



PROJECT PIPELINE

**BR-23-07: MARION, VIRGINIA
US 11 (MAIN STREET) FROM S. HOLSTON
STREET TO MEDICAL PARK DRIVE AND VA 16
(PARK BOULEVARD) FROM RADIO HILL ROAD
TO US 11 (MAIN STREET)**





US 11 (Main Street) from S. Holston Street to Medical Park Drive and
VA 16 (Park Boulevard) from Radio Hill Road to US 11 (Main Street)

Complete Project Pipeline Study Report

August 2024

Prepared for



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Chapter 1:

Needs Evaluation and Diagnosis

Introduction

Project Pipeline is a performance-based planning program to identify cost-effective solutions to multimodal transportation needs in Virginia. Through this planning process, projects and solutions may be considered for funding through programs, including SMART SCALE, revenue sharing, interstate funding, and others. Visit the Project Pipeline webpage for additional information: vaprojectpipeline.org.

This study focuses on concepts targeting identified needs including congestion mitigation, safety improvement, pedestrian and bicycle infrastructure along the corridor, as well as transit access. The objectives of Project Pipeline are shown below in **Figure 1**.

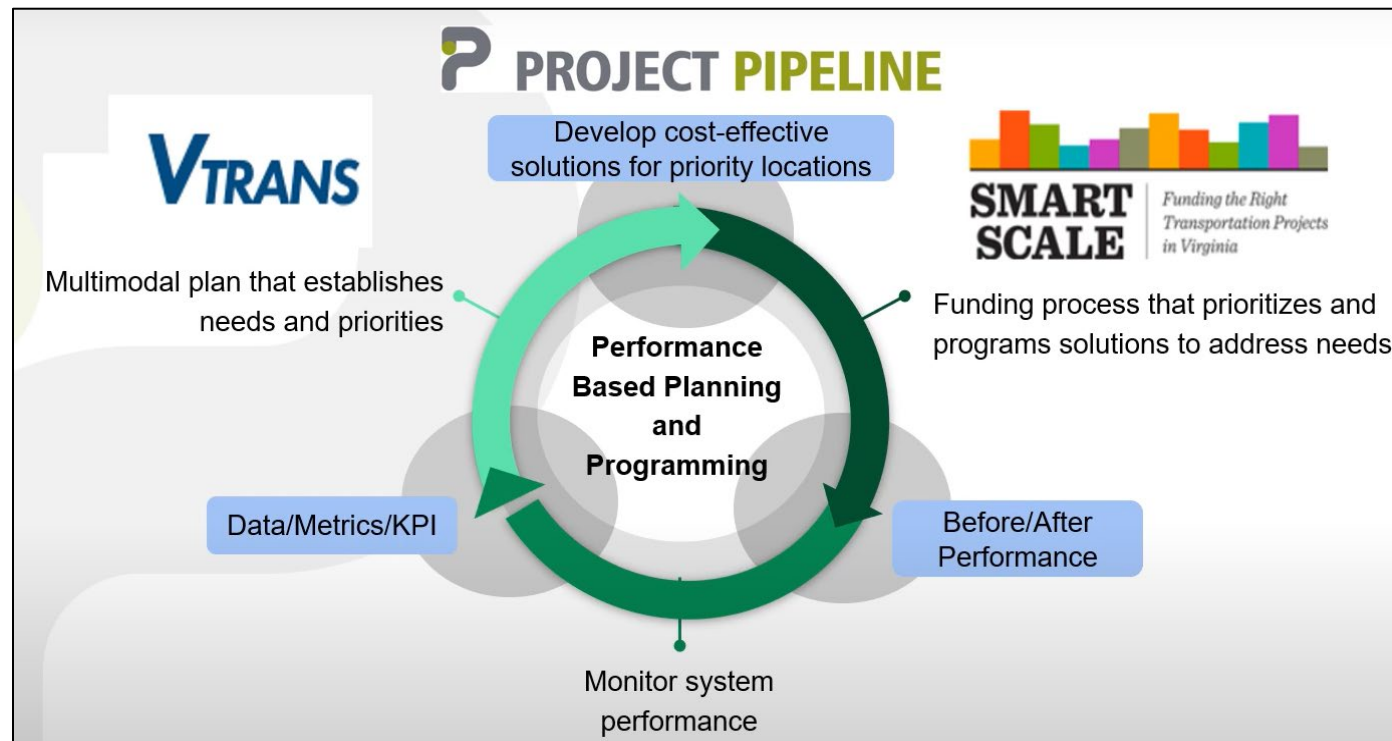









Figure 1: Project Pipeline Objectives

Background

The Office of Intermodal Planning and Investment (OIPI) prepared the VTrans Virginia's statewide transportation plan for the Commonwealth Transportation Board (CTB) in which mid-term needs (0 - 10 years) were identified for different categories listed in **Table 1**. This study focuses on addressing needs identified in VTrans, and those previously identified by the localities.

Table 1: List of VTrans Needs

VTrans Needs	
	Safety Improvement
	Transportation Demand Management
	Congestion Mitigation
	Pedestrian Safety Improvement
	Transit Access
	Capacity Preservation
	Bicycle Access

Methodology

The study is broken down into three phases. Phase 1 involves problem diagnosis and brainstorming of alternatives, Phase 2 is the detailed evaluation of alternatives and developed of initial concepts, and Phase 3 is the finalization of the preferred alternative in regard to design concept and cost estimate. Details on methods and solutions for each study phase are outlined below in **Figure 2**.

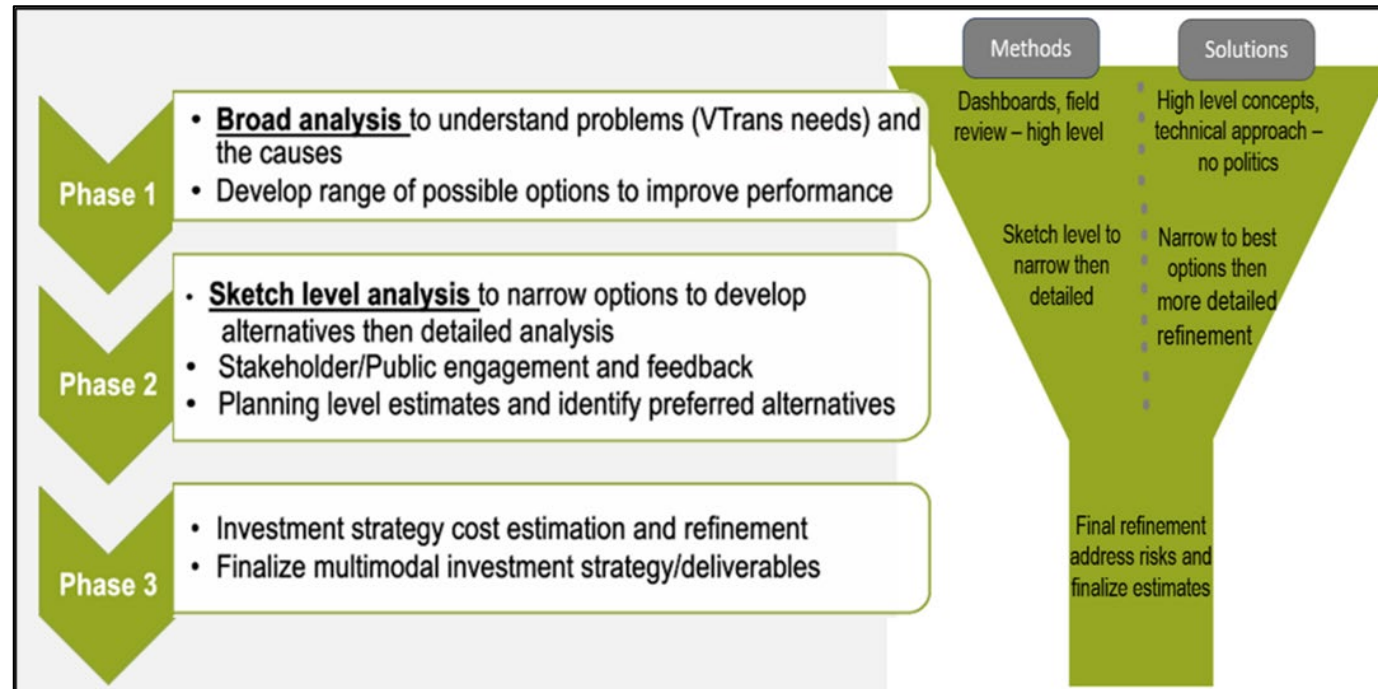


Figure 2: Study Phase Methods and Solutions

The study team is also broken down into three teams with each team simultaneously working on different areas of the study. Team 1 focuses on Traffic Operations, Capacity, and Access, Team 2 focuses on Road Reliability and Safety, while Team 3 focuses on Rail, Transit, and Transportation Demand Management (TDM), as shown in **Figure 3**. The following details the focus area of study for each team:

- Team 1 – Identify operation and access needs by conducting future traffic demand volume forecasts and performing operational analysis of future conditions using Synchro and VISSIM. Evaluate operational mitigations such as geometric modifications, access management improvements, and installation of facilities for pedestrians and bicycles.
- Team 2 – Identify safety needs with respect to vehicles, pedestrians, and cyclists by evaluating existing roadway conditions as well as crash patterns and crash hot spot locations based on the most recent five-year crash history obtained from the Virginia Department of Transportation (VDOT) Crash Analysis Tool. Recommend safety improvement options through geometric

modifications, access management improvements, and installation of facilities for pedestrians and bicycles.

- Team 3 – Identify needs with respect to rail, transit, and TDM by reviewing existing rail and transit routes and future traffic demand volume forecasts. Consider improvements recommended through public transit route extensions and the addition of Park and Ride lots.

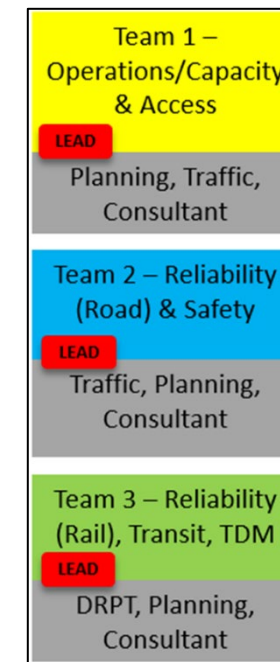


Figure 3: Study Team and Focus Area of Study

Study Area

The US 11 (Main Street) from S. Holston Street to Medical Park Drive and VA 16 (Park Boulevard) from Radio Hill Road to US 11 (Main Street) study corridors are located in Marion, Virginia. The study area on US 11 (Main Street) is 1.4 miles and is classified as an urban minor arterial road; this road is also part of the Corridors of Statewide Significance (CoSS). The facility is a five-lane undivided road with a posted speed limit of 35 MPH, and there are five signalized intersections along the corridor. The study area on VA 16 is around 0.6 miles and is classified as an urban major collector road. The facility is a two-lane undivided road with unbuffered bike lanes and a signed bike route. It has a posted speed limit of 35 MPH. A map detailing the general location of the US 11 and VA 16 study area is shown below in **Figure 4**.

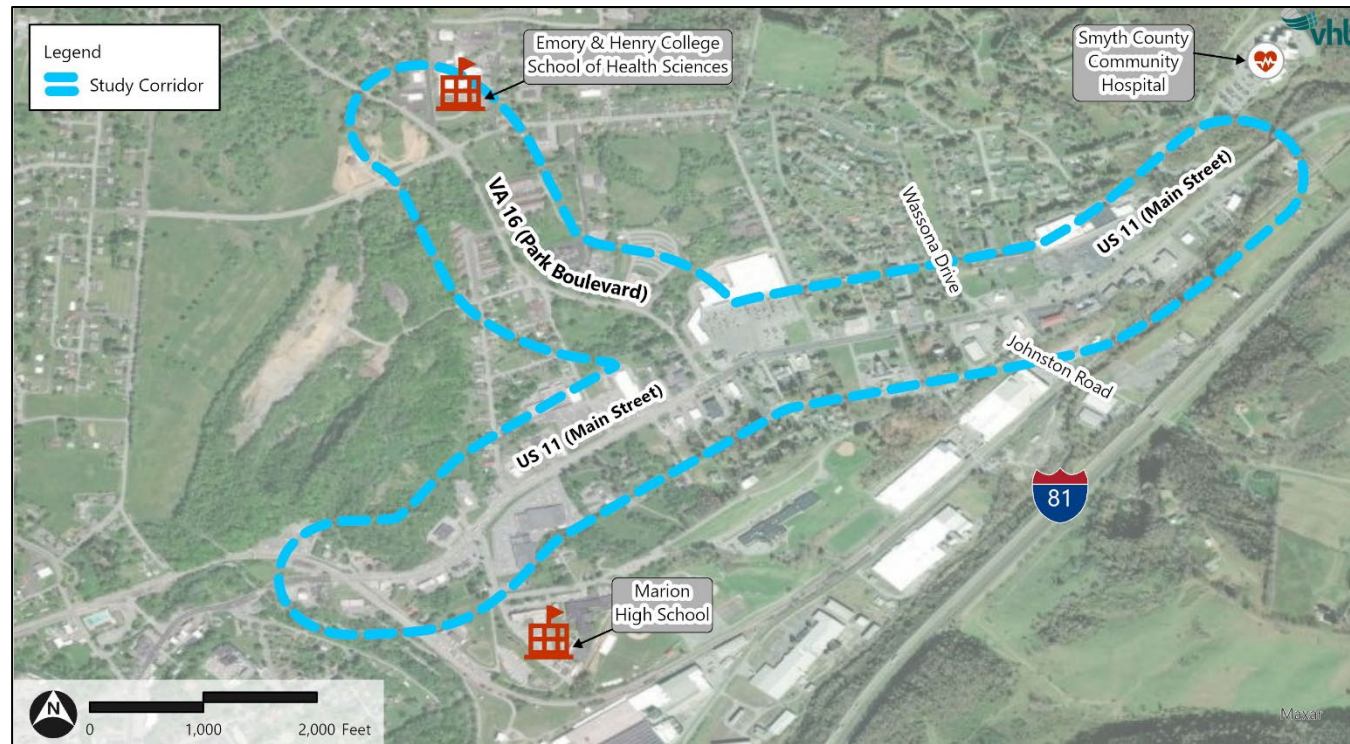


Figure 4: US 11 and VA 16 Study Area Map

VTrans is Virginia’s statewide transportation plan. It identifies and prioritizes locations with transportation needs using data-informed transparent processes. The policy for identifying VTrans mid-term needs establishes multimodal need categories that correspond to the Commonwealth Transportation Board-adopted VTrans visions, goals, and objectives.¹ Each need category has one or more performance measures and thresholds to identify one or more needs. Visit the VTrans policy guide for additional information: https://vtrans.org/resources/VTrans_Policy_Guide_v6.pdf.

The mid-term needs, as identified in VTrans for the study corridor, were identified as ‘Very High’ for one need area, ‘Low’ for three need areas, and ‘None’ for the rest of the need areas, as presented in Table 2. These mid-term needs, identified in VTrans, are prioritized on a tier from 1 to 4, with 1 being the most critical and 4 being the least critical. The segments ranked as “Priority 1” represent those with multiple categories identified as high in need. Figure 5 presents a map of the study area with 2019 VTrans mid-term needs prioritized for District attention. As can be seen in the figure, the western and eastern segments of the study corridor contain most of the Priority 2 needs.

Each VTrans need present on the US 11 and VA 16 corridor (as identified in Table 2) is individually shown in Table 3. This facilitates the identification of specific need locations along the corridor.

¹ Commonwealth Transportation Board, Actions to Approve the 2019 VTrans Vision, Goals, Objectives, Guiding Principles and the 2019 Mid-term Needs Identification Methodology and Accept the 2019 Mid-term Needs, January 15, 2020

Table 2: VTrans Needs in Study Area

VTrans 2019 Mid-Term Need	District Priority*
Congestion	Low
Reliability	Low
Transit Access for Equity Emphasis Areas	None
Transit Access to Activity Centers	None
Pedestrian Access to Activity Centers	None
Bicycle Access to Activity Centers	None
Access to Industrial & Economic Development Areas	None
Road Safety	Very High
Capacity Preservation	None
Transportation Demand Management (TDM)	Low
Pedestrian Safety	None

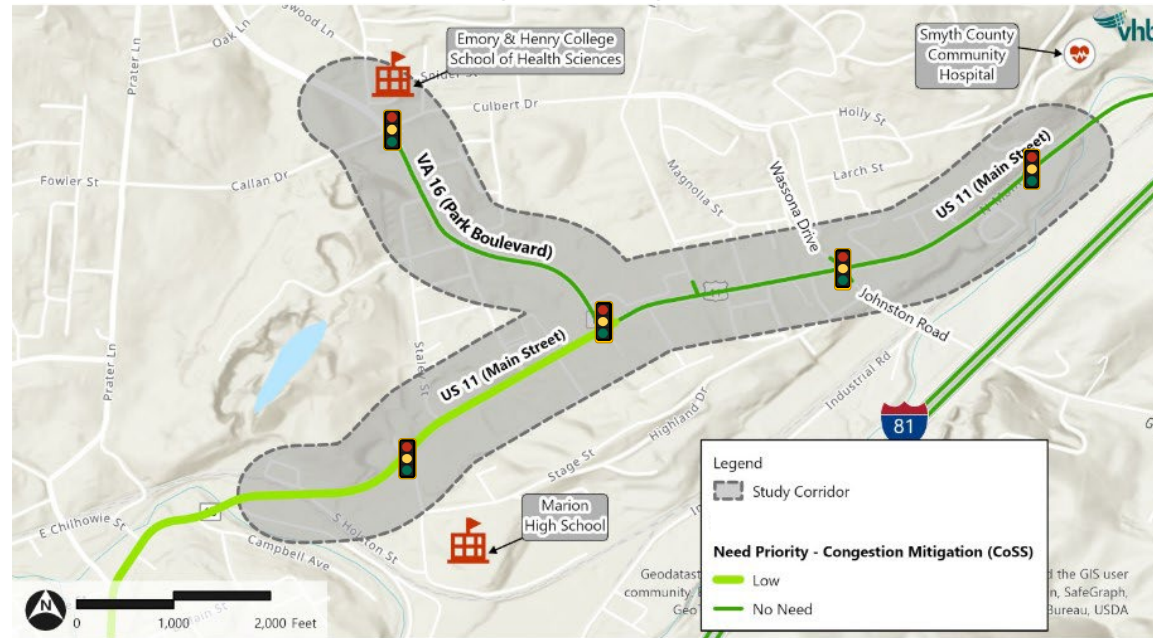
*Max priority within study area



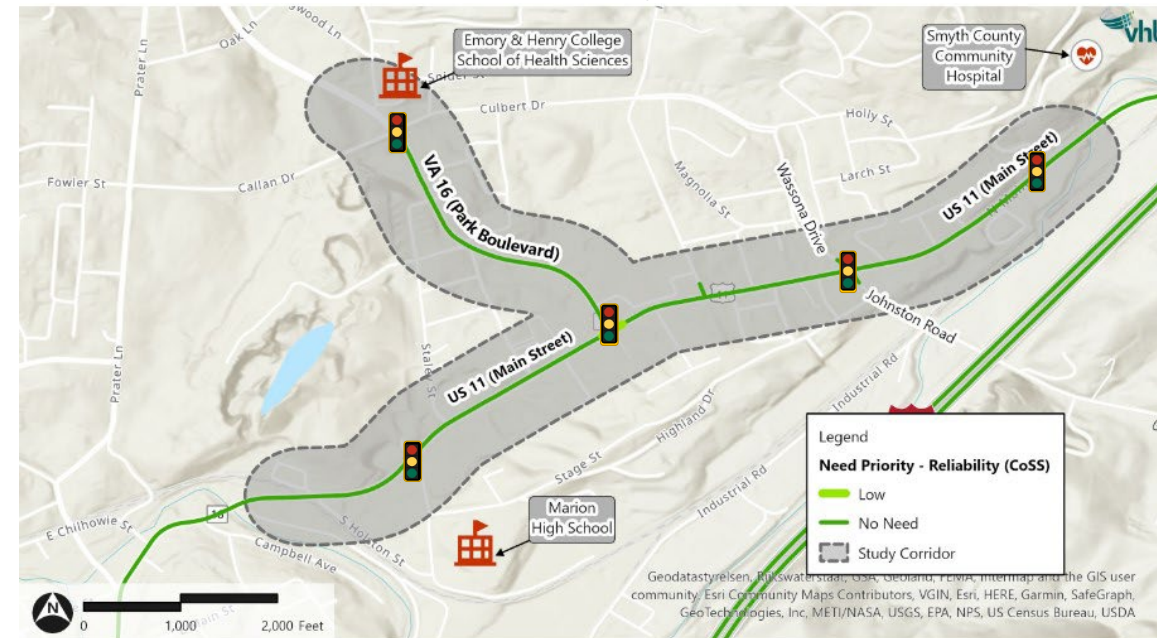
Figure 5: 2019 VTrans Prioritized Mid-term Needs in the Study Area

Table 3: Specific VTrans Needs in Study Area

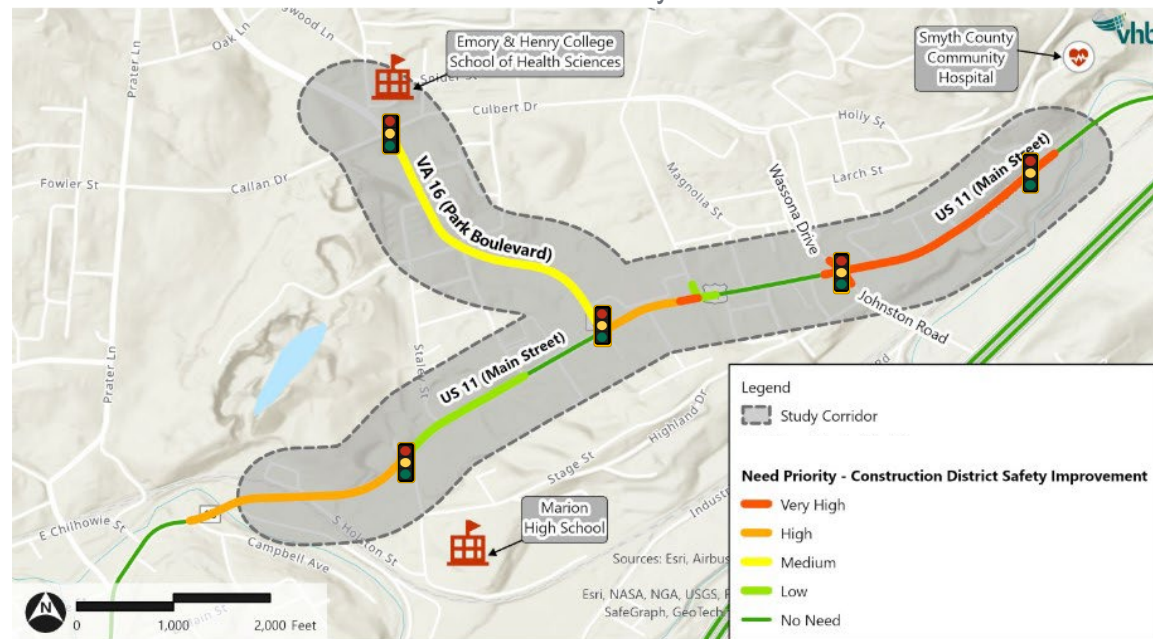
Congestion Mitigation



Reliability



Road Safety



Transportation Demand Management (TDM)



Underway Projects, Previous Studies, and Planning Documents

There are multiple ongoing projects that will impact conditions within the study area. These projects are discussed in greater detail in the following subsections.

