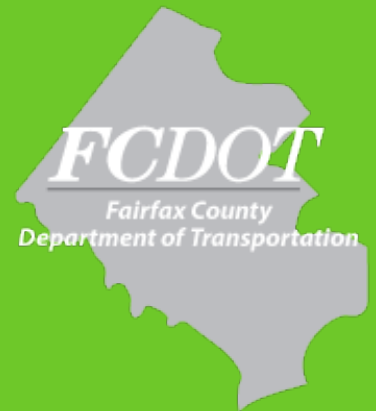
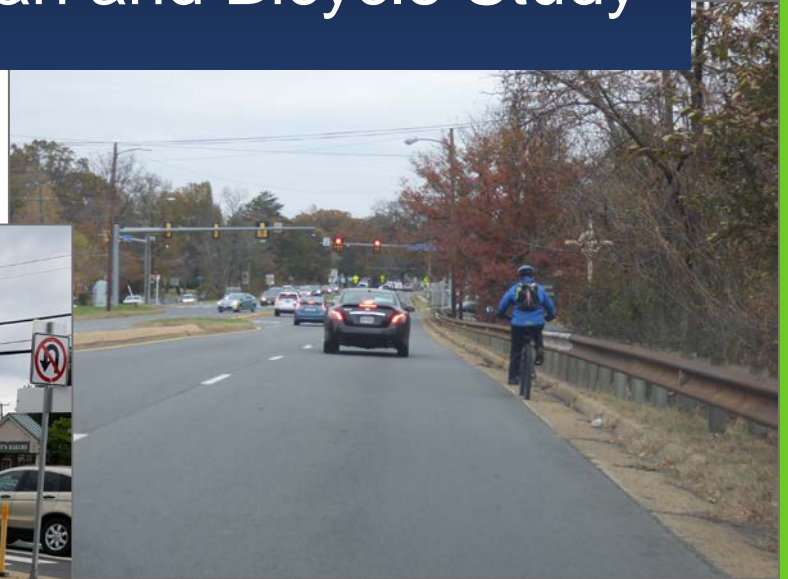


# Columbia Pike Pedestrian and Bicycle Study



May 31, 2018

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# Introduction

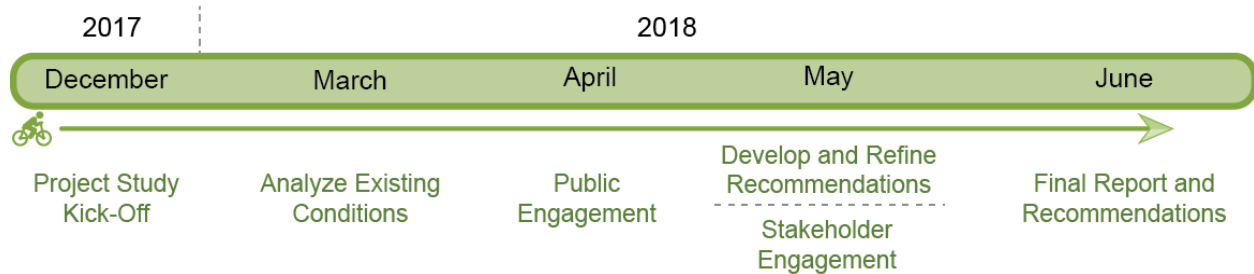
The *Columbia Pike Pedestrian and Bicycle Study* was conducted to assess existing conditions and propose planning recommendations that aim to make walking and bicycling safer and more enjoyable along the 4.5-mile Fairfax County corridor. The study was sponsored by the Metropolitan Council of Governments (MWCOCG) on behalf of Fairfax County through the Transportation-Land Use Connections Program. This report briefly summarizes the existing conditions analysis and public involvement activities as well as presenting planning level recommendations, implementation strategies, and cost estimates.

## Project Overview

The study's purpose was to propose improvements to bicycle and pedestrian infrastructure and present planning level cost estimates that may be used to support future project selection by Fairfax County Department of Transportation (FCDOT). An emphasis was placed on improving the connectivity of bicycle and pedestrian facilities, as well as proposing better roadway crossings that could enhance transportation safety and comfort for transit riders, pedestrians and cyclists. Both near-term and long-term recommendations are proposed and include treatments such as new sidewalks, shared-use paths, bicycle lanes, and crosswalk enhancements.

## Project Process

The project team included MWCOCG, FCDOT, Sam Schwartz Consulting, nSpire Green, and Lee Engineering. Throughout the project development, the project team communicated progress through means of email, conference calls, and in-person meetings. The project timeline is shown in Figure 1.



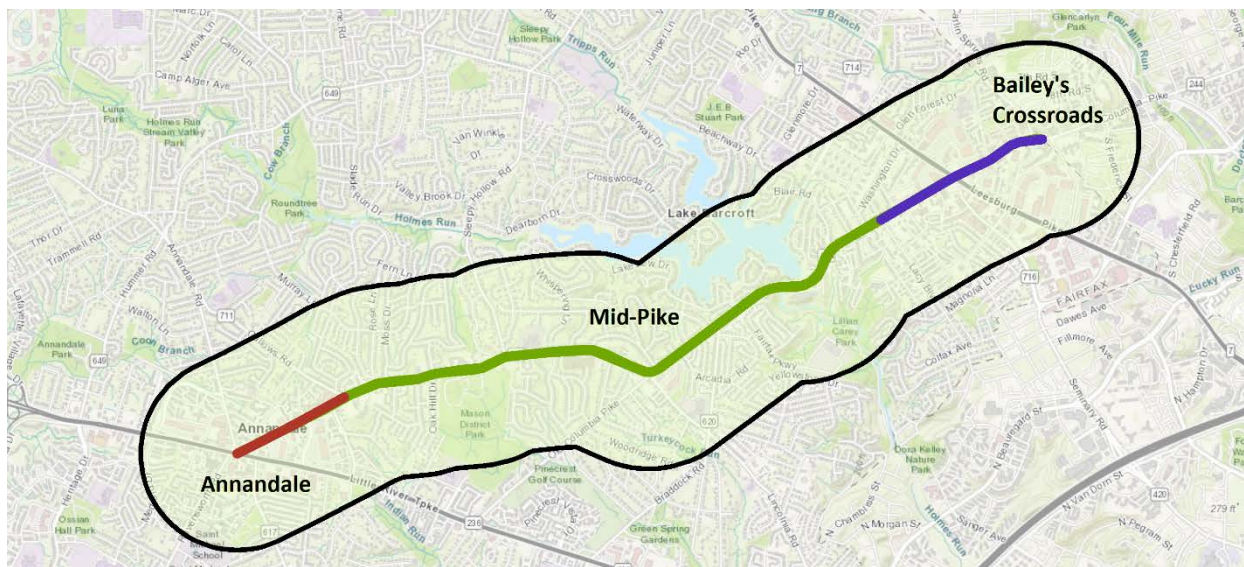
**Figure 1: Project Schedule**

# Corridor Details

The study area covered the entire 4.5-mile Columbia Pike corridor stretching from Little River Turnpike in Annandale to the Arlington County border in Bailey's Crossroads. The Fairfax County Bicycle Master Plan identifies Columbia Pike as a "use caution" roadway and a "Policy Road" that requires further study to determine how the roadway can accommodate safe bicycle travel. The existing bicycle and pedestrian facilities consist of a patchwork of shared use paths, bikeable sidewalks and crosswalks, with some areas that lack pedestrian and bicycle facilities altogether.

Columbia Pike is a principal arterial that serves approximately 32,000 vehicle trips per day according to the 2016 VDOT Traffic Volume Estimates.

The study approach divided Columbia Pike into three context zones with similar profiles and land uses to review, analyze, and provide recommendations. The context zones were Annandale, Mid-Pike, and Bailey's Crossroads (Figure 1).



**Figure 2: Columbia Pike Context Zones**

Within each context zone there are similar land use characteristics and roadway cross-sections. The context of each context zone is summarized below:

- Annandale – Urban community with highly commercialized space. The Annandale context zone covered Columbia Pike from Little River Turnpike to Gallows Road. The roadway has four-lanes with 25 mph posted speed limits through the commercial portions of Columbia Pike. Pedestrian facilities include five to six-foot sidewalks throughout the context zone and in some portions, features street-scaping improvements such as five-foot brick sidewalks and landscaping amenity panels.
- Mid-Pike – Mostly residential throughout the context zone. The Mid-Pike context zone covered Columbia Pike from Gallows Road to Powell Lane. Also includes Mason District

Park, which is heavily used by the public. The roadway has four-lanes with 35 to 40 mph posted speed limits, plus service roads connecting Columbia Pike to residential areas. The context zone features limited pedestrian facilities, however shared use paths have been constructed along portions of the corridor.

- Bailey's Crossroads – Urban community that is mostly commercial. The Bailey's Crossroads context zone covered Columbia Pike from Powell Lane to Carlin Springs Road. The roadway has four-lanes with 35 mph posted speed limits throughout the context zone, and features street-scaping improvements such as five-foot brick sidewalks and planted medians.

# Data Collection Process

The project team used satellite imagery, geographic information systems data, VDOT traffic and field data to analyze the corridor.

## Site Visit

Throughout the course of the study, several site visits were made to the entire corridor, as well as to specific points of concern or interest. The site visits were generally conducted to assess roadway geometry or to inspect recent updates to pedestrian facilities.

## Crash Analysis

The crash history for the study corridor during 2014 to 2016 was reviewed utilizing VDOT's Motor Vehicle Crash Data, which covered Columbia Pike between Little River Turnpike and the Fairfax-Arlington County border (see Table 1).

**Table 1: Crash Data for Columbia Pike for 2014-2016**

	<b>#</b>	<b>% of Total</b>
Total Number of Crashes	174	100%
Total Number of Property Damage Crashes	90	51.7%
Total Number of Injury Crashes	67	38.5%
Total Number of Pedestrian Fatalities	2	1.1%
Total Number of Pedestrian Injuries	12	6.8%
Total Number of Bicyclist Fatalities	0	0.0%
Total Number of Bicyclist Injuries	3	1.7%

A total of 174 crashes were reported for the corridor during 2014-2016, nearly half of which involved property damage only. A map of the 174 crash locations is shown in Figure 3.

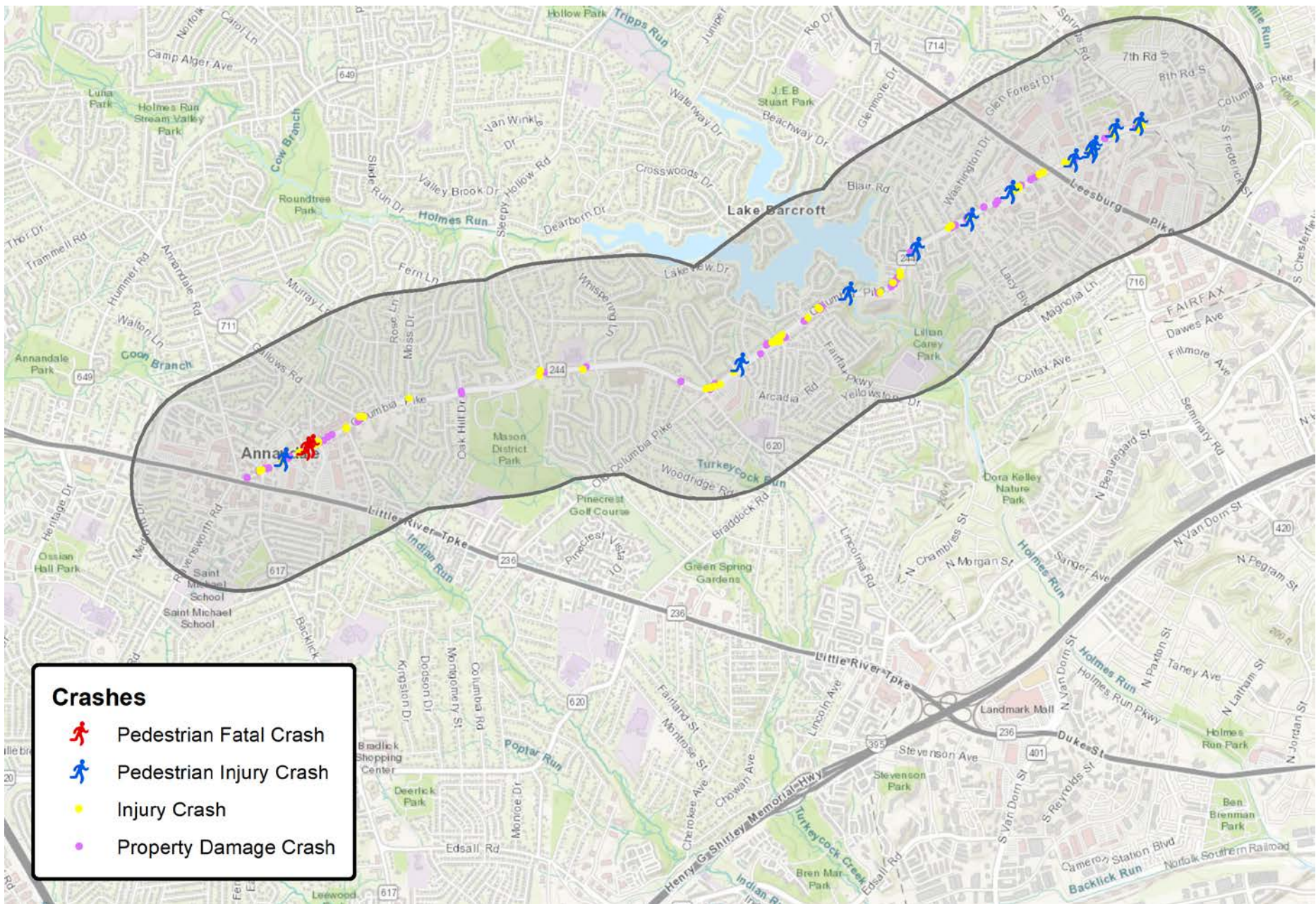
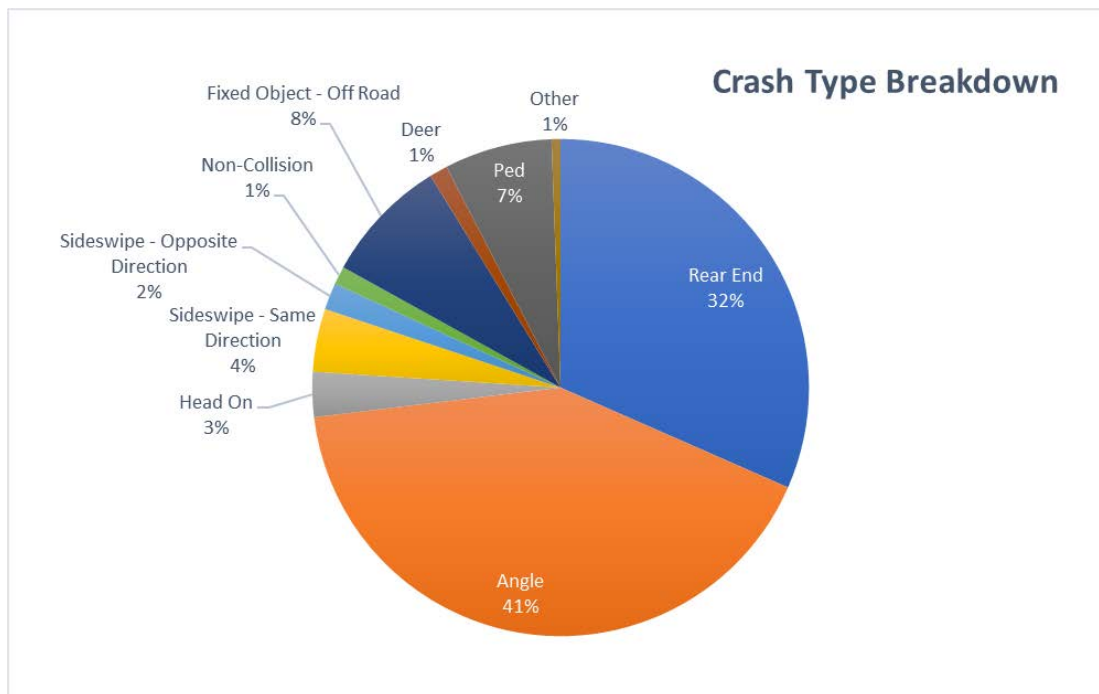


