



City of Sweetwater

US Highway 11 / State Route 2 Main Street Mobility Plan

FINAL REPORT

May 2023



RESOLUTION to adopt the Sweetwater Downtown Mobility Plan

WHEREAS, the City of Sweetwater TN received an Urban Transportation Planning grant from the Tennessee Department of Transportation (TDOT) to conduct a mobility study along Highway 11/Main Street in Sweetwater; and

WHEREAS, HNTB has conducted the study, and a public hearing was held on Monday, June 26, 2023 at City Hall; and

WHEREAS, the Downtown Planning Committee has reviewed and provided feedback on the plan over the course of several meetings; and the Mayor and Board of Commissioners of the City of Sweetwater reviewed the plan in their meeting on Monday, June 26, 2023