

APRIL 20, 2012

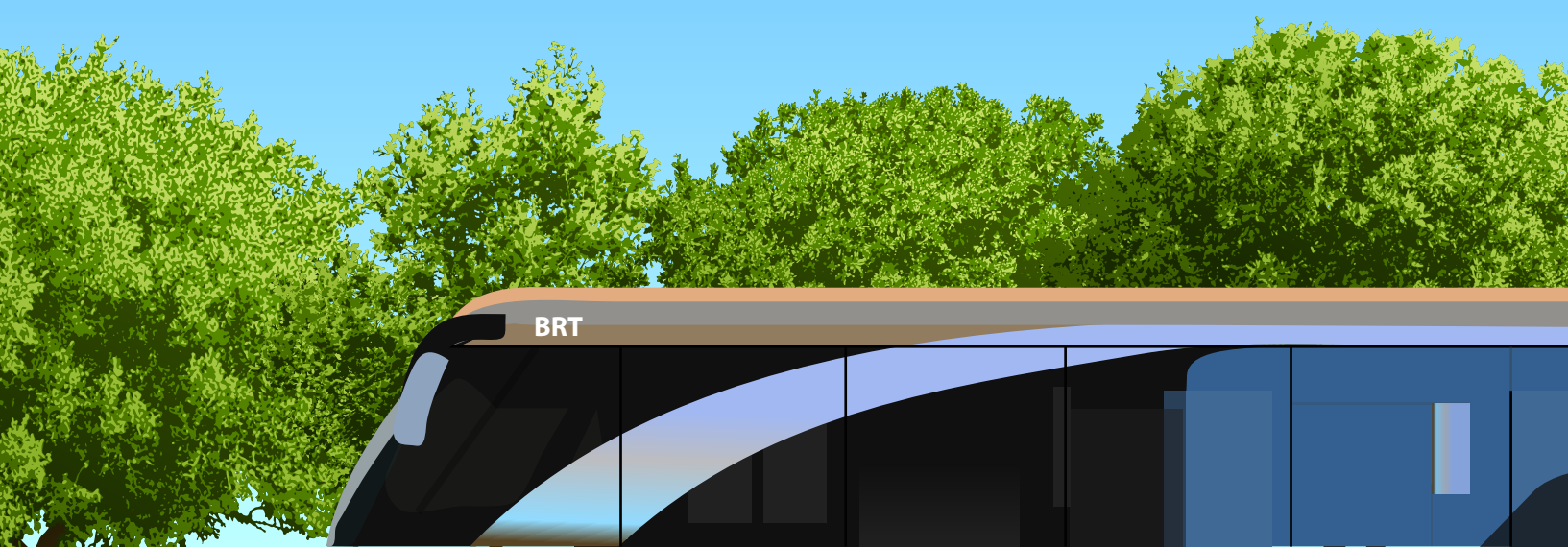
HOWARD COUNTY BRT

Concept Plans and Preliminary Cost Estimates for the Envisioned System

Prepared By:



Howard County Department of
Planning & Zoning





CORPORATE OFFICE
Baltimore, MD

Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410.931.6600
fax: 410.931.6601
1.800.583.8411

FIELD OFFICE LOCATIONS

Arkansas
Maryland
New York
Texas
Virginia

TABLE OF CONTENTS

- Executive Summary
- How this report is organized
- Acronyms and definitions
- BRT scoring matrix calculation sheet

- 1a. US 29 Columbia Pike (Burtonsville Park & Ride to Gales Lane)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section
- 1b. US 29 Columbia Pike (Gales Lane to MD 99)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section
- 2. MD 216 (US 29 to I-95)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section
- 3a. MD 32 (MD 108 to Broken Land Parkway)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section
- 3b. MD 32 (Broken Land Parkway to Savage Marc Station)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section
- 4a. Broken Land Parkway (Snowden River Parkway to Columbia Town Center)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section
- 4b. Snowden River Parkway (Broken Land Parkway to the Intersection of Oakland Mills Road at existing Rail Road Crossing)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section

- 4c. Abandoned CSX Right-of-way (Oakland Mills Road to Savage Marc Station)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section

- 5. Broken Land Parkway (Snowden River Parkway to MD 32 Interchange)
 - Preliminary Cost Estimate Sheet
 - Typical cross-section

- Cost Estimate Summary

- Concept Plans (11x17)



CORPORATE OFFICE

Baltimore, MD

Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410.931.6600
fax: 410.931.6601
1.800.583.8411

FIELD OFFICE LOCATIONS

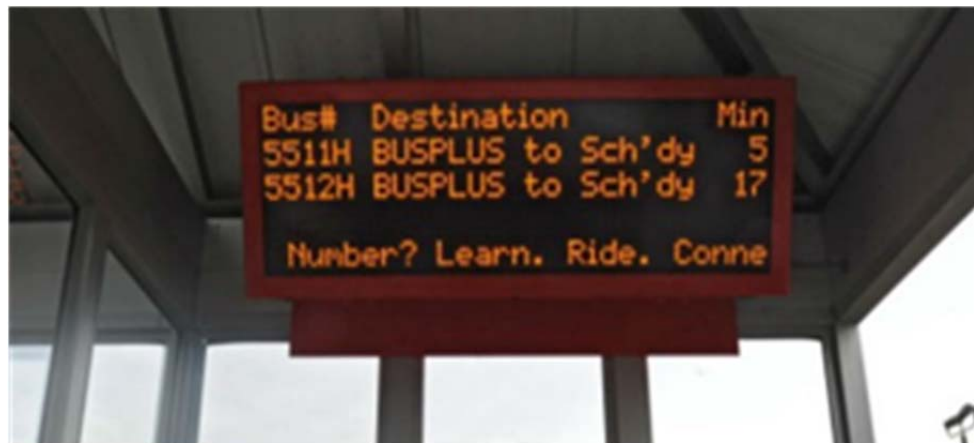
Arkansas
Maryland
New York
Texas
Virginia

EXECUTIVE SUMMARY

The Traffic Group has designed Howard County's Phase I Rapid Transit Vehicle System (B.R.T.) with the following goals and attributes.

- Rapid
- Efficient
- Cost-effective – different cross section typicals
- Quickly constructed
- Little or no environmental impact if bridges are not built for the transit ways
- Creative and Innovative (Example: Uses railroad right of way)
- Rapid Transit Technology – for vehicle and stations
- Traffic Engineering Problem Solving Techniques
- Little or No R.O.W. required
- Limited utility pole relocations

Example of Next Bus Technology – notifies patrons of next vehicle arrival.



Bridges – We can avoid the construction of most any bridge for the system to eliminate the environmental and time impact of building or expanding bridges. RTVs (Rapid Transit Vehicles) will run in mixed traffic for short distances to avoid building bridges, or lane shifts using shoulders. In the alternate we have provided bridge concepts and cost estimates if it is demanded bridges are to be built.

Stations – We have shown actual 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 other bus systems. 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. Stations will also be located at the end points of a route. We have suggested as few stations as possible to increase “Rapid” service for riders.

Due to the location of employment centers along the routes, very few stations are shown at this time.

In Road Day/ Night Lighting- We recommend (and included in our costs) lighting to differentiate the transit lanes from auto lanes when transit ways are next to auto lanes. These lights (by 3iii Traffic) are color programmable.

Cross Section Typical – Each route has some unique/different characteristics. The typicals 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. (Also assumed for cost estimates)

CHALLENGES

The principal challenge in designing this RTV System stems from trying to meet the goals/objectives of dedicated median based transitways while limiting the cost of bridges.

RESULTS

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

- a) Using existing medians
- b) Using auto lanes for RTVs in short sections of mixed traffic
- c) No right-of-way needed at all for transit ways
- d) Using existing Abandoned CSX rail corridor for dual guide way

SUMMARY

- Our unit prices are worst case, based on unit prices from July 2011 SHA cost estimates for recent contracts on SHA roads. When a median guideway is shown, the cost estimate reflects curbed guideway with grass pavers between the concrete ribbons.
- Grass pavers will not be installed in sections where the guideway changes from a closed section guideway to a RTV merge lane. The entire new lane will be concrete to allow access in/out from mixed traffic.
- We have priced all guideways – exclusive or median-based as concrete.
- Overall, the cost/mile is \$5,254,601 million/mile.

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).
- c. Acquire funding for routes, vehicles, and O&M facilities. (Possible sharing with Montgomery County)
- d. Begin detailed civil/traffic engineering study of 30% plans for the routes after selected option.

Illuminated Lane Markers





CORPORATE OFFICE

Baltimore, MD

Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410.931.6600
fax: 410.931.6601
1.800.583.8411

FIELD OFFICE LOCATIONS

Arkansas
Maryland
New York
Texas
Virginia

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. Where reasonable at this time, intermediate stations are noted.
2. Definitions/acronym list.
3. Each route has a tab/section containing the following:
 - a) Route description
 - b) Route length
 - c) Preliminary cost estimate
 - d) Recommended Option(s) to build transit way
 - e) Typical cross sections

(F:\2012\2012-0209\Wp\Organization.docx)

ACRONYMS AND DEFINITIONS

APTA	American Public Transportation Association
Auto Lane	Lane within a road used for mixed traffic: cars, trucks, buses
BAT Lane	Business Access and Transit - dedicated RTV lane not intended to be used by autos - RTVs only
BRT	Bus Rapid Transit
CCT	Corridor Cities Transit Way
CLRP	Constrained Long-Range Transportation Plan
FTA	Federal Transit Administration
GIS	Geographic Information System
Guideway	A dedicated lane for RTVs typically 8.5 ft wide with curbing that accommodates RTVs with side guide wheels to assist with horizontal sway
NCHRP	National Cooperative Highway Research Program
O&M	Operations and Maintenance
Peak Hour	The 60-min. interval with the highest volume of traffic from 6:30-9:30 AM and from 4-7 PM
PID	Passenger Information Display
R.O.W.	Right-of-Way; land owned by Gov't. avail. for public purposes.
RTV	Rapid Transit Vehicle - with or without articulation
SHA	Maryland State Highway Administration
Station	Closed area 10 ft - 12 ft wide, with amenities
TAZ	Traffic Analysis Zone
TCRP	Transit Cooperative Research Program
Transitway	A dedicated lane for RTVs
TSP	Traffic Signal Priority

(f:\2012\2012-0209\Wp\Definitions.xlsx)

BRT SCORING MATRIX

(established by ITDP)



SERVICE PLANNING

- Off-vehicle fare collection 7
- Multiple routes use same BRT infrastructure 4
- Peak period frequency 4
- Routes in top 10 demand corridors 4
- Integrated fare collection with other public transport 3
- Limited and local stop services 3
- Off-peak frequency 3
- Part of (planned) multi-corridor BRT network 3
- Performance-based contracting for operators 3
- Enforcement of right-of-way 2
- Operates late nights and weekends 2
- Operational control system to reduce bus bunching 2
- Peak-period pricing 2

INFRASTRUCTURE

- Bus lanes in central verge of the road 7
- Physically-separated right-of-way 7
- Intersection treatments (elimination of turns across the busway and signal priority) 4
- Physically-separated passing lanes at station stops 4
- Stations occupy former road/median space (not sidewalk space) 3
- Stations set back from intersections (100 feet min) 3
- Stations are in center and shared by both directions of service 2

STATION DESIGN AND STATION-BUS INTERFACE

- Platform-level boarding 5
- Buses have 3+ doors on articulated buses or 2+ very wide doors on standard buses 4
- Multiple docking bays and sub-stops (separated by at least half a bus length) 3

QUALITY OF SERVICE AND PASSENGER INFORMATION SYSTEMS

- Branding of vehicles and system 3
- Safe, wide, weather-protected stations with artwork (>/=8 feet wide) 3
- Passenger information at stops and on vehicles 2

INTEGRATION AND ACCESS

- Bicycle lanes in corridor 2
- Bicycle sharing systems at BRT stations 2
- Improved safe and attractive pedestrian access system and corridor environment 2
- Secure bicycle parking at station stops 2

— TOTAL POSSIBLE POINTS
GOLD STANDARD NEEDS 85 POINTS



US 29/Columbia Pike

OVERALL DESCRIPTION

From Burtonsville Park & Ride to MD 99

Burtonsville Park & Ride is located within the Montgomery County Limits and is the southernmost destination for the Howard County US 29 BRT Route. RTV's vehicles will travel in mixed traffic along both NB and SB within the Montgomery County portion of US 29 which begins south of the bridge over the Rocky Gorge Reservoir.

Southbound US 29 RTV's will exit directly into the Burtonsville Park & Ride. RTV's exiting the Burtonsville Park & Ride will make a left turn onto Old Columbia Pike, then a left turn onto MD 198 (Sandy Spring road), travel under US 29, and then make a left onto the Northbound on ramp to US 29.

Recommendation

1. From Burtonsville Park & Ride to County Line – In Mixed Traffic
2. North of County Line (Bridge Structure) install dedicated single lane merge area for RTV to access Dual median BRT Guide way.
3. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
4. Upgrade existing signalized intersection cross-over located at US 29 and Old Columbia Pike.
5. Install new bridge structure 2,100 feet south of the intersection of Rivers Edge Road to provide dual BRT guided crossing. NOTE: An alternative to constructing a new bridge structure is to shift lanes slightly on the existing US 29 Bridge to maintain a dedicated RTV lane within the shoulder area. (See separate cost estimate eliminating bridge construction cost).
6. Upgrade existing signalized intersection cross-over located at US 29 and Rivers Edge Road.
7. Install BRT Station along US 29 below the MD 32 Cloverleaf Interchange. Provide elevator and escalator access between the US 29 and MD 32 BRT stations.
8. Install new bridge structure 900 feet north of the Broken Land Parkway overpass to provide dual BRT guided crossing. NOTE: An alternative to constructing a new bridge structure is to shift lanes slightly on the existing US 29 Bridge to maintain a dedicated RTV lane within the shoulder area. (See separate cost estimate eliminating bridge construction cost).
9. Install un-guided single BRT lanes in both directions of US 29 at the existing median cross-over's. No curb and gutter to be installed to allow for cross-over traffic flow for emergency use.
10. Install single guided BRT lane in both directions of US 29 adjacent to median shoulder.

14.6 miles

\$ 57,775,498

Cost/Mile

\$ 4,126,821

11. Upgrade existing shoulder area to provide connection between dedicated BRT guide way and mixed traffic area adjacent to the MD 100 ramps.
12. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
13. SB US 29 – Mixed Traffic MD 99 Park & Ride Lot to just south of US 40 ramp tie-in.
14. NB US 29 – Mixed Traffic US 40 ramp area to new MD 99 Park & Ride lot.

Us 29 - Burtonsville Park & Ride to Gales Lane (Part I)

Location: Howard County Maryland

Miles:	8.10
Cost Per Mile:	\$4,258,900
	Recommended Option

ALT. Preliminary Cost Estimate w/ NO BRIDGE COST

RTV's will travel in mixed traffic within Montgomery County Limits. Install median merge lanes just north of county line bridge to access dual guide way within median. Upgrade traffic signals. Install Station below MD 32 Station.

