

ROUTE 50 STARS SAFETY AND OPERATIONAL IMPROVEMENTS STUDY - ARLINGTON COUNTY

A Study undertaken as part of VDOT's **S**trategically **T**argeted and **A**ffordable **R**oadway **S**olutions (STARS) Program

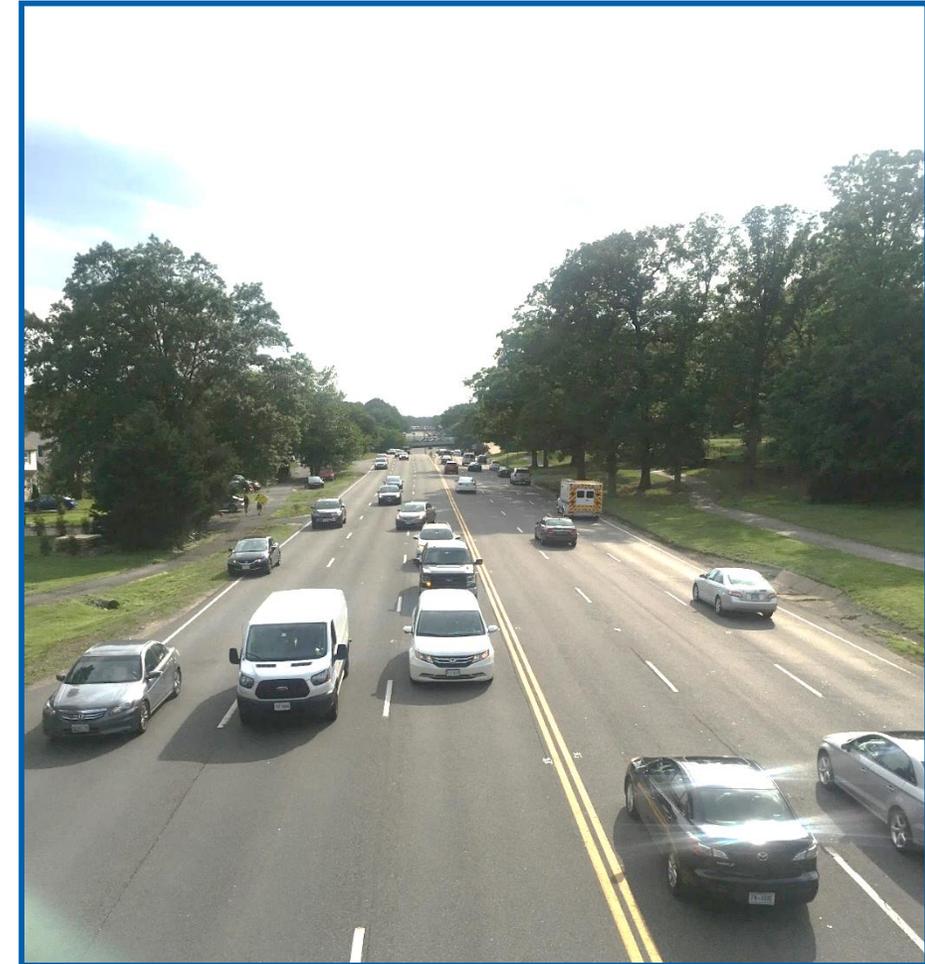
April 30, 2020

Virtual Presentation



Presentation Outline

- **Study Overview**
- **Existing Traffic and Safety Conditions**
- **Study Progress Since November 2019 Public Information Meeting (PIM)**
- **November 2019 PIM Survey Results**
- **Alternatives Summary**
 - **Traffic operations analysis**
 - **Safety analysis**
- **Next Steps**



Study Purpose / Elements

- Evaluate operational and safety conditions along Route 50 from Glebe Road to Fillmore Street
- Consider and evaluate potential improvements to enhance safety and operations in the study area
- Develop cost estimates for the preferred alternatives

Project is Not Currently Funded

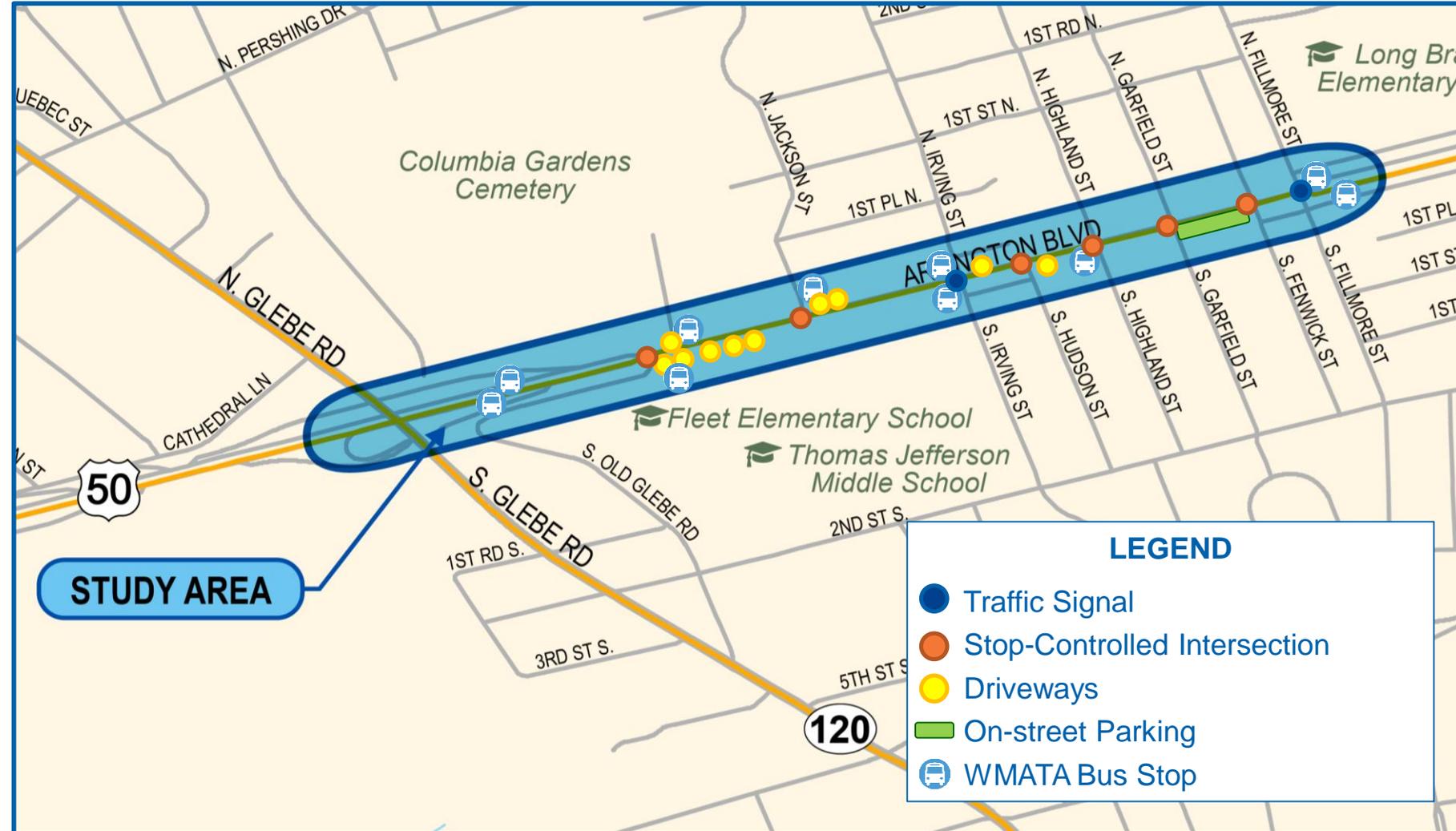


Study Area

Route 50 (Arlington Boulevard) between Glebe Road and Fillmore Street

Intersections

- 2 traffic signals
 - Irving Street
 - Fillmore Street
- 6 stop-controlled
- 10 driveways
- 5 bus stops per direction



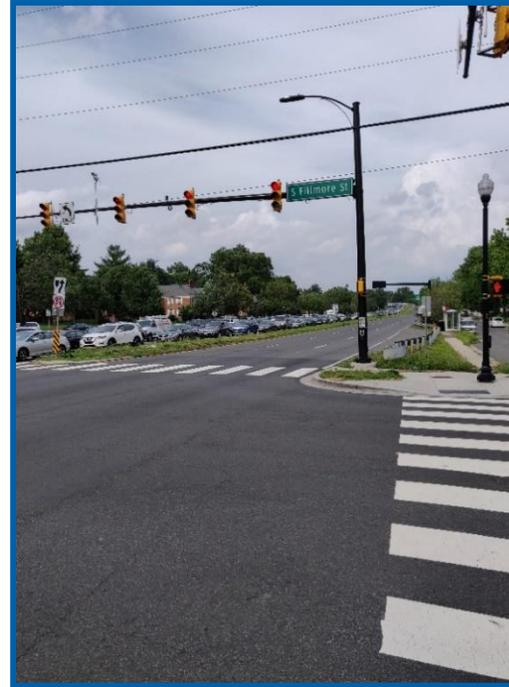
Route 50 Study Area Features

- 0.7-mile corridor
- 62,000 vehicles per day
- 45-mph speed limit
- Six lanes without a median
- No turn lanes at most intersections
- On-street parking between Garfield Street and Fenwick Street
- Frontage roads (segments)
- Recent signal and pedestrian improvements at Irving Street and Fillmore Street