Multimodal Improvements on VA 16

Two separate projects will provide additional pedestrian accommodations along VA 16. At the signalized intersection of VA 16 / Culbert Drive / Callan Drive, a Virginia Highway Safety Improvement Program (VHSIP) project will install marked crosswalks. This project is entering design. A two-phase Transportation Alternative Program (TAP) project will install sidewalk along the east side of VA 16 between US 11 and Radio Hill Drive – Phase 1 will add sidewalk from US 11 to the drive-in movie theater and Phase 2 will extend the sidewalk to Radio Hill Drive. This project will also modify the pedestrian crossings at the intersection of US 11 and VA 16. The project will reconstruct the crossing across VA 16 to include pedestrian refuge within the channelizing islands and updated curb ramps in the NE and NW quadrants. This project also eradicates the crossing of US 11 at this intersection. Phase 1 of this project is currently under construction.

Infrastructure Improvements

One VHSIP project will install flashing yellow arrow (FYA) signal heads at the intersection of US 11 and Medical Park Drive. The FYA signal heads will replace the existing 3-section green ball signal heads. A separate SMART SCALE project will construct a green T intersection at the intersection of US 11 and Rifton Drive, east of the study area.

Town of Marion Transportation Plan

The Town of Marion's Transportation Plan (part of the 2022 Comprehensive Plan) documents two planned transportation improvement concepts within the Pipeline study area – improving the pedestrian crossing and traffic signal at the US 11 / VA 16 intersection and extending sidewalk east along US 11 from the current limits east of Wassona Drive to the Town corporate limits at I-81 Exit 47.

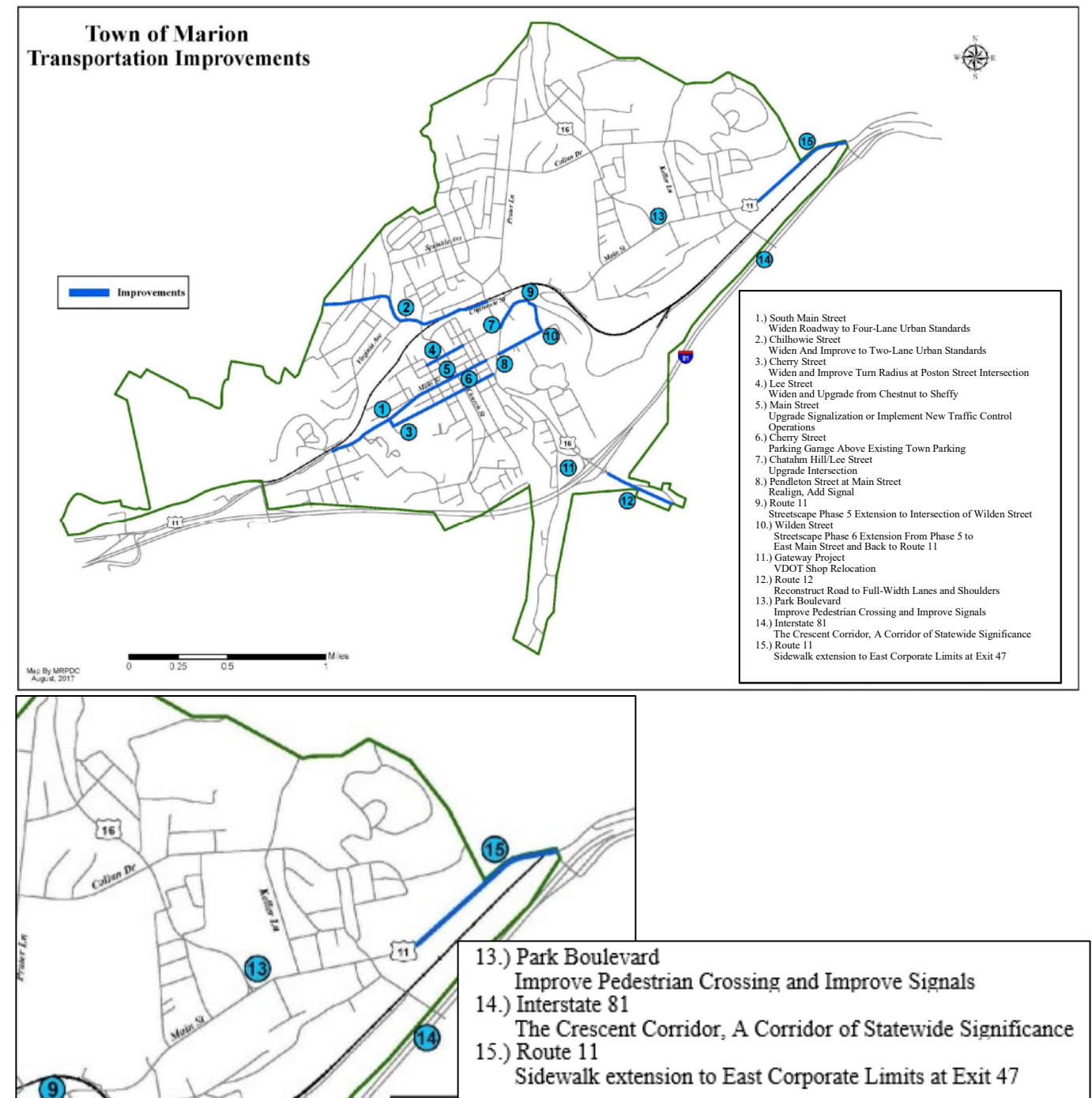


Figure 6: Excerpt from Town of Marion Transportation Plan

Traffic Operations and Accessibility

Initial diagnosis of the traffic operations and accessibility issues along the US 11 and VA 16 corridor was completed via traffic count data, Town of Marion signal timing plan information, field and aerial imagery review, and geospatial analysis.

Traffic Data

Traffic volume data (i.e., vehicle turning movement counts) was collected in May 2023 for the Pipeline Study. Peak hours of 7:30-8:30 AM and 4:30-5:30 PM were computed. Peak hour turning movement counts and the raw traffic volume data are provided in **Appendix A**. Other available traffic data included INRIX speed data, which indicates the average vehicle speeds along the corridor at different times of day. VDOT's 2021 Average Annual Daily Traffic (AADT) for the study area is reported as follows:

US 11 (Main Street)

- E Lee Street / Chatham Hill Road to VA 16 (Park Boulevard): 15,000 Vehicles per Day (VPD)
- VA 16 (Park Boulevard) to Keller Lane: 14,000 VPD
- Keller Lane to Eastern Town Border: 9,800 VPD

VA 16 (Park Boulevard)

- Northern Town Border to US 11 (Main Street): 4,500 VPD

Measures of Effectiveness

There are many measures of effectiveness (MOE) in traffic operations analysis to quantify operational and accessibility metrics and provide a basis for evaluating the performance of a transportation network. A summary of the MOEs evaluated for the study corridor during the Phase 1 analysis is presented below:

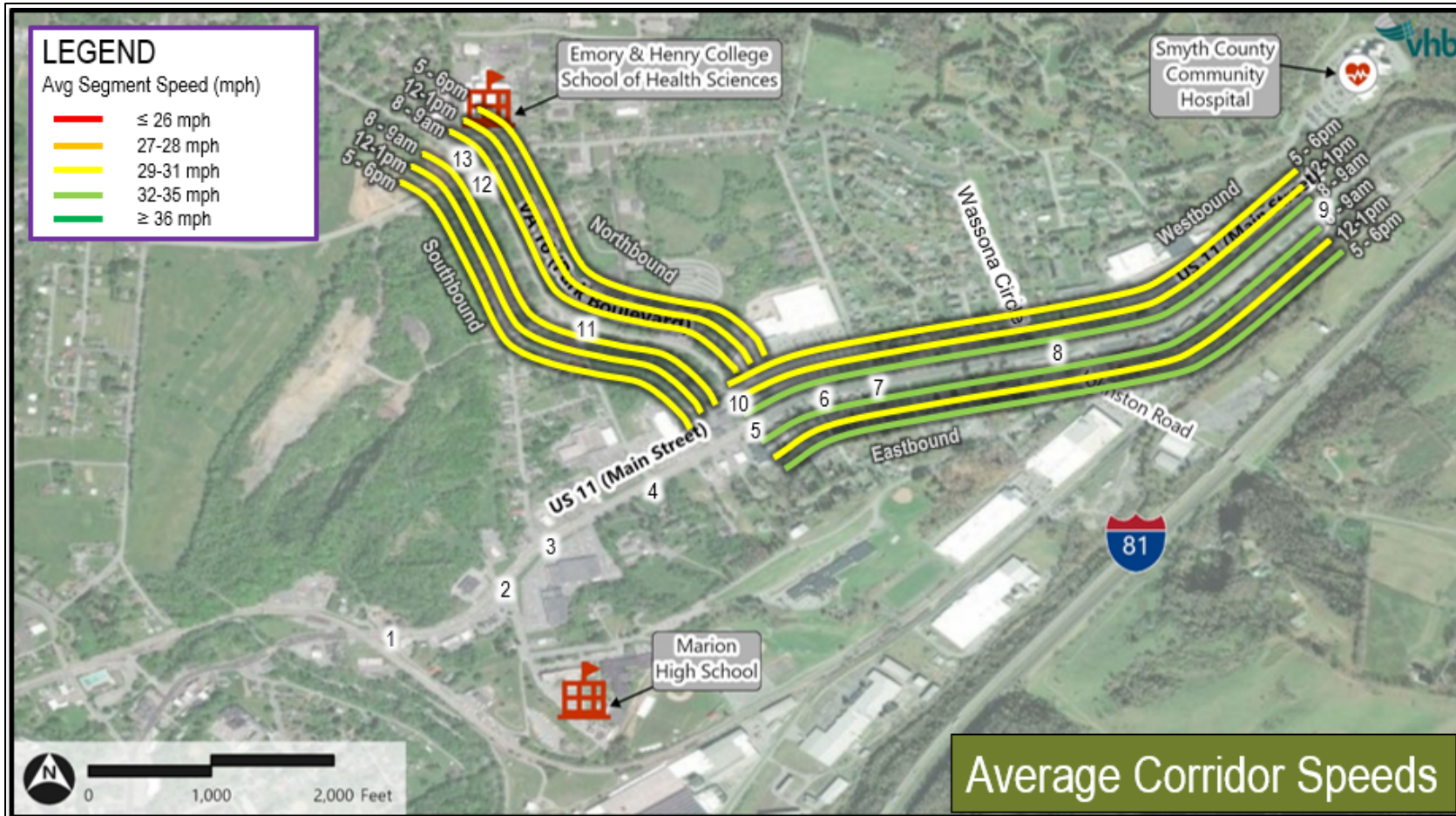
- Intersection Operations Metrics (Computed in Synchro/SimTraffic)
 - Control Delay (measured in seconds per vehicle – sec/veh)
 - Level of Service (LOS)
 - Maximum Queue Length (measured in feet – ft)
- Average Segment Vehicle Speed by Direction of Travel and Time of Day (Sourced from INRIX)
- Travel Time Index (TTI) by Direction of Travel and Time of Day (Sourced from VDOT)
- Access Point Density (geospatially computed in GIS)
- Inventory of Pedestrian and Bicyclist Accommodations

Traffic Operations Analysis Results

In Phase 1, a traffic operational analysis was performed using Synchro/SimTraffic 11 software for the intersections within the US 11 and VA 16 study area. Synchro is a traffic operations software package that is based upon *Highway Capacity Manual* (HCM) calculations, while SimTraffic is a microsimulation traffic operations software package that is utilized to estimate vehicle queuing. Utilized inputs and analysis methodologies are consistent with the VDOT *Traffic Operations and Safety Analysis Manual* (TOSAM) guidelines. AM and PM peak hour analyses were performed for the traffic volume dataset.

Figure 7 summarizes the operations needs of the corridor and shows the level of service (LOS) and delay in seconds based on the Synchro analysis (reports included in **Appendix B**). The intersection level LOS/delay is reported for signalized intersections, while the LOS/delay for the worst operating approach is reported for two-way stop-controlled intersections. The results of this analysis do not indicate any significant delay at the study intersections on US 11 or VA 16. **Figure 7** also shows average corridor segment speed by time of day, which indicates that the average vehicle speed along VA 16 is consistent across the corridor and across the day. On US 11, the average speed is the lowest in the westbound direction between 12-1PM and 5-6PM and in the eastbound direction between 8-9AM and 5-6PM.

The average Travel Time Index (TTI), which is shown on **Figure 8 and Figure 9**, indicates minimal levels of congestion along the corridor. TTI is a metric that compares average travel time to free flow travel time; it is a surrogate measure for level of congestion. A TTI value of 1.0 means that average travel time equals free flow travel time. VDOT considers a TTI value greater than 1.3 as an indicator of minor congestion, a TTI value greater than 1.5 as an indicator of moderate congestion, and a TTI value greater than 2.0 as an indicator of severe congestion. As seen in the figures, the greatest TTI values on US 11 are approximately 1.2 during the mid-afternoon / evening peak period. These figures also show travel time data across the day; the highest travel times occur in the afternoon for both the eastbound and westbound directions, corresponding to the greatest TTI values. These data findings corroborate the low “Congestion” VTrans Need that exists on the corridor.



Average Corridor Speeds

Operations Summary

- Numerous access points contributing to average speeds lower than the speed limit.
- All intersections operate with an acceptable level of service, with the lowest level of service at the intersection of US 11 and Holston Street (LOS C in the AM and LOS D in the PM).

VTrans Operations Needs

NEED	PRIORITY
Congestion	Low

Existing Conditions – Synchro Output

Intersection	Level of Service	
	AM	PM
1. Holston Street and US 11*	C	D
2. Dabny Drive / Windy Drive and US 11	B	B
3. Staley Street and US 11*	A	B
4. Groseclose Street and US 11*	B	B
5. VA 16 and US 11	B	C
6. Copenhaver Street / Walmart Entrance and US 11*	B	C
7. Keller Lane and US 11*	B	B
8. Wassona Circle / Johnston Road and US 11	A	A
9. Medical Park Drive and US 11	A	A
10. VA 16 and Smyth Valley Shopping Center*	A	B
11. VA 16 and Groseclose Street / Sayers Street / Terrace Drive**	A	A
12. VA 16 and Callan Drive / Culbert Drive	B	B
13. VA 16 and Radio Hill Road*	A	B

*Intersection Level of Service is not calculated for two-way stop control intersection. Level of Service shown is worse of side street approaches.
 **Level of service reported by SimTraffic.

Figure 7: Operations Needs and Diagnosis

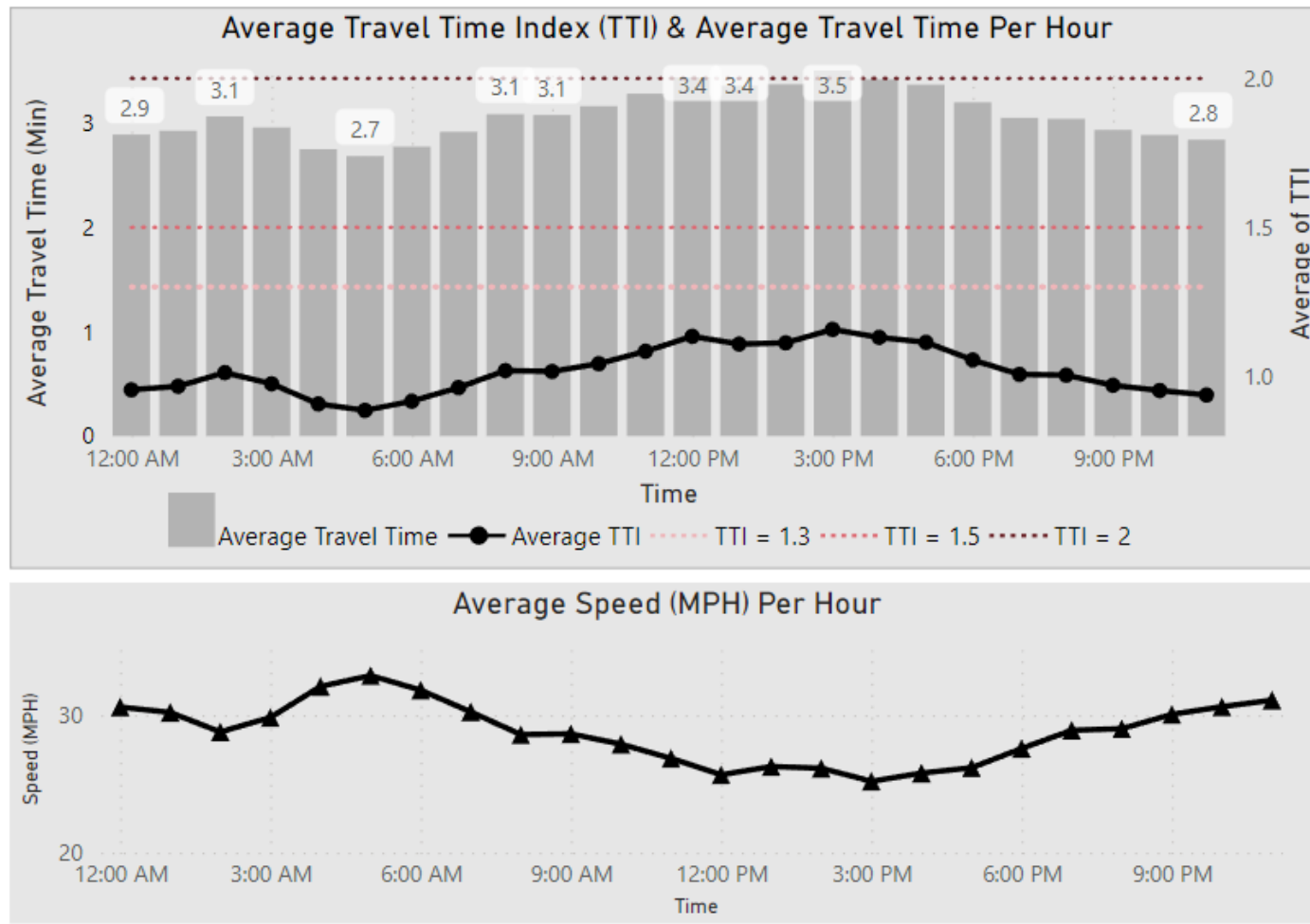


Figure 8: Eastbound US 11 Travel Time and Speed Data

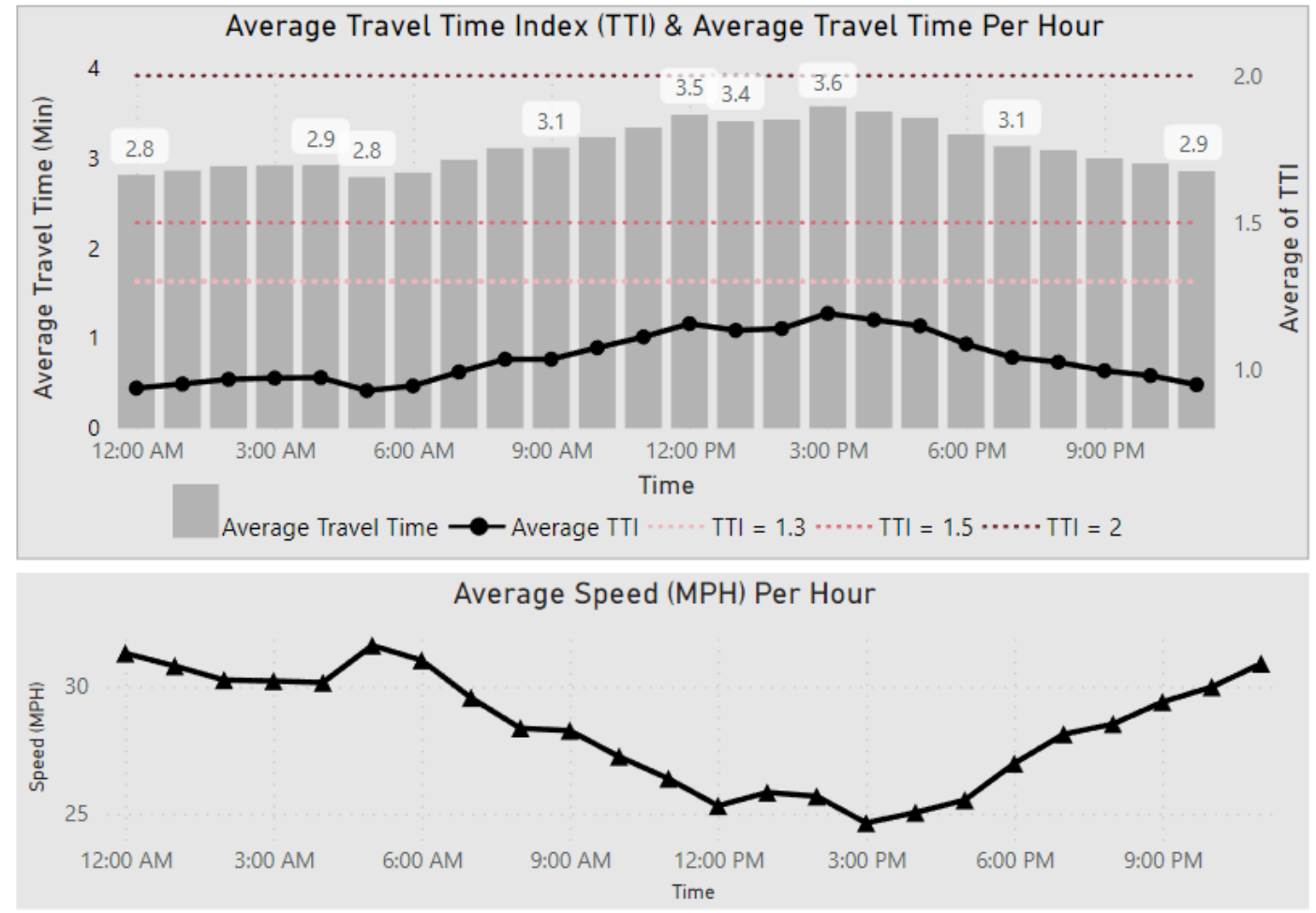


Figure 9: Westbound US 11 Travel Time and Speed Data

Figure 11 shows a density heatmap of access points along the corridor. The density of access points along the study corridor likely exacerbates the safety and operational issues on US 11, particularly in key locations such as the VA 16 to Keller Lane segment. VDOT’s *Roadway Design Manual (RDM) Appendix F* has intersection spacing standards with minimum distances at which commercial access points should be spaced. The minimum spacing distances from the RDM can be used as a guide for potential access management on US 11. **Figure 10** compares the existing spacing between access points to the recommended Appendix F values on US 11 between VA 16 and Keller Lane. The US 11 corridor was developed prior to the adoption of current VDOT access management standards; therefore, any access management improvement would be a best practice, not a mandate.

