National Capital Region (NCR) Trail Monitoring and Analysis Program Annual Report

Report No. 1

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In response to:

National Capital Region National Park Service

Introduction

The National Park Service (NPS) needs to understand trail travel patterns in order to better serve visitors. This includes those visiting on foot and by bicycle. Other local agencies around the Capital Area also want to understand pedestrian and bicyclist travel in the region. This project addresses these needs by providing a centralized database and dashboard to house and manage existing and future trail count data from various jurisdictions, where all can access it in a standard format. The project not only manages and maintains the data, but also encourages collaboration between agencies through quarterly meetings between NPS and local and regional agencies. The project also produces quarterly and annual reports on travel patterns and monitoring system expansion, validation and maintenance and engages University partners in research activities including network volume estimation using emerging datasets.

This report is the first of our "annual" reports. This report will serve as a template for future reports and data presentation, so we seek input from NPS and project partners on the type of summaries provided and the way the information is presented, in order to guide our future reports and efforts to automate reporting. The report contains three sections:

- financial summary
- summary of work done during the past year
- data summary

The data summary lists counters and their volumes for 2018-2021 for four main trail corridors. Summary tables include an inventory of all counters in the region including name and status of whether they've been uploaded to Bike-Ped Portal yet. Summary graphs of volume per month by trail corridor are provided for 2021. Maps of count sites by mode show 2021 traffic volumes relative to other sites on the trail corridors.

Work Done in Year 1 (Aug. 2021 to Aug. 2022)

Below is a summary of work done by the five Task Areas.

1. Jurisdiction Coordination
2. Maintenance of Automated Counters and Siting New Counters
3. Creation of Shared Regional Database and Public Dashboard and Data Monitoring
4. Analysis and Reporting
5. Explore Big Data Procurement and Analysis

Task Area 1. Jurisdiction Coordination

<u>Quarterly Meetings</u>. The team participated in two quarterly meetings hosted by Volpe (November 2021 and Feb 2022) and hosted one additional quarterly meeting (July 2022). Notes and presentations from the meetings are posted in the "Quarterly Meetings" folder on the "NCA Trail Count Program" Teams account.

<u>Monthly Meetings</u>. The team held monthly meetings with National Park Service and other special meetings as necessary. Notes from these meetings are now posted in the "Monthly Progress Meetings" folder on the "NCA Trail Count Program" Teams account.

In addition, HSRC staff responded to emails from NPS staff throughout the year and met with potential partners, including DDOT.

Task Area 2. Maintenance of Automated Counters and Siting New Counters

Studio Class Findings

The Virginia Tech (VT) team, started the year with a Fall 2021 class project in their graduate studies studio class, led by Professor Ralph Buehler. The class inventoried and analyzed data from 19 existing counters on four trail systems: Capital Crescent Trail, C&O Canal, Anacostia River Trail (ART), and the Mount Vernon Trail (MVT). Of these, 11 were TRAFx infrared counters on the C&O and Capital Crescent Trails, all of which were functioning and 8 were Eco-Counters on the MVT and ART, of which, only three were functional, all of which were on the ART.

Most count sites showed travel patterns with highs on weekends for both bicyclists and pedestrians, indicative of recreational travel. Winter traffic was substantially lower than Spring, Summer and Fall pedestrian and bicyclist traffic.

The students conducted manual counts to validate some of the counters and found that the TRAFx counters were generally undercounting, while the Eco-Counters were generally overcounting. The students recommended continued installation of Eco-Counter equipment due to ease of use and additional data features like directionality and differentiation between pedestrians and cyclists, though the need for Android-specific applications can be a challenge with this equipment.

The students detailed their work and findings in a Report which is available in the "VT_StudioClass" folder on the "NCA Trail Count Program" Teams account. Other information available in this folder includes photos of the count sites, an inventory of the count sites, and a recording of the final presentation.

Ongoing Maintenance and Validation

During the course of the year, the team worked with Alexandria, Arlington, DDOT and NPS staff to access, identify maintenance issues, and validate counters.

After the studio class, the VT team created a thorough validation procedure, similar to that used by NCHRP 797 and NCDOT, which involves collecting roughly 30 hours of video of the count site and counting it manually in the office. Data were collected using video cameras specific for this type of multi-day outdoor video traffic data collection. The VT team began collecting this video for the ART count sites and hired students to watch and code the video for validation. This process includes identification of trail user types to help pinpoint potential reasons for over or undercounts: trail users in groups or side by side, those who walk or ride outside of the counted area (bypass riders/walkers), non-typical trail users (scooters, skateboarders, inline skaters, etc.), and other characteristics or behaviors which may be associated with under or overcounts. This data can help with both creating bias adjustment factors or functions, and troubleshooting potential problems that could be corrected by changes to the counter location, physical setup, or software settings. Results of these validations will be summarized in future reports.

Site Selection

In their December 2021 report and presentation, the students mentioned that the placement of TRAFx counters at trail access paths rather than the main path, doesn't provide a count of the travelers on the trail and can lead to overcounting people who make multiple trips to and from their motor vehicle, or those who congregate around the counter. The students recommend installation of counters on the Mount Vernon Trail south of Old Town Alexandria.

Task Area 3. Creation of Shared Regional Database and Public Dashboard and Data Monitoring

Portland State University's Transportation Research and Education Center (PSU TREC) added 45 count sites and their associated data to the BikePed Portal (https://bikeped.trec.pdx.edu/) database:

- 27 TRAFx counters on C&O and Capital Crescent Trails managed by NPS
- 16 DDOT Eco-Counters
- 2 Alexandria MVT Eco-Counters

While the BikePed Portal publicly provides basic online data (counter location, summary graphs and statistics), additional information and features are available to those with accounts. Such accounts were provided to partner agencies. There are four levels of authorization for partner accounts: organization owner, organization user, research, and public. The features available to partners in the BikePed Portal accounts include review and editing quality checks and improved data download functionality.

The TREC team also investigated what announcement categories should be added to the BikePed Portal database in order to flag data for known events or issues such as construction on the trail, extreme weather events, races or other organized events, or known maintenance issues, such as battery failure or insect infestation. The team hosted meetings with data users from DDOT and Arlington to identify the categories. This feature is planned to be implemented in Year 2.

BikePed Portal also includes automated checks for over 48 hours of zero volumes and for over a given number of same value non-zero volumes in a row. Data were also checked manually by HSRC staff. Future work comparing volumes show similar AADT values from BikePed Portal and manual calculations. Data owners can accept or reject the automated checks in the BikePed Portal User Interface.

BikePed Portal provides basic information about the count sites including AADT values, graphs of average and AADT volumes over all years for which data are available, over any given year, over any given month, and over any given day of the year by mode and direction of travel.

