









US 29 Bus Rapid Transit (BRT) Corridor Planning Study Briefing

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Summary

The Maryland Transit Administration (MTA), in coordination with the Maryland State Highway Administration (SHA) and the Montgomery County Department of Transportation (MCDOT) has recently completed a Draft Corridor Study Report that evaluates three different alternatives for providing BRT service between the Silver Spring Central Business District (CBD) and the Burtonsville Park and Ride Facility. The study of these alternatives – along with on-going similar planning studies for the MD 586 (Veirs Mill Road) and MD 355 (Rockville Pike / Wisconsin Avenue) corridors - are “next step” studies following the adoption of the Countywide Transit Corridors Functional Master Plan (CTCFMP) in December 2013. **This briefing will consist of three short presentations. The MTA will first present a summary of the Draft Corridor Study Report. Staff will follow with comments on the technical aspects of the Draft Corridor Study Report that are to be forwarded to the MTA, MCDOT, and the Washington Metropolitan Area Transit Authority (WMATA) after Planning Board review and approval. The briefing will close with a presentation by MCDOT on the County Executive’s 2020 Plan that is designed to have BRT operational in the corridor by 2020.**

Planning Board Action

This is primarily a briefing. The purpose is to provide the Planning Board with an opportunity to review the staff comments on the Draft Corridor Study Report and receive an update on the status of BRT planning in the US 29 corridor. The Planning Board will be asked to approve forwarding the staff comments with revisions as necessary. In addition, MTA and MCDOT staff will review the scope of the next phase of work related to the introduction of BRT in the corridor. **Emphasis will be placed on the recent decision by MTA and MCDOT that more analysis is required to reach a recommendation on how or whether to include managed lanes as part of the longer term and given that, there is no plan to recommend a Locally Preferred Alternative from among those analyzed in this Study for advancing into preliminary engineering (30% design). The near-term focus instead will be on advancing the County Executive’s 2020 Plan.** The staff comments are noted in bold throughout the document and presented in summary format at the end of the staff report. It is this set of comments that the staff is requesting the Planning Board approve for forwarding to the stakeholder agencies.

Draft Corridor Study Alternatives

The Study initially reviewed eight preliminary conceptual alternatives that varied with respect to design elements and roadway running way options for the BRT. Three conceptual “build” alternatives were retained for further study, along with a “No-Build” alternative.¹

No Build Alternative

The No Build Alternative assumed no improvements to infrastructure or bus service along US 29 beyond those improvements in the regional 2014 Constrained Long Range Plan (CLRP) for 2040. The CLRP includes the planned interchange at Musgrove/Fairland Road in 2025. Other than the Purple Line, there are no other major projects in the CLRP that are located within the US 29 corridor itself.

The Study notes that there are other projects planned but not currently programmed or funded that are identified in the White Oak Science Gateway (WOSG) Master Plan. These include (1) the BRT network, (2) the Old Columbia Pike Bridge opened to traffic, (3) the planned US 29 interchange at Tech Road / Industrial Parkway, (4) new local roads proposed in the Life Sciences / FDA Village Center, and (5) intersection geometric improvements.²

Alternative A

Alternative A includes the following treatments and assumptions regarding the BRT running-way:

- From Stewart Lane to MD 198 – Median Shoulder BRT lanes
- From the Silver Spring Transit Center (SSTC) to Stewart Lane - Intermittent peak period – peak direction curbside business access transit lanes (“BAT” lanes).

The BAT lanes would be created by re-purposing the peak direction curb lane to accommodate BRT buses, local buses, and right turning traffic. There would also be segments between the SSTC and Stewart Lane where the BRT buses would run in mixed traffic. The segments where the BRT buses would be in mixed traffic are (1) Stewart Lane and Lockwood Drive, (2) US 29 between University Boulevard and I-495, and (3) Colesville Road between Georgia Avenue and the SSTC.³

