

US 29 Mobility and Reliability Study Continuation

CAC Update
6.9.22

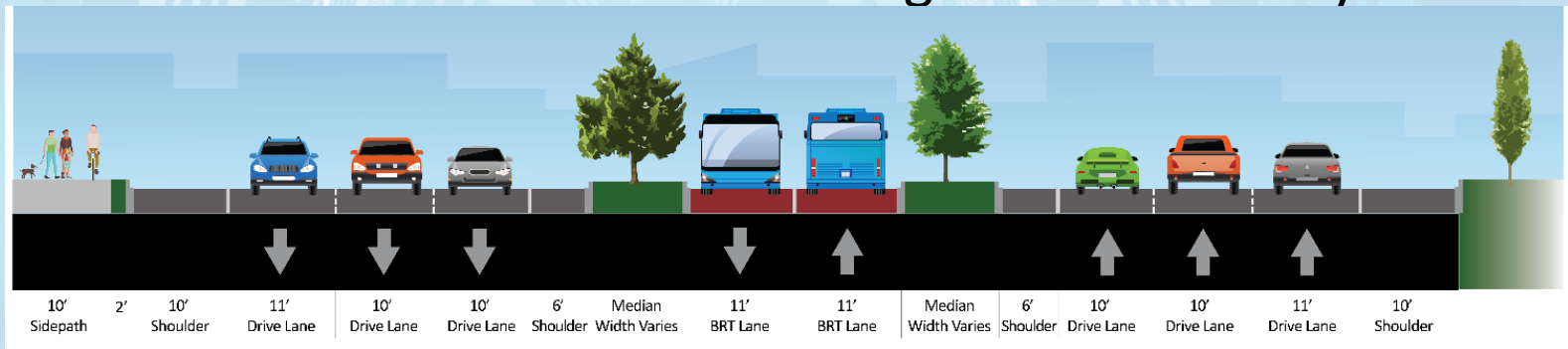
Agenda

- Previous Study Summary
- Follow-on Study Goals & Objectives
- Additional Alternatives
 - Concept Design
 - Costs
 - Traffic Operations
- Preferred Alternatives
- Next Steps

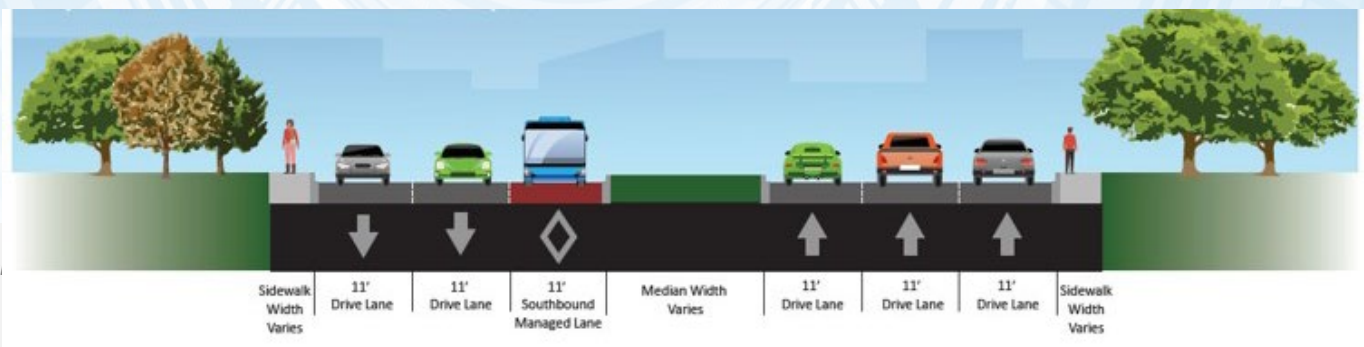
Previous Alternatives Evaluated

- **Corridor-wide Alternatives**

- **Median Bus Lane: Tech Road to Sligo Creek Parkway**



- **Managed Lane (Rush-hour Bus/HOV Lanes): Musgrove Road to Spring Street and Bus on shoulder north of Musgrove Road**



Previous Alternatives Evaluated

- **Supplemental Options**
 - **Intersection Improvements** at select locations
 - **System/ Demand Management** measures to reduce non-recurring congestion and encourage carpooling
 - **Pedestrian and Bicycle** improvements for better access (Silver Spring to Tech Road)

Study Goals based on feedback

- Improve the Median Bus Lane for traffic and transit operations.
- Make the Median Bus Lane more cost effective.
- Provide clarity regarding the HOV and transit mode shifts.
- Identify the independent utility of the spot intersection improvements.

Mobility Study Alternatives

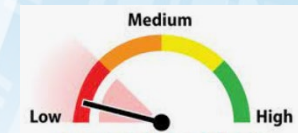
1. Managed (Bus/HOV) Lanes
2. Median Bus Lane (Baseline)
 - A. Median Bus Lane + Intersection Improvements
 - B. Median Bus Lane Optimized

Include improvements necessary to make Median Bus Lane operate best while maintaining acceptable vehicle operations
 - C. Median Bus Lane Value Engineered

Reduce cost of Median Bus Lane Concept

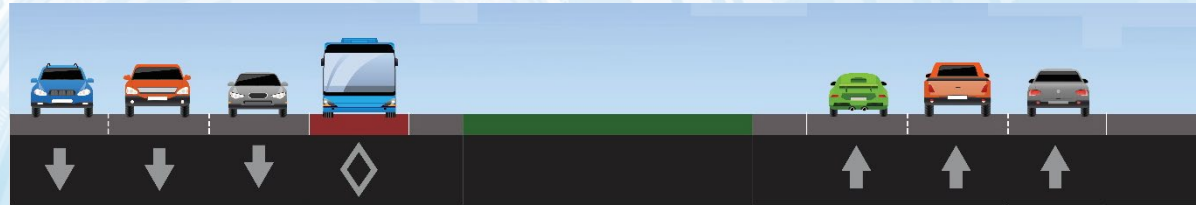
Elements Evaluated

- Intersection Improvements
- New Traffic Signals
- Station Location / Design
- Transit Guideway
- Construction Cost
- Traffic and Transit Operations
 - Level of Service, Travel Time, Throughput)