HSRC set up the data feed for four newly installed counters in a new "NPS – National Capital Region" Eco-Visio Account accessible to DDOT:

- Rock Creek Trail @ Peirce Mill (Y2H21070157)
- Rock Creek Trail @ Shoreham Drive (Y2H21070158)
- Rose Park Trail @ P Street NW (Y2H21070159)
- Zoo Loop Trail (Y2H21070155)

Task Area 4. Analysis and Reporting

The HSRC team has explored different ways of presenting the count data by count site, trail and travel type (walk, bike or both). The results of these analyses were shared informally in presentations to NPS and the larger group of partners. Annualized volume data for 2018-2021 are summarized in this document (see Table 2 and graphs and maps herein).

Note that as stated above, for data in BikePed Portal volumes and AADT for a given site can be plotted using the "Explore" feature across years, by month for any given year, by day for any given month, and by hour for any given day of the year. Such graphs can supplement the summary graphs provided in this report if detailed information on the counter is desired. For those with BikePed Portal accounts, detailed data can also be readily downloaded for further analysis. For those without accounts, graphs and summary data are available.

Task Area 5. Explore Big Data Procurement and Analysis

Though the bulk of this task has yet to start, the Virginia Tech students in the capstone studio class in Fall 2021 looked into use of Streetlight Data and found that while such data can be used to fill in pedestrian and bicyclist volumes on road and path segments where counts are not conducted, these data must be validated regularly and could be biased based on the availability of cell phone data.

APPENDIX

Data Summary

Summary Metrics

Several Summary metrics are used: MADT, AADT, and WWI as defined below.

Monthly Average Daily Traffic (MADT): For each day of the week for each month in each year for each segment area for each mode, compute MADT (from FHWA-PL-015-008, 201)

$$MADT{m,y} = \frac{1}{7}\sum_{j=7}^{1}\left[\frac{1}{n}\sum_{i=1}^{n}Vijmy\right]$$

where V = total traffic volume for i^{th} occurrence of the jth day of the week within the mth month, for year y.

n = the count of the jth day of the week during the mth month for which traffic volume is available (a number between 1 and 5)

Annual Average Daily Traffic (AADT):

$$AADTy = \frac{1}{12}\sum_{m=1}^{12}MADT_{m,y}$$

Where m is the month of the year, y

Finally, the Weekend/Weekday Index was calculated by average the total Weekend volume and the total Weekday volume and dividing the Weekend average by the Weekday average.

Weekend-Weekday Index (WWI) *(Miranda-Moreno et al. 2013)*

$$WWI = V_{we}/V_{wd}$$

where:

WWI = Weekend/Weekday Index

V_{we}=average weekend daily traffic

V_{wd}=average weekday daily traffic

Trail Volumes

Table 3 summarizes pedestrian and bicycle volumes by trail. This is followed by three maps showing the trail volumes for 2021 by mode: pedestrian-only, bicycle-only, and combined pedestrian-bicycle traffic.

The blanks in the AADT columns demonstrate the need for more consistent data collection in order to track change over time. It also shows that all trail sites have higher weekend traffic than weekday traffic (WWI>1) which is associated with recreational travel as expected on these trails.

The trail with the highest volume (bike and pedestrians combined) is the Capital Crescent Trail, but these locations have not yet been validated, so

Table 1 Summary of Traffic Volume for Trails

Trail	Count Site	Mode	2018 AADNT	2019 AADNT	2020 AADNT	2021 AADNT	Week-end Daily Ave (2021)	Week-day Daily Ave (2021)	WWI
C&O Canal Trail	Dickerson Conservation Park	Both			128	76			
	Marsden Tract Foot Bridge	Both			290	213	410	131	3.1
	Lock 10	Both				215	354	159	2.2
	Lock 8	Both				259	360	219	1.6
	Glen Echo	Both			297	202	297	163	1.8
	Lock 7	Both				123	198	93	2.1
	Lock 6	Both	151	150	289				
	Lock 5	Both			298				
	Chain Bridge Access	Both			786	297	466	229	2.0
Capital Crescent Trail	Capital Crescent	Both	432	320		729	1,161	561	2.1
	Georgetown Mule Bridge	Both			1,794	1,645	2,595	1,266	2.1
	Georgetown Level 3 Access (VC)	Both				343	506	280	1.8
Anacostia River Trail	Benning	Bike		255			515	196	2.6
	Benning	Ped		87			189	107	1.8
	Benning	Both		342			704	303	2.3
	Deane Ave	Bike		188		336	580	238	2.4
	Deane Ave	Ped		73		99	136	84	1.6
	Deane Ave	Both		261		435	716	322	2.2
	Kenilworth Park	Bike		232		398	676	287	2.4
	River Terrace	Bike		180		329	537	246	2.2
	River Terrace	Ped		85		177	239	151	1.6
	River Terrace	Both		265		506	776	397	1.6

Trail	Count Site	Mode	2018 AADNT	2019 AADNT	2020 AADNT	2021 AADNT	Week-end Daily Ave (2021)	Week-day Daily Ave (2021)	WWI
Mount Vernon Trail	MVT Airport	Bike	**1,459**	**1,872**	**1,737**	**1,238**	**1,721**	**1,045**	1.6
	MVT Airport	Ped		332	508	387	566	315	1.8
	MVT Airport	Both		**2,204**	**2,245**	**1,625**	**2,287**	**1,360**	1.7
	CC Connector	Bike	510	512	447	384	472	348	1.4
	CC Connector	Ped	493	576	526	425	502	394	1.3
	CC Connector	Both	**1,003**	**1,088**	**973**	**809**	**974**	**742**	1.3
	14th Street Bridge	Bike		1,487	1,133	956	1,190	862	1.4
	14th Street Bridge	Ped		339	249	245	385	189	2.0
	14th Street Bridge	Both		**1,826**	**1,382**	**1,201**	**1,575**	**1,051**	1.5