Quantity	Unit	Description	Unit Price	Total Price
110,000	CY	Earthwork	\$25.00	\$2,750,000.00
35,000	CY	Removal of Existing Grass Area	\$30.00	\$1,050,000.00
1,200	LF	Removal of Existing Curb & Gutter	\$15.00	\$18,000.00
500	LF	Saw-Cut Existing Pavement	\$10.00	\$5,000.00
500	SY	Removal of Existing Paving	\$35.00	\$17,500.00
69,100	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$8,292,000.00
300	CY	Concrete for raised Station Plat form	\$100.00	\$30,000.00
140,000	LF	Curb & Gutter	\$30.00	\$4,200,000.00
425	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$19,125.00
195,000	SF	Grass Pavers	\$5.00	\$975,000.00
6,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$18,000.00
5,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$15,000.00
3,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$9,000.00
40	EA	Ground Mounted Sign	\$350.00	\$14,000.00
220,000	SF	Topsoil and Hydro seed	\$1.00	\$220,000.00
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	\$250.00	\$0.00
2,500	SF	Mill and Overlay	\$7.00	\$17,500.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
25,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$142,500.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
2	EA	Esculator	\$100,000.00	\$200,000.00
2	EA	Elevator	\$400,000.00	\$800,000.00
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:	\$19,712,625.00
Utilities (20%)	\$3,942,525.00
M.O.T. (10%)	\$1,971,262.50
Design Fees (10%)	\$1,971,262.50
Contingency (35%)	\$6,899,418.75
Total:	\$34,497,093.75

NO BRIDGE COST

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.

Us 29 - Burtonsville Park & Ride to Gales Lane (Part I)

Location: Howard County Maryland

Miles:	8.10
Cost Per Mile:	\$4,584,896
	Recommended Option

Preliminary Cost Estimate

RTV's will travel in mixed traffic within Montgomery County Limits. Install median merge lanes just north of county line bridge to access dual guide way within median. Upgrade traffic signals. Install new bridge crossings, Install Station below MD 32 Station.

Quantity	Unit	Description	Unit Price	Total Price
110,000	CY	Earthwork	\$25.00	\$2,750,000.00
35,000	CY	Removal of Existing Grass Area	\$30.00	\$1,050,000.00
1,200	LF	Removal of Existing Curb & Gutter	\$15.00	\$18,000.00
500	LF	Saw-Cut Existing Pavement	\$10.00	\$5,000.00
500	SY	Removal of Existing Paving	\$35.00	\$17,500.00
69,100	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$8,292,000.00
300	CY	Concrete for raised Station Plat form	\$100.00	\$30,000.00
140,000	LF	Curb & Gutter	\$30.00	\$4,200,000.00
425	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$19,125.00
195,000	SF	Grass Pavers	\$5.00	\$975,000.00
3,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$9,000.00
2,500	LF	5" Solid White Pavement Marking Line	\$3.00	\$7,500.00
1,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$4,500.00
40	EA	Ground Mounted Sign	\$350.00	\$14,000.00
220,000	SF	Topsoil and Hydro seed	\$1.00	\$220,000.00
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
6,250	SF	Construct Bridge Surface	\$250.00	\$1,562,500.00
0	SF	Mill and Overlay	\$7.00	\$0.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
22,350	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$127,395.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
2	EA	Esculator	\$100,000.00	\$200,000.00
2	EA	Elevator	\$400,000.00	\$800,000.00
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:	\$21,221,520.00
Utilities (20%)	\$4,244,304.00
M.O.T. (10%)	\$2,122,152.00
Design Fees (10%)	\$2,122,152.00
Contingency (35%)	\$7,427,532.00
Total:	\$37,137,660.00

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.

US 29 - Gales Lane to MD 99 (Part II)

Location: Howard County Maryland

Miles:	6.50
Cost Per Mile:	\$3,175,052
	Recommended Option

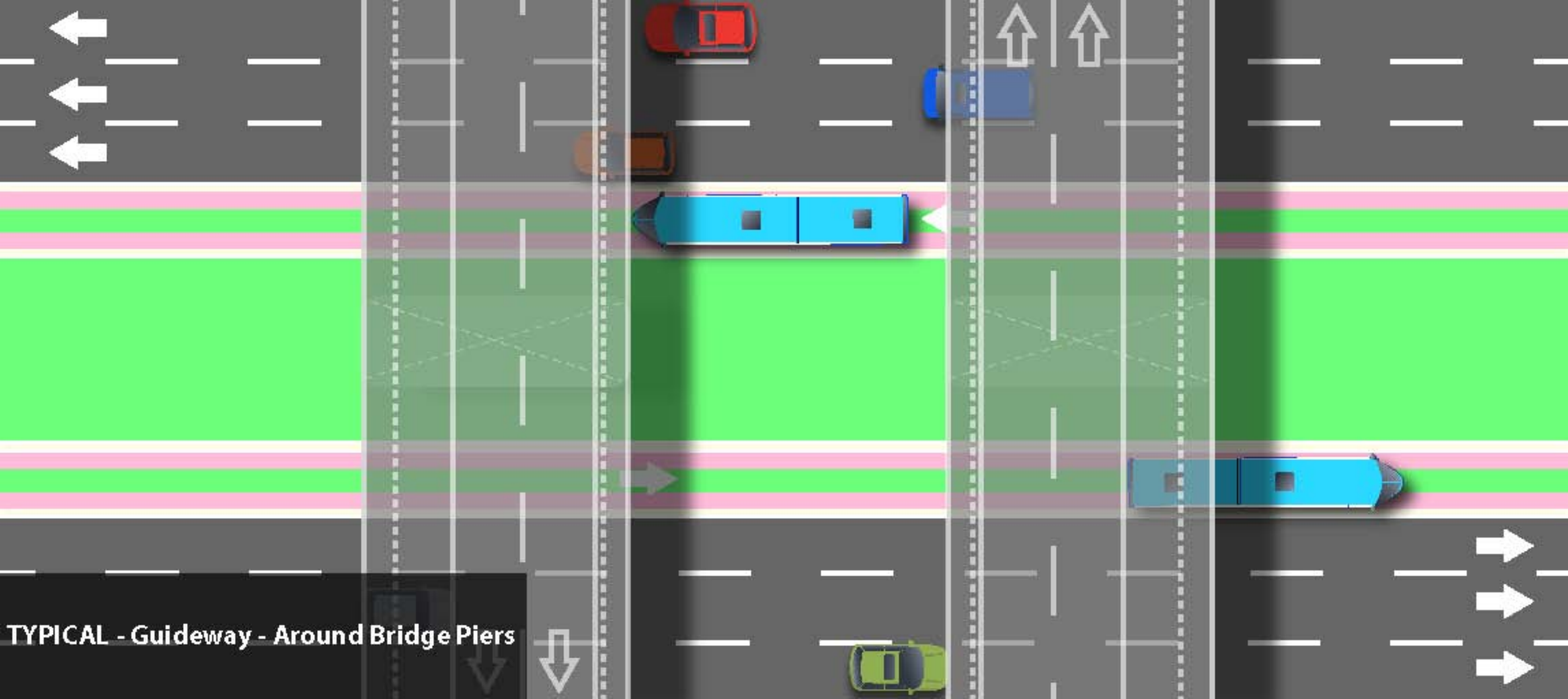
Preliminary Cost Estimate

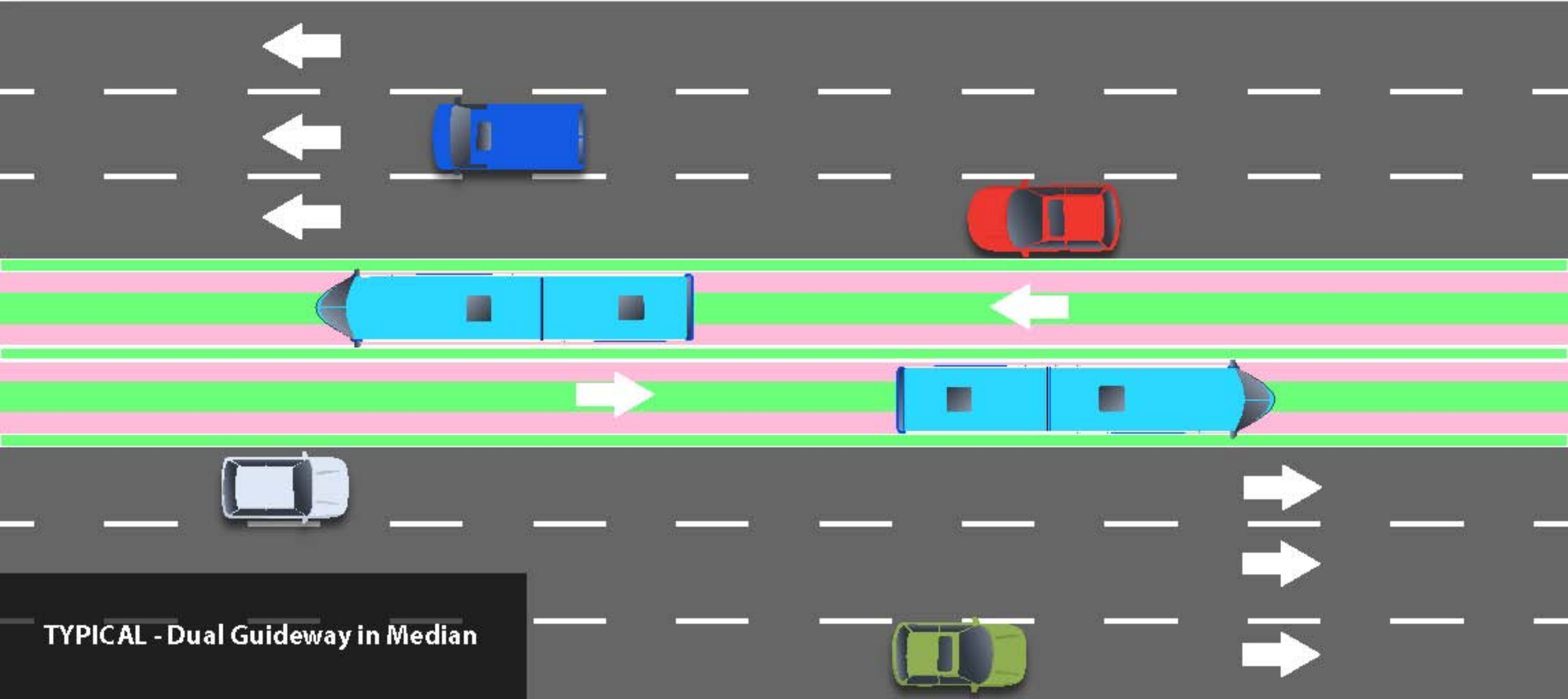
Install dual guide way within median area. Upgrade traffic signals. Maintain cross-over areas. Upgrade shoulder area to RTV lanes. Install merge lane between Guide way and Mixed Traffic areas.

Quantity	Unit	Description	Unit Price	Total Price
80,000	CY	Earthwork	\$25.00	\$2,000,000.00
30,000	CY	Removal of Existing Grass Area	\$30.00	\$900,000.00
300	LF	Removal of Existing Curb & Gutter	\$15.00	\$4,500.00
500	LF	Saw-Cut Existing Pavement	\$10.00	\$5,000.00
4,800	SY	Removal of Existing Paving	\$35.00	\$168,000.00
39,350	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,722,000.00
300	CY	Concrete for raised Station Plat form	\$100.00	\$30,000.00
80,000	LF	Curb & Gutter	\$30.00	\$2,400,000.00
450	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$20,250.00
118,050	SF	Grass Pavers	\$5.00	\$590,250.00
4,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$12,000.00
2,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$6,000.00
1,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$4,500.00
45	EA	Ground Mounted Sign	\$350.00	\$15,750.00
315,000	SF	Topsoil and Hydro seed	\$1.00	\$315,000.00
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	\$250.00	\$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
1	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$25,000.00
1	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$260,000.00
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:				\$11,793,050.00
Utilities (20%)				\$2,358,610.00
M.O.T. (10%)				\$1,179,305.00
Design Fees (10%)				\$1,179,305.00
Contingency (35%)				\$4,127,567.50
Total:				\$20,637,837.50

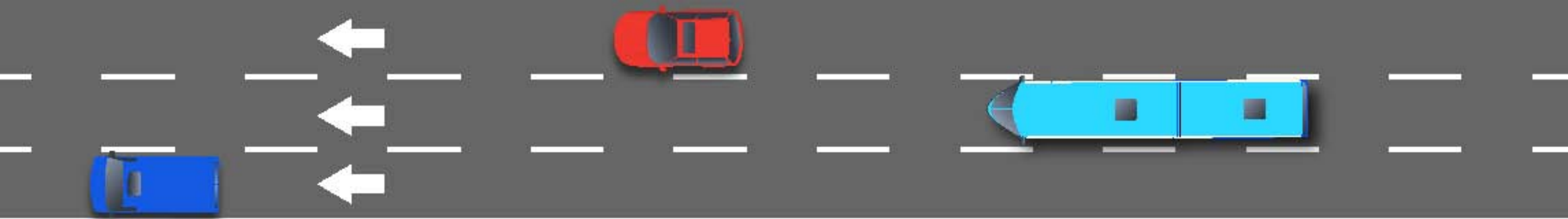
Opinion of Probable Construction Costs

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.

