



Morningwood Drive Safety Analysis

July 2021



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1 Introduction

In 2020, the Montgomery County Department of Transportation (MCDOT) evaluated the feasibility to connect North High Street with Morningwood Drive in the Olney area. The feasibility study showed that with the connection, operations at the impacted intersections would be adequate, while safety issues at the new Morningwood Drive intersection could potentially arise due to the limited available sight distance with the roadway alignment. Also, multiple safety concerns, particularly for pedestrian safety, involving nearby school traffic for Olney Elementary School and Goddard School, were brought to light in the 2020 September public meeting with the community. MCDOT requested Gannett Fleming, Inc. to evaluate safety concerns along Morningwood Drive between the intersections with Georgia Avenue (MD 97) and Homeland Drive.

This study conducts a traffic safety analysis for this corridor to determine existing safety conditions, potential safety impacts that the proposed North High Street connection would need to address, and strategies for addressing safety challenges moving forward.

2 Existing Traffic and Field Condition

2.1 Location and Traffic Volume

The full 1.63-mile corridor of Morningwood Drive between Cashell Road and MD 97 is a two-lane urban collector roadway, traversing the western Olney area in the east-west direction. The study corridor section of 0.25 miles between Homeland Drive and MD 97 is classified as a Primary Residential Road in the Olney Master Plan, and provides an access to MD 97 for the residential communities and adjacent businesses and schools. According to the Montgomery County Complete Streets guide (Draft, Feb. 2021), the study segment is classified as a Neighborhood Connector-type street. Much of the section between MD 97 and North High Street is commercial in nature, and the section between North High Street and Homeland Drive is residential with several apartment/townhome communities. Access roads to the residential communities are located along the study corridor (Vintage River Terrace/Softwood Terrace, Golden Spring Court, Bantry Way (north), and Bantry Way (south)) as are several driveways for the commercial buildings near MD 97. The Morningwood Drive corridor section is free flow west of MD 97 and the intersecting access roads / driveways are stop-controlled. The study corridor is shown in Figure 1-1.

A vehicular North High Street connection to Morningwood Drive is proposed between Bantry Way (north) and Bantry Way (south). An apartment/condo community (Towne Centre Place) with 49 units is located along Bantry Way, and its maintenance office building is located opposite to the existing North High Street steps, as shown in Figure 2-2. The two Bantry Way access points function as the apartment community entrances.



Figure 2-1: Morningwood Drive Study Corridor

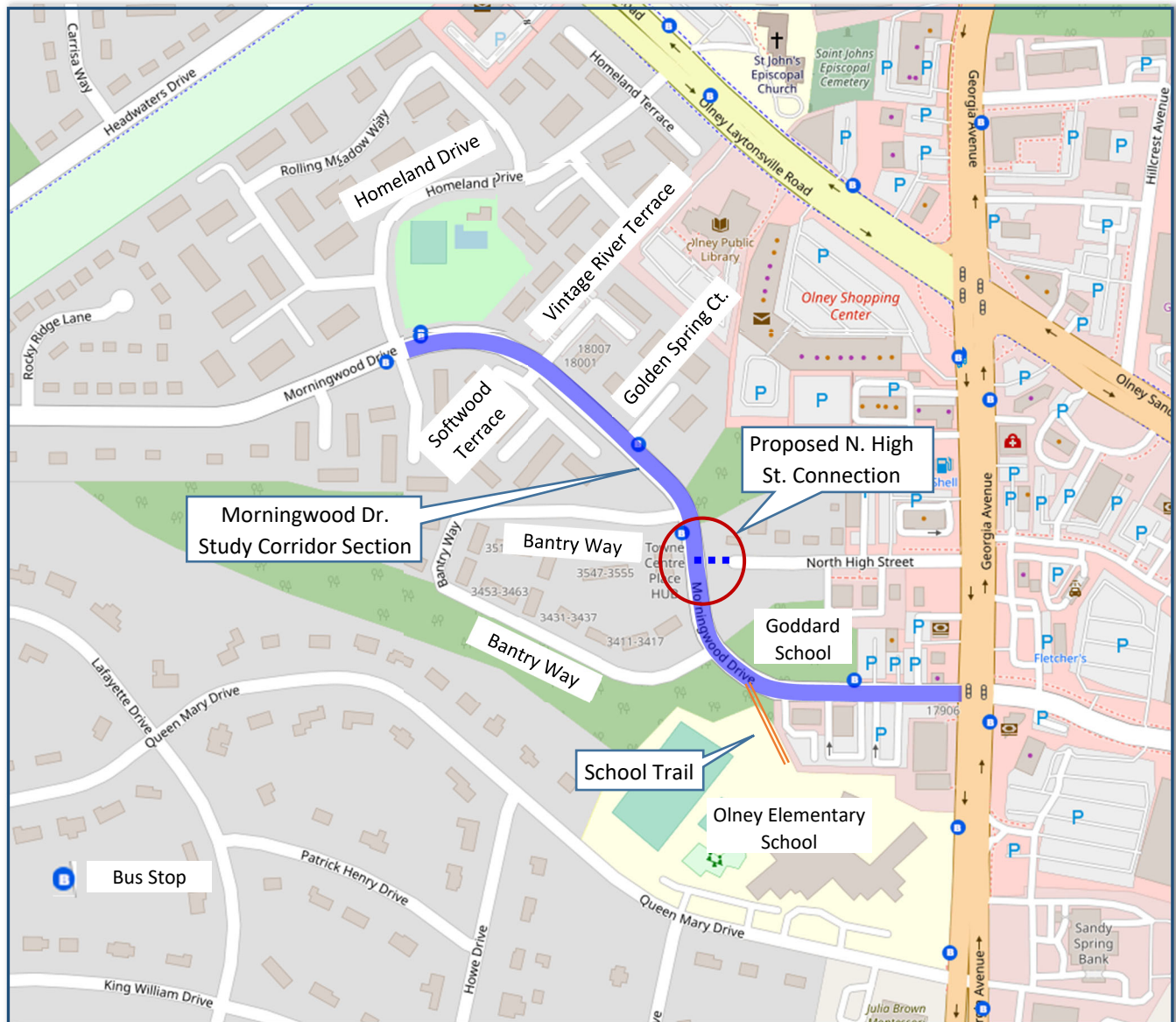
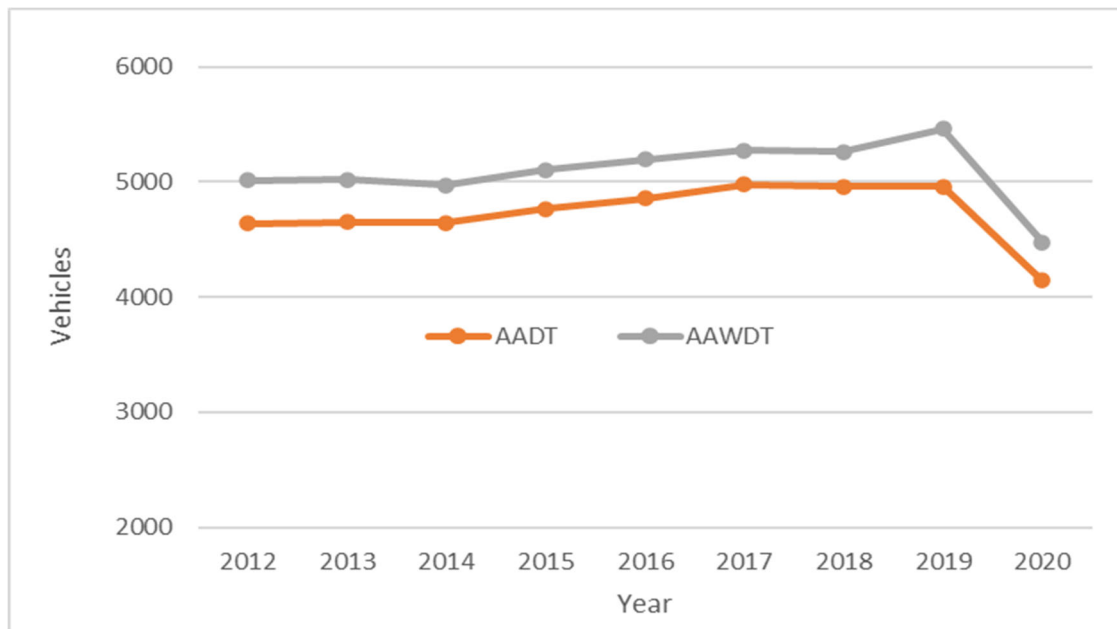


Figure 2-3 presents the Morningwood Drive AADT (Average Annual Daily Traffic) and AAWDT (Average Annual Weekday Traffic) over the latest eight years estimated by MDOT SHA. The chart indicates that the traffic volumes on Morningwood Drive slightly increased from 2012 to 2019, and dropped in 2020. The 2020 AADT appears to still be over 4,000 vehicles per day, even with likely reductions in volumes due to the Covid pandemic. Community resident comments noted that many people use Morningwood Drive as a cut-through to Cashell Road, Bowie Mill Road, and points in the western part of Olney to avoid waiting at the intersection of MD 97 and MD 108.

