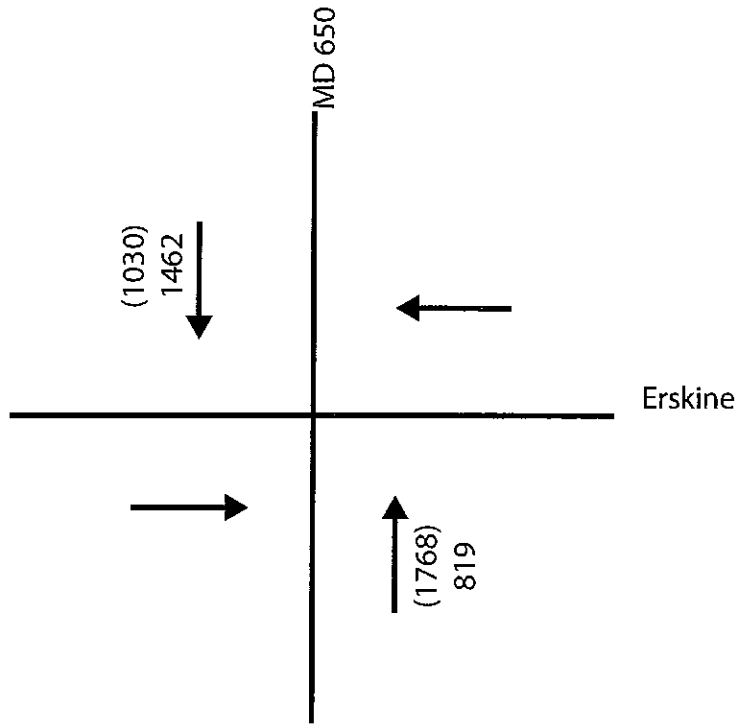




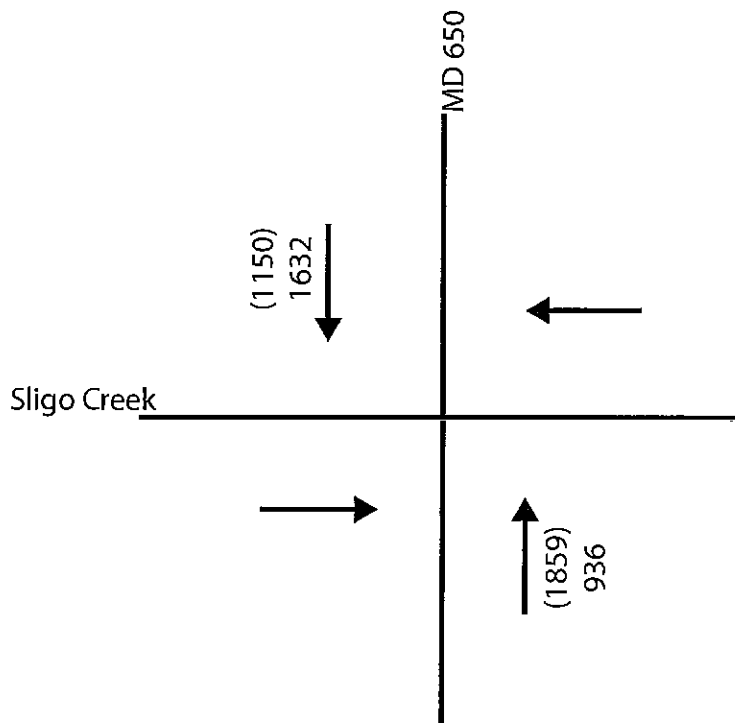
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2.8.2011



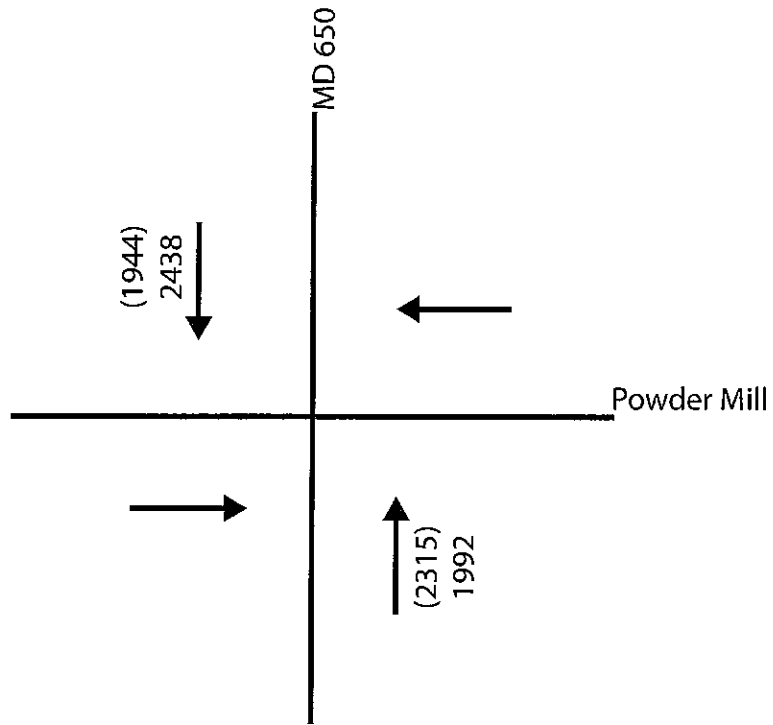
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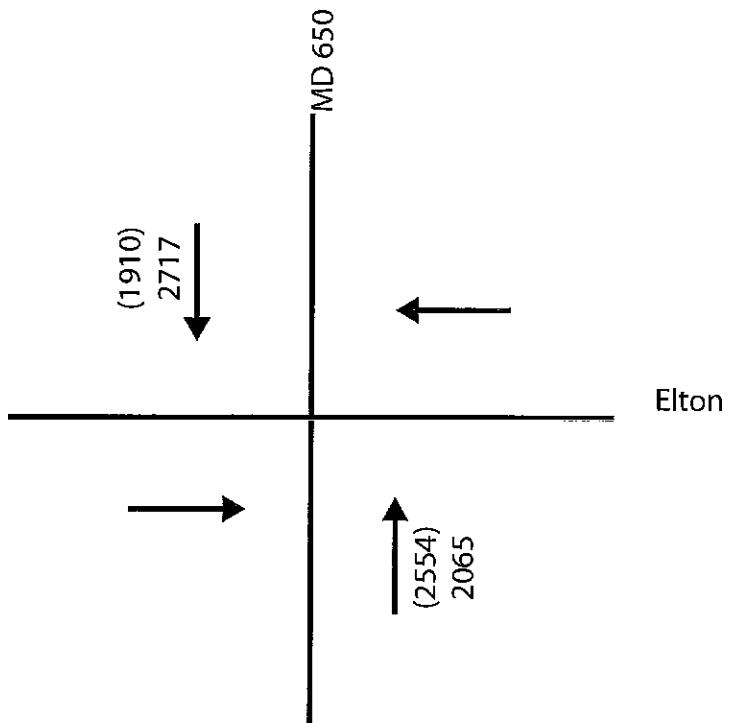
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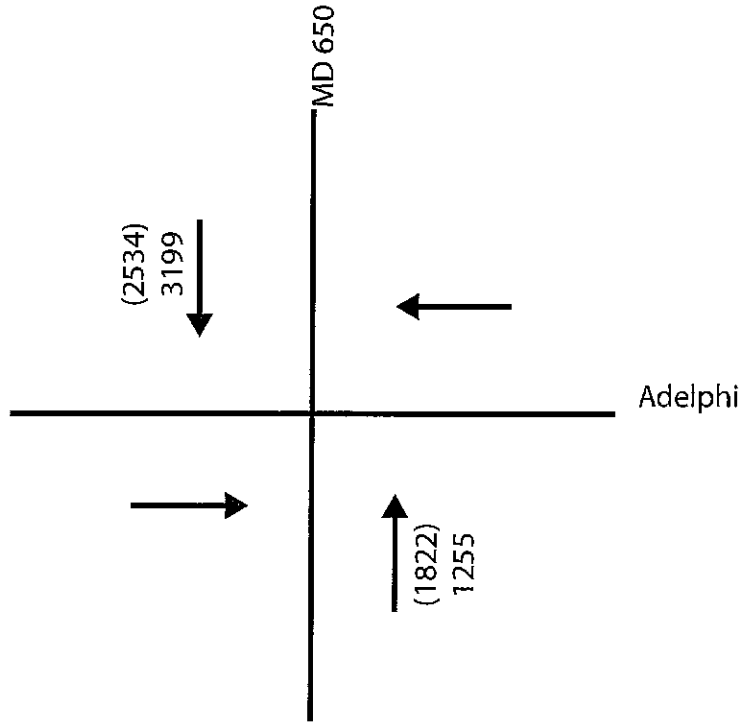
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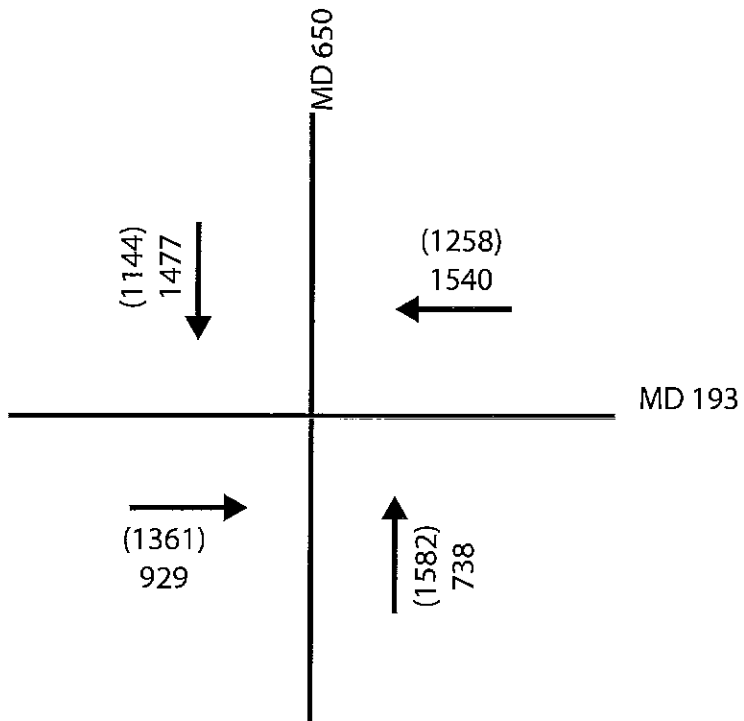
Date of Count  
2.8.2011



Date of Count  
1.19.2011



Date of Count  
1.25.2011



Date of Count  
6.21.2011

# Route 12

## MD 187/Old Georgetown Road

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<b>PHASE 2</b>
<b>5.53miles</b>
<b>\$ 26,117,224</b>
<hr/>
<b>Cost/Mile</b>
<b>\$ 4,722,825</b>

### OVERALL DESCRIPTION

#### From Bethesda Metro Station to White Flint Metro Station

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option

1. Remove median and left turn lanes and build single dedicated guideway – all 6 auto lanes remain.

#### Option 1 – No R.O.W. Needed

2. Begin reversible lanes at Arlington Road for morning peak – 1 BAT lane southbound, 2 southbound auto, 2 northbound auto (5 total), and reverse for evening 1 BAT lane northbound, 2 auto lanes northbound, 2 auto lanes southbound and carry to McKinley Street.
3. At McKinley Street – begin 7 lane reversible lane system past Cedar Lane.
4. At I-495 – go to mixed traffic thru interchange area.
5. North of I-495 – back to 7 lane reversible to Rock Spring, DC, then in mixed traffic.
6. After I-270 interchange and north of Tuckerman – 7 lane reversible to Tilden Lane.
7. Then in mixed traffic to MD 355.