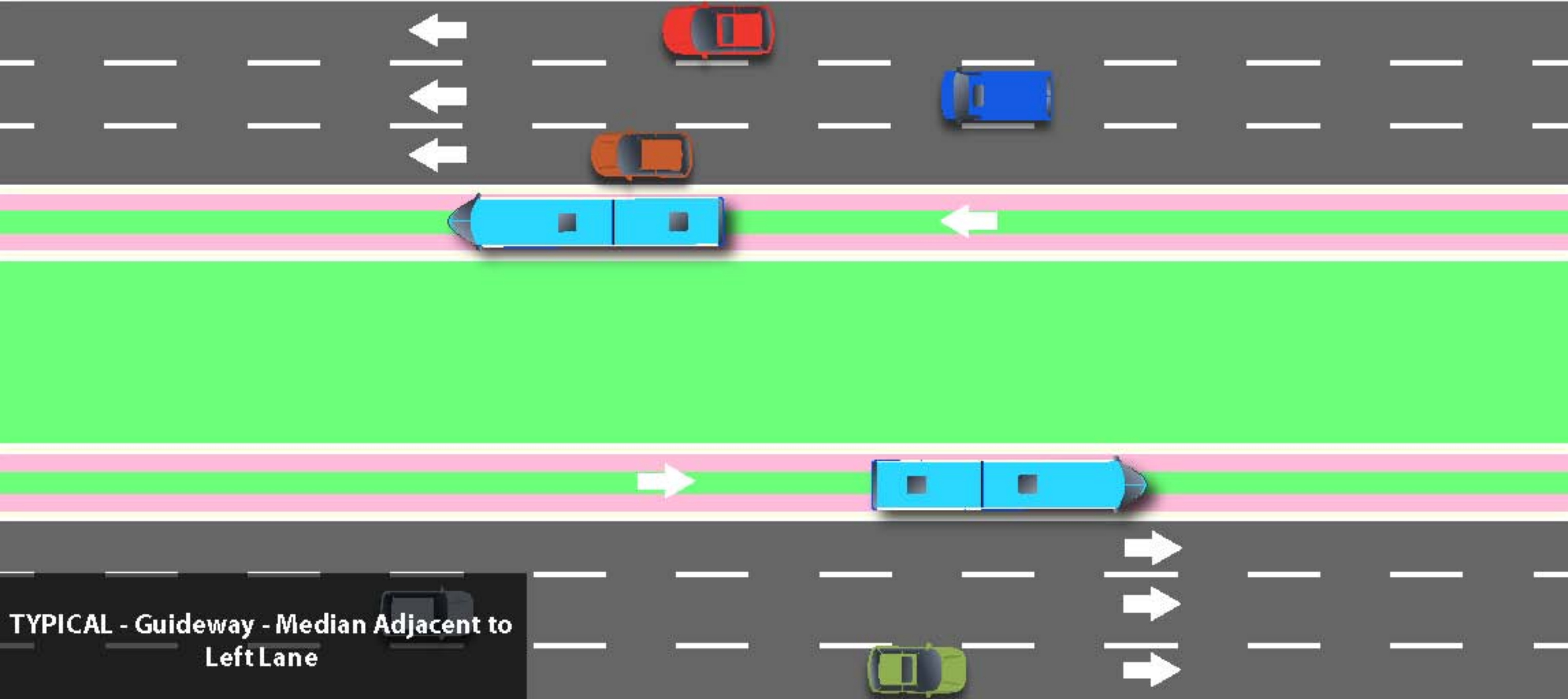




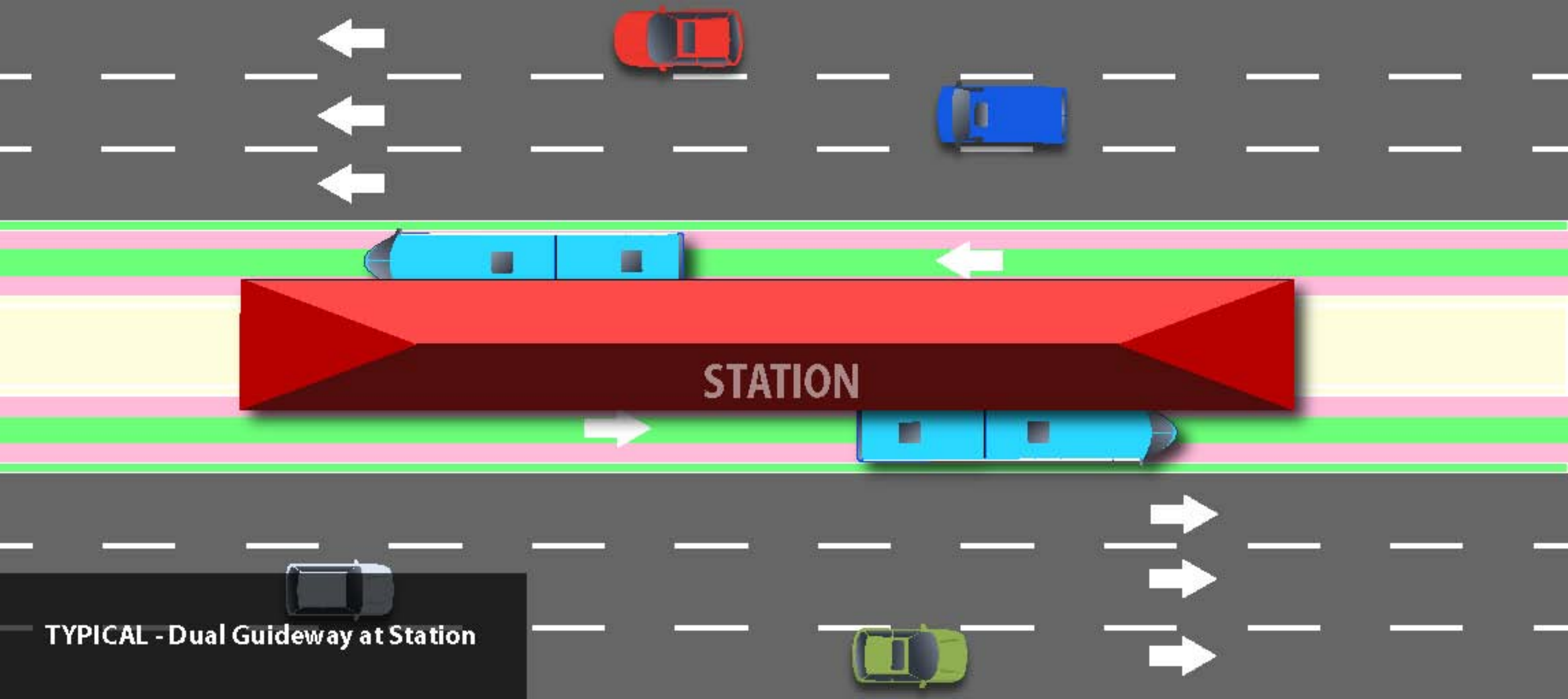
TYPICAL - Dual Guideway in Median



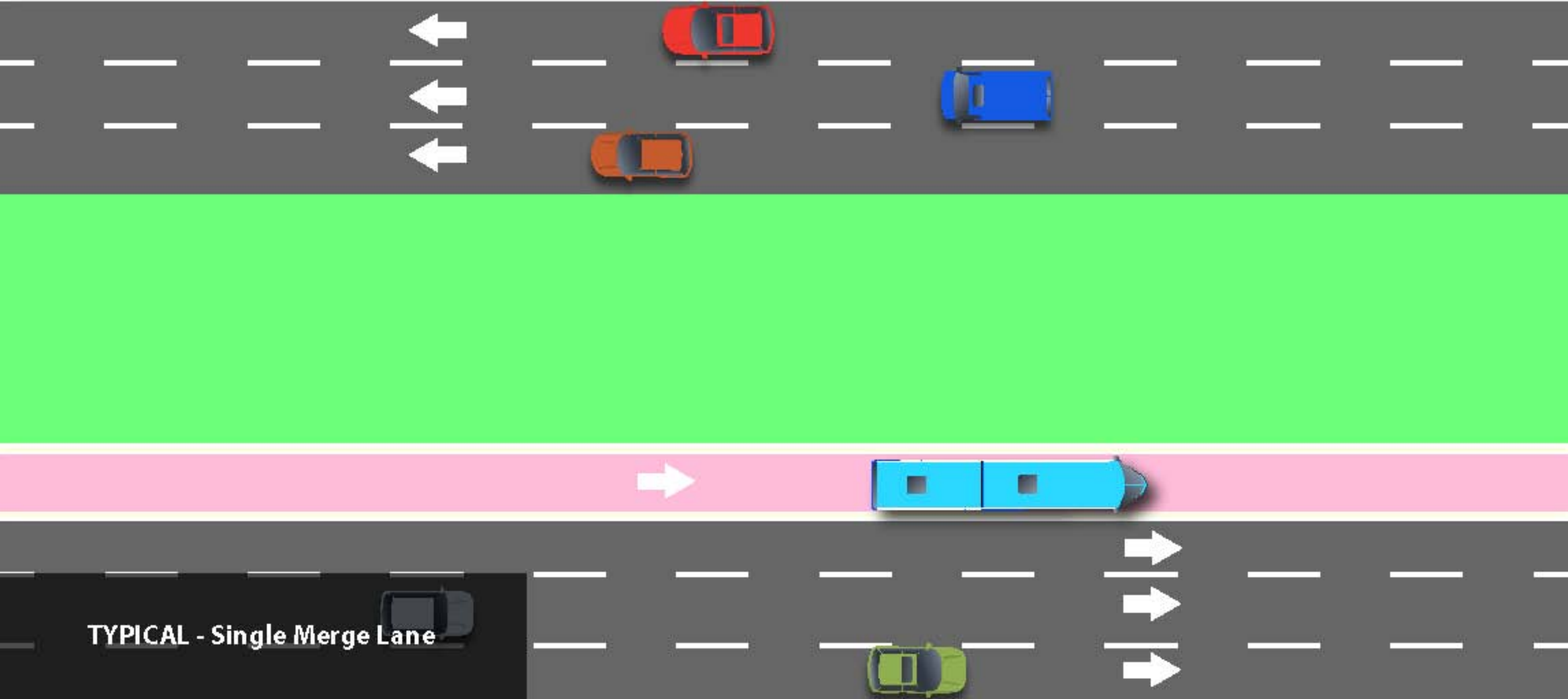
TYPICAL - Mixed Traffic



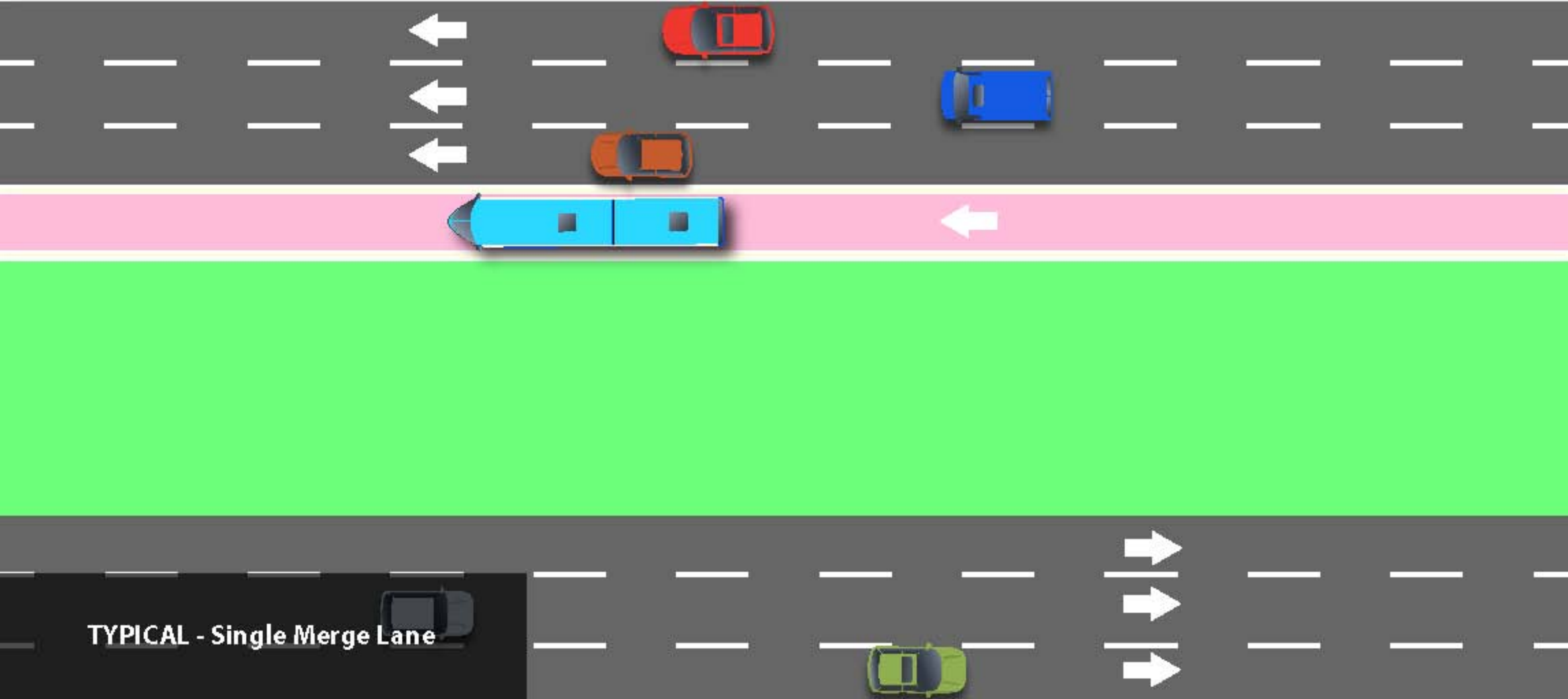
TYPICAL - Guideway - Median Adjacent to Left Lane



TYPICAL - Dual Guideway at Station



TYPICAL - Single Merge Lane



TYPICAL - Single Merge Lane

MD 216

OVERALL DESCRIPTION

**From MD 216 at Roundabout to/from NB US 29 Ramps to I-95
Bridge Structure**

Recommendation

1. Install concrete merge lane both directions of MD 216 beginning 1,100 feet east of MD 216 at Roundabout to/from the NB US 29 Ramps.
2. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
3. Install dual guide way 400 Feet west of the intersection of Crest Road.
4. Upgrade existing signalized intersection cross-over at Crest Road.
5. Widen MD 216 to maintain existing left turn storage lengths at the intersection.
6. Continue dual guide way east past Crest Road to a point 1,500 feet west of the intersection of Leishear Road.
7. Provide Transition area between dual to single guide way.
8. Install single guide way beginning 1,500 Feet west of the intersection of Leishear Road. Continue single guide way to the intersection of Leishear Road. BRT vehicles EB along MD 216 will be held prior to reaching the single RTV lane area until the link clears of WB BRT vehicles. Traffic Signals interconnected on each end will control BRT vehicle flow thru the single section guide way.
9. Upgrade existing signalized intersection cross-over at Leishear Road.
10. Widen MD 216 to maintain existing left turn storage lengths at the intersection.
11. Continue single guide way east past Leishear Road to a point 650 feet East of the intersection of Leishear Road.
12. Provide Transition area between single to dual guide way.
13. Install concrete merge lane both directions of MD 216 up to the bridge structure over I-95.
14. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.

2.3 miles

\$ 11,382,175

Cost/Mile

\$ 4,948,772

MD 216 - NB US 29 Ramp Roundabout to I-95

Location: Montgomery County Maryland

Miles:	2.30
Cost Per Mile:	\$4,948,772
	Recommended Option

Preliminary Cost Estimate

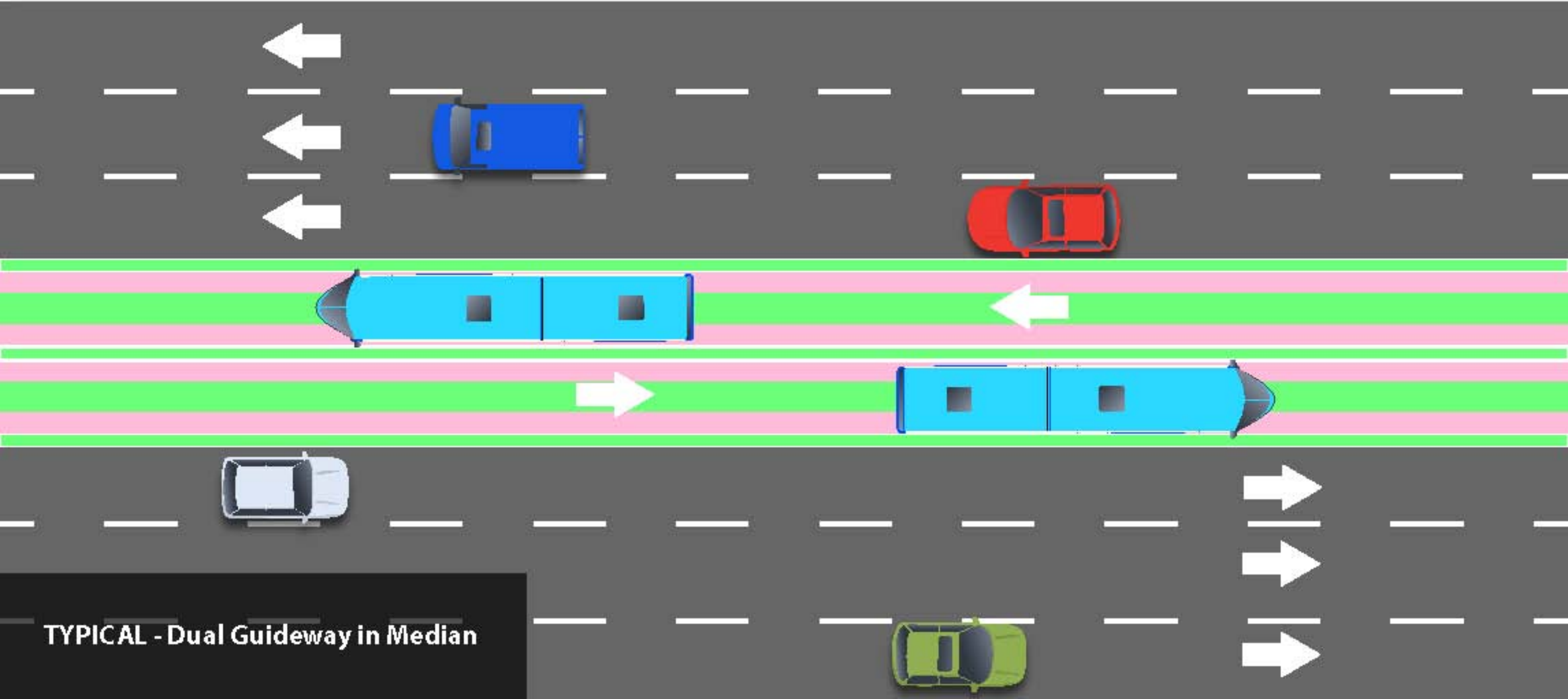
Install median merge area to access dual guideway. Install dual and single guideway. Widen MD 216 to provide additional paving to maintain left turn storage lanes. Reconstruct traffic signals. Merge back to mixed traffic before I-95 bridge structure.

