





Corridor Forward: The I-270 Transit Plan – Phase One Briefing

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SUMMARY

Work on *Corridor Forward: The I-270 Transit Plan (Corridor Forward)* has advanced since the project's scope of work was presented to the Planning Board on April 30, 2020. During the scope of work presentation, staff provided the Board an overview of the project's purpose. The project's statement of purpose acknowledges that there are many master-planned and speculative transit options that could improve accessibility along the I-270 Corridor, but it also acknowledges that the county cannot realistically advance each option and needs a clear strategy to ensure resources are directed to the most advantageous projects.

To satisfy the purpose as defined, *Corridor Forward* will evaluate and prioritize transit options based on typical transit planning metrics such as ridership and capital costs, but also metrics representative of each option's support of environmental resilience, economic health, and equity, consistent with the Public Hearing Draft of *Thrive Montgomery 2050*. Once priorities are determined, the project team will develop an implementation plan detailing the major steps necessary to realize the highest priority projects.

The first major milestones in the planning process include a comparison of transit vehicle attributes—or *mode* attributes—and the development of conceptual transit alternatives. This briefing will primarily focus on these two items. The conceptual transit alternatives will be refined during a pre-screening process, which will identify six ultimate alternatives to advance for robust scenario planning. This briefing will provide initial information on pre-screening and refinement and will also provide information on previous and anticipated outreach tactics.

PURPOSE OF THE BRIEFING

The purpose of the briefing is fourfold:

1. Provide an outline of the Plan's planning process, including refinements to the April 30, 2020 scope of work following the project's procurement process;

2. Review the attributes of various transit modes included in the scope and discuss the role of limited use technology in the project;
3. Provide an overview of the conceptual transit alternatives and provide feedback to staff on the initial pre-screening framework; and
4. Provide an update on outreach efforts.

PLAN SCHEDULE

The major project milestones have been slightly refined since the April 30, 2020 scope of work to be consistent with the process proposed by the selected project consultant. Table 1 outlines major project milestones with additional detail regarding anticipated timing and coordination with the Planning Board and County Council. As noted in Table 1, this briefing focuses on the attributes of various transit modes and conceptual transit alternatives.

Project Phase	Tasks	Anticipated Timing	Planning Board/Council Coordination
Phase One, Part A	<ul style="list-style-type: none"> Develop an inventory of mode characteristics. Develop transit alternatives. 	Present-December, 2020	Planning Board Briefing One (subject briefing)
Phase One, Part B	<ul style="list-style-type: none"> Pre-screen and refine conceptual alternatives to identify six key study alternatives. Develop metrics to compare six key alternatives. Develop and execute a methodology to realize evaluation metrics. 	Winter 2021	Planning Board Briefing Two
Phase Two	<ul style="list-style-type: none"> Prioritize alternatives based on evaluation metrics. 	Spring 2021	Planning Board Briefing Three
Phase Three	<ul style="list-style-type: none"> Solicit feedback and solidify priorities; develop preliminary recommendations. 	Spring & Summer, 2021	Planning Board Briefing Four; Potential County Council PHED Committee Briefing
Phase Four	<ul style="list-style-type: none"> Refine preliminary recommendations. Develop an implementation plan. Present working draft. 	Fall 2021	Planning Board Briefing Five

Table 1 – Project Milestones

During the April 30, 2020 scope of work, staff presented an initial *Plan Goal* that included the combination of four values, to define a framework for the development of future evaluation objectives, as shown in Figure 1 below.

Plan Goal: Prioritize and advance transit opportunities that achieve the best combination of the following values:

- **Strategic Connections:** *Serve high-demand origin and destination pairs, balancing costs of implementation with projected benefits.*
- **Economic Health:** *Enable existing development and master-planned communities to realize their potential as livable and economically vibrant places.*
- **Community Equity:** *Align with the County’s social equity goals and principles.*
- **Environmental Resilience:** *Operate sustainably and reduce negative environmental impacts.*

Figure 1 – Scope of Work Plan Goal and Values

PLAN PROCESS

Stakeholder coordination, including coordination with the Montgomery County Department of Transportation (MCDOT), the State Highway Administration (SHA), and various community groups, confirmed the following technical approach to the Plan:

- Develop performance measures of effectiveness—or *metrics*—that align with the Plan goal of 1) strategic connections; 2) environmental resilience; 3) economic health, and 4) community equity;
- Develop a methodology to obtain metric outputs for six key study alternatives; and
- Present a comprehensive package of metric outputs to the Planning Board and community, demonstrating how well each option or package of options can support a given value relative to other options.

The process described above provides the Planning Board and community the opportunity to have a larger impact on planning outcomes and a more comprehensive view into the benefits of six key study alternatives. The transit values questionnaire discussed under the *Previous and Upcoming Outreach* header has provided staff with initial public perceptions pertaining to the values encompassed by the Plan’s goal.

TRANSIT MODE ATTRIBUTES

Several different transit modes could serve the I-270 corridor, ranging from local bus service to commuter rail. Each mode has different attributes, from stop spacing and average speed to energy use and passenger capacity. Staff worked with the project consultant, Steer, to develop informational graphics in a matrix that summarize the attributes of eight transit modes: bus, streetcar, Bus Rapid Transit (BRT), urban style light rail, light rail transit, monorail, subway, and commuter rail. Attributes for each mode include design, service, and vehicle elements, as well as generalized environmental impacts and capital and operating costs. The following has been completed:

- A **graphic mode matrix**, presented as a slide deck of key attributes of interest to the public and decisionmakers (Attachment 1) for use in presentations, communications materials and the final Plan document.
- A **detailed mode matrix** that includes many more attributes for each mode, which will be included in the final Plan’s appendix. In addition to summarizing the typical or average value for a given metric, the detailed mode matrix also includes example speed, passenger capacity, and other attributes from existing transit service in the region (e.g. Ride On, DC Streetcar, and Metroway BRT

in northern Virginia). The detailed mode matrix will be used as a reference for staff during the planning process.

MODES EXCLUDED FROM STUDY

Staff has received comments and inquiries from individuals who believe the project's scope should be expanded to include less commonly used technologies including maglev and personal rapid transit (PRT) pods.

- **Maglev** – Magnetic levitation vehicles, or maglevs, are rapid transit vehicles that are typically designed to cover long-distances at possible speeds up to 373 miles per hour. Maglevs use electromagnetic rails, which allow a train to levitate, reducing friction to improve speed, facility durability, and noise. The mode has no propulsion emissions. Because of the mode's speed capabilities and significant capital costs, maglevs are generally most appropriate to provide intercity regional connectivity in high-density locations with very few intermediary stops. Beyond costs, skeptics point out political concerns relating to the provision of service that travels through, but provides no access to, adjacent non-terminal communities. While there are several maglevs operating in Japan, China and Korea, the United States does not have any operating maglev systems. In 2016, the Federal Railway Administration funded a NEPA study for a regional maglev service connecting Washington, DC and Baltimore. The process was halted due to design and engineering considerations, but it has been resumed and is now targeting the release of a draft Environmental Impact Statement (EIS) in March of 2021. 2016 estimates for the Baltimore-Washington system ranged from \$10 to \$12 billion; however, proponents of maglev systems suggest that maglev facility companies are willing to finance or outright fund systems in order to prove the technology in new markets.
- **Personal Rapid Transit (PRT)** – PRT is a general term for small individual transit vehicles, usually facilitating travel for three to six individuals, that run along a guideway network. Like many mass transit systems, PRT systems are automated. Unlike other options, they offer privacy, and when featured in a network, the ability to switch guideway paths to provide improved potential for point to point service. In practice, there is only one PRT-type system operating in the United States, which is located in Morgantown, West Virginia on the campus of West Virginia University. Other PRT systems operate at Heathrow Airport in the United Kingdom and in the United Arab Emirates. PRT systems require significantly greater number of vehicles to provide short enough headways to be viable solutions.