Figure 3: Locations of 2014-2016 Crashes Along Columbia Pike



Based on analysis of 174 crashes along the study corridor, 41 percent of crashes involved angle collisions, 31 percent involved rear-ends, 8 percent involved fixed-object collisions, and 7 percent involved pedestrian collisions. (see Figure 4).



**Figure 4: Crash Type Breakdown for 2014-2016**

Of these 174 crashes, 46 occurred in 2014, 53 occurred in 2015, and 75 occurred in 2016. The two (2) pedestrian fatalities occurred in 2014 and 2016, both occurring in Annandale between Tom Davis Drive and John Marr Drive (Table 2).

**Table 2: Crash Breakdown by Year**

Year	Crashes	Fatalities	Injuries	Pedestrian Injuries	Bicyclist Injuries
2014	46	1	13	4	0
2015	53	0	20	6	0
2016	72	1	34	2	3

According to the VDOT data, there was (1) pedestrian injury within the Annandale context zone in addition to the two fatalities, for a total of three (3) total pedestrian crashes in Annandale during 2014-2016. There were four (4) pedestrian injuries within the Mid-Pike context zone and seven (7) injury crashes within the Bailey’s Crossroads context zone (Table 3). There were also two (2) bicycle crashes within this time period, both occurring in the Bailey’s Crossroads context zone.

**Table 3: Total Number of Pedestrian and Bicycle Injuries by Context Zone**

	<b>Pedestrian</b>	<b>Bicycle</b>
<b>Annandale Crashes:</b>	3 (2 Fatal)	0
<b>Mid-Pike Crashes:</b>	4	1
<b>Bailey's Crossroads Crashes</b>	7	2

The VDOT data does not include four ped/bike collisions shown on the *Sharing the Roads in Virginia* (<http://sharevaroads.org/>) website for the period from 2014 to 2016. The additional 'Sharing the Roads in Virginia' crashes are listed below.

- (1) Pedestrian Crash at Tom Davis Drive
- (1) Pedestrian Crash at Bennett Drive
- (1) Bike Crash at Braddock Road
- (1) Bike Crash at Lacy Blvd
- (1) Bike Crash at Carlin Springs Road

## Existing Conditions

The project team analyzed crash, land use, transit, right-of-way, speed limit, traffic volume, bicycle network and pedestrian facility data within the study area.

### Public Transit

Columbia Pike is not only a major commuter route for passenger vehicles, but also hosts several Metrobus routes. Metrobus lines that serve Columbia Pike include the 401, and 402 in Annandale; the 16A, 16B, 16E, 16L, 26A throughout the corridor; and the 16X and 28A in Bailey's Crossroads.

### Sidewalk Gap Analysis

Figure 5 and Figure 6 show pedestrian infrastructure gaps located along the north and south curbs of Columbia Pike. On each map, four different types of pedestrian facilities are shown: trails, sidewalks, frontage roads, and frontage road sidewalks.

The eastbound direction (south curb) has far fewer gaps than the westbound direction (north curb), which make the eastbound direction a more viable option for complete connectivity along the corridor.

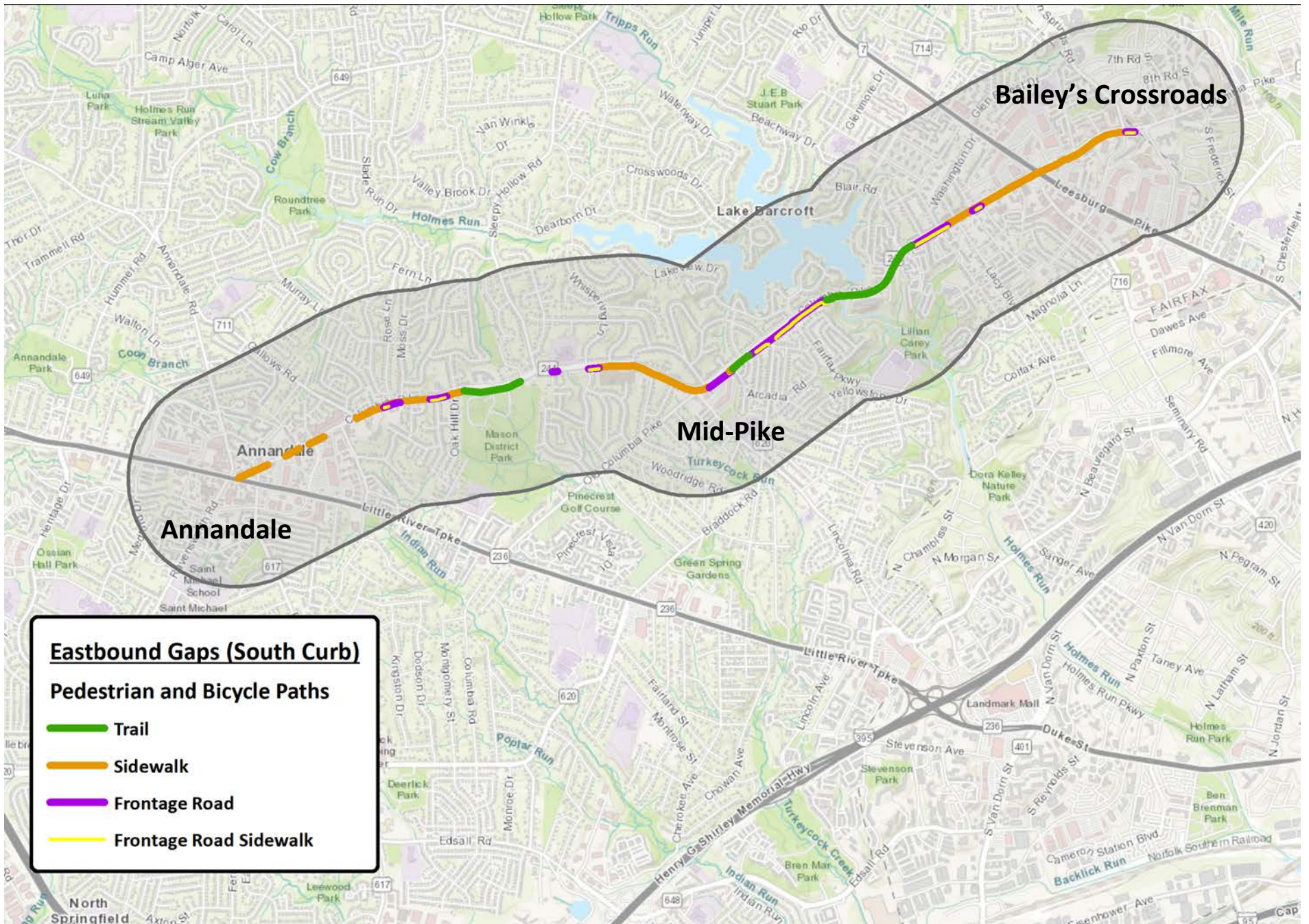


Figure 5: Eastbound Columbia Pike Gap Analysis

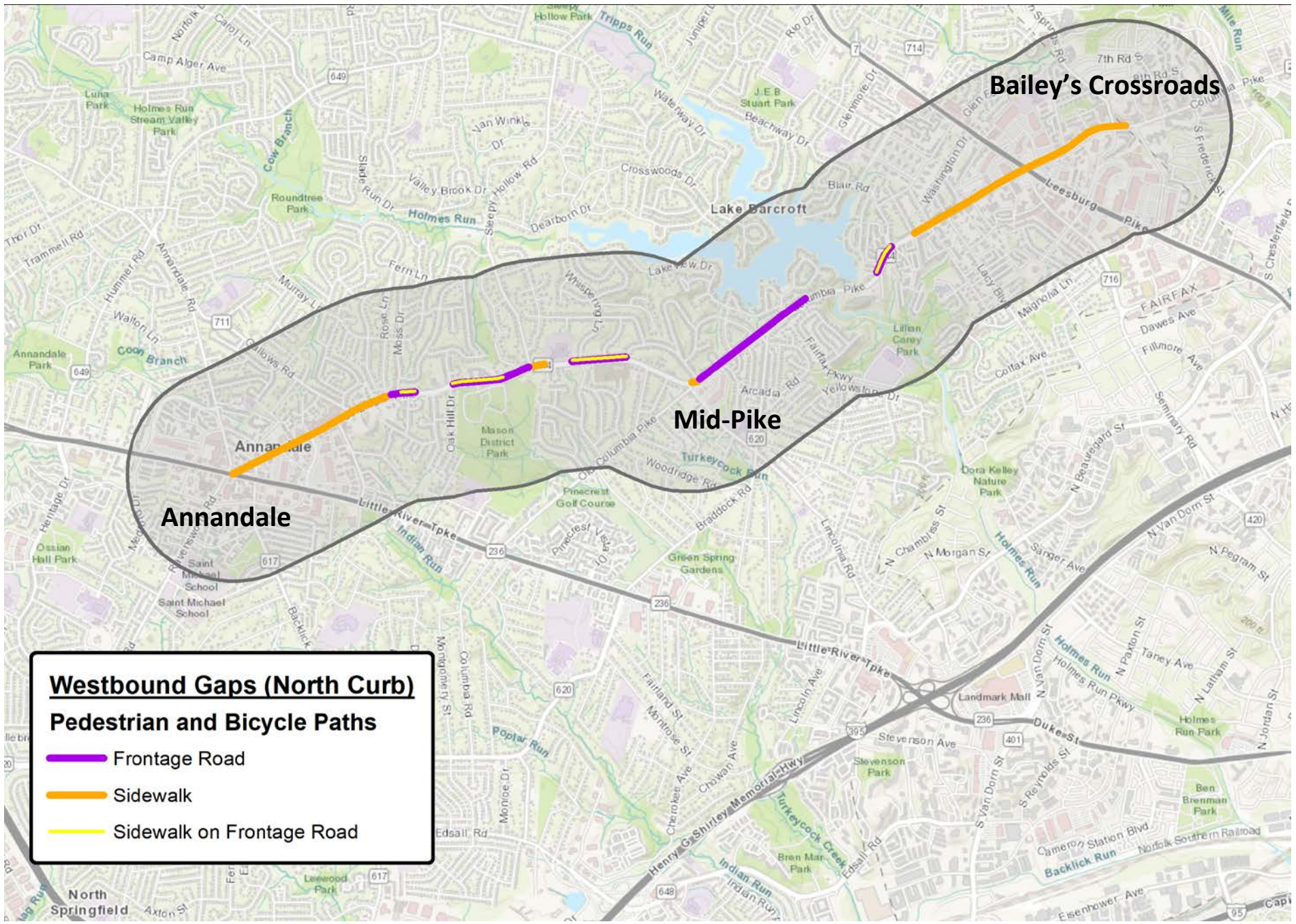


Figure 6: Westbound Columbia Pike Gap Analysis

## Annandale

Within Annandale, Columbia Pike is fronted by commercial properties, community facilities, and shopping centers. In the Annandale context zone, five-foot sidewalks are generally constructed along Columbia Pike in both the eastbound and westbound directions. Some portions of the Annandale area feature five-foot brick paver sidewalks and landscaped amenity panels. Most of the roadway has sidewalks, but there are intermittent gaps, frequent curb cuts, and some substandard sidewalks.