Transitway Design Options

Bus on Shoulder



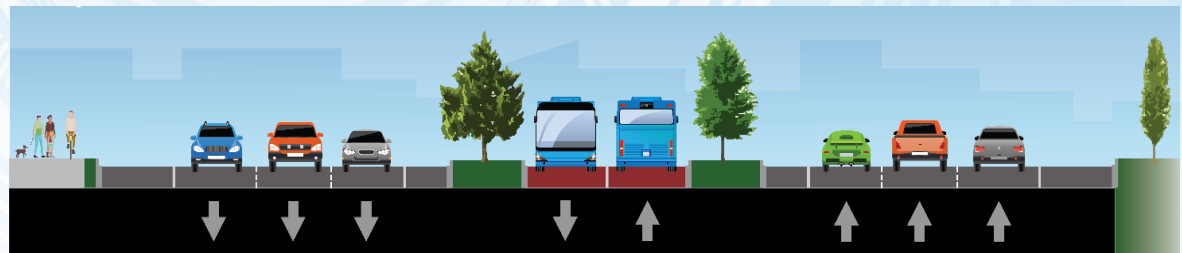
Peak Hour/ Repurposed Bus Lane



Single Median Reversible Bus Lane

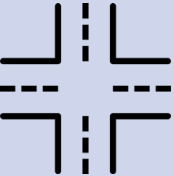




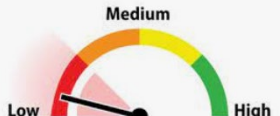


Dual Median Bus Lane

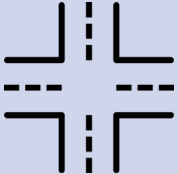







US 29 Mobility and Reliability Study

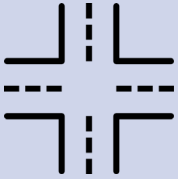





1 - Managed (Bus/HOV) Lane

Design Elements	Notes
 <p>Intersection Improvements</p>	<p>Six (6) intersection/interchange improvements included: Greencastle Rd; Tech Rd; Stewart Ln; MD 650 Interchange; I-495 Interchange; Sligo Creek Pkwy</p>
 <p>New Traffic Signals</p>	<p>No new traffic signals proposed</p>
 <p>Station Location / Design</p>	<p>No changes proposed</p>
 <p>Dedicated Bus Lane Segments</p>	<p>Rush-hour Bus/HOV from Musgrove to Stewart, MD 650 to Burnt Mill, and Sligo Creek Pkwy to Spring St</p>
 <p>Lane Width</p>	<p>No change</p>
 <p>Level of Service E/F</p>	<p>Seven (7) signalized intersections operating at LOS E or LOS F</p>

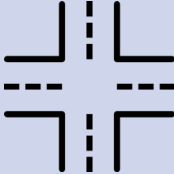





2 - Median Bus Lane (Baseline)

Design Elements	Notes
 <p>Intersection Improvements</p>	Interchange improvement at I-495
 <p>New Traffic Signals</p>	Six (6) new traffic signals proposed
 <p>Station Location / Design</p>	New station locations for Burnt Mills and Four Corners
 <p>Dedicated Bus Lane Segments</p>	Dual median bus lane from Tech to Stewart and Timberwood to I-495; single median bus lane from Stewart to Timberwood and I-495 to Sligo Creek Pkwy
 <p>Lane Width</p>	Lane widths reduced to 10 feet minimum
 <p>Level of Service E/F</p>	Thirteen (13) signalized intersections operating at LOS E or LOS F

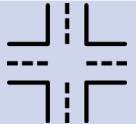





Alternative 2A – Median Bus Lane + Intersection Improvements

Design Elements	Notes
 <p>Intersection Improvements</p>	<p>Six (6) intersection/interchange improvements included: Greencastle Rd; Tech Rd; Stewart Ln; MD 650 Interchange; I-495 Interchange; Sligo Creek Pkwy</p>
 <p>New Traffic Signals</p>	<p>Six (6) new traffic signals proposed</p>
 <p>Station Location / Design</p>	<ul style="list-style-type: none"> -Relocation of Burnt Mills BRT Station to US 29 and Lockwood - Relocation of Four Corners Station to US 29 and MD 193
 <p>Dedicated Bus Lane Segments</p>	<p>Dual median bus lane from Tech to Stewart and Timberwood to I-495; single median bus lane from Stewart to Timberwood and I-495 to Sligo Creek Pkwy</p>
 <p>Lane Width</p>	<p>Lane widths reduced to 10 feet minimum</p>
 <p>Level of Service E/F</p>	<p>Seventeen (17) signalized intersections operating at LOS E or LOS F</p>

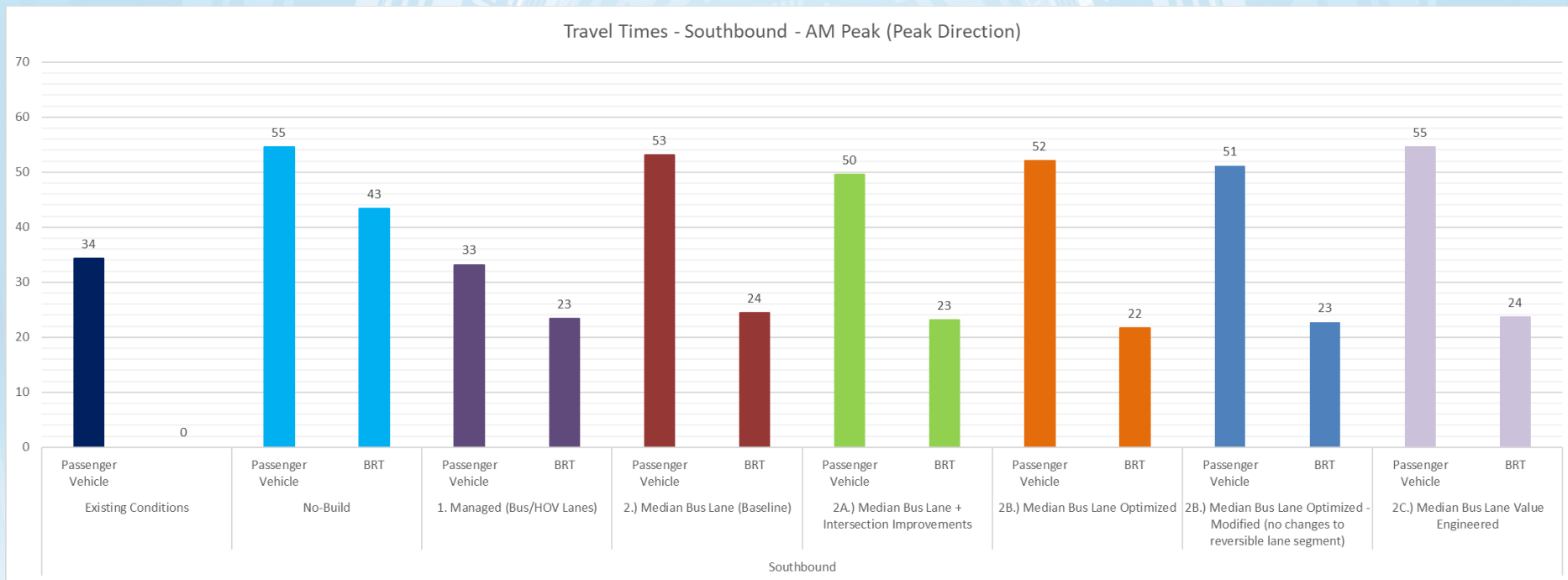
Alternative 2B - Median Bus Lane Optimized

Design Elements	Notes
 <p>Intersection Improvements</p>	<p>Six (6) intersection/interchange improvements included: Greencastle Rd; Tech Rd; Stewart Ln; MD 650 Interchange; I-495 Interchange; Sligo Creek Pkwy</p>
 <p>New Traffic Signals</p>	<p>Five (5) new traffic signals proposed</p> <ul style="list-style-type: none"> - Northwest Drive to remain unsignalized and all left-turn movements prohibited
 <p>Station Location / Design</p>	<ul style="list-style-type: none"> -Relocation of Burnt Mills BRT Station to US 29 Median at Hillwood Drive -Addition of new BRT Station at Franklin Avenue
 <p>Dedicated Bus Lane Segments</p> 	<p>Dual median bus lane from Tech to Stewart and Timberwood to I-495; single median bus lane from Stewart to Timberwood and I-495 to Sligo Creek Pkwy. Outer lane dedicated bus lane south of Sligo Creek Pkwy</p> <ul style="list-style-type: none"> -Southbound in AM, Northbound in PM -Not included in Alt 2B Modified (no changes to reversible lane segment)
 <p>Lane Width</p>	<p>Lane widths not changed from existing</p>
<p>Level of Service E/F</p>	<p>Eighteen (18) signalized intersections operating at LOS E or LOS F</p> <p><i>Seventeen (17) under Alt 2B Modified</i></p>