#### Option 2 – in 6 lane section – No. R.O.W. Needed

8. Remove 1 auto lane each direction and build BAT lanes northbound and southbound. (Results in 4 auto lanes)

#### Option 3 – in 6 lane section – No. R.O.W. Needed (see Alternate 3)

9. Remove median and 1 auto lane each direction. Then, build dedicated double guideway and new left turn lanes (results in 4 auto lanes).



**MD 187 / Old Georgetown Road - Bethesda Metro Station to White Flint Metro Station**

Location: Montgomery County Maryland

Miles:	5.53
Cost Per Mile:	\$4,722,825
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
10,000	CY	Earthwork	\$25.00	\$250,000.00
8,000	CY	Removal of Existing Grass Area	\$30.00	\$240,000.00
40,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$600,000.00
36,000	LF	Saw-Cut Existing Pavement	\$10.00	\$360,000.00
24,500	SY	Removal of Existing Paving	\$35.00	\$857,500.00
19,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,280,000.00
2,400	CY	Concrete for raised Station Plat form	\$100.00	\$240,000.00
70,000	LF	Curb & Gutter	\$30.00	\$2,100,000.00
1,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$81,000.00
56,000	SF	Grass Pavers	\$5.00	\$280,000.00
37,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$111,000.00
3,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$9,000.00
200	LF	5" Broken White Pavement Marking Line	\$3.00	\$600.00
90	EA	Ground Mounted Sign	\$350.00	\$31,500.00
56,000	SF	Topsoil and Hydro seed	\$1.00	\$56,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
1,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$14,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
8	EA	RTV Station (inc. install)	\$250,000.00	\$2,000,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
16	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$480,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
9,600	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$88,128.00

Subtotal:	\$14,924,128.00
Utilities (20%)	\$2,984,825.60
M.O.T. (10%)	\$1,492,412.80
Design Fees (10%)	\$1,492,412.80
Contingency (35%)	\$5,223,444.80
<b>Total:</b>	<b>\$26,117,224.00</b>

**Opinion of Probable Construction Costs**

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**MD 187 / Old Georgetown Road - Bethesda Metro Station to White Flint Metro Station**

Location: Montgomery County Maryland

Miles:	5.53
Cost Per Mile:	<b>\$7,709,629</b>
	<b>Option 1</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
25,000	CY	Earthwork	\$25.00	\$625,000.00
12,000	CY	Removal of Existing Grass Area	\$30.00	\$360,000.00
18,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$270,000.00
42,000	LF	Saw-Cut Existing Pavement	\$10.00	\$420,000.00
50,000	SY	Removal of Existing Paving	\$35.00	\$1,750,000.00
37,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,440,000.00
2,400	CY	Concrete for raised Station Plat form	\$100.00	\$240,000.00
0	LF	Curb & Gutter	\$30.00	\$0.00
1,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$81,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
3,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$9,000.00
42,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$126,000.00
500	LF	5" Broken White Pavement Marking Line	\$3.00	\$1,500.00
90	EA	Ground Mounted Sign	\$350.00	\$31,500.00
0	SF	Topsoil and Hydro seed	\$1.00	\$0.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
1,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$14,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
8	EA	RTV Station (inc. install)	\$250,000.00	\$2,000,000.00
37,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$210,900.00
93	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$8,370,000.00
16	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$480,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
9,600	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$88,128.00

Subtotal:	\$24,362,428.00
Utilities (20%)	\$4,872,485.60
M.O.T. (10%)	\$2,436,242.80
Design Fees (10%)	\$2,436,242.80
Contingency (35%)	\$8,526,849.80
<b>Total:</b>	<b>\$42,634,249.00</b>

**Opinion of Probable Construction Costs**

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**MD 187 / Old Georgetown Road - Bethesda Metro Station to White Flint Metro Station**

Location: Montgomery County Maryland

Miles:	5.53
Cost Per Mile:	<b>\$4,842,541</b>
	<b>Option 2</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
25,000	CY	Earthwork	\$25.00	\$625,000.00
0	CY	Removal of Existing Grass Area	\$30.00	\$0.00
0	LF	Removal of Existing Curb & Gutter	\$15.00	\$0.00
36,000	LF	Saw-Cut Existing Pavement	\$10.00	\$360,000.00
50,000	SY	Removal of Existing Paving	\$35.00	\$1,750,000.00
37,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,440,000.00
2,400	CY	Concrete for raised Station Plat form	\$100.00	\$240,000.00
0	LF	Curb & Gutter	\$30.00	\$0.00
1,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$81,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
3,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$9,000.00
42,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$126,000.00
500	LF	5" Broken White Pavement Marking Line	\$3.00	\$1,500.00
90	EA	Ground Mounted Sign	\$350.00	\$31,500.00
0	SF	Topsoil and Hydro seed	\$1.00	\$0.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
1,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$14,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
8	EA	RTV Station (inc. install)	\$250,000.00	\$2,000,000.00
37,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$210,900.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
16	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$480,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
9,600	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$88,128.00

Subtotal:	<b>\$15,302,428.00</b>
Utilities (20%)	<b>\$3,060,485.60</b>
M.O.T. (10%)	<b>\$1,530,242.80</b>
Design Fees (10%)	<b>\$1,530,242.80</b>
Contingency (35%)	<b>\$5,355,849.80</b>
<b>Total:</b>	<b>\$26,779,249.00</b>

**Opinion of Probable Construction Costs**

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**MD 187 / Old Georgetown Road - Bethesda Metro Station to White Flint Metro Station**

Location: Montgomery County Maryland

Miles:	5.53
Cost Per Mile:	<b>\$6,598,933</b>
	<b>Option 3</b>

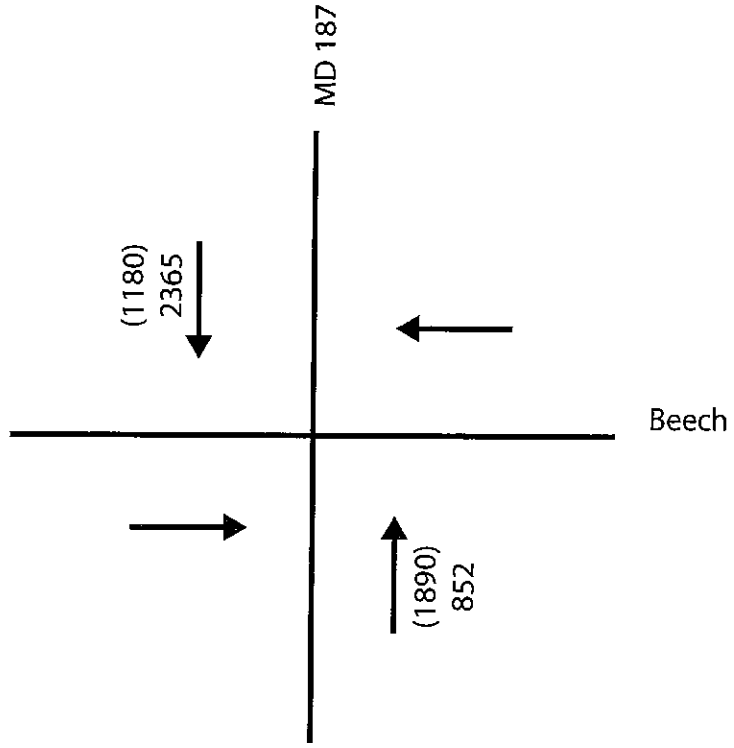
**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
20,000	CY	Earthwork	\$25.00	\$500,000.00
8,000	CY	Removal of Existing Grass Area	\$30.00	\$240,000.00
40,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$600,000.00
36,000	LF	Saw-Cut Existing Pavement	\$10.00	\$360,000.00
49,000	SY	Removal of Existing Paving	\$35.00	\$1,715,000.00
38,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,560,000.00
2,400	CY	Concrete for raised Station Plat form	\$100.00	\$240,000.00
140,000	LF	Curb & Gutter	\$30.00	\$4,200,000.00
1,800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$81,000.00
112,000	SF	Grass Pavers	\$5.00	\$560,000.00
37,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$111,000.00
13,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$39,000.00
1,200	LF	5" Broken White Pavement Marking Line	\$3.00	\$3,600.00
90	EA	Ground Mounted Sign	\$350.00	\$31,500.00
112,000	SF	Topsoil and Hydro seed	\$1.00	\$112,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$30,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
8,000	SF	Mill and Overlay	\$7.00	\$56,000.00
8	EA	RTV Station (inc. install)	\$250,000.00	\$2,000,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
16	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$480,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
9,600	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$88,128.00

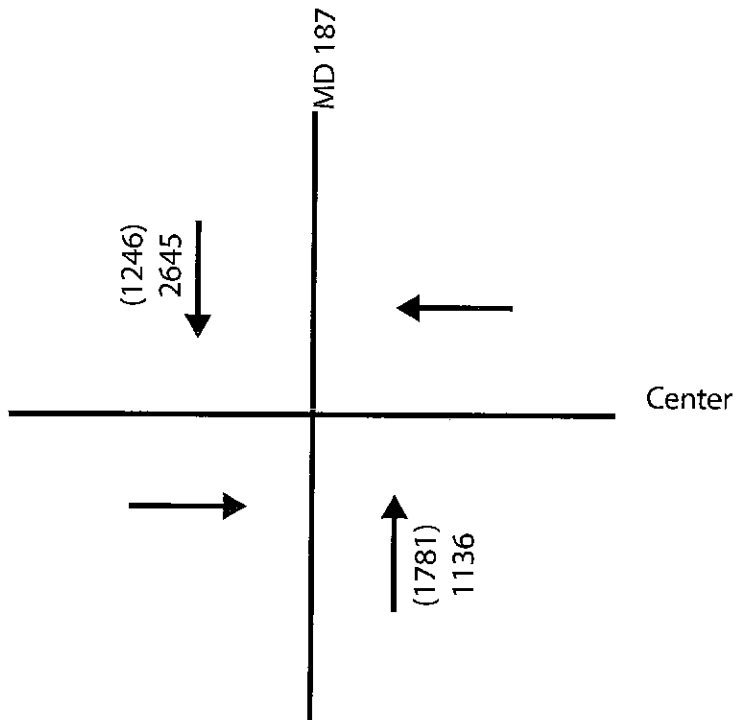
Subtotal:	<b>\$20,852,628.00</b>
Utilities (20%)	\$4,170,525.60
M.O.T. (10%)	\$2,085,262.80
Design Fees (10%)	\$2,085,262.80
Contingency (35%)	\$7,298,419.80
<b>Total:</b>	<b>\$36,492,099.00</b>

**Opinion of Probable Construction Costs**

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Date of Count  
2.3.2011



Date of Count  
5.11.2011

# Route 18

## MD 193/University Boulevard

<b>PHASE 2</b>
<b>4.90miles</b>
<b>\$ 24,865,876</b>
<b>Cost/Mile</b>
<b>\$ 5,074,669</b>

### OVERALL DESCRIPTION

#### From Langley Park North to Wheaton Metro Station

We suggest the TTF consider extending this MD 193 route from MD 97 (Georgia Avenue) to MD 185 (Connecticut Avenue) at a total of 1.24 miles additional to the 4.9 miles.

