



# ASPEN HILL VISIONZERO STUDY



November 2019

 **Montgomery Planning**

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

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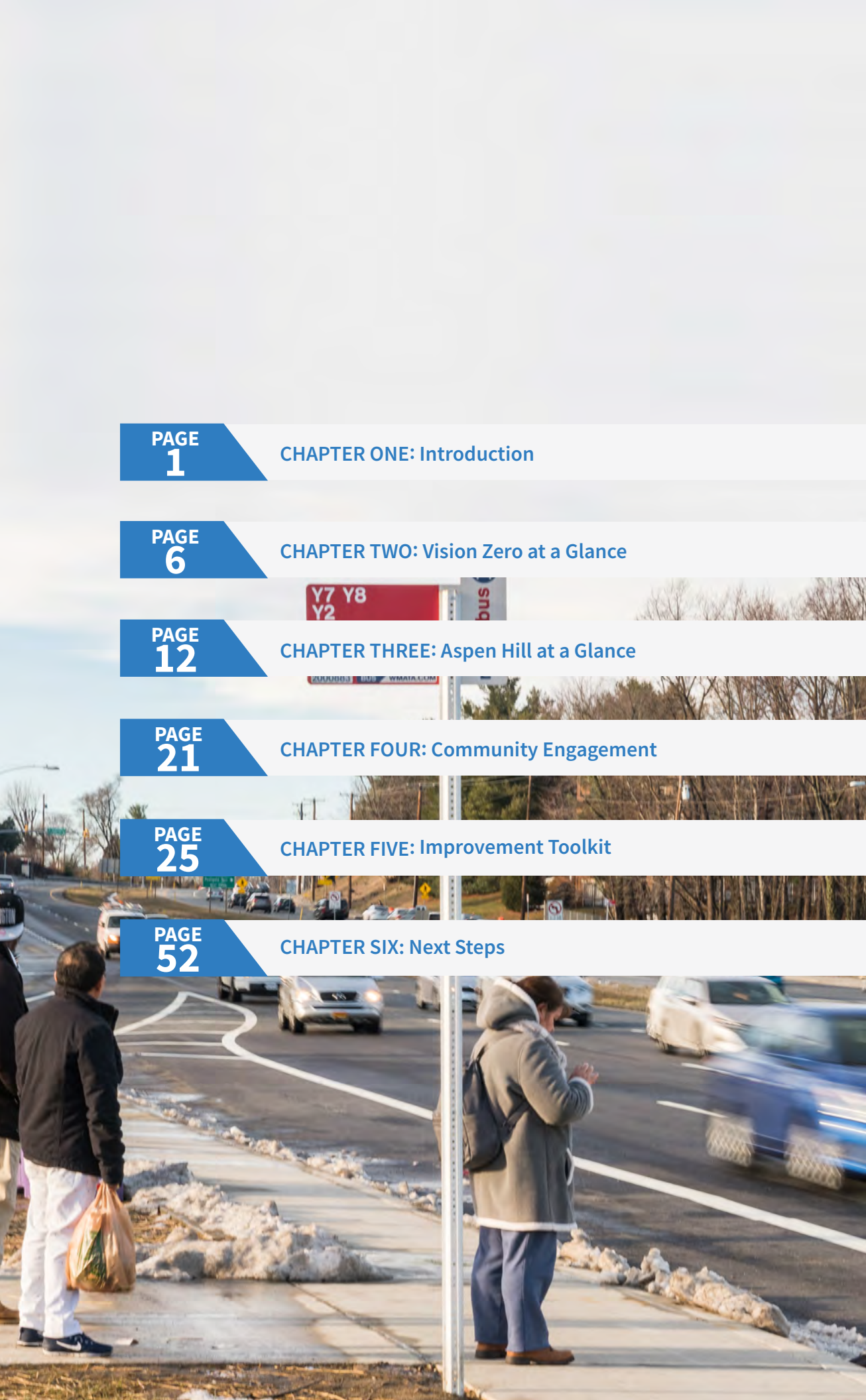
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The background image shows two young women walking away from the camera on a concrete sidewalk. They are both wearing backpacks; the one on the left has a black backpack, and the one on the right has a blue and white Nike backpack. They are walking on a wet sidewalk that reflects the sky. To their right is a wet asphalt road with several cars driving in the distance. The scene is set in a suburban or urban area with trees and a clear sky.

## Executive Summary

Traffic fatalities in our communities are preventable and unacceptable. But some areas of Montgomery County suffer from unsafe, hazardous conditions for travelers on foot, bike or behind the wheel. Community safety data indicate that parts of Aspen Hill experience higher rates of severe and fatal crashes than in other areas of the county and are in dire need of improvement.

The *Aspen Hill Vision Zero Study* identifies a broad range of solutions—from specific intersection improvements to area-wide policies and strategies—that comprehensively addresses traffic safety in Aspen Hill. Individual traffic safety recommendations are prioritized based on existing safety risks and potential impacts, supported by data collected for the study or from county databases.



# CHAPTER ONE



## Introduction





## Purpose and Vision

The *Aspen Hill Vision Zero Study* identifies strategies to improve safety for all people walking, biking, rolling, driving and using transit in Aspen Hill.

Proposed short-term and long-term measures prioritize access and safety improvements. They focus on people, how and where they travel, and their comfort traveling in their neighborhood.

The *Aspen Hill Vision Zero Study* provides potential strategies to transform Aspen Hill into a multimodal community where residents and visitors can reach their homes and destinations safely and comfortably.

## Study Area



Map of Aspen Hill Vision Zero Study area boundary



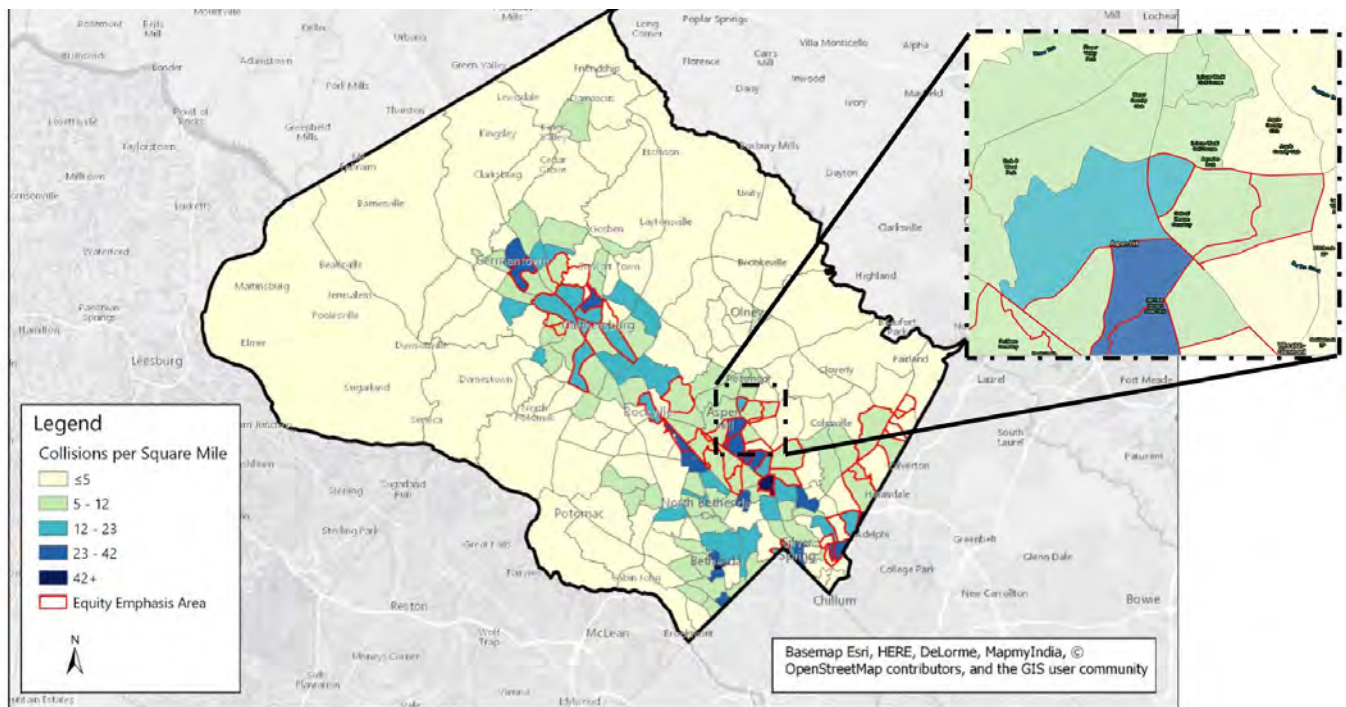
The *Aspen Hill Vision Zero Study* encompasses approximately 450 acres. The study area is centered on the shopping centers at the intersections of Connecticut Avenue (MD-185), Georgia Avenue (MD-97) and Aspen Hill Road. The shopping centers in the study area include Northgate Shopping Center, Aspen Hill Shopping Center, Aspen Manor Shopping Center and Home Depot. This area represents a portion of the greater Aspen Hill area and was chosen for further study because it has experienced a higher number of traffic crashes than in other areas of the county.

The study area includes designated Equity Emphasis Areas—areas with a higher concentration of low-income and minority populations than the rest of the region. The Montgomery County Two-Year Vision Zero Action Plan (Action Plan) prioritizes the Equity Emphasis Areas with high crash rates for improvement.

The study area also includes the residential neighborhoods of single-family detached homes and garden-style apartments south of Bel Pre Road between Georgia Avenue and Connecticut Avenue, and the neighborhoods south of Aspen Hill Road between Georgia Avenue and Parkland Drive, north of Matthew Henson State Park.

Facilitating safe and accessible connections between residential neighborhoods and Aspen Hill’s commercial core is a critical component of this study.

## EQUITY EMPHASIS AREA MAP



This map shows the study area’s designated Equity Emphasis Area. The Metropolitan Washington Council of Governments defines Equity Emphasis Areas as locations that have a concentration of low-income population and concentration of two or more minority groups greater than 1.5 times the regional average. Low-income is defined as a household income of less than 1.5 times the federal poverty level, depending on size.



## History and Context

In the mid-1860s, a post office and general store opened on Washington-Brookeville Pike, now the intersection of Georgia Avenue and Connecticut Avenue. This area of Silver Spring became known as Aspen Hill.

Following World War II, a growing federal workforce and housing demands of returning veterans spurred the development of affordable, single-family homes in Aspen Hill. In the late 1950s, shopping centers and offices developed at the intersections of Aspen Hill Road, Georgia Avenue and Connecticut Avenue. Garden-style apartments were constructed through the late 1960s and mid-1970s, and commercial development expanded. The land use patterns in Aspen Hill have remained relatively unchanged over the past 50 years, protected by plans and policies to preserve single-family residential neighborhoods and limit the expansion of commercial centers.



### Commerce Advances Into Far-Out Suburbia

The first section of a new shopping center was opened this week at the intersection of Georgia ave. and the proposed Connecticut ave. extension in Montgomery County. The Aspen Hill Community Shopping Center already has an A&P in operation and further occupancy and expansion already are planned for the site with 1000 parking spaces. Ted Englehardt is the architect; David Elsen the builder and David Seull the management agent of the project north of Wheaton.

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## GRAND OPENING

BEL PRE Luxury Garden Apartments Belong in Montgomery County's

Finest Manor Community...

SO DO YOU!



A whole new dimension in luxury garden apartments living has been created to order your home for convenience & ready today. Bel Pre is a "master neighborhood" in the strategic area of Montgomery County, you will find the ultimate in convenience - close to where you work, play, go to school and eat, and convenient to shopping centers and country clubs.

Where in the World Are These Locations?

Bel Pre is located in the heart of the nation's capital, just a few minutes drive from the White House and the Pentagon. It is a beautiful area with a rich history and a vibrant community. The location is perfect for those who want to live in a luxurious setting with all the amenities of a modern community.

Bel Pre is a truly unique community, offering a lifestyle that is both luxurious and convenient. It is a place where you can enjoy the best of both worlds, with the comfort of a home and the convenience of a modern community.

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Clockwise from top left: A Washington Post article from 1960 announcing the opening of the Aspen Hill Shopping Center, a 1971 aerial photo of the study area, an advertisement for Bel Pre apartments published in The Evening Star in 1967. The study area in Aspen Hill had practically no development in 1950, but by the early 1970s most of the single family houses, apartments and shopping centers that remain today had already been built.

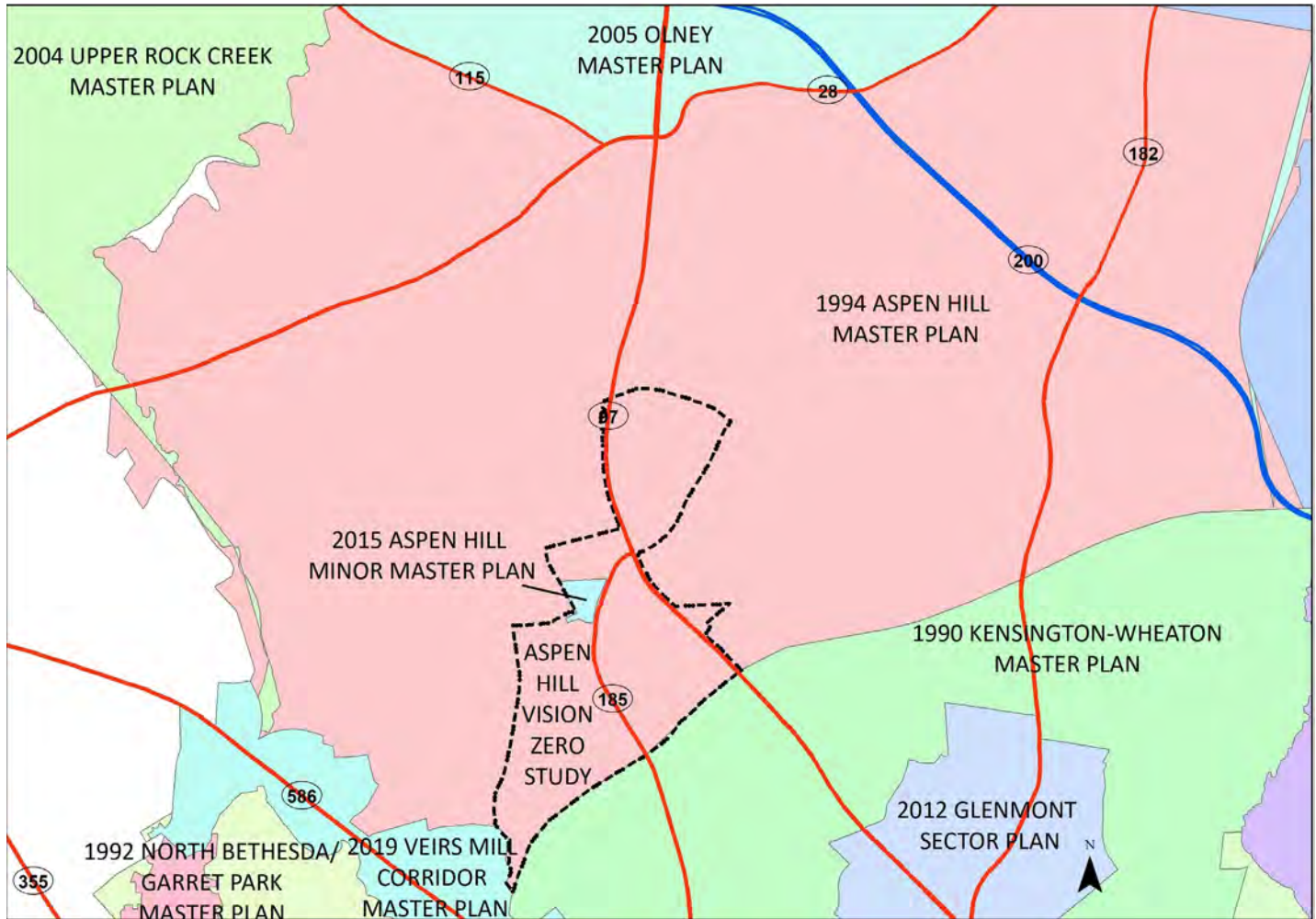
Aspen Hill's development coincided with the rise in vehicle ownership. Land use and zoning reflected the dependence on cars, with residential communities intentionally separated from jobs and commercial services. Aspen Hill's residential neighborhoods are divided from each other and from the area's shops and businesses by multi-lane, high-speed roadways that prioritize the movement of vehicles and are uncomfortable and unsafe for people walking, biking and using transit.