Figure 2-2: Community Maintenance Building from N. High Street



Figure 2-3: AADT and AAWDT Trends on Morningwood Drive (vehicles per day)



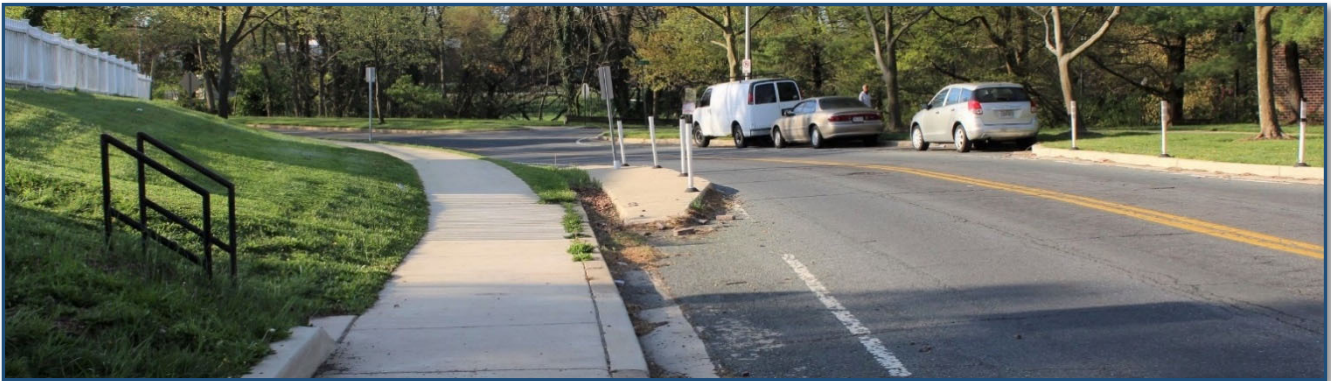


2.2 Field Observations

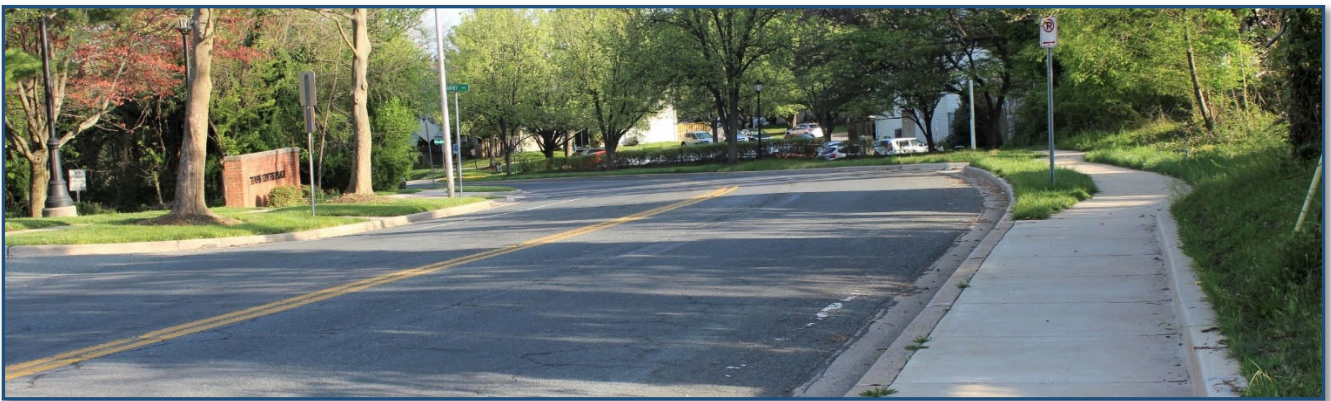
The existing corridor conditions were field reviewed on Tuesday, April 20 and Thursday, May 6, 2021. As of late April, it appeared from the Montgomery County Public Schools website that many students had returned to the public schools for in-person learning, although there were still students remaining in virtual-only instruction. The field review first focused on checking community comments from the 2020 public meeting, which are provided in Appendix 1. Some of the comments noted concerns about blind curves along the study corridor section.

Figure 2-4 shows Morningwood Drive looking left and right from the proposed North High Street approach. From the figures and aerial photo, the visible sight distance is less than 250 feet to both the left and right directions with the horizontal curves. Sight distances are discussed in more detail in Section 5 of this report.

Figure 2-4: Morningwood Drive Visibility from Proposed N. High Street Approach



(a) Morningwood Dr. looking left

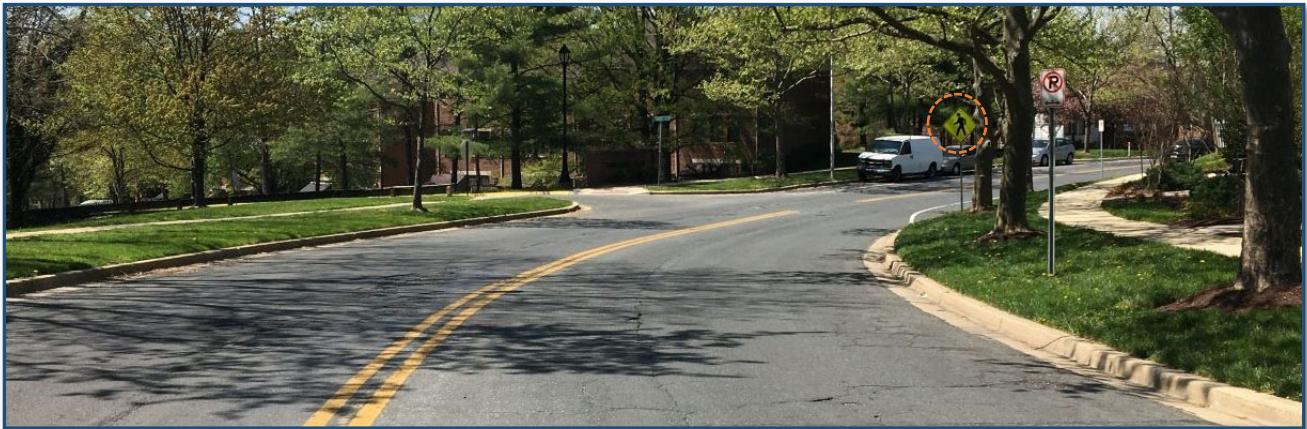


(b) Morningwood Dr. looking right

Figure 2-5 shows the Morningwood Drive horizontal curves approaching the proposed connection in both directions. As shown in the figures, pedestrian traffic signs are posted in each direction.

Figure 2-5: Horizontal Curves and Pedestrian Traffic Signs before N. High Street

(a) Eastbound



(b) Westbound

Many pedestrians were seen along the study corridor, especially near the North High Street steps and the intersections with Bantry Way (south and north). In the morning and afternoon, most of the pedestrian traffic at these locations are related to the access to/from Olney Elementary School. There is a trail of approximately 4-feet in width connecting Morningwood Drive and the elementary school building; the trail entrance is located along Morningwood Drive between Bantry Way (south) and the 1st driveway (3420 Block of Morningwood Drive) south of Bantry Way (Figures 2-1 and 2-6). Olney Elementary School is located on Queen Mary Drive accessible by automobile via MD 97. However, it appeared that many of the students were using the trail to enter from Morningwood Drive and exit the school onto Morningwood Drive, as commented on by the community in the public meeting.

It was noted in the field review that a dozen child/parent/guardian groups got to the entrance by walking along the sidewalk on Morningwood Drive, mostly from the north, in the morning (8:10 – 9:00 AM). Some groups were observed crossing Morningwood Drive near the North High Street steps. Some parents took their child to the entrance and turned around, and others accompanied them along the trail to the school building and came back several minutes later. Around 3:00 PM, parents came to the entrance by walking along the sidewalk, went into the trail/school to take their children, and later parents and children came out of the school/trail. Some of parents/guardians came by driving and waited near the trail entrance



until their children got out of the trail, parking or standing their vehicles on Bantry Way (south) or on the shoulder on Morningwood Drive. This pattern lasted up to around 4:00 PM. In Figure 2-7, the photos (a) to (c) are of the morning pedestrian traffic, and (d) is of the afternoon pedestrian traffic. Some parents with young children walking along the sidewalk passed the trail entrance in the morning, and were most likely going to the Goddard School, though most of the Goddard School trips were likely made by vehicle. The afternoon Goddard School trips occurred much later than the public school (around/after 5:00 PM).

