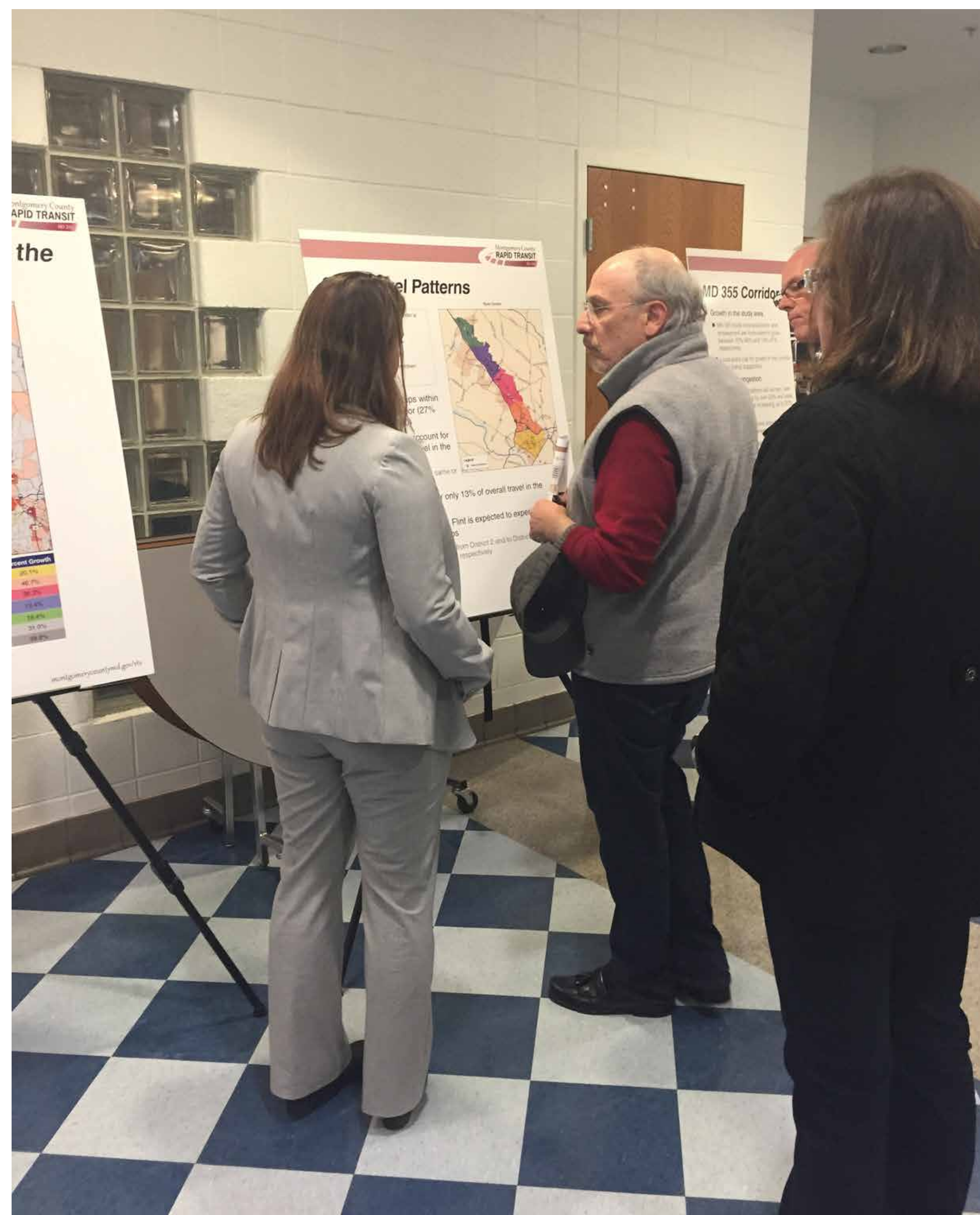


Welcome

Please Sign In

Purpose of This Open House

- Introduce Bus Rapid Transit (BRT)
- Present the MD 355 BRT Conceptual Alternatives
- Review the results and takeaways of the Preliminary Analysis
- Provide input on which BRT Conceptual Alternatives should be refined and retained for the next phase of study
- Discuss Station Design Concepts
- Meet with the project team, ask questions and provide feedback
- Present the next steps in the study process



What is Bus Rapid Transit?

BRT stands for Bus Rapid Transit, a modern, flexible, premium form of transportation that combines features of both a bus system and a light rail system. BRT features may include:

- Frequent, all day service
- Dedicated BRT only lanes, meaning less traffic congestion for riders
- Lane and signal priority, allowing for shorter travel times and increased reliability
- Multiple doors and low floor vehicles, resulting in easy and efficient entry and exiting
- Pay stations to pay for the fares before boarding, allowing for faster boarding
- Vehicles with rubber tires, allowing them to divert from the transitway on to local streets to provide neighborhood service



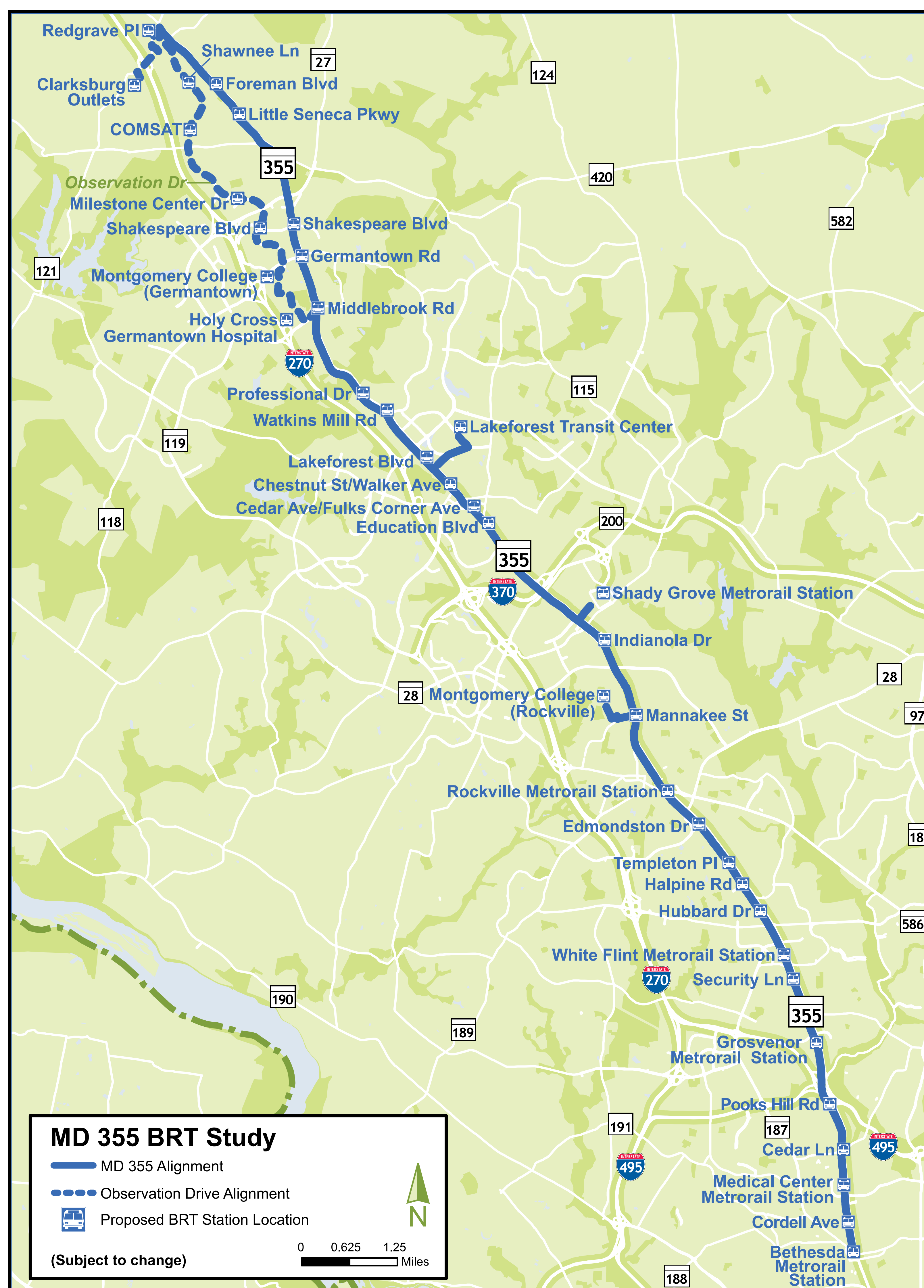
Countywide Transit Corridors Functional Master Plan

- Approved and adopted by County Council in 2013
- 102-mile BRT network comprised of 11 corridors, including MD 355
- Running way options for various BRT segments
- Potential station locations
- Establishes public rights-of-way to implement the BRT network



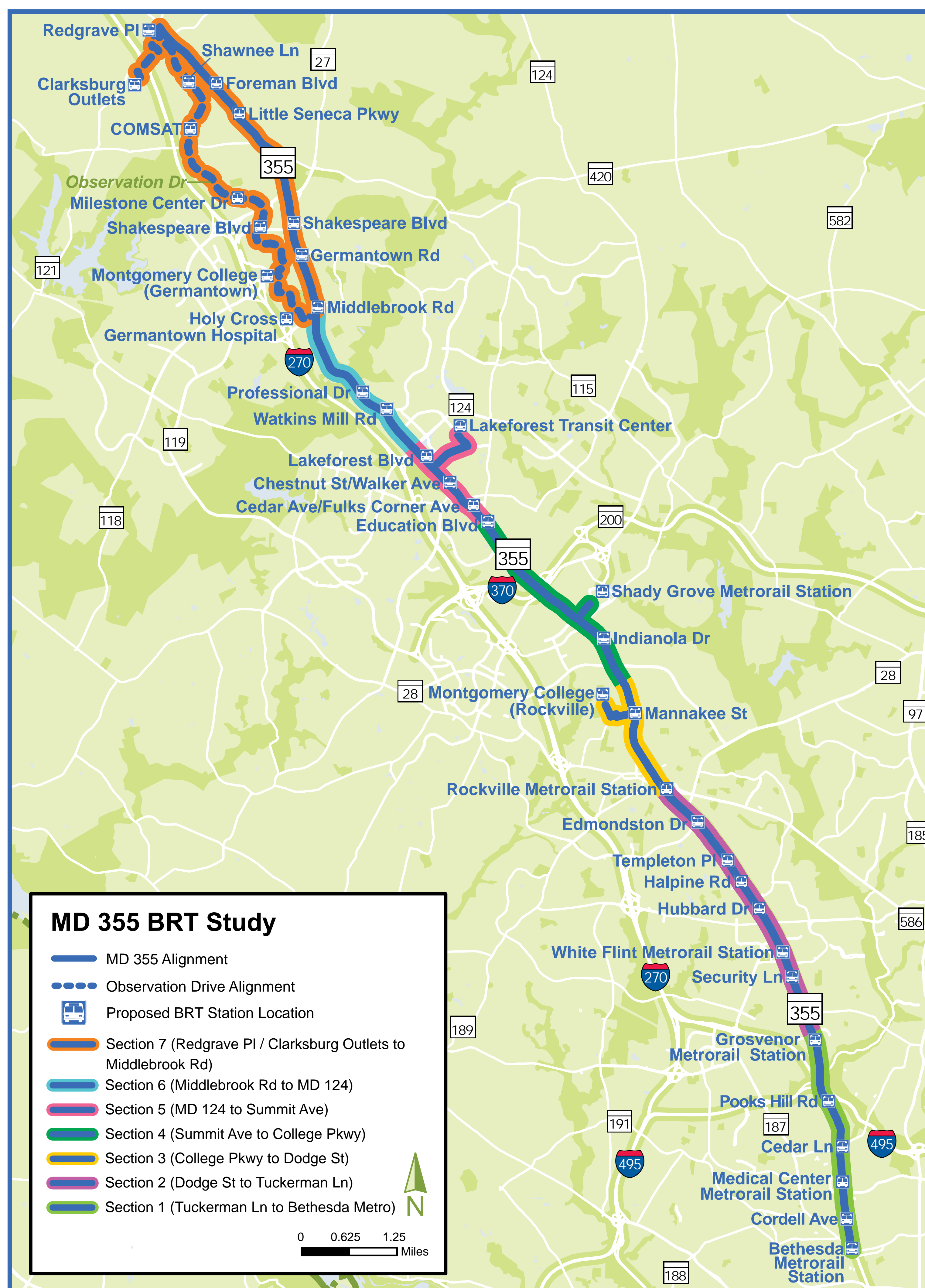
MD 355 BRT Study Overview

- Advance the Countywide Transit Corridors Functional Master Plan
- Propose BRT service along MD 355 (and Observation Drive) from Clarksburg to Bethesda
- Evaluate alternatives for accommodating BRT



Corridor Sections

Within the Study Area, the MD 355 Corridor varies from a rural setting in Clarksburg to an urban setting in Bethesda. The corridor was divided into seven sections to evaluate different running way options.