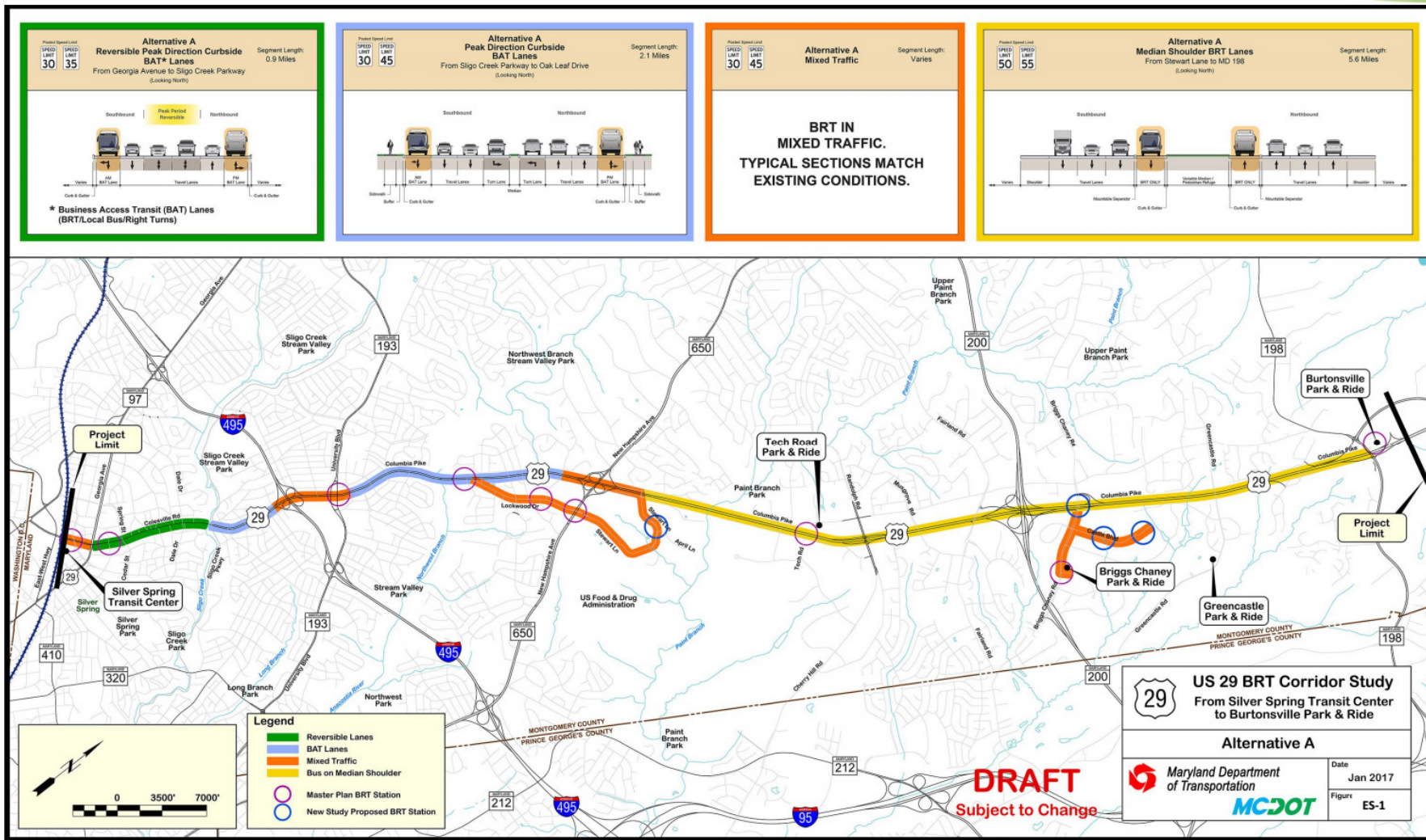
Figure 1 depicts the treatments assumed for Alternative A for the entire corridor.

¹ As noted in the Study, five alternatives were eliminated in part because of opposition (as expressed through the Citizens Advisory Committee) to alternatives that would require major right of way acquisition, create significant property impacts and/or could not be implemented in a relatively short time frame. See page 66 of the Draft Corridor Study Report.

² For an update on the status of advancing certain transportation improvements in White Oak see the County Council staff report of February 2, 2017 at http://montgomerycountymd.granicus.com/Viewer.php?view_id=136&event_id=5240&meta_id=131086

³ The Countywide Transit Corridors Functional Master Plan (CTCFMP) included a recommendation for operation in mixed traffic along Stewart Lane and Lockwood Drive and dedicated BRT lanes along the balance of the corridor. The Plan (pages 14 and 15) “*recommends the more efficient use of existing rights of way along (other) corridor segments by repurposing existing travel lanes where the value of doing so is confirmed through more detailed facility studies and operational planning. This Plan does not envision that full-time dedicate bus lanes will be implemented as a first step in most locations.*”