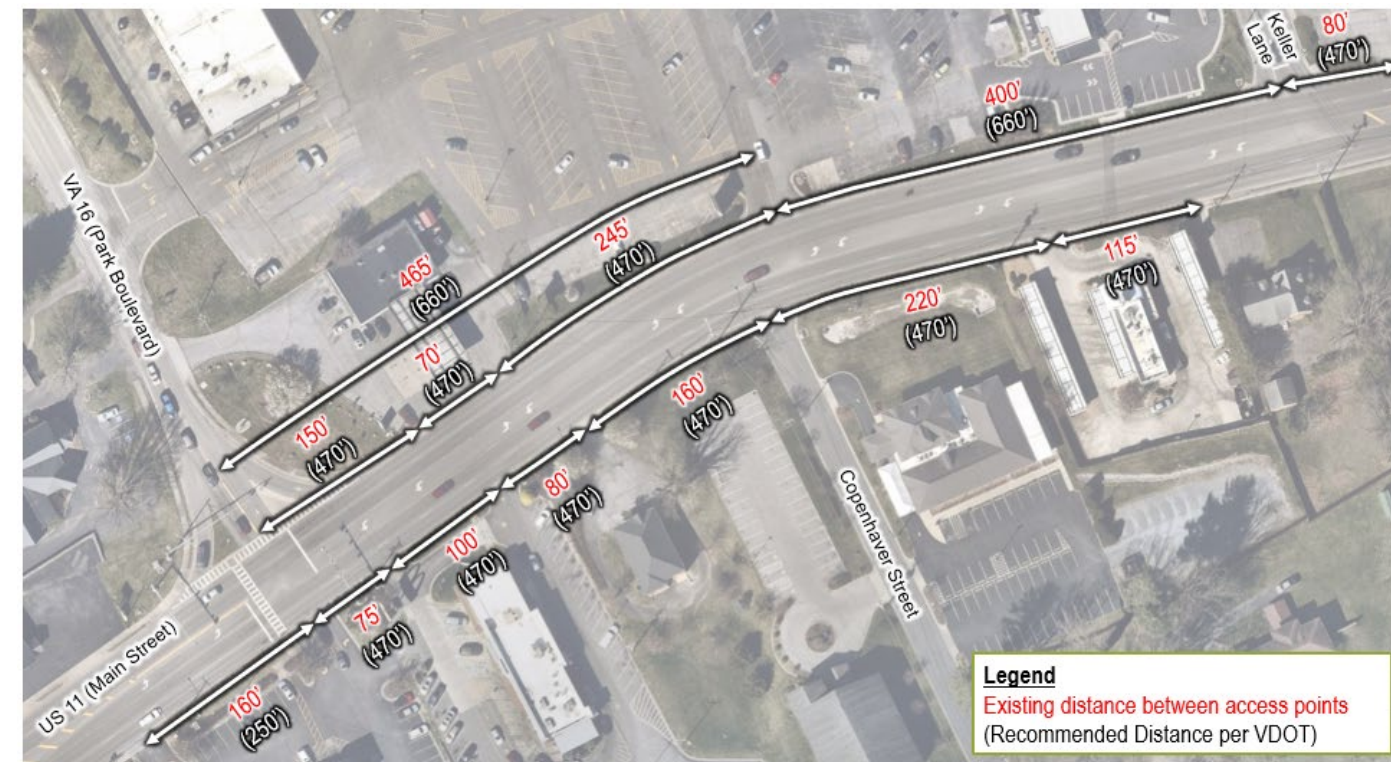


Figure 10: US 11 Existing Access Point Spacing

Pedestrian and Bicycle Access

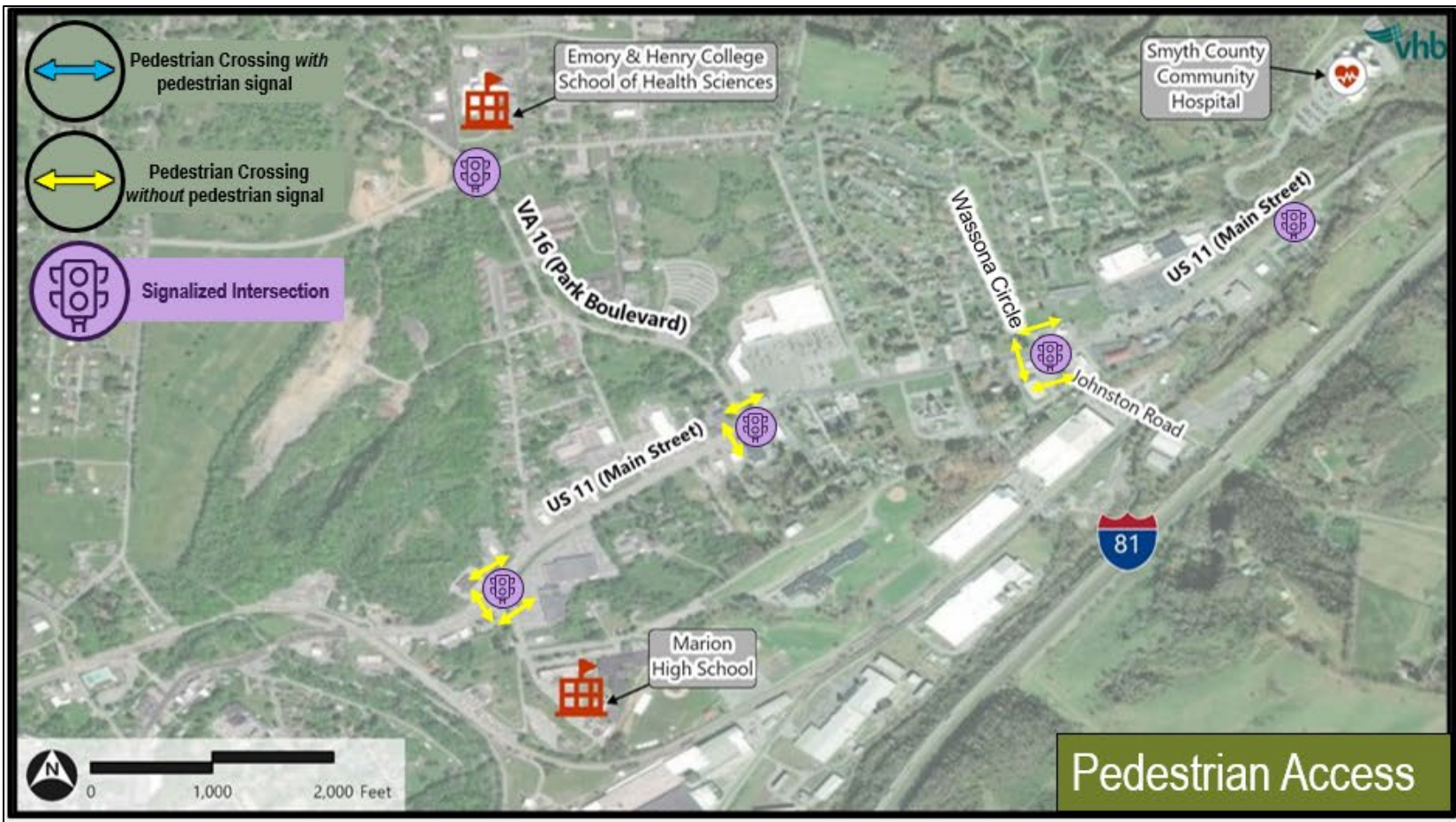
To identify the needs with respect to multimodal accessibility, the study team reviewed the existing conditions of pedestrian and bicycle accommodations. In existing conditions, the only pedestrian crossings across US 11 are at VA 16 (soon to be removed through TAP project), Wassona Drive / Johnston Road, and Dabny Drive / Windy Drive. VA 16 currently has one pedestrian crossing at US 11, and an additional crossing planned at Culbert Drive / Callan Drive (VHSIP project). **Figure 11** shows the pedestrian crossings at signalized intersections. The marked pedestrian crossings at these intersections

do not include pedestrian signal heads or pushbuttons. Linear pedestrian and bicycle facilities are also present along portions of the study area. Sidewalks are currently provided along US 11 through much of the study corridor. The sidewalks end east of Wassona Drive / Johnston Road. Along VA 16, unbuffered bike lanes are provided in the northbound and southbound direction. Sidewalk is funded and Phase 1 is under construction on the east side of VA 16 through the separate TAP project previously discussed.

Transit and TDM

As discussed in **Figure 11**, Mountain Lynx Transit currently serves the study area with a combination of seasonal fixed routes, fixed-deviated routes, and on-demand routes. The fixed-deviated routes are fixed routes that, with advance notice, may deviate from the route to pick up or drop off a passenger from an adjacent location without a fixed bus stop. If the driver does deviate from the route, they will rejoin the fixed route at the same location they exited or deviated. The fixed-deviated route operates Monday through Friday 8AM to 6PM and Saturday 10AM-4PM. Passengers are able to board anywhere along the route. Additionally, Mountain Lynx provides an on-demand “route” within Town limits that can be requested through a call center. These routes are available Monday through Friday 8AM-4PM.

The only Transportation Demand Management (TDM) VTrans need in the study area is at the US 11 / VA 16 intersection and it is a “low” priority need. TDM is the strategy of reducing vehicular traffic and congestion by shifting transportation mode choice to carpools, transit, or human-powered (e.g., walk, bike). There are no park and ride lots within the study area, which is the only TDM infrastructure element not previously discussed.



Existing Transit Service

- Local transit routes serviced by Mountain Lynx Transit.
 - Operate along fixed routes but can deviate off the general route for a requested pick-up/drop-off.
 - Service provided Monday-Friday 8AM-6PM and Saturday 10AM-4PM. Request-based service is provided Monday-Friday only.
 - Primary Marion Town Loop and Summer Express loop are serviced every hour. Other routes are serviced on-demand only.
- No regional connections provided.

Multimodal Summary

- Pedestrian access is provided at most signalized intersections along the corridor; however, no pedestrian signal heads or phasing is provided.
- A current TAP project is signaling the crossings at the US 11 and VA 16 intersection as well as providing sidewalk on the east side of VA 16.
- Survey respondents indicated a need for additional pedestrian accommodations / improvements to the existing facilities.
- Multiple access points break up pedestrian sidewalks and introduce additional conflicts with vehicles.

VTrans Access Needs	
NEED	PRIORITY
Pedestrian Safety Improvement	No Need
Transportation Demand Management (TDM)	Low

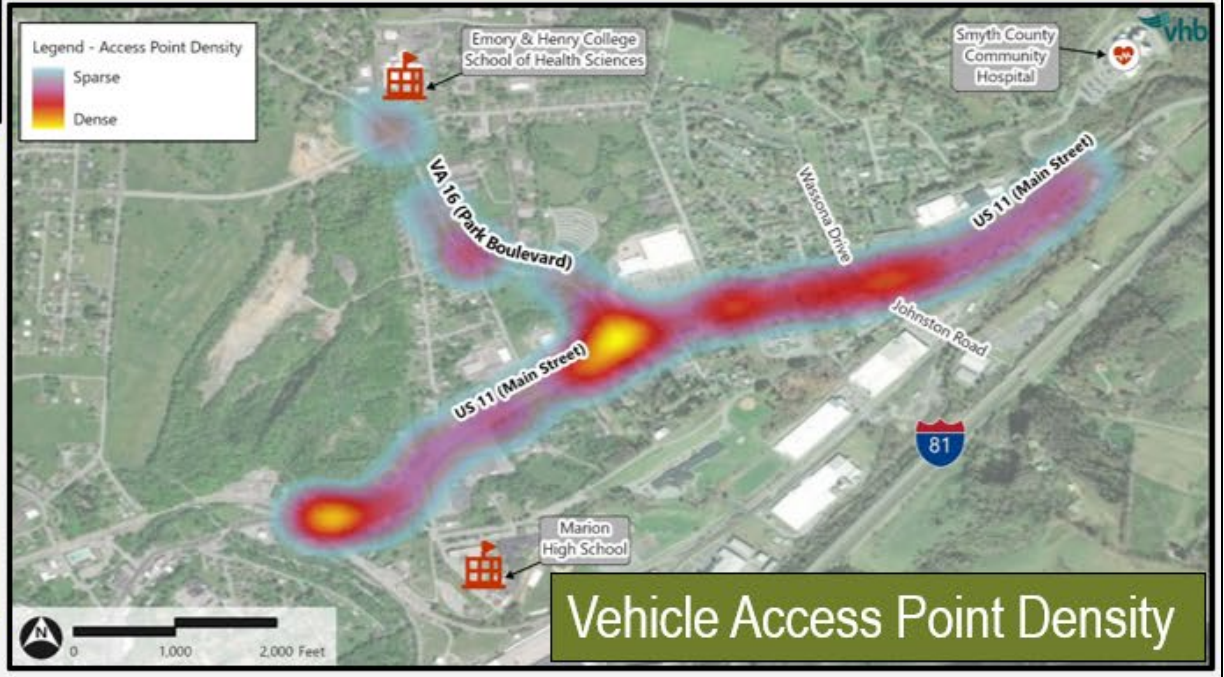


Figure 11: Multimodal Needs and Diagnosis Summary

Safety and Reliability

VDOT's Crash Analysis Tool was utilized to determine the crash history within the study area on US 11 and VA 16. Crash data was collected and analyzed for a five-year period spanning from January 2018 to December 2022. The study team reviewed the crash details within VDOT's Crash Analysis Tool as well as the FR300 crash reports to determine specific trends. The study team also performed geospatial analysis to identify "hot spot" areas for consideration in developing alternative improvement concepts. The study team also reviewed the reliability metrics for the study area; reliability is the consistency of expected travel time along a corridor. While the study area only has a "low" priority reliability VTrans need at the US 11 / VA 16 intersection, US 11's status as an I-81 detour route induces the potential for varying travel time during incidents on the interstate.

Safety Analysis Results

VDOT SAFETY SCREENING

Through a systemic analysis methodology that incorporates bicycle/pedestrian crash history, roadway characteristics, proximity to pedestrian generating land uses, and socioeconomic data, VDOT identified a Pedestrian Safety Action Plan (PSAP) roadway network of high-risk corridors. As seen in **Figure 12**, US 11 (Main Street) through the study area is classified as a Districtwide Top 1% Corridor. This means that based on a combination of crash history and systemic risk factors, US 11 falls into the top 1% of all VDOT Bristol District road corridors that should be targeted for pedestrian safety improvement. VA 16 is not an identified PSAP corridor.

VDOT also conducts safety screening analysis at a network level to identify critical hot spots where crashes are statistically overrepresented. A metric called Potential for Safety Improvement (PSI) is computed that identifies locations where actual crashes are overrepresented compared to what would be anticipated for a roadway of those characteristics (e.g., traffic volume, classification, number of lanes, etc.). The top 100 intersections and segments are then ranked by PSI in each VDOT District. **Figure 13** shows that the US 11 (Main Street) and VA 16 (Park Boulevard) study area contains two of the top 100 intersections and three of the top 100 segments within the Bristol District, conveying the multiple safety needs on this specific corridor.

CRASH ANALYSIS

The crashes for US 11 (Main Street) that occurred within the study area are summarized by type and severity in **Figure 14**. There were 84 total crashes and rear-ends accounted for 37% of the crashes that occurred in the past five years and angle crashes accounted for 33%. The next most common crash type were sideswipe crashes. The significant percentage of rear end crashes is reflective of the commercial corridor context with a high density of access points. There were eight crashes on VA 16 (Park Boulevard) within the study area. Neither corridor had any crashes causing a severe injury or fatality in the past five years.



Figure 12: VDOT PSAP 3.0 Map of US 11 and VA 16 Corridor



Figure 13: PSI Map of US 11 and VA 16 Corridor

There is a higher portion of senior drivers in the study area, and 57% of the sideswipe and angle crashes that occurred on US 11 (Main Street) involved senior drivers. 40% of the overall crashes involved senior drivers. **Figure 15** displays a heat (density) map of all crashes. The crashes are primarily clustered at the US 11 (Main Street) / VA 16 (Park Boulevard) intersection and the US 11 (Main Street) / Wassona Drive / Johnston Road intersection. These clusters also align with the PSI intersections and segments from **Figure 13**. The clusters of crashes are of particular importance in regard to identifying and addressing potential safety concerns.

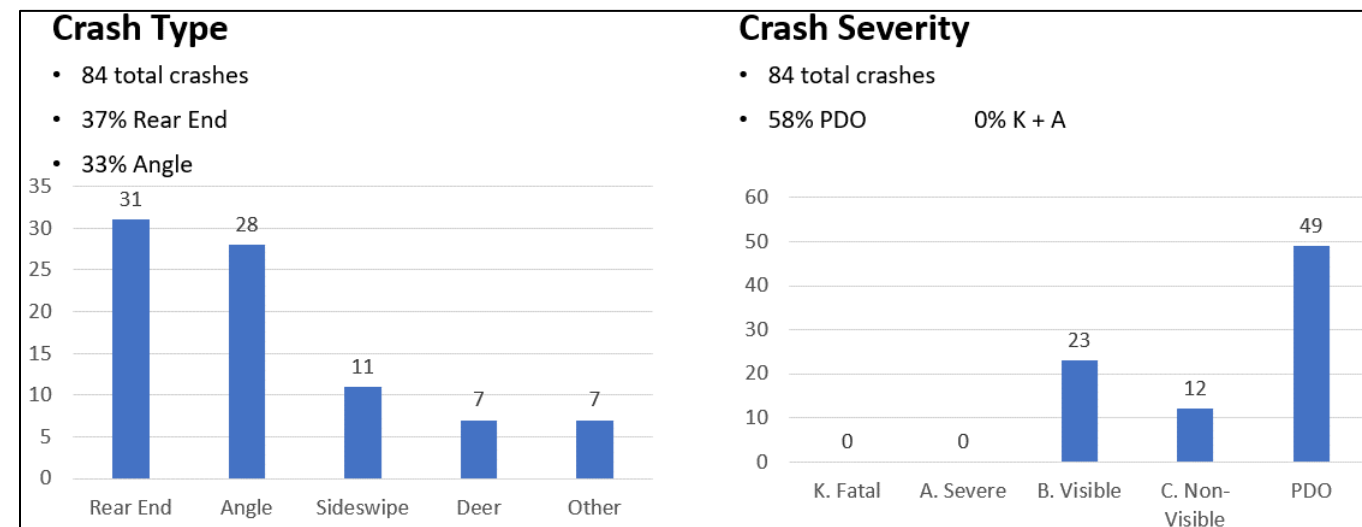


Figure 14: US 11 (Main Street) Crash Statistics

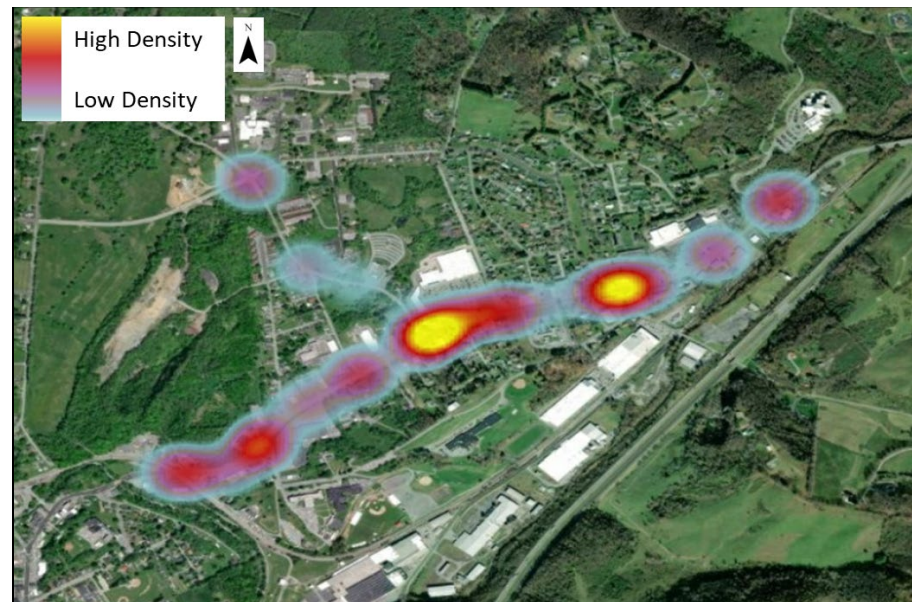


Figure 15: US 11 and VA 16 Crash Heat (Density) Map

The crashes in the clusters (crash hot spots) were further studied to look for any patterns and trends in the location or type of crashes. The FR 300 reports as well as the VDOT crash data were used to create collision diagrams. The collision diagrams, **Figure 16** to **Figure 19**, show a trend of access management related issues contributing to rear-end and angle crashes throughout corridor. **Table 4** presents some of the patterns and trends seen in each collision diagram.

Table 4: Collision Diagram Notes

Hot Spot Collision Diagram	PSI Ranking	Note
Figure 16: US 11 from Holston Street to Dabny Drive	Segment Rank #7	Multiple westbound rear ends exiting horizontal roadway curve could be due to limited sight distance and queueing.
Figure 17: US 11 from VA 16 to Keller Lane	Intersection Ranks #37 and #95 Segment Rank #19	Many crashes associated with driveway access - 7 crashes with egress from driveways and 8 crashes with turning movements at intersections.
Figure 18: US 11 and Wassona Drive / Johnston Road	Intersection Rank #18 Segment Rank #20	6 rear end crashes associated with left-turning vehicles and 3 other access related crashes.
Figure 19: US 11 and Tractor Supply Co Shopping Center	Segment Rank #20	6 crashes associated with exiting the Shell gas station / Roadrunner Convenience Store.

The safety and reliability needs and diagnosis (including crash type and severity by intersection) identified during the analysis are summarized in **Figure 20**.