Section	Section Limits
Section 7 – Clarksburg / Germantown	Redgrave Place / Clarksburg Outlets to Middlebrook Road ~4.7 miles
Section 6 – Germantown / Montgomery Village	Middlebrook Road to MD 124 ~3.2 miles
Section 5 – Gaithersburg	MD 124 to Summit Avenue ~1.4 miles
Section 4 – Shady Grove / Rockville	Summit Avenue to College Parkway ~3.2 miles
Section 3 – Rockville Town Center	College Parkway to Dodge Street ~1.8 miles
Section 2 – Rockville / White Flint	Dodge Street to Tuckerman Lane ~4.1 miles
Section 1 – Bethesda	Tuckerman Lane to Bethesda Metro ~3.2 miles

BRT Alternative Components

The MD 355 project team developed Conceptual BRT Alternatives for the corridor. They have three components:



Running Way

A designated facility such as striped/signed lane or exclusive busway in which the vehicle would travel between stations

Station Location

Specific locations where passengers can access the service and the service can support the local land uses (residential, commercial, etc.)

Service Plan

The way in which BRT operates including service frequency, hours of service, routing and connecting services

Conceptual Alternatives

Running Way

Six Conceptual Alternatives are being studied. Two alternatives (Alternatives 1 and 2) are moving forward to the next phase of study. The remaining four BRT Alternatives (Alternatives 3A, 3B, 4A, 4B) are being evaluated to identify refinements and determine which of these four alternatives should be carried forward to the next phase.

Alternatives Advancing to Next Phase

Alternative 1 No-Build: No improvements to infrastructure or bus service along the MD 355 Study Corridor beyond those improvements already planned and programmed in the Constrained Long-Range Plan.

Alternative 2 Transportation System Management (TSM): Consists of enhanced bus service operating in mixed traffic in existing lanes in addition to minor infrastructure improvements. The infrastructure improvements would consist of queue jumps and Transit Signal Priority (TSP) at select intersections.

BRT Alternatives

Mostly Median

Alternative 3A: New BRT service from Clarksburg Outlets to the Grosvenor Metrorail Station. The service would be in mixed traffic from the Clarksburg Outlets to Middlebrook Road along Observation Drive and on dedicated median lanes from Middlebrook Road to the Grosvenor Metrorail Station along MD 355.

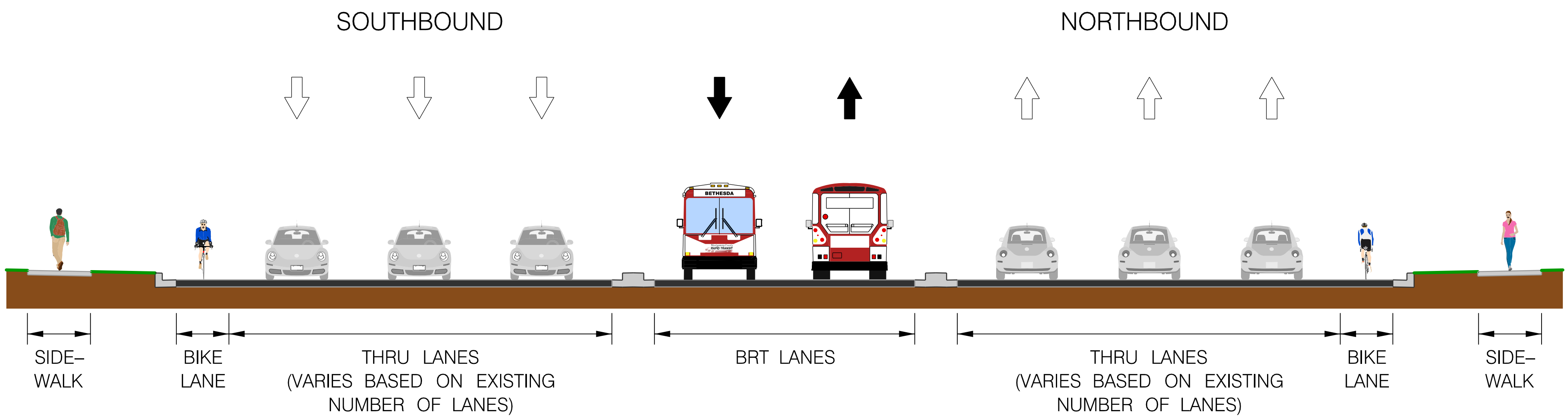
Alternative 3B: New BRT service from Redgrave Place in Clarksburg to the Bethesda Metrorail Station. The service would be mostly on dedicated median lanes from Redgrave Place to the Bethesda Metrorail Station along MD 355.

Mostly Curb

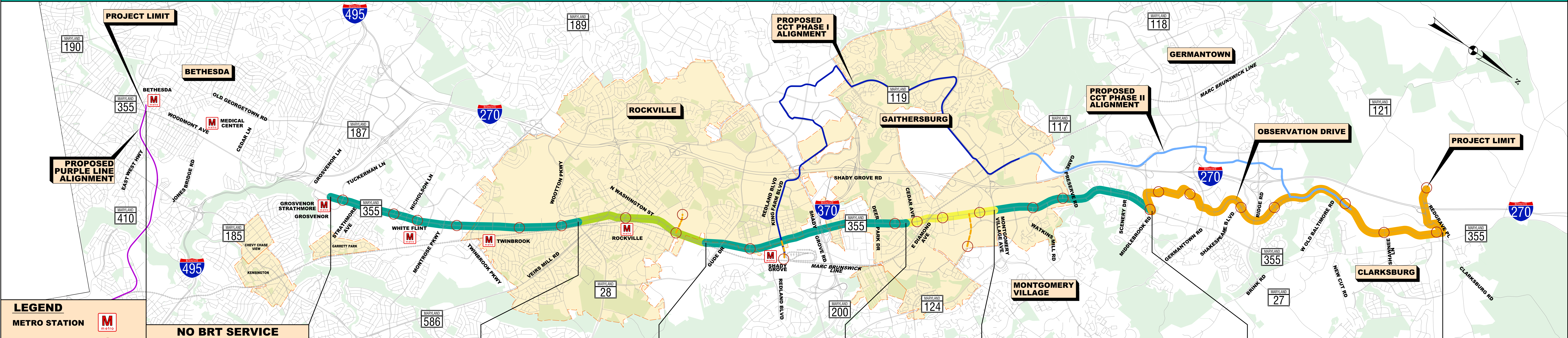
Alternative 4A: New BRT service from Redgrave Place in Clarksburg to the Grosvenor Metrorail Station. The service would be mostly on dedicated curb lanes from Redgrave Place to the Grosvenor Metrorail Station along MD 355.

Alternative 4B: New BRT service from Redgrave Place in Clarksburg to the Bethesda Metrorail Station. The service would be mostly on dedicated curb lanes from Redgrave Place to the Bethesda Metrorail Station along MD 355.

SECTIONS 2, 4 & 6



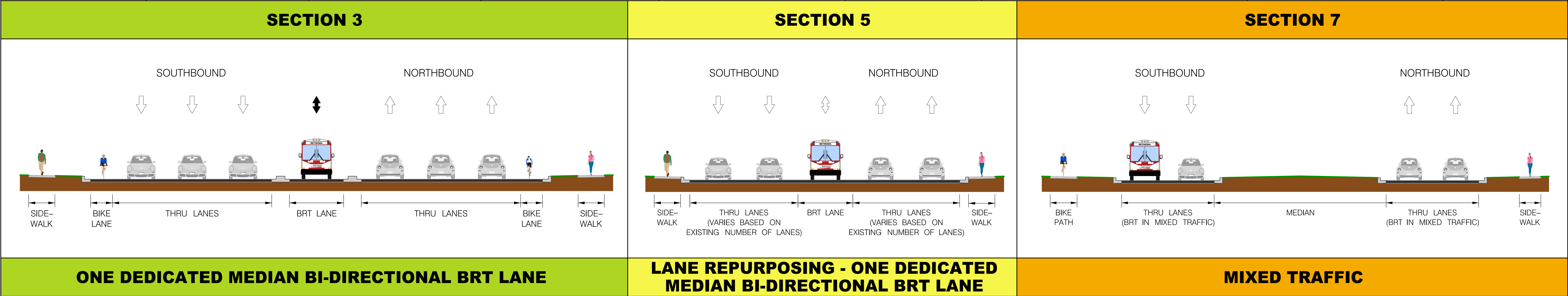
TWO DEDICATED MEDIAN BRT LANES WHERE FEASIBLE



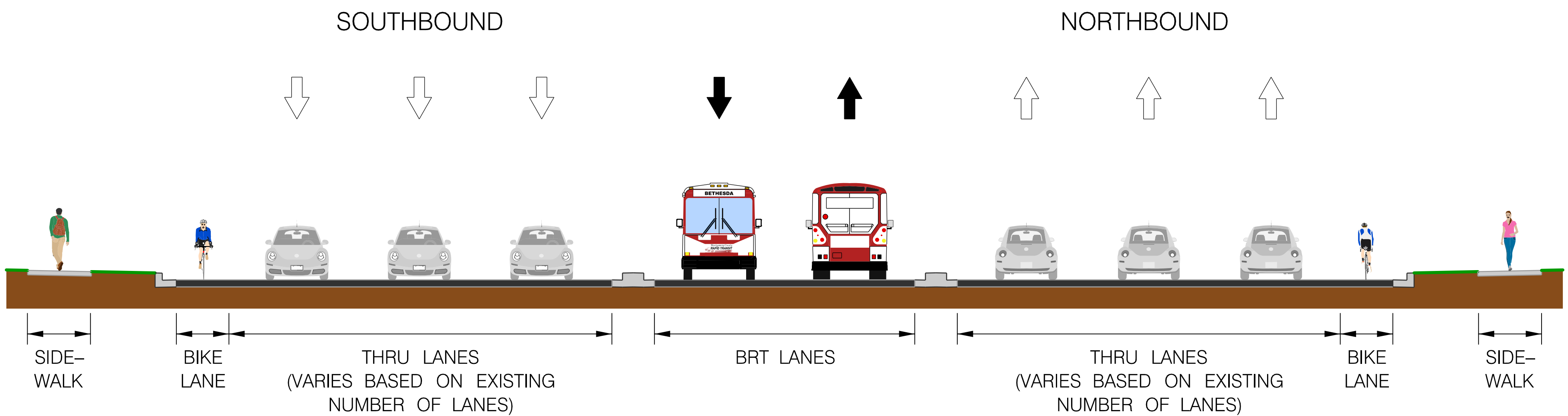
LEGEND

METRO STATION	
BRT STATION	
EXISTING LANE	
PROPOSED LANE	
MIXED TRAFFIC	

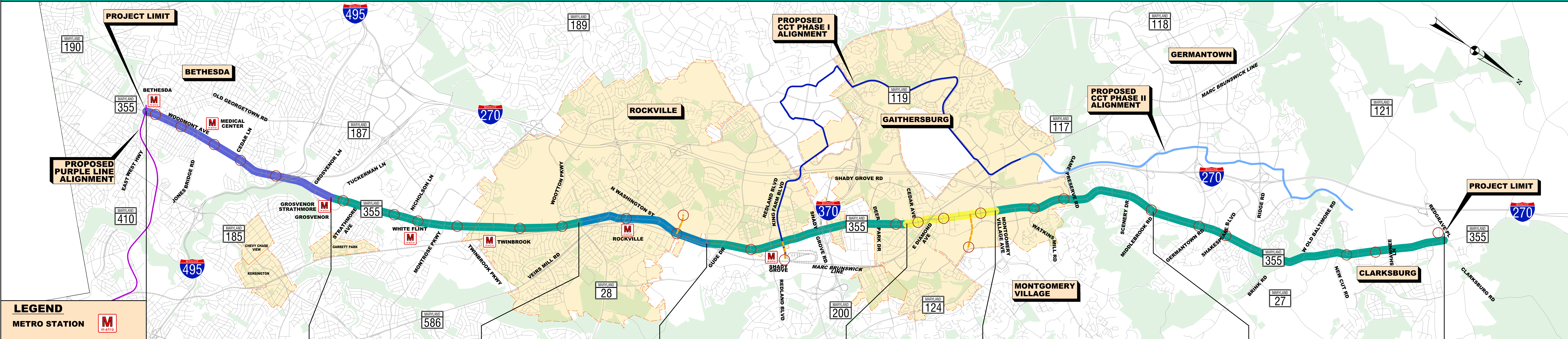
NO BRT SERVICE	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	SECTION 7	SCALE 1" = 0.5 MILE
SECTION 1 BETHESDA	WHITE FLINT / ROCKVILLE	ROCKVILLE TOWN CENTER	ROCKVILLE / SHADY GROVE	GAITHERSBURG	MONTGOMERY VILLAGE / GERMANTOWN	GERMANTOWN / CLARKSBURG	
FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)	FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)	FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)	FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)	FROM SUMMIT AVE TO MD 124 (~1.4 MILES)	FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)	FROM MIDDLEBROOK RD TO CLARKSBURG OUTLETS (~6.1 MILES)	



