

US 60 AND CAMPBELLS CREEK DRIVE

ROAD SAFETY ASSESSMENT

Regional Intergovernmental Council



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- Appendix A – Raw Traffic Counts
- Appendix B – Existing Capacity Analysis
- Appendix C– Crash Diagram
- Appendix D – Detailed Cost Estimate

1.0 Executive Summary

The purpose of this study is to analyze the existing safety conditions and traffic operations and to determine potential countermeasures to mitigate crashes at the intersection of US 60 and Campbells Creek Drive in Kanawha County, West Virginia.

US 60 is a four-lane two-way divided roadway and Campbells Creek Drive is a two-lane two-way undivided roadway. Sidewalks are not provided along either roadway. Overhead lighting is provided at the intersection, but it is sparse along US 60 and not provided along Campbells Creek Drive. A few pedestrians and bicyclists were observed traveling through the intersection during the field visit. Pedestrian facilities (i.e., crosswalks, pedestrian push buttons, and pedestrian signal heads) are not provided at the intersection. According to the Kanawha Valley Regional Transportation Authority (KRT), a bus stop is located on the northbound right-turn channelized island at the intersection. Semi-trucks and large vehicles turning left from the southbound approach were observed driving over the left-turn lane due to its close proximity to the receiving lane.

Crash data from January 1, 2016 to December 31, 2020 was downloaded from the ReportBeam website. In the five-year study period, there were 21 crashes with seven (33 percent) resulting in injury. No fatalities were reported at this intersection. Rear end collisions were the most prominent crash type accounting for 12 total crashes with three (25 percent) resulting in injury. The highest crash patterns at the intersection were rear end collisions in the northbound and southbound direction, likely due to both the high speed at which drivers are traveling through the intersection and driver inattention. Angle collisions were the second most frequent crash type with five crashes of which three (60 percent) resulted in injury. Out of the five angle collisions, two occurred when southbound left-turning vehicles struck vehicles waiting in the westbound left-turn lane on Campbells Creek Drive. The two fixed object crashes that occurred in the study area were due to wet road conditions causing vehicles to lose control and strike the median barriers and rock wall along the roadway.

While not directly at the intersection, a fatal pedestrian crash occurred approximately 0.2 mile south of the intersection on northbound US 60. Poor lighting along the corridor may have contributed to the severity of this crash.

Based on the crash patterns and traffic operations in the study corridor, the following countermeasures are recommended:

- Coordinate with the West Virginia Department of Transportation (WVDOT) to improve lighting along US 60.
- Coordinate with KRT to relocate or remove the KRT bus stop.
- Restripe the Campbells Creek Drive approach to widen the receiving lane for left-turning trucks (\$22,000 – 2022 Dollars).
- Enhance police enforcement in the area.

2.0 Purpose and Location

The purpose of this study is to analyze the existing safety conditions and traffic operations and to determine potential countermeasures to mitigate crashes at the intersection of US 60 and Campbells Creek Drive in Kanawha County, West Virginia. The study area is shown in **Figure 1**.



Figure 1: Study Area

3.0 Existing Conditions

Roadway Conditions

US 60 is classified as a trunkline roadway with a posted speed limit of 45 mph. Campbells Creek Drive is classified as an essential arterial with a posted speed limit of 40 mph. US 60 is a four-lane two-way divided roadway and Campbells Creek Drive is a two-lane two-way undivided roadway. Sidewalks are not provided along either roadway. Overhead lighting is sparse along US 60 and is not provided along Campbells Creek Drive. However, there is lighting at the intersection. The land use along Campbells Creek Drive is mainly residential, with occasional commercial businesses located along the roadway. An interchange to I-64 is located approximately half a mile north of the intersection.