Multi-Modal Accommodations

- **Arlington Boulevard Trail along north and south sides (along frontage roads in some areas)**
 - Trail Improvements along the south side of Route 50 from west of Irving Street to Fillmore Street
- **Route 50 at Irving St – 4 crosswalks**
 - 10 pedestrian and bike crossings of Route 50 in peak hour
- **Route 50 at Fillmore St – 4 crosswalks**
 - 35 pedestrian and bike crossings of Route 50 in peak hour
- **Pedestrian bridge east of Jackson St**
- **5 bus stops per direction (WMATA 4A); 30 buses per day**

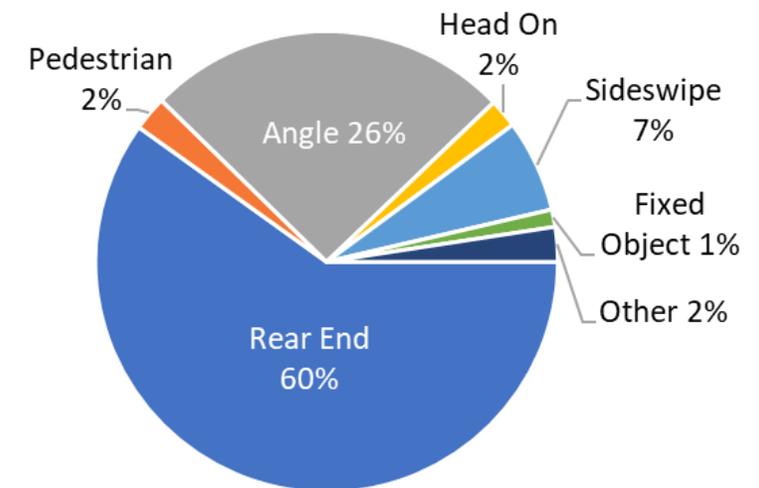


Safety Conditions

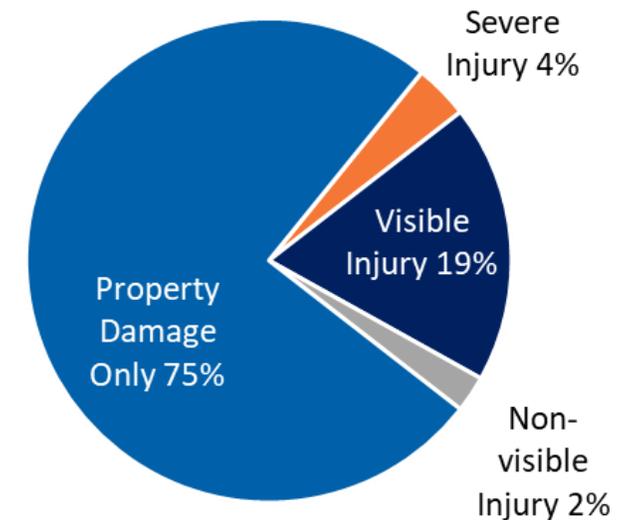
- Five year crash study period (2014 – 2018)
- 247 total crashes within the study area
 - 61 injury crashes / 0 fatal crashes
 - 7 pedestrian/bicycle crashes
 - 5 near Fillmore Street (4 pedestrian/1 bicycle)
 - 1 near Irving Street (bicycle)
 - 1 on Glebe Road at westbound Route 50 ramps (pedestrian)
 - Crashes are concentrated at intersections
- More eastbound than westbound Route 50 crashes during the PM peak period

Crashes were evaluated by location, severity, type, time of day, and circumstances to examine contributing factors and develop appropriate improvements

CRASH TYPES

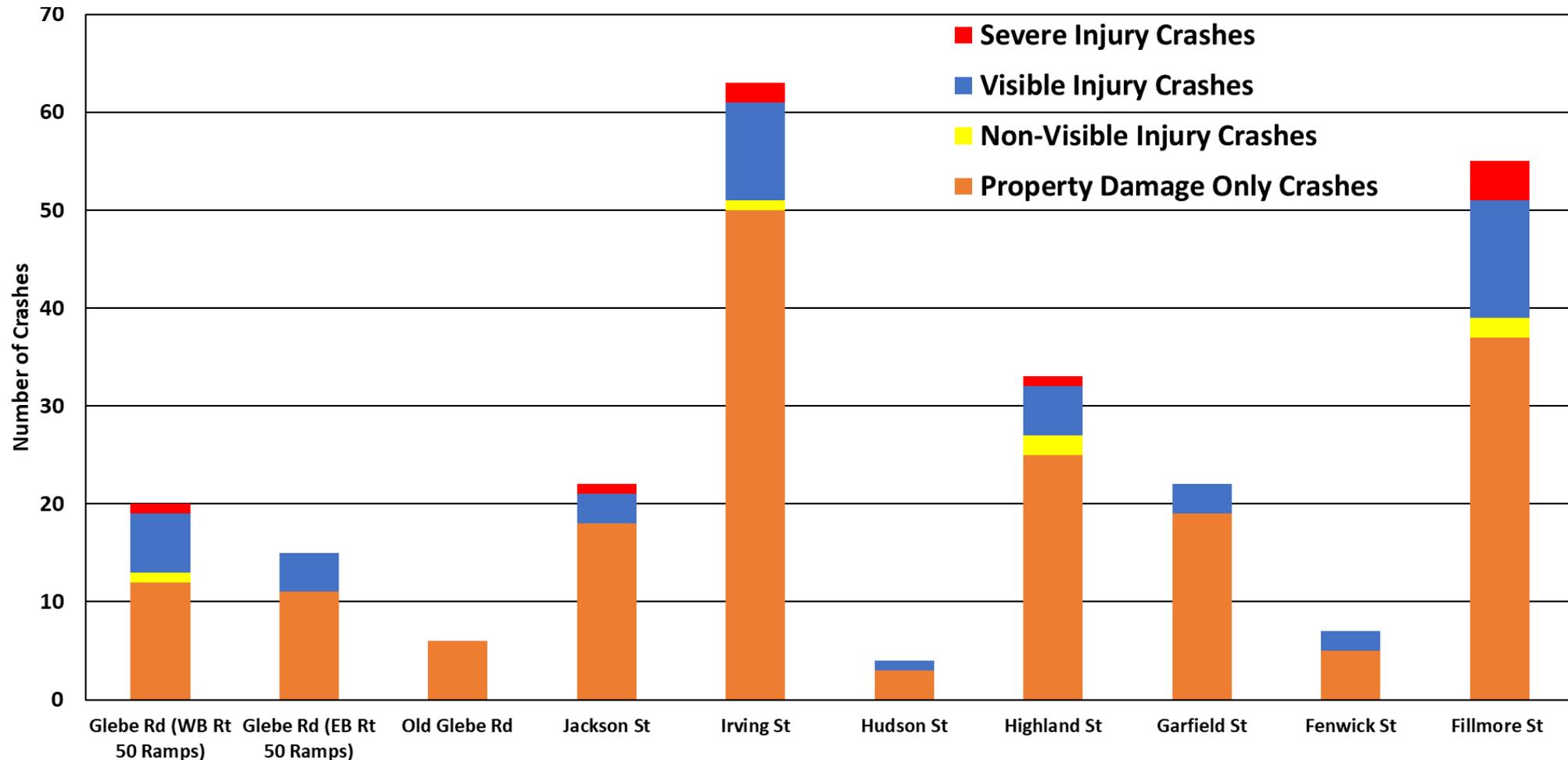


CRASH SEVERITY



Intersection Crashes (2014 – 2018)

