

VDOT Repaving Design and
Operational Analysis
2024 Road Diet Assessments

DRAFT REPORT – Huntington Avenue

April 30, 2024

Prepared for:



Prepared by:

Kimley»»Horn

Table of Contents

Executive Summary	i
Introduction	1
Data Collection	2
Crash Analysis	9
Existing Conditions Traffic Analysis	10
Road Diet Assessment	14
Geometry.....	14
Potential Crash Mitigation	18
Build Traffic Analysis.....	20
Conclusions and Recommendations.....	29

List of Figures

Figure 1: Study Corridor Map and Intersection Spacing Diagram (Not to scale).....	2
Figure 2: Huntington Avenue Peak Hour Traffic Volumes (7:30-8:30 AM, 4:45-5:45 PM).....	4
Figure 3: Curb inlet at access ramp between Telegraph Road and Kathryn Street	7
Figure 4: Truck parked in the painted median on the east leg of Farrington Avenue and Huntington Avenue.....	7
Figure 5: Crosswalk at Foley Street and Huntington Avenue, looking west.....	8
Figure 6: Huntington Avenue Existing Conditions Cross Section – With Median.....	14
Figure 7: Huntington Avenue Existing Conditions Cross Section – No Median	15
Figure 8: Huntington Avenue Build Conditions Typical Cross Section – With Median	15
Figure 9: Huntington Avenue Build Conditions Typical Cross Section – No Median.....	15
Figure 10: Huntington Avenue and Telegraph Road Alternative Build Conditions Cross Section and Plan View.....	16
Figure 11: Intersection of Huntington Avenue and Richmond Highway Build Conditions Cross Section and Plan View	18

List of Tables

Table 1: Historical AADT	6
Table 2: AM and PM Peak Hour Results.....	11
Table 3: Proposed Build Condition Comparison at Telegraph Road - AM Peak Hour.....	20
Table 4: Proposed Build Condition Comparison at Telegraph Road - PM Peak Hour.....	21
Table 5: AM Peak Hour Build Condition Results	23
Table 6: PM Peak Hour Build Condition Results	26

Executive Summary

The Virginia Department of Transportation (VDOT) will be repaving the Huntington Avenue corridor between Telegraph Road and Richmond Highway. As such, the Fairfax County Department of Transportation (FCDOT) initiated an assessment for a road diet to potentially reallocate existing pavement width for the purposes of accommodating bike lanes. The corridor contains five signalized intersections and ten unsignalized intersections. This report summarizes the findings of a crash analysis, existing traffic conditions, a road diet assessment, and final recommendations and conclusions.

There were a total of 54 reported crashes between January 1, 2021 and December 31, 2023 along the Huntington Avenue corridor, with the majority of crashes occurring at the intersections with Telegraph Road and Richmond Highway. The results of the crash analysis suggest that these crashes were more likely a result of human error rather than existing road geometry or operations. However, one quarter of the crashes occurred during the PM peak hours, indicating that traffic congestion is a potential contributing factor. Using turning movement count (TMC) data collected in March 2024 and Synchro software, weekday AM and PM peak hour traffic conditions were analyzed for existing conditions. The result of this analysis indicate that the intersection of Huntington Avenue and Telegraph Road operates at an acceptable overall level of service (LOS) B during both the AM and PM peak hours. At the intersection of Huntington Avenue and Richmond Highway, the overall intersection operates at LOS D during the AM and PM peak hours. This can be attributed in part to the 180-second cycle length operating at this intersection. The three other signalized intersections operate at an acceptable overall LOS A or LOS B.

Given the existing configuration of Huntington Avenue with a raised center median between Telegraph Road and Farrington Avenue/Biscayne Drive and at Richmond Highway, the road diet would repurpose the rightmost vehicular travel lane as a buffered bike lane. Left-turn lanes currently exist at all unsignalized intersections within the median. For Huntington Avenue between Farrington Avenue/Biscayne Drive and Richmond Highway where there is no median, the potential road diet conforms to the typical reconfiguration from a four-lane undivided roadway to two travel lanes with a center left-turn lane. Build traffic analysis was completed using the 2024 TMC data and the existing Synchro model, which was updated to reflect the proposed road diet conditions. AM peak hour build operations operate at acceptable levels of service and are comparable to existing conditions at all intersections. During the PM peak hour, the eastbound travel lane experiences increased delay at many intersections, as do the westbound left turns. The primary factor contributing to increased delay is the reduction in capacity associated with the build configuration of one travel lane in each direction along Huntington Avenue. However, the wide green band of 70 seconds offers a significant portion of the cycle to allow sustained progression in the eastbound direction, which preserves LOS D or better conditions for eastbound through travel. Within the undivided section, there is also an opportunity to install additional crosswalks with pedestrian refuge islands to facilitate safer crossings of Huntington Avenue at unsignalized intersections, as noted below.

Based on the outcome of the road diet assessment, it is recommended that the following be considered as part of the implementation of buffered bike lanes on Huntington Avenue between Telegraph Road and Richmond Highway:

- Eastbound Huntington Avenue
 - Where there is a median:
 - Reduce geometry to one travel lane, keep existing left-turn lanes at intersections.
 - Install a buffered bike lane in the existing outside travel lane.
 - Where there is no median:
 - Reduce geometry to one travel lane, install two-way left-turn lane (TWLTL) in the center.
 - Install a buffered bike lane (2.5' buffer, 4' bike lane).
 - Add stop control (signs and stop bar) to both approaches in the eastbound direction at the access ramp between Telegraph Road and Kathryn Street. Westbound Huntington Avenue remains free flow.
- Westbound Huntington Avenue
 - Where there is a median:
 - Reduce geometry to one travel lane, keep existing left-turn lanes at intersections.
 - Install a buffered bike lane in the existing outside travel lane.
 - Where there is no median:
 - Reduce geometry to one travel lane, install TWLTL in the center.
 - Install a buffered bike lane (2.5' buffer, 4' bike lane).
- Other considerations
 - At Telegraph Road, remove the rightmost westbound right-turn lane to provide a buffered bike lane that connects to the crosswalk and shared use path along Telegraph Road. No change to existing signal displays will be required.
 - At Richmond Highway, re-stripe the rightmost eastbound left-turn lane as a shared left-through lane, remove the northbound inside left-turn lane, and remove the rightmost westbound through lane to accommodate one travel lane westbound on Huntington Avenue. This will require the rightmost 3-section left-turn arrow signal to be replaced with a 4-section green arrow and ball signal. The additional load presented by the additional signal could be offset by removing one of the existing 3-section ball signals or by shifting the position of the street name sign closer to the signal pole. A formal structural evaluation should be completed to confirm acceptable loading conditions.
 - At Richmond Highway, consider installing a short bike lane on the westbound approach with bicycle detection to call the vehicle signals to cross Richmond Highway. If implemented, extend the bike lane markings and buffer on the westbound departure lanes of the intersection up to the intersection with Richmond Highway (currently shown stopping at Old Richmond Highway).
 - Optimize signal operations at all intersections to balance green time among the different signal phases to best align with the reduction in capacity for the through movements along Huntington Avenue.
 - Install additional crosswalks at unsignalized intersections to reduce the spacing of crosswalks along the corridor. FCDOT has a funded project to add a pedestrian refuge island to the existing crosswalk at Hunting Creek Road. This should be evaluated in accordance with VDOT TE-384.1. Considering spacing and sight distance, potential candidate locations for crosswalks could include:
 - Blaine Drive with potential future pedestrian refuge island

Introduction

As part of the 2024 Virginia Department of Transportation (VDOT) annual paving program, the Fairfax County Department of Transportation (FCDOT) requested that two separate corridors be evaluated to explore the feasibility of implementing a road diet to reallocate pavement space by removing a travel lane in each direction and to install buffered bicycle lanes. Huntington Avenue is one corridor included in this evaluation. The corridor extends from the signalized intersection of Huntington Avenue and Telegraph Road and ends at the signalized intersection of Huntington Avenue and Richmond Highway (approximately 1 mile). The corridor contains three other signalized intersections, at Huntington Avenue and Metroview Parkway, Huntington Avenue and Fenwick Drive, and Huntington Avenue and Farrington Avenue. The corridor also contains ten unsignalized intersections:

1. Huntington Avenue and Telegraph Road Access Ramp,
2. Huntington Avenue and Kathryn Street,
3. Huntington Avenue and Huntington Service Road,
4. Huntington Avenue and Blaine Drive,
5. Huntington Avenue and Fifer Drive,
6. Huntington Avenue and Mt Vernon Drive,
7. Huntington Avenue and Foley Street,
8. Huntington Avenue and Huntington Creek Club,
9. Huntington Avenue and Huntington Creek Road, and
10. Huntington Avenue and Riverside/Mainstay Drive.

Huntington Avenue is a four-lane minor arterial roadway that is divided between Telegraph Road and Farrington Avenue and at Richmond Highway, and undivided otherwise. It provides access to the Huntington Metrorail station and some retail land uses, as well as a mix of multifamily and single-family residential neighborhoods located along the corridor. The posted speed limit along this stretch of Huntington Avenue is 30 mph. Huntington Avenue provides a means for vehicles to access I-495 to the north of the study corridor via Telegraph Road or Richmond Highway. **Figure 1** provides an overview of the study area and location relative to the surrounding area. Left- and right-turn lanes are provided at the signalized intersections noted above. At unsignalized intersections, left-turn lanes are provided where there is a median. Also noted in **Figure 1** is the intersection spacing between study intersections as well as the typical cross-section of Huntington Avenue.

FCDOT has initiated this road diet study to evaluate the potential to improve the four-lane corridor regarding accessibility, safety, and improved mobility for all travel modes. Huntington Avenue is identified as a recommended for bike lane facility according to the most recent Fairfax County Countywide Bicycle Master Plan. In 2022, Fairfax County completed a study of Huntington Avenue which recommended that a road diet be studied and implemented. This report outlines the analysis of existing traffic conditions, build condition traffic analysis accounting for the proposed bike lanes, potential cross sections, and recommendations. Due to proximity to the Metro, potential future transit oriented development, and the Richmond Highway Bus Rapid Transit project, Fairfax County has concluded that traffic volumes are unlikely to grow in a meaningful way, and as such, did not direct Kimley-Horn to forecast future traffic volumes.

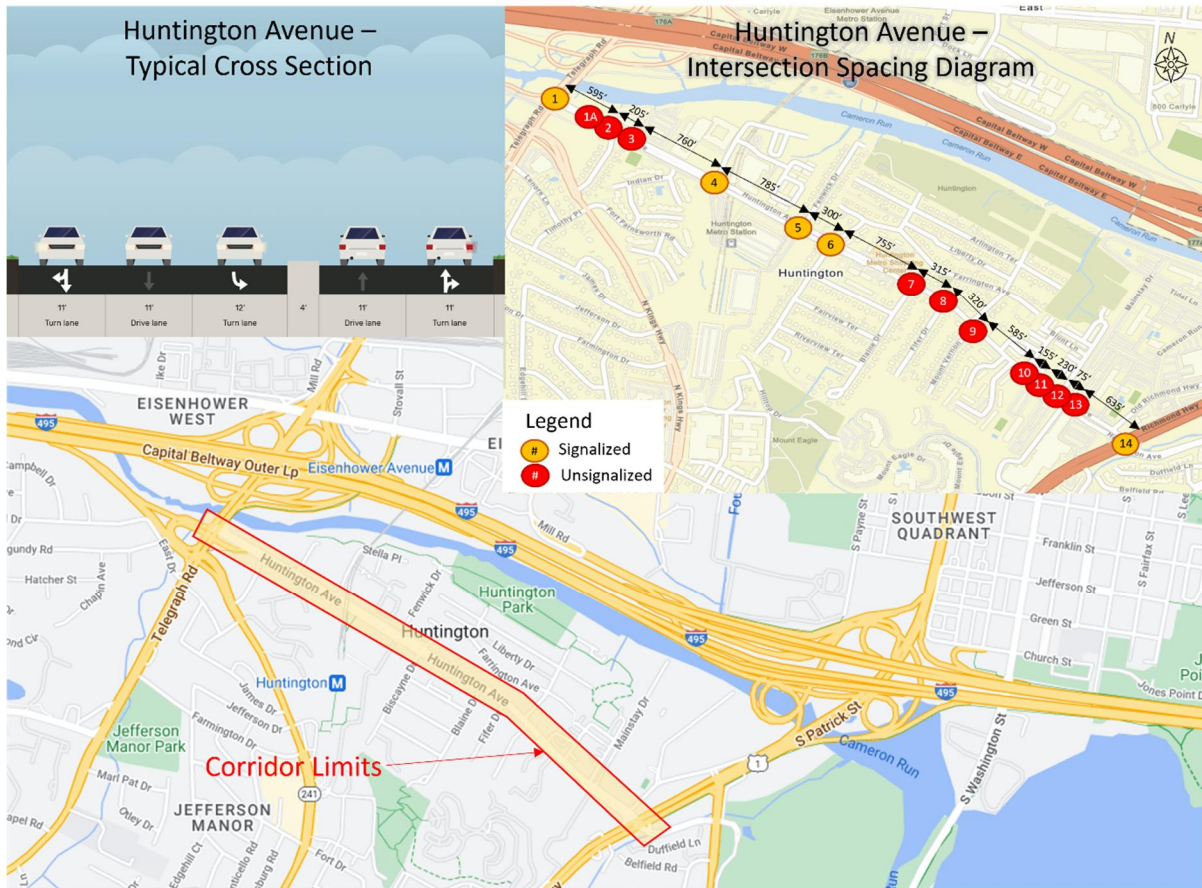


Figure 1: Study Corridor Map and Intersection Spacing Diagram (Not to scale)

Data Collection

Turning movement count (TMC) data was collected Tuesday, March 5th, 2024 from 6:00 AM to 9:00 AM and from 4:00 PM to 7:00 PM for the following intersections:

1. Huntington Avenue and Telegraph Road (signalized)
2. Huntington Avenue and Kathryn Street
3. Huntington Avenue and Huntington Avenue Service Road
4. Huntington Avenue and Metroview Parkway (signalized)
5. Huntington Avenue and Huntington Metro Access Road/Fenwick Drive (signalized)
6. Huntington Avenue and Farrington Avenue/Biscayne Drive (signalized)
7. Huntington Avenue and Blaine Drive
8. Huntington Avenue and Mt Vernon Drive
9. Huntington Avenue and Huntington Creek Club
10. Huntington Avenue and Riverside Drive/Mainstay Drive
11. Huntington Avenue and Richmond Highway (signalized)

Based upon a review of the collected TMC data, the network peak hour for the corridor was determined to be 7:30 AM to 8:30 AM and 4:45 PM to 5:45 PM.

