



PROPOSED BICYCLE AND PEDESTRIAN FACILITY

Vicinity of Route 123/I-495 Interchange
Tysons, Fairfax County, Virginia

PRELIMINARY ENGINEERING REPORT

Prepared for:



Prepared by:



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1 INTRODUCTION

The purpose of this report is to document the planning, preliminary engineering, public outreach, and recommendations for the Bicycle and Pedestrian Facility project in the vicinity of the interchange of Route 123 (Dolley Madison Blvd) and I-495 (Capital Beltway) in Tysons. The project is being accomplished by the Virginia Department of Transportation (VDOT), in close coordination with the Fairfax County Department of Transportation (FCDOT), with consultant support from Kimley-Horn and Associates. The recommendations in this report have been vetted with citizens and elected officials in the Tysons area through community forums and public information meetings. Next steps include design and implementation of the preferred option.

1.1 Need for Connection

As stated in Fairfax County’s Countywide Bicycle Master Plan (October 2014), there is a need for enhanced bicycle and pedestrian connectivity in Tysons, especially across I-495 (Capital Beltway). As shown in Figure 1, for the Tysons area, the master plan shows several planned connections across the Beltway, with the project area for this preliminary engineering effort outlined. The project area has a mix of retail, business, and residential communities with very little bicycle and pedestrian access across I-495. The objective of this effort has been to identify a preferred option for the first of these planned bicycle/pedestrian connections across I-495 in the vicinity of Route 123.

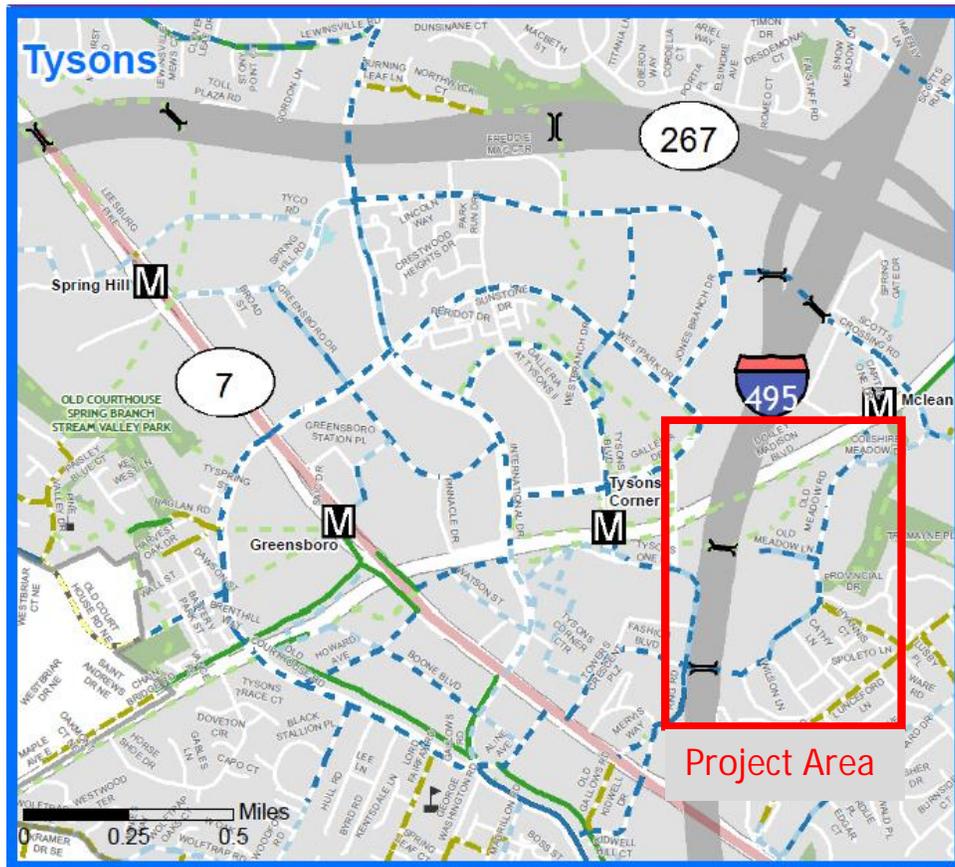


Figure 1 – Fairfax County Bicycle Master Plan for Tysons / Project Area

1.2 Scope of Preliminary Engineering Effort

The scope of this preliminary engineering effort has been built upon previous planning in the Route 123/I-495 interchange area, which resulted in two primary options being considered for a bicycle/pedestrian facility in the Route 123 vicinity:

- Option 1: Shared use path along Route 123—from the Westpark Drive bridge on a bicycle/pedestrian bridge proceeding down to the south side of Route 123, under I-495, across two I-495 ramps, to the intersection of Route 123 and Old Meadow Road
- Option 2: Shared use path along Old Meadow Road—from Tysons One Place west of I-495, over I-495 on a bicycle/pedestrian bridge to east side of I-495, along a ramp to a shared use path behind the Dolley Madison Apartments, to a shared use path along the west side of Old Meadow Road to the Route 123/Old Meadow Road intersection

The consultant team developed conceptual designs for each of these options, making use of a recent land survey conducted by VDOT, and analyzed each concept using a number of factors. VDOT and the consultant team also met with citizen groups and held a public information meeting (PIM) to discuss the project and the pros and cons of each option. Feedback from this public outreach led to a consensus on Option 2 being the preferred option.

2 PREVIOUS PLANNING

2.1 HOT Lanes Project

Given the need for bicycle and pedestrian connectivity in Tysons, the project began as a new proposed connection along Route 123 as part of the Capital Beltway HOT Lanes Project. Two options were developed and presented at a public hearing in 2014: (1) on street bicycle facility (wide right lane) in both directions on Route 123 from Tysons Boulevard to Old Meadow Road and (2) shared use path on the south side of Route 123, crossing a two-lane on-ramp to I-495, proceeding east under I-495, crossing two more ramps, to Old Meadow Road. Figure 2 shows the shared use path along Route 123 and its multiple ramp crossings.



Figure 2 – Capital Beltway HOT Lanes Project Shared Use Path Option (not accepted)

The public voiced significant safety concerns with the at grade crossing of the I-495 ramps, especially the two-lane ramp where vehicles accelerate to get onto I-495. There were also safety concerns expressed about on street bicycle lanes on Route 123, given vehicle speeds and weaving with multiple ramps to and from I-495. There were requests from the public for flashing signs and grade separations, as well as full trail connections between Tysons Corner Center and Metrorail stations.

2.2 VDOT Planning

In 2015, VDOT conducted additional analyses of the study area and held a two-day planning workshop to further the conceptual ideas for a bicycle and pedestrian facility in the Route 123 corridor.

2.2.1 Additional Analyses

A connectivity analysis was conducted in the Tysons area to understand gaps in the existing bicycle/pedestrian network, the quality of connections in the network, and the effect of new connections. From the analysis it was found that building a new bicycle and pedestrian facility along Route 123 would offer significant travel savings across the beltway (compared to the existing crossing on Route 7). The analysis also found that the development of a path with tie-ins near Westpark Drive or Tysons One Place produced the best connectivity results.

A cost analysis was also conducted, resulting in a budget of approximately \$7.6 million allocated for preliminary engineering, right of way, construction, and contingencies. Potential additional funding may be available through development proffers.

2.2.2 Planning Workshop

Building upon the additional analyses, a two-day planning workshop was held in June 2015 to provide the opportunity for the public to come together with VDOT and Fairfax County to discuss concepts to move forward in the design process. The goals of the first day of the charrette process were to understand the priorities, concerns, and constraints and to develop initial concepts. Existing and potential safety challenges were identified and priorities for cycling and land use were discussed. Figure 3 shows a small group collaborating to develop initial concepts. Different concepts were developed, and several were advanced for further consideration.



Figure 3 – Small Group Collaboration at Workshop

The goal of the second day of the charrette process was to give people the opportunity to provide the planning team with feedback and discuss tradeoffs for the initial options. The process for Day 2 also involved refining, evaluating, and developing high-levels costs for the options. Each of the alternatives moved forward from Day 1 was evaluated by working groups.