Intersection Conditions

The lane configuration for this signalized intersection is illustrated in **Figure 2**. The current signal has backplates on the northbound and southbound approaches of US 60. A new signal has been designed and is currently under construction. The intersection operates as a “Green-T” intersection, with the right-most southbound lane operating as a free-flowing movement, shown **Photo 1**. The southbound approach has protected left-turn signal phasing. The northbound right-turn movement is yield controlled. According to the Kanawha Valley Regional Transportation Authority (KRT), a bus stop is located on the northbound right-turn channelizing island, shown in **Figure 3**. Pedestrian facilities (i.e., crosswalks, pedestrian push buttons, pedestrian signal heads) are not provided at the intersection. The speed limit signage around the intersection is shown in **Figure 4**. Intersection ahead warning signs are present on both the northbound and southbound approaches. The majority of the intersection is constructed on bridge structure.

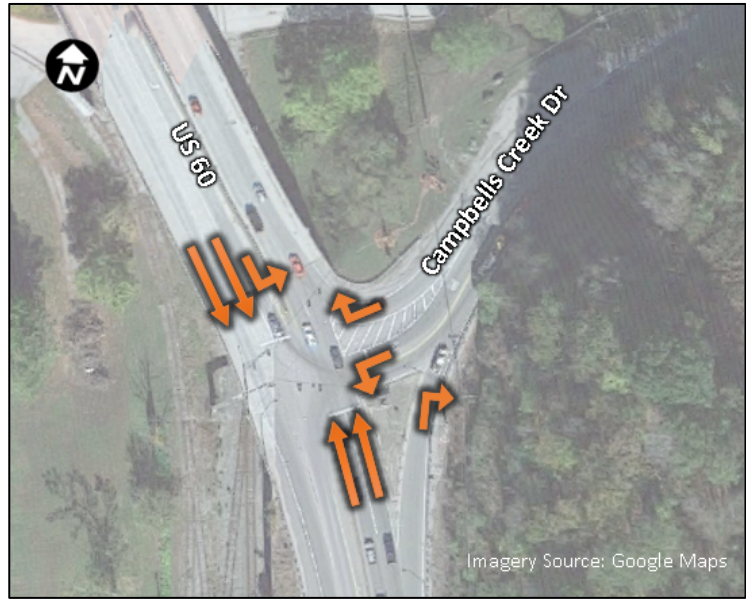


Figure 2: Lane Configuration



Photo 1: Free flowing Southbound Through Movement

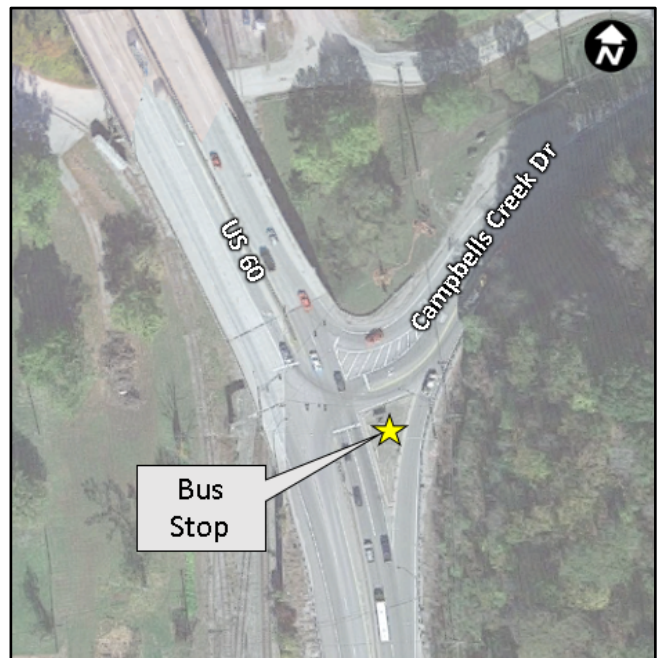


Figure 3: Bus Stop Location

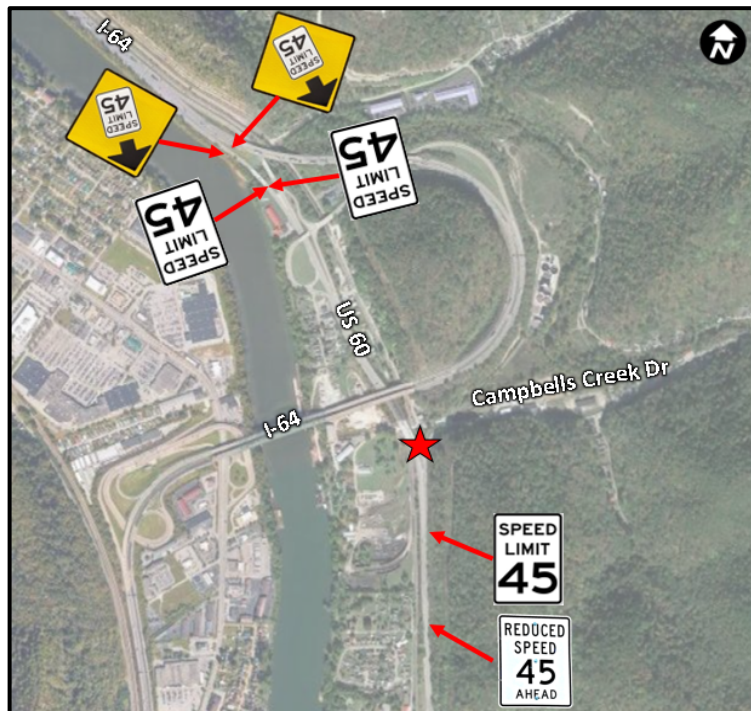


Figure 4: Speed Limit Signage

Site Visit Observations

A site visit was performed at the the intersection on April 6th, 2022 from 10:00 AM to 12:00 PM with two people from Burgess and Niple and one person from Regional Intergovernmental Council (RIC). A Deputy from the Kanawha County Sheriff's Office was present for a portion of the site visit. Observations from the site visit are summarized below:

- A few pedestrians and bicyclists were observed traveling through the intersection, shown in **Photo 2**.
 - When observing the traffic count camera footage, a pedestrian was also seen wandering around and into the center of the intersection at night, shown in **Photo 3**.
 - The Deputy indicated that pedestrians and bicyclists occasionally use US 60 to travel from the residential areas along Campbells Creek Drive to the communities located south of the intersection.
- Semi-trucks and large vehicles turning left from the southbound approach were observed driving over the left-turn lane due to its close proximity to the receiving lane, shown in **Photo 4**.
- Many of the drivers appeared to be exceeding the 45-mph speed limit during the field visit.
 - The Deputy indicated that, due to the narrow shoulders through this portion of US 60, it is very difficult to enforce the speed limit. Deputies do not have a location where they can pull over vehicles or watch for speeding vehicles.
- The lane-use and stop bar pavement markings on the westbound approach on Campbells Creek Drive were faded.
- The guardrail on the northern corner of the intersection was bent from a previous collision, shown in **Photo 5**.



Photo 2: Bicyclist Traveling Through the Intersection



Photo 3: Pedestrian Walking Through the Intersection at Night



Photo 4: Semi-Truck Traveling Through the Intersection



Photo 5: Guardrail on Northern Corner of Intersection

4.0 Data Collection

Turning movement counts were collected for 12 hours between 6:00 AM and 6:00 PM on Tuesday, April 5th, 2022 by Burgess and Niple. The peak hours were determined to be 7:15 AM to 8:15 AM and 4:00 PM to 5:00 PM. The rounded peak hour counts are shown in **Figure 5**. Raw traffic counts are provided in **Appendix A**.