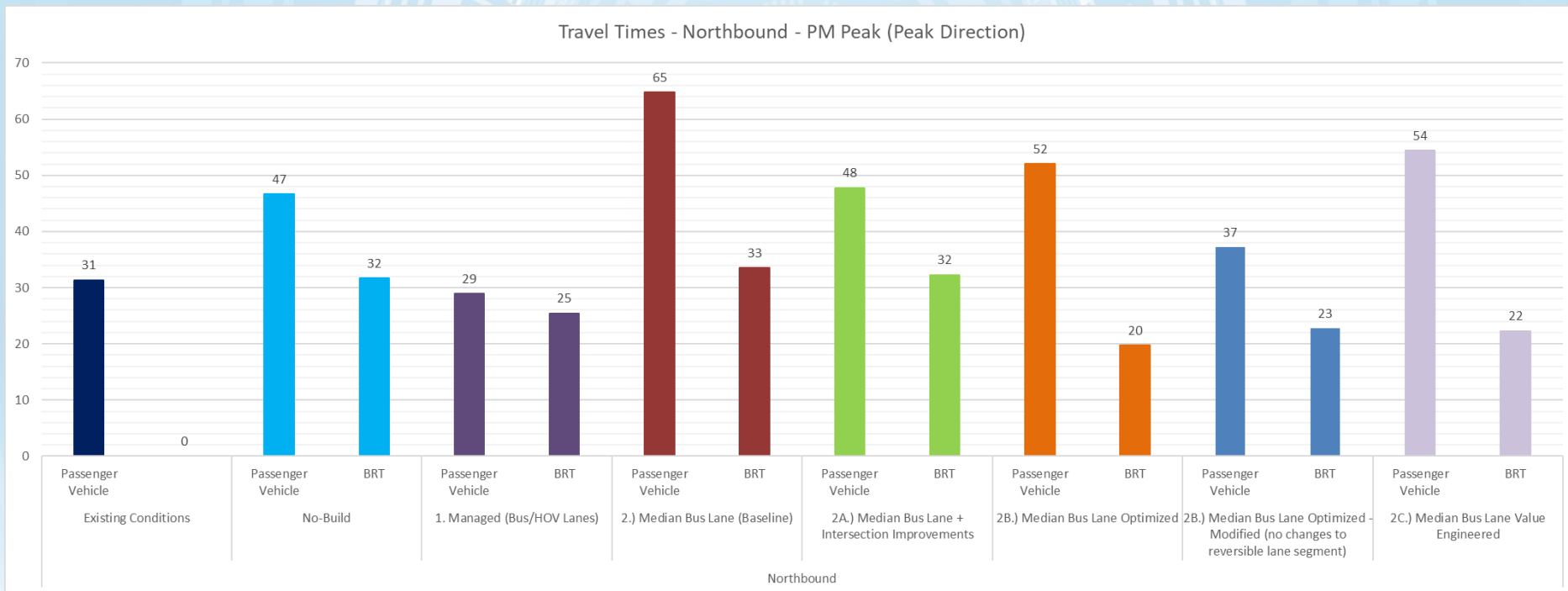
Alternative C - Median Bus Lane Value Engineered

Design Elements	Notes
 <p>Intersection Improvements</p>	<p>One (1) intersection improvement included: Greencastle Rd</p>
 <p>New Traffic Signals</p>	<p>Three (3) new traffic signals proposed</p> <ul style="list-style-type: none"> - No signal and restricted access at Oak Leaf Dr, Northwest Dr, and Timberwood Ave
 <p>Station Location / Design</p>	<ul style="list-style-type: none"> -Relocation of Burnt Mills BRT Station near Hillwood Drive (NB in outer lane, SB in median) -Four Corners BRT Station relocated to Lanark Ave
 <p>Dedicated Bus Lane Segments</p>	<ul style="list-style-type: none"> • Dedicated Bus Lanes on inner shoulder between Tech Rd to Stewart Ln • Single reversible bus lane from Stewart to Sligo Creek Pkwy (maintains 4 northbound lanes through Four Corners) • Outer lane dedicated bus lane south of Sligo Creek Pkwy <ul style="list-style-type: none"> -Southbound in AM, Northbound in PM
 <p>Lane Width</p>	<p>Lane widths not changed from existing, except around Paint Branch crossing</p>
 <p>Level of Service E/F</p>	<p>Eighteen (18) signalized intersections operating at LOS E or LOS F</p>

Comparison of Travel Time (AM Peak, Southbound)



Comparison of Travel Time (PM Peak, Northbound)



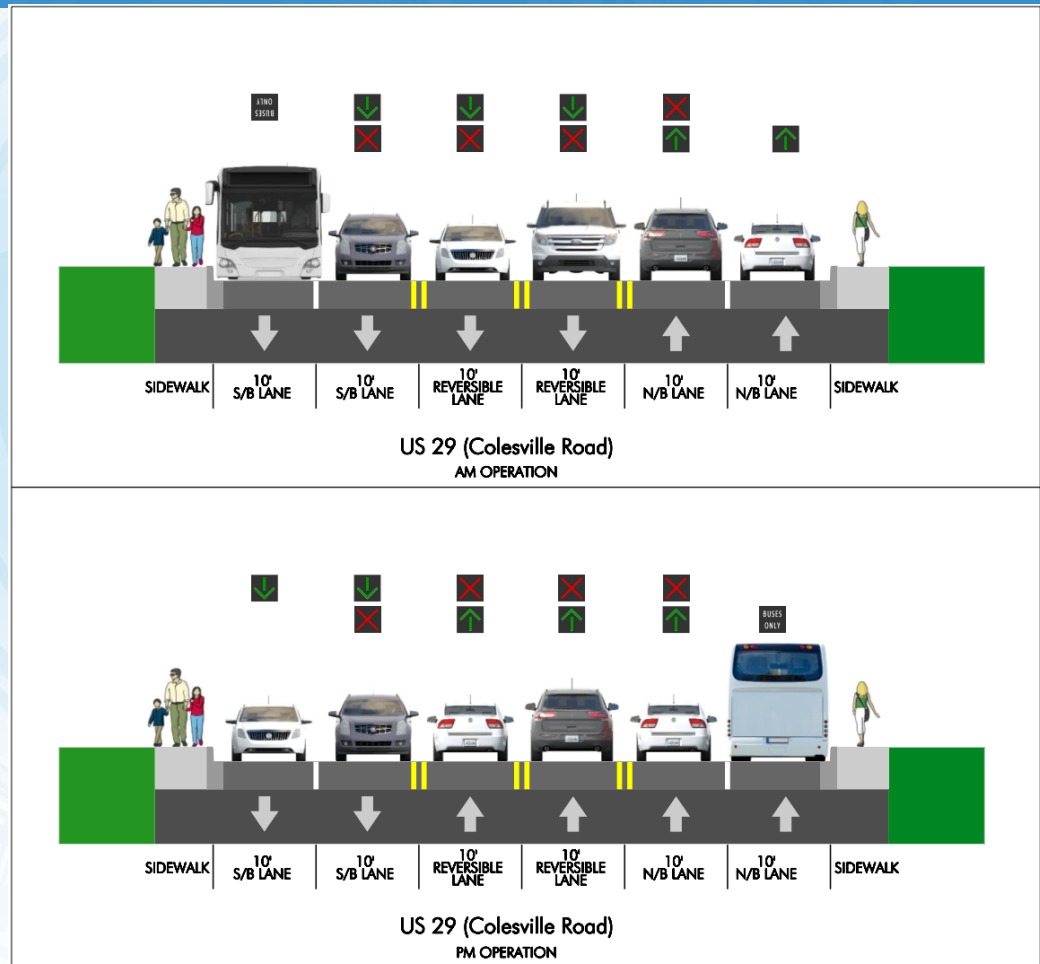
Comparison of Estimated Costs (adjusted to 2022 dollars)