Key considerations for implementation of alternatives from the charrette process included:

- Grade separations between a bicycle/pedestrian facility and the ramp crossings
- Direct connections to Tysons Corner Center, existing neighborhoods to south of Route 123, and proposed development in Tysons East
- Multiple connections across I-495 in the Tysons area
- Shorter bridge connections south of Route 123 (making use of existing concrete medians to mitigate construction challenges and to save cost)
- Coordination with multiple private land owners
- Stormwater facility modification evaluations
- Phased implementation of bicycle/pedestrian facilities, including eventual integration with planned grid connections and planned Route 123 “Super Street” configuration
- Limits of currently budgeted project funding

2.2.3 Screening of Concepts

Following the workshop, VDOT continued the planning effort into 2016, which resulted in the analysis and screening of seven concepts—Options A through G—for a bicycle and pedestrian facility in the Route 123 corridor, ranging from the shared use path concept along the south side of Route 123 to multiple variations of shared use path and bicycle/pedestrian bridge combinations. These options are shown in Figure 4.



Figure 4 – Bicycle/Pedestrian Facility Options Developed through VDOT Planning Process (2015-2016)

- Option A was essentially the HOT Lanes project alternative. For reasons discussed above, this option was removed from further consideration.
- Option B included a shared use path along the south side of Route 123, under the existing I-495, and a bicycle/pedestrian bridge up to Westpark Drive. While this option had two at grade crossings of one-lane ramps, the option was otherwise consistent with input received during the workshop and was moved forward for additional study.
- Option C was a variation of Option B but with the bicycle/pedestrian bridge constructed over I-495. This option was deemed too costly and removed from further consideration.
- Option D was a variation of Option C with the at grade ramp crossings moved away from Route 123. This option was also too costly and removed from further consideration.
- Option E was for a shared use path or on street bicycle lanes along Old Meadow Road, from Route 123 to an existing private driveway, where the path proceeded to and across I-495 on a long span bicycle/pedestrian bridge to Tysons One Place. While consistent with the feedback received at the workshop, this option was too costly and removed from further consideration.
- Option F included a shared use path along the south side of Route 123 and the I-495 off ramp to Route 123, with a long span bicycle/pedestrian bridge for crossing I-495 to Tysons One Place. This option was also too costly and removed from further consideration.
- Option G was a variation of Option E and developed to take advantage of the existing concrete median barrier on I-495, allowing shorter bridge spans and thus reducing cost of the bicycle/pedestrian bridge. This option was moved forward for additional study.

Following this VDOT planning effort, Options B and G moved forward to the next stage of the planning process—selecting a preferred option.

3 PRELIMINARY ENGINEERING ANALYSIS

Following the planning efforts discussed above and with Options B and G emerging as feasible, VDOT moved into a preliminary engineering and public outreach process with the objective of arriving at a preferred option for near-term implementation. As shown in Figure 5, Options B and G became Options 1 and 2, respectively, to simplify the evaluation process. As VDOT and the consultant team advanced the conceptual designs, community meetings were held in January, February, and March 2017. Option 2 emerged as preferred, which was confirmed at the project’s public information meeting (PIM) on May 17, 2017.

3.1 Conceptual Design

The consultant team advanced the designs for Options 1 and 2 by developing conceptual plans using survey files provided by VDOT and using MicroStation software. The design parameters included:

- Shared use path: Asphalt path on grade, 10 feet wide, with 2-foot shoulders on each side
- Grass buffer: 8 feet between edge of roadway and edge of shared use path
- Bicycle/pedestrian bridge: 14 feet wide, 5% maximum grade

Through multiple site visits, VDOT and consultant staff verified existing conditions and challenges and opportunities of each option. Photos from the site visits are shown in Figure 6.