SECTIONS 2, 4, 6 & 7

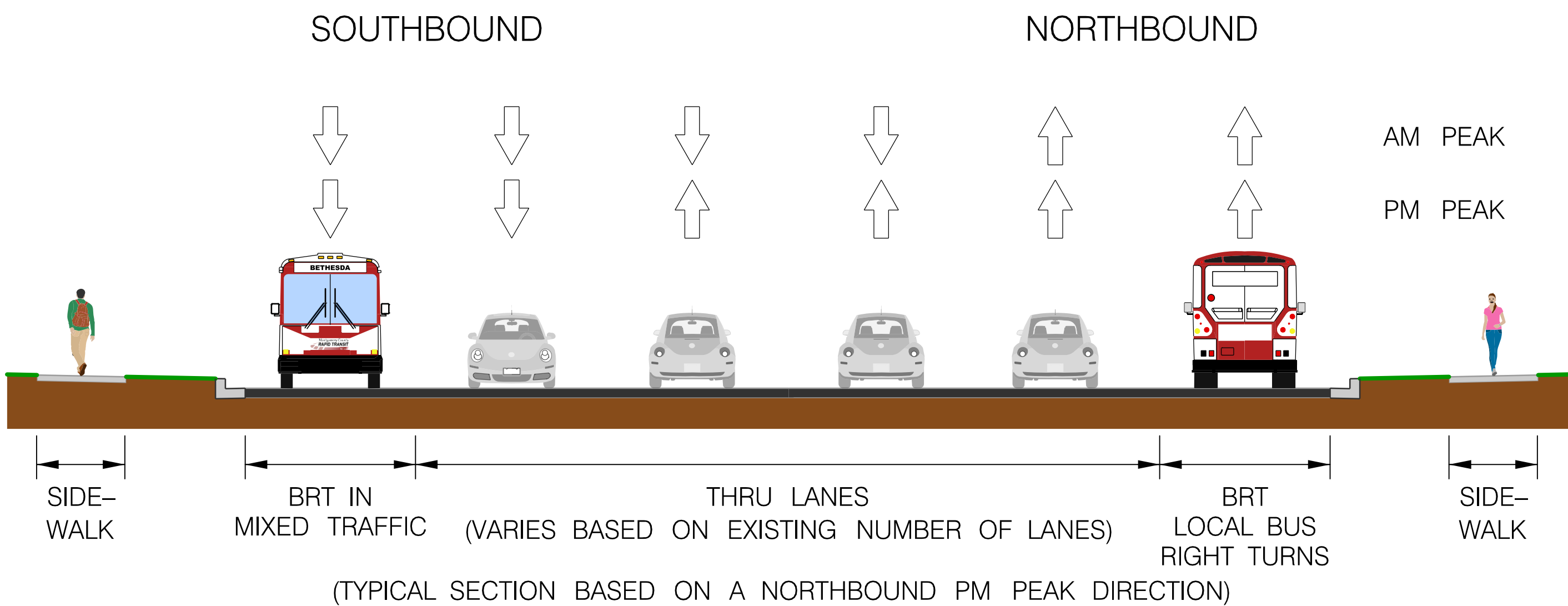


TWO DEDICATED MEDIAN BRT LANES WHERE FEASIBLE



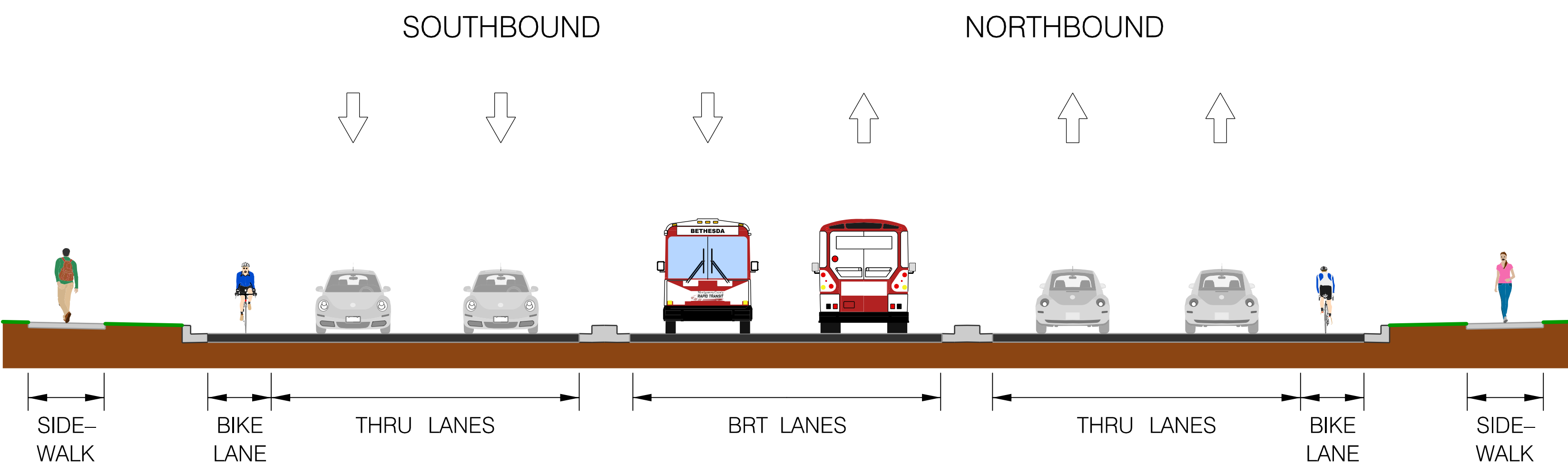
SECTION 1 BETHESDA	SECTION 2 WHITE FLINT / ROCKVILLE	SECTION 3 ROCKVILLE TOWN CENTER	SECTION 4 ROCKVILLE / SHADY GROVE	SECTION 5 GAITHERSBURG	SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN	SECTION 7 GERMANTOWN / CLARKSBURG	SCALE 1" = 0.5 MILE
FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)	FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)	FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)	FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)	FROM SUMMIT AVE TO MD 124 (~1.4 MILES)	FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)	FROM MIDDLEBROOK RD TO REDGRAVE PL (~4.7 MILES)	

SECTION 1



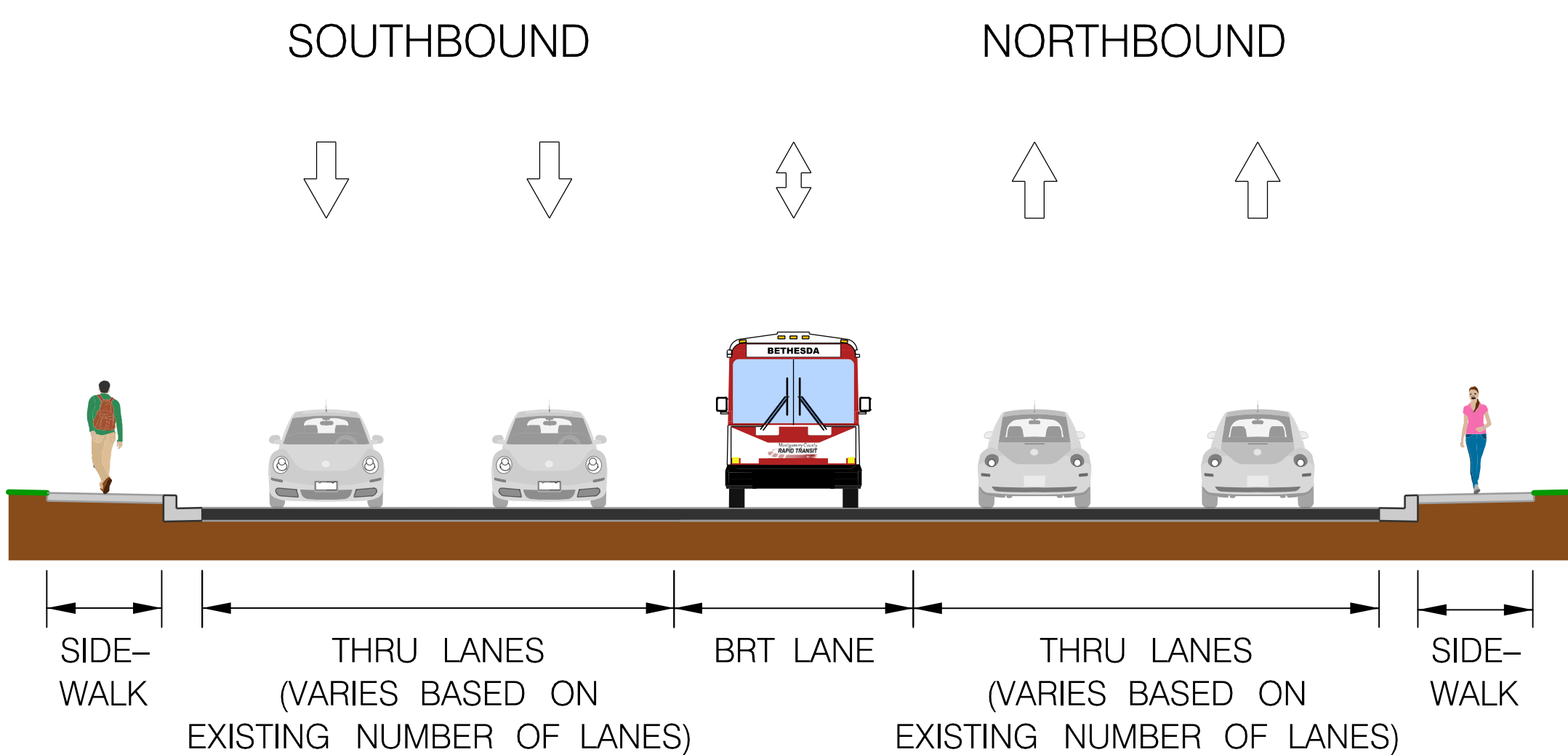
LANE REPURPOSING - CURB BRT LANE

SECTION 3



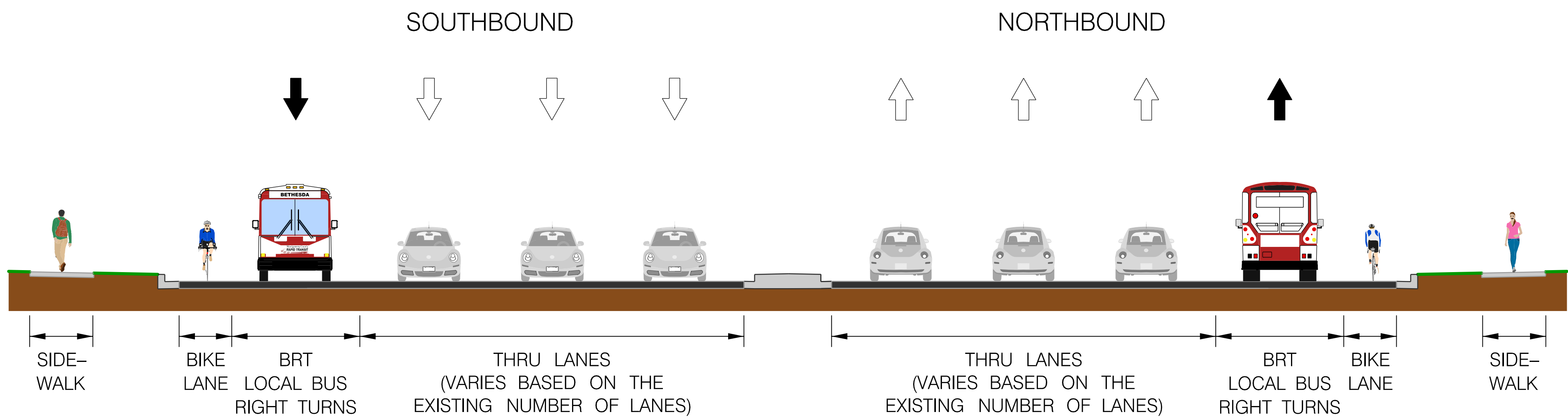
LANE REPURPOSING - TWO DEDICATED MEDIAN BRT LANES