- Managed Lane - \$105M
 - Includes priority Intersection Improvements (\$25M)
 - Includes station Improvements – (\$25M)
- Alt 2 Median Bus Lane Baseline - \$133M
- Alt 2A Median Bus Lane + Intx Impr.- \$151M
- Alt 2B Median Bus Lane Optimized - \$149M
 - Alternative 2B Modified - \$147M
- Alt 2C Median Bus Lane Value Engineered - \$123M



Dedicated Bus Lanes between Sligo Creek Parkway and SSTC

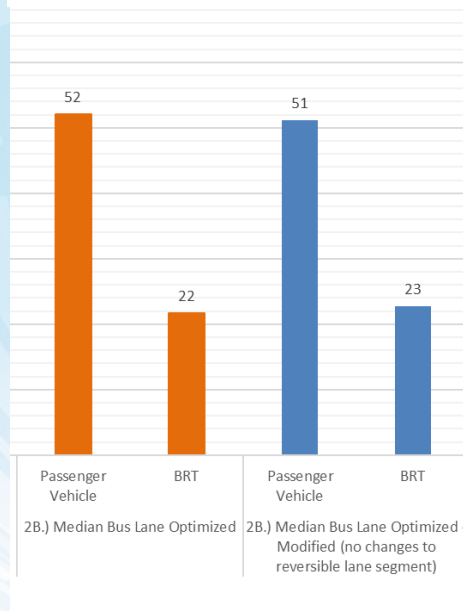
- Dedicated bus lanes between Sligo Creek Parkway and Silver Spring Transit Center (\$2.3M)
- Included in Alt 2B and Alt 2C, not Alt 2B Modified
- Reduction from 4 to 3 travel lanes in peak direction
- Would require new overhead mounting structures



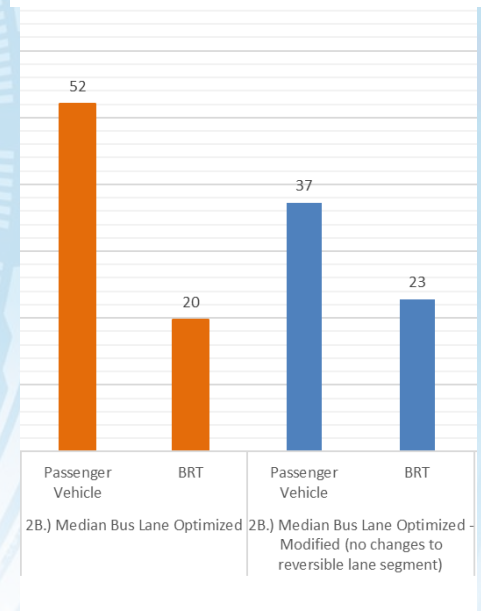
Dedicated Bus Lanes between Sligo Creek Parkway and SSTC

- Travel time results show positive benefit for BRT and minimal change to cars in the SB, AM
- The results were less favorable in the NB, PM

Southbound, AM Peak

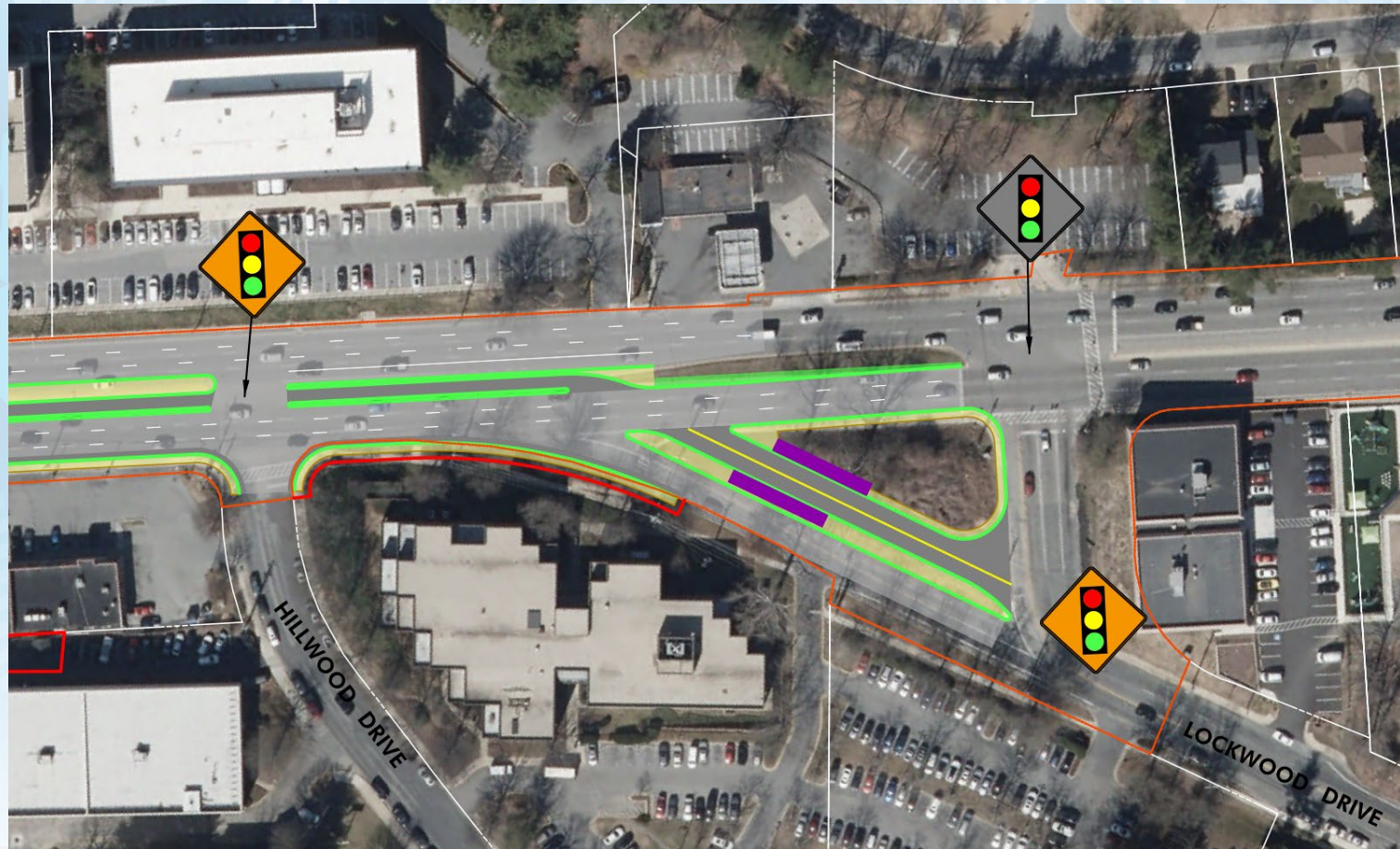


Northbound, PM Peak



Burnt Mills Station Location/ Design Alternatives

Alt 2 – Median Bus Lane Baseline (\$17.4 million)



