

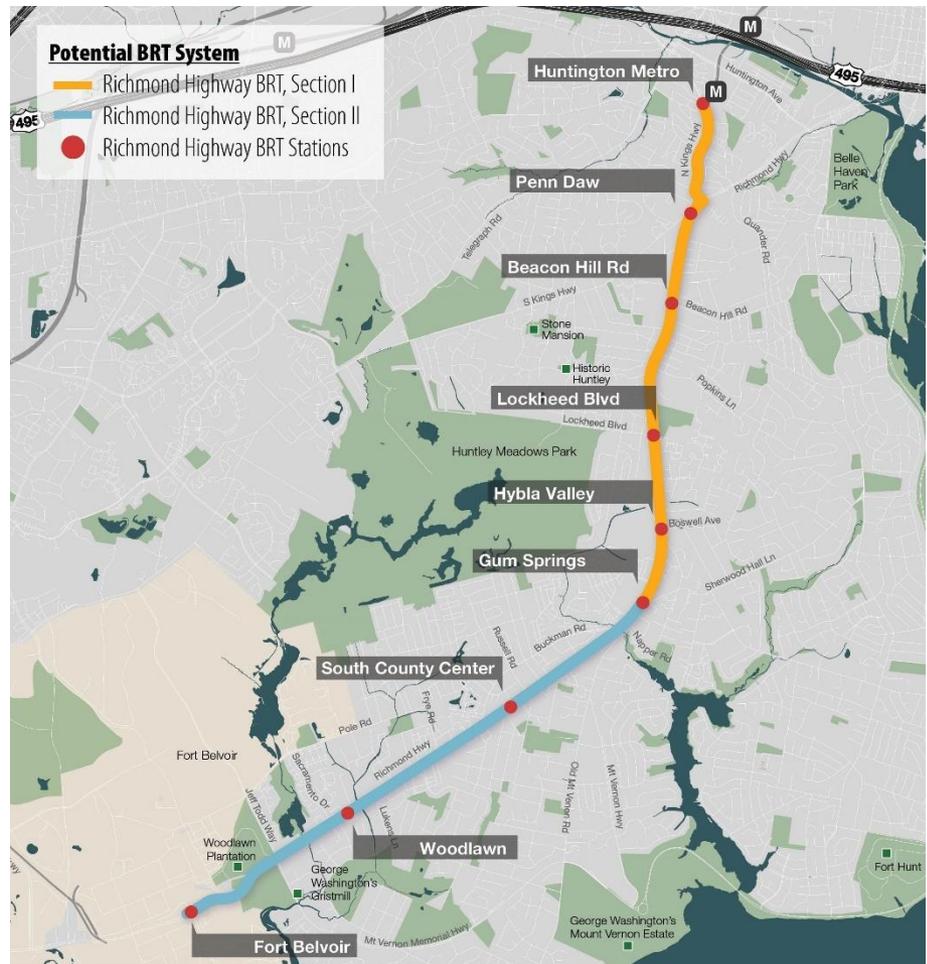


County of Fairfax, Virginia



Richmond Highway Bus Rapid Transit Executive Committee Meeting

September 28, 2022



The Richmond Highway BRT project is funded in part by the Northern Virginia Transportation Authority.

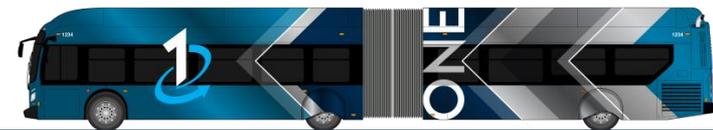


Agenda

- **Project Status**
 - Design Progress
 - Third Party Coordination
 - FTA Coordination
 - Right-of-Way Acquisition
- **Turn Lane Analysis Follow-Up**
- **Community Charm**
 - Station Themes
 - Station Renaming
- **12-Month Outlook**



Project Status



Richmond Highway Bus Rapid Transit

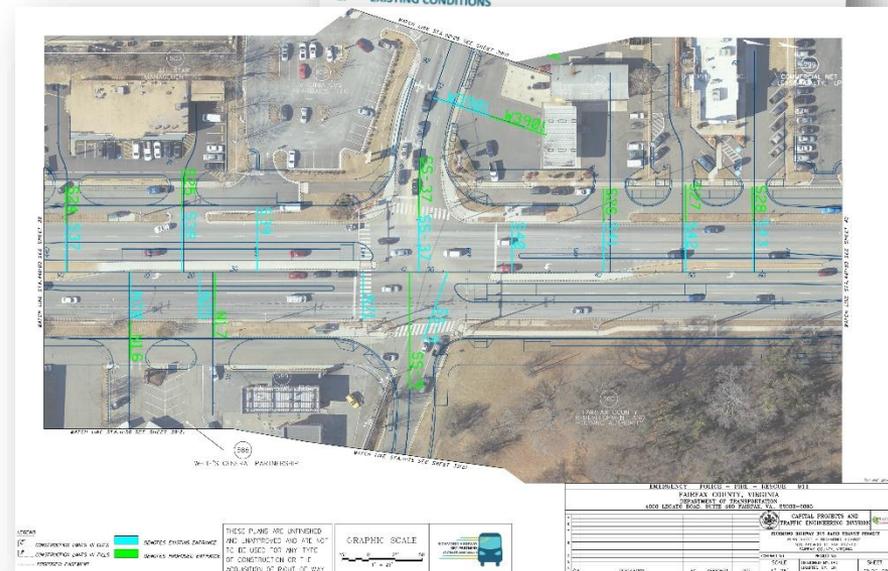




County of Fairfax, Virginia

Civil Design Progress

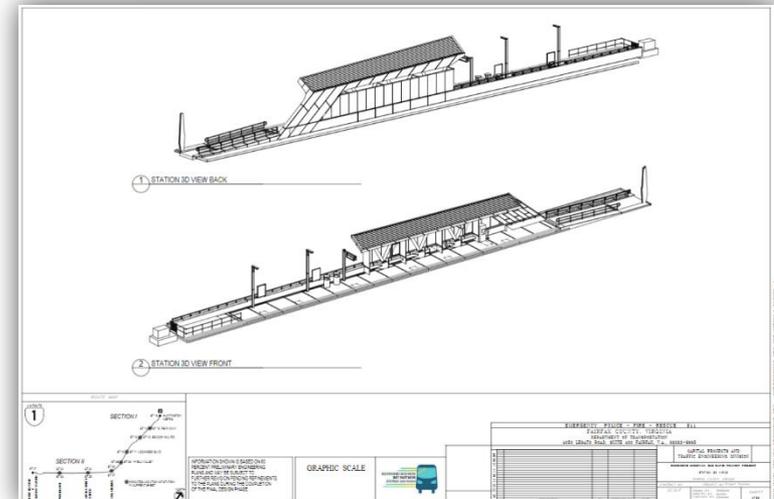
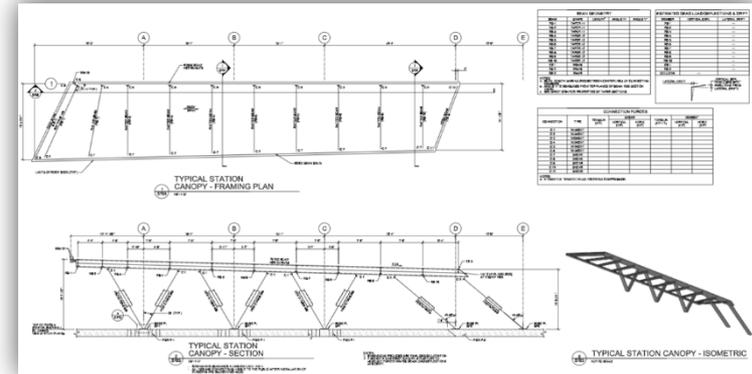
- **Current focus:**
 - VDOT design waivers
 - Pedestrian safety features
 - Stormwater management & landscaping
 - Retaining walls
 - Construction phasing & maintenance of traffic
 - Utility design coordination
 - Developing easement & right-of-way lines





Station Design Progress

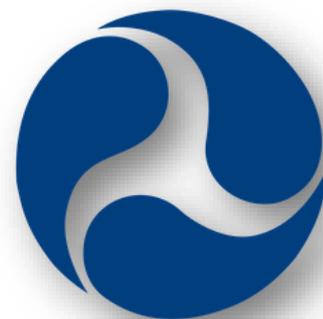
- 60% design completed in Summer 2022
- Current focus:
 - Materials selection & Buy America compliance
 - Furnishings
 - Structural framing
 - Electrical & communications equipment
 - Pedestrian access
 - Safety & security





FTA Coordination

- **Project accepted into “Project Development” stage in March 2020; entry into “Engineering” phase expected Q1 2023**
 - FTA contribution is set at entry to Engineering
- **Approval to enter Engineering includes detailed review of:**
 - Scope
 - Schedule
 - Costs
- **FTA conducted risk assessment in Summer 2022; may assign higher cost or longer schedule based on analysis of risks**
- **Monthly meetings with FTA staff; weekly meetings with oversight consultant**



**Federal Transit
Administration**



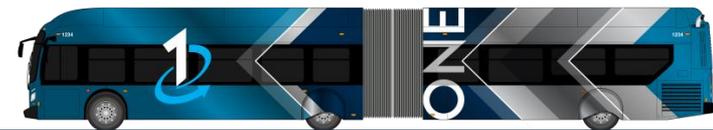


Right-of-Way Acquisition

- **Demolition of Alexandria Motel scheduled for October 2022**
- **Group 1 Parcels**
 - 9 offers out
 - 4 offers accepted; settlement in October
- **Group 2 Parcels**
 - Notice sent to owners
 - Appraisals underway
- **FTA Real Estate Acquisition Management Plan finalized**
- **Information on process provided on BRT website**
- **Additional meetings can be scheduled to assist property owners during the process, as requested**