See Recommended Option number 1 for discussion of Purple Line in median of MD 193. Consider BAT lanes from MD 320 to MD 193 ( $\pm$  0.86 miles)

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option – No R.O.W. Needed

1. Begin at MD 320 (Piney Branch Road) where Purple Line is proposed to be built in the median of MD 193. This option should not be extended to MD 650, if the Purple Line is built in the median.
2. At St. Lawrence Street, remove median and 1 auto lane each direction, build dedicated dual guideway in median and left turn lanes.
3. In mixed traffic past US 29.
4. From east of MD 97, at Amherst Avenue, remove median and 1 auto lane in each direction. Then, build dedicated dual guideway and new left turn lanes – to Lorain Avenue (just west/north of Four Corners).

#### Option 1 – No R.O.W. Needed (see Alternates 8 and 9)

5. Remove median and build reversible lane system (7 lanes). Peak direction 1 BAT lane, 3 auto lanes; non-peak direction 1 BAT lane, 2 auto lanes.

#### Option 2 – No R.O.W. Needed(see Alternate 3a)

6. Remove 1 auto lane each direction and build BAT lanes (results in 4 auto lanes).

#### Option 3 – No R.O.W. Needed(see Alternate 1)

7. Remove median and left turn lanes.
8. Build single dedicated guideway.



**MD 193 / University Blvd - Langley Park north to Wheaton Metro Station**

Location: Montgomery County Maryland

Miles:	4.90
Cost Per Mile:	<b>\$5,074,669</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
17,000	CY	Earthwork	\$25.00	\$425,000.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
31,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$465,000.00
31,000	LF	Saw-Cut Existing Pavement	\$10.00	\$310,000.00
22,000	SY	Removal of Existing Paving	\$35.00	\$770,000.00
32,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$3,840,000.00
600	CY	Concrete for raised Station Plat form	\$100.00	\$60,000.00
40,000	LF	Curb & Gutter	\$30.00	\$1,200,000.00
1,400	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$63,000.00
70,000	SF	Grass Pavers	\$5.00	\$350,000.00
40,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$120,000.00
29,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$87,000.00
800	LF	5" Broken White Pavement Marking Line	\$3.00	\$2,400.00
142	EA	Ground Mounted Sign	\$350.00	\$49,700.00
70,000	SF	Topsoil and Hydro seed	\$1.00	\$70,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$24,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
3	EA	RTV Station (inc. install)	\$250,000.00	\$750,000.00
12,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$68,400.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
6	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$180,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
5,400	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$49,572.00

Subtotal:	<b>\$14,209,072.00</b>
Utilities (20%)	\$2,841,814.40
M.O.T. (10%)	\$1,420,907.20
Design Fees (10%)	\$1,420,907.20
Contingency (35%)	\$4,973,175.20
<b>Total:</b>	<b>\$24,865,876.00</b>

**Opinion of Probable Construction Costs**

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**MD 193 / University Blvd - Langley Park north to Wheaton Metro Station**

Location: Montgomery County Maryland

Miles:	4.90
Cost Per Mile:	\$9,300,463
	Option 1

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
34,500	CY	Earthwork	\$25.00	\$862,500.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
31,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$465,000.00
31,000	LF	Saw-Cut Existing Pavement	\$10.00	\$310,000.00
70,000	SY	Removal of Existing Paving	\$35.00	\$2,450,000.00
72,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$8,640,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
400	LF	Curb & Gutter	\$30.00	\$12,000.00
1,400	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$63,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
52,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$156,000.00
35,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$105,000.00
1,800	LF	5" Broken White Pavement Marking Line	\$3.00	\$5,400.00
142	EA	Ground Mounted Sign	\$350.00	\$49,700.00
1,200	SF	Topsoil and Hydro seed	\$1.00	\$1,200.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$24,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
4	EA	RTV Station (inc. install)	\$250,000.00	\$1,000,000.00
52,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$296,400.00
65	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$5,850,000.00
8	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$240,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
7,200	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$66,096.00
Subtotal:				\$26,041,296.00
Utilities (20%)				\$5,208,259.20
M.O.T. (10%)				\$2,604,129.60
Design Fees (10%)				\$2,604,129.60
Contingency (35%)				\$9,114,453.60
<b>Total:</b>				<b>\$45,572,268.00</b>

**Opinion of Probable Construction Costs**

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**MD 193 / University Blvd - Langley Park north to Wheaton Metro Station**

Location: Montgomery County Maryland

**Preliminary Cost Estimate**

Miles:	4.90
Cost Per Mile:	<b>\$6,354,034</b>
	<b>Option 2</b>

Quantity	Unit	Description	Unit Price	Total Price
34,500	CY	Earthwork	\$25.00	\$862,500.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
31,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$465,000.00
31,000	LF	Saw-Cut Existing Pavement	\$10.00	\$310,000.00
70,000	SY	Removal of Existing Paving	\$35.00	\$2,450,000.00
52,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$6,240,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
400	LF	Curb & Gutter	\$30.00	\$12,000.00
1,400	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$63,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
52,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$156,000.00
35,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$105,000.00
1,800	LF	5" Broken White Pavement Marking Line	\$3.00	\$5,400.00
142	EA	Ground Mounted Sign	\$350.00	\$49,700.00
1,200	SF	Topsoil and Hydro seed	\$1.00	\$1,200.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$24,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
4	EA	RTV Station (inc. install)	\$250,000.00	\$1,000,000.00
52,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$296,400.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
8	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$240,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
7,200	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$66,096.00
		Subtotal:		<b>\$17,791,296.00</b>
		Utilities (20%)		<b>\$3,558,259.20</b>
		M.O.T. (10%)		<b>\$1,779,129.60</b>
		Design Fees (10%)		<b>\$1,779,129.60</b>
		Contingency (35%)		<b>\$6,226,953.60</b>
		<b>Total:</b>		<b>\$31,134,768.00</b>

**Opinion of Probable Construction Costs**

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**MD 193 / University Blvd - Langley Park north to Wheaton Metro Station**

Location: Montgomery County Maryland

**Preliminary Cost Estimate**

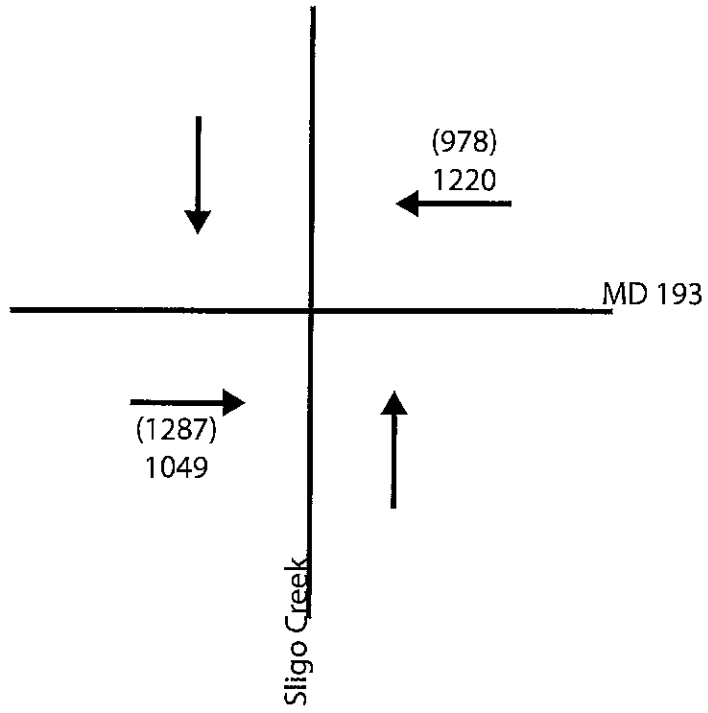
Miles:	4.90
Cost Per Mile:	<b>\$5,138,607</b>
	<b>Option 3</b>

Quantity	Unit	Description	Unit Price	Total Price
17,000	CY	Earthwork	\$25.00	\$425,000.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
31,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$465,000.00
35,000	LF	Saw-Cut Existing Pavement	\$10.00	\$350,000.00
35,000	SY	Removal of Existing Paving	\$35.00	\$1,225,000.00
26,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$3,120,000.00
1,800	CY	Concrete for raised Station Plat form	\$100.00	\$180,000.00
52,000	LF	Curb & Gutter	\$30.00	\$1,560,000.00
2,200	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$99,000.00
78,000	SF	Grass Pavers	\$5.00	\$390,000.00
53,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$159,000.00
2,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$6,000.00
800	LF	5" Broken White Pavement Marking Line	\$3.00	\$2,400.00
142	EA	Ground Mounted Sign	\$350.00	\$49,700.00
78,000	SF	Topsoil and Hydro seed	\$1.00	\$78,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$24,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
3	EA	RTV Station (inc. install)	\$250,000.00	\$750,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
6	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$180,000.00
17	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$425,000.00
17	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$4,420,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00

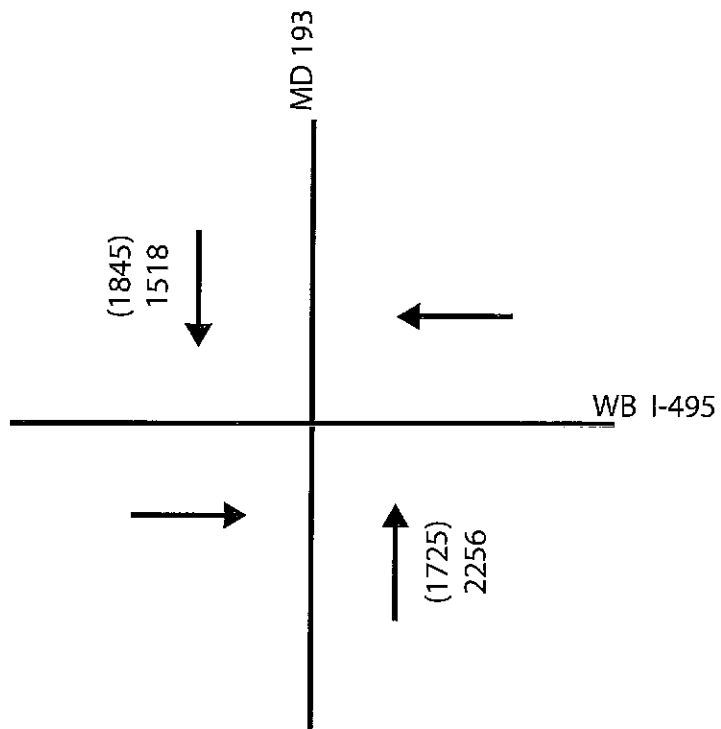
Subtotal:	<b>\$14,388,100.00</b>
Utilities (20%)	<b>\$2,877,620.00</b>
M.O.T. (10%)	<b>\$1,438,810.00</b>
Design Fees (10%)	<b>\$1,438,810.00</b>
Contingency (35%)	<b>\$5,035,835.00</b>
<b>Total:</b>	<b>\$25,179,175.00</b>