Due to project resource constraints, staff has not included the above modes in its study work to date as they are not reflective of options that have been master-planned, studied by a governmental or non-profit organization, or frequently requested by the community at large. Staff proposes to include information about these modes in the Plan as options to consider for future mobility; however, it is highly unlikely that Montgomery County, the State, or the Federal Government would pioneer these modes in the Frederick-Northern Virginia Corridor in the near-term. Maglev and PRT options may be intriguing for numerous reasons; however, the limited sourcing of facilities and vehicles is consequential for lifespan system costs. Staff recommends that the Planning Board confirm that these options remain outside the scope of the Plan, particularly given that the study of such services would require additional project resources for support from third-party industry experts.

Staff has also received suggestions to consider Diesel Multiple Unit (DMU) and Electric Multiple Unit (EMU) technologies. The term *multiple unit* describes a type of railway transit in which each carriage or a grouped set of single carriages has the attribute of self-propulsion. In other words, carriage cars or sets of carriage cars coupled together have the potential to move separately when uncoupled. This contrasts with rail facilities that require a locomotive engine responsible for powering the movement of each of its attached carriages. Many existing rapid transit services, such as the Washington Metropolitan Area Transit Authority's (WMATA) Metrorail, are multiple unit systems. As such, the project does include this mode in its scope.

CONCEPTUAL ALTERNATIVES OVERVIEW

Per the project purpose, staff and the consultant team focused on compiling options that exist either as master-planned transitways, studied concepts, or frequently requested concepts, into a package of conceptual alternatives for analysis. As previously stated, the conceptual alternatives are distinct in scale, geography, and type of service. Table 2 organizes each conceptual alternative by mode, corridor, and type of service.

Conceptual Alternative Number	Option Name	Mode	General Corridor Alignment	Service Type	To	From
1*	MD 355 BRT	Bus Rapid Transit	MD 355	Local	Clarksburg	Bethesda
2A	MARC Commuter Rail – Station Revision	Commuter Rail	CSX Rail Corridor	Regional	Frederick/ Martinsburg	Union Station
2B	MARC Commuter Rail – Additional Mainline Track	Commuter Rail	CSX Rail Corridor	Regional	Frederick/ Martinsburg	Union Station
3A	Redline Extension Segment 1	Metrorail	CSX Rail Corridor	Limited Stop Local Service	Shady Grove	Downtown Gaithersburg
3B	Redline Extension Segment 1	Metrorail	MD 355	Limited Stop Local Service	Shady Grove	Downtown Gaithersburg
4A	Redline Extension Segment 2	Metrorail	CSX Rail Corridor	Limited Stop Local Service	Downtown Gaithersburg	Germantown
4B	Redline Extension Segment 2	Metrorail	MD 355	Limited Stop Local Service	Downtown Gaithersburg	Germantown
5	Corridor Cities Transitway Phase 1	Bus Rapid Transit	Local Great Seneca Science Corridor	Local	Existing: Shady Grove, additional variants TBD	Existing: Metropolitan Grove, additional variants TBD

6	Purple Line Extension	Light Rail Transit	I-495/ American Legion Bridge	Regional	Bethesda Station	Tysons Corner or Dunn Loring (VA)
7	North Bethesda Transitway Extension	Bus Rapid Transit	Old Georgetown Road & I-495 /American Legion Bridge	Hybrid Local-Regional	White Flint	Tysons Corner or Dunn Loring (VA)
8	I-270 Monorail	Monorail	I-270	Regional	Downtown Frederick Vicinity	Shady Grove
9	Managed Lanes Enhanced Commuter Bus – County Tech Corridor Extended	Commuter Bus	I-270 & I-495	Regional	Clarksburg	Downtown Bethesda
10	I-270 Light Rail – County Tech Corridor	Light Rail Transit	I-270 & I-495	Regional	Gaithersburg Vicinity	Downtown Bethesda
11	I-270 Bus Rapid Transit – County Tech Corridor	Bus Rapid Transit	I-270 & I-495	Regional	Gaithersburg Vicinity	Downtown Bethesda
12	I-270/I-495 Bus Rapid Transit: NoVa	Bus Rapid Transit	I-270 & I-495 /American Legion Bridge	Regional	Downtown Frederick Vicinity	Tysons Corner or Dunn Loring (VA)
13	I-270/I-495 Bus Rapid Transit: Silver Spring	Bus Rapid Transit	I-270 & I-495	Regional	Downtown Frederick Vicinity	Downtown Silver Spring

* To be excluded from further study and assumed as a future service given the resources invested in the project to date.

Table 2 – Conceptual Alternatives Summary

Because there are conceptual monorail and managed-lanes commuter bus alternatives proposed to run directly on I-270, staff worked with the consultant to also examine additional mode-alignment alternatives running directly on the I-270 Corridor (see alternatives 10, 11, 12 and 13 in Table 2). To do this, existing transit service, population density and employment density in the corridor were mapped, as shown in Figure 2. The consultant aggregated afternoon travel volumes by corridor segment with Frederick, MD as the northern terminus, and three separate southern terminus options (Silver Spring, Bethesda, and Tysons). An analysis was performed to better assess which major highway segments generate the most demand from points north and south along each of the three respective termini options. During the pre-screening process, staff will continue to refine options.