Quantity	Unit	Description	Unit Price	Total Price
31,000	CY	Earthwork	\$25.00	\$775,000.00
10,000	CY	Removal of Existing Grass Area	\$30.00	\$300,000.00
11,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$165,000.00
20,000	LF	Saw-Cut Existing Pavement	\$10.00	\$200,000.00
400	SY	Removal of Existing Paving	\$35.00	\$14,000.00
20,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,400,000.00
0	CY	Concrete for raised Station Plat form	\$100.00	\$0.00
40,000	LF	Curb & Gutter	\$30.00	\$1,200,000.00
0	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$0.00
120,000	SF	Grass Pavers	\$5.00	\$600,000.00
4,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$12,000.00
3,800	LF	5" Solid White Pavement Marking Line	\$3.00	\$11,400.00
1,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$4,500.00
20	EA	Ground Mounted Sign	\$350.00	\$7,000.00
150,000	SF	Topsoil and Hydro seed	\$1.00	\$150,000.00
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
1,500	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$12,000.00
0	SF	Construct Bridge Surface	\$250.00	\$0.00
7,000	SF	Mill and Overlay	\$7.00	\$49,000.00
0	EA	RTV Station (inc. install)	\$250,000.00	\$0.00
6,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$34,200.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
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:	\$6,504,100.00
Utilities (20%)	\$1,300,820.00
M.O.T. (10%)	\$650,410.00
Design Fees (10%)	\$650,410.00
Contingency (35%)	\$2,276,435.00
Total:	\$11,382,175.00

Opinion of Probable Construction Costs

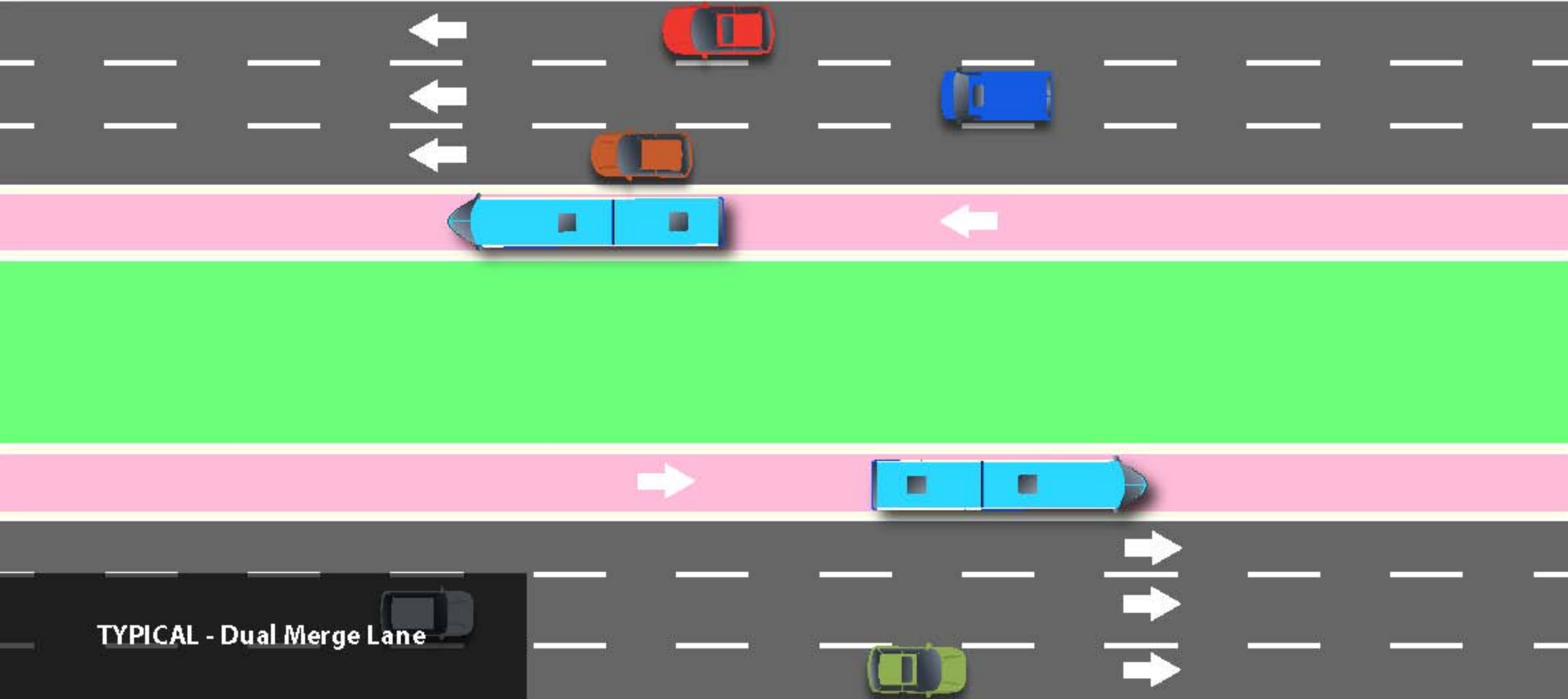
This form is The Traffic Group's OPINION OF PROBABLE COSTS. The Traffic Group, Inc. is not a construction cost estimator or construction contractor, nor should The Traffic Group's rendering an opinion of probable construction costs be considered equivalent. This is based solely upon The Traffic Group's 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.



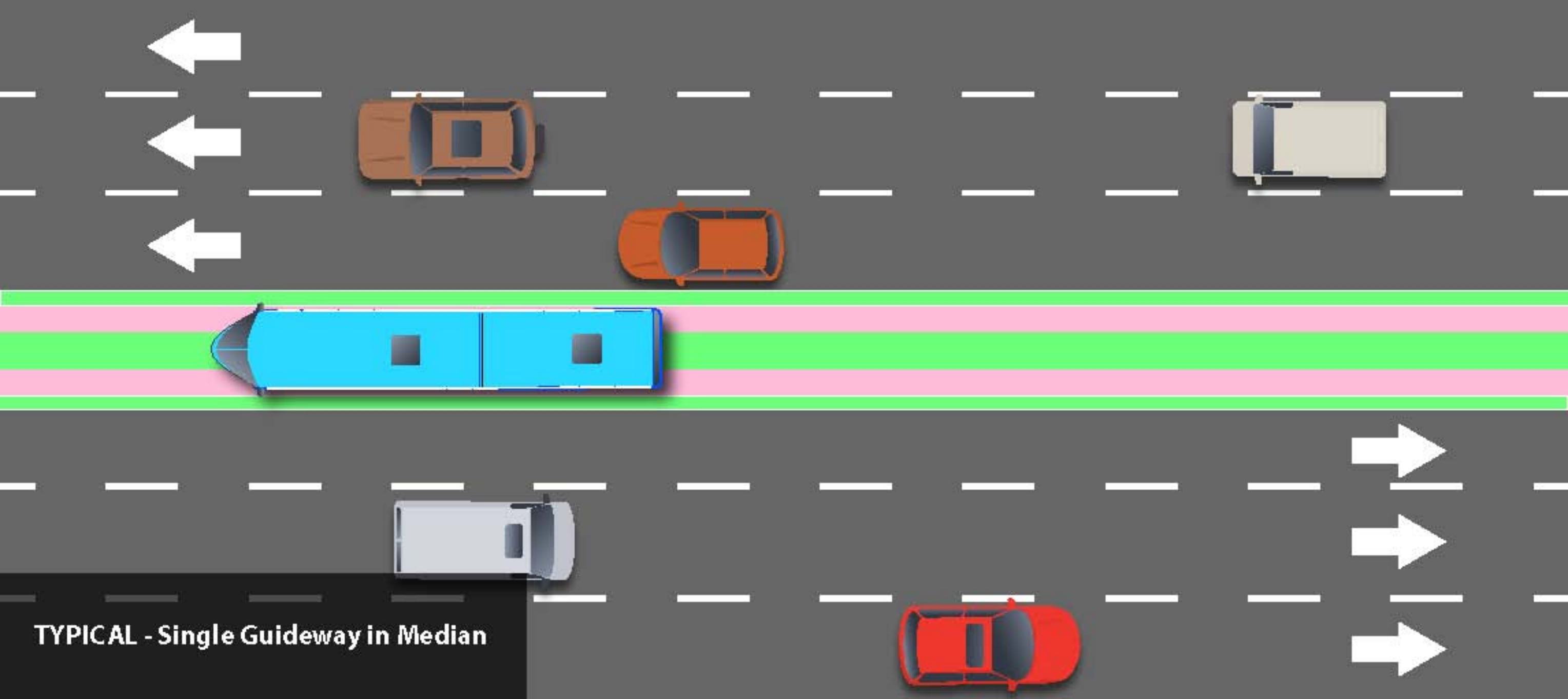
TYPICAL - Dual Guideway in Median



TYPICAL - Mixed Traffic



TYPICAL - Dual Merge Lane



TYPICAL - Single Guideway in Median

MD 32

10 miles
\$ 69,635,869

OVERALL DESCRIPTION

From MD 108 to Savage MARC

BRT Station (likely with parking lot) located in the vicinity of MD 108 will be determined at a later date.

Cost/Mile
\$ 6,963,587

Recommendation

1. Install dual guide way beginning at the MD 108 bridge structure. Bridge structure to be modified to allow entry / exit of BRT vehicles to/from the MD 32 median east of MD 108.
2. Install new traffic signal at the new intersection of MD 108 middle of bridge.
3. Install ramp down to the MD 32 Median at less than 6% grade.
4. Install single BRT Lane along the median in both directions.
5. Install dual BRT guide way along the center of the median.
6. Install single BRT merge area to allow BRT to merge out of median into dedicated BRT lane.
7. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
8. Shift lanes in the vicinity of the MD 32 Bridge structures above Cedar Lane to allow for a dedicated BRT lane in each direction.
9. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
10. Install dual BRT guide way in the center of the median.
11. Install new bridge structure 1,800 feet east of the intersection Cedar Lane overpass to provide dual BRT guided crossing. NOTE: An alternative to constructing a new bridge structure is to shift lanes slightly on the existing MD 32 Bridge in both directions to maintain a dedicated RTV lane within the shoulder area. However, the existing bridge structures are not sufficient. Another Alternative would be to merge back into mix traffic before the bridge then back into the dedicated guide way. (See separate cost estimate eliminating bridge construction cost).
12. Install BRT Station along MD 32 at US 29 Cloverleaf Interchange. Station to be located on new bridge structure elevated above US 29. Provide elevator and escalator access between the US 29 and MD 32 BRT stations.
13. Install new bridge structure above US 29 crossing to provide dual guided BRT lane thru station area.
14. Install dual BRT guide way along the center of the median both directions of MD 32 under Broken Land Parkway. Install dual guided BRT ramps to / from both directions of MD 32 beginning at the

center of the Broken Land Parkway Bridge Structure. Install new traffic signal at the new intersection of MD 108 middle of bridge.

15. Install new bridge structure 1,350 feet east of the Shaker Road overpass to provide dual BRT guided crossing over stream area. NOTE: An alternative to constructing a new bridge structure is to shift lanes slightly on the existing MD 32 Bridge in both directions to maintain a dedicated RTV lane within the shoulder area. However, the existing bridge structure for westbound is not wide enough to provide the additional area. The eastbound bridge currently contains a wider shoulder area that will allow shifting of the lanes to provide the dedicated transit lane. An Alternative would be to merge back into mix traffic before the bridge then back into the dedicated guide way after the existing bridge structure. (See separate cost estimate eliminating bridge construction cost).
16. Install dual BRT guide way along the center of the median.
17. Install new bridge structure over Gerwig Lane / Guilford Road to provide dual BRT guided crossing. An Alternative would be to merge back into mix traffic before the bridge then back into the dedicated guide way after the existing bridge structure. (See separate cost estimate eliminating bridge construction cost).
18. Install un-guided dual BRT lane in both directions of MD 32 at the existing median cross-over's. No curb and gutter to be installed to allow for cross-over traffic flow.
19. Install single BRT merge area to allow BRT to merge out of median into dedicated BRT lane.
20. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
21. Upgrade existing shoulder area both direction of MD 32 in the vicinity of I-95 to provide dedicated BRT lanes.
22. Install new bridge structure over US 1 to provide dual BRT guided crossing. An Alternative would be to merge back into mix traffic before the bridge then back into the dedicated guide way after the existing bridge structure. (See separate cost estimate eliminating bridge construction cost).
23. Install single BRT Lane along the median in both directions up to existing county line located at the existing bridge structure over the CSX railroad area. Install In-Road Day / Night Lighting to differentiate the transit merge lane from auto lane.
24. Eastbound BRT vehicles in route to Savage Marc Station will exit dedicated BRT median lane and merge to the Dorsey Run Road exit. BRT vehicle will then continue thru the intersection of Dorsey Run Road to Henkels Lane then turn right into Savage Marc Station.
25. Existing RTV vehicles from the Savage Marc Station will make a left onto Henkels Lane, a Right onto Dorsey Run Road, then a Left onto the Westbound On-ramp to MD 32. RTV vehicles will then merge back to the median lane, then merge back into the dedicated RTV merge lane, then into the dual guided RTV lane.

MD 32 - MD 108 to Broken Land Parkway (Part I)

Location: Howard County Maryland

Miles:	5.60
Cost Per Mile:	\$8,253,000
	Recommended Option

Preliminary Cost Estimate

Install bridge ramps to / from MD 108 to MD 32 median. Install dual guide way within median. Shift lanes on existing bridge above Cedar Lane to provide RTV lane. Widen existing bridge structures east of Cedar Lane. Install Station at US 29 Interchange. Install bridge west of Broken land Interchange. Install bridge ramp to/from Broken Land Parkway to access median.