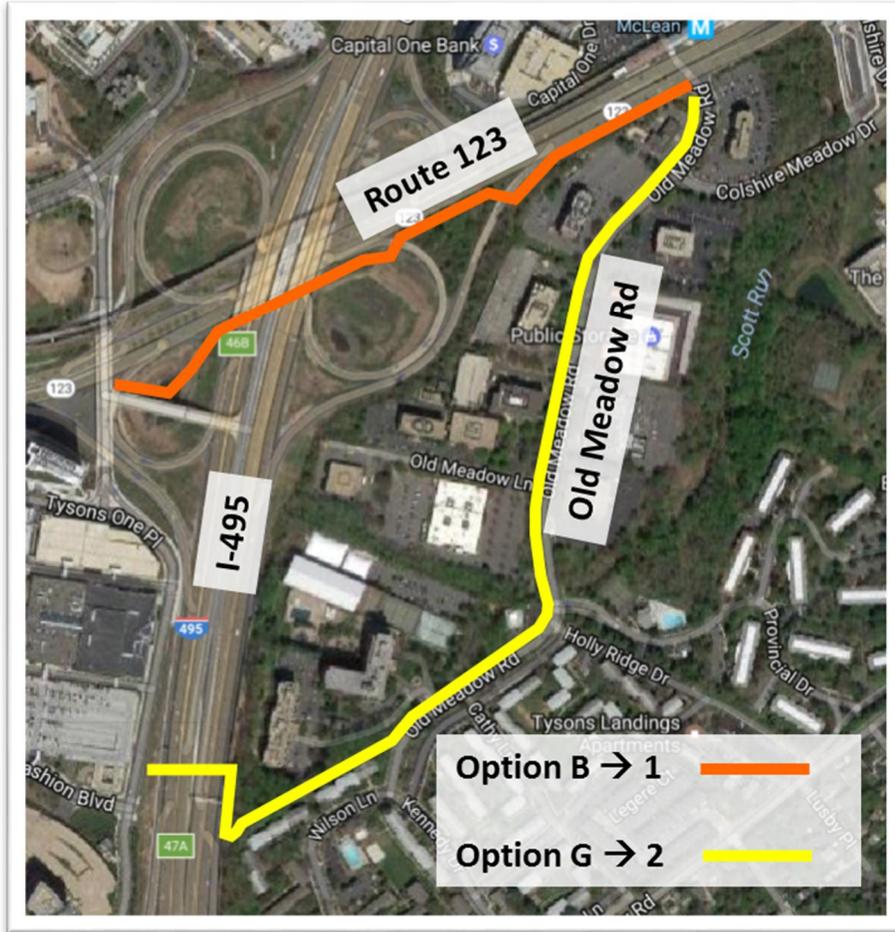


Figure 5 – Options 1 and 2 Carried Forward to the Preliminary Design Phase



Figure 6 – Site Visit Photos along Route 123 and Old Meadow Road

3.1.1 Option 1

Option 1 would be a shared use path along the south side of Route 123 from the intersection of Old Meadow Road, across two I-495 ramps (at grade), under the existing I-495 overpass, and on structure up to the existing sidewalk at Westpark Drive. Figure 7 shows a plan view of this concept. Figure 8 shows a rendering of the shared use path (looking to the south), crossing across one of the ramps, proceeding under I-495, and climbing up to Westpark Drive.

The two at grade crossings would include the I-495 northbound off-ramp to eastbound Route 123 and the Route 123 eastbound on-ramp to I-495 northbound. The bicycle/pedestrian bridge would begin underneath the existing I-495 overpass where it would gain elevation to reach Westpark Drive and tie-in with the existing sidewalk network.



Figure 7 – Option 1 Shared Use Path and Bridge Plan View



Figure 8 – Option 1 Shared Use Path and Bridge Rendering (looking to the southwest)

As shown in Table 1, Option 1 would require approximately 1,740 feet of asphalt trail and 1,100 feet of elevated structures. This option has an estimated cost of \$8.1 million dollars, the breakdown of which is shown in Table 2.

Table 1 – Option 1 Design Statistics

Route 123 Bike/Ped Facilities - Design Information					
Option 1 - Multiuse Path Along South Side of Route 123, Old Meadow Road to Westpark Drive Bridge					
Design Element	Subelement	From	To	Length (ft)	Elevation Change (ft)
Path on grade	Segment 1	Old Meadow Road	NB 495 Off-Ramp	904	27
	Segment 2	NB 495 Off-Ramp	NB 495 On-Ramp	498	5
	Segment 3	NB 495 On-Ramp	Bike/Ped Bridge	338	5
			Subtotal - On-Grade Segments:	1740	37
Path on structure	Bridge Segment 1			429	20
	Bridge Segment 2			60	3
	Bridge Segment 3			80	4
	Bridge Segment 4			80	4
	Bridge Segment 5			90	5
	Bridge Segment 6			130	7
	Bridge Segment 7			120	6
	Bridge Segment 8			120	6
			Subtotal - Bridge Segments:	1109	54
			Totals - Option 1	2849	91
				Width (ft)	
Multiuse Path on grade				10 feet	
Bike/Ped Bridge				14 feet	
				Height (ft)	
Bridge					
Clearance under I-495				10	
Height at Westpark Drive				31	