SECTION 5

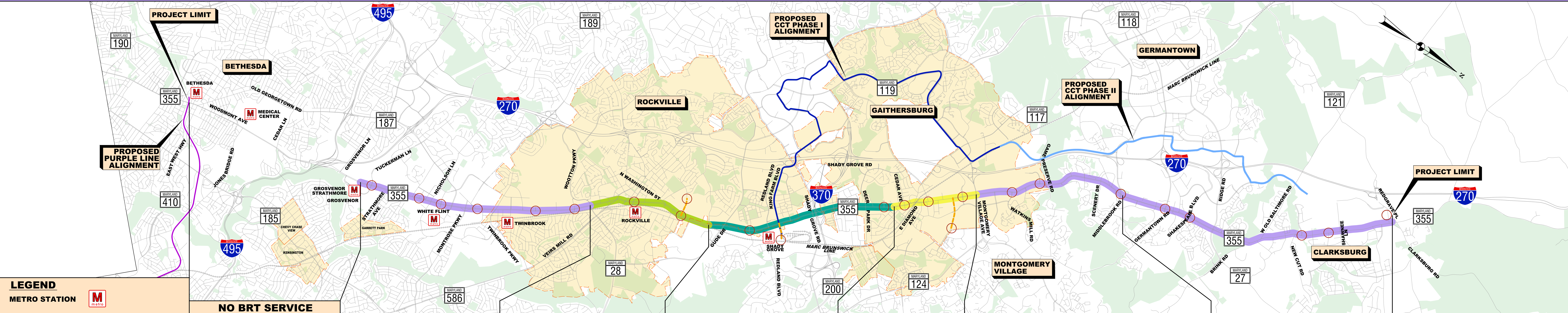


LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

SECTIONS 2, 6 & 7



TWO DEDICATED CURB BRT LANES WHERE FEASIBLE



LEGEND

METRO STATION

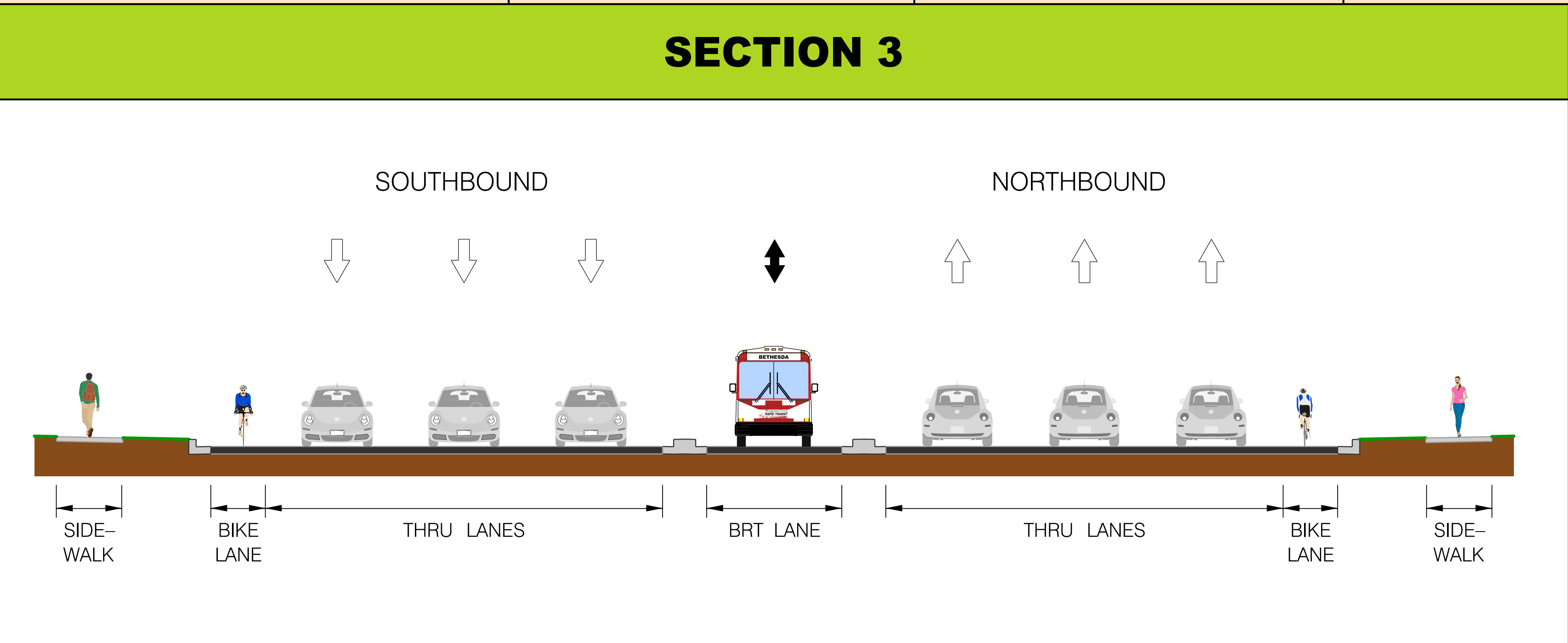
BRT STATION

EXISTING LANE

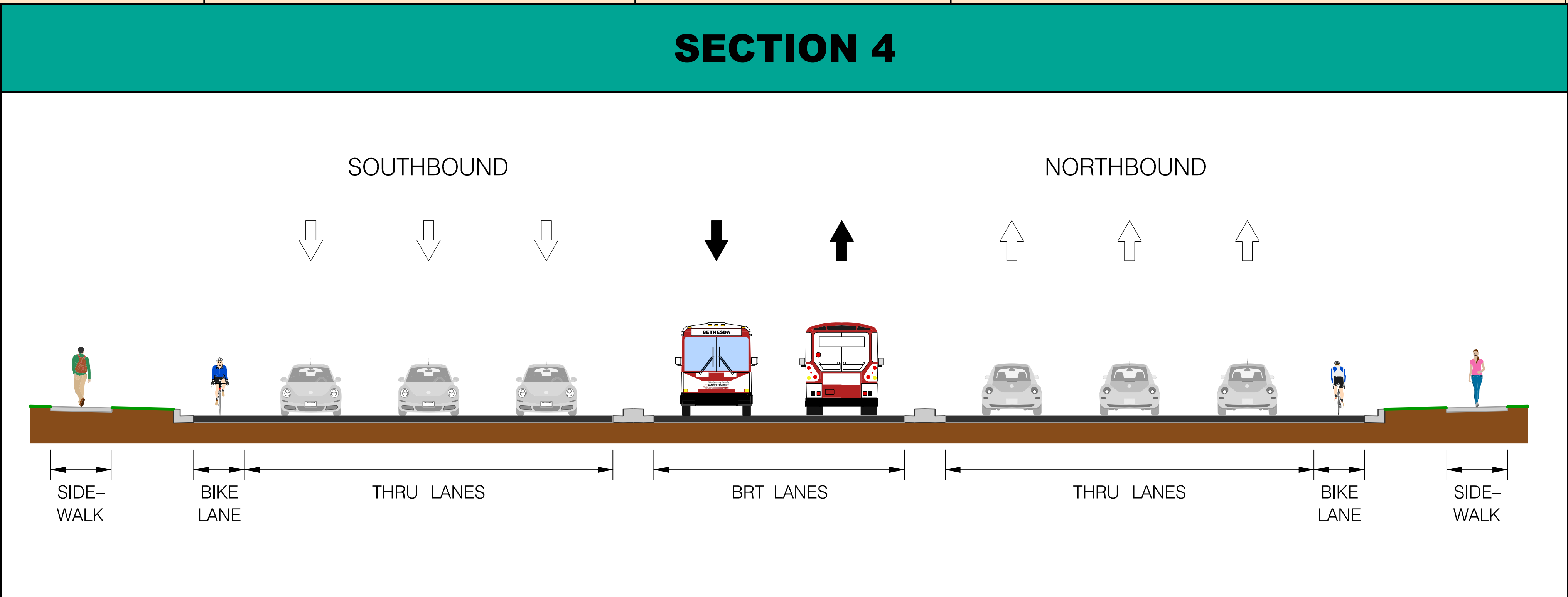
PROPOSED LANE

MIXED TRAFFIC

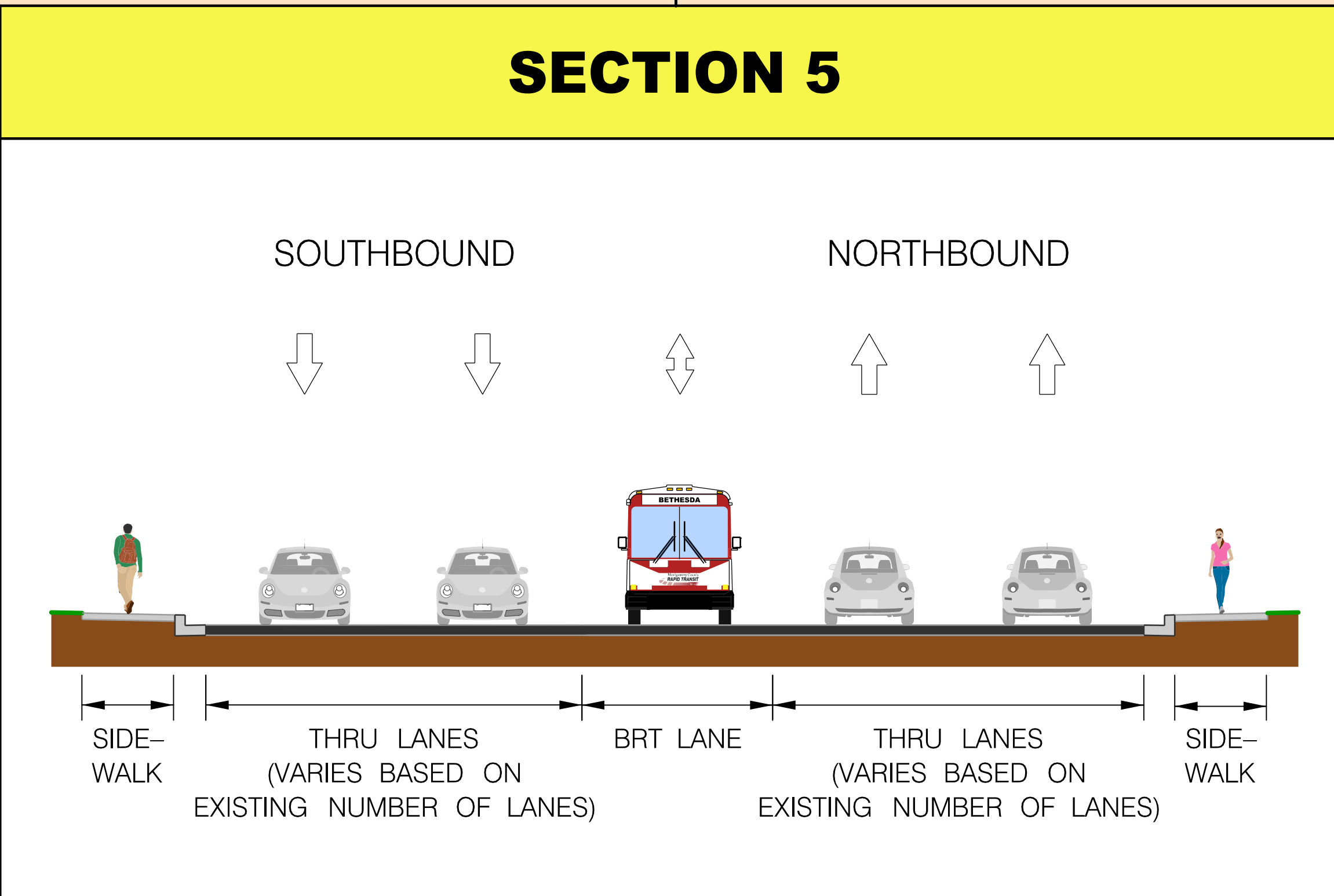
NO BRT SERVICE	SECTION 1 BETHESDA	SECTION 2 WHITE FLINT / ROCKVILLE	SECTION 3 ROCKVILLE TOWN CENTER	SECTION 4 ROCKVILLE / SHADY GROVE	SECTION 5 GAITHERSBURG	SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN	SECTION 7 GERMANTOWN / CLARKSBURG	SCALE 1" = 0.5 MILE
	FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)	FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)	FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)	FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)	FROM SUMMIT AVE TO MD 124 (~1.4 MILES)	FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)	FROM MIDDLEBROOK RD TO REDGRAVE PL (~4.7 MILES)	



ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

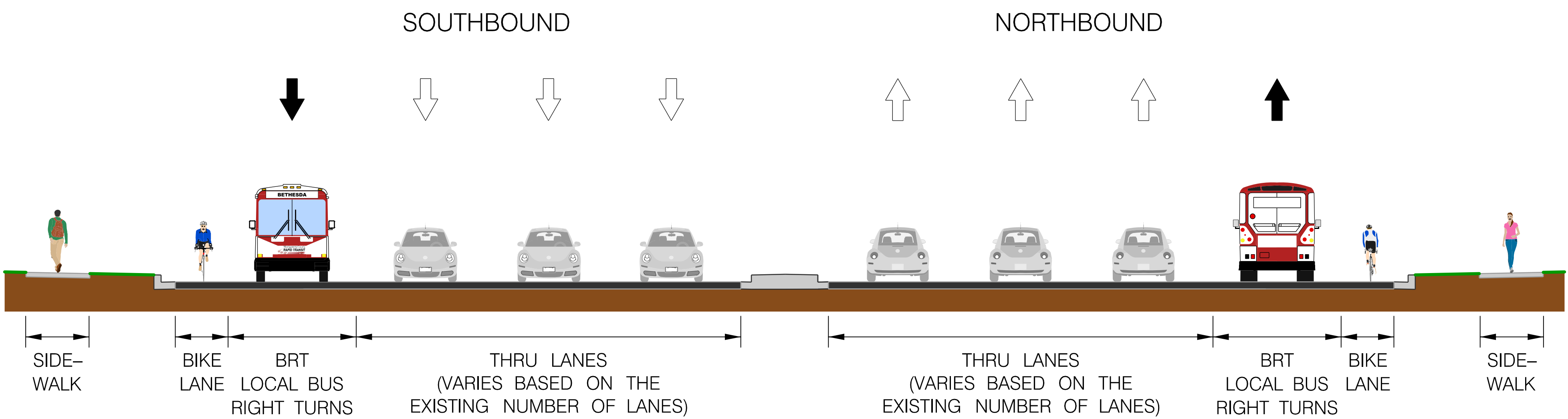


TWO DEDICATED MEDIAN BRT LANES WHERE FEASIBLE

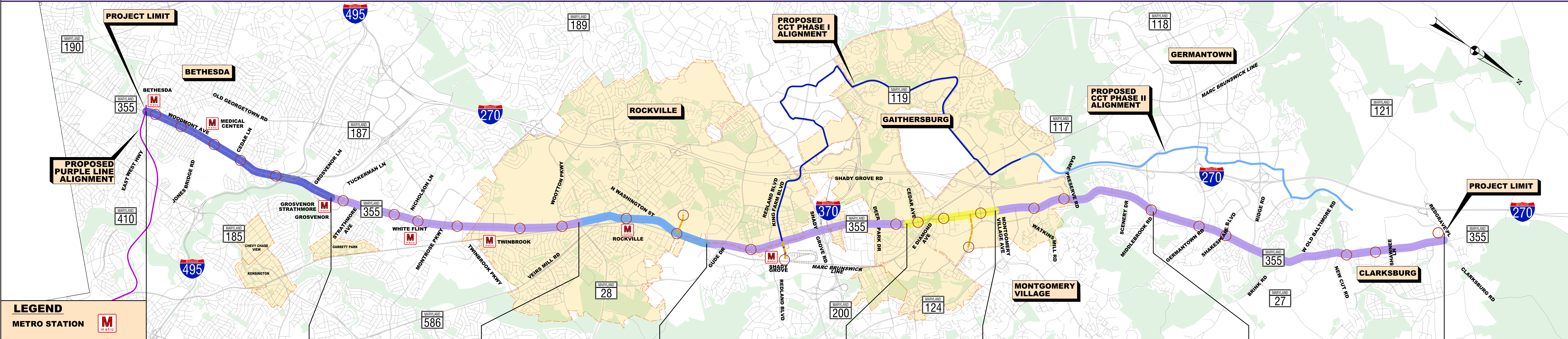


LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE

SECTIONS 2, 4, 6 & 7

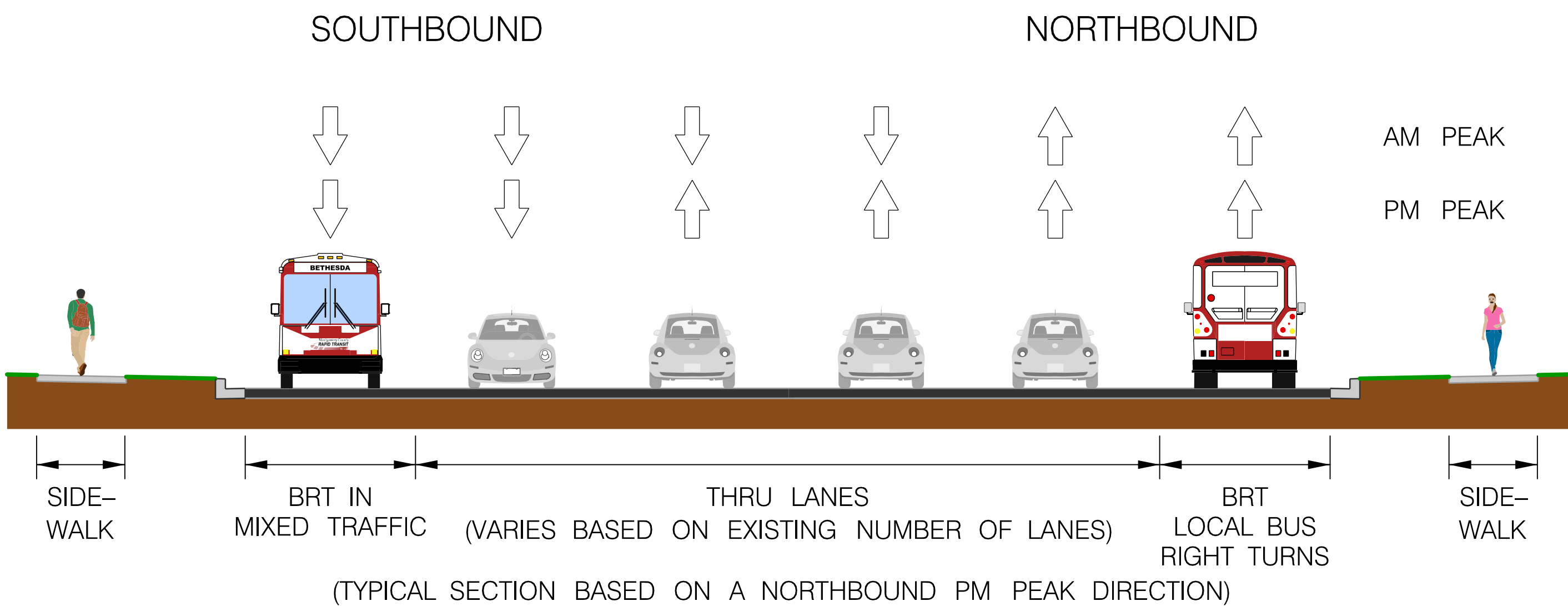


TWO DEDICATED CURB BRT LANES WHERE FEASIBLE



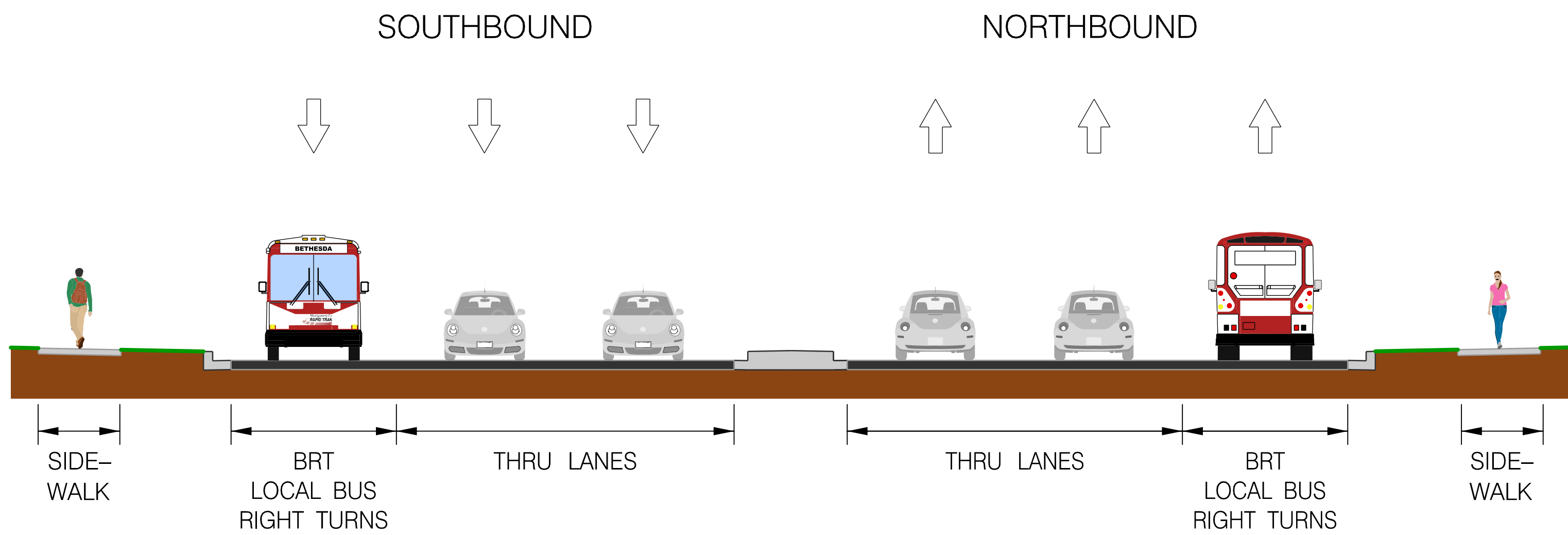
LEGEND	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	SECTION 7	SCALE 1" = 0.5 MILE
	BETHESDA FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)	WHITE FLINT / ROCKVILLE FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)	ROCKVILLE TOWN CENTER FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)	ROCKVILLE / SHADY GROVE FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)	GAITHERSBURG FROM SUMMIT AVE TO MD 124 (~1.4 MILES)	MONTGOMERY VILLAGE / GERMANTOWN FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)	GERMANTOWN / CLARKSBURG FROM MIDDLEBROOK RD TO REDGRAVE PL (~4.7 MILES)	

SECTION 1



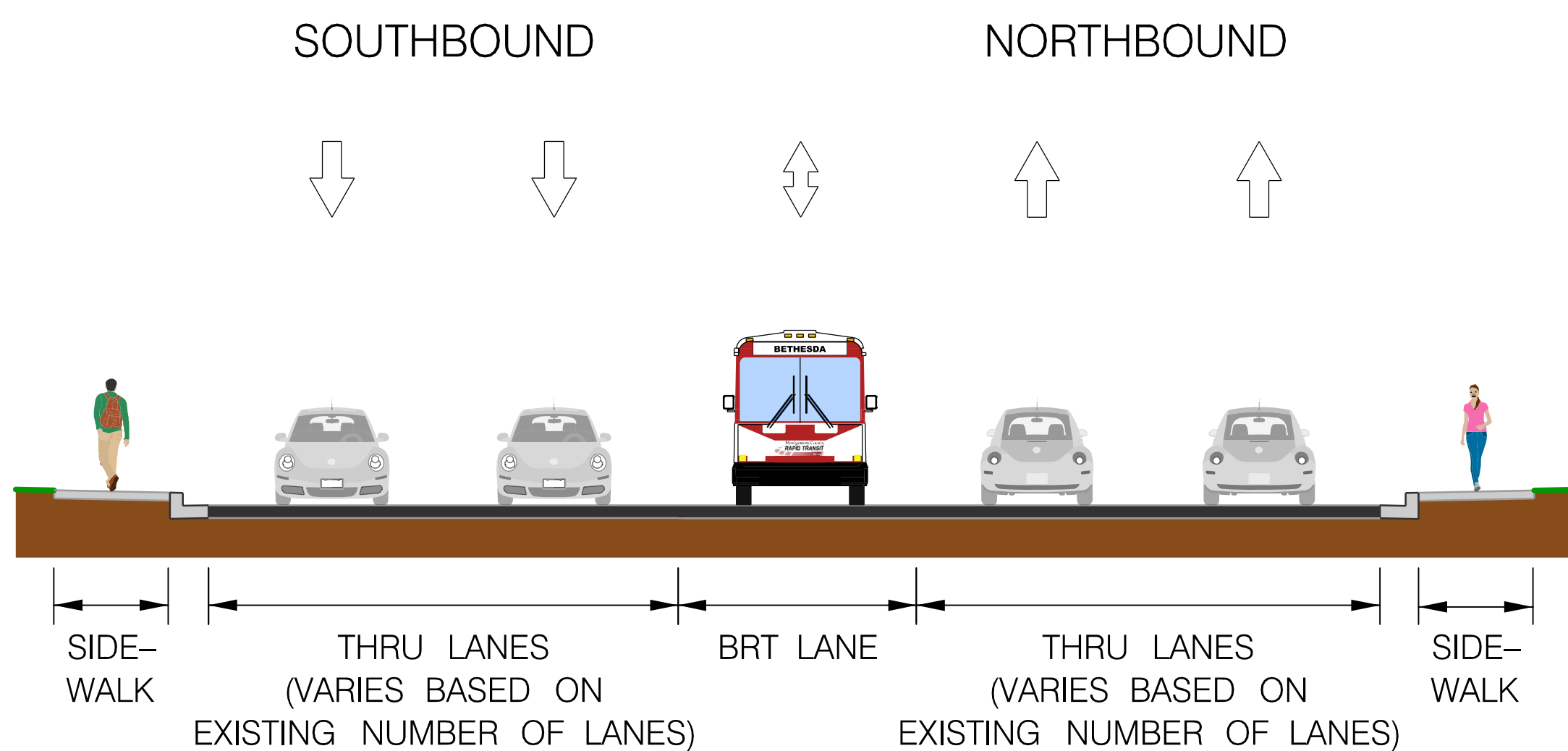
LANE REPURPOSING - CURB BRT LANE

SECTION 3

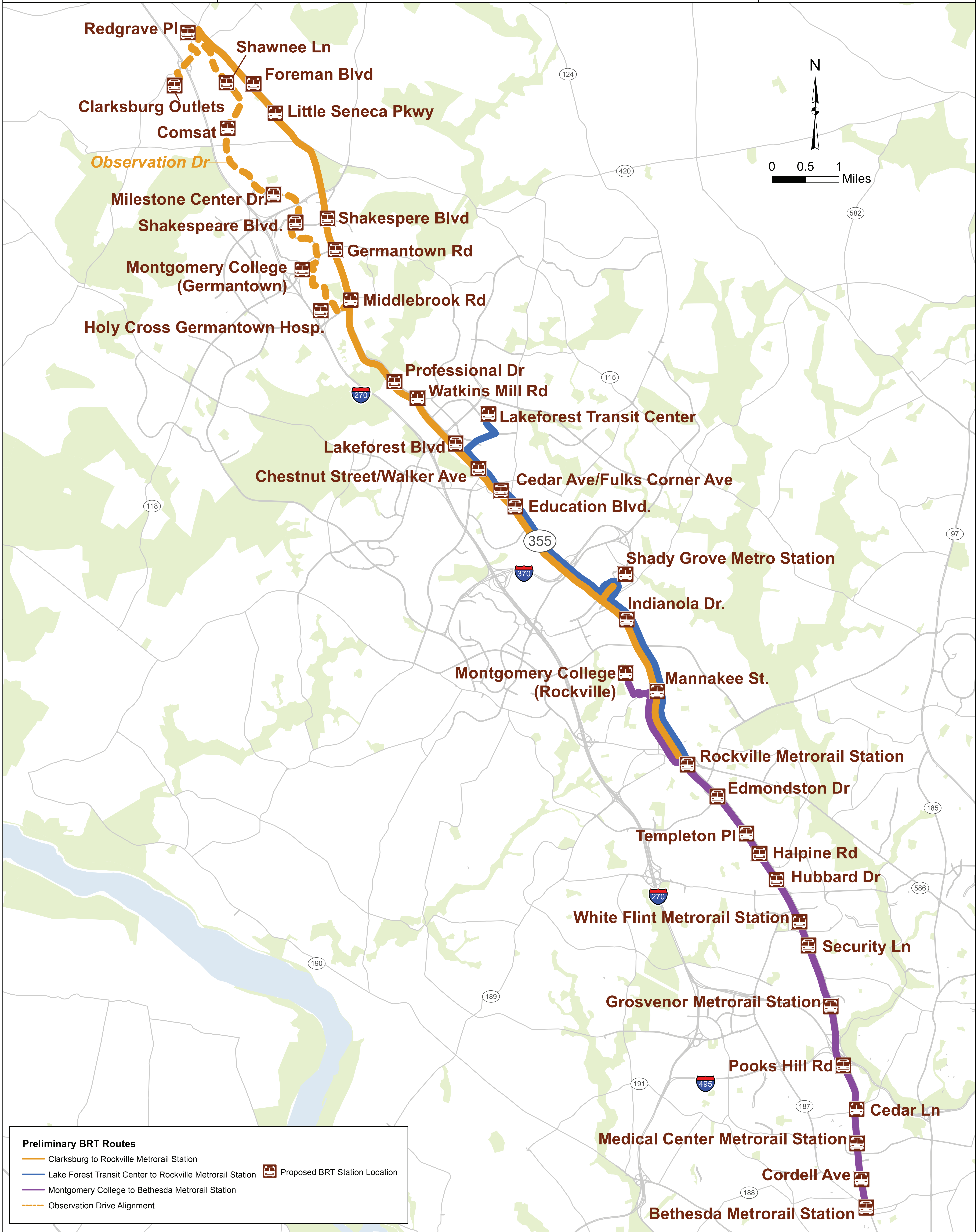


LANE REPURPOSING - TWO DEDICATED CURB BRT LANES

SECTION 5



LANE REPURPOSING - ONE DEDICATED MEDIAN BI-DIRECTIONAL BRT LANE



Steps to Recommending an Alternative

The Corridor Planning Study is utilizing a three-step process to recommend an Alternative at the conclusion of this Study.