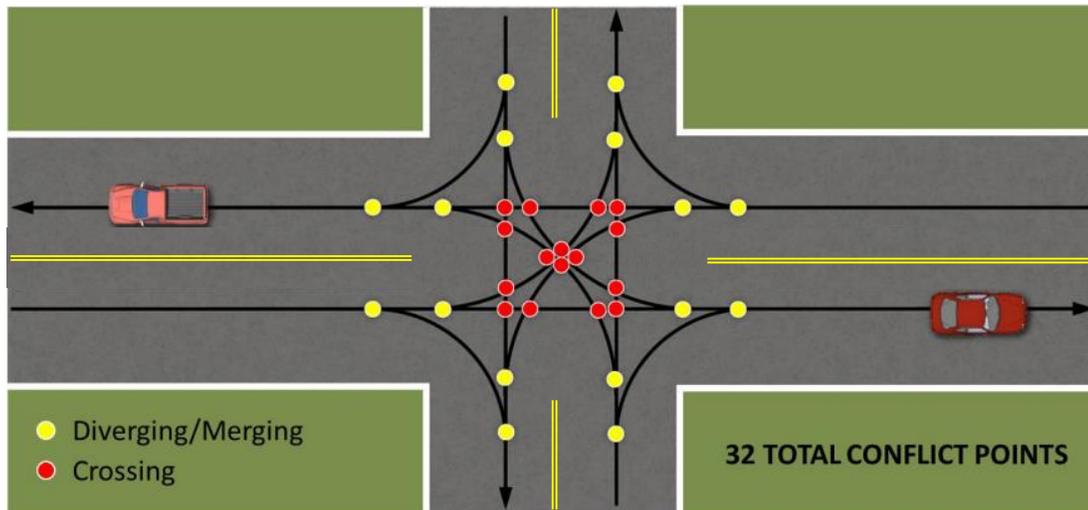
Many crashes are the result of long queues at intersections and vehicles stopping to make left turns



Intersection Safety and Conflict Points

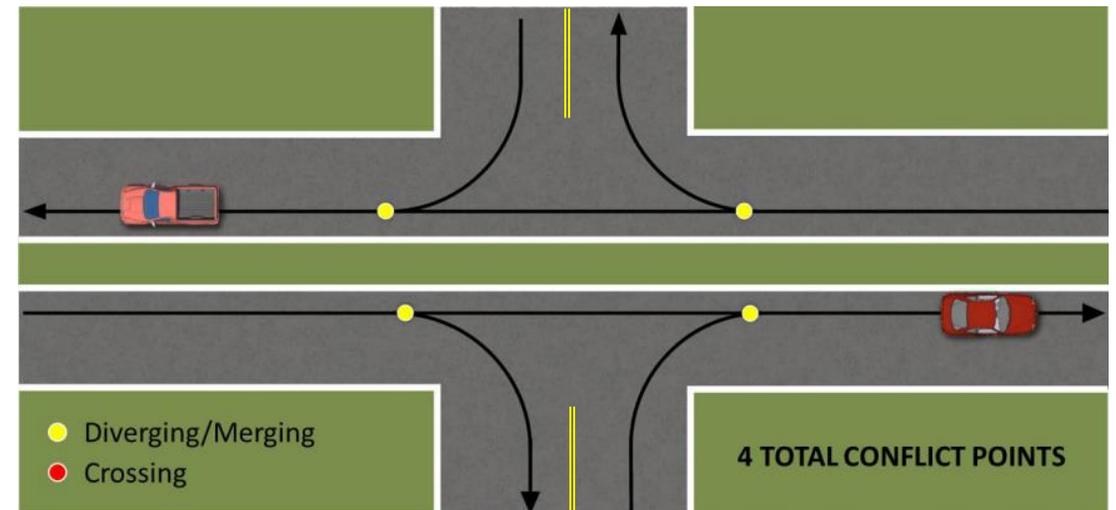
- Used to evaluate safety performance of alternatives
- Fewer conflict points results in improved safety

Example Intersection Without Raised Median



32 conflict points

Example Intersection With Raised Median



4 conflict points

Irving Street Intersection Existing Operations – AM Peak

- **Westbound Route 50 left turns to Irving Street wait for a gap in traffic**
 - Westbound Route 50 through vehicles get trapped behind left turns
 - Westbound Route 50 through vehicles change lanes to go around left turns
- **Eastbound Route 50 queues back up through Irving Street**



Looking Southeast at Irving Street

Fillmore Street Intersection Existing Operations – AM Peak

- NB and SB Fillmore Street left turns must wait for a gap in opposing traffic and also yield to pedestrians
- NB and SB Fillmore Street through vehicles get trapped behind left turns and use the right-turn lane to enter the intersection
- Pedestrians see a WALK indication at the same time as left turns and right turns from Fillmore Street creating potential conflicts



Looking Southeast at Fillmore Street

Fillmore Street Intersection Existing Operations – PM Peak

- NB and SB left-turn vehicles must wait for a gap in opposing traffic and also yield to pedestrians
- NB and SB Fillmore Street through vehicles get trapped behind left turns and use the right-turn lane to enter the intersection
- Motorist confusion as well as varying levels of driver aggressiveness contribute to potential conflicts



Looking Southeast at Fillmore Street

Study Progress since November 2019

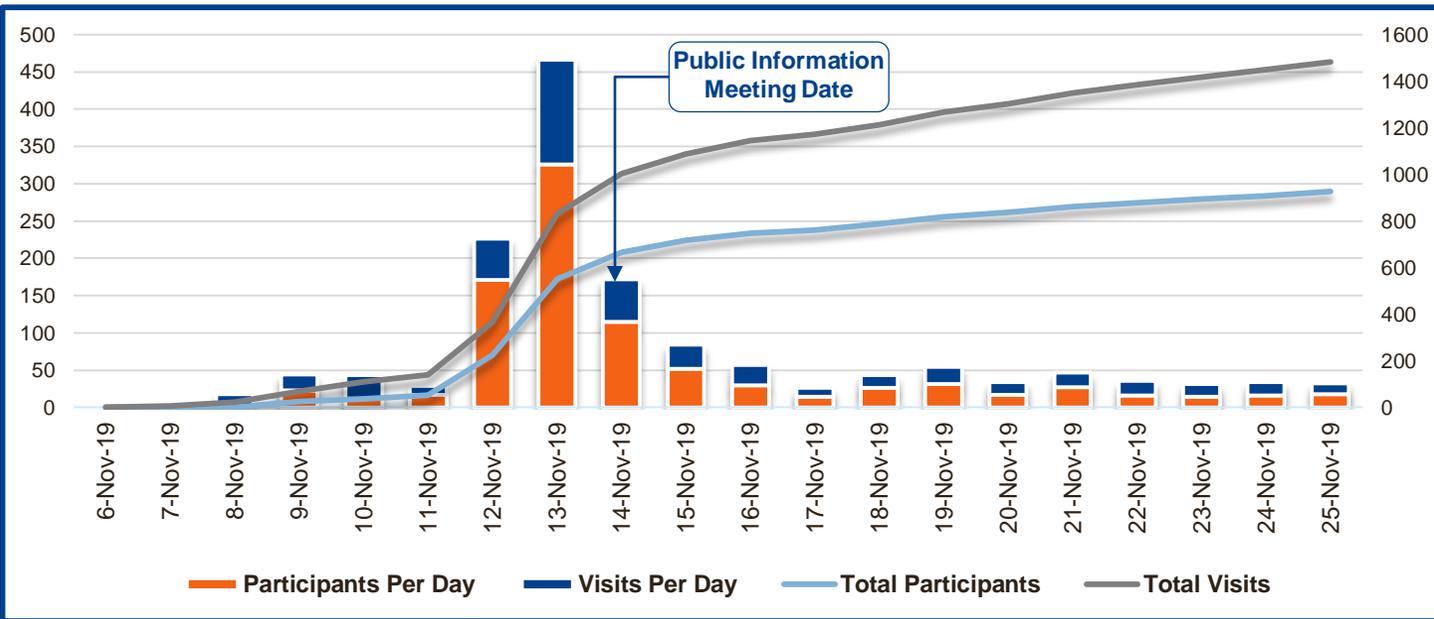
- Reviewed November 2019 Public Information Meeting survey responses
- Developed improvement alternatives based on survey feedback
- Analysis of existing conditions (No Build) and alternatives
 - Traffic operations analysis
 - Safety analysis
- Cost estimates for alternatives