200-600 AADT	
>600 AADT	

Figure 1 Pedestrian 2021 Trail Counter Volumes

Pedestrian Counter Map
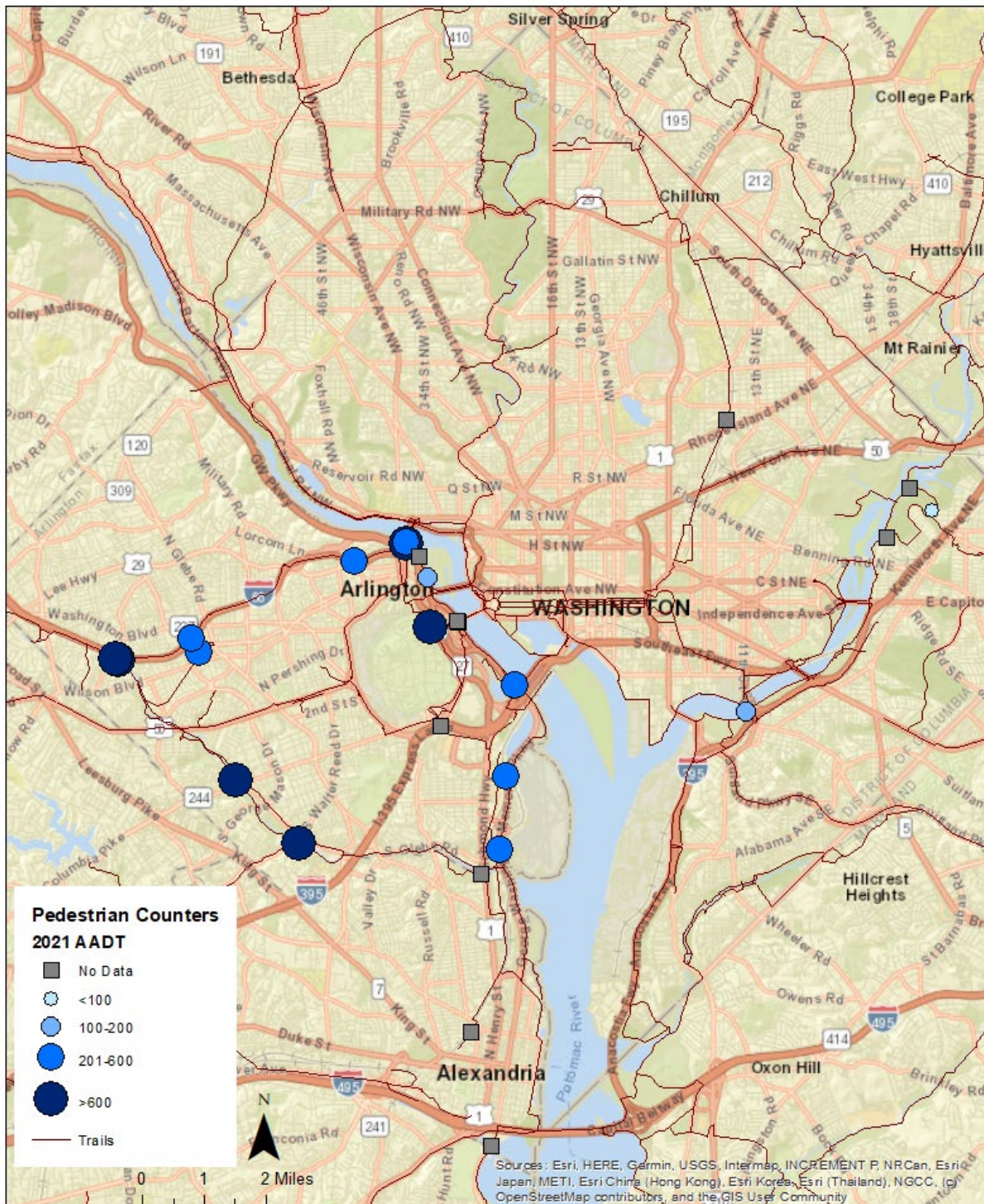
Figure 2 Bicycle 2021 Trail Counter Volumes

Bike Counter Map
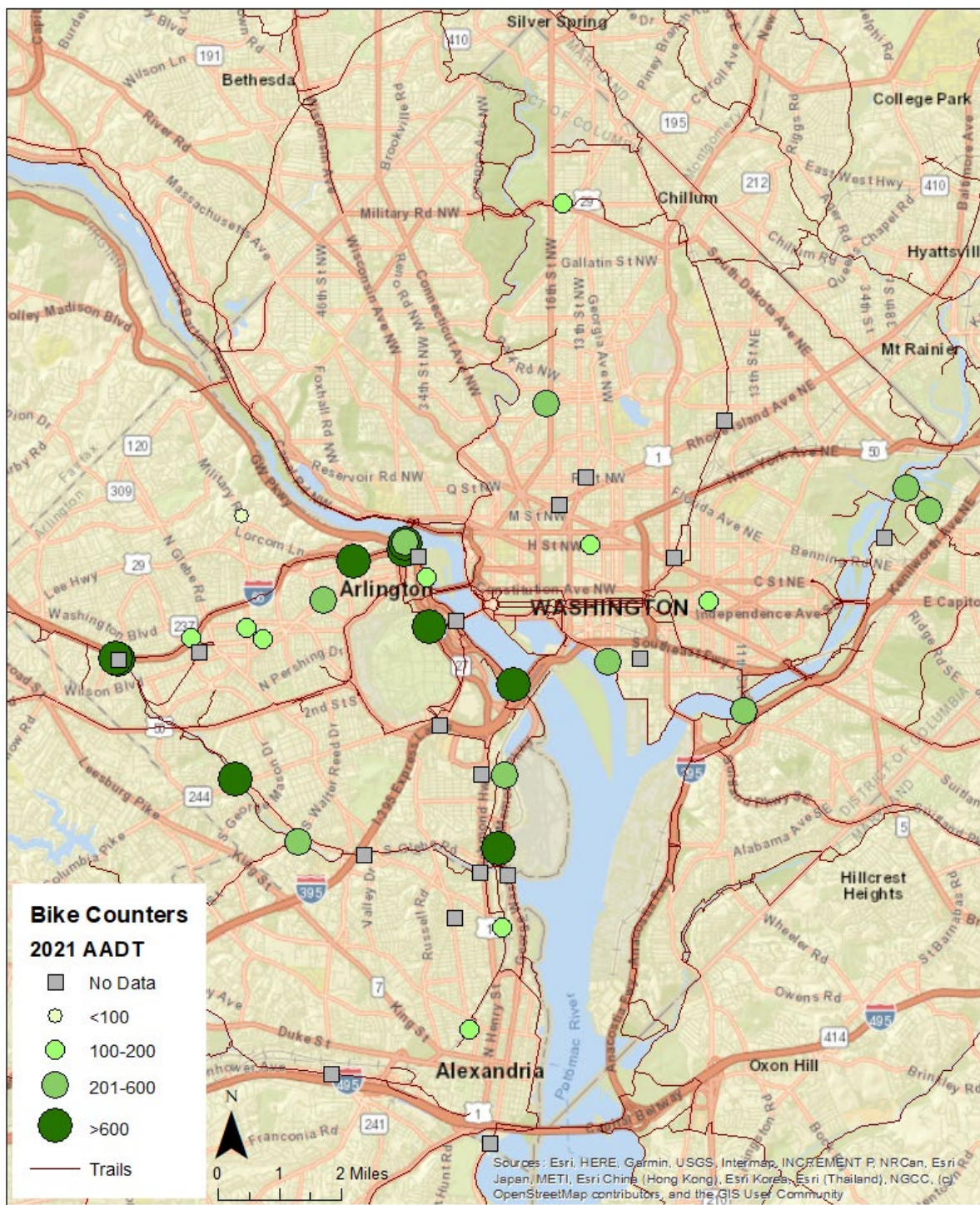
Figure 3 Combined Pedestrian and Bicycle 2021 Trail Counter Volumes


