

Prices Fork Road Safety and Mobility Study

Town of Blacksburg
Blacksburg, Virginia

Prepared by: VHB

June 2017



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Executive Summary

Prices Fork Road is a critical east-west thoroughfare through the Town of Blacksburg providing multi-modal transportation access to the residential development and schools located west of the US 460 interchange to the Virginia Polytechnic Institute and State University (Virginia Tech) Campus, downtown residential, and commercial developments located to the east. The Town of Blacksburg is interested in enhancing pedestrian, bicycle, transit, and vehicle mobility and safety along and across the Prices Fork Road corridor between the Blacksburg town limits to the North Main Street intersection. This document analyzes and recommends improvements to enhance the facilities for each mode type utilizing Prices Fork Road.

The study area’s western limit begins at the intersection of Prices Fork Road and Old Mill Road. The study corridor continues east on Prices Fork Road, to the eastern terminus of the corridor at North Main Street. The total length of the corridor is approximately 3 miles. The study team gathered information on existing conditions, collected vehicle, bicycle and pedestrian count data, and reviewed prior studies completed along the corridor.

Pedestrian and bicycle accommodations are inconsistent along the corridor. While sidewalks are present along the corridor, the current facilities are narrow and inconsistent along the entire corridor. The existing bicycle lanes are narrow or non-existent along sections of the corridor. Numerous transit routes utilize Prices Fork Road and the amenities provided at the stops along Prices Fork Road are varying and inadequate at some locations. Physical constraints such as limited right-of-way, roadway curvature, and overpasses all limit certain improvement opportunities within portions of the corridor. There are recent and ongoing development projects along the corridor that will affect future circulation patterns. In addition, any planned projects on the Virginia Tech campus were taken into consideration when determining future circulation pattern impacts.

The project team collected a substantial amount of pedestrian, bicycle, and vehicular mobility and crash data for Prices Fork Road as well as received input and past studies from Town of Blacksburg staff. A series of recommendations were developed based on analyses of this information, field evaluations, and comments from the public and area stakeholders. The recommendations are intended to be built over time to meet the goal of improving multi-modal safety and mobility along the Prices Fork Road corridor. The following section identifies the recommended corridor enhancements by each of the various travel modes.

Bicycle & Pedestrian Recommendations

Western Segment

To provide more separation between vehicular, bicycle and pedestrian modes and the desire to create a continuous network along Prices Fork Road, it is recommended that a 10’ minimum shared use path be constructed to replace the current sidewalk and a 4’ bike lane be constructed on both sides of Prices Fork Road.

The construction of the shared use paths and bike lanes will provide a continuous, consistent network and create connections to the existing side street paths. In addition, this will potentially increase the recreational use of the bicycle facilities, provide space along the west segment for aesthetic roadside treatments, and give cyclists options for traveling along Prices Fork Road.

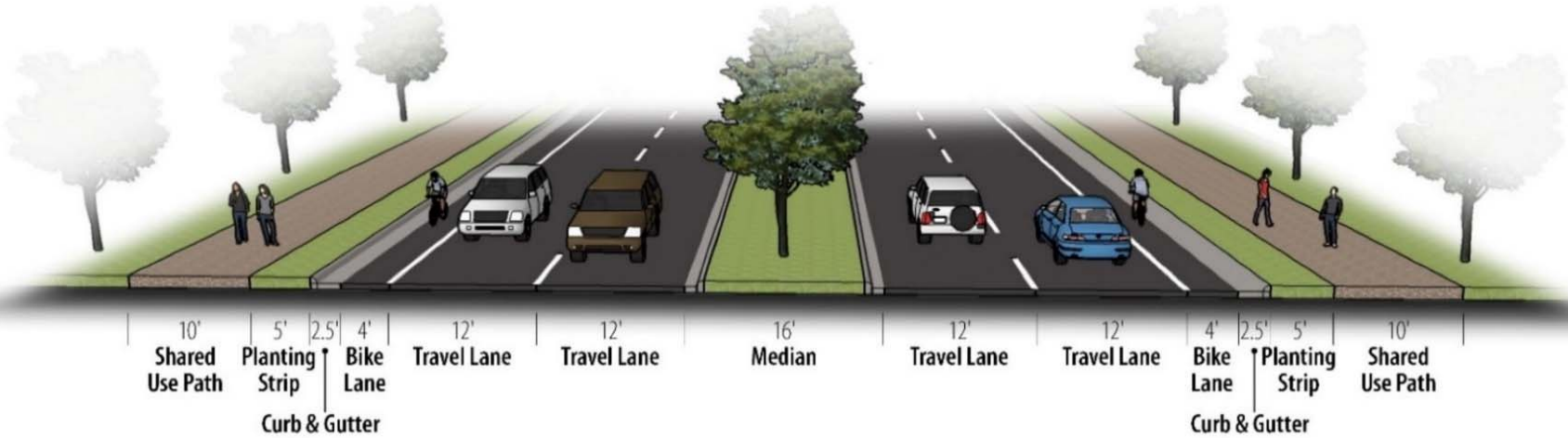


Figure ES-1: Recommended Cross-Section (west of US 460)

US 460 Interchange

The US 460 interchange was an area of interest, in regards to bicycle and pedestrian safety improvements along the corridor. The project team identified the desire for increased separation for bicyclists and pedestrians utilizing the US 460 bridge, with emphasis on ramp crossings, as a priority for this corridor study. Therefore, it was recommended that the existing bridge is re-purposed to allow for a 14' barrier separated shared use path for cyclists and pedestrians on the south side of the bridge shifting the vehicular travel lanes to the north side. The raised barrier physically separates and better protects both pedestrians and cyclist as they cross US 460.

In addition, it was recommended that both free-flowing on-ramps onto Princes Fork Road are eliminated. The sweeping US 460 westbound ramp currently creates a high speed vehicular movement towards the University and downtown areas which have substantial pedestrian and bicycle activity. By creating a slower ramp that intersects Princes Fork Road at a right angle, vehicles leaving the high-speed freeway condition would experience a more evident contextual change entering town and would yield to pedestrian and bicycling traffic. Similarly, the current US 460 westbound loop would intersect Princes Fork Road at a signalized intersection reducing the weaving movement on the bridge, which can be difficult for westbound cyclists. New traffic signals with enhancements like high visibility painted crosswalks and pedestrian signal phases will allow for controlled crossings of the ramps.

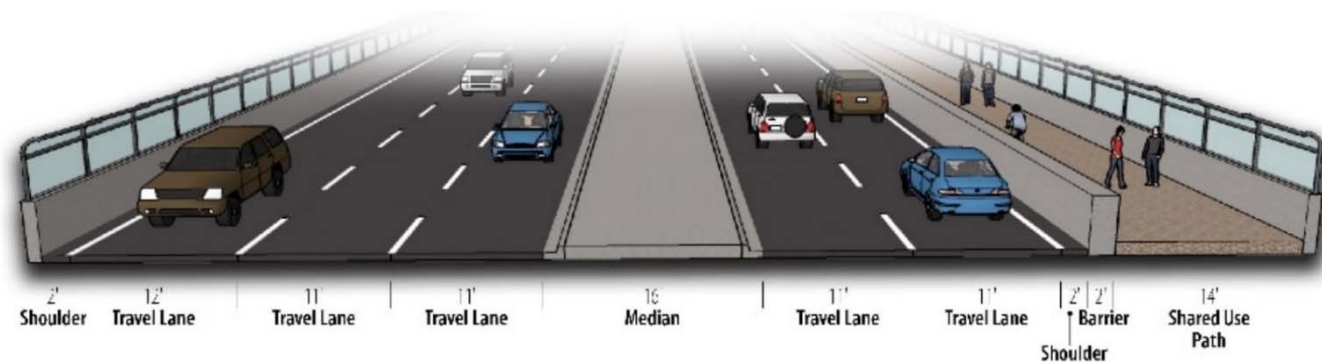
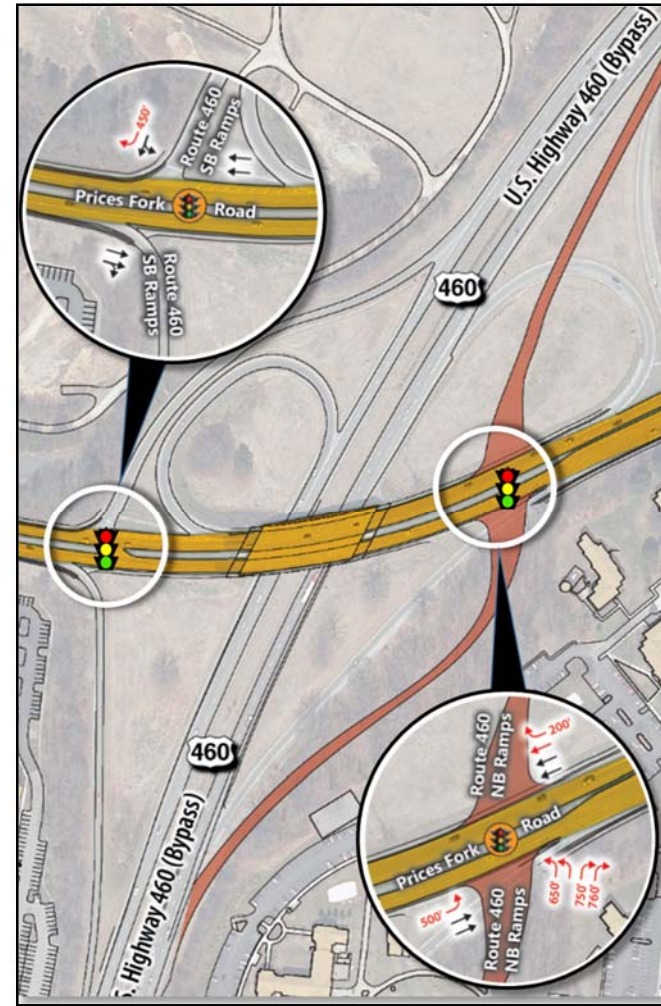


Figure ES-2: Recommended Cross-Section (US 460 Bridge)

Eastern Segment

It is recommended that the existing sidewalk facilities on the south side of the corridor be replaced with a 10' wide shared use path with a 5' separation from the Princes Fork Road travel lanes and transition to a 10' sidewalk east of the Toms Creek Road/Stanger Street intersection. The specific transition would occur on either side of a wide high visibility crosswalk through that intersection. The streetscape east of Stanger Street will be updated to match the current design along North Main Street, and create a new gateway into the downtown area. The median barrier recently installed near The Edge apartments is recommended to remain as pedestrians should cross at the signalized crosswalk at Toms Creek Road/Stanger Street. As properties on either side of Princes Fork Road redevelop in this area, there may be opportunities to provide a long-term grade separated pedestrian and bicycle crossing to further reduce pedestrian and vehicle conflicts. Current bicycle lanes along the corridor will either be maintained or widened to provide a 4' minimum bike lane along both sides of Princes Fork Road.

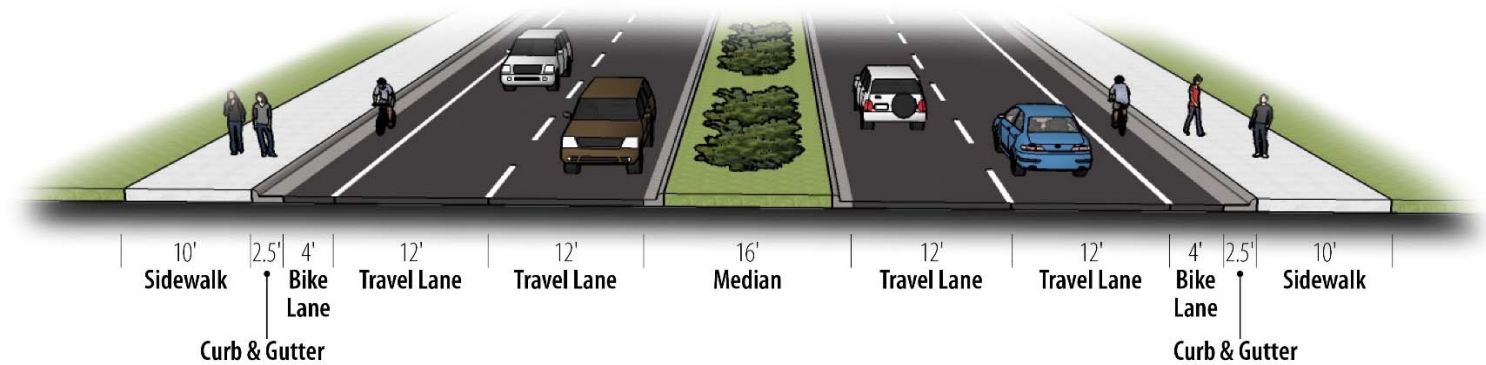


Figure ES-3: Recommended Cross-Section (East of Toms Creek Road)

Traffic Recommendations

A series of roadway improvements were identified to improve safety and/or address congestion observed in the field or projected in the future. The following roadway improvements by intersection are as follows:

Old Mill Road

- Update the current signal phasing to allow the northbound exclusive right-turn to overlap during the same phase as the westbound left-turn.

Princes Fork Road at Brightwood Manor Drive/Strock Street

- Modify the existing median to fully restrict left-turn and crossing movements from the side street.

Plantation Road

- Construct an exclusive southbound right-turn lane.

US 460 Southbound Ramps

- Signalize and add one exclusive southbound right-turn lane with at least 450 feet of storage and appropriate taper.

US 460 Northbound Ramps

- Reconfigure and signalize the US 460 westbound ramps onto Prices Fork Road. The existing free-flowing US 460 westbound off-ramps will be eliminated and replaced with dual northbound left-turn and right-turn lanes.

Old Glade Road

- Install a partial signal and construct and/or lengthen turn lanes at the intersection. Consider relocation of this intersection to the west to align with the future Western Perimeter Road Spur to improve intersection signal spacing.

Western Perimeter Road Spur

- Signalize this future intersection and provide additional turn lanes.

University City Boulevard/Western Perimeter Road

- Lengthen the exclusive northbound left-turn lane to accommodate at least 250 feet of storage and appropriate taper.
- Construct a shared northbound through/left-turn lane.
- Construct an exclusive northbound right-turn lane with at least 200 feet of storage and appropriate taper.

Toms Creek Road/Stanger Street

- Eliminate the free-flowing channelized eastbound right-turn lane and replace with a standard, parallel right turn lane or channelized right-turn with a channelized island with a tighter radius.
- Incorporate a series of pedestrian safety measures, including countdown pedestrian signals, refurbished pedestrian crossings and restrict right-turns on red.

McBryde Drive/Parking Garage Entrance

- Prohibit the southbound and northbound through and left-turn movements onto Prices Fork Road.

Webb Street/Turner Street and Orchard Street/Driveway

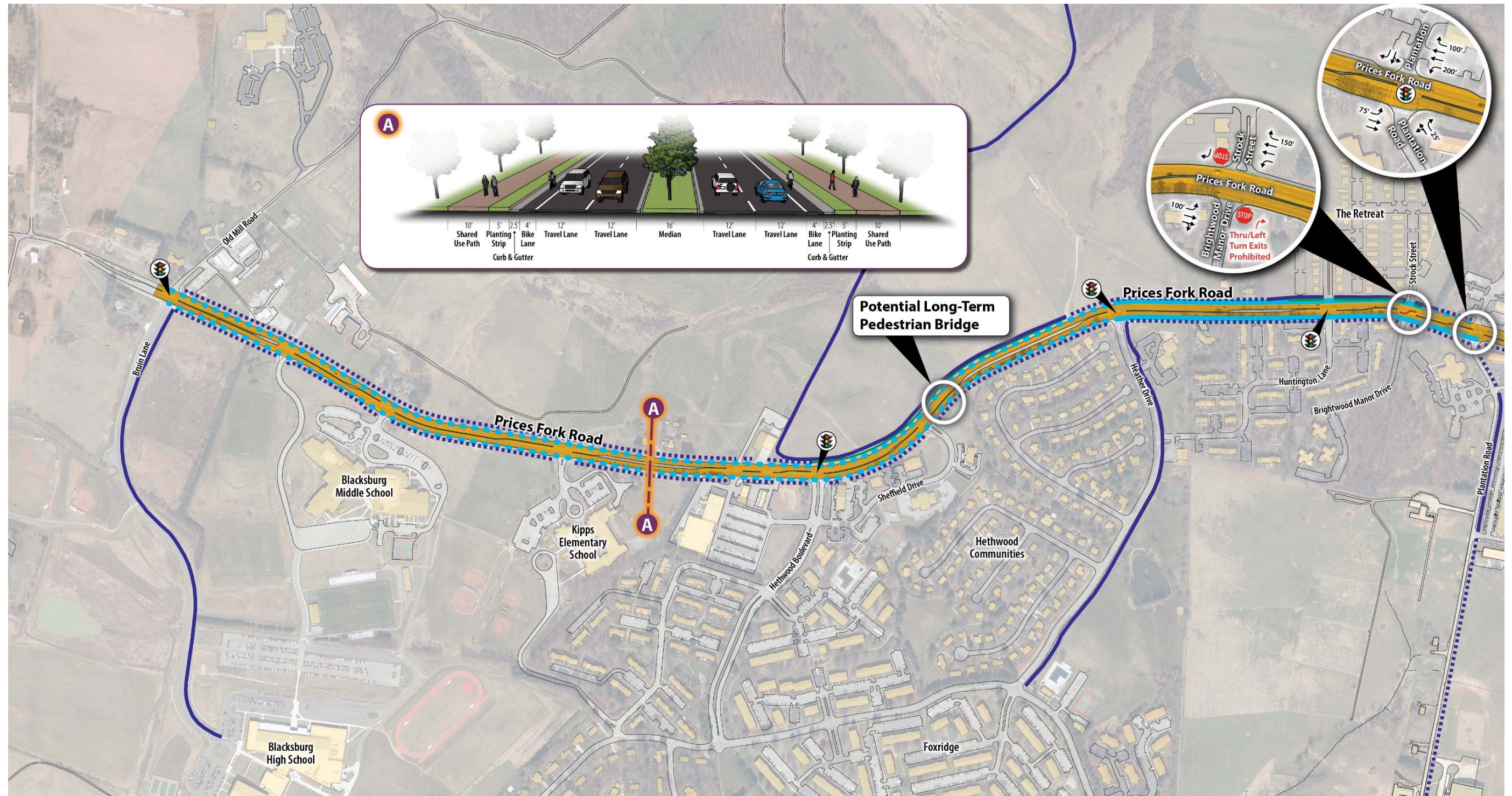
- Prohibit the southbound and northbound through and left-turn movements onto Prices Fork Road.

Transit Recommendations

It is recommended that the proposed shared use path be modified so that bicycles can travel behind the bus stops, as illustrated in the picture below. This improves safety during bus boarding/alighting by decreasing conflict opportunities between cyclists and transit users as well as conflicts between bicyclists and vehicles as a cyclist could pass the stopped bus on the right rather than left. As evidenced by the goat path on the southwest corner of the Prices Fork Road and Plantation Road intersection, many cyclists are choosing to pull off Prices Fork Road to cut the corner towards Smithfield Road at this point. In addition, it is recommended that bus stop amenities be prioritized and improved along the entire corridor.



Figure ES-4 and Figure ES-5 provide a summary of the major improvements along the corridor and the report provides a detailed assessment and evaluation of the corridor for vehicular, transit, bicycle, and pedestrian mobility to identify and prioritize recommendations and projects which improve the overall mobility for those using the corridor. This effort will determine project requirements and inform future work priorities by providing the Town a range of design options and projects to be implemented as funding becomes available.



- - - Future 10' Path and 5' Separation
 — Existing Path
- - - Widen Existing Shoulder to Provide a 4' Minimum Bike Lane
STOP Existing Stop Control
→ Existing Lane
- - - Restrict Access to Left-In, Right-In, Right-Out
- Maintain Existing Sidewalk
 — Future 14' Barrier Separated Path
— Maintain Existing 4' Minimum Bike Lane
🚦 Existing Signal
→ Proposed Lane
— Proposed Roadway Plan
- Future Urban 10' Sidewalk
 — Potential Long-Term Pedestrian Bridge
🚦 Proposed Signal

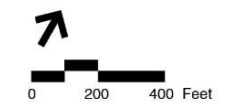
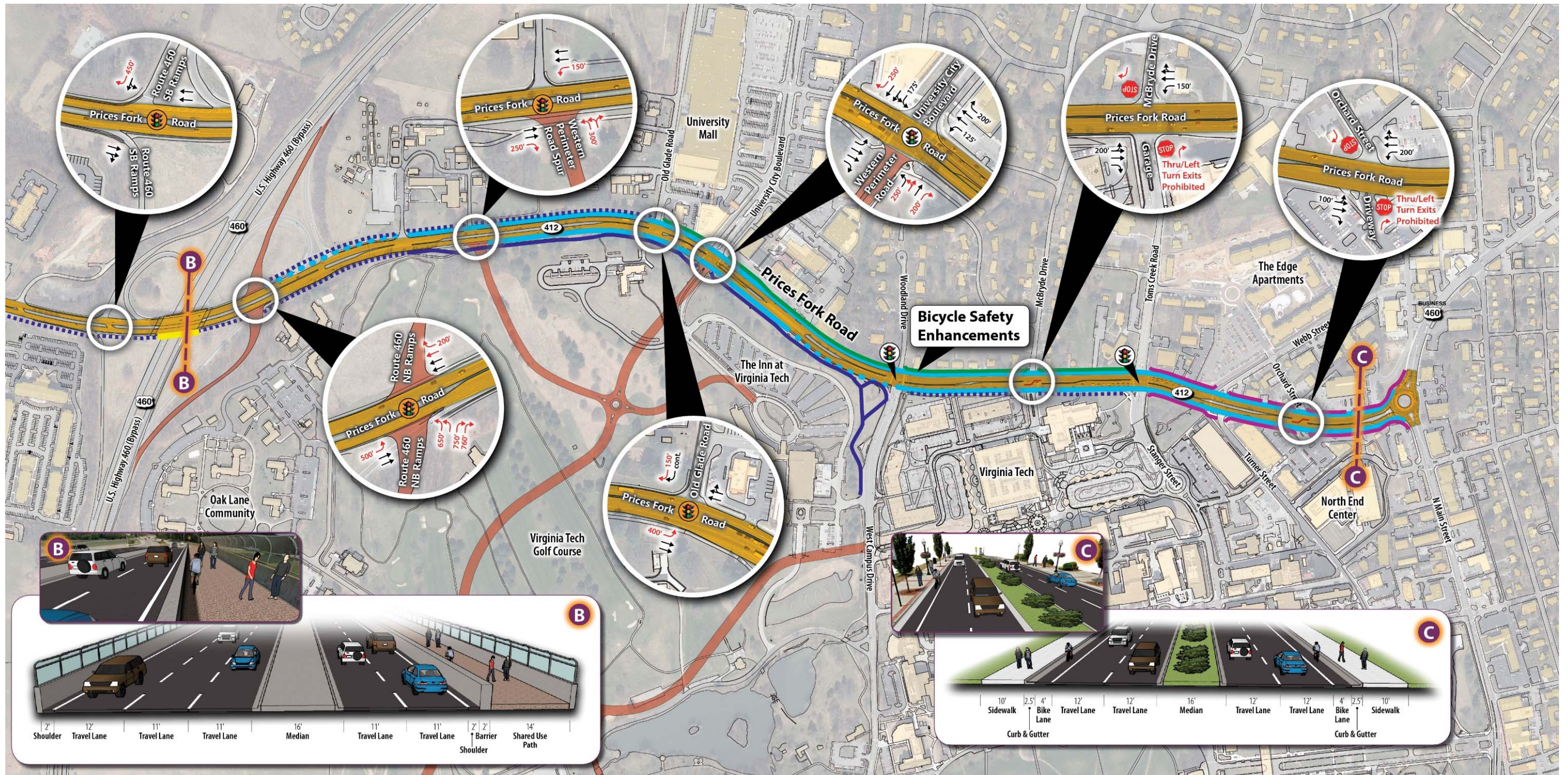