Turning volumes for the AM and PM peak hours were estimated based on similar intersections for the following intersections:

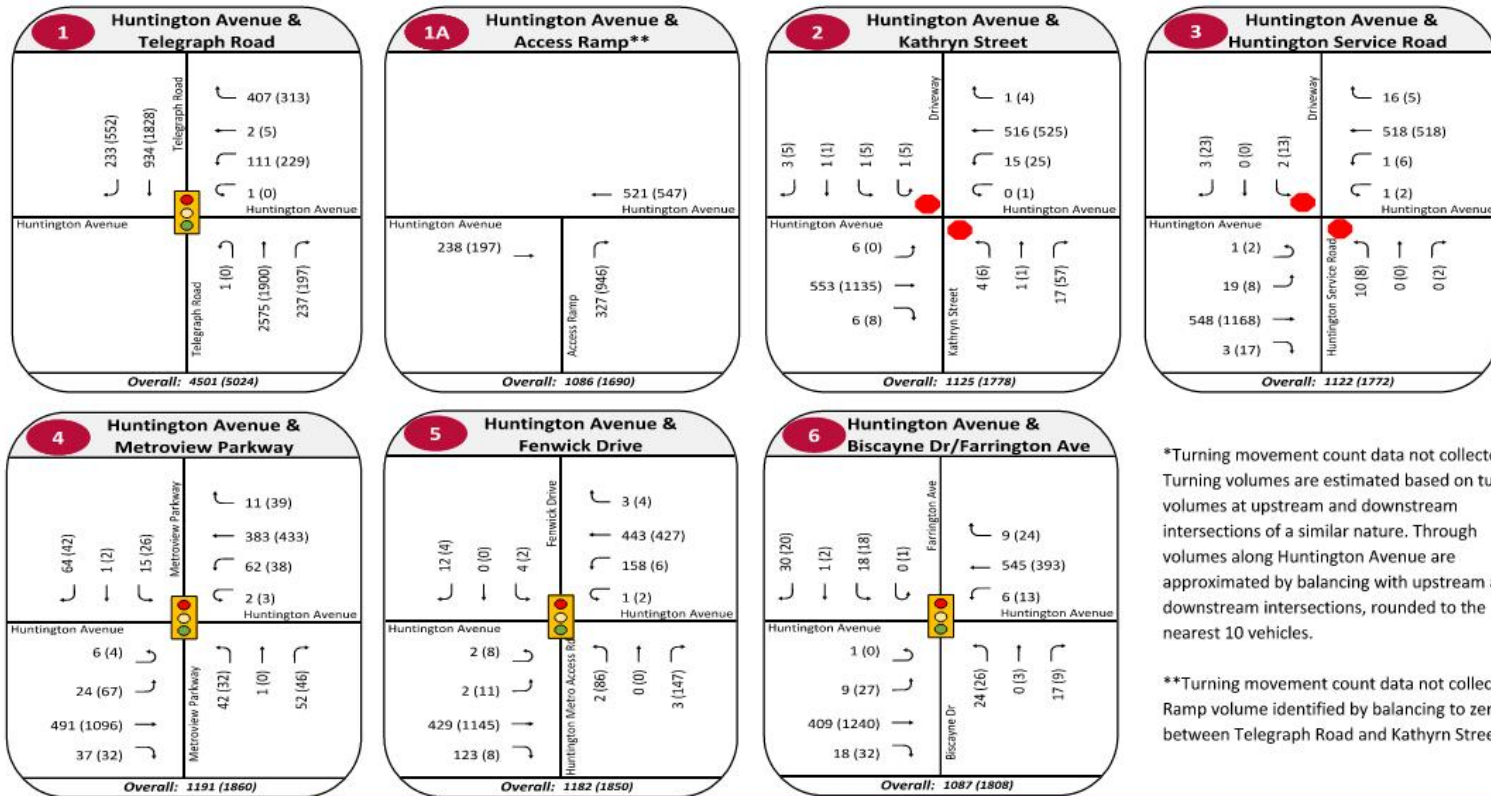
1. Huntington Avenue and Fifer Drive
2. Huntington Avenue and Foley Street
3. Huntington Avenue and Huntington Creek Road

At each of these intersections, the turns from Huntington Avenue were estimated using the number of turns onto the side street at a comparable intersection on the corridor that counts were collected for, multiplied by a ratio based on the number of units the side street contains (all side streets were dead ends), multiplied by a directional factor based on the counts collected for the corridor. The number of turns off the side street followed a similar process. For any side streets that connected to one another, a proportion of turns was allocated to each one based on how many units were on that side street. Finally, based on the estimated turning values, the through volumes were calculated to balance the volumes between intersections.

Volume balancing was used to estimate the volume at the intersection of the Telegraph Road access ramp with Huntington Avenue, between Telegraph Road and Kathryn Street. This was feasible given that a network peak hour was utilized and TMC data was collected at the intersections west and east of this ramp.

The network peak hours were used to evaluate the existing traffic conditions and build scenario conditions (with road diet). Peak hour turning movement count data is summarized in **Figure 2**. Based on a review of the network peak hour volumes in Synchro, traffic volumes were fairly balanced along the corridor and no adjustments were made to the source volumes.

Figure 2: Huntington Avenue Peak Hour Traffic Volumes (7:30-8:30 AM, 4:45-5:45 PM)



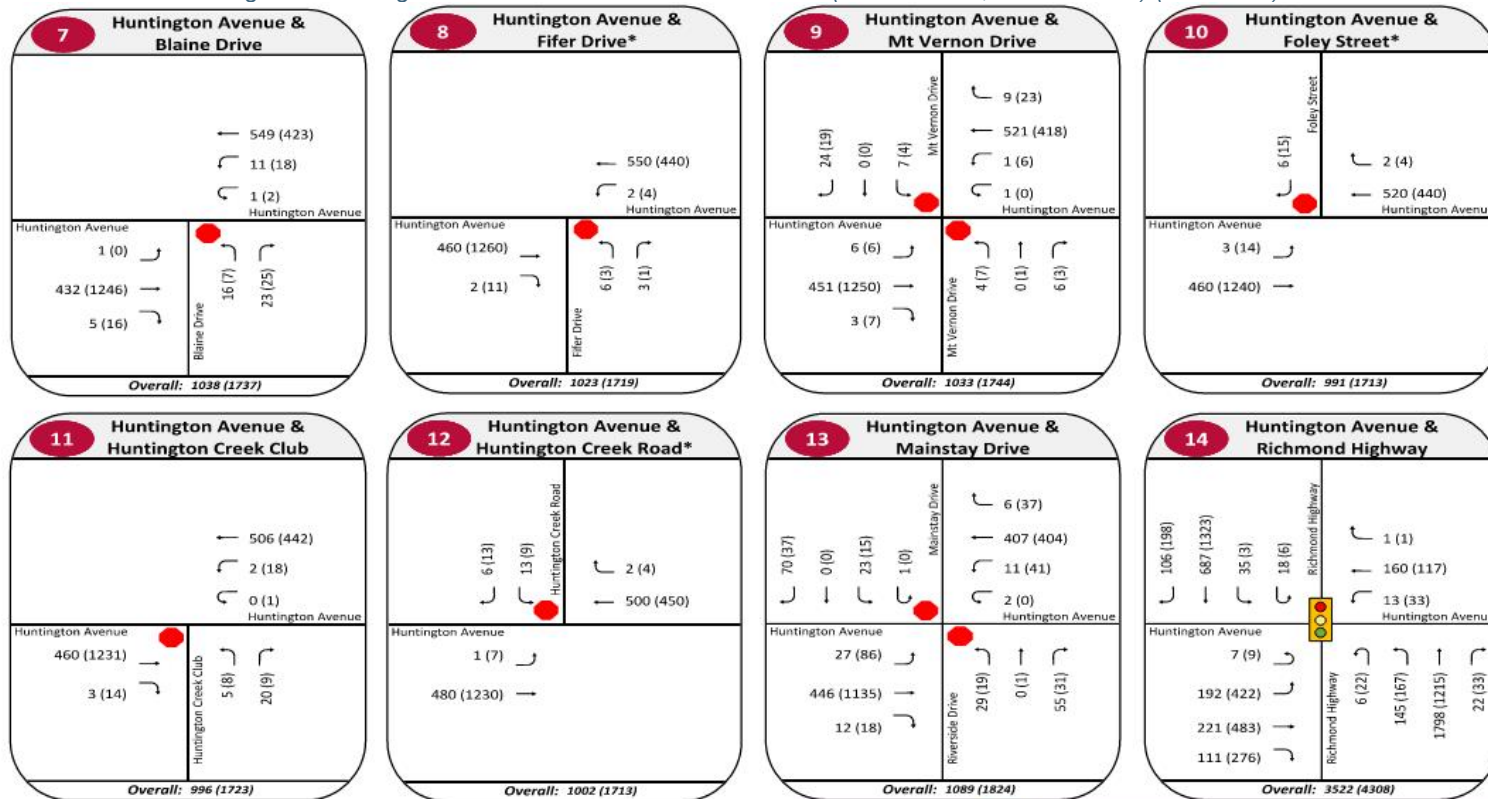
*Turning movement count data not collected. Turning volumes are estimated based on turning volumes at upstream and downstream intersections of a similar nature. Through volumes along Huntington Avenue are approximated by balancing with upstream and downstream intersections, rounded to the nearest 10 vehicles.

**Turning movement count data not collected. Ramp volume identified by balancing to zero between Telegraph Road and Kathryn Street.

LEGEND
 # Intersection ID
 XX (XX) AM (PM) Peak Hour Vehicle Volumes



Figure 2: Huntington Avenue Peak Hour Traffic Volumes (7:30-8:30 AM, 4:45-5:45 PM) (Continued)



LEGEND

Intersection ID

XX (XX) AM (PM) Peak Hour Vehicle Volumes

*Turning movement count data not collected. Turning volumes are estimated based on turning volumes at upstream and downstream intersections of a similar nature. Through volumes along Huntington Avenue are approximated by balancing with upstream and downstream intersections, rounded to the nearest 10 vehicles.

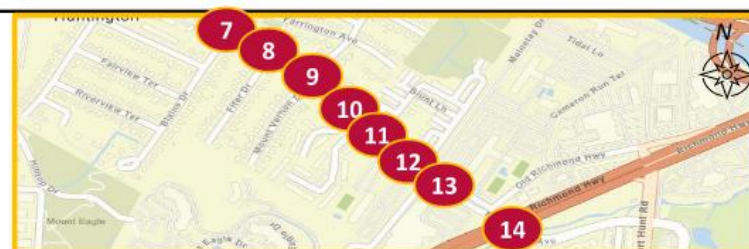


Table 1 contains the historical annual average daily traffic (AADT) volumes along the study corridor from the most recent five years of traffic data provided by VDOT. The data below shows that between 2018 and 2022, the annual average daily traffic along Huntington Avenue between Telegraph Road and Richmond Highway has decreased by 3,000 vehicles per day. Based upon the 2024 traffic data collected and a K factor of 0.111, the hourly peak hour TMC data at the endpoint intersections with Telegraph Road and Richmond Highway would suggest an average daily volume between 7,000 and 12,000 vehicles. This approximated daily volume suggests that 2024 daily volumes may be comparable to 2020 and 2021 traffic conditions.