More recently, suburban corridors like Georgia Avenue and Connecticut Avenue have been transforming from automobile-centric roadways to transit-focused ones, characterized by significant bus ridership and increased rates of walking and biking. However, the transportation infrastructure has not kept pace with changes in how people travel to homes, jobs, schools and shops.



## Previous Planning Initiatives

Several previous master plans and studies defined the land use patterns and planning goals for Aspen Hill. The 1994 *Aspen Hill Master Plan*, 2008 *Georgia Avenue Study*, 2013 *Countywide Transit Corridors Functional Master Plan* and 2015 *Aspen Hill Minor Master Plan* envision a future Aspen Hill with more transit, walking and biking options. These plans and studies recognize the inconsistencies with healthier, greener and more equitable travel choices people are making and the character and conditions of the roadways in Aspen Hill. This study, using a Vision Zero framework, proposes a suite of safety improvements that support multi-modal transportation choices.



Map of Master Plan boundaries in the Aspen Hill vicinity.





Vision Zero at a Glance





Nearly 40,000 people are killed and more than 4.5 million people suffer severe injuries every year from traffic collisions in the United States. Traffic collisions are the leading cause of death for children and teens in the US. These fatalities and life-altering injuries are unacceptable, and they are also preventable.

Vision Zero offers a set of proven strategies to eliminate all traffic-related fatalities and severe injuries, while improving safety, health and mobility for everyone. Initiated in Sweden in 1997, Vision Zero is widely credited with significant reductions in fatal and severe collisions on Sweden's roads. Cities all over the world have adopted and implemented Vision Zero policies. Montgomery County is one of the first county governments in the United States to commit to Vision Zero.



Man walks across four lanes of vehicle traffic at the intersection of Georgia Avenue and Hewitt Avenue. Roadways like this do not support Vision Zero principles: wide lanes encourage speeding; lack of pedestrian islands and of high visibility crosswalks, narrow sidewalks and absence of bike facilities fail to provide adequate separation between different road users.

Vision Zero prioritizes human life and aims to dispel the myth that severe traffic crashes are unavoidable and inevitable. Many crashes can be avoided using tested strategies to design roads and mitigate the severity of all crashes. Vision Zero policy considers traffic collisions preventable, but also recognizes that human error is inevitable. Therefore, so mistakes aren't life-changing or life-ending, transportation systems should be designed to encourage slower, safer speeds and enable frequent safe pedestrian crossings.

Vision Zero represents a fundamental change in the planning and design of road networks; shifting auto-centric design to safety-centric design for all travel modes. Traditional approaches to evaluating vehicle delay and intersection congestion focus on vehicular level of service (LOS), but Vision Zero promotes safety measures that focus on safety for all users—above all else.

## VISION ZERO PRINCIPLES



- Prize human life above all else.
- Account for human error in the design of the road network.
- Reduce the severity of collisions. Emphasize a systems approach.
- Identify equitable solutions.

## Creating Safe Communities

Decreasing the frequency and the severity of crashes are core Vision Zero principles. Creating a safe environment for all modes of travel is achieved by providing predictability through separate spaces, increasing visibility and decreasing travel speeds.



## VISION ZERO PRINCIPLES



Streets designed to protect and serve the most vulnerable road users are safer for everyone. People walking and biking are more likely to be severely injured or killed if involved in a crash. In the study area, while pedestrians and bicyclists make up a fraction of the total reported crashes, they accounted for 53 percent of the severe and fatal crashes between 2015 and 2017.

### Separate Spaces

Conflicts occur when modes of travel intersect on the road. A bicyclist and a pedestrian meeting at an intersection, a motorist and a pedestrian crossing a driveway, a motorist turning across a bike lane and a motorist turning left against opposing traffic are examples of potential roadway conflicts that occur every day. While many conflicts are navigated safely, they increase the likelihood that a crash will occur. Providing clearly designated spaces for different modes, such as bike lanes and sidewalks, reduces potential conflicts. Creating predictability for when people cross paths, such as with traffic signals, reduces the frequency of crashes.



Separate Spaces. Clearly delineated spaces for different road users provide clarity and reduce conflicts. This street provides wide sidewalks, protected bicycle lanes, tactile pavers, high visibility crosswalks, pedestrian islands, as well as signals for people walking, biking and driving.



## Reducing Speed

Speed kills. Excessive vehicle speeds both increase the likelihood of a crash and a fatality. The abilities for drivers to process unexpected events, such as a stopped vehicle or a child running into the road, and to yield appropriately, are key to reducing collisions. At higher speeds, a driver's field of vision is reduced, and reaction time is limited. At slower speeds, a driver's field of vision widens, increasing reaction time and enabling drivers to better anticipate and successfully yield.

Speed is also a fundamental predictor of crash survival, no matter how people choose to travel. Managing speed is one of the most effective ways to prevent severe injuries and fatalities in traffic crashes. Lower speeds are especially important to protect the most vulnerable road users—children, people with limited mobility and older adults. A difference of only 5 or 10 miles per hour can be the difference between life or death in a crash.

HIT BY A VEHICLE  
TRAVELING AT:

**20  
MPH**

**10%**  
DEATH RISK

HIT BY A VEHICLE  
TRAVELING AT:

**30  
MPH**

**40%**  
DEATH RISK

HIT BY A VEHICLE  
TRAVELING AT:

**40  
MPH**

**85%**  
DEATH RISK



Speed is especially lethal for vulnerable users like people walking or riding a bicycle. The risk of severe injury or death increases as a driver's field of vision narrows. Slower speeds enable a driver to see more of the road and upcoming potential conflicts.

## SPEED AND SPEEDING

### Hit by a vehicle traveling at 20 MPH



**90% Chance of Survival**

### Hit by a vehicle traveling at 30 MPH



**60% Chance of Survival**

### Hit by a vehicle traveling at 40 MPH



**15% Chance of Survival**

Pedestrian Chance of Survival in a Collision.

On most roads, the speed limit is not set for safety, but for the 85th percentile speed, the speed at which 85 percent of all drivers travel at or below—meaning the speed at which approximately 15 percent of drivers exceed. As people speed more, the speed limit may be raised, rather than safety measures implemented to reduce speeds. Using the 85th percentile speed to set speed limits perpetuates unsafe conditions for all road users and prevents the full achievement of Vision Zero goals and our communities reaching their full potential.



Overall, about 63 percent of severe and fatal crashes occur on suburban arterial streets, including suburban commercial streets. Land use and urban design—what our buildings are used for and what our streets and public spaces look like—contribute to the safety along these corridors.

## DESIGN SPEED



Streets must be designed for safety. Design speed is the speed at which drivers feel comfortable driving based on how the street is designed. Narrower travel lanes, frequent intersections and visual enclosure, such as bus stops, closely spaced buildings and trees, all contribute to drivers traveling more slowly. Conversely, wide lanes, long block lengths and open sky—lacking enclosure—communicate to drivers that higher speeds are appropriate. Two roads that have the same posted speed limit may have different design speeds.

On these arterials and commercial streets, a change in vision for the area can have major safety benefits. Many of these roads have been so over-built for traffic that they often offer an opportunity to repurpose the use of the public right-of-way by narrowing lanes and, in some cases, reducing lanes.

Redevelopment provides opportunities to increase the level of activity, create a strong streetscape with a sense of enclosure and break up large parcels to create smaller blocks. More frequent and safe crossings can be established and space repurposed for medians, wider sidewalks, bikeways and streetscape enhancements.

## Increasing Visibility

Increasing visibility provides all users with more time to react and avoid potential conflicts. All roads should be designed with appropriate lighting, which improves overall visibility for all road users and leads to fewer conflicts. Additionally, improving sight distance at intersections, along with slowing travel speeds, provides people with more time to perceive and react to unexpected conflicts ahead.



Lighting conditions play a major factor in pedestrian fatalities: three quarters of pedestrian fatalities nationwide occur in dark conditions. Lighting at intersections and along roads improve visibility and allow drivers to see upcoming crosswalks, pedestrians and bicyclists.

## VISION ZERO IN MONTGOMERY COUNTY



In 2016, the Montgomery County Council unanimously adopted a Vision Zero policy with the goal of eliminating traffic fatalities and severe injuries by 2030. Montgomery is one of the first county governments in the nation to make such a commitment. Nearby Washington, DC, Arlington, VA and Alexandria, VA have since adopted Vision Zero policies.

In 2017, the Montgomery County Executive released the initial two-year Action Plan of strategies to advance the county toward Vision Zero. The action plan identifies crash trends and priority areas, and developed a High Injury Network (HIN), mapping the roadways where high numbers of people have been killed or severely injured in traffic crashes.

The action plan lays out specific activities with deadlines for implementation. These strategies are built around five key action areas: engineering; enforcement; education and training; traffic incident management; and law, policy and advocacy. The county is on-schedule to complete all engineering and policy action items or in the process of tackling the items. Examples of these tasks include updating the county's standards for roadway design, lighting, signing, marking and signals; studying and designing engineering improvements along the identified High Injury Network; and completing a sidewalk inventory. As the county moves to develop a long-term Vision Zero plan, the information collected during the two-year plan period will inform prioritization of improvement projects.







Aspen Hill at a Glance







Aspen Hill is characterized predominantly by single-family detached homes and garden style apartments. The study area is anchored by a strong commercial core, with several shopping centers and national big-box retailers serving residents. The low-density development and auto-centric shopping centers are accompanied by high-speed roads that carry heavy vehicular traffic and have wide crossings of multiple lanes, requiring people to cross 125 feet of pavement. People who walk or bike are often traveling on four to five foot sidewalks against six to eight lanes of traffic. These roads limit access to the commercial core and create a safety hazard for people traveling within Aspen Hill.

## Community in Aspen Hill

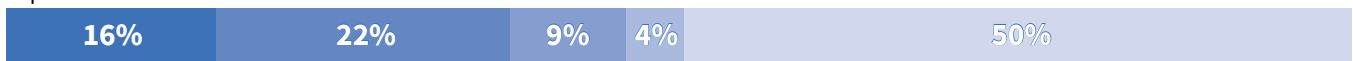
The Aspen Hill Vision Zero Study area is home to more than 11,000 people. Several demographic characteristics distinguish Aspen Hill's diverse population from other parts of Montgomery County. Half of the study area's residents are Latino—50 percent in the study area versus 19 percent countywide. Spanish is the most common language spoken other than English and approximately one third of residents are not fluent English speakers.

### COMMUNITY STATISTICS

#### Montgomery County



#### Aspen Hill



■ Non-Hispanic White ■ Non-Hispanic Black ■ Non-Hispanic Asian or Pacific Islander ■ Non-Hispanic Other ■ Hispanic or Latino



The area has a younger median age, 32 years versus 39 years countywide, and approximately one-third of residents are under the age of 19 and more than half are under the age of 34.



Lower rates of homeownership, with 52 percent of households renting versus 31 percent countywide.



More than 85 percent of households in the study area earn less than the county median income.

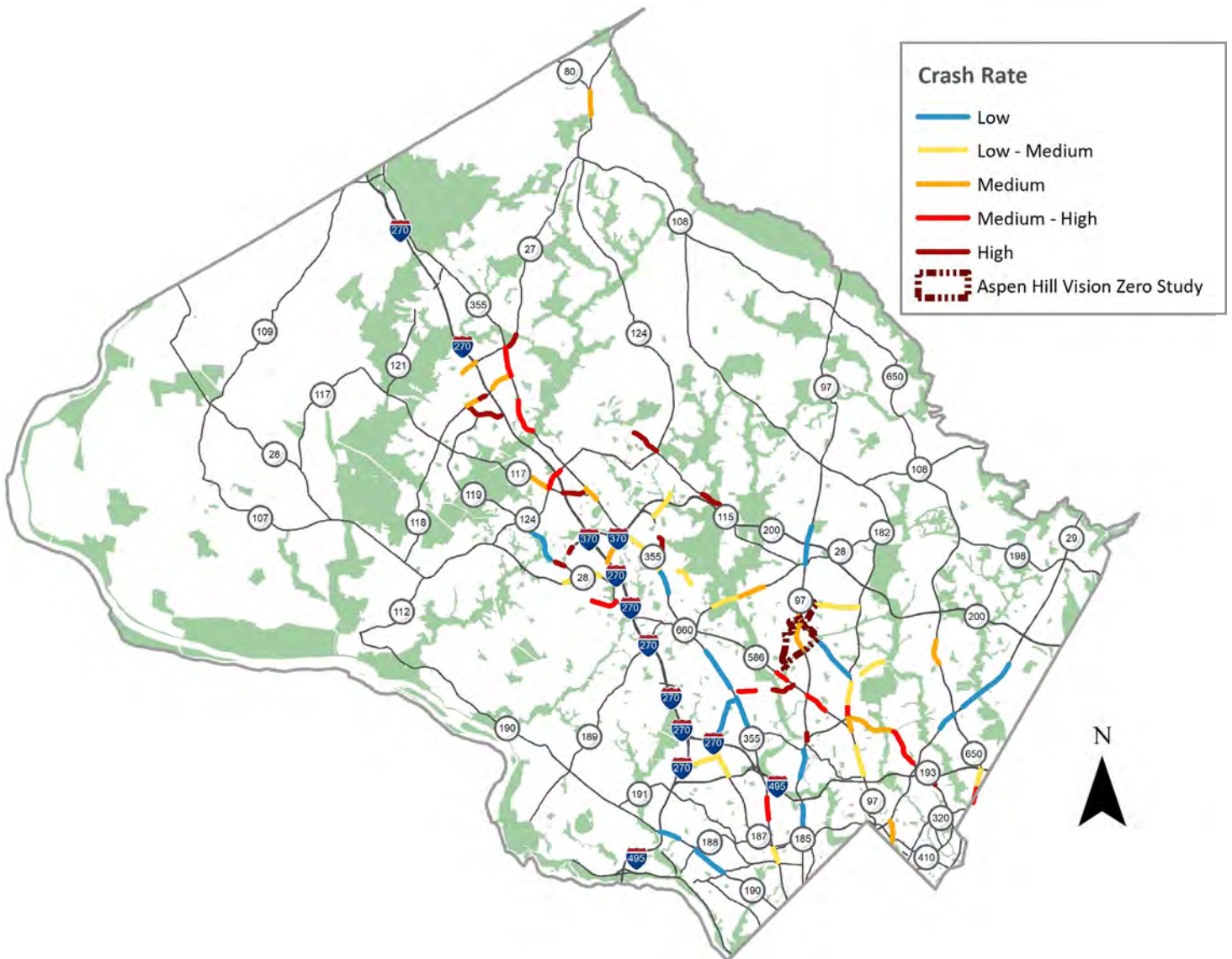


Approximately 15 percent of people living in the study area commute to work by bus, which is significantly higher than the countywide average of 5.5 percent. Black and Latino residents are more likely to take public transit than white residents. Older residents, aged 60 years and older, have a higher dependency on public transit than in other parts of the county.