Figure ES-4: Future Year (2040) Build Comprehensive Recommendations Map (west)



- ■ ■ ■ ■ Future 10' Path and 5' Separation
 — Existing Path
● ● ● ● ● Widen Existing Shoulder to Provide a 4' Minimum Bike Lane
 Existing Stop Control
 Existing Lane
 Restrict Access to Left-In, Right-In, Right-Out
- Maintain Existing Sidewalk
 — Future 14' Barrier Separated Path
— Maintain Existing 4' Minimum Bike Lane
 Existing Signal
 Proposed Lane
 Proposed Roadway Plan
- Future Urban 10' Sidewalk
 — Maintain Existing 4' Minimum Bike Lane
 Proposed Signal

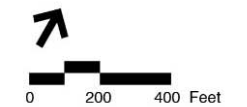


Figure ES-5: Future Year (2040) Build Comprehensive Recommendations Map (east)

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Table of Contents

Executive Summary.....	3
Bicycle & Pedestrian Recommendations.....	3
Traffic Recommendations.....	4
Transit Recommendations	5
Introduction.....	10
Study Purpose.....	10
Study Process.....	10
Context & Character.....	11
Previous Studies & Projects.....	12
Study Area Segments.....	12
Existing Corridor Conditions.....	13
Pedestrian Connections.....	13
Bicycle Facilities	14
Transit Operations.....	14
Existing (2016) Traffic Analysis	15
Traffic Data Collection.....	15
Level of Service Description.....	15
Traffic Capacity Analysis.....	15
Crash Data Analysis.....	17
Crash Patterns	18
Field Review	19
Field Observations and Recommendations Summary	19
Future Conditions.....	29
Future Year (2040) No-Build Analysis.....	29
Future Year (2040) Build Analysis.....	31
Recommendations.....	35
Bicycle & Pedestrian Recommendations.....	35
Transit Recommendations	37

List of Figures

Figure 1: Regional Context Map.....	11
Figure 2: Current Land Use Along Corridor.....	11
Figure 3: Typical Existing Section.....	13
Figure 4: Blacksburg Transit Route Map	14
Figure 5: Existing (2016) AM and PM Peak Hour Turning Movement Volumes	16
Figure 6: Number of Crashes by Year for Prices Fork Road	17
Figure 7: Number of Crashes by Time of Day for Prices Fork Road.....	17
Figure 8: Number of Crashes by Type of Crash for Prices Fork Road	17
Figure 9: Number of Crashes by Roadway Surface Condition for Prices Fork Road	17
Figure 10: Number of Crashes by Type by Intersection	19
Figure 11: Historic VDOT ADT along Prices Fork Road.....	29
Figure 12: Potential Long-Term Improvements at Virginia Tech.....	29
Figure 13: Future Year (2040) No-Build AM and PM Peak Hour Turning Movement Volumes	30
Figure 14: US 460 Interchange Recommendations.....	31
Figure 15: Future Year (2040) Build AM and PM Peak Hour Turning Movement Volumes	33
Figure 16: Future Year (2040) Build Lane Configuration and Traffic Control.....	34
Figure 17: Recommended Cross-Section (west of US 460).....	35
Figure 18: Recommended Cross-Section (US 460 Bridge).....	35
Figure 19: Recommended Cross-Section (east of Toms Creek Road)	36
Figure 20: Future Year (2040) Build Comprehensive Recommendations Map (west)	38
Figure 21: Future Year (2040) Build Comprehensive Recommendations Map (east)	39

List of Tables

Table 1: Level of Service Description for Intersections.....	15
Table 2: Existing (2016) Intersection Level of Service Results.....	15
Table 3: Field Lighting Measurements for Prices Fork Road.....	19
Table 4: Prices Fork Road Field Review Summary Table.....	20
Table 5: Existing and Forecasted Regional Employment and Population	29
Table 6: Future Year (2040) No-Build LOS Results.....	29
Table 7: Future Year (2040) Build LOS Results.....	32

Appendix

Introduction

Existing and anticipated long-term development along the corridor and in the region rely on Prices Fork Road for mobility, and as a result the Town of Blacksburg seeks to preserve and enhance pedestrian, bicycle, transit, and vehicle travel along and across the Prices Fork Road corridor between the Blacksburg town limits to the North Main Street intersection. In addition to being the primary east to west connection for the Town, Prices Fork Road is utilized as a primary link for bicyclists, pedestrians, and transit traveling between different areas within the Town of Blacksburg. Numerous Blacksburg Transit (BT) routes use this corridor, with major bus stops located along Prices Fork Road. The pedestrian and bicycle facilities are inconsistent along the corridor.

Physical constraints such as limited right-of-way, roadway curvature, and overpasses all limit certain improvement opportunities within portions of the

corridor. The Town has active and planned construction projects along the corridor that will affect future circulation patterns. In addition, any planned projects on the Virginia Tech campus or any adjacent properties along Prices Fork Road were taken into consideration when determining future circulation pattern impacts.

This report reviews the study process, including context, reviews results of an existing conditions assessment, and finally provides an assessment and evaluation of the corridor for vehicular, transit, bicycle, and pedestrian mobility to identify and prioritize recommendations and projects which improve the overall safety and mobility for those using the corridor. This effort will determine project requirements and inform future work priorities by providing the Town with a range of design options and projects to be implemented as funding becomes available.



Study Purpose

Develop recommendations to improve multi-modal safety and mobility along the Prices Fork Road corridor.

Study Process

The study team complete work in four primary efforts:

- Data Collection and Research
- Field Evaluation
- Stakeholder/Public Meetings
- Findings and Documentation



Field Evaluation

VHB conducted field reviews to observe multi-modal transportation patterns, physical conditions, and constraints along the corridor. This occurred over the course of multiple days and during a variety of time periods, including peak periods for pedestrian, bicycle, and motor vehicle observations. VHB documented existing facilities and deficiencies along the corridor.

Data Collection and Research

The data collection phase of the study included review of relevant information including crash data, vehicle/pedestrian/bicycle counts, speed studies, transit information, previous studies, and GIS mapping. VHB also conducted three (3) turning movement counts during the AM and PM peak hours on October 06, 2016 while classes were in session at Virginia Tech. Additional research focused on past and ongoing studies within and adjacent to the corridor provided by the Town of Blacksburg.

Stakeholder/Public Meetings

A series of stakeholder and public meetings were conducted on May 31, 2016, November 16, 2016, and May 16, 2017. Feedback gathered at each meeting was used to identify areas of concern and develop recommendations that addressed the issues most important to the public and stakeholders.



Findings and Documentation

Based on the field evaluation, data collection, research, and feedback from the stakeholder and public meetings, VHB developed and presented findings on corridor deficiencies, opportunities, and potential improvements. Following an additional review with the Town of Blacksburg and stakeholders, VHB finalized our recommendations and produced this report.

Context & Character

At approximately 3 miles in length, the Prices Fork Road corridor forms the primary connection between the area west of the US 460 interchange and the downtown and campus destinations. The road is readily used by communities to the east, including Prices Fork Village, Radford, Pulaski, and Dublin as the means of traveling to the Town. The corridor includes significant volumes of vehicular, transit, pedestrian, and bicycle traffic. On the west side of the corridor, Prices Fork Road is primarily bordered by residential developments, multiple schools, and vacant lots. The east side of Prices Fork Road is bordered by the Virginia Tech campus to the south and commercial and residential development to the north. The number of lanes needed to carry the high traffic demand on Prices Fork Road presents a barrier to pedestrians.

Prices Fork Road east of the Town is a low volumes 2-lane facility that travels through a rural, low density part of Montgomery County. As drivers travel east and enter the town limits, pedestrians and bicycle activity increases near the schools and residential areas. Further east the road carries high traffic volumes with its highest pedestrian crossing volumes along Virginia Tech's northern frontage, eventually entering a low speed, downtown context at North Main Street. Drivers approaching Prices Fork Road from US 460 also experience a major transition from a high speed, automobile dominated freeway to a slower, high-activity corridor.

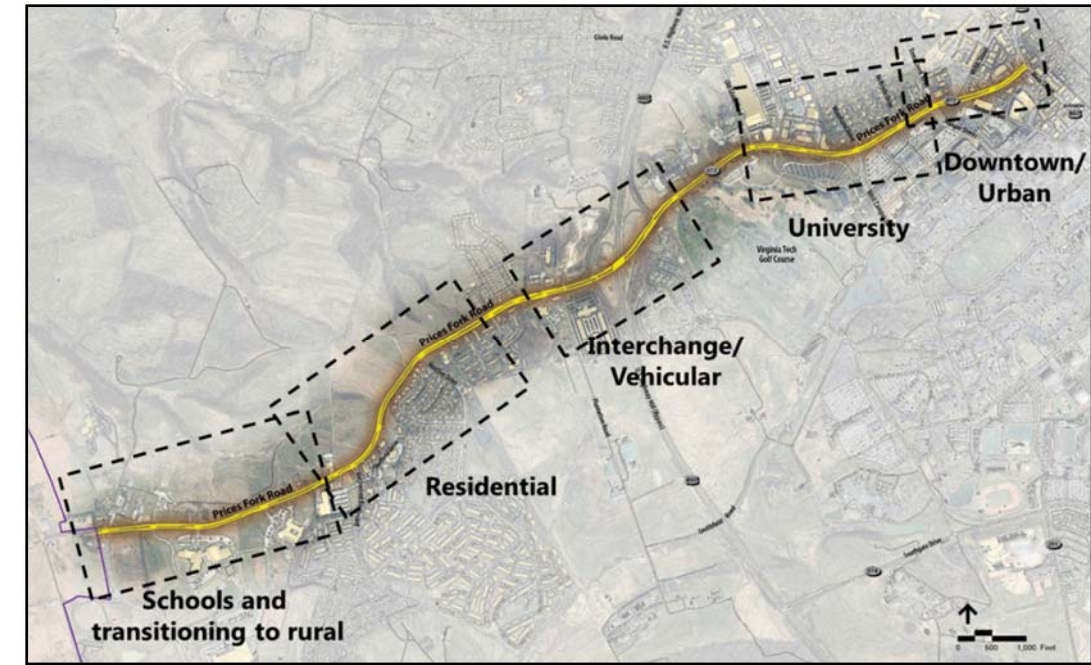
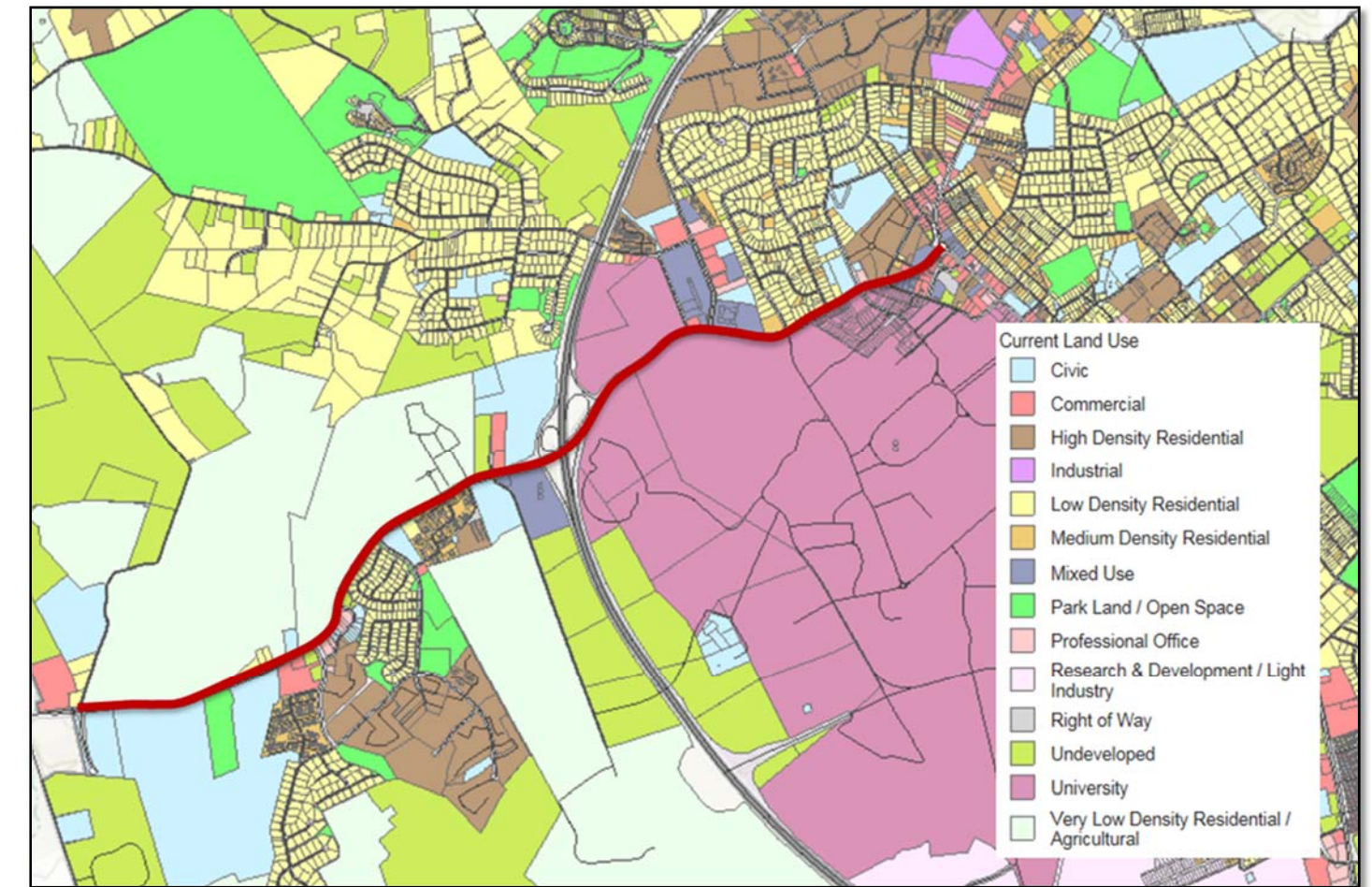


Figure 1: Regional Context Map



Figure 2: Current Land Use Along Corridor



Previous Studies & Projects

Several related traffic impact studies, planning studies and design projects have already been completed that detail past and ongoing developments within and adjacent to the corridor. Where relevant, VHB incorporated data and information for the proposed study. These include:

- Blacksburg High School Traffic Impact Study (dated July 26, 2011)
- Virginia Tech Precinct B/Prices Fork Road/MMTF Traffic Analysis Summary (dated April 22, 2013)
- The Retreat Traffic Impact Analysis (dated January 05, 2015)
- Traffic Impact Analysis for University Crossroads (dated February 2015)
- Town of Blacksburg Speed Limit Study (dated May 18, 2016)
- Western Perimeter Road Traffic and Concept Study (dated July 09, 2015)
- Town of Blacksburg Bicycle Master Plan (dated 2015)
- Virginia Tech Parking & Transportation Master Plan (dated July 2016)
- Blacksburg/Christiansburg/Montgomery Area 2035 Transportation Plan (dated June 02, 2011)

Study Area Segments

Based on our findings during the field evaluation and the review of existing plans, specific areas were identified to improve pedestrian and bicycle safety, mobility, and enhance transit within the corridor. This report focuses on the following plan study areas:

- West Segment: Segment begins at the Blacksburg town limits and continues to the US 460 southbound Ramps intersection.
- East Segment: Segment begins at the US 460 southbound Ramps intersection and continues to the North Main Street and Prices Fork Road intersection.



Prices Fork Road West Segment



Prices Fork Road East Segment

Existing Corridor Conditions

The ToXcel team conducted a field evaluation of the corridor on October 12-13, 2016 during the morning and afternoon peak travel periods. The objective was to observe road user behaviors and safety and operational conditions. The team noted numerous positive features including the presence of sidewalks, bicycle lanes and lighting along the corridor. Crosswalks and other pavement markings were well maintained and visible to all users in most cases. Continuity and connectivity of the bicycle and pedestrian facilities was a noted deficiency. There were inconsistent markings and signage of the bicycle facilities along the corridor. Although there were long queues observed in a few locations during the peaks, normally located closer to the Virginia Tech Campus, vehicles were generally able to travel along the corridor at posted speeds.



Pedestrian Connections

Pedestrian facilities within the corridor include sidewalks, crosswalks, and pedestrian signals. There is a five (5) foot sidewalk generally present along both sides of Prices Fork Road. In addition, there are crosswalks and pedestrian signal phasing present at most signalized intersections. Along the corridor there is generally no separation between the back of the curb and the sidewalk. This lack of separation and sidewalk width is largely dictated by the limited right-of-way, which is only 85-95 feet along the corridor.

Striped crosswalks exist at most of the primary intersections within the corridor. Crosswalk treatments vary dependent upon site specific conditions, and range from pedestrian warning signs to pedestrian countdown timers at some signalized intersections.

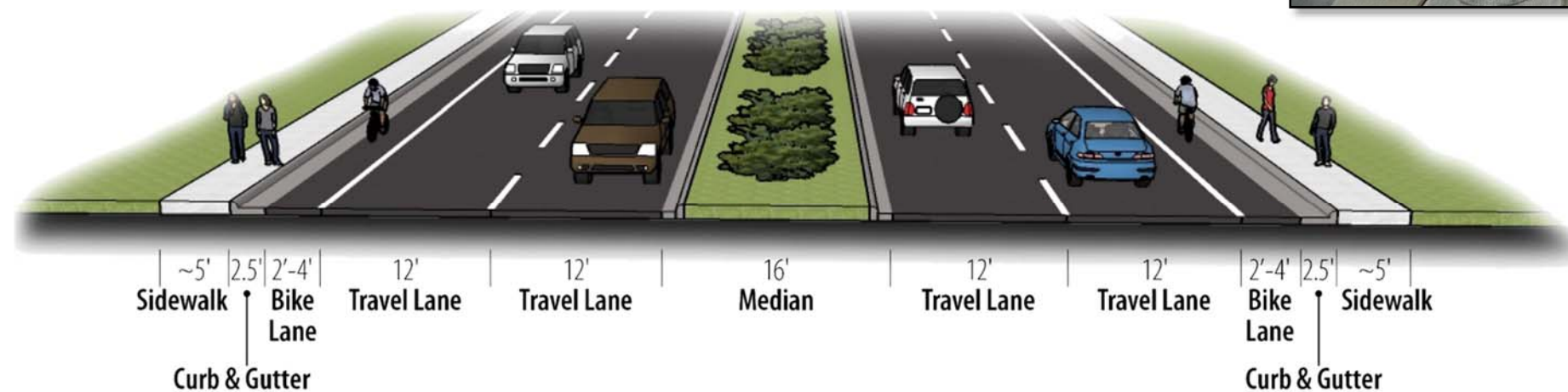


Figure 3: Typical Existing Section

Bicycle Facilities

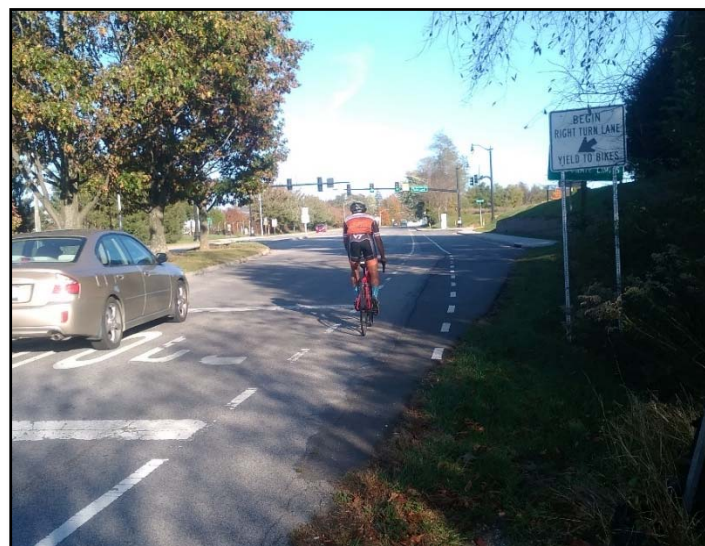
Bicycle facilities along the corridor vary in type and condition, and reflect implementation over time and in response to changing standards and guidance. The existing bicycle accommodations along Prices Fork Road are as follows:

- Bruin Lane to Heather Drive: No bicycle lanes present (2-foot shoulder only) and partial shared use path along the north side of the corridor.
- Heather Drive to Plantation Drive: Four (4) foot bicycle lanes present with a partial shared use path along the north side of the corridor.
- US 460 Interchange: No bicycle lanes present and a narrow path adjacent to the sidewalk for bicyclists.
- US 460 to North Main Street: Four (4) foot bicycle lanes generally present with an additional off-street shared use path located on the south side of the corridor between US 460 and West Campus Drive.

There were some deficiencies observed in regards to the connectivity and continuity of the existing bicycle facilities along Prices Fork Road. The lack of facilities west of Heather Drive, the frequent gaps in the on-street network, and the lack of off-street options were a few observed insufficiencies.

Additional deficiencies were observed specifically at the US 460 interchange and are as follows:

- Conflicts associated with high speed merges, diverges, and weaves along Prices Fork Road
- Lack of adequate bicycle lanes or shared use paths
- A narrow path exists next to a low guardrail with a steep adjacent slope



Transit Operations

The Prices Fork Road corridor is served by Blacksburg Transit (BT), providing bus transportation to the Town and the Virginia Tech community. This corridor is served by several BT routes including:

- Carpenter Boulevard – Provides service from The Retreat area to campus with seven (7) stops on Prices Fork Road.
- Hethwood A – Provides service from the Hethwood residential area to Virginia Tech campus with eight (8) stops on Prices Fork Road.
- Hethwood B – Provides service from the Hethwood residential area to Virginia Tech campus with eight (8) stops along Prices Fork Road.
- North Main Street – Provides service along North Main Street (from Whipple Drive to Fairfax Road) to Virginia Tech campus with one stop on Prices Fork Road.
- Patrick Henry – Provides service from Giles Road, Seneca Circle, Patrick Henry Drive and Progress Street to Virginia Tech Campus with one stop along Prices Fork Road.

These routes help students, faculty and staff circulate within the University as well as access the other parts of the Town of Blacksburg. Maximizing transit use is essential to reducing the vehicle demand along the corridor.