Table 1: Historical AADT

Street	From	To	Year	AADT	%T	K	D
Huntington Avenue	Kings Highway North	Richmond Highway	2018	16,000	0%	0.117	0.68
			2019	16,000	0%	0.117	0.68
			2020	12,000	0%	0.117	0.68
			2021	12,000	2%	0.111	0.69
			2022	13,000	2%	0.111	0.69

On March 7th, 2024, at approximately 10:15 AM, field observations were completed to evaluate the current traffic conditions and document existing roadway geometry. These observations were documented in a field data collection checklist and can be referenced in **Appendix A**. There was no sign of aggressive driving or speeding.

Potential bike lane impacts include poor pavement conditions, which will be remedied by the repaving project, and one in-road inlet at the access ramp between Telegraph Road and Kathryn Street, visible in **Figure 3**. However, since this inlet is within the two-foot gutter pan, it does not directly conflict with any modifications made to accommodate a bike lane.



Figure 3: Curb inlet at access ramp between Telegraph Road and Kathryn Street

Vehicles present on the corridor included school buses, garbage trucks, and delivery trucks. There was one semi-trailer truck parked in the painted median on the east leg of the Farrington Avenue and Huntington Avenue intersection, visible below in **Figure 4**.



Figure 4: Truck parked in the painted median on the east leg of Farrington Avenue and Huntington Avenue

There are 14 bus stops located along the corridor. Current bus operations are the Washington Metropolitan Area Transit Authority (WMATA) Metrobus Route 10A, the WMATA Richmond Highway Express (REX), and Fairfax Connector Routes 101 and 171, all of which operate consistently throughout weekdays and weekends. With four bus routes and many stops along the Huntington Avenue corridor, there is the potential for consolidation of bus stops. Also of note, there are long

distances with infrequent pedestrian crossings between the many bus stops for each route on the corridor.

Bicycles were observed using the sidewalks in the corridor, as well as the shared use path at Telegraph Road and Huntington Avenue. One bicyclist was observed illegally crossing Telegraph Road during the red interval going westbound and turning into the outside southbound lane on Telegraph Road.

Pedestrians were observed crossing midblock at Huntington Avenue and Mainstay Drive. There is an existing crosswalk at this intersection, but the pedestrians crossed nearby and not within the crosswalk. At the existing crosswalk at the intersection of Foley Street and Huntington Avenue, no vehicles stopped for pedestrians using the crosswalk.

It also should be noted that the stopping sight distance is limited by the vertical curve for vehicles traveling eastbound at Foley Street. This can be referenced below in **Figure 5**. The photograph was taken east of the crosswalk east of the intersection of Foley Street and Huntington Avenue, looking west.



Figure 5: Crosswalk at Foley Street and Huntington Avenue, looking west

Crash Analysis

A crash analysis for the Huntington Avenue corridor was conducted using the previous three years of crash data to identify crash patterns that may impact recommendations in the road diet assessment. The crash reports for the calendar years 2021 through 2023 were obtained from the Virginia Department of Transportation database. Each study intersection was isolated to a 150-foot radius around the center of the intersection and analyzed individually. The crash data along the corridor segments, which includes roadway outside of each 150-foot intersection radius, was also collected and analyzed.

There was a total of 54 reported crashes between January 1, 2021 and December 31, 2023 along the Huntington Avenue corridor. Of the 54 crashes, 15 were at the intersection with Telegraph Road and 11 were at the intersection with Richmond Highway. Three crashes occurred at each of the following intersections: Metroview Parkway, Farrington Avenue, and Blaine Drive. Two or fewer crashes occurred at the remaining study intersections. Eight crashes occurred along the Huntington Avenue corridor, not at an intersection. The majority of the crashes resulted in property damage only and occurred in the off-peak hours. However, one quarter of the crashes occurred during the PM peak hours, indicating that traffic congestion is a potential contributing factor.

Three of the reported crashes were pedestrian crashes, one each at the following cross streets: Metroview Parkway, Riverside/Mainstay Drive, and Richmond Highway. The majority of crashes resulted in property damage only (33 crashes), while one third of the crashes resulted in suspected minor injury (18 crashes) and three crashes resulted in suspected major injury. The findings from the crash analysis are summarized in **Appendix B**.

Existing Conditions Traffic Analysis

The existing operating conditions for each study intersection along the corridor were analyzed using Synchro software for the AM and PM peak hours. The key steps in preparing the network for existing AM and PM peak hour conditions were as follows:

- Modifying VDOT-provided Synchro files to include all study intersections and geometry
- Estimating turning volumes using the method provided above for intersections not collected
- Inputting AM and PM peak hour TMC data for all study intersections, including peak hour factors
- Inputting heavy truck percentages
- Network review for volume balancing

The TMC data indicated that the study intersections had various AM and PM intersection-specific peak hours. For the volumes at each intersection to be properly balanced, the network peak hour was used, which represented the highest total network volume across all study intersections. The network peak hour for the morning was found to be 7:30-8:30 AM, and it was 4:45-5:45 PM for the evening. Several measures of effectiveness (MOE) generated by Synchro software were used to analyze existing operations at the 14 intersections along the study corridor. Highway Capacity Manual (HCM) 6th Edition methodology was used to report MOEs from Synchro at unsignalized intersections. HCM 2000 methodology was used to report MOEs from Synchro at signalized intersections due to limitations of HCM 6 methodology to analyze current signal operations.

Table 2 below summarize the findings from the MOEs for all intersections, including average vehicular delay, level of service (LOS), available storage, and 95th percentile queue length. Overall intersection delay is not reported for unsignalized intersections since delay cannot be calculated for uncontrolled through movements along Huntington Avenue. Movements for which delay cannot be calculated are indicated with “(-)” in the table. The majority of the ten unsignalized intersections did not have significant delay results. The highest delay for any side street approach at unsignalized intersections was 51.9 seconds in the AM peak hour and 137.7 seconds in the PM peak hour. For the AM peak hour, this delay occurred at the side street northbound left turn at Huntington Service Road. For the PM peak hour, this delay occurred for the side street northbound approach at Riverside Drive/Mainstay Drive. Both of these delays are primarily attributed to difficulty in finding a gap in both the eastbound and westbound traffic to make a turn, especially at Riverside Drive/Mainstay Drive. The consecutive operation of the northbound left turn and westbound approach at Richmond Highway results in nearly one minute of sustained volume traveling west from the intersection toward Riverside Drive/Mainstay Drive. Delay is further compounded by the high volume of traffic traveling eastbound along Huntington Avenue from upstream signals that are not coordinated with the signal at Richmond Highway. Furthermore, having to cross multiple lanes of traffic to make a left turn contributes to delay and potential safety concerns at these unsignalized intersections. MOEs for AM and PM peak hour existing conditions for all intersections can be found in **Appendix C**.

Table 2: AM and PM Peak Hour Results

Approach	Movement	Storage Length	Existing AM			Existing PM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 1: Huntington Avenue and Telegraph Road (Signalized)								
Overall Intersection		-	B (14.5)	0.73	-	B (16.6)	0.54	-
Westbound (Huntington Avenue)	WBL	297	C (33.1)	0.31	80	F (84.3)	0.75	287
	WBT	-	D (46.7)	0.76	158	F (92.3)	0.81	291
	WBR	-	D (43.5)	0.72	148	F (90.5)	0.79	274
	WB Approach	-	D (42.8)	-	-	F (88.9)	-	-
Northbound (Telegraph Road)	NBL	-	(-)	0.00	0	(-)	0.00	0
	NBTR	-	B (12.4)	0.72	476	A (7.6)	0.43	327
	NB Approach	-	B (12.4)	-	-	A (7.6)	-	-
Southbound (Telegraph Road)	SBL	-	(-)	0.00	0	(-)	0.00	0
	SBTR	-	A (6.7)	0.27	117	A (7.8)	0.49	380
	SB Approach	-	A (6.7)	-	-	A (7.8)	-	-
Intersection 2: Huntington Avenue and Kathryn Street (Unsignalized)								
Eastbound (Huntington)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	62	A (8.8)	0.02	3	B (12.0)	0.05	5
	WBT	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	A (0.6)	-	-
Northbound (Kathryn Street)	NBLTR	-	B (12.2)	0.04	3	C (18.8)	0.20	18
	NB Approach	-	B (12.2)	-	-	C (18.8)	-	-
Intersection 3: Huntington Avenue and Huntington Service Road (Unsignalized)								
Eastbound (Huntington)	EBL	72	A (8.8)	0.02	3	A (9.0)	0.01	0
	EB Approach	-	A (0.3)	-	-	A (0.1)	-	-
Westbound (Huntington Avenue)	WBL	72	A (9.7)	0.00	0	B (13.5)	0.02	3
	WBT	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	A (0.2)	-	-
Northbound (Huntington Service)	NBLTR	-	C (21.6)	0.05	3	E (48.4)	0.11	10
	NB Approach	-	C (21.6)	-	-	E (48.4)	-	-
Southbound (N/A)	SBLTR	-	B (14.4)	0.01	0	C (19.3)	0.13	10
	SB Approach	-	B (14.4)	-	-	C (19.3)	-	-
Intersection 4: Huntington Avenue and Metroview Parkway (Signalized)								
Overall Intersection		-	A (9.9)	0.24	-	A (9.0)	0.46	-
Eastbound (Huntington Avenue)	EBL	385	A (2.7)	0.04	m5	A (3.0)	0.10	16
	EBTR	-	A (4.3)	0.23	80	A (6.9)	0.49	230
	EB Approach	-	A (4.2)	-	-	A (6.6)	-	-
Westbound (Huntington Avenue)	WBL	470	A (1.1)	0.11	1	A (3.2)	0.15	2
	WBTR	-	A (2.2)	0.17	3	A (4.5)	0.21	38
	WB Approach	-	A (2.0)	-	-	A (4.4)	-	-
Northbound (Metroview Parkway)	NBL	100	D (51.9)	0.44	65	D (46.5)	0.35	50
	NBTR	-	D (47.6)	0.05	38	D (43.5)	0.03	0
	NB Approach	-	D (49.4)	-	-	D (44.7)	-	-
Southbound (Metroview Parkway)	SBL	132	D (48.7)	0.18	32	D (46.5)	0.32	43
	SBTR	-	D (47.6)	0.06	42	D (43.6)	0.05	34
	SB Approach	-	D (47.8)	-	-	D (44.7)	-	-
Intersection 5: Huntington Avenue and Fenwick Drive/Huntington Metro Access Road (Signalized)								
Overall Intersection		-	A (6.5)	0.25	-	B (13.4)	0.51	-
Eastbound (Huntington Avenue)	EBL	137	A (4.6)	0.01	m4	A (6.9)	0.03	m10
	EBT	-	A (7.1)	0.21	86	A (9.6)	0.57	182
	EBR	580	A (5.4)	0.09	7	A (4.3)	0.01	m0
	EB Approach	-	A (6.7)	-	-	A (9.5)	-	-
Westbound (Huntington Avenue)	WBL	-	A (4.5)	0.25	43	A (7.2)	0.04	6
	WBTR	-	A (4.8)	0.19	121	A (8.3)	0.21	134
	WB Approach	-	A (4.7)	-	-	A (8.3)	-	-
Northbound (Huntington Metro Access Road)	NBL	132	D (54.5)	0.05	6	D (43.4)	0.28	61
	NBT	-	D (54.4)	0.04	6	D (43.2)	0.27	62
	NBR	132	D (45.8)	0.00	0	D (40.7)	0.10	47
	NB Approach	-	D (49.3)	-	-	D (41.7)	-	-
Southbound (Fenwick Drive)	SBLTR	-	D (52.3)	0.01	0	D (48.7)	0.00	0
	SB Approach	-	D (52.3)	-	-	D (48.7)	-	-