## Equity in Safety

Everyone deserves to have safe access to their homes, residential neighborhoods, transit stops, community facilities and commercial centers. Unfortunately, some areas and communities in Montgomery County are disproportionately impacted by traffic deaths and severe injuries. The Aspen Hill Vision Zero Study area includes two of the 20 high injury road segments identified in the County Executive's Vision Zero Action Plan—segments of Bel Pre Road and Connecticut Avenue.



The Montgomery County High Injury Network (HIN) consists of roadway segments with 5 or more severe or fatal collisions and one or more collisions per mile per year. In the study area, segments of Connecticut Avenue and Bel Pre Road are part of Montgomery County's High Injury Network.



County-Owned Roads				State-Owned Roads			
Roadway	Total Collisions	Collisions per Mile per Year	Collisions per 100M VMT**	Roadway	Total Collisions	Collisions per Mile per Year	Collisions per 100M VMT**
<b>Middlebrook Rd</b>	15	2.6	33.1	<b>University Blvd W</b>	30	2.2	18.5
From Germantown Rd to I-270				From Georgia Ave to Colesville Rd			
<b>Shady Grove Rd</b>	14	2.7	18.3	<b>Frederick Rd</b>	15	1.9	11.9
From Frederick Rd to I-270				From Gude Dr to Shady Grove Rd			
<b>Shady Grove Rd</b>	11	2.3	12.9	<b>Georgia Ave</b>	14	2.7	12.5
From Metro Access Rd to Midcounty Hwy				From Forest Glen Rd to Plyers Mill Rd			
<b>Bel Pre Rd*</b>	10	1	12.5	<b>Frederick Rd</b>	13	2.3	18.8
From Layhill Rd to Georgia Ave				From Middlebrook Rd to Wheatfield Dr			
<b>Randolph Rd</b>	9	2	13.6	<b>Veirs Mill Rd</b>	12	3.3	24.5
From Kemp Mill Rd to Glenallan Ave				From Connecticut Ave to Newport Mill Rd			
<b>Crabb's Branch Way</b>	9	3.8	51.9	<b>Rockville Pike</b>	12	3.6	22.1
From Redland Rd to Indianola Dr				From Jones Bridge Rd to Cedar Ln			
<b>Randolph Rd</b>	9	2.6	30.7	<b>Connecticut Ave*</b>	11	2.4	18
From Veirs Mill Rd to Rock Creek Park				From Matthew Henson Trail to Georgia Ave			
<b>Snouffer School Rd</b>	9	2	25.4	<b>Muncaster Mill Rd</b>	10	1.5	24.7
From Woodfield Rd to Flower Hill Way				From ICC (MD-200) to Olde Mill Run			
<b>Darnestown Rd</b>	6	1.5	20.4	<b>Ridge Rd</b>	9	3.3	28.6
From W Montgomery Ave to Shady Grove Rd				From Frederick Rd to Brink Rd			
<b>Sam Eig Hwy</b>	5	4.9	42.8	<b>W Diamond Ave</b>	5	1.6	44.4
From Fields Rd to Diamondback Dr				From I-270 to Water St			

\*road segments within the Aspen Hill Vision Zero study area.

Several of the characteristics that distinguish Aspen Hill from other parts of the county correlate with higher incidence of severe and fatal crashes. County statistics, included in the Action Plan, show that communities with higher rates of poverty, people of color, people who speak English as a second language and young residents have higher than average collision rates, compared to the rest of the county.

Identifying and rectifying safety inequities, educating residents and enabling them to be informed community participants are integral components of creating a safe and equitable Montgomery County. This action starts with identifying roads with the highest number of collisions and developing safety infrastructure projects so that resources can be allocated to communities with the highest needs.

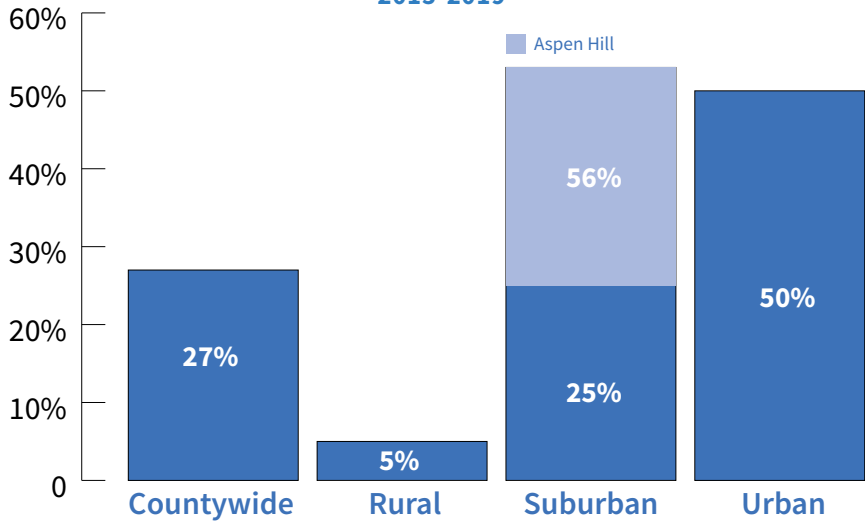
### Crashes in Aspen Hill

The study area has a higher concentration of collisions than other areas of the County. Between 2015 and 2019, 23 severe or fatal crashes occurred. Of the victims, 43 percent were motor vehicle occupants, 52 percent were pedestrians and 4 percent were bicyclists. Although vehicle trips represent most person trips in the study area, people walking and biking were involved in 56 percent of the area's severe and fatal crashes. Despite the auto-



centric development pattern of the study area, the crash pattern is more representative of areas of the county within a quarter mile of a Metrorail station, where people traditionally walk and bike at higher rates.

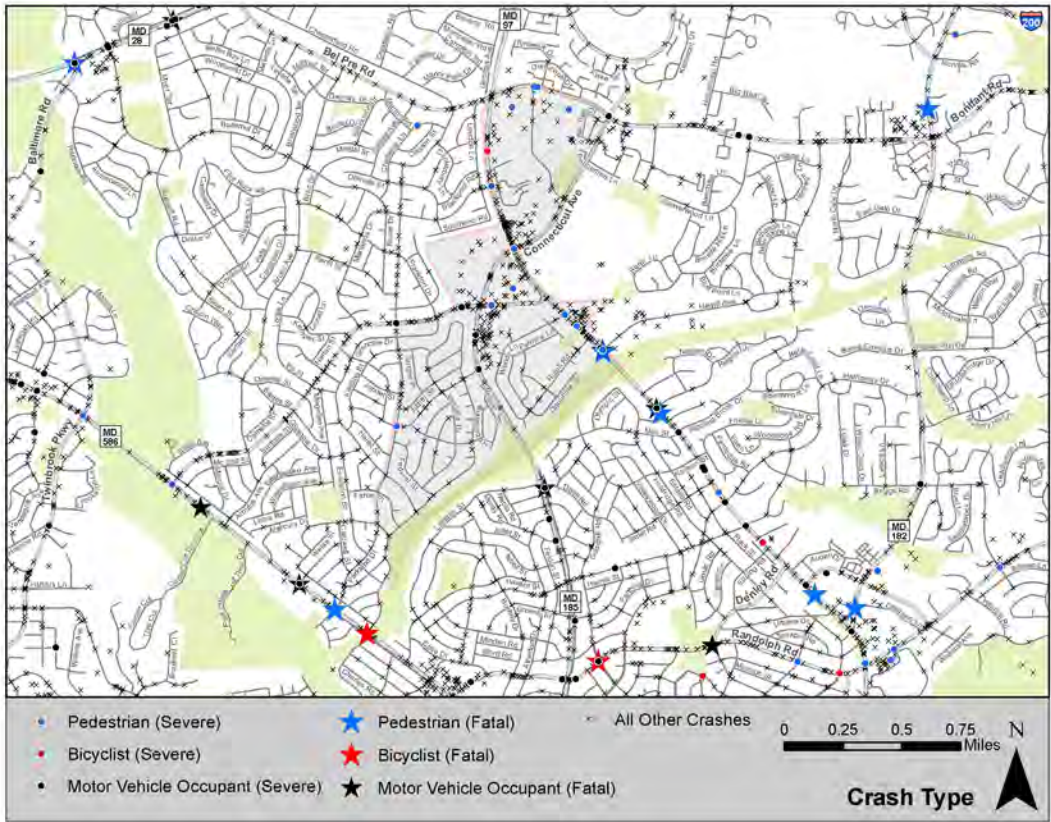
**Percent of Severe and Fatal Crashes Involving Pedestrians & Bicyclists**  
**2015-2019**



The study area experiences crash patterns more representative of urban areas that feature higher rates of crashes involving bicyclists and pedestrians.

The higher percentage of pedestrian and bicycle crashes in this study area demonstrates the need to improve safety and access for people walking and biking in Aspen Hill. Wide, high-speed arterial roads like Georgia Avenue and Connecticut Avenue do not meet the safety needs of people walking, biking and accessing bus stops and other destinations. New design solutions are needed for these high-speed arterials to create safe streets for everyone.

**Aspen Hill Area Crashes (2015 - 2019)**



The most crashes occurred at the intersections of Georgia Ave and Connecticut Avenue (74), Connecticut Avenue and Aspen Hill Road (58), Georgia Avenue and Bel Pre Road (54), Connecticut Avenue and Bel Pre Road (51), Georgia Avenue and Hewitt Avenue (37). The intersection with the most severe and fatal crashes is Georgia Avenue and Hewitt (4). The road segment with the most severe and fatal crashes is between Hewitt Avenue and Aspen Hill Road on Georgia Avenue (3). There have also been severe crashes in parking lots, highlighting the importance of safe parking lot design for pedestrians.

## Recent Improvements

In response to several high-profile collisions in Aspen Hill as well as advocacy by community members, the Montgomery County Department of Transportation (MCDOT) and the Maryland State Highway Administration (SHA) have installed new traffic safety measures in the study area.



New traffic signals will slow vehicle speeds through the study area and provide protected crossings for people walking, biking and driving.

### *HAWK Signal*

Midblock pedestrian crossings of arterial roadways without a traffic control stop for vehicles may be especially dangerous and warrant additional protection measures. MCDOT installed a high-intensity activated crosswalk (HAWK) signal on Aspen Hill Road to facilitate pedestrian access between Northgate Plaza and the Aspen Hill Shopping Center. This location has 72 pedestrian crossings during the peak hour—one of the highest volume pedestrian crossings in the area. The HAWK signal is activated by a push button, flashes yellow to warn approaching motorists of an impending crossing and then changes to solid red, requiring drivers to stop. Pedestrians receive a walk signal, indicating that oncoming traffic is stopped.

### *Speed Reduction*

SHA reduced speed limits along Georgia Avenue in spring 2019, due to concerns about pedestrian safety. The speed limit reductions were accompanied by traffic-calming measures, such as narrowed lanes and crosswalk upgrades in downtown Wheaton, but not in the study area. However, this study provides a list of improvements that improve traffic safety beyond the Wheaton area to Aspen Hill.

## REDUCED SPEED LIMITS ON GEORGIA AVENUE



- Between Veirs Mill Road and Arcola Avenue in Wheaton changed from 35 mph to 25 mph.
- Between Glenallan Avenue and Connecticut Avenue in Silver Spring, changed from 45 mph to 35 mph.
- Between Connecticut Avenue and Cherry Valley Drive, changed from 50 mph to 45 mph.



The newly installed traffic signals at the intersections of Georgia Avenue and Heathfield Road will make it simpler and safer for people crossing the street and using Metrobus.

### *Traffic Signals*

In the Aspen Hill Study area two pedestrians have been severely injured attempting to cross Georgia Avenue at Heathfield Road, the site of a Metrobus stop and the entrance to an apartment community. In 2019, SHA installed a traffic signal at the intersection to provide a protected pedestrian phase, increase access to the Metrobus stop, and to create a signalized break along a previously unsignalized stretch of Georgia Avenue between Connecticut Avenue and Bel Pre Road. Pedestrians were legally allowed to cross the intersection prior to the installation of the traffic signal, but it lacked lighting, crosswalks, pedestrian signals and a median refuge.



There are no traffic controls on Georgia Avenue between Hewitt Avenue and Hathaway Drive, south of the study boundary. The distance between these controlled crossings is approximately 4,500 feet or 17 minutes of walking. Residents accessing the five bus stops along this road segment do not have protected crossings. Between 2015 and 2018, three people were severely injured and one was killed walking or bike crossing Georgia Avenue on this stretch. SHA plans to install a traffic signal at the intersection of Georgia Avenue and May Street in fall 2019 or winter 2020. A signal in this location will reduce the distance between safe crossings to approximately 2,500 feet between Hewitt Avenue and May Street, and 2,000 feet between May Street and Hathaway Drive. These new traffic signals will slow vehicle speeds through the study area and provide protected crossings for people walking, biking and driving.



Significant distances between safe crossings – over three quarters of a mile or a 15 minute walk in some locations—creates significant safety challenges especially on high ridership bus corridors.



County Executive and County Council members joined officials from MCDOT to activate the HAWK Signal on Aspen Hill Road, the second in Montgomery County.



In Maryland, pedestrians have right of way when crossing at a crosswalk. A crosswalk is formed anytime two roads meet; the intersection is still considered a crosswalk even if it is unmarked and does not have traffic controls or signage. In addition to using marked crosswalks at signalized intersections like Connecticut Avenue and Aspen Hill Road, and Georgia and Connecticut Avenues, pedestrians have the legal right and the right of way to cross at intersections of Wendy Lane or Ralph Road with Georgia Avenue.

The Maryland Transportation code section 21.101 defines a crosswalk as that part of a roadway that is:

- 1.** Within the prolongation or connection of the lateral lines of sidewalks at any place where two or more roadways of any type meet or join, measured from the curbs or, in the absence of curbs, from the edges of the roadway;
- 2.** Within the prolongation or connection of the lateral lines of a bicycle way where a bicycle way and a roadway of any type meet or join, measured from the curbs or, in the absence of curbs, from the edges of the roadway; or
- 3.** Distinctly indicated for pedestrian crossing by lines or other markings.





Riding a bike is challenging on many roads in the study area, including Georgia Avenue, which connects to the Matthew Henson Trail

## Aspen Hill Neighborhood Greenway

Neighborhood greenways are streets with low vehicular volumes and speeds that are designed to prioritize walking and bicycling. They employ signage, pavement markings and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient crossings of busy arterial streets.