Table 2 – Option 1 Estimated Cost

Option 1:
Preliminary Engineering \$1.1 million
Existing Utility Adjustment/Relocation \$50,000
Construction \$6.8 million
Total Cost \$8.1 million

3.1.2 Option 2

Option 2 would include a shared use path that travels south along Old Meadow Road from Route 123 to the Dolley Madison Apartments, where the path would travel west behind the apartments, along the property line until reaching the existing I-495 sound wall. There the path would ascend to approximately 6 feet below the top of the sound wall, then proceed across I-495 to the existing shared use path along the east side of Tysons One Place. Figure 9 shows this concept in plan view. Figure 10 shows a rendering of the path and the bicycle/pedestrian bridge. As shown in Table 3, Option 2 would require approximately 4150 feet of at grade path and 550 feet of bridging structure. Option 2 has an estimated cost of \$6.2 million dollars, as detailed in Table 4.

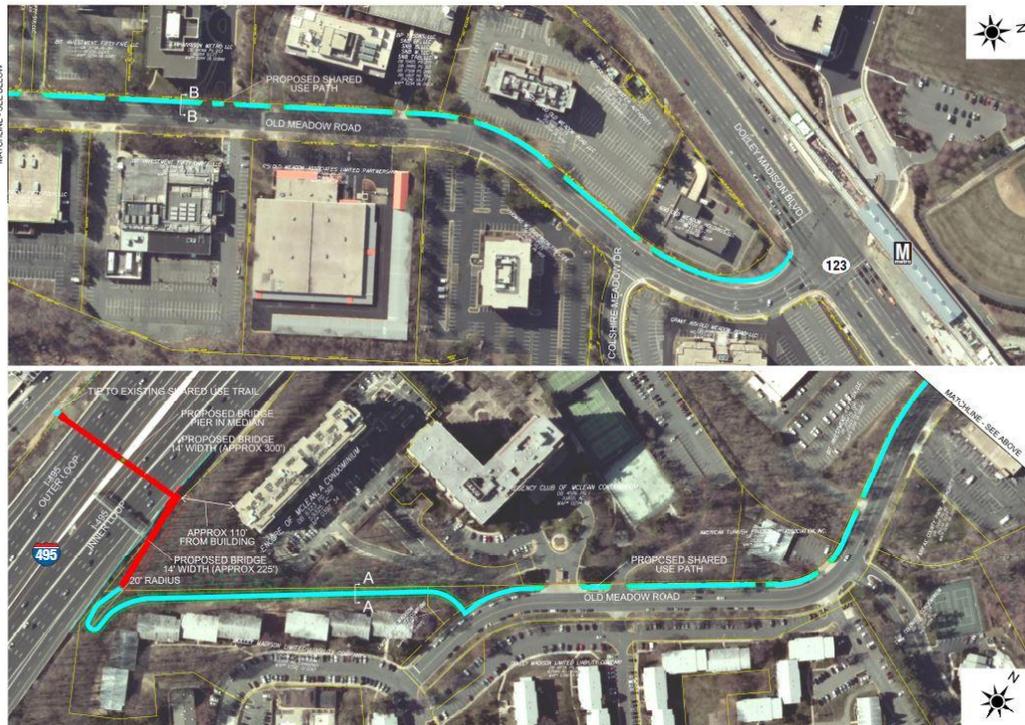


Figure 9- Option 2 Shared Use Path and Bridge Plan View

Table 3 – Option 2 Design Statistics

Route 123 Bike/Ped Facilities - Design Information					
Option 2 - Multiuse Path Across I-495, Behind Dolley Madison Apts, and Along West Side of Old Meadow Road					
Design Element	Subelement	From	To	Length (feet)	Elevation Change (feet)
Path on grade	Segment 1	Dolley Madison Blvd	Colshire Meadow Drive	361	7
	Segment 2	Colshire meadow Drive	Dolley Madison Apts	2784	72
	Segment 3	Dolley Madison Apts	Beginning of Bridge structure	992	49
	Subtotal - On-Grade Segments:			4137	128
Path on structure	Bridge Segment 1	Path from old Meadow Road	Landing at sound wall	225	11
	Bridge Segment 2	Landing at soundwall	Path at Tysons One Place	300	-2
	Subtotal - Bridge Segments:			525	9
Totals - Option 2				4662	137
				Width	
Multiuse Path on grade				10 feet	
Bike/Ped Bridge				14 feet	
Bridge				Height (ft)	Elevation (ft)
Height at west side of Beltway				23	467
Height at centerline of Beltway				24	468
Height at east side of Beltway				25	469
Height of Landing at Soundwall				23	469

Table 4 – Option 2 Estimated Cost

Option 2:
Preliminary Engineering \$0.9 million
Existing Utility Adjustment/Relocation \$0.95 million
Construction \$4.3 million