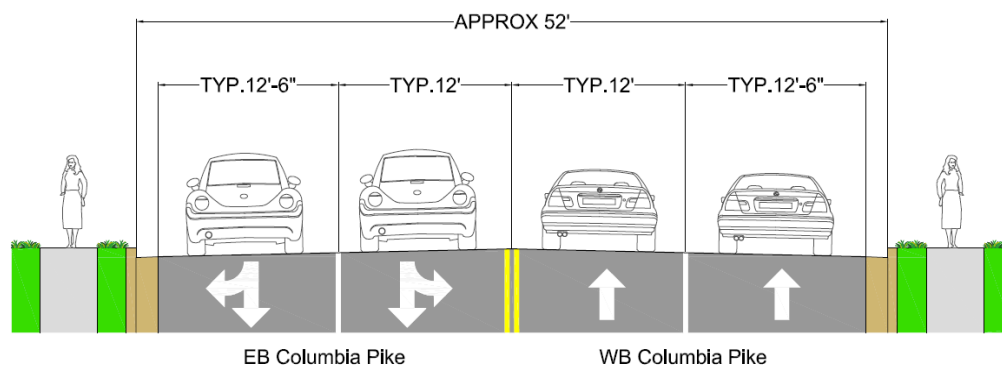


**Figure 7: Missing Crosswalk at Evergreen Lane**

There are also two signalized intersections on Columbia Pike (John Marr Drive and Gallows Road) within the Annandale area that do not include pedestrian signals. John Marr Drive and Gallows Road have ongoing VDOT projects that will address this issue. Between Backlick Road and John Marr Drive, there are no signalized intersections or pedestrian crossings. Between John Marr Drive and Gallows Road, there is one unsignalized, high visibility crossing across Columbia Pike by Evergreen Lane.

In addition to the pedestrian facilities in the Annandale context zone, there are on-street bicycle lanes on Evergreen Lane between Columbia Pike and Little River Turnpike.

The typical four-lane cross section is shown in Figure 8. Throughout Annandale, the left moving lanes are typically 12 feet wide, while the outer lanes are 12.5 feet and feature a 1.5-foot concrete gutter. This makes the combined typical width of the roadway 52 feet. From Little River Turnpike to Gallows Road, the posted speed limit is 25 mph. Many of the lanes at the intersections in the commercial area of Annandale are shared left and right turn lanes, as illustrated in Figure 8 for the intersection of Columbia Pike and John Marr Drive.



**Figure 8: Cross Section for Intersection of Columbia Pike and John Marr Drive**

## Mid-Pike

The Mid-Pike zone is a vehicle-oriented roadway with intermittent service roads and sidewalks. Portions of the eastbound roadway have both six and eight-foot wide multi-use trails but are not fully connected throughout the corridor. Sidewalks are much more frequent along the eastbound side than the westbound side of Columbia Pike, but are discontinuous on both sides. This context zone also has two uncontrolled pedestrian crossings; one at Evergreen Lane (see Figure 7) and another in front of Mason District Park.

Portions of the sidewalk require repairs. Mason District Park also falls within this context zone. This park has a trail that connects with a sidewalk just past Oak Hill Drive and continues up until



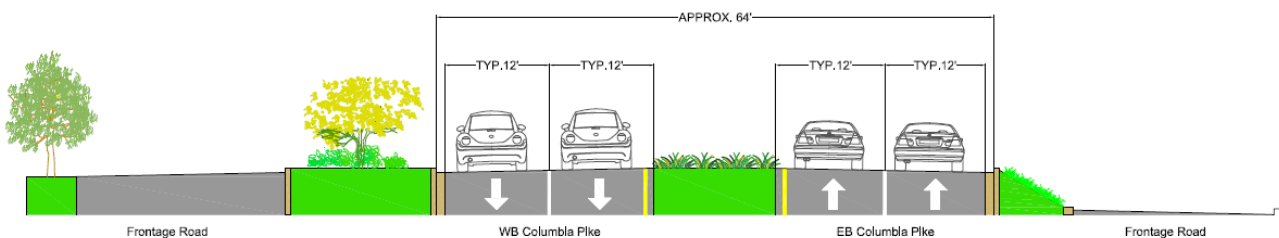
**Figure 9: Existing Pedestrian Bridge by Barcroft Dam**

just before Sleepy Hollow Road but does not connect with any other path. There are bike lanes along both sides of Sleepy Hollow Road from Columbia Pike to Bay Tree Lane.

The Mid-Pike zone also has frontage roads that provide access to the residential areas along Columbia Pike. These frontage roads are generally unmarked, two-

way roads that are used by residents. They typically have five-foot concrete sidewalks in front of the homes on the service roads.

Cross sections within the Mid-Pike context zone generally consist of 12-foot wide travel lanes and wide grass medians. An example of the typical cross section in this zone is illustrated in Figure 10, which shows the intersection of Columbia Pike and Aqua Terrace.



**Figure 10: Cross Section for Intersection of Columbia Pike and Aqua Terrace**

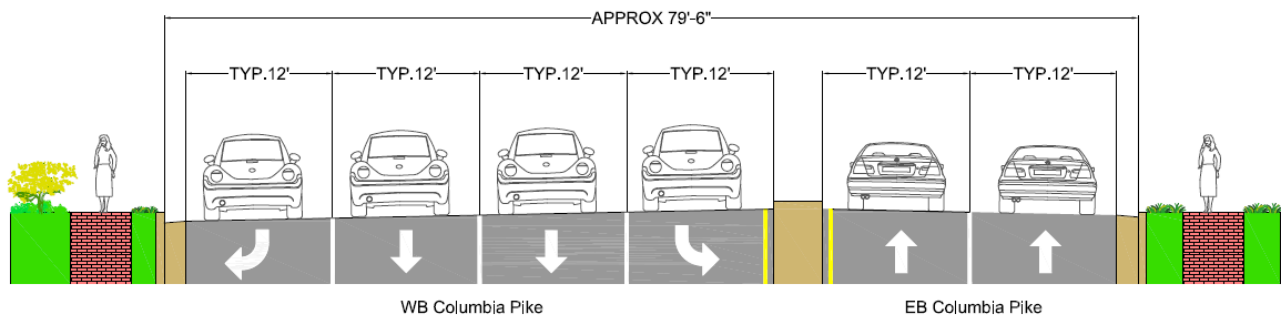
## Bailey's Crossroads

Columbia Pike is primarily a commercial corridor in the Bailey's Crossroads context zone. The area has distinctive sidewalks and roadway medians dividing eastbound and westbound traffic. The pedestrian facilities in this area consist of five- to six-foot wide, unit paver sidewalks, generally constructed alongside Columbia Pike in both the eastbound and westbound directions. This area has been enhanced in recent years by adding planted medians on both sides of the sidewalks and additional landscaping in the roadway medians. Bailey's Crossroads has three uncontrolled pedestrian crossings located at Tyler Street, Spring Lane, and Hess Station. Additionally, the signalized intersection of Maple Court and Columbia Pike does not have pedestrian signals.



**Figure 11: Typical Intersection in Bailey's Crossroads Context Zone**

Cross sections within the Bailey's Crossroads context zone generally have two lanes in each direction, with some segments having three lanes in each direction. This context zone also features turn lanes into the many shopping centers located along Columbia Pike. The lane widths throughout the area are generally 12 feet and feature 1.5-foot concrete gutters.



**Figure 12: Cross Section for Moray Lane and Columbia Pike**

# Identifying Community Concerns

## Community Engagement Pop-up Event

### Event

On April 14<sup>th</sup>, 2018 from 10:00 am to 2:00 pm, two pop-up events were held at the locations below:

Safeway at Bailey's Crossroads  
5821 Crossroads Circle  
Falls Church, VA 22041

Giant Food  
7137 Columbia Pike  
Annandale, VA 22003

The pop-up meeting format allowed participants to come and go on their own schedule, allowing for greater flexibility in attendance. The weather was a very comfortable 70-degree day with full sun.

### Purpose

The purpose of the community engagement event was to gather thoughts and concerns of the public regarding current pedestrian and bicycle safety conditions along Columbia Pike. The goal was to gather input from a variety of stakeholders surrounding the study area. Attendees at this event ranged from experienced cyclists, to local pedestrians, to driving commuters. As a result, a range of comments were gathered regarding the existing conditions and potential upgrades to the corridor.



**Figure 13: Pop-up Event Held at Annandale Giant**

### Outreach Efforts

Project stakeholders were informed about the pop-up events through a series of email blasts. The team developed a distribution list of various stakeholders in the area including community and neighborhood organizations, churches, businesses, schools, and cycling organizations. FCDOT also contacted elected officials from the study area directly.

To provide some basic facts and figures about the study, the team developed a factsheet to be distributed. FCDOT translated the information sheet to Spanish, Korean, Vietnamese, and Chinese in order to accommodate the predominant languages spoken in the area.

### Meeting Materials

At each pop-up location, the presentation materials included two informational boards, flyers regarding the project study, handouts about the Fairfax County Bike Network, and a scroll map of the study area which was used to gather information from the community.



Each pop-up location had two boards:

- Board 1 presented the project goal, timeline, study area, and pictures of four locations along the study area. These included: Evergreen Lane, Whispering Lane, Maplewood Drive, and Bailey's Crossroads Shopping Center
- Board 2 showed the existing conditions and the eastbound and westbound pedestrian and bike paths.

### Attendance

Approximately 80 members of the public attended the pop-up events to learn about the project and/or provide feedback. Most of the participants attended the Giant Food location in Annandale, with many of the attendees being members of the local biking community.

## Comments from the Public

A variety of comments were received at each both pop-up events. The sections below summarize the input received by activity.



**Figure 14: Scroll Map Filled with Comments from the Public**

In general, attendees supported improvements to Columbia Pike's pedestrian and cycling facilities. However, there were a few frequently mentioned topics from event participants:

- **Difficulty Crossing Columbia Pike:** Many of the comments noted difficulty crossing Columbia Pike. Multiple participants stated they would like to bike and/or walk to nearby destinations (such as schools, parks, and grocery stores), however, heavy traffic, high speeds, and aggressive drivers were considered as major deterrents. Some participants suggested adding flashing crosswalks (RFBs/HAWKs<sup>1</sup>), reducing the speed limit in Mid-Pike, and implementing police enforcement of the speed limit.
- **Separation Between Bicycles and Vehicles:** There was hesitation regarding the implementation of bike lanes, unless there is physical separation between people biking and driving (buffered bike lanes). This was expressed specifically by adults with children. To address this concern, some participants suggested using the existing service roads for bikes, implementing bike trails, or adding protected bike lanes.
- **Repair Sidewalks:** Many attendees stated that sidewalks in Annandale needed renovations, especially the south side of Columbia Pike.

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<sup>1</sup> RFB (Rapid Flashing Beacon) and HAWK (High-Intensity Activated Crosswalk)

# Concept Development

## Final Concepts

The project team developed concept-level recommendations for the 4.5-mile stretch of Columbia Pike in order to create a complete network of pedestrian and bicycle infrastructure. Some of the tools that were used in developing these recommendations include proposing buffered bike lanes, side paths, pedestrian activated crossings, high-visibility and standard crosswalks, Leading Pedestrian Intervals, and installing pedestrian signal poles at signalized crossings. Also included in these recommendations are maintaining existing paths and sidewalks and widening existing paths and sidewalks to accommodate both pedestrians and cyclists. Each of these tools are described in the sections below.

### Buffered Bike Lanes

Buffered bike lanes are created by striping a buffer zone between a bike lane and the adjacent travel lane. Buffered bicycle lanes should be considered at locations where there is excess pavement width or where adjacent traffic speeds are above 35 mph. Within this study corridor, buffered bike lanes are recommended on Sheets 3 and 4, for Annandale Options 2 and 3. Alternative 2 features two lanes in the westbound direction of Columbia Pike and one lane in the eastbound portion from Backlick Road to John Marr Drive. Alternative 3 features one travel lane in each direction with a two-way left-turn lane and buffered bike lanes in both directions. By utilizing buffered bike lanes in this portion of Annandale, the need for widening the existing sidewalks is eliminated. It also serves as a traffic calming measure by narrowing the lanes to 11-feet. A traffic study is required to determine the feasibility of this recommendation because of the removal of an eastbound vehicular lane.



**Figure 15: Buffered Bike Lane Example**



**Figure 16: Wayfinding Signage for Cyclists**

### Bike Route Signage

There are several frontage roads and side streets that can be utilized in the short term as workarounds to bypass uncomfortable portions of Columbia Pike. Signage could be used to direct cyclists to alternative routes instead of being forced to share the roadway with heavy vehicle traffic along the mid-Pike context zone. As an alternative or supplement to bike signage, sharrows or shared-use markings could be installed on the frontage roads along Columbia Pike.

## Sidepaths



**Figure 17: Existing Sidepath along Columbia Pike**

A sidepath is a shared-use path located adjacent to a roadway. It is designed for use by bicyclists and pedestrians and each may travel in either direction. Sidepaths are sometimes created by designating a wide sidewalk for shared use, or they may be a segment of a longer trail or network of trails. Sidepaths are sometimes provided to facilitate connections to on- and off-street bicycle facilities. Throughout the corridor, sidepaths are generally acceptable due to the low pedestrian

activity. In some areas of the corridor, existing sidepaths simply need to be maintained, whereas others need to be replaced and widened to a minimum width of 8-feet. Another important part of installing and maintaining sidepaths is to ensure that there is adequate pedestrian scale lighting along the pathway. This improves pedestrian and bicyclist visibility during darker hours, as well as enhancing the security and safety of the sidepath.

## Pedestrian Activated Crossings

Several pedestrian crossings along the corridor could benefit from adding a pedestrian activated crossing. A pedestrian activated signal would make it safer to cross Columbia Pike by requiring drivers to stop when pedestrians call for a WALK signal. The existing crossings that could be considered for this pedestrian improvement include the intersection of Columbia Pike and Evergreen Lane, the areas in front of Mason District Park, the Mason District Governmental Center (by Maplewood Drive), the intersection of Columbia Pike and Tom Davis Drive, the intersection of Columbia Pike and Moncure Avenue, and the intersection of Columbia Pike and Tyler Street. For the two new proposed crossings near Moss Drive and Ashwood Place, a pedestrian activated signal could also improve pedestrian safety.

## High-Visibility and Standard Crosswalks

Crosswalks are used to identify where pedestrians should cross the road. Recommendations for standard crosswalks have been added to many of the side street entrances onto Columbia Pike that currently do not have crosswalks. Several new high-visibility crosswalks could be added to create more prominent pedestrian crossings. Several standard crosswalks are recommended to be upgraded to high visibility crosswalks, including upgrades to the standard crosswalks across Columbia Pike at Gallows Road and throughout Bailey's Crossroads.