Figure 2-6: Elementary School Trail Entrance

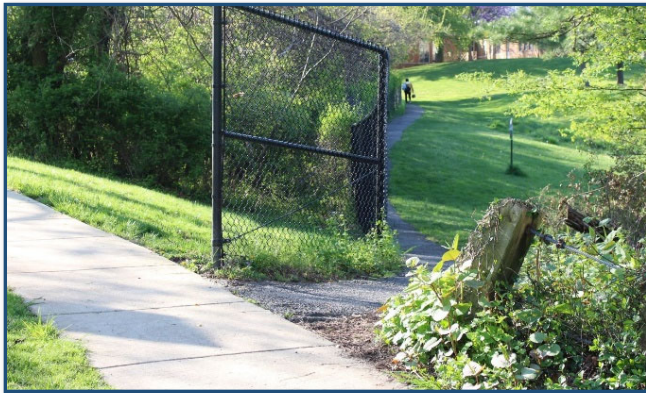
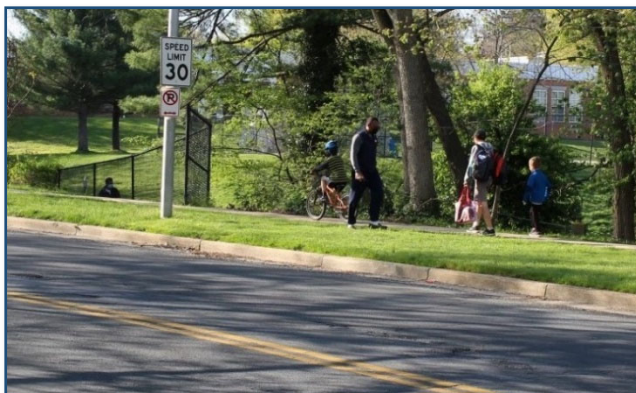
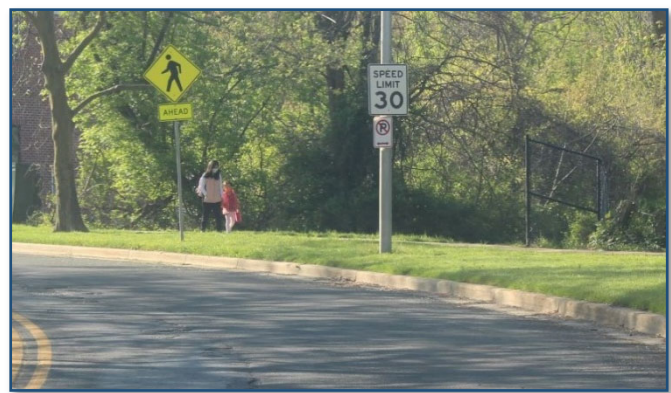


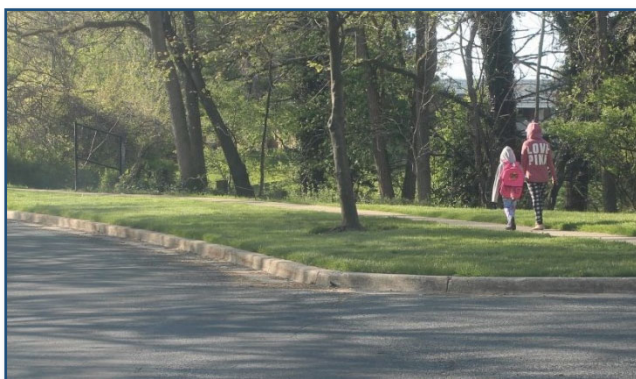
Figure 2-7: School Children and Parents/Guardians accessing School Trail



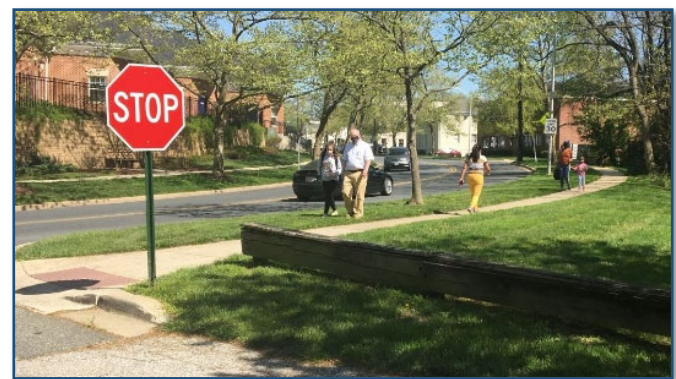
(a)



(b)



(c)



(d)



No crosswalks are provided along this section of Morningwood Drive, except near the Goddard School (Figure 2-8b). However, ADA (Americans with Disabilities Act) pedestrian ramps to cross Morningwood Drive are provided south of Bantry Way (north), as shown in Figure 2-8(a), supported by pedestrian crossing signs near the two Bantry Way intersections. The crosswalk provided near the Goddard School entrance is the only marked crosswalk on Morningwood Drive (Figure 2-8(b)).

Figure 2-8: Pedestrian Crossing Facility on Morningwood Drive



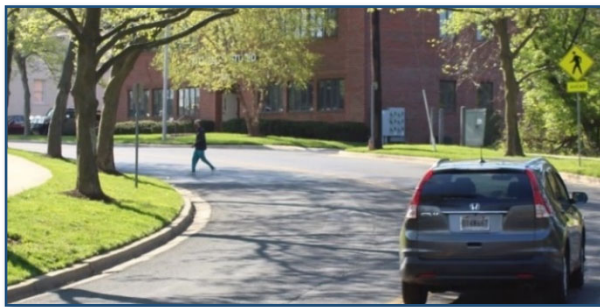
(a) ADA Ramp south of Bantry Way (north)



(b) Crosswalk near Goddard School

Numerous pedestrians were seen crossing Morningwood Drive at locations other than the marked crosswalk or the ADA ramp locations. Most of the pedestrian crossings, including school trips, were made near Bantry Way (south), the North High Street steps, or Bantry Way (north), as shown in Figure 2-9, where (a) and (b) are near the Bantry Way (south), (c) is near the apartment office driveway, and (d) is near the Bantry Way north access. Additional information regarding ADA compliance for pedestrian facilities is discussed in Section 6.

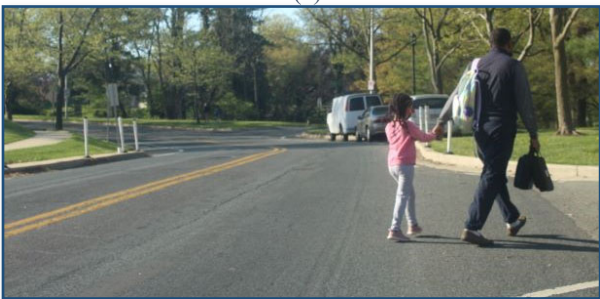
Figure 2-9: Pedestrians Crossing Morningwood Drive



(a)



(b)



(c)

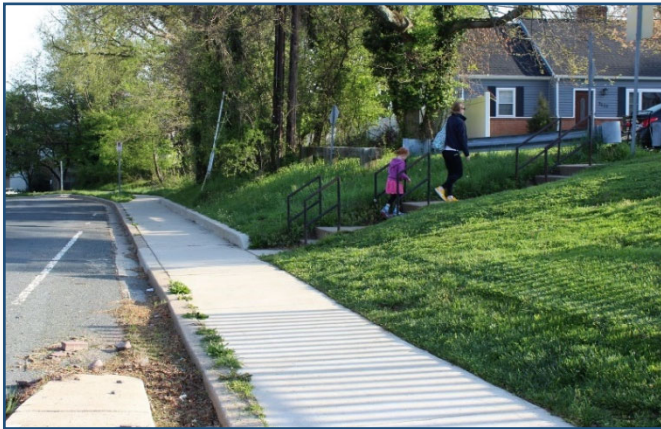


(d)

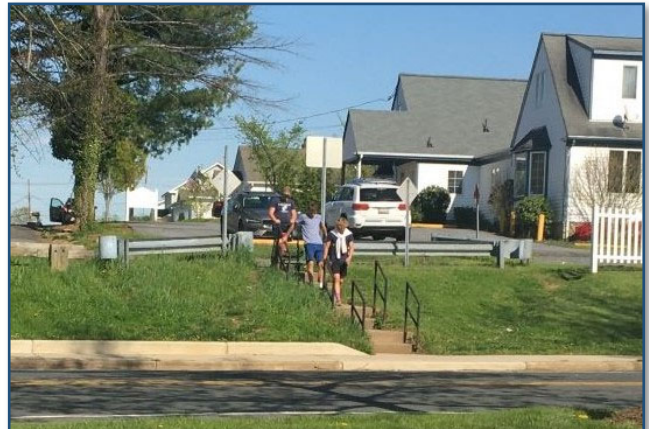


Figure 2-10 shows pedestrians using the North High Street steps. The 1st photo (a) shows a parent and child going up to the steps, possibly toward for the Goddard School in the morning. The 2nd photo (b) shows a group of pedestrians going down the steps in the afternoon. In the recent public meeting, one resident described teenagers crossing over to North High Street as an after-school pattern typically seen in the corridor. The resident assumed that they were likely going to the McDonald's restaurant or other businesses in the adjacent shopping district.

Figure 2-10: Pedestrians using the N. High Street Steps



(a)



(b)

Pedestrians with strollers and pets and joggers on the sidewalks were also seen during the day, as shown in Figure 2-11.