Figure 1 – Alternative A



US 29 BRT Corridor Planning Study
 DRAFT Corridor Study Report

WORK-IN-PROGRESS: SUBJECT TO CHANGE

Alternative B

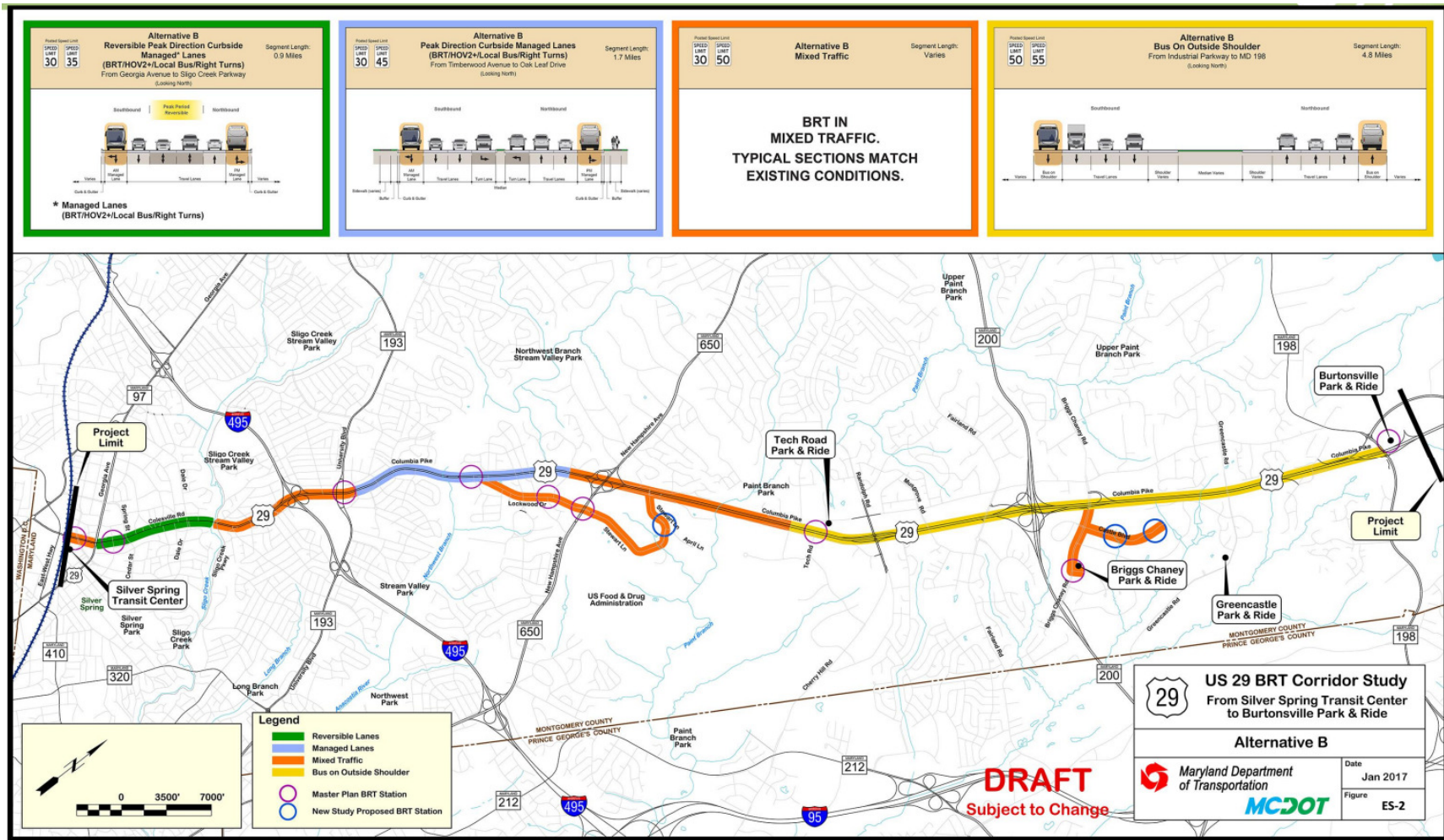
Alternative B includes the following treatments and assumptions regarding the BRT running-way:

- From Industrial Parkway to MD 198 – Peak period bus on outside shoulder lanes
- From Timberwood Avenue to Oak Leaf Drive – Peak direction curbside managed lanes for BRT, HOV+2, local bus, and right turning vehicles.
- From Georgia Avenue to Sligo Creek Parkway - reversible peak direction curbside managed lanes for BRT, HOV-2, local bus, and right turning vehicles.

BRT buses would operate in mixed traffic on US 29 from Industrial Parkway to Oak Leaf Drive, along Stewart Lane and Lockwood Drive, between University Boulevard and Sligo Creek Parkway and between Georgia Avenue and the SSTC.

Figure 2 depicts the treatments assumed for Alternative B for the entire corridor.

Figure 2 – Alternative B



Alternative B Modified

Alternative B Modified assumes the similar treatment (Median shoulder BRT lanes) as Alternative A for the segment between Stewart Lane and MD 198 and the similar treatment(s) as Alternative B for the segment between the SSTC and Stewart Lane. The one exception is that the peak direction curbside managed lanes for BRT, HOV+2, local bus, and right turning vehicles extend from Sligo Creek Parkway to Oak Leaf Drive.