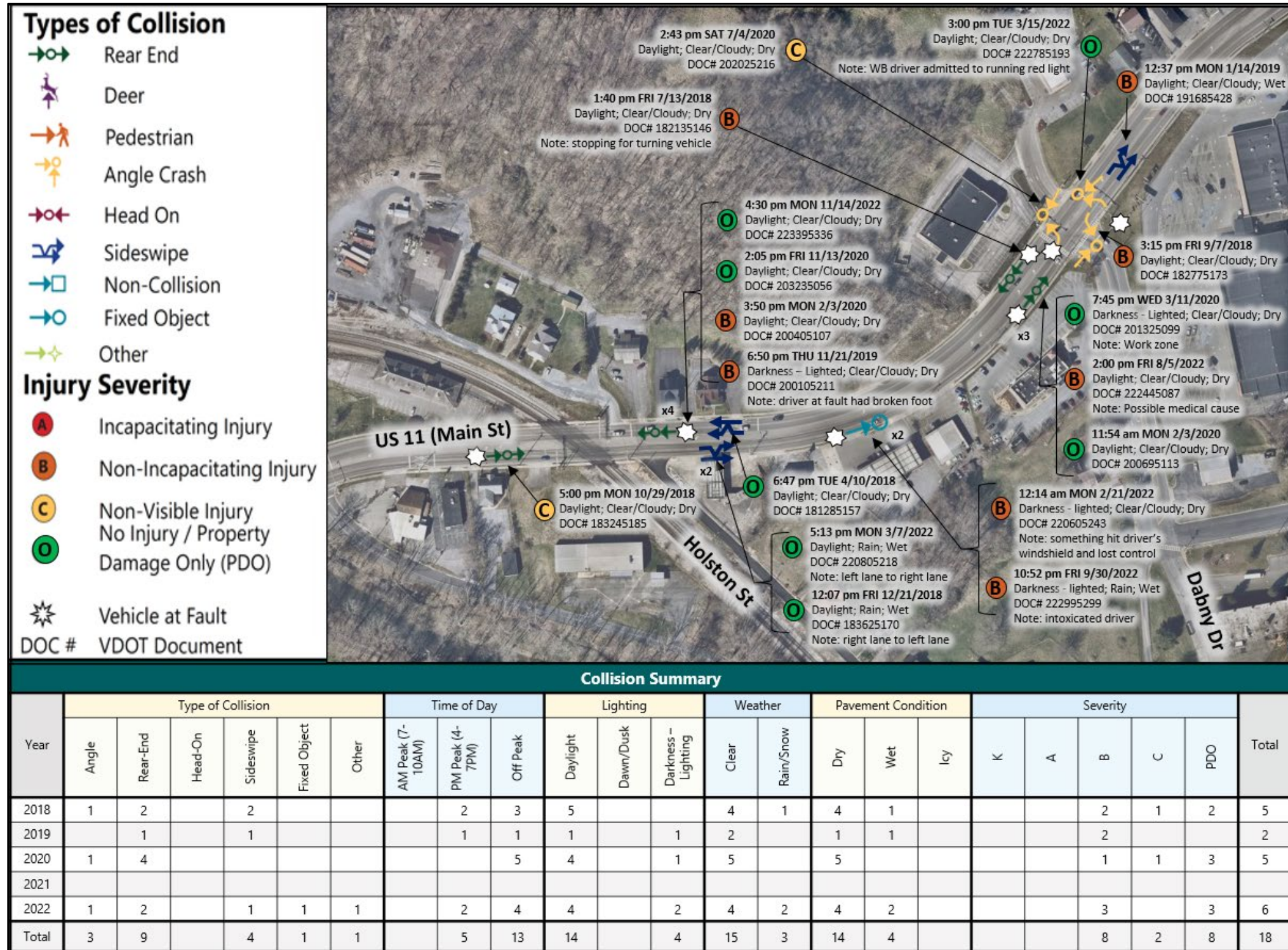


Figure 16: US 11 from Holston Street to Dabny Drive Collision Diagram

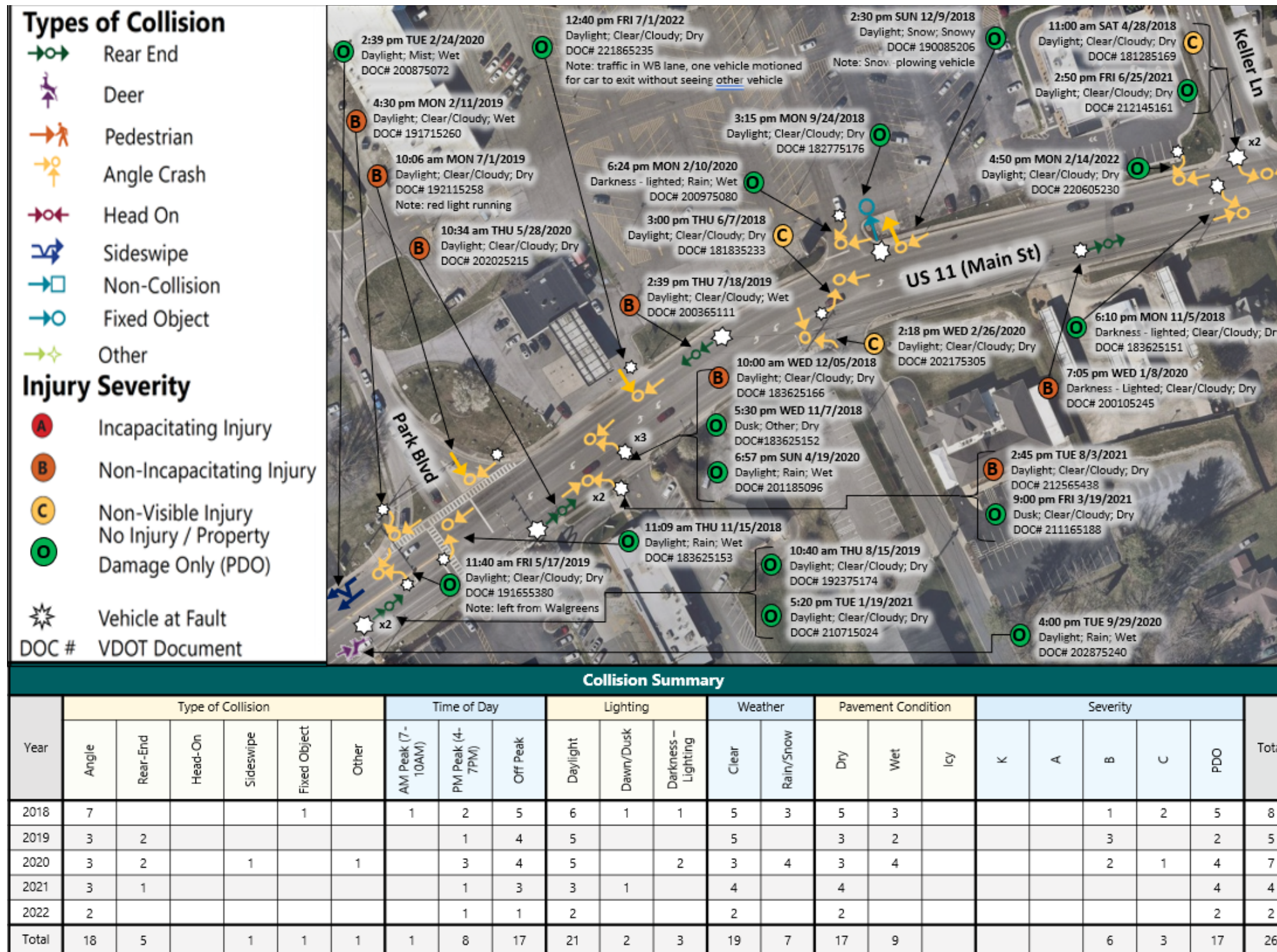


Figure 17: US 11 from VA 16 to Keller Lane Collision Diagram

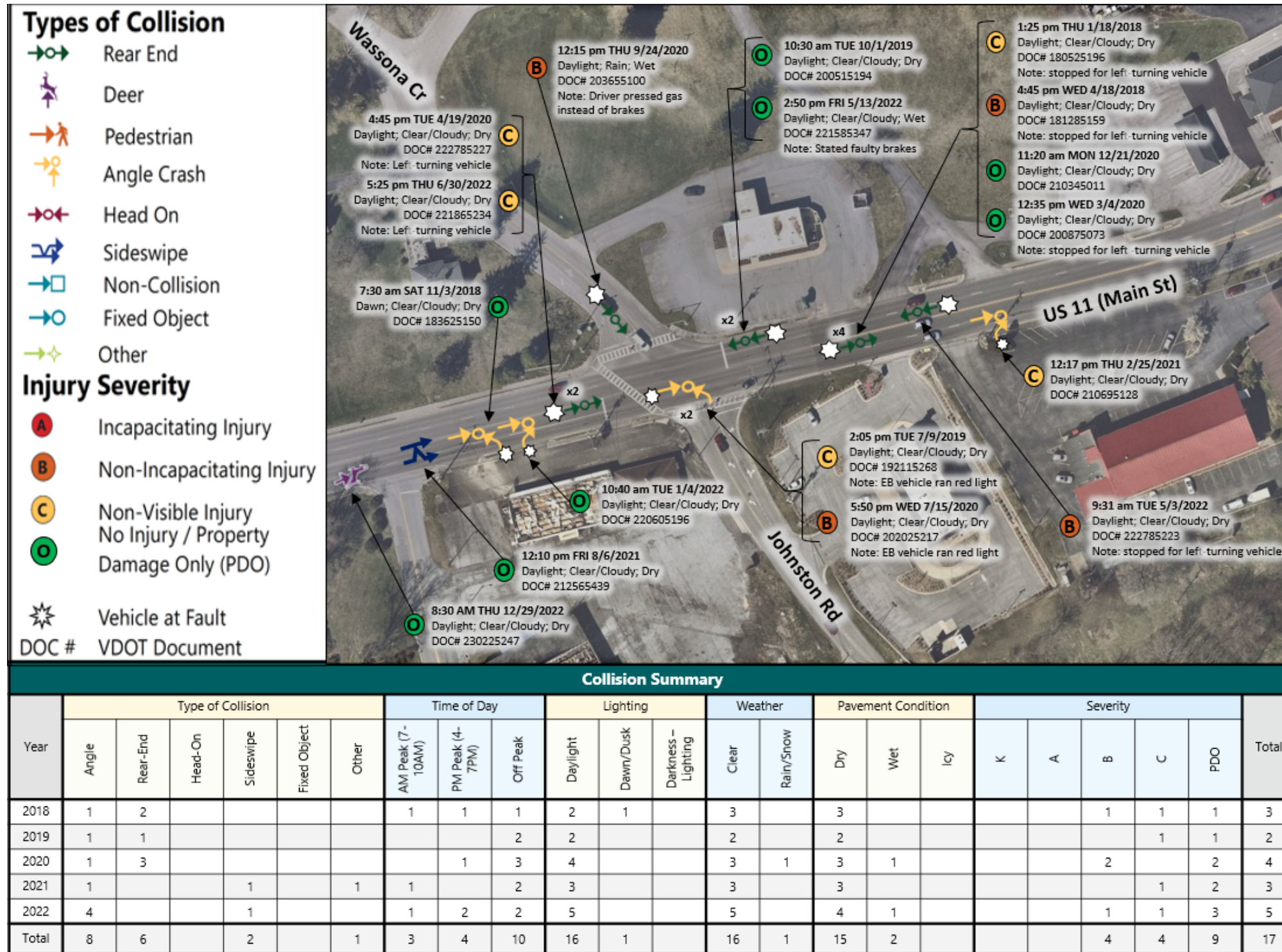
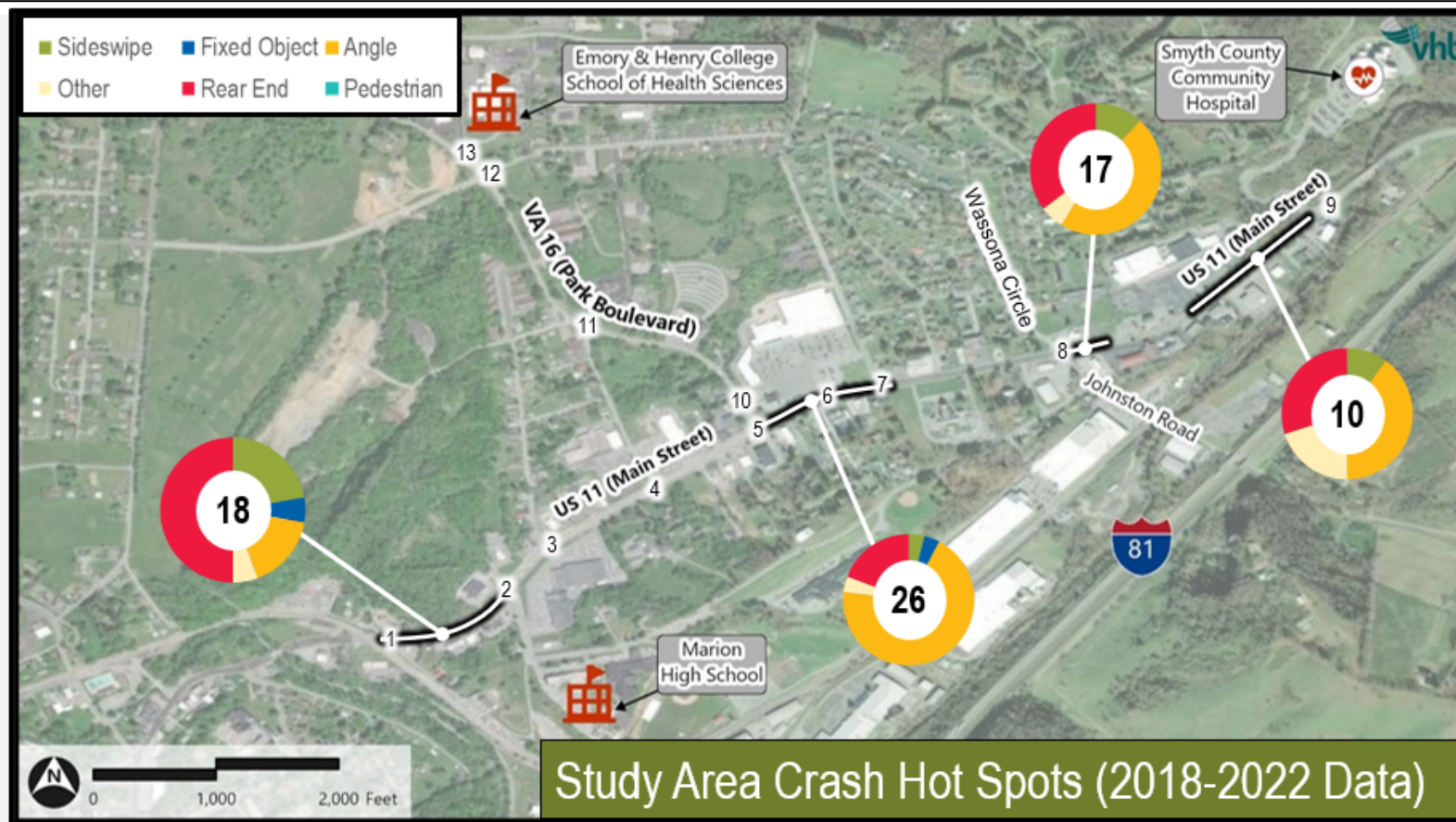


Figure 18: US 11 and Wassona Drive / Johnston Road Collision Diagram



Collision Summary																							
Year	Type of Collision						Time of Day			Lighting			Weather		Pavement Condition			Severity					Total
	Angle	Rear-End	Head-On	Sideswipe	Fixed Object	Other	AM Peak (7-10AM)	PM Peak (4-7PM)	Off Peak	Daylight	Dawn/Dusk	Darkness - Lighting	Clear	Rain/Snow	Dry	Wet	Icy	K	A	B	C	PDO	
2018	1	2		1			1	1	2	3		1	2	2	2	2				1	1	2	4
2019	1					1			2	2			2		1	1				1		1	2
2020																							0
2021	1	1							1	1	1	1	1	1	1	1				1	1		2
2022	1					1			1	1	2		2		2						1	1	2
Total	4	3		1		2	1	3	6	8	1	1	7	3	6	4			3	3	4	10	

Figure 19: US 11 and Tractor Supply Co Shopping Center / Road Runner Gas Station Collision Diagram



Safety Summary

- The safety needs along the corridor are primarily related to the numerous access points. The primary crash pattern involves entering/exiting traffic from the various access points along US 11. Survey respondents indicated confusion with the multiple access points and noted that many access points were difficult to turn out of. Comments specifically cited difficulty turning out of McDonalds, Walmart, and Keller Lane. This finding was corroborated through the safety analysis and field observations.
- Rear end crash pattern between Holston Street and Dabney Drive indicates a sight distance issue of queueing within the horizontal curvature.
- Limited sight distance at 5-leg intersection of Park Boulevard and Groseclose Street and Sayers Street and Terrace Drive. While there are few existing crashes, the conditions indicate a crash risk that will be exacerbated by future volume growth.

Study Area Crash Hot Spots (2018-2022 Data)

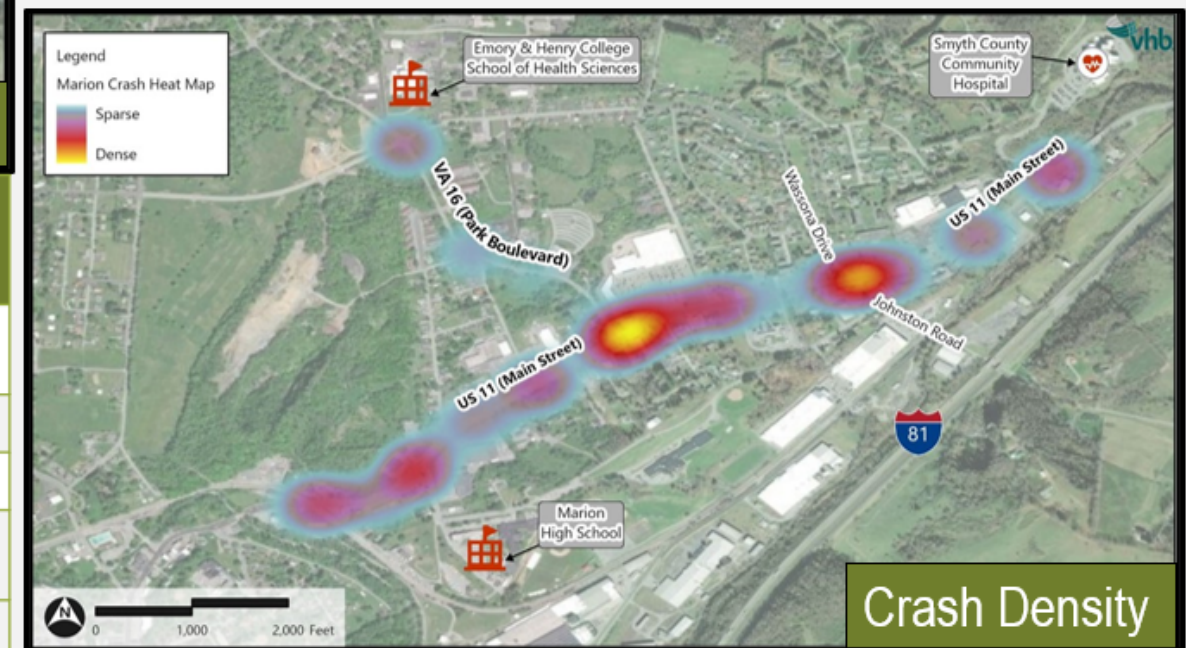
VTrans Safety / Reliability Needs

NEED	PRIORITY
Reliability	Low
Road Safety	Very High

VDOT 2018-2022 Crash Data

Hot Spot Intersection / Segment	Crashes by Severity				
	A	B	C	O	Total
Between Holston Street and Dabney Drive	0	8	2	8	18
Park Boulevard to Keller Lane	0	6	3	17	26
Wassona Circle Segment	0	4	4	9	17
Tractor Supply Co Shopping Center to Medical Park Drive	0	3	3	4	10
Total	0	21	12	38	71

K = Fatal Injury; A = Severe Injury; B = Visible Injury; C = Non-visible Injury; O = Property Damage Only



Crash Density

Figure 20: Safety and Reliability Needs and Diagnosis Summary

FHWA Screening Tool for Equity Analysis of Projects (STEAP)

This screening shows the demographic make-up of the population residing within the study area, the city/town, the county, and then all of Virginia. The tool allows you to compare the representation of the population with regard to a demographic characteristic, such as age or household income, within the study area compared to the city/town, county, and all of Virginia. **Figure 21** shows the household incomes present in the study area compared to all of Marion, the entirety of Smyth County, and the state of Virginia. **Figure 22** shows the age groups present in the study area compared to all of Marion, the entirety of Smyth County, and the state of Virginia. **Figure 21** shows that there is a higher representation of households with a \$50,000 or lower household income in the study area when compared to the rest of Virginia and Smyth County. Also, there is a larger representation of senior citizens in the study area compared to the percentage of senior citizens present in Marion, Smyth County, and all of Virginia.

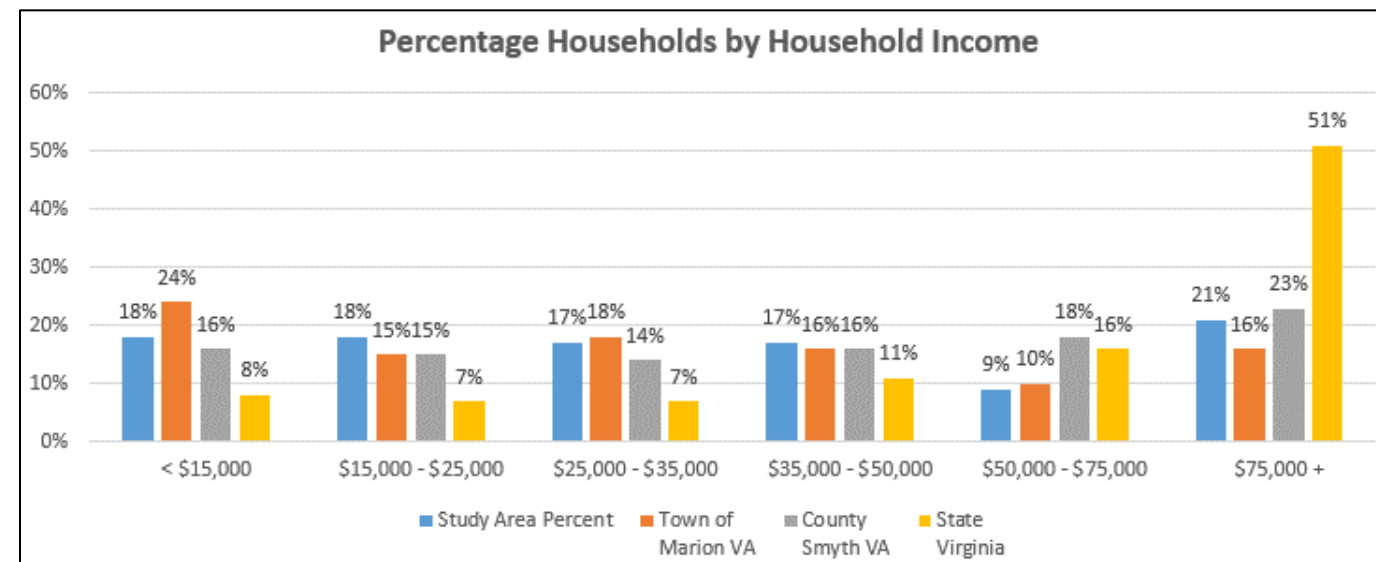


Figure 21: Percent Households by Income

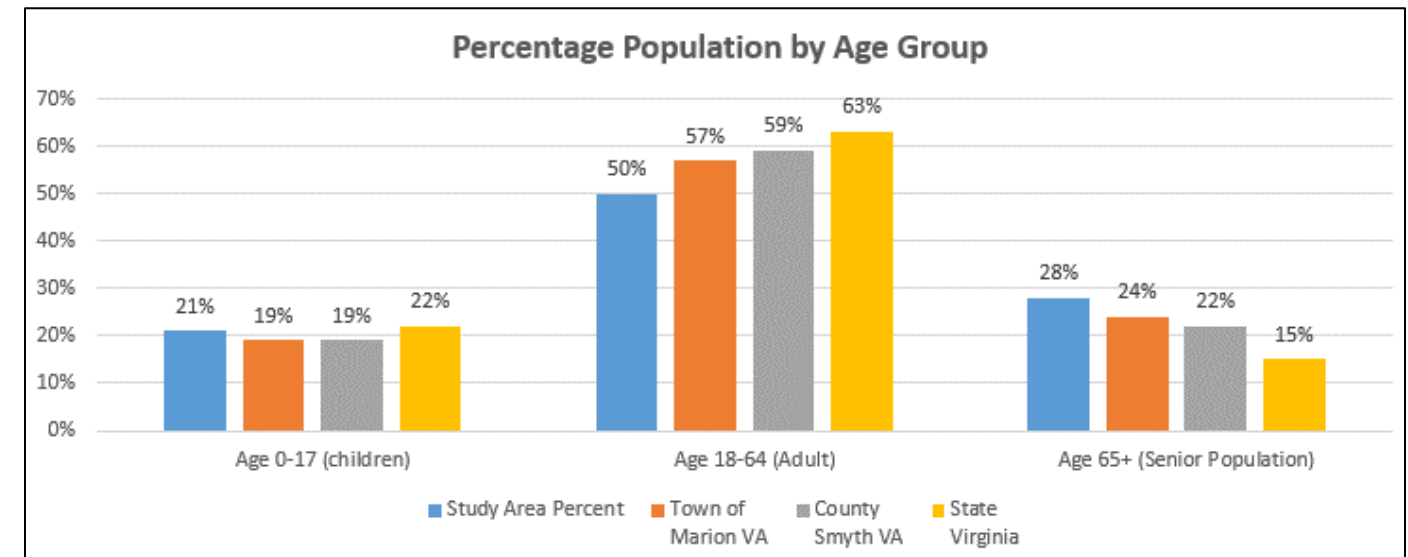


Figure 22: Percent Population by Age

Public Involvement

During Phase 1, a public survey was developed to garner public input on the study corridor. The survey asked the public to rank the issues along the corridor and provided multiple free-form questions for the public to input open-ended responses. The survey was distributed online via VDOT's PublicInput.com platform between June 19, 2023, and July 10, 2023. 135 participants responded to the survey with a total of 3,370 unique survey question responses and 220 free-form comments. The participants of the survey ranged from people who drive on the study corridor daily to a few times per year, the breakdown of participants can be seen in **Figure 23**. Full public survey results are provided in **Appendix D**.