**Opinion of Probable Construction Costs**

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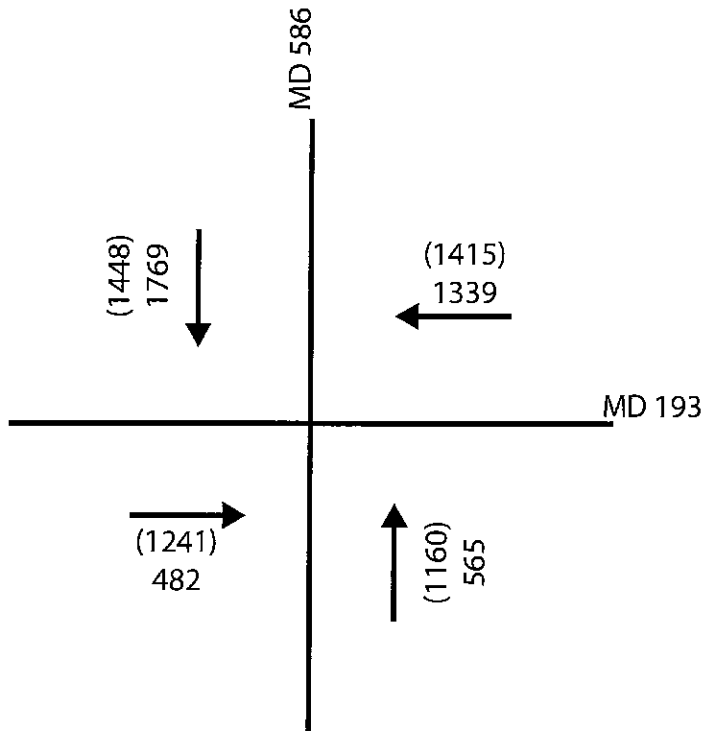


Date of Count  
6.1.2011

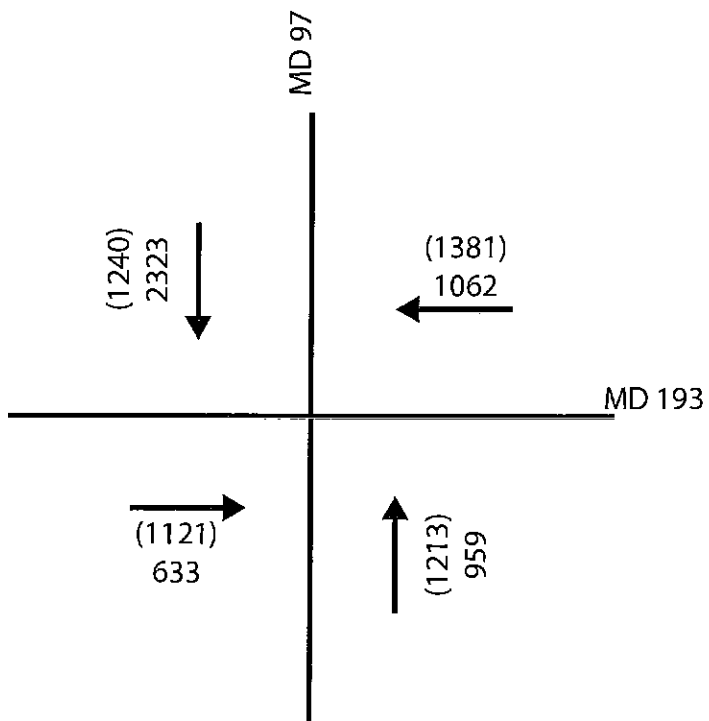


Date of Count  
5.26.2010





Date of Count  
9.16.2010



Date of Count  
9.16.2010

# Route 23

## North Bethesda Transit Way

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<b>PHASE 2</b>
<b>4.58 miles</b>
<b>\$ 11,738,954</b>
<hr/>
<b>Cost/Mile</b>
<b>\$ 2,563,090</b>

### OVERALL DESCRIPTION

#### From Montgomery Mall East to Grosvenor Metro Station

Ultimate decision makers need to re-evaluate the practicality of building this route. The route is described below. Long sections of RTVs in mixed traffic will occur for reasons noted below. Only  $\pm 34\%$  of the route can be in dedicated lanes; or, dedicated BAT lanes, or we will need to reduce auto lanes.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option

##### *Do not build RTV route at this time.*

1. The proposed route extends from around Montgomery Mall, including Democracy Boulevard, Westlake Drive, Westlake Terrace, Fernwood Road, and Old Georgetown Road, and Tuckerman Lane.
2. There is sufficient width in the median along Democracy Boulevard, from Fernwood Road to MD 187 (Old Georgetown Road) to construct a single guideway (but only 0.56 miles).
3. There are three major bridges that we want to avoid widening along Fernwood Road over I-270, Democracy Boulevard over I-270, and along Old Georgetown Road over I-270. This route is 2.94 miles long and Tuckerman Lane is primarily a 5 lane, undivided roadway from MD 355 to Old Georgetown Road and is 1.23 miles long.
4. Overall, this 2.94 mile long route does not appear to have much possibility for dedicated transitway other than portions of Fernwood Road, between I-270 and Democracy Boulevard and along Democracy Boulevard from Fernwood Road to MD 187 – about 25% of the overall route.
5. If the center turn lane along Tuckerman Lane were to be removed, another section of 1.2 miles of transitway could be built. Overall, dedicated transitway should be built and planned only after additional right-of-way is acquired along the entire route. (all roads)



**North Bethesda Transit Way - Montgomery Mall east to Grosvenor Metro Station**

Location: Montgomery County Maryland

Miles:	4.58
Cost Per Mile:	<b>\$2,563,090</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
5,000	CY	Earthwork	\$25.00	\$125,000.00
6,500	CY	Removal of Existing Grass Area	\$30.00	\$195,000.00
16,400	LF	Removal of Existing Curb & Gutter	\$15.00	\$246,000.00
8,200	LF	Saw-Cut Existing Pavement	\$10.00	\$82,000.00
6,500	SY	Removal of Existing Paving	\$35.00	\$227,500.00
8,200	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$984,000.00
0	CY	Concrete for raised Station Plat form	\$100.00	\$0.00
16,400	LF	Curb & Gutter	\$30.00	\$492,000.00
0	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$0.00
24,600	SF	Grass Pavers	\$5.00	\$123,000.00
16,500	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$49,500.00
8,200	LF	5" Solid White Pavement Marking Line	\$3.00	\$24,600.00
1,200	LF	5" Broken White Pavement Marking Line	\$3.00	\$3,600.00
42	EA	Ground Mounted Sign	\$350.00	\$14,700.00
24,600	SF	Topsoil and Hydro seed	\$1.00	\$24,600.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$6,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
0	EA	RTV Station (inc. install)	\$250,000.00	\$0.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
4	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$120,000.00
14	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$350,000.00
14	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$3,640,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
8	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$73.44

Subtotal:	<b>\$6,707,973.44</b>
Utilities (20%)	\$1,341,594.69
M.O.T. (10%)	\$670,797.34
Design Fees (10%)	\$670,797.34
Contingency (35%)	\$2,347,790.70
<b>Total:</b>	<b>\$11,738,953.52</b>

**Opinion of Probable Construction Costs**

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# Route 5

## Key West Avenue

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<b>PHASE 2</b>
<b>4.85miles</b>
<b>\$ 11,158,788</b>
<hr/>
<b>Cost/Mile</b>
<b>\$ 2,300,781</b>

### OVERALL DESCRIPTION

#### From Life Science Center to Rockville Metro Station

We suggest that the TTF consider moving this route to Phase 3. West Montgomery Avenue and East Jefferson Street: we believe it is impractical to build a dedicated guideway. Overall 72% of this route would need to be in mixed traffic at this time.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

### Recommended Option

***Consider NOT building this route at this time.***

1. Build single guide way in median along Key West Avenue to Omega Drive (0.53 miles).
2. Interchange is planned at Key West Avenue/Shady Grove Road. Run in mixed traffic thru intersection.
3. Run single guide way in median to Research Boulevard (1.06 miles).
4. Then RTVs in mixed traffic to MD 355.
5. MD 28 north/east of I-270 is a basic 2 lane road making RTV guideway very difficult, impractical.
6. Re-examine after R.O.W. is acquired.

**Key West Avenue - Life Science Center to Rockville Metro Station**

Location: Montgomery County Maryland

Miles:	4.85
Cost Per Mile:	<b>\$2,300,781</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
9,600	CY	Earthwork	\$25.00	\$240,000.00
5,800	CY	Removal of Existing Grass Area	\$30.00	\$174,000.00
3,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$45,000.00
4,500	LF	Saw-Cut Existing Pavement	\$10.00	\$45,000.00
1,500	SY	Removal of Existing Paving	\$35.00	\$52,500.00
7,200	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$864,000.00
300	CY	Concrete for raised Station Plat form	\$100.00	\$30,000.00
14,200	LF	Curb & Gutter	\$30.00	\$426,000.00
0	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$0.00
21,600	SF	Grass Pavers	\$5.00	\$108,000.00
14,200	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$42,600.00
5,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$15,000.00
200	LF	5" Broken White Pavement Marking Line	\$3.00	\$600.00
25	EA	Ground Mounted Sign	\$350.00	\$8,750.00
21,000	SF	Topsoil and Hydro seed	\$1.00	\$21,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
500	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$4,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
2	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$60,000.00
14	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$350,000.00
14	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$3,640,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00

Subtotal:	\$6,376,450.00
Utilities (20%)	\$1,275,290.00
M.O.T. (10%)	\$637,645.00
Design Fees (10%)	\$637,645.00
Contingency (35%)	\$2,231,757.50
<b>Total:</b>	<b>\$11,158,787.50</b>

**Opinion of Probable Construction Costs**

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# MD 28/Norbeck Road

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## OVERALL DESCRIPTION

### From Rockville Metro Station North to Rossmoor Boulevard

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option – No R.O.W. Needed

1. Build single guideway from MD 586 to MD 97, remove dedicated left turns from Baltimore Road to MD 97.
2. In mixed traffic from MD 115 to MD 97.
3. Then, use the MD 97 route North to ICC or South to Wheaton.