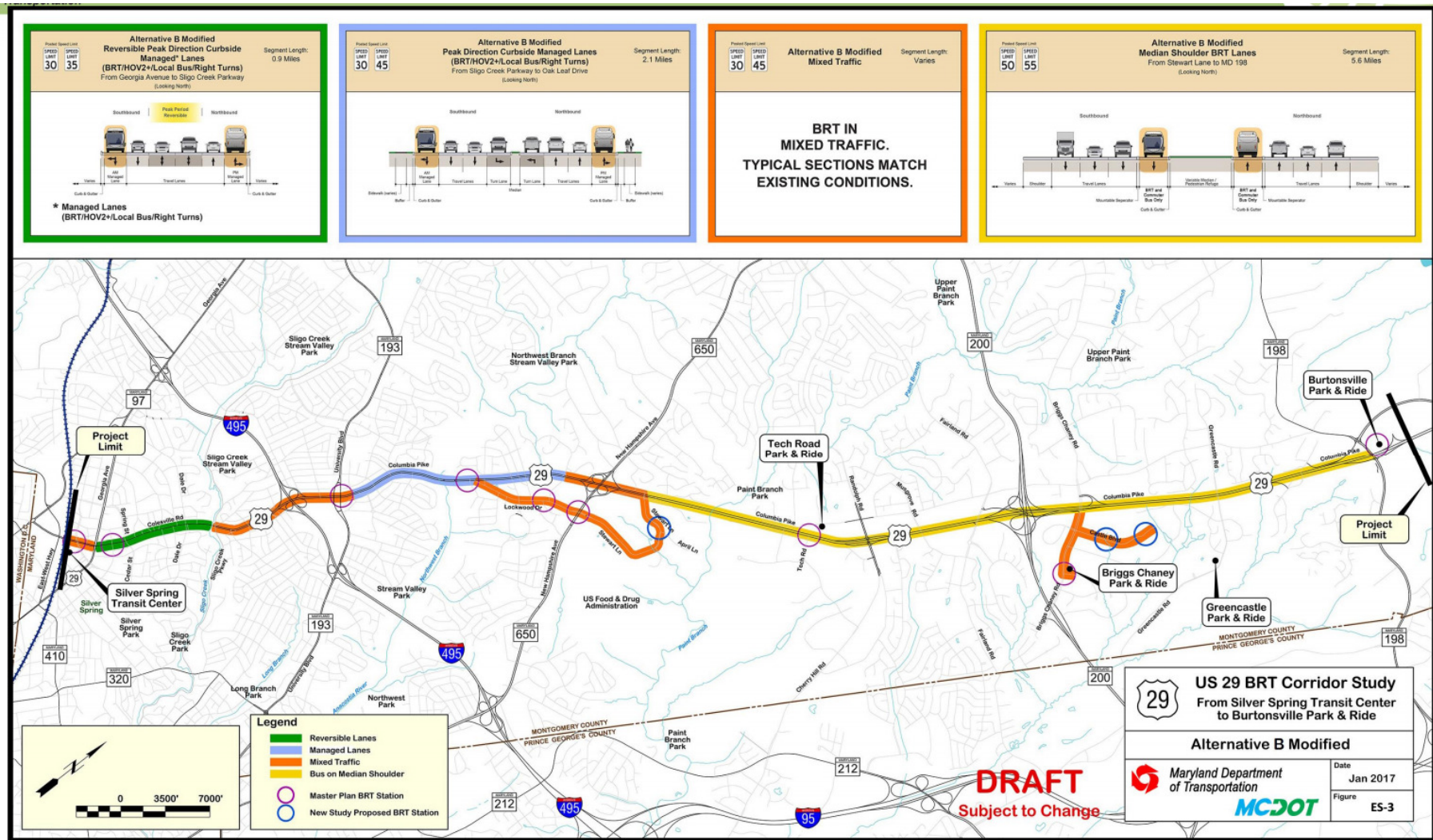
Figure 3 depicts the treatments assumed for Alternative B Modified for the entire corridor.⁴

Transition from Median to Curb Lane Operation

Alternative A and Alternative B Modified transition from the buses using center lanes in the north to outside or shoulder lanes in the south. Staff is concerned this transition will further slowdown buses in heavy traffic. Therefore, it may be helpful to describe this transition and what can be done to assist in the large merge required mid-way through the route.

⁴ The section title and corridor depiction of peak direction curbside managed lanes (i.e., the blue segment) appear to be inconsistent with respect to where the treatment ends on the south end of the corridor.

Figure 3 – Alternative B Modified



Station Locations

The Study included some modifications to the recommended station locations in the CTCFMP after coordination with staff, WMATA, MCDOT, and the US 29 Citizens Advisory Committee.

Draft US 29 BRT Station Locations	CTCFMP Recommended Station Locations
Silver Spring Transit Center	Silver Spring Transit Center
US 29 at Fenton Street / Spring Street	US 29 and Fenton Street
	US 29 and Franklin Avenue
US 29 at University Boulevard	US 29 and University Boulevard
US 29 at Burnt Mills Shopping Center (just south of Hillwood Drive)	US 29 and Hillwood Drive
Lockwood Drive at Oak Leaf Drive	Lockwood Drive and Oak Leaf Drive
White Oak Transit Center	White Oak Transit Center
US 29 at Tech Road	US 29 and Tech Road
	US 29 and Fairland Road
US 29 at Briggs Chaney Road (Alternative A Only)	
Castle Ridge Way at Castle Boulevard	
Castle Terrace at Castle Boulevard	
Briggs Chaney Park and Ride	Briggs Chaney Park and Ride
Burtonsville Park and Ride	Burtonsville Park and Ride

No BRT Station is planned at the intersection of US Route 29 and Fairland Road as called for in the Countywide Transit Corridors Functional Master Plan (CTCRMP). The Study should include an explanation of why this station was removed.

Comparison of Alternatives

A summary of the key travel related findings of the evaluation of the alternatives as listed in the Study is provided below:

- The forecast 2040 BRT daily boardings range from 16,400 to 18,120 with Alternative A the highest.
- The forecast for all transit daily boardings range from 33,700 to 34,900 – an increase of 18 to 22 percent over the “No-Build” 2040 estimate. Currently, there are about 11,000 transit daily boardings.⁵
- Auto vehicle miles of travel (VMT) is reduced under all three alternatives when compared to the No-Build.
- Transit person miles traveled (PMT) is increased under all three alternatives when compared to the No-Build.
- Peak period person throughput improves somewhat under each of the alternatives when compared to the No-Build. The exception is the segment south of Fenton Street northbound in the evening.
- Transit travel times improve with BRT passengers saving as much as 20 minutes compared to the No-Build local buses.
- The forecast number of miles of roadway operating in the PM peak hour at Level of Service (LOS) E or F shows a decrease from 5.4 miles for the No-Build to 2.1 (Alternative A) to 3.7 (Alternative B) miles under the alternatives. The AM however shows an increase from 7.3 miles under the No-Build to up to 8.9 miles (Alternative B modified) under the alternatives.