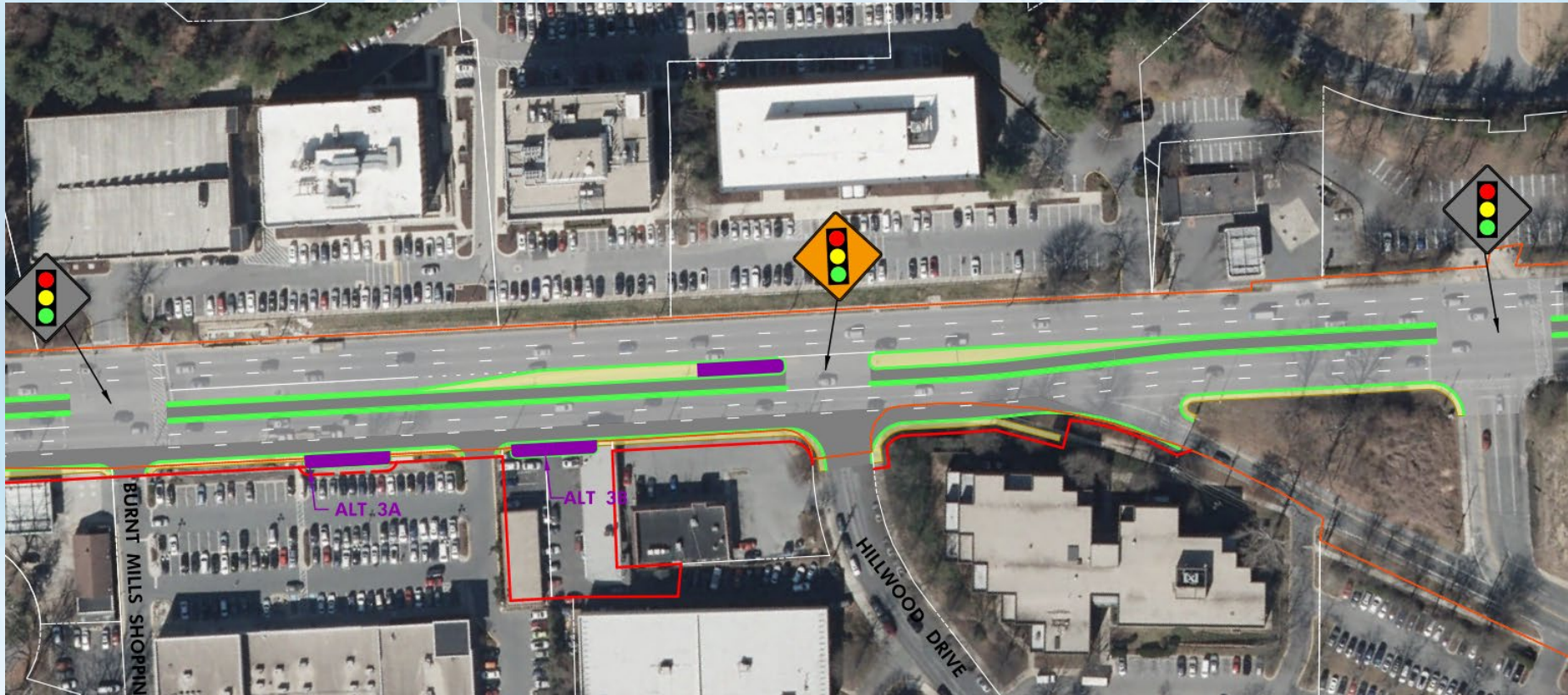
Burnt Mills Station Location/ Design Alternatives

Alt 2B – Median Bus Lane Optimized (\$15.8 million)



Burnt Mills Station Location/ Design Alternatives

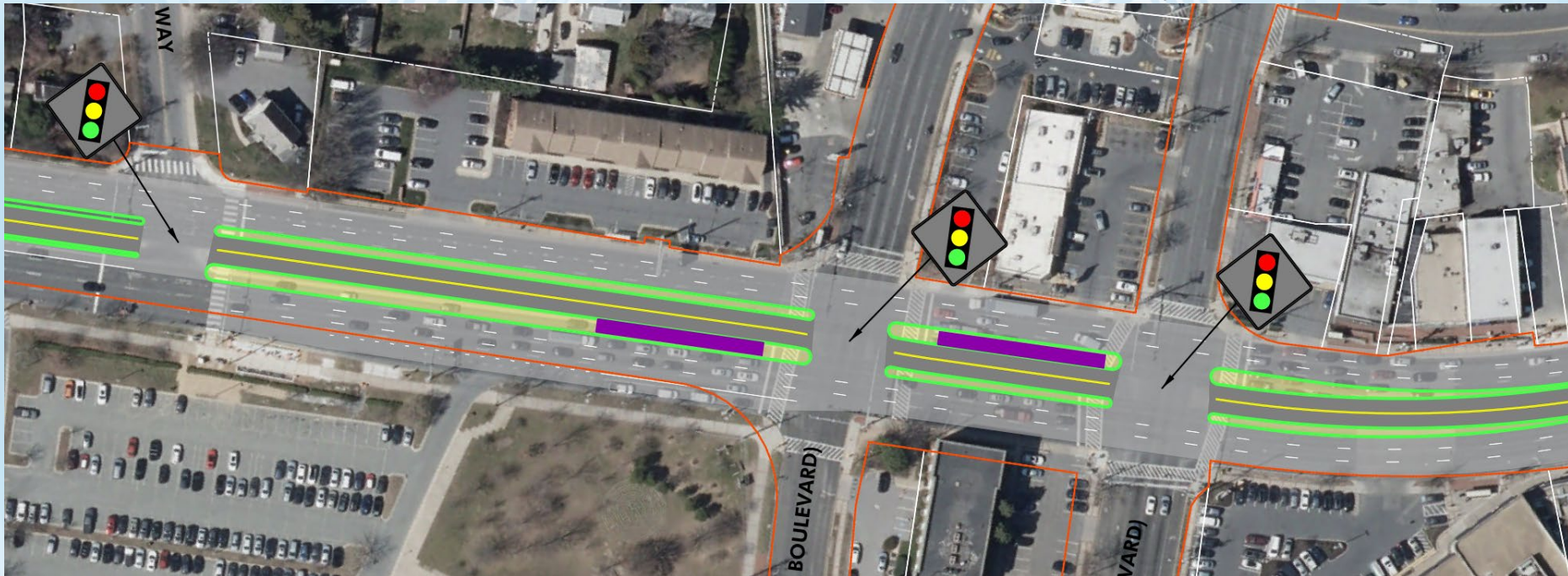
Alt 2C – Median Bus Lane Value Engineered (\$14.0 million)