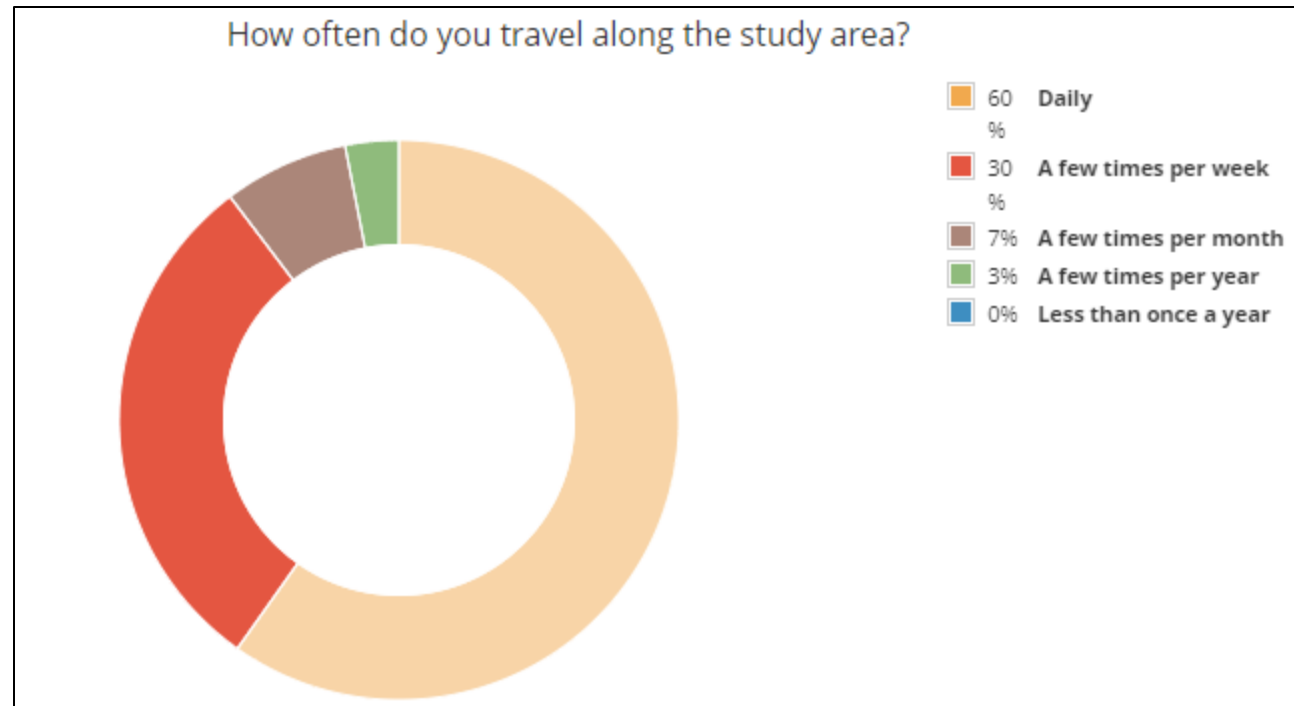


Figure 23: Frequency of Survey Participants Traveling in the Study Area

The top issues that concerned the public include “pedestrian safety and accessibility”, “reducing traffic congestion”, “corridor safety / intersection safety”, “speeding / aggressive driving”, and “proper pavement marking and signage”. **Figure 24** shows how the survey participants ranked the issues on the study corridor with regard to what was important to them. The survey also asked, “what mobility issues do you typically experience when using the study area?” As shown in **Figure 25**, the top responses include “difficulty making left turns”, “lack of turn lanes”, and “difficulty when walking.” “Lack of sidewalks / missing sidewalks” and “insufficient / missing crosswalks and pedestrian signal timing” were the major safety issues cited by survey response.

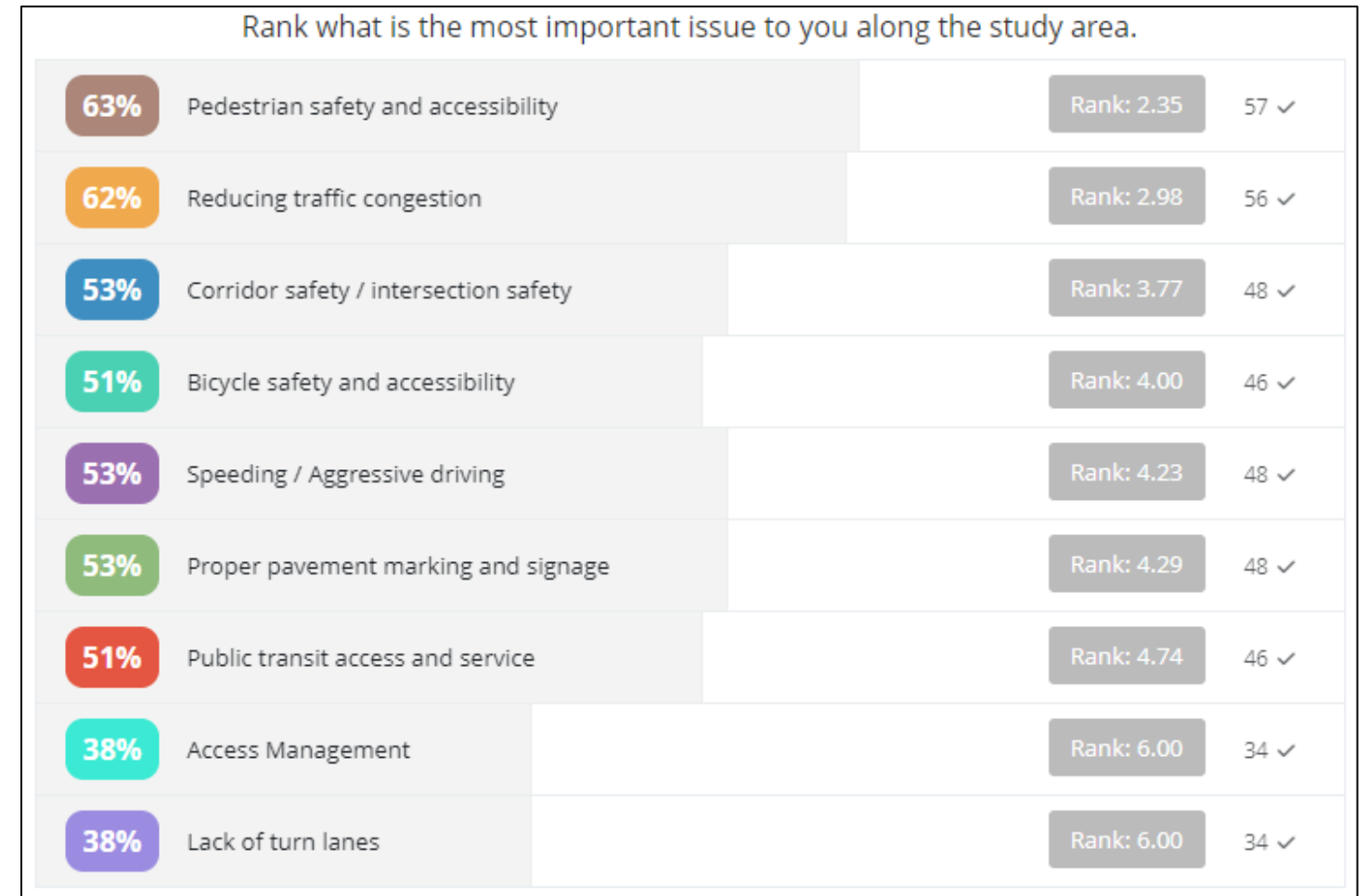


Figure 24: Study Corridor Issues Rankings per Survey

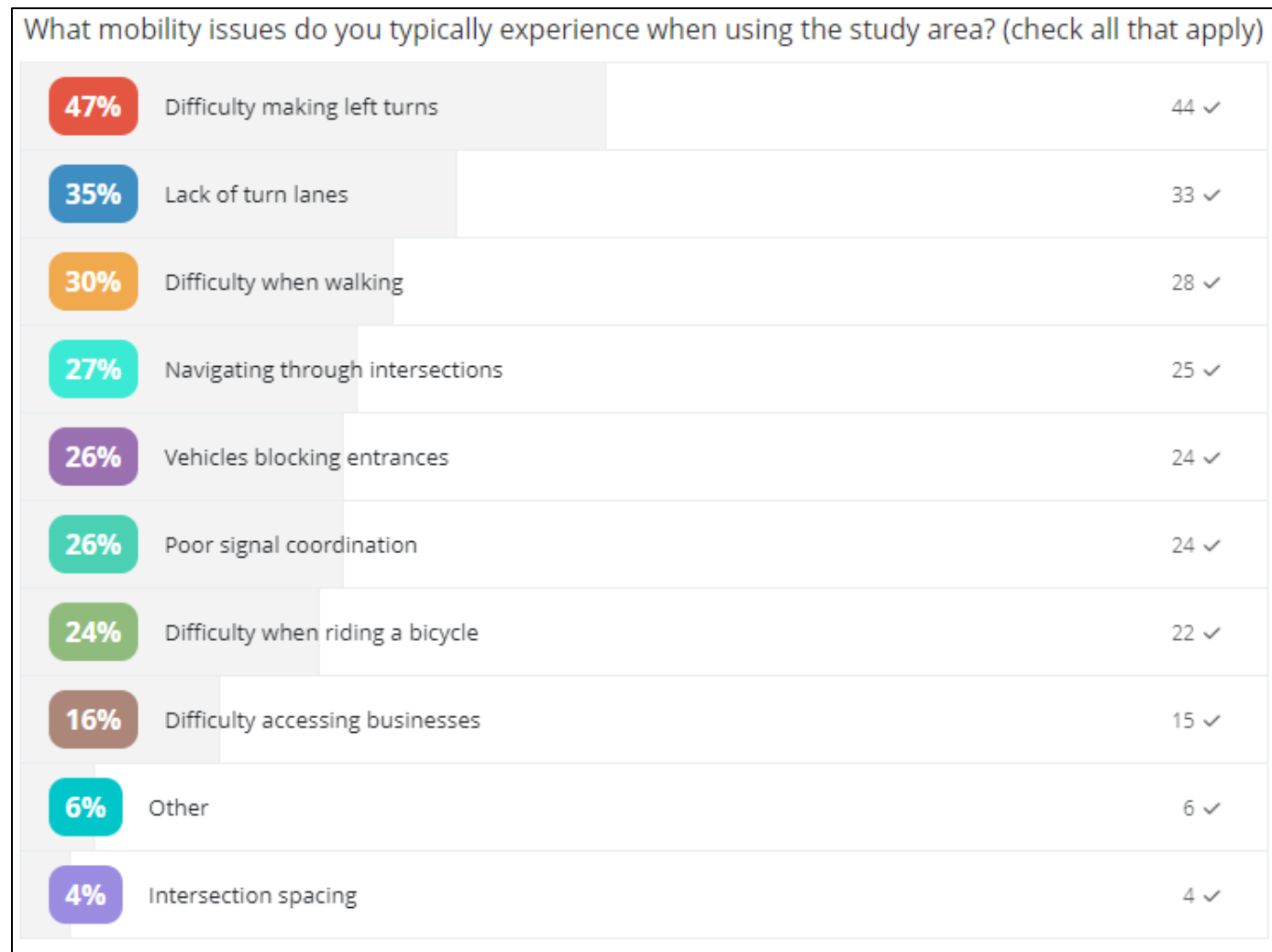


Figure 25: Mobility Issues Rankings per Survey

The survey had sections for participants to provide freeform written comments. Many of these open-ended responses mentioned safety concerns. Common safety-related themes include difficulty turning in and out of parking lots, limited sight distance, and red-light running. The open-ended responses also highlighted access concerns (e.g., difficulty entering and exiting Walmart parking lot, Keller Lane, and McDonald's), traffic concerns (e.g., congestion near Walmart shopping center, long delays at train tracks), and pedestrian concerns (e.g., need for sidewalks and lighting on both sides of US 11 (Main Street) and too many curb cuts interrupting sidewalks). **Figure 26** bins the comments by theme.

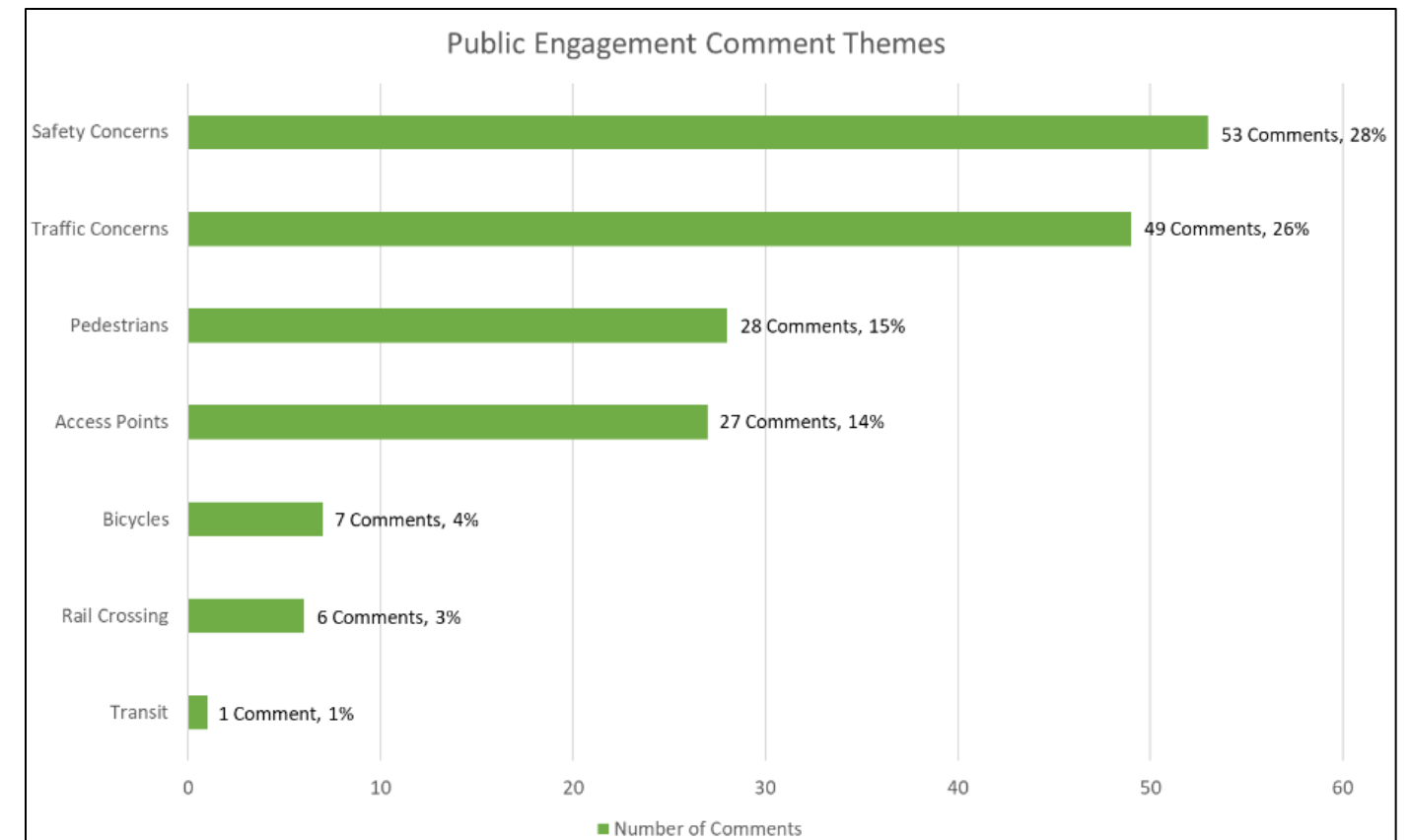


Figure 26: Survey Comment Themes

Chapter 2:

Alternative Development and Refinement

Alternatives Development

To develop alternative concepts that address the needs and incorporate diagnosis identified in Chapter 1, a thorough review of the existing conditions data was conducted. There were multiple safety needs and areas that could be improved identified in the study area in the Town of Marion. The study team brainstormed multiple alternatives and improvements to address the safety and operations concerns identified. The alternatives were developed, evaluated, and presented to the stakeholders in varying stages in the development process. Stakeholder input was also considered when determining the final alternatives.

Initial Alternatives Development

The following sections document the alternatives developed for a safety or operations need. The development process for each alternative is explained with regard to the origin of the concept, detailed analysis to quantify potential benefits, and further consideration and refinement.

ACCESS MANAGEMENT IMPROVEMENTS

To address the issue of access management on US 11 (Main Street), one of the earlier alternatives considered was a targeted access management strategy. This alternative considered closing or modifying specific access points on the corridor. Some access points could be fully closed, and others could be converted to Right-In/Right-Out only driveways. The access points that would be closed or modified would be dependent on the crash patterns around that area. For instance, this strategy can be implemented at the US 11 (Main Street) and Wassona Drive / Johnston Road intersection, the area shown in **Figure 27**. The driveways to the east of the intersection have been attributed to four left-turn crashes. By closing or modifying these access points, these crashes could be mitigated, and full access is still provided via Wassona Drive and Johnston Road. During a stakeholder meeting, the Town indicated that the proposed access closures on the west side of this intersection were already planned as part of a land-use redevelopment project in this quadrant.

The section of US 11 (Main Street) between the VA 16 (Park Boulevard) intersection and the Keller Lane intersection has a need for access management improvements. The citizens in the Town of Marion (via the Phase 1 public engagement survey), as well as the crash data, indicate that access and uncontrolled left turns are a challenge on this section of US 11 (Main Street) in front of the Smyth Valley Shopping Center. The following list summarizes this need.

- Concentration of access management related crashes between Park Boulevard and Keller Lane
 - 2016-2020 Potential for Safety Improvement (PSI) **#19 Segment** in District (Crash Overrepresentation)
 - 2016-2020 PSI **#35 and #95 Intersections** in District (Crash Overrepresentation)

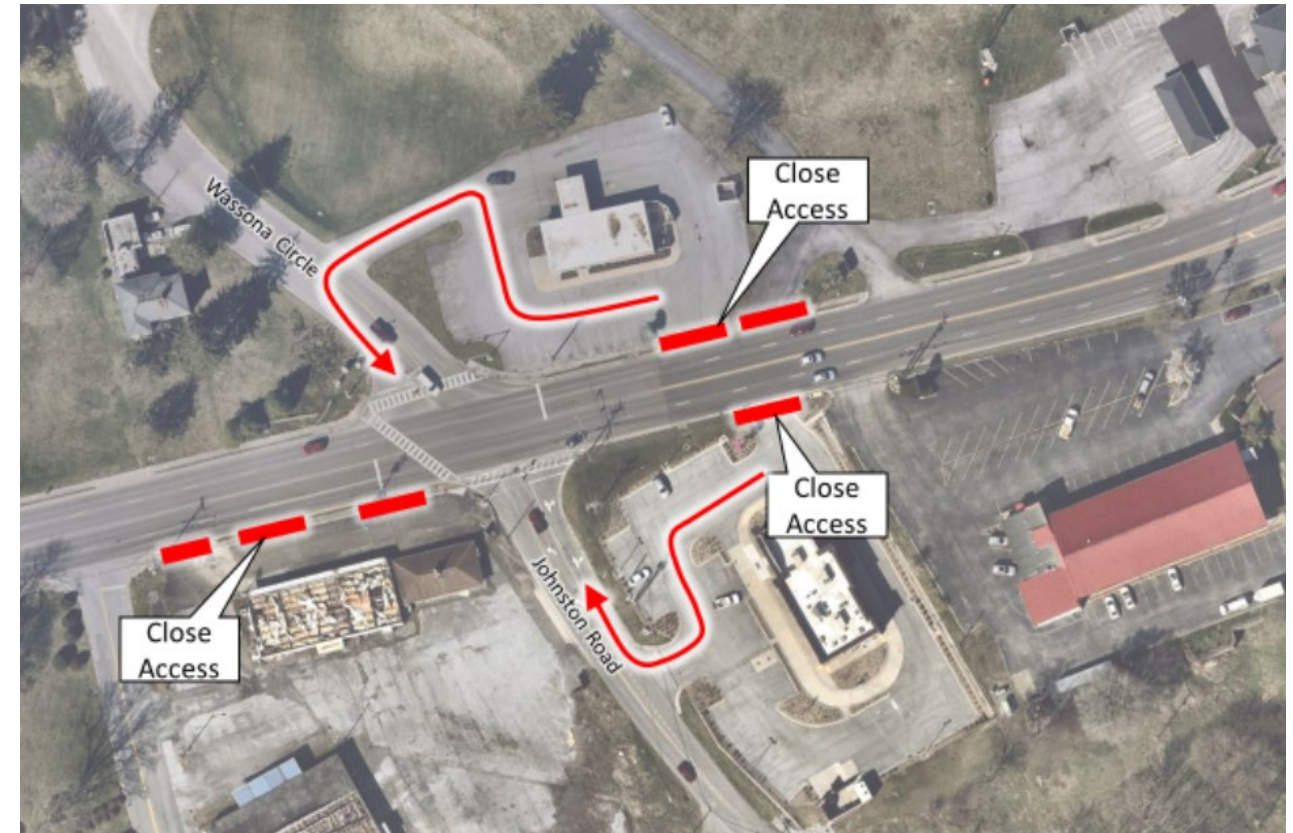


Figure 27: US 11 (Main Street) and Wassona Drive / Johnston Road

- 15 crashes between 2018-2022 that could be attributed to access and uncontrolled left turns
- 77% of Phase 1 survey respondents ranked Safety Improvement as a Study Area Need
- Drivers have difficulty turning left out of the Walmart Shopping Center during the PM peak period
 - 47% of Phase 1 survey respondents expressed difficulty with making left turns
 - 27 unique free-response comments from survey respondents about turns, access, and driveways

An alternative considered to improve the access management on this section of US 11 (Main Street) is to construct a raised median between Park Boulevard and Keller Lane, restricting all left turns to and from US 11 (Main Street) within this segment. The design concept for this alternative is shown in **Figure 28**. The raised median would help mitigate the existing crashes as many of the crashes on this corridor are attributable to the access points and associated uncontrolled movements. The concept sketch shows a potential traffic signal at Keller Lane; Keller Lane intersection control is discussed in more detail in the next report section.