Quantity	Unit	Description	Unit Price	Total Price
95,000	CY	Earthwork	\$25.00	\$2,375,000.00
29,000	CY	Removal of Existing Grass Area	\$30.00	\$870,000.00
300	LF	Removal of Existing Curb & Gutter	\$15.00	\$4,500.00
200	LF	Saw-Cut Existing Pavement	\$10.00	\$2,000.00
400	SY	Removal of Existing Paving	\$35.00	\$14,000.00
60,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$7,200,000.00
500	CY	Concrete for raised Station Plat form	\$100.00	\$50,000.00
120,000	LF	Curb & Gutter	\$30.00	\$3,600,000.00
600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$27,000.00
180,000	SF	Grass Pavers	\$5.00	\$900,000.00
5,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$15,000.00
3,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$9,000.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
50	EA	Ground Mounted Sign	\$350.00	\$17,500.00
400,000	SF	Topsoil and Hydro seed	\$1.00	\$400,000.00
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
1,500	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$12,000.00
40,000	SF	Construct Bridge Surface	\$250.00	\$10,000,000.00
1,500	SF	Mill and Overlay	\$7.00	\$10,500.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
3,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$17,100.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
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:				\$26,409,600.00
Utilities (20%)				\$5,281,920.00
M.O.T. (10%)				\$2,640,960.00
Design Fees (10%)				\$2,640,960.00
Contingency (35%)				\$9,243,360.00
Total:				\$46,216,800.00

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.

MD 32 - MD 108 to Broken Land Parkway (Part I)

Location: Howard County Maryland

Miles:	5.60
Cost Per Mile:	\$5,995,719
	Recommended Option

ALT. Preliminary Cost Estimate - Reduced BRIDGE COST

Install bridge ramps to / from MD 108 to MD 32 median. Install dual guide way within median. Shift lanes on existing bridge above Cedar Lane to provide RTV lane. Install Station at US 29 Interchange. Install bridge ramp to/from Broken Land Parkway to access median.

Quantity	Unit	Description	Unit Price	Total Price
95,000	CY	Earthwork	\$25.00	\$2,375,000.00
29,000	CY	Removal of Existing Grass Area	\$30.00	\$870,000.00
300	LF	Removal of Existing Curb & Gutter	\$15.00	\$4,500.00
200	LF	Saw-Cut Existing Pavement	\$10.00	\$2,000.00
400	SY	Removal of Existing Paving	\$35.00	\$14,000.00
60,000	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$7,200,000.00
500	CY	Concrete for raised Station Plat form	\$100.00	\$50,000.00
120,000	LF	Curb & Gutter	\$30.00	\$3,600,000.00
600	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$27,000.00
180,000	SF	Grass Pavers	\$5.00	\$900,000.00
8,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$24,000.00
5,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$15,000.00
4,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$12,000.00
50	EA	Ground Mounted Sign	\$350.00	\$17,500.00
400,000	SF	Topsoil and Hydro seed	\$1.00	\$400,000.00
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
1,500	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$12,000.00
11,000	SF	Construct Bridge Surface	\$250.00	\$2,750,000.00
1,500	SF	Mill and Overlay	\$7.00	\$10,500.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
4,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$22,800.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
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:	\$19,186,300.00
Utilities (20%)	\$3,837,260.00
M.O.T. (10%)	\$1,918,630.00
Design Fees (10%)	\$1,918,630.00
Contingency (35%)	\$6,715,205.00
Total:	\$33,576,025.00

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.

MD 32 - Broken Land Parkway to Savage MARC (Part II)

Location: Howard County Maryland

Miles:	4.40
Cost Per Mile:	\$5,322,516
	Recommended Option

Preliminary Cost Estimate

Install dual guide way within median. Install bridge for guide ways. Install merge lane along median to access mixed traffic area. Upgrade traffic signals along Dorsey Run Road.

Quantity	Unit	Description	Unit Price	Total Price
63,000	CY	Earthwork	\$25.00	\$1,575,000.00
15,000	CY	Removal of Existing Grass Area	\$30.00	\$450,000.00
100	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,500.00
3,000	LF	Saw-Cut Existing Pavement	\$10.00	\$30,000.00
4,000	SY	Removal of Existing Paving	\$35.00	\$140,000.00
40,500	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,860,000.00
400	CY	Concrete for raised Station Plat form	\$100.00	\$40,000.00
81,000	LF	Curb & Gutter	\$30.00	\$2,430,000.00
425	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$19,125.00
104,000	SF	Grass Pavers	\$5.00	\$520,000.00
400	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$1,200.00
200	LF	5" Solid White Pavement Marking Line	\$3.00	\$600.00
100	LF	5" Broken White Pavement Marking Line	\$3.00	\$300.00
40	EA	Ground Mounted Sign	\$350.00	\$14,000.00
205,000	SF	Topsoil and Hydro seed	\$1.00	\$205,000.00
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
8,750	SF	Construct Bridge Surface	\$250.00	\$2,187,500.00
1,000	SF	Mill and Overlay	\$7.00	\$7,000.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
3,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$17,100.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
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:	\$13,382,325.00
			Utilities (20%)	\$2,676,465.00
			M.O.T. (10%)	\$1,338,232.50
			Design Fees (10%)	\$1,338,232.50
			Contingency (35%)	\$4,683,813.75
			Total:	\$23,419,068.75

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.

MD 32 - Broken Land Parkway to Savage MARC (Part II)

Location: Howard County Maryland

Miles:	4.40
Cost Per Mile:	\$4,461,197
	Recommended Option

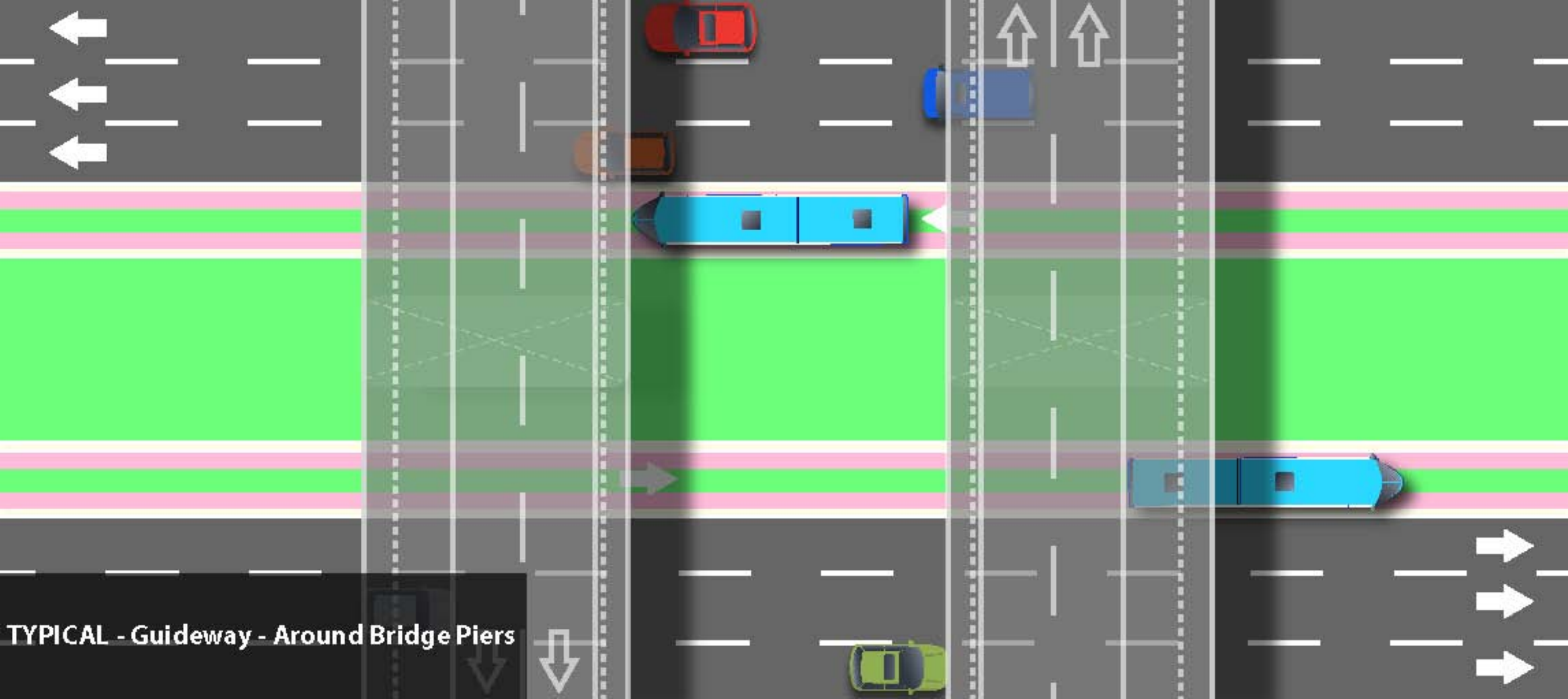
ALT. Preliminary Cost Estimate - NO BRIDGE COST

Install dual guide way within median. Install merge lane along median to access mixed traffic area. Upgrade traffic signals along Dorsey Run Road.

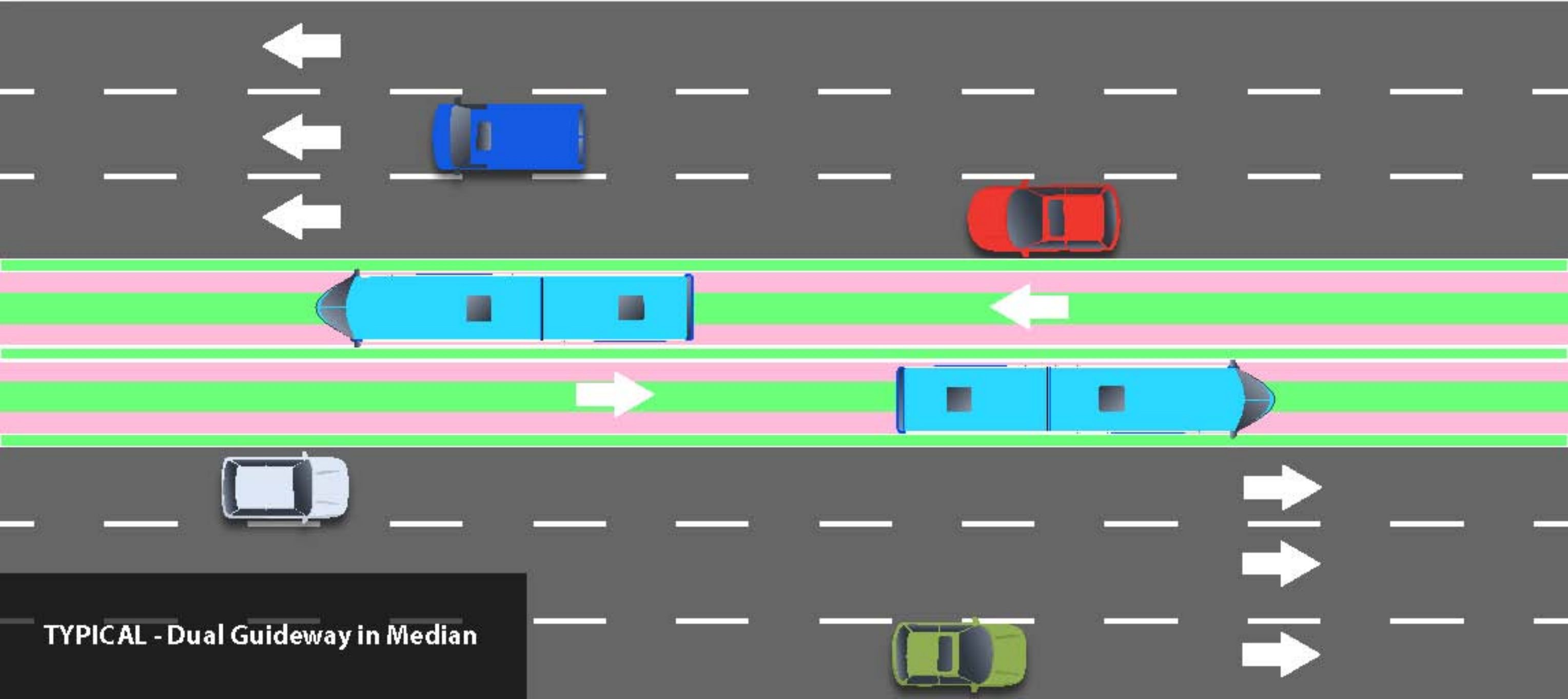
Quantity	Unit	Description	Unit Price	Total Price
63,000	CY	Earthwork	\$25.00	\$1,575,000.00
15,000	CY	Removal of Existing Grass Area	\$30.00	\$450,000.00
100	LF	Removal of Existing Curb & Gutter	\$15.00	\$1,500.00
3,000	LF	Saw-Cut Existing Pavement	\$10.00	\$30,000.00
4,000	SY	Removal of Existing Paving	\$35.00	\$140,000.00
40,500	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$4,860,000.00
400	CY	Concrete for raised Station Plat form	\$100.00	\$40,000.00
81,000	LF	Curb & Gutter	\$30.00	\$2,430,000.00
425	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$19,125.00
104,000	SF	Grass Pavers	\$5.00	\$520,000.00
2,400	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$7,200.00
2,200	LF	5" Solid White Pavement Marking Line	\$3.00	\$6,600.00
1,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$4,500.00
40	EA	Ground Mounted Sign	\$350.00	\$14,000.00
205,000	SF	Topsoil and Hydro seed	\$1.00	\$205,000.00
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	\$250.00	\$0.00
1,000	SF	Mill and Overlay	\$7.00	\$7,000.00
1	EA	RTV Station (inc. install)	\$250,000.00	\$250,000.00
4,000	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$22,800.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
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:	\$11,216,725.00
			Utilities (20%)	\$2,243,345.00
			M.O.T. (10%)	\$1,121,672.50
			Design Fees (10%)	\$1,121,672.50
			Contingency (35%)	\$3,925,853.75
			Total:	\$19,629,268.75

Opinion of Probable Construction Costs

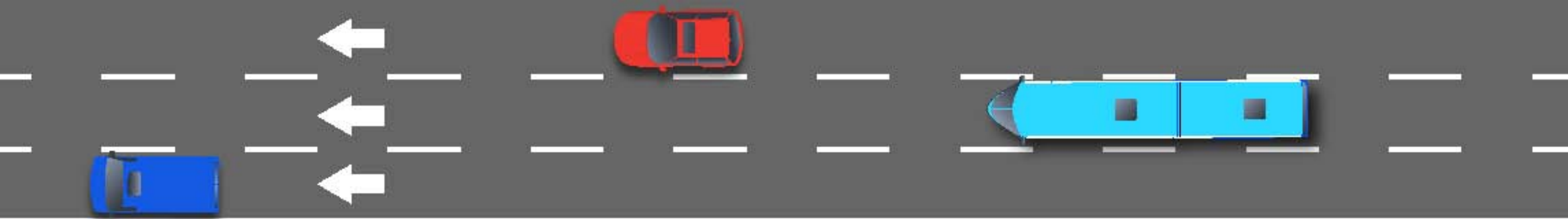
This form is The Traffic Group's OPINION OF PROBABLE COSTS. The Traffic Group, Inc. is not a construction cost estimator or construction contractor, nor should The Traffic Group's rendering an opinion of probable construction costs be considered equivalent. This is based solely upon The Traffic Group's 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.