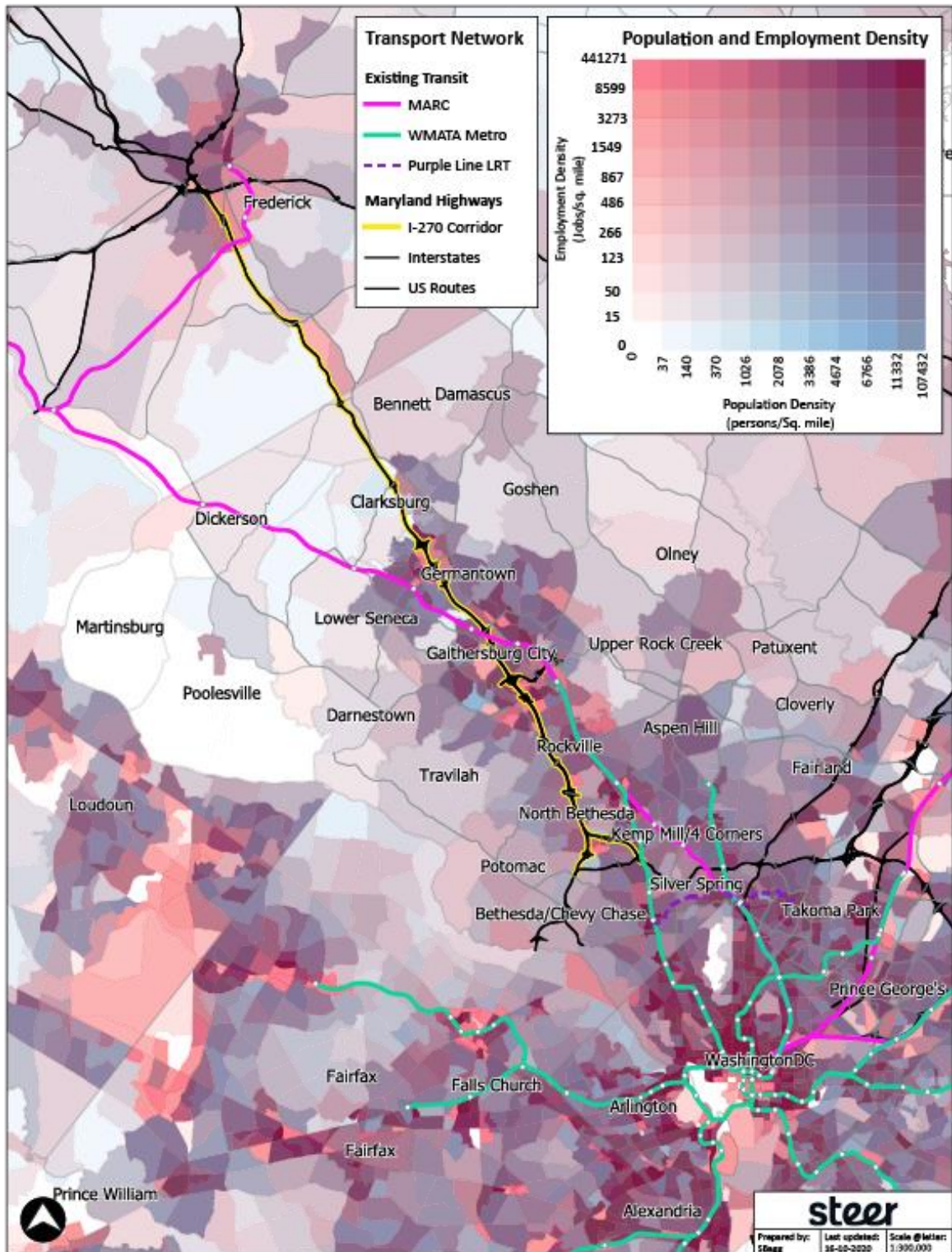


Figure 2 – Corridor Employment and Population Density

CONCEPTUAL ALTERNATIVES DETAILED DESCRIPTION

Alternative 1 – MD 355 Bus Rapid Transit – To Be Excluded from Further Study and Assumed as a Future

Service: The MD 355 BRT originates in the 2013 *Countywide Transit Corridors Functional Master Plan* and is a proposed branded MCDOT Flash service that will run between Clarksburg and Bethesda. While initially considered as a conceptual alternative, staff has coordinated with MCDOT and agreed to assume that this service will be implemented by 2045 given the resources invested in the project to date. For this reason, the merits and costs of the MD 355 BRT service will not be compared with other corridor options, and this service will be assumed as existing. It is important to note that assuming the MD 355 BRT service as existing will impact the performance of some of the conceptual alternatives listed below due to geographical redundancy.

Alternatives 2A and 2B – MARC Rail: There are two options under consideration related to MARC Rail service on the Brunswick Line: 2A offers additional storage capacity and mainline track, which could achieve midday and weekend service, and 2B considers a revised station program, which could improve equity and corridor accessibility within CSX's current policy framework.

The Maryland Transit Administration's (MTA) *MARC Rail Cornerstone Plan* details the advancements that must be made to achieve additional capacity on the Brunswick Line, including storage capacity enhancements and additional mainline track. To achieve limited midday service, approximately \$720 million worth of storage capacity enhancements and additional mainline track would be necessary. An additional \$620 million of investment in storage capacity and mainline track would allow for additional midday service, weekend service, and increased frequency to Frederick from the Point of Rocks split. These combined investments are presented as conceptual Alternative 2A.

Another MARC conceptual alternative variant, Alternative 2B, intends to assess the potential capacity enhancements that could be achieved were MTA and the county to reconsider the location of existing stops. While storage and mainline track may be challenging from a cost perspective, the potential of the MARC line could increase with a different service program.

The forthcoming *Shady Grove Minor Master Plan Amendment* (2020) retains the 2006 recommendation for a MARC station within the vicinity of the Shady Grove Metrorail Station, and the 2010 *White Flint Sector Plan* also recommends a new MARC Station. These recommendations cannot be advanced, however, as CSX controls all of the Brunswick Line (excluding the Frederick Branch) and has a policy of restricting new stations without the removal of existing stations. South of Metropolitan Grove, Washington Grove and Garrett Park host the lowest average weekday MARC boardings at 41 and 38 boardings respectively. Exchanging these stations for locations with greater transit transfer connectivity and population density could prove strategically advantageous, support economic growth, and provide accessible transit more equitably, albeit prove politically challenging.

Brunswick Line run-through service to Virginia is not proposed for study. Investments to allow for run-through service require, at minimum, \$2.95 billion worth of investment by the MTA and its funding partners. If such investments were made, Penn and Camden Line trains would be able to enter the Virginia. In order to allow Brunswick Line trains to also enter Virginia, substantial reconfigurations to Union Station would need to occur to allow Brunswick Line trains to access the run-through service.

Alternatives 3A, 3B, 4A and 4B – Redline Extension: At public meetings, staff frequently receive requests to study extensions of the Washington Metropolitan Area Transit Authority's (WMATA) Metrorail Redline service to points north in Gaithersburg and Germantown. An extension to Metropolitan Grove, which includes an intermediary stop in Gaithersburg, was studied in WMATA's 2016 *Connecting Greater Washington* scenario-planning effort. The effort found that the extension generated over 16,000 daily

riders—the study’s extension threshold— and freed up Park & Ride capacity at Shady Grove. The study also found that of the 16,000 daily riders, only approximately 7,000 riders were new riders. The extension shifted riders from other services, such as the proposed Corridor Cities Transitway, MARC Rail, or other local bus routes.

Alternative 5 – Corridor Cities Transitway: The Corridor Cities Transitway (CCT) is a bus rapid transit system that is divided into two separate phases, which are depicted in MTA’s Corridor Cities Transitway Map in Figure 3. The first phase of the CCT, as proposed, provides local service between WMATA’s Shady Grove Metrorail Station and the Metropolitan Grove MARC Rail Station in Gaithersburg. The second phase of the CCT connects Washington Grove to Clarksburg via Germantown. To date, only the first phase has advanced into preliminary design resulting in thirty percent civil engineering plans. These plans have some gaps, including the segment planned to link King Farm in Rockville to the east of I-270 with Crown Farm in Gaithersburg, which will require a grade-separated bridge over the existing highway.

The existing master-planned alignment for the first phase supports economic development by connecting major activity centers planned for further growth, including King Farm, Crown Farm, the Life Sciences Center East, and Kentlands. Unfortunately, improved access to these locations reduces operational efficiency and could reduce the project’s overall benefit to users. Concerns about potential benefits, community concerns about the existing alignment’s impact on community character, and the cost of some elements such as the bridge have slowed the project’s advancement. While the CCT is proposed to be included in the State’s upcoming Constrained Transportation Plan (CTP), it is zeroed-out; no new state funds are allocated to its advancement. Because the project has failed to advance after decades of study, staff recommends *Corridor Forward* examine alternative alignments for the first phase and reconsider whether or not a second phase is necessary given the advancement of the MD 355 BRT system, which provides service to similar markets.

Despite this, supporters of the existing CCT phase one alignment point out that significant investment has been made already and, because the route is currently master-planned, dedications, easements, and reservations of space have been provided with development approvals. If *Corridor Forward* were to reassess the alignment, it could potentially reduce the value of previous efforts, as well as dedications, easements, and reservations of space.

Staff seeks input from the Planning Board on its impressions regarding the CCT, as well as the potential to explore alternative alignments through *Corridor Forward*. Table 3 summarizes the perceived challenges and advantages with maintaining the current phase 1 alignment. Staff proposes excluding phase 2 from study as it is largely redundant with the MD 355 Bus Rapid Transit service, which will be assumed as a given project for future-year analyses. Staff also plans to consider alternative alignments, including but not limited to, revisiting the existing alignment of phase 1 of the CCT and revisiting the service area to consider extensions to new locations such as the Lakeforest Mall. Any proposed changes could impact the thirty percent design work developed to date.

Potential Advantages of Maintaining Phase 1 Alignment	Potential Disadvantages of Maintaining Phase 1 Alignment
<ul style="list-style-type: none"> • Certainty for property owners and municipal partners; • Ensures resources invested to date advance their planned end; • Supports use of space previously dedicated, reserved, or proffered for public transit use; and • Supports economic development. 	<ul style="list-style-type: none"> • High costs associated with grade separation over I-270; • Inefficient alignment routing; • Changes in market demand for proximate land use; • Skepticism over alignment from residents of now-developed neighborhoods, originally planned for service; and • Inability to advance past thirty percent design suggests skepticism from funding partners.