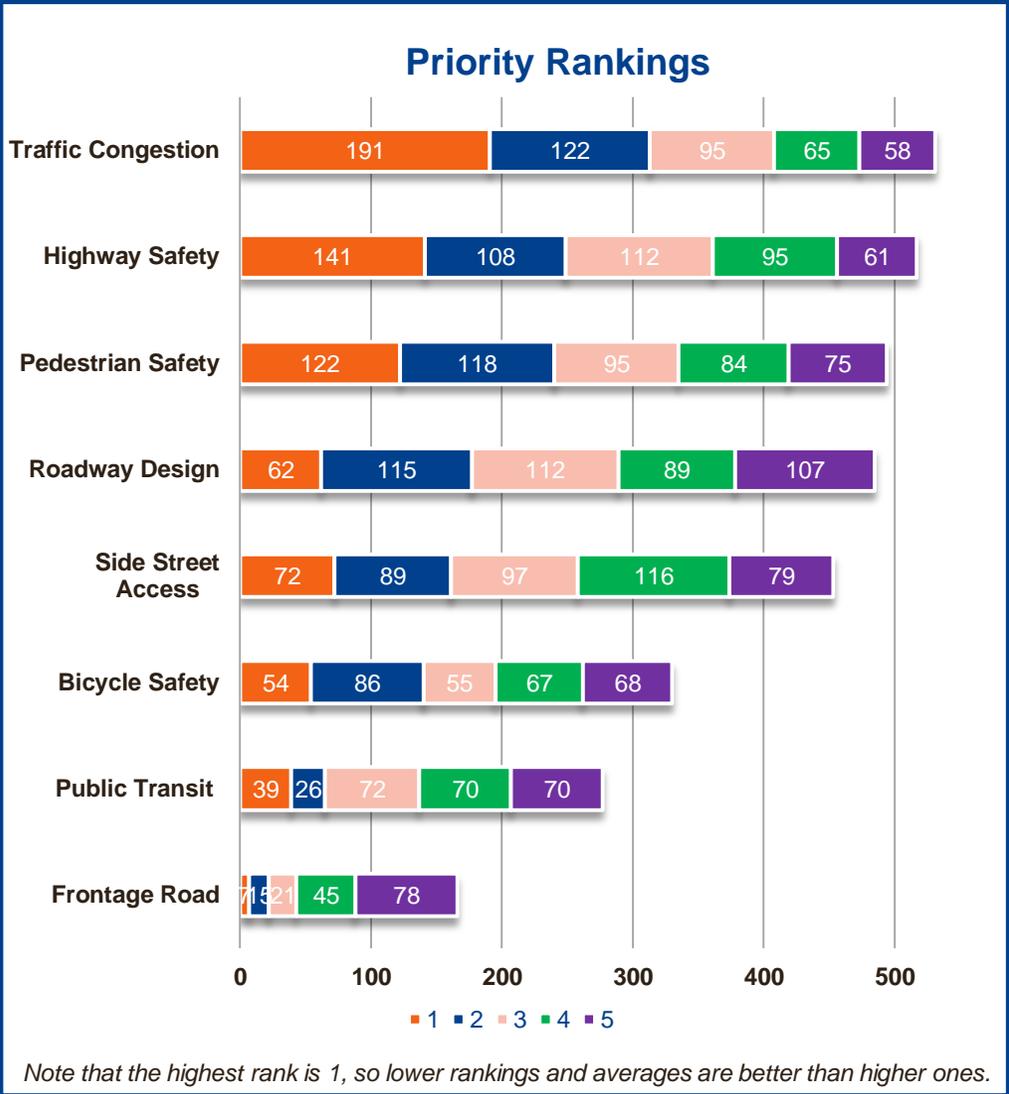
Survey Summary

MetroQuest
 Online Survey
 Conducted November 6 – November 25, 2019

** Includes 908 survey participants with unique Internet Protocol (IP) addresses*



Traffic Congestion and Highway Safety were Ranked as the Two Highest Priorities



Survey Summary

- **Top 3 mobility issues**
 - Lack of turn lanes
 - Difficulty making left turns
 - Difficulty when walking within the corridor/crossing Route 50
- **Top 3 safety issues**
 - Congestion
 - Difficulty turning onto side streets from Route 50
 - Aggressive/distracted driving
- **Additional corridor concerns include:**
 - Traffic turning to and from Route 50 results in safety concerns for vehicular traffic, bicycles, and pedestrians
 - Need for dedicated pedestrian and bicycle facilities and improved bus stops
 - Request for median barriers or signage to restrict left turn movements



For detailed survey results, please visit the study website: www.virginiadot.org/route50arlingtonstudy

Summary of Alternatives

Alternative 1: Raised median with left-turn lanes at Irving Street and Fillmore Street

- Three variations (Alternatives 1a, 1b, and 1c)

Alternative 2: Raised median with left-turn lanes at Fillmore Street

- No left-turn lanes at Irving Street
- Prohibit left turns from Route 50 to Irving Street

Alternative 3: No left turns at unsignalized intersections

- Install right-in/right-out islands at all unsignalized intersections
- No left-turn lanes at Irving Street
- Prohibit left turns from Route 50 to Irving Street

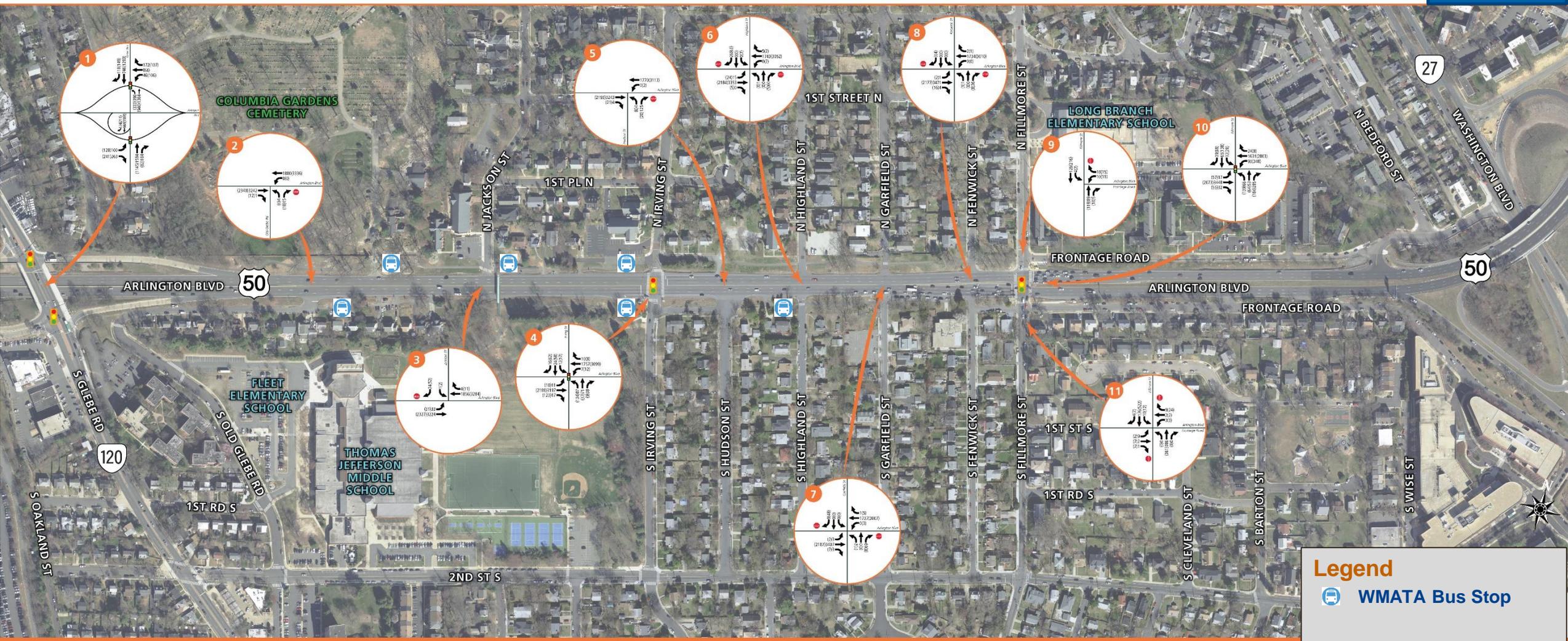
Options (may be combined with any Alternative)