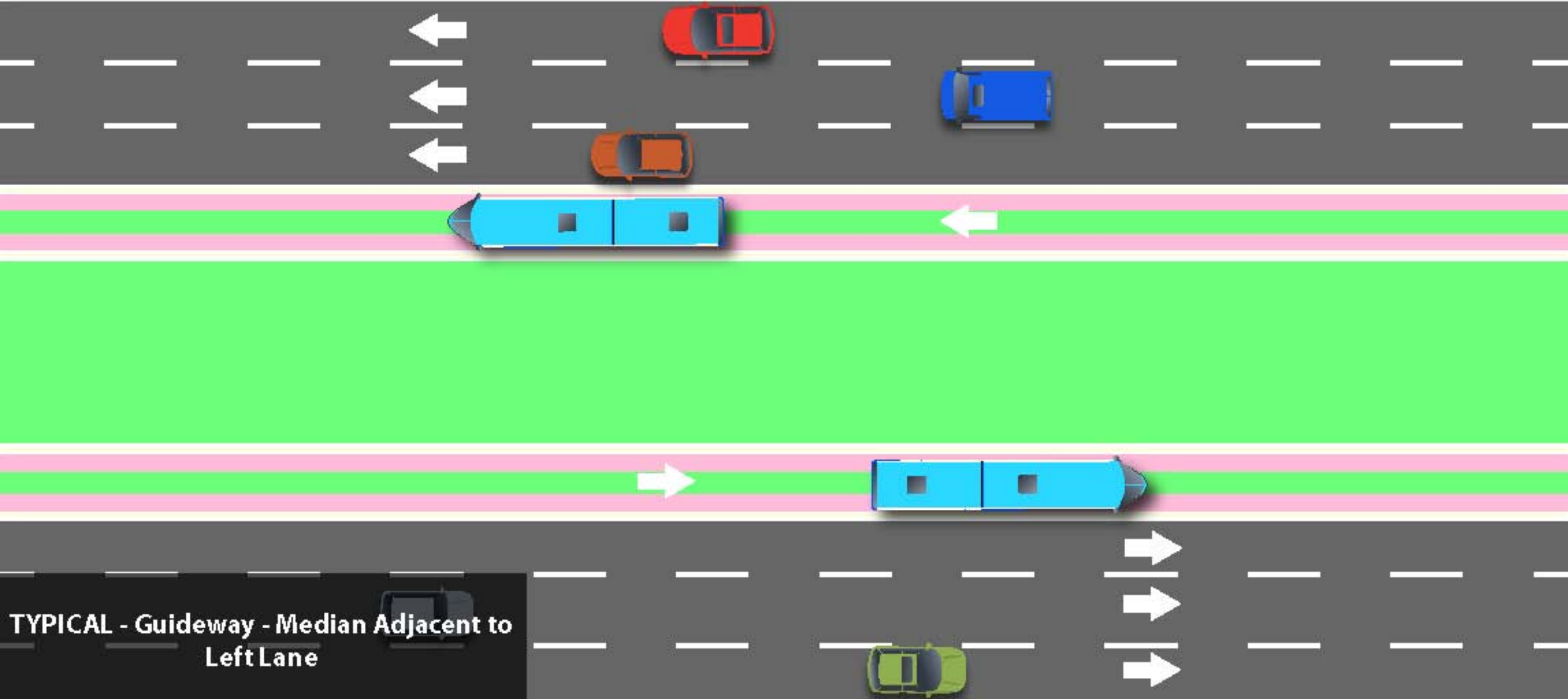
TYPICAL - Guideway - Around Bridge Piers



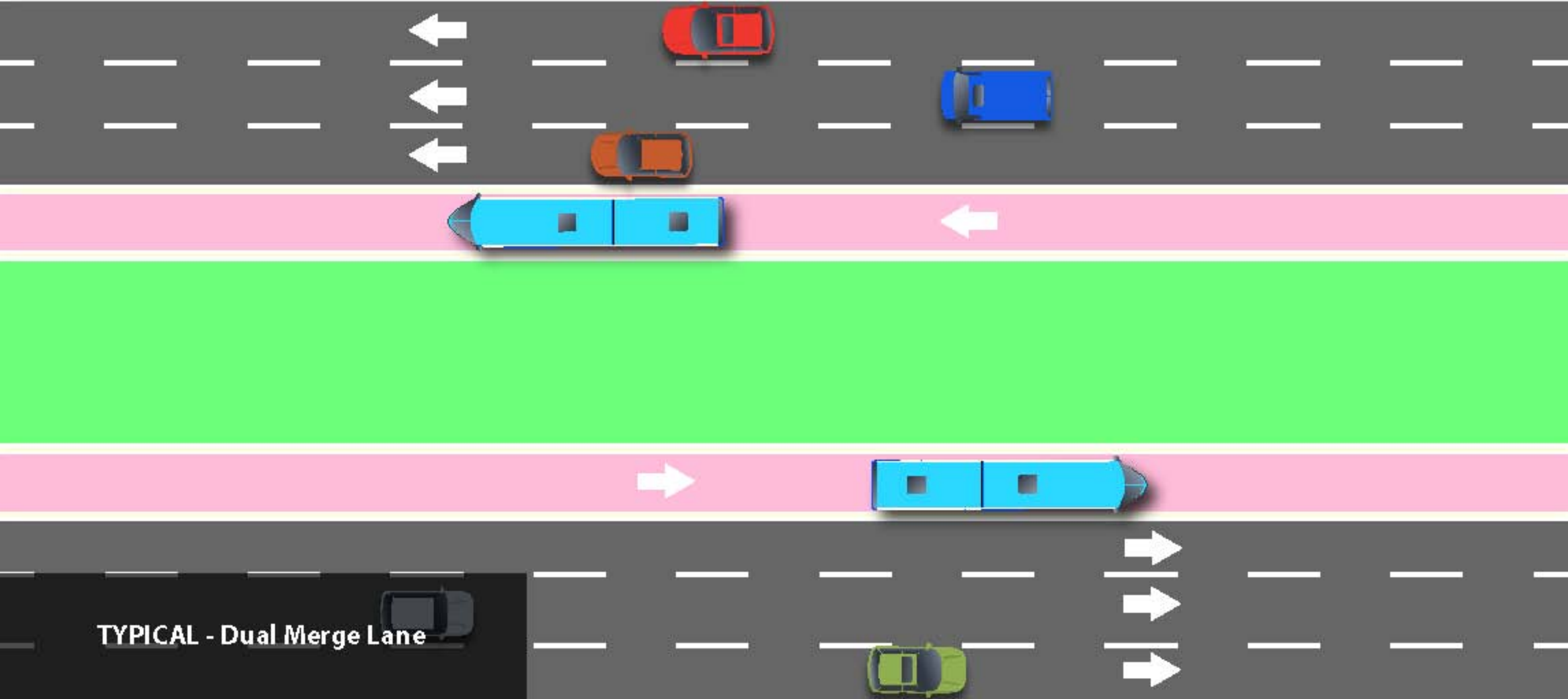
TYPICAL - Dual Guideway in Median



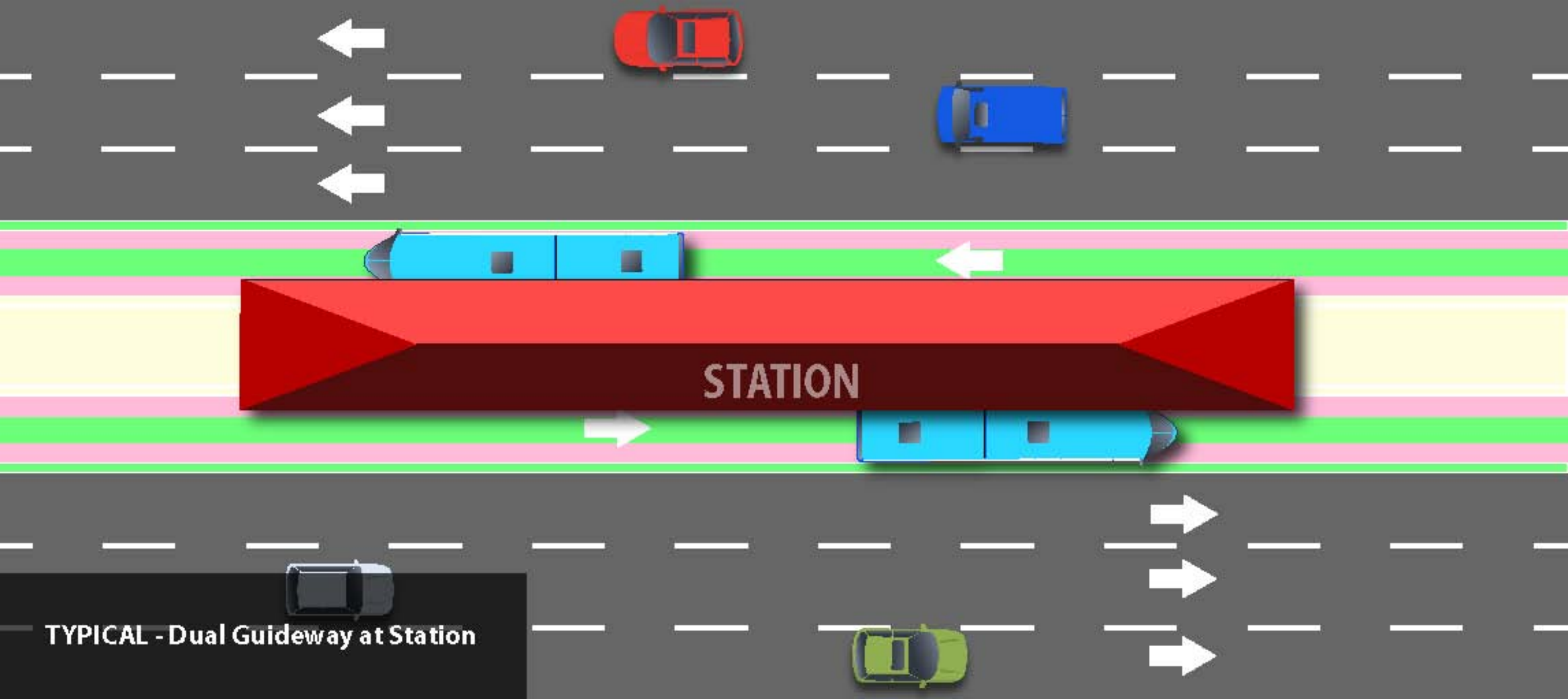
TYPICAL - Mixed Traffic



TYPICAL - Guideway - Median Adjacent to Left Lane



TYPICAL - Dual Merge Lane



STATION

TYPICAL - Dual Guideway at Station

Broken Land Parkway

OVERALL DESCRIPTION

From Snowden River Parkway to Columbia Town Center

3.5 miles

\$ 22,857,625

Cost/Mile

\$ 6,530,750

Recommendation

1. Install BRT Station in the existing median area of Broken Land Parkway just north of Snowden River Parkway.
2. Install dual BRT guide way in the center of the median.
3. Install new bridge structure over existing asphalt path located 1,750 feet north of Snowden River Parkway to provide dual BRT guided crossing.
4. Install new traffic signal with BRT traffic signal prioritization at each intersection crossing.
5. Install BRT Station in the existing median area of Broken Land Parkway just south of the intersection of Stevens Forest Road.
6. Install dual to single BRT guide way north of Stevens Forest Road northerly to Hickory Ridge Road. BRT vehicles NB along Broken Land Parkway will be held at the Stevens Forest Road Station until the single RTV link clears of SB BRT vehicles. Traffic Signals interconnected on each end will control BRT vehicle flow thru the single section guide way.
7. If required, Install new bridge structure over existing stream / road crossing located 1,200 feet north of Stevens Forest Road Intersection to provide single BRT guided crossing. An Alternative would be to use the traffic signal at Stevens Forest Road to access mixed traffic north of Stevens Forest Road then back into the dedicated guide way after the intersection of US 29 ramps. It may be determined at a later date that these three existing bridge structures in the vicinity of US 29 Interchange could maintain the proposed guide way – they currently contain concrete medians that should be checked under the next phase of design stage. (See separate cost estimate eliminating bridge construction cost).
8. If required, Install new bridge structure over existing US 29 Ramp crossing located 700 feet south of Us 29 Interchange to provide single BRT guided crossing.
9. If required, Install new bridge structure over existing US 29 crossing to provide single BRT guided crossing.
10. Install new traffic signal with BRT traffic signal priority at the intersection for US 29 Ramps.
11. Modify the intersection of Broken Land Parkway at Hickory Ridge Road to provide single BRT guide way south of the intersection and dual guide way north of the intersection. Replace existing turn storage lanes by widening the roadway. Install new traffic signal with BRT traffic signal prioritization at the intersection

12. Modify the intersection of Broken Land Parkway at Little Patuxent Parkway to provide dual BRT guide way south of the intersection and mixed traffic north of the intersection. Replace existing turn storage lanes by widening the roadway. Install new traffic signal with BRT traffic signal priority at the intersection.
13. BRT to travel in Mixed Traffic north of Little Patuxent Parkway, make a right onto Windstream Drive, then another right turn back to Broken Land Parkway via Mall Connection Road.
14. Install BRT Station along the west side of Windstream Drive. Exact location to be determined at a later date. It may be determined at a later date that the RTV circulate around or thru the Columbia Mall Property.

Broken Land Parkway - Snowden River Parkway to Columbia Town Center

Location: Howard County Maryland

Miles:	3.50
Cost Per Mile:	\$5,780,750
	Recommended Option

ALT. Preliminary Cost Estimate NO BRIDGE COST

Install Station at Broken Land Parkway and within the Mall area. Install Single and Dual Guide way and upgrade Signals.

Quantity	Unit	Description	Unit Price	Total Price
41,000	CY	Earthwork	\$25.00	\$1,025,000.00
14,000	CY	Removal of Existing Grass Area	\$30.00	\$420,000.00
50,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$750,000.00
25,000	LF	Saw-Cut Existing Pavement	\$10.00	\$250,000.00
10,000	SY	Removal of Existing Paving	\$35.00	\$350,000.00
24,500	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,940,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
50,000	LF	Curb & Gutter	\$30.00	\$1,500,000.00
1,200	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$54,000.00
74,000	SF	Grass Pavers	\$5.00	\$370,000.00
6,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$18,000.00
3,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$9,000.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
30	EA	Ground Mounted Sign	\$350.00	\$10,500.00
200,000	SF	Topsoil and Hydro seed	\$1.00	\$200,000.00
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
2,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$16,000.00
0	SF	Construct Bridge Surface	\$250.00	\$0.00
4,000	SF	Mill and Overlay	\$7.00	\$28,000.00
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
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
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
			Subtotal:	\$11,561,500.00
			Utilities (20%)	\$2,312,300.00
			M.O.T. (10%)	\$1,156,150.00
			Design Fees (10%)	\$1,156,150.00
			Contingency (35%)	\$4,046,525.00
			Total:	\$20,232,625.00

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.