Step 1: Identify Constraints

Data of existing conditions and input from the Corridor Advisory Committees (CAC) was collected to identify opportunities and constraints along the corridor.

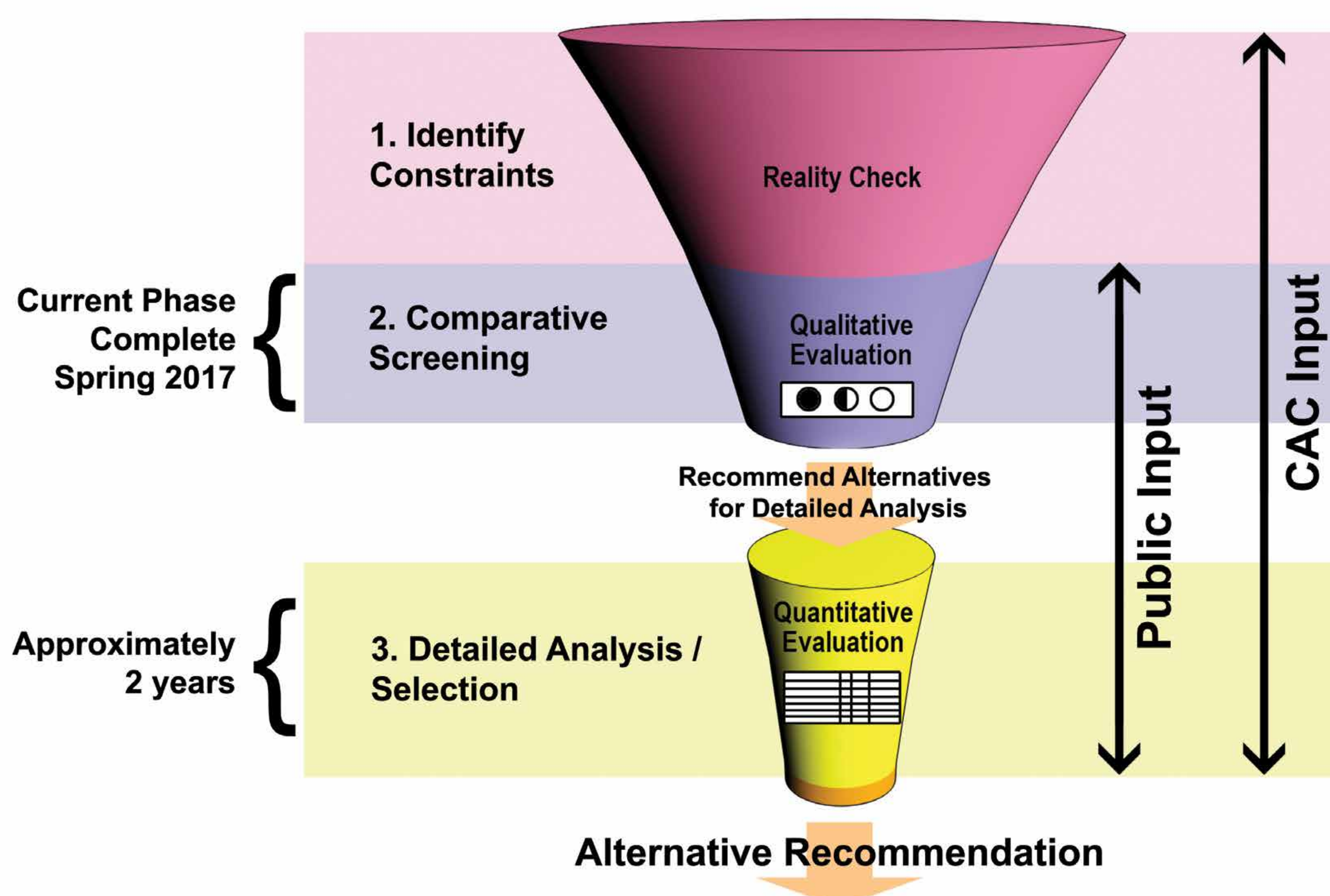
Step 2: Comparative Screening



Conceptual Alternatives were developed for testing purposes to answer questions about the project limits, alignment, running way operations and impacts. Screening criteria were identified to qualitatively compare and then refine the alternatives that will be studied in detail as part of Step 3.

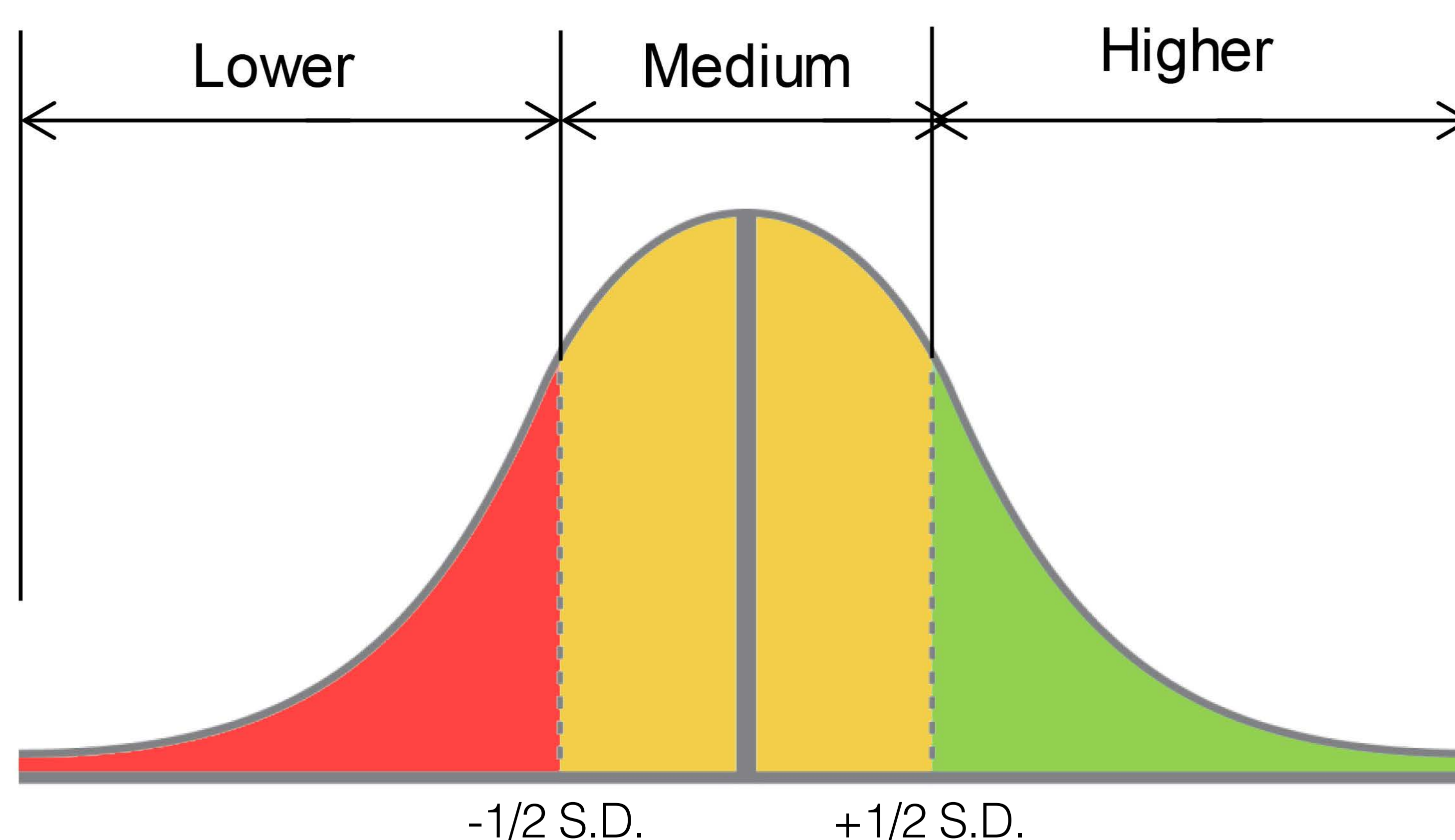
Step 3: Detailed Analysis

The refined alternatives will be compared using selection criteria. Ultimately an alternative will be recommended for future implementation.



Screening Criteria Results

- To help determine which alternative(s) should be carried forward to the next phase of study, each of the alternatives was analyzed using screening criteria
 - Results of the analysis are being compared using a Higher-Medium-Lower rating scale
 - If an alternative performed better than the others (more than half a standard deviation higher than the mean), it is presented in **green***
 - If an alternative performed worse than the others (more than a half a standard deviation lower than the mean), it is presented in **red***
 - If an alternative ranked in the middle (within half a standard deviation of the mean), it is presented in **yellow**
- * For screening criteria related to travel times, impacts and costs, if an alternative performed better than the others (lower travel times, impacts and costs), it is presented in **green**; if an alternative performed worse than the others (higher impacts and costs), it is presented in **red**



Corridor Wide - Screening Criteria Results

Screening Criteria	Alt 3A	Alt 3B	Alt 4A	Alt 4B
Increase in total daily transit ridership	Medium	Higher	Lower	Higher
Increase in total daily bus ridership	Medium	Higher	Lower	Higher
Total daily BRT ridership	Medium	Higher	Lower	Higher
Boardings by station – North Section (Section 7)	Higher	Medium	Medium	Lower
Boardings by station – Central Section (Section 6 through Section 2)	Lower	Higher	Lower	Higher
Boardings by station – South Section (Section 1)	Same for Alternative 3B and Alternative 4B			
Increase in jobs within 45 minutes along the corridor	Medium	Higher	Lower	Lower
Increase in jobs within 60 minutes along the corridor	Medium	Higher	Lower	Medium
Increase in households within 45 and 60 minutes of activity centers	Lower	Higher	Lower	Higher
Property impacts*	Medium	Higher	Medium	Lower
Total operating costs*	Higher	Medium	Lower	Medium
Construction costs*	Medium	Higher	Medium	Lower

* For screening criteria related to impacts and costs, if an alternative has lower impacts and costs it performed better and therefore is presented in Green. If an alternative has higher impacts and costs it performed worse and therefore is presented in Red.