Table 2 (continued): AM and PM Peak Hour Results

Approach	Movement	Storage Length	Existing AM			Existing PM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 6: Huntington Avenue and Farrington Avenue/Biscayne Drive (Signalized)								
Overall Intersection		-	A (5.5)	0.22	-	A (4.0)	0.50	-
Eastbound (Huntington)	EBLTR	-	A (0.4)	0.18	1	A (2.0)	0.50	26
	EB Approach	-	A (0.4)	-	-	A (2.0)	-	-
Westbound (Huntington Avenue)	WBL	97	A (1.7)	0.01	4	A (2.1)	0.05	6
	WBTR	-	A (2.2)	0.21	60	A (2.1)	0.16	43
	WB Approach	-	A (2.2)	-	-	A (2.1)	-	-
Northbound (Biscayne Drive)	NBLTR	-	D (50.1)	0.14	41	D (48.9)	0.39	50
	NB Approach	-	D (50.1)	-	-	D (48.9)	-	-
Southbound (Farrington)	SBLTR	-	D (51.0)	0.25	53	D (47.3)	0.28	46
	SB Approach	-	D (51.0)	-	-	D (47.3)	-	-
Intersection 7: Huntington Avenue and Blaine Drive (Unsignalized)								
Eastbound (Huntington)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	A (8.6)	0.01	0	B (13.7)	0.04	3
	WBTR	-	A (0.2)	-	-	A (0.8)	-	-
	WB Approach	-	A (0.4)	-	-	A (1.4)	-	-
Northbound (Blaine Drive)	NBLR	-	B (13.4)	0.09	8	C (24.6)	0.15	13
	NB Approach	-	B (13.4)	-	-	C (24.6)	-	-
Intersection 8: Huntington Avenue and Fifer Drive (Unsignalized)								
Eastbound (Huntington)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	A (8.4)	0.00	0	B (12.4)	0.01	0
	WBTR	-	(-)	-	-	A (0.1)	-	-
	WB Approach	-	(-)	-	-	A (0.2)	-	-
Northbound (Fifer Drive)	NBLR	-	B (14.0)	0.02	3	E (36.4)	0.04	3
	NB Approach	-	B (14.0)	-	-	E (36.4)	-	-
Intersection 9: Huntington Avenue and Mt Vernon Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (9.1)	0.01	0	A (8.3)	0.01	0
	EBTR	-	(-)	-	-	A (0.1)	-	-
	EB Approach	-	A (0.1)	-	-	A (0.1)	-	-
Westbound (Huntington Avenue)	WBL	-	A (9.2)	0.00	0	B (12.3)	0.01	0
	WBTR	-	(-)	-	-	A (0.1)	-	-
	WB Approach	-	(-)	-	-	A (0.3)	-	-
Northbound (Mt Vernon Drive)	NBLTR	-	B (13.6)	0.03	3	F (52.6)	0.13	10
	NB Approach	-	B (13.6)	-	-	F (52.6)	-	-
Southbound (Mt Vernon Drive)	SBLTR	-	B (12.6)	0.07	5	B (13.6)	0.06	5
	SB Approach	-	B (12.6)	-	-	B (13.6)	-	-
Intersection 10: Huntington Avenue and Foley Street (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (9.0)	0.00	0	A (8.3)	0.01	0
	EBT	-	(-)	-	-	A (0.2)	-	-
	EB Approach	-	A (0.1)	-	-	A (0.3)	-	-
Westbound (Huntington)	WBTR	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Southbound (Foley Street)	SBR	-	B (10.1)	0.01	0	A (9.8)	0.02	3
	SB Approach	-	B (10.1)	-	-	A (9.8)	-	-
Intersection 11: Huntington Avenue and Huntington Creek Club (Unsignalized)								
Eastbound (Huntington)	EBTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington)	WBTL	-	(-)	-	-	A (0.7)	-	-
	WB Approach	-	(-)	-	-	A (1.2)	-	-
Northbound (Huntington Creek Club)	NBL	-	C (16.0)	0.02	0	E (49.6)	0.10	8
	NBR	-	B (10.1)	0.03	3	B (14.6)	0.03	3
	NB Approach	-	B (11.3)	-	-	D (31.1)	-	-
Intersection 12: Huntington Avenue and Huntington Creek Road (Unsignalized)								
Eastbound (Huntington)	EBT	-	(-)	-	-	A (0.1)	-	-
	EB Approach	-	(-)	-	-	A (0.1)	-	-
Westbound (Huntington)	WBTR	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Southbound (Huntington Creek)	SBLR	-	B (14.7)	0.05	5	C (16.1)	0.07	5
	SB Approach	-	B (14.7)	-	-	C (16.1)	-	-

Table 2 (continued): AM and PM Peak Hour Results

Approach	Movement	Storage Length	Existing AM			Existing PM		
			LOS+Delay	VC Ratio	95th % Queue Length	LOS+Delay	VC Ratio	95th % Queue Length
Intersection 13: Huntington Avenue and Riverside Drive/Mainstay Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (8.5)	0.03	3	A (8.7)	0.09	8
	EBTR	-	A (0.1)	-	-	A (1.0)	-	-
EB Approach		-	A (0.6)	-	-	A (1.5)	-	-
Westbound (Huntington Avenue)	WBL	-	A (8.9)	0.01	0	B (12.0)	0.08	5
	WBTR	-	A (0.2)	-	-	A (0.5)	-	-
WB Approach		-	A (0.5)	-	-	A (1.4)	-	-
Northbound (Riverside Drive)	NBLTR	-	C (16.1)	0.22	20	F (137.7)	0.74	85
	NB Approach	-	C (16.1)	-	-	F (137.7)	-	-
Southbound (Mainstay Drive)	SBLTR	-	B (13.8)	0.20	18	D (27.4)	0.25	25
	SB Approach	-	B (13.8)	-	-	D (27.4)	-	-
Intersection 14: Huntington Avenue and Richmond Highway (Signalized)								
Overall Intersection		-	D (36.8)	0.54	-	D (43.6)	0.55	-
Eastbound (Huntington Avenue)	EBL	395	E (78.9)	0.57	162	E (65.4)	0.60	287
	EBT	-	E (79.9)	0.60	181	E (66.5)	0.64	327
	EBR	277	E (72.6)	0.07	6	E (58.1)	0.18	79
	EB Approach	-	E (78.0)	-	-	E (64.2)	-	-
Westbound (Huntington Avenue)	WBL	180	E (76.7)	0.09	40	F (81.0)	0.28	79
	WBTR	-	F (82.8)	0.58	143	F (82.7)	0.50	111
	WB Approach	-	F (82.4)	-	-	F (82.4)	-	-
Northbound (Richmond Highway)	NBL	567	F (84.4)	0.60	132	F (85.0)	0.67	160
	NBTR	-	C (22.5)	0.52	470	C (26.3)	0.40	359
	NB Approach	-	C (27.3)	-	-	C (34.1)	-	-
Southbound (Richmond Highway)	SBL	415	F (97.6)	0.63	119	F (90.0)	0.24	32
	SBT	-	C (20.1)	0.21	164	D (35.6)	0.49	429
	SBR	-	B (10.7)	0.07	24	B (11.4)	0.14	44
	SB Approach	-	C (23.8)	-	-	C (32.7)	-	-

m = Volume for 95th percentile queue is metered by upstream signal

From the MOE results for the intersection of Huntington Avenue at Telegraph Road, it can be concluded that the intersection operations are acceptable in the AM peak hour, with an overall intersection LOS B, and the worst intersection movements operating at LOS D, which occur for the westbound approach of Huntington Avenue. This is primarily attributed to Huntington Avenue operating as the side street compared to Telegraph Road. The same is true for this intersection during the PM peak hour, during which the intersection operates with an overall intersection LOS B and the side street approaches at LOS F. The cycle length increases from a 110-second cycle length in the AM peak to a 200-second cycle length in the PM peak.

The signalized intersections of Huntington Avenue at Metroview Parkway, Fenwick Drive, and Farrington Avenue operate at an acceptable level of delay, with an overall intersection LOS B or better for both AM and PM peak hours. For these three signalized intersections, the northbound and southbound approaches operate at a LOS D. This can be attributed to the signal timing favoring the mainline eastbound and westbound approaches as there is much higher volume on those approaches.

The intersection of Huntington Avenue and Richmond Highway operates poorly at LOS D during both the AM and PM peak hours. The primary factors contributing to the poor operations are cycle length and volume. AM and PM peak hour signal operations run a cycle length of 180 seconds. This inherently increases delay as certain movements can experience a dwell time of over two minutes waiting for the signal phase to be served. In addition, the high volumes and limited number of lanes to accommodate turning movements (no more than two lanes) impacts the capacity of the intersection

to process volume. Overall AM peak hour operations are better than the PM peak hour, likely as a result of approximately 780 fewer vehicles (nearly 20% less volume) traveling through the intersection.

Of note in the collected data, there is approximately 1 pedestrian crossing of Huntington Avenue at every intersection without a crosswalk throughout the corridor. These movements indicate there may be a need for additional pedestrian facilities, especially given the quantity of bus routes in the corridor.

Road Diet Assessment

GEOMETRY

Using the information from the analysis of existing roadway geometry and traffic conditions, an assessment of the impact of the proposed road diet was completed. The modifications of the corridor include the removal of one eastbound and one westbound through travel lane to install a buffered bike lane along the north and south curbs. **Figure 6** and **Figure 8** show the existing cross sections of the corridor, while **Figure 8** and **Figure 9** show typical cross sections for the potential build conditions. The graphics were created using Streetmix.

Cross section graphics do not include existing gutters, which represent additional horizontal space to accommodate the reconfiguration of the roadway width for bike lanes. Gutters along Huntington Avenue were measured to be 2 feet. The bike lane is proposed to be 4' wide, leveraging additional 2 feet of gutter to provide an effective bike lane width of 6 feet and a resulting buffer of 2.5 feet.