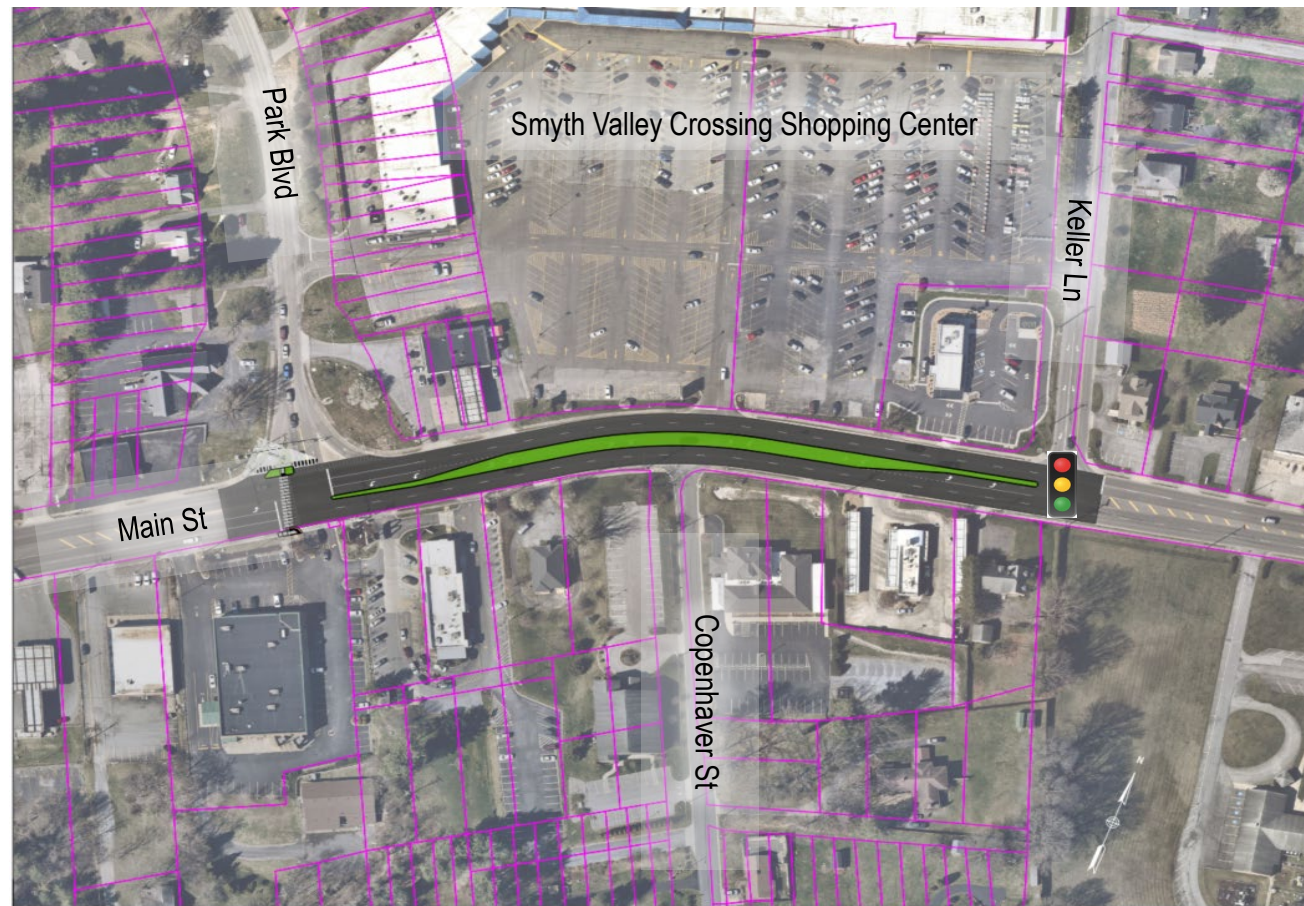


Figure 28: Median with Full Access Closure on US 11 between VA 16 and Keller Lane

KELLER LANE TRAFFIC SIGNAL EVALUATION

The potential median closure at the Smyth Valley Crossing Shopping Center entrance directly on US 11 would induce a traffic volume shift to the Keller Lane unsignalized intersection. In existing volume conditions, residents have difficulty making left turns from Keller Lane due to a combination of opposing traffic volume and sight distance. The study team evaluated whether the re-routed vehicles due to the complete median closure would trigger a signal warrant at the Keller Lane intersection. Traffic signal warrants are formal criteria in the *Manual of Uniform Traffic Control Devices* (MUTCD) and a proposed traffic signal must meet VDOT's signal justification report (SJR) requirements to receive VDOT funding. The following list summarizes the results of the Keller Lane signal warrant analysis:

- Under existing 2023 volume totals, no signal warrants are met with or without induced traffic shift.
- Under projected 2030 volume totals, a four-hour signal warrant is met only with an induced traffic shift. This signal warrant is shown in **Figure 29**.
- An eight-hour signal warrant is not met in any scenario.

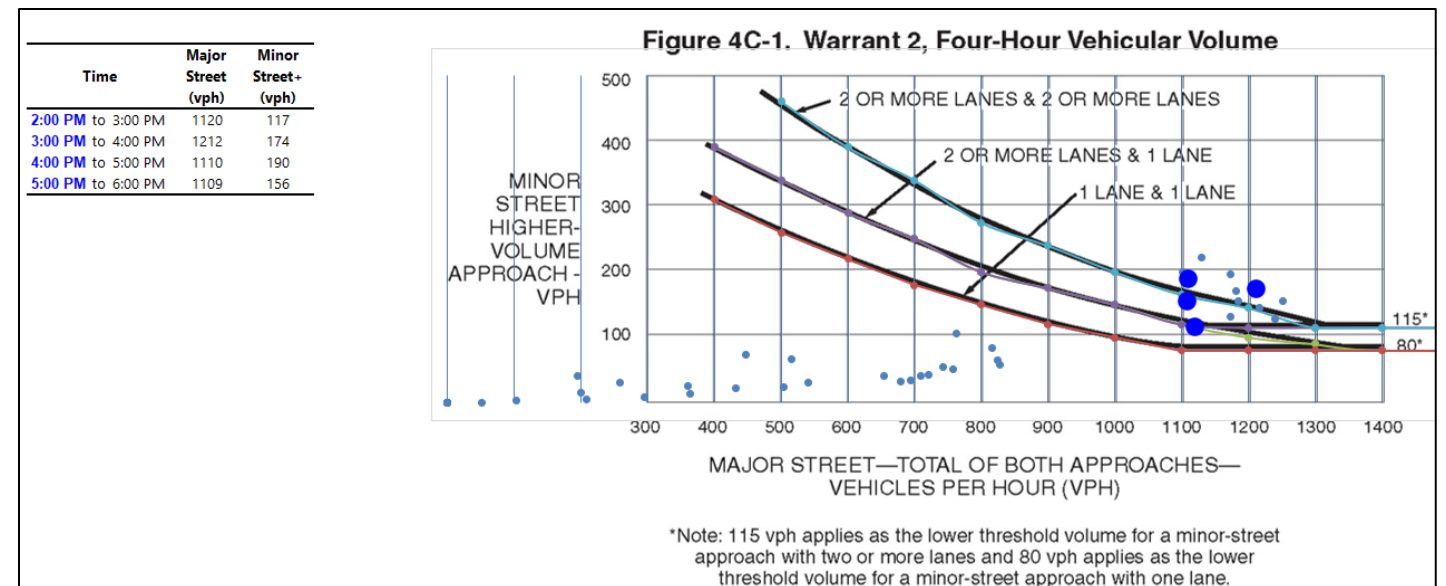


Figure 29: Keller Lane 4-hour Signal Warrant for Projected 2030 Build Volumes

A four-hour signal warrant at Keller Lane is only met in 2030 projected traffic volume conditions with a full access median closure at the existing Smyth Valley Crossing Shopping Center entrance directly on US 11. A partial access median closure does not induce sufficient traffic volume shift to meet the signal warrant. An eight-hour signal warrant is not met in any scenario due to the low traffic volume on the Keller Lane approach in the AM peak period. This analysis is based on eight hours of available traffic data (6-10 AM, 2-6 PM); it's possible that additional midday and evening traffic data could support an eight-hour signal warrant.

In addition to signal warrants, a potential traffic signal at Keller Lane would require an access management exception due to its proximity to the US 11 (Main Street) / VA 16 (Park Boulevard) signalized intersection. The existing intersection spacing is 850 feet, compared to the 1,050 foot spacing requirement in VDOT's access management standards for spacing between signalized intersections on a minor arterial with a 40-mph design speed. US 11 is also a Virginia Corridor of Statewide Significance (CoSS) and part of the I-81 detour route, which increase traffic signal approval complexity.

The full median closure and Keller Lane traffic signal were not considered further due to a lack of support from the Town of Marion and the owners of the Smyth Valley Crossing Shopping Center; however, a partial median closure concept was developed further as an alternative access management strategy. This is discussed in the "Intermediate Proposed Alternatives" report section.

KELLER LANE ROUNDABOUT

Given the challenges with a potential Keller Lane traffic signal, the study team also considered pairing a median closure access management concept with a roundabout as the intersection control type at Keller Lane. A roundabout could help facilitate the rerouted traffic movements that would need to occur with a

median, especially the former left-turn movements that would become U-Turn movements. The roundabout would also mitigate the left-turn crashes seen at the Main Street / Keller Lane intersection. This alternative was evaluated further and is discussed in the “Intermediate Proposed Alternatives” report section.

PARK BLVD / SAYERS ST / TERRACE DR / GROSECLOSE ST INTERSECTION RECONFIGURATION

The existing VA 16 (Park Boulevard) / Sayers Street / Terrace Drive / Groseclose Street five-leg intersection has limited sight-distance due to the horizontal and vertical roadway curvature, and the five-leg intersection creates driver confusion with regard to driver right-of-way. The study team evaluated alternative concepts to reduce driver confusion and improve sight distance, particularly considering a forthcoming land-use development project that will likely increase traffic volumes at this intersection. There is a funded sidewalk project under design along the northeast side of Park Boulevard that will improve sight distance for drivers turning off Terrace Drive due to vegetation clearing on the inside of the horizontal curve.

The study team developed a low cost alternative to better define right-of-way. This alternative, shown in **Figure 30**, would substantially maintain the existing roadway alignment. The existing bifurcation of Sayers Street would be replaced by a single perpendicular approach to Park Boulevard. The team also developed a higher cost alternative that realigns Groseclose Street to create two separate intersections with improved sight distance. This alternative was evaluated further and is discussed in the “Intermediate Proposed Alternatives” report section.

OPERATIONS AND SAFETY LOW-COST IMPROVEMENTS

The study team also considered the following low-cost alternatives to improve the overall operations and safety of the corridor. These are discussed in more detail in the “Intermediate Proposed Alternatives” report section.

- Traffic Signal Upgrades
 - Install left-turn green arrow signal heads at split-phase approaches.
 - Remove the right-turn green arrow at Windy Drive to improve the safety of the opposing crosswalk.
 - Install Flashing Yellow Arrows (FYAs) and High-Visibility Backplates at the VA 16 (Park Boulevard) and Callen Drive / Culbert Drive intersection.
- Add additional signing and marking on US 11 (Main Street) at the at-grade railroad crossing.



Figure 30: VA 16 (Park Boulevard) / Sayers Street / Terrace Drive / Groseclose Street Alternative

Intermediate Proposed Alternatives

This section discusses alternative concepts in the next stage of the development process where the study team conducted detailed analyses and produced more comprehensive concept sketches. The study team also solicited stakeholder and public feedback at this stage to further refine alternatives. The operational analysis documented in this section utilized 2045 traffic volume forecasts that were developed according to an approved traffic forecasting memo included in **Appendix E**.

VA 16 (PARK BOULEVARD) / SAYERS STREET / TERRACE DRIVE / GROSECLOSE STREET INTERSECTION

The proposed alternative option for this intersection is to realign both Sayers Street and Groseclose Street. This alternative is supported by the Town of Marion, and the Town expressed during stakeholder meetings that they would ideally like this alternative implemented prior to the completion of the nearby

land use development project that will generate more vehicle traffic on Groseclose Street. This concept separates the existing five-leg intersection into two distinct intersections and aligns Sayers Street with Terrace Drive, as shown in **Figure 31**. Groseclose Street is realigned to create a 90-degree intersection with VA 16 (Park Boulevard) to improve sight distance and create further separation from Sayers Street / Terrace Drive. While there are identified safety risks at this location, the alternative concept would not be eligible for SMART SCALE funding as there is no 2021 VTrans Need. The Town would need to seek other funding sources to implement the alternative.



Figure 31: VA 16 (Park Boulevard) / Sayers Street / Terrace Drive / Groseclose Street High-Cost Alt.

US 11 (MAIN STREET) BETWEEN VA 16 (PARK BOULEVARD) AND KELLER LANE

The revised alternative for this segment of US 11 (Main Street) includes a partial median closure and maintaining the existing intersection control at Keller Lane (stop-controlled on Keller Lane). The partial median closure restricts all left turn movements between Park Boulevard and Keller Lane, except for the eastbound left into the Smyth Valley Crossing Shopping Center, as shown in **Figure 32**. This concept partially addresses the access management issue by restricting many of the left turns; however, this alternative does not readily accommodate U-Turn movements. Many of the left turn movements would likely shift to either the Park Boulevard signalized intersection or the unsignalized Keller Lane intersection. Traffic signal warrants at Keller Lane are not met in this scenario.

This alternative could also include the reintroduction of a pedestrian crossing across US 11 (Main Street) at the US 11 (Main Street) / VA 16 (Park Boulevard) intersection. This pedestrian crossing could be implemented with the partial median concept or as a standalone project without any access management treatments.

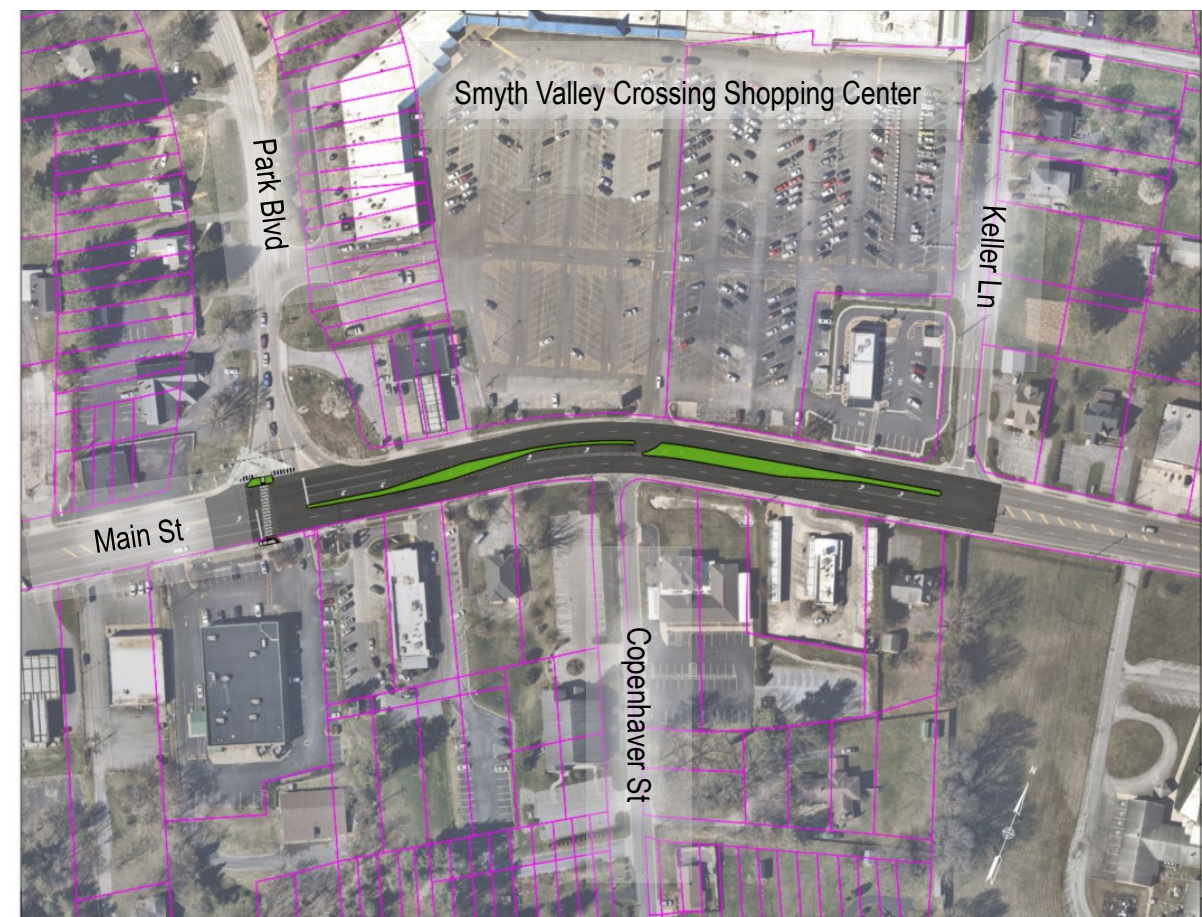


Figure 32: US 11 (Main Street) Between VA 16 (Park Boulevard) and Keller Lane Partial Median

KELLER LANE INTERSECTION

At the Keller Lane intersection, the study team considered a roundabout to replace the existing stop-control intersection configuration. The roundabout is proposed as a two-by-one lane roundabout due to the existing five-lane section on US 11 and the status of US 11 as a detour route for incidents on I-81. The study team determined that a one-by-one lane roundabout would suffice operationally, but the stakeholder group concluded it was not feasible due to the detour route for I-81. This two-by-one lane design concept is shown in **Figure 33**. Property impacts include full takes of the property to the northeast and the property to the southwest of the intersection. These properties are shown in red in **Figure 33**. A rectangular rapid flashing beacon (RRFB) is also proposed across the multilane roundabout legs. The Town of Marion expressed initial interest in further exploration of this alternative, though they recognized the substantial property impacts of the alternative. During the later public engagement portion of this study, described in report Chapter 3, the public strongly disliked this alternative; therefore, the Town withdrew their interest and the study team removed it from consideration.

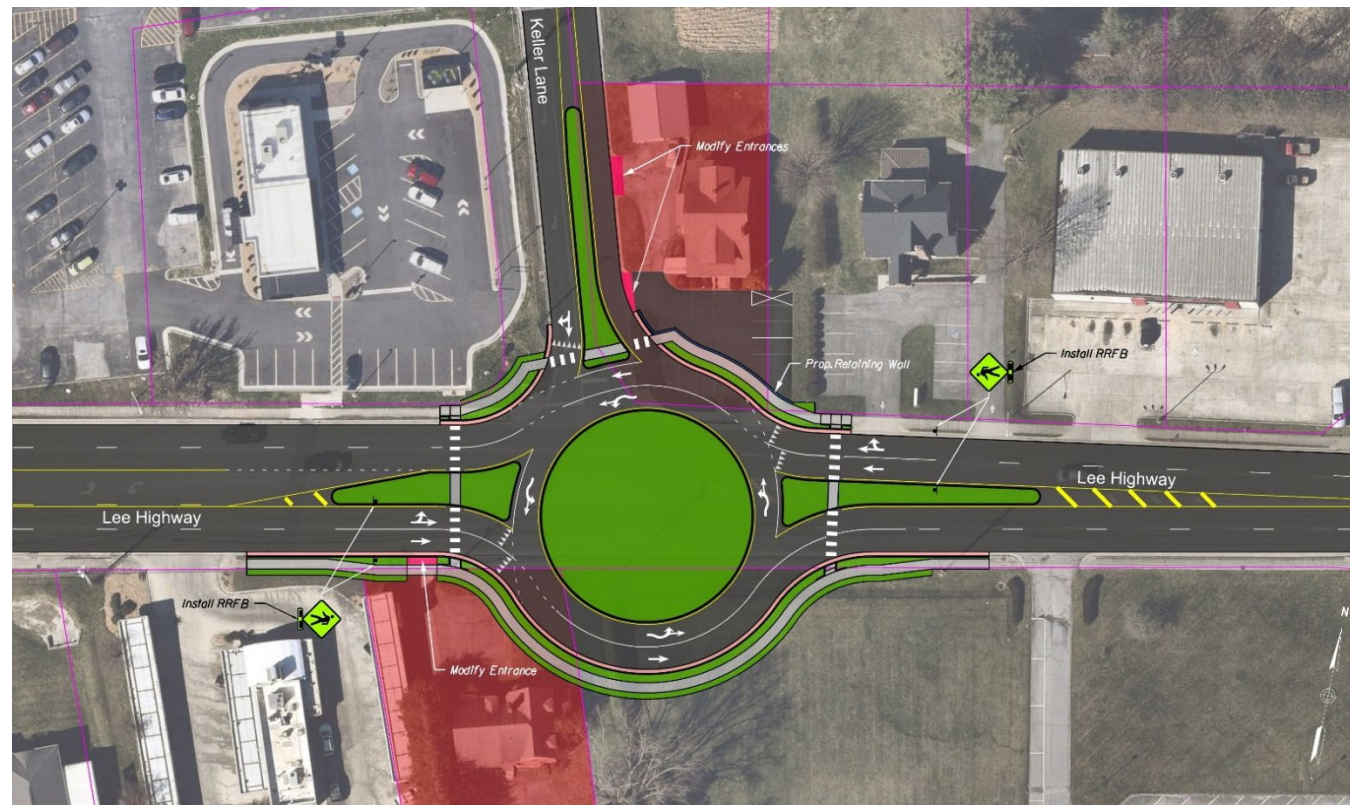


Figure 33: Keller Lane Roundabout Alternative

US 11 (MAIN STREET) / WASSONA DRIVE / JOHNSTON ROAD INTERSECTION

At the US 11 (Main Street) / Wassona Drive / Johnston Road intersection, the study team developed a concept that includes pedestrian crossing signalization, upgraded ADA crossings, access management

improvements, and signal head modifications. The signal heads on the Wassona Drive and Johnston Road approaches are recommended to be updated to have a green left-turn arrow instead of a green ball; this change will clearly indicate driver right of way for left-turning vehicles and eliminate potential driver confusion associated with the signal split phasing. As part of installing ADA compliant curb ramps and pedestrian signals, the existing west crossing across US 11 (Main Street) should be realigned to create a more perpendicular crossing and limit the exposure distance for pedestrians. Since this intersection operates split phase, the pedestrian phase across the west leg of Main Street will run concurrently with the southbound right-turn movement and will not run concurrently with the northbound left-turn movement. For that reason, the offset of the crosswalk created by the perpendicular crossing is not an anticipated concern. The existing crosswalk on Johnston Road is recommended to be removed due to constraints limiting the ability to construct ADA-compliant curb ramps as well as the lack of connection to a sidewalk facility in the southeast quadrant. Additional access management recommendations include closing the three existing driveways to the east of the intersection. Closing these driveways can improve the safety by mitigating the angle crash pattern at this location. **Figure 34** shows the proposed alternative for this intersection.