BRT Travel Times AM / PM

Peak by Section

BRT Travel Time – AM Peak Southbound

	Alternative 3A	Alternative 3B	Alternative 4A	Alternative 4B
Section 7	Higher	Lower	Medium	Medium
Section 6	Lower	Medium	Higher	Higher
Section 5	Lower	Medium	Higher	Lower
Section 4	Lower	Medium	Medium	Higher
Section 3	Higher	Lower	Higher	Lower
Section 2	Lower	Lower	Medium	Higher
Section 1	Same for Alternatives 3B and 4B			

BRT Travel Time – PM Peak Northbound

	Alternative 3A	Alternative 3B	Alternative 4A	Alternative 4B
Section 7	Higher	Medium	Lower	Lower
Section 6	Medium	Lower	Medium	Higher
Section 5	Lower	Medium	Higher	Medium
Section 4	Lower	Medium	Medium	Higher
Section 3	Higher	Lower	Higher	Medium
Section 2	Lower	Lower	Higher	Medium
Section 1	Same for Alternatives 3B and 4B			

Person Throughput by Section

Person throughput measures how many people move through a certain location

- Transit person throughput is how many people move through that certain location using transit
- Auto person throughput is how many people move through a certain location in an auto

Increase in AM Peak Hour Total Person Throughput

	Alternative 3A	Alternative 3B	Alternative 4A	Alternative 4B
Section 7	-	Medium	Higher	Lower
Section 6	Higher	Medium	Medium	Lower
Section 5	Higher	Medium	Medium	Lower
Section 4	Higher	Medium	Medium	Lower
Section 3	Higher	Decrease	Lower	Decrease
Section 2	Higher	Higher	Lower	Medium
Section 1	-	Decrease	-	Decrease

Increase in PM Peak Hour Total Person Throughput

	Alternative 3A	Alternative 3B	Alternative 4A	Alternative 4B
Section 7	-	Medium	Higher	Lower
Section 6	Higher	Medium	Medium	Lower
Section 5	Higher	Medium	Lower	Lower
Section 4	Higher	Medium	Medium	Lower
Section 3	Lower	Decrease	Higher	Decrease
Section 2	Higher	Higher	Lower	Lower
Section 1	-	Decrease	-	Decrease

Impacts and Costs by Section

Property Impacts (Acres)

	Alternative 3A	Alternative 3B	Alternative 4A	Alternative 4B
Section 7	Lower	Higher	Medium	Medium
Section 6	Higher	Higher	Lower	Lower
Section 5	Same for all Alternatives			
Section 4	Higher	Higher	Higher	Lower
Section 3	Higher	Medium	Higher	Lower
Section 2	Higher	Higher	Lower	Lower
Section 1	Same for Alternatives 3B and 4B			

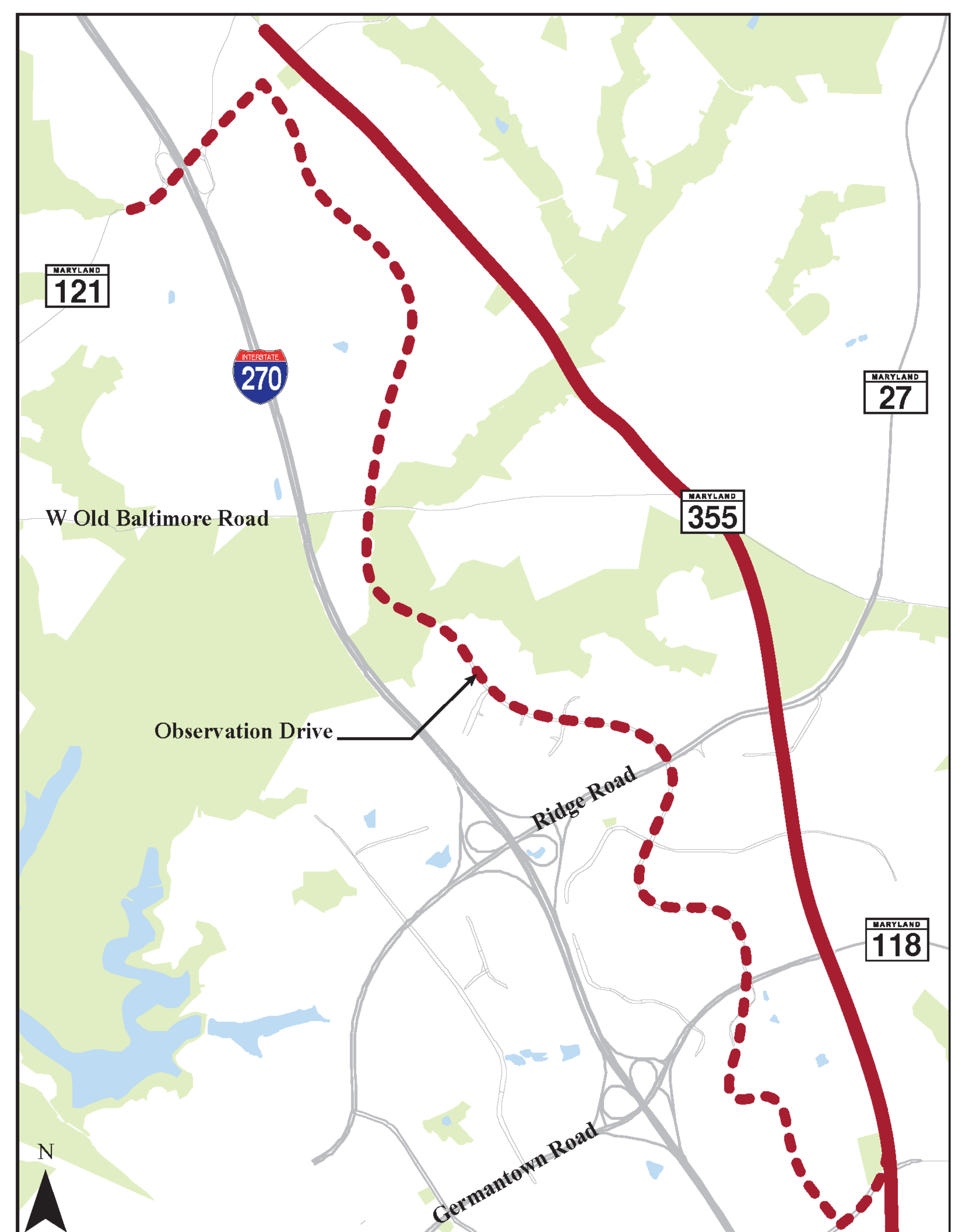
Total Construction Costs

	Alternative 3A	Alternative 3B	Alternative 4A	Alternative 4B
Section 7	Lower	Higher	Medium	Medium
Section 6	Higher	Higher	Lower	Lower
Section 5	Same for all Alternatives			
Section 4	Higher	Higher	Higher	Lower
Section 3	Higher	Medium	Higher	Lower
Section 2	Higher	Higher	Lower	Lower
Section 1	Same for Alternatives 3B and 4B			

Preliminary Analysis - Takeaways

Comparison of the two northern alignment Alternatives in Section 7 - MD 355 (Alt 3B, 4A, 4B) and Observation Drive (Alt 3A)

- Over 50% higher ridership identified along Observation Drive compared to MD 355
- It takes twice as long (or more) for the BRT to travel along Observation Drive compared to MD 355
- Observation Drive has higher ridership despite longer BRT travel times due to higher number of large trip generators
- Observation Drive has operational costs that are over 40% higher than the other Alternatives due to higher ridership and longer travel times
- The mixed traffic running way along Observation Drive results in lower property impacts and lower construction costs than Alternatives along MD 355



Preliminary Analysis - Takeaways

Comparison of the two southern limits in Section 1 - Grosvenor Metrorail Station(Alt 3A and 4A) and Bethesda Metrorail Station (Alt 3B and 4B)

- Approximately 15% of ridership is generated at stations south of Grosvenor Metrorail Station
- Extending service to Bethesda Metrorail Station:
 - Increases the ridership on the central section (Middlebrook Road to Grosvenor Metrorail Station – Sections 2-6) by more than 10%
 - Increases accessibility to households from activity centers by approximately 40 to 75%
 - Provides improved transit access to key activity centers including Medical Center and downtown Bethesda without having to transfer to Metrorail
- Terminating service at Grosvenor Metrorail Station would result in lower property impacts, operational costs and construction costs



Preliminary Analysis - Takeaways

Differences in ridership for new BRT service between the Alternatives

- Providing service along Observation Drive increases ridership due to higher number of large trip generators
- Extending service to Bethesda increases ridership by expanding the BRT market and providing improved transit access to additional activity centers without having to transfer to Metrorail
- In general, the median running way sections have up to 20% shorter travel times generating higher ridership within those sections

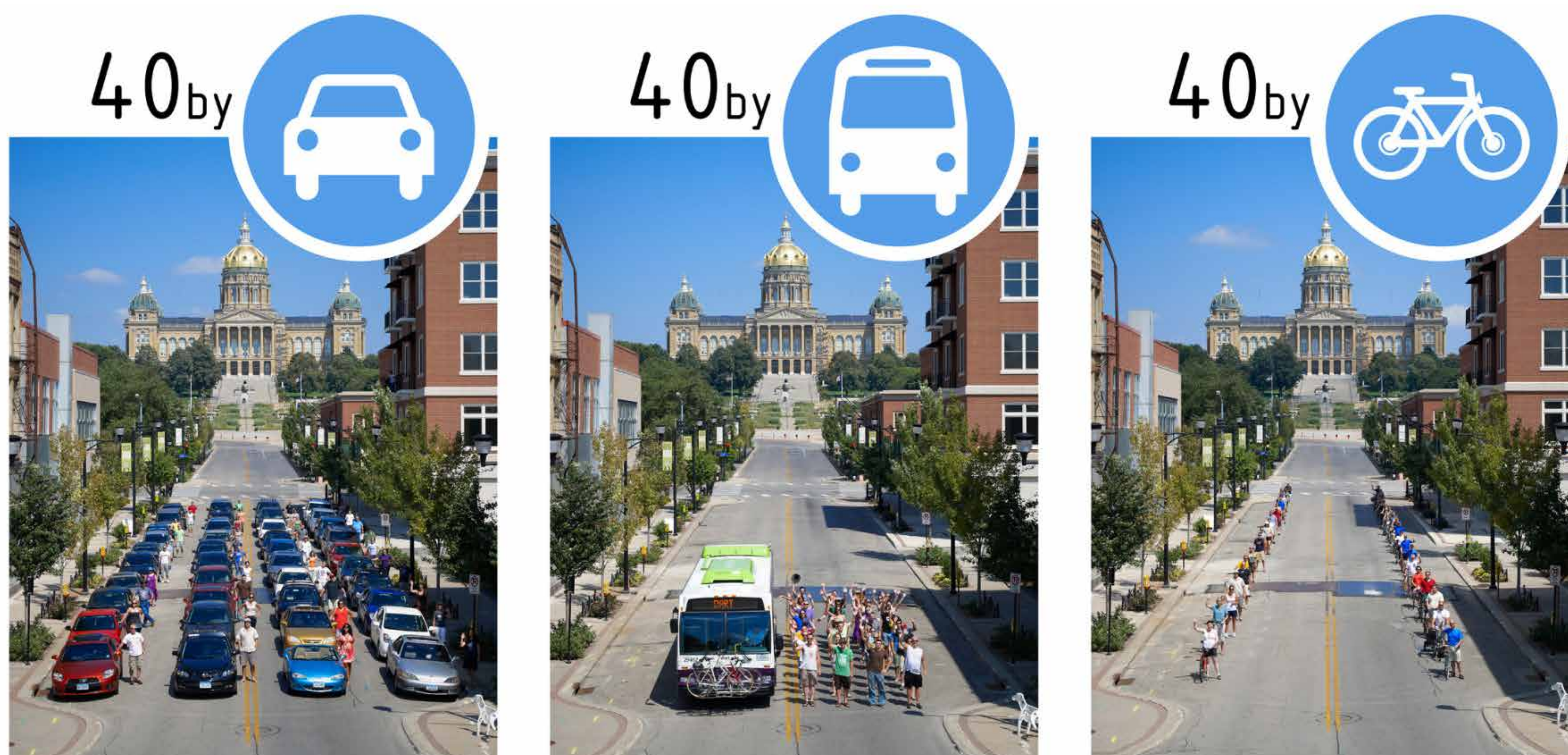


Preliminary Analysis - Takeaways

Effects of lane repurposing in Sections 1 and 3 (Alt 3B and 4B)

- Transit person throughput increases between 80% and 130% within the different sections with repurposed lanes compared to the No-Build Alternative
- Total person throughput decreases by up to 15% in sections where lane repurposing is being proposed due to a decrease in auto throughput outweighing increase in transit throughput
- The running ways where lane repurposing is being proposed results in lower impacts and lower construction costs