A closer look at the peak period person throughput summary as provided in the report is shown below:

	No Build		Alt A				Alt B				Alt B Modified			
	AM	PM	AM	PM	% Change AM	% Change PM	AM	PM	% Change AM	% Change PM	AM	PM	% Change AM	% Change PM
Northbound														
South of Fenton Street	1,390	3,260	1,560	2,320	12%	-29%	1,580	2,490	14%	-24%	1,590	2,750	14%	-16%
North of Franklin Avenue	2,090	4,770	2,450	4,470	17%	-6%	2,370	4,670	13%	-2%	2,390	4,700	14%	-1%
South of Burnt Mills SC	3,140	5,300	3,450	5,100	10%	-4%	3,430	5,540	9%	5%	3,440	5,590	10%	5%
On Lockwood Drive	500	940	640	1,290	28%	37%	630	1,250	26%	33%	630	1,250	26%	33%
North of Stewart Lane	3,080	4,000	3,290	4,490	7%	12%	3,310	4,460	7%	12%	3,310	4,590	7%	15%
North of Greencastle Road	3,060	3,940	3,070	4,200	0%	7%	3,070	4,170	0%	6%	3,090	4,230	1%	7%
Southbound														
North of Greencastle Road	4,410	3,410	4,720	3,420	7%	0%	4,660	3,420	6%	0%	4,740	3,430	7%	1%
North of Stewart Lane	3,270	3,260	3,310	3,550	1%	9%	3,590	3,510	10%	8%	3,610	3,560	10%	9%
On Lockwood Drive	340	500	790	650	132%	30%	780	640	129%	28%	790	540	132%	8%
South of Burnt Mills SC	4,450	3,390	4,480	3,670	1%	8%	4,950	3,630	11%	7%	4,950	3,610	11%	6%
North of Franklin Avenue	4,480	2,580	4,410	2,720	-2%	5%	4,980	2,670	11%	3%	5,010	2,690	12%	4%
South of Fenton Street	3,730	1,790	3,990	1,950	7%	9%	4,150	2,010	11%	12%	4,230	1,990	13%	11%

As shown above, the travel forecast reflects increased throughput for all three build alternatives along most segments in the corridor.⁶

⁵ Montgomery County US 29 BRT FY 2016 TIGER Grant Application

⁶ The fourth bullet on page 7 of the Study related to this appears to be incorrect (i.e., the reference to 940 people).

The Study also includes a range for capital and operating costs for each alternative as well as ranges for certain environmental impacts as noted in the table below.

Evaluation Criteria		No-Build Alternative	Alternative A	Alternative B	Alternative B Modified
COSTS¹	Right-of-way (ROW)	\$0	\$1.5M-\$3M	\$2M-\$4.5M	\$1.5M-\$3M
	Construction	\$0	\$80M - \$112.4M	\$60M-\$107.9M	\$77M-\$105.6M
	Vehicles	\$0	\$21M	\$17M	\$19M
	Total Capital Cost	\$0	\$102.5M-\$136.4M	\$79M-\$129.4M	\$97.5M-\$127.6M
	Annual Operating Cost	\$0	\$8.8M-\$9.8M	\$7.6M-\$8.6M	\$8.5M-\$9.5M
ENVIRONMENTAL IMPACTS	Socioeconomic				
	Total ROW Required (acres)	0	2-4	3-6	2-4
	Properties Impacted (number)	0	5-20	20-30	5-20
	Residential Relocations (number)	0	0	0	0
	Business Displacements (number)	0	0	0	0
	Public Parks Affected (number)	0	1	1	1
	Public Park Property Required (acres)	0	0-0.2	0-0.2	0-0.2
	Total Number of Public/Community Facilities Permanently Impacted	0	1	2	2
	Cultural Resources				
	Historic Properties (acre)	0	0-0.1	0-0.1	0-0.1
	Natural Resources				
	Stream Impact (linear feet)	0	0-20	0-125	0-20
	100-Year Floodplain (acres)	0	0-0.5	0-1	0-0.5
	Wetlands (acres)	0	0-0.2	0-0.2	0-0.2
	Forests (acres)	0	1-3	2-5	1-3
Federally or State Listed RTE Species (number)	0	0	0	0	

1. Costs presented in 2016 dollars and as ranges developed using SHA estimating guidelines to account for currently unknown design and construction needs.

The study corridor crosses three Stream Valley Parks (SVPs):

- Sligo Creek Stream Valley Park (Units 2 and 3)
- Northwest Branch Stream Valley Park (Unit 4)
- Paint Branch Stream Valley Park (Unit 4)

There are an additional eight Commission properties in the study area:

- Gene Lynch Urban Park
- Ellsworth Urban Park
- Hastings Neighborhood Conservation Area
- Burnt Mills West Special Park
- Martin Luther King Jr. Recreational Park
- Stonehedge Local Park
- Calverton Neighborhood Conservation Area
- Stonecrest Neighborhood Conservation Area

In addition, one existing hard surface park trail and two natural surface park trails (one existing, one proposed) cross U.S. 29:

Hard Surface: Sligo Creek Trail, at grade and signalized, at Sligo Creek Parkway

Natural Surface: Northwest Branch Trail/Rachel Carson Greenway Trail (uncontrolled); Paint Branch Trail (proposed) under the US 29 bridge over Paint Branch stream.