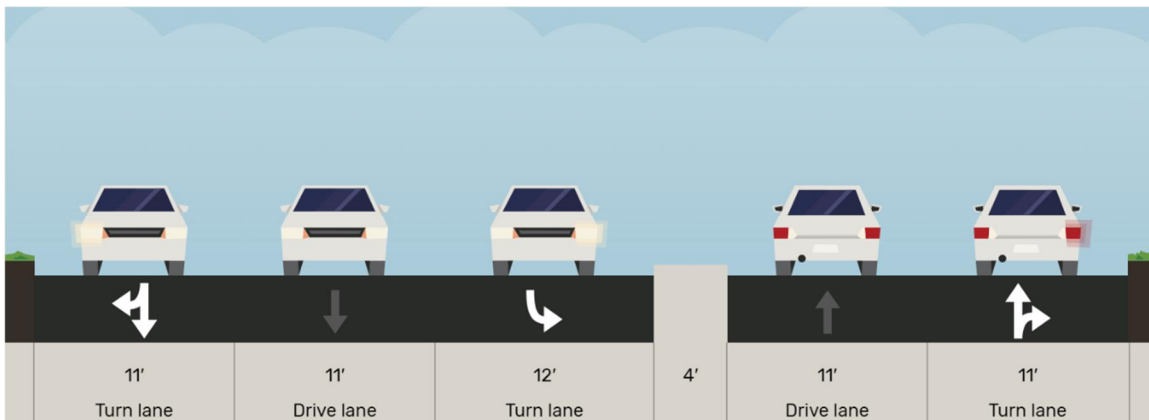


Figure 6: Huntington Avenue Existing Conditions Cross Section – With Median

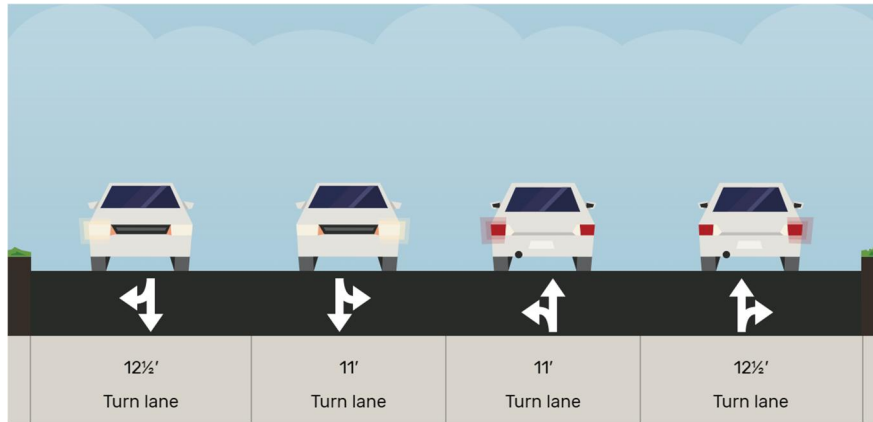


Figure 7: Huntington Avenue Existing Conditions Cross Section – No Median

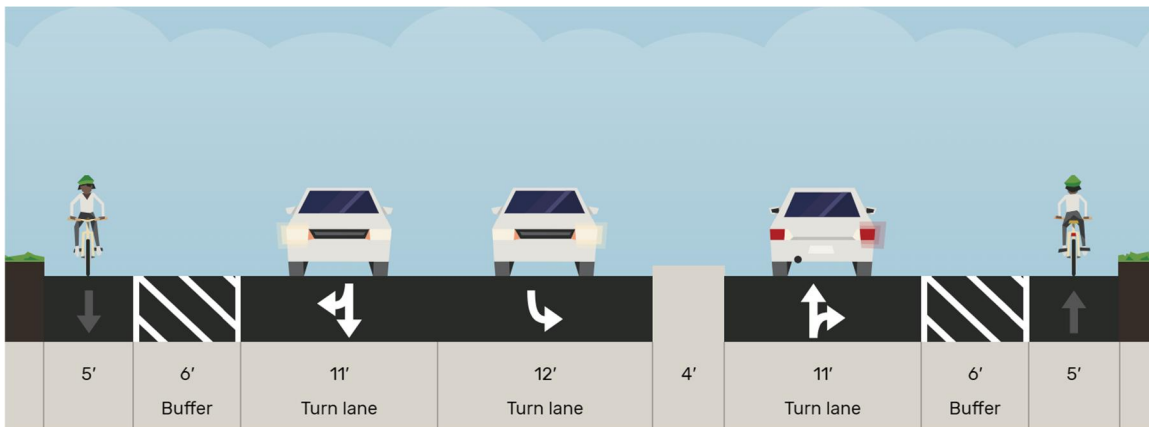


Figure 8: Huntington Avenue Build Conditions Typical Cross Section – With Median

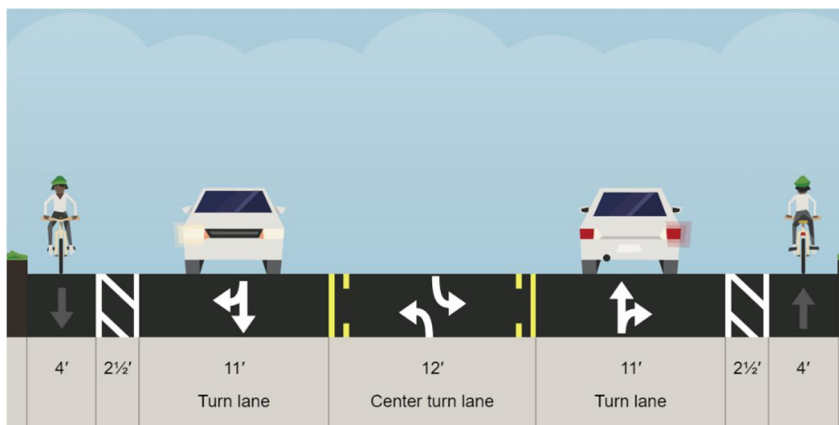


Figure 9: Huntington Avenue Build Conditions Typical Cross Section – No Median

Potential changes to the geometry at the intersection of Huntington Avenue and Telegraph Road are recommended as follows to accommodate bike lanes at the intersection:

- Repurpose the existing eastbound and westbound outside travel lanes as bike lanes with a buffer for the westbound bike lane
- Remove one westbound right-turn lane
- Add stop control on the eastbound approach at the access ramp for both approaches

Figure 10 illustrates the modifications proposed at this signalized intersection outlined above (cross section and plan view). The five-foot bike lane will begin on the east leg of the intersection and continue along the north and south curb along Huntington Avenue. Bicyclists will enter or exit the Huntington Avenue corridor from the shared-use path which parallels Telegraph Road. As shown in **Figure 10**, the removal of the second westbound right-turn lane is required to provide access to the shared-use path for bicyclists traveling westbound.



Figure 10: Huntington Avenue and Telegraph Road Alternative Build Conditions Cross Section and Plan View

In addition, stop signs should be added at both approaches at the intersection with the access ramp between Telegraph Road and Kathryn Street to ensure the safety of eastbound bicyclists, as well as

drivers, as the add-lane for ramp vehicles will be removed. This was identified as the safest condition for vehicles and bicyclists. Sight distance is poor along the Huntington Avenue and access ramp approaches, which is why yield or stop conditions for one of the approaches and uncontrolled operations for the other approach is not recommended. According to Section 2B.16 of the MUTCD, all-way stop control is warranted when the major approach has 300 or more units of traffic (pedestrians, bicycles, and vehicles) and the minor approach has 200 or more units of traffic. For the Huntington Avenue approach, there are 238 vehicles in the AM peak hour and 197 during the PM peak hour. For the access ramp approach, there are 327 vehicles in the AM peak hour and 946 during the PM peak hour. While the threshold of 200 is not satisfied in the PM peak hour, it is likely that bicycle volumes would increase in the build condition, exceeding the minimum threshold for the minor approach. Further study is recommended to confirm the 8-hour MUTCD warrant is satisfied. Based on the build alternative analysis outlined later in this report, queuing does not spill back onto Telegraph Road but does extend along the access ramp approximately 520 feet during the PM peak hour. This is the equivalent of the queue extending onto the bridge over Telegraph. Alternatively, mitigation to improve sight distance should be explored to potentially consider alternate intersection control options. If sign distance mitigation is not feasible, that is another criteria to consider as part of the all-way stop control warrant (Section 2B.14).

When identifying potential geometry changes at Richmond Highway, a Build condition was identified that provided bike lanes in both directions and included the following modifications:

- Remove a northbound left-turn lane
- Remove a westbound through lane
- Repurpose the outside eastbound and westbound travel lane as a bike lane with a buffer
- Re-stripe the rightmost eastbound left-turn lane to a shared through and left-turn lane

Figure 11 illustrates the modifications proposed at this signalized intersection (cross section and plan view). Given the reduction to one travel lane westbound downstream of the signal, lanes on other approaches must be removed or adjusted. The westbound bike lane begins after the intersection with Old Richmond Highway. Lane control figures for existing and proposed conditions can be found in **Appendix D**. The proposed configuration likely does not require moving the traffic signal detector loops and will not require an evaluation in auto-turn as the existing lane geometry will be maintained. Furthermore, the proposed configuration reduces the crossing distance for pedestrians.

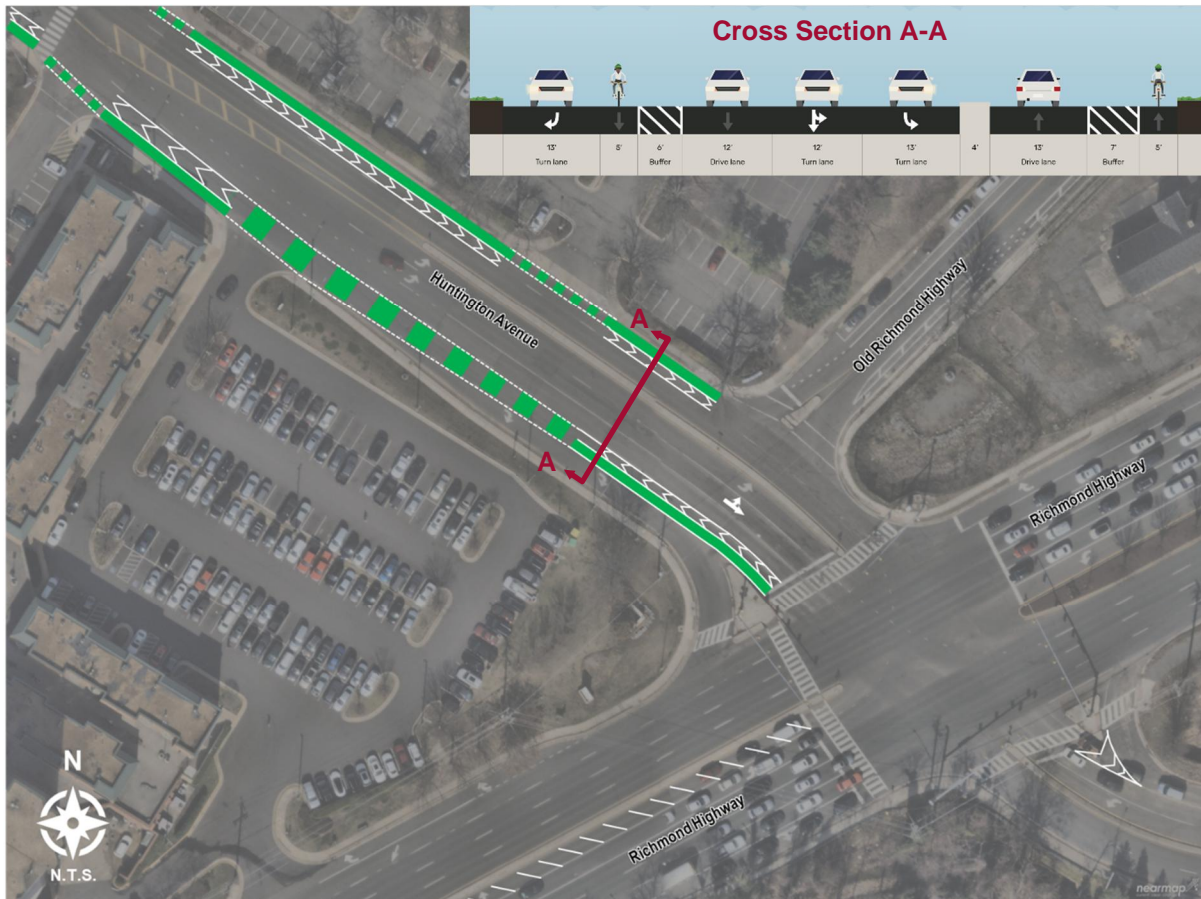


Figure 11: Intersection of Huntington Avenue and Richmond Highway Build Conditions Cross Section and Plan View

POTENTIAL CRASH MITIGATION

The Virginia state preferred crash modification factors (CMF) list¹ was referenced to identify appropriate modification factors and the potential impact on crash likelihood along the corridor. Given the primary objective of this project to implement enhanced accommodations for non-auto users, the assessment of potential crash mitigation was focused on bicycle and pedestrian-related crashes. However, benefits of a road diet are not limited to non-auto users. Road diets reduce vehicle speeds, which can help reduce the number and severity of vehicle-to-vehicle crashes. Additionally, road diets can benefit vehicle operations by separating left-turning traffic and reducing the number of lanes required for side-street traffic to cross.²

¹ https://www.vdot.virginia.gov/media/vdotvirginiagov/doing-business/technical-guidance-and-support/traffic-operations/vhsip/VA-State-Preferred-CMF-List_acc050222.pdf

² https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/ch2.cfm

Relative to non-auto users, there were three reported crashes that involved a pedestrian at three intersections on Huntington Avenue: Metroview Parkway, Hunting Creek Road, and Richmond Highway. Two of the crashes occurred at or near existing crosswalks that are already signalized. Based on the available crash data information, the crash at Hunting Creek Road places the location of the crash crossing the southbound approach. However, there is an existing crosswalk crossing Huntington Avenue, so it is possible that a pedestrian may have been hit by a driver when crossing Huntington Avenue at this unsignalized intersection. The relevant CMF pertaining to this crash is described as follows:

- **Add Rectangular Rapid Flashing Beacon (RRFB)**, CMF = 0.526 this factor applies to all crashes and crash severities and has a service life of 6 years.

There was one crash over a three-year period that occurred at Hunting Creek Road. Applying this CMF could reduce the number of crashes from 1 crash every three years to less than 1 crash every three years (0.526 crashes). Note that Fairfax County indicated at the study kickoff meeting that there are plans to install an RRFB at this location.

Of the two remaining crashes at signalized crosswalks, one occurred at or near a crosswalk that is marked with parallel pavement markings only (Metroview Parkway). The other occurred at a signalized crosswalk at Richmond Highway that is marked with high visibility pavement markings. Further mitigation within the parameters of the at-grade signalized intersection is not feasible outside of implementing an exclusive pedestrian phase at Richmond Highway. This mitigation is not recommended given the low pedestrian volume. The relevant CMF for Metroview Parkway is described as follows:

- **Convert Standard Crosswalk Pavement Marking to High-Visibility Crosswalk**, CMF = 0.63 this factor applies to all crashes and crash severities and has a service life of 2 years.

There was one crash over a three-year period that occurred at Metroview Parkway. Applying this CMF could reduce the number of crashes from 1 crash every three years to less than 1 crash every three years (0.63 crashes). Note that the CMF for implementing a leading pedestrian interval (LPI) was not considered at Metroview Parkway since the intersection currently operates with an LPI to cross Huntington Avenue, which would be proposed for improvement to high-visibility crosswalk markings. This CMF was also not considered at Richmond Highway. Current VDOT policy does not allow for LPIs to be programmed for crossings of the minor approach to an intersection, as was the case of the pedestrian crash at Richmond Highway.

Related to vehicle countermeasures, there is a CMF for roadway segments with the countermeasure of a road diet. A road diet is also another fundamental component of this study as a means of creating space for bicyclists within the roadway. The road diet countermeasure is specific to the conversion of a four-lane undivided roadway to two travel lanes with a center turn lane. Huntington Avenue west of Farrington Avenue and east of Mainstay Drive is currently a divided roadway with existing center left-turn lanes. Since the proposed configuration does not meet that criterion, this CMF cannot be applied. However, between Farrington Avenue and Mainstay Drive the corridor is a four-lane undivided roadway. The CMF can be applied in this area, and the relevant CMF is described as follows:

- **Road Diet (4U to 3T)**, CMF = 0.71 this factor applies to all crashes and has a service life of 20 years.