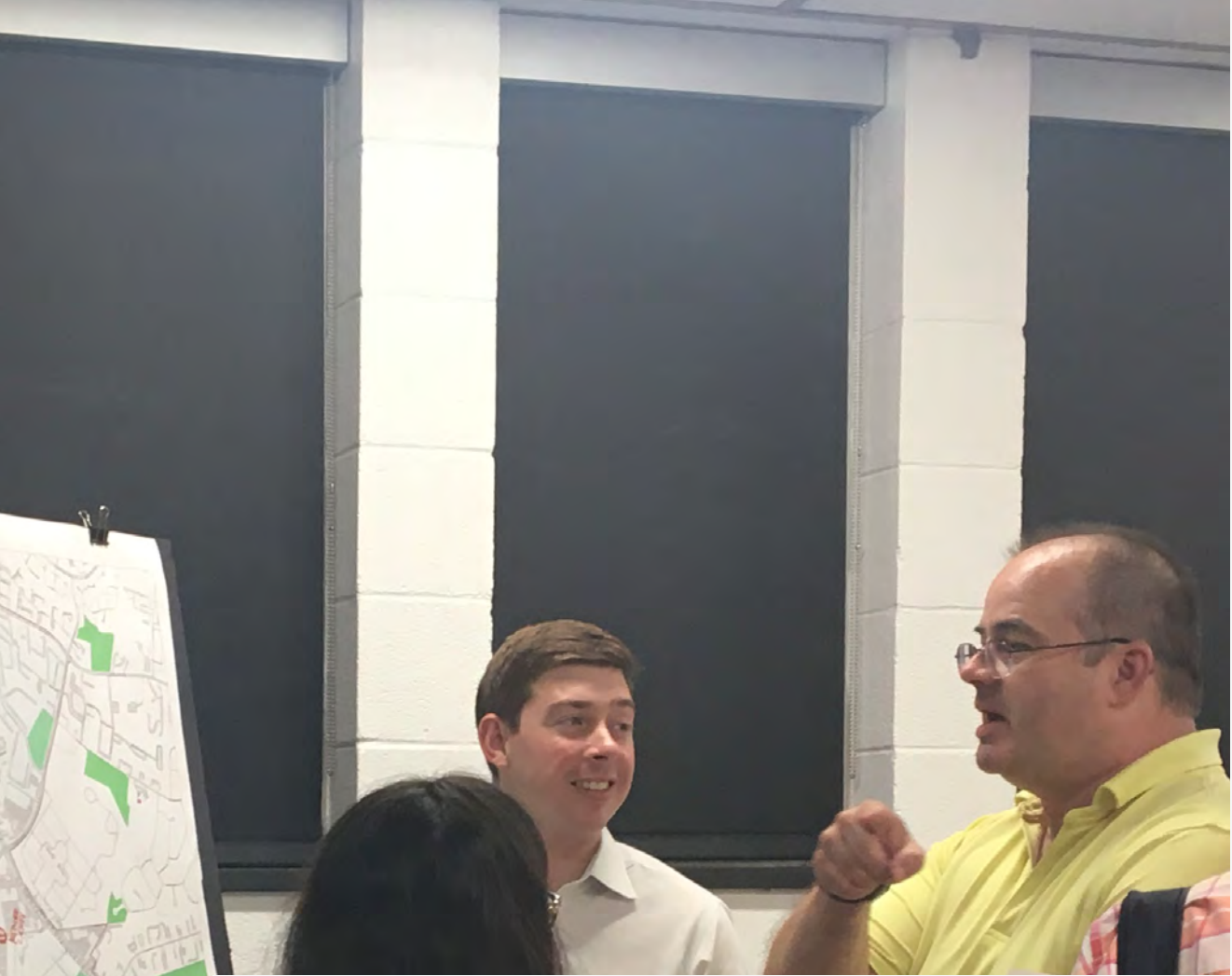
The Aspen Hill Neighborhood Greenway will provide a cost-effective, low-stress alternative for people walking and biking between Aspen Hill and the Glenmont Metro Station. The first greenway project in Montgomery County, this route includes 23 intersection improvements as well as pedestrian improvements, including repairs to areas of missing sidewalk, installation of crosswalks and minor adjustment to curb ramps. MCDOT is set to begin implementing improvements in spring 2020.

While these safety improvements are encouraging, more upgrades are needed, including the improvements recommended in this study, to ensure a safe, accessible and comfortable environment in Aspen Hill.

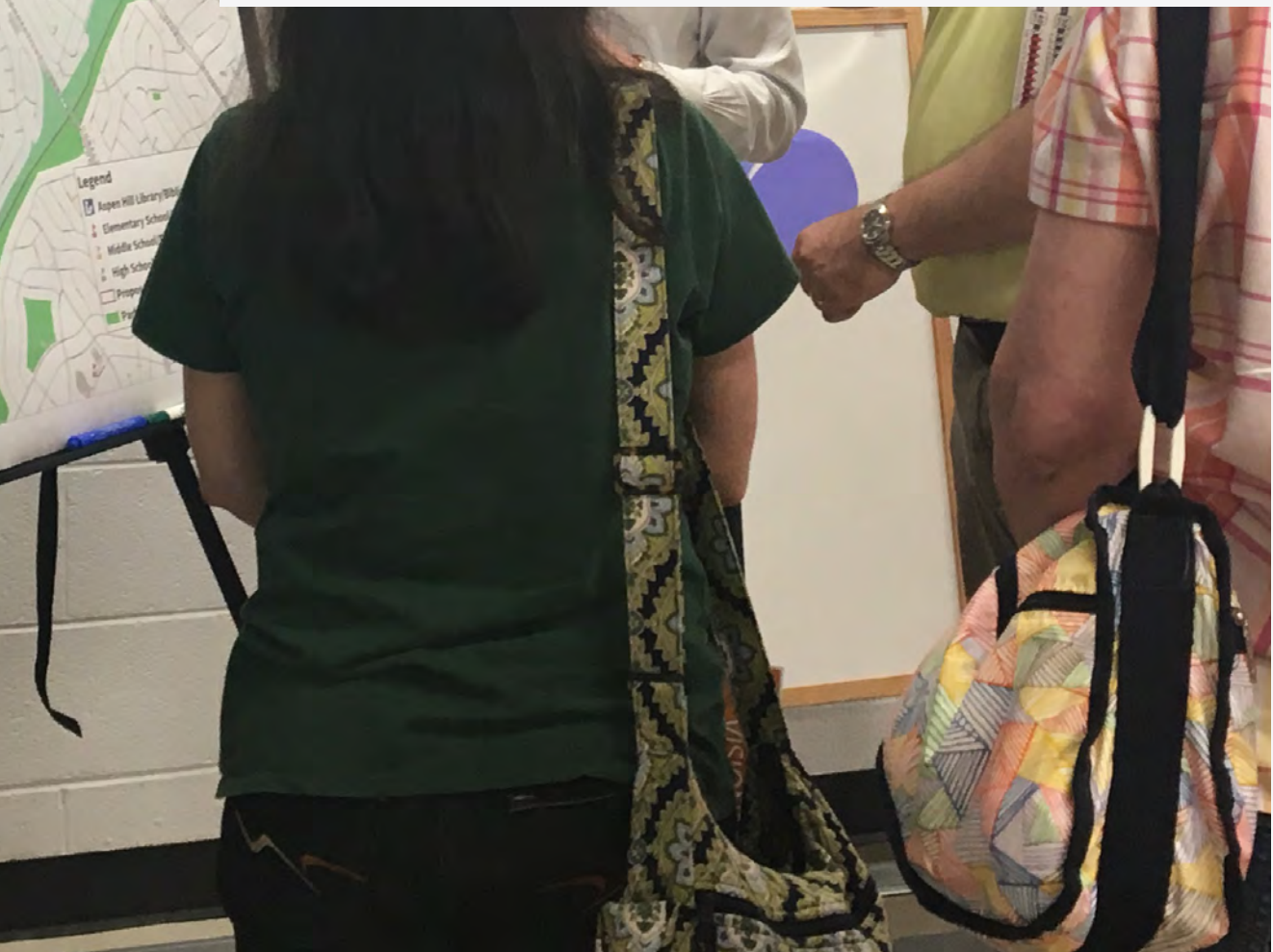


Map of the proposed Aspen Hill Neighborhood Greenway alignment. Once completed, the neighborhood greenway will provide a safe, low-stress bike connection between the Glenmont Metro Station and Aspen Hill.





**Community Engagement**





The voices, opinions and experiences of Montgomery County residents are central to the development of this study. To reach a broad audience, Montgomery Planning staff used a variety of engagement strategies to connect with community members and encourage participation in the study process.

## BY THE NUMBERS



**15** community events attended

**265** responses to the Aspen Hill ReactMap

**11** events hosted by Montgomery Planning

**12** advisory group members

**50** commuter surveys submitted

The study area is racially and ethnically diverse; approximately 50 percent of the population is Latino and nearly 70 percent of residents speak a language other than English. Promotional materials were produced in English and Spanish, and bilingual staff or interpreters were available at all meetings and events.

The study area has a larger proportion of family households and single-spouse households with children under the age of 18 than the county as a whole. All community engagement events hosted by Montgomery Planning were family-friendly events, providing children's activities to enable families to participate without having to pay for childcare services.

## Engagement Highlights

- **Advisory Group.** This 12-person group advised Montgomery Planning staff on community outreach, identified key challenges and assisted with recommendations. Members were selected through an application process to represent diverse interests of residents, business owners, commuters and civic groups.
- **Walk Audit.** Residents, kids and business owners joined planning, county and state staff, and elected officials for a neighborhood walk audit in November 2018. The audit was divided into three separate walking routes; participants assessed the safety and comfort of traveling through the neighborhood.
- **Aspen Hill Shopping Center Pop-up.** A graphic recording artist set up in the Aspen Hill Shopping Center to create a mural depicting community member comments and responses to "how can you feel safer?" in Aspen Hill.
- **Commuter Survey.** Aspen Hill is a small regional commercial hub. Every day, employees arrive from all over Montgomery County to work at the shops, restaurants and offices. The survey captures the concerns of employees, many of whom live outside the study area, about traveling to and from work.
- **ReactMap.** An interactive, online map, the ReactMap allowed community members to submit feedback about the assets, challenges and needs of pedestrians, bicyclists, transit riders and motorists in Aspen Hill.
- **Bus Advertisements and Yard Signs.** Signs and bus advertisements were placed throughout the study area, inviting residents to participate in the study online or through texting by phone.

## What We Heard

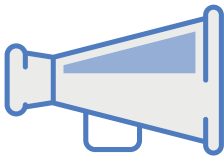


Neighborhood outreach included visual recording artists that interacted with residents and depicted their ideas for a safer Aspen Hill.

## ReactMap

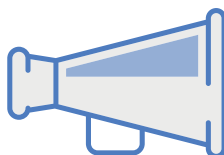
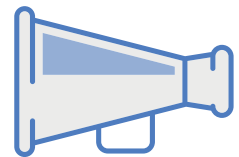
The ReactMap was launched in September 2018, collecting feedback from residents through June 2019.

- **39 percent** of respondents expressed concerns about the frequency and safety of road crossings.
- **24 percent** of people identified speed and speeding as safety concerns.
- **22 percent** of people said parts of Aspen Hill were too dangerous.
- **17 percent** of people cited quality of sidewalks as a barrier to walking.



“It is very dangerous to walk to the nearby commercial establishments such as the Aspen Hill Shopping Center because of the narrow sidewalks and high-speed limits. When I walk to these establishments with my children, we have to walk single file in order to walk safely and hope that nobody is coming in the opposite direction. It appears that more affluent neighborhoods in the county have more pedestrian-friendly options.”

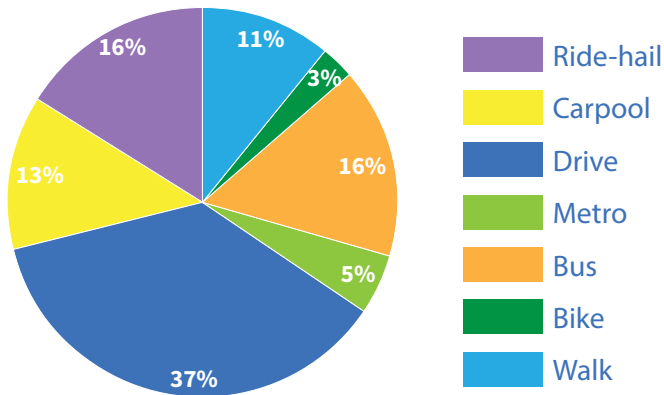
“Need to provide more frequent pedestrian crossings. There is a lot of foot traffic on Georgia and people are putting their lives at risk by trying to cross mid-block.”



“This area is so unappealing and uninviting. I never walk here if I can help it. It feels unsafe and only designed for cars.”



## COMMUTER SURVEY



### What would make you feel safer on your trip to work?

- “Slower speeds on Georgia Avenue.”
- “More traffic lights and police.”
- “Better lighting, more crosswalks for pedestrians and better bus stops.”
- “Better roads and sidewalks; during winter weather, salt is rarely scattered on the sidewalks, causing us to slip and fall.”
- “Less confusing crosswalks; when crossing the street, even though the signal gives us the sign, cars from the right still turn.”

### Walk Audit

Community members recorded observations on the Walk Audit such as:

- There is insufficient signal time to cross many intersections along Georgia Avenue and Connecticut Avenue. It is even difficult for healthy walkers to make it across in the time provided.
- It's a much safer and inviting experience when there is a grass buffer between the road and the sidewalk.
- Wide sidewalks are much more comfortable when they can accommodate pedestrians walking abreast, and people using wheelchairs and strollers can pass each other without leaving the sidewalk. Narrow sidewalks can lead to a negative walking experience, especially if there is any overgrowth or overhanging of landscape bushes that further crimps the pathway.



Graphic recording from the pop-up at Aspen Hill Shopping Center. Passersby answered the question, “How can you feel safer traveling?” in English, Spanish or Portuguese.



Improvement Toolkit





The Aspen Hill Vision Zero Study is informed by a vigorous community engagement process, work sessions with the community advisory group, consultation with the Montgomery County Department of Transportation, Maryland State Highway Administration and Montgomery County Police Department, and speed and crash data. Montgomery Planning used this input to develop a menu of safety improvements to address the issues contributing to the frequency and severity of collisions in Aspen Hill.

## SAFETY FOR ALL PEOPLE



**Most victims of fatal and severe crashes in Montgomery County are riding in cars at the time of the crash. Many of the suggested improvements discuss enhancing safety for people walking and biking because they are the most vulnerable road users, but slowing vehicles and reducing conflicts improve safety for ALL people.**

The toolkit is divided into two categories: study-wide improvements and location-specific improvements. The study-wide improvements should be implemented throughout the area over time and this document identifies priority locations for each study-wide improvement. The location-specific improvements are identified as long-term or short-term improvements.

## STUDY-WIDE IMPROVEMENTS



### INSTALL SPEED CAMERAS TO ENFORCE SPEED LIMITS AND REDUCE FATAL CRASHES

For all crashes, including multi-vehicle crashes, the severity of the injuries and the likelihood of fatality increase as speed rises. Automated, electronic enforcement using speed cameras is a proven tool to deter speeding and reduce the frequency of severe crashes.

#### Locations:

- Georgia Avenue between Hewitt Avenue and Connecticut Avenue.
- Aspen Hill Road between Connecticut Avenue and Parkland Drive.
- Parkland Drive between Evanston Street and Grenoble Drive.
- Connecticut Avenue between Independence Street and Georgia Avenue.

**Priority:** High collision road segments, high pedestrian volume roads, transit corridors and road segments near community facilities, such as schools, churches, recreation centers, and parks.

#### Considerations:

- Roadway grade: Maryland State Highway Administration recommends speed camera sites on level roadways, not on significant downgrades.
- Posted speed limit: According to state law, speed cameras cannot be placed on roads with speed limits greater than 35 mph in Maryland.
- Speed cameras are cost-effective, allowing police to concentrate on other issues.
- Cameras may act as a deterrent even when a camera is not present, but conversely, may lead to situational compliance—drivers may only comply where they know a camera to be present.
- Automated enforcement is only applied to drivers traveling 12 mph above the posted speed limit.

### Equity and Accessibility:

- Tickets may be disproportionately burdensome, consider sliding scale based on income level. Sliding scale tickets are commonplace in Europe and have been piloted in Staten Island, NY and Milwaukee, WI. The Montgomery County Vision Zero Equity Task Force has recommended examining sliding scale ticketing.
- Automated enforcement eliminates potential bias in the enforcement of speeding.