Turn Lane Analysis



Richmond Highway Bus Rapid Transit





Turn Lane Analysis-Process Summary

- **Public Information Meeting held on May 3, 2022**
- **Survey results showed most respondents agreed with Staff recommendations**
- **BRT Executive Committee meeting held on June 10, 2022**
 - Supervisors requested additional consideration at:
 - Beacon Hill Road
 - North Buckman Road/Mt. Vernon Highway
 - Sacramento Drive/Cooper Road

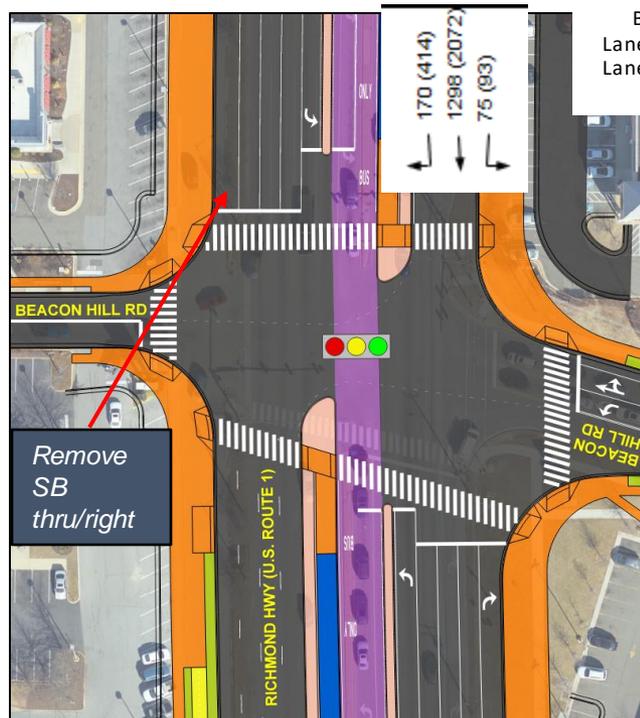




Initial Analysis-Beacon Hill Road - Southbound

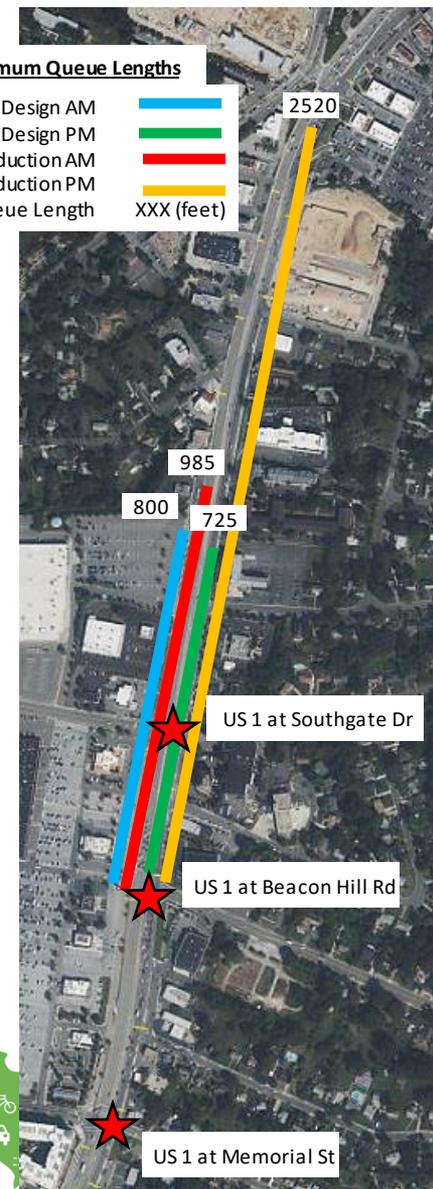
- Potential modification: Removal of Southbound thru/right turn lane along Richmond Highway

Findings for Removal of SB Thru/Right Turn Lane	
BRT Impact	No Impact
Ped Crossing Distance	11-foot reduction
Walk time for signal	Potential 3s reduction
Safety	Potential increase for rear-ends
Delay	Increased SBR delay (14+s)
Existing Lane (Y/N)	Yes
Cost Impacts/Other Considerations	Additional project cost, VDOT Design Waiver
Recommendation	Do not remove



Maximum Queue Lengths

Base Design AM	Blue line
Base Design PM	Green line
Lane Reduction AM	Red line
Lane Reduction PM	Yellow line
Queue Length	XXX (feet)



	Intersection Delay (s)					
	SB Right Turn Delay					
	AM Peak Hour			PM Peak Hour		
	SBR	SB Approach	Overall Intersection	SBR	SB Approach	Overall Intersection
Base Design	18.7	22.6	51.5	32.0	35.0	52.5
Lane Reduction	16.1	20.3	51.0	46.4	42.6	55.5





Beacon Hill Road Turn Lane Analysis

- Request for additional analysis from County leadership & local community groups based on survey results
- Key considerations
 - Additional consideration due to station location
 - Minimizing overall cross section of roadway
- Additional analysis for opening year has been completed & other design tweaks considered





Beacon Hill Road Opening Year Analysis

- **Previous 2028 Opening Year model**

- Two scenarios analyzed
 - SBR Lane Reduction at Beacon Hill
 - SBR Lane Reduction at Beacon Hill + additional lane on Shopping Center approach

- **Results**

- Maximum queues were significantly less than the 2040 results (still approximately 1,000 feet long)
- No significant benefit to adding a lane on Shopping Center approach
- The BRT delays were generally similar for all scenarios



Concept Plan w/o Southbound Right

- **Pros**
 - Shortens the pedestrian crossing on north leg
 - Avoids impacts to the existing retaining wall at Groveton Baptist Church
 - Avoids a full displacement & building impacts to **parcel 610**, a retail/office site (**6701 Richmond Hwy**)
 - Makes the roadway alignment more consistent
 - Accommodates potential future inclusion of the RT lane at Beacon, if/when needed
- **Cons**
 - Longer queues with removal of SBR. Queuing could extend up to Kings Hwy





Conclusions & Recommendations

• Conclusions

- Opening year traffic operational & maximum queues are significantly lower compared to the 2040 buildout year
- Pedestrian crossing & shorter cross section can be accommodated, if longer maximum queues are acceptable
- Turn lane removal provides additional geometric/roadway alignment benefits

• Staff Recommendation

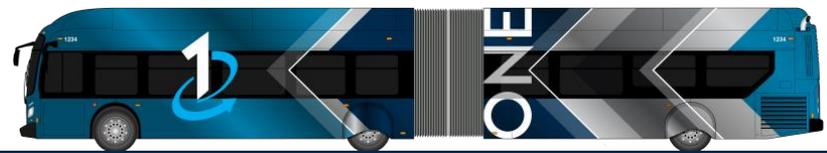
- Not to construct the right turn lane & preserve the ROW if lane is warranted in the future
- **VDOT has agreed to remove the SB right turn lane with some conditions.**
 - Conditions include monitoring of queuing after BRT system opening, acquiring ROW & having the design completed for potential construction of lane in the future

- **County staff is reasonably comfortable with conditions with an acknowledgement that the future turn lane construction is driven by monitoring of traffic operations after BRT opening**

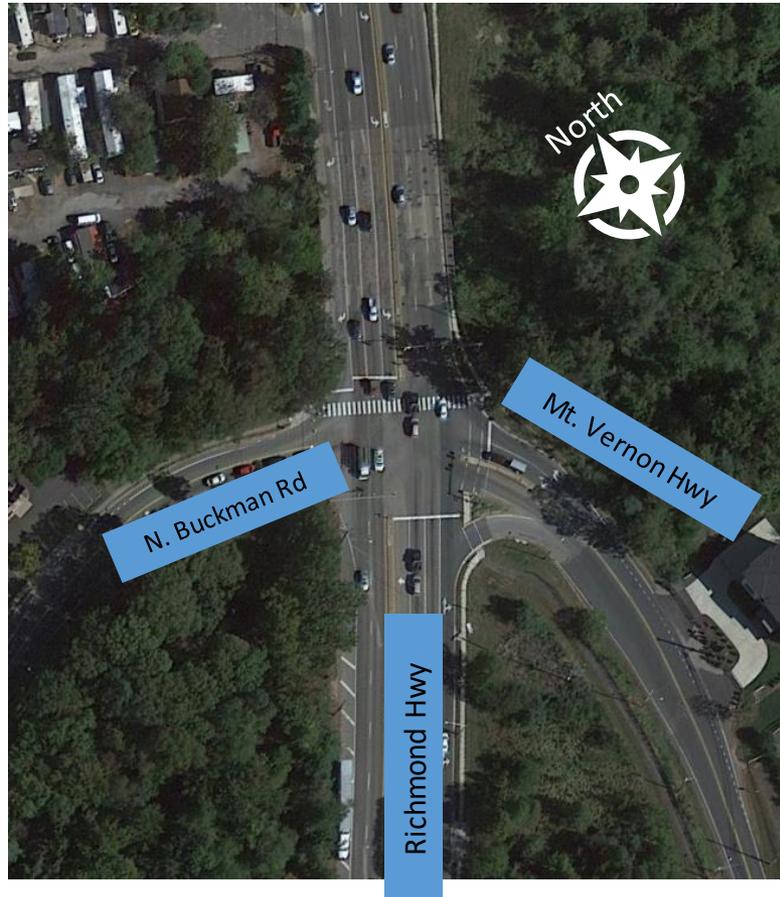


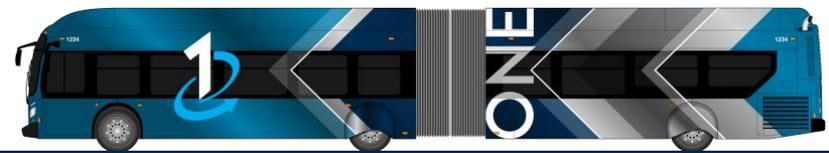


County of Fairfax, Virginia



Turn Lane Evaluation for Richmond Highway at North Buckman Road/Mount Vernon Highway