**PHASE 2**

5.54miles

\$ 13,454,700

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Cost/Mile

\$ 2,428,646



**MD 28 / Norbeck Road - Metro Station north to Rossmoor Boulevard**

Location: Montgomery County Maryland

Miles:	5.54
Cost Per Mile:	<b>\$2,428,646</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
8,000	CY	Earthwork	\$25.00	\$200,000.00
6,000	CY	Removal of Existing Grass Area	\$30.00	\$180,000.00
20,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$300,000.00
19,500	LF	Saw-Cut Existing Pavement	\$10.00	\$195,000.00
2,000	SY	Removal of Existing Paving	\$35.00	\$70,000.00
19,400	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,328,000.00
400	CY	Concrete for raised Station Plat form	\$100.00	\$40,000.00
40,000	LF	Curb & Gutter	\$30.00	\$1,200,000.00
500	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$22,500.00
60,000	SF	Grass Pavers	\$5.00	\$300,000.00
40,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$120,000.00
17,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$51,000.00
300	LF	5" Broken White Pavement Marking Line	\$3.00	\$900.00
84	EA	Ground Mounted Sign	\$350.00	\$29,400.00
60,000	SF	Topsoil and Hydro seed	\$1.00	\$60,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
200	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$1,600.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
2	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$60,000.00
8	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$200,000.00
8	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$2,080,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
Subtotal:				<b>\$7,688,400.00</b>
Utilities (20%)				<b>\$1,537,680.00</b>
M.O.T. (10%)				<b>\$768,840.00</b>
Design Fees (10%)				<b>\$768,840.00</b>
Contingency (35%)				<b>\$2,690,940.00</b>
<b>Total:</b>				<b>\$13,454,700.00</b>

**Opinion of Probable Construction Costs**

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# Route 46

## Georgia Avenue South

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<b>PHASE 3</b>
<b>3.52miles</b>
<b>\$ 33,221,202</b>
<hr/>
<b>Cost/Mile</b>
<b>\$ 9,437,841</b>

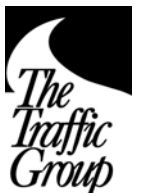
### OVERALL DESCRIPTION

#### **Silver Spring Transit Center North to Wheaton Metro Station**

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### **Recommended Option – No R.O.W. Needed**

1. South of 16<sup>th</sup> Street, remove median and build 7 lane reversible lane system as noted in #3.
2. At I-495 to 16<sup>th</sup> Street, use existing reversible lanes.
3. Remove median, build basic 7 lane reversible lane system – morning peak hour 1 BAT lane southbound, 3 auto lanes southbound, 2 auto lanes northbound, 1 BAT lane northbound.





**Georgia Avenue South - Silver Spring Transit Center north to Wheaton Metro Station**

Location: Montgomery County Maryland

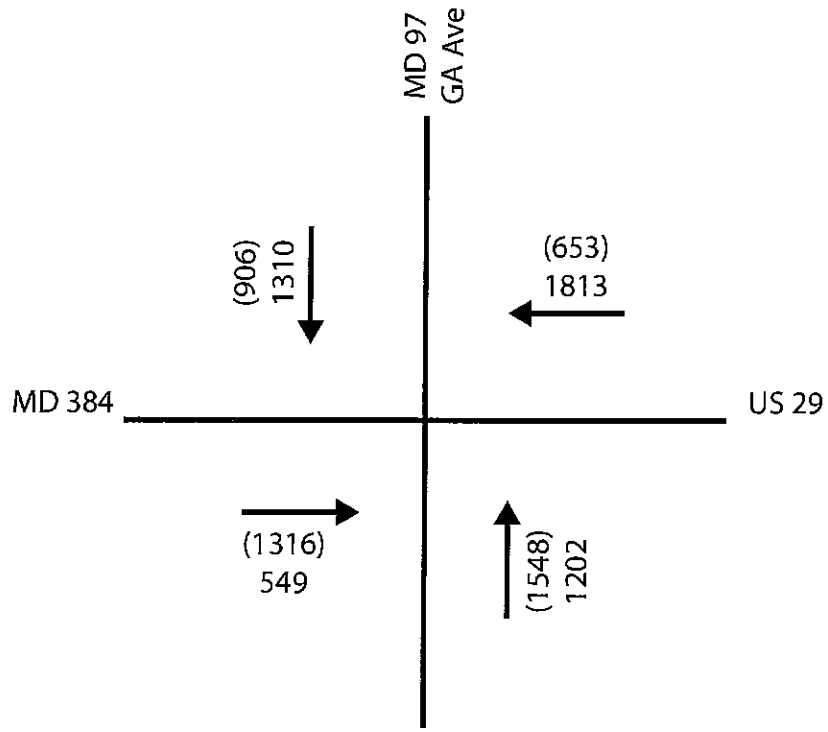
**Preliminary Cost Estimate**

Miles:	3.52
Cost Per Mile:	<b>\$9,437,841</b>
	<b>Recommended Option</b>

Quantity	Unit	Description	Unit Price	Total Price
26,000	CY	Earthwork	\$25.00	\$650,000.00
500	CY	Removal of Existing Grass Area	\$30.00	\$15,000.00
480	LF	Removal of Existing Curb & Gutter	\$15.00	\$7,200.00
52,000	LF	Saw-Cut Existing Pavement	\$10.00	\$520,000.00
52,000	SY	Removal of Existing Paving	\$35.00	\$1,820,000.00
37,400	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,488,000.00
2,000	CY	Concrete for raised Station Plat form	\$100.00	\$200,000.00
0	LF	Curb & Gutter	\$30.00	\$0.00
2,000	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$90,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
78,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$234,000.00
110,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$330,000.00
360	LF	5" Broken White Pavement Marking Line	\$3.00	\$1,080.00
260	EA	Ground Mounted Sign	\$350.00	\$91,000.00
0	SF	Topsoil and Hydro seed	\$1.00	\$0.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
5,200	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$41,600.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
190,000	SF	Mill and Overlay	\$7.00	\$1,330,000.00
4	EA	RTV Station (inc. install)	\$250,000.00	\$1,000,000.00
38,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$216,600.00
44	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$3,960,000.00
8	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$240,000.00
13	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$325,000.00
13	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$3,380,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
4,800	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$44,064.00
Subtotal:				<b>\$18,983,544.00</b>
Utilities (20%)				\$3,796,708.80
M.O.T. (10%)				\$1,898,354.40
Design Fees (10%)				\$1,898,354.40
Contingency (35%)				\$6,644,240.40
Total:				<b>\$33,221,202.00</b>

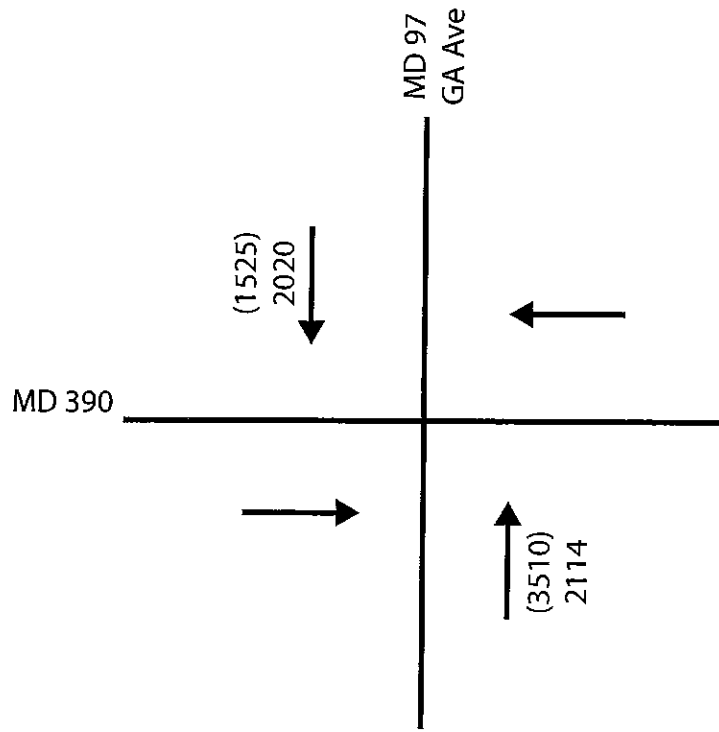
**Opinion of Probable Construction Costs**

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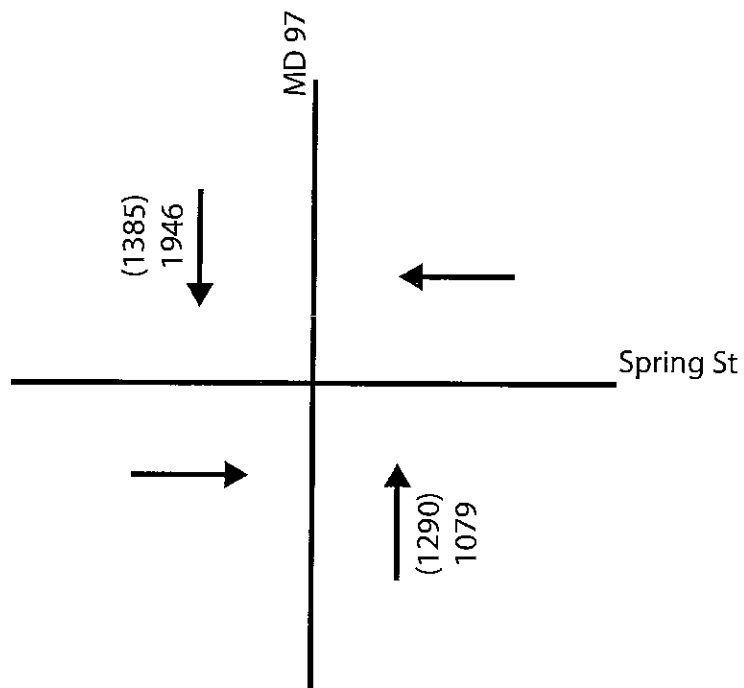