### Resources:

- Montgomery County Speed Camera Program: <https://www.montgomerycountymd.gov/POL/Chief/bureaus/field/traffic/ateu/index.html>
- Selection Process for Speed Camera Locations in Montgomery County: [https://www.montgomerycountymd.gov/POL/Chief/bureaus/field/traffic/ateu/selection\\_process\\_safespeed.html](https://www.montgomerycountymd.gov/POL/Chief/bureaus/field/traffic/ateu/selection_process_safespeed.html)
- Maryland state law, Traffic Article 21-809
- Montgomery County Safe Speed Program

### Safety Benefits:

- Speed management.
- Crash reduction.



The District Department of Transportation conducted an engineering study to determine this nexus between traffic safety and speed cameras throughout the District. The study included traffic speed and volume studies, field assessments and speed and crash data analysis for all 295 speed camera locations in DC. The study revealed an overall reduction in the number of crashes by as much as 20 percent in these locations as well as a 20 percent decrease in injury crashes at these locations. The study determined that the speed cameras are a critical tool for improving vehicular and pedestrian safety.

[https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/Safety\\_Nexus\\_Executive\\_Summary.pdf](https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/Safety_Nexus_Executive_Summary.pdf)

### PROVIDE HIGH VISIBILITY CROSSWALKS ON ALL APPROACHES AT TRAFFIC-CONTROLLED INTERSECTIONS

Crosswalk markings provide guidance for both pedestrians and motorists when navigating intersections. High visibility crosswalk markings also alert drivers to slow down and be mindful of people crossing the street.

**Location:** Appropriate for all signalized intersections, view appendix for list of priority intersections.

**Priority:** High-volume pedestrian roads, commercial and transit corridors, intersections near schools.

### Considerations:

- In accordance with Maryland state law, all intersections, whether they are marked or not, are crosswalks. Pedestrians can cross unless specifically prohibited.
- Frequently marked crossings reinforce walkability, comfort and compliance.
- Street lighting should be provided at all intersections, with special attention at marked crosswalks.





### Design:

- Continental, ladder or zebra design. For continental or ladder markings, stripe the longitudinal lines within between 12 inches to 24 inches in width and separated by gaps of 12 inches to 60 inches.
- Crosswalks should be marked as close as possible and perpendicular to turning traffic (that receives the signal simultaneously with crossing pedestrians) to maximize visibility.
- Continental crosswalk markings should be aligned so that vehicle tires pass between and not over the markings.
- Crosswalks should be painted with reflective paint.

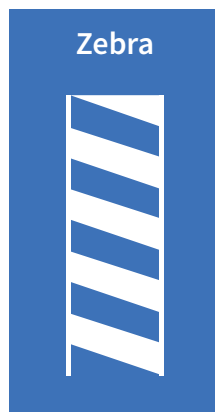
### Equity and Accessibility:

- Some pedestrians with low vision prefer ladder markings, which help them follow the crosswalk better, particularly where bar pairs are widely separated.
- Crosswalks must be paired with Americans with Disabilities Act-compliant curb ramps and tactile warning strips.

### Safety Benefits:

- Visibility.
- Separate spaces for people walking and driving.

## HIGH VISIBILITY CROSSWALKS



Many of the crosswalks in the study area consist of two transverse lines. However, a Federal Highway Administration study found that high visibility markings were detected at about twice the distance, providing drivers traveling at 30 mph eight additional seconds of awareness time when approaching crossing pedestrians.

## INSTALL INTERSECTION LIGHTING TO ENHANCE VISIBILITY AT CROSSWALKS

Enhancing nighttime visibility at crosswalks and intersections is critical to improving safety for pedestrians and bicyclists. Illuminating intersections and crosswalks increases safety and comfort for people walking and biking and improves visibility for motorists.

**Location:** Appropriate for all existing and proposed crosswalks. See appendix for priority locations.

**Priority:** Crosswalks at high-volume pedestrian streets, intersections near community facilities and parks, multilane streets.

### Considerations:

- Light pollution, glare (brightness and wattage).
- Electricity and cost.

### Design:

- Lighting should be placed before and after crosswalks to illuminate crossing pedestrians and cyclists for approaching motorists.
- In-pavement lighting should be considered for uncontrolled crossings.

### Equity and Accessibility:

- People who use transit may be required to cross high-volume roads multiple times per day to access their bus stops. Adequate lighting should be provided at all crosswalks near bus stops to ensure transit users have safe access.

### Resources:

Lighting requests on SHA roads require an application, including a review of roadway characteristics, crash data, traffic counts and existing lighting.

Maryland SHA Lighting Guidelines [https://www.roads.maryland.gov/OOTS/tcddm\\_part-4.pdf](https://www.roads.maryland.gov/OOTS/tcddm_part-4.pdf)

<https://www.montgomerycountymd.gov/dot-traffic/streetlights.html>

[https://www.montgomerycountymd.gov/DOT-Traffic/streetlight\\_install.html](https://www.montgomerycountymd.gov/DOT-Traffic/streetlight_install.html)

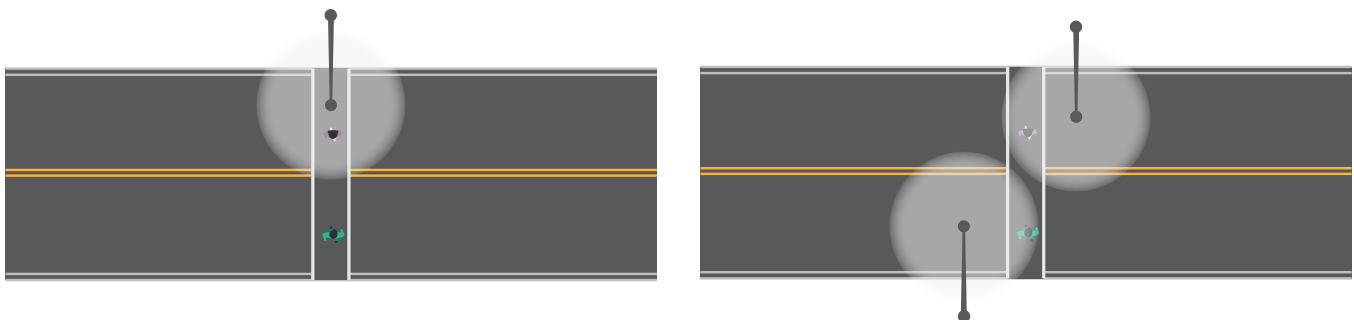
### Safety Benefits:

- Enhanced visibility for people walking and biking.
- Separate spaces between people walking and people driving, by illuminating pedestrian paths.

### CRASHES AFTER DARK



A disproportionate number of traffic related deaths and injuries occur after dark. Although both vehicle miles traveled and pedestrian activity decrease at night, more than half of traffic deaths occur after dark in the United States. In the study area, 45 percent of crashes involving non-motorists occurred during low-light and night-time hours.



Offset lighting at crosswalks (right) that illuminates the approach to the crosswalk is preferred to traditional lighting configurations that only illuminate the crosswalk from above.



## REDUCE TARGET SPEEDS

The faster a car is moving, the less time the driver has to yield and the more likely a severe injury or a death will occur in the case of a collision. Speed is a fundamental predictor of crash survival and even small increases in vehicle speed can have fatal results. The study recommends reducing target speeds on three road segments: Connecticut Avenue, Bel Pre Road and Grand Pre Road. The segments of Connecticut Avenue and Bel Pre Road that run through the study area are both part of the county's high injury network and several severe crashes have occurred on each of these roadways segments. Grand Pre Road is a half mile road that runs adjacent to apartments, condominiums, four bus stops and a local park and has no controlled crossings.

### Location:

- Connecticut Avenue between Independence Street and Bel Pre Road reduce from 40 mph to 35 mph.
- Bel Pre Road between Layhill Road and Georgia Avenue reduce from 35 mph to 30 mph.
- Grand Pre Road reduce from 30 mph to 25 mph.

**Priority:** High Injury Network roadway segments, roadways with posted speeds of greater than 25 mph, roadways with community or commercial destinations, roadways with high rates of severe or fatal crashes.

### Considerations:

- Location and number of access points along the roadway.
- Existing or planned traffic controls.
- Grade change on the roadway.

### Design:

- Should be accompanied by traffic calming measures or other design changes to support slower speeds.

### Equity and Accessibility:

- High traffic speed is especially problematic for populations who rely on walking, bicycling, and public transit.

### Resources:

- National Association of City Transportation Officials Urban Street Design Guide: <https://nacto.org/publication/urban-street-design-guide/design-controls/design-speed/>
- Insurance Institute for Highway Safety: <https://www.iihs.org/news/detail/city-drivers-slow-down-for-lower-speed-limit-in-boston>
- Health Resources in Action: <https://hria.org/resources/community-speed-reduction/> and [https://hria.org/wp-content/uploads/2013/12/ColumbiaCaseStudy\\_120313.pdf](https://hria.org/wp-content/uploads/2013/12/ColumbiaCaseStudy_120313.pdf)

### Safety Benefits:

- Lower speeds reduce the severity of collisions.
- Lower speeds reduce likelihood of collisions.
- Lower posted speed limits may reduce speeds on adjacent roads.

## REDUCING TRAVEL SPEEDS

Road design is paramount in reducing vehicle travel speeds, however lowering the posted speed limit can contribute to slowing vehicle traffic as well. An Insurance Institute for Highway Safety study found that when Boston lowered speed limits 5 mph, from 30 mph to 25 mph, vehicles slowed down. The odds of speeding for vehicles traveling faster than 35 mph declined 29 percent, faster than 30 mph declined by 9 percent and faster than 25 mph declined 3 percent. Traffic calming measures should accompany lower posted speed limits and vice versa. [<https://www.iihs.org/news/detail/city-drivers-slow-down-for-lower-speed-limit-in-boston>]



Reducing speed is a key to reducing severe crashes. The risk of injury rises sharply when crashes occur with people driving above 20 mph. Small differences in speed make big differences in safety; fatalities are four times more likely if a person walking is hit by a person driving at 30 mph as compared to 20 mph. Communities throughout the United States have been adopting “Twenty is Plenty” campaigns and policies to reduce traffic related injuries and fatalities as part of their Vision Zero commitments.

Twenty is Plenty is aimed at changing both norms and laws, and the approaches vary by jurisdiction. Portland, OR reduced the default speed limit on all residential streets from 25 mph to 20 mph. The City also distributed yard signs to raise awareness about the change. In Hoboken, NJ, the City launched a Twenty is Plenty campaign to educate drivers about the safety benefits of driving at slower speeds and asking people to voluntarily drive at 20 mph, even though the standard speed limit remains 25 mph on residential streets.

Residential roads make up approximately 75 percent of Montgomery County’s roads network. Many of these roads are narrow, some lack sidewalks, few have marked crosswalks, and most do not include bicycle facilities. It is critical to slow down driving speeds to protect people walking, using mobility devices, biking and waiting for the bus.

Implementing a 20 is plenty approach on these residential neighborhood roads would contribute to the broader countywide effort to support safe travel speeds everywhere.





## INSTALL MEDIAN REFUGE ISLANDS

Median refuge islands provide protected areas for pedestrians to wait or rest safely while crossing streets and intersections. These respites break up long or difficult crossings into several shorter crossing segments. In Montgomery County, refuge islands are especially important for pedestrians who require more time to cross than the cycle provides and are common on the county's wider arterial roads. In the study area, there are no median refuge islands at crossings on Connecticut Avenue and Georgia Avenue, despite wide dimensions in these locations, spanning six to eight travel lanes.

### Location:

- Connecticut Avenue intersections with Independence Street, Aspen Hill Road, Georgia Avenue and Bel Pre Road.
- Georgia Avenue intersections with Hewitt Avenue, Connecticut Avenue, Aspen Hill Road, Heathfield Road and Bel Pre Road.

**Priority:** Multilane roads with four or more travel lanes, commercial corridors, intersections with high pedestrian volumes, intersections near schools and community facilities, and intersections where signal timing might not allow pedestrians to cross in one phase.

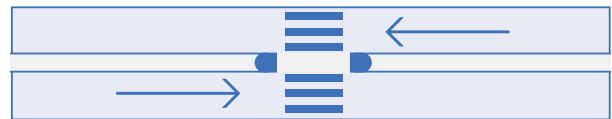
### Considerations:

- Should be considered on all roads where total roadway width exceeds 60 feet at intersections with three or more lanes, or one or two lane high speed roadways.
- Should be considered at intersections with difficult crossing geometry.
- Should be designed to discourage drivers from encroaching into the pedestrian realm (e.g., include curbs, plantings or bollards).
- May be used for stormwater management.

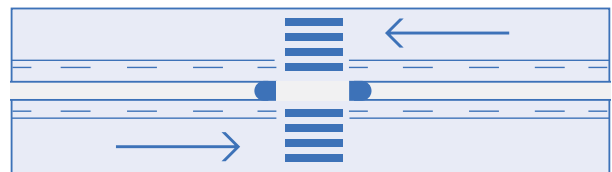
### Design:

- Include curb ramps and tactile pavement meeting the Americans with Disabilities Act (ADA) standards.
- Any plantings should maintain adequate sightlines.
- Median refuge islands should be at least 6 feet wide.
- Medians should have a nose which extends beyond the crosswalk to protect waiting pedestrians and slow turning drivers. To accommodate turning radii for large vehicles, the nose may need to be within the crosswalk, or have a mountable outside edge.
- At signalized intersections with button-actuated crossing phases, pedestrian push buttons should be mounted in the pedestrian refuge areas to provide pedestrians with the ability to request the pedestrian signal phase. Push buttons should be accessible to people using wheelchairs.
- The pedestrian travel way should be clear of obstructions, including push button posts and utility poles.

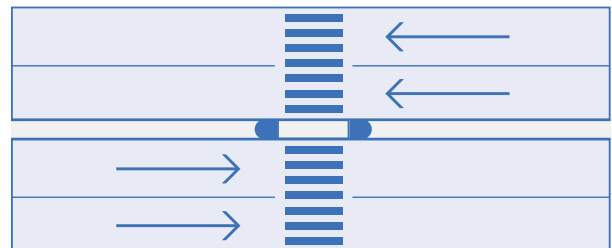
#### TWO LANES



#### THREE LANES



#### FOUR LANES



As the number of vehicle travel lanes increases, pedestrians are more exposed and less safe entering the intersection. Pedestrians have longer distances to cross, and some pedestrians—particularly vulnerable population—may not be able to cross during a single phase. Refuge islands break up the crossings into shorter segments.

### Equity and Accessibility:

- Provides protected spaces for people who need more than one pedestrian cycle to cross, ensuring comfort for users with a wide range of ages and abilities.
- Paved crossing allows easy crossing for people with mobility devices, strollers and grocery carts.
- ADA compliant tactile pavers notify people with low and no vision that they have reached a safe waiting space.

### Resources:

- National Association of City Transportation Officials Urban Street Design Guide: <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/>
- AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities, July 2004

### Safety Benefits:

- Separates car traffic from people walking or biking by prohibiting drivers from encroaching on a crosswalk.
- Reduces pedestrian exposure to vehicles.



The median at Georgia Avenue and Bel Pre Road is typical of medians in the Aspen Hill area: they are not protected and may present barriers to people with mobility devices, strollers, and low or no vision. Refuge islands provide a safe space for people to rest or wait while crossing the roadway and may also be used for stormwater management.