The level of amenities at the existing stops varies in the corridor. Upgrading the transit stops to better serve the transit users is an important component of the mobility through the corridor and helps make transit use and attractive and efficient alternative to driving a personal vehicle.

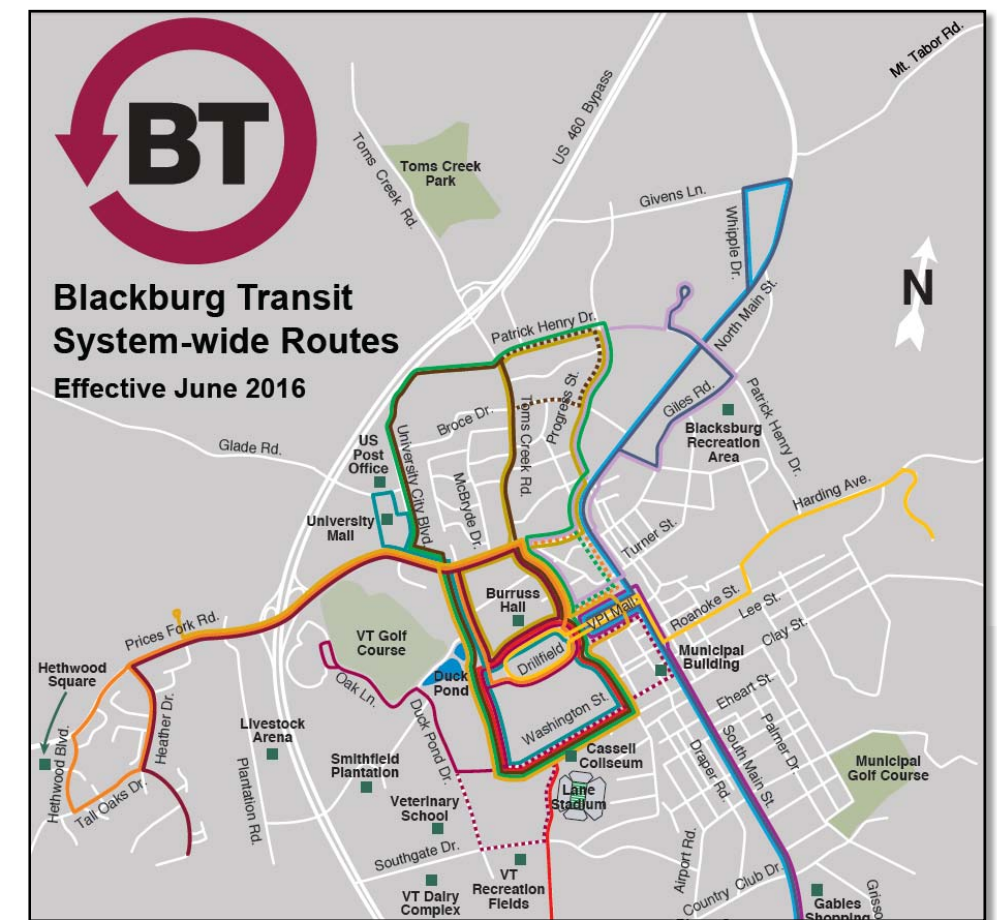


Figure 4: Blacksburg Transit Route Map

Existing (2016) Traffic Analysis

Traffic Data Collection

VHB collected peak hour vehicular, pedestrian, and bicycle turning movement counts to establish the movement of vehicles, pedestrians, and bicyclists along the corridor and conduct an intersection capacity analysis. The counts for the intersections of interest were collected from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on October 06, 2016, and are as follows:

- Prices Fork Road and North Main Street
- Prices Fork Road and Orchard Street
- Prices Fork Road and Webb Street/Turner Street

Recent turning movement counts were available for several intersections along the corridor. The intersections and studies where they were obtained from are as follows:

- Prices Fork Road and Old Mill Road (Obtained from the Blacksburg High School Traffic Impact Study)
- Prices Fork Road and High School Bus Lot Entrance (Obtained from the Blacksburg High School Traffic Impact Study)
- Prices Fork Road and Blacksburg Middle School Entrance (Obtained from the Blacksburg High School Traffic Impact Study)
- Prices Fork Road and Elementary School Entrance (Obtained from the Blacksburg High School Traffic Impact Study)
- Prices Fork Road and Hethwood Boulevard (Obtained from the Blacksburg High School Traffic Impact Study)
- Prices Fork Road and Sheffield Drive (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and Heather Drive (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and Huntington Lane (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and Brightwood Manor Drive/Driveway (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and Plantation Road/Hotel Driveway (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and US 460 Southbound Ramps (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and US 460 Northbound Ramps (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and Old Glade Road (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and University City Boulevard/Virginia Tech Inn Entrance (Obtained from the Revised Retreat Traffic Study)
- Prices Fork Road and W Campus Drive/Woodland Drive (Obtained from the Virginia Tech Parking and Transportation Master Plan Study)

- Prices Fork Road and McBryde Drive/Parking Garage Entrance (Obtained from the Virginia Tech Parking and Transportation Master Plan Study)
- Prices Fork Road and Toms Creek Road/Stanger Street (Obtained from the Virginia Tech Parking and Transportation Master Plan Study)

The AM and PM vehicular turning movement counts are shown in Figure 5 and the full counts can be found in the Appendix.

Level of Service Description

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of an intersection or approach for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to the traffic control device (e.g., signals or stop signs). The engineering profession generally accepts LOS D as an acceptable operating condition for signalized intersections in urban areas and LOS C for rural areas.

At unsignalized intersections, LOS E is generally considered acceptable only if the side street encounters delay. Nevertheless, side streets sometimes function at LOS F during peak traffic periods; however, the traffic volumes often do not warrant a traffic signal to assist side street traffic. Table 1 provides a general description of various levels of service categories and delay ranges.

Table 1: Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	< = 10 sec.	< = 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

An intersection capacity analysis was performed for the major intersections along the corridor for Existing (2016), No-Build (2040), and Build (2040) conditions during the AM and PM peak hours using *Synchro/SimTraffic Professional Version 9* software. Volumes for the future scenarios were derived using a 1.2% growth rate to the existing volumes. Future No-Build conditions tests future operations under the current lane configurations and traffic control. The Build conditions tests operations with a series of potential improvement options in place. Future year analysis results are detailed later in this report and the complete *Synchro* output is contained in the Appendix.

Traffic Capacity Analysis

The following table reports the level of service for each study intersection along Prices Fork Road. The overall level of service and worst approach are reported for each signalized intersection and only the worst stop-controlled approach is reported for the unsignalized intersections.

As reported in Table 2, all signalized intersections operate at acceptable levels of service during the AM and PM peak hours. The stop-controlled intersections are operating at acceptable LOS during the AM and PM peak hours except for six intersections. The northbound Middle School Entrance at Prices Fork Road operates at LOS F during the AM peak hour. The US 460 SB Ramps, US 460 NB Ramps, and Old Glade Road intersections operate at LOS F during at least one peak period. The McBryde Drive/Parking Garage Entrance and Orchard Street/Parking Lot Entrance intersections operate at an unacceptable LOS during both peak hours.

Table 2: Existing (2016) Intersection Level of Service Results

ID	Prices Fork Road Intersection	Traffic Control	Existing 2016	
			AM	PM
1	Old Mill Road	Signalized	C (WB-C)	B (EB-B)
2	High School Bus Lot Entrance	Unsignalized	(NB-C)	(NB-B)
3	Middle School Entrance	Unsignalized	(NB-F)	(NB-C)
4	Elementary School Entrance	Unsignalized	(NB-D)	(NB-C)
5	Hethwood Boulevard	Signalized	A (NB-D)	A (NB-C)
6	Sheffield Drive	Unsignalized	(NB-B)	(NB-C)
7	Heather Drive	Signalized	B (NB-D)	B (EB-B)
8	Huntington Lane/Carpenter Blvd	Signalized	B (SB-E)	B (SB-E)
9	Brightwood Manor Dr/Strock St	Unsignalized	(NB-C)	(SB-C)
10	Plantation Road	Signalized	B (SB-E)	B (SB-E)
11	Route 460 SB Ramps	Unsignalized	(SB-C)	(SB-F)
13	Old Glade Road	Unsignalized	(SB-B)	(SB-F)
14	University City Boulevard	Signalized	C (SB-D)	C (NB-F)
15	W Campus Dr/Woodland Drive	Signalized	B (SB-D)	C (NB-D)
16	McBryde Drive	Unsignalized	(SB-F)	(SB-F)
17	Tom's Creek Road/Stanger Street	Signalized	B (SB-C)	D (NB-D)
18	Turner Street/Webb Street	Unsignalized	(SB-B)	(NB-C)
19	Orchard Street	Unsignalized	(SB-E)	(NB-F)
20	North Main Street	Roundabout	D (SB-E)	F (SB-F)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

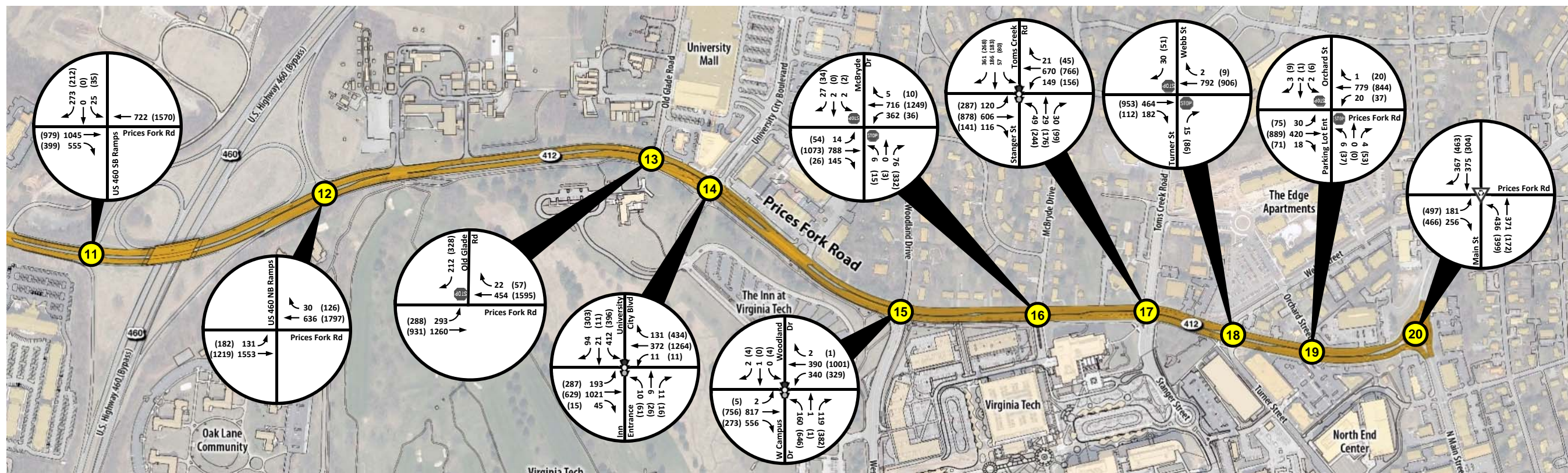
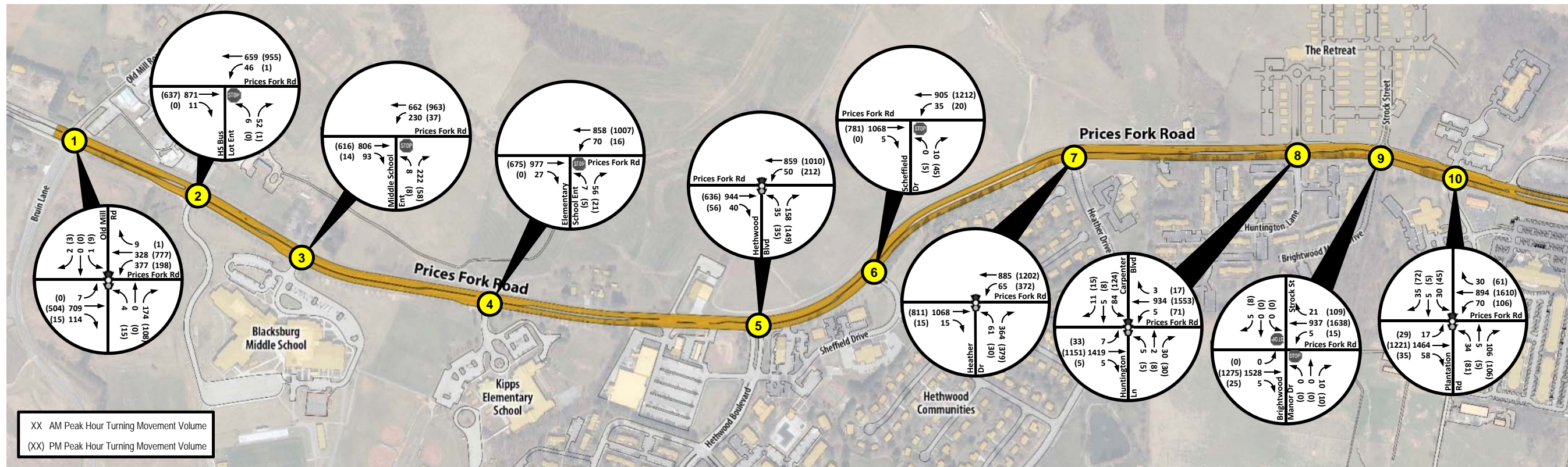


Figure 5: Existing (2016) AM and PM Peak Hour Turning Movement Volumes

Crash Data Analysis

Crash data for the most recent five (5) years (June 30, 2011 through June 30, 2016) were obtained from the Virginia Department of Transportation (VDOT) *Crashtools* Database. The crash data were evaluated to identify crash locations and patterns, severity of crashes, and likely causes of crashes. The crash data were examined to identify crash locations on which to focus during field reviews. Field reviews were conducted, focusing on the crash patterns and locations, to evaluate conditions within the field that could be influencing the crash locations. The crash data were used to identify an AM Peak period (6:00 AM–9:00 AM) and a PM Peak period (3:00 PM–6:00 PM), during which the highest number of crashes occurred. The Crash Data Analysis findings describe trends in the data regarding time of day, type of crash, and roadway conditions. The findings, including summaries of the crash data analysis and recommendations, are provided in the following sections.

Crashes by Year

A total of 348 crashes occurred within the Pricess Fork Road segment from June 2011 through June 2016, as shown in Figure 6. Note that 2011 and 2016 are shown as striped since the data window for these years does not include a full calendar year. A total of 87 visible injuries and zero (0) fatalities occurred along the Pricess Fork Road roadway segment within the five-year period. The number of crashes increased between 2012 and 2015. It should be noted, that while the number of crashes appears to increase from 2012 to 2015, this could be a result of the changes in AADT, as shown in Figure 6 (i.e. orange trend line).

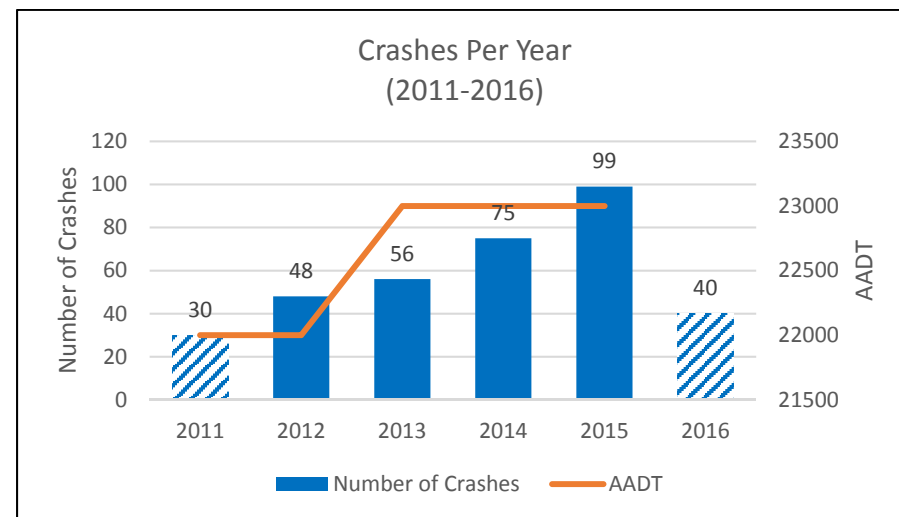


Figure 6: Number of Crashes by Year for Pricess Fork Road

Crashes by Time of Day

Figure 7 displays the number of crashes that occurred by time of day, presented in 3-hour increments. Although crashes occurred during each time frame throughout the day, the highest frequency of crashes occurred from

3:00 PM–6:00 PM (23%), from 6:00 PM–9:00 PM (18%), from 12:00 PM–3:00 PM (17%), and from 9:00 AM–12:00 PM (16%).

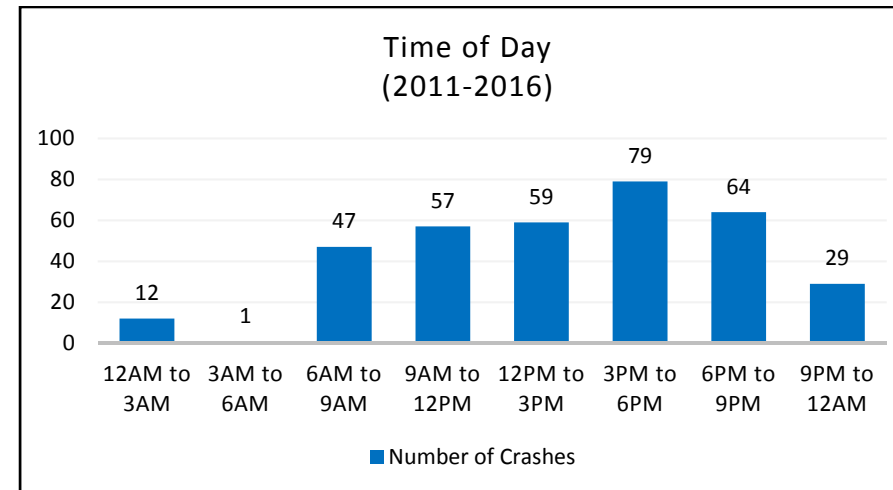


Figure 7: Number of Crashes by Time of Day for Pricess Fork Road

Crashes by Type

As shown in Figure 8, most crashes that occurred were rear-end crashes (50%), followed by angle crashes (29%), sideswipe – same direction (6%), and fixed object – off road (5%); the remaining crash types each accounted for less than 3% of the overall crashes. It should be noted that some of the designated angle crashes that were recorded may have been sideswipe crashes, as reporting officers have often incorrectly coded these types of crashes in the past.

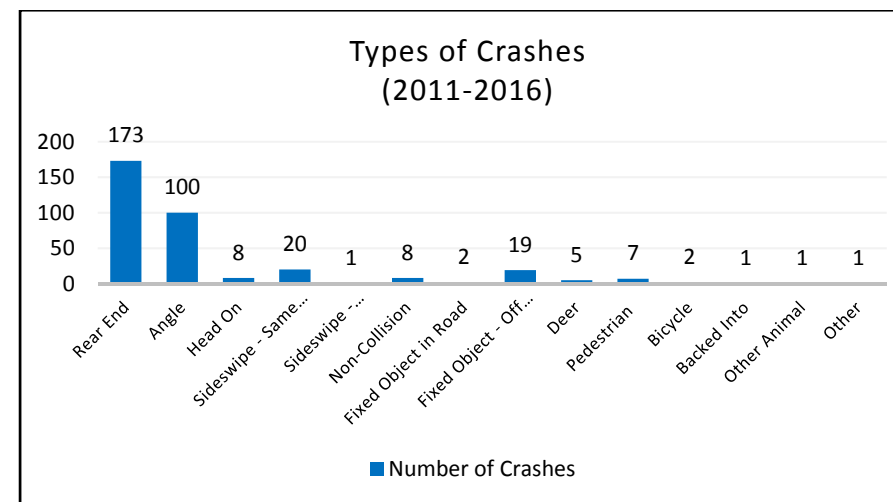


Figure 8: Number of Crashes by Type of Crash for Pricess Fork Road

Crashes by Roadway Condition

Figure 9 indicates the number of crashes by roadway surface condition. The majority (66%) of crashes occurred during dry roadway conditions. Wet conditions accounted for 29% of crashes.

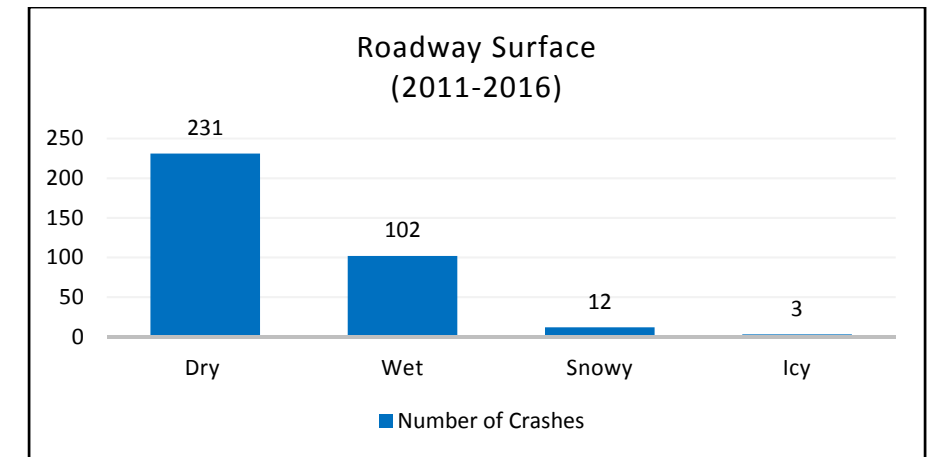


Figure 9: Number of Crashes by Roadway Surface Condition for Pricess Fork Road

Crash Data Summary

The following observations were made for crashes that occurred during the five (5) year period along Pricess Fork Road:

- 40 percent (40%) of crashes that occurred on Pricess Fork Road resulted in 139 injuries (e.g. ambulatory, visible, and non-visible injuries).
- 29 percent (29%) of crashes that occurred on Pricess Fork Road occurred under wet pavement conditions (102 crashes).
- 50 percent (50%) of crashes that occurred over the five (5) year period were rear-end crashes (173 crashes).
- 12 percent (12%) of crashes that occurred on Pricess Fork Road occurred during dark lighting conditions, which includes the following time periods: 9pm – 12 am, 12am – 3am, and 3am – 6 am (42 crashes).
- 14 percent (14%) of crashes (47 crashes) that occurred on Pricess Fork Road occurred during the AM peak period (6am – 9am). 23 percent (23%) of crashes (79 crashes) occurred during the PM peak period (3pm – 6pm).

Pedestrian-Bicycle Crash Summary

There were six pedestrian collisions reported along the corridor. Three crashes occurred at the Toms Creek Road intersection. Two were reported at Turner Street with another one reported at McBryde Drive. A single bicycle crash was reported at Toms Creek Road and another occurred at McBryde Drive. These locations coincide with the great number of vehicle, bicycle, and pedestrian crossing conflicts.