Four Corners Station Location/ Design

Alternatives

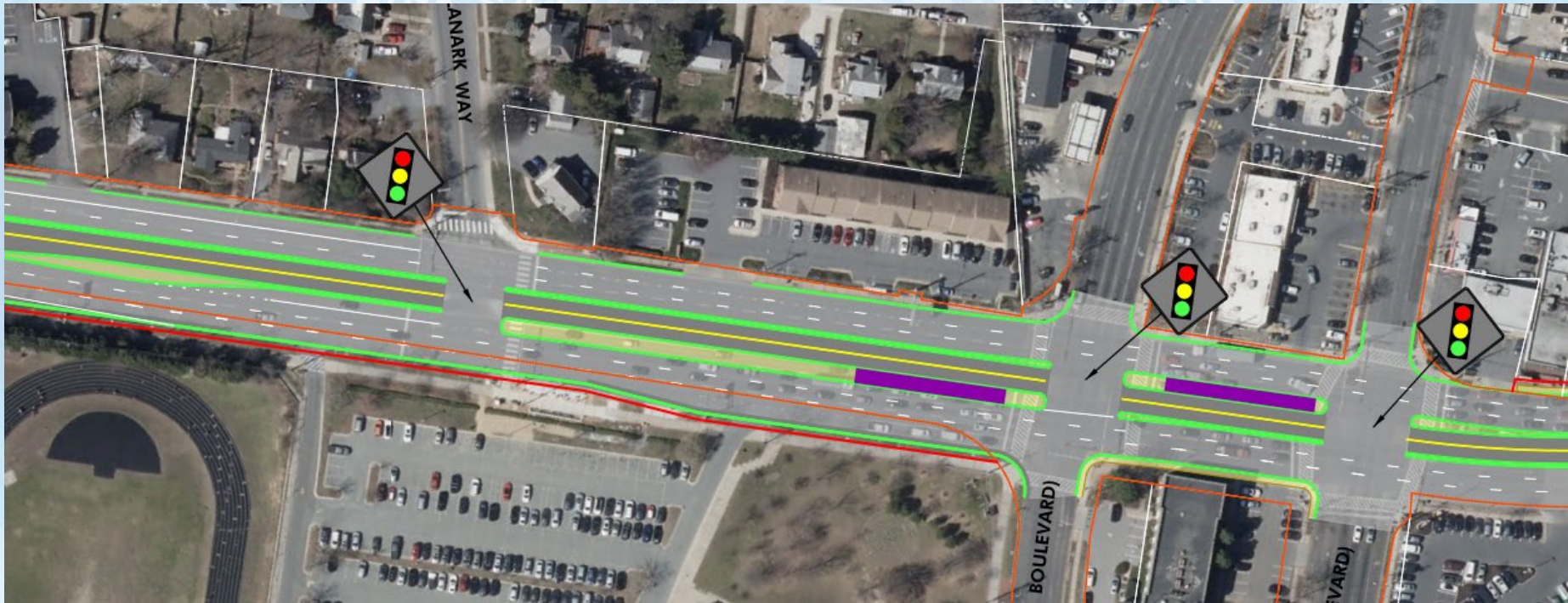
Alt 2 and 2A – Median Bus Lane Baseline (\$15.8)



Four Corners Station Location/ Design

Alternatives

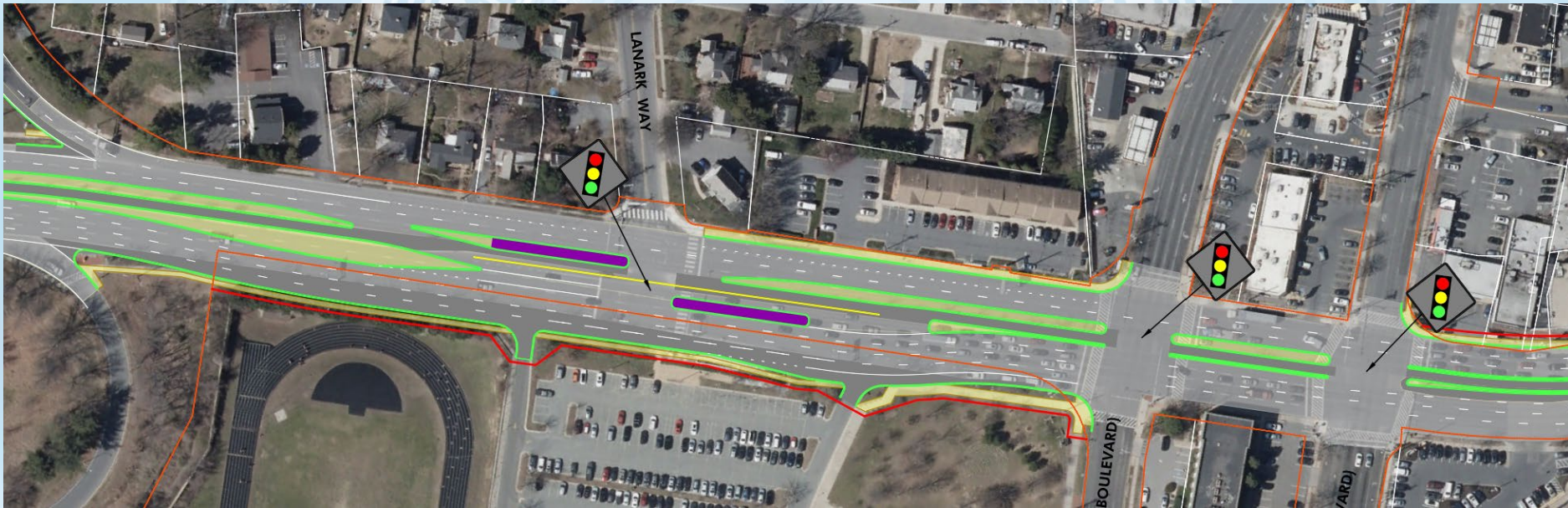
Alt 2B – Median Bus Lane Optimized (\$16.4 million)