Table 3 – Advantages and Disadvantages of Maintaining Phase 1 Alignment

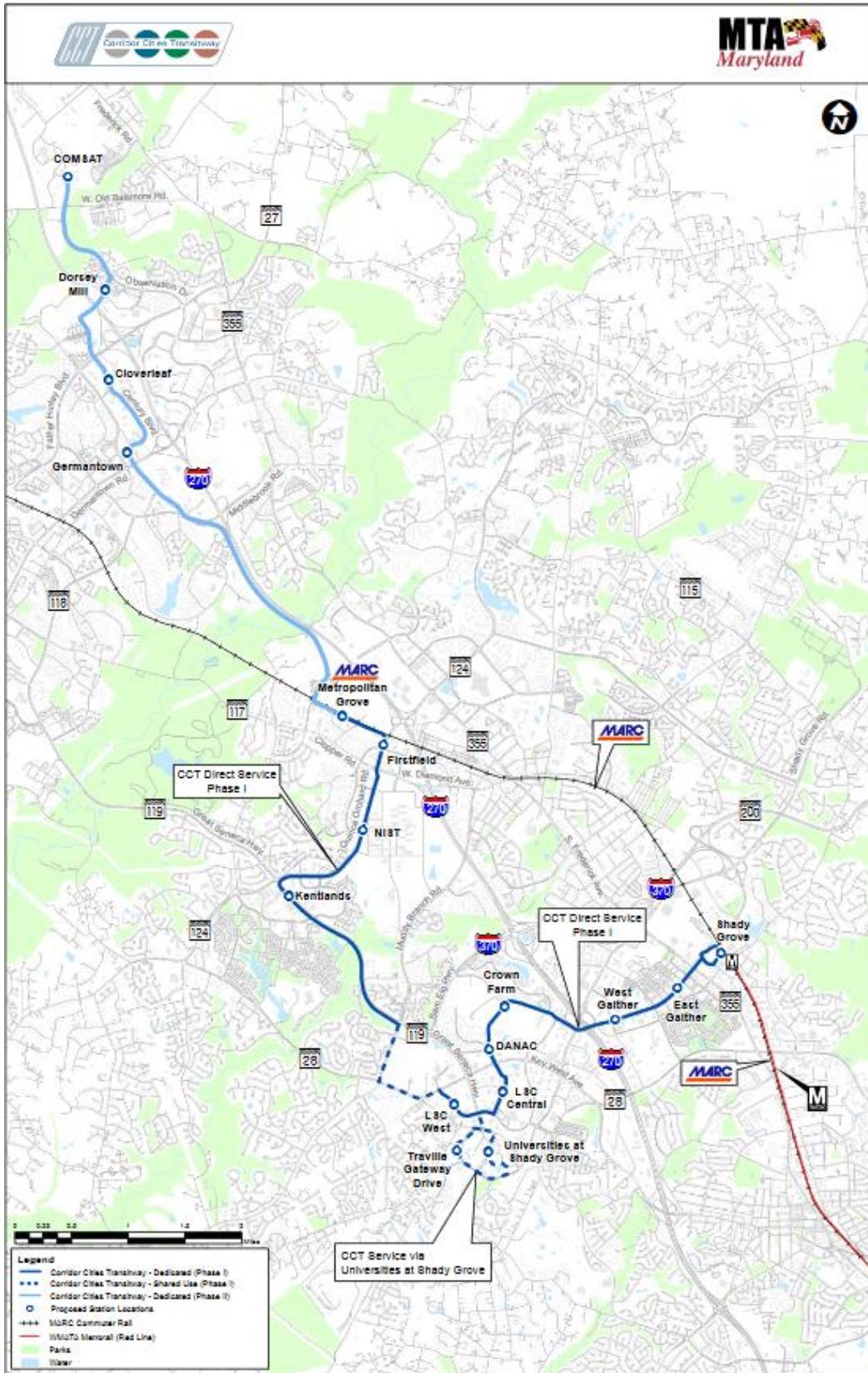


Figure 3 – MTA's Corridor Cities Transitway Map

Alternative 6 – Purple Line Extension: A potential light rail extension connecting Bethesda and Tysons was recommended in the Northern Virginia Transportation Authority’s (NVTA) *TransAction 2040* Plan. The NVTA is responsible for long-range transportation planning, prioritization, and funding determinations for transportation projects identified by local jurisdictions in Northern Virginia. *TransAction 2040* (2012) proposes includes a light rail connection from Bethesda to Tysons, which essentially extends the proposed Purple Line west over the Potomac River. The next iteration of *TransAction* (2018) revises this recommendation to a Bus Rapid Transit connection into Montgomery County over the American Legion Bridge (ALB). Conceptual alternative 6 assumes an extension of the light rail along or within the direct vicinity of the ALB.

Alternative 7 – North Bethesda Transitway Extension: The 2013 *Countywide Transit Corridors Functional Master Plan* recommends the North Bethesda Transitway as a BRT system facilitating travel between White Flint/Grosvenor and Rock Spring. As previously mentioned, *TransAction* (2018), proposes a BRT connection into Montgomery County. As White Flint is a focus area for economic development in the county, staff proposes to evaluate a hybrid local-regional BRT service that provides greater accessibility in the county, with rapid service to Tysons and/or other points in Northern Virginia.

Alternative 8 – Monorail: The High Road Foundation has proposed and advocated for a monorail service between the City of Frederick in Maryland and WMATA’s Shady Grove Metrorail Station with intermediary station locations in Urbana, Clarksburg (Comsat), Germantown, and Metropolitan Grove. The High Road Foundation posits that monorail has a low carbon footprint compared to other modes as well as stormwater, utility avoidance, and right-of-way acquisition advantages due to the facility’s small column footprint at spacing intervals of approximately 100 feet. The Maryland Department of Transportation has undertaken a feasibility study of the service but has yet to release its findings. In 2002, monorail was investigated as part of the State’s US-15/I-270 Multimodal Corridor Study and subsequent Draft Environmental Impact Statement, but it was not advanced.

Alternative 9 – Alternative 13: I-270 Running Options: In partnership with the Virginia Department of Rail and Public Transit, the MTA has undertaken a study to assess transit opportunities and transportation demand management (TDM) initiatives that could improve mobility over the American Legion Bridge (ALB). Similarly, the *Corridor Forward* team has worked closely with the project consultant, Steer, to develop a series of options that could improve accessibility in the corridor. Options vary in terms of termini and mode, but generally follow the alignment of the highway and are regional in essence (i.e. limited stop). During the pre-screening process, discussed in greater detail under the *Pre-Screening* header below, staff will continue to refine options to determine which corridor termini are the most important to serve, and which modes may offer the best solutions for a regional, highway-running service.

PRE-SCREENING

Each of the conceptual alternatives compiled above will be evaluated through a pre-screening and refinement process. Beyond travel demand, this process will examine the options considering the Plan goal and values of strategic connections, economic health, community equity, and environmental resilience. Pre-screening will provide an opportunity to tweak and alter alignments. Figure 3 depicts an initial pre-screening decision tree, which may include a forthcoming cost screening for all options.