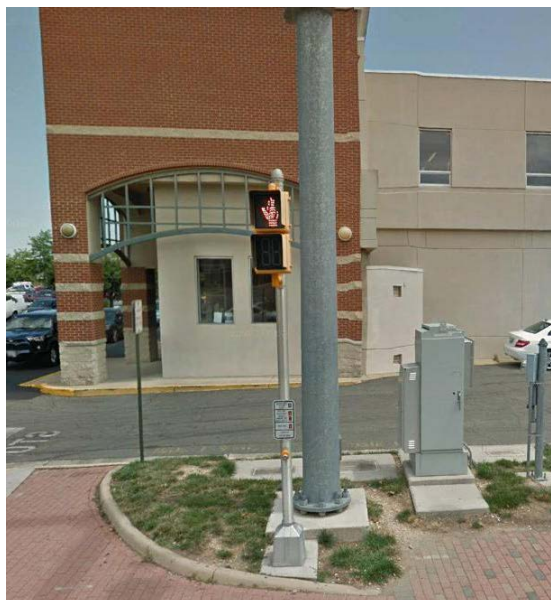


**Figure 18: High-Visibility Crosswalk Example**

## Leading Pedestrian Intervals

A Leading Pedestrian Interval (LPI) is a signal timing adjustment that gives pedestrians a head-start when crossing the street. The 'walk' signal for pedestrians appears at least three seconds before the green signal for drivers. Because pedestrians start to cross before cars begin moving, they are already well into the crosswalk when signal changes to green. As a best

practice, intersections with LPIs do not allow vehicles to turn right on red. Along the study corridor, it is recommended to conduct a traffic study at the intersection of Columbia Pike and Gallows Road to see if it meets the warrants for an LPI. It was stated during the public engagement event that it was difficult to cross Columbia Pike at that intersection within the crossing time currently allotted.



**Figure 19: Existing Pedestrian Signal Pole in Bailey's Crossroads**

### Pedestrian Signals

Pedestrian signals work in coordination with vehicular traffic signals to display the timing allowed for a pedestrian to cross the roadway. All signalized intersections should have countdown pedestrian timers. Three signals on Columbia Pike – John Marr Drive, Gallows Road, and Maple Court do not have pedestrian signals at this time. John Marr Drive and Gallows Road have projects currently addressing this issue, which is why these locations were excluded from adding pedestrian signals in this recommendation. It is recommended that two (2) pedestrian signal poles are added at Maple Court, and one (1) pedestrian signal pole be added at the intersection of Columbia Pike and Lincolnia Drive (in concordance with the new crossing).

### Pedestrian Wayfinding Signage

A short-term measure that could be implemented to improve pedestrian safety is to install pedestrian wayfinding signs to direct pedestrians to cross at the safest locations. These signs would be installed prior to major gaps in pedestrian infrastructure. Some examples of current locations that would benefit from this measure include the area in front of Mason District Park, in front of the Mason Governmental Center, and at the intersection of Columbia Pike and Blair Road. Certain locations in the recommendations would require pedestrian wayfinding signage in concordance with the installation of new sidewalks.



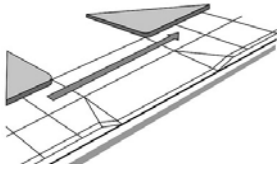
**Figure 20: Example of Potential Wayfinding Sign**

### Widening and Creating New Sidewalks

Throughout the study corridor, existing sidewalks are generally 5-foot wide with 2-foot planted medians. There are also several critical gaps located along the corridor – perhaps most notably, around the Mason District Park. In order to address the issues of the public, widening sidewalks and installing new sidewalks is recommended to improve pedestrian and bicycle safety. While some of the recommended new sidewalks are next to Columbia Pike, there are a few areas where it is recommended to install new frontage road sidewalks. New sidewalks along Columbia Pike could be 8-foot wide with a two-foot planted median. For the purposes of this study, the

recommendations outline the areas needing new sidewalks and where the existing sidewalks should be widened or improved to accommodate both pedestrians and cyclists.

### Roadway Access Points



Efforts should be made to consolidate driveway access points, particularly in the Annandale and Bailey's crossroads context zones. At driveway entrances, sidewalks should be maintained at-grade through the conflict zone. This recommendation needs to be implemented in coordination with property owners and land developers.

### Road Diet

A Road Diet is a treatment in which the number of travel lanes and/or effective width of the roadway is reduced to achieve better operations for all roadway users. Two versions road diet versions are presented for the four-lane undivided roadway segment of Columbia Pike in Annandale. One consists of removing one travel lane in the eastbound direction. The other consists of converting the same four-lane segment to a three-lane segment with two through lanes and a center two-way left-turn lane (TWLTL). Implementation of a road diet should explore opportunities for on-street parking along the eastbound (south curb) side of Columbia Pike.



**Figure 21: Road Diet Implementation in Reston, Virginia**

# Long-Term Visions

Long-Term Visions of Columbia Pike would be coordinated with redevelopment in Annandale and Bailey’s Crossroads context zones and roadway redesign in the mid-pike context zones. Cost estimates for long-term visions were not prepared as part of this study.

## Annandale Context Zone

The Fairfax County Comprehensive Plan, 2017 edition, Annandale Planning District Community Business Center (CBC) envisions Columbia Pike from Backlick Road to Gallows Road as an “Avenue Streetscape” with a 5-8’ landscape amenity panel, a 6-8’ sidewalk and a 4-6’ building zone. Bicycle facilities would be provided on-street. While the existing urban footprint does not have sufficient space to implement this in the near term, this vision can be accomplished in coordination with the redevelopment of the Annandale CBC.

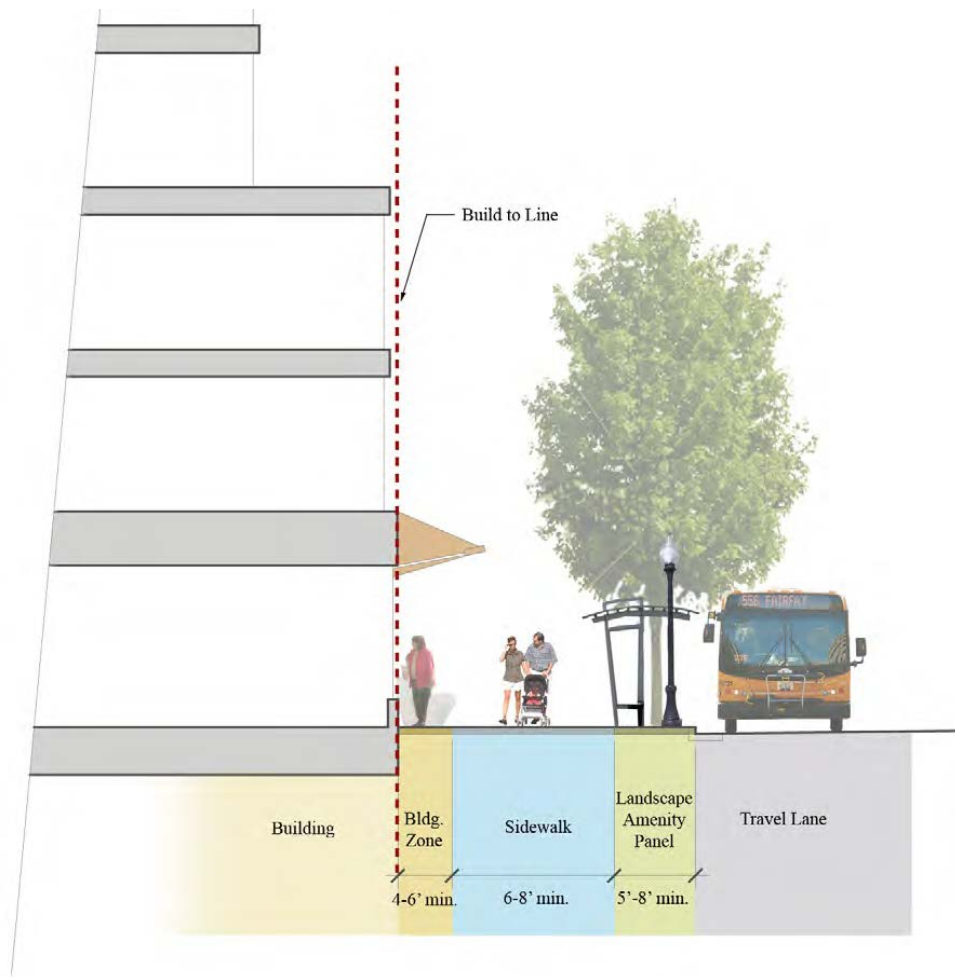
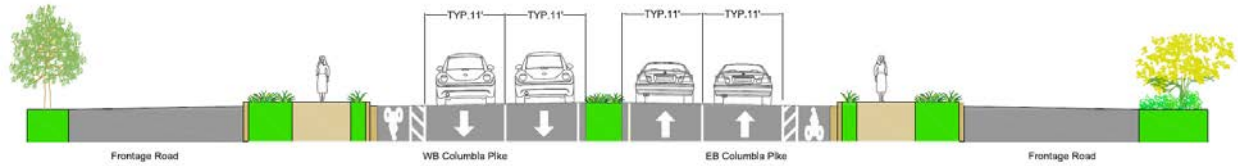


Figure 22: Long-Term Vision for Annandale Context Zone

### Mid-Pike Context Zone

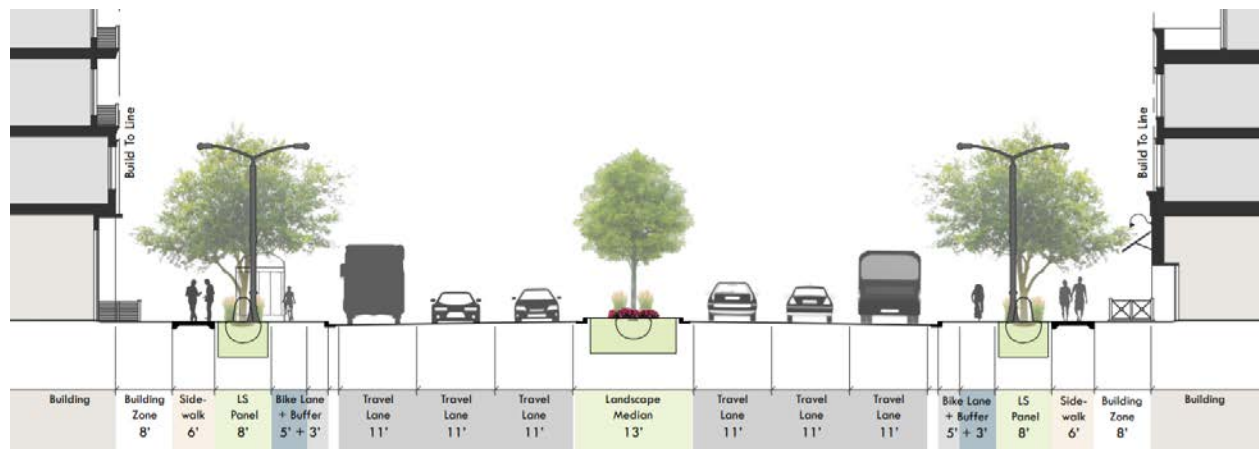
Protected bike lanes could be implemented in the Mid-Pike context zone through narrowing or eliminating medians and narrowing travel lanes to 11-feet. The speed limits in the Mid-Pike context zone would have to be lowered from existing 35 and 40 mph. Traffic calming measures such as narrowing travel lanes and reducing the speed limits would help to make protected bike lanes more comfortable for cyclists.



**Figure 23: Long-Term Vision for Mid-Pike Context Zone**

### Bailey's Crossroads Context Zone

The long-term vision for Bailey's Crossroads can be found in the District Design Guidelines for Bailey's Crossroads and Seven Corners ([found here](#)). The plan involves constructing a series of sidewalks and cycle tracks featuring landscaping panels. Implementation of this design concept would occur during redevelopment and may require land acquisition.



**Figure 24: Long-Term Vision for Bailey's Crossroads**

# Implementation Plan

An implementation plan was developed to identify short-term and long-term solutions for the corridor. This implementation plan consists of three phases, with Phase 1 consisting of the simplest solutions for the corridor. The phasing was chosen based on what could be done under existing VDOT and FCDOT maintenance programs, while phases 2 and 3 would require allocation of capital funding. Phase 3 would require the most amount of planning and funding to implement the extensive sidewalk installations and improvements. All proposed sidewalk costs were calculated on a square-yard (SY) unit cost of 4" concrete with no base. All proposed paths were calculated on a square-yard unit cost of 2" bituminous concrete with a 4" base. These cost estimates were found in the County of Fairfax, Virginia Land Development Services 2018 Unit Price Schedule. This study aimed to reduce the amount of land acquisition necessary to implement the recommendations. Therefore, most of the sidewalks improvements proposed attempt to follow right-of-way restrictions. Right-of-way boundaries were determined by using Fairfax County's Geospatial Data parcel maps.

In Phase I, it is recommended to install yield markings for vehicles coming from Backlick Road onto eastbound Columbia Pike, add wayfinding signage for pedestrians and cyclists to direct them away from critical gaps and upgrade some of the pedestrian crossings along Columbia Pike. The upgrades to the crossings would include studying the feasibility of adding an LPI at Gallows Road and making existing standard crossings in Bailey's Crossroads into high-visibility crosswalks. The totals for each item was calculated by taking the subtotal and factoring in Maintenance of Traffic (10%), Utilities (30%), Mobilization (10%), and also the Construction Contingency (25%), Engineering Fees (5%), and Design Fees (7%).

Phase 1					
Location	Improvement Measure	Quantity	Unit	Unit Price	Price
Backlick Road	Add Yield Markings on Ramp from Backlick Road to Columbia Pike	10	LF	\$ 11.57	\$ 116
Gallows Road	Leading Pedestrian Interval Study and Implementation at Gallows Road	1	each	\$ 1,200	\$ 1,200
Mid-Pike	Add Pedestrian Wayfinding Signs near Critical Gaps	7	each	\$ 450.00	\$ 3,150
Mid-Pike	Add Wayfinding to Frontage and Side Roads	37	each	\$ 450.00	\$ 16,650
Bailey's Crossroads	Upgrade Existing Crosswalks in Baileys to High Visibility	704	LF	\$ 48.00	\$ 33,792
<i>Subtotal</i>					\$ 54,908
<i>Total</i>					\$ 115,306

Phase 2 of the implementation plan consists mostly of addressing the critical pedestrian infrastructure gaps. This phase outlines what gaps could easily be closed by adding a sidewalk or sidepath. The sidewalk could vary from eight to ten feet in width but should be at least eight feet so that it can be utilized by both pedestrians and cyclists. Also, in this phase is the critical gap between Belvedere Elementary School and Mason District Park. Currently, there is not a completely connected path between these two locations, however, it was a frequently occurring comment at the public engagement event. Although there are grade challenges in creating this new sidewalk, it is included in Phase 2 due to the impact of the current challenges faced by pedestrians.