Within the section of Huntington Avenue where the undivided four-lane section exists, there were no reported crashes during the three-year analysis period. Therefore, this CMF is not applicable to the entire study limits of Huntington Avenue.

BUILD TRAFFIC ANALYSIS

Two Build configurations were initially considered at the intersection of Huntington Avenue and Telegraph Road. The first preserved the existing geometry of the westbound approach, providing 125 feet of storage for the rightmost turn lane. A second build condition (Alternative Telegraph) removed one westbound right-turn lane at Huntington Avenue and Telegraph Road, reducing pedestrian crossing distance and allowing the proposed on-street bike lane to connect to the trail along Telegraph Road. This initial build analysis at Telegraph Road is presented to demonstrate the limited operational benefit of retaining two westbound right-turn lanes at the intersection in support of the recommended intersection configuration shown in **Figure 10**.

As shown in **Table 2** above, the existing configuration of Telegraph Road without bike lanes operates at an overall LOS B during both the AM and PM peak hours. In the Existing Telegraph build condition, which preserves both right-turn lanes, LOS B is maintained. When one right-turn lane is removed, overall delay increases to LOS C conditions for both the AM and PM peak hours. This is a not a significant change, an increase of 8 and 6 seconds, respectively, shown in **Table 3** and **Table 4** below. As shown, reducing the number of right-turn lanes does not significantly impact intersection operations for vehicles and provides a benefit for bicyclists and pedestrians at the intersection. This reduction in the number of right-turn lanes also simplifies downstream operations on Telegraph Road at the on-ramps to Eisenhower Avenue and I-95/I-495, eliminating the need for drivers to navigate a lane change to access these ramps when turning from Huntington Avenue in the rightmost right-turn lane. A summary of the two Build traffic conditions for Huntington Avenue and Telegraph Road is provided in **Appendix E**.

Table 3: Proposed Build Condition Comparison at Telegraph Road - AM Peak Hour

Approach	Movement	Storage Length	Build AM - Existing Telegraph			Build AM - Alternative Telegraph		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 1: Huntington Avenue and Telegraph Road (Signalized)								
Overall Intersection		-	B (15.0)	0.73	-	C (24.0)	0.88	-
Westbound (Huntington Avenue)	WBL	297	D (36.1)	0.30	96	C (24.5)	0.19	75
	WBT	-	D (47.5)	0.74	191	D (50.7)	0.90	#448
	WBR	125*	D (44.7)	0.69	178	s	s	s
	WB Approach	-	D (44.2)	-	-	D (45.7)	-	-
Northbound (Telegraph Road)	NBT	-	B (12.9)	0.73	495	C (24.7)	0.88	592
	NBR	-	s	s	s	s	s	s
	NB Approach	-	B (12.9)	-	-	C (24.7)	-	-
Southbound (Telegraph Road)	SBTR	-	A (7.0)	0.28	123	B (12.8)	0.33	149
	SB Approach	-	A (7.0)	-	-	B (12.8)	-	-

= 95th percentile volume exceeds capacity, queue may be longer

*Westbound right-turn storage provided in the Existing Telegraph Build condition only

Table 4: Proposed Build Condition Comparison at Telegraph Road - PM Peak Hour

Approach	Movement	Storage Length	Build PM - Existing Telegraph			Build PM - Alternative Telegraph		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 1: Huntington Avenue and Telegraph Road (Signalized)								
Overall Intersection			B (16.9)	0.55	-	C (21.6)	0.63	-
Westbound (Huntington Avenue)	WBL	297	F (86.0)	0.73	316	E (63.3)	0.30	193
	WBT	-	F (93.4)	0.79	334	E (63.3)	0.30	193
	WBR	125*	F (91.0)	0.77	311	F (89.2)	0.85	521
	WB Approach	-	F (90.1)	-	-	E (78.1)	-	-
Northbound (Telegraph Road)	NBT	-	A (7.8)	0.43	337	B (14.3)	0.48	462
	NBR	-	s	s	s	s	s	s
	NB Approach	-	A (7.8)	-	-	B (14.3)	-	-
Southbound (Telegraph Road)	SBTR	-	A (8.1)	0.49	394	B (14.9)	0.55	543
	SB Approach	-	A (8.1)	-	-	B (14.9)	-	-

*Westbound right-turn storage provided in the Existing Telegraph Build condition only

The Build analysis results for the remaining study intersections are summarized below in **Table 5** and **Table 6**, with complete results included in **Appendix F**. The signalized intersections of Huntington Avenue at Metroview Parkway, Fenwick Drive, and Farrington Avenue operate at an acceptable level of delay during the AM peak hour with an overall intersection LOS B or better. Operations deteriorate slightly during the PM peak hour at Metroview Parkway and Fenwick Drive, with overall intersection delay increasing by as much as 21 seconds to LOS C conditions. The largest changes during the PM peak hour occur for the eastbound through movement, which changes from LOS A to LOS D conditions at Fenwick Drive. This can be attributed to the reduction in lanes under the build condition geometry. Westbound left-turn movements also experience a change in operations to LOS D conditions at Metroview Parkway. These turning movements must wait for a gap in opposing through traffic to turn during the permissive phase, and with as many as 1,240 eastbound through movements, the frequency of gaps is much less compared to existing conditions. Ultimately, LOS D or better operations are expected for all movements.

95th percentile queues and volume-to-capacity (V/C) ratios also increase in the eastbound direction during the PM peak hour under build conditions. Through-movement V/C ratios range from 0.91 to 1.05, and queue lengths range from approximately 450 feet to as much as 1,200 feet. The intersection at Fenwick Drive is the location where the greatest delay, V/C ratio, and queue length occurs on the eastbound approach. While the results suggest oversaturated conditions, the progression favors eastbound travel, with a 70-second arterial green band between Metroview Parkway and Farrington Avenue. This translates to a significant portion of the 100-second cycle length that eastbound drivers are able to flow continuously through this segment. Another factor to consider is the split phase operations at Fenwick Drive. Given the low approach volume in the southbound direction (less than 10 vehicles per hour), it is very likely that this phase will be skipped frequently. This would then restore up to 15 seconds of green time to Huntington Avenue. Thus, these results represent a conservative estimate of delay and operations in the build condition, and actual operations should be expected to be better.

Operations at the intersection of Huntington Avenue and Richmond Highway are comparable to existing conditions, with LOS D for existing and build conditions during both peak hours. Under build conditions, northbound left-turn lane and the westbound through/right lane have worse operation, with the northbound left-turn lane having a volume-to-capacity ratio of 0.85 during the PM peak hour. This can be attributed to the build geometry of a single left-turn lane. It should be noted that LOS is

maintained by movement, so drivers are unlikely to experience much difference in their current delay under existing conditions. Furthermore, the 95th percentile queue length in the PM peak hour would increase from 160 feet to 341 feet, which would be accommodated within the approximately 450 foot left-turn lane. Additional median width can also be provided with the removal of one of the left-turn lanes to serve as a future pedestrian refuge island, improving safety for people walking along the high crash corridor.

Additionally, the build condition adds stop control for both approaches at the access ramp between Telegraph Road and Kathryn Street. This operates at LOS A during the AM peak hour and at LOS E during the PM peak hour. There is significant volume on the access ramp during the PM peak hour (almost 1,000 vehicles), which contributes to the nearly one minute of average delay and more than 500 feet of queuing along the access ramp. As noted above, the all-way stop condition is added to provide safety for both bicyclists and drivers. While the ramp V/C ratio is 1.02, this represents the peak-of-the-peak operations and is not expected to be a sustained condition. The stop control could provide a benefit to corridor operations to the east, metering the volume of traffic entering the corridor, resulting in less delay at the three signalized intersection east of the ramp. This metering effect could also provide additional gaps in traffic to allow more opportunities for opposing westbound left turns or side street maneuvers.

HCM 6 results during the AM peak hour indicate the highest unsignalized intersection approach delay occurs for the northbound approach at Huntington Service Road, with 28.3 seconds of delay. This is 7 seconds more than existing conditions, so the build condition is comparable to the existing condition. During the PM peak hour, the highest unsignalized intersection approach delay occurs for the northbound approach at Riverside Drive/Mainstay Drive, with 158.2 seconds of delay. This can be attributed to the limited opportunity to find gaps in traffic along Huntington Avenue with a combined east-west through volume of more than 1,500 vehicles per hour. While this is a significant level of delay, it should be noted that delay for this approach is only 20.5 seconds longer on average than the delay under existing conditions, which is 137.7 seconds.

Overall, build conditions are comparable to existing conditions during the AM peak hour, but worse during the PM peak hour.

Table 5: AM Peak Hour Build Condition Results

Approach	Movement	Storage Length	Existing AM			Build AM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 2: Huntington Avenue and Kathryn Street (Unsignalized)								
Eastbound (Huntington)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	62	A (8.8)	0.02	3	A (8.8)	0.02	3
	WBT	-	(-)	-	-	(-)	-	-
Northbound (Kathryn Street)	WB Approach	-	(-)	-	-	A (0.2)	-	-
	NBLTR	-	B (12.2)	0.04	3	B (14.9)	0.06	5
	NB Approach	-	B (12.2)	-	-	B (14.9)	-	-
	Intersection 3: Huntington Avenue and Huntington Service Road (Unsignalized)							
Eastbound (Huntington)	EBL	72	A (8.8)	0.02	3	(-)	-	-
	EB Approach	-	A (0.3)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	72	A (9.7)	0.00	0	(-)	~	~
	WBTR	-	(-)	-	-	(-)	-	-
Northbound (Huntington Service)	WB Approach	-	(-)	-	-	(-)	-	-
	NBLTR	-	C (21.6)	0.05	3	D (28.3)	0.06	5
Southbound (N/A)	NB Approach	-	C (21.6)	-	-	D (28.3)	-	-
	SBLTR	-	B (14.4)	0.01	0	C (18.0)	0.02	3
	SB Approach	-	B (14.4)	-	-	C (18.0)	-	-
	Intersection 4: Huntington Avenue and Metroview Parkway (Signalized)							
Overall Intersection		-	A (9.9)	0.24	-	B (11.9)	0.42	-
Eastbound (Huntington Avenue)	EBL	385	A (2.7)	0.04	m5	A (3.9)	0.04	11
	EBTR	-	A (4.3)	0.23	80	A (8.3)	0.44	272
Westbound (Huntington Avenue)	EB Approach	-	A (4.2)	-	-	A (8.0)	-	-
	WBL	470	A (1.1)	0.11	1	A (1.3)	0.12	1
Northbound (Metroview Parkway)	WBTR	-	A (2.2)	0.17	3	A (2.8)	0.32	7
	WB Approach	-	A (2.0)	-	-	A (2.6)	-	-
Southbound (Metroview Parkway)	NBL	100	D (51.9)	0.44	65	D (51.9)	0.44	65
	NBTR	-	D (47.6)	0.05	38	D (47.5)	0.05	38
Southbound (Metroview Parkway)	NB Approach	-	D (49.4)	-	-	D (49.4)	-	-
	SBL	132	D (48.7)	0.18	32	D (48.7)	0.18	32
Southbound (Metroview Parkway)	SBTR	-	D (47.6)	0.06	42	D (47.5)	0.06	42
	SB Approach	-	D (47.8)	-	-	D (47.8)	-	-
Intersection 5: Huntington Avenue and Fenwick Drive/Huntington Metro Access Road (Signalized)								
Overall Intersection		-	A (6.5)	0.25	-	A (7.3)	0.39	-
Eastbound (Huntington Avenue)	EBL	137	A (4.6)	0.01	m4	A (4.4)	0.01	m2
	EBT	-	A (7.1)	0.21	86	A (8.8)	0.41	173
Westbound (Huntington Avenue)	EBR	580	A (5.4)	0.09	7	A (3.2)	0.09	3
	EB Approach	-	A (6.7)	-	-	A (7.5)	-	-
Northbound (Huntington Metro Access Road)	WBL	-	A (4.5)	0.25	43	A (4.7)	0.26	43
	WBTR	-	A (4.8)	0.19	121	A (6.0)	0.36	282
Southbound (Fenwick Drive)	WB Approach	-	A (4.7)	-	-	A (5.6)	-	-
	NBL	132	D (54.5)	0.05	6	D (54.5)	0.05	6
Southbound (Fenwick Drive)	NBT	-	D (54.4)	0.04	6	D (54.4)	0.04	6
	NBR	132	D (45.8)	0.00	0	D (44.5)	0.00	0
Southbound (Fenwick Drive)	NB Approach	-	D (49.3)	-	-	D (48.5)	-	-
	SBLTR	-	D (52.3)	0.01	0	D (52.3)	0.01	0
	SB Approach	-	D (52.3)	-	-	D (52.3)	-	-
	Intersection 6: Huntington Avenue and Farrington Avenue/Biscayne Drive (Signalized)							
Overall Intersection		-	A (5.5)	0.22	-	A (6.2)	0.40	-
Eastbound (Huntington)	EBLTR	-	A (0.4)	0.18	1	A (0.7)	0.32	3
	EB Approach	-	A (0.4)	-	-	A (0.7)	-	-
Westbound (Huntington Avenue)	WBL	97	A (1.7)	0.01	4	A (1.7)	0.01	4
	WBTR	-	A (2.2)	0.21	60	A (3.3)	0.41	155
Northbound (Biscayne Drive)	WB Approach	-	A (2.2)	-	-	A (3.3)	-	-
	NBLTR	-	D (50.1)	0.14	41	D (50.1)	0.14	41
Southbound (Farrington)	NB Approach	-	D (50.1)	-	-	D (50.1)	-	-
	SBLTR	-	D (51.0)	0.25	53	D (51.0)	0.25	53
	SB Approach	-	D (51.0)	-	-	D (51.0)	-	-
	Intersection 7: Huntington Avenue and Blaine Drive (Unsignalized)							
Eastbound (Huntington)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	A (8.6)	0.01	0	(-)	-	-
	WBTR	-	A (0.2)	-	-	(-)	-	-
Northbound (Blaine Drive)	WB Approach	-	A (0.4)	-	-	(-)	-	-
	NBLR	-	B (13.4)	0.09	8	B (13.5)	0.09	8
	NB Approach	-	B (13.4)	-	-	B (13.5)	-	-