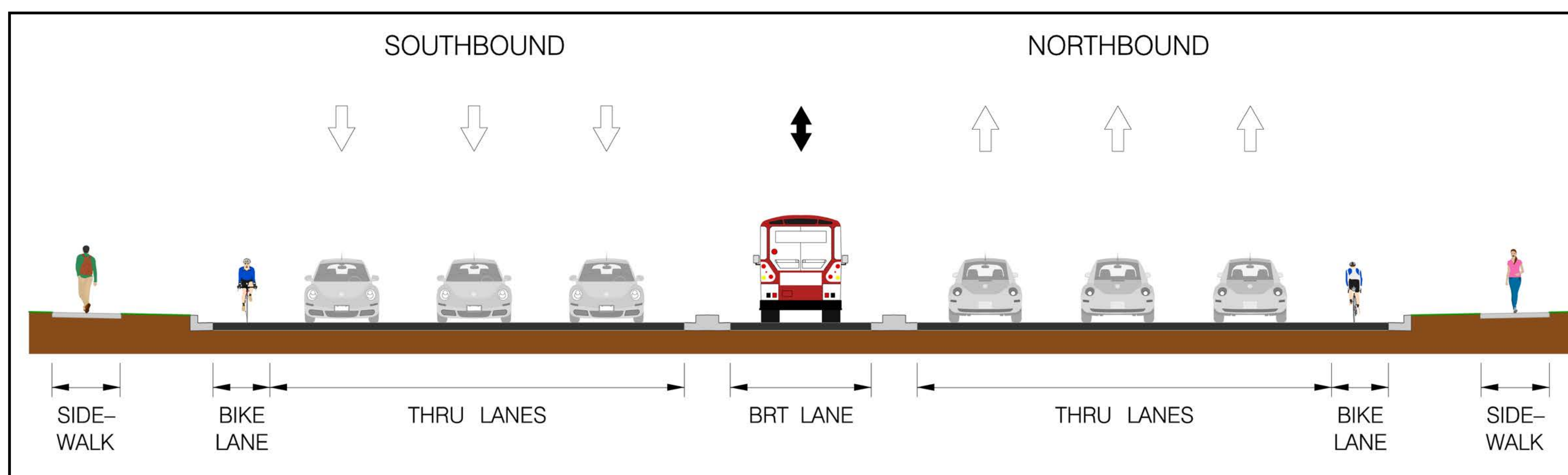
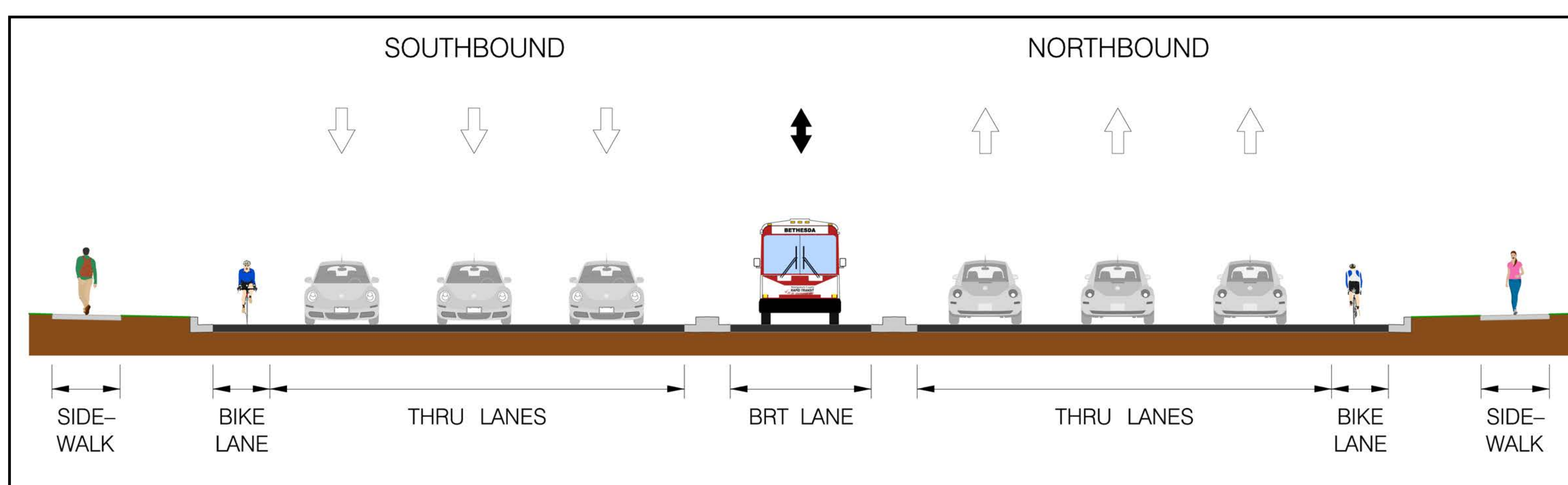
How much space does it take?



Preliminary Analysis - Takeaways

Operational characteristics for the bi-directional running way (Alt 3A and 4A) Section 3

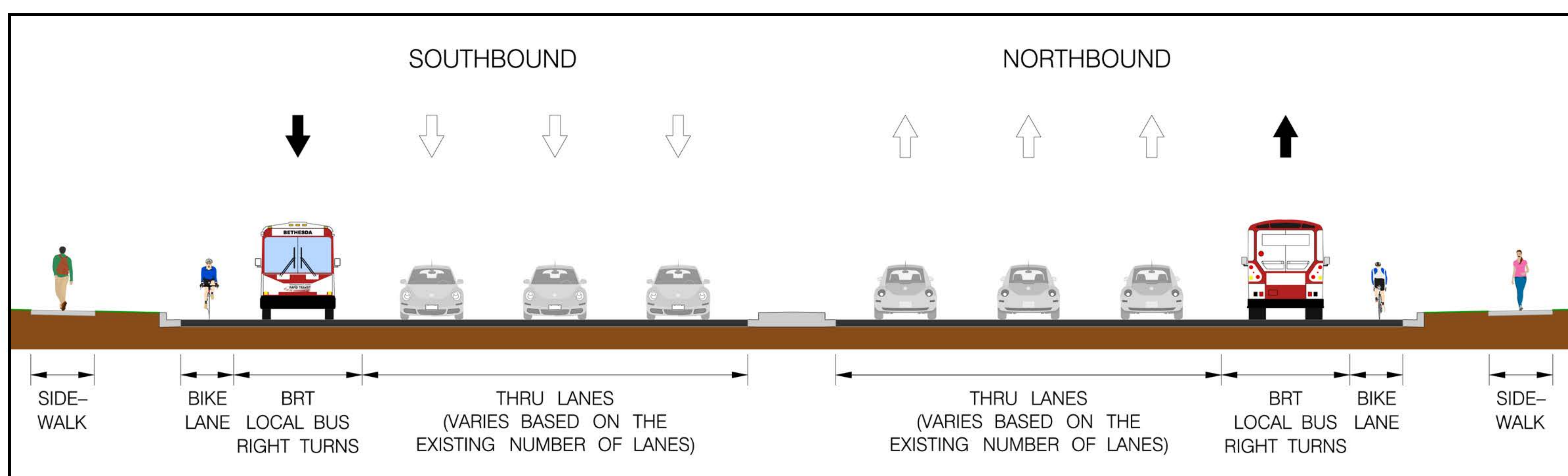
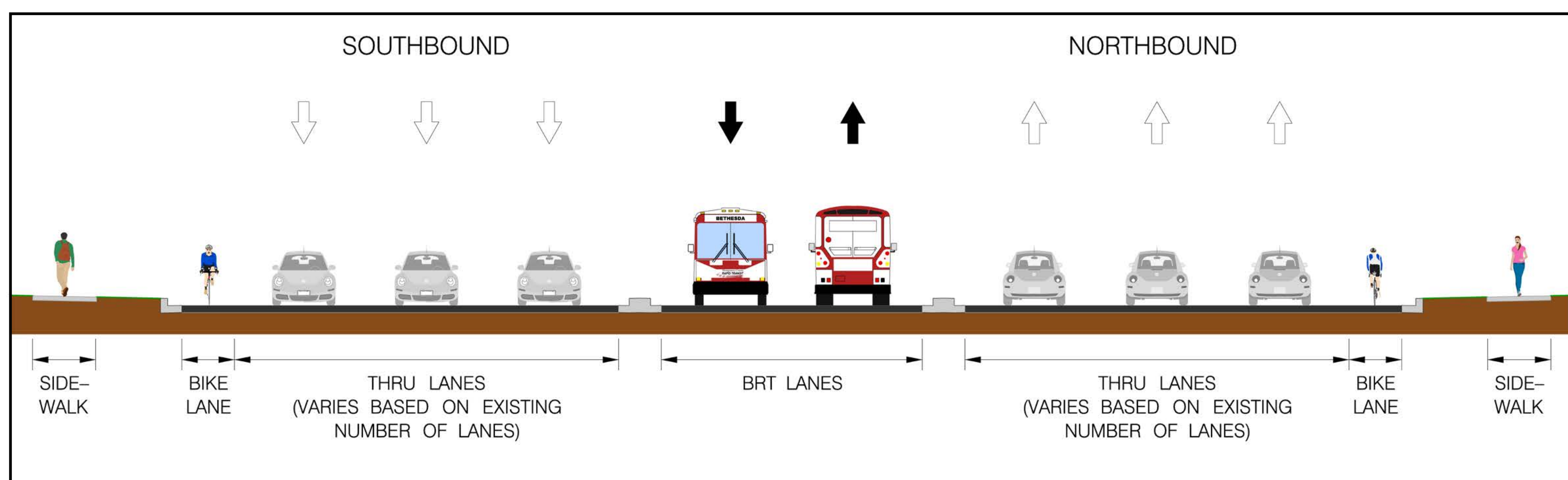
- BRT travel times are up to 25% longer (Alternative 3A and 4A)
- BRT ridership is up to 25% lower (Alternatives 3A and 4A)
- Average delay per BRT trip ranges from a low of 1 minute 30 seconds to more than 3 minutes
- Wider footprint results in construction costs more than 13% higher compared to lane repurposing option



Preliminary Analysis - Takeaways

Median vs Curb Running Way Comparison

- In general, the median running way sections have up to 20% shorter travel times generating higher ridership within those sections
- Median running way has a wider footprint and results in more than 25% higher property impacts and 60% higher construction costs compared to the curb running way



Preliminary Analysis - Takeaways

BRT service features affecting operational costs

- Orange BRT Route (Clarksburg to Rockville) is more than double the cost to operate than the other BRT Routes in the service plan
- Higher ridership would require more frequent service and result in slower travel times and more buses in service, resulting in higher operational costs



Preliminary Analysis - Takeaways

BRT service features affecting property impacts and construction costs

- Median running way has a wider footprint and results in over 25% higher property impacts and 60% higher construction costs compared to the curb running way
- Mixed traffic running way along Observation Drive is reducing property impacts and construction costs on Alternative 3A
- Extending service to Bethesda Metrorail Station results in higher property impacts and construction costs due to stations



MD 355 Public Involvement

- Two Corridor Advisory Committees (CAC)
 - Includes residents, business owners and interested stakeholders
 - Meets regularly with the project team to review information, ask questions, and provide feedback
- Additional public involvement - public workshops/open houses, community meetings, and the project website

Previous Open Houses include:

- April 28, 2016
 - May 3, 2016
- Meeting materials for the open houses can be found at montgomerycountymd.gov/brt



Study Timeline



Stay Involved

Your comments and suggestions are very important to us

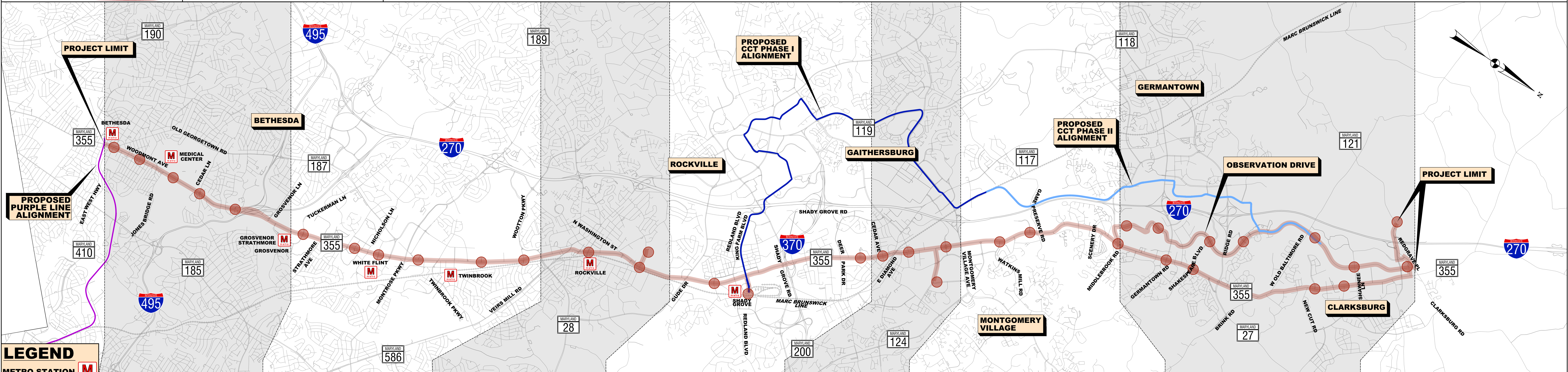
- Please provide us with your ideas, comments and questions
- Sign up for project updates and/or request a presentation to your community or organization
 - Fill out a comment card today
 - Send an e-mail to: md355brt@mta.maryland.gov
 - Mail information to:



MD 355 BRT Project Manager
Maryland Transit Administration
6 St. Paul Street, Suite 902
Baltimore, MD 21202



For more information, visit the project website at
montgomerycountymd.gov/brt

MD 355 BUS RAPID TRANSIT ALTERNATIVES



LEGEND									
METRO STATION									
BRT STATION		SECTION 1 BETHESDA	SECTION 2 WHITE FLINT / ROCKVILLE	SECTION 3 ROCKVILLE TOWN CENTER	SECTION 4 ROCKVILLE / SHADY GROVE	SECTION 5 GAITHERSBURG	SECTION 6 MONTGOMERY VILLAGE / GERMANTOWN	SECTION 7 GERMANTOWN / CLARKSBURG	
ALTERNATIVE		FROM BETHESDA METRO TO TUCKERMAN LN (~3.2 MILES)	FROM TUCKERMAN LN TO DODGE ST (~4.1 MILES)	FROM DODGE ST TO COLLEGE PKWY (~1.8 MILES)	FROM COLLEGE PKWY TO SUMMIT AVE (~3.2 MILES)	FROM SUMMIT AVE TO MD 124 (~1.4 MILES)	FROM MD 124 TO MIDDLEBROOK RD (~3.2 MILES)	FROM MIDDLEBROOK RD TO REDGRAVE PL (~4.7 MILES)	COMMENTS
3A		NO BRT SERVICE						OBSERVATION DRIVE	MOSTLY MEDIAN RUNNING GROSVENOR METRORAIL TO CLARKSBURG OUTLETS ALONG OBSERVATION DRIVE NORTH OF MIDDLEBROOK RD
3B									MOSTLY MEDIAN RUNNING BETHESDA METRORAIL TO REDGRAVE PLACE ALONG MD 355
4A		NO BRT SERVICE							MOSTLY CURB RUNNING GROSVENOR METRORAIL TO REDGRAVE PLACE ALONG MD 355
4B									MOSTLY CURB RUNNING BETHESDA METRORAIL TO REDGRAVE PLACE ALONG MD 355