Total Cost \$6.2 million



Figure 10 – Option 2 Shared Use Path and Bridge Rendering (looking to the northwest)

It should be noted that on street bicycle lanes were considered for Old Meadow Road during the conceptual design process. The bike lanes would be consistent with the Fairfax County Bicycle Master Plan, and the lanes would supplement the existing sidewalks on either side of Old Meadow Road. However, adding bike lanes would require a so called “road diet” along segments of Old Meadow Road, i.e., replacing the four-lane cross section with two through lanes and a center left turn lane. In other segments of Old Meadow Road, bike lanes would likely require the removal of on street parking. Given the pending redevelopment in this area, as well as the citizens expressed desire for on street parking, it was decided that a shared use path along the west side of Old Meadow Road was more feasible to implement in the near term than on street bicycle lanes. This design decision was supported by FCDOT.

During this preliminary engineering process, the conceptual design of Option 2 was refined in response to feedback from the Encore and Regency Club condominiums (see discussion on Public Outreach below). Of note, the alignment for the shared use path between Old Meadow Road and I-495 was moved completely off of the condominium’s property, except for a small sliver needed for the ramp up to the bicycle/pedestrian bridge. This alignment saves several mature trees, which serve to visually screen the path, the ramp, and the bridge from the condominiums. In addition, the rendering of the proposed ramp (shown in Figure 11) was developed to show how additional trees would be planted and an opaque sound wall would be extended around the top of the ramp.



Figure 11 – Conceptual Rendering of Ramp Behind Sound Wall

Also during the conceptual design process, the team coordinated with VDOT’s Air and Noise section in the Central Office to discuss the feasibility of modifying the existing sound wall along the east side of I-495. It was confirmed that removing the top panel of the sound wall would be permissible, with addition of sound wall to the top of the ramp to bicycle/pedestrian bridge. Figure 12 show this modification to the sound wall.