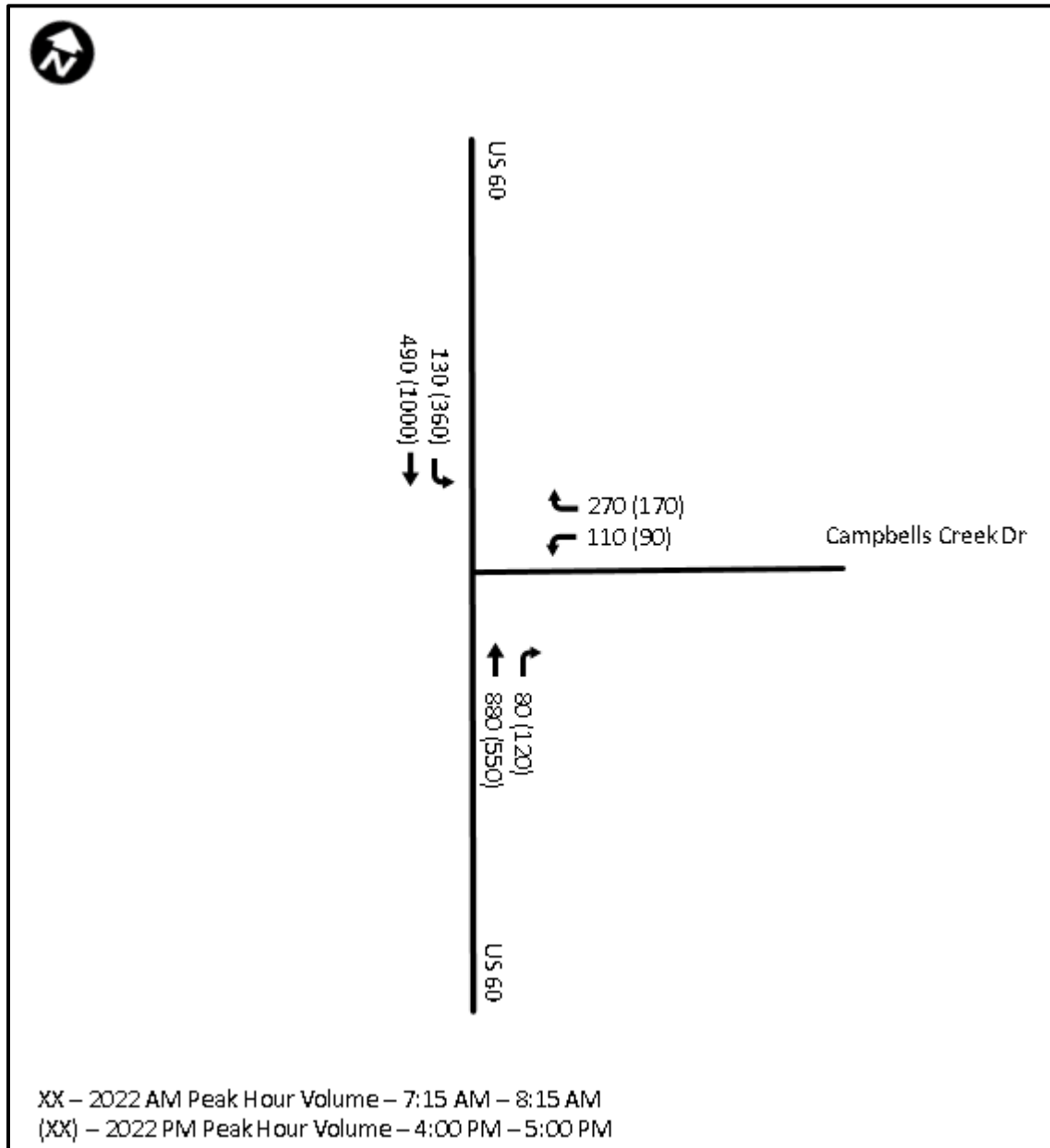


Figure 5: 2022 Existing Condition Peak Hour Counts

5.0 Existing Capacity Analysis

Intersection capacity was evaluated at the intersection of US 60 at Campbells Creek Drive using the existing 2022 peak hour traffic volumes, existing lane configurations, and existing traffic control using *Synchro*, version 11. *SimTraffic* was used to obtain 95th percentile queue lengths. *SimTraffic* is the microsimulation package included with *Synchro*. The results of five microsimulation runs were averaged together to obtain the results provided herein. The videos from the traffic counts were utilized to obtain approximate signal timings for the analysis. The existing conditions analysis is summarized in **Table 1** with analysis output provided in **Appendix B**.