Figure 2-11: Sidewalk Users

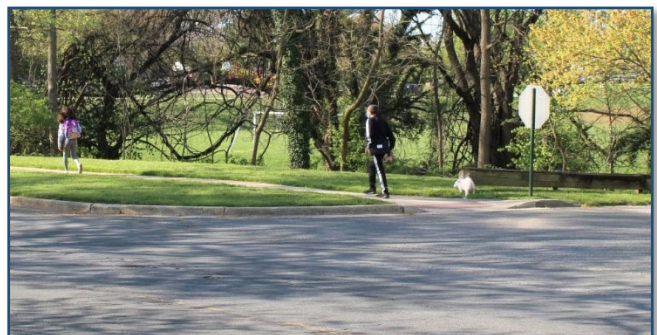
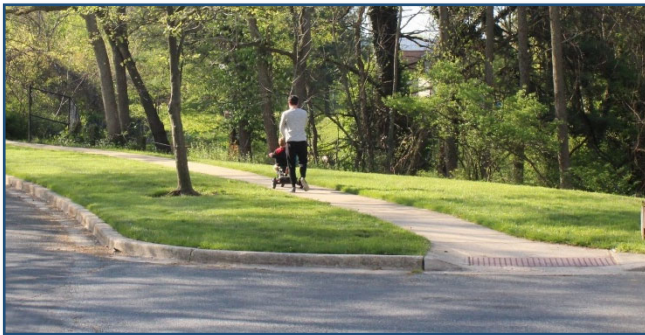
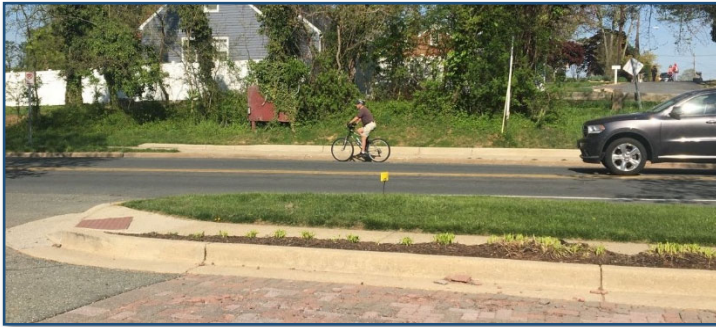
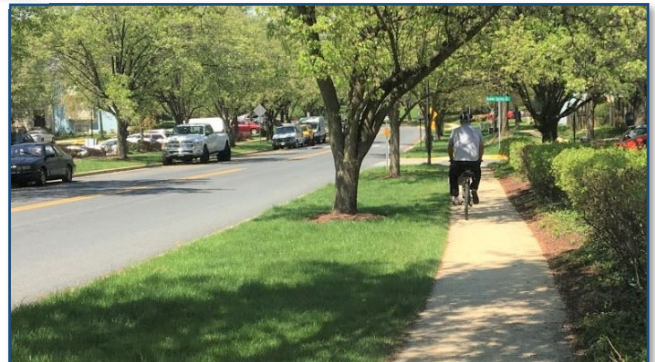




Figure 2-12: Bicyclists



Several bicyclists were also seen along the study corridor (Figure 2-12). Most of bicyclists seen were traveling on the sidewalks of Morningwood Drive, with fewer cyclists traveling on the vehicle roadway.



Several school buses were seen along the corridor in the morning and afternoon. Some school buses were entering Bantry Way (south) for the bus riders in the apartment community and exiting Bantry Way (north) after a few minutes, and other school buses were stopping for riders on Morningwood Drive between Bantry Way (north) and Golden Spring Court, thereby causing other traffic to stop, as shown in Figure 2-13.

Figure 2-13: Traffic Stopped for School Bus

(a) Eastbound
Morning



(b) Westbound
Afternoon

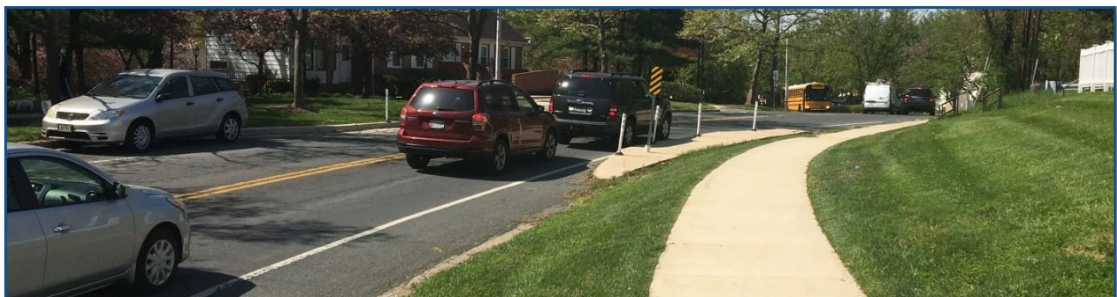




Figure 2-14: School Buses turning around at Side Streets



(a) At Golden Spring Court



(b) At Softwood/Vintage River Terrace



(c) A student riding on School Bus

There are four Ride On bus stop signs along the study corridor section. A couple of Ride On buses (#52) were seen on Morningwood Drive but were not seen stopping at these locations on the field review. Figure 2-15 shows the bus stop between Bantry Way (north) and the apartment office driveway.

Figure 2-15: Ride On Bus Stop





3 Crash Data Analysis

The Montgomery County Crash Reporting dataset provides information about each reported crash since January 1, 2015 occurring on roadways within Montgomery County, as collected via the Automated Crash Reporting System (ACRS) of the Maryland State Police, and reported by the Montgomery County Police, Gaithersburg Police, Rockville Police, or the Maryland-National Capital Park Police.

This study compiled all of the crash data available (2015 through Spring 2021) for the study segment along Morningwood Drive from Homeland Drive to Georgia Avenue. Table 3.1 presents traffic crashes and severity trends over the latest six+ years. Eleven crashes occurred from 2015 through Spring 2021 in this section. On average, approximately two reported crashes occurred every year in the corridor segment. Four out of the eleven crashes resulted in injuries and there were no reported fatalities. Details of the crash data are provided in Appendix 2.

Table 3-1: Morningwood Drive Segment (Homeland Dr. to Georgia Ave.) Reported Traffic Crash Severities (2015-2021)

Year	2015	2016	2017	2018	2019	2020	2021*	Total	%
Fatal Crashes	-	-	-	-	-	-	-	-	-
Injury Crashes	2	1	1	-	-	-	-	4	36.4
Property Damage Crashes	-	1	2	1	-	2	1	7	63.6
Total	2	2	3	1	-	2	1	11	100.0

*: The 2021 data are from January 2021 through April 2021.

Based on the mile point (MP) data where each crash was reported to occur, the eleven crashes were sorted by location. As shown in Table 3-2, four crashes occurred at the Georgia Avenue intersection (36%), and three crashes occurred at the Bantry Way (south) intersection (27%). The Homeland Drive crash was an injury crash, and one-half of the Georgia Avenue intersection crashes were also injury crashes.

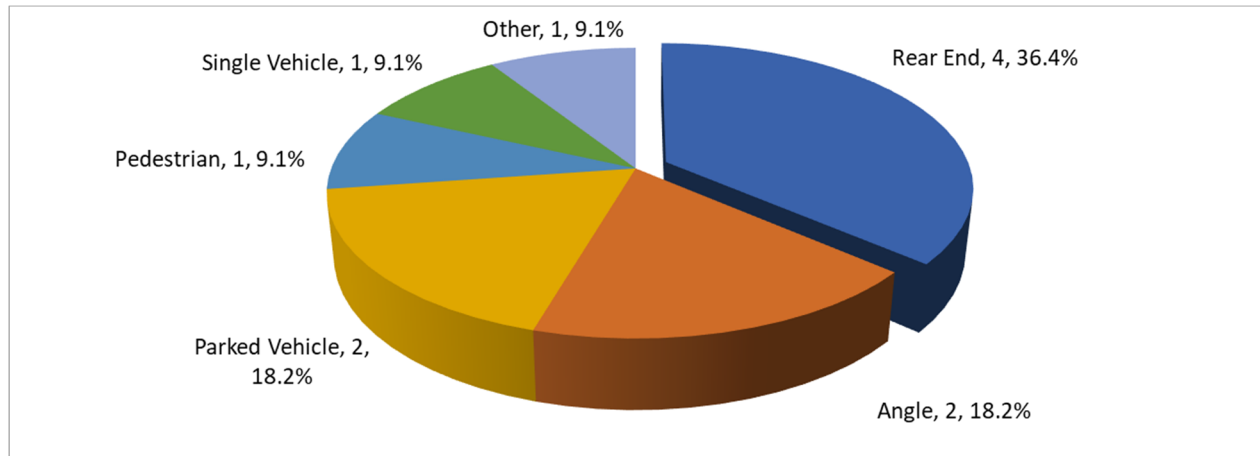
Table 3-2: MD 97 Corridor Reported Crashes by Location (2015-2021)

Crossing Streets	Total Crashes	%	Injury Crashes	% of Total Crashes
At Homeland Drive (MP 1.25)	1	9%	1	100%
At Golden Spring Court (MP 1.38)	2	18%	0	-
At Bantry Way (North) (MP 1.42)	1	9%	0	-
At Bantry Way (South) (MP 1.49)	3	27%	1	33%
At Georgia Ave (MP 1.63)	4	36%	2	50%
Total	11	100%	4	40%



As shown in Figure 3-1, the most frequent collision type in the study section was the same direction Rear End (36.4%), followed by Angle and Parked Vehicle (both 18.2%). One pedestrian crash occurred near the Georgia Avenue intersection. No bicyclists were reported to be involved in any of the crashes. The Single Vehicle crash involved a vehicle that collided with the curb near Bantry Way (south) and overturned.