Broken Land Parkway - Snowden River Parkway to Columbia Town Center

Location: Howard County Maryland

Miles:	3.50
Cost Per Mile:	\$6,530,750
	Recommended Option

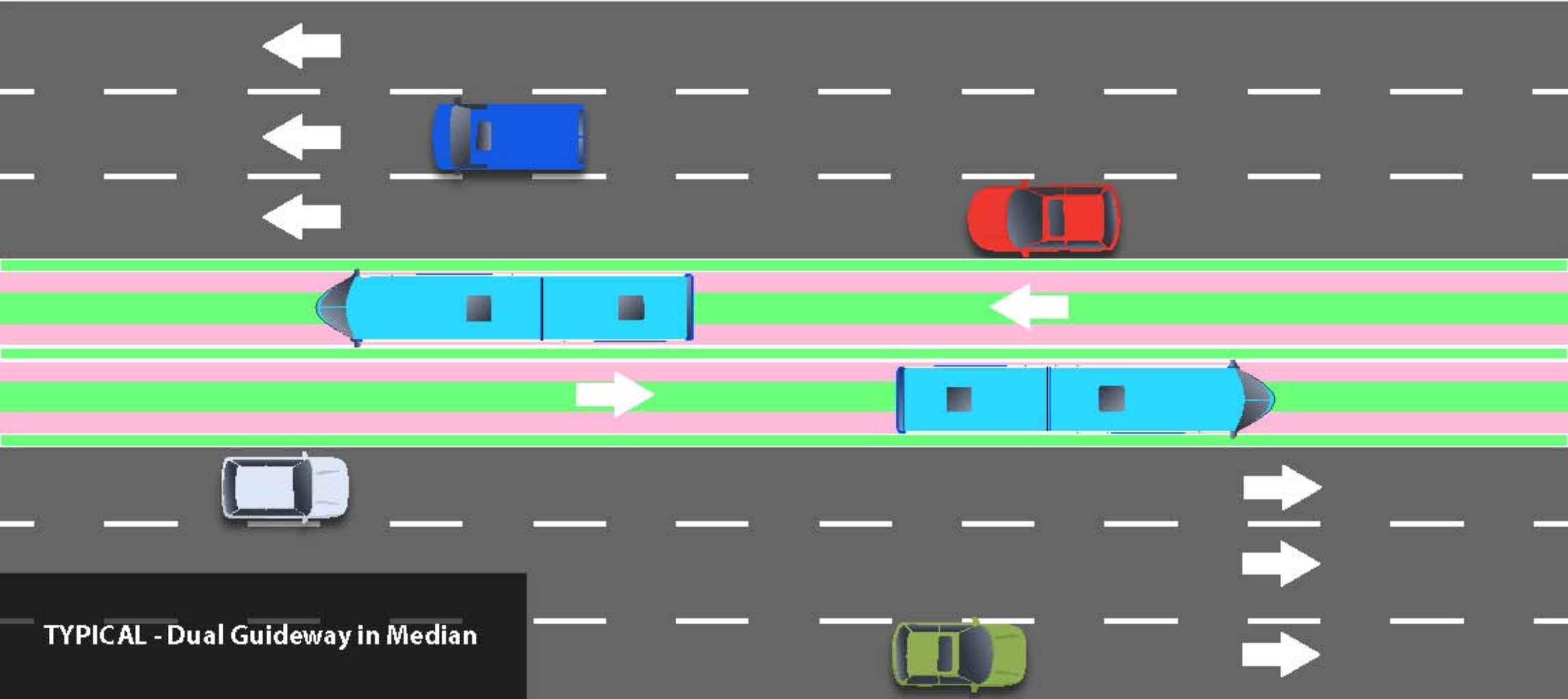
Preliminary Cost Estimate

Install Station at Broken Land Parkway and within the Mall area. Install Single and Dual Guide way and upgrade Signals.

Quantity	Unit	Description	Unit Price	Total Price
41,000	CY	Earthwork	\$25.00	\$1,025,000.00
14,000	CY	Removal of Existing Grass Area	\$30.00	\$420,000.00
50,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$750,000.00
25,000	LF	Saw-Cut Existing Pavement	\$10.00	\$250,000.00
10,000	SY	Removal of Existing Paving	\$35.00	\$350,000.00
24,500	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$2,940,000.00
1,200	CY	Concrete for raised Station Plat form	\$100.00	\$120,000.00
50,000	LF	Curb & Gutter	\$30.00	\$1,500,000.00
1,200	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$54,000.00
74,000	SF	Grass Pavers	\$5.00	\$370,000.00
6,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$18,000.00
3,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$9,000.00
2,000	LF	5" Broken White Pavement Marking Line	\$3.00	\$6,000.00
30	EA	Ground Mounted Sign	\$350.00	\$10,500.00
200,000	SF	Topsoil and Hydro seed	\$1.00	\$200,000.00
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
2,000	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$16,000.00
6,000	SF	Construct Bridge Surface	\$250.00	\$1,500,000.00
4,000	SF	Mill and Overlay	\$7.00	\$28,000.00
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
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
0	SF	Right-of-Way Purchase - based on \$400,000 / acre	\$9.18	\$0.00
			Subtotal:	\$13,061,500.00
			Utilities (20%)	\$2,612,300.00
			M.O.T. (10%)	\$1,306,150.00
			Design Fees (10%)	\$1,306,150.00
			Contingency (35%)	\$4,571,525.00
			Total:	\$22,857,625.00

Opinion of Probable Construction Costs

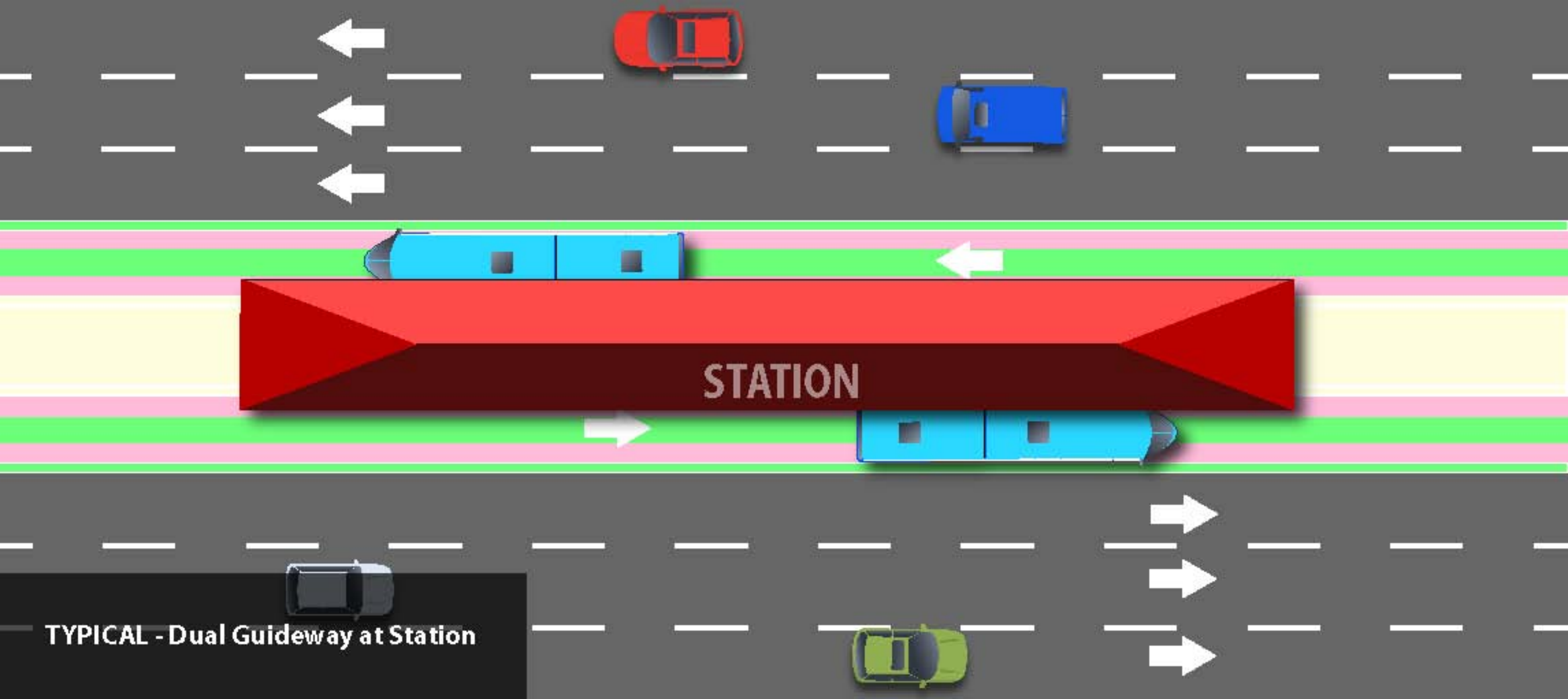
This form is The Traffic Group's OPINION OF PROBABLE COSTS. The Traffic Group, Inc. is not a construction cost estimator or construction contractor, nor should The Traffic Group's rendering an opinion of probable construction costs be considered equivalent. This is based solely upon The Traffic Group's 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.



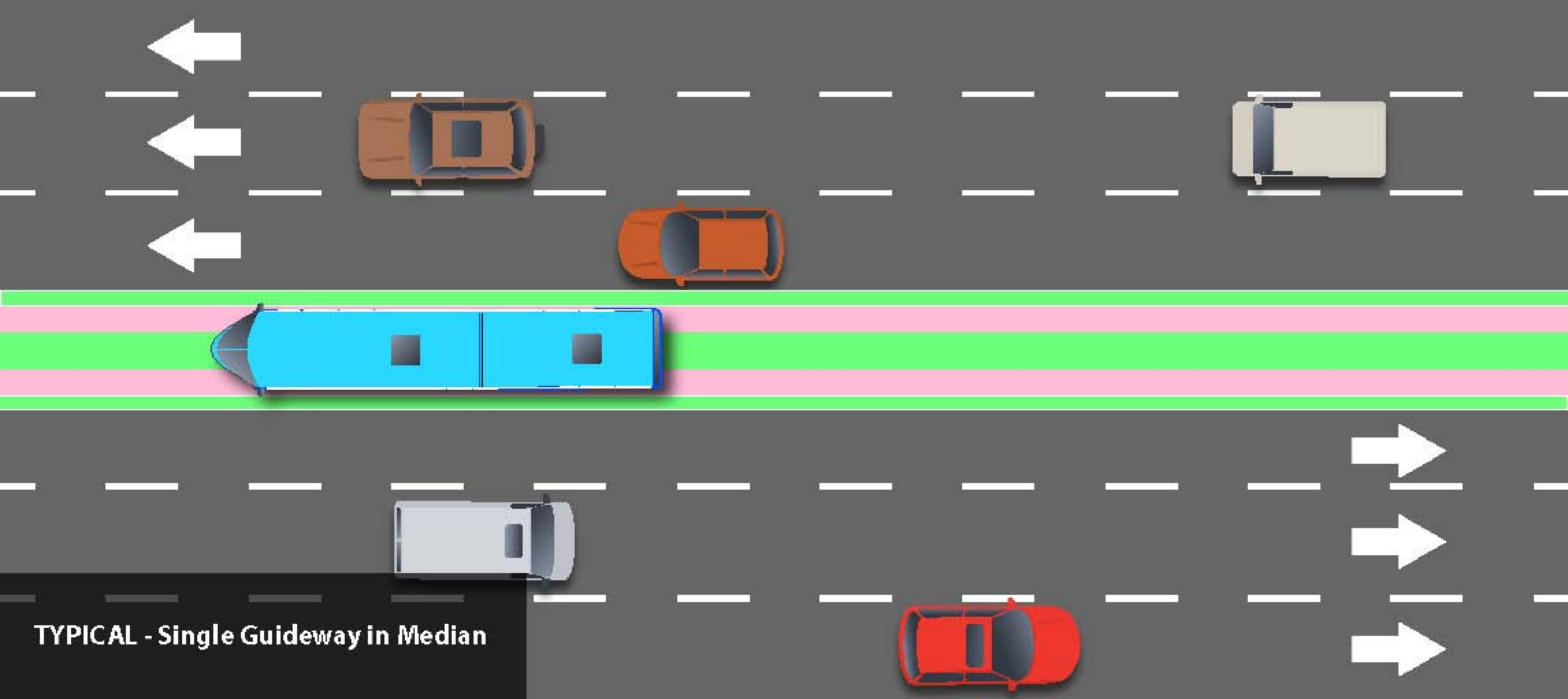
TYPICAL - Dual Guideway in Median



TYPICAL - Mixed Traffic



TYPICAL - Dual Guideway at Station



TYPICAL - Single Guideway in Median

Snowden River Parkway / Oakland Mills Rd.

OVERALL DESCRIPTION

From Broken Land Parkway to Oakland Mills Road at R/R Crossing

Recommendation

1. Install Single BRT guide way east of Broken Land Parkway to Carved Stone / Berger Road.
2. Install new traffic signal with BRT traffic signal priority at each signalized intersection crossing.
3. BRT vehicles along Broken Land Parkway will be held until the single RTV link clears of WB BRT vehicles. BRT vehicles along WB Snowden River Parkway will be held until the single RTV link clears of EB BRT vehicles. Traffic Signals interconnected on each end will control BRT vehicle flow thru the single section guide way.
4. Upgrade the traffic signal intersections with new traffic signal priority.
5. BRT vehicles to / from Oakland Mills Intersection along Snowden River Parkway will use the existing shoulder area that will be converted to a dedicated BRT Lane.
6. Install In-Road Day / Night Lighting to differentiate the transit shoulder lane from auto lane.
7. BRT vehicles will travel in mixed traffic along Oakland Mills Road between Snowden River Parkway and the existing Rail / Road Crossing located 2,000 feet south of Snowden River Parkway.
8. Install new traffic signal at the Rail / Road intersection to allow traffic signal priority for BRT vehicles to / from the CSX repurposed BRT guide way.

1.3 miles

\$ 3,775,415

Cost/Mile

\$ 2,904,165

Snowden River Parkway - Broken Land Pkwy to Oakland Mills Rd at R/R Crossing

Location: Howard County Maryland

Miles:	1.30
Cost Per Mile:	\$2,904,165
	Recommended Option

Preliminary Cost Estimate

Install single guide way within median. Remove existing shoulder and upgrade with concrete paving. Upgrade traffic signals.

Quantity	Unit	Description	Unit Price	Total Price
6,000	CY	Earthwork	\$25.00	\$150,000.00
4,000	CY	Removal of Existing Grass Area	\$30.00	\$120,000.00
6,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$90,000.00
4,000	LF	Saw-Cut Existing Pavement	\$10.00	\$40,000.00
5,400	SY	Removal of Existing Paving	\$35.00	\$189,000.00
3,300	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$396,000.00
0	CY	Concrete for raised Station Plat form	\$100.00	\$0.00
7,000	LF	Curb & Gutter	\$30.00	\$210,000.00
0	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$0.00
7,000	SF	Grass Pavers	\$5.00	\$35,000.00
5,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$15,000.00
4,000	LF	5" Solid White Pavement Marking Line	\$3.00	\$12,000.00
1,500	LF	5" Broken White Pavement Marking Line	\$3.00	\$4,500.00
14	EA	Ground Mounted Sign	\$350.00	\$4,900.00
15,000	SF	Topsoil and Hydro seed	\$1.00	\$15,000.00
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
0	EA	RTV Station (inc. install)	\$250,000.00	\$0.00
3,400	LF	Inlaid Road Lighting-per lane one side (\$30k/mi.)-inc install	\$5.70	\$19,380.00
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:	\$2,157,380.00
			Utilities (20%)	\$431,476.00
			M.O.T. (10%)	\$215,738.00
			Design Fees (10%)	\$215,738.00
			Contingency (35%)	\$755,083.00
			Total:	\$3,775,415.00

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.