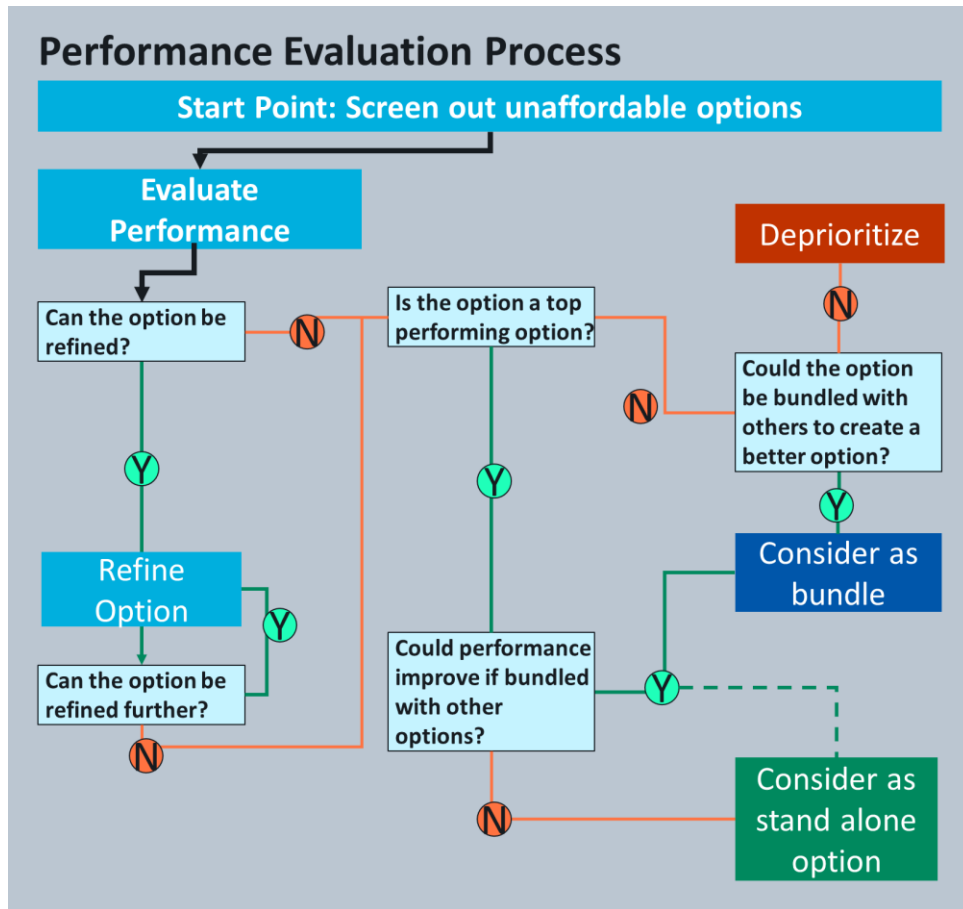


Figure 3 – Initial Pre-Screening Decision Tree

PREVIOUS AND UPCOMING OUTREACH

Since the last briefing to the Planning Board, staff has conducted several outreach events with key stakeholders and hosted a public kick-off meeting for the project. In addition, staff has developed several outreach materials, including a transit values questionnaire, educational videos, a project infographic, and an interactive web map. Each of these outreach activities and materials are described below:

September 30th Public Kick-Off: Staff hosted and facilitated a one-hour virtual kick-off meeting for *Corridor Forward* on September 30th. During the meeting, staff provided an overview of *Corridor Forward*, its scope and schedule, and the results of the transit values questionnaire as of the meeting date (described in more detail below). Following the presentation, staff facilitated a panel discussion with representatives from Montgomery Planning, MCDOT, MDOT SHA, and the Coalition for Smarter Growth. Over 180 people registered for the event, and over 80 participated in the virtual meeting. As of this writing, the [recorded video](#) of the event, which is posted on the project’s website, has been viewed 65 times.

Stakeholder Meetings: Staff briefed several regional stakeholders about *Corridor Forward*, including the Citizen Transportation Boards from the Cities of Rockville and Gaithersburg, Montgomery County Economic Development Corporation, Maryland Building Industry Association, Action Committee for

Transit, Coalition for Smarter Growth, the Community Action Board's Executive Committee, and the Transportation Management Districts.

Transit Values Questionnaire: Staff published an [online questionnaire](#) to understand travelers' values and priorities for transit along the I-270 corridor. The questionnaire was publicized through social media, the Plan's e-newsletter, targeted meetings with stakeholders (e.g. the Transportation Management Districts), and during the September 30th kick-off meeting. To date, the survey has received over 180 responses. More responses to the questionnaire are expected through upcoming outreach initiatives, including bus signage and targeted mailers. Results from the questionnaire will be used as a data source to inform prioritization of transit projects.

Educational Videos: Staff developed five brief videos, which are hosted on the project website, to educate the public about transit planning and *Corridor Forward*. These videos provide the public with a foundational understanding of the project and transit planning terms and concepts:

- [Introducing Corridor Forward](#). This video provides an overview of *Corridor Forward*, summarizing the Plan's purpose and the existing transit options that will be evaluated as part of this effort. As of this writing, the video has been viewed 180 times.
- [What is Transit?](#) This video introduces and summarizes several transit modes, including bus, bus rapid transit (BRT), light rail transit, subway or heavy rail transit, commuter rail, and monorail. As of this writing, the video has been viewed 106 times.
- [Why is Transit Important?](#) This video outlines the environmental, equity, and economic benefits of transit and ties these benefits back to the Public Hearing Draft of *Thrive Montgomery 2050*. As of this writing, the video has been viewed 81 times.
- [How is Transit Funded?](#) This video defines capital and operating costs and describes how fares typically cover only a portion of transit's operating costs. It outlines tradeoffs in transit planning associated with determining a service's mode, frequency, and fares. As of this writing, the video has been viewed 79 times.
- [How Do We Plan for Transit?](#) This video explains the role of existing and future demand in determining transit planning priorities and discusses the tradeoffs between access and efficiency, regional and local service, and transfers and "one-seat" rides. It concludes with a brief discussion of the role of economic development in transit planning. As of this writing, the video has been viewed 116 times.

Infographic: Staff developed an infographic highlighting how transit advances the county's environmental, equity, and economic values, as well as benefits community health (Attachment 2). The infographic includes statistics from local and national research to quantify transit's role in supporting these values and make the case that transit is a beneficial and necessary part of the county's future.

Interactive Web Map: Staff published an [interactive web map](#) that displays information on where people live and work, how they travel to work, and the travel options available to them along the I-270 corridor. The map allows users to review these metrics for communities and employment centers located along the corridor in Montgomery County, Frederick County, the District of Columbia, Fairfax County, Alexandria, and Arlington. The map highlights some of the transportation challenges and opportunities along the I-270 corridor: that job accessibility is far greater by car than by transit, and that many commuters in the region commute more than 45 minutes to work.

Upcoming Outreach: Outreach to date has generally focused on educating and informing the public about the project. Staff is now looking to solicit additional feedback, with a focus on current transit

users and Montgomery County populations residing in equity focus areas. To reach these populations, staff is proceeding with two engagement strategies:

- **Bus Signage:** Staff is currently working with MCDOT to purchase in-bus advertising for routes that run along and in the proximity of the I-270 corridor. The advertising, which will be provided in both English and Spanish, will direct bus riders to the online transit values questionnaire. The purpose of this outreach strategy is to better understand the priorities and challenges faced by current transit users. In addition, it provides broad exposure to *Corridor Forward* for transit users in the study area.
- **Targeted Mailers:** Staff is developing targeted mailer postcards that will direct readers to the online transit values questionnaire. The mailers will be primarily in English and Spanish, but also include directions in Amharic, Vietnamese, Korean, French, Chinese, and Hindi on how to access translated versions of the online questionnaire. Target communities will be identified with the assistance of the Research and Strategic Projects Division's work on equity focus areas. Staff also anticipates working with the Housing Opportunities Commission of Montgomery County and the Montgomery Housing Partnership to locate properties of interest along the corridor.

CONCLUSION

The purpose of this briefing is to:

1. Provide an outline of the Plan's planning process, including refinements to the April 30, 2020 scope of work following the project's procurement process;
2. Review the attributes of various transit modes included in the scope and discuss the role of limited use technology in the project;
3. Provide an overview of the conceptual transit alternatives and solicit feedback from the Planning Board on the initial pre-screening framework; and
4. Provide an overview of previous and planned engagement and outreach tactics.

Following the briefing, staff will work through the pre-screening to refine the conceptual alternatives and determine which of the conceptual transit alternatives will be recommended to advance into robust scenario planning. Staff will also develop the evaluation metrics and methodology. Following these tasks, staff will return to the Planning Board in winter 2021 to confirm the alternatives and metric outputs.