## EMPLOY RIGHT TURN ON RED RESTRICTIONS

Restricting right turns on red lights (RTOR) reduces conflicts between turning vehicles, pedestrians and bicycles, and improves safety for all users. “No turn on red” signage is cost-effective and flexible; restrictions may be applied when pedestrian activity is highest, such as during the morning and evening peak periods.

### Locations:

- Connecticut Avenue and Aspen Hill Road.
- Georgia Avenue and Hewitt Avenue.



**Priority:** High-volume pedestrian streets, streets with bicycle facilities and commercial corridors, intersections with high pedestrian volumes or a history of right-turn collisions, near schools and community facilities.

### Considerations:

- Vehicles turning right on red are required to fully stop.
- RTOR restrictions may be paired with leading pedestrian intervals (LPI) to reduce conflicts during the LPI phase.
- Should be placed where turning vehicles lack adequate sight distance to approaching vehicles.
- Red-light cameras can be used to increase compliance and shift driver behavior.
- Prohibiting RTOR may lead to higher right-turn-on-green conflicts.
- Part-time ROTR prohibitions during the busiest times of the day may be sufficient to address the problem.

### Design:

- Signage is cost-effective and easy to install.
- Signage should be employed at intersections with inadequate sight distance or unusual geometry.

### Equity and Accessibility:

- For people with low or no vision who depend on the audible signal to cross, vehicles entering the crosswalk during a walk phase may be more dangerous to pedestrians.

### Resources:

- Maryland Manual on Uniform Traffic Control Devices 2011, Section 2B.54.

### Safety Benefits:

- Separates car traffic from people walking or biking by prohibiting drivers from encroaching on a crosswalk.

## RIGHT TURN ON RED CRASHES



The percentage of crashes related to RTOR are low, however vulnerable road users like pedestrians and bicyclists are disproportionately impacted by these collisions. Fears about these types of crashes may also discourage people from walking.

According to the National Highway Traffic Safety Administration, the majority of these RTOR crashes involved a driver looking left for a break in traffic and hitting a person walking or biking from the driver's right. Although there are no national guidelines for RTOR restrictions, cities all over the US are beginning to ban RTOR in select locations to reduce turning vehicle crashes. In 2019, Washington, DC, added RTOR restrictions at 100 intersections and Alexandria, VA installed RTOR restrictions in Old Town and at high-volume intersections.



**Perceptions of safety:** Everyone is a pedestrian at some point; whether walking to a school bus stop, running an errand at the store or just traveling from the house to a car. Walking is a healthy, socially equitable, environmentally friendly mode of transportation. The perception of safety and comfort influences how many trips people choose to take by foot. Even in locations where there are not large numbers of crashes, concerns about cars turning right on red or turning left during a pedestrian crossing phase may discourage walking. Improving perceptions of safety, as well as safety conditions, may increase the number of people walking.

## LEFT TURN PROTECTION MEASURES

Left turn movements are the highest-risk movement at intersections, accounting for approximately 25 percent of all intersection collisions. Protected left turn signals, hardened centerlines and slow turn wedges can reduce conflicts between left-turning vehicles and pedestrians and bicyclists by slowing vehicle turning speeds, tightening vehicle turning radii and increasing pedestrian visibility at crosswalks. Washington, D.C., as part of its Vision Zero initiative, is installing left-turn calming measures at 85 intersections in 2019 and 2020. Montgomery County has begun to install left-turn measures as well, which should be extended to the Aspen Hill area.



- **Protected left turn signal:** Provides a green arrow for vehicles turning left while stopping both oncoming traffic and parallel pedestrian crossings. Protected turn signals increase pedestrian safety by eliminating conflict points between pedestrians crossing at a walk signal and left-turning vehicles accelerating through a gap in oncoming traffic at a permissive signal. A protected phase also reduces conflicts between oncoming vehicles and left-turning vehicles.



- **Hardened centerlines:** Plastic flex posts or bollards and rubber curbs that extend from the intersection to the stop bar provide greater protection for pedestrians by slowing vehicle turning speeds and increasing visibility for pedestrians.



- **Slow turn wedges:** Low-cost “curb extensions” demarcated with flex posts or bollards and pavement striping slow vehicle turning speeds, tighten vehicle turning radii, and decrease crossing distances.

### Location:

- Protected left turn signals should be considered at the following locations:
  - Aspen Hill Road and Connecticut Avenue.
  - Georgia Avenue and Hewitt Avenue.
  - Connecticut Avenue and Independence Street.
  - Connecticut Avenue and Bel Pre Road.
  - Georgia Avenue and Bel Pre Road.



- Centerline hardening should be considered at the following locations:
  - Aspen Hill Road and Parkland Drive.
  - Aspen Hill Road and Grenoble Drive.
  - Connecticut Avenue and Grand Pre Road.

Slow turn wedges should be considered at Connecticut Avenue and Grand Pre Road.

#### Priority:

- High volume pedestrian streets and intersections with high left turn volumes.

#### Considerations:

- Protected left-turn phases may decrease intersection capacity, require longer cycle lengths and lead to increased vehicular congestion.
- Critical factors for multi-vehicle collisions during left turn movements are obstructed views, misjudgment of the gap in traffic, opposing vehicle speed and false assumption of another driver's actions. Factors for vehicle-pedestrian crashes include poor crosswalk lighting and drivers failing to look beyond oncoming traffic to pedestrians crossing.
- Hardened centerlines and slow turn wedges addressing failure-to-yield turning movements are best applied to lower volume streets.

#### Design:

- Protected left-turn phases should be considered where opposing speeds exceed 45 mph, sight distance is restricted or a severe left-turn crash problem exists that could be corrected by introducing a protected phase.
- Centerline hardening should be considered at lower volume intersections with permissive or free left turn movements.

#### Equity and Accessibility:

- Provides protected time to slower-moving pedestrians, the very young, older adults and people with limited mobility.

#### Resources:

- [https://safety.fhwa.dot.gov/intersection/conventional/signalized/case\\_studies/fhwasa09015/](https://safety.fhwa.dot.gov/intersection/conventional/signalized/case_studies/fhwasa09015/)

#### Safety Benefits:

- Slows turning traffic.
- Creates predictability.
- Reinforces separate spaces between turning motorists and people walking or biking.

#### BY THE NUMBERS



Left turns create safety issues for people who drive, walk and bike. Between 2015 and 2019, five out of the nine severe and fatal crashes at the intersection of Hewitt Avenue and Georgia Avenue were caused by turning vehicles. Between 2015 and 2019, there were four severe injuries and one fatality caused by turning vehicles.



This slip lane in the neighborhood of Silver Lake in Los Angeles was dramatically transformed using only planters and paint. The space reclaimed from slip lanes can provide space for parklets, bike infrastructure, stormwater management, buffers, and wider sidewalks.

## REMOVE CHANNELIZED RIGHT-TURN LANES

Channelized right-turn lanes, also referred to as slip lanes, prioritize vehicle throughput and enable vehicles to turn at faster speeds, endangering people walking and biking. Removing channelized right-turn lanes slows vehicle turning movements, improves visibility of pedestrians and reduces the crossing distance and the time that people must wait to get a walk signal.

In Montgomery County, channelized right-turn lanes are most prevalent on state-owned arterials, including Connecticut Avenue and Georgia Avenue. In the study area, there are channelized right-turn lanes at the intersections of Georgia Avenue at Aspen Hill Road, Georgia Avenue at Bel Pre Road, and Connecticut Avenue at Bel Pre Road and Georgia Avenue at Connecticut Avenue.

The dual southbound channelized right-turn lanes from Georgia Avenue to Connecticut Avenue carry significant traffic volumes and are not recommended for removal. However, other options should be explored to reduce crash risk, including consolidation into one lane, relocation of the existing crosswalk or measures to slow turning movements.

### Locations:

- All channelized right-turn lanes in the study area, except for the dual right-turn lanes connecting Georgia Avenue to Connecticut Avenue.

### Priority:

- Removing channelized right-turn lanes at Georgia Avenue and Aspen Hill Road, Georgia Avenue and Bel Pre Road, and Connecticut Avenue and Bel Pre Road.



A slip lane from northbound Georgia Avenue to Bel Pre Road.



### Considerations:

- Channelized right-turn lanes create an additional crossing location for people walking and biking.
- Removing channelized right-turn lanes may increase vehicular delay and intersection congestion.
- Right-turn lanes may be closed in the short-term using bollards, paint, planters and other temporary infrastructure.
- Space may be reclaimed for people through parklets, bike lanes, safety buffers.

### Design:

- Intersections should be reconstructed with a standard four-way intersection, requiring a full-stop for right-turn movements.

### Equity and Accessibility:

- Channelized right turn lanes can be hazardous for people with low or no vision.

### Safety Benefits:

- Slow turning motorists.
- Create predictability at intersections, pedestrians know when to cross.
- Reduce crossing distance for pedestrians.

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## PROVIDE FIXED-TIME SIGNALS AT ALL SIGNALIZED INTERSECTIONS

Regularly occurring, dedicated pedestrian crossing phases will improve circulation and limit delay for people walking and biking in Aspen Hill. Fixed-time (automatic) signals provide pedestrian crossing phases at set intervals, regardless of traffic volumes, and should be installed at all signalized intersections in Aspen Hill.

Fixed-time signals establish consistent crossing patterns for pedestrians and require less maintenance than actuated signals. Actuated signals, triggered by ground sensors or pedestrian-activated signals, are not recommended in areas with high pedestrian volumes.

In Aspen Hill, fixed-time pedestrian crossing phases are provided for crosswalks for minor/approach streets (e.g. Aspen Hill Road), but pedestrian-activated push buttons or activated signals regulate crossing phases for higher classification roads, such as Connecticut Avenue and Georgia Avenue. Actuated signals prioritize vehicular movement along the primary corridor and can limit pedestrian access and connectivity.



Pedestrians cross Georgia Avenue at Connecticut Avenue.

**Locations:**

- all signalized intersections

**Priority:**

- Intersections adjacent to the shopping centers, schools, and parks.
- Aspen Hill Road and Connecticut Avenue.
- Georgia Avenue and Hewitt Avenue.
- Georgia Avenue and Aspen Hill Road.

**Considerations:**

- MCDOT manages traffic signal timing in Montgomery County, but SHA approval is required prior to updating signal timing on state roadways (e.g. Connecticut Avenue and Georgia Avenue).
- Incur lower initial and ongoing maintenance costs than actuated signals.

**Design:**

- Accessible pedestrian signals and pushbuttons should remain, even if push buttons are not required to cross. They will still communicate information about the walk and don't walk intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision.

**Equity and Accessibility:**

- Push buttons may be difficult for people with limited mobility (e.g. using wheelchairs) to reach. Fixed-time signals eliminate the need for the pushbutton.
- Youth and children are less likely to activate push buttons than older road users.

**Resources:**

- <https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/fixed-vs-actuated-signalization/>

**Safety Benefits:**

- Predictability, both drivers and pedestrians know when to cross.
- Increase pedestrian compliance by consistently providing a safe time to cross.



## INSTALL LEADING PEDESTRIAN INTERVALS

Leading pedestrian intervals (LPI) provide two to four seconds of dedicated pedestrian crossing time before a parallel vehicular movement, during which all vehicle traffic is stopped. LPIs grant pedestrians crossing priority, increasing their visibility to motorists and reducing conflicts with turning vehicles. LPIs should be applied at intersections with high pedestrian activity or right-turn movements.

### Locations:

- Georgia Avenue and Hewitt Avenue.
- Connecticut Avenue and Aspen Hill Road.

**Priority:** Signalized intersections on Georgia Avenue and Connecticut Avenue.

### Considerations:

- LPIs should be co-located with no-turn on red restrictions.

### Design:

- LPIs are programmed through accessible pedestrian signals and may not require additional infrastructure.

### Equity and Accessibility:

- People that use transit may be required to cross high-volume roads multiple times per day to access their bus stops. LPIs help ensure transit users have safe access to transit.

### Safety Benefits:

- LPIs increase visibility of pedestrians by enabling them to walk farther into the crosswalk before motorists are allowed to turn.



LPIs allow pedestrians to begin crossing while vehicle traffic still has a red light, enabling them to reach the middle of the intersection and to be more visible to turning drivers.



Bilingual advertisements were placed at select bus stations to raise awareness about the Aspen Hill Vision Zero Study.

## DEVELOP A BILINGUAL EDUCATION CAMPAIGN

Targeted public awareness campaigns, when coupled with structural improvements, can increase safety compliance and shift driver attitudes and behaviors.

**Location:** Bus shelters, schools, community facilities, shopping centers, religious institutions.

**Priorities:** Educational campaigns should focus on known safety issues in the area, such as distracted driving and walking, and misunderstood traffic laws. They should inform the public that pedestrians are legally permitted to cross at all intersections. New traffic infrastructure or modes of transportation that may be unfamiliar to road users, such as HAWK signals or e-scooters, should be included in the public educational and awareness campaigns.

### Considerations:

- Campaigns should be bilingual, with materials produced in Spanish, English and other languages as needed.
- Community-based organizations, schools and religious institutions may disseminate education materials more effectively than government agencies.
- Targeted messages should be located appropriately (i.e.; messages for drivers should not be placed at bus stops where they can't be seen easily).

### Design:

- Educational and awareness campaigns should be brief and eye-catching.

### Equity and Accessibility:

- Language should reflect community demographics.
- Educational campaigns can be used to highlight vulnerable groups improve their safety.

### Safety Benefits:

- Raise community awareness.
- Supplement infrastructure improvements.
- May change dangerous behaviors.



The joint campaign by MCDOT and MCPS, Eyes Up Phone Down, aimed to educate people about the risks of distracted driving.



## EXAMINE ANY COMPATIBILITY ISSUES BETWEEN BIKE FACILITIES AND ACCESSIBILITY NEEDS

Bike lanes provide separate spaces for bicyclists and an additional buffer between pedestrians and motorists. They can slow vehicle traffic by creating a visual enclosure, improving safety for everyone. People in wheelchairs can use bike lanes to travel more comfortably, but for people with limited vision, new bicycle infrastructure may present new challenges.

As Montgomery County begins to implement its 2018 *Bicycle Master Plan*, transportation officials and the Bicycle Master Plan Implementation Committee should address concerns about compatibility between bike facilities and accessibility needs, to ensure the infrastructure supports safety for all.



## PRODUCE A STATUS REPORT FOR THE DESIGNATED ASPEN HILL BICYCLE AND PEDESTRIAN PRIORITY AREA

Bicycle and Pedestrian Priority Areas (BiPPAs) are designated geographical areas of Montgomery County where the enhancement of bicycle or pedestrian traffic is a priority. The objective of the BiPPA program is to increase safe bicycle and pedestrian access to support cohesive neighborhoods, replace aging infrastructure and improve long-range connectivity and circulation.

The program includes planning, design and construction funding for bicycle and pedestrian improvements within 30 Montgomery County Department of Transportation-designated BiPPAs. MCDOT, in partnership with the Maryland State Highway Administration (SHA) and the Maryland-National Capital Park and Planning Commission (M-NCPPC), have created an improvement list and status report for five of these areas. MCDOT has not yet produced a status report for Aspen Hill, although it is a designated BiPPA, and should work with agency partners to produce such a report. The current Aspen Hill BiPPA is centered on the commercial area at the intersections of Georgia Avenue, Connecticut Avenue and Aspen Hill Road. MCDOT should consider expanding the boundaries of the BiPPA to include Harmony Hills Elementary School and the Aspen Hill Library.



Map of the existing Aspen Hill BiPPA boundary. A goal of this study is to expand the boundary to include popular community destinations.