Option A: Service Road east of Old Glebe Road

Option B: Service Road west of Irving Street

Option C: Permit on-street parking between Garfield Street and Fenwick Street

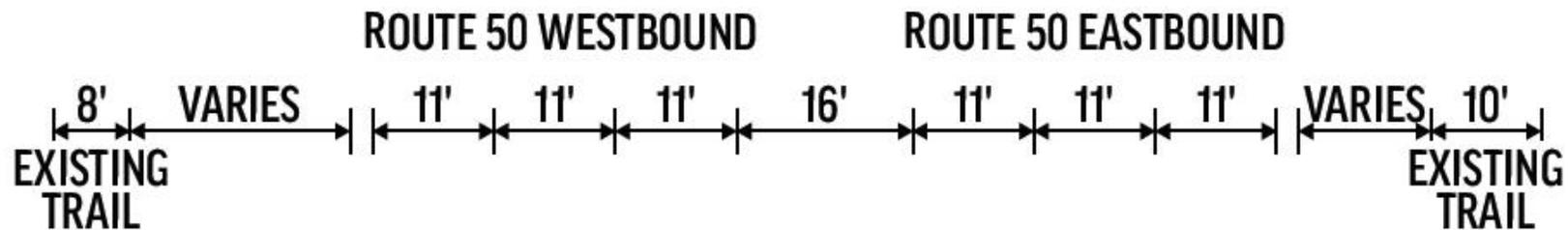
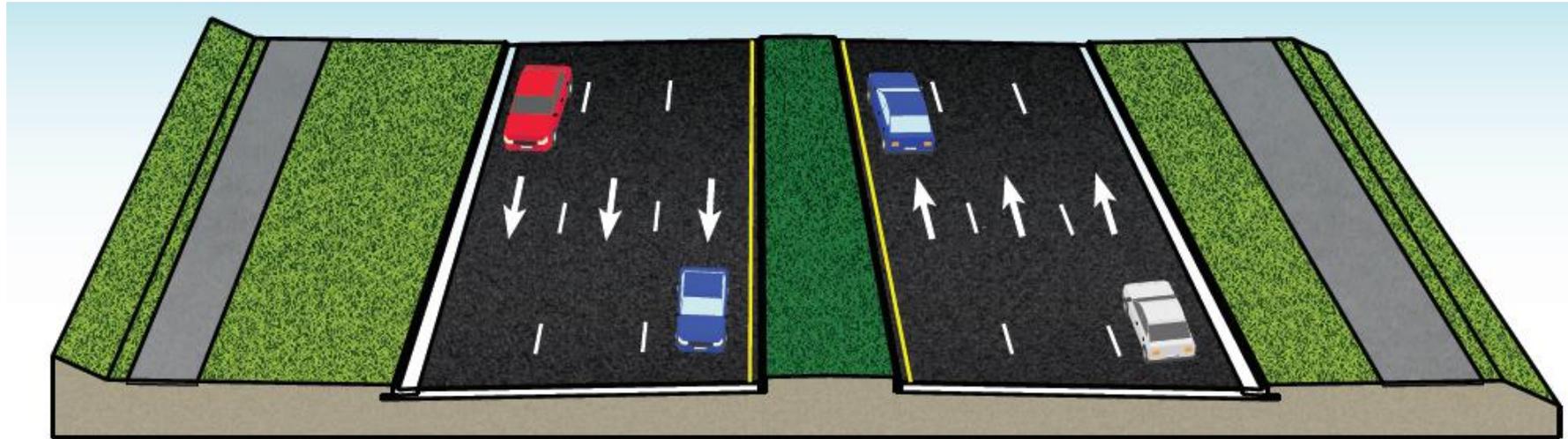
Option D: Service Road between Garfield Street and Fenwick Street



Legend

 WMATA Bus Stop

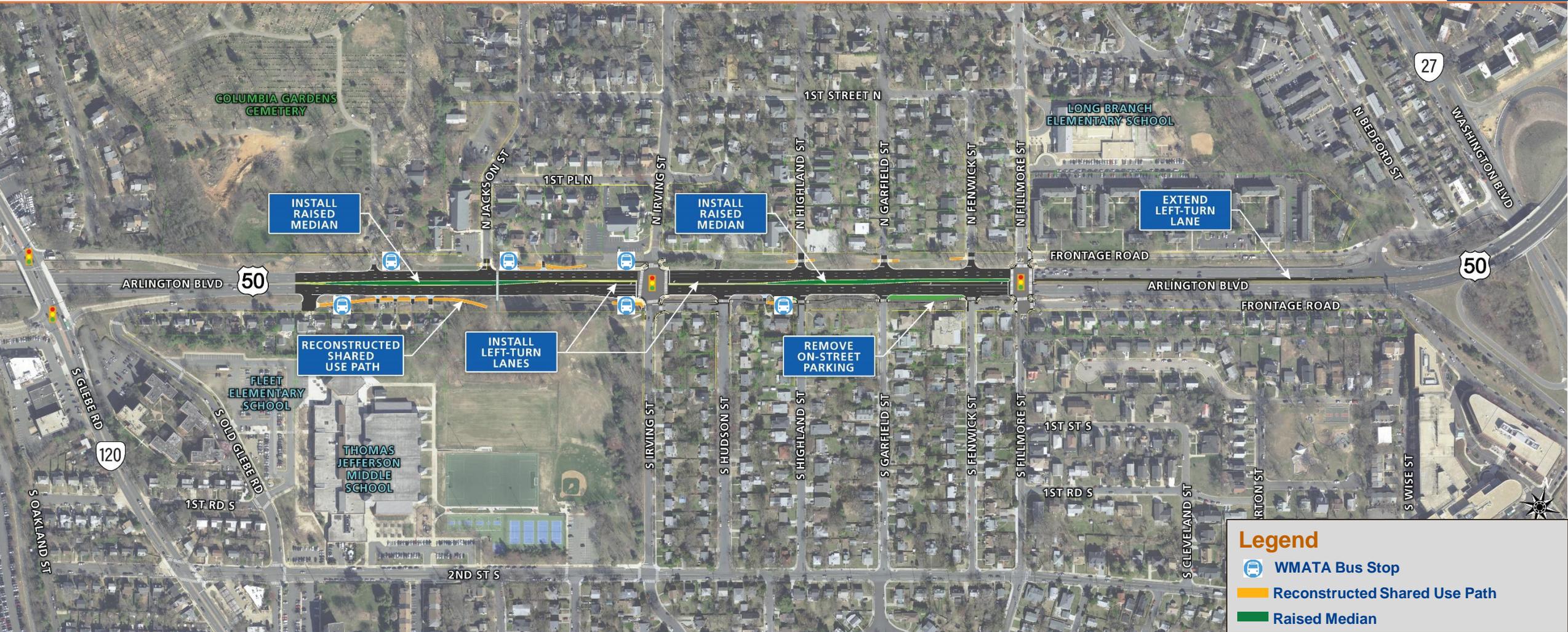
Typical Section – Alternatives 1a, 1b, 1c



Wide Raised Median Separating EB and WB Route 50 Travel Lanes

- Reduces conflict points at unsignalized intersections
- Reduces conflict points at unsignalized trail crossings
- More separation between EB and WB travel lanes with wide raised median (compared to Alternative 2)
- Results in widening impacts along Route 50 requiring curb and a closed drainage system

ALTERNATIVE 1a: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET



- Left-turn lanes at Irving St reduce the potential for rear end crashes
- Increases use of third travel lane on Route 50
- Improves bicycle and pedestrian safety at Irving St
- Increase in left turn movements at Fillmore St and Irving St
- Does not reduce conflict points at Irving St and Fillmore St

ALTERNATIVE 1b: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB THROUGH MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT FILLMORE STREET



- Left-turn lanes at Irving St reduce the potential for rear end crashes
- Increases use of third travel lane on Route 50
- Irving Street and Fillmore St approach delays decrease and operate more efficiently
- Improves bicycle and pedestrian safety at Fillmore St and Irving St

- Difficult to enforce turn restrictions at Irving St and Fillmore St
- Higher traffic volumes on Fillmore St (north leg) and Irving St (south leg)
- Higher left turns from Irving St increases potential conflicts with pedestrians and bikes

ALTERNATIVE 1b: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB THROUGH MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT FILLMORE STREET



Legend

- WMATA Bus Stop
- Reconstructed Shared Use Path
- Raised Median
- Prohibited Movement
- Alternate Routes

Alternate Routes for Northbound Through Movement at Irving Street

ALTERNATIVE 1b: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB THROUGH MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT FILLMORE STREET



Alternate Routes for Southbound Through Movement at Irving Street

ALTERNATIVE 1b: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB THROUGH MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT FILLMORE STREET



Alternate Route for Northbound Left Turn at Fillmore Street

ALTERNATIVE 1b: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB THROUGH MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT FILLMORE STREET



Alternate Route for Southbound Left Turn at Fillmore Street

ALTERNATIVE 1c: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB THROUGH MOVEMENTS AT FILLMORE STREET



- Left-turn lanes at Irving St reduce the potential for rear end crashes
- Increases use of third travel lane on Route 50
- Irving St and Fillmore St approach delays decrease and operate more efficiently
- Improves bicycle and pedestrian safety at Irving St

- Difficult to enforce turn restrictions at Irving St and Fillmore St
- Higher traffic volumes on Irving St
- Higher left turns from Fillmore St increases potential conflicts with pedestrians and bikes
- Longer EB Route 50 travel time during AM peak hour

ALTERNATIVE 1c: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT IRVING STREET
PROHIBIT NB AND SB THROUGH MOVEMENTS AT FILLMORE STREET



Alternate Route for Northbound Left Turn at Irving Street

ALTERNATIVE 1c: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB THROUGH MOVEMENTS AT FILLMORE STREET



Alternate Route for Southbound Left Turn at Irving Street

ALTERNATIVE 1c: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT IRVING STREET
 PROHIBIT NB AND SB THROUGH MOVEMENTS AT FILLMORE STREET



Legend

- WMATA Bus Stop
- Reconstructed Shared Use Path
- Raised Median
- Prohibited Movement
- Alternate Routes