Date of Count  
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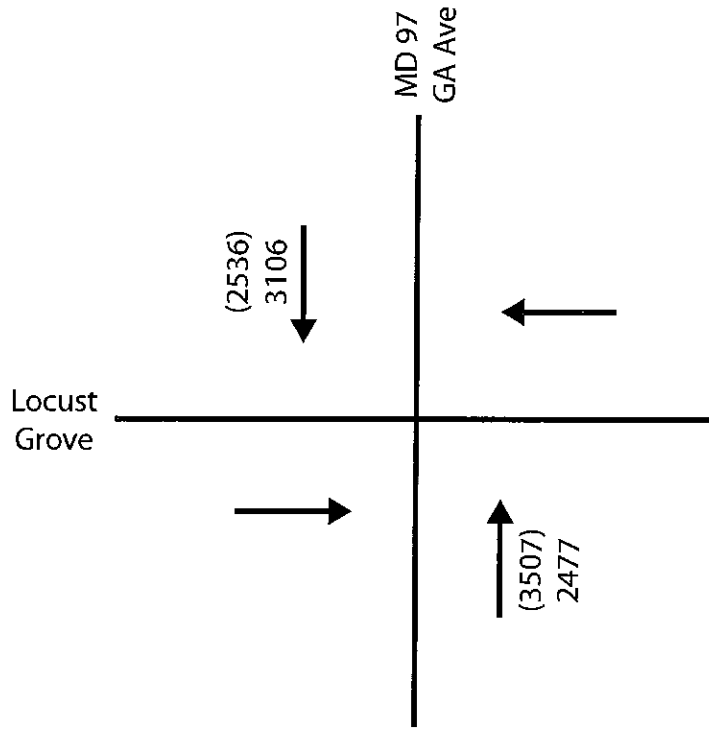
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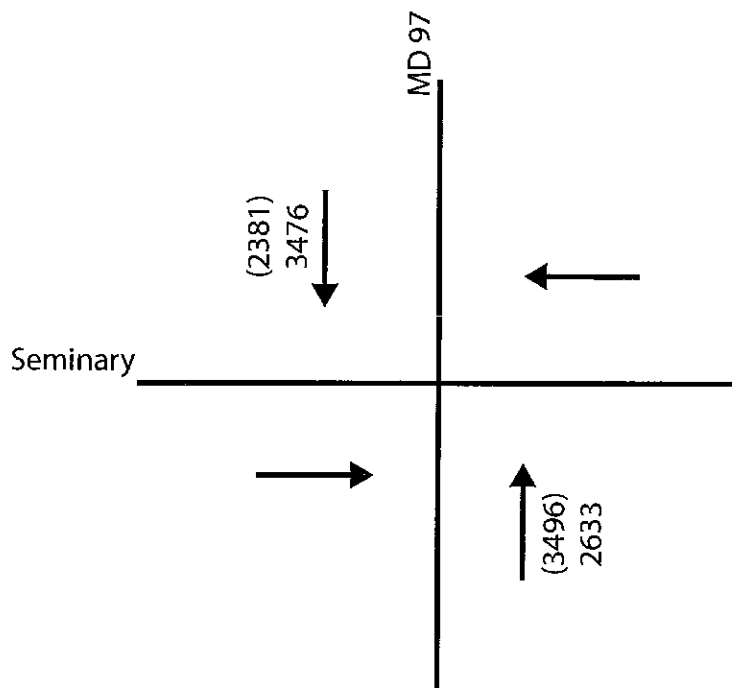
Date of Count  
6.15.2011



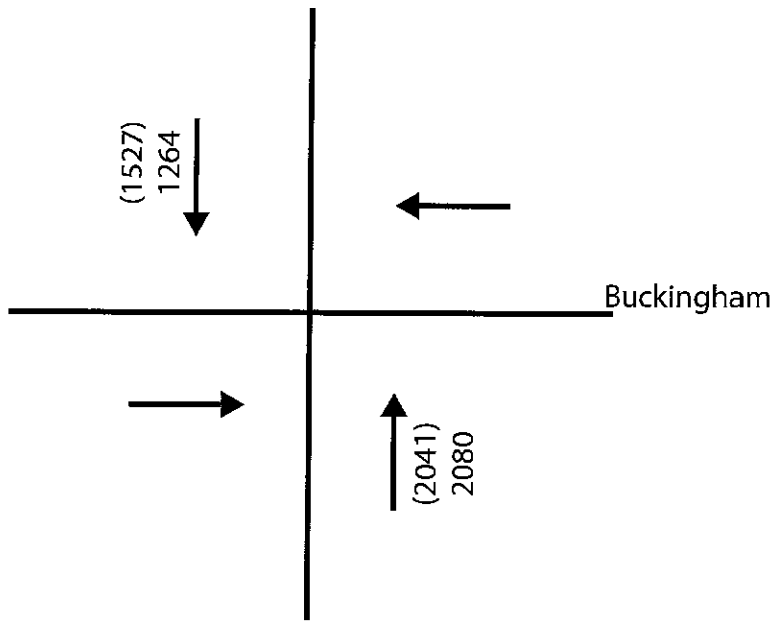
Date of Count  
9.13.2006



Date of Count  
6.2.2011



Date of Count  
6.8.2011



Date of Count  
4.22.2010

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# Route 7

## Muddy Branch

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**PHASE 3**

**5.16miles**

**\$ 14,297,850**

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**Cost/Mile**

**\$ 2,770,901**

### OVERALL DESCRIPTION

#### **MD 119 at Muddy Branch North to Lake Forest Mall**

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### **Recommended Option - No R.O.W. Needed**

1. Single guideway along MD 119 from County Training Center Station (for CCT) northerly.
2. Run RTVs in mixed traffic along MD 117 to MD 355, then along MD 355 to mall.

**Muddy Branch - MD 119 at Muddy Branch north to Lake Forest Mall**

Location: Montgomery County Maryland

Miles:	5.16
Cost Per Mile:	<b>\$2,770,901</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
10,300	CY	Earthwork	\$25.00	\$257,500.00
12,000	CY	Removal of Existing Grass Area	\$30.00	\$360,000.00
6,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$90,000.00
7,500	LF	Saw-Cut Existing Pavement	\$10.00	\$75,000.00
1,400	SY	Removal of Existing Paving	\$35.00	\$49,000.00
15,400	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$1,848,000.00
800	CY	Concrete for raised Station Plat form	\$100.00	\$80,000.00
30,000	LF	Curb & Gutter	\$30.00	\$900,000.00
1,000	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$45,000.00
46,200	SF	Grass Pavers	\$5.00	\$231,000.00
30,800	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$92,400.00
9,600	LF	5" Solid White Pavement Marking Line	\$3.00	\$28,800.00
600	LF	5" Broken White Pavement Marking Line	\$3.00	\$1,800.00
50	EA	Ground Mounted Sign	\$350.00	\$17,500.00
46,200	SF	Topsoil and Hydro seed	\$1.00	\$46,200.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
1,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$8,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
2	EA	RTV Station (inc. install)	\$250,000.00	\$500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
4	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$120,000.00
12	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$300,000.00
12	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$3,120,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
			Subtotal:	\$8,170,200.00
			Utilities (20%)	\$1,634,040.00
			M.O.T. (10%)	\$817,020.00
			Design Fees (10%)	\$817,020.00
			Contingency (35%)	\$2,859,570.00
			<b>Total:</b>	<b>\$14,297,850.00</b>

**Opinion of Probable Construction Costs**

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# Route 10a

## MD 355 North

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**PHASE 3**

**8.08miles**

**\$ 54,188,575**

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**Cost/Mile**

**\$ 6,706,507**

### OVERALL DESCRIPTION

#### Rockville Metro Station North to Milestone Manor Road

Consider RTV at such time as MD 355 is widened to five or more lanes North of MD 27 to Clarksburg. The mileage of this section as 2 lanes is 2.6 miles. If this is included, the total length is 13.3 miles.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

#### Recommended Option - No R.O.W. Needed

1. Remove median. Eliminate left turn lanes and build a single dedicated guideway.

#### Option 1 - No R.O.W. Needed (see Alternate5)

2. Build BAT lanes.

#### Option 2 - No R.O.W. Needed (see Alternate 3)

3. Remove median build double guideway, build new left turn lanes, eliminate 1 auto lane in each direction.

#### Option 3 - No R.O.W. Needed (see Alternates 8 and 9)

4. Remove median and build 7 lane reversible lane system. Morning peak hour 1 BAT lane southbound, 3 auto lanes southbound, 2 auto lanes northbound, 1 BAT lane northbound.



**MD 355 North - Rockville Metro Station to Milestone Manor Road**

Location: Montgomery County Maryland

Miles:	8.08
Cost Per Mile:	<b>\$6,706,507</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
33,400	CY	Earthwork	\$25.00	\$835,000.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
90,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,350,000.00
52,000	LF	Saw-Cut Existing Pavement	\$10.00	\$520,000.00
38,000	SY	Removal of Existing Paving	\$35.00	\$1,330,000.00
50,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$6,000,000.00
3,600	CY	Concrete Raised Station Plat form	\$100.00	\$360,000.00
102,000	LF	Curb & Gutter	\$30.00	\$3,060,000.00
2,600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$117,000.00
160,000	SF	Grass Pavers	\$5.00	\$800,000.00
102,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$306,000.00
24,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$72,000.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
310	EA	Ground Mounted Sign	\$350.00	\$108,500.00
160,000	SF	Topsoil and Hydro seed	\$1.00	\$160,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$30,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
13	EA	RTV Station (inc. install)	\$250,000.00	\$3,250,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
26	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$780,000.00
40	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$1,000,000.00
40	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$10,400,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00

Subtotal:	\$30,964,900.00
Utilities (20%)	\$6,192,980.00
M.O.T. (10%)	\$3,096,490.00
Design Fees (10%)	\$3,096,490.00
Contingency (35%)	\$10,837,715.00
<b>Total:</b>	<b>\$54,188,575.00</b>

**Opinion of Probable Construction Costs**

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**MD 355 North - Rockville Metro Station to Milestone Manor Road**

Location: Montgomery County Maryland

Miles:	8.08
Cost Per Mile:	<b>\$8,886,158</b>
	<b>Option 1</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
67,000	CY	Earthwork	\$25.00	\$1,675,000.00
2,000	CY	Removal of Existing Grass Area	\$30.00	\$60,000.00
2,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$30,000.00
102,000	LF	Saw-Cut Existing Pavement	\$10.00	\$1,020,000.00
134,000	SY	Removal of Existing Paving	\$35.00	\$4,690,000.00
102,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$12,240,000.00
8,600	CY	Concrete Raised Station Plat form	\$100.00	\$860,000.00
2,000	LF	Curb & Gutter	\$30.00	\$60,000.00
2,600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$117,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
2,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$6,000.00
124,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$372,000.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
310	EA	Ground Mounted Sign	\$350.00	\$108,500.00
0	SF	Topsoil and Hydro seed	\$1.00	\$0.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
3,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$30,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
26	EA	RTV Station (inc. install)	\$250,000.00	\$6,500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
52	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$1,560,000.00
40	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$1,000,000.00
40	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$10,400,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
32,000	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$293,760.00

Subtotal:	<b>\$41,028,660.00</b>
Utilities (20%)	\$8,205,732.00
M.O.T. (10%)	\$4,102,866.00
Design Fees (10%)	\$4,102,866.00
Contingency (35%)	\$14,360,031.00
<b>Total:</b>	<b>\$71,800,155.00</b>

**Opinion of Probable Construction Costs**

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**MD 355 North - Rockville Metro Station to Milestone Manor Road**

Location: Montgomery County Maryland

Miles:	8.08
Cost Per Mile:	\$11,259,756
	<b>Option 2</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
83,000	CY	Earthwork	\$25.00	\$2,075,000.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
100,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,500,000.00
156,000	LF	Saw-Cut Existing Pavement	\$10.00	\$1,560,000.00
114,000	SY	Removal of Existing Paving	\$35.00	\$3,990,000.00
150,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$18,000,000.00
3,600	CY	Concrete Raised Station Plat form	\$100.00	\$360,000.00
202,000	LF	Curb & Gutter	\$30.00	\$6,060,000.00
2,600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$117,000.00
300,000	SF	Grass Pavers	\$5.00	\$1,500,000.00
102,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$306,000.00
44,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$132,000.00
3,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$9,000.00
310	EA	Ground Mounted Sign	\$350.00	\$108,500.00
300,000	SF	Topsoil and Hydro seed	\$1.00	\$300,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
5,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$46,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
2,000	SF	Mill and Overlay	\$7.00	\$14,000.00
13	EA	RTV Station (inc. install)	\$250,000.00	\$3,250,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
26	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$780,000.00
40	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$1,000,000.00
40	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$10,400,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00