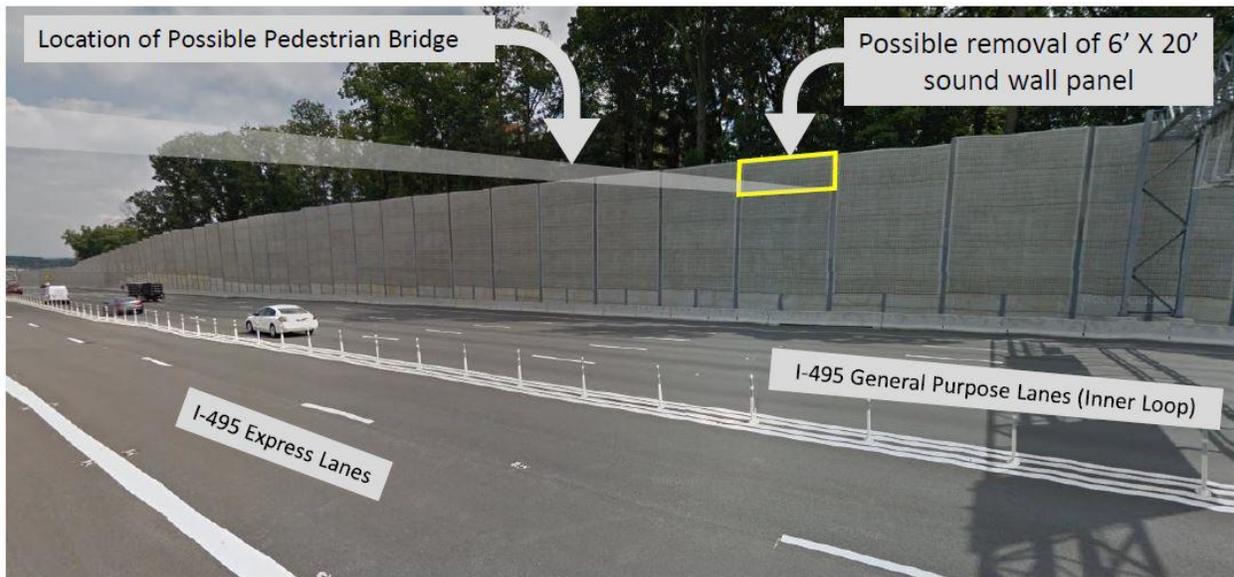


Figure 12 – Conceptual Sketch of Pedestrian Bridge Through the Sound Wall at I-495

3.1.3 Evaluation of Options

Options 1 and 2 as designed were evaluated based on their comparative strengths and weaknesses and using a set of evaluation criteria. These evaluations were based on input received during the VDOT planning process (2015-2016) and the meetings with the community (summarized below) that were conducted as part of this preliminary engineering effort.

The comparative strengths and weaknesses of each option are shown in Table 5. As shown, the strengths of Option 2 generally outweigh those of Option 1. It should be noted the weakness of Option 1 could be overcome in the longer term with the redevelopment of Route 123 into a Superstreet, per Fairfax County’s plan, as well as additional funding from proffers or other sources.

Table 5: Comparative Strengths and Weaknesses of Options 1 and 2

Option 1: Old Meadow Road To Westpark Drive		Option 2 (preferred): Route 123 to Tysons One Place	
STRENGTHS	WEAKNESSES	STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ➤ No Right-of-Way acquisitions ➤ Relatively flat path, easy to use 	<ul style="list-style-type: none"> ➤ Two high-speed at-grade ramp crossings affecting bike and pedestrian safety* ➤ Large and complicated bridge structure ➤ Higher projected cost ➤ Proposed bridge piers would be in the existing drainage pond 	<ul style="list-style-type: none"> ➤ Safer for bike and pedestrian users with no I-495 ramp crossings ➤ Lower projected cost ➤ Will provide direct access across I-495 for the community along Old Meadow Road ➤ Smaller bridge structure 	<ul style="list-style-type: none"> ➤ Right-of-way acquisition is necessary ➤ Steeper grades along Old Meadow Road
<p><small>* Route 123 Superstreet Project may allow increased safety on path when completed</small></p>			

The evaluation criteria used for additional analysis of each alternative were as follows:

- General bicycling quality: The perceived ability for a bicyclist to have a good experience using this facility
- General walking quality: The perceived ability for a pedestrian to have a good experience using this facility
- Protection from intersecting traffic: Physical separation from vehicle traffic, including a qualitative consideration of the volume and speed of the traffic
- Direct access to existing places: The ability of the path to connect existing residential, commercial, recreational, and similar areas
- Direct access to future places: The ability of the path to connect potential development of future residential, commercial, recreational, and similar areas
- Right of way impacts: The need to acquire property or easements, which can increase cost and delay construction
- Ease of construction: The ability of the project to be constructed efficiently considering complexity of design, equipment staging, and maintenance of traffic
- Preliminary project cost: The cost of the project as compared with the available funding of \$6.7M

Options 1 and 2 were evaluated against these criteria. The results of this evaluation are shown in Table 6. Note that using a scale of 1 to 3 for each criteria (with 1 being “fair” and 3 being “best”), the total score for Options 1 and 2 were 13 and 18, respectively. From the analysis, Option 2 emerged as the

most feasible to construct in the near term. Option 2 has a lower overall cost, increased safety for bicyclists and pedestrians, and provides very good access for existing residential communities.