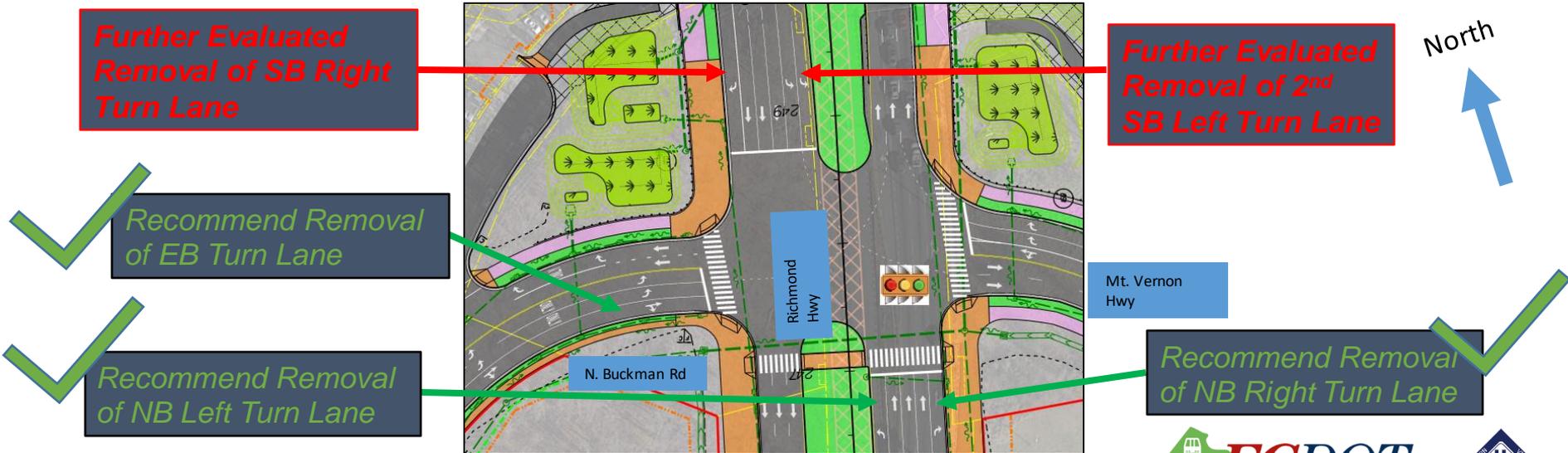
Richmond Hwy at North Buckman Rd/Mt. Vernon Hwy

Previous Recommendations from Turn Lane Study

Removal of Northbound (NB) Richmond Hwy Right, NB Richmond Hwy Left Turn Lane & Eastbound (EB) N Buckman Rd Turn Lane.

Current Analysis as Part of this Evaluation

Feasibility of Removing Southbound (SB) Richmond Hwy Right Turn Lane & SB 2nd Left Turn Lane.





Existing Conditions - Traffic Volume Data

- Average Annual Daily Traffic (AADT) is the typical daily traffic (veh/day) on a road segment based on year-round data
- Pre-pandemic 2019 AADT data indicate that there is heavy turning volumes from SB Richmond Hwy onto N. Buckman Rd & Mt. Vernon Hwy year-round





Existing Conditions – Turning Movement Counts

Peak Hour Turning Count from 2015

- AM Peak Hour: 264 SB lefts & 215 SB rights
- PM Peak Hour: **340 SB lefts & 517 SB rights**

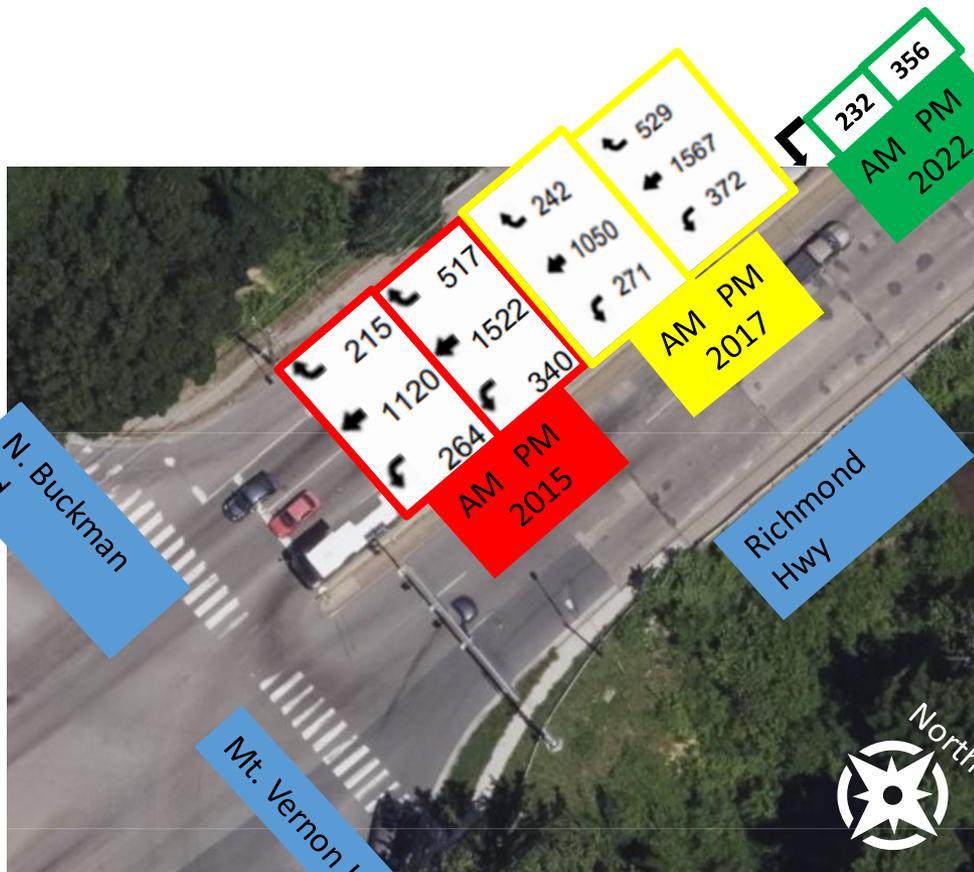
Peak Hour Turning Count from 2017

- AM Peak Hour: 271 SB lefts & 242 SB rights
- PM Peak Hour: **372 SB lefts & 529 SB rights**

Peak Hour Turning Count from March 31, 2022

- AM Peak Hour: 232 SB lefts
- PM Peak Hour: **356 SB lefts**

- The SB left-turn volumes exceed the threshold for considering dual left-turn lanes per VDOT standards.
- The SB right-turn volumes meet the warrants for an exclusive right-turn lane per VDOT standards.

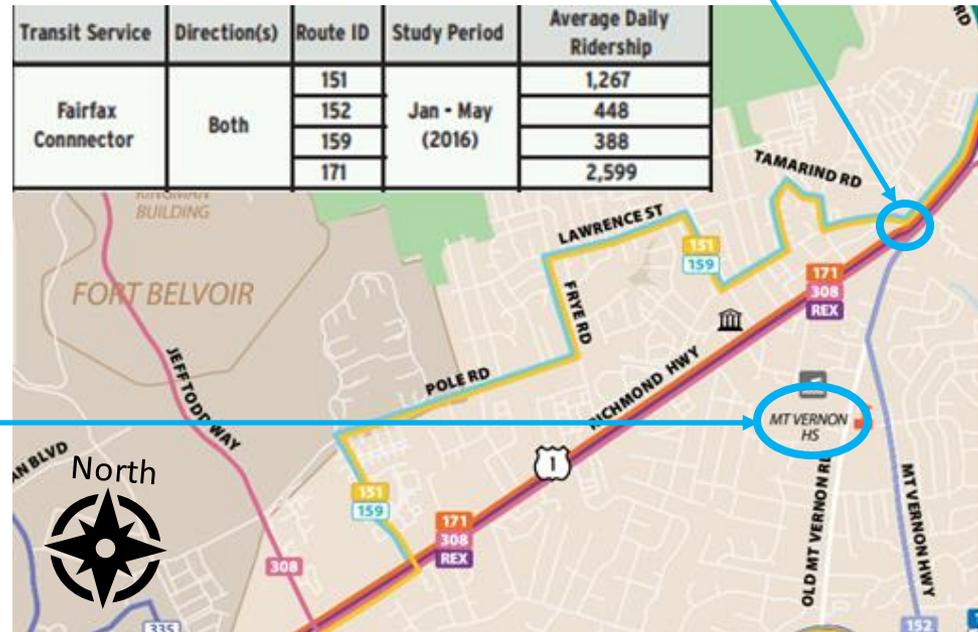




Existing Conditions – Bus Routes

- This intersection is a **critical juncture for several bus routes** turning from SB Richmond Hwy onto Mt. Vernon Hwy & N. Buckman Road
- Fairfax Connector **Route 152** turns left from SB Richmond Hwy to Mount Vernon Hwy
- Fairfax Connector **Routes 151 & 159** turn right from SB Richmond Hwy to North Buckman Road
- **School buses also turn left from SB Richmond Hwy onto Mt. Vernon Hwy to Mt. Vernon High School**
- Note: Since a bus (e.g., 40') is longer than a typical automobile (e.g., 19'), each bus requires more turn lane storage than each automobile