ATTACHMENTS

1. Mode Matrix
2. Infographic

Attachment 1 - Mode Matrix

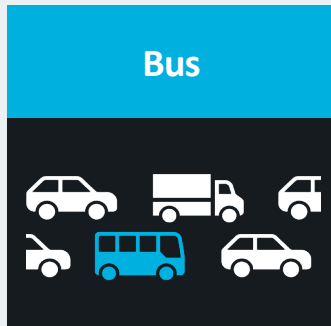
Corridor Forward: I-270 Transit Plan Task 2A – Graphic Mode Matrix



October 2020
I-270 Corridor Forward – Task 2A



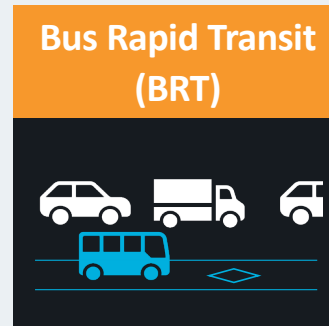
Transit Modes – Local Examples



(Ride On / Extra)



(DC Streetcar)



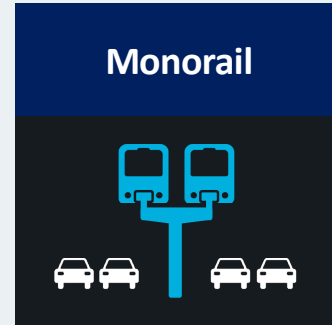
(Alexandria / Arlington Metroway)



(Minneapolis-St. Paul LRT)



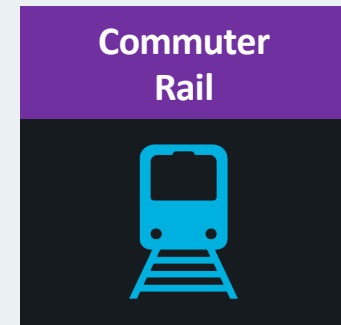
(Future Purple Line / Seattle Link)



(Las Vegas Monorail)



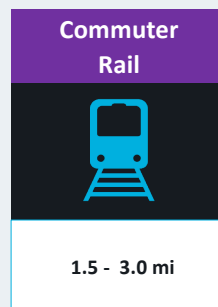
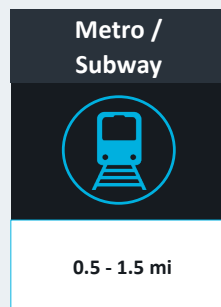
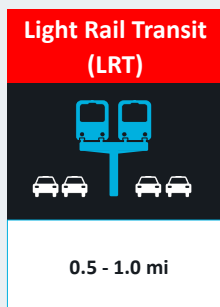
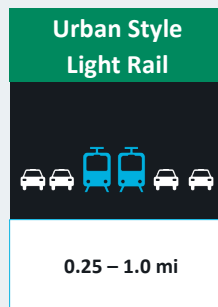
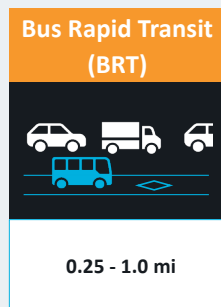
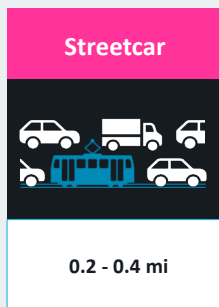
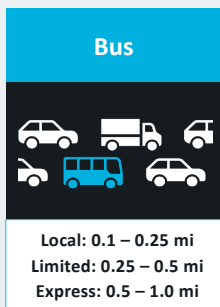
(Metrorail)



(MARC)

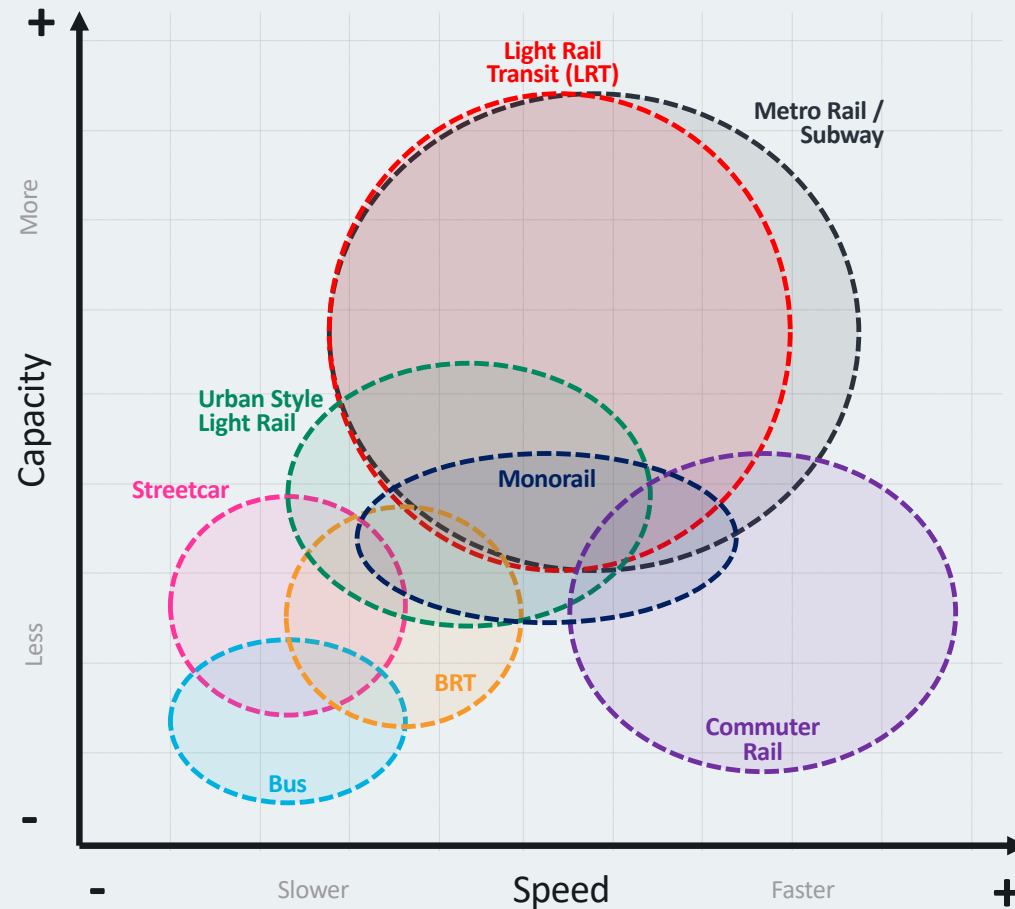
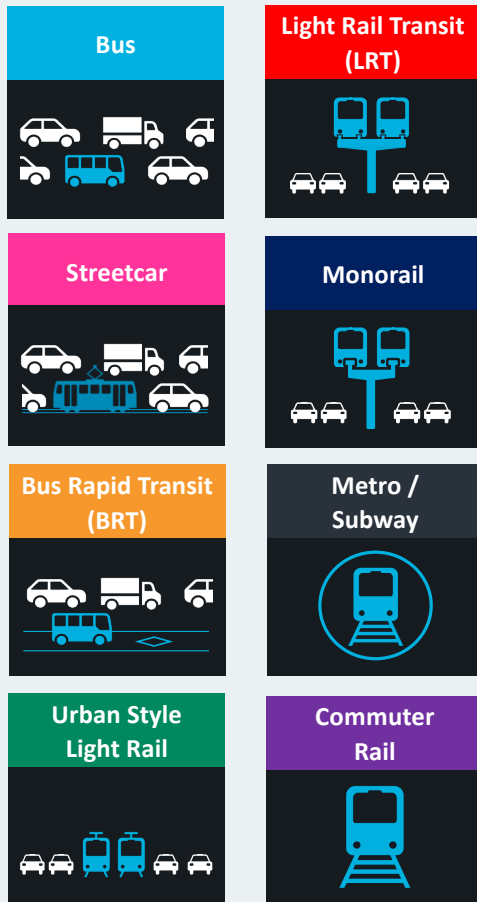
Stop Spacing