### Equity and Accessibility:

- BiPPA report covers an Equity Emphasis Area, will prioritize area for funding and improvements.

### Safety Benefits:

- Greater safety improvements for bicyclists and pedestrians.



## PARKING CONCERNS



As the population in Aspen Hill has grown, concerns about parking have grown as well. Although Aspen Hill has fewer cars per house than in the county overall, more multi-generational households, with more eligible drivers, have created new parking pressures. Some residents have paved their lawns to create more parking spaces for cars. Such changes can create hazards such as additional curb cuts and vehicles blocking sidewalks. Future infrastructure projects should address the concerns residents have about parking, as well as tools to manage parking demand, if any parking is to be removed.

## INSTALL TACTILE PAVEMENT TO IDENTIFY BUS STOPS

In Aspen Hill, there are often no audible or tactile cues to notify transit riders with low or no vision that they have reached a bus stop, absent a bus shelter. This situation is even more challenging when stops are not located at intersections. Tactile paving can be used to mark where a bus stop is located, reducing inconvenience and improving safety for people with limited vision.

**Locations:** All bus stops in the study area.

**Priority:** Bus stops without an existing bus shelter.

### Considerations:

- Not a current standard practice for transit markings.
- May require education for users.

### Design:

- Stops are usually marked off using lozenge paving. These blocks were created specifically to designate platform edges but have also been used to mark where a bus is supposed to stop.

### Equity and Accessibility:

- Assists transit riders with limited vision locate bus stops.

### Safety Benefits:

- Direct people to safe waiting areas.



Tactile paving provides distinctive surface patterns to indicate approaching streets and grade changes or mark destinations. Tactile paving should be placed at all bus stops and crosswalks in the study area.



## ENSURE ALL SIDEPATHS AND SIDEWALKS ARE UNOBSTRUCTED

Sidewalks and sidepaths are separated from vehicle traffic and provide safe spaces for people to walk and bike. Too frequently, signage, fire hydrants, utility poles and trash cans are in walkways, impeding access and discouraging people from walking or biking. Seasonally, snow or water may block paths and curb ramps as well. These obstructions can push people closer to traffic, making their journey less comfortable and safe, and may create unpassable obstacles for people with strollers or wheelchairs.

**Locations:** All sidewalks and side paths.

**Priority:** Sidewalks and sidepaths on Connecticut Avenue, Georgia Avenue and Bel Pre Road.

### Considerations:

- Improvements on SHA-owned roads will require additional coordination.
- The cost of relocating utility poles and fire hydrants is significant so re-routing sidewalk or sidepath around utility poles and fire hydrants should be considered.
- Reconstructed sidewalks and sidepaths must be built to Americans with Disabilities Act (ADA) standards.
- Unobstructed sidewalks and sidepaths are easier to maintain in winter.
- Road resurfacing projects by SHA and MCDOT must comply with ADA law and, as a result, accompanying sidewalks, curbs and paths must be brought up to standard. If there is a Complete Streets Policy, this should be applied as well.
- Snow removal plans should prioritize transit corridors, school bus stops and walking routes.

### Design:

- Signs, utility poles and fire hydrants should be located in buffers between the road and sidewalk.
- Signs, utility poles and fire hydrants should be located behind the sidewalk when there is no buffer between the road and the sidewalk.
- Utilities should be buried underground whenever possible, reducing obstructions and improving aesthetics.
- If sidewalks are closed due to construction, signed alternate routes with limited detours should be provided. When alternate routes are unavailable, adequate warning of obstructions should be placed at intersections to provide advance notice to people walking and biking.
- Lane diets should be considered along roadways to capture buffer areas for sidewalks or median islands.

### Equity and Accessibility:

- Sidewalk obstructions may prevent people using mobility with devices, strollers, and grocery carts from passing and can be hazardous for visually impaired individuals.

### Resources:

- <https://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm>
- [https://www.montgomerycountymd.gov/DOT/ADA/sidewalk\\_access.html](https://www.montgomerycountymd.gov/DOT/ADA/sidewalk_access.html)
- <https://www.montgomerycountymd.gov/dot-dte/sidewalk/SWevaluation.html#>



Utility poles like this one on Georgia Avenue create hazards for pedestrians. Long-term, utility poles located on sidewalks should be relocated or constructed underground.

### Safety Benefits:

- Sidewalks and sidepaths provide separate spaces, pedestrians do not have to move into or toward the road.
- Buffer areas are available in case people walking or biking slip into the roadway.
- Separation from vehicle crash zone is provided.
- Space exists for users with mobility devices and strollers.
- [<https://twitter.com/KostelecPlan/status/1082758840276242432>]

## RELOCATE SCHOOL BUS STOPS FROM HIGH-VOLUME ROADS

Sidewalks along Georgia Avenue and Connecticut Avenue, carrying high volumes of vehicles traveling at high speeds are unsafe locations for school bus stops. Montgomery County Public Schools should consider moving school bus stops from highways to adjacent residential streets or off-street locations with protected waiting spaces, such as at shopping centers, civic buildings or religious institutions.

**Locations:** All bus stops should be located on residential streets or off-street locations with protected waiting areas.

**Priority:** Remove bus stops from Georgia Avenue, Connecticut Avenue and Bel Pre Road in the study area.

### Considerations:

- School bus stops on private property may not be feasible due to necessary liability agreements.
- Access to off-street private facilities may be limited.
- Schedule of selected facilities.
- Off-street locations may be more difficult for buses to serve and may lengthen bus routes.

### Design:

- Signage and designated paths to off-street bus stops.
- Bus stops should be separated from traffic by 12 feet for roads with speed limits at or above 35 mph.
- Bus stops should be fully visible for both approaching pedestrians and drivers.

### Equity and Accessibility:

- Increased safety for youth while waiting for buses.

### Safety Benefits:

- Physically separating bus stops from high-volume, high-speed roads provides a more comfortable and safer environment for students waiting for the bus.

### BUS STOP SITING



There are six school bus stops on the major highways in the study area that serve 16 elementary schools, seven middle schools and six high schools. One stop was the site of a terrible crash involving four students who were waiting on a sidewalk along Georgia Avenue in October 2018. Private and public schools all over the country already pick up and drop off at stops outside of the public right-of-way.



## LOCATION SPECIFIC IMPROVEMENTS

### COMPLETE SAFE CROSSING IMPROVEMENTS FOR THE EASTERN SIDE OF GEORGIA AVENUE BETWEEN THE MATTHEW HENSON TRAIL AND HEWITT AVENUE

The Matthew Henson Trail is a popular shared-use path that runs through the southern portion of the study area. The trail crosses Georgia Avenue at-grade, but abruptly transitions from an eight-foot sidepath surrounded by trees to an eight-foot sidewalk with no buffer separating bicyclists and pedestrians from six lanes of high-speed traffic.

In compliance with the 2018 *Bicycle Master Plan* recommendations, this intersection can be redesigned to provide greater physical separation between vehicles and trail users by repurposing unused pavement on Georgia Avenue, adjacent to the median, and widening the sidewalk. Installing a buffer from Georgia Avenue at the trail entrance will improve the transition for bicyclists moving at higher speeds and enhance access to the Metrobus stop. Many people walk and bike on the Matthew Henson Trail, crossing 122 feet at the Georgia Avenue and Hewitt Avenue intersection, which connects the east and west segments of the trail.

#### Safety Benefits:

- Reduces crossing distance and therefore reduces conflicts between people walking and biking and people who are driving.
- Greater visibility for all transportation modes.
- Provides greater separation between people walking and biking and people driving.
- Speed management through visual enclosure, to reduce fatal crashes.



Bicyclists and pedestrians cross Georgia Avenue to access the Matthew Henson Trail. The Trail transitions from a tree-lined, separated path to an eight foot sidewalk with no buffer from traffic.



Expanding the sidewalk and connection to the Matthew Henson Trail on the east side of Georgia Avenue will create a safer connection for people walking and biking.

## NARROW INTERIOR TRAVEL LANES TO 10 FEET AND CURB LANES TO 11 FEET ON GEORGIA AVENUE AND CONNECTICUT AVENUE

Reducing the width of existing travel lanes can greatly improve safety and comfort on Georgia Avenue and Connecticut Avenue, two high-speed corridors in the study area. Narrower lane widths promote slower driving speeds, reducing the severity of collisions and providing space for important safety treatments, such as planted tree buffers, bike lanes and wider sidewalks.

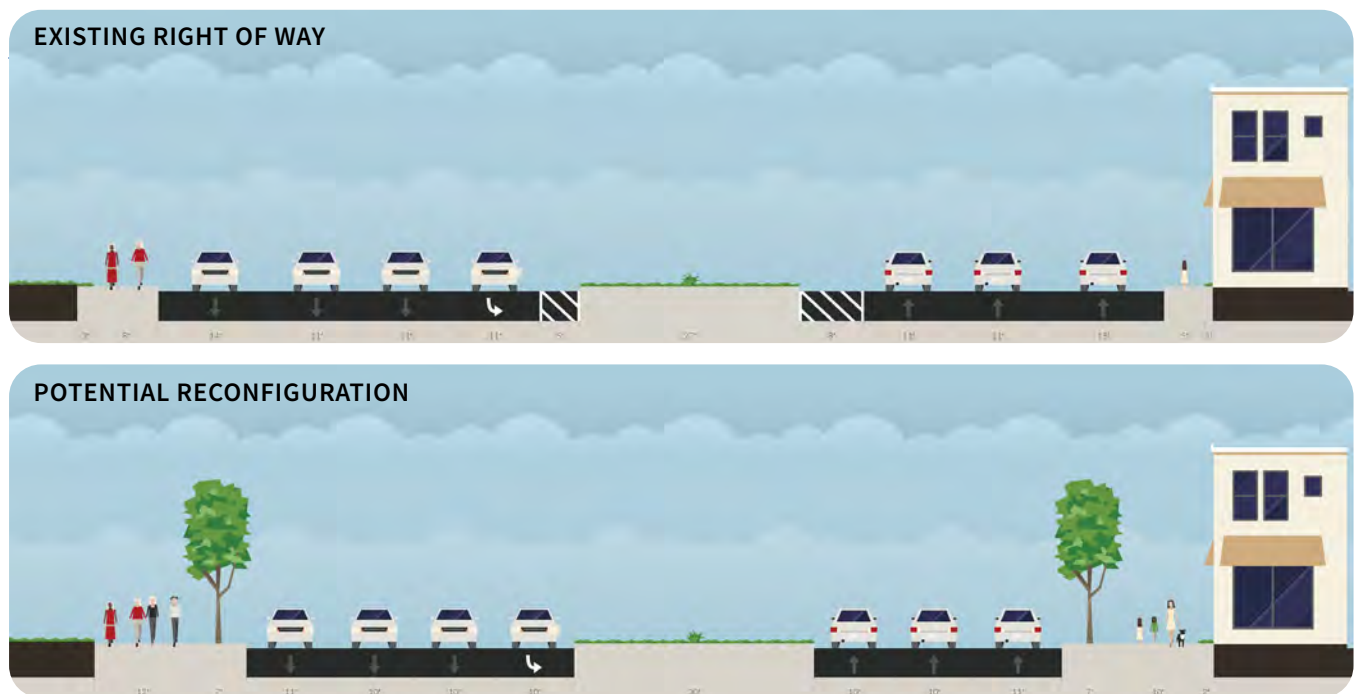
Narrowing roads will also reduce crossing distances for pedestrians and lead to shorter traffic signal cycles—which reduce wait times at traffic signals for people who drive, walk and bike. Interior travel lanes should be reduced to 10 feet and curb-running lanes should be reduced to 11 feet to accommodate buses. SHA reduced the lane widths from 12 feet to 10 feet on Georgia Avenue between Interstate-495 and University Boulevard in 2018 and is considering additional lane reductions on Connecticut Avenue and Veirs Mill Road.

### Safety Benefits:

- Speed management.
- Reduces crossing distance and exposure to vehicle crash risks at intersections for people walking and biking.

### Resources:

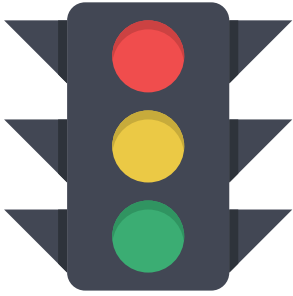
Montgomery County Code; Bill 33-13 (2014), Amending Chapter 49, Streets and Roads



The existing right of way on Georgia Avenue can be reallocated to provide tree planted buffers and side paths, maintain the same number of traffic lanes, and preserve space for future Bus Rapid Transit. The top picture illustrates the existing conditions of Georgia Avenue at Aspen Hill Road. The bottom picture illustrates a potential reconfiguration of Georgia Avenue in the interim, before BRT.



## CYCLE LENGTHS



Traffic signal cycle lengths have a significant impact on the quality and comfort of the road. Traffic signal cycle length is the amount of total time dedicated to allowing motorists, pedestrians and bicyclists to cross a road—the green light time plus any additional transition time until the red light is activated. Long signal cycles, compounded over multiple intersections, can make crossing a street or walking even a short distance prohibitive and frustrating. Longer cycles also accommodate more vehicles per hour but produce higher average delays. Pedestrians are given a minimum of one second for every 3.5 feet of road they have to cross. Lane diets reduce the width of the road, which reduces the minimum time needed for crossing during a signal cycle.

## SAFE LANE WIDTHS

The American Association of State Highway Transportation Officials recommends between nine to 12-foot lanes on various road types, allowing for 10-foot lanes on roads with posted speed limits of 45 mph or less. Travel lanes of 10 and 11 feet on arterials and collectors do not negatively affect motorist safety or have a measurable effect on capacity. Montgomery County has approved 10-foot interior lanes with 11-foot curb lanes on Veirs Mill Road and implemented 10-foot interior lanes with 11-foot curb lanes on Georgia Avenue between Interstate-495 and New Hampshire Avenue (MD193).

Vehicle	Vehicle Length	Vehicle Width	Operating Width <sup>1</sup>
Passenger Cars and Light Trucks	19.0 ft	7.0 ft	9.0 ft
School Bus	36.0 ft	8.0 ft	10.0 ft
Transit Bus	40.0 ft	8.5 ft	10.5 ft
Single Unit Truck <sup>2</sup>	30.0 ft	8.0 ft	10.0 ft
Tractor-Trailer	55.0 ft	8.5 ft	10.5 ft

Source: a Policy on the Geometric Design of Streets and Highways, AASHTO, 2004. Chapter 2 Design Controls and Criteria

<sup>1</sup> Assuming one-foot clearance on both of vehicle

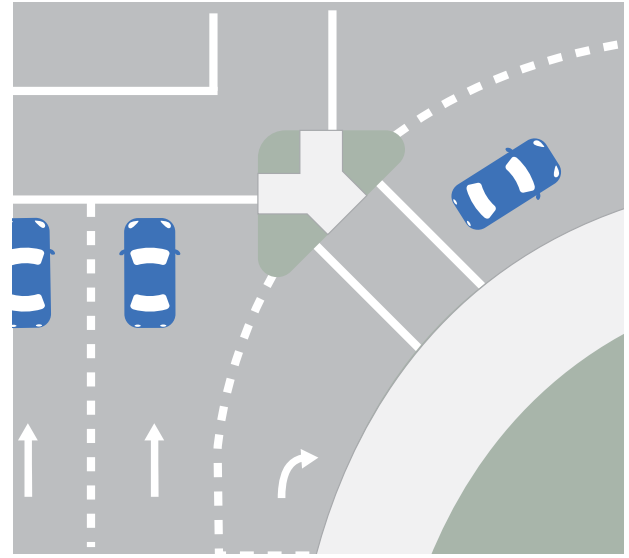
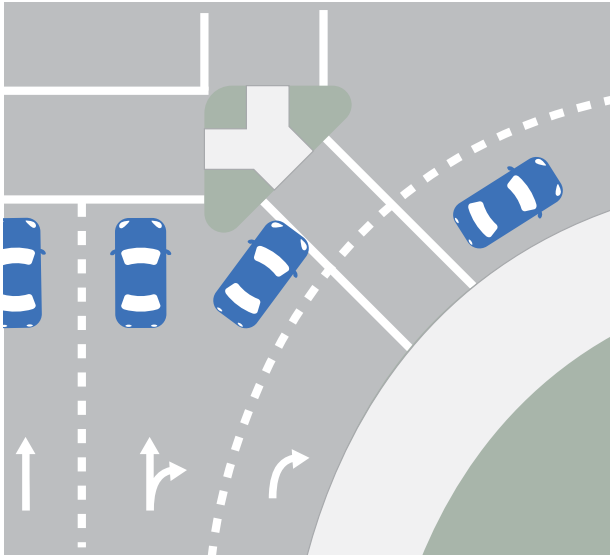
<sup>2</sup> The SU-30 design vehicle is commonly used to model emergency response vehicle operations

## RECONFIGURE CHANNELIZED RIGHT TURN LANES AT GEORGIA AVENUE AND CONNECTICUT AVENUE.

### Long-term: Reconfigure right-turn lanes

The southbound right turn from Georgia Avenue to Connecticut Avenue is the highest volume approach at the Georgia Avenue and Connecticut Avenue intersection. While it may not be feasible to remove the double channelized right turn lanes, long-term improvements should be examined to mitigate conflicts and reduce turning speeds.