Figure 3-1: Study Section Reported Crashes by Collision Type (2015-2021)



Note: Three out of four “Other” type collisions in the dataset are listed as Parked Vehicle and Pedestrian in this chart by considering the 1st Harmful Event involved.

Table 3-3 shows temporal patterns for the corridor crashes. The highest number of total crashes occurred between Noon and 3 PM (27.3%). Friday, Saturday, and Sunday had the highest number of crashes of the days of week; ten of the eleven crashes occurred on those three days. No notable seasonal pattern was revealed from the data.

Table 3-3: Temporal Crash Patterns (2015-2021)

Time of Day	Midnight to 6:00 AM	6:00 AM to 9:00 AM	9:00 AM to Noon	Noon to 3:00 PM	3:00 PM to 6:00 PM	6:00 PM to 9:00 PM	9:00 PM to Midnight	Total
Crashes	1	2	1	3	2	1	1	11
%	9.1%	18.2%	9.1%	27.3%	18.2%	9.1%	9.1%	100.0%
Day of Week	Sunday	Monday	Tuesday	Wed.	Thursday	Friday	Sat.	Total
Crashes	3	0	0	1	0	4	3	11
%	27.3%	0.0%	0.0%	9.1%	0.0%	36.4%	27.3%	100.0%
Month	Dec.-Feb.	March-May	June-August	Sep.-Nov.	-	-	-	Total
Crashes	3	3	3	2	-	-	-	11
%	27.3%	27.3%	27.3%	18.2%	-	-	-	100.0%



Table 3-4 provides crashes by weather, roadway surface, and light conditions and Driver Substance Abuse. Clear weather and Dry condition accounted for 90% and 100%, respectively, of the total crashes. Hence, weather and roadway surface conditions do not appear to be major contributing factors to the Morningwood Drive crashes. There were two alcohol-related crashes in the data: one occurred at Homeland Drive and the other occurred near Golden Spring Court. There were multiple collisions with parked cars in the vicinity of the Golden Spring Court intersection after dark.

Table 3-4: Crashes by Weather, Surface, Light, and Driver Substance Use Condition (2015-2021)

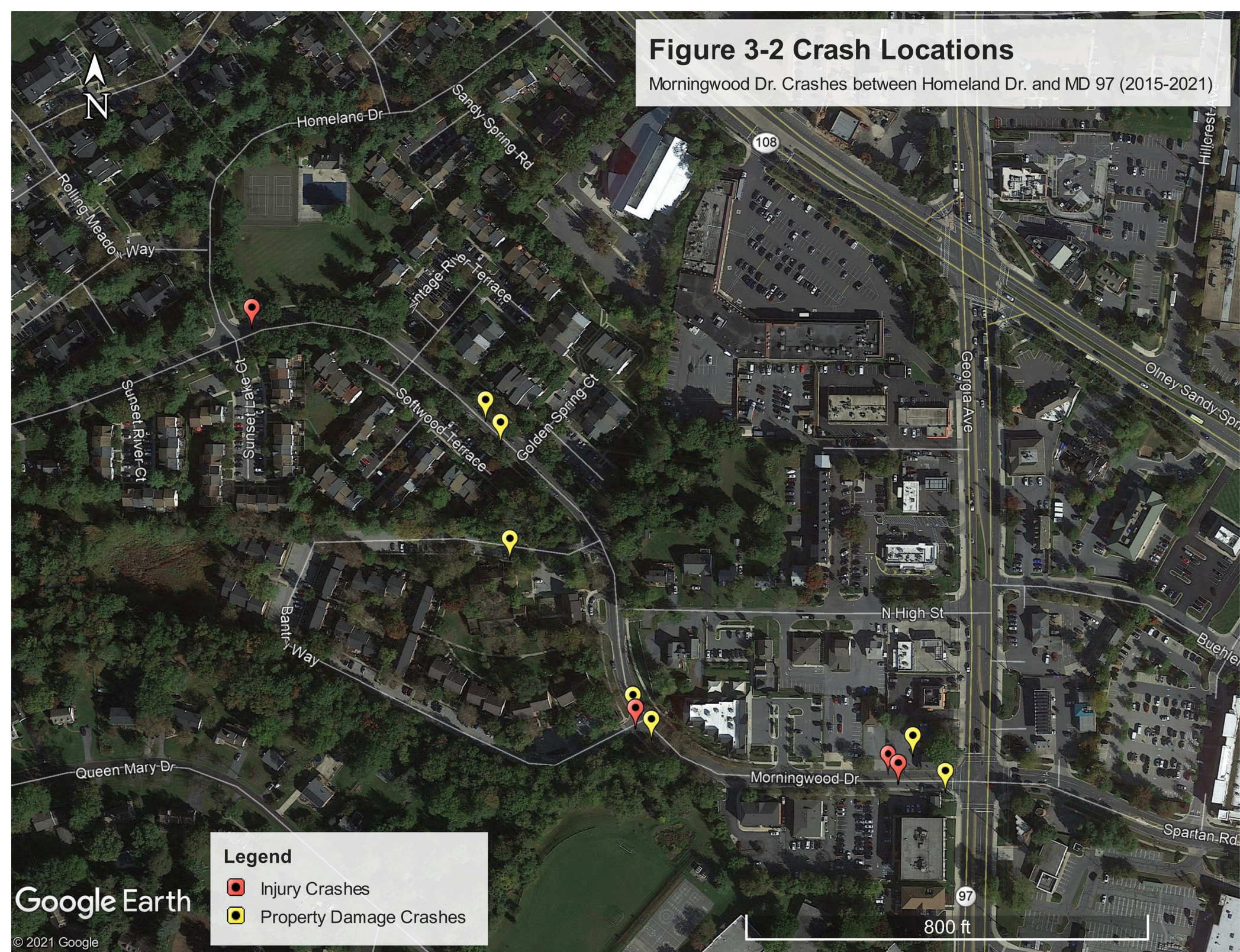
Weather	Clear	Cloudy	Raining	Foggy	Total
Crashes	9	2	0	0	11
%	81.8%	18.2%	0.0%	0.0%	100.0%
Surface	Dry	Wet	Snow	Ice	Total
Crashes	11	0	0	0	11
%	100.0%	0.0%	0.0%	0.0%	100.0%
Light	Day Light	Dark - Street Light On	Dawn	Dusk	Total
Crashes	8	3	0	0	11
%	72.7%	27.3%	0.0%	0.0%	100.0%
Driver Substance Abuse	Alcohol Present	Alcohol Present/None Detected	None Detected	N/A	Total
Crashes	2	1	6	2	11
%	18.2%	9.1%	54.5%	18.2%	100.0%

Figure 3-2 presents the crash locations identified in the crash data, based on the latitude and longitude coordinate data. Four crashes occurred near the driveways along the west leg of the Morningwood Drive/Georgia Avenue intersection. Some crashes have conflicting XY coordination data with the location descriptions. For such cases, their crossing street name and mile point were used in mapping the crash locations (Crashes #4, #7, and #10).

The most prevailing crash pattern involved vehicles entering/exiting the business parking lots near the MD 97 intersection, where one pedestrian was injured. The second notable pattern was the crashes in the Bantry Way (south) intersection. Two crashes near Golden Spring Court and one crash at Homeland Drive included collisions with parked vehicles during nighttime, though the crash at Homeland Drive was recorded as a rear-end collision.

Figure 3-2 Crash Locations

Morningwood Dr. Crashes between Homeland Dr. and MD 97 (2015-2021)



Legend

- Injury Crashes
- Property Damage Crashes



4 Speed Study

4.1 Recorded Speed Data

Weekday speed data along the study corridor was collected on March 9th (Tuesday) and 10th (Wednesday), 2021 along Morningwood Drive near the North High Street steps (Figure 4-1). Table 4-1 shows that the 85th percentile speed (the speed at which 85 percent of drivers remain at or under) over the course of two days was approximately 28 mph, and the average speed was around 25 mph, in both directions. The SB/EB speeds were slightly higher than for NB/WB. The highest speed was approximately 53 mph between 1-2 AM in the westbound direction, and the lowest speed was about 6 mph in both directions. It appeared that the lowest speeds were measured in the 3-4 PM period for westbound Morningwood Drive and in the 4-6 PM periods for eastbound (see Appendix 3). 30-mph speed limit signs are posted along Morningwood Drive in both directions.