Table 6: Evaluation and Scoring of Options 1 and 2

General bicycling quality	General walking quality	Protection from intersecting traffic	Direct access to existing places	Direct access to future places	Right-of-way impacts	Ease of construction	Preliminary project cost	Total Score
OPTION 1: OLD MEADOW ROAD TO WESTPARK DRIVE								
○	○	○	○	●	●	○	○	13
OPTION 2 (PREFERRED): ROUTE 123 TO TYSONS ONE PLACE								
○	○	●	●	●	○	○	●	18

KEY		
●	○	○
Best (3)	Good (2)	Fair (1)

3.2 Public Outreach

While this analysis described above was being conducted by VDOT and the consultant team, the options were presented and discussed at multiple community meetings and at the Public Information Meeting (PIM) on May 17, 2017. The feedback during these meetings helped refine the conceptual designs and provided valuable input on the evaluations of the options.

The following community meetings were held during January, February, and March 2017:

- January 11: Meeting with management of the Dolley Madison Apartments
- January 18: Meeting with management of Tysons Corner Center
- February 16: Meeting with Supervisor Smyth, Fairfax County
- March 27: Community Meeting at The Colonies of McLean
- March 30: Community Meeting at Encore of McLean

While the first three of these meetings were with specific audiences, the two community meetings included the participation of 60 to 70 residents at each meeting.

Similarly, the PIM was held on May 17 at Westgate Elementary School at 7500 Magarity Road, just to the east of the project area. This meeting also had approximately 60 to 70 residents in attendance. At the PIM, VDOT delivered a presentation outlining the previous efforts and history of the project, along with a discussion of the current options and a recommendation that Option 2 be considered as the preferred option moving forward. The public was also presented with informational boards that included graphics and photos that depicted the options for the proposed path. The public was given an opportunity to provide comments in written form and by speaking at the podium to the audience.

The input received during these community meetings and the PIM is summarized as follows:

- Concerns were expressed that a road diet on Old Meadow Road would have serious objections from the residents along the corridor
- Residents expressed the desire to keep on street parking along Old Meadow Road
- Residents would also like VDOT to have adequate lighting of the trail and the bridge, to include amenities like bike racks and benches, and to make sure safety and security are addressed in the design
- Option 2 realignment from condominium property to apartments was well received by all parties
- Option 1 raised safety concerns given the crossing of the I-495 ramps
- Option 2 received very positive feedback from many citizens, backed up by applause after some comments at the PIM
- Some residents of the Encore condominium expressed concern about noise, visual impacts, and potential impacts to privacy, requesting VDOT mitigate these concerns
- Residents want to be kept informed as design progresses, including a future meeting to discuss design elements and aesthetics

Ultimately the decision to choose Option 2 as the preferred option was well received, and many members of the public were supportive of a new connection in the area. VDOT representatives at these meetings said the final design process will strive to mitigate their concerns and that the citizens will be kept informed of the design process. A future design workshop will be scheduled, along with the Design Public Hearing at the appropriate time.

4 RECOMMENDATION AND NEXT STEPS

Based on the preliminary engineering analyses and the feedback received during the public outreach efforts, it is the recommendation of VDOT to proceed with final design and construction of Option 2—a shared use path along Old Meadow Road from Route 123, to behind the Dolley Madison Apartments, to a bicycle/pedestrian bridge across the Capital Beltway, to the existing shared use path along Tysons One Place.

VDOT intends to move forward into final design and complete the necessary steps toward implementation in accordance with the following schedule:

- | | |
|----------------------------|-----------|
| ▪ Design Public Hearing | Late 2017 |
| ▪ Final Design | 2018 |
| ▪ Right of way acquisition | 2018-2019 |
| ▪ Utility relocations | 2019 |
| ▪ Construction completion | 2020 |

For additional information about this project, including design updates and future meetings, the reader may contact Abi Lerner, VDOT Project Manager, at abraham.lerner@vdot.virginia.gov.

APPENDIX

Conceptual Design Plans for Options 1 and 2