Intersection of Richmond Hwy at N. Buckman Rd/Mt. Vernon Hwy



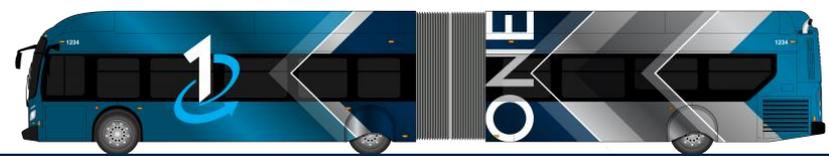


Existing Conditions – Field Observations

- Photographs from 2017 show the queue of vehicles turning left from SB Richmond Hwy onto Mount Vernon Hwy
- The existing SB left-turn lane could not handle the heavy volumes. The left-turn queue backed up into the SB through lane(s) up to Ladson Ln & beyond
- Numerous buses (e.g., Fairfax Connector & school) were observed in the SB left turn lane contributing to the queue



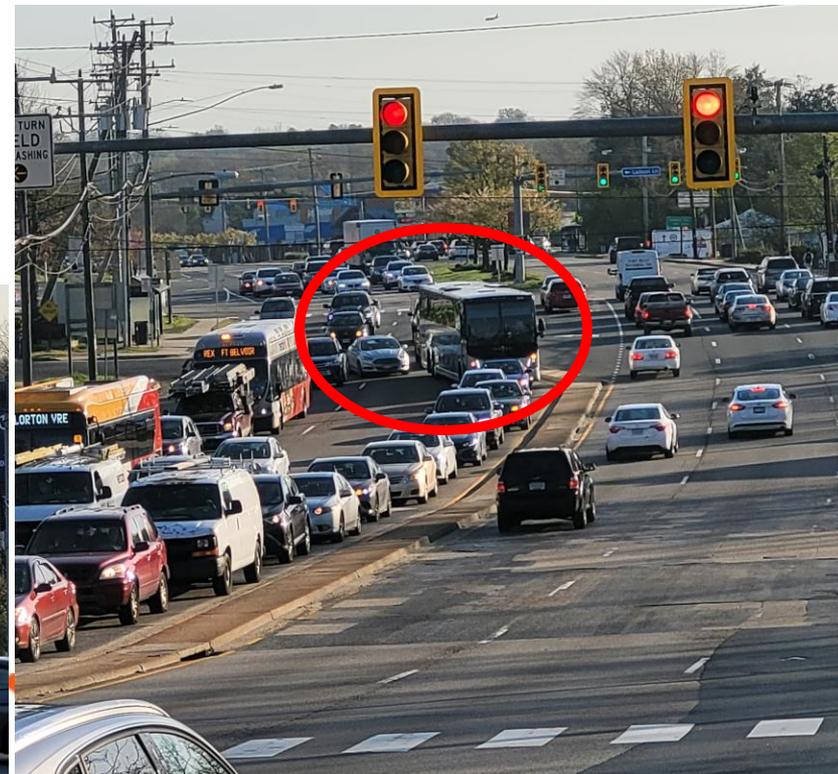
Left-Turn Queue from Southbound Richmond Hwy to Mount Vernon Hwy



County of Fairfax, Virginia

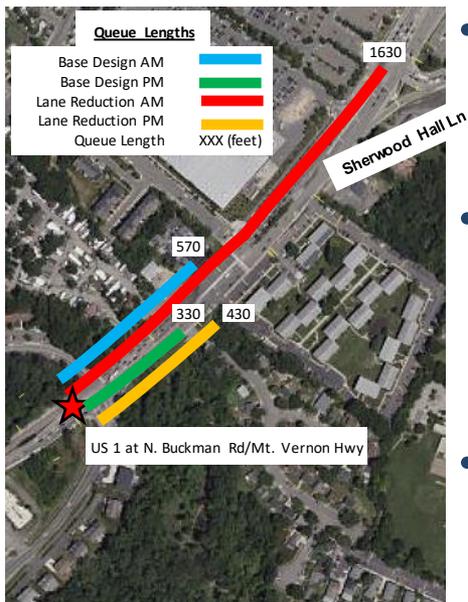
Existing Conditions – Field Observations

- Photographs taken in April 2022 show SB Richmond Hwy left-turn queues continue to be an operational & safety problem
- SB left-turn queue spilling over into the through lanes increases the chances of crashes

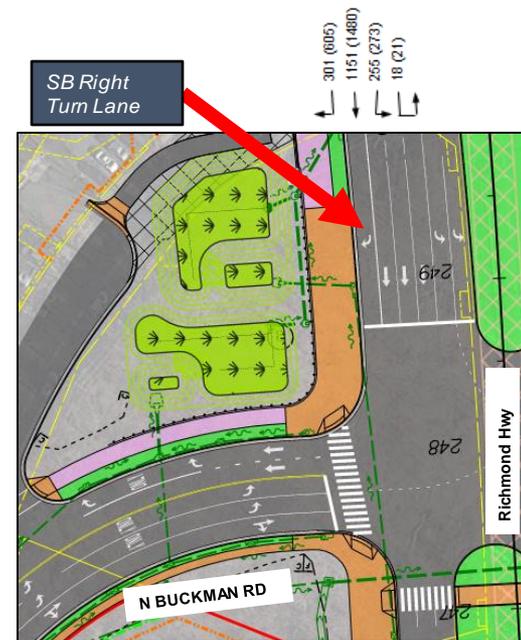




Future Projections



- Based on VISSIM Traffic Simulations for 2040 Build Scenario for SB Right Turn Lane
- SB right turn lane would carry up to **600 right turns** per hour from Richmond Hwy onto N. Buckman Rd.
- Removing the SB right turn lane & SB dual left-turn lanes would extend maximum SB queue all the way to Sherwood Hall Ln intersection (refer to red line in queue graphic to right)
- The additional queuing would impact Fairfax Connector bus routes



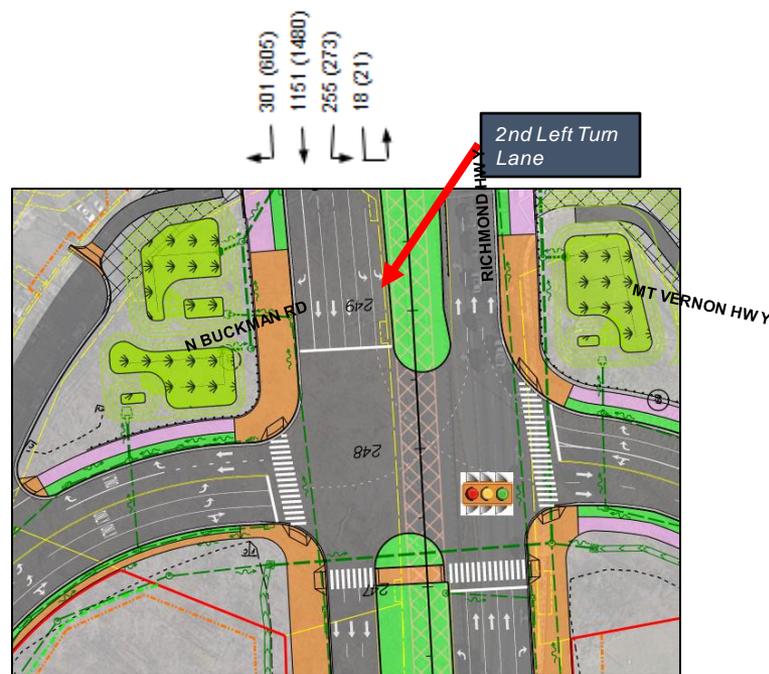
LEGEND:
Potential modifications for analysis/evaluation



Future Projections

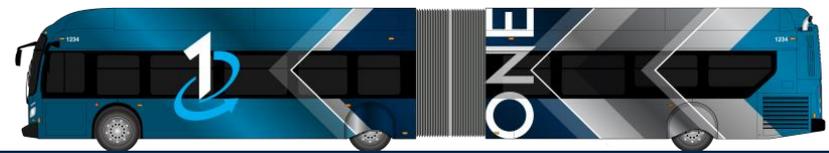
- Based on VISSIM Traffic Simulations for 2040 Build Year for SB Left Turn Lanes
- Removing one of the dual SB left turn lanes would more than triple delay for SB left-turning traffic in the AM peak hour (see data circled in orange in Intersection Delay table below)
- The increased delay would impact school buses & Fairfax Connector buses

	Intersection Delay (s)							
	AM Peak Hour				PM Peak Hour			
	SBR	SBL	SB Approach	Overall Intersection	SBR	SBL	SB Approach	Overall Intersection
Base Design	11.9	66.8	29.8	47.2	9.6	96.3	23.0	33.9
Lane Reduction	27.0	197.9	51.0	59.0	17.1	99.1	26.8	39.8