Figure 4-1: Location to Collect Speed Data



Table 4-1: Corridor Speed Study Summary

	3/9/2021		3/10/2021		Total	
	NB (WB)	SB (EB)	NB (WB)	SB (EB)	NB (WB)	SB (EB)
50th Percentile	24.05	25.05	24.27	25.61	24.16	25.39
85th Percentile	27.29	28.52	27.51	29.3	27.4	28.97
Avg. Speed	24.1	25.0	24.2	25.5	24.1	25.2
Max. Speed	37.7	52.6	52	52	52	52.6
Min. Speed	10.7	6.3	6.3	6.3	6.3	6.3
Standard Deviation	3.30	3.88	3.41	4.09	3.35	3.99
Total vehicles Measured	2,076	1,538	2,132	1,520	4,208	3,058

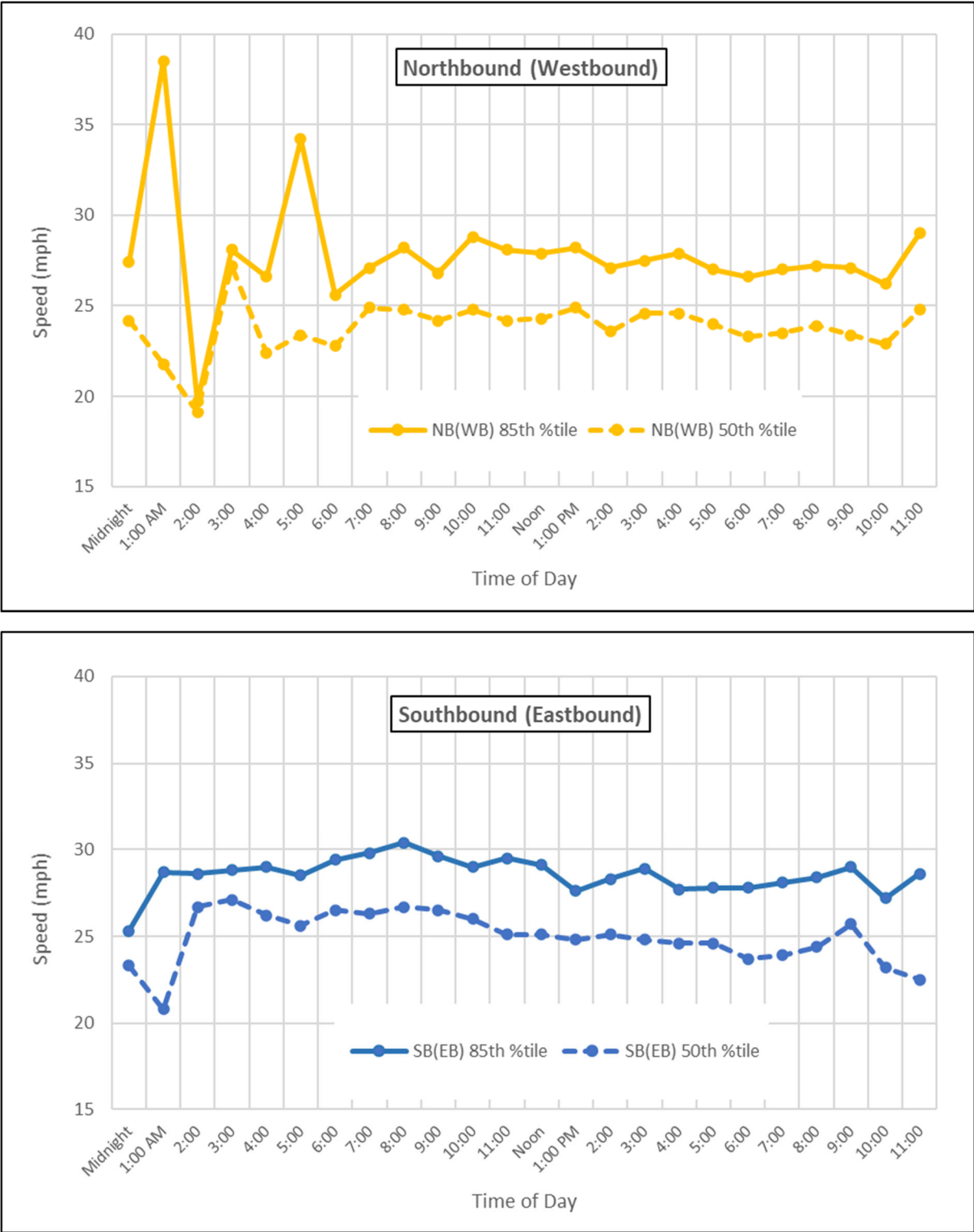
Figure 4-2 presents the speed distributions over the time of day in the two days, showing the 85th percentile and the 50th percentile speeds over time. The charts indicate that overall speed variations are not significant in either direction, except for some nighttime hours in the northbound direction where there are small sample sizes. It should be noted that a MCDOT speed/volume analysis for this location conducted in 2016 determined an 85th percentile speed of 31 mph. A follow-up speed study could be done in the Fall of 2021 or later when volumes (pedestrian and vehicles) return to closer to pre-pandemic levels with more complete opening of schools and businesses.

85th percentile speeds in off-peak periods unaffected by interference from heavier traffic volumes are a common measure used to determine posted speed limits. Off-peak 85th percentile speeds with more



than 100 vehicles per hour for any day were approximately 27-29 mph in each direction. Appendix 3 shows the speed data measured by each of the days.

Figure 4-2: Speed Distribution by Time of Day (Two Days)





4.2 Calculated Speed Limits

Based on the speed data and field data, this study calculated a recommendation for a posted speed limit by use of USLIMITS2, which is a Federal Highway Administration (FHWA) web-based tool designed to recommend reasonable, safe, and consistent speed limits for specific segments of roads. Table 4-2 presents the major input data and resultant recommended speed limit from the tool, showing that the recommended speed limit of the study corridor based strictly on these inputs is 25 mph, which is 5 mph lower than the current posted speed limit. This recommended speed is consistent with the draft Montgomery County Complete Streets design guide (to be adopted by the end of 2021) for the posted speed on a "Neighborhood Connector" road. Details of the USLIMITS2 method are provided in Appendix 4.

Table 4-2: USLIMITS2 Input Data

Segment	Homeland Drive to Georgia Avenue (MD 97)
Route Type	Road Section in Developed Area
Existing Speed Limit	30 mph
Adverse Alignment	Yes
Length	0.6 miles
Number of Thru Lanes	2
Number of Driveways/Access Points	17
Area Type	Residential-Collector/Arterial
85th Percentile Speed	28
50th Percentile Speed	25
AADT	4961*
On Street Parking and Usage	High
Pedestrian / Bicyclist Activity	High
Crash Data Years	6 (2015-2020)
Crash AADT	4776**
Total Crashes	10
Injury Crashes	4
Section Crash Rate	153 per 100 MVM
Section Injury Crash Rate	61 per 100 MVM
Crash Rate Average for Similar Roads	217***
Injury Rate Average for Similar Roads	66***
Recommended Speed Limit	25 mph

* 2019 AADT

** Average AADT from 2015 to 2020

*** The rates from the Highway Safety Information System by FHWA were used here.



5 Sight Distance Analysis

The current posted speed limit and design speed along Morningwood Drive is 30 mph. For a design speed of 30 mph, the intersection sight distance per AASHTO intersection sight distance guidance for “Case B – Intersections with Stop Control on the Minor Road” (AASHTO 2018 Table 9-6 pg. 9-44) should be at least 331 feet for left turns and 290 feet for right turns.

Figure 5-1 shows sight triangles from an imaginary car looking from the proposed connection of North High Street to Morningwood Drive. Looking left from North High Street, the required minimum sight line potentially cuts into the hillside and white picket fence (see Figure 5-2), establishing a sight distance of about 250 feet. Looking right from North High Street, the needed sight line could cut through a wooded area and fence (see Figure 5-3), establishing a sight distance of about 250 feet. Additionally, before the end of the sightline is the start of the parking lane allowed along southbound Morningwood Drive, creating another visual obstruction.

Figure 5-1: North High Street Intersection Required Sight Distance





Figure 5-2: Looking Left at Proposed North High Street Connection



Figure 5-3: Looking Right at Proposed North High Street Connection





In order to achieve the required intersection sight distance for the proposed connection of North High Street to Morningwood Drive, extensive grading and Right-of-Way impacts may be required. Existing utilities would also need to be investigated for potential impacts in this area. Potential solutions to avoiding these impacts would be to implement a right-in/right-out configuration or an all-way stop condition at the proposed North High Street connection. The right-in/right-out configuration would eliminate the intersection sight distance requirement for left turning vehicles. The intersection sight distance requirement for right turning vehicles would still need to be achieved. The all-way stop condition would eliminate all intersection sight distance requirements because the turning vehicles would be protected by the stop condition of all vehicles. A Synchro analysis of this intersection with an all-way Stop shows that it would operate at a LOS A in the AM and PM peaks (Appendix 5).