Bike/Pedestrian Counter Map
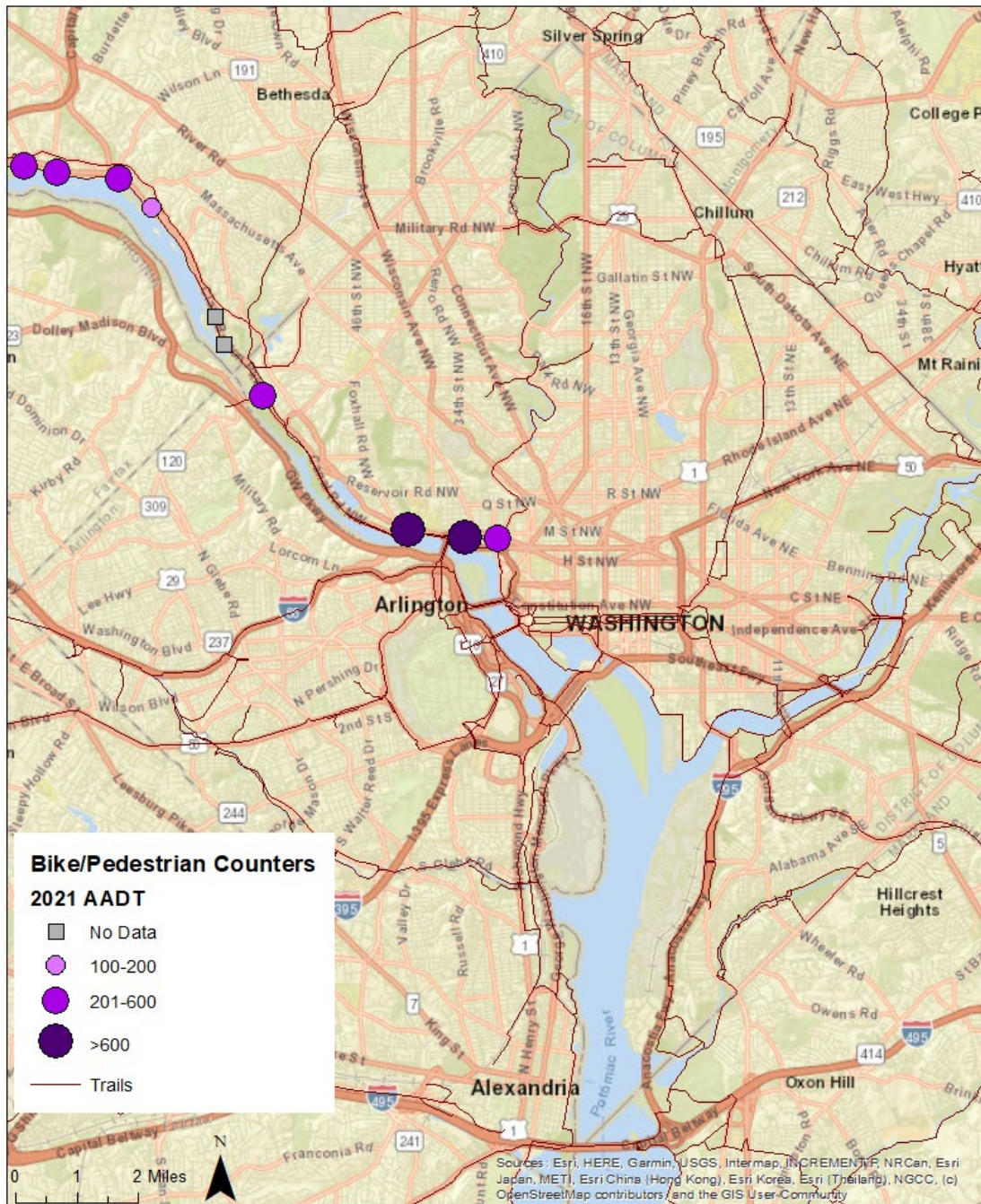
Volume Graphs by Month by Trail by Travel Mode

In this section we provide graphs of average trail traffic for 2021 by trail and mode by month as a percent of AADT. The purpose of these graphs was to determine the seasonality of the travel. They show that traffic is highest in summer, but relatively high throughout the non-winter months (March through October). Plots for other years were also created but are not shown because they were not substantially different from those shown below. Generally pedestrian travel tends to be less seasonal (more equal throughout the year) than bicycle travel as can be seen in the ART and MVT graphs.

Anacostia River Trail – Bike
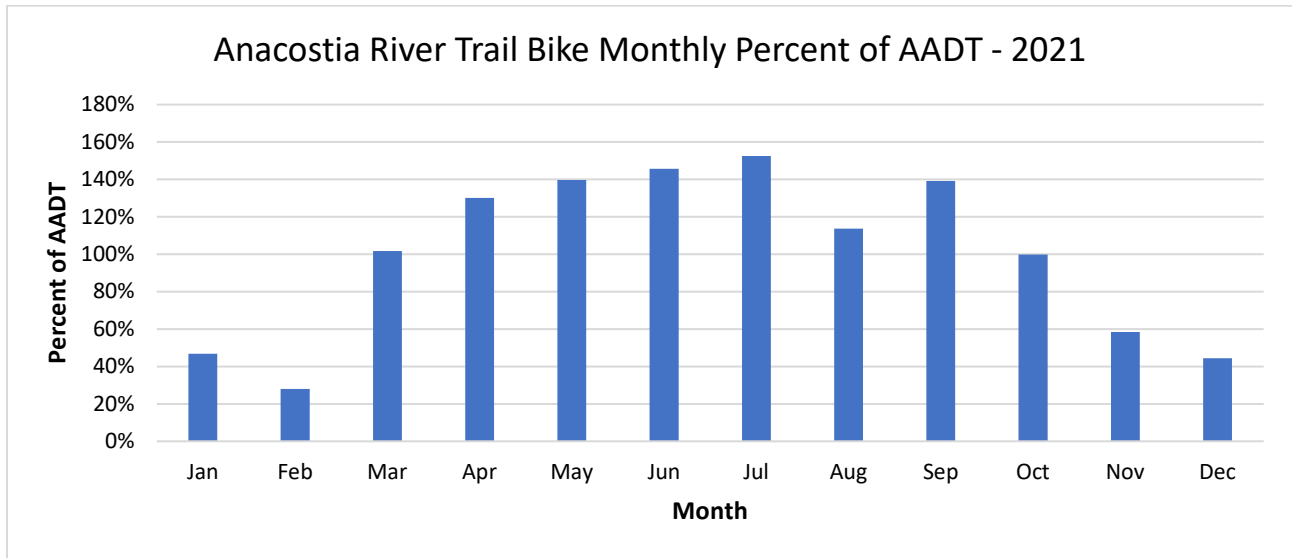
Does not include Benning