Subtotal:	\$51,987,900.00
Utilities (20%)	\$10,397,580.00
M.O.T. (10%)	\$5,198,790.00
Design Fees (10%)	\$5,198,790.00
Contingency (35%)	\$18,195,765.00
<b>Total:</b>	<b>\$90,978,825.00</b>

**Opinion of Probable Construction Costs**

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**MD 355 North - Rockville Metro Station to Milestone Manor Road**

Location: Montgomery County Maryland

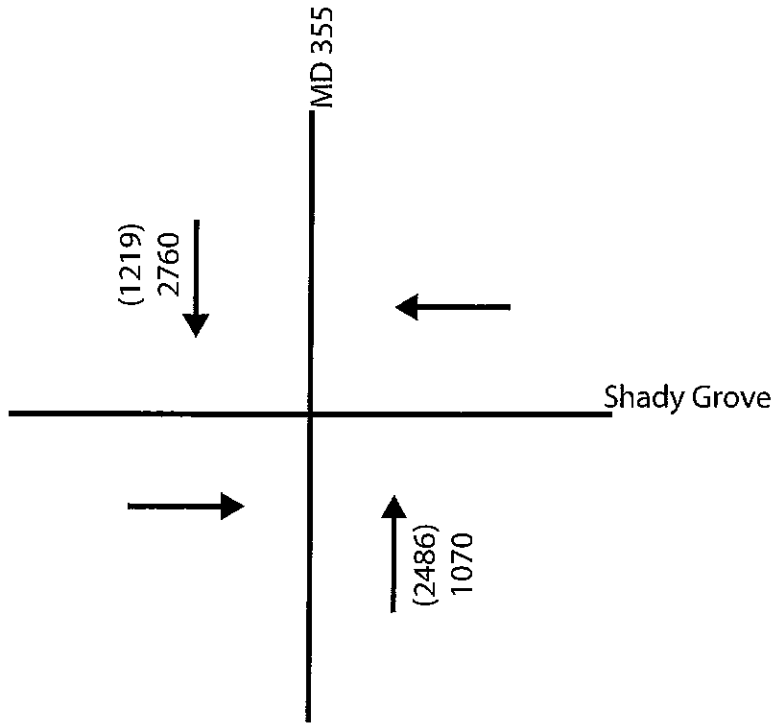
Miles:	8.08
Cost Per Mile:	<b>\$10,602,154</b>
	<b>Option 3</b>

**Preliminary Cost Estimate**

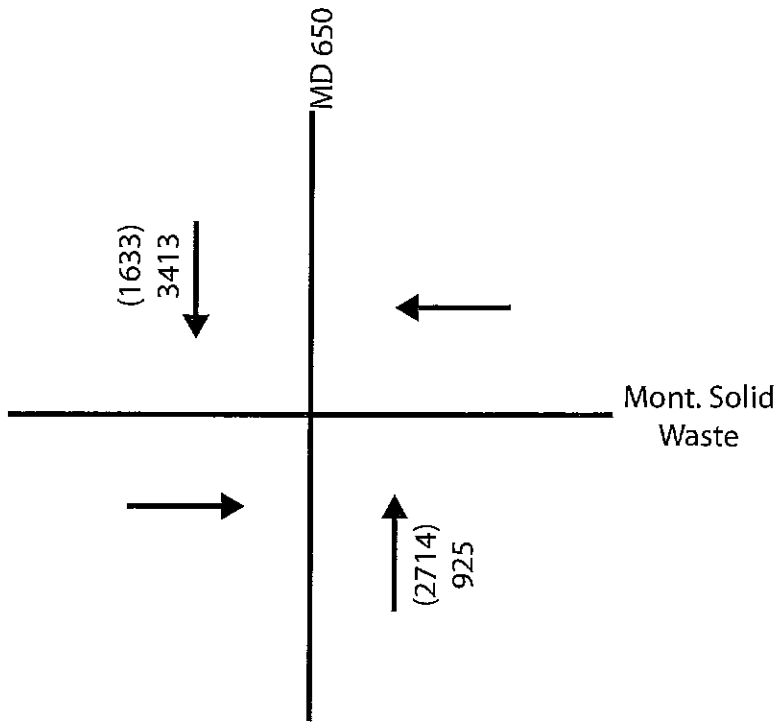
Quantity	Unit	Description	Unit Price	Total Price
83,000	CY	Earthwork	\$25.00	\$2,075,000.00
16,000	CY	Removal of Existing Grass Area	\$30.00	\$480,000.00
100,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,500,000.00
156,000	LF	Saw-Cut Existing Pavement	\$10.00	\$1,560,000.00
114,000	SY	Removal of Existing Paving	\$35.00	\$3,990,000.00
150,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$18,000,000.00
7,200	CY	Concrete Raised Station Plat form	\$100.00	\$720,000.00
2,000	LF	Curb & Gutter	\$30.00	\$60,000.00
5,600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$252,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
2,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$6,000.00
115,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$345,000.00
8,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$24,000.00
310	EA	Ground Mounted Sign	\$350.00	\$108,500.00
3,000	SF	Topsoil and Hydro seed	\$1.00	\$3,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
5,800	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$46,400.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
4,000	SF	Mill and Overlay	\$7.00	\$28,000.00
26	EA	RTV Station (inc. install)	\$250,000.00	\$6,500,000.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
52	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$1,560,000.00
40	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$1,000,000.00
40	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$10,400,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
32,000	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$293,760.00
		<b>Subtotal:</b>		<b>\$48,951,660.00</b>
		Utilities (20%)		\$9,790,332.00
		M.O.T. (10%)		\$4,895,166.00
		Design Fees (10%)		\$4,895,166.00
		Contingency (35%)		\$17,133,081.00
		<b>Total:</b>		<b>\$85,665,405.00</b>

**Opinion of Probable Construction Costs**

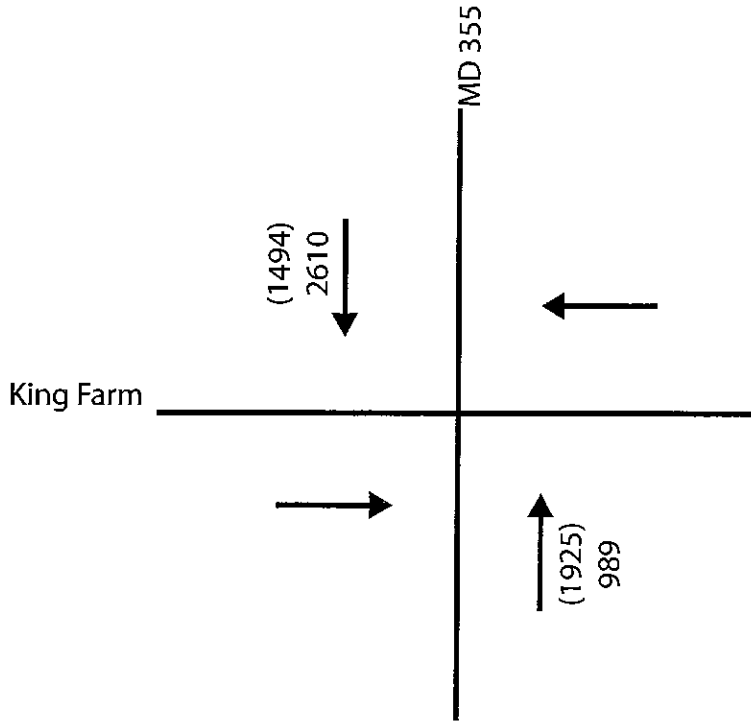
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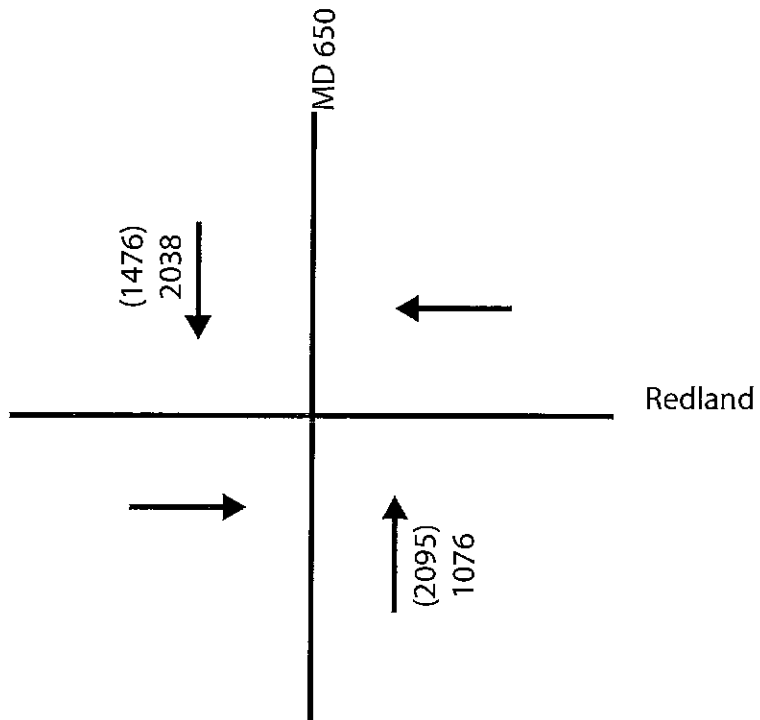
Date of Count  
5.12.2011