steer



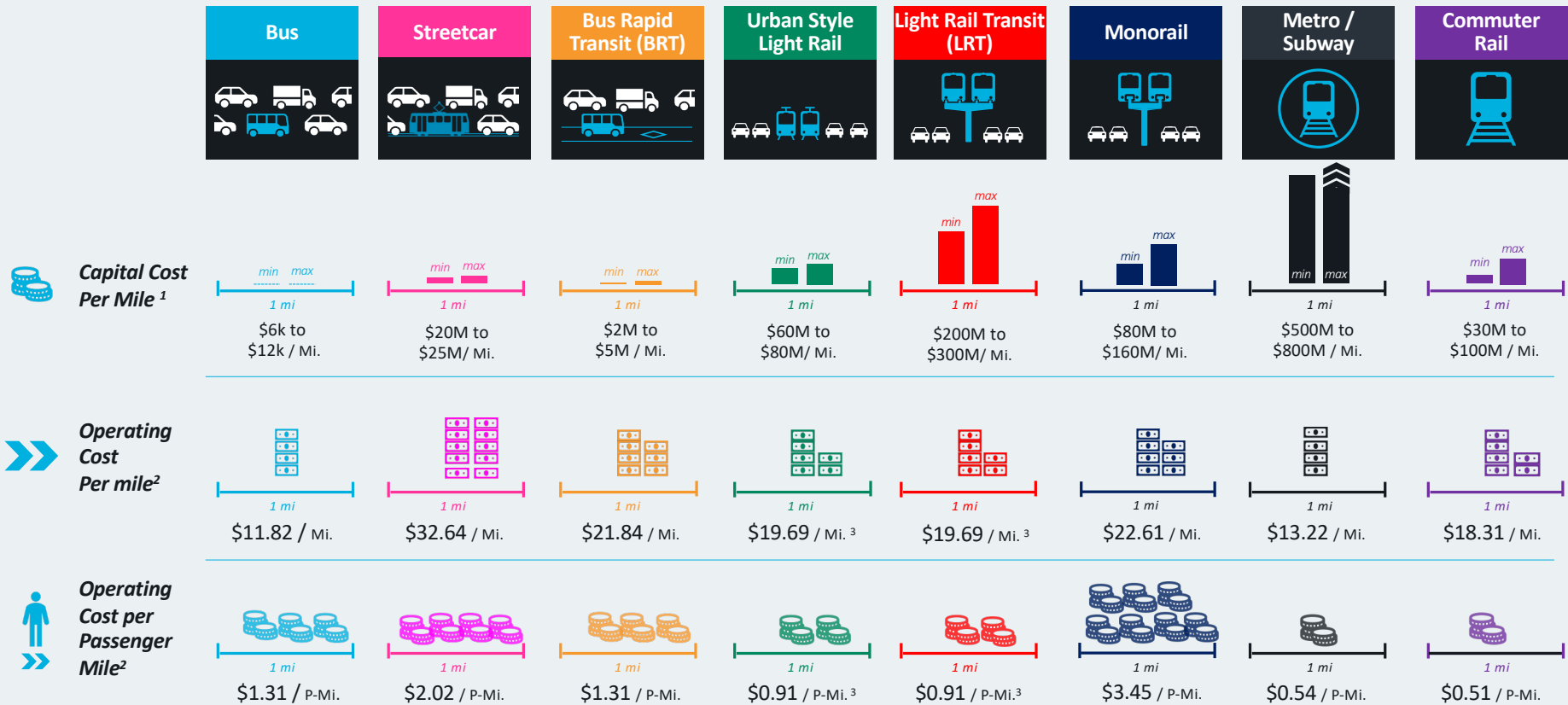
Speed vs. Capacity >>>

steer



Cost Factors

steer



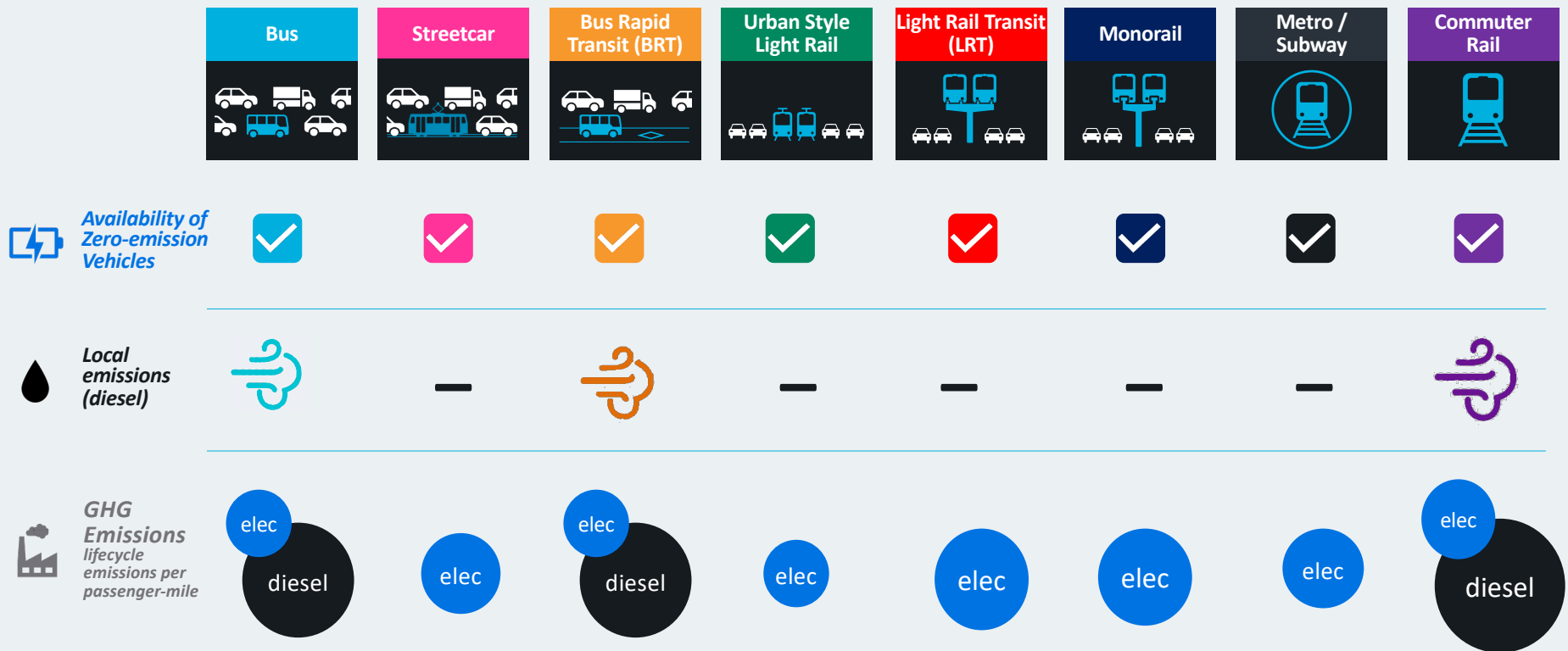
1. Capital cost data from example system

2. Operating cost data from 2018 NTD reports

3. NTD definitions combine urban LRT and guideway LRT

Environmental Impacts

















steer



Note: electric vehicle lifecycle emissions are energy source dependent – comparison based on energy use





















































































Implementation Factors

steer

	Bus	Streetcar	Bus Rapid Transit (BRT)	Urban Style Light Rail	Light Rail Transit (LRT)	Monorail	Metro / Subway	Commuter Rail
Segregation	Mixed traffic	Mixed traffic	Dedicated ROW / shoulder lane	Dedicated Right-of-way (within street w/signals)	Grade-separated (Tunneled / Elevated)	Grade-separated (Tunneled / Elevated)	Grade-separated (Tunneled / Elevated)	Segregated Right-of-way (at grade)
Alignment Width	 12 ft.	 10 ft.	 12 ft.	 10 ft.	 12 ft.	 10 ft.	 15 ft.	 15 ft.
Maximum Grade	 12%	 8%	 12%	 8%	 6%	 6%	 6%	 2%