Table 5 (continued): AM Peak Hour Build Condition Results

Approach	Movement	Storage Length	Existing AM			Build AM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 8: Huntington Avenue and Fifer Drive (Unsignalized)								
Eastbound (Huntington)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	A (8.4)	0.00	0	A (8.4)	0.00	0
	WBTR	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Northbound (Fifer Drive)	NBLR	-	B (14.0)	0.02	3	B (13.5)	0.02	3
	NB Approach	-	B (14.0)	-	-	B (13.5)	-	-
Intersection 9: Huntington Avenue and Mt Vernon Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (9.1)	0.01	0	A (8.9)	0.01	0
	EBTR	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	EB Approach	-	A (0.1)	-	-	A (0.1)	-	-
	WBL	-	A (9.2)	0.00	0	(-)	~	~
Northbound (Mt Vernon Drive)	WBTR	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Southbound (Mt Vernon Drive)	NBLTR	-	B (13.6)	0.03	3	C (17.2)	0.04	3
	NB Approach	-	B (13.6)	-	-	C (17.2)	-	-
Southbound (Mt Vernon Drive)	SBLTR	-	B (12.6)	0.07	5	C (15.4)	0.09	8
	SB Approach	-	B (12.6)	-	-	C (15.4)	-	-
Intersection 10: Huntington Avenue and Foley Street (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (9.0)	0.00	0	A (8.9)	0.00	0
	EBT	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	EB Approach	-	A (0.1)	-	-	A (0.1)	-	-
	WBTR	-	(-)	-	-	(-)	-	-
Southbound (Foley Street)	WB Approach	-	(-)	-	-	(-)	-	-
	SBR	-	B (10.1)	0.01	0	B (11.9)	0.01	0
Southbound (Foley Street)	SB Approach	-	B (10.1)	-	-	B (11.9)	-	-
	Intersection 11: Huntington Avenue and Huntington Creek Club (Unsignalized)							
Eastbound (Huntington Avenue)	EBTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	s	s	s	A (9.3)	0.00	0
	WBTL	-	(-)	-	-	(-)	-	-
Northbound (Huntington Creek Club)	WB Approach	-	(-)	-	-	(-)	-	-
	NBL	-	C (16.0)	0.02	0	B (14.5)	0.01	0
Northbound (Huntington Creek Club)	NBR	-	B (10.1)	0.03	3	B (11.7)	0.04	3
	NB Approach	-	B (11.3)	-	-	B (12.3)	-	-
Intersection 12: Huntington Avenue and Huntington Creek Road (Unsignalized)								
Eastbound (Huntington Avenue)	EBT	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBTR	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Southbound (Huntington Creek)	SBLR	-	B (14.7)	0.05	5	B (13.9)	0.05	5
	SB Approach	-	B (14.7)	-	-	B (13.9)	-	-
Intersection 13: Huntington Avenue and Riverside Drive/Mainstay Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (8.5)	0.03	3	A (8.4)	0.03	3
	EBTR	-	A (0.1)	-	-	(-)	-	-
Westbound (Huntington Avenue)	EB Approach	-	A (0.6)	-	-	A (0.5)	-	-
	WBL	-	A (8.9)	0.01	0	(-)	-	-
Northbound (Riverside Drive)	WBTR	-	A (0.2)	-	-	(-)	-	-
	WB Approach	-	A (0.5)	-	-	(-)	-	-
Southbound (Mainstay Drive)	NBLTR	-	C (16.1)	0.22	20	C (21.2)	0.29	30
	NB Approach	-	C (16.1)	-	-	C (21.2)	-	-
Southbound (Mainstay Drive)	SBLTR	-	B (13.8)	0.20	18	C (17.7)	0.26	25
	SB Approach	-	B (13.8)	-	-	C (17.7)	-	-

Table 5 (continued): AM Peak Hour Build Condition Results

Approach	Movement	Storage Length	Existing AM			Build AM			
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length	
Intersection 14: Huntington Avenue and Richmond Highway (Signalized)									
Overall Intersection			-	D (36.8)	0.54	-	D (43.3)	0.63	-
Eastbound (Huntington Avenue)	EBL	395	E (78.9)	0.57	162	F (84.6)	0.69	262	
	EBT	-	E (79.9)	0.60	181	E (78.9)	0.67	232	
	EBR	277	E (72.6)	0.07	6	E (69.0)	0.07	6	
	EB Approach	-	E (78.0)	-	-	E (78.3)	-	-	
Westbound (Huntington Avenue)	WBL	180	E (76.7)	0.09	40	E (70.6)	0.06	38	
	WBTR	-	F (82.8)	0.58	143	F (91.5)	0.76	276	
	WB Approach	-	F (82.4)	-	-	F (89.9)	-	-	
Northbound (Richmond Highway)	NBL	567	F (84.4)	0.60	132	F (90.3)	0.75	257	
	NBTR	-	C (22.5)	0.52	470	C (29.6)	0.58	533	
	NB Approach	-	C (27.3)	-	-	C (34.2)	-	-	
Southbound (Richmond Highway)	SBL	415	F (97.6)	0.63	119	F (97.6)	0.63	119	
	SBT	-	C (20.1)	0.21	164	C (30.5)	0.25	206	
	SBR	-	B (10.7)	0.07	24	B (16.3)	0.07	31	
	SB Approach	-	C (23.8)	-	-	C (32.9)	-	-	
Intersection 1A: Huntington Avenue and Access Ramp									
Overall Intersection			-	- (-)	-	A (9.4)	-	-	
Eastbound (Huntington)	EBT	-	-	-	-	A (9.7)	0.31	33	
	EB Approach	-	-	-	-	A (9.7)	-	-	
Northbound (Access Ramp)	NBR	-	-	-	-	A (9.1)	0.36	40	
	NB Approach	-	-	-	-	A (9.1)	-	-	

= 95th percentile volume exceeds capacity, queue may be longer
 m = Volume for 95th percentile queue is metered by upstream signal
 dl = Defacto Left Lane

Table 6: PM Peak Hour Build Condition Results

Approach	Movement	Storage Length	Existing PM			Build PM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 2: Huntington Avenue and Kathryn Street (Unsignalized)								
Eastbound (Huntington Avenue)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	62	B (12.0)	0.05	5	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Northbound (Kathryn Street)	NBLTR	-	C (18.8)	0.20	18	D (31.8)	0.33	35
	NB Approach	-	C (18.8)	-	-	D (31.8)	-	-
Intersection 3: Huntington Avenue and Huntington Service Road (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	72	A (9.0)	0.01	0	(-)	-	-
	EB Approach	-	A (0.1)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	72	B (13.5)	0.02	3	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Northbound (Huntington Service Road)	NBLTR	-	E (48.4)	0.11	10	F (65.0)	0.15	13
	NB Approach	-	E (48.4)	-	-	F (65.0)	-	-
Southbound (N/A)	SBLTR	-	C (19.3)	0.13	10	E (38.4)	0.26	25
	SB Approach	-	C (19.3)	-	-	E (38.4)	-	-
Intersection 4: Huntington Avenue and Metroview Parkway (Signalized)								
Overall Intersection		-	A (9.0)	0.46	-	C (22.4)	0.85	-
Eastbound (Huntington Avenue)	EBL	385	A (3.0)	0.10	16	A (3.5)	0.11	19
	EBTR	-	A (6.9)	0.49	230	C (26.5)	0.93	#1061
Westbound (Huntington Avenue)	WBL	470	A (3.2)	0.15	2	D (40.0)	0.30	34
	WBTR	-	A (4.5)	0.21	38	A (7.1)	0.40	173
Northbound (Metroview Parkway)	NBL	100	D (46.5)	0.35	50	D (46.4)	0.35	50
	NBTR	-	D (43.5)	0.03	0	D (43.4)	0.04	0
Southbound (Metroview Parkway)	SBL	132	D (46.5)	0.32	43	D (46.4)	0.32	43
	SBTR	-	D (43.6)	0.05	34	D (43.5)	0.05	34
Intersection 5: Huntington Avenue and Fenwick Drive/Huntington Metro Access Road (Signalized)								
Overall Intersection		-	B (13.4)	0.51	-	C (34.1)	0.94	-
Eastbound (Huntington Avenue)	EBL	137	A (6.9)	0.03	m10	A (2.2)	0.03	m1
	EBT	-	A (9.6)	0.57	182	D (42.3)	1.05	m#1200
	EBR	580	A (4.3)	0.01	m0	A (4.3)	0.01	m0
Westbound (Huntington Avenue)	WBL	-	A (7.2)	0.04	6	C (22.9)	0.09	m4
	WBTR	-	A (8.3)	0.21	134	A (9.4)	0.40	275
Northbound (Huntington Metro Access Road)	NBL	132	D (43.4)	0.28	61	D (45.2)	0.33	65
	NBT	-	D (43.2)	0.27	62	D (45.0)	0.32	66
	NBR	132	D (40.7)	0.10	47	D (42.0)	0.10	51
Southbound (Fenwick Drive)	NB Approach	-	D (41.7)	-	-	D (43.1)	-	-
	SBLTR	-	D (48.7)	0.00	0	D (48.7)	0.00	0
Intersection 6: Huntington Avenue and Farrington Avenue/Biscayne Drive (Signalized)								
Overall Intersection		-	A (4.0)	0.50	-	B (10.3)	0.88	-
Eastbound (Huntington Avenue)	EBLTR	-	A (2.0)	0.50	26	B (10.5)	0.91	m#448
	EB Approach	-	A (2.0)	-	-	B (10.5)	-	-
Westbound (Huntington Avenue)	WBL	97	A (2.1)	0.05	6	A (2.0)	0.04	6
	WBTR	-	A (2.1)	0.16	43	A (2.8)	0.31	103
Northbound (Biscayne Drive)	NBLTR	-	A (2.1)	-	-	A (2.8)	-	-
	NB Approach	-	D (48.9)	0.39	50	D (49.0)	0.39	50
Southbound (Farrington Avenue)	SBLTR	-	D (47.3)	0.28	46	D (47.4)	0.28	46
	SB Approach	-	D (47.3)	-	-	D (47.4)	-	-
Intersection 7: Huntington Avenue and Blaine Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	B (13.7)	0.04	3	(-)	-	-
	WBTR	-	A (0.8)	-	-	(-)	-	-
Northbound (Blaine Drive)	NBLTR	-	C (24.6)	0.15	13	D (30.0)	0.19	18
	NB Approach	-	C (24.6)	-	-	D (30.0)	-	-