Phase 2					
Location	Improvement Measure	Quantity	Unit	Unit Price	Price
Backlick and John Marr	New EB Sidewalk b/w Backlick and John Marr	411	SY	\$ 55.00	\$ 22,629
	Install ADA Compliant Ramps	4	ramps	\$ 2,820.00	\$ 11,280
<i>Subtotal</i>					<b>\$ 33,909</b>
<b>Total</b>					<b>\$ 71,210</b>
John Marr and Evergreen	New EB Sidewalk b/w John Marr and Evergreen Ln	489	SY	\$ 55.00	\$ 26,901
	Install ADA Compliant Ramps	2	ramps	\$ 2,820.00	\$ 5,640
	New Standard Crosswalk	82	LF	\$ 2.54	\$ 208
	New Stop Bar	18	LF	\$ 19.20	\$ 346
<i>Subtotal</i>					<b>\$ 33,095</b>
<b>Total</b>					<b>\$ 69,499</b>
Martin Taylor Ct and Rose Ln	New Sidewalk b/w Martin Taylor Court and Rose Lane	110	SY	\$ 55.00	\$ 6,068
	Install ADA Compliant Ramps	2	ramps	\$ 2,820.00	\$ 5,640
	New Standard Crosswalk	88	LF	\$ 2.54	\$ 224
<i>Subtotal</i>					<b>\$ 11,932</b>
<b>Total</b>					<b>\$ 25,057</b>
Rose Lane and Moss Drive	New WB Sidewalk b/w Rose Lane and Moss Drive	277	SY	\$ 55.00	\$ 15,247
	Install ADA Compliant Ramps	6	ramps	\$ 2,820.00	\$ 16,920
	New Standard Crosswalk	263	LF	\$ 2.54	\$ 668
	New Stop Bar	30	LF	\$ 19.20	\$ 576
	New High Visibility Crosswalk	78	LF	\$ 48.00	\$ 3,744
	Possible HAWK Signal	1	each	\$225,000.00	\$225,000
<i>Subtotal</i>					<b>\$262,155</b>
<b>Total</b>					<b>\$550,526</b>
Wynnwood Drive	New EB Sidewalk by Wynnwood Drive	368	SY	\$ 55.00	\$ 20,258
	Install ADA Compliant Ramps	2	ramps	\$ 2,820.00	\$ 5,640
	New Standard Crosswalk	86	LF	\$ 2.54	\$ 218
<i>Subtotal</i>					<b>\$ 26,117</b>
<b>Total</b>					<b>\$ 54,845</b>
Ancient Oaks Court	New EB Sidewalk by Ancient Oaks Court	34	SY	\$ 55.00	\$ 1,858
	Install ADA Compliant Ramps	1	ramps	\$ 2,820.00	\$ 2,820
	New Standard Crosswalk	88	LF	\$ 2.54	\$ 224
	New Stop Bar	20	LF	\$ 19.20	\$ 384
<i>Subtotal</i>					<b>\$ 5,285</b>
<b>Total</b>					<b>\$ 11,099</b>
Crossing at Sleepy Hollow	Add EB 10' Critical Sidewalk across from Sleepy Hollow Road	289	SY	\$ 55.00	\$ 15,889
	Gravity Wall	47	CY	\$ 750.00	\$ 35,100
	Earthwork for New Extensive Engineering Sidewalks	265	CY	\$ 8.00	\$ 2,119
	Add Sidewalk on Corner of Sleepy Hollow Road	66	SY	\$ 55.00	\$ 3,642
	Add High Visibility Crosswalk by Sleepy Hollow Road	84	LF	\$ 48.00	\$ 4,032
	Install ADA Compliant Ramps	4	ramps	\$ 2,820.00	\$ 11,280
	Refurbish Curb Ramp	1	ramps	\$ 3,840.00	\$ 3,840
<i>Subtotal</i>					<b>\$ 75,902</b>

					<b>Total</b>	<b>\$ 159,393</b>
Belvedere Elementary	New WB Sidewalk in Front of Belvedere Elementary	319	SY	\$ 55.00	\$ 17,539	
	Install ADA Compliant Ramps	4	ramps	\$ 2,820.00	\$ 11,280	
	New High Visibility Crosswalk	58	LF	\$ 48.00	\$ 2,784	
<i>Subtotal</i>					<b>\$ 31,603</b>	
					<b>Total</b>	<b>\$66,366</b>
Whispering Lane	New EB Sidewalk by Whispering Lane	2223	SY	\$ 55.00	\$122,271	
<i>Subtotal</i>					<b>\$122,271</b>	
					<b>Total</b>	<b>\$256,769</b>
Barcroft Shopping Center	New EB Sidewalk in front of Barcroft Shopping Center	913	SY	\$ 55.00	\$ 50,221	
	New WB Sidewalk on Frontage Road by Barcroft Shopping Center	316	SY	\$ 55.00	\$ 17,356	
	Install ADA Compliant Ramps	10	ramps	\$ 2,820.00	\$ 28,200	
	New Standard Crosswalk	288	LF	\$ 2.54	\$ 732	
	New High Visibility Crosswalk	70	LF	\$ 48.00	\$ 3,360	
	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000	
<i>Subtotal</i>					<b>\$ 324,868</b>	
					<b>Total</b>	<b>\$682,223</b>
Birchwood and Lakewood Drive	New EB Sidewalk b/w Birchwood and Lakewood Drive	483	SY	\$ 55.00	\$ 26,553	
	Install ADA Compliant Ramps	3	ramps	\$ 2,820.00	\$ 8,460	
	New Standard Crosswalk	178	LF	\$ 2.54	\$ 452	
	New Stop Bar	28	LF	\$ 19.20	\$ 538	
<i>Subtotal</i>					<b>\$ 36,002</b>	
					<b>Total</b>	<b>\$ 75,605</b>
Fairfax Parkway	New EB Frontage Road Sidewalk by Fairfax Parkway	246	SY	\$ 55.00	\$ 13,530	
	New Standard Crosswalk	144	LF	\$ 2.54	\$ 366	
	New Stop Bar	28	LF	\$ 19.20	\$ 538	
<i>Subtotal</i>					<b>\$ 14,433</b>	
					<b>Total</b>	<b>\$ 30,310</b>
Blair Road	New WB Sidewalk by Blair Road	284	SY	\$ 55.00	\$ 15,602	
<i>Subtotal</i>					<b>\$ 15,602</b>	
					<b>Total</b>	<b>\$ 32,764</b>
New Tom Davis Crosswalk	New High Visibility Crosswalk	48	LF	\$ 48.00	\$ 2,304	
	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000	
	Install ADA Compliant Ramps	2	ramps	\$ 2,820.00	\$ 5,640	
<i>Subtotal</i>					<b>\$ 232,944</b>	
					<b>Total</b>	<b>\$ 489,182</b>
New Moncure Ave Crosswalk	New High Visibility Crosswalk	64	LF	\$ 48.00	\$ 3,072	
	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000	
	Install ADA Compliant Ramps	4	ramps	\$ 2,820.00	\$ 11,280	
<i>Subtotal</i>					<b>\$ 239,352</b>	
					<b>Total</b>	<b>\$ 502,639</b>
Tyler Street	New EB Sidewalk by Tyler Street	198	SY	\$ 55.00	\$ 10,872	
	Install ADA Compliant Ramps	2	ramps	\$ 2,820.00	\$ 5,640	

	New Standard Crosswalk	152	LF	\$ 2.54	\$ 386
	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000
<i>Subtotal</i>					<b>\$ 241,898</b>
<b>Total</b>					<b>\$507,985</b>
Evergreen Lane	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000
<i>Subtotal</i>					<b>\$ 225,000</b>
<b>Total</b>					<b>\$ 472,500</b>
Mason District Park	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000
<i>Subtotal</i>					<b>\$ 225,000</b>
<b>Total</b>					<b>\$ 472,500</b>
Mason Governmental Center	Possible HAWK Signal	1	each	\$ 225,000	\$ 225,000
<i>Subtotal</i>					<b>\$ 225,000</b>
<b>Total</b>					<b>\$ 472,500</b>
Lincolnia Drive	Add Pedestrian Signal Poles at Lincolnia Drive	1	each	\$ 9,360.00	\$ 9,360
<i>Subtotal</i>					<b>\$ 9,360</b>
<b>Total</b>					<b>\$ 19,656</b>
Maple Ct/Lacy Blvd	Add Pedestrian Signal Poles at Maple Court/Lacy Boulevard	2	each	\$ 9,360.00	\$ 18,720
<i>Subtotal</i>					<b>\$ 18,720</b>
<b>Total</b>					<b>\$ 39,312</b>

Phase 3 consists of long-term infrastructure improvements such as widening existing sidewalks and shared use paths as well as tackling the areas with grade differences or other engineering difficulties. This section is split up by context zones and by the three major sidewalks that require more significant financial contribution than the sidewalks added in Phase 2. It also includes the suggested improvements to existing curb ramps that are not ADA compliant.

Phase 3					
Location	Improvement Measure	Quantity	Unit	Unit Price	Price
Annandale	Demolish Existing 5' Sidewalks	2013	SY	\$ 25.00	\$ 50,332
	Widen Sidewalks to 10'	4027	SY	\$ 55.00	\$221,461
	Upgrade Existing Ramps to ADA Compliant Ramps	17	ramps	\$ 3,840.00	\$ 65,280
	Install ADA Compliant Ramps	8	ramps	\$ 2,820.00	\$ 22,560
	New High Visibility Crosswalk	130	LF	\$ 48.00	\$ 6,240
<i>Subtotal</i>					<b>\$365,873</b>
<b>Total</b>					<b>\$768,332</b>
Mid-Pike	Demolish Existing 5' Sidewalks	3825	SY	\$ 25.00	\$ 95,614
	Widen Sidewalks to 10'	7649	SY	\$ 55.00	\$420,701
	Demolish Existing 6' Paths	1367	SY	\$ 13.20	\$ 18,040
	Widen Paths to 10'	2278	SY	\$ 36.00	\$ 82,000
	Upgrade Existing Ramps to ADA Compliant Ramps	32	ramps	\$ 3,840.00	\$122,880
	Install ADA Compliant Ramps	17	ramps	\$ 2,820.00	\$ 47,940

	New High Visibility Crosswalk	0	LF	\$ 48.00	\$ 0
	New Standard Crosswalk	1961	LF	\$ 2.54	\$ 4,981
	Stop Bars	220	LF	\$ 19.20	\$ 4,224
<i>Subtotal</i>					<b>\$796,380</b>
<b>Total</b>					<b>\$1,672,398</b>
North Side between Maplewood Dr & Maplewood Dr	Clear & Grub	0.429	AC	\$ 20,000	\$ 8,586
	Concrete Removal	133	SY	\$ 25.00	\$ 3,333
	Excavation	1131	CY	\$ 8.00	\$ 9,044
	Extensive Engineering Sidewalk	1889	SY	\$ 55.00	\$103,889
	Concrete Driveway 6"	222	SY	\$ 55.00	\$ 12,222
	Gravity Wall	216	CY	\$ 750.00	\$161,625
<i>Subtotal</i>					<b>\$298,700</b>
<b>Total</b>					<b>\$627,269</b>
Existing structural wall & Excavation b/w Moss Dr & Oak Hill Dr	Clear & Grub	0.303	AC	\$ 20,000	\$ 6,061
	Concrete Removal	78	SY	\$ 25.00	\$ 1,944
	Excavation	519	CY	\$ 8.00	\$ 4,148
	Extensive Engineering Sidewalk	1333	SY	\$ 55.00	\$ 73,333
	Curb & Gutter	75	LF	\$ 25.00	\$ 1,875
	Gravity Wall/Retaining Wall	215	CY	\$ 750.00	\$161,250
<i>Subtotal</i>					<b>\$248,612</b>
<b>Total</b>					<b>\$522,084</b>
Existing Gravity Wall Sidewalk between Gallows & Martin Taylor Court	Concrete Removal	83	SY	\$ 25.00	\$ 2,083
	Excavation	222	CY	\$ 8.00	\$ 1,778
	Extensive Engineering Sidewalk	139	SY	\$ 55.00	\$ 7,639
	Gravity Wall/Retaining Wall	108	CY	\$ 750.00	\$ 80,625
	Trench Drain behind wall	200	LF	\$ 50.00	\$ 10,000
<i>Subtotal</i>					<b>\$102,125</b>
<b>Total</b>					<b>\$ 214,463</b>
Bailey's Crossroads	Demolish Existing 5' Sidewalks	4145	SY	\$ 25.00	\$103,618
	Widen Sidewalks to 10'	8289	SY	\$ 55.00	\$455,919
	Upgrade Existing Ramps to ADA Compliant Ramps	3	ramps	\$ 3,840.00	\$ 11,520
	New High Visibility Crosswalk (Existing are Decorative)	71	LF	\$ 48.00	\$ 3,408
	New Standard Crosswalk	800	LF	\$ 2.54	\$ 2,032
	Stop Bars	161	LF	\$ 19.20	\$ 3,091
<i>Subtotal</i>					<b>\$579,589</b>
<b>Total</b>					<b>\$1,217,136</b>

Phase 3 visions for this project would require additional studies to determine the feasibility of the design concepts at that time. An entire cost estimate for the corridor can be found in Appendix C, which summarizes the combination of all three phases.