Anacostia River Trail – Pedestrian

Does not include Benning

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C & O Canal Trail – Bike/Pedestrian

C & O Canal Trail Bike/Pedestrian Monthly Percent of AADT - 2021
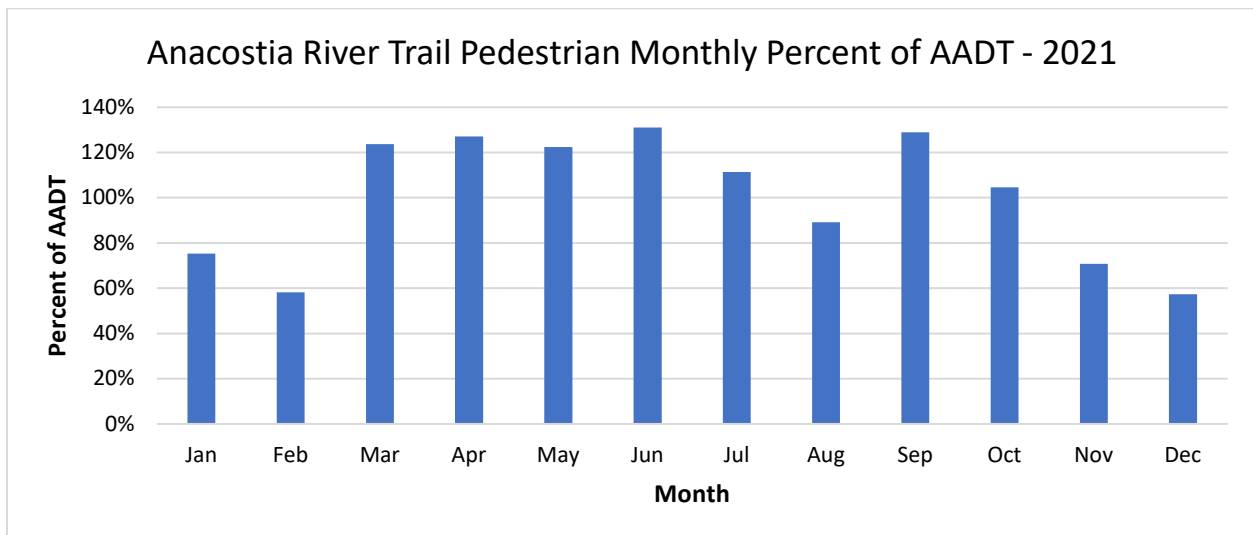
Capital Crescent Trail – Bike/Pedestrian

Capital Crescent Trail Bike/Pedestrian Monthly Percent of AADT - 2021
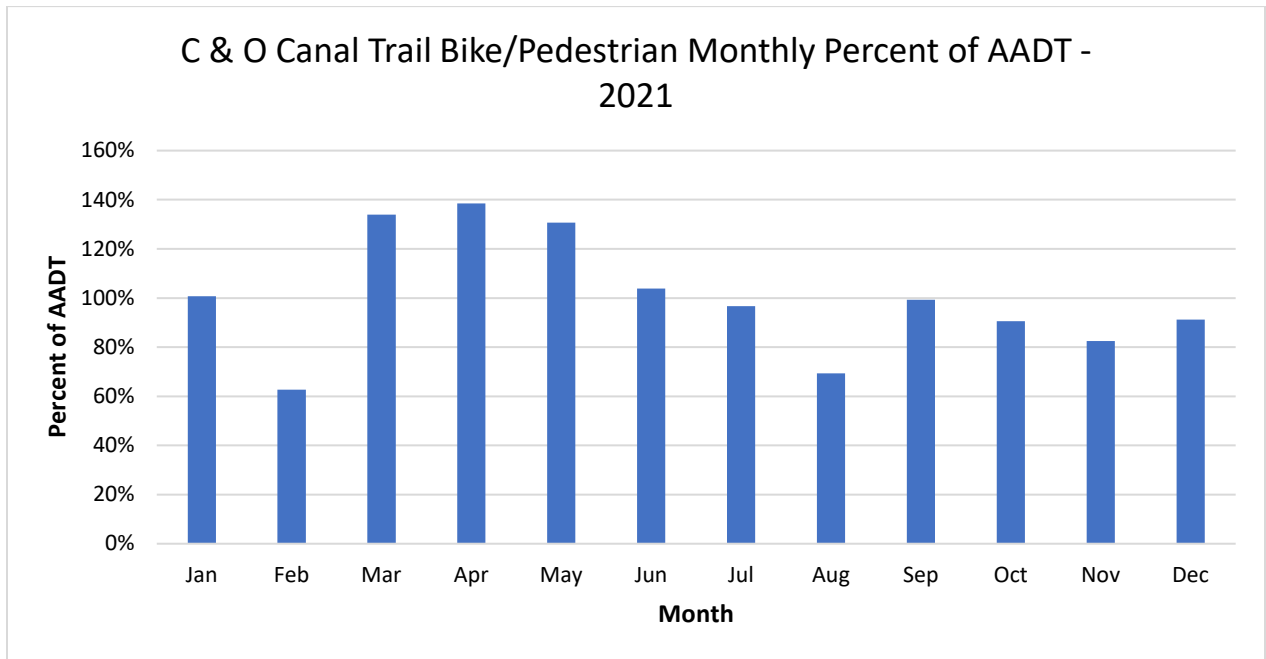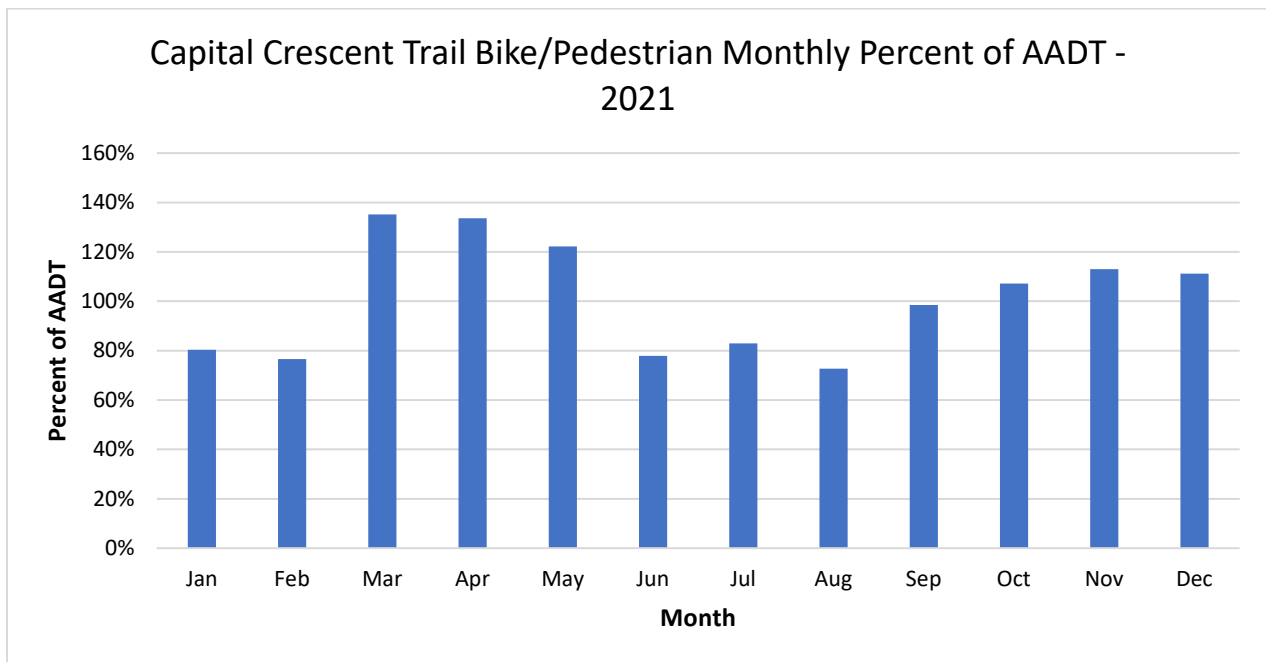
Georgetown MM-1 only