Crash Patterns

West Segment

Based on the data output from VDOT's *Crashtools* Database, the following crash patterns were observed at the study intersections along the west segment of Princes Fork Road:

- Princes Fork Road at Old Mill Road/Bruin Lane: Rear-end collisions (60% of crashes at the intersection) occurred in 2013, 2015, and 2016. Collisions at the intersection predominately occurred during the AM peak period (70% of crashes at the intersection). In addition, 50% of crashes occurred under wet pavement conditions.
- Princes Fork Road from Old Mill Road/Bruin Lane to Heather Drive: No significant collision patterns were observed along this section of roadway from 2011 to 2016.
- Princes Fork Road at Heather Drive: Rear-end collisions (65% of crashes at the intersection) occurred from 2011 to 2016 at the eastbound and westbound intersection approaches. Angle crashes (18% of crashes at the intersection) were also common at the eastbound, westbound, and northbound intersection approaches from 2012 to 2015. Collisions at the intersection occurred during the period between 3pm and 6pm (22% of crashes at the intersection), 6pm and 9pm (22% of crashes at the intersection), and from 12pm to 3pm (28% of crashes at the intersection).
- Princes Fork Road at Huntington Lane: Rear-end crashes (80% of crashes at the intersection) were common at the eastbound and westbound intersection approaches from 2011 to 2012 and 2014 to 2016. Collisions at the intersection predominately occurred during the PM peak period (50% of crashes at the intersection). In addition, 50% of crashes occurred under wet pavement conditions.
- Princes Fork Road at Plantation Road: Rear-end crashes (70% of crashes at the intersection) and angle crashes (24% of crashes at the intersection) were common along the eastbound and westbound approaches at the Plantation Road intersection from 2011 to 2016. Collisions at the intersection predominately occurred during the PM peak period (32% of crashes at the intersection). In addition, 22% of crashes occurred under wet pavement conditions.

East Segment

Based on the data output from VDOT's *Crashtools* Database, the following crash patterns were observed at the study intersections along the east segment of Princes Fork Road:

- Princes Fork Road at US 460 West Ramp: Rear-end crashes (88% of crashes at the intersection) were common along the eastbound, westbound, and southbound approaches at the ramp access

between 2014 and 2016. Collisions at the intersection predominately occurred during the AM peak period (34% of crashes at the intersection) and during the PM peak period (34% of crashes at the intersection). In addition, 25% of crashes occurred under wet pavement conditions.

- Princes Fork Road at US 460 East Ramp: Angle crashes (29% of crashes at the intersection) occurred at the eastbound and westbound approaches in 2014 and 2015. Side-swipe collisions (29% of crashes at the intersection) occurred at the eastbound and westbound approaches in 2016. No specific crash patterns occurred based on the time of day. In addition, 43% of crashes occurred under wet pavement conditions.
- Princes Fork Road from US 460 East Ramp to Old Glade Road: No significant collision patterns were observed along this section of roadway from 2011 to 2016.
- Princes Fork Road at Old Glade Road: Rear-end collisions (40% of crashes at the intersection) were common on the eastbound and westbound approaches in 2011, 2014, and 2015. Angle collisions (35% of crashes at the intersection) occurred on the eastbound, westbound, and southbound approaches in 2012, 2014, and 2015. No specific crash patterns occurred based on the time of day. In addition, 50% of crashes occurred under wet pavement conditions.
- Princes Fork Road at University City Boulevard: Rear-end collisions (76% of crashes at the intersection) were common on the eastbound and westbound approaches from 2011 to 2016. Angle collisions (21% of crashes at the intersection) were common on the eastbound, westbound, and southbound approaches from 2011 to 2015. Collisions at the intersection predominately occurred during the PM peak period (33% of crashes at the intersection). In addition, 36% of crashes occurred under wet pavement conditions.
- Princes Fork Road at West Campus Drive/Woodland Drive: Angle collisions (50% of crashes at the intersection) were common on the eastbound, westbound, and northbound approaches from 2013 to 2016. Rear-end collisions (28% of crashes at the intersection) were common on the eastbound, westbound, and northbound approaches from 2011 to 2016. No specific crash patterns occurred based on the time of day. In addition, 19% of crashes occurred under wet pavement conditions.
- Princes Fork Road at McBryde Drive: Rear-end collisions (44% of crashes at the intersection) were common on the eastbound, westbound, and northbound approaches from 2012 to 2015. Angle collisions (31% of crashes at the intersection) were common on the eastbound, westbound, and southbound approaches from 2012 to 2015. A pedestrian and bicycle collision occurred along the eastbound and westbound approaches in 2014. No specific crash

patterns occurred based on the time of day. In addition, 13% of crashes occurred under wet pavement conditions.

- Princes Fork Road at Toms Creek Road/Stanger Street: Angle collisions (51% of crashes at the intersection) were common on all approaches from 2012 to 2016. Rear-end collisions (31% of crashes at the intersection) were common on the eastbound, westbound, and southbound approaches from 2012 to 2015. Three pedestrian collisions (2013 and 2014) occurred along the east leg of the intersection, and a bicycle collision (2014) occurred in the middle of the intersection while traveling eastbound. Collisions at the intersection predominately occurred during the period between 6pm and 9pm (36% of crashes at the intersection). In addition, 28% of crashes occurred under wet pavement conditions.
- Princes Fork Road at Turner Street NW/Webb Street: Rear-end collisions (58% of crashes at the intersection) were common on the eastbound and westbound approaches from 2011 to 2015. Two pedestrian collisions involving eastbound traveling vehicles occurred in 2013 and 2015. Collisions at the intersection predominately occurred during the period between 9am and 12pm (42% of crashes at the intersection). In addition, 26% of crashes occurred under wet pavement conditions.
- Princes Fork Road at Orchard Street: Angle collisions (63% of crashes at the intersection) were common on all approaches from 2011 to 2015. No specific crash patterns occurred based on the time of day. No crashes occurred under wet pavement conditions.
- Princes Fork Road at North Main Street: Rear-end collisions (27% of crashes at the intersection), and side-swipe collisions (32% of crashes at the intersection) were common on all approaches from 2012 to 2016. Angle collisions (23% of crashes at the intersection) were common on all approaches in 2015. One pedestrian collision along the eastbound lanes occurred in 2015. No specific crash patterns occurred based on the time of day. In addition, 27% of crashes occurred under wet pavement conditions.

Figure 10 summarizes the crashes by intersection and type for the Princes Fork Road corridor.

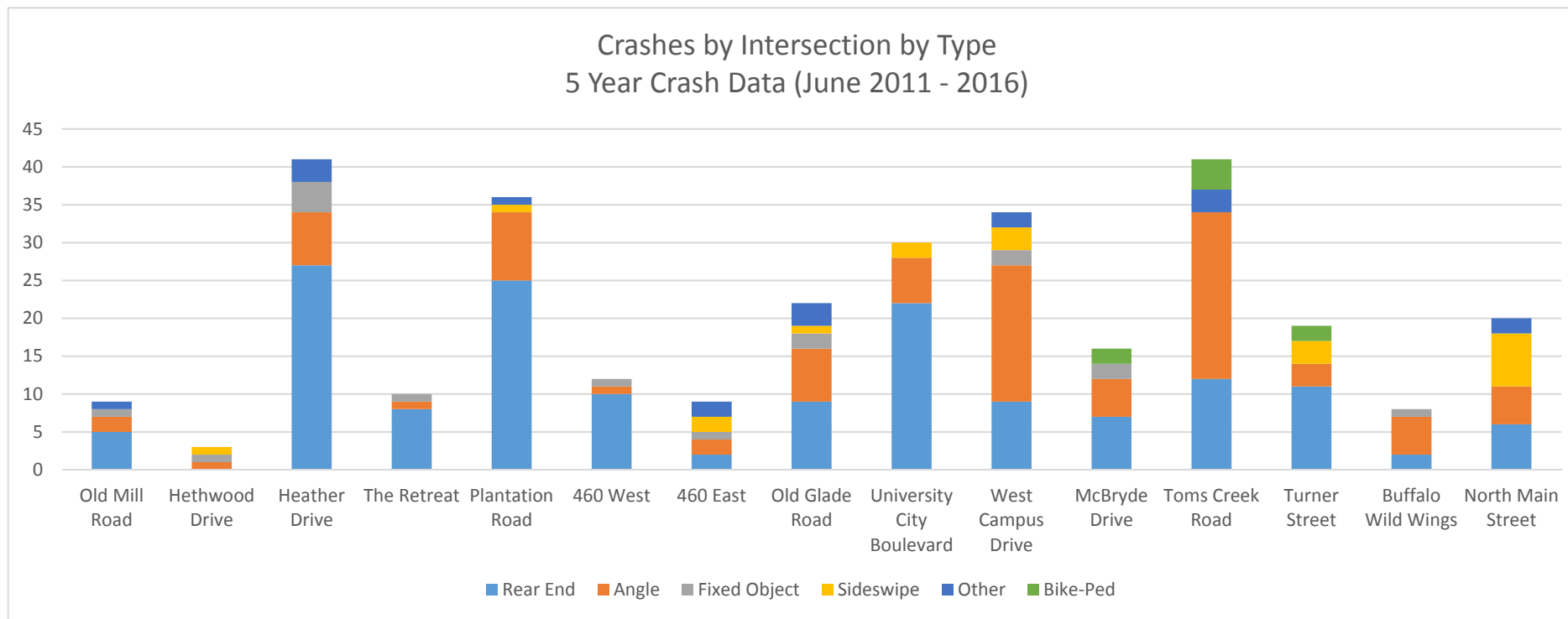


Figure 10: Number of Crashes by Type by Intersection

Field Review

Field observations were conducted by ToXcel along Prices Fork Road on October 12-13, 2016 during the AM and PM peak periods to assess traffic operations, roadway geometrics, safety, queuing, vehicle interaction conflicts, and existing signage. To evaluate these conditions within the field, the following engineering manuals were used to guide the recommendations:

- o Manual on Uniform Traffic Control Devices (MUTCD)
- o Virginia Supplement to MUTCD
- o VDOT Traffic Engineering Design Manual (TEDM)
- o VDOT Road and Bridge Specifications (VDOT RBS)
- o 2010 ADA Standards for Accessible Design (ADA)
- o VDOT Road Design Manual (VDOT RDM)
- o AASHTO Guide for the Development of Bicycle Facilities (AASHTO)

It should be noted that other recommendations and/or observations were noted that may not be directly correlated to crash patterns; however, it is important to record all field recommendations and/or observations since they could potentially create unsafe conditions for road users. The observations made during the AM and PM peak periods are detailed below.

Overall Corridor Observations

- o All signalized intersections along Prices Fork Road from Old Mill Road/Bruin Lane to North Main Street could benefit from the installation of retro-reflective borders on all traffic signal heads, which increase signal head visibility for drivers.
- o All pedestrian clearance intervals were evaluated at all signalized intersections to ensure that the timings comply with standards

- o During the AM peak period, no significant queuing was observed at any of the intersections west of the access ramps for US 460. Note that an increase in traffic was observed during the arrival period for Blacksburg Middle School and Kipps Elementary School; however, no queues extended outside of storage lanes.
- o During the PM peak period, saturated traffic conditions were observed at multiple intersections along Prices Fork Road, including University City Boulevard, West Campus Drive/Woodland Drive, Toms Creek Road/Stanger Street, and North Main Street.
- o In general, the road name sign panels east of the US 460 ramps are too small, and larger sign panels should be installed to improve legibility for drivers. The road name sign panels at the Prices Fork Road and Heather Drive intersection are excellent examples.

Lighting

The roadway lighting was measured by ToXcel at all major intersections along Prices Fork Road from Old Mill Road/Bruin Lane to North Main Street, including the following intersections: Old Mill Road/Bruin Lane, Hethwood Boulevard, Heather Drive, Huntington Lane, Plantation Road, University City Boulevard, West Campus Drive/Woodland Drive, Toms Creek Road/Stanger Street, and North Main Street. However, the night-time field evaluation revealed that the roadway lighting along this section of Prices Fork Road does not meet existing lighting standards. Please see Table 3 for the field lighting measurements.

Table 3: Field Lighting Measurements for Prices Fork Road

Intersection	# of Measurements		Average Measurements (footcandles)	
	Corner-Crossings	Mid-Crossings	Corner-Crossings	Mid-Crossings
Old Mill Road/Bruin Ln	4	3	0.44	0.35
Hethwood Boulevard	3	2	0.11	0.17
Heather Drive	3	2	0.66	0.59
Huntington Lane	4	4	0.38	0.55
Plantation Road	4	3	0.49	0.25
University City Boulevard	4	4	1.31	0.71
West Campus Drive/Woodland Drive	4	4	0.72	0.73
Toms Creek Road/Stanger Street	4	4	0.28	0.21
North Main Street	6	3	1.69	0.12

Based on the Illuminating Engineering Society of North America (IESNA) Recommended Practices for Roadway Lighting, a minimum average horizontal illuminance of three (3) footcandles is required for major roads and four (4) footcandles for collector roads. Since the roadway lighting at the major intersections along Prices Fork Road from the Old Mill road/Bruin Lane and the North Main Street intersection does not meet these standards, additional and/or stronger roadway lighting should be added. Further night-time lighting evaluations should be conducted to ensure that the lighting standards are upheld, while considering the Town's Dark Sky policies.

It was also noted that the overhead roadway lamps attached to the mast arms on the northwest and southeast corners of the Prices Fork Road and Plantation Road intersection were not functioning. Therefore, it is recommended that the overhead roadway lamps be examined to determine functionality and adjusted if it is found that they are not functioning properly.

It should be noted that customized pedestrian lanterns were utilized along the sidewalks at the Prices Fork Road and North Main Street intersection. All other roadway lighting was 20/25 Watt Cobrahead luminaires along the corridor. This should be considered when deciding on the streetscape design along Prices Fork Road.

Field Observations and Recommendations Summary

Table 4 highlights the observations and issues observed along the corridor. For each issue identified, a recommendation was made to help address the observed issue. Most recommendations are categorized as Short-Term (less than 5 years to implement), however Mid-Term (5-10 years) or Long-Term (10+ years) recommendations are noted as well.

Table 4: Prices Fork Road Field Review Summary Table

Intersection	Observation	Recommendation
<p>Prices Fork Road at Old Mill Road/Bruin Lane</p>	<ul style="list-style-type: none"> The pedestrian crosswalk across the east leg of the Prices Fork Road and Old Mill Road/Bruin Lane intersection is faded. <i>(See Recommendation A1)</i> The pushbutton located on the northwest corner of the Prices Fork Road and Old Mill Road/Bruin Lane intersection for pedestrians crossing the north leg is incorrectly located on the base of the mast arm, as shown in Exhibit 1. <i>(See Recommendation A2)</i> The vegetation along the eastbound lanes on the east leg of the Prices Fork Road and Old Mill Road/Bruin Lane intersection is obstructing the "Speed Limit" sign panel (R2-1). <i>(See Recommendation A3)</i> The left sight distance for northbound right-turning vehicles exiting Bruin Lane is obstructed due to the mast arm and topography (hill), as shown in Exhibit 2. While there are no crash patterns at this location, this sight distance obstruction could influence future angle and side-swipe crashes. <i>(See Recommendation A4)</i> The intersection provides the following pedestrian change intervals: 12 seconds for the north leg, 14 seconds for the east leg, and 12 seconds for the south leg. As the signal timing was not provided for this intersection, ensure that the pedestrian clearance intervals meet standards outlined in MUTCD Chapter 4E. 	<ul style="list-style-type: none"> A1. Refurbish the pedestrian crosswalk across the east leg of the Prices Fork Road and Old Mill Road/Bruin Lane intersection, per MUTCD Section 3B.18. <i>(Short-Term)</i> A2. Re-locate the pushbutton on the mast arm at the northwest corner of the Prices Fork Road and Old Mill Road/Bruin Lane intersection so the directional arrow is pointing across the pedestrian crossing on the north leg. <i>(Short-Term)</i> A3. Trim the vegetation along the eastbound lanes on the east leg of the Prices Fork Road and Old Mill/Bruin Lane intersection that is currently obstructing the "Speed Limit" sign panel (R2-1). <i>(Short-Term)</i> A4. Excavate the hill located on the southwest corner of the intersection to provide adequate left sight distance for northbound right-turning vehicles at the Prices Fork Road and Old Mill Road/Bruin Lane intersection. <i>(Short-Term)</i>
<p>Prices Fork Road and Blacksburg Middle School Bus Entrance</p>	<ul style="list-style-type: none"> The current pedestrian tactile domes on the southeast corner at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses do not comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(See Recommendation A5)</i> The pavement markings on the northbound approach at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses are faded. <i>(See Recommendation A6)</i> There is no pedestrian crossing across the south leg at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses. <i>(See Recommendation A7)</i> The "School" pavement marking is faded along the eastbound lanes just east of the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses. <i>(See Recommendation A8)</i> The current "Stop" sign panel at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses, as shown in Exhibit 3, does not comply with MUTCD Section 2B.05 (i.e. R1-1). <i>(See Recommendation A9)</i> 	<ul style="list-style-type: none"> A5. Install tactile domes on the southeast corner at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(Short-Term)</i> A6. Refurbish the pavement markings on the northbound approach at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses. <i>(Short-Term)</i> A7. Install a pedestrian crossing across the south leg at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses, per MUTCD Section 3B.18. To accommodate the pedestrian crossing, relocate the stop bar for northbound right-turning vehicles further south, in compliance with the buffer (e.g. 4-foot minimum between pedestrian crossing and stop bar), per MUTCD Section 3B.16. <i>(Short-Term)</i> A8. Refurbish the "School" pavement marking along the eastbound lanes just east of the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses. <i>(Short-Term)</i> A9. Install a "Stop" sign panel (R1-1) at the intersection of Prices Fork Road and the driveway for Blacksburg Middle School buses that complies with MUTCD Section 2B.05 (i.e. R1-1). <i>(Short-Term)</i>



Exhibit 1



Exhibit 2

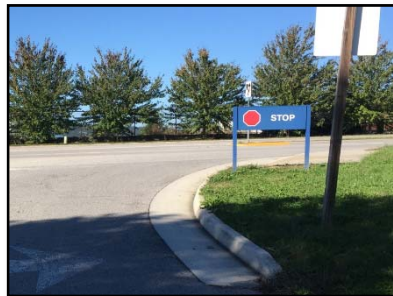


Exhibit 3

Table 4: Prices Fork Road Field Review Summary Table (continued)




Intersection	Observation	Recommendation
<p>Prices Fork Road and Blacksburg Middle School Driveway</p>	<ul style="list-style-type: none"> There are no tactile domes on the southeast and southwest corners of the intersection of Prices Fork Road and the driveway for Blacksburg Middle School. <i>(See Recommendation A10)</i> There is no pedestrian crossing across the south leg of the intersection of Prices Fork Road and the driveway for Blacksburg Middle School. <i>(See Recommendation A11)</i>  <p>The bike lane surrounding the intersection of Prices Fork Road and the driveway for Blacksburg Middle School is approximately 4 feet wide; however, only 2 feet of the bike lane is roadway pavement (i.e. the remaining 2 feet of the bike lane is gutter), as shown in Exhibit 4. In addition, this hybrid bike lane design exists from Old Mill Road/Bruin Lane to just east of Heather Drive along Prices Fork Road. <i>(See Recommendation A12)</i></p> <p style="text-align: center;"><i>Exhibit 4</i></p>	<p>A10. Install tactile domes on the southeast and southwest corners of the intersection of Prices Fork Road and the driveway for Blacksburg Middle School that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(Short-Term)</i></p> <p>A11. Install a pedestrian crossing on the south leg of the intersection of Prices Fork Road and the driveway for Blacksburg Middle School, per MUTCD Section 3B.18. <i>(Short-Term)</i></p> <p>A12. Regarding bike lane widths along roadways where parking is prohibited, ensure that the AASHTO guidelines for proper bike lane widths is followed throughout the corridor, especially from Old Mill Road/Bruin Lane to just east of Heather Drive along Prices Fork Road where the gutter accounts for half of the bike lane. Widen to a full four-foot7 minimum bicycle lane (five foot desired). <i>(Long-Term)</i></p>
<p>Prices Fork Road at Kipps Elementary School Driveway</p>	<ul style="list-style-type: none"> The "Stop" sign panel (R1-1) for vehicles exiting the Kipps Elementary School driveway is in the median on the left-hand side for northbound right-turning vehicles. <i>(See Recommendation A13)</i> There is no stop bar on the northbound approach at the intersection of Prices Fork Road and the driveway for Kipps Elementary School. In addition, the tactile domes on the southeast and southwest corners at the intersection do not comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(See Recommendation A14)</i> The left sight distance on the northbound approach at the intersection of Prices Fork Road and the driveway for Kipps Elementary School is slightly obstructed due to topography and vegetation, as shown in Exhibit 5. In addition, the right sight distance on the northbound approach is obstructed by a hill, as shown in Exhibit 6. While there are no crash patterns at this location, this sight distance obstruction could influence future angle and side-swipe crashes. <i>(See Recommendation A15)</i>  <p style="text-align: center;"><i>Exhibit 5</i></p>  <p style="text-align: center;"><i>Exhibit 6</i></p>	<p>A13. Re-locate the "Stop" sign panel (R1-1) for vehicles exiting the Kipps Elementary School driveway to the right-hand side of the northbound approach, per MUTCD Section 2B.10. <i>(Short-Term)</i></p> <p>A14. Install a stop bar on the northbound approach at the intersection of Prices Fork Road and the driveway for Kipps Elementary School, per MUTCD Section 3B.16. In addition, install tactile domes on the southeast and southwest corners at the intersection that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(Short-Term)</i></p> <p>A15. Trim the vegetation that is slightly obstructing the left sight distance on the northbound approach at the intersection of Prices Fork Road and the driveway for Kipps Elementary School. In addition, consider excavating the hill that is obstructing the right sight distance on the northbound approach until proper sight distance is achieved. <i>(Short-Term)</i></p>

Table 4: Prices Fork Road Field Review Summary Table (continued)

Intersection	Observation	Recommendation
Prices Fork Road and Hethwood Square Driveway	<ul style="list-style-type: none"> ○ The "Speed Limit" sign panel (R2-1) along the eastbound lanes just west of the Hethwood Square driveway is obstructed by vegetation. <i>(See Recommendation A16)</i> ○ There is no pedestrian crossing across the south leg at the intersection of Prices Fork Road and the Hethwood Square driveway. In addition, there are no tactile domes at the intersection and the pavement is uneven on the south leg. <i>(See Recommendation A17)</i> ○ There is no pedestrian crossing at either driveway access point for the Blacksburg Fire Department Station #2 along Prices Fork Road. In addition, there are no tactile domes on the corners of either driveway. <i>(See Recommendation A18)</i> ○ There is no "Stop" sign panel (R1-1), no stop bar, and no pedestrian crosswalk at the driveway access point just east of the Hethwood Square driveway along Prices Fork Road. The absence of the "Stop" sign panel (R1-1) and stop bar could influence future crashes. <i>(See Recommendation A19)</i> 	<p>A16. Trim the vegetation that is currently obstructing the "Speed Limit" sign panel (R2-1) along the eastbound lanes just west of the Hethwood Square driveway. <i>(Short-Term)</i></p> <p>A17. Add pedestrian crossing pavement markings across the south leg at the intersection of Prices Fork Road and the Hethwood Square driveway, per MUTCD Section 3B.18. Install tactile domes on the southeast and southwest corners at the intersection that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. In addition, consider re-paving the south leg of the intersection to provide a smooth roadway surface. <i>(Short-Term)</i></p> <p>A18. Add pedestrian crossing pavement markings across both driveway access points for the Blacksburg Fire Department Station #2, per MUTCD Section 3B.18. In addition, install tactile domes on the corners of both driveways that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(Short-Term)</i></p> <p>A19. Consider removing the driveway access point just east of the Hethwood Square driveway along Prices Fork Road. If the driveway access point is deemed necessary, then install a "Stop" sign panel (R1-1) (per MUTCD Section 2B.10), a stop bar (per MUTCD Section 3B.16) and pedestrian crosswalk pavement markings (per MUTCD Section 3B.18). <i>(Short-Term)</i></p>
Prices Fork Road and Hethwood Boulevard	<ul style="list-style-type: none"> ○ There is no "Turning Traffic Must Yield to Pedestrians" sign panel (R10-15L) for northbound left-turning vehicles at the Prices Fork Road and Hethwood Boulevard intersection. As northbound pedestrian walk phase is congruent with the northbound vehicle phase, signage should be provided regarding yielding to pedestrians along the west leg. <i>(See Recommendation A20)</i> ○ The left sight distance on the northbound approach at the Prices Fork Road and Hethwood Boulevard intersection is obstructed by electric/traffic control boxes located on the southwest corner of the intersection, as shown in Exhibit 7. While there are no crash patterns at this location, this sight distance obstruction could influence future angle and side-swipe crashes. ○ The "Hethwood Boulevard" road name sign panel located on the mast arm for the eastbound approach of the Prices Fork Road and Hethwood Boulevard intersection is obstructed by vegetation and may be difficult for drivers to read. <i>(See Recommendation A21)</i> 	<p>A20. Add a "Turning Traffic Must Yield to Pedestrians" sign panel (R10-15L) to the mast arm for the northbound approach for northbound left-turning vehicles at the Prices Fork Road and Hethwood Boulevard intersection. <i>(Short-Term)</i></p> <p>A21. Trim the vegetation that is blocking the "Hethwood Boulevard" road name sign panel located on the mast arm for the eastbound approach at the Prices Fork Road and Hethwood Boulevard intersection. <i>(Short-Term)</i></p>
Prices Fork Road and Sheffield Drive	<ul style="list-style-type: none"> ○ The pedestrian crossing pavement markings at the Prices Fork Road and Sheffield Drive intersection are faded. In addition, the tactile domes on the southeast and southwest corners do not comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(See Recommendation A22)</i> 	<p>A22. Refurbish the pedestrian crossing pavement markings at the Prices Fork Road and Sheffield Drive intersection, per MUTCD Section 3B.18. In addition, install tactile domes on the southeast and southwest corners of the intersection that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(Short-Term)</i></p>



Exhibit 7

Table 4: Prices Fork Road Field Review Summary Table (continued)


Intersection	Observation	Recommendation
Prices Fork Road and Heather Drive	<ul style="list-style-type: none"> ○ There is no “Left Turn Yield on Flashing Yellow Arrow” sign panel (R10-12a) on the mast arm for the westbound approach of the Prices Fork Road and Heather Drive intersection for westbound left-turning vehicles. There were angle collisions along the westbound approach from 2012 to 2015. <i>(See Recommendation A23)</i> ○ There are “Traffic Signal Ahead” warning sign panels (W3-3) with distance plaques for the eastbound approach of the Prices Fork Road and Heather Drive intersection. However, the warning sign panels do not include advanced warning flashers. There was a presence of rear-end collisions on the eastbound approach from 2011 to 2016, which could be reduced with the installation of advanced warning flashers. <i>(See Recommendation A24)</i> ○ There are currently no “Traffic Signal Ahead” warning sign panels (W3-3) for the westbound approach of the Prices Fork Road and Heather Drive intersection. There was a presence of rear-end collisions on the westbound approach from 2012 to 2015, which could be reduced with the installation of advanced warning flashers. <i>(See Recommendation A25)</i> ○ During the PM peak period, more aggressive driving was observed at the eastbound and westbound approaches of the Prices Fork Road and Heather Drive intersection. There was a presence of angle crashes because of westbound left-turning vehicles attempting to turn onto Heather Drive with inadequate gaps from 2012 to 2015. <i>(See Recommendation A26)</i> 	<p>A23. Install a “Left Turn Yield on Flashing Yellow Arrow” sign panel (R10-12a) on the mast arm for the westbound approach of the Prices Fork Road and Heather Drive intersection for westbound left-turning vehicles. <i>(Short-Term)</i></p> <p>A24. Due to the curvature of the eastbound approach and the higher speeds observed in the field at the Prices Fork Road and Heather Drive intersection, consider installing advanced warning flashers on the existing “Traffic Signal Ahead” warning sign panels (W3-3). <i>(Mid-Term)</i></p> <p>A25. Due to the vertical grade along the westbound approach of the Prices Fork Road and Heather Drive intersection, consider installing “Traffic Signal Ahead” warning sign panels (W3-3) with advanced warning flashers along the westbound approach. <i>(Mid-Term)</i></p> <p>A26. Consider installing a protected only left-turn phase for the westbound left-turn to reduce left-turn crashes. <i>(Short-Term)</i></p>
Prices Fork Road and Huntington Lane	<div style="display: flex; align-items: flex-start;">  <div style="margin-left: 10px;"> <ul style="list-style-type: none"> ○ The left sight distance on the northbound approach at the Prices Fork Road and Huntington Lane intersection is fully obstructed due to existing vegetation and roadway curvature, as shown in Exhibit 8. While there are no crash patterns at this location, this sight distance obstruction could influence future angle and side-swipe crashes. <i>(See Recommendation A27)</i> ○ There is no “Begin Right Turn Lane Yield to Bikes” sign panel (R4-4) at the beginning of the westbound right-turn lane at the Prices Fork Road and Huntington Lane intersection. <i>(See Recommendation A28)</i> </div> </div> <ul style="list-style-type: none"> ○ The “Hidden Entrance” sign panel located just east of the Prices Fork Road and Huntington Lane intersection is obstructed by vegetation. <i>(See Recommendation A29)</i> ○ Note that there was a presence of rear-end crashes along the eastbound and westbound lanes from 2011 to 2016. This intersection used to be 2-way stop-controlled, and the rear-end collisions could be a result of vehicles entering/exiting the stop-controlled approaches from/onto Prices Fork Road with inadequate gaps. However, this intersection has recently been modified to include signalization. As signalization does not necessary reduce rear-end collisions, it should help control the entrance and exit of vehicles at the northbound and southbound approaches. 	<p>A27. Due to the left sight distance obstruction, consider adding a “No Turn On Red” sign panel (R10-11) for the northbound right-turning vehicles at the Prices Fork Road and Huntington Lane intersection. <i>(Short-Term)</i></p> <p>A28. Install a “Begin Right Turn Lane Yield to Bikes” sign panel (R4-4) at the beginning of the westbound right-turn lane at the Prices Fork Road and Huntington Lane intersection. <i>(Short-Term)</i></p> <p>A29. Trim the vegetation that is currently obstructing the “Hidden Entrance” sign panel (W11-24a) located just east of the Prices Fork Road and Huntington Lane intersection. <i>(Short-Term)</i></p>

Table 4: Prices Fork Road Field Review Summary Table (continued)

Intersection	Observation	Recommendation
Prices Fork Road and Plantation Road	<ul style="list-style-type: none"> The pedestrian crossings across the north, west, and south legs of the Prices Fork Road and Plantation Road intersection are faded. In addition, the pavement markings on all approaches are faded. <i>(See Recommendation A30)</i> There is a "Traffic Signal Ahead" warning sign panel (W3-3) with a distance plaque for the eastbound approach of the Prices Fork Road and Plantation Road intersection. However, the warning sign panel does not include advanced warning flashers. There was a presence of rear-end collisions from 2011 to 2016, which could be reduced by the installation of advanced warning flashers. <i>(See Recommendation A31)</i> 	<p>A30. Refurbish the pedestrian crossings across the north, west, and south legs of the Prices Fork Road and Plantation Road intersection, per MUTCD Section 3B.18. In addition, refurbish the pavement markings on the northbound, southbound, and eastbound approaches of the intersection. <i>(Short-Term)</i></p> <p>A31. Due to the curvature of the eastbound approach at the Prices Fork Road and Plantation Road intersection, consider installing advanced warning flashers on the existing "Traffic Signal Ahead" warning sign panel (W3-3). <i>(Short-Term)</i></p>
Prices Fork Road and the Access Ramps for US 460	<ul style="list-style-type: none"> There are no pedestrian crossings, no tactile domes, and no "Pedestrian Crossing" warning sign panels (W11-2) on any of US 460 ramps along Prices Fork Road. <i>(See Recommendation A32)</i> The current width of the sidewalks on either side of the ramp from eastbound Prices Fork Road to eastbound US 460 is inadequate due to vegetation around the perimeter of the sidewalks, as shown in Exhibit 9. Based on VDOT standards, an adequate sidewalk width is 5 feet. <i>(See Recommendation A33)</i> As alluded to previously, there is no pedestrian crossing and no tactile domes on the ramp from eastbound US 460 to eastbound/westbound Prices Fork Road. The stop bar is located closer to the edge of roadway along Prices Fork Road than where the pedestrian crossing would be installed, as shown in Exhibit 10. In addition, the left sight distance is limited due to roadway curvature and topography, and the right sight distance is obstructed by vegetation. While there are no crash patterns at this location, this sight distance obstruction could influence future angle and side-swipe crashes. <i>(See Recommendation A34)</i> Gravel pedestrian pathways are present on either side of the ramp from westbound US 460 to eastbound Prices Fork Road. <i>(See Recommendation A35)</i> The route designation sign (Route 412 East) located along the eastbound lanes of Prices Fork Road just east of the ramp from westbound US 460 to eastbound Prices Fork Road next to the Virginia Tech Golf Course is faded. <i>(See Recommendation A36)</i> There is no bike lane provided along Prices Fork Road just east of Plantation Road to just east of the US 460 ramps, across from the Virginia Maryland Regional College of Veterinary Medicine. <i>(See Recommendation A37)</i> There was a presence of rear-end collisions along the off-ramp from eastbound US 460 to eastbound/westbound Prices Fork Road. However, based on the field review, no specific conditions were identified that would influence these collisions. 	<p>A32. Add pedestrian crossing pavement markings on all US 460 ramps along Prices Fork Road, per MUTCD 3B.18. Consider installing "Pedestrian Crossing" warning sign panels (W11-2) for all pedestrian crossings on all US 460 ramps to provide warning to drivers. In addition, install tactile domes on all US 460 ramps that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. <i>(Short-Term)</i></p> <p>A33. Consider trimming the vegetation around the perimeter of the sidewalks or completely replacing the sidewalks on either side of the ramp from eastbound Prices Fork Road to eastbound US 460 to provide a 5-foot minimum sidewalk width for pedestrians, per VDOT standards. <i>(Short-Term)</i></p> <p>A34. Install a pedestrian crossing on the ramp from eastbound US 460 to eastbound/westbound Prices Fork Road, per MUTCD Section 3B.18. In addition, install tactile domes that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. Re-evaluate the off-ramp approach at the connection with Prices Fork Road as the pedestrian crossing would be behind the stop bar, assuming a crosswalk was added. Trim the vegetation that is obstructing the right sight distance. <i>(Short-Term)</i></p> <p>A35. Consider installing 5-foot minimum pedestrian sidewalks on either side of the ramp from westbound US 460 to eastbound Prices Fork Road to provide access and generate continuity for pedestrians, per VDOT standards. <i>(Short-Term)</i></p> <p>A36. Replace the route designation sign (Route 412 East) located along the eastbound lanes of Prices Fork Road just east of the ramp from westbound US 460 to eastbound Prices Fork Road next to the Virginia Tech Golf Course to increase clarity for drivers. <i>(Short-Term)</i></p> <p>A37. Install a bike lane along Prices Fork Road just east of Plantation Road to just east of the US 460 ramps, across from the Virginia Maryland Regional College of Veterinary Medicine, to provide access and generate continuity for bicyclists, per AASHTO Chapter 2. <i>(Mid-Term)</i></p>



Exhibit 9



Exhibit 10

Table 4: Prices Fork Road Field Review Summary Table (continued)

Intersection	Observation	Recommendation
Prices Fork Road and Old Glade Road	<ul style="list-style-type: none"> Vehicles were observed making southbound left-turns from Old Glade Road onto Prices Fork Road even though left-turns are prohibited at that location. (See Recommendation A38) 	<p>A38. To discourage illegal southbound left-turns from Old Glade Road onto Prices Fork Road, consider extending the existing median (along eastbound left-turn lane at Old Glade Road) 25 feet further east along Prices Fork Road. (Short-Term)</p>
Prices Fork Road and University City Boulevard	<ul style="list-style-type: none"> There is a "Traffic Signal Ahead" warning sign panel (W3-3) with a distance plaque for the eastbound approach of the Prices Fork Road and University City Boulevard intersection. However, the warning sign panels do not include advanced warning flashers. There is a presence of rear-end collisions on the eastbound approach from 2011 to 2016, which could be reduced by the installation of the advanced warning flashers. (See Recommendation A39) The pavement markings on the eastbound and southbound approaches of the Prices Fork Road and University City Boulevard intersection are faded. (See Recommendation A40) The pedestrian crossings across all legs of the Prices Fork Road and University City Boulevard intersection are faded. (See Recommendation A41) The left sight distance for the southbound approach of the Prices Fork Road and University City Boulevard intersection is completely obstructed by a black fence on top of a stone wall outside the CVS Pharmacy located on the northeast corner of the intersection, as shown in Exhibit 11. Note that there is a 20-foot buffer (based on the outside lane) between the pedestrian crossing and the stop bar, which meets the 4-foot minimum standard per MUTCD Section 3B.16. However, this distance could be influencing angle crashes as the left sight distance is obstructed from the southbound approach. In addition, there was an angle crash related to a southbound right-turning vehicle hitting a westbound through vehicle in 2015. (See Recommendation A42) During the AM peak period, the queue in the left-turn bay on the eastbound approach of the Prices Fork Road and University City Boulevard intersection extended outside the storage lane into the leftmost through lane. In addition, the queue in the left-turn bay on the southbound approach of the intersection extended backwards into the signalized intersection near Panera Bread during the AM peak period. (See Recommendation A43) During the PM peak period, queuing was observed on the westbound approach of the Prices Fork Road and University City Boulevard intersection, as shown in Exhibit 12, which extended through West Campus Drive/Woodland Drive and obstructed the northbound left-turn and westbound through movements, as shown in Exhibit 13. (See Recommendation A44) 	<p>A39. Due to the roadway curvature along the eastbound approach of the Prices Fork Road and University City Boulevard intersection, consider installing "Traffic Signal Ahead" warning sign panels (W3-3) with advanced warning flashers along the eastbound approach to indicate the signal status to drivers. (Short-Term)</p> <p>A40. Refurbish the pavement markings on the eastbound and southbound approaches of the Prices Fork Road and University City Boulevard intersection. (Short-Term)</p> <p>A41. Refurbish the pedestrian crossings across all legs of the Prices Fork Road and University City Boulevard intersection, per MUTCD 3B.18. (Short-Term)</p> <p>A42. First, consider re-locating the stop bar closer to edge of roadway to provide adequate left sight distance for the southbound approach of the Prices Fork Road and University City Boulevard intersection, in compliance with the buffer (e.g. 4-foot minimum between pedestrian crossing and stop bar), per MUTCD Section 3B.16. (Short-Term)</p> <p>A43. Re-evaluate the existing signal timing during the AM peak period, and consider allocating more green time for the left-turning vehicles along the eastbound and southbound approaches of the Prices Fork Road and University City Boulevard intersection. (Short-Term)</p> <p>A44. Re-evaluate the existing signal timing during the PM peak period, and consider allocating more green time for the westbound approach of the Prices Fork Road and University City Boulevard intersection. (Short-Term)</p>



Exhibit 11



Exhibit 12



Exhibit 13

Table 4: Prices Fork Road Field Review Summary Table (continued)


Intersection	Observation	Recommendation
<p>Prices Fork Road and West Campus Drive/Woodland Drive</p>	<ul style="list-style-type: none"> The pedestrian crossing across the channelized right-turn lane for eastbound right-turning vehicles at the Prices Fork Road and West Campus Drive/Woodland Drive intersection is faded. (See Recommendation A45) Note that an all-pedestrian signal phase exists at the Prices Fork Road and West Campus Drive/Woodland Drive intersection. During the AM peak period, queuing was observed along the westbound approach of the Prices Fork Road and West Campus Drive/Woodland Drive intersection. (See Recommendation A46) During the PM peak period, queuing was observed on the westbound approach of the Prices Fork Road and West Campus Drive/Woodland Drive intersection, which extended back into and beyond the Toms Creek Road/Stanger Street intersection, as shown in Exhibit 14. (See Recommendation A47) There was a large presence of angle collisions as a result of westbound left-turning vehicles attempting to turn with inadequate gaps from 2013 to 2016. Due to topography of the roadway at the Prices Fork Road and West Campus Drive/Woodland Drive intersection, westbound left-turning vehicles have limited sight distance of opposing eastbound vehicles when making the turning maneuver. (See Recommendation A48)  <p style="text-align: center;">Exhibit 14</p>	<ul style="list-style-type: none"> A45. Refurbish the pedestrian crossing pavement markings across the channelized right-turn lane for eastbound right-turning vehicles at the Prices Fork Road and West Campus Drive/Woodland Drive intersection, per MUTCD Section 3B.18. (Short-Term) A46. Re-evaluate the existing signal timing during the AM peak period and consider allocating more green time for the westbound approach of the Prices Fork Road and West Campus Drive/Woodland Drive intersection. (Short-Term) A47. Re-evaluate the existing signal timing during the PM peak period and consider allocating more green time for the westbound approach of the Prices Fork Road and West Campus Drive/Woodland Drive intersection. In addition, evaluate the signal timing coordination for the eastbound and westbound approaches. (Short-Term) A48. Consider re-evaluating the signal phasing for westbound left-turning vehicles as the topography at the Prices Fork Road and West Campus Drive/Woodland Drive intersection obstructs the sight distance for westbound left-turning vehicles of opposing eastbound through vehicles. Consider updating the signal head to include flashing yellow operations as they improve yielding conditions for permissive left-turns, or consider changing the protected-permissive westbound left-turn movement to a protected only movement. (Short-Term)
<p>Prices Fork Road and McBryde Drive</p>	<ul style="list-style-type: none"> The pedestrian crossings across the north and east legs of the Prices Fork Road and McBryde Drive intersection are faded. In addition, there are no tactile domes for either of the pedestrian crossings. There was one pedestrian and one bicycle collision along the east leg of the intersection in 2014, which could be influenced by the lack of warning provided to drivers both from faded crossings and from limited signage. (See Recommendation A49) There is no pedestrian crossing across the south leg of the Prices Fork Road and McBryde Drive intersection, which is the access point for the parking garage. In addition, there is no stop bar on the northbound approach of the intersection. The absence of the stop bar could be influencing crashes at this location. (See Recommendation A50) The "Begin Right Turn Lane Yield to Bikes" sign panel (R4-4) and the "Right Lane Must Turn Right" sign panel (R3-7R) along the eastbound lanes on the east leg of the Prices Fork Road and McBryde Drive intersection are slightly obstructed by vegetation. (See Recommendation A51) Several pedestrians were observed crossing various legs of the Prices Fork Road and McBryde Drive intersection, and vehicles were not yielding to the crossing pedestrians. (See Recommendation A52) The road name sign panels on the northwest corner of the Prices Fork Road and McBryde Drive intersection are extremely small and obstructed by vegetation, which decreases visibility for drivers. (See Recommendation A53) The left sight distance for the southbound approach of the Prices Fork Road and McBryde Drive intersection is obstructed by vegetation. (See Recommendation A54) 	<ul style="list-style-type: none"> A49. Refurbish the pedestrian crossings across the north leg of the Prices Fork Road and McBryde Drive intersection, per MUTCD Section 3B.18. In addition, install tactile domes for current pedestrian crossings at the intersection that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. A crosswalk on the east leg (crossing Prices Fork Road) was recently removed by the Town due to the wide roadway width (without a refuge), high vehicle speeds/volumes and lack of signalized control. (Short-Term) A50. Adding a pedestrian crossing across the south leg of the Prices Fork Road and McBryde Drive intersection, per MUTCD Section 3B.18. Install tactile domes for the pedestrian crossing that comply with standards in both the VDOT RBS and ADA Section 705.1. In addition, install a stop bar on the northbound approach of the intersection, per MUTCD Section 3B.16. (Short-Term) A51. Trim the vegetation that is currently blocking the "Begin Right Turn Lane Yield to Bikes" sign panel (R4-4) and the "Right Lane Must Turn Right" sign panel (R3-7R) along the eastbound lanes on the east leg of the Prices Fork Road and McBryde Drive intersection. (Short-Term) A52. Consider installing "Pedestrian Crossing" warning sign panels (W11-2) and "Pedestrian Crossing" warning sign panels (W11-2) with an "Ahead" plaque (W16-9) to the appropriate approaches of the Prices Fork Road and McBryde Drive intersection to increase crossing visibility for drivers. A53. Install larger road name sign panels on the northwest corner of the Prices Fork Road and McBryde Drive intersection, and trim the vegetation that is currently obstructing the road name sign panels at the intersection to increase sign legibility for drivers. (Short-Term) A54. Trim vegetation obstructing the left sight distance for the southbound approach. (Short-Term)

Table 4: Prices Fork Road Field Review Summary Table (continued)

Intersection	Observation	Recommendation
Prices Fork Road and Toms Creek Road/Stanger Street	<ul style="list-style-type: none"> ○ The road name sign panels at the Prices Fork Road and Toms Creek Road/Stanger Street intersection are extremely small and difficult to read, especially at night. There is no road name sign panel provided on the mast arm for the eastbound approach. In addition, the "Prices Fork Road" road name sign panel on the mast arm for the northbound approach is obstructed by vegetation. <i>(See Recommendation A55)</i> ○ The pedestrian crossing for the eastbound channelized right-turn lane at the Prices Fork Road and Toms Creek Road/Stanger Street intersection is faded. <i>(See Recommendation A56)</i> ○ There are no pedestrian signals with countdown displays at the Prices Fork Road and Toms Creek Road/Stanger Street intersection. There were three pedestrian collisions along the east leg of the intersection between 2013 and 2014, which could be influenced by the lack of pedestrian change interval display provided on the signals. In addition, since pedestrian signals did not provide countdown displays, pedestrians were observed attempting to cross the intersection with inadequate crossing time. <i>(See Recommendation A57)</i> ○ There are no "Turning Traffic Must Yield to Pedestrians" sign panels (R10-15R) for northbound, westbound, and southbound right-turning vehicles at the Prices Fork Road and Toms Creek Road/Stanger Street intersection. As discussed in the previous bullet point, there were three pedestrian crashes, which could be influenced by the lack of signage. <i>(See Recommendation A58)</i> ○ During the PM peak hour, queuing was observed on the northbound, eastbound, and westbound approaches of the Prices Fork Road and Toms Creek Road/Stanger Street intersection. The northbound approach queue extended backwards past Perry Street, the eastbound approach extended backwards to the parking garage access point across from McBryde Drive, and the westbound approach extended past Webb Street, as shown in Exhibit 15. <i>(See Recommendation A59)</i> <div style="text-align: center;"> <p style="text-align: center;"><i>Exhibit 15</i></p> </div>	<ul style="list-style-type: none"> A55. Install larger road name sign panels at the Prices Fork Road and Toms Creek Road/Stanger Street intersection on the mast arms for all approaches. In addition, trim the vegetation that is obstructing the "Prices Fork Road" sign panel on the mast arm for the northbound approach. <i>(Short-Term)</i> A56. Refurbish the pedestrian crossing for the eastbound channelized right-turn lane at the Prices Fork Road and Toms Creek Road/Stanger Street intersection, per MUTCD Section 3B.18. <i>(Short-Term)</i> A57. Since the pedestrian change interval is more than 7 seconds, pedestrian countdown signals should be installed at the Prices Fork Road and Toms Creek Road/Stanger Street intersection, per MUTCD Section 4E.07. <i>(Short-Term)</i> A58. Install "Turning Traffic Must Yield to Pedestrians" sign panels (R10-15R) for northbound, westbound, and southbound right-turning vehicles at the Prices Fork Road and Toms Creek Road/Stanger Street intersection. <i>(Short-Term)</i> A59. Re-evaluate the existing signal timing of the Prices Fork Road and Toms Creek Road/Stanger Street intersection. <i>(Short-Term)</i>
Prices Fork Road and Turner Street NW	<ul style="list-style-type: none"> ○ The pavement markings and the pedestrian crossing at the Prices Fork Road and Turner Street NW intersection are faded. <i>(See Recommendation A60)</i> ○ There were two pedestrian collisions and a presence of rear-end collisions at the Prices Fork Road and Turner Street NW intersection. However, this pedestrian crossing has recently been removed, and this should eliminate pedestrian-related collisions and help reduce rear-end collisions. 	<ul style="list-style-type: none"> A60. Refurbish the pavement markings and the pedestrian crossing, per MUTCD Section 3B.18, on Turner Street NW along Prices Fork Road. <i>(Short-Term)</i>

Table 4: Prices Fork Road Field Review Summary Table (continued)

Intersection	Observation	Recommendation
Prices Fork Road and Buffalo Wild Wings Driveway	<ul style="list-style-type: none"> The pedestrian crossing provided across the Buffalo Wild Wings driveway does not comply with standards in MUTCD Section 3B.18, as shown in Exhibit 16. In addition, the pavement markings at the driveway access point are faded. (See Recommendation A61) The left sight distance for vehicles exiting the Buffalo Wild Wings driveway onto Prices Fork Road is obstructed due to the curvature of the roadway and vegetation, as shown in Exhibit 17. Vehicles were observed attempting northbound and southbound left-turn movements with inadequate gaps during the PM peak hour. (See Recommendation A62) 	<p>A61. Install a pedestrian crossing at the Buffalo Wild Wings driveway, per MUTCD Section 3B.18. In addition, refurbish the pavement markings at the driveway access point. (Short-Term)</p> <p>A62. Consider extending the median between the eastbound and westbound lanes of Prices Fork Road to eliminate left-turning and through movements from the Buffalo Wild Wings driveway and left-turning and through movements from Orchard Street. Restricting these movements would create a safer roadway environment by eliminating risky turn maneuvers at the intersection. A review of the existing turning movement counts was conducted, and it was determined that the northbound and southbound left-turning and through movements would not be significantly impacted by the new traffic flow. (Mid-Term)</p>
Prices Fork Road and Orchard Street	<ul style="list-style-type: none"> No pedestrian crossing is provided at the Prices Fork Road and Orchard Street intersection. In addition, no tactile domes are provided at the intersection. (See Recommendation A63) 	<p>A63. Add pedestrian crossing pavement markings at the Prices Fork Road and Orchard Street intersection, per MUTCD 3B.18. In addition, install tactile domes that comply with standards outlined in both the VDOT RBS and the ADA Section 705.1. (Short-Term)</p>
Prices Fork Road and North Main Street	<ul style="list-style-type: none"> Multiple sign panels were obstructed by vegetation on the eastbound approach of the Prices Fork Road and North Main Street intersection, as shown in Exhibit 18. (See Recommendation A64) The pavement markings at all approaches of the traffic circle at the Prices Fork Road and North Main Street intersection are faded. (See Recommendation A65) During the PM peak period, the eastbound approach of the Prices Fork Road and North Main Street intersection extended backwards past the Buffalo Wild Wings driveway. 	<p>A64. Trim the vegetation that is currently obstructing multiple sign panels on the eastbound approach of the Prices Fork Road and North Main Street intersection. (Short-Term)</p> <p>A65. Refurbish the pavement markings at all approaches of the traffic circle at the Prices Fork Road and North Main Street intersection. (Short-Term)</p>



Exhibit 16



Exhibit 17



Exhibit 18

Future Conditions

Future Year (2040) No-Build Analysis

As shown in Figure 11, the average daily traffic (ADT) volumes along Prices Fork Road have been growing at a relatively flat rate over the last fifteen years. The New River Valley Metropolitan Planning Organization (NRVMO) projects a 1.2% traffic increase along Prices Fork Road by 2035, which is generally consistent with the overall population and employment growth projected for the region listed in Table 5. Thus, projected volumes for the Future Year (2040) No-Build scenario were calculated based on applying a 1.2% uniform annual growth rate to the existing volumes. The Future No-Build conditions tests future operations under the current lane configurations and traffic control. The rates were then adjusted to reflect shifts in traffic relating to plans on Virginia Tech's campus. This specifically includes referencing forecast from the Western Perimeter Road and Virginia Tech Parking and Transportation Master Plan to incorporate volume shifts associated with the new Western Perimeter Road (Figure 12), Multi-Modal Transit Facility (MMTF), and parking shifts from the northern area of campus to other lots near the Duck Pond and Stadium. Improvements along Prices Fork Road identified from those studies were also incorporated into the Synchro analysis networks.

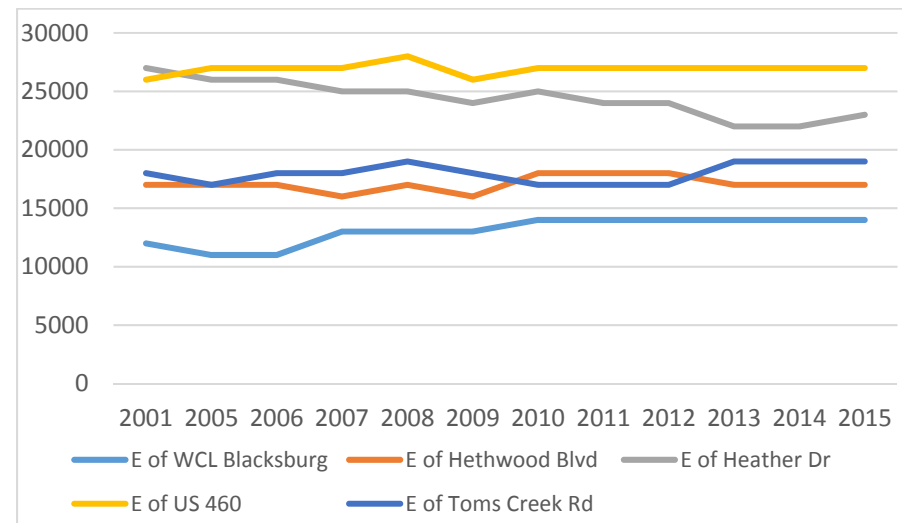


Figure 11: Historic VDOT ADT along Prices Fork Road

Table 5: Existing and Forecasted Regional Employment and Population

Area	Employment			Population		
	2008	2035	Rate	2008	2035	Rate
Blacksburg	13,667	19,007	1.2%	35,192	44,333	0.9%
Virginia Tech	7,794	12,713	1.8%	9,120	12,038	1.0%
Christiansburg	13,464	17,278	0.9%	22,343	28,011	0.8%
Other	3,198	6,346	2.6%	16,938	25,211	1.5%
Total MPO*	38,123	55,344	1.4%	83,593	109,593	1.0%

Obtained from MPO 2035 Transportation Plan (Exhibit 3)

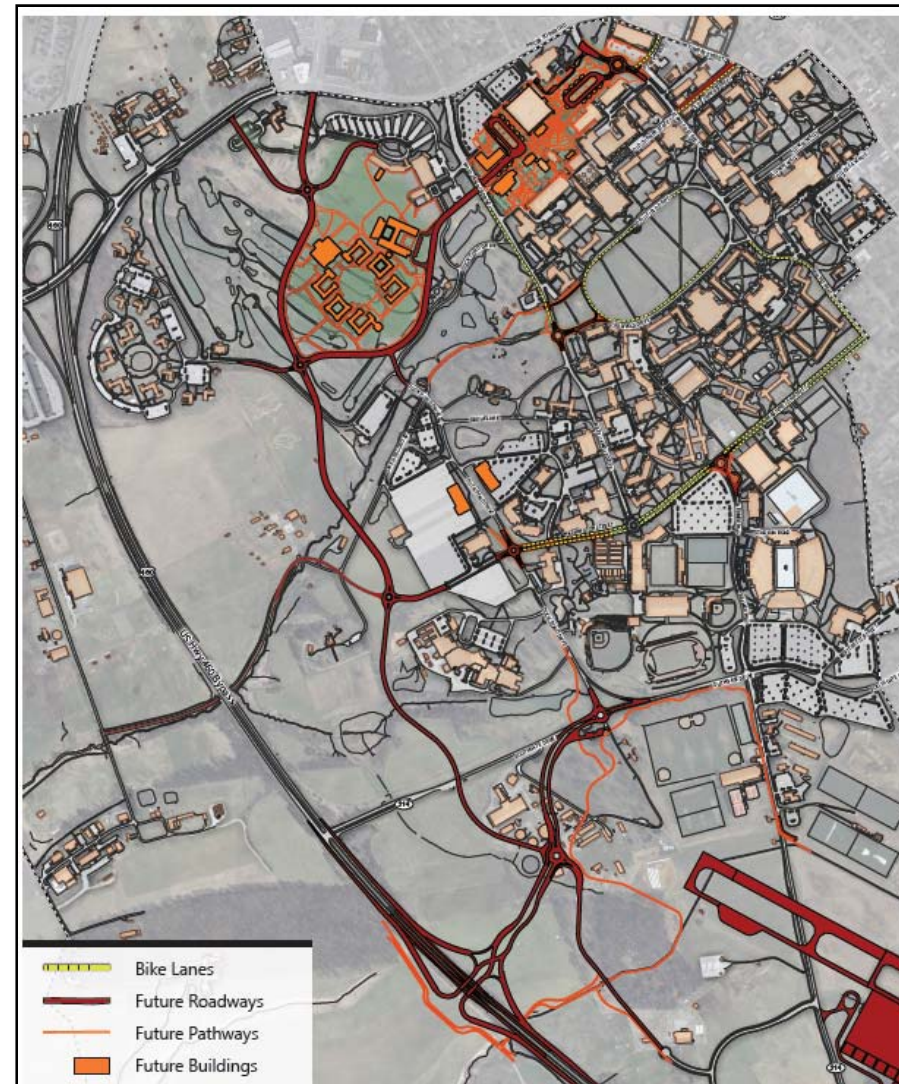


Figure 12: Potential Long-Term Improvements at Virginia Tech

As reported in Table 6, all signalized intersections operate at acceptable levels of service during the AM and PM peak hours except one intersection. The signalized Prices Fork Road and University City Boulevard/Inn Entrance intersection degrades from LOS C to LOS F during the PM peak hour. The intersection of Prices Fork Road and North Main Street degrades from LOS D to LOS E in the AM peak hour and continues to operate at LOS F during the PM peak hour. The stop-controlled northbound Middle School Entrance continues to operate at LOS F during the AM peak hour and degrades from LOS C to LOS E in the PM peak hour. The northbound stop-controlled Elementary School Entrance degrades from LOS D to LOS F during the AM peak hour. The US 460 SB Ramp approach at Prices Fork Road degrades from LOS C to LOS E during the AM peak hour and continues to operate at LOS F during the PM peak hour with increased delay. The US 460 NB Ramp and Old Glade Road approaches at Prices Fork Road continue to operate at LOS F

during the PM peak hour with increased delay. The McBryde Drive/Parking Garage Entrance and Orchard Street/Parking Lot Entrance intersections continue to operate at an unacceptable LOS during both peak hours.

Table 6: Future Year (2040) No-Build LOS Results

ID	Prices Fork Road Intersection	Traffic Control	No-Build 2040	
			AM	PM
1	Old Mill Road	Signalized	D (EB-E)	B (EB-C)
2	High School Bus Lot Entrance	Unsignalized	(NB-D)	(NB-B)
3	Middle School Entrance	Unsignalized	(NB-F)	(NB-E)
4	Elementary School Entrance	Unsignalized	(NB-F)	(NB-D)
5	Hethwood Boulevard	Signalized	B (NB-E)	A (NB-C)
6	Sheffield Drive	Unsignalized	(NB-C)	(NB-D)
7	Heather Drive	Signalized	B (NB-C)	B (EB-C)
8	Huntington Lane/Carpenter Blvd	Signalized	B (SB-E)	D (SB-E)
9	Brightwood Manor Drive/Strock St	Unsignalized	(NB-C)	(SB-D)
10	Plantation Road	Signalized	B (SB-F)	D (SB-F)
11	Route 460 SB Ramps	Unsignalized	(SB-E)	(SB-F)
12	Route 460 NB Ramps	Unsignalized	(EBL-B)	(EBL-F)
13	Old Glade Road	Unsignalized	(SB-C)	(SB-F)
14	University City Boulevard	Signalized	D (NB-E)	F (NB-F)
15	W Campus Drive/Woodland Drive	Signalized	C (NB-D)	D (NB-E)
16	McBryde Drive	Unsignalized	(SB-F)	(NB-F)
17	Tom's Creek Road/Stanger Street	Signalized	C (SB-D)	D (NB-F)
18	Turner Street/Webb Street	Unsignalized	(SB-C)	(NB-F)
19	Orchard Street	Unsignalized	(SB-F)	(NB-F)
20	North Main Street	Roundabout	E (SB-F)	F (SB-F)
21	Western Perimeter Road Spur	Unsignalized	(NB-C)	(NB-C)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

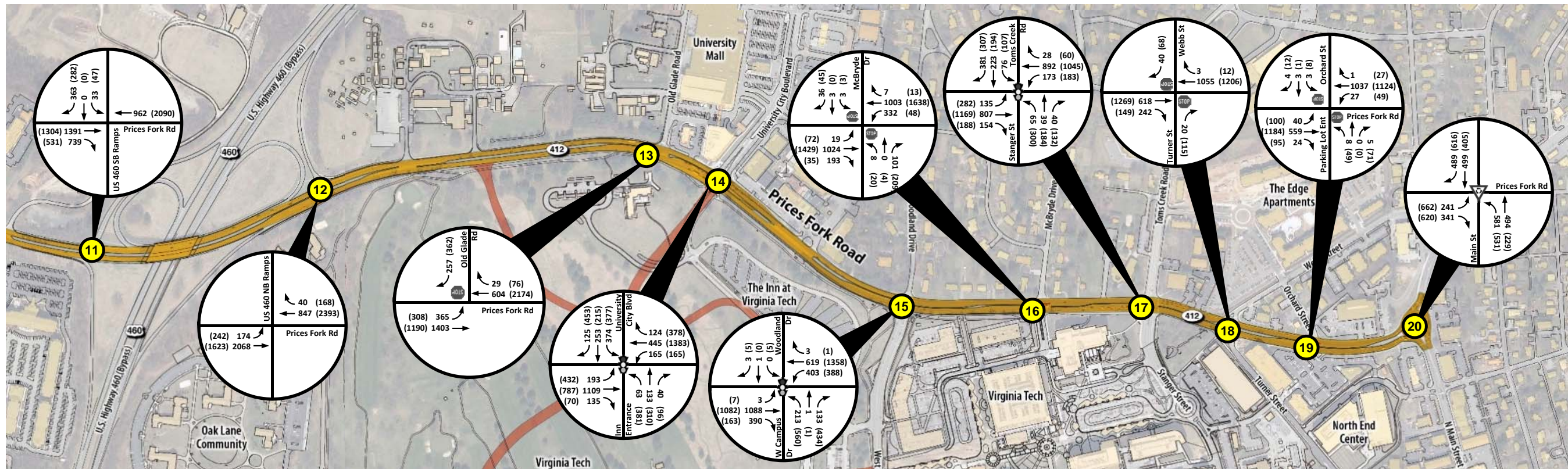
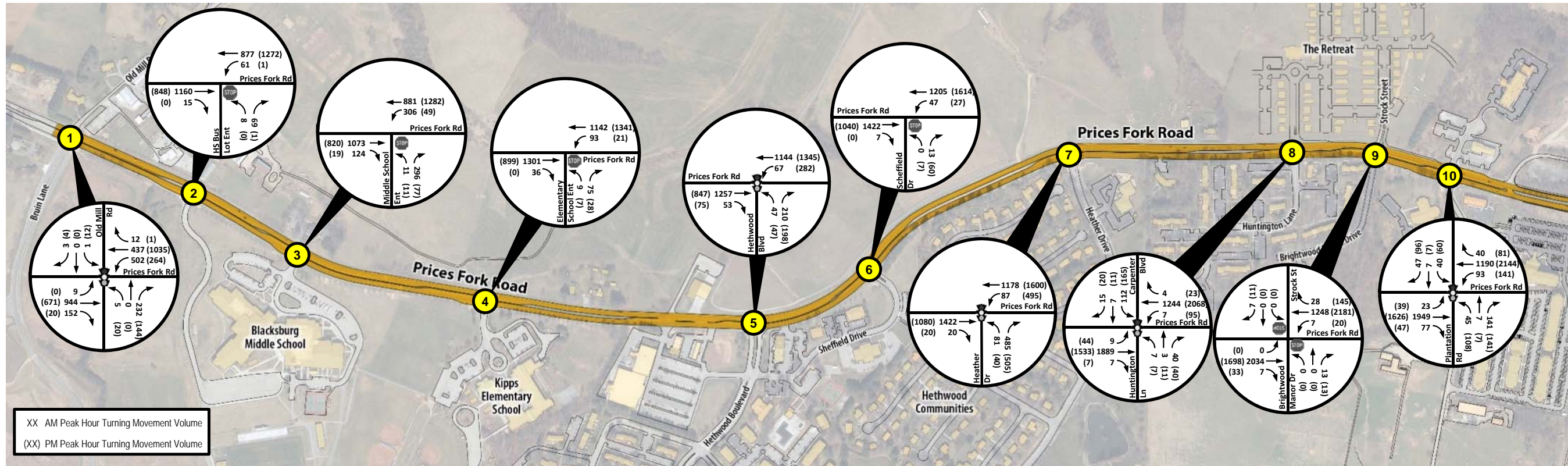


Figure 13: Future Year (2040) No-Build AM and PM Peak Hour Turning Movement Volumes

Future Year (2040) Build Analysis

The Future Year Build (2040) Scenario incorporates additional roadway and signalization improvements to improve operations or safety. The volumes are generally identical to the 2040 No-Build volumes, however reflect vehicle re-routing associated with access restrictions, interchange reconfigurations or other similar access changes. The specific roadway improvements incorporated into this scenario include:

Old Mill Road

- Update the current signal phasing to allow the northbound exclusive right-turn to overlap during the same phase as the westbound left-turn.

This improves the northbound approach delay during the AM peak hour by approximately 10 seconds.

Middle School Entrance and Elementary School Entrance

- No intersection improvements are recommended.

Although the unsignalized school entrance approaches operate at unacceptable levels during the AM peak hour, the intersection volumes do not meet warrants for signalization nor is the queuing substantial enough to warrant signalization. The AM and PM school bell times produce the highest delay and queuing during, which is over a relatively short duration when school is in session. Therefore, it is recommended that a police officer be stationed at these intersections during these time periods if the congestion becomes substantial or safety issues arise.

Prices Fork Road at Brightwood Manor Drive/Strock Street

- Modify the existing median to fully restrict left-turn and crossing movements from the side street.

This improves safety and operations of the intersection and reduces illegal southbound crossing movements at this location. Brightwood Manor Drive does not currently interconnect to Huntington Lane. Providing a connection to Huntington Lane is suggested to provide additional options for residents to access Prices Fork Road. Brightwood Manor residents would then have an option to make a direct northbound left-turn via the Huntington Lane signal rather than turn at an uncontrolled location or make a downstream U-turn movement.

Plantation Road

- Construct an exclusive southbound right-turn lane.

The additional southbound right-turn lane improves the overall intersection level of service from LOS D to LOS C during the PM peak hour.

US 460 Southbound Ramps

- Signalize and add one exclusive southbound right-turn lane with at least 450 feet of storage and appropriate taper.

Signalization at this intersection improves the operations from LOS E to LOS C and LOS F to LOS D for the southbound approach during the AM and PM peak hours, respectively.

US 460 Northbound Ramps

- Reconfigure the northbound ramp to eliminate the free-flowing movement onto along Prices Fork Road.
- Eliminate the US 460 westbound off-ramp and replace with an exclusive eastbound left-turn lane with at least 500 feet of storage and appropriate taper.
- Construct an additional westbound through lane which terminates into the US 460 eastbound on-ramp.
- Construct an exclusive westbound right-turn lane with at least 200 feet of storage and appropriate taper.
- Construct dual northbound left-turn lanes. One continuous lane and one lane with at least 650 feet of storage and taper.
- Construct dual exclusive northbound right-turn lanes with at least 750 feet of storage and appropriate taper.

The recommended improvements will increase safety for pedestrians and cyclists and create a more distinct context change for drivers leaving US 460. An alternative configuration for the interchange can keep the loop, but only signalize the left-turn movements at the interchange.

Old Glade Road

- Install a partial signal and add one exclusive southbound right-turn lane with at least 150 feet of storage and appropriate taper.
- Lengthen the eastbound left-turn lane to accommodate at least 400 feet of storage and appropriate taper.

The SimTraffic simulations show substantial delay for the eastbound left-turn onto Old Glade Road and the southbound right-turn from Old Glade Road without control at this intersection. Therefore, a partial signal is recommended to improve the operations for those movements in the long-term. The eastbound through movement would not be impacted by the partial signal and would still be free-flow at this intersection. If congestion at this intersection persists, possible relocation of this intersection to the west to align with the future Western Perimeter Road Spur and improve intersection spacing should be considered.

Western Perimeter Road Spur

- Signalize the intersection.
- Construct an exclusive eastbound right-turn lane with at least 250 feet of storage and appropriate taper.

- Construct an exclusive westbound left-turn lane with at least 150 feet of storage and appropriate taper.
- Construct an exclusive northbound left-turn lane with at least 300 feet of storage and appropriate taper.
- Construct a continuous shared northbound left-turn/right-turn lane.

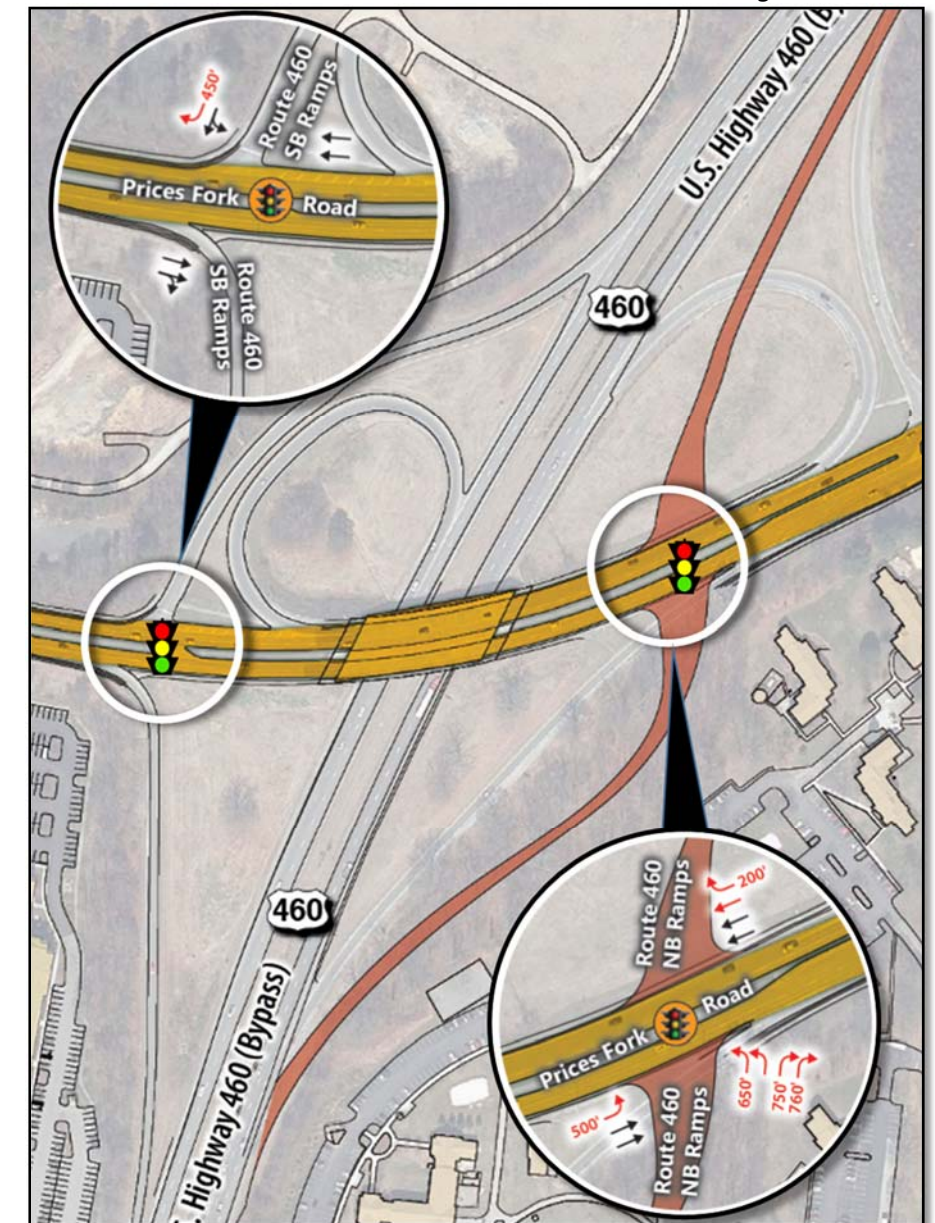


Figure 14: US 460 Interchange Recommendations

Allowing full northbound left-turn access was necessary at this location to reduce the vehicle demand and improve operations at the University City Boulevard intersection. Consider relocating Old Glade Road to this location, forming the fourth intersection leg in the future as the Virginia Tech Veterinary property redevelops.

University City Boulevard/Western Perimeter Road

- Lengthen the exclusive northbound left-turn lane to accommodate at least 250 feet of storage and appropriate taper.
- Construct a shared northbound through/left-turn lane.
- Construct an exclusive northbound right-turn lane with at least 200 feet of storage and appropriate taper.

The additional lanes and recommended increased storage at this intersection are to increase the capacity in response to the added congestion due to the construction of Western Perimeter Road.



McBryde Drive/Parking Garage Entrance

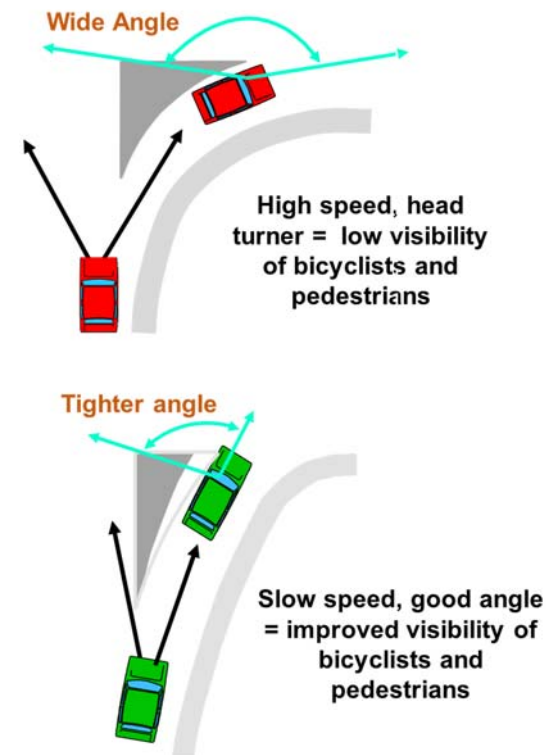
- Prohibit the southbound and northbound through and left-turn movements onto Prices Fork Road.

The restriction at this intersection will improve operations and safety. The northbound lefts at this intersection will most likely be rerouted to W Campus Drive.

Toms Creek Road/Stanger Street

- Eliminate the eastbound free-flowing right-turn (hot right) onto Stanger Street and replace with a standard, parallel right turn lane or channelized right-turn with a channelized island with a tighter radius and prohibit right-turns on red.

This intersection has the highest numbers of pedestrian, bicycling, and vehicular conflicts and was the location of the most pedestrian and bicycling collisions. Thus, measures to improve safety should be balanced against vehicular demands at this location. The illustration to the right helps highlight the safety benefits associated with a tighter right-turn angle.



Webb Street/Turner Street and Orchard Street/Driveway

- Prohibit the southbound and northbound through and left-turn movements onto Prices Fork Road.

The movement restriction at these intersections will improve the operations and safety. Although the side street approaches operate at unacceptable levels of service during one or both peak hours under future year conditions, signalization is not recommended at these intersections due to the minimal queuing experienced.

North Main Street

Under Future Year (2040) Build conditions, the roundabout at this intersection operates at LOS E and LOS F during the AM and PM peak hours, respectively. However, no improvements were recommended at this intersection due to its proximity to the downtown area and the Town's desire to keep roundabout as it is currently designed, rather than widen or signalize this intersection.

The AM and PM peak hour volumes for the Build Scenario are shown in Figure 15. The recommended lane configurations and traffic control are illustrated in Figure 16. As reported in Table 7, all signalized intersections operate at acceptable levels of service during the AM and PM peak hours with the planned improvements. Some of the unsignalized locations operate at LOS E or LOS F, however do not have substantial queuing or delay necessary to warrant additional mitigation improvements.

Table 7: Future Year (2040) Build LOS Results

ID	Prices Fork Road Intersection	Traffic Control	No-Build 2040		Build 2040	
			AM	PM	AM	PM
1	Old Mill Road	Signalized	D (EB-E)	B (EB-C)	D (EB-E)	B (NB-C)
2	High School Bus Lot Entrance	Unsignalized	(NB-D)	(NB-B)	(NB-D)	(NB-B)
3	Middle School Entrance	Unsignalized	(NB-F)	(NB-E)	(NB-F)	(NB-E)
4	Elementary School Entrance	Unsignalized	(NB-F)	(NB-D)	(NB-F)	(NB-D)
5	Hethwood Boulevard	Signalized	B (NB-E)	A (NB-C)	B (NB-D)	A (NB-D)
6	Sheffield Drive	Unsignalized	(NB-C)	(NB-D)	(NB-C)	(NB-D)
7	Heather Drive	Signalized	B (NB-C)	B (EB-C)	B (NB-C)	B (NB-C)
8	Huntington Ln./ Carpenter Blvd	Signalized	B (SB-E)	D (SB-E)	A (SB-F)	C (SB-F)
9	Brightwood Manor Drive	Unsignalized	(NB-C)	(SB-D)	(NB-C)	(SB-D)
10	Plantation Road	Signalized	B (SB-F)	D (SB-F)	B (NB-D)	C (NB-E)
11	Route 460 SB Ramps	Unsignalized/Signalized	(SB-E)	(SB-F)	B (SB-C)	B (SB-E)
12	Route 460 NB Ramps	Unsignalized/Signalized	(EBL-B)	(EBL-F)	C (NB-C)	D (NB-E)
13	Old Glade Road	Unsignalized/Signalized	(SB-C)	(SB-F)	A (SB-B)	B (SB-D)
14	University City Boulevard	Signalized	D (NB-E)	F (NB-F)	C (NB-D)	D (SB-F)
15	W Campus Dr./ Woodland Drive	Signalized	C (NB-D)	D (NB-E)	C (SB-D)	C (NB-D)
16	McBryde Drive	Unsignalized	(SB-F)	(NB-F)	(NB-C)	(NB-E)
17	Tom's Creek Rd/ Stanger St.	Signalized	C (SB-D)	D (NB-F)	C (SB-C)	D (NB-F)
18	Turner Street/ Webb Street	Unsignalized	(SB-C)	(NB-F)	(SB-C)	(NB-F)
19	Orchard Street	Unsignalized	(SB-F)	(NB-F)	(SB-C)	(NB-F)
20	North Main Street	Roundabout	E (SB-F)	F (SB-F)	E (SB-F)	F (SB-F)
21	Western Perimeter Road Spur	Unsignalized/Signalized	(NB-C)	(NB-C)	A (NB-D)	B (NB-E)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

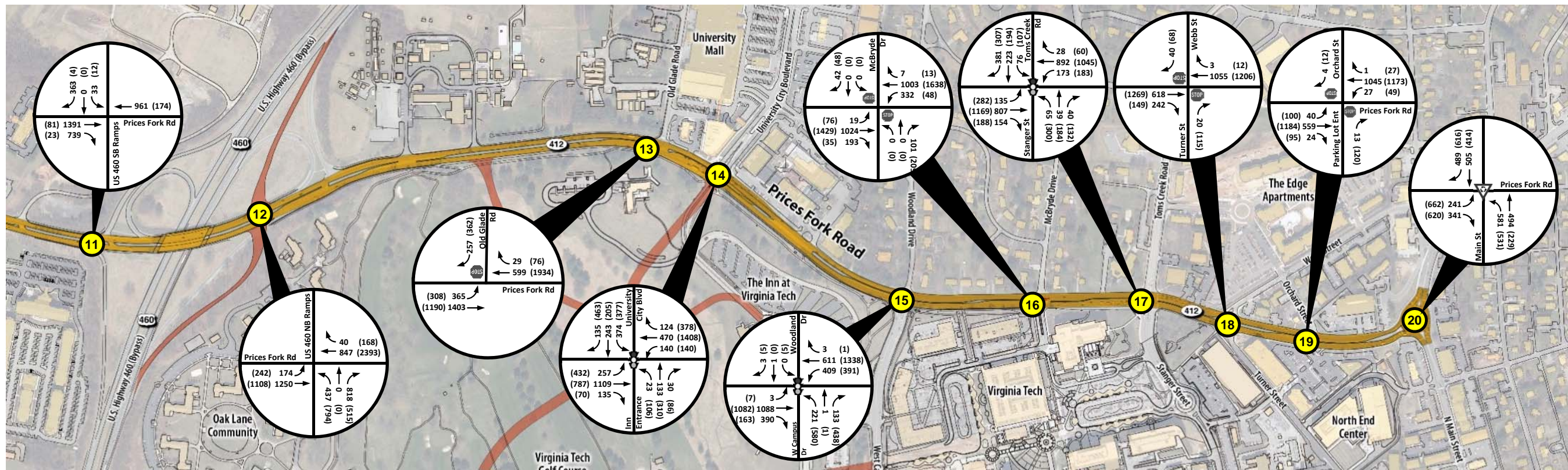
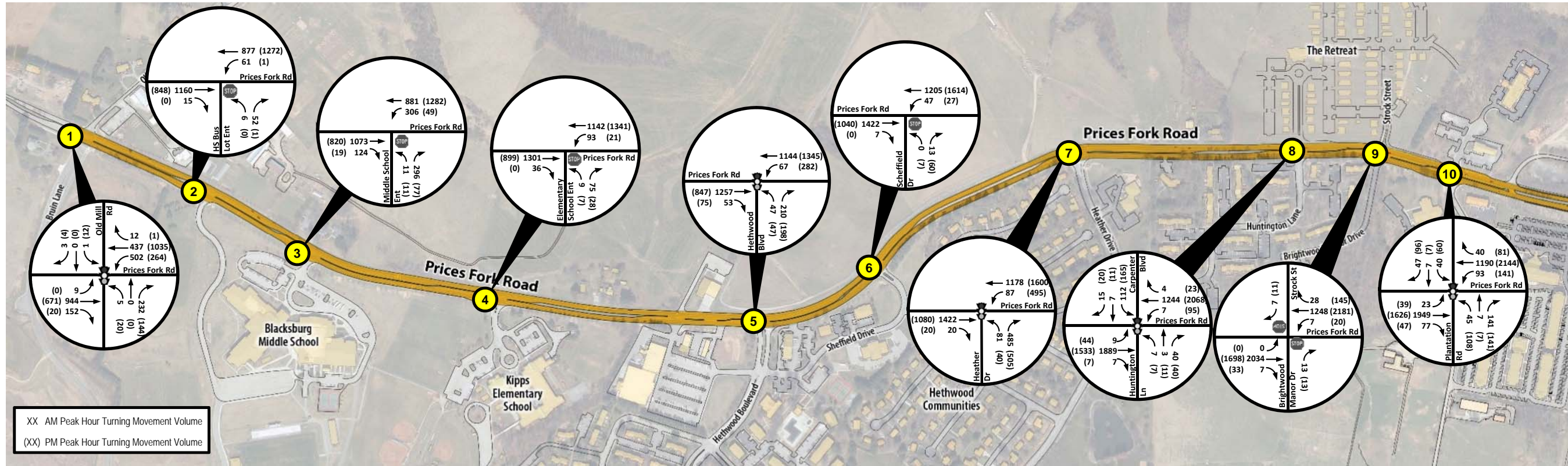


Figure 15: Future Year (2040) Build AM and PM Peak Hour Turning Movement Volumes

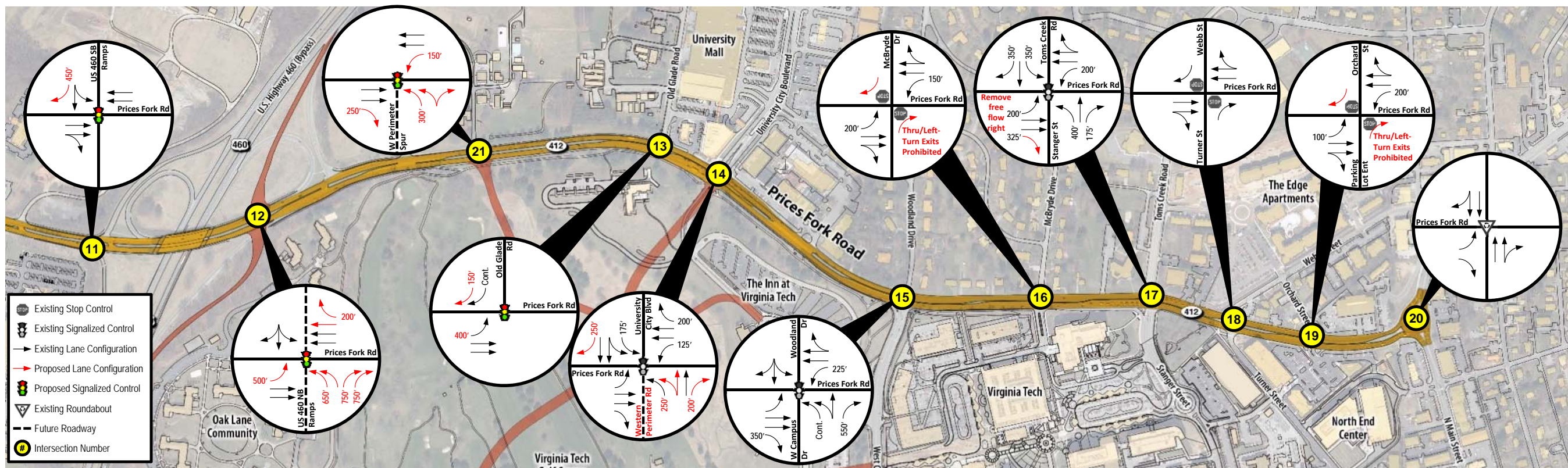
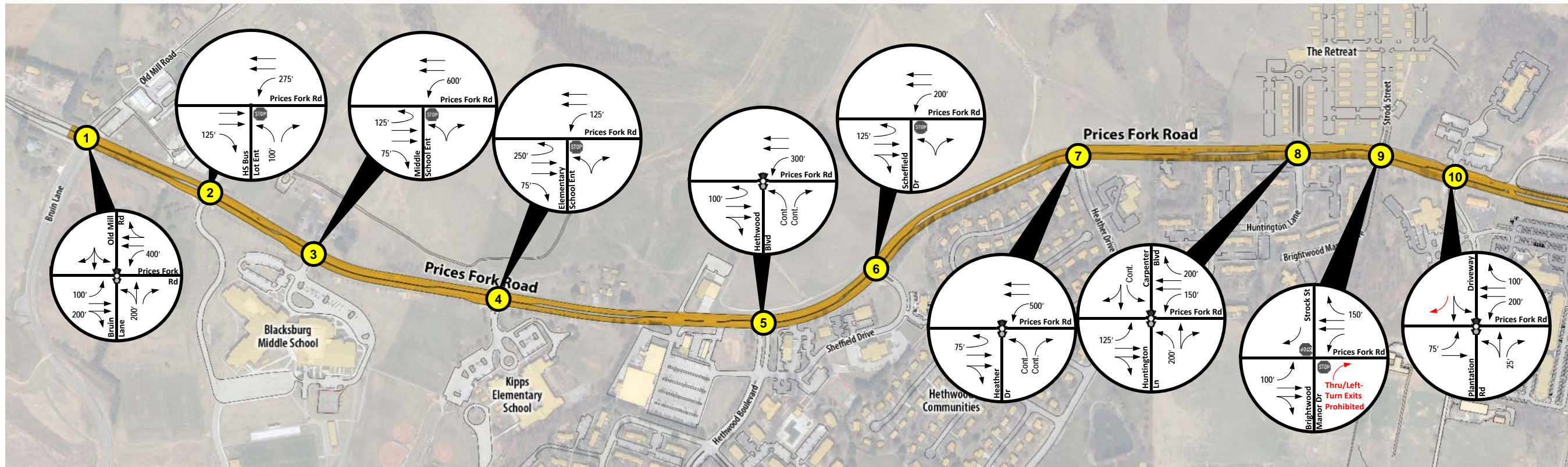


Figure 16: Future Year (2040) Build Lane Configuration and Traffic Control

Recommendations

Bicycle & Pedestrian Recommendations

Western Segment

A shared use path currently exists along portions of the west segment of Pricess Fork Road, specifically portions of the Huckleberry Trail and along The Retreat development frontage. To provide more separation between vehicular, bicycle and pedestrian modes and the desire to create a continuous network along Pricess Fork Road, it is recommended that a 10' minimum shared use path be constructed to replace the current sidewalk and a 4' minimum bike lane be constructed on both sides of Pricess Fork Road.

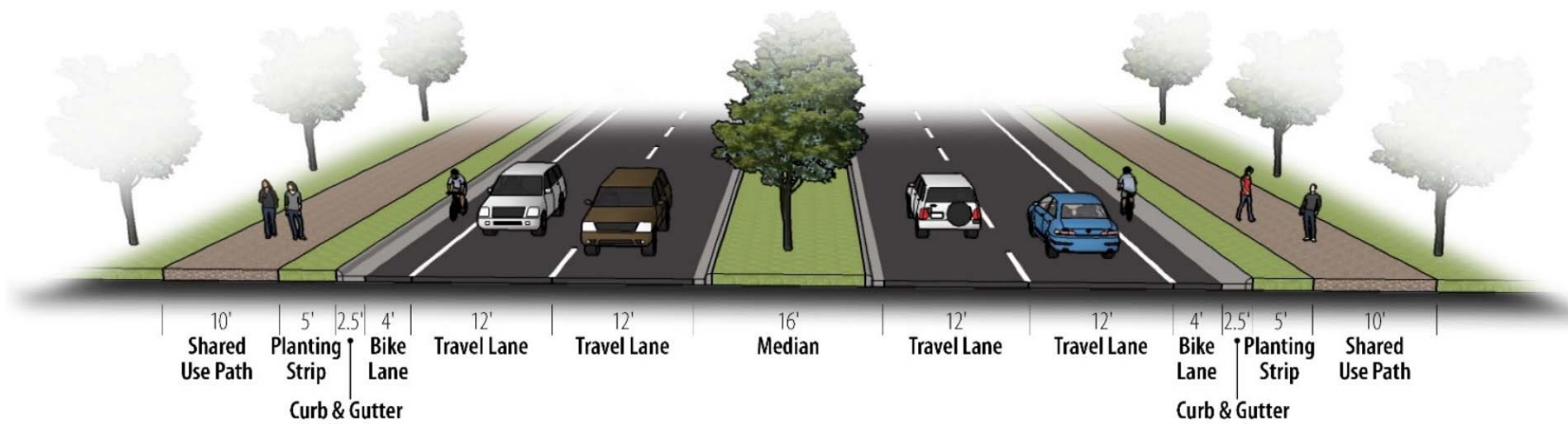
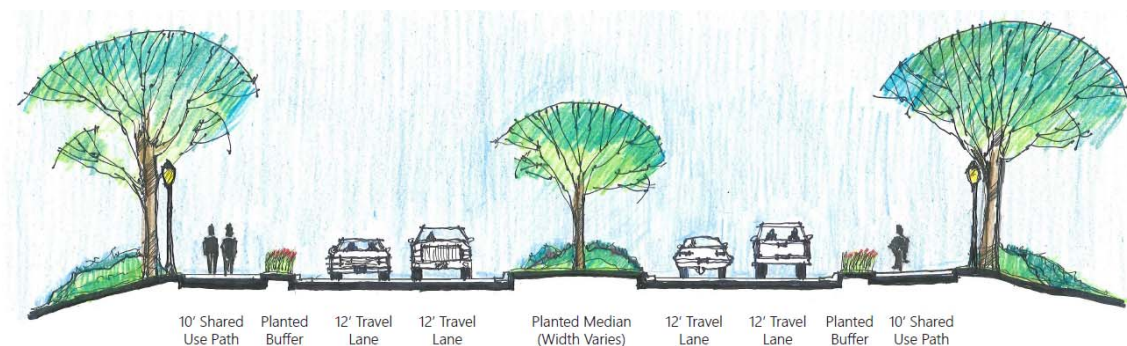


Figure 17: Recommended Cross-Section (west of US 460)

The construction of the shared use paths and bike lanes will provide a continuous, consistent network and create connections to the existing side street paths. In addition, this will potentially increase the recreational use of the bicycle facilities, provide space along the west segment for aesthetic roadside treatments, and give cyclists options for traveling long Pricess Fork Road. Note that the travel lanes, planting strips, and median widths can be reduced as needed to fit within constrained right-of-way locations.

A grade separated bicycle shared use path is planned across Pricess Fork Road near the Sheffield Drive intersection. Although it is an unfunded longer-term project, the Town should continue to plan for this grade separated Huckleberry Trail crossing. Bicycle demand along the path is anticipated to continue to grow, particularly as the Town extends the path north to the Heritage Community Park and shared use paths get added along Pricess Fork Road and a grade separated crossing will nearly eliminate vehicular conflicts for the pedestrians and bicycles using this bridge.



US 460 Interchange

The US 460 interchange was a high priority, as it is perceived to be a major impediment to bicycle and pedestrian safety along the corridor. The presence of free-flowing ramps and loops introduces high speed vehicle movements along this portion of Pricess Fork Road. The project team identified the desire for increased separation for bicyclists and pedestrians utilizing the US 460 bridge, with emphasis on ramp crossings, as a priority for this corridor study. Therefore, the following recommendations were made for the US 460 interchange:

- Shift the vehicular travel lanes to the north side of the bridge, and construct a 14' barrier separated shared use path for cyclists and pedestrians. This improvement does not require any bridge widening, but instead reallocates the existing width. A structural assessment of shifted vehicle loading patterns would be required to ensure feasibility of this concept.
- Eliminate both free-flowing on-ramps onto Pricess Fork Road. This will provide a contextual change for drivers and decrease vehicle speed along this portion of the corridor. Experienced cyclists may continue to ride on the street instead of utilizing the barrier separated path and would also benefit from having the two free-flowing on-ramps eliminated.
- Signalize both ramp intersections and enhance Pricess Fork Road crossings with high visibility painted crosswalks and pedestrian signal phases.



Transition areas for cyclists to shift over to the separated path will be integrated into the bicycle network on either side of the bridge. Barrier separated paths on bridges have been successfully applied in Virginia to enhance pedestrian comfort and safety across a constrained environment. A similar path is currently being constructed along Pine Chapel Road in Hampton. VDOT has jurisdiction over the interchange and thus any potential changes must be coordinated with the state to balance the mobility needs of all modes.

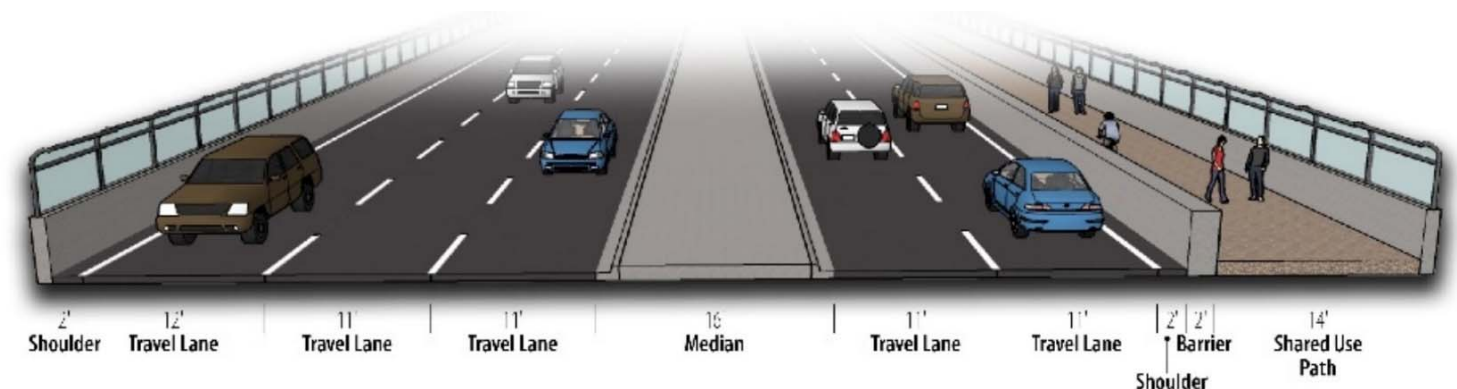


Figure 18: Recommended Cross-Section (US 460 Bridge)

In addition to trying to improve safety for non-motorized travel across the US 460 bridge, providing linkages to alternative crossings should continue to be evaluated. As shown by the red lines in the illustration to the right, there are opportunities to construct or improve paths to both Glade Road or Smithfield Road to give bicyclists and pedestrians more choices for crossing US 460.

Eastern Segment

The east segment of Prices Fork Road has the highest pedestrian crossing volumes along the corridor, due primarily to the Virginia Tech campus which is located along the south side of the roadway. A high number of cyclists also utilize the corridor as a main connection between the campus and their place of residence. Thus, the Town must closely coordinate all bicycle and pedestrian improvements with the University. The long-term redevelopment potential of the Orchard Street and Webb Street area with mixed-use and ground level retail facing the street also influenced the recommendations for the east segment of Prices Fork Road to incorporate impacts of this land-use change should it occur.

Therefore, it is recommended that the existing sidewalk facilities on the south side of the corridor be replaced with a 10' wide shared use path with a 5' separation from the Prices Fork Road travel lanes and transitioning to a 10' sidewalk east of the Toms Creek Road/Stanger Street intersection. Countdown pedestrian signals, no right-turn on red restrictions, elimination of the free-flowing eastbound right-turn movement, and other safety enhancements are suggested at this intersection to further improve safety for individuals walking or cycling through this intersection. The specific transition would occur on either side of a wide high visibility crosswalk through that intersection. The streetscape east of Stanger Street will be updated to match the current design along North Main Street, and create a new gateway into the downtown area. The median barrier recently installed near The Edge apartments is recommended to remain as pedestrians should cross at the signalized crosswalk at Toms Creek Road/Stanger Street. As properties on either side of Prices Fork Road redevelop in this area, there may be opportunities to provide a long-term grade separated pedestrian and bicycle crossing to further reduce pedestrian and vehicle conflicts. Current bicycle lanes along the corridor will either be maintained or widened to provide a 4' minimum bike lane along both sides of Prices Fork Road. Lastly, reduction of the speed limit from 35 mph to 25 mph east of Stanger Street is recommended as is consistent with a Town-issued 2016 speed study conducted along this roadway segment.



Pedestrian Grade Separation Considerations

Grade separated crossings, such as a pedestrian bridge or tunnel, are useful when attempting to create an uninterrupted connected network for those individuals utilizing bikes or walking. They create a safer crossing for pedestrians and bicyclists by separating them from vehicular traffic and reducing the conflicts they have with vehicles while crossing. Their effectiveness relies on the likelihood that the grade separated crossing will be used. A crossing that is not perceived as a safe and convenient alternative to an at-grade crossing will not be used. In addition, special consideration must be given to ensure that the bridges are ADA compliant and accessible to all users. The high cost of construction and implementation associated with pedestrian bridges is one major deterrent when determining their feasibility at a location. As previously mentioned, a grade separated bicycle shared use path is planned across Prices Fork Road near the Sheffield Drive intersection and a second one may be considered east of Toms Creek Road, particularly in conjunction with future redevelopment where the paths could be incorporated into a future building design.

Streetscape

Streetscaping is an essential tool in creating a corridor that accommodates a variety of transportation modes and cultivates an inclusive and inviting atmosphere for all users. By creating a space that people find aesthetically appealing and safe, a variety of transportation options become feasible for people who would have otherwise driven a motor vehicle, chosen a different route, or stayed home. These improvements can include a vegetated buffer to separate pedestrians from motor vehicles, trees to supply shade, or street lighting to provide safety for individuals walking or biking at night.



As upgrades to the corridor occur, the unification of design elements should be considered with emphasis on a seamless integration into the existing downtown streetscape on the east segment of Prices Fork Road and designing a streetscape on the west segment that provides multi-modal transportation access for the residents.

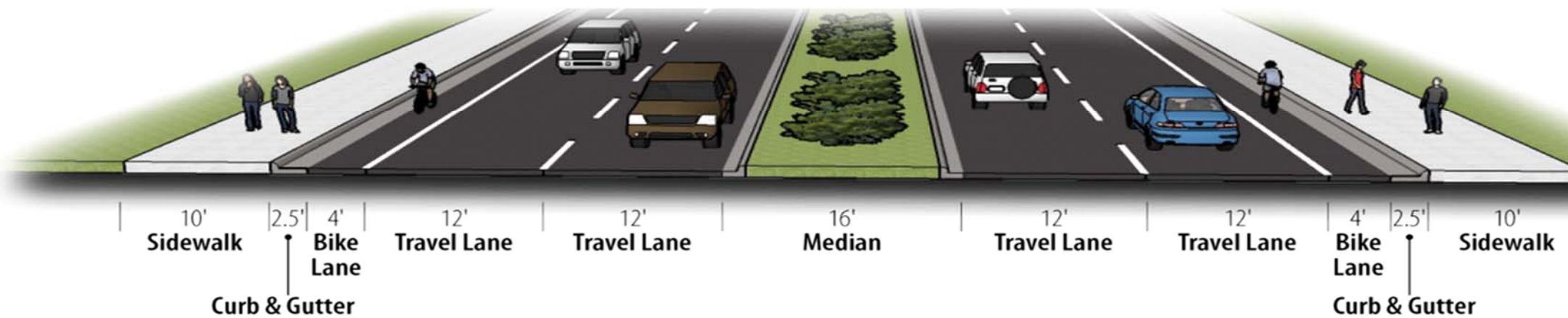


Figure 19: Recommended Cross-Section (east of Toms Creek Road)

Traffic Recommendations

A series of traffic improvements were tested for the corridor to mitigate the impacts of the expected future year growth and assess the impacts associated with projects adjacent to Prices Fork Road. The following recommendations were made for the study intersections along the corridor:

Old Mill Road

- Update the current signal phasing to allow the northbound exclusive right-turn to overlap during the same phase as the westbound left-turn.

Prices Fork Road at Brightwood Manor Drive/Strock Street

- Modify the existing median to fully restrict left-turn and crossing movements from the side street.

Plantation Road

- Construct an exclusive southbound right-turn lane.

US 460 Southbound Ramps

- Signalize and add one exclusive southbound right-turn lane with at least 450 feet of storage and appropriate taper.

US 460 Northbound Ramps

- Reconfigure the northbound ramp to eliminate the free-flowing movement onto along Prices Fork Road.
- Eliminate the US 460 westbound off-ramp and replace with an exclusive eastbound left-turn lane with at least 500 feet of storage and appropriate taper.
- Construct an additional westbound through lane which terminates into the US 460 eastbound on-ramp.
- Construct an exclusive westbound right-turn lane with at least 200 feet of storage and appropriate taper.
- Construct dual exclusive northbound left-turn lanes. One continuous lane and one lane with at least 650 feet of storage and appropriate taper.
- Construct dual exclusive northbound right-turn lanes with at least 750 feet of storage and appropriate taper.

Old Glade Road

- Install a partial signal and add one exclusive southbound right-turn lane with at least 150 feet of storage and appropriate taper.
- Lengthen the eastbound left-turn lane to accommodate at least 400 feet of storage and appropriate taper.
- Consider relocation of this intersection to the west to align with the future Western Perimeter Road Spur to improve intersection signal spacing.

Western Perimeter Road Spur

- Signalize the intersection.
- Construct an exclusive eastbound right-turn lane with at least 250 feet of storage and appropriate taper.
- Construct an exclusive westbound left-turn lane with at least 150 feet of storage and appropriate taper.
- Construct an exclusive northbound left-turn lane with at least 300 feet of storage and appropriate taper.
- Construct a continuous shared northbound left-turn/right-turn lane.

University City Boulevard/Western Perimeter Road

- Lengthen the exclusive northbound left-turn lane to accommodate at least 250 feet of storage and appropriate taper.
- Construct a shared northbound through/left-turn lane.

- Construct an exclusive northbound right-turn lane with at least 200 feet of storage and appropriate taper.

McBryde Drive/Parking Garage Entrance

- Prohibit the southbound and northbound through and left-turn movements onto Prices Fork Road.

Toms Creek Road/Stanger Street

- Eliminate the free-flowing channelized eastbound right-turn lane and replace with a standard, parallel right turn lane or channelized right-turn with a channelized island with a tighter radius.
- Incorporate a series of pedestrian safety measures, including countdown pedestrian signals, refurbished pedestrian crossings and restrict right-turns on red.

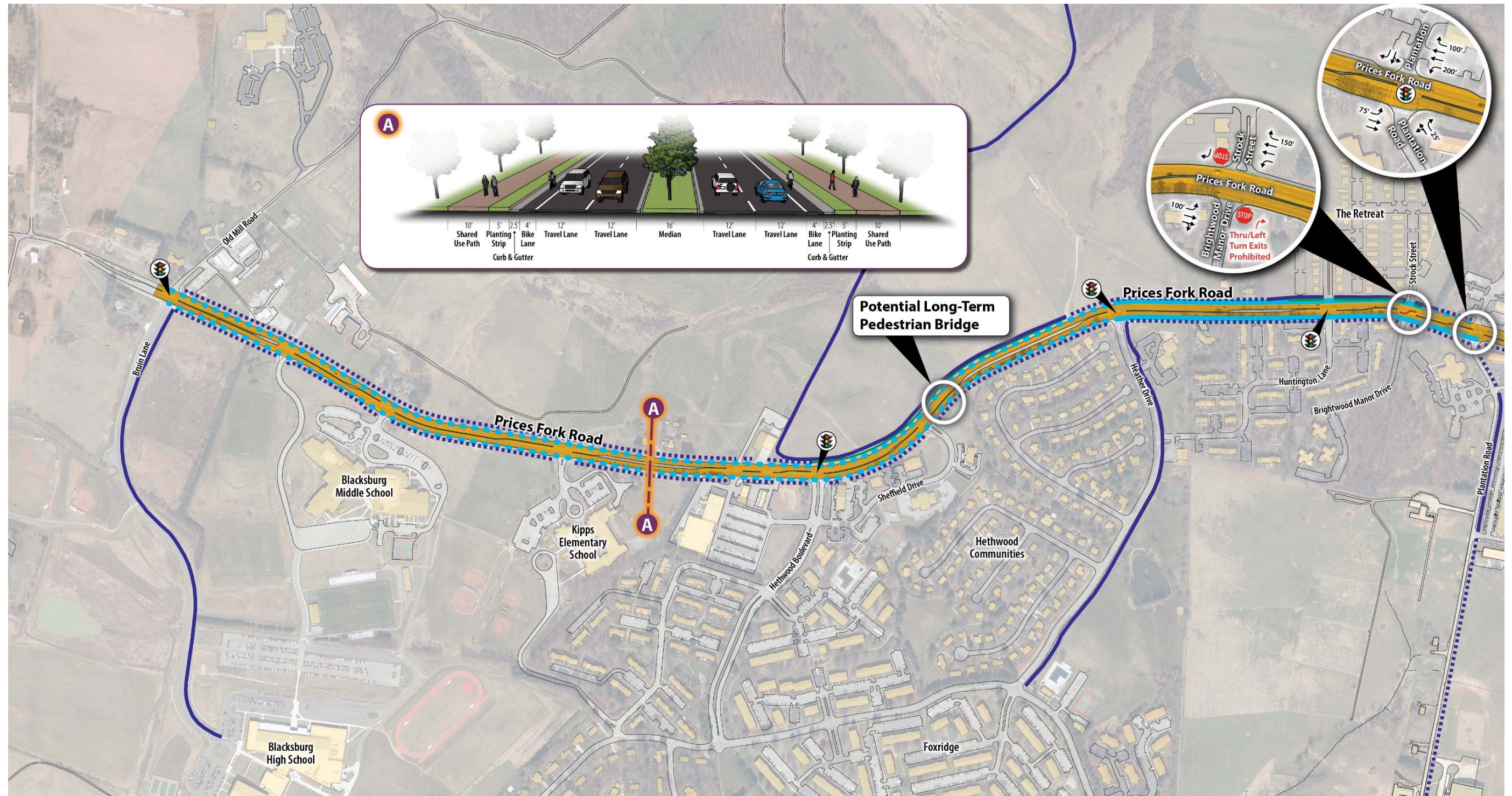
Webb Street/Turner Street and Orchard Street/Driveway

- Prohibit the southbound and northbound through and left-turn movements onto Prices Fork Road.

Transit Recommendations

It is recommended that the proposed shared use path be modified so that bicycles can travel behind the bus stops, as illustrated in the picture to the right. This improves safety during bus boarding/alighting by decreasing conflict opportunities between cyclists and transit users as well as conflicts between bicyclists and vehicles as a cyclist could pass the stopped bus on the right rather than left. As evidenced by the goat path on the southwest corner of the Prices Fork Road and Plantation Road intersection, many cyclists are choosing to pull off Prices Fork Road to cut the corner towards Smithfield Road at this point. In addition, it is recommended that bus stop amenities be prioritized and improved along the entire corridor.





- - - Future 10' Path and 5' Separation
 — Existing Path
- - - Widen Existing Shoulder to Provide a 4' Minimum Bike Lane
 Existing Stop Control
→ Existing Lane
- - - Restrict Access to Left-In, Right-In, Right-Out
- Maintain Existing Sidewalk
 — Future 14' Barrier Separated Path
— Maintain Existing 4' Minimum Bike Lane
 Existing Signal
→ Proposed Lane
— Proposed Roadway Plan
- Future Urban 10' Sidewalk
 — Existing Path
— Maintain Existing 4' Minimum Bike Lane
 Proposed Signal

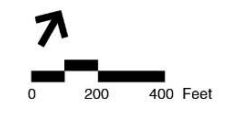
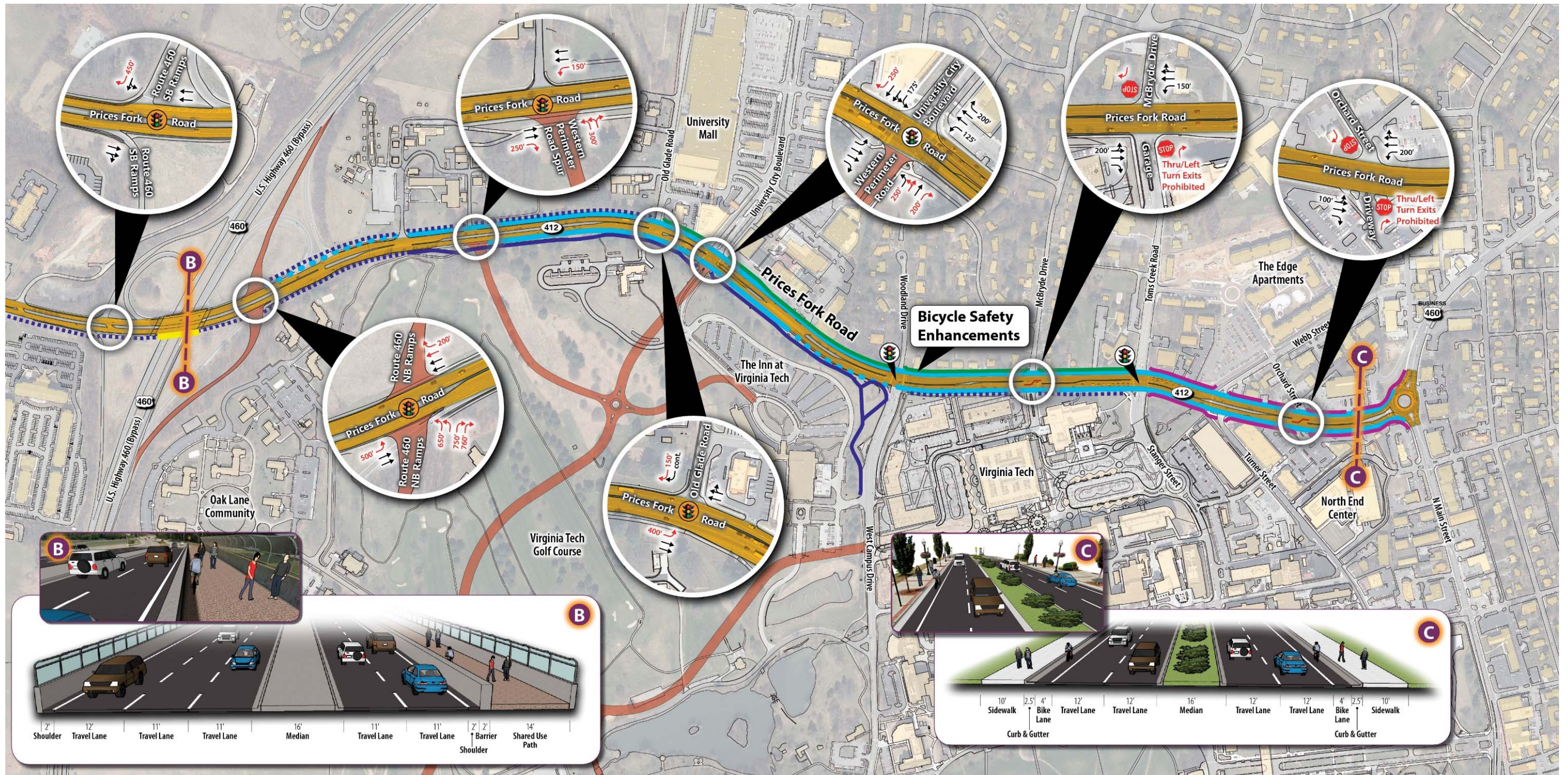


Figure 20: Future Year (2040) Build Comprehensive Recommendations Map (west)



- Future 10' Path and 5' Separation
- Existing Path
- Widen Existing Shoulder to Provide a 4' Minimum Bike Lane
- Maintain Existing Sidewalk
- Future 14' Barrier Separated Path
- Maintain Existing 4' Minimum Bike Lane
- Future Urban 10' Sidewalk
- Existing Stop Control
- Existing Signal
- Proposed Signal
- Existing Lane
- Proposed Lane
- Restrict Access to Left-In, Right-In, Right-Out
- Proposed Roadway Plan

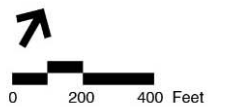


Figure 21: Future Year (2040) Build Comprehensive Recommendations Map (east)