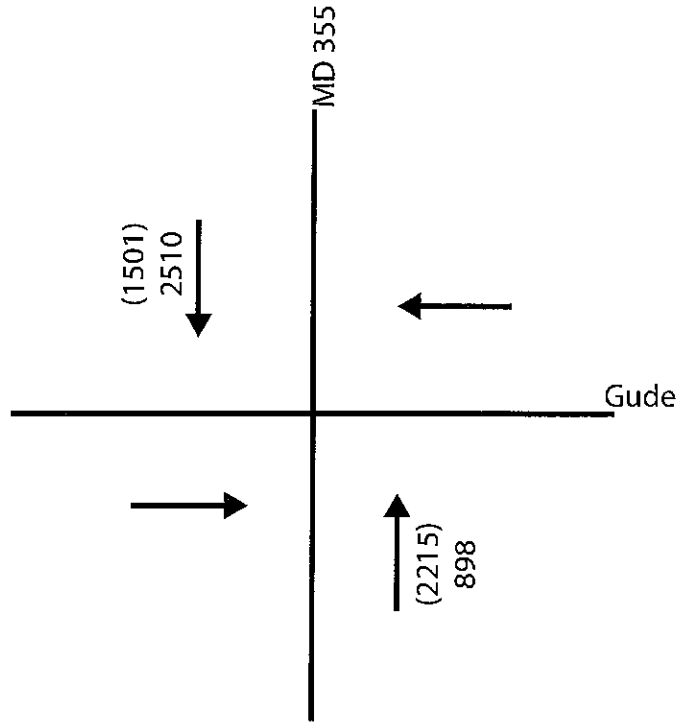
Date of Count  
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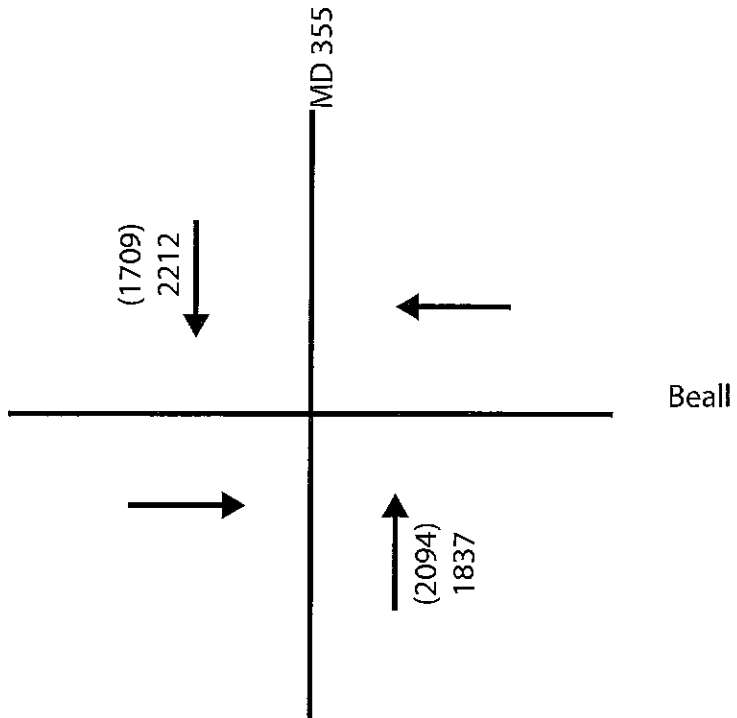
Date of Count  
3.11.2010



Date of Count  
10.28.2010



Date of Count  
1.19.2011



Date of Count  
9.16.2008

# MD 355 South

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**PHASE 3**

**1.71miles**

**\$ 9,705,892**

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**Cost/Mile**

**\$ 5,675,960**

## OVERALL DESCRIPTION

**From DC Line [Friendship Heights Metro Station] North to Bethesda Metro Station**

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

### Recommended Option - No R.O.W. Needed

1. Remove median and build dedicated single guideway and remove left turn lanes.

### Option 1 - No R.O.W. Needed (see Alternates 7 and 9)

2. Remove median and build 7 lane reversible lane system – morning peak – 1 BAT lane southbound (dedicated), 3 auto lanes southbound, 2 auto lanes northbound, 1 BAT lane northbound (dedicated).

### Option 2 - No R.O.W. Needed (see Alternate 5)

3. Build BAT lanes northbound and southbound, remove 1 auto lane each direction.



**MD 355 South (DC Line to Bethesda Metro Station)**

Location: Montgomery County Maryland

Miles:	1.71
<b>Cost Per Mile:</b>	<b>\$5,675,960</b>
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
2,800	CY	Earthwork	\$25.00	\$70,000.00
1,800	CY	Removal of Existing Grass Area	\$30.00	\$54,000.00
13,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$195,000.00
6,800	LF	Saw-Cut Existing Pavement	\$10.00	\$68,000.00
5,500	SY	Removal of Existing Paving	\$35.00	\$192,500.00
7,600	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$912,000.00
1,400	CY	Concrete for raised Station Plat form	\$100.00	\$140,000.00
14,000	LF	Curb & Gutter	\$30.00	\$420,000.00
800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$36,000.00
24,000	SF	Grass Pavers	\$5.00	\$120,000.00
14,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$42,000.00
7,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$21,000.00
200	LF	5" Broken White Pavement Marking Line	\$3.00	\$600.00
34	EA	Ground Mounted Sign	\$350.00	\$11,900.00
24,000	SF	Topsoil and Hydro seed	\$1.00	\$24,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
700	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$5,600.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
2	EA	RTV Station (inc. install)	\$250,000.00	\$500,000.00
800	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$4,560.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
4	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$120,000.00
9	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$225,000.00
9	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$2,340,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
4,800	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$44,064.00

Subtotal:	\$5,546,224.00
Utilities (20%)	\$1,109,244.80
M.O.T. (10%)	\$554,622.40
Design Fees (10%)	\$554,622.40
Contingency (35%)	\$1,941,178.40
<b>Total:</b>	<b>\$9,705,892.00</b>

**Opinion of Probable Construction Costs**

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**MD 355 South (DC Line to Bethesda Metro Station)**

Location: Montgomery County Maryland

Miles:	1.71
Cost Per Mile:	<b>\$9,088,481</b>
	<b>Option 1</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
300	CY	Earthwork	\$25.00	\$7,500.00
200	CY	Removal of Existing Grass Area	\$30.00	\$6,000.00
10,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$150,000.00
21,400	LF	Saw-Cut Existing Pavement	\$10.00	\$214,000.00
23,200	SY	Removal of Existing Paving	\$35.00	\$812,000.00
20,800	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,496,000.00
1,400	CY	Concrete for raised Station Plat form	\$100.00	\$140,000.00
200	LF	Curb & Gutter	\$30.00	\$6,000.00
800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$36,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
200	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$600.00
21,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$63,000.00
800	LF	5" Broken White Pavement Marking Line	\$3.00	\$2,400.00
34	EA	Ground Mounted Sign	\$350.00	\$11,900.00
200	SF	Topsoil and Hydro seed	\$1.00	\$200.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
500	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$4,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
2	EA	RTV Station (inc. install)	\$250,000.00	\$500,000.00
14,400	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$82,080.00
18	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$1,620,000.00
4	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$120,000.00
9	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$225,000.00
9	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$2,340,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
4,800	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$44,064.00
			Subtotal:	<b>\$8,880,744.00</b>
			Utilities (20%)	<b>\$1,776,148.80</b>
			M.O.T. (10%)	<b>\$888,074.40</b>
			Design Fees (10%)	<b>\$888,074.40</b>
			Contingency (35%)	<b>\$3,108,260.40</b>
			<b>Total:</b>	<b>\$15,541,302.00</b>

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**MD 355 South (DC Line to Bethesda Metro Station)**

Location: Montgomery County Maryland

Miles:	1.71
Cost Per Mile:	\$6,276,200
	<b>Option 2</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
300	CY	Earthwork	\$25.00	\$7,500.00
200	CY	Removal of Existing Grass Area	\$30.00	\$6,000.00
0	LF	Removal of Existing Curb & Gutter	\$15.00	\$0.00
14,400	LF	Saw-Cut Existing Pavement	\$10.00	\$144,000.00
19,200	SY	Removal of Existing Paving	\$35.00	\$672,000.00
14,400	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$1,728,000.00
1,400	CY	Concrete for raised Station Plat form	\$100.00	\$140,000.00
200	LF	Curb & Gutter	\$30.00	\$6,000.00
800	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$36,000.00
0	SF	Grass Pavers	\$5.00	\$0.00
200	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$600.00
21,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$63,000.00
800	LF	5" Broken White Pavement Marking Line	\$3.00	\$2,400.00
34	EA	Ground Mounted Sign	\$350.00	\$11,900.00
200	SF	Topsoil and Hydro seed	\$1.00	\$200.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
500	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$4,000.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
2	EA	RTV Station (inc. install)	\$250,000.00	\$500,000.00
14,400	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$82,080.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
4	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$120,000.00
9	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$225,000.00
9	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$2,340,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
4,800	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$44,064.00

Subtotal:	\$6,132,744.00
Utilities (20%)	\$1,226,548.80
M.O.T. (10%)	\$613,274.40
Design Fees (10%)	\$613,274.40
Contingency (35%)	\$2,146,460.40
<b>Total:</b>	<b>\$10,732,302.00</b>

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# Sam Eig Highway

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## OVERALL DESCRIPTION

### From MD 119 North to I-270

This section will be built in the median. RTVs will be operating in the auto lanes of the ICC (MD 200) and I-370, then to median of Sam Eig Highway.

At major signalized intersections and interchanges, we assumed RTVs in mixed traffic due to heavy left turns (not removing left turns lanes for transitways), ramps, bridges, etc. and lack of right of way at this time.

### Recommended Option – No R.O.W. Needed

1. Build guideway in median from I-270 to MD 119.
2. Then, follow MD 119 system to be built for route from Lake Forest Mall to the CCT at the county Service Center.

**PHASE 3**

**1.03miles**

**\$ 4,073,825**

**Cost/Mile**

**\$ 3,995,170**

**Sam Eig Highway - MD 119 north to I-270**

Location: Montgomery County Maryland

Miles:	1.03
Cost Per Mile:	\$3,955,170
	<b>Recommended Option</b>

**Preliminary Cost Estimate**

Quantity	Unit	Description	Unit Price	Total Price
7,300	CY	Earthwork	\$25.00	\$182,500.00
4,200	CY	Removal of Existing Grass Area	\$30.00	\$126,000.00
200	LF	Removal of Existing Curb & Gutter	\$15.00	\$3,000.00
500	LF	Saw-Cut Existing Pavement	\$10.00	\$5,000.00
400	SY	Removal of Existing Paving	\$35.00	\$14,000.00
5,500	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$660,000.00
0	CY	Concrete for raised Station Plat form	\$100.00	\$0.00
10,800	LF	Curb & Gutter	\$30.00	\$324,000.00
0	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$0.00
19,000	SF	Grass Pavers	\$5.00	\$95,000.00
10,800	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$32,400.00
800	LF	5" Solid White Pavement Marking Line	\$3.00	\$2,400.00
200	LF	5" Broken White Pavement Marking Line	\$3.00	\$600.00
12	EA	Ground Mounted Sign	\$350.00	\$4,200.00
19,000	SF	Topsoil and Hydro seed	\$1.00	\$19,000.00
0	EA	Utility Pole Relocation	\$25,000.00	\$0.00
0	EA	Utility Pole Relocation	\$50,000.00	\$0.00
0	EA	Utility Pole Relocation	\$100,000.00	\$0.00
600	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$4,800.00
0	SF	Construct Bridge Surface	\$200.00	\$0.00
0	SF	Mill and Overlay	\$7.00	\$0.00
0	EA	RTV Station (inc. install)	\$250,000.00	\$0.00
0	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$0.00
0	EA	Overhead Lane Control Signage w/wiring and controller.	\$90,000.00	\$0.00
0	EA	Pay on Foot Station (2 Per Location)	\$30,000.00	\$0.00
3	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$75,000.00
3	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$780,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
			Subtotal:	\$2,327,900.00
			Utilities (20%)	\$465,580.00
			M.O.T. (10%)	\$232,790.00
			Design Fees (10%)	\$232,790.00
			Contingency (35%)	\$814,765.00
			<b>Total:</b>	<b>\$4,073,825.00</b>

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Montgomery County  
Transit Task Force

# Rapid Transit

MONTGOMERY COUNTY, MARYLAND