The following streams on parkland pass under U.S. 29:

- Sligo Creek
- Northwest Branch
- Paint Branch

All alternatives appear to impact at least one of the above parks, and all will have impacts to the streams. At the time of more detailed design for the selected alternative, Montgomery Parks will provide detailed comments, including opportunities to improve stormwater discharge into streams on parkland. Montgomery Parks staff should be included in any interagency coordination meetings regarding more detailed design of the selected alternative. In addition, any work on parkland will require a park permit.

The Study notes that the potential exists for sidewalk uses and/or park entrances to be altered depending on final design and bus stop locations. The number of public parks impacted ranges from zero to two and the estimated acreage impacted ranges from zero to 0.2 acres.

The estimated linear feet of streams impacted range from zero to 125. The estimated wetland impacts range from zero to less than 0.2 acre. The estimated forest impacts range from 1.0 acres to 5.0 acres.

The several cultural resources were identified within the study area (architectural and archaeological resources (Table 5-2), page 93-96). Of these, four (Polychrome Historic District, Robert B. Morse Water Filtration Plant, Silver Theater and Silver Spring Shopping Center, and Montgomery Arms) are County designated sites or districts listed in the Master Plan for Historic Preservation and two (Old Silver Spring Commercial Area and the J.C. Penney Co Building) are identified in the Locational Atlas. These resources are protected under Chapter 24A of the County Code. The study included no analysis of the potential impact to cultural resources, but acknowledges that future studies will need to assess the project's impact on identified cultural resources consistent with Section 4(f) of the US Department of Transportation Act of 1966, Section 106 of the National Historic Preservation Act and the Maryland Historical Trust Act of 1985 (as amended).

None of the conceptual build alternatives are estimated to have disproportionately high adverse impact on minority or low-income populations.

The estimated number of properties impacted by the conceptual build alternatives ranges from five to 30. There are no property displacements or relocations anticipated.

Decision to Not Advance into Environmental Analysis / Preliminary Engineering Phase

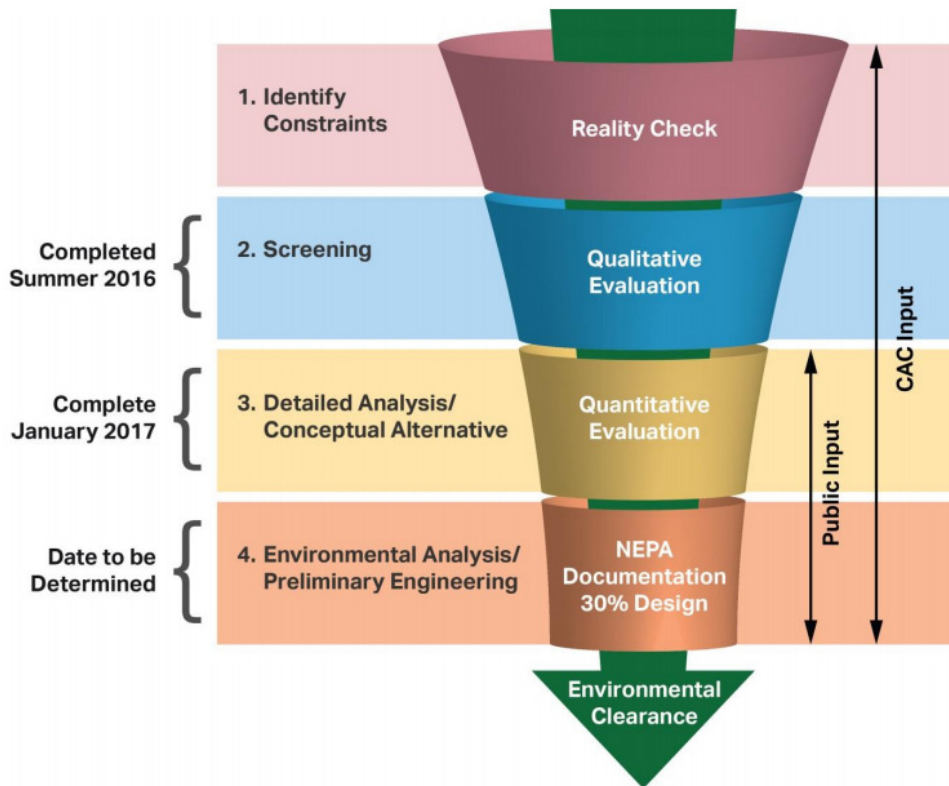
Last month, the Study team notified the US 29 Advisory Committee of the following change in the evaluation process:

“One notable finding of the Corridor Study Report (CSR) is that implementation of managed lanes requires additional analysis. As a result, managed lanes will not be included as part of the County’s BRT project on US 29. The US 29 BRT will use existing Bus on Shoulder north of Tech Road and existing travel lanes south of Tech Road. The project will include BRT stations, new vehicles, Transit Signal Priority (TSP), and station-area bike/pedestrian improvements. MCDOT will continue to work with MDOT to implement improvements within State right of way.

Completion of the CSR, which focuses on a 2040 horizon year, is a significant milestone and represents a point of transition from long range planning into design of more immediate transit improvements for the US 29 corridor. The more immediate BRT implementation is based on the County Executive’s vision described last March for implementation using existing infrastructure as much as possible by 2020.”