Alternate Routes for Northbound Through Movement at Fillmore Street

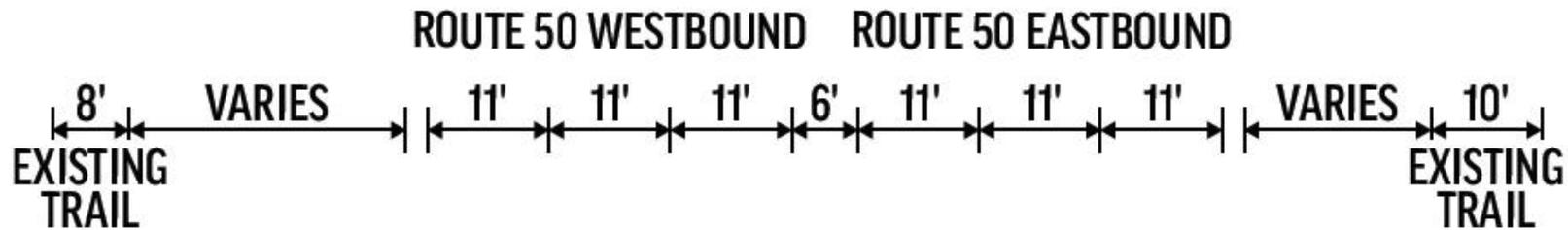
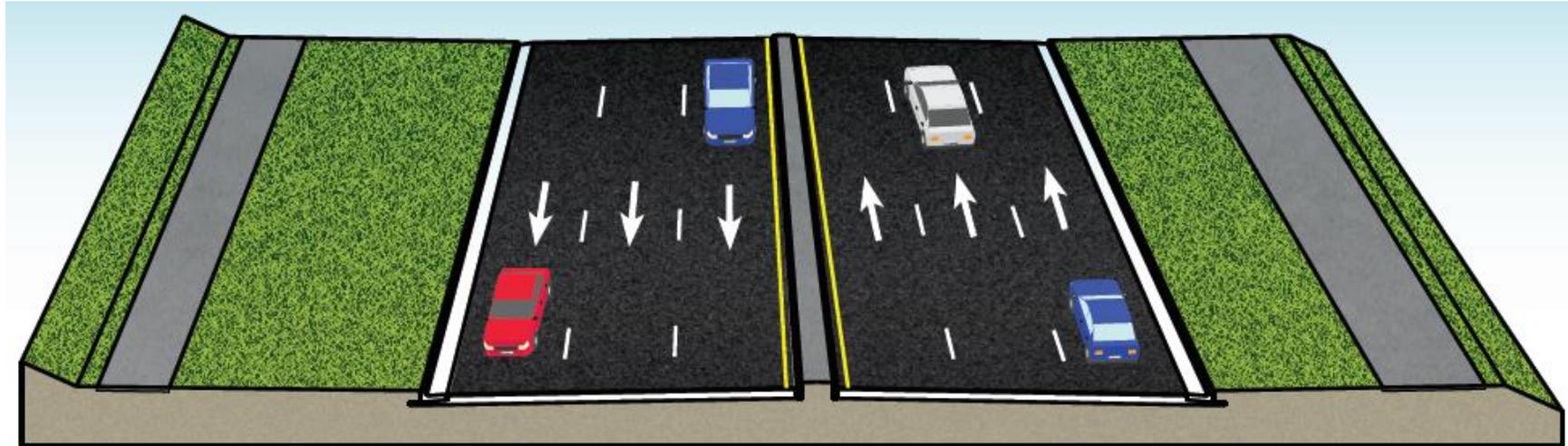
ALTERNATIVE 1c: RAISED MEDIAN WITH LEFT-TURN LANES AT IRVING STREET AND FILLMORE STREET

PROHIBIT NB AND SB LEFT-TURN MOVEMENTS AT IRVING STREET
PROHIBIT NB AND SB THROUGH MOVEMENTS AT FILLMORE STREET



Alternate Routes for Southbound Through Movement at Fillmore Street

Typical Section – Alternative 2



Narrow Raised Median Separating EB and WB Route 50 Travel Lanes

- Reduces conflict points at unsignalized intersections
- Reduces conflict points at unsignalized trail crossings
- Less widening of Route 50 due to no left-turn lanes onto Irving St (compared to Alternatives 1a, 1b, and 1c)
- Less separation between EB and WB travel lanes with narrow raised median (compared to Alternatives 1a, 1b, and 1c)

PROHIBIT EB AND WB LEFT-TURN MOVEMENTS TO IRVING STREET



- Reduces conflict points at Irving St
- Route 50 at Irving St operates more efficiently
- Increases use of third travel lane on Route 50
- Reduces widening of Route 50 (compared to Alternative 1a, 1b, and 1c)

- Does not reduce turning conflict points at Fillmore St
- Higher traffic volumes and delays at Fillmore St
- Longer EB Route 50 travel times

PROHIBIT EB AND WB LEFT-TURN MOVEMENTS TO IRVING STREET



Alternate Route for Eastbound Left Turn at Irving Street

PROHIBIT EB AND WB LEFT-TURN MOVEMENTS TO IRVING STREET



Alternate Route for Westbound Left Turn at Irving Street

PROHIBIT EB AND WB LEFT-TURN MOVEMENTS TO IRVING STREET



- Reduces conflict points at Irving St and unsignalized intersections
- Route 50 at Irving St operates more efficiently
- Increases use of third travel lane on Route 50
- Does not require widening of Route 50

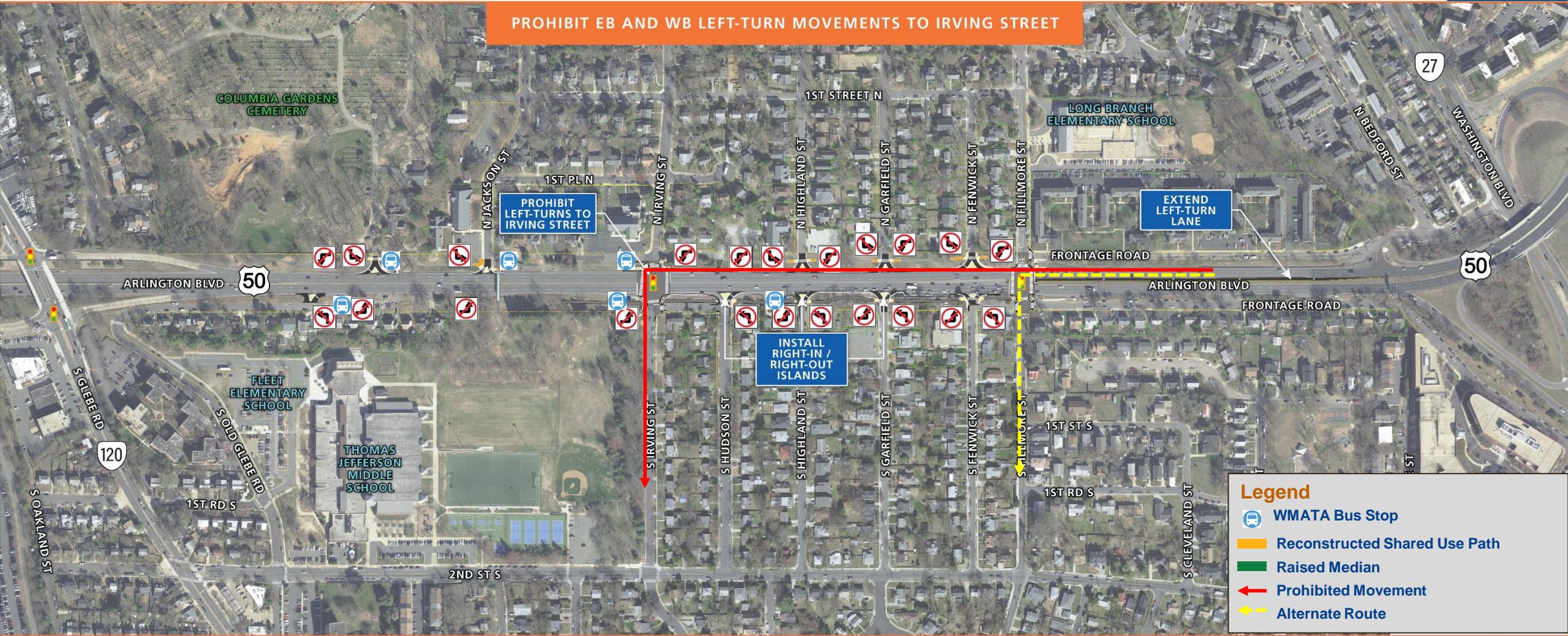
- Difficult to enforce left-turn restrictions; likely to require overhead sign structures
- Does not reduce turning conflict points at Fillmore St
- Higher traffic volumes and delays at Fillmore St
- Longer EB Route 50 travel time
- No separation between EB and WB travel lanes

PROHIBIT EB AND WB LEFT-TURN MOVEMENTS TO IRVING STREET



Alternate Route for Eastbound Left Turn at Irving Street

PROHIBIT EB AND WB LEFT-TURN MOVEMENTS TO IRVING STREET



Legend

- WMATA Bus Stop
- Reconstructed Shared Use Path
- Raised Median
- Prohibited Movement
- Alternate Route