Alternatives					
Location	Improvement Measure	Quantity	Unit	Unit Price	Price
Braddock Road Side	Demolish Curb and Gutter	183	LF	\$ 18.10	\$ 3,312
	Install Curb and Gutter	243	LF	\$ 25.00	\$ 6,075

Road Narrowing	Clear and Grub	0.0480	AC	\$20,000	\$ 960
	Plant Grass	232	SY	\$ 3.00	\$ 697
	Borrow	77	CY	\$ 31.20	\$ 2,415
	Demolition of Asphalt Pavement	232	SY	\$ 13.20	\$ 3,065
				<i>Subtotal</i>	<b>\$16,524</b>
				<b>Total</b>	<b>\$34,700</b>
Annandale Option 2	Striping - 4"	9129.25	LF	\$ 0.73	\$ 6,664
	Elongated Arrow	3	each	\$132.00	\$ 396
	Elongated Double Arrow	1.0000	each	\$192.00	\$ 192
	Bike Lane Marking	19	each	\$300.00	\$ 5,700
	Eradicate Pavement Markings	4152	LF	\$ 0.60	\$ 2,491
	Slurry Seal Coat	24662	SY	\$ 2.00	\$49,324
				<i>Subtotal</i>	<b>\$64,768</b>
				<b>Total</b>	<b>\$136,012</b>
Annandale Option 3	Striping - 4"	10108	LF	\$ 0.73	\$ 7,379
	Elongated Arrow	25	each	\$ 132.00	\$ 3,300
	Elongated Double Arrow	1	each	\$ 192.00	\$ 192
	Bike Lane Marking	19	each	\$ 300.00	\$ 5,700
	Pedestrian Refuge Island	1	each	\$ 15,000	\$ 15,000
	High-Visibility Crosswalk Markings - 10'	48	LF	\$ 48.00	\$ 2,304
	Eradicate Pavement Markings	4152	LF	\$ 0.60	\$ 2,491
	Slurry Seal Coat	24662	SY	\$ 2.00	\$ 49,324
				<i>Subtotal</i>	\$ 85,690
				<b>Total</b>	<b>\$179,949</b>

In the long term, Columbia Pike could be redesigned to become an urban arterial that operates at slower speeds and is better suited for pedestrians, cyclists and transit users. If travel lanes are narrowed to 11 feet, curb radii tightened and pedestrian refuges added, the roadway would be able to support separated on-street bicycle lanes. Cost estimates for a total redesign of the roadway were not prepared as part of this project.

# Appendix A

## Public Engagement Materials

ITEM	USE	DESCRIPTION/ CONTENT
<b>Press Release</b>	Used to remind organization to join our public event.	The press has the public meeting or event information and sends to all related organizations. It serves the same function as e-blast, in addition, it informs public through news or other media.
<b>Project One Pager</b>	Used to summarize the project and status for the public	The one-pager is a front and back printed fact sheet containing more in-depth information about the study process and the current status. The layout typically features the introductory project blurb, study area map, process graphic, study goals and/or objectives, and ways to stay connected

## Public Engagement Comments

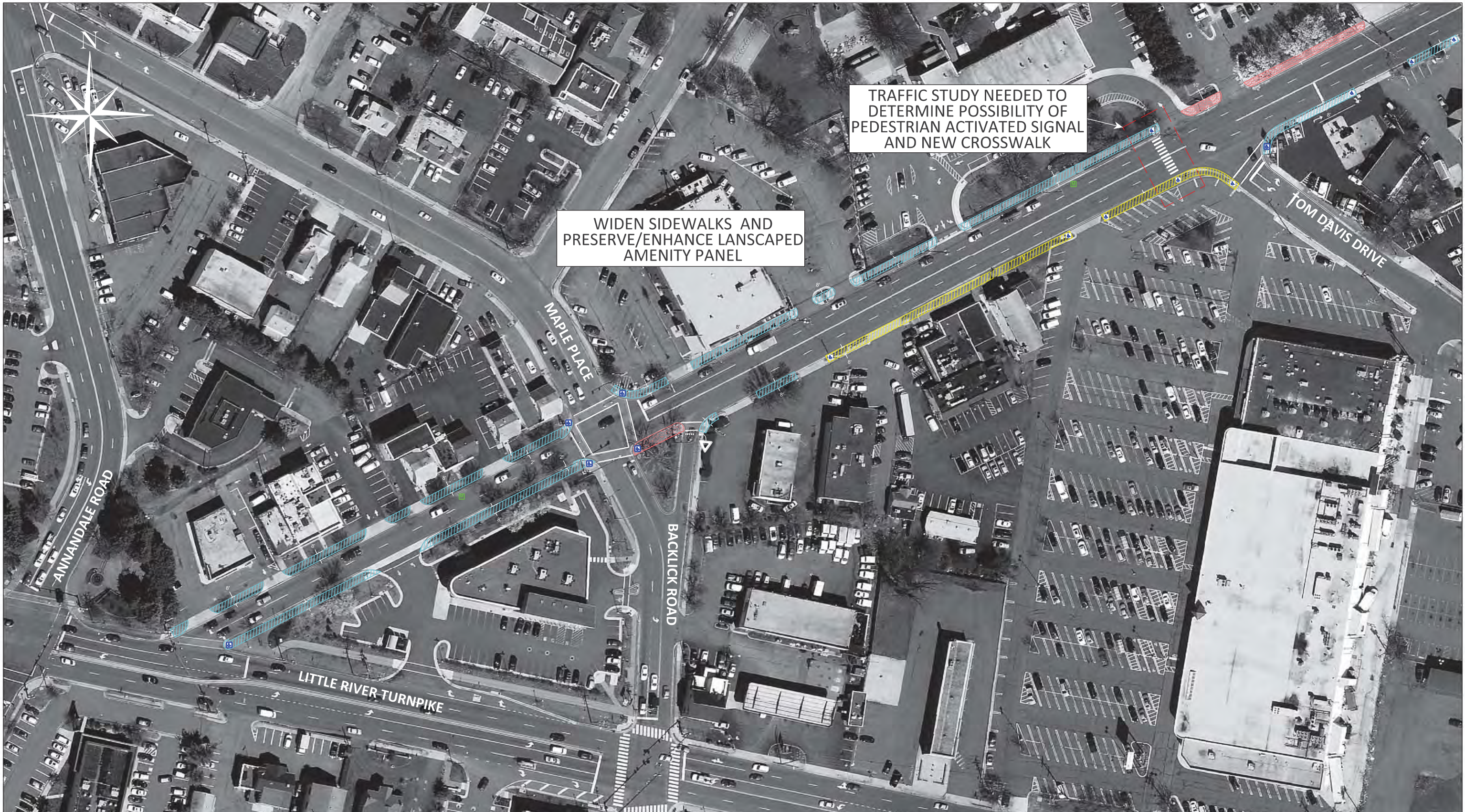
LOCATION SPECIFIC COMMENTS	
<b>Annandale</b>	<ul style="list-style-type: none"> <li>• Desire for bike parking, particularly around shopping area</li> <li>• Desire for bike lanes throughout Annandale</li> <li>• Sidewalks need renovation</li> <li>• Desire for crosswalk across Columbia Pike near Tom Davis Drive from ACCA to Giant</li> <li>• The intersection of John Marrs Drive and Columbia Pike is not clear for crossing pedestrians</li> <li>• Cyclists have issues biking over curbs throughout Annandale, specifically between John Marr Drive and Gallows Road</li> <li>• Desire for better enforcement of yielding to pedestrians in crosswalks</li> <li>• The pedestrian signal at Gallows Road is too short to cross</li> <li>• Desire for a speed limit reduction or more enforcement after crossing into the residential area of Annandale, past Gallows Road</li> <li>• Desire to have sidewalks between Moss Drive and Oak Hill Drive</li> </ul>
<b>Mason District Park</b>	<ul style="list-style-type: none"> <li>• Desire for a traffic light at intersection with entrance to the park</li> <li>• Desire for better enforcement of yielding to pedestrians in crosswalks</li> <li>• Desire for a lower speed limit around the curb to make crossing safer for pedestrians</li> <li>• Trail needs repaving, dangerous for cyclists</li> <li>• Trail should be made a true shared-use path and marked as a two-way path for cyclists</li> <li>• Kids should be able to walk/bike to the park, especially from the school</li> </ul>
<b>Mid-Pike</b>	<ul style="list-style-type: none"> <li>• Desire for bike lanes throughout the mid-pike area</li> <li>• Desire to lower the speed limit</li> <li>• Utilize service roads as bike corridors, not cut-throughs for drivers. Reduce lane width and paint bike lanes</li> <li>• Desire for sidewalks on both sides of Columbia Pike in addition to safe bike access on both sides</li> <li>• Rose Lane is used by cyclists</li> <li>• Desire for a bike trail from Lake Barcroft to the Mason District Park</li> <li>• Drivers in the Barcroft Plaza Shopping Center area do not yield to pedestrians in the crosswalks</li> </ul>
<b>Area Around Governmental Center</b>	<ul style="list-style-type: none"> <li>• Make the crosswalk at Maplewood Drive automatic rather than a push button that slows down cyclists</li> <li>• Desire to make crossing at Maplewood Drive a flashing crosswalk, also with police enforcement</li> </ul>

	<ul style="list-style-type: none"> <li>• There are bad speed bumps on this stretch of the service road. You really need to put bike lanes directly on Columbia Pike.</li> <li>• Desire for bike lanes from Maplewood Drive to Lincolnia Drive</li> <li>• The pedestrian crossing near Downing Street is not safe for pedestrian crossing</li> </ul>
<b>Bailey's Crossroads</b>	<ul style="list-style-type: none"> <li>• There is a high concentration of families in this area that walk to grocery stores from apartments</li> </ul>
<b>Corridor-Wide</b>	<ul style="list-style-type: none"> <li>• Frequent comments regarding connectivity of sidewalks throughout the corridor</li> <li>• Desire to have a shared-use trail over having bike lanes because trails can be used by all ages</li> <li>• Neighborhood roads can be used to get from Sleepy Hollow Woods to Annandale</li> <li>• Possible bike routes include Blair – Lake - Glen Forest - Carlin Springs - Dirt path over Long Brank Creek. Also, Glen Forest Dr - Charles St - Lake St - Blair Rd are an ok by-pass.</li> <li>• Speeding and use of cell phones are frequent along the corridor, there should be enforcement of these issues</li> </ul>

# Appendix B

## Concept-Level Recommendations





TRAFFIC STUDY NEEDED TO DETERMINE POSSIBILITY OF PEDESTRIAN ACTIVATED SIGNAL AND NEW CROSSWALK

WIDEN SIDEWALKS AND PRESERVE/ENHANCE LANSCAPED AMENITY PANEL

PLANNING LEVEL DRAWING

SCALE: 1"=100'

- Maintain Existing Sidewalk/Trail
- Widen Sidewalks
- Widen Existing Trails
- Add Sidewalks
- Existing Curb Lines
- Private Frontage Road Sidewalks
- Utilize Frontage or Side Road Sidewalks
- Extensive Engineering Required to Widen/Add Sidewalk
- Add Pedestrian Signal Pole
- Install ADA Compliant Curb Ramp
- Upgrade to ADA Compliant Curb Ramp
- Existing Metro Bus Stops

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FAIRFAX COUNTY DEPARTMENT OF TRANSPORTATION

1 of 26 (ANNANDALE OPTION 1)



PLANNING LEVEL DRAWING

SCALE: 1"=100'

- Maintain Existing Sidewalk/Trail
- Widen Sidewalks
- Widen Existing Trails
- Add Sidewalks
- Existing Curb Lines
- Private Frontage Road Sidewalks
- Utilize Frontage or Side Road Sidewalks
- Extensive Engineering Required to Widen/Add Sidewalk
- Add Pedestrian Signal Pole
- Install ADA Compliant Curb Ramp
- Upgrade to ADA Compliant Curb Ramp
- Existing Metro Bus Stops

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2 of 26 (ANNANDALE OPTION 1)



CONDUCT STUDY TO EXAMINE POSSIBILITY TO REDUCE ONE LANE NORTHBOUND, ADD 5' BUFFERED BIKE LANES BOTH DIRECTIONS

CONDUCT STUDY TO EXAMINE POSSIBILITY OF EXTENDING THE BUFFERED BIKE LANE FROM BACKLICK ROAD TO LITTLE RIVER TURNPIKE BY REMOVING ONE TRAVEL LANE

PLANNING LEVEL DRAWING

SCALE: 1"=100'

- Maintain Existing Sidewalk/Trail
- Widen Sidewalks
- Widen Existing Trails
- Add Sidewalks
- Existing Curb Lines
- Private Frontage Road Sidewalks
- Utilize Frontage or Side Road Sidewalks
- Extensive Engineering Required to Widen/Add Sidewalk
- Add Pedestrian Signal Pole
- Install ADA Compliant Curb Ramp
- Upgrade to ADA Compliant Curb Ramp
- Existing Metro Bus Stops

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FAIRFAX COUNTY DEPARTMENT OF TRANSPORTATION

3 of 26 (ANNANDALE OPTION 2)



PLANNING LEVEL DRAWING

SCALE: 1"=100'

- Maintain Existing Sidewalk/Trail
- Widen Sidewalks
- Widen Existing Trails
- Add Sidewalks
- Existing Curb Lines
- Private Frontage Road Sidewalks
- Utilize Frontage or Side Road Sidewalks
- Extensive Engineering Required to Widen/Add Sidewalk
- Add Pedestrian Signal Pole
- ♿ Install ADA Compliant Curb Ramp
- ♿ Upgrade to ADA Compliant Curb Ramp
- M Existing Metro Bus Stops

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FAIRFAX COUNTY DEPARTMENT OF TRANSPORTATION  
 4 of 26 (ANNANDALE OPTION 3)



CONDUCT STUDY TO ADD LEADING PEDESTRIAN INTERVALS TO ALLOW MORE TIME TO CROSS COLUMBIA PIKE AT GALLOWS ROAD

EXISTING RETAINING WALL WOULD NEED TO BE MOVED IN ORDER TO WIDEN SIDEWALK TO 8'

TRAFFIC STUDY NEEDED TO DETERMINE POSSIBILITY OF PEDESTRIAN ACTIVATED SIGNAL AND NEW CROSSWALK

PLANNING LEVEL DRAWING

SCALE: 1"=100'

- Maintain Existing Sidewalk/Trail
- Widen Sidewalks
- Widen Existing Trails
- Add Sidewalks
- Existing Curb Lines
- Private Frontage Road Sidewalks
- Utilize Frontage or Side Road Sidewalks
- Extensive Engineering Required to Widen/Add Sidewalk
- Add Pedestrian Signal Pole
- ♿ Install ADA Compliant Curb Ramp
- ♿ Upgrade to ADA Compliant Curb Ramp
- M Existing Metro Bus Stops

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In the long term, the entire roadway could be redesigned as a slower speed roadway with narrower lanes, pedestrian refuges and a separated on-street bike lane.