Four Corners Station Location/ Design

Alternatives

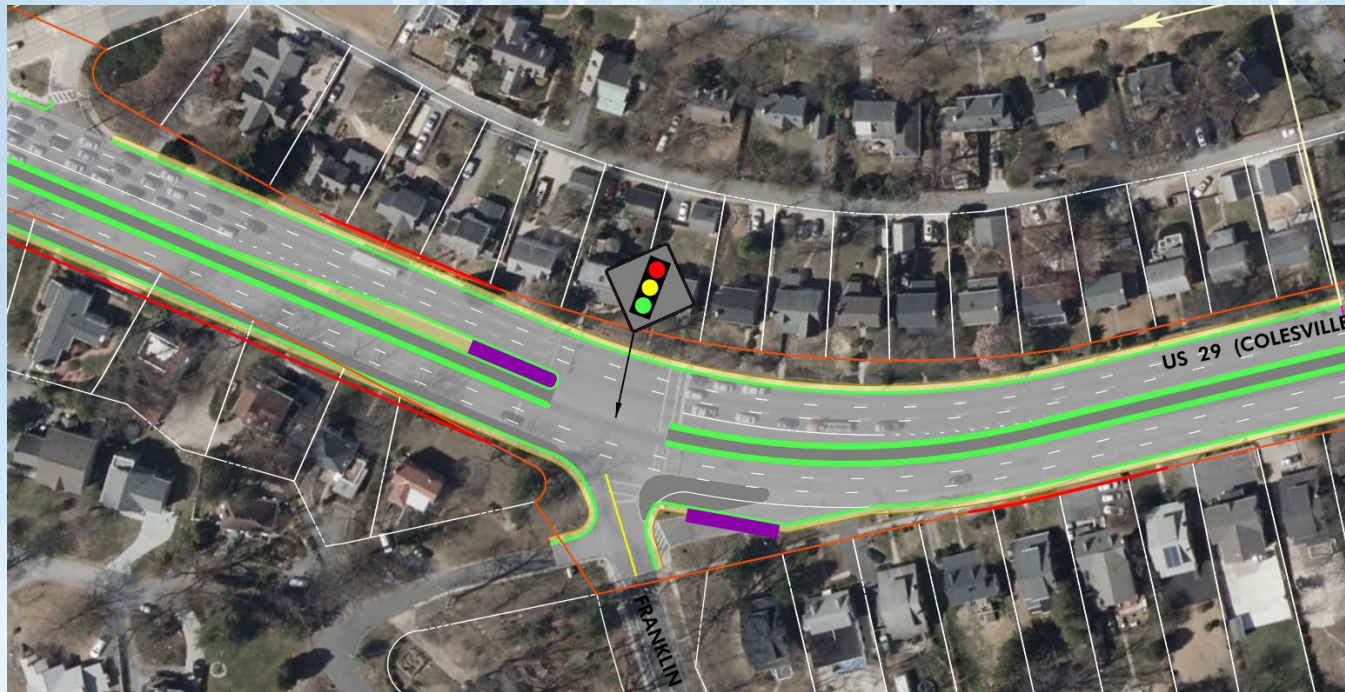
Alt 2C – Median Bus Lane Value Engineered (\$16.2 million)



Franklin Station Location/ Design

Alternatives


Alt 2B – Median Bus Lane Optimized



- New Station at Franklin Ave included in Alt 2 (\$3.9M)
 - Requested during previous community outreach
- Permanent station locations (i.e. do not change by time of day)
- Not included in any other alternatives






Alternatives - Legend

Transitway Type, New Signal, Intersection Impr, Station Location

- Transitway Type
 - **Shoulder** – Bus on Inside or Outside Shoulder
 - **Bus Only** – Bus Only Lane
 - **Managed** – Peak Period/Direction Managed Lane (e.g. Bus and HOV)
 - **Single** – Single Median Busway
 - **Dual** – Dual Median Busway
 - Mixed – Mixed Traffic
- Signals
 - New Signal - 
- Intersections
 - Intersection Improvements - 
- Stations
 - Station Location - 

























Alternatives

Transitway Type, New Signal, Intersection Impr, Station Location

	Alt 1 – Managed Lane	Alt 2 – Median Bus Lane Baseline	Alt 2A – Median Bus Lane + Intx Impr	Alt 2B – Median Bus Lane Optimized	Alt 2C – Median Bus Lane VE
Sandy Spring Rd	Shoulder	Shoulder	Shoulder	Shoulder	Shoulder
Blackburn Rd	Shoulder	Shoulder	Shoulder	Shoulder	Shoulder
Greencastle Rd	Shoulder +	Shoulder	Shoulder +	Shoulder +	Shoulder +
Briggs Chaney Rd	Shoulder	Shoulder	Shoulder	Shoulder	Shoulder
ICC	Shoulder	Shoulder	Shoulder	Shoulder	Shoulder
Fairland Rd	Shoulder	Shoulder	Shoulder	Shoulder	Shoulder
Musgrove Rd	Managed	Shoulder	Shoulder	Shoulder	Shoulder
Randolph/Cherry Hill	Managed	Shoulder	Shoulder	Shoulder	Shoulder
Tech	Managed + 	Shoulder 	Shoulder + 	Shoulder + 	Shoulder 
Industrial	Managed	Dual	Dual	Dual	Shoulder


















Alternatives

Transitway Type, New Signal, Intersection Impr, Station Location

	Alt 1 – Managed Lane	Alt 2 – Median Bus Lane Baseline	Alt 2A – Median Bus Lane + Intx Impr	Alt 2B – Median Bus Lane Optimized	Alt 2C – Median Bus Lane VE
Stewart	Managed 	Dual	Dual 	Dual 	Shoulder
MD 650	Managed 	Single	Single 	Single 	Single
Oak Leaf	Managed	Single 	Single 	Single 	Single
Prelude	Managed	Single	Single	Single	Single
Northwest	Managed	Single 	Single 	Single	Single
Southwest	Managed	Single	Single	Single	Single
Burnt Mills	Managed	Single	Single	Single	Single
Lockwood	Managed	Single 	Single 	Single	Single
Hillwood	Managed 	Single 	Single 	Dual  	Single  
Crestmoor	Managed	Single 	Single 	Single 	Single 

Alternatives

Transitway Type, New Signal, Intersection Impr, Station Location





	Alt 1 – Managed Lane	Alt 2 – Median Bus Lane Baseline	Alt 2A – Median Bus Lane + Intx Impr	Alt 2B – Median Bus Lane Optimized	Alt 2C – Median Bus Lane VE
Southwood	Managed	Single	Single	Single	Single
Lorain	Mixed	Single	Single	Single	Single
Timberwood	Mixed	Dual 	Dual 	Dual 	Single
MD 193	Mixed	Dual 	Dual 	Dual 	Single
Lanark	Mixed 	Dual	Dual	Dual	Dual 
I-495	Mixed 	Dual 	Dual 	Dual 	Dual 
Granville/Hastings	Mixed	Single 	Single 	Single 	Single 
Indian Spring	Mixed	Single	Single	Single	Single
Brewster	Mixed	Single	Single	Single	Single
Leighton	Mixed	Single	Single	Single	Single

*Granville and Hastings signal is currently proposed as a SHA project

US 29 Mobility and Reliability Study






Alternatives

Transitway Type, New Signal, Intersection Impr, Station Location

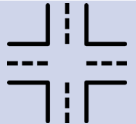




	Alt 1 – Managed Lane	Alt 2 – Median Bus Lane Baseline	Alt 2A – Median Bus Lane + Intx Impr	Alt 2B – Median Bus Lane Optimized	Alt 2C – Median Bus Lane VE
Franklin	Mixed	Single	Single	Single 	Single
Sligo Creek	Mixed 	Single	Single 	Single 	Single
Greycastle	Mixed	Mixed	Mixed	Bus Only	Bus Only
Dale	Managed	Mixed	Mixed	Bus Only	Bus Only
Highland	Managed	Mixed	Mixed	Bus Only	Bus Only
Rowen	Managed	Mixed	Mixed	Bus Only	Bus Only
Woodside	Managed	Mixed	Mixed	Bus Only	Bus Only
Mansion	Managed	Mixed	Mixed	Bus Only	Bus Only
Noyes	Managed	Mixed	Mixed	Bus Only	Bus Only
Spring	Managed	Mixed	Mixed	Bus Only	Bus Only