Figure 5-4 shows intersection sight distance sight triangles for the remaining five existing intersections within the study area.

Figure 5-4: Existing Intersections Intersection Sight Distance



(a) Bantry Way (South)



Morningwood Drive Safety Analysis



(b) Bantry Way (North)



(c) Golden Circle Court



(d) Vintage River Terrace



(e) Softwood Terrace



(f) Homeland Drive



The only existing intersections that have obstructions to required intersection sight distances are right and left turns from Bantry Way (north) and both left and right turns from Softwood Terrace. At Bantry Way (north), right and left turn sight distance is obstructed by a wooded area and parked cars along Morningwood Drive (see Figure 5-5). At Softwood Terrace, right turn sight distance is obstructed by trees and parked cars in the adjacent parking lot (see Figure 5-6) and left turn sight distance is obstructed by trees and parked cars along Morningwood Drive (see Figure 5-7). Trimming of vegetation and limits on street parking would enhance sight distance at these locations.

Figure 5-5: Looking Left at Bantry Way (North)



Figure 5-6: Looking Right at Softwood Terrace





Figure 5-7: Looking Left at Softwood Terrace





6 Pedestrian Facilities Review

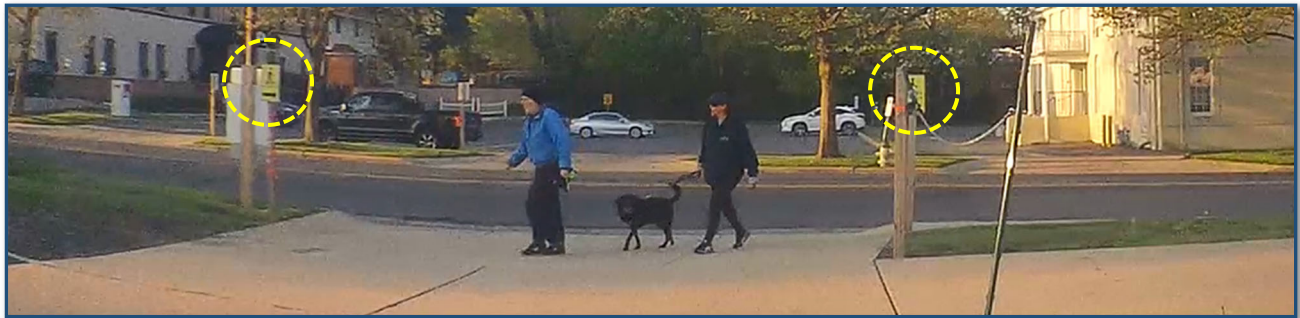
Sidewalks are provided along both sides of the Morningwood Drive study section. For the west/south side of the roadway, the sidewalk is provided along the entire corridor from Homeland Drive to MD 97, while for the east/north side, the sidewalk does not reach MD 97, ending after the Goddard School parking lot. The entire length of sidewalk on the west/south side of the study corridor and the sidewalk on the east/north side of the study corridor from Homeland Drive to the proposed N. High Street connection is four feet wide, thus not conforming to the ADA requirement of a minimum sidewalk width of five feet or the draft Complete Streets design guide recommendation of six feet for a sidewalk and 8 feet for a sidepath. The sidewalk on the east/north side of the study corridor is five feet wide from just north of the proposed N. High Street connection to the end of the sidewalk after the Goddard School parking lot (see Figure 6-1), again not meeting the Complete Streets guidance. ADA pedestrian ramps are provided at each intersection and across the driveways along the entire Morningwood Drive corridor. Any pedestrian ramp along the sidewalk areas that are four feet wide do not meet ADA requirements. All the sidewalk and pedestrian ramps along the west/south side of Morningwood Drive and the portion that is four feet wide along the east/north side of Morningwood drive would need to be reconstructed to be six feet wide in order to be ADA and Complete Streets compliant.

Figure 6-1: ADA Deficient Sidewalks



Figure 6-2 shows that pedestrians with a dog were walking through the parking lot at the end of the sidewalk near the Chang Hai Restaurant. Non-standard pedestrian crossing signs are placed at the parking lot access, as shown in the circles of the figure. The opposite driveways also have the same pedestrian crossing signs posted.

Figure 6-2: End of Sidewalk on the Morningwood Drive north side and Pedestrian Crossing Signs



The ADA pedestrian ramps are provided across the driveways along the Morningwood Drive corridor, as shown in Figure 6-3. It appeared that the pedestrian ramp across the 3420 Block driveway of Morningwood Drive does not conform to the ADA standard as it is without a detectable warning surface (Figure 6-1(d)).

Figure 6-3: Pedestrian ADA Ramps across Driveways along Morningwood Drive



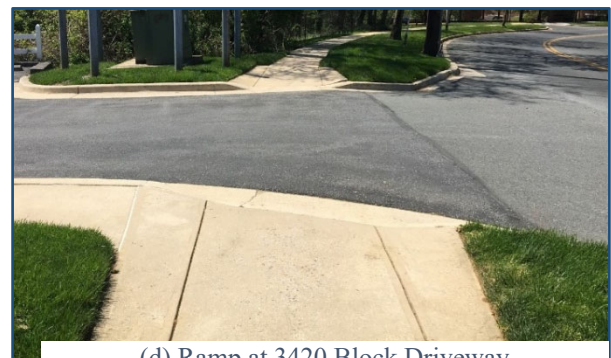
(a) Ramp at Goddard School



(b) Ramp at Towne Center Place Driveway



(c) Ramp at Silverwood Terrace



(d) Ramp at 3420 Block Driveway



7 Signing, Pavement Markings, and On-Street Parking

30 mph speed limit signs are posted in advance of the crosswalk at the Goddard School parking lot in both directions. The westbound traffic speed on the corridor can be controlled with this speed sign over the corridor after entering Morningwood Drive from MD 97 (See Figure 7-1(a)). However, for the eastbound traffic, no speed limit sign is posted, except for the advisory speed plaques at speed humps, along the Morningwood Drive corridor from Cashell Road to the sign near the school (Figure 7-1(c)). For Cashell Road, the speed limit signs of 35 mph are posted in both directions. The No Parking sign on the westbound receiving lane of the MD 97/Morningwood Drive intersection is faded and needs to be replaced or fixed (Figure 7-1(b)).

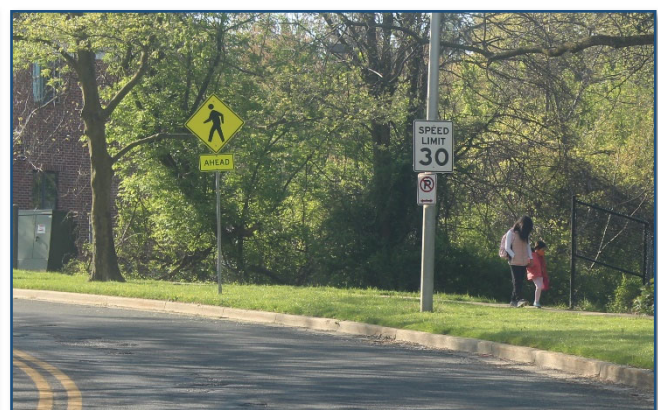
Figure 7-1: Traffic Signs in advance of Crosswalk



(a) WB Traffic Signs



(b) WB Pedestrian Crossing/Ahead and No Parking Signs



(c) EB Pedestrian Crossing/Ahead and Speed Limit Signs

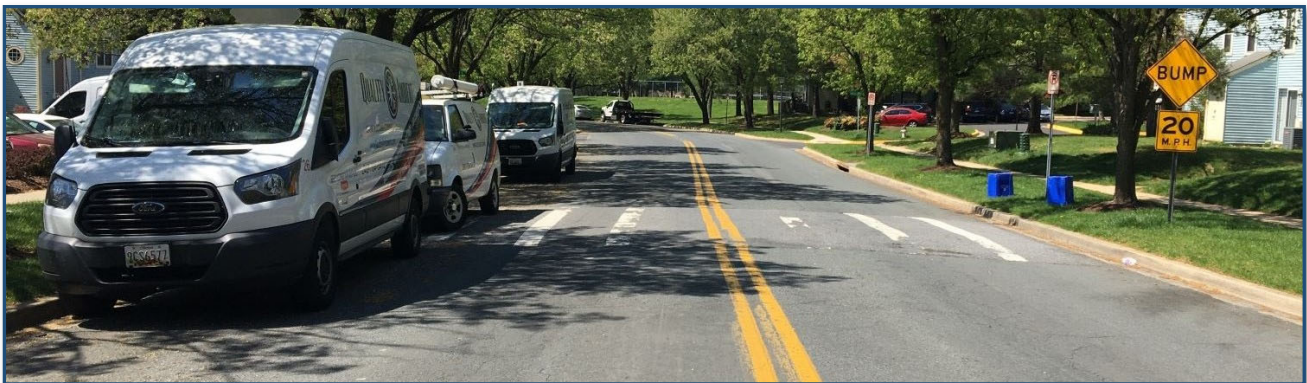
One speed hump on Morningwood Drive is provided between Vintage River Terrace and Golden Spring Court. In conjunction with the hump, Bump and 20 mph-advisory speed plaque signs are provided. As shown in Figure 7-2, the speed hump marking is faded and is not installed per MUTCD standards (MUTCD 3B.25 and 3B.26). A few commercial vans were seen parked on the street near the speed hump all day. It is possible that parked vehicles block the speed bump signs.