CSX Right-of-Way

OVERALL DESCRIPTION

From Oakland Mills Road to Savage Marc Station via Henkels Lane

Recommendation

1. Install dual BRT guide way beginning at the intersection of Oakland Mills Road. Remove existing abandoned rail road tracks and re-grade.
2. Install new traffic signals at each at grade intersection to provide BRT signal priority.
3. Existing Mission Road and Dorsey Run Road R/R bridge structures need to be modified and or replaced to provide dual BRT guide way. A single BRT guide way bridge structure may be substituted for dual guide way but will require additional traffic signalization to provide alternating right of way for BRT vehicle flow. An additional Alternative would be to grade each approach to Mission Road and Dorsey Run Road down to be an at-grade crossing with a new traffic signal at each. (See separate cost estimate eliminating bridge construction cost).
4. BRT vehicles will be in mixed traffic between the CSX dedicated dual guide way (end of Henkels Lane) and the Savage Marc Station Entrance.
5. Install BRT Station equipment within the Savage Marc Station.

4.9 miles

\$ 27,471,325

Cost/Mile

\$ 5,606,393

CSX Right-of-Way - Oakland Mills Road to Savage Marc Station via Henkels Lane

Location: Howard County Maryland

Miles:	4.90
Cost Per Mile:	\$5,606,393
	Recommended Option

Preliminary Cost Estimate

Remove existing abandoned Rail Road Tracks and regrade. Install dual guideway. Install bridges for guideway across Mission and Dorsey Run Road. Install traffic signal at grade crossings. Install Station within Savage marc Station.

Quantity	Unit	Description	Unit Price	Total Price
80,000	CY	Earthwork	\$25.00	\$2,000,000.00
2,000	CY	Removal of Existing Grass Area	\$30.00	\$60,000.00
1,500	LF	Removal of Existing Curb & Gutter	\$15.00	\$22,500.00
800	LF	Saw-Cut Existing Pavement	\$10.00	\$8,000.00
400	SY	Removal of Existing Paving	\$35.00	\$14,000.00
51,100	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$6,132,000.00
400	CY	Concrete for raised Station Plat form	\$100.00	\$40,000.00
103,000	LF	Curb & Gutter	\$30.00	\$3,090,000.00
400	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$18,000.00
154,000	SF	Grass Pavers	\$5.00	\$770,000.00
1,000	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$3,000.00
500	LF	5" Solid White Pavement Marking Line	\$3.00	\$1,500.00
300	LF	5" Broken White Pavement Marking Line	\$3.00	\$900.00
16	EA	Ground Mounted Sign	\$350.00	\$5,600.00
400,000	SF	Topsoil and Hydro seed	\$1.00	\$400,000.00
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
300	LF	Removal of Existing Painted Line by Grinding Method	\$8.00	\$2,400.00
5,000	SF	Construct Bridge Surface	\$250.00	\$1,250,000.00
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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
2	LS	Remove existing Steel Bridge structure	\$500,000.00	\$1,000,000.00
			Subtotal:	\$15,697,900.00
			Utilities (20%)	\$3,139,580.00
			M.O.T. (10%)	\$1,569,790.00
			Design Fees (10%)	\$1,569,790.00
			Contingency (35%)	\$5,494,265.00
			Total:	\$27,471,325.00

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.

CSX Right-of-Way - Oakland Mills Road to Savage Marc Station via Henkels Lane

Location: Howard County Maryland

Miles:	4.90
Cost Per Mile:	\$5,534,357
	Recommended Option

ALT. Preliminary Cost Estimate NO BRIDGE COST

Remove existing abandoned Rail Road Tracks and regrade. Install dual guideway. Remove bridges and convert to at-grade crossing across Mission and Dorsey Run Road. Install traffic signal at grade crossings. Install Station within Savage marc Station.

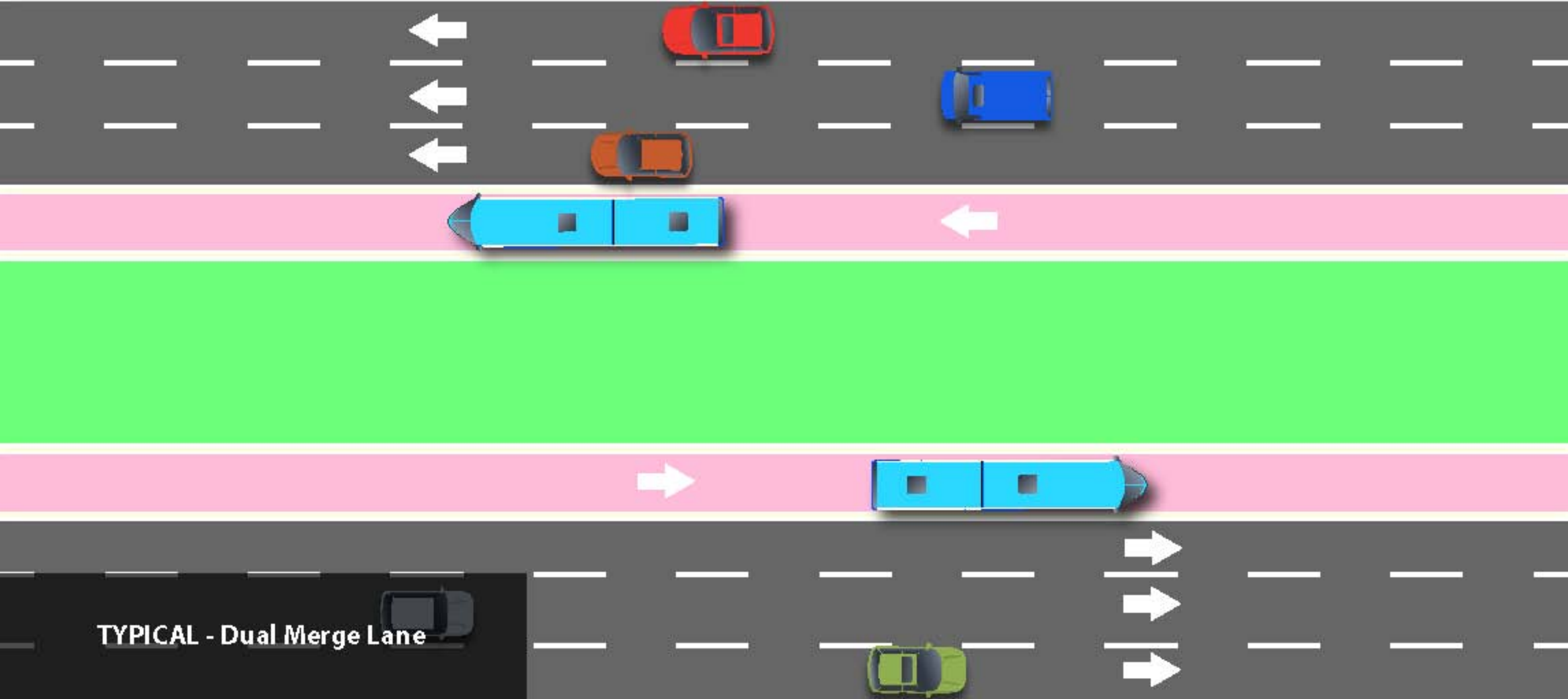
Quantity	Unit	Description	Unit Price	Total Price
112,000	CY	Earthwork	\$25.00	\$2,800,000.00
6,000	CY	Removal of Existing Grass Area	\$30.00	\$180,000.00
3,000	LF	Removal of Existing Curb & Gutter	\$15.00	\$45,000.00
800	LF	Saw-Cut Existing Pavement	\$10.00	\$8,000.00
400	SY	Removal of Existing Paving	\$35.00	\$14,000.00
51,100	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$6,132,000.00
400	CY	Concrete for raised Station Plat form	\$100.00	\$40,000.00
103,000	LF	Curb & Gutter	\$30.00	\$3,090,000.00
400	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$18,000.00
154,000	SF	Grass Pavers	\$5.00	\$770,000.00
1,200	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$3,600.00
800	LF	5" Solid White Pavement Marking Line	\$3.00	\$2,400.00
500	LF	5" Broken White Pavement Marking Line	\$3.00	\$1,500.00
22	EA	Ground Mounted Sign	\$350.00	\$7,700.00
500,000	SF	Topsoil and Hydro seed	\$1.00	\$500,000.00
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	\$250.00	\$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
2	EA	Traffic Signal Priority for Each Signal (TSP)	\$25,000.00	\$50,000.00
2	EA	Rebuild Existing Traffic Signal	\$260,000.00	\$520,000.00
0	SF	Right-of-Way Sidewalk Easements	\$4.00	\$0.00
2	LS	Remove existing Steel Bridge structure	\$500,000.00	\$1,000,000.00
Subtotal:				\$15,496,200.00
Utilities (20%)				\$3,099,240.00
M.O.T. (10%)				\$1,549,620.00
Design Fees (10%)				\$1,549,620.00
Contingency (35%)				\$5,423,670.00
Total:				\$27,118,350.00

Opinion of Probable Construction Costs

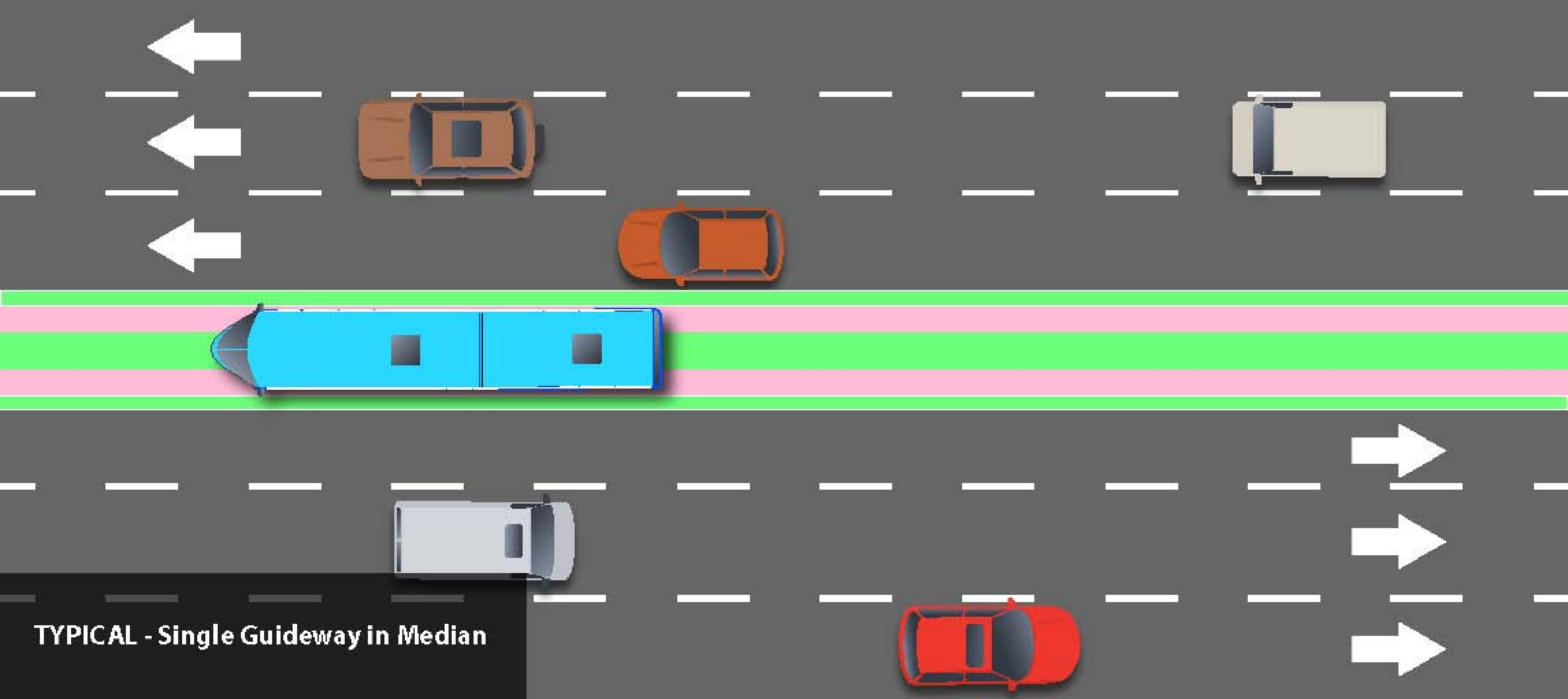
This form is The Traffic Group's OPINION OF PROBABLE COSTS. The Traffic Group, Inc. is not a construction cost estimator or construction contractor, nor should The Traffic Group's rendering an opinion of probable construction costs be considered equivalent. This is based solely upon The Traffic Group's 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.



TYPICAL - Mixed Traffic



TYPICAL - Dual Merge Lane



TYPICAL - Single Guideway in Median

Broken Land Parkway

OVERALL DESCRIPTION

From Snowden River Parkway to MD 32

Recommendation

1. Install new traffic signalized intersection in the middle of the existing bridge structure over MD 32 to allow BRT vehicles to access directly to MD 32 median via new dual guide way ramps.
2. Upgrade the traffic signal intersections with new traffic signal priority
3. BRT vehicles will travel in mixed traffic between Snowden River Parkway and the median access ramps to MD 32.

.4 miles

\$ 1,522,325

Cost/Mile

\$ 3,805,813



Broken Land Parkway - Snowden River Parkway to MD 32

Location: Howard County Maryland

Miles:	0.40
Cost Per Mile:	\$3,805,813
	Recommended Option

Preliminary Cost Estimate

Provide RTV Mixed Traffic Link between the intersection of Snowden River Parkway to the Interchange of MD 32. Upgrade existing traffic signals.

Quantity	Unit	Description	Unit Price	Total Price
0	CY	Earthwork	\$25.00	\$0.00
0	CY	Removal of Existing Grass Area	\$30.00	\$0.00
200	LF	Removal of Existing Curb & Gutter	\$15.00	\$3,000.00
100	LF	Saw-Cut Existing Pavement	\$10.00	\$1,000.00
0	SY	Removal of Existing Paving	\$35.00	\$0.00
0	LF	Continuous Pour Concrete Paving - 11 Ft. wide	\$120.00	\$0.00
0	CY	Concrete for raised Station Plat form	\$100.00	\$0.00
200	LF	Curb & Gutter	\$30.00	\$6,000.00
0	LF	Curb & Gutter - 14 Inch Height	\$45.00	\$0.00
0	SF	Grass Pavers	\$5.00	\$0.00
200	LF	5" Solid Yellow Pavement Marking Line	\$3.00	\$600.00
100	LF	5" Solid White Pavement Marking Line	\$3.00	\$300.00
100	LF	5" Broken White Pavement Marking Line	\$3.00	\$300.00
6	EA	Ground Mounted Sign	\$350.00	\$2,100.00
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
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
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:	\$869,900.00
Utilities (20%)	\$173,980.00
M.O.T. (10%)	\$86,990.00
Design Fees (10%)	\$86,990.00
Contingency (35%)	\$304,465.00
Total:	\$1,522,325.00

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.



TYPICAL - Mixed Traffic