Alternatives

Transitway Type, New Signal, Intersection Impr, Station Location

	Alt 1 – Managed Lane	Alt 2 – Median Bus Lane Baseline	Alt 2A – Median Bus Lane + Intx Impr	Alt 2B – Median Bus Lane Optimized	Alt 2C – Median Bus Lane VE
Fenton	Mixed 	Mixed 	Mixed 	Bus Only 	Bus Only 
MD97	Mixed	Mixed	Mixed	Bus Only	Bus Only
Ramsey	Mixed	Mixed	Mixed	Bus Only	Bus Only
Wayne	Mixed	Mixed	Mixed	Bus Only	Bus Only

Alternative 4 – Hybrid (Proposal)

Design Elements	Notes
 <p>Intersection Improvements</p>	<p>One (1) common intersection improvement included: Greencastle Rd</p>
 <p>New Traffic Signals</p>	<p>Four (4) new traffic signals proposed</p> <ul style="list-style-type: none"> - No signal and restricted access at Oak Leaf Dr, Northwest Dr
 <p>Station Location / Design</p>	<ul style="list-style-type: none"> -Relocation of Burnt Mills BRT Station to US 29 at Hillwood Drive (NB in outer lane, SB in median) -Addition of new BRT Station at Franklin Avenue
 <p>Dedicated Bus Lane Segments</p>	<ul style="list-style-type: none"> • Dedicated Bus Lanes on inner shoulder between Tech Rd to Stewart Ln • Single median bus lane from Stewart to Four Corners • Dual median bus lane through Four Corners • Outer lane dedicated bus lane south of Sligo Creek Pkwy -Southbound in AM only as pilot
 <p>Lane Width</p>	<p>Lane widths not changed from existing, except around Paint Branch crossing</p>

Schedule and Next Steps

- CAC Meeting – Tonight
- Final Alternatives Development and Analysis – Summer 2022
- CAC Meeting: Final Results – Summer/Fall 2022
- Public Meeting # 4 – Summer/ Fall 2022
- Planning Board/T&E – Summer/Fall 2022
- Report and Recommendation – Fall 2022

Open Discussion/ Q&A

Supplemental Content

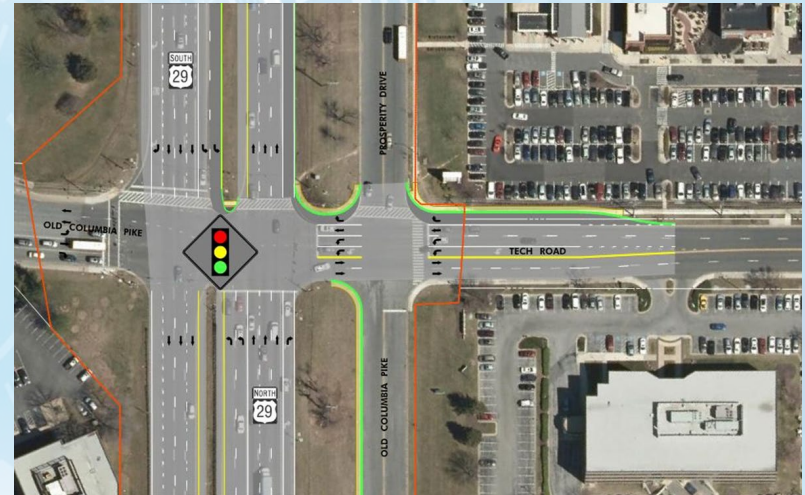
Common Intersection Improvements (1-2 of 5)

Greencastle Road



- Add Eastbound Right-turn Lane
- Add Second Southbound Left-turn Lane and Eastbound Receiving Lane
- Pedestrian Crossing Upgrades

Tech Road



- Additional US 29 turn lanes (2nd SBL) and side street widening for additional westbound right-turn lane at Tech Road
- Pedestrian Crossing Upgrades

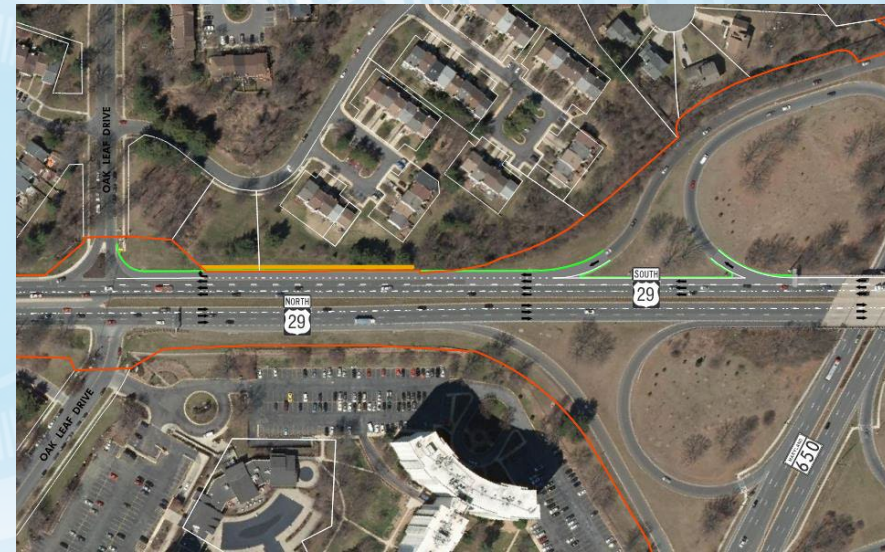
Common Intersection Improvements (3-4 of 5)

Stewart Lane



- Add a 2nd SB left turn lane on US 29 at Stewart Lane
- Pedestrian Crossing Upgrades

MD 650



- 3rd Southbound US 29 lane addition through MD 650
- Potential Additional Intersection / Ramp Configuration Revisions
- Pedestrian Crossing Upgrades

Common Intersection Improvements (5 of 5)

Sligo Creek Parkway



- Sligo Creek Parkway enhancement at US 29 for 2nd westbound through lane

- Both the Median Bus Lane and Managed Lane alternatives included a 2nd exit lane from SB US 29 to WB I-495
- Final design will consider active traffic controls for ped x-ing and enhanced alternatives routes through I-495



Proposed New Signals (Oak Leaf to Hastings)

Intersection	Alt 1 – Managed Lane	Alt 2 – Median Bus Lane Baseline	Alt 2A – Median Bus Lane + Intx Impr	Alt 2B – Median Bus Lane Optimized	Alt 2C – Median Bus Lane VE
Oak Leaf Drive		✓	✓	✓	
Northwest Drive		✓	✓		
Hillwood Drive	✓	✓	✓	✓	✓
Crestmoor Drive		✓	✓	✓	✓
Timberwood Avenue		✓	✓	✓	
Granville Drive /Hastings Drive		✓	✓	✓	✓

Currently Planned US 29 SHA Projects

- New signals at Oak Leaf and Hastings
- Extended US 29 southbound left-turn lane at Stewart Lane