TRAFFIC STUDY NEEDED TO DETERMINE POSSIBILITY OF PEDESTRIAN ACTIVATED SIGNAL

PLANNING LEVEL DRAWING

SCALE: 1"=100'

- Maintain Existing Sidewalk/Trail
- Widen Sidewalks
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UTILIZE SIDE STREETS FROM  
OAK HILL DR TO MOSS DR  
AS BIKE PATH

WAYFINDING SIGNAGE  
LOCATED BY TURNS.  
CONCEPT-LEVEL PLAN ONLY

TRAFFIC STUDY NEEDED TO  
DETERMINE POSSIBILITY OF  
PEDESTRIAN ACTIVATED SIGNAL

In the long term, the entire roadway could be redesigned as a slower speed roadway with narrower lanes, pedestrian refuges and a separated on-street bike lane.

TRAFFIC STUDY NEEDED TO  
DETERMINE POSSIBILITY OF  
PEDESTRIAN ACTIVATED SIGNAL

PLANNING LEVEL DRAWING

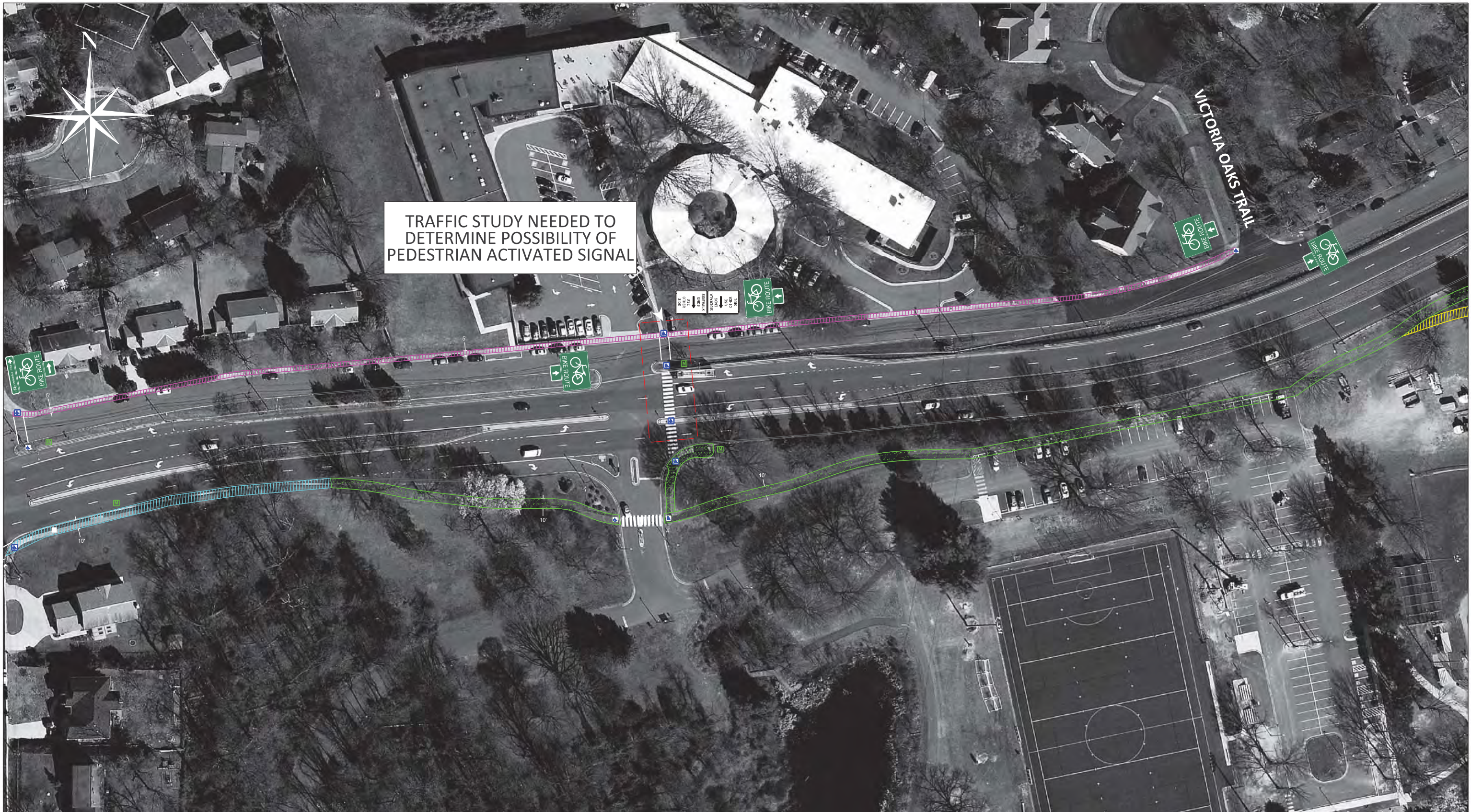
SCALE: 1"=150'

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7 of 26 (COLUMBIA PIKE BYPASS ROUTE)



TRAFFIC STUDY NEEDED TO DETERMINE POSSIBILITY OF PEDESTRIAN ACTIVATED SIGNAL

PLANNING LEVEL DRAWING

SCALE: 1"=100'

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- Widen Sidewalks
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SIDEWALK CONSTRUCTION REQUIRES ACQUISITION OF RIGHT-OF-WAY ON NW CORNER OF INTERSECTION.

INSTALL CROSSWALK AND WAYFINDING SIGNS IN CONCORDANCE WITH EASTBOUND SIDEWALK INSTALLATION

MOVE BUS STOP 50' CLOSER TO ANCIENT OAKS COURT

<p>PLANNING LEVEL DRAWING</p>	<ul style="list-style-type: none"> <li><span style="color: red;">■</span> Maintain Existing Sidewalk/Trail</li> <li><span style="color: blue;">■</span> Widen Sidewalks</li> <li><span style="color: green;">■</span> Widen Existing Trails</li> <li><span style="color: yellow;">■</span> Add Sidewalks</li> <li>— Existing Curb Lines</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: red;">■</span> Private Frontage Road Sidewalks</li> <li><span style="color: purple;">■</span> Utilize Frontage or Side Road Sidewalks</li> <li><span style="color: orange;">■</span> Extensive Engineering Required to Widen/Add Sidewalk</li> <li><span style="color: orange;">●</span> Add Pedestrian Signal Pole</li> </ul>	<ul style="list-style-type: none"> <li> Install ADA Compliant Curb Ramp</li> <li> Upgrade to ADA Compliant Curb Ramp</li> <li> Existing Metro Bus Stops</li> </ul>	<p><b>Sam Schwartz</b>          Transportation Consultants          322 EIGHTH AVENUE          5TH FLOOR          NEW YORK, NY 10001</p>	<p>FAIRFAX COUNTY DEPARTMENT OF TRANSPORTATION</p> <p style="text-align: right;">9 of 26</p>
<p>SCALE: 1"=100'</p>					



In the long term, the entire roadway could be redesigned as a slower speed roadway with narrower lanes, pedestrian refuges and a separated on-street bike lane.

SIGNIFICANT GRADE DIFFERENCE AT THIS LOCATION. EXTENSIVE ENGINEERING STUDY NECESSARY TO DETERMINE HOW TO CONSTRUCT NEW SIDEWALK. (NOT INCLUDED IN COST ESTIMATES)

PLANNING LEVEL DRAWING

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PLANNING LEVEL DRAWING

SCALE: 1"=150'

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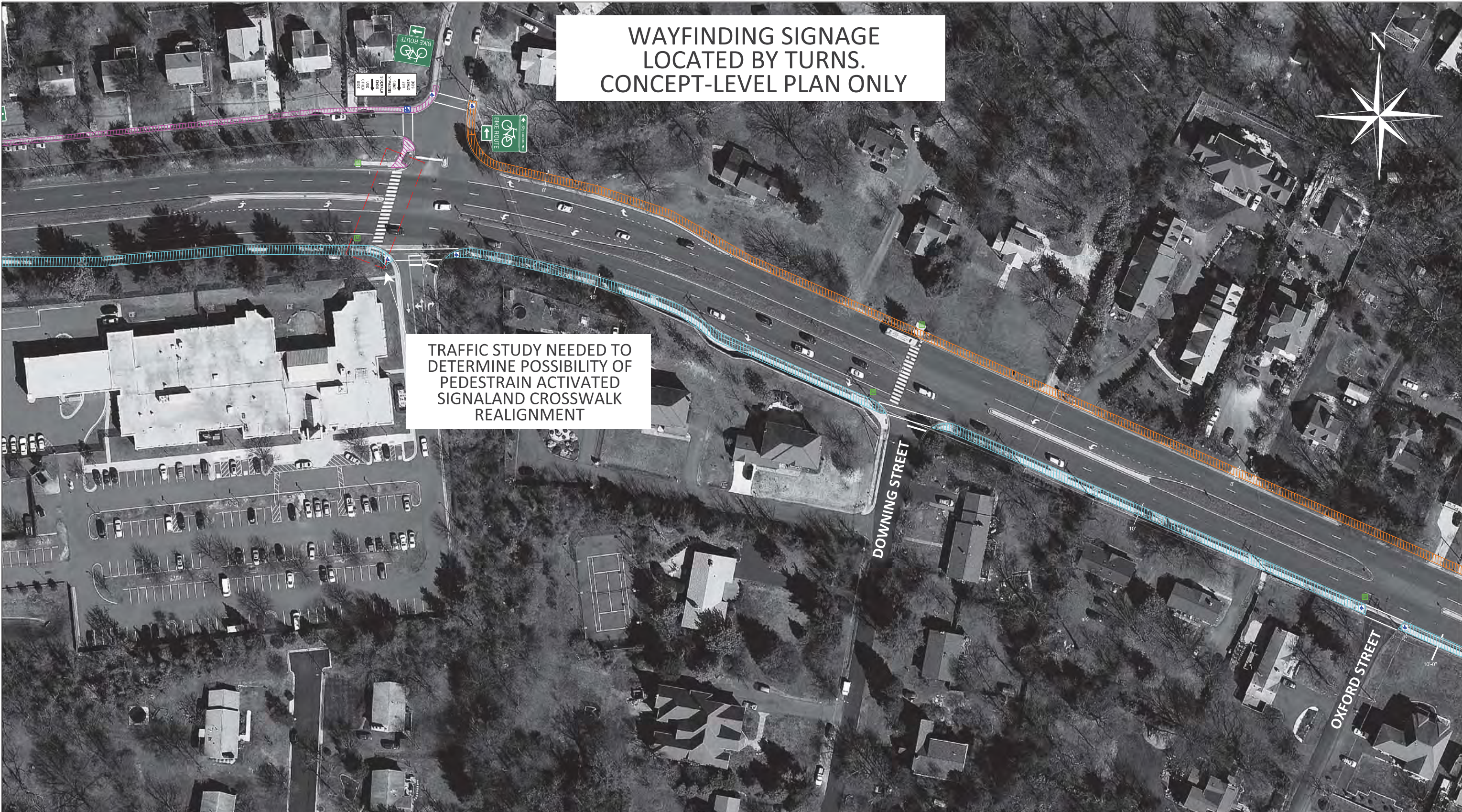
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WAYFINDING SIGNAGE  
LOCATED BY TURNS.  
CONCEPT-LEVEL PLAN ONLY



TRAFFIC STUDY NEEDED TO  
DETERMINE POSSIBILITY OF  
PEDESTRIAN ACTIVATED  
SIGNAL AND CROSSWALK  
REALIGNMENT



PLANNING LEVEL DRAWING

SCALE: 1"=100'

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WAYFINDING SIGNAGE  
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TRAFFIC STUDY NEEDED TO  
DETERMINE POSSIBILITY OF  
PEDESTRIAN ACTIVATED  
SIGNAL AND CROSSWALK  
REALIGNMENT