Mount Vernon Trail – Bike

Mount Vernon Trail Bike Monthly Percent of AADT - 2021

Mount Vernon Trail – Pedestrian

Mount Vernon Trail Pedestrian Monthly Percent of AADT - 2021
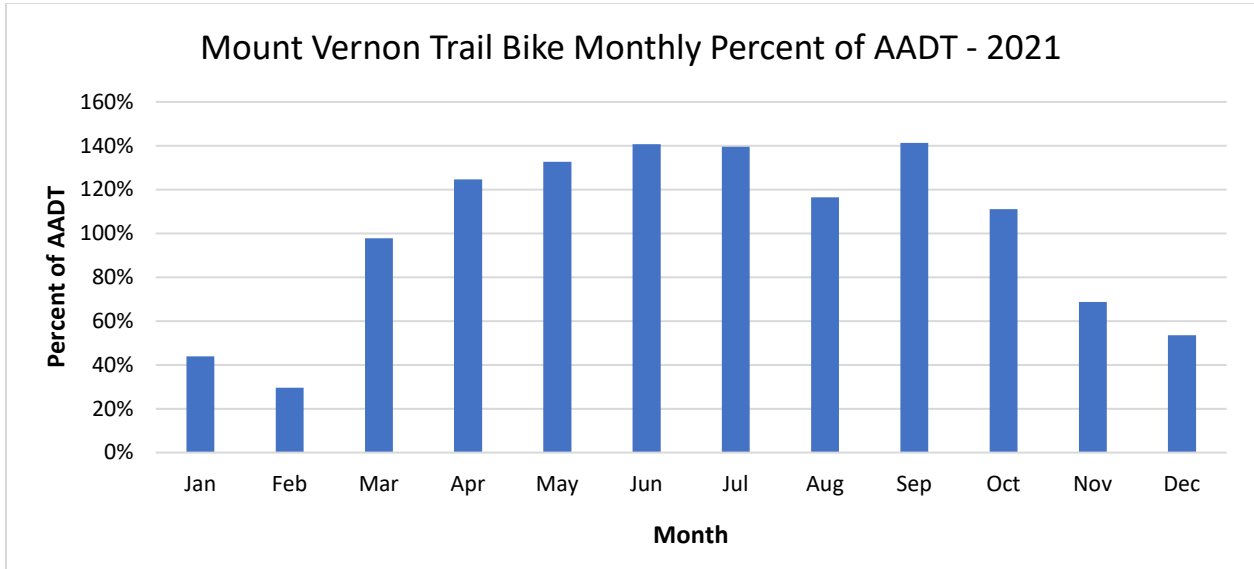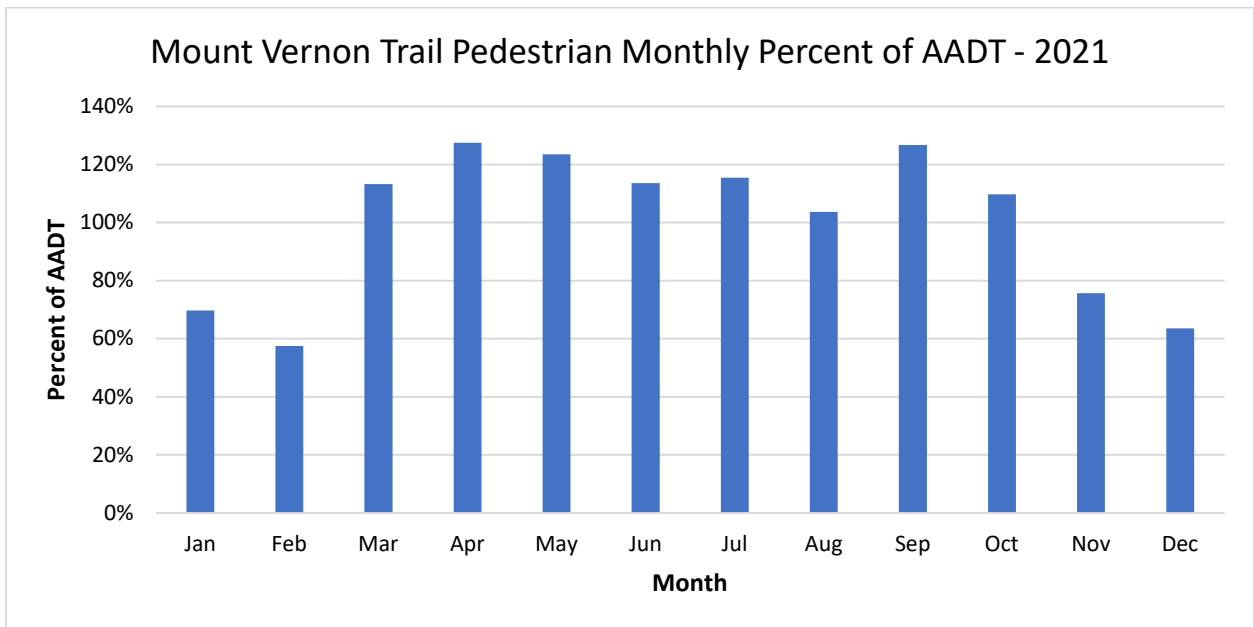
Inventory

Table 2 summarizes 145 counters in the National Capital Region most of which are permanently installed. This is based on the inventory provided by Volpe, and updated with newly installed counters and a column to indicate if the counter has been loaded into BikePed Portal.