Figure 7-2: Speed Hump and Parked Vehicles on Morningwood Drive



(a) Looking east

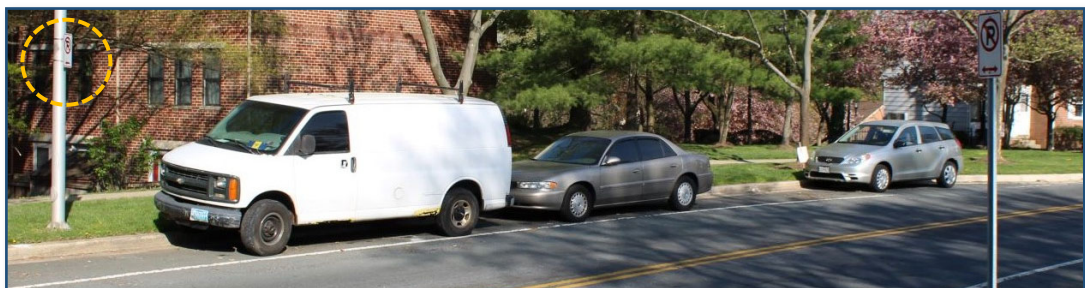


(b) Looking west

Figure 7-3(a) shows vehicles that parked on the southbound shoulder between the apartment office driveway and Bantry Way (south). Those three vehicles on the shoulder were parked for the full time of the site review. Although this parking is not illegal, the parking on the narrow shoulder induces potential safety issues at this curve segment, such as sight distance for pedestrian traffic and causing some traffic to go over the roadway center line to pass. Figure 7-3(b) shows that the right-side wheels of the van is on the curb for the vehicle to be able to stay outside of the lane edge line. Figure 7-3(c) demonstrates that a Ride On Bus is crossing the centerline, probably due to the presence of adjacent parked vehicles.

Figure 7-3: Parked Vehicles on SB Shoulder near Bantry Way (South)

(a) Parked Vehicles on Shoulder





(b) Parked Vehicle on Curb



(c) Bus Crossing Ceterline

Also, parked vehicles affect the left sight distance from Bantry Way (south). Figure 7-4(a) shows a minivan was standing/parking on the shoulder in the reverse direction to pick an elementary student from the school trail in the afternoon. This vehicle was standing/parking beyond the parking area available from the No Parking sign in the circle drawn in Figure 7-3(a).

Figure 7-4: Illegal Parking/Standing near Bantry Way (south)



(a)
Illegal
Parking



(b) Vehicle
Standing on
Narrow Shoulder

Figure 7-4(b) shows a vehicle crossing the centerline on the curve section due to the standing minivan on the northbound shoulder in the afternoon. It appeared that the minivan driver was stopping the vehicle on the shoulder in order to throw trash away into the trash can in the adjacent resting space with benches.

On-street parking is available on the straight segment of eastbound Morningwood Drive between Softwood Terrace and Bantry Way (north), and some part of the westbound Morningwood Drive between Vintage River Terrace and Homeland Drive (Figure 7-7). “No Parking” signs regulate the street parking locations. There are no marked bicycle facilities along the roadway or sidepaths.

Figure 7-5: Parked Vehicles on the EB Morningwood Drive



The draft Montgomery County Complete Streets guide recommended design parameters for Neighborhood Connector roadways state that lanes should be striped to 10.5 feet wide. The lane widths along the corridor are typically 17-18 feet where shoulders are not marked, and 12 feet where they are marked. Marking the lanes for the recommended 10.5 feet could be a method for traffic calming and provide more defined parking and/or bicycle facilities where allowed.

In the 2020 virtual public meeting, one resident commented about the All-Way Stop at the Morningwood Drive/Headwaters Drive intersection noting that many people do not come to a full stop at that intersection, treating the Stop signs as suggestions. In the field observations, the operation of All-Way Stop at Headwaters Drive appeared with the standard signage and pavement markings, including advanced warning signs on Morningwood Drive. However, it should be noted the observations of drivers was limited to single day.



Figure 7-6: All-Way Stop Control at Morningwood Drive/Headwaters Drive Intersection

- (a) Stop Signs and Crosswalk



- (b) Advance Stop Warning Sign





Figure 7-7: Current On-Street Parking Locations





8 Potential Safety Needs/Improvements for the Corridor

Based on the information found in the field observations, and review of crash and speed data, the following are recommendations to consider for enhancing pedestrian, bicycle, and vehicular safety along Morningwood Drive. These may be done as standalone changes or in combination.

Signage

- Consider lowering the posted speed limit to 25 mph from 30 mph in the study corridor section while also looking at factors such as corridor and network context.
- If lowering the posted speed limit is not available along the corridor, provide the horizontal alignment signage in advance of Bantry Way (north and south) and the speed warning plaques of 20 or 25 mph.
- Provide additional speed limit signs along Morningwood Drive.
- Replace the faded No Parking sign (R7-1(1)) along the westbound receiving lane of the MD 97/Morningwood Drive intersection (south side of the gift shop).
- Provide Advance warning signs for the speed bump or eliminate adjacent parking.
- Provide additional pedestrian/school zone signage along Morningwood independently or as part of a new crosswalk as discussed below.

Pedestrian Facilities

- Consider providing a marked and signed crosswalk on Morningwood Drive near Bantry Way (north) and corresponding pedestrian crossing signage as this appears to be a location with pedestrian demand to cross. If N. High Street is connected to Morningwood, consider placing the crosswalk at this location. Pedestrian count data for the study area, including counts from Olney Elementary School, need to be evaluated for identifying possible crosswalk locations. If marked crosswalks are warranted, additional pedestrian facilities including bump outs, pedestrian refuge islands, lighting, and flashers can be considered. This data may be collected once schools reopen in the fall assuming a more complete reopening of the school system to in-person learning.
- Update the pedestrian ramp across 3420 Block Driveway to ADA-conformity with detectable warning surface.
- Upgrade four-foot and five-foot sidewalks and pedestrian ramps to be six feet to comply with ADA design standards and the draft Montgomery County Complete Streets design guide (to be approved later in 2021).
- Extend the sidewalk adjacent to the Chinese Restaurant along the north side of the Morningwood Drive toward MD 97, if feasible, to complete this pedestrian connection. This may require redevelopment of the adjacent property on the corner of MD 97/Morningwood Drive in order to have room to do so to provide the recommended 6 feet plus space for Maintenance and Street Buffers.

On-Street Parking

- Consider removing on-street parking on southbound Morningwood Drive between Bantry Way (south) and Bantry Way (north), utilizing No Parking signs (R7-1(1)) and curb markings on the



existing shoulders, to improve sight distance for turning vehicles and crossing pedestrians. Would also provide more on-street space for bicycle traffic.

- Consider removal of on-street parking along the eastbound (southbound) Morningwood Drive from Golden Spring Court to Bantry Way (north), utilizing No Parking signs and curb markings on the existing shoulders, to improve sight distance for turning vehicles and crossing pedestrians. Would also provide more on-street space for bicycle traffic.
- Removal of any parking would need to include coordination with adjacent property owners to understand impacts.

Pavement Markings

- Reinstall the markings on the speed hump using MdMUTCD-standard markings and provide advance speed hump markings.
- Provide yellow crosshatch curb markings on the existing shoulders near Bantry Way (south), the North High Street steps, and the apartment office driveway where parking is not allowed to discourage illegal stopping.
- Provide pavement markings so that the width of travel lanes for this "Neighborhood Connector" roadway are 10.5 feet per the draft County Complete Street Design Guide (to be adopted later this year). This would provide additional traffic calming and potential room for marked parking or bicycle space.

Vegetation Management and Visibility

- Coordinate with property owners and County maintenance to review and clear vegetation where it interferes with sight distances.
- Review lighting near the Golden Spring Court intersection where there were multiple parked car collisions after dark.

Access Control

- Consider possible consolidation of access points to Morningwood Drive for the commercial properties near the MD 97 intersection. The connection of N. High Street may provide additional opportunities for access consolidation. It should be noted that consolidation is only possible with the desire to cooperate by the impacted property owners.
- For the proposed vehicular connection to N. High Street, consider making the new intersection an all-way Stop or a right-in/out connection to limit movements with limited sight distance.