Alternate Route for Westbound Left Turn at Irving Street

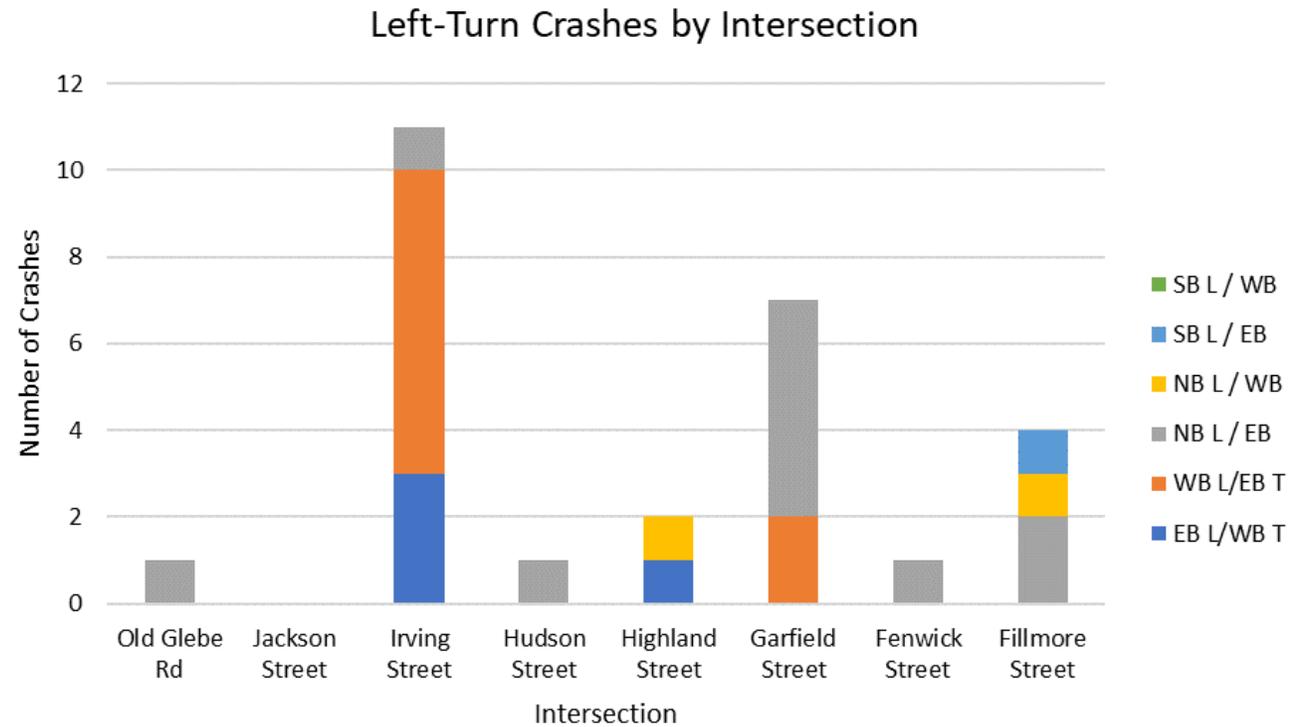
Route 50 Safety Analysis

- **16 (28%) of 57 angle/left-turn crashes occurred at midblock locations**
 - **Would be eliminated with a raised median**
- **26 (20%) of 133 rear end crashes were specifically attributed to midblock left turns (based on police reports)**

Conflict Point Comparison

- **Alternative 1a – 56% reduction of conflict points**
- **Alternatives 1b and 1c – 69% reduction of conflict points**
 - **Increased safety benefits with turn restrictions at Fillmore Street and Irving Street**
- **Alternatives 2 and 3 – 63% reduction of conflict points**
 - **Increased safety benefits with prohibition of left turns at Irving Street**

Note: Conflict point reductions assume motorists comply with the turn restrictions



Evaluation of Left-Turn Safety and Operations

- The November 2019 Survey results identified “difficulty making left-turns and/or lack of left-turn lanes” as one of the public’s main concerns
- All Build Alternatives improve corridor operations by prohibiting left-turns to/from unsignalized intersections and increasing the WB left-turn lane storage at Fillmore Street

Alternative		Modifications to Left Turns
Wide Median with Turn Lanes	1a	<ul style="list-style-type: none"> • Dedicated left-turn lanes from Route 50 to Irving St reduces the potential for rear end crashes and improves utilization of the third Route 50 travel lane
	1b	<ul style="list-style-type: none"> • Dedicated left-turn lanes from Route 50 to Irving St reduces the potential for rear end crashes and improves utilization of the third Route 50 travel lane • Prohibiting left-turns from Fillmore St and through movements from Irving Street reduces left-turn conflict points
	1c	<ul style="list-style-type: none"> • Dedicated left-turn lanes from Route 50 to Irving St reduces the potential for rear end crashes and improves utilization of the third Route 50 travel lane • Prohibiting left-turns from Irving St and through movements from Fillmore St reduces left-turn conflict points
Narrow Median	2	<ul style="list-style-type: none"> • Prohibiting left-turn movements onto Irving St reduces conflict points
No Median	3	<ul style="list-style-type: none"> • Prohibiting left-turn movements onto Irving St reduces conflict points

Evaluation of Pedestrian Safety

- The November 2019 survey results identified “pedestrian crossing safety across Route 50” as one of the public’s main concerns
- All Build alternatives improve pedestrian crossings at unsignalized intersections due to less traffic turning from Route 50 onto unsignalized intersections

Alternative		Impacts to Pedestrian Safety
Wide Median with Turn Lanes	1a	<ul style="list-style-type: none"> • Signalizing the left-turn movements onto Irving St improves bike and pedestrian safety
	1b	<ul style="list-style-type: none"> • Signalizing the left-turn movements onto Irving St improves bike and pedestrian safety • Prohibiting left turns from Fillmore St improves bike and pedestrian safety (the location with the highest pedestrian volume)
	1c	<ul style="list-style-type: none"> • Signalizing the left-turn movements onto Irving St improves bike and pedestrian safety • Prohibiting left turns from Irving St improves bike and pedestrian safety
Narrow Median	2	<ul style="list-style-type: none"> • Prohibiting left turns onto Irving St reduces left-turn conflicts with pedestrians
No Median	3	<ul style="list-style-type: none"> • Prohibiting left turns onto Irving St reduces left-turn conflicts with pedestrians

Evaluation of Alternatives

Criteria	Existing (No Build)	Alternative 1: Wide Median with Turn Lanes			Alternative 2:	Alternative 3:
		1a	1b	1c	Narrow Median	No Median
Left Turn Operations	●	○	●	●	○	○
Pedestrian Safety	○	○	●	○	○	○
Vehicle Conflict Points <i>% Reduction of Conflict Points</i>	● 0%	○ -56%	● -69%	● -69%	○ -63%	○ -63%
Separation Between Route 50 Travel Lanes	●	●	●	●	○	●
Travel Time <i>Total of both EB and WB Route 50 during both AM and PM peak (minutes)</i>	● 9.2	● 7.6	○ 7.9	○ 8.7	○ 7.9	○ 7.9
Enforcement of Turn Restrictions	--	●	○	○	○	●
Right-Of-Way Impacts	●	○	○	○	○	○
Preliminary Cost	--	\$14-18 million	\$14-18 million	\$14-18 million	\$12-14 million	\$5-7 million

Alternative 1 (1a, 1b, and 1c): Raised median with left-turn lanes at Irving Street and Fillmore Street

Alternative 2: Raised median with left-turn lanes at Fillmore Street

Alternative 3: No left turns at unsignalized intersections

Note: "Options" presented in the next 4 slides could be considered with any "Alternative" under consideration and do not impact the evaluation criteria.