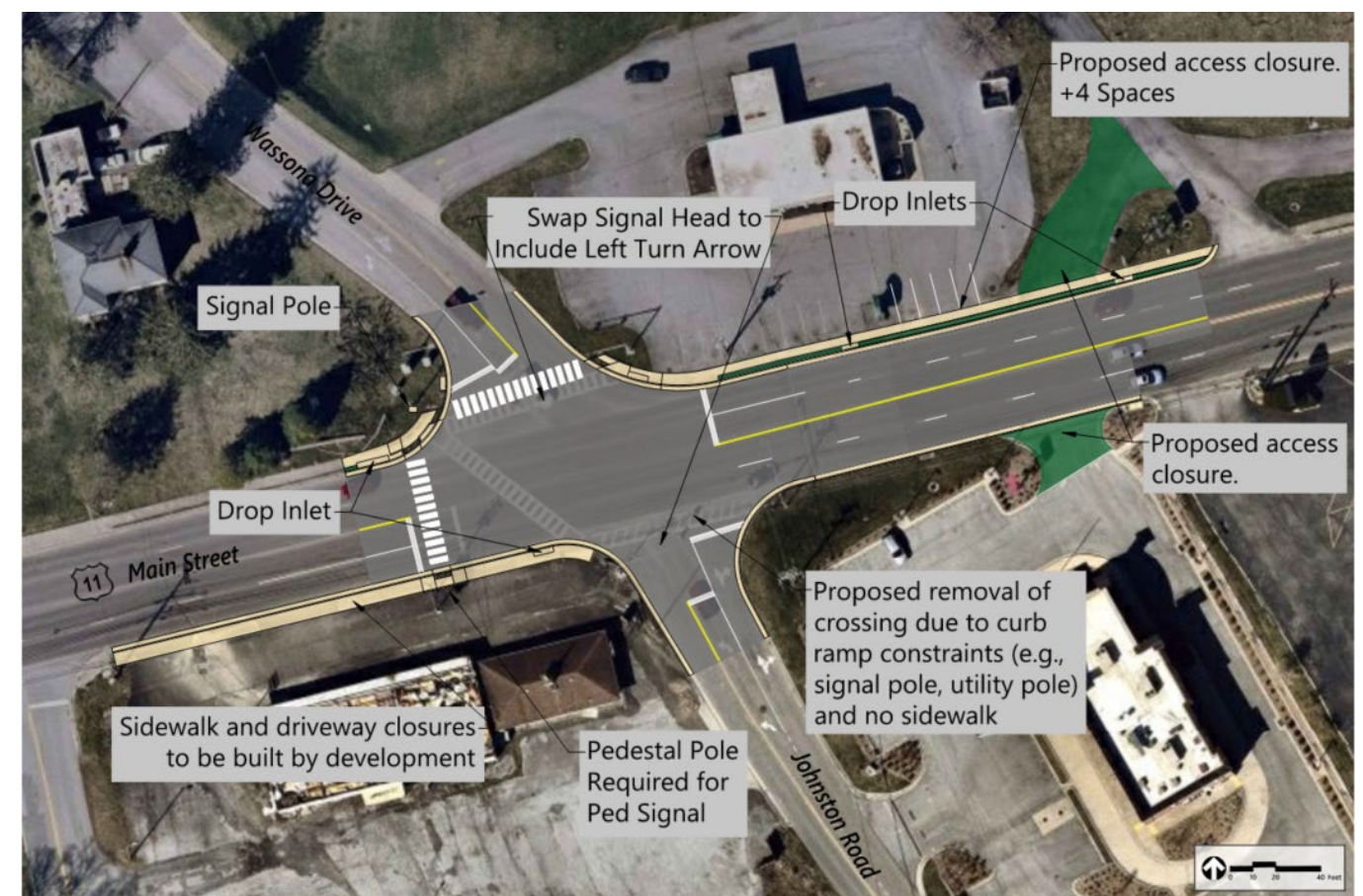


Figure 34: US 11 (Main Street) and Wassona Drive / Johnston Road Proposed Alternative

US 11 (MAIN STREET) / DABNY DRIVE / WINDY DRIVE INTERSECTION

At the US 11 (Main Street) / Dabny Drive / Windy Drive intersection, pedestrian signals, ADA curb ramps, and modified crosswalks are recommended on three approaches of the intersection. The proposed alternative is shown in **Figure 35**. If the Main Street pedestrian crossing receives a green signal indication concurrent to Windy Drive, the right turn green arrow signal head should be replaced with a green ball signal head to properly convey to drivers that they must yield to crossing pedestrians.

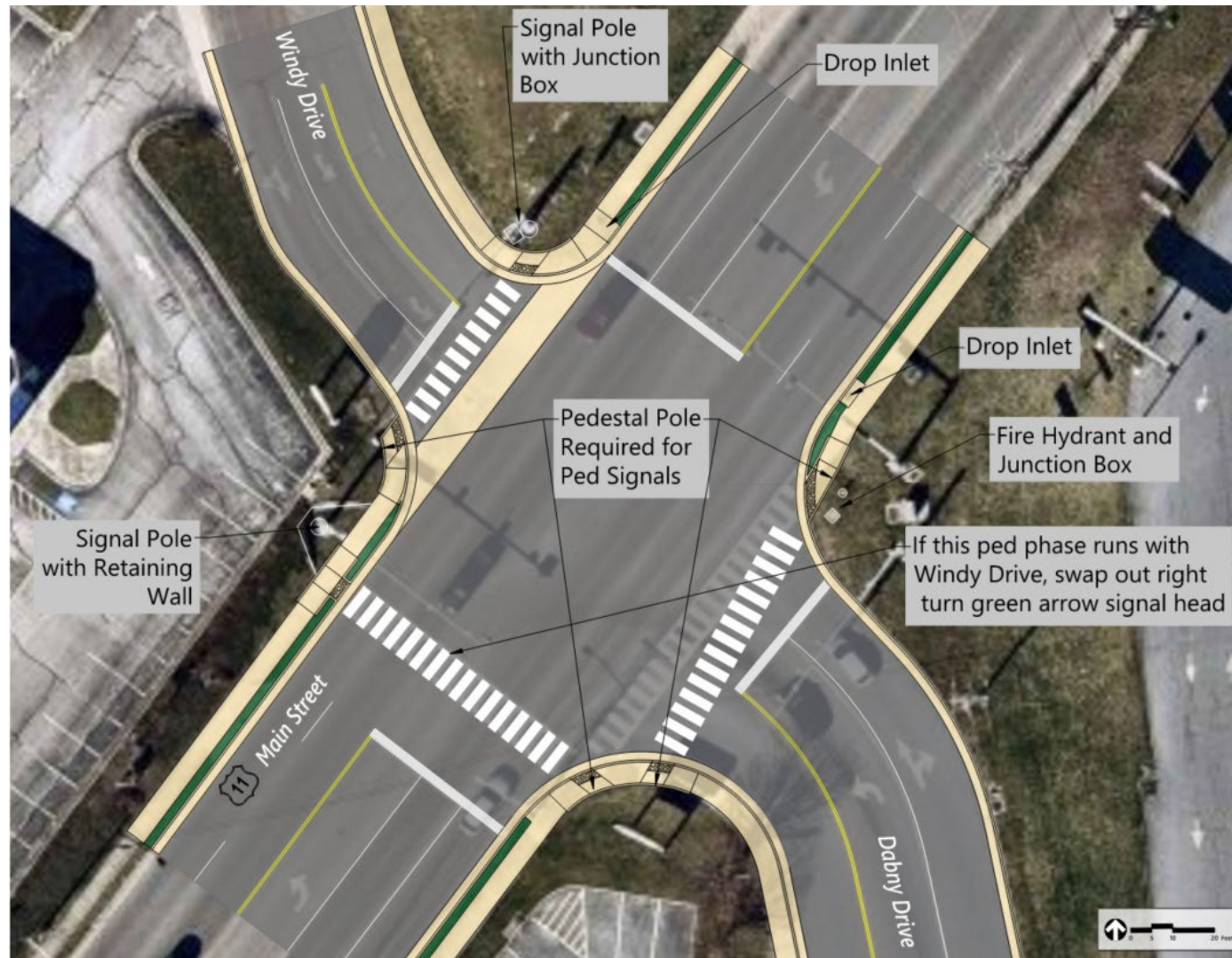


Figure 35: US 11 (Main Street) and Dabny Drive / Windy Drive Proposed Alternative

VA 16 (PARK BOULEVARD) / CALLAN DRIVE / CULBERT DRIVE INTERSECTION

At the VA 16 (Park Boulevard) / Callan Drive / Culbert Drive intersection, a pedestrian signal, ADA curb ramps, and a crosswalk on the east-leg of the intersection are recommended to be installed as part of

the TAP-funded sidewalk project. It is also recommended to install Flashing Yellow Arrows (FYA) and High Visibility Signal Backplates on all four of the approaches. These proposed alternatives are shown in **Figure 36**.



Figure 36: VA 16 (Park Boulevard) and Callan Drive / Culbert Drive Proposed Alternative

RAILROAD CROSSING

At the railroad crossing, additional warning signs for the railroad crossing are recommended to help mitigate the rear end crash trend at this location. The improvements are shown in **Figure 37**.



Figure 37: Railroad Crossing Additional Signs

Preferred Study Alternative

The following preferred study alternative is the result of the development process. The Town of Marion's Town Council voted not to support any access management concept. As such, the study team did not advance any alternative to a funding application. Of the access management alternatives developed within this study to address existing crash concerns, this concept was the most viable and received the most support. It is therefore recommended as the study's preferred alternative.

US 11 (MAIN STREET) BETWEEN VA 16 (PARK BOULEVARD) AND KELLER LANE

The recommended study alternative include a partial median along US 11 (Main Street) between the Park Boulevard and Keller Lane intersections. The concept includes two directional median openings to allow left-turn movements onto Copenhaver Street and into the shopping center. To achieve both left-turn lanes, the driveway access to Smyth Valley Crossing Shopping Center needs to be relocated approximately 85 feet west of the existing entrance. The alternative also includes left-turn lanes with 100-foot storage lanes and 100-foot tapers for the Walgreens/McDonald's entrance and Keller Lane, as well as a pedestrian crossing of US 11 (Main Street) at Park Boulevard. The study preferred alternative can be seen in **Figure 38**, and **Table 5** shows the planning level cost estimate for the alternative. This estimate has not been developed to VDOT SMART SCALE standard, nor has it been thoroughly reviewed by VDOT's discipline engineers.

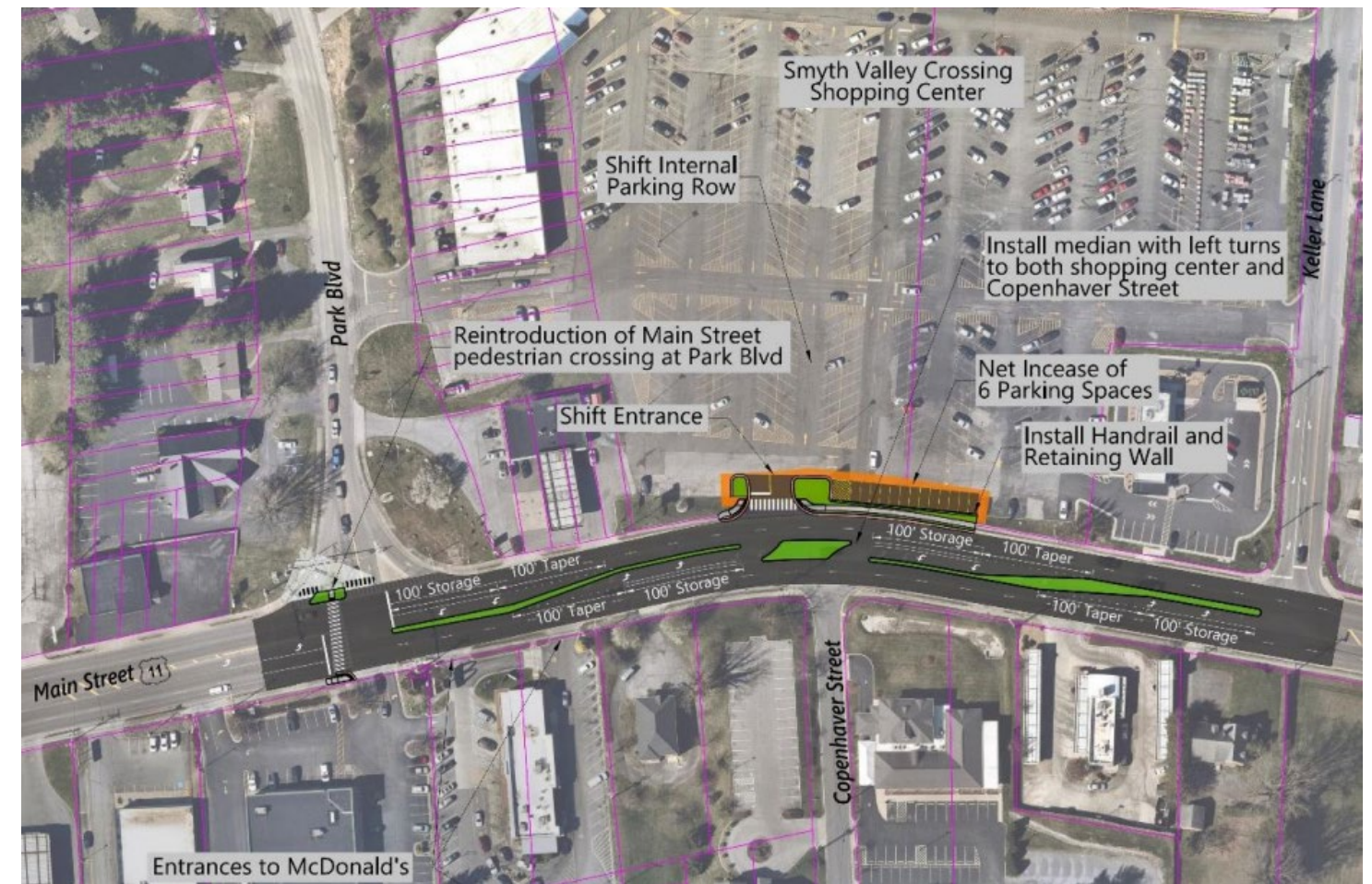


Figure 38: US 11 (Main Street) between the Park Boulevard and Keller Lane Recommended Alternative

Table 5: Study Preferred Alternative Cost Estimate*

Estimate Phase	PE	ROW	CN
Base Estimate (2024)	\$ 94,355	\$ 427,473	\$ 629,034
Contingency (2024)	\$ 42,460	\$ 192,363	\$ 283,065
CEI (2024)	-	-	\$ 145,936
Estimate with Contingency (2024)	\$ 136,815	\$ 619,836	\$ 1,058,034

* This is a planning-level cost estimate that would need to be updated and refined should this study preferred alternative ever be considered for implementation.

Chapter 3:

Public and Stakeholder Outreach and Feedback

Public Involvement:

Following the development and analysis of the Preliminary Build Alternatives, a public involvement survey was developed to determine the public's response to the recommended improvements. This survey was available online for 14 days spanning from February 12, 2024, to February 25, 2024. In addition to the online survey, an in-person public meeting was held on February 21, 2024, at Marion's Town Hall. The same material was shared in the survey and at the meeting.

Survey Design

Public involvement for this study partially took place in the form of an online survey developed in VDOT's PublicInput Platform, which is an online engagement platform that is designed to educate the public while gathering informed output. The goals of this public outreach effort were to present relevant issues, educate the public on the recommended improvement concepts outlined in Chapter 2, and to receive the public's feedback on the proposed improvements.

Overall, the survey is divided into five sections, which include the following:

1. Introduction to the study and background information
2. Proposed intersection improvements
3. Proposed safety improvements
4. Proposed concept combinations
5. Wrap up with demographic questions

The first section provides an overview of the study partners, background, and study location, as shown in **Figure 39**. In the second section, participants were presented with recommended improvements at four intersections that addressed vehicular-based operation, safety, and pedestrian needs. Next, in the third section, participants were presented with raised median concepts between Park Boulevard and Keller Lane to address the access-related crash patterns in this segment. In the fourth section, participants were presented with two concepts that combine the concepts shown in the third section with the intersection improvement (roundabout) shown in the second section.

For each concept, participants were asked (on a 1 to 5 scale) if they opposed or supported the project concept. A score of 1 represented "strongly oppose", and a score of 5 represented "strongly support." Participants were also able to provide freeform comments on each concept. At the end of the survey, the participants were asked a few demographic questions.

A total of 541 people responded to the survey with 744 unique freeform comments. A compilation of all freeform public comments can be found in **Appendix F**.

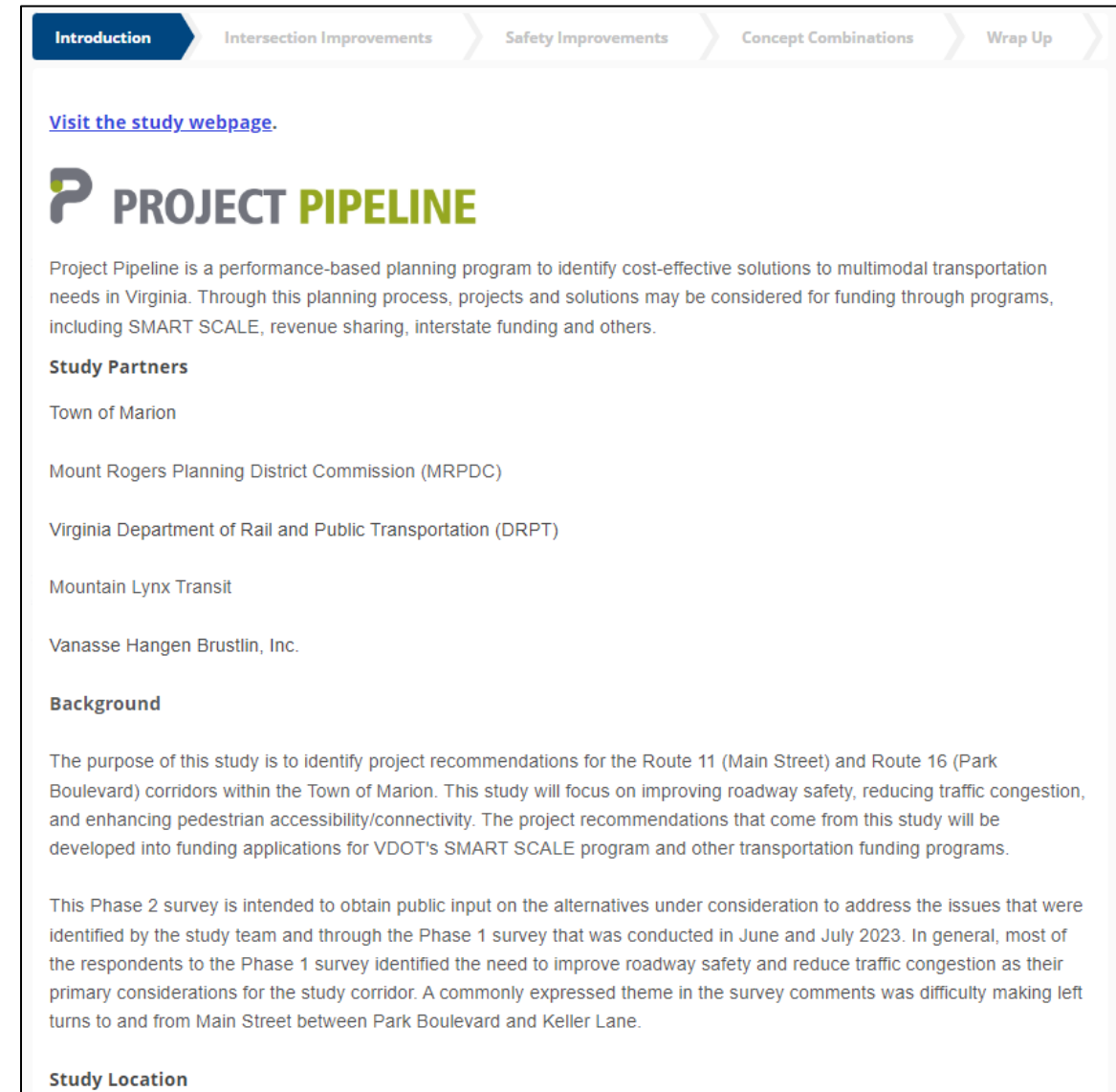


Figure 39: Public Survey Layout

Survey Questions and Results

INTERSECTION IMPROVEMENTS

The first concept presented to the public for feedback included intersection improvements at the Park Boulevard / Sayers Street / Terrace Drive / Groseclose Street intersection that includes realigning Sayers Street and Groseclose Street to improve sight distance.

Respondents were informed that “*The Park Boulevard / Sayers Street / Terrace Drive / Groseclose Street intersection is a five-leg intersection with poor visibility due to a combination of horizontal and vertical curvature of the roadway. This safety risk is anticipated to grow with an expected increase in traffic using this intersection. The proposed concept will realign Sayers Street to line up with Terrace Drive and realign Groseclose Street to Park Boulevard to create two separate intersections. A previously funded sidewalk project will also improve sight lines exiting Terrace Drive.*”

The respondents’ feedback is recorded in **Figure 40**; they had the opportunity to rate the proposed concept on a 1 (strongly oppose) to 5 (strongly support) scale. The average respondent score is a 3.51, indicating moderate support for the concept.

Next, the public was invited to provide feedback on a roundabout option at Main Street and Keller Lane. Respondents were informed “*The Main Street / Keller Lane intersection is the #95 crash safety need in the region. Phase 1 survey respondents also expressed difficulty turning left out of Keller Lane, particularly in the afternoon. The proposed concept will replace the existing unsignalized intersection with a roundabout that will mitigate left turn crash risk, improve traffic flow exiting Keller Lane, and facilitate a new pedestrian crossing of Main Street.*” **Figure 41** provides the public response for this concept. Based on the weighted score of the 2.02, the majority of respondents do not support this concept. Over 60% of respondents indicated that they strongly oppose this concept.

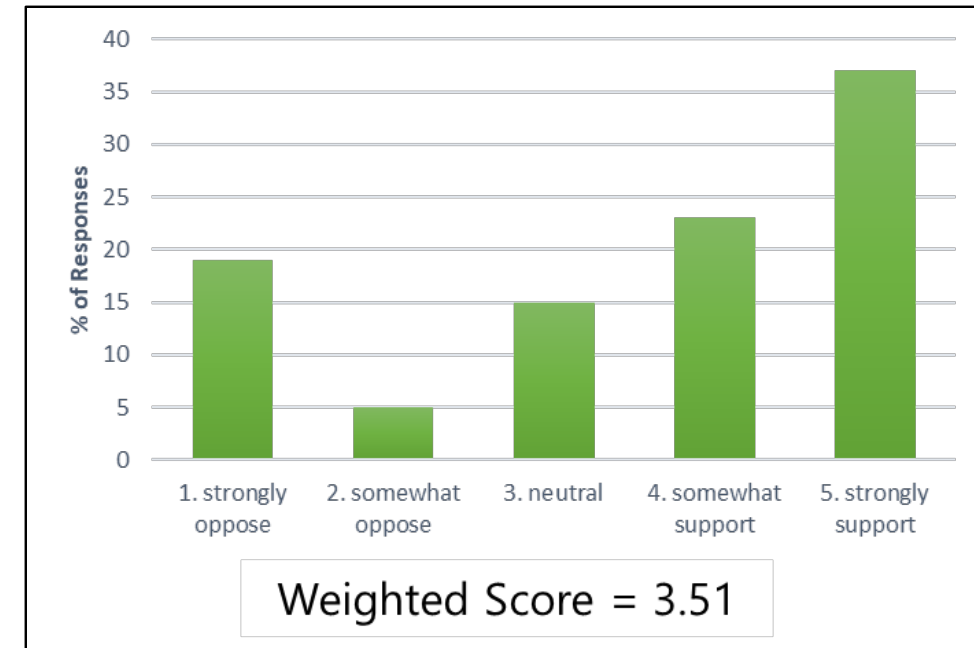


Figure 40: Respondents’ Feedback on Sayers Street and Groseclose Street Realignment

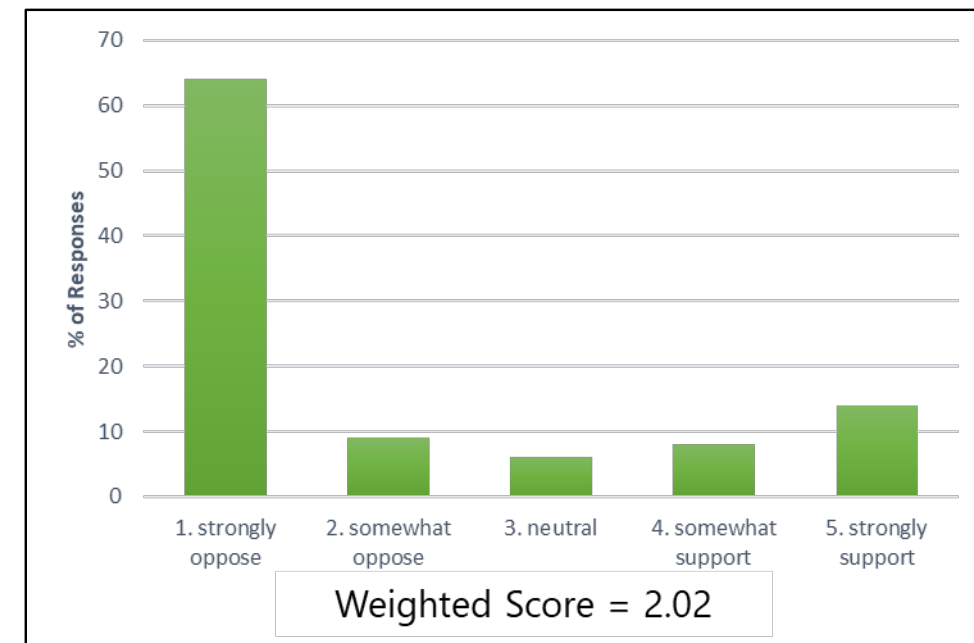


Figure 41: Respondents’ Feedback on Roundabout at Main Street and Keller Lane

The third concept presented to respondents included pedestrian safety updates at the Main Street / Dabny Drive / Windy Drive intersection. Respondents were informed “*The Main Street / Dabny Drive /*

Windy Drive intersection currently has unsignalized pedestrian crosswalks. This location is near the Marion Senior High School. The proposed concept will install pedestrian signals at the three pedestrian crosswalks and update the curb ramps to be ADA compliant. A signal head display will also be changed to be compliant.”