Table 6 (continued): PM Peak Hour Build Condition Results

Approach	Movement	Storage Length	Existing PM			Build PM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 8: Huntington Avenue and Fifer Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBLTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	B (12.4)	0.01	0	B (12.3)	0.01	0
	WBTR	-	A (0.1)	-	-	(-)	-	-
Northbound (Fifer Drive)	WB Approach	-	A (0.2)	-	-	A (0.1)	-	-
	NBLR	-	E (36.4)	0.04	3	D (25.4)	0.02	3
Northbound (Fifer Drive)	NB Approach	-	E (36.4)	-	-	D (25.4)	-	-
	Intersection 9: Huntington Avenue and Mt Vernon Drive (Unsignalized)							
Eastbound (Huntington Avenue)	EBL	-	A (8.3)	0.01	0	A (8.3)	0.01	0
	EBTR	-	A (0.1)	-	-	(-)	-	-
Westbound (Huntington Avenue)	EB Approach	-	A (0.1)	-	-	(-)	-	-
	WBL	-	B (12.3)	0.01	0	B (12.3)	0.01	0
Northbound (Mt Vernon Drive)	WBTR	-	A (0.1)	-	-	(-)	-	-
	WB Approach	-	A (0.3)	-	-	A (0.2)	-	-
Southbound (Mt Vernon Drive)	NBLTR	-	F (52.6)	0.13	10	F (66.4)	0.17	15
	NB Approach	-	F (52.6)	-	-	F (66.4)	-	-
Southbound (Mt Vernon Drive)	SBLTR	-	B (13.6)	0.06	5	C (22.4)	0.11	8
	SB Approach	-	B (13.6)	-	-	C (22.4)	-	-
Intersection 10: Huntington Avenue and Foley Street (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (8.3)	0.01	0	A (8.3)	0.01	0
	EBT	-	A (0.2)	-	-	(-)	-	-
Westbound (Huntington Avenue)	EB Approach	-	A (0.3)	-	-	A (0.1)	-	-
	WBTR	-	(-)	-	-	(-)	-	-
Southbound (Foley Street)	WB Approach	-	(-)	-	-	(-)	-	-
	SBR	-	A (9.8)	0.02	3	B (11.2)	0.03	3
Southbound (Foley Street)	SB Approach	-	A (9.8)	-	-	B (11.2)	-	-
	Intersection 11: Huntington Avenue and Huntington Creek Club (Unsignalized)							
Eastbound (Huntington Avenue)	EBTR	-	(-)	-	-	(-)	-	-
	EB Approach	-	(-)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBL	-	s	s	s	(-)	-	-
	WBTL	-	A (0.7)	-	-	(-)	-	-
Northbound (Huntington Creek Club)	WB Approach	-	A (1.2)	-	-	(-)	-	-
	NBL	-	E (49.6)	0.10	8	D (25.2)	0.05	3
Northbound (Huntington Creek Club)	NBR	-	B (14.6)	0.03	3	D (25.5)	0.05	5
	NB Approach	-	D (31.1)	-	-	D (25.4)	-	-
Intersection 12: Huntington Avenue and Huntington Creek Road (Unsignalized)								
Eastbound (Huntington Avenue)	EBT	-	A (0.1)	-	-	(-)	-	-
	EB Approach	-	A (0.1)	-	-	(-)	-	-
Westbound (Huntington Avenue)	WBTR	-	(-)	-	-	(-)	-	-
	WB Approach	-	(-)	-	-	(-)	-	-
Southbound (Huntington Creek)	SBLR	-	C (16.1)	0.07	5	C (16.8)	0.07	5
	SB Approach	-	C (16.1)	-	-	C (16.8)	-	-
Intersection 13: Huntington Avenue and Riverside Drive/Mainstay Drive (Unsignalized)								
Eastbound (Huntington Avenue)	EBL	-	A (8.7)	0.09	8	A (8.7)	0.08	8
	EBTR	-	A (1.0)	-	-	(-)	-	-
Westbound (Huntington Avenue)	EB Approach	-	A (1.5)	-	-	A (0.6)	-	-
	WBL	-	B (12.0)	0.08	5	B (12.0)	0.08	5
Northbound (Riverside Drive)	WBTR	-	A (0.5)	-	-	(-)	-	-
	WB Approach	-	A (1.4)	-	-	A (1.0)	-	-
Southbound (Mainstay Drive)	NBLTR	-	F (137.7)	0.74	85	F (158.2)	0.79	93
	NB Approach	-	F (137.7)	-	-	F (158.2)	-	-
Southbound (Mainstay Drive)	SBLTR	-	D (27.4)	0.25	25	F (66.0)	0.49	55
	SB Approach	-	D (27.4)	-	-	F (66.0)	-	-

Table 6 (continued): PM Peak Hour Build Condition Results

Approach	Movement	Storage Length	Existing PM			Build PM		
			LOS+Delay	VC_Ratio	95th % Queue Length	LOS+Delay	VC_Ratio	95th % Queue Length
Intersection 14: Huntington Avenue and Richmond Highway (Signalized)								
Overall Intersection		-	D (43.6)	0.55	-	D (50.9)	0.72	-
Eastbound (Huntington Avenue)	EBL	395	E (65.4)	0.60	287	E (71.6)	0.76	489
	EBT	-	E (66.5)	0.64	327	E (66.7)	0.75	450
	EBR	277	E (58.1)	0.18	79	D (54.0)	0.21	95
	EB Approach	-	E (64.2)	-	-	E (64.9)	-	-
Westbound (Huntington Avenue)	WBL	180	F (81.0)	0.28	79	E (78.7)	0.24	79
	WBTR	-	F (82.7)	0.50	111	F (110.0)	0.81	#257
	WB Approach	-	F (82.4)	-	-	F (102.9)	-	-
Northbound (Richmond Highway)	NBL	567	F (85.0)	0.67	160	F (99.9)	0.85	#341
	NBTR	-	C (26.3)	0.40	359	C (31.5)	0.44	360
	NB Approach	-	C (34.1)	-	-	D (40.5)	-	-
Southbound (Richmond Highway)	SBL	415	F (90.0)	0.24	32	F (90.0)	0.24	32
	SBT	-	D (35.6)	0.49	429	D (48.8)	0.61	457
	SBR	-	B (11.4)	0.14	44	B (15.3)	0.13	34
	SB Approach	-	C (32.7)	-	-	D (44.7)	-	-
Intersection 1A: Huntington Avenue and Access Ramp								
Overall Intersection		-	- (-)		-	E (49.9)		-
Eastbound (Huntington)	EBT	-				B (11.7)	0.33	35
	EB Approach	-			-	B (11.7)	-	-
Northbound (Access Ramp)	NBR	-				F (57.9)	1.02	518
	NB Approach	-			-	F (57.9)	-	-

= 95th percentile volume exceeds capacity, queue may be longer
 m = Volume for 95th percentile queue is metered by upstream signal
 dl = Defacto Left Lane

Conclusions and Recommendations

The majority of Huntington Avenue has existing roadway geometry that can be easily modified to introduce buffered bike lanes; however, this is expected to cause increases in delay and congestion for eastbound traffic during the weekday PM peak hour. The primary factor contributing to increased delay is the reduction in capacity associated with the build configuration of one travel lane in each direction along Huntington Avenue.

Based on the outcome of the road diet assessment, it is recommended that the following be considered as part of the implementation of buffered bike lanes on Huntington Avenue between Telegraph Road and Richmond Highway:

- Eastbound Huntington Avenue
 - Where there is a median:
 - Reduce geometry to one travel lane, keep existing left-turn lanes at intersections.
 - Install a buffered bike lane in the existing outside travel lane.
 - Where there is no median:
 - Reduce geometry to one travel lane, install two-way left-turn lane (TWLTL) in the center.
 - Install a buffered bike lane (2.5' buffer, 4' bike lane).
 - Add stop control (signs and stop bar) to both approaches at the access ramp between Telegraph Road and Kathryn Street.
- Westbound Huntington Avenue
 - Where there is a median:
 - Reduce geometry to one travel lane, keep existing left-turn lanes at intersections.
 - Install a buffered bike lane in the existing outside travel lane.
 - Where there is no median:
 - Reduce geometry to one travel lane, install TWLTL in the center.
 - Install a buffered bike lane (2.5' buffer, 4' bike lane).
- Other considerations
 - At Telegraph Road, remove the rightmost westbound right-turn lane to provide a buffered bike lane that connects to the crosswalk and shared use path along Telegraph Road. No change to existing signal displays will be required.
 - At Richmond Highway, re-stripe the rightmost eastbound left-turn lane as a shared left-through lane, remove the northbound inside left-turn lane, and remove the rightmost westbound through lane to accommodate one travel lane westbound on Huntington Avenue. This will require the rightmost 3-section left-turn arrow signal to be replaced with a 4-section green arrow and ball signal. The additional load presented by the additional signal could be offset by removing one of the existing 3-section ball signals or by shifting the position of the street name sign closer to the signal pole. A formal structural evaluation should be completed to confirm acceptable loading conditions.

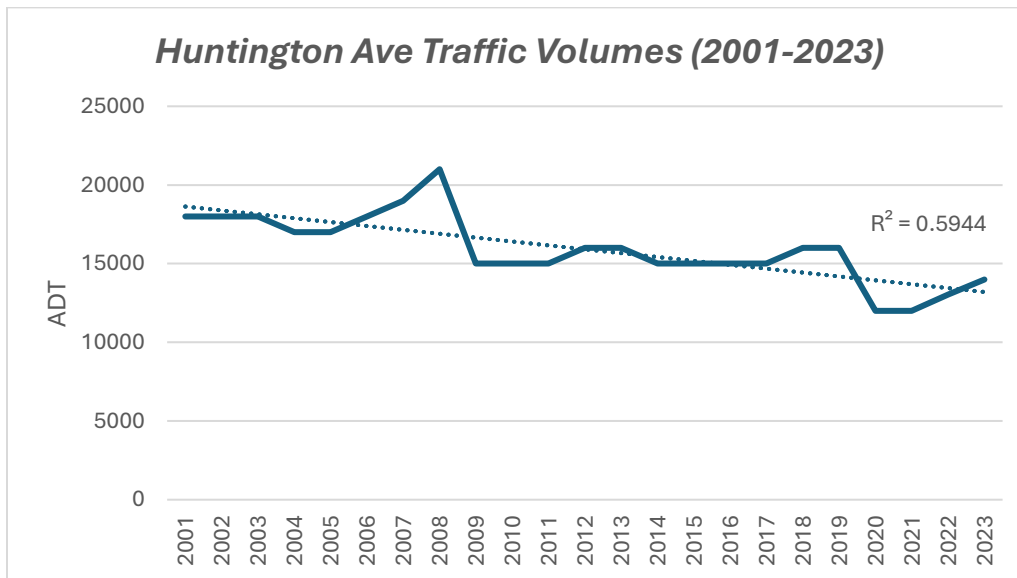
- At Richmond Highway, consider installing a short bike lane on the westbound approach with bicycle detection to call the vehicle signals to cross Richmond Highway. If implemented, extend the bike lane markings and buffer on the westbound departure lanes of the intersection up to the intersection with Richmond Highway (currently shown stopping at Old Richmond Highway).
- Optimize signal operations at all intersections to balance green time among the different signal phases to best align with the reduction in capacity for the through movements along Huntington Avenue.
- Install additional crosswalks at unsignalized intersections to reduce the spacing of crosswalks along the corridor. Also consider pedestrian refuge islands. This should be evaluated in accordance with VDOT TE-384.1. Considering spacing and sight distance, potential candidate locations for crosswalks could include:
 - Blaine Drive with potential future pedestrian refuge island

FUTURE GROWTH ASSESSMENT (PREPARED BY FCDOT)

Huntington Ave located within the Huntington Transit Station Area (TSA) with the Huntington Metrorail station located in the middle of the proposed road diet. Fairfax County's Comprehensive Plan for the Huntington TSA encourages residential, pedestrian-oriented redevelopment. The Plan envisions place where residents can live, work and shop without excessive dependence upon the automobile, thus realizing some of the county's key policy objectives. The plan states that an overall minimum level of service "E" may be acceptable as a result of redevelopment and calls for a significant reduction in trips via transportation demand management.

The TSA has seen some development in recent years such as the Arden affordable housing complex and the Parker Apartments planned expansion. Since these developments are transit-oriented, they generate fewer trips than previous land-uses such as offices. Further along Huntington Ave, the plan calls for replacement of auto-oriented strip malls and office complexes with transit-oriented development with a mix of residential, commercial and office spaces which will further reduce depend for automobile trips.

The plan cites the Countywide Master Plan's recommendation for bike lanes on Huntington Ave via a road diet. The proposed bike lanes on Huntington Ave will encourage some people to make trips by bicycle or walking instead of driving. The 2022 Huntington Metrorail Active Transportation Study also recommends a road diet on Huntington Ave.



In addition, traffic volumes have declined on Huntington Ave since 2001 and even omitting the COVID-19 pandemic, traffic growth is unlikely given the projected development.

Huntington Ave was widened from two travel lanes to four travel lanes in the 1980's for the arrival of the Washington Metro as the station was expected to become a popular park and ride destination, a key trip generator along Huntington Ave. However over the past decade, park and ride trips have declined and Metro closed one of the garages in 2018 and has no plans to replace it. Between 2012

and 2019, park and ride garage utilization dropped from 55% to 35% even factoring in the closure of a parking garage. When the north park and ride garage which connects to Huntington Ave reaches its useful life 2035, it may be replaced with transit-oriented development. Furthermore, the Richmond Hwy Bus Rapid Transit project will likely depress demand for park and ride once it opens later in the decade as people switch to fast, frequent bus service instead of driving to a park and ride facility.

Given the County's Comprehensive Plan, park and ride trends, and a two-decade long decline in traffic volumes, Fairfax County anticipates a road diet on Huntington Ave will have enough capacity until the next repaving cycle in a decade and likely beyond.