The Study includes the following process flow chart depicting the fourth step as now occurring on a date to be determined. Typically, at this point in the process, a Locally Preferred Alternative would be recommended to advance into the fourth step.⁷ In this case, the Study team has concluded that it cannot recommend an alternative because the implementation of managed lanes requires additional analysis. Managed lanes as defined in the Study are an element of both Alternative B and Alternative B Modified. Managed lanes are not an element of Alternative A. The Study (page 56) notes the slight difference between Managed Lanes and BAT lanes being that non-bus HOVs are restricted from the BAT lanes and must remain in the general-purpose traffic lanes.

⁷ The Planning Board may choose however to recommend an alternative with the understanding that MTA will not be advancing any alternative into Step 4 in the above flow chart. **If the Board chooses to recommend an alternative now, staff would recommend Alternative A as Alternatives B and B Modified include the managed lane segments (with HOV-2) that require additional analysis and are generally used more on limited access facilities (see discussion below).**



If MDOT is not advancing any of the three alternatives in the US 29 BRT Corridor Study Report (CSR), it is important for the CSR to note the improvements that are being implemented as part of the County Executive’s 2020 BRT Plan. ⁸

The Study also does not include narrative on why managed lanes require additional analysis or why the additional analysis cannot be conducted now to better evaluate the alternatives before moving into the fourth step as shown in the chart above. This information should be included in the Final Study Report.

If MDOT is not advancing any of the alternatives in the US 29 BRT Corridor Study Report (CSR), the CSR should note when MDOT intends to finish the remaining study needed (managed lanes), choose a preferred alternative, and move forward with advancing the preferred alternative as originally planned.

Managed Lanes vs. BAT Lanes

The Study notes that the Managed Lane and BAT Lane segments of the respective alternatives are typically repurposed from existing general purpose travel lanes – something the CTCFMP encourages where feasible. Managed Lanes as defined in Alternatives B and B modified in the Study include HOV-2 as part of the operating assumption in the southern segment of the corridor. More often, designating a lane for both BRT and HOV-2

⁸ The CSR, for example, does not note that the current plans are to use existing Bus on Shoulder north of Tech Road and existing travel lanes south of Tech Road or that the project will include BRT stations, new vehicles, Transit Signal Priority (TSP), and station-area bike/pedestrian improvements.

use is an application reserved for limited access facilities like freeways or expressways.⁹ **The Final Study Report should provide background on the decision to include HOV-2 as part of two of the build alternatives in the southern segment of the corridor to inform the follow-up analysis that is to take place at some undetermined time in the future.**

Incremental Introduction of Priority Treatments vs. Functional Plan Vision

MCDOT will brief the Planning Board on the County Executive's US 29 BRT 2020 Plan. As noted above the Plan includes BRT stations, new vehicles, Transit Signal Priority (TSP), and station-area bike/pedestrian improvements and is intended to have select major components of BRT operating in the corridor in the near term with relatively little impact on adjacent property and at a lower cost than would otherwise be the case. Funds to complete final design and begin construction in FY 19 have been included in the County Executive's recommended FY 18 amendments to the FY 17 – FY 22 Capital Improvements Program.

The incremental introduction of BRT is consistent with the CTCFMP which notes the following:

“Since a large part of the initial ridership for BRT service will come from existing transit users whose numbers do not warrant a high level of treatment at this time, it is likely that there will be an incremental introduction of priority treatments and features that, with actual operating and ridership experience, ultimately lead to the maximum level of treatment appropriate for the specific corridor in question.”

This approach introduces BRT elements of in a corridor with right of way constraints along certain segments. This is an approach that will likely be repeated in various segments of each corridor identified in the Countywide Transit Corridors Functional Master Plan. It is important however – as noted in the review of the MD 586 Study – that subsequent analyses begin to address the potential network effect on forecast ridership so that higher end treatments are not automatically eliminated from consideration as alternatives are refined. In the context of the CTCFMP recommendations, the County Executive's 2020 BRT Plan should be viewed as an interim condition leading to more segments with dedicated lanes. This is especially important in the US 29 corridor – given the role of BRT in support of the vision of the White Oak Science Gateway Plan.

Purpose and Need

The Study has not adequately addressed the Purpose and Need for the project. Specifically, the Study acknowledges there is a need to provide mobility options by providing a high frequency, **reliable** transit service.

If the existing bus service has poor reliability operating in mixed traffic, the Study should document the extent to which the BRT build alternatives would improve system reliability in 2040. Additional detail is needed on the following key questions:

- What are the causes of the existing bus reliability problems?

⁹ As an example, the American Public Transportation Association (APTA) 2005 Recommended Practice on Designing Rapid Transit Running Ways includes HOV as an application on freeways but excludes HOV as a feature for arterial design guidelines.

- Where along the corridor do reliability, problems occur today and how will that change in the 2040 No-Build?
- Will the alternatives allow buses and BRT services to bypass these congestion points, thus being able to adhere to bus schedules more consistently?

From a more technical standpoint staff would recommend consideration of whether VISSIM could be used to evaluate these measures, possibly by breaking out the components of the local bus and BRT trips to compare stopped delay, running time, boarding and alighting time (which should increase with more ridership), and simulation events (having to wait through an entire signal cycle length to proceed). One question / comment staff has is whether multiple runs of VISSIM might show variability between bus average travel times, enough to calculate the 95th percentile travel time?

Finally, it may be that there are studies of successful BRT systems where pre/post-studies that have been conducted to quantify the effect of reliability on travel time.