Table 2 Inventory of Pedestrian and Bicycle Counters in the National Capital Region

Owner Agency	Model Company	Facility Name	Counter Name	Direction Capable	Separate Bike and Ped Detection	Loaded into BikePed Portal?
Alexandria	Eco-Counter	Beauregard Trail	Beauregard Trail	Yes	Yes	
Alexandria	Eco-Counter	Eisenhower Trail	Eisenhower Trail	Yes	Yes	
Alexandria	Eco-Counter	Four Mile Trail	Four Mile Trail	Yes	Yes	
Alexandria	Eco-Counter	Holmes Run Trail	Holmes Run Trail	Yes	Yes	
Alexandria	Eco-Counter	Metro Linear Trail	Metro Linear Trail	Yes	Yes	
Alexandria	Eco-Counter	MVT	Mount Vernon Trail #3	Yes	Yes	Yes
Alexandria	Eco-Counter	MVT	Mount Vernon Trail #2	Yes	Yes	
Alexandria	Eco-Counter	MVT	Mount Vernon Trail #1	Yes	Yes	Yes
Alexandria	Eco-Counter	Old Cameron Run Trail	Old Cameron Run Trail	Yes	Yes	
Alexandria	Eco-Counter	Onroad	Commonwealth at Mount Vernon	Yes	Bike Only	
Alexandria	Eco-Counter	Potomac Yard Trail	Potomac Yard Trail #1	Yes	Yes	
Arlington	Eco-Counter	Arlington Memorial Bridge	Memorial Bridge South	Yes	Yes	
Arlington	Eco-Counter	Arlington Memorial Bridge	Pyro 11 (Memorial Circle/Arlington Memorial Bridge Sidewalk Ped in Bike Ped Portal)	Yes	No	Yes
Arlington	Eco-Counter	Arlington Memorial Bridge	Memorial Bridge North	Yes	Yes	
Arlington	Eco-Counter	Arlington Mill Drive	Arlington Mill Drive	Yes	Yes	
Arlington	Eco-Counter	Bluemont Junction Trail	Bluemont Connector	Yes	Yes	Yes
Arlington	Eco-Counter	Custis Trail	Custis Bon Air	Yes	Yes	Yes
Arlington	Eco-Counter	Custis Trail	Ballston Connector	Yes	Yes	Yes
Arlington	Eco-Counter	Custis Trail	Custis Rosslyn	Yes	Yes	Yes
Arlington	Eco-Counter	Custis Trail	Custis Trail (Ballston Beaver Pond)			Yes
Arlington	Eco-Counter	Four Mile run	Four Mile Run - piezo*	Yes	Bike Only	Yes
Arlington	Eco-Counter	Four Mile run	Pyro 04 - Four Mile Run*	Yes	No	Yes
Arlington	Eco-Counter	Four Mile Run Trail	Pyro 09	Yes	No	
Arlington	Eco-Counter	Ft. Myer Trail	Pyro 10	Yes	No	

Owner Agency	Model Company	Facility Name	Counter Name	Direction Capable	Separate Bike and Ped Detection	Loaded into BikePed Portal?
Arlington	Eco-Counter	Joyce Street	Joyce SB	Yes	Yes	Yes
Arlington	Eco-Counter	Joyce Street	Joyce NB	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	MVT Airport	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	CC Connector	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	14th Street Bridge	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	Roosevelt Bridge	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	TR Island	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	Bikeometer	Yes	Bike Only	Yes
Arlington	Eco-Counter	MVT	Key Bridge East	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	Key Bridge West	Yes	Yes	Yes
Arlington	Eco-Counter	MVT	Mt. Vernon Trail (Lee Hwy & N Lynn St.)			Yes
Arlington	Eco-Counter	Onroad	Crystal NB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Eads NB	No	Bike Only	
Arlington	Eco-Counter	Onroad	Eads SB	No	Bike Only	
Arlington	Eco-Counter	Onroad	Fairfax EB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Fairfax WB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Quincy SB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Quincy NB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Clarendon EB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Wilson WB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Military NB	No	Bike Only	Yes
Arlington	Eco-Counter	Onroad	Military SB	No	Bike Only	Yes
Arlington	Eco-Counter	Trail in Arlington National Cemetery parallelling 110	110 Trail (Medgar Evers Bike Trail?)	Yes	Yes	Yes
Arlington	Eco-Counter	W&OD	W&OD Columbia Pike	Yes	Yes	Yes
Arlington	Eco-Counter	W&OD	W&OD Bon Air East	Yes	Yes	Yes
Arlington	Eco-Counter	W&OD	W&OD Bon Air West	Yes	Yes	Yes
Arlington	Eco-Counter	W&OD	W&OD East Falls Church	Yes	Yes	Yes
Arlington	Eco-Counter	Washington Boulevard Trail	Washington Boulevard Trail	Yes	Yes	
Arlington	Eco-Counter		Pyro 07	Yes	No	
Arlington	Eco-Counter		Pyro 08	Yes	No	
Arlington	Eco-Counter		Arlington Boulevard Trail			Yes
Arlington	Eco-Counter		Sidewalk on Campbell Avenue (outside Robeks)			Yes