●	○	○	○	●
Excellent	Favorable	Fair	Unfavorable	Poor



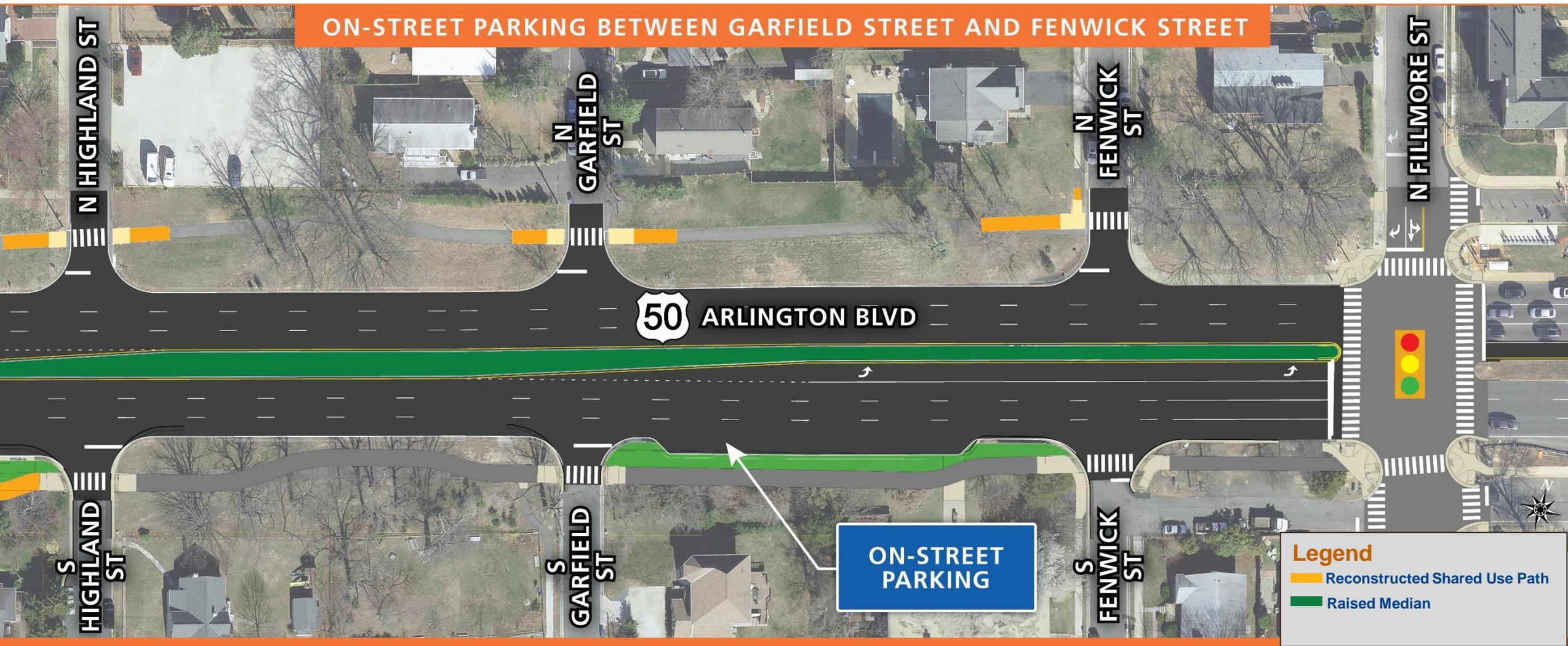
(may be included in any Alternative)

- Eliminates 5 residential driveways on Route 50
- Eliminates 5 conflict points along the Arlington Boulevard Trail
- Impacts to residential properties
- Increased cost



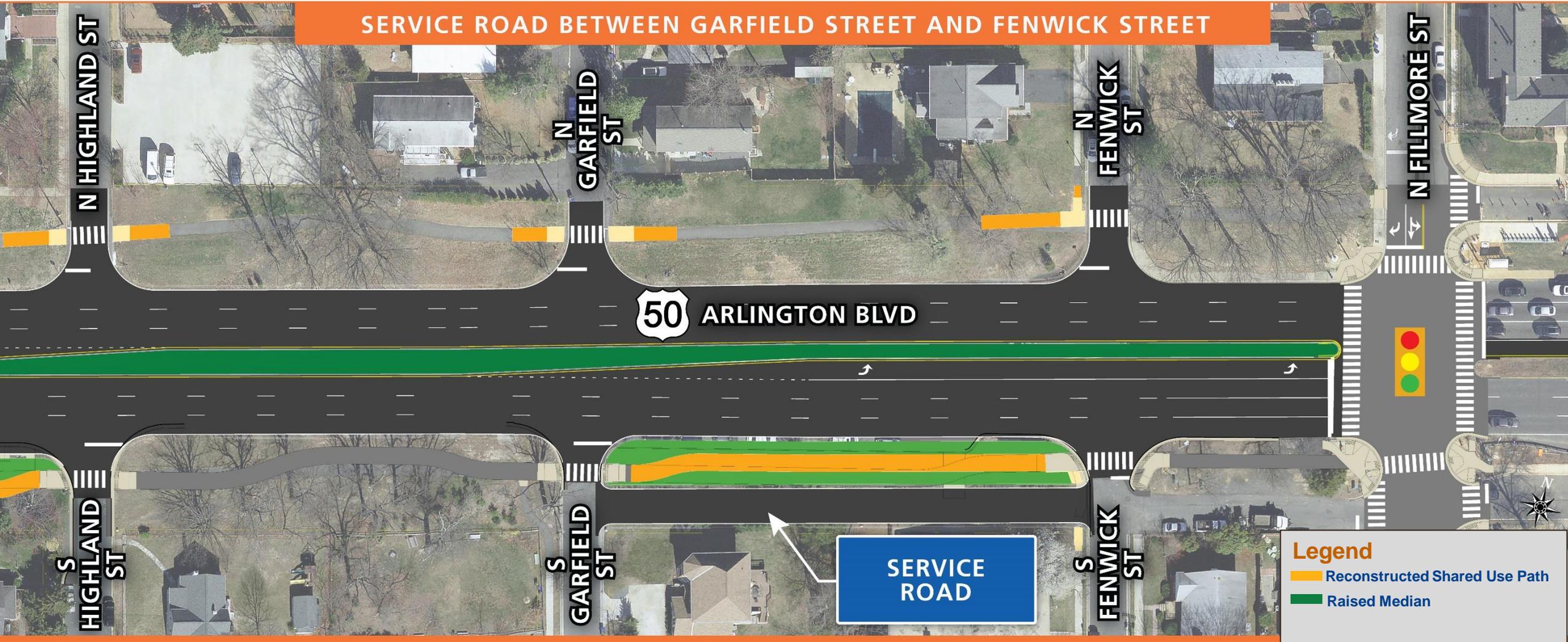
(may be included in any Alternative)

- Eliminates 2 residential driveways on Route 50
- Eliminates 2 conflict points along the Arlington Boulevard Trail
- Impacts to residential properties
- Increased cost



(may be included in any Alternative)

- Maintains 9 parking spots (current capacity is approx. 11 spaces)
- Increased impacts to properties
- Does not decrease potential for conflicts along Route 50

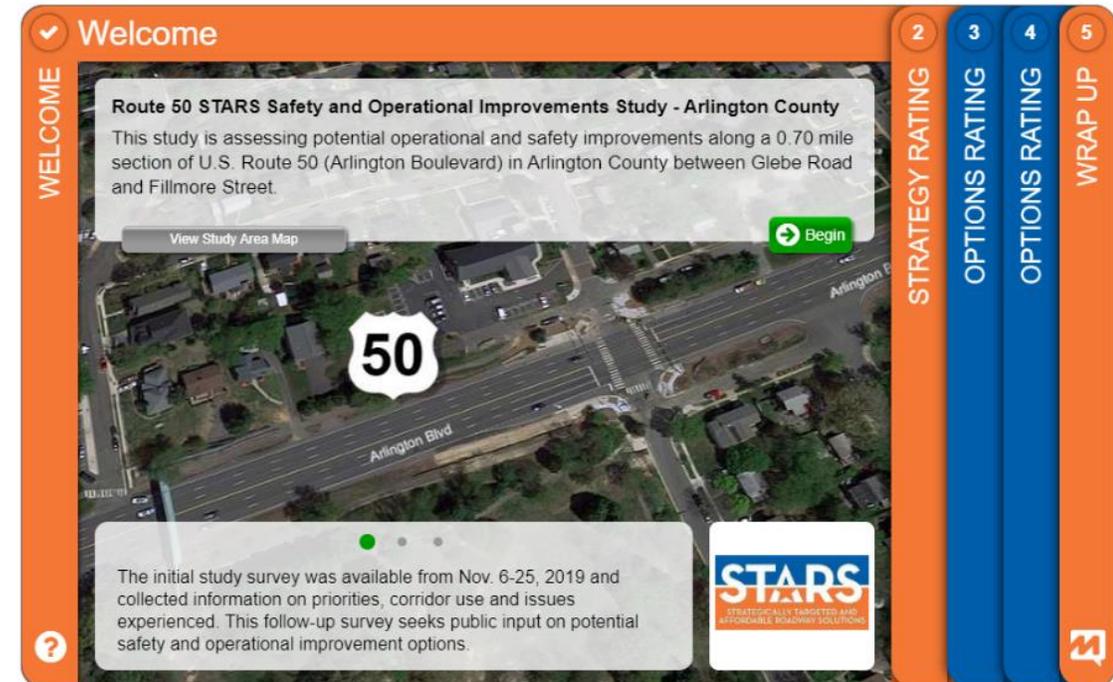


(may be included in any Alternative)

- Eliminates potential conflicts along Route 50
- Provides additional parking opportunities off of Route 50
- Increased impacts to properties
- Increased cost

Next Steps

- Provide comments using the following link: www.virginiadot.org/route50arlingtonstudy
- Comment period closes May 29, 2020
- VDOT and Arlington County to identify preferred alternative and refine based on public feedback
- Study recommendations will be finalized and posted online this summer 2020
- VDOT will work together with Arlington County to identify project funding (the project is not currently funded)
 - Arlington County to submit SMART SCALE funding application in August 2020



THANK YOU!

Your input is essential as we evaluate potential improvement alternatives.

Please take our survey located on our project website!

www.virginiadot.org/route50arlingtonstudy

**Comments may also be sent to:
meetingcomments@vdot.virginia.gov**