Table 1: Existing Capacity Analysis at US 60 and Campbells Creek Drive

	Overall Intersection	Westbound Campbells Creek Dr		Northbound US 60		Southbound US 60	
		LT	RT	TH	RT	LT	TH
AM Peak Hour							
LOS	B	D	C	B	A	E	A
Delay	18.2	41.4	21.7	19.1	7.7	58.8	0.4
v/c		0.34	0.47	0.53	0.10	0.65	0.30
95 th % Queue		128'	62'	274'	40'	158'	0'
		C - 27.4		B - 18.2		B - 12.7	
PM Peak Hour							
LOS	B	D	A	C	B	D	A
Delay	17.1	38.5	7.3	26.4	10.1	48.2	1.4
v/c		0.28	0.22	0.47	0.21	0.82	0.60
95 th % Queue		113'	0'	234'	0'	288'	0'
		B - 18.1		C - 23.5		B - 13.8	

The existing intersection of US 60 and Campbells Creek Drive operates at level of service (LOS) B during both peak hours. The southbound left-turn movement operates at LOS E during the AM peak due to the amount of time provided for the conflicting mainline northbound through movement. However, the overall queue lengths are minimal and the delay is within four seconds of being considered LOS D.

6.0 Crash Analysis

Crash data from January 1, 2016 to December 31, 2020 was downloaded from the ReportBeam website. Each crash report was reviewed to determine potential factors contributing to crashes. A collision diagram that shows crash patterns by illustrating the approximate location of each reported crash is provided in **Appendix C**. In the five-year study period, there were 21 crashes with seven (33 percent) resulting in injury. No fatalities were reported at the intersection. **Figure 6** shows the crash frequency by year and severity.

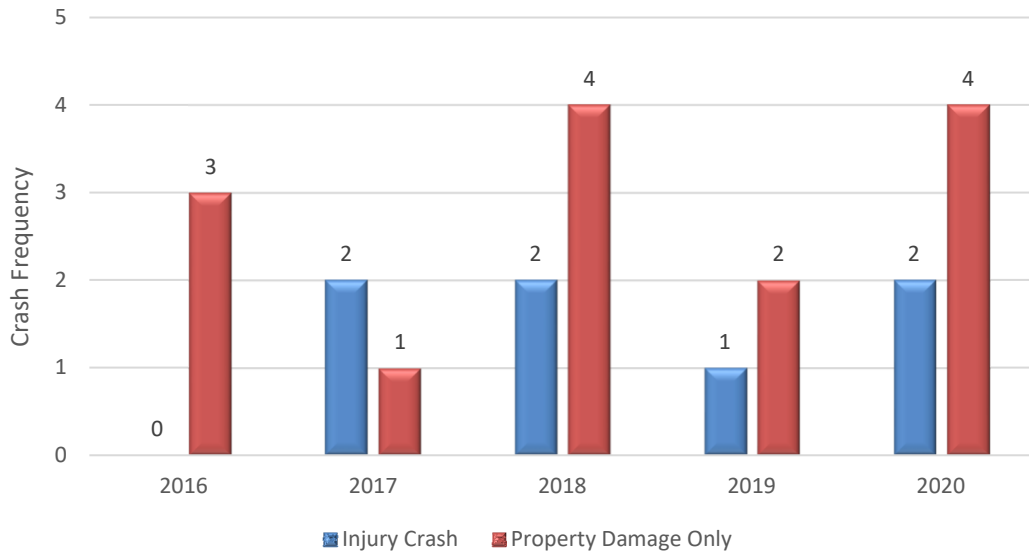


Figure 6: Frequency of Crashes by Year and Severity

Figure 7 shows the crash frequency in the study area by the crash type. Rear end collisions were the most prominent crash type accounting for 12 total crashes with three (25 percent) resulting in injury. Angle collisions were the second most frequent crash type with five total crashes of which three (60 percent) resulted in injury.