To create a safer environment for pedestrians, the turning radii should be reduced or consolidated to a single turn lane, lighting should be installed at the crosswalk and the location of sidewalks and bus stops should be examined. Reducing the turning radius and adding signage may increase motorist awareness of pedestrians as they turn. Improving crosswalk lighting and examining bus stop placement, as well as sidewalk locations, may reduce conflicts.



Eliminating one of the channelized right lanes from southbound Georgia Avenue to Connecticut Avenue, reducing the turning radius, and installing lighting and signage will encourage slower speeds. These treatments mitigate risks for people walking, biking, riding in vehicles and crossing to transit stops.

#### **Safety Benefit:**

- Create predictability for drivers traveling southbound on Georgia Avenue.
- Slow turning motorists and increase yield time for both vehicles and pedestrians.

### **INSTALL HIGH-VISIBILITY TREATMENTS AND SIGNAGE ON ASPEN HILL ROAD**

Pedestrian safety treatments, such as curb extensions, stormwater management or pedestrian refuges, may be difficult for drivers to see at night. This lack of visibility can lead to cars hitting and damaging infrastructure, crashes with other cars or with non-motorists. Adding reflective material or paint is a low-cost way to increase visibility and decrease crashes. Areas for reflective material include the bioretention facility on Aspen Hill Road in front of the Aspen Hill Library and pedestrian refuges along Aspen Hill Road. Additionally, signage should be provided on Aspen Hill Road, alerting drivers that the road narrows from two lanes to one lane west of the intersection with Connecticut Avenue.

### **CONVERT MEDIAN OPENINGS ON GEORGIA AVENUE TO FULL SIGNALS**

The unsignalized full median openings on Georgia Avenue at Ralph Road and the entrance to Home Depot are excessively wide and feature multiple major conflict points between turning vehicles. Wide median openings allow multiple vehicles to stack in the intersection, complicating right-of-way movements and creating additional conflicts between turning vehicles.



Reflective paint on curbs can help drivers see curb extensions and stormwater facilities along the road, avoiding collisions and damage.



### **Short-term: Stripe Median Openings at Georgia Avenue at Ralph Road and at the Home Depot entrance**

Striping directional turn lanes in the median openings at Ralph Road and the entrance to Home Depot will provide greater direction for cross-traffic movement. Additional restrictions should be considered to restrict access and limit vehicular conflicts. Directional median openings, as exist at Georgia Avenue and Wendy Lane, may also be considered. While directional median openings reduce conflict points, they also limit vehicle turning movements and do not allow for full cross-traffic movements.

### **Long-term: Traffic control signal should be installed at the median opening of the Home Depot entrance on Georgia Avenue.**

Traffic signals at this intersection will provide protected phases for turning vehicles and protected crosswalks for people who walk and bike. Traffic signals will increase predictability and can be phased with Heathfield Road and Connecticut Avenue traffic signals.

## **STUDY TRAFFIC CONTROL OPTIONS FOR MEDIAN OPENINGS ON GEORGIA AVENUE**

Pedestrians may legally cross Georgia Avenue at Wendy Lane, but several people have been seriously injured attempting to cross this unmarked intersection. Installing a traffic control device will provide a safe crossing for pedestrians to access the Aspen Hill Manor Shopping Center, Harmony Hills Elementary School and Metrobus and school bus stops on Georgia Avenue. Additionally, a traffic signal will simplify vehicular access to the Harmony Hills neighborhood for both residents and visitors. The study should provide opportunity for substantial community input about these measures.

### **Safety Benefits:**

- Additional controlled crossing provides predictability and separate spaces.



Buffers between the sidewalk and the road, as pictured here on Connecticut Avenue, should be at least five feet wide. Trees planted in the buffer provide additional protection for pedestrians and discourage speeding.

## **SIDEWALK BUFFERS**

**Install permanent buffers along the sidewalk by moving the curb on Georgia Avenue and Connecticut Avenue to separate fast moving vehicles from people who walk and people who are waiting at bus stops.**

Buffers physically separate the sidewalk and the curb and provide protection for pedestrians from adjacent traffic. In addition to providing a more comfortable environment for people walking, biking and waiting for transit, buffers with plantings may offer additional speed reduction benefits, although they can impede visibility at intersections or driveways. Buffers should be no less than five feet wide.

### **Safety Benefits:**

- Speed management by creating a sense of enclosure.
- Reinforces separate spaces by increasing the distance between vehicles and non-motorists, reducing the risk of collisions.

## INSTALL CURB EXTENSIONS AT INTERSECTIONS ON HIGH-VOLUME RESIDENTIAL STREETS

Curb extensions are traffic-calming measures that physically and visually narrow the roadway by extending the sidewalk at intersections or midblock crossings to the edge of the on-street parking lane. They are most effective on residential streets and unsignalized intersections with high pedestrian activity. In the study area, curb extensions are appropriate on Parkland Drive and Aspen Hill Road. Parkland Drive is a wide, tree-lined residential street used by students to reach Wheaton Woods Elementary School, transit riders accessing Ride On stops, and residents accessing the Aspen Hill Library or the shopping centers on Georgia Avenue and Connecticut Avenue. Despite Parkland's residential character and 25 mph speed limit, the wide travel lanes encourage higher speeds. Placing curb extensions at select intersections along Parkland Drive will discourage speeding, increase visibility for pedestrians and create safer crossing opportunities.

### Safety Benefits:

- Reduces crossing distance for pedestrians.
- Increases visibility for pedestrians, bicyclists and drivers.
- Slows motor vehicles at intersection.
- Reinforces separate spaces by blocking parking in the crosswalk.
- Slows turning vehicles.
- Traffic calming can sometimes be combined with stormwater management.



Curb extensions extend the sidewalk into the parking lane to narrow the roadway and to make pedestrians more visible to drivers. Curb extensions can also provide additional space for plantings and stormwater management.



## CHAPTER SIX



### Next Steps





# ASPEN HILL VISIONZERO

## NEXT STEPS

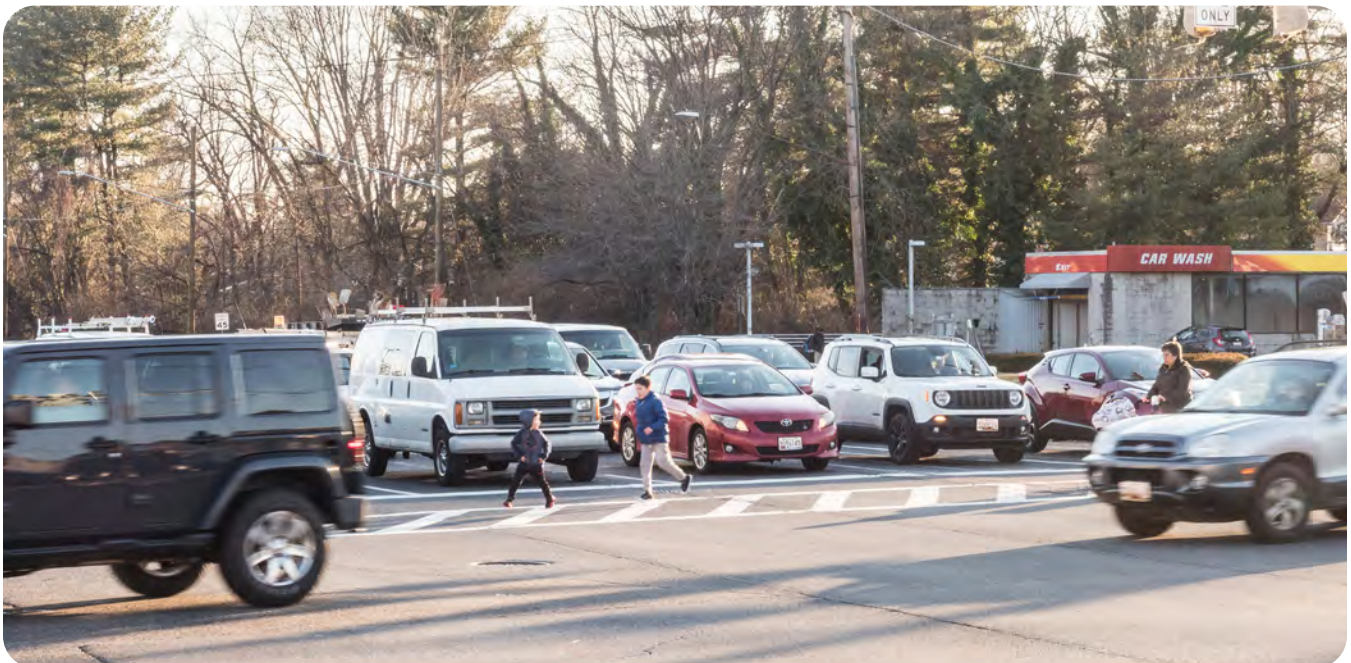
The Aspen Hill Vision Zero Study supports the evolutionary nature of the 1994 Aspen Hill Master Plan and the 2008 Georgia Avenue Study by enhancing community safety and increasing access to transportation options, while decreasing reliance on personal vehicles. The toolkit of strategies for improving safety and access in this study is the first step toward addressing Aspen Hill's hazardous and outdated infrastructure, which prioritizes vehicle throughput over community connectivity. By identifying problematic intersections and programming context-sensitive solutions, this study establishes an implementation road map for achieving Vision Zero goals.

Successfully implementing Vision Zero in Aspen Hill will require proactive coordination with both county and state agencies, especially on heavily traveled state-owned highways, such as Connecticut Avenue and Georgia Avenue. Leveraging Aspen Hill's designation as a Bicycle and Pedestrian Priority Area and an Equity Emphasis Area, as well as a part of the county's High Injury Network, may provide opportunities to fund infrastructure improvements in the community.

At the county level, private investment in new development and the county's capital improvement program (CIP) are the primary funding mechanisms for implementing the study's strategies. New development creates opportunities to redesign property frontage through the development review process and involves both the MCDOT and the SHA. Besides the former Vitro BAE parcel in the study area, no significant redevelopment of Aspen Hill is anticipated over the next couple of decades, meaning significant public investment would be required to implement pieces of the study's toolkit.

Montgomery County's CIP allocates funding for transportation projects over six years based on county policies, priorities, cost estimates and relationships to long-range development plans. In addition to the CIP, multiple funding programs administered by state and federal agencies support projects and initiatives related to Vision Zero, roadway safety and pedestrian and bicycle facilities; these funding opportunities are reviewed in the Appendix. An allocation should be made in the Pedestrian Safety CIP for funding safety improvements in the Aspen Hill Vision Zero Study Area.

The Aspen Hill Vision Zero Study fully supports active planning efforts, including the 2018 Bicycle Master Plan and the Aspen Hill Neighborhood Greenway, and builds on the success of previous master plans. By prioritizing safety and access improvements through the strategies in this study, the county can transform Aspen Hill into a more walkable, equitable and vibrant community.





## ACKNOWLEDGEMENTS

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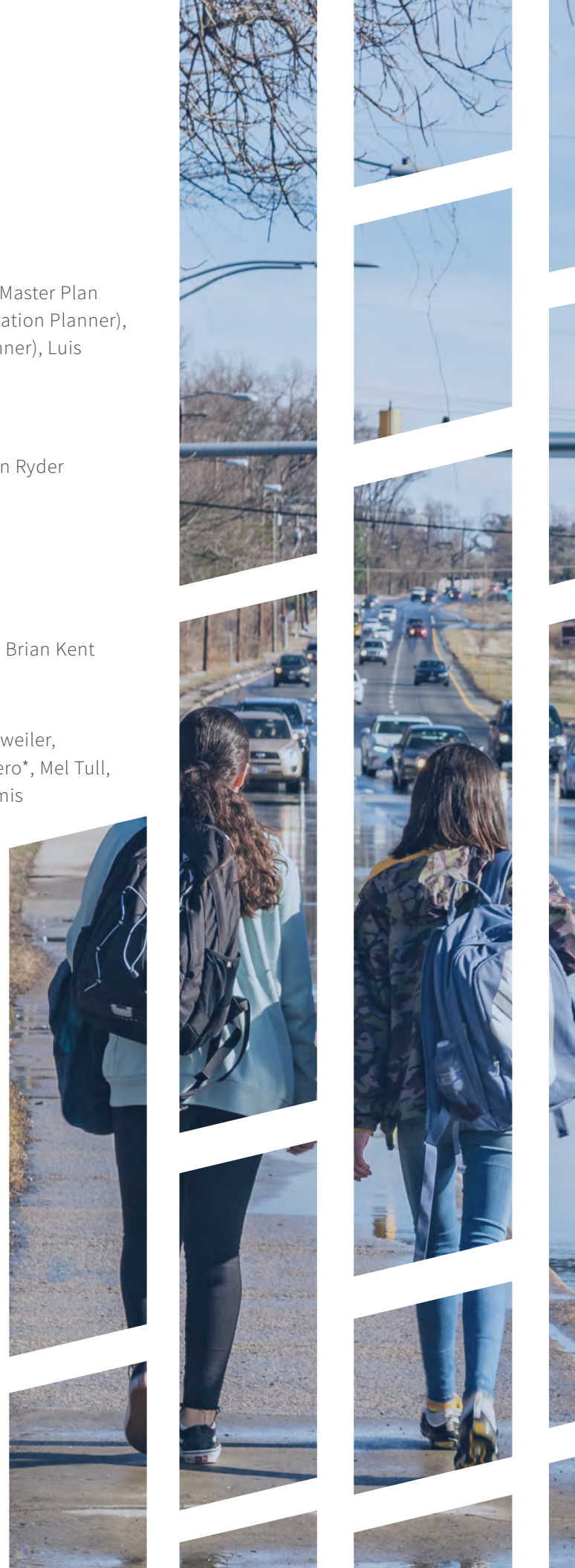
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THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

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# ASPEN HILL VISIONZERO STUDY



November 2019

 **Montgomery Planning**

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