Summary of Comments to be Forwarded

- 1. If MDOT is not advancing any of the three alternatives in the US 29 BRT Corridor Study Report (CSR), it is important for the CSR to note the improvements that are being implemented as part of the County Executive's 2020 BRT Plan.**
- 2. The Study does not include narrative on why managed lanes require additional analysis or why the additional analysis cannot be conducted now to better evaluate the alternatives. This information should be included in the Final Study Report.**
- 3. If MDOT is not advancing any of the alternatives in the US 29 BRT Corridor Study Report (CSR), the CSR should note when MDOT intends to finish the remaining study needed (managed lanes), choose a preferred alternative, and move forward with advancing the preferred alternative as originally planned.**
- 4. The Final Study Report should provide background on the decision to include HOV-2 as part of two of the build alternatives in the southern segment of the corridor to inform the follow-up analysis that is to take place at some undetermined time in the future.**
- 5. The US 29 2020 BRT Plan as explained to the CAC in January introduces BRT elements in a corridor with right-of-way constraints along certain segments. This is an approach that will likely be repeated in various segments of each corridor identified in the Countywide Transit Corridors Functional Master Plan. It is important however – as noted in the review of the MD 586 Study – that subsequent analyses begin to address the potential network effect on forecast ridership so that higher end treatments are not automatically eliminated from consideration as alternatives are refined. In the context of the CTCFMP recommendations, the County Executive's 2020 BRT Plan should be viewed as an interim condition leading to more segments with dedicated lanes. This is especially important in the US 29 corridor – given the role of BRT in support of the vision of the White Oak Science Gateway Plan.**

6. The Study has not adequately addressed the Purpose and Need for the project. If the existing bus service has poor reliability operating in mixed traffic, the Study should document the extent to which the BRT build alternatives would improve system reliability in 2040.

7. Consider whether VISSIM could be used to evaluate these measures, possibly by breaking out the components of the local bus and BRT trips to compare stopped delay, running time, boarding and alighting time (which should increase with more ridership), and simulation events (having to wait through an entire signal cycle length to proceed).

8. Identify studies of successful BRT systems where pre/post-studies that have been conducted to quantify the effect of reliability on travel time.

9. All alternatives appear to have park impacts and all will have impacts to the streams. At the time of more detailed design for the selected alternative, Montgomery Parks will provide detailed comments, including opportunities to improve stormwater discharge into streams on parkland. Montgomery Parks staff should be included in any interagency coordination meetings regarding more detailed design of the selected alternative. In addition, any work on parkland will require a park permit.

Comments of a more technical or editorial nature include the following:

1. There is discrepancy between the average travel times for 2040 No-Build conditions for cars & trucks and for buses between Table ES-2 and Table 3-2a (See table below). Are these both based on VISSIM simulation runs?

Location in Corridor Study Report	Cars & Trucks		Buses	
	SB Average Travel Time (min)	NB Average Travel Time (min)	SB Average Travel Time (min)	NB Average Travel Time (min)
Table 3-2a: 2040 AM	45	21	47	25
Table ES-2: 2040 AM	44	18.6	49.4	27.5
Table 3-2a: 2040 PM	25	37	30	44
Table ES-2: 2040 PM	24.3	35.3	27.3	44.5

2. If the shoulder is being proposed for BRT use for a portion of the corridor, an analysis of the pavement condition of these shoulders, improvement needs and construction costs should be included in the alternative evaluation.
3. Please clarify the travel time/delay reduction benefits to local buses versus BRT in terms of location (segments, intersections, and improvement action)?
4. Please provide additional detail on why the build alternatives retained for further evaluation differ from the recommended plans in the CTCRMP when the CSR discusses what the CTCRMP recommends. For example, the CTCRMP calls for dedicated lanes along the whole alignment except for the stretch of the route on Lockwood Drive, but none of the retained alternatives propose dedicated lanes for the entire corridor.
5. Reducing travel times was a goal of the CTCRMP, but was not an express goal of the US BRT Corridor Study Report. Will reducing travel times be an official goal of future US Route 29 BRT improvements after this first phase?
6. Please check if the “Proposed Interchange in the CLRP (Funded)” as shown in Figure 2-1 (at Fairland Rd?) should be included in Table ES-1: Planned/Programmed Projects, as it is a funded project in the CLRP. If so, please add that interchange to Table ES-1 or explain in a footnote to Figure 2-1 why it is not included in Table ES-1.
7. Table 1-1 notes that the ROW for US 29 from MD 198 to Stewart Lane is 200 ft. However, the Fairland Master Plan notes that the section of US 29 from south of Randolph Rd/Cherry Hill Rd should be between 100 and 200 feet. Please confirm with Steve Aldrich of our Functional Planning and Policy Division if the ROW along this noted section of US 29 should be less than 200 feet for any section.
8. There is an inventory of natural resources, but no indication of if/how they will be impacted.
9. Page 83 last line of 2nd paragraph. Forests, floodplains, and nontidal wetlands are also associated with these stream systems.
10. Alternative A and Alternative Modified B transition from the buses using center lanes in the north to outside or shoulder lanes in the south. Staff is concerned this transition will further slowdown buses in heavy traffic. Therefore, it may be helpful to describe this transition and what can be done to assist in the large merge required mid-way through the route.
11. No BRT Station is planned at the intersection of US Route 29 and Fairland Road as called for in the Countywide Transit Corridors Functional Master Plan (CTCRMP). The Study should include an explanation of why this station was removed.