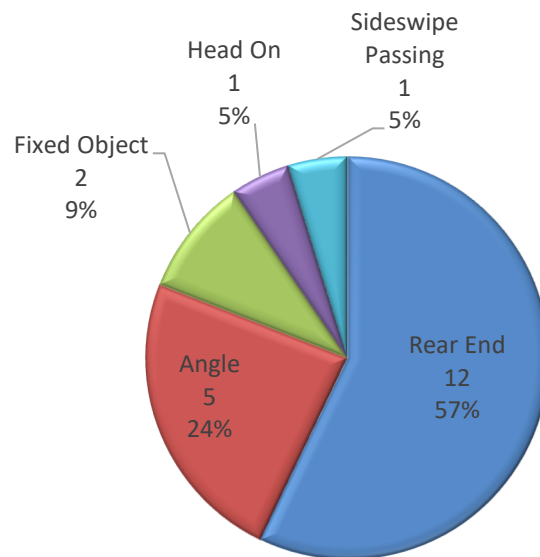


Figure 7: Frequency of Crashes by Crash Type

The highest crash patterns in the study area were rear end collisions in the northbound and southbound direction, likely due to both the high-speed at which drivers are traveling through the intersection and driver inattention.

Out of the five angle collisions, two occurred when southbound left-turning vehicles struck a vehicle waiting in the westbound left-turn lane on Campbells Creek Drive. The two fixed object crashes that occurred in the study area were due to wet road conditions causing vehicles to lose control and strike the median barriers and rock wall along the roadway.


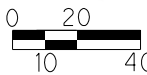
While not directly in the study area, a fatal pedestrian crash occurred approximately 0.2 mile south of the intersection on northbound US 60. Poor lighting along the corridor may have contributed to the severity of this crash.

7.0 Countermeasures for Consideration

The following countermeasures were identified to mitigate crashes and improve safety within the study area.

- **Coordinate with WVDOT to improve lighting along US 60.** The segments along US 60 outside of the intersection are not sufficiently lighted. While pedestrian and bicycle activity is not encouraged along this corridor, improving the lighting in corridor would help increase pedestrian and bicycle safety for those users that choose to walk and bike on the corridor. The lack of lighting along this corridor likely contributed to the severity of the fatal pedestrian crash that occurred along northbound US 60 south of the intersection. A lighting improvement project is likely part of a larger corridor project that should be facilitated through the WVDOT.
- **Coordinate with KRT to relocate or remove the KRT bus stop.** The current bus stop is in the raised island between the northbound through lanes and the channelized northbound right-turn lane, with no pedestrian accommodations at the intersection. This bus stop should be removed or relocated to improve pedestrian safety and prevent future collisions from occurring. Coordination with KRT will be necessary to modify the bus stop location. Per conversations with KRT, there are no ridership numbers for this stop, but bus drivers for this route will be asked for anecdotal information about ridership and the frequency of passengers boarding or alighting at this location.
- **Restripe the Campbells Creek Drive approach to widen the receiving lane for left-turning trucks.** While performing the field review, trucks were tracking over the westbound left-turn lane at Campbells Creek Drive. Restriping the approach will allow more space for vehicles to turn into Campbells Creek Drive. The layout of the restriping is shown in **Figure 8**.
- **Construct a roundabout.** A roundabout was analyzed at this intersection and would work operationally but the costs to build the roundabout on structure far outweigh the safety benefits that could be gained from the roundabout improvement.
- **Enhance police enforcement in the area.** Due to the pedestrian and bicycle activity observed along US 60, a high-speed facility, enhanced enforcement is recommended in the area to dissuade impaired users from walking and biking in the roadway.





 SCALE IN FEET

Restriping on Campbells Creek Drive Westbound Approach
BURGESS & NIPLE
 Engineers ■ Architects ■ Planners



FIGURE 8

8.0 Cost Estimate

The estimated cost of restriping the westbound approach is \$22,000. This cost estimate includes layout/staking along with a 30 percent contingency. Minor resurfacing is also included in the estimate. A detailed breakdown of the construction cost estimate is provided in **Appendix D**.

9.0 Conclusions and Recommendations

Based on the crash patterns and traffic operations in the study corridor, the following countermeasures are recommended:

- Coordinate with WVDOT to improve lighting along US 60.
- Coordinate with KRT to relocate or remove the KRT bus stop.
- Restripe the Campbells Creek Drive approach to widen the receiving lane for left-turning trucks (\$22,000 – 2022 Dollars).
- Enhance police enforcement in the area.