TRAFFIC STUDY NEEDED TO  
DETERMINE POSSIBILITY OF  
PEDESTRIAN ACTIVATED SIGNAL  
AND NEW CROSSWALK

CONCEPT REQUIRES  
FURTHER STUDY

SIMPLIFY INTERSECTION BY  
CLOSING FRONTAGE ROAD  
ACCESS TO LINCOLNIA DRIVE

PLANNING LEVEL DRAWING

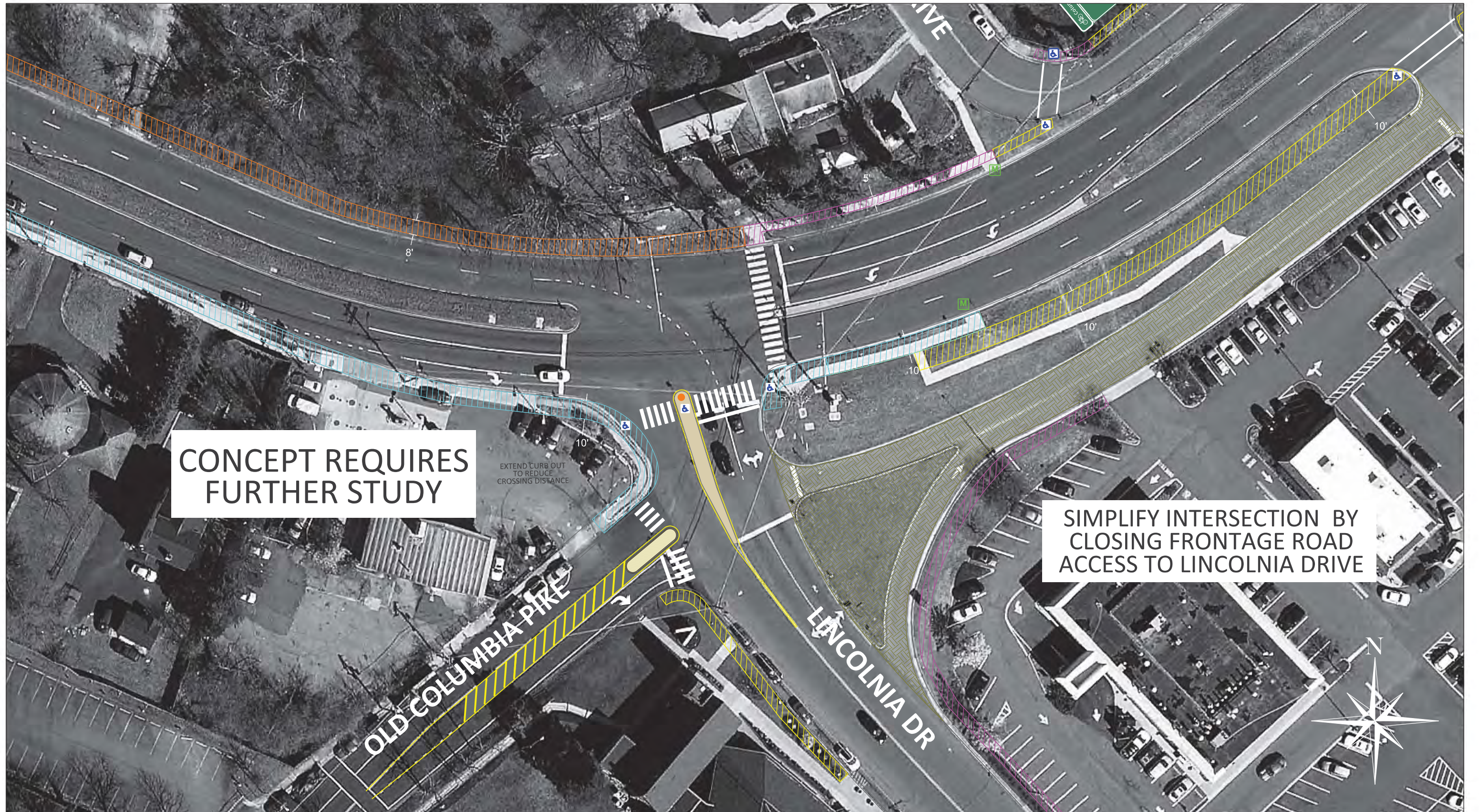
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13 of 26 (COLUMBIA PIKE BYPASS ROUTE)



**CONCEPT REQUIRES FURTHER STUDY**

EXTEND CURB OUT TO REDUCE CROSSING DISTANCE

**SIMPLIFY INTERSECTION BY CLOSING FRONTAGE ROAD ACCESS TO LINCOLNIA DRIVE**

**OLD COLUMBIA PIKE**

**LINCOLNIA DR**



PLANNING LEVEL DRAWING

SCALE: 1"=50'

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TRAFFIC STUDY NEEDED TO DETERMINE POSSIBILITY OF PEDESTRIAN ACTIVATED SIGNAL AND NEW CROSSWALK

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






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PLANNING LEVEL DRAWING

SCALE: 1"=100'

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16 of 26 (BRADDOCK ROAD OPTION 1)





Narrow side street entrance to Columbia Pike Service Road and transform into public space. Further study would be required to close entrance completely.

PLANNING LEVEL DRAWING

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17 of 26 (BRADDOCK ROAD OPTION 2)



WAYFINDING SIGNAGE  
LOCATED BY TURNS.  
CONCEPT-LEVEL PLAN ONLY

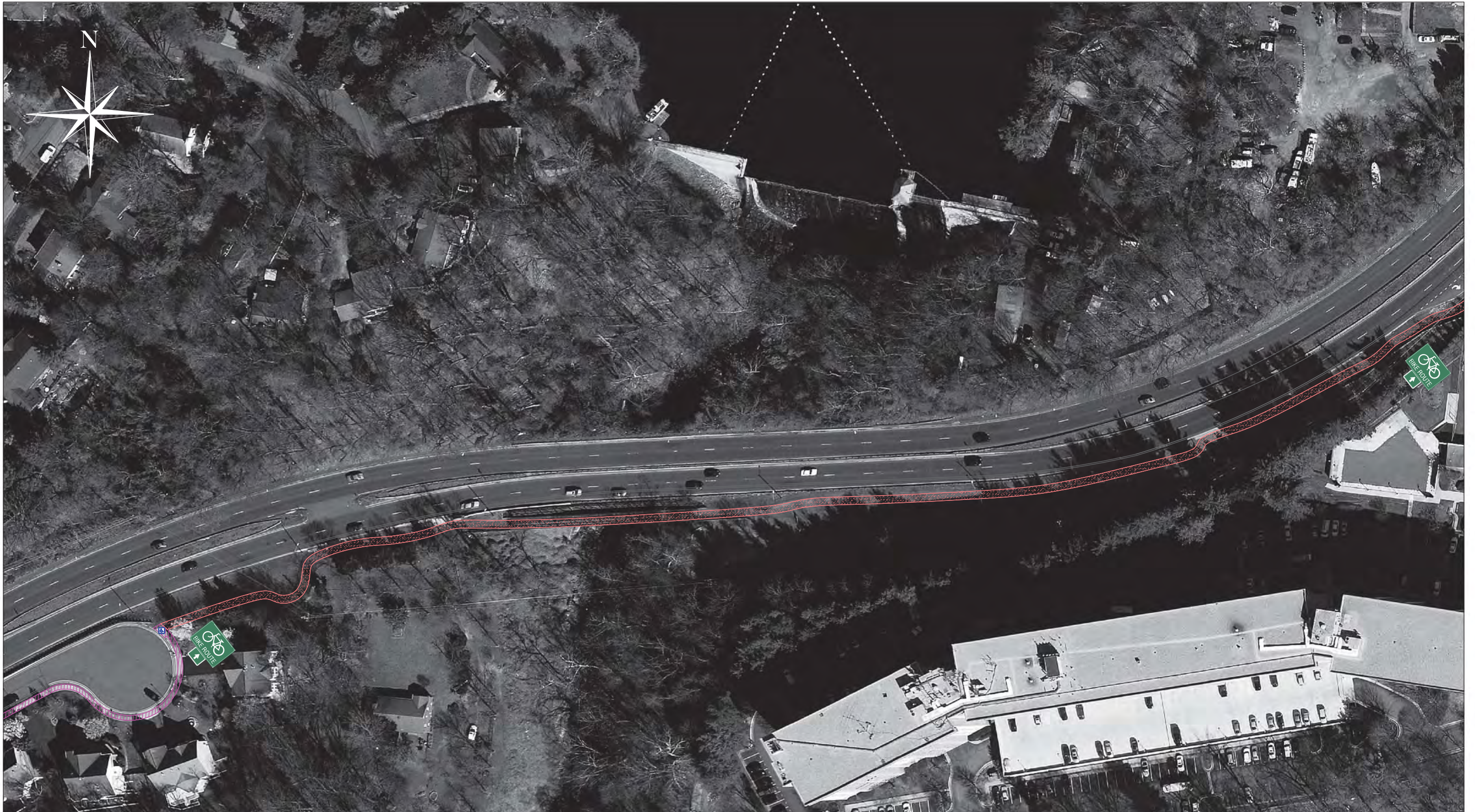
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
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PLANNING LEVEL DRAWING

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
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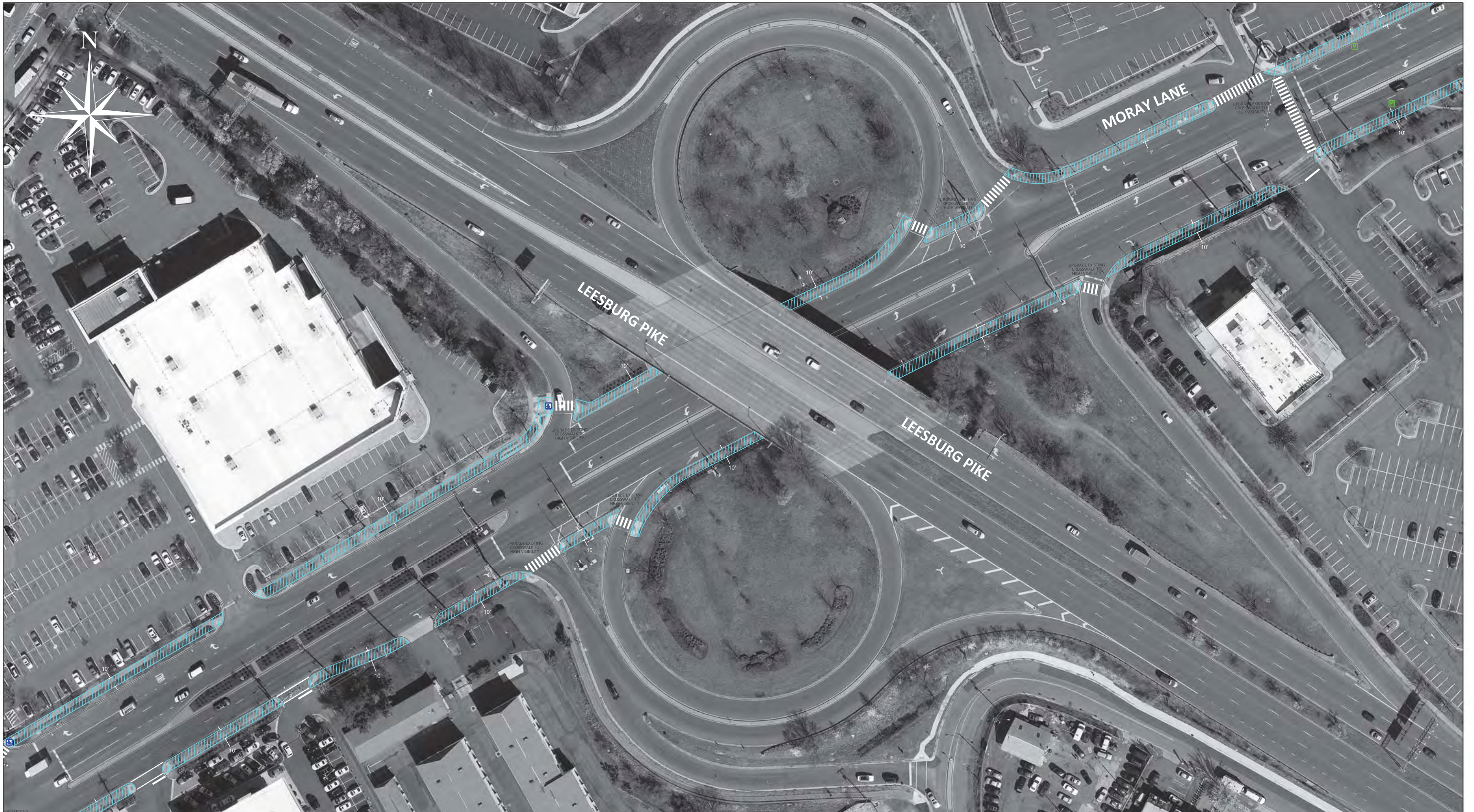
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ALSO EXPLORE OPTION TO MOVE CROSSWALK BACK AND CREATE PEDESTRIAN REFUGE ON COLUMBIA PIKE AT SPRING LANE

PLANNING LEVEL DRAWING

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25 of 26



PLANNING LEVEL DRAWING

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FAIRFAX COUNTY DEPARTMENT OF TRANSPORTATION

# Appendix C

## Planning-Level Cost Estimates

## Columbia Pike Pedestrian and Bike Cost Estimate

Date Prepared: May 15, 2018

Prepared by Sam Schwartz Engineering

Item	Quantity	Unit	Unit Cost	Total Cost
Stop Bar	505	LF	\$ 19.20	\$ 9,696
Yield Markings	10	LF	\$ 11.57	\$ 116
High-Visibility Crosswalk Markings - 10'	1307	LF	\$ 48.00	\$ 62,736
Crosswalk Pavement Markings - 6"	4130	LF	\$ 2.54	\$ 10,490
Bicycle Wayfinding Signage	37	each	\$ 450.00	\$ 16,650
Construct ADA-Compliant Curb Ramp	71	ramps	\$ 2,820.00	\$ 200,220
Replace Existing Curb Ramp with ADA-Compliant Curb Ramp	53	ramps	\$ 3,840.00	\$ 203,520
Removal of Concrete Sidewalk and Entrance	9983	SY	\$ 25.00	\$ 249,564
Demolition of Asphalt Pavement	1367	SY	\$ 13.20	\$ 18,040
Sidewalk, Concrete 4" - no reinforcement and no base & Concrete 4" with WWF & no base	26703	SY	\$ 55.00	\$ 1,468,653
Sidewalk, Bituminous concrete - 2" with 4" base	2278	SY	\$ 36.00	\$ 82,000
New Pedestrian Signal Pole	3	each	\$ 9,360.00	\$ 28,080
HAWK Signal Installation	8	each	\$ 225,000.00	\$ 1,800,000
Implement Leading Pedestrian Interval (LPI)	1	each	\$ 1,200.00	\$ 1,200
Pedestrian Wayfinding Signs	7	each	\$ 450.00	\$ 3,150
Clear & Grub	0.73	AC	\$ 20,000.00	\$ 14,646
Extensive Engineering Sidewalk	3650	SY	\$ 55.00	\$ 200,750
Concrete Driveway 6"	222	SY	\$ 55.00	\$ 12,222
Concrete Removal	294	CY	\$ 25.00	\$ 7,361
Excavation	2136	CY	\$ 8.00	\$ 17,089
Install Curb and Gutter	75	LF	\$ 25.00	\$ 1,875
Trench Drain behind wall	200	LF	\$ 50.00	\$ 10,000
Gravity Wall/Retaining Wall	585	CY	\$ 750.00	\$ 438,600
<b>Notes</b>				
	<i>Construction Total</i>			\$ 4,856,658
	Maintenance of Traffic - 10%			\$ 485,666
	Utilities - 30%			\$ 1,456,997
	Mobilization - 10%			\$ 485,666
	<i>Subtotal</i>			\$ 7,284,987
	Construction Contingency - 25%			\$ 1,821,247
	<i>Subtotal</i>			\$ 9,106,234
	Engineering - 5%			\$ 455,312
	Design - 7%			\$ 637,436
	<b>TOTAL</b>			<b>\$ 10,198,982</b>