Detailed Matrix

steer

	Bus	Limited stop Bus	Bus Rapid Transit (BRT)	Streetcar	Urban Style Light Rail	Light Rail Transit (LRT)	Monorail	Metro / Subway	Commuter Rail
									
	<i>Ride On</i>	<i>Ride On Extra</i>	<i>Arlington Metroway</i>	<i>Washington DC Streetcar</i>	<i>Minneapolis-St Paul LRT</i>	<i>Seattle Link Light Rail</i>	<i>Las Vegas Monorail</i>	<i>Washington Metro</i>	<i>MARC (Maryland Commuter)</i>
Design Elements	Level of Segregation	 Mixed Traffic	 Mixed + Transit Service Priority	 Dedicated ROW / HOV / shoulder lane	 Mixed Traffic	 Dedicated ROW (within street w/ signal prio.)	 Grade-Separated (Tunneled / Elevated)	 Grade-Separated (Tunneled / Elevated)	 Segregated ROW (At-Grade)
	Typical Alignment Width	 12 ft / direction	 12 ft / direction	 12 ft / direction	 10 ft / direction	 10 ft / direction	 12 ft / direction	 10 ft / direction	 13 ft / direction
	Typical Stop/Station Spacing	 Basic: 650 ft - 1600 ft Freq.: 1000 ft - 2600 ft	 2600 - 5000 ft 0.5 mi - 1.0 mi	 1300 - 5000 ft 0.25 mi - 1.0 mi	 1000 ft - 2000 ft 0.2 mi - 0.4 mi	 1300 - 5000 ft 0.25 mi - 1.0 mi	 2500 - 5000 ft 0.5 mi - 1.0 mi	 2500 - 7000 ft 0.5 mi - 1.5 mi	 7,000 - 25,000 ft 1.5 - 5.0 mi
	Maximum Grade	 12%	 12%	 12%	 8%	 8%	 6%	 6% ¹	 2%
Service	Max Operating Speed	50 mph 	50 mph 	50 mph 	43 mph 	50 mph 	55 mph 	50 mph 	60 mph 
	Avg Operating Speed (from example)	13 mph 	20 mph 	20 mph 	7 mph 	18mph 	25 mph 	12 mph 	27 mph 
Vehicle Elements	Vehicle capacity	 standard: 80 articulated: 100	 standard: 80 articulated: 100	 standard: 80 articulated: 100	 80 - 170	 200 - 250 (30m vehicle)	 130 - 250 / car	 240/train ¹	 standard car: 120 double-decker: 200
	Propulsion options	 Diesel / N Gas / EV / Hybrid	 Diesel / N Gas / EV / Hybrid	 Diesel / N Gas / EV / Hybrid	 Electric	 Electric	 Electric	 Electric	 Diesel / Elec. / Hybrid
	Tailpipe Emissions?	Yes for 	Yes for 	Yes for 	-	-	-	-	Yes for 
	Guideway requirements	None	 None / HOV / Shoulder	 Dedicated lanes	 Tracks/guideway in shared traffic lane	 Dedicated lanes	 Tunneled / Elevated / Segregated at-grade	 Elevated	 Tunneled / Elevated
Economic	Property Value Impact	Low	Low	Low	Low	Med	Med	High	High
	Est. Capital Cost	\$6k - \$12k / mi	\$15k - \$25k / mi	\$2M - \$5M / mi	\$20M - \$25M / mi	\$60M - \$80M / mi	\$200M - \$300M / mi	\$80M - \$160M / mi	\$500M - \$800M / mi
	Est. Operating Cost per passenger mile ²	\$1.50 - \$1.70 / p-mi	\$1.50 - \$1.70/ p-mi	\$1.50 - \$1.70/ p-mi	\$2.10 / p-mi	\$1.00 / p-mi	\$1.25 / p-mi	\$2.00 - \$8.00/ p-mi	\$0.75 / p-mi

1. Bombardier specifications

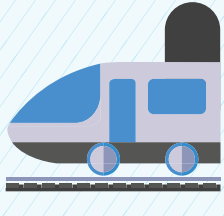
2. 2018 NTD full Reporter data

MONTGOMERY PLANNING'S CORRIDOR FORWARD: THE I-270 TRANSIT PLAN

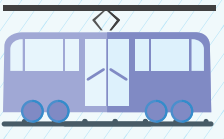
ENHANCING ENVIRONMENTAL RESILIENCE

Forty percent of greenhouse gas emissions in Montgomery County are related to the transportation sector. To reduce the transportation sector's impact and address climate change, we improve alternatives to driving.

FUEL-POWERED VEHICLES EMIT CARBON AND OTHER EMISSIONS THAT DEGRADE OUR ENVIRONMENT AND AIR QUALITY, WHICH IN TURN HAVE NEGATIVE IMPACTS ON HEALTH.



WMATA's Metro
75%



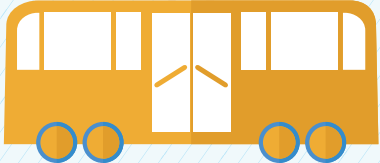
Light Rail
62%



Busses
33%

LOWER
EMISSIONS
PER PASSENGER

Households living near newly opened light rail



in Los Angeles reduced their vehicle miles traveled by approximately 10 miles per day.

NATIONALLY, PUBLIC TRANSPORTATION



4.2 BILLION GALLONS OF GAS EACH YEAR.



More transit results in less congestion. Traffic congestion impacts air quality more than free-flowing vehicles. More transit improves air quality by reducing the emissions associated with congestion.

STRENGTHENING COMMUNITY EQUITY

Owning a car is expensive – between buying and maintaining a vehicle, insurance, gas, tolls and parking, the cost can be a burden. Transit provides a more affordable alternative.

IN URBAN AREAS, TRAVELING BY TRANSIT COSTS **25% TO 50% OF** TRAVELING BY AUTO

CHOOSING TRANSIT OVER DRIVING CAN **SAVE AN AVERAGE HOUSEHOLD \$10,000 PER YEAR.**

HOUSEHOLD TRANSPORTATION COSTS DECLINE IN REGIONS WITH HIGH TRANSIT USE.

CO₂

The pollution and negative health effects of transportation are more likely to impact communities of color. In 12 northeast states, the emissions exposure for Latino and African American residents are 75% and 61% higher, respectively, than they are for white residents. More sustainable transportation options, such as transit, can help reduce these disparities.

CO₂

PROMOTING ECONOMIC HEALTH

Because high-quality transit can move large numbers of people to job centers, transit investments can strengthen existing jobs centers and provide a foundation for new job centers.



EVERY \$1 BILLION SPENT ON TRANSIT GENERATES \$3.6 BILLION IN ADDED SALES VOLUME AND \$82 MILLION IN LOCAL SALES TAX AND PROPERTY TAX REVENUE.

In Phoenix, AZ, the rate of new business formed near light rail stations

WAS 28% TO 88% GREATER

than for the rest of the city.

28% of the Washington, DC area's tax base is located within half a mile of a Metro station



Jobs are growing in transit locations, especially high-skill jobs.

PROVIDING HEALTH AND SAFETY

Transit benefits community health by promoting an active lifestyle.

Each percentage point increase in frequent transit use within a jurisdiction results in a **0.5 percentage point decrease in obesity.**



Traveling by transit can be safer than traveling by private vehicle.



Transit passengers have about **1/10 the fatality rate of car occupants.**

Transit users average about **three times as much walking** as people who rely on cars, **achieving over 20 daily minutes of moderate activity.**



ABOUT THE CORRIDOR FORWARD PLAN

The plan will involve community engagement and a detailed evaluation of potential projects, resulting in a prioritized list of transit projects.

For more information, contact Patrick Reed, Corridor Forward Plan project manager, at 301-495-4538 or patrick.reed@montgomeryplanning.org.

Stay informed and subscribe to the [Corridor Forward: The I-270 Transit Plan eLetter](#).