The results are shown in **Figure 42**. Based on the weighted score, participants were in support of these improvements with a weighted score of 4.02. Almost 50% of participants strongly support this concept.

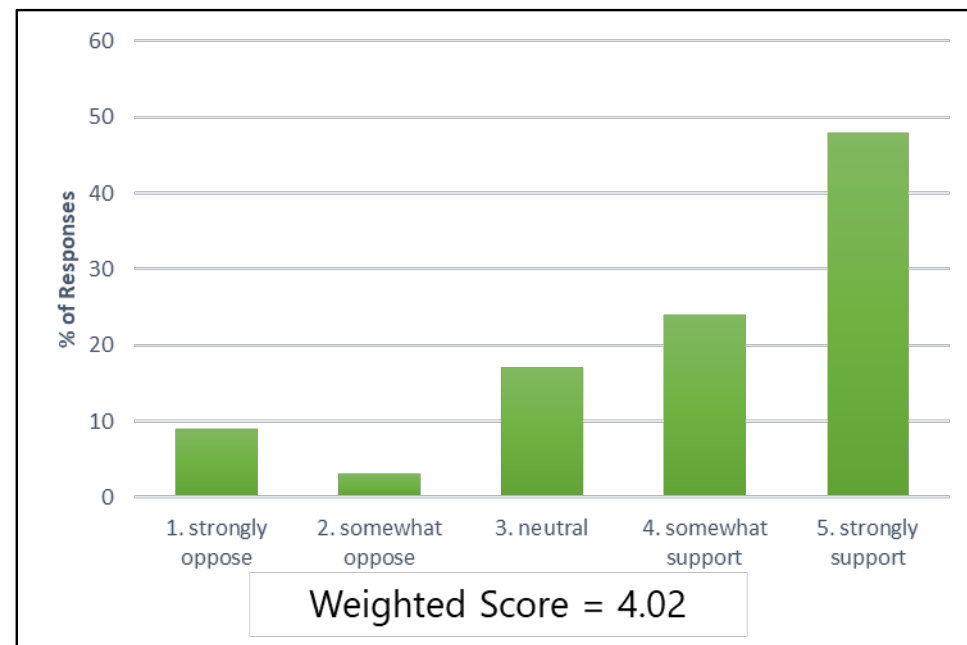


Figure 42: Respondents' Feedback on Curb Extensions at Court Street

Lastly, respondents were presented with intersection improvements at the Main Street / Wassona Drive / Johnston Road intersection. Respondents were informed “The Main Street / Wassona Drive / Johnston Road intersection currently has unsignalized pedestrian crossings, signal head displays that were observed to cause driver confusion, and driveways located close to the intersection that have contributed to some crashes. The proposed concept would signalize two pedestrian crossings, remove the crossing of Johnston Road, upgrade curb ramps to be ADA compliant, swap out traffic signal heads, and close driveways on Main Street near the intersection. Businesses can still be accessed from Wassona Drive and Johnston Road.”

Participants were asked to separately rank their support for the pedestrian improvements and their support for the access management improvements. **Figure 43** and **Figure 44** present the results of both. Participants showed general support for both concepts, and more so for the pedestrian improvements. The pedestrian improvements received a weighted score of 3.79, and the access management alternatives received a weighted score of 3.09.

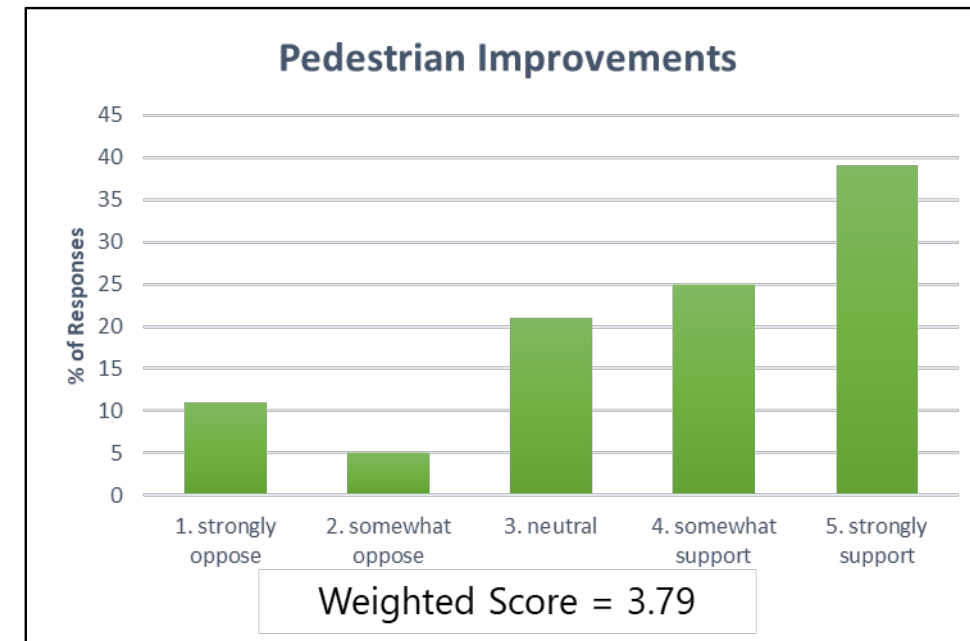


Figure 43: Respondents' Feedback on Pedestrian Improvements at Main Street / Wassona Drive / Johnston Road

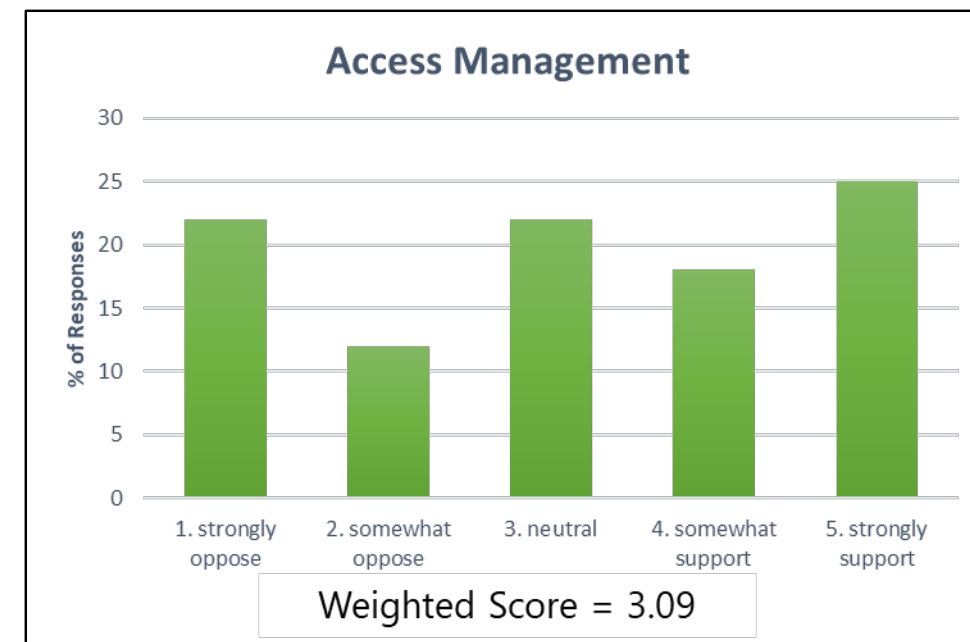


Figure 44: Respondents' Feedback on Access Management at Main Street / Wassona Drive

SAFETY IMPROVEMENTS

In the next section of the public input survey, respondents were presented with two alternatives for a raised median between Park Boulevard and Keller Lane. The first concept presented includes an eastbound left-turn lane to the Walmart Shopping Center. The respondents were informed “The Main Street segment between Park Boulevard and Keller Lane is the #19 crash safety need in the region, and the Main Street / Park Boulevard intersection is the #37 crash safety need in the region. Many of the existing crashes are associated with left turns in and out of driveways within this segment and the functional area of the Park Boulevard intersection. Phase 1 survey respondents also expressed difficulty turning left out of these driveways, particularly in the afternoon. The proposed concept will replace the existing two-way left turn lane with a landscaped median between Park Boulevard and Keller Lane. In the first variation of this concept, left turn movements would still be allowed from Main Street into the Walmart Shopping Center. This project would improve roadway safety by concentrating turns to a few locations. It would also include the construction of a signalized pedestrian crossing of Main Street at the Park Boulevard intersection.” **Figure 45** provides the public response for this concept. Based on the weighted score of the 2.87, the response to this concept is neutral leaning to somewhat opposed.

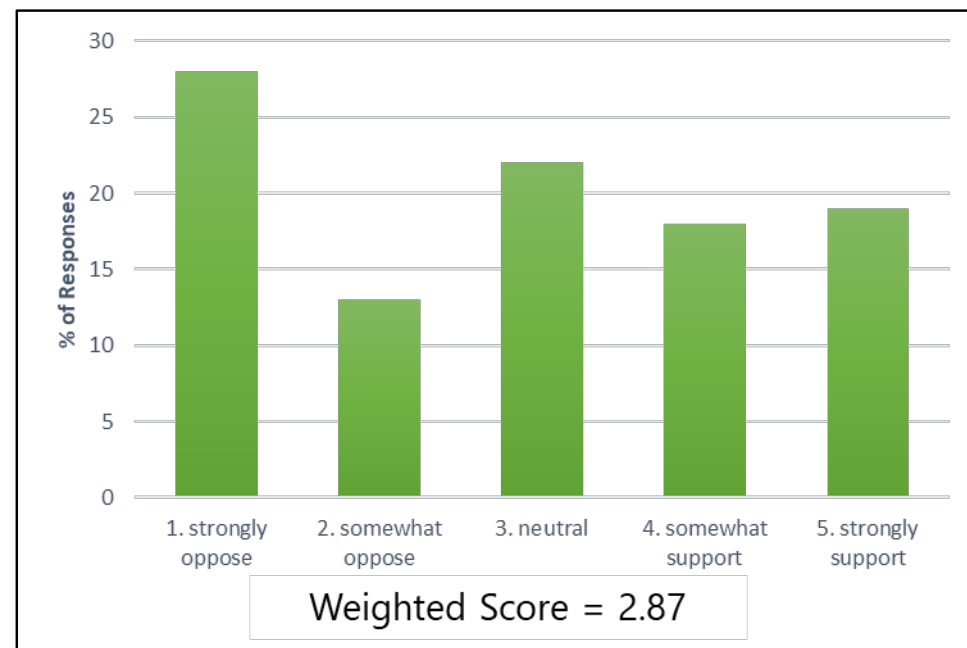


Figure 45: Respondents' Feedback on Raised Median between Park Boulevard and Keller Lane - Concept 1

The second concept presented in this section is a raised median between Park Boulevard and Keller Lane, like the first concept, but with an additional westbound left-turn lane to Copenhaver Street. This concept also relocates the Walmart entrance to accommodate a westbound left-turn lane to Copenhaver Street. Respondents were informed “This next alternative concept is a second variation of the above concept to construct a landscaped median on Main Street between Park Boulevard and Keller Lane. In

this second variation of this concept, left turn movements would be allowed from Main Street into both the Walmart Shopping Center and Copenhaver Street. This would require relocating the existing Walmart Shopping Center access point. This project would improve roadway safety by concentrating turns to a few locations.” **Figure 46** provides the public response for this concept. Based on the weighted score of the 2.92, participants slightly prefer this concept over the first concept presented but are still overall neutral to this improvement.

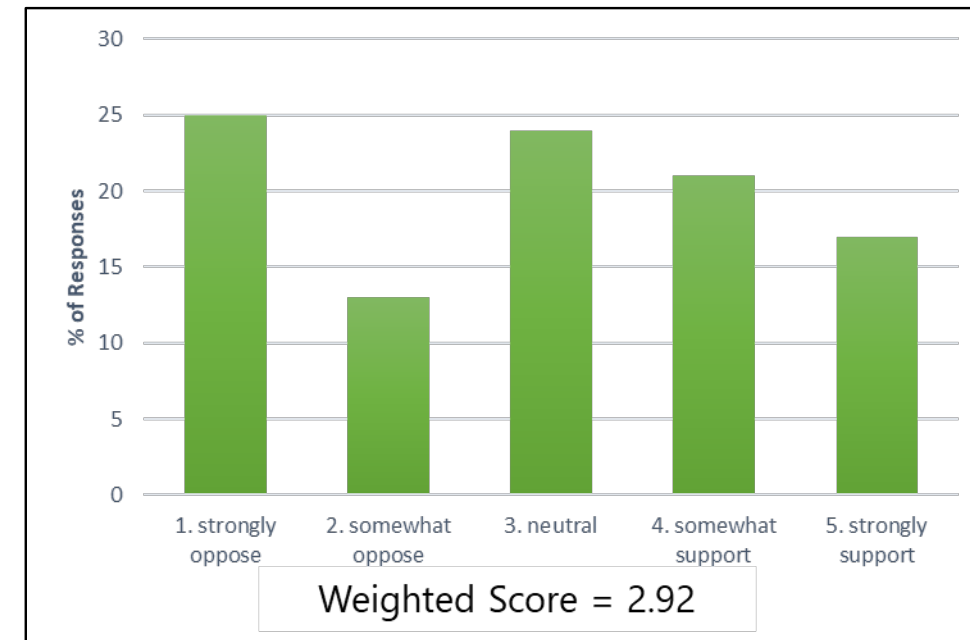


Figure 46: Respondents' Feedback on Raised Median between Park Boulevard and Keller Lane - Concept 2

After the two previous concepts, respondents were asked which concept they prefer. Of the two concepts presented, the respondents preferred the second option that included an eastbound left-turn lane to Walmart and a westbound left-turn lane to Copenhaver Street. 32% of respondents indicated that they do not like either option. The full results are shown in **Figure 47**.

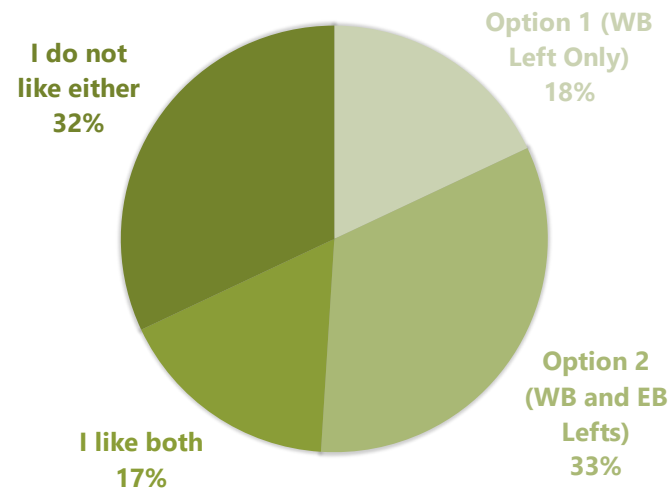


Figure 47: Respondents' Feedback on the Raised Median Alternatives between Park Boulevard and Keller Lane

CONCEPT COMBINATIONS

The fourth section of the survey presented two combinations of previous concepts – the raised median options between Park Boulevard and Keller Lane and a roundabout at Main Street / Keller Lane. The first concept combines the roundabout at Keller lane with the raised median concept #1 from the previous section (eastbound left-turn lane into Walmart). The second concept combines the roundabout at Keller Lane with the raised median concept #2 from the previous section (eastbound left-turn lane to a relocated Walmart access and a westbound left-turn lane to Copenhaver Street). After being presented both combination concepts, participants were asked to provide their general support for the roundabout combined with one of the two raised median concepts. As shown in **Figure 48**, respondents were opposed to this concept. Over 60% of respondents indicated that they strongly oppose combining the roundabout with a raised median concept.

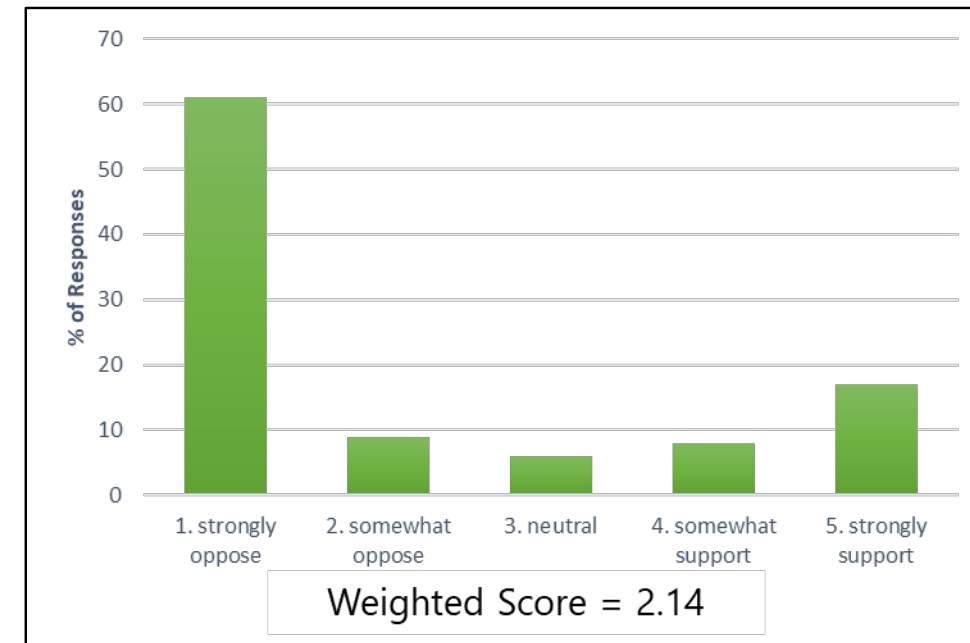


Figure 48: Respondents' Feedback on Roundabout Combination with Raised Median

FREEFORM SURVEY COMMENTS

In addition to being invited to score and rank the proposed alternatives, survey respondents had the option to provide freeform comments both generally on the study area and on individual concepts. A sampling of these comments with study team responses are shown in **Table 6**. A compilation of all freeform public comments can be found in **Appendix E**.

IN-PERSON PUBLIC MEETING

In addition to the online survey, an in-person public meeting was held on February 21, 2024, at Marion's Town Hall. 35 participants officially signed into the meeting; however, estimated attendance was 75 people. The public feedback received at that meeting generally followed the same themes and level of support as the online survey responses.

Table 6: Summary of Public Comments and Study Team Responses

Public Comments and Study Team Responses		
	Public Comment	Study Team Response
Roundabout at Keller Lane with Median Concept	<ol style="list-style-type: none"> 1. "I think a traffic light would be a simpler and more effective solution at this intersection" 2. "Round about an are the worst idea at any time." 	<ol style="list-style-type: none"> 1. The <i>Manual on Uniform Traffic Control Devices</i> (MUTCD) and VDOT set requirements for when a traffic signal should be installed, defined as traffic signal warrants. The warrants are primarily based on volume and crash history. This intersection does not meet the warrant thresholds for traffic signal installation. The only way a traffic signal may be warranted by traffic signal volume is based on future (2030) conditions with a full median between Park Boulevard and Keller Lane. Additionally, VDOT maintains criteria for the spacing required between two signalized intersections, and this intersection does not meet the required spacing from the signalized intersection at Park Boulevard. 2. Roundabouts have proven safety benefits, including reducing conflict points, reducing severe crashes, lowering vehicle travel speeds, and providing benefit for pedestrians. Converting an intersection to a roundabout has been studied to reduce injury-causing crashes by up to 44% and fatal crashes by up to 72%. However, the study team recognizes that there are additional factors that determine the suitability of a roundabout, including property impacts, local input, and cost.
Median Concepts between Park Boulevard and Keller Lane	<ol style="list-style-type: none"> 1. "Cuts off access to businesses opposite of Walmart, including several doctors offices, an architect, and Sonic." 2. "I don't understand how the median installation affects access to my property up Copenhaver Street. Will I not longer be able to turn left from Hwy 11 onto Copenhaver? It is difficult to turn left from Copenhaver onto Hwy 11 but I don't see that addressed. I don't want to be limited in my approach onto Copenhaver. I need clarification." 	<ol style="list-style-type: none"> 1. Access is still maintained to all businesses, but vehicles will be rerouted to access those businesses. In the study preferred alternative, a left-turn lane into Walmart and into Copenhaver is proposed, which accommodates a majority of the left-turning movements from US 11. The remaining movements will make a U-turn at either Park Boulevard, the two median opening, or Keller Lane to turn right into their business of choice. Overall, this concept reduces conflict points and, according to the Crash Modification Factor Clearinghouse, installing a raised median reduces crashes by up to 70%. In the study preferred alternative, you will be able to turn left onto Copenhaver from US 11. You will not be able to turn left from Copenhaver to US 11. Instead, you will turn right out of Copenhaver and make a U-turn to travel west on US 11. This removes the difficulty and crashes caused by vehicles turning left out of Copenhaver and the Walmart shopping center.
Park Boulevard / Sayers Street / Terrace Drive / Groseclose Street Improvements	<p>"I live off of Groseclose Street and use this intersection multiple times a day. The sight distance in trying to pull out from the intersection is poor. Unless it is a larger vehicle approaching from the North Main end of Park Boulevard, you can not see it until it is right at you. There have been several accidents and numerous close calls at this intersection. These improvements would be a very welcome change."</p>	<ol style="list-style-type: none"> 1. Acknowledged. There were few reported crashes associated with vehicles turning at this location; however, the study team recognizes that there are multiple characteristics of this intersection that create difficulty and this treatment aims to alleviate those. Additionally, close calls are not tracked in vehicle crash data, so that information is helpful to confirm the need for improvements at this intersection.
Main Street / Dabny Drive / Windy Drive	<ol style="list-style-type: none"> 1. "Any time pedestrian safety can be improved, it is a plus for our community. There are more and more people walking in that area" 	<ol style="list-style-type: none"> 1. Acknowledged and agreed.

Public Comments and Study Team Responses		
	Public Comment	Study Team Response
Intersection Improvements	everyday and pedestrian crossings would make it safer for those who choose to cross the road.”	
Main Street / Wassona Drive / Johnston Road Intersection Improvements	1. “Are you going to give property owners another means of egress?”	1. Yes, the existing access points are redundant and there are additional access points located on Wassona Drive and Johnston Circle that would remain open.