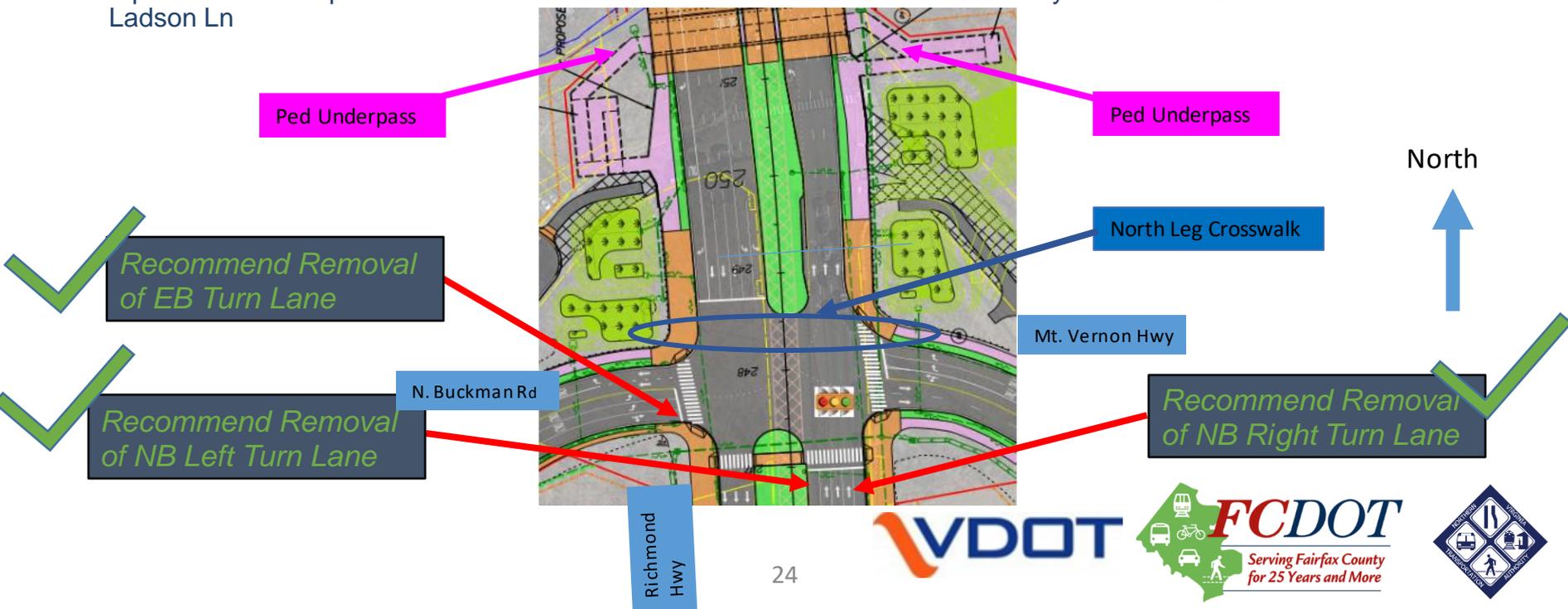
LEGEND:
Potential modifications for analysis/evaluation





Pedestrian Considerations

- Turn lane study already recommended removal of the NB left & right turn lanes on the south leg & an EB turn lane (see locations identified by green check marks in graphic below)
- Removal of those turn lanes will reduce pedestrian crossing distances for crosswalks on south & west legs
- **VDOT & FCDOT are hopeful there is a way to add a crosswalk on the north leg by channelizing the dual westbound right-turn lanes on Mt. Vernon Hwy. A concept is being designed.**
- Crosswalks will be provided for all legs of the adjacent intersections of Richmond Hwy at Ladson Ln & at Janna Lee Ave
- A pedestrian underpass will also be available to cross underneath Richmond Hwy between N. Buckman Rd & Ladson Ln





Recommendation

- Do not remove the SB exclusive right-turn lane & SB dual left-turn lanes
- Re-evaluate the need for the SB exclusive right-turn lane after construction based on land development & other conditions

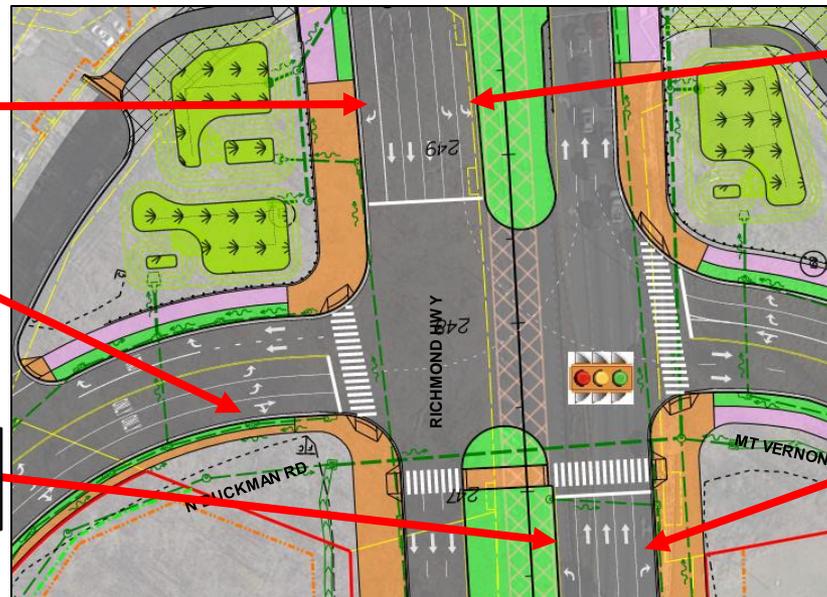
Do Not Remove SB Right Turn Lane

Recommend Removal of EB Turn Lane

Recommend Removal of NB Left Turn Lane

Do Not Remove 2nd Left Turn Lane

Recommend Removal of NB Right Turn Lane

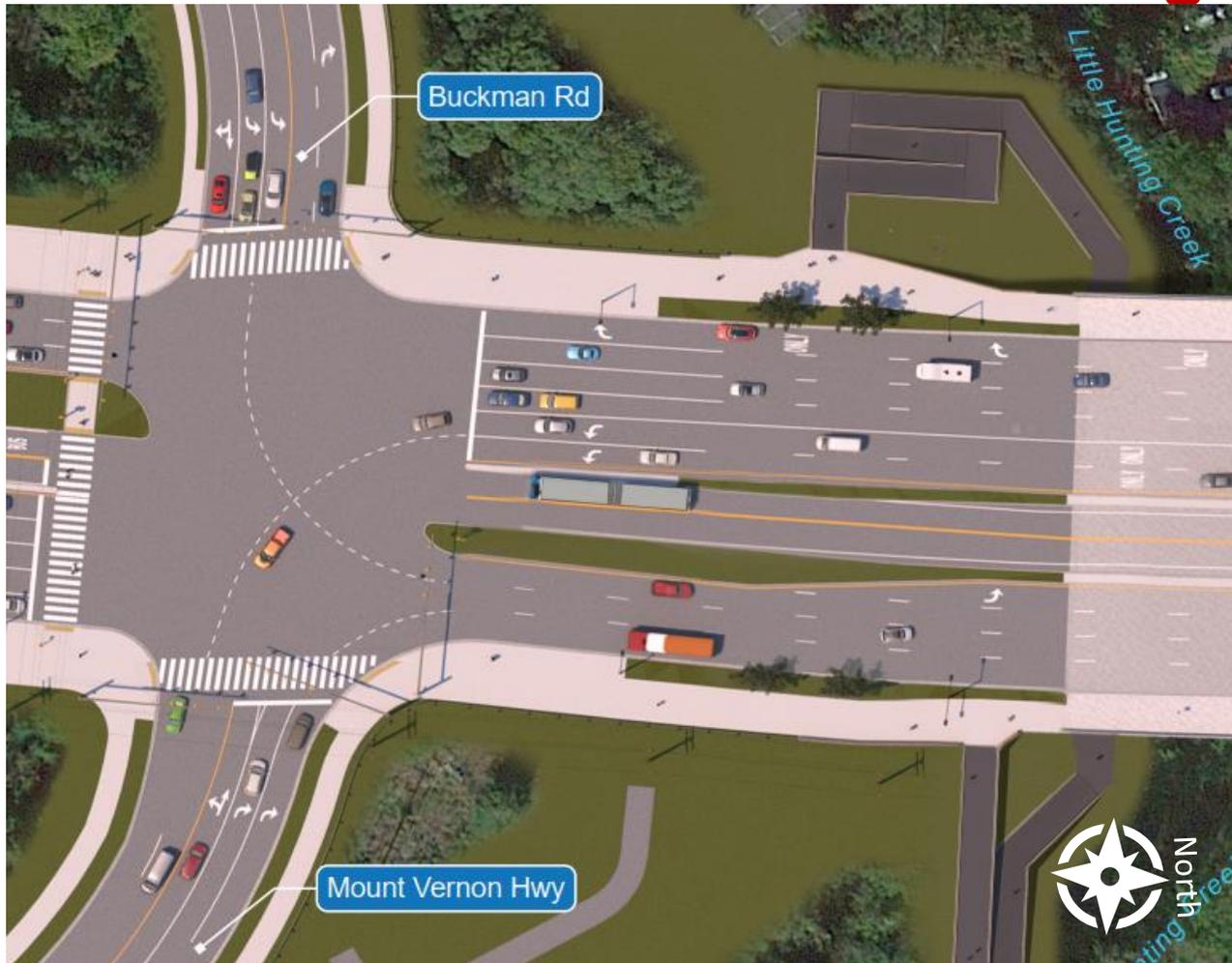


LEGEND:

Proposed Turn Lanes which were Evaluated for Removal



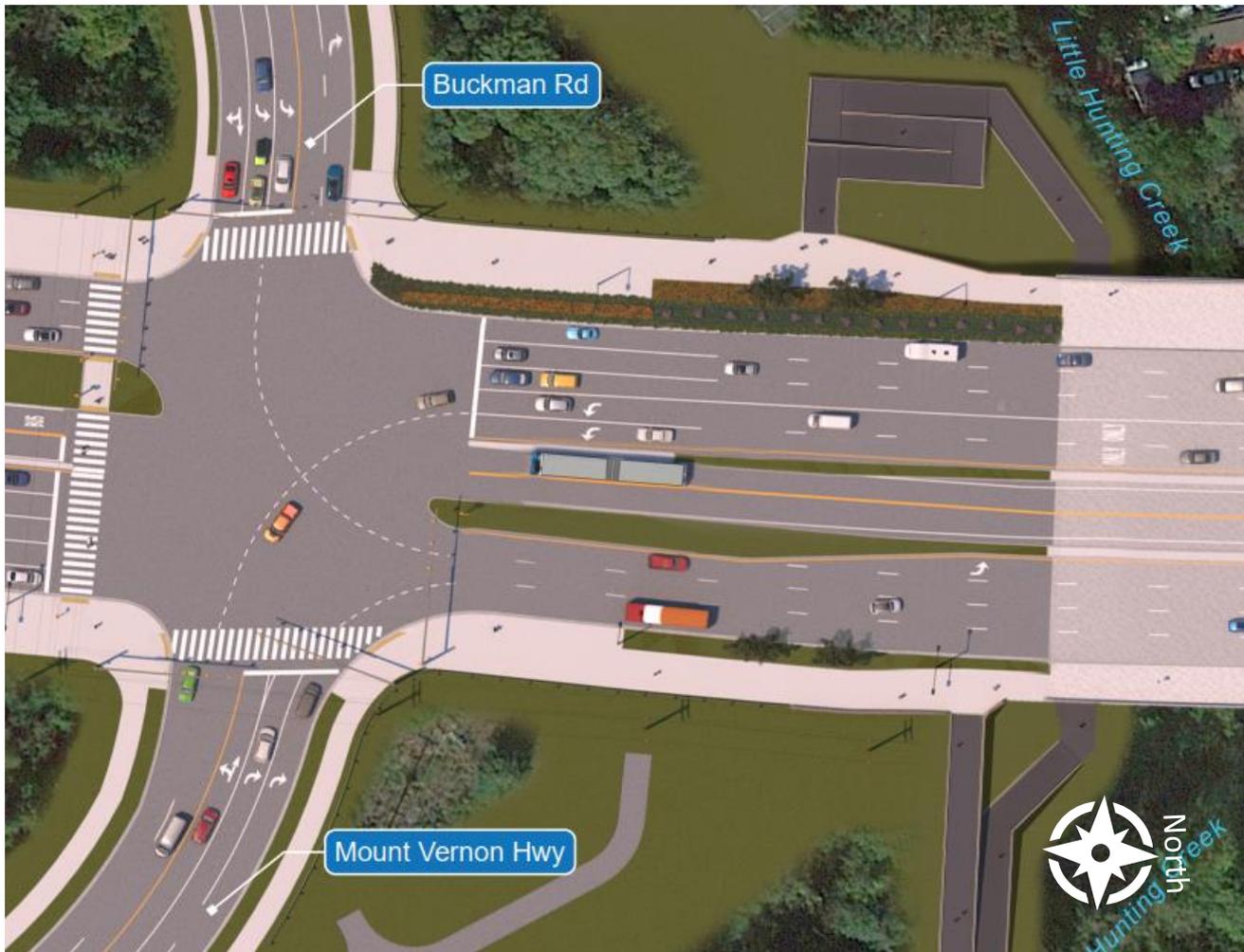
With Exclusive Southbound Right-Turn Lane



- The rendering depicts the intersection with the recommended turn lane configuration which includes an exclusive SB right-turn lane & dual SB left-turn lanes.
- After construction, the need for the exclusive SB turn lane can be re-evaluated depending on land development & other conditions.



Without Exclusive Southbound Right-Turn Lane



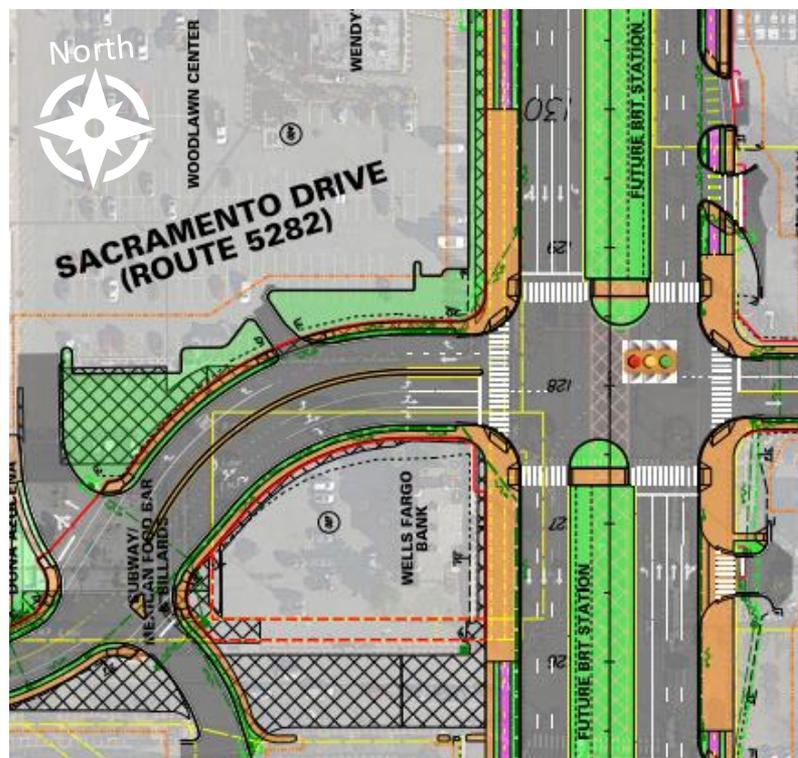
- The rendering depicts the intersection in the hypothetical situation in which the exclusive SB right-turn lane is removed after construction of the project based on an evaluation of land development & other conditions.





Sacramento Drive/Cooper Road Lane Reduction Evaluation

- **Public Information Meeting recommendation from May 3, 2022: Do not remove exclusive eastbound (EB) right-turn lane**
- **BRT Executive Committee on June 10, 2022: Re-evaluate the need for the EB right-turn lane.**





Sacramento Drive Current Conditions

- Photos taken Thursday July 14, 2022 between 5:30 & 6:30pm
- Driveway on right is the main drive aisle to Woodlawn Shopping Center
- School is not in session
- Traffic approaching pre-Covid levels





County of Fairfax, Virginia

Current Conditions

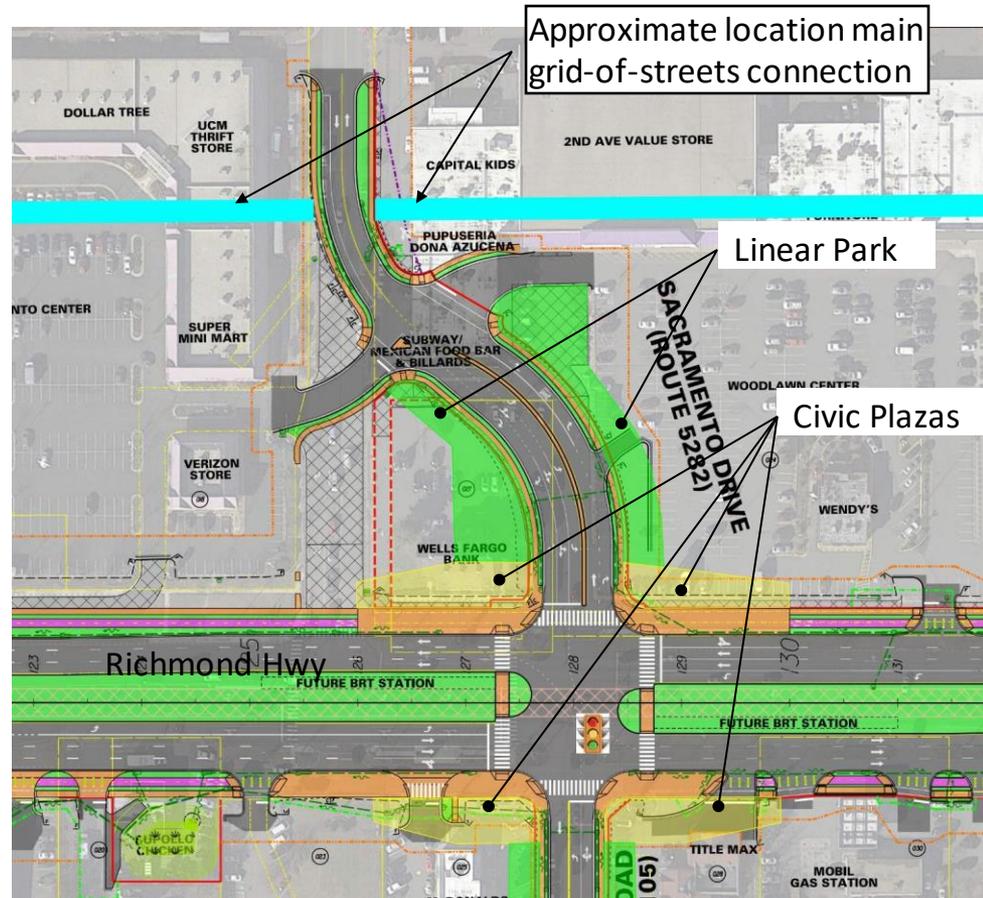
- Traffic backing up through the shopping center entrance is a concern
- Many vehicles in dedicated right turn lane are successfully making right on red, minimizing Sacramento queue
- Woodlawn Center signal at Cooper also processing eastbound traffic





Future Embark Conditions

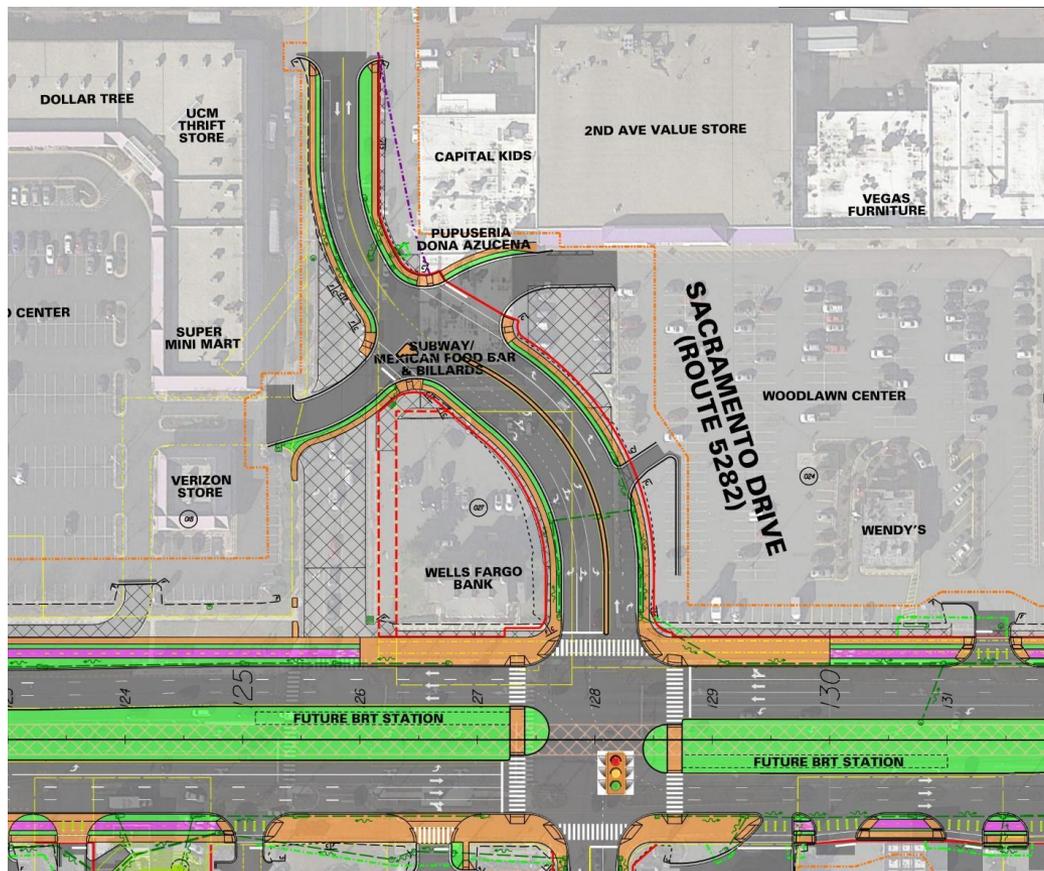
- Sacramento Dr identified as a Livability Spine within the Woodlawn CBC
- Grid-of-Streets created
- Livability spine recommends on-street parking on both sides
- Linear parks on both sides
- Civic plazas at all four corners at Richmond Highway





Opening Year Conditions

- Tighter Sacramento Drive curves than originally envisioned to minimize impacts to the Woodlawn Shopping Center
- Intersection sight distance with increased crash risk at Woodlawn Shopping Center entrance requires a waiver
- Wells Fargo Building retained but drive-thru impacted
- Future Sacramento Drive is only replacement for existing eastbound Sacramento Drive & eastbound Cooper Road





Lane Reduction Impacts

- Eastbound AM & PM queues double in 2040
 - AM: 180 ft to 410 ft
 - PM: 180 ft to 385 ft
- Higher risk of crashes at the shopping center entrance due to erratic vehicular movements & extended queues causing vehicles to further limit substandard sight lines
- Potential negative impacts to the shopping center business from congested & riskier conditions

SACRAMENTO DR/COOPER RD - EASTBOUND

Potential modification: Removal of eastbound right turn

- As development occurs, lane will be dual purposed for future off-peak parking

	Intersection Delay (sec.)					
	AM Peak Hour			PM Peak Hour		
	EB R	EB Approach	Overall Intersection	EB R	EB Approach	Overall Intersection
Base Design	39.0	58.8	39.9	53.5	88.2	42.8
Lane Reduction	41.0	58.9	40.3	56.1	90.9	47.9

Findings for Removal of EB Right Turn Lane	
BRT impact	No impact
Ped. crossing distance	11-foot reduction
Walk time for signal	With mainline green
Potential conflicts	Potential increase for rear-ends
Delay	Increased northbound left/southbound left delay (35 sec.)
Existing lane (Y/N)	No (combining intersections)
Cost impacts/other considerations	Blocking of driveways, economic development impact
Recommendation	Do not remove



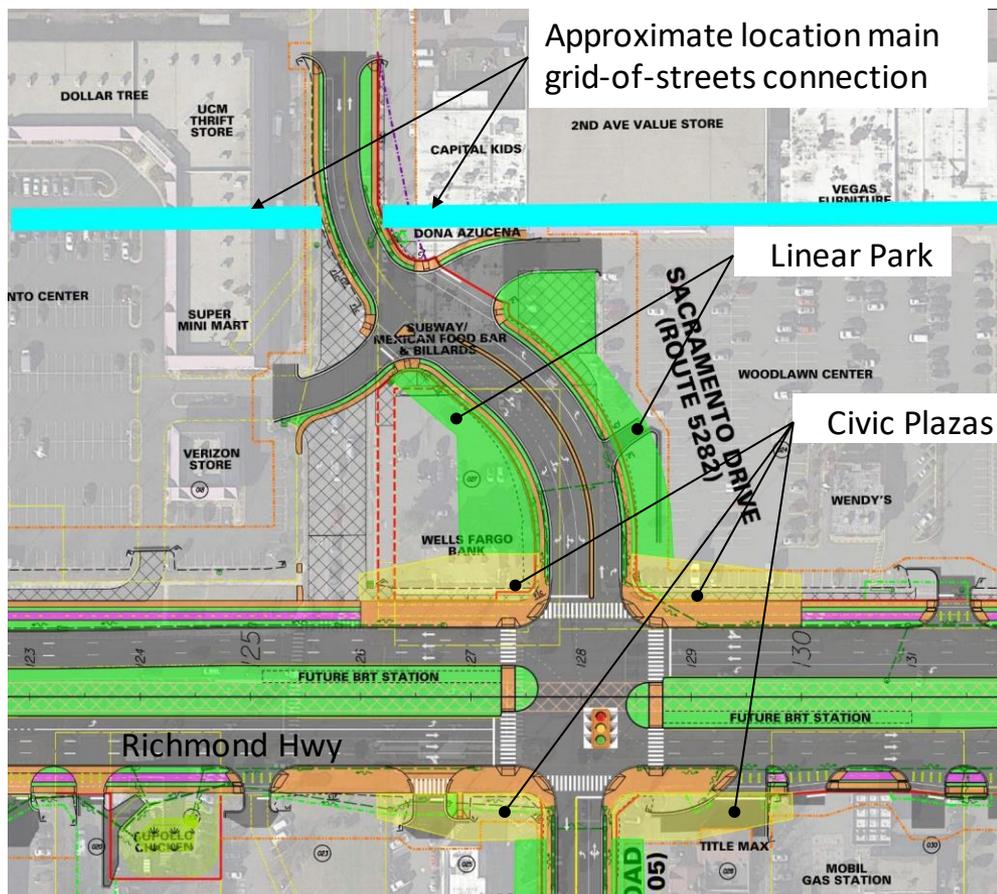
LEGEND

- Potential modifications for analysis/evaluation
- ✕ Change not proposed for inclusion in design
- ✔ Change proposed for inclusion in design
- Direction of Northbound Richmond Highway Travel



Conclusions

- As recommended by staff, **the proposed configuration should proceed as currently designed** for opening year due to increased congestion & safety risks
- Future development conditions will be significantly different & may warrant future lane configuration changes
- Future turn lane may be repurposed to **off peak parking lane with redevelopment**





Summary of all Recommendations

Intersection with Richmond Highway	Potential Modification	Recommended for Implementation
Shields Avenue	Remove 2 nd left turn lane along northbound Richmond Highway	No
	Reduce median width on north side of intersection	Yes
	Remove dedicated right turn lane along southbound Richmond Highway	Yes
	Remove 2 nd dedicated right turn lane along eastbound Shields Avenue	No
	Replace asphalt with landscaped grass median along southbound Richmond Highway south of the intersection	Yes
	Remove/reduce the width of the grass medians south of the intersection	No
Entrance to Kings Crossing	Remove 4 th through lane along northbound Richmond Highway	No
Furman Lane	Replace asphalt lane with grass median	Yes



Summary of all Recommendations

Intersection with Richmond Highway	Potential Modification	Recommended for Implementation
Southgate Drive	Remove through/right turn lane along southbound Richmond Highway	Yes
Beacon Hill Road	Remove dedicated right turn lane along southbound Richmond Highway	No YES (with conditions)
	Remove dedicated right turn lane along northbound Richmond Highway	Yes
Memorial Street	Remove dedicated right turn lane along eastbound Memorial Street	No (dual purposed for future off-peak parking)
	Remove dedicated right turn lane along southbound Richmond Highway	No
Arlington Drive	Remove dedicated right turn lane along westbound Arlington Drive	No
Fordson Road/Boswell Avenue	Remove dedicated right turn lane along eastbound Fordson Road	No
Sherwood Hall Lane	Remove dedicated right turn lane along northbound Richmond Highway	No
	Remove 2 nd left turn lane along northbound Richmond Highway	Yes
	Remove dedicated right turn lane along southbound Richmond Highway	Yes
	Remove dedicated right turn lane along eastbound Sherwood Hall Lane	No





Summary of all Recommendations

Intersection with Richmond Highway	Potential Modification	Recommended for Implementation
Ladson Lane	Remove through/right turn lane along southbound Richmond Highway	No
	Remove dedicated right turn lane along eastbound Ladson Lane	Yes
North Buckman Road/Mount Vernon Highway	Remove through/right turn lane along eastbound North Buckman Road	Yes
	Remove dedicated right turn lane along southbound Richmond Highway	No
	Remove 2 nd left turn lane along southbound Richmond Highway	No
	Remove dedicated right turn lane along westbound Mount Vernon Highway	No
	Remove dedicated right turn lane along northbound Richmond Highway	Yes
	Remove dedicated northbound left turn lane along Richmond Highway	Yes
	Potential for a crosswalk on the north leg of intersection	Yes (under evaluation/design)
Sacramento Drive/Cooper Road	Remove dedicated right turn lane along eastbound Sacramento Drive	No (dual purposed for future off-peak parking)
Jeff Todd Way/Mount Vernon Memorial Highway	Remove dedicated right turn lane along westbound Mt Vernon Memorial Hwy	No
	Remove 2 nd left turn lane along westbound Mount Vernon Memorial Highway	No





Summary of Turn Lane Analysis

- After June 10, 2022 BRT Executive Committee Action
 - **12 of 30** reductions/modifications will be incorporated
 - Plus **2** for off-peak street parking
- With additional analysis, design & coordination with VDOT
 - **14 of 31** reductions/modifications will be incorporated
 - Plus **2** for off-peak street parking
 - Questions?





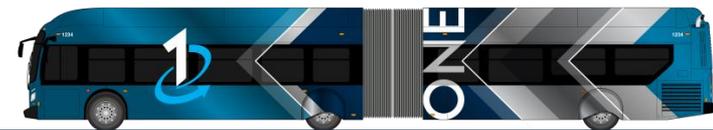
Executive Committee Action

Adoption of resolution approving the updated designs for the following intersections as recommended by staff.

- Richmond Highway and Beacon Hill Road
 - Remove 4th combination right/through lane along southbound Richmond Highway with conditions such as monitoring queuing after BRT system opening, acquiring right-of-way with BRT project, and having the design completed with BRT design for potential construction of lane in the future
- Richmond Highway and North Buckman Road/Mount Vernon Highway
 - Do not remove dedicated right turn lane along southbound Richmond Highway
 - Add a crosswalk across the north leg of Richmond Highway
- Richmond Highway and Sacramento Drive/Cooper Road
 - Do not remove dedicated right turn lane along eastbound Sacramento Drive (As development occurs, lane may be dual purposed for future off-peak parking)



Station Design: Community Charm Elements

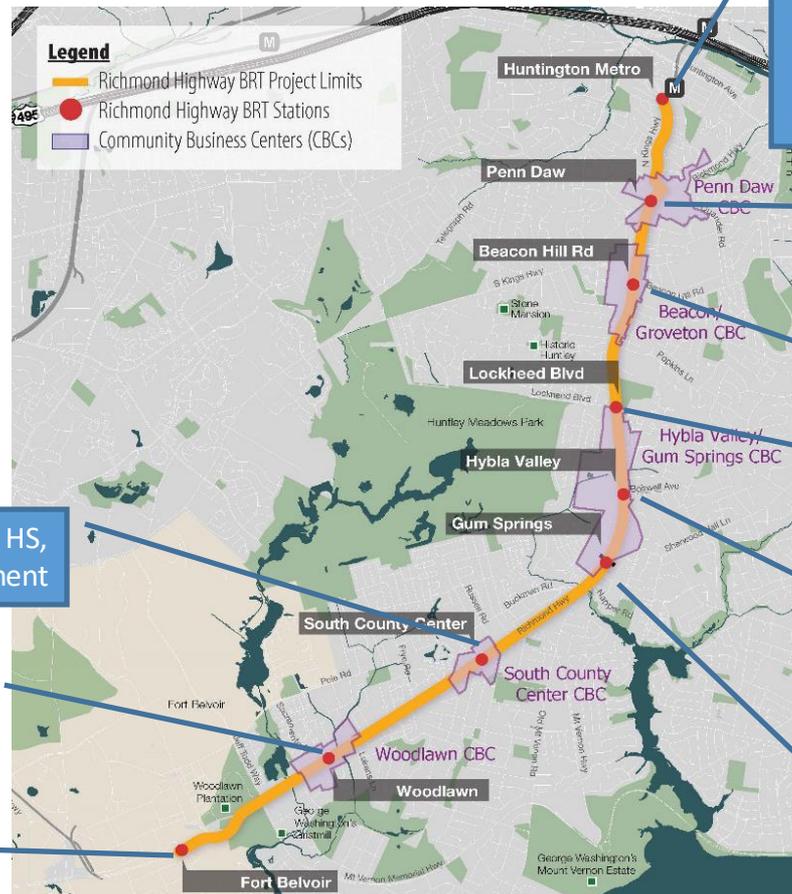


Richmond Highway Bus Rapid Transit





Station Themes Survey Results



History of Route 1, diverse culture, gateway to Fairfax & Old Town Alexandria, nature, Metro

History & culture, nature, community crossroads

Historic airport, view

History & culture, Huntley Meadows Park

History & culture, nature, Huntley Meadows Park

Gum Springs/African American history

Original Mt. Vernon HS, County government

History (Mt. Vernon, Woodlawn)

Military culture & history





Community Charm Survey Process

- **Purpose:** Expand on previous survey results to find out more & narrow potential themes for stations
- **Timeframe:** July 26 - August 22
- **Responses:** 325
- **Outreach:**
 - Pop-Up events (8)
 - The One email list
 - HOA, CA & CAG email
 - Supervisor emails
 - Media release
 - Website updates
- **Consideration for final themes based on proximity & local to Richmond Highway communities (in addition to survey results)**



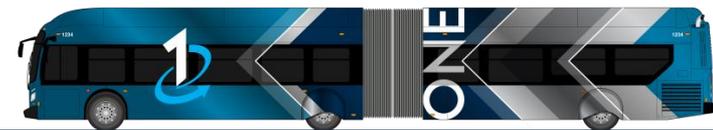


Survey Summary and Refined Station Themes

Station Area	Top Chosen Themes	Refined Station Themes
Huntington Metro	History of Route 1, diverse culture, gateway to Fairfax & Old Town Alexandria, nature, Metro	<ul style="list-style-type: none"> History Fort Lyon General Route 1 History/Facts: History of Transportation RH, Historic Events that took place on around RH, Transformation of Richmond Highway
Penn Daw	History & culture, nature, community crossroads	<ul style="list-style-type: none"> Roadside & Historic Motels (Penn Daw Motor Hotel) & Restaurants History of Mount Eagle
Beacon Hill	Historic airport, view	<ul style="list-style-type: none"> Historic Beacon Hill Field Airport Historic Groveton: residents, churches, schools, businesses
Lockheed	History & culture, Huntley Meadows Park	<ul style="list-style-type: none"> Huntley Meadows park Huntley House
Hybla Valley	History & culture, nature, Huntley Meadows Park	<ul style="list-style-type: none"> Retail Hub Diversity & Multiculturalism: local communities, diversity of area & community, local people (specifically Latino communities/immigration)
Gum Springs	Gum Springs/ African American history	<p>History of Gum Springs:</p> <ul style="list-style-type: none"> Topics to include West Ford, Bethlehem Baptist Church, Churches, School House, Gum Springs Museum, African American Community
South County Center	Original Mt. Vernon HS, County government	<ul style="list-style-type: none"> Original Mt Vernon HS Local Government & County Services
Woodlawn	History (Mt. Vernon, Woodlawn)	<ul style="list-style-type: none"> Pope-Leighy House & Frank Lloyd Wright, Woodlawn Plantation History
Fort Belvoir	Military, Culture, History	<ul style="list-style-type: none"> Fort Belvoir: History, Development & current use National Museum of U.S Army



Station Design: Station Names



Richmond Highway Bus Rapid Transit

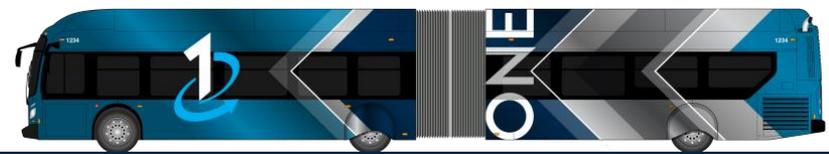




Station Renaming

- Interest from Supervisors to rename some BRT stations to align with community identity & foster community ownership
- Under reconsideration:
 - Penn Daw
 - Hybla Valley
 - Gum Springs
- To maintain schedule, concurrence on name changes is **needed in/by December 2022**; changes after that time frame will delay station design schedule
- Team will come back to Executive Committee for final resolution in December





Station Renaming Schedule

Effort	Duration/	Approximate Date
Kickoff Open house Meeting for Station Renaming	Night event	October 12
Discuss potential names with community stakeholders	2 -4 weeks	Now-Late October
Survey and Outreach	3-4 Weeks	October
Survey outreach	3 weeks (concurrent with survey)	October
Supervisor briefing	-	Mid-Late November
BRT Executive Meeting	-	Early December
Effort complete	-	Early December





Station Renaming Alternatives

Station	Names for Consideration (Will be part of survey)
Penn Daw	Penn Daw-Keep as is Kings Crossing Spring Bank Mount Eagle Community Choice/Fill in
Hybla Valley	Hybla Valley-Leave as is Gum Springs (Flip station name to this location) Fordson- Side Street Name Community Choice/Fill in
Gum Springs	Gum Springs- Leave as is Hybla Valley (Flip station name to this location) Sherwood Hall- Side Street Name Community Choice/Fill in

Staff Notes/Recommendations:

- Staff will include a historic reference to the background of stations, as available for survey
- To avoid confusion, names should not be used in more than one location
- Limit survey to three options, aside from a community write in and existing station name



12-Month Outlook



Richmond Highway Bus Rapid Transit





12-Month Outlook

- **Station Renaming Outreach (Fall 2022)**
- **Obtain Results of FTA Review of Cost & Schedule (October 2022)**
- **Sound Wall Coordination (Fall 2022)**
- **Final Station Renaming Decision (December 2022)**
- **Readiness to Enter FTA Engineering (January 2023)**
- **FTA Project Rating (March 2023)**
- **90% Design Milestone (June 2023)**
- **Right-Of-Way Acquisition/Demolition (Ongoing)**
- **Third Party Coordination (Ongoing)**
- **Utility Coordination (Ongoing)**