Owner Agency	Model Company	Facility Name	Counter Name	Direction Capable	Separate Bike and Ped Detection	Loaded into BikePed Portal?
Arlington	Eco-Counter		Sidewalk on N Nash Street (Arlington Temple)			Yes
Arlington	Eco-Counter		Trail along N Rhodes Street			Yes
Arlington	Eco-Counter		W&OD (near Fire Station 6)			Yes
DDOT	Eco-Counter	ART	Anacostia River Walk Trail 11th Street	Yes	Yes	Yes
DDOT	Eco-Counter	ART	Anacostia River Walk Trail River Terrace	Yes	Yes	Yes
DDOT	Eco-Counter	ART	Anacostia River Walk Trail Benning	Yes	Yes	Yes
DDOT	Eco-Counter	ART	Anacostia River Walk Trail Deane Ave	Yes	Yes	Yes
DDOT	Eco-Counter	ART	Anacostia River Walk Trail Keniworth Park	Yes	Yes	Yes
DDOT	Eco-Counter	MBT	Met Branch Trail			Yes
DDOT	Eco-Counter	Onroad	Wharf Classic - Maine Ave Cycle Track			Yes
DDOT	Eco-Counter	Onroad	Eye St SW bikelane			Yes
DDOT	Eco-Counter	Onroad	East Capitol Street			Yes
DDOT	Eco-Counter	Onroad	1st St NE			Yes
DDOT	Eco-Counter	Onroad	Kaiser Permanente Center for Total Health			Yes
DDOT	Eco-Counter	Onroad	11th St NW			Yes
DDOT	Eco-Counter	Onroad	15th St NW Cycletrack			Yes
DDOT	Eco-Counter	Onroad	R Street NW			Yes
DDOT	Eco-Counter	Onroad	Columbia Rd NW			Yes
DDOT	Eco-Counter	Onroad	14th St NW			Yes
DDOT	Eco-Counter	ROCR	Rose Park Trail @ P Street NW	Yes	Yes	
DDOT	Eco-Counter	ROCR	Rock Creek Trail @ Shoreham Drive	Yes	Yes	
DDOT	Eco-Counter	ROCR	Zoo Loop Trail	Yes	Yes	
DDOT	Eco-Counter	ROCR	Piney Branch Trail	Yes	Yes	
DDOT	Eco-Counter	ROCR	Rock Creek Trail @ Peirce Mill	Yes	Yes	
Montgomery	Eco-Counter	CCT	CCT #2 @ Dalecarlia	Yes	Yes	
Montgomery	TRAFx	CCT	CCT @ Loughboro Mill	No	No	
Montgomery	TRAFx	CCT	CCT & Little Falls S	No	No	

Owner Agency	Model Company	Facility Name	Counter Name	Direction Capable	Separate Bike and Ped Detection	Loaded into BikePed Portal?
Montgomery	TRAFx	CCT	CCT & Little Falls N	No	No	
Montgomery	Eco-Counter	CCT	CCT #1 @ Bethesda	Yes	Yes	
Montgomery	Eco-Counter	CCT	CCT #1 @ Bethesda	Yes	Yes	
Montgomery	TRAFx	Little Falls Parkway	LFPkwy NB Mass Av			
Montgomery	TRAFx	Little Falls Parkway	Little Falls Pkwy S	No	No	
Montgomery	TRAFx	Little Falls Parkway	LFPkwy SB Mass Av			
Montgomery	TRAFx	Little Falls Parkway	Little Falls Pkwy N	No	No	
Montgomery	Eco-Counter	Matthew Henson Trail	Matthew Henson Trail 2 @ Winding Creek	Yes	Yes	
Montgomery	Eco-Counter	Matthew Henson Trail	Matthew Henson Trail 1@ Layhill	Yes	Yes	
Montgomery	TRAFx	Onroad	BH RP Contact Station	No	No	
Montgomery	TRAFx	Powerline Trail	Powerline @ Colton	No	No	
Montgomery	TRAFx	Powerline Trail	Powerline @ 118	No	No	
Montgomery	Eco-Counter	ROCR	Rock Creek Trail @ Wildwood	Yes	Yes	
Montgomery	TRAFx	ROCR	Rock Creek Trail @ Wildwood	No	No	
Montgomery	TRAFx	ROCR	Beach Dr @ Wildwood	No	No	
Montgomery	TRAFx	ROCR	Beach Dr @ Knowles	No	No	
Montgomery	Eco-Counter	ROCR	Rock Creek Trail @ Baltimore	Yes	Yes	
Montgomery	TRAFx	Sligo Creek Parkway	Sligo Creek Pkwy @ Kennebec	No	No	
Montgomery	TRAFx	Sligo Creek Parkway	Sligo Creek Pkwy @ Piney Branch S	No	No	
Montgomery	TRAFx	Sligo Creek Parkway	Sligo Creek Pkwy @ Dennis	No	No	
Montgomery	TRAFx	Sligo Creek Trail	Sligo Creek Trail @ Kennebec	No	No	
Montgomery	TRAFx	Sligo Creek Trail	Sligo Creek Trail @ Piney Branch S	No	No	
Montgomery	TRAFx	Sligo Creek Trail	Sligo Creek Trail @ Dennis	No	No	
Montgomery	TRAFx	Ten Mile Creek Trail	Ten Mile Creek Trail @ 121	No	No	
Montgomery	TRAFx	Ten Mile Creek Trail	Ten Mile Creek Trail @ Old West Baltimore	No	No	
Montgomery	TRAFx		NW Branch South of Lamberton	No	No	
Montgomery	TRAFx		RC Greenway South of Springbrook	No	No	

Owner Agency	Model Company	Facility Name	Counter Name	Direction Capable	Separate Bike and Ped Detection	Loaded into BikePed Portal?
NPS	Eco-Counter	MVT	MVT at Waynewood Blvd. (Bridge 12)	Yes	Yes	
NPS CHOH	TRAFx	C&O Canal Trail	Falls Spur Road	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Chain Bridge Access	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 5	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 6	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 7	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Glen Echo	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 8	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 10	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Marsden Tract Foot Bridge	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Anglers Inn	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Berma Road	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Swains Lock	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Pennyfield	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Violettes Lock	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Sycamore Landing access	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Whites Ferry	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Dickerson / Warm Water access	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 33	No	No	
NPS CHOH	TRAFx	C&O Canal Trail	Lock 31 access	No	No	
NPS CHOH	TRAFx	C&O Canal Trail	Lock 38 Lower	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Lock 38 Upper	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	McMahon's Mill access	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Fort Frederick access	No	No	
NPS CHOH	TRAFx	C&O Canal Trail	Cumberland Terminal	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Cohill Station	No	No	
NPS CHOH	TRAFx	C&O Canal Trail	Little Pool access	No	No	
NPS CHOH	TRAFx	C&O Canal Trail	Billy Goat Trail A - Upstream Entrance	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Billy Goat Trail C	No	No	Yes
NPS CHOH	TRAFx	C&O Canal Trail	Weaverton	No	No	Yes
NPS CHOH	TRAFx	CCT	Georgetown VC (Level 3 access)			Yes
NPS CHOH	TRAFx	CCT	Georgetown Mule Bridge (MM-1)			Yes
NPS CHOH	TRAFx	CCT	Capital Crescent			Yes

Owner Agency	Model Company	Facility Name	Counter Name	Direction Capable	Separate Bike and Ped Detection	Loaded into BikePed Portal?
Prince George's	Eco-Counter	ART	ART, Bladensburg Waterfront Park			
Prince George's	Eco-Counter	ART	ART, Route 1			

References

Miranda-Moreno, L., Nosal, T., Schneider, R., & Proulx, F. (2013). Classification of Bicycle Traffic Patterns in Five North American Cities. *Transportation Research Record: Journal of the Transportation Research Board*, *2339*, 68-79. https://doi.org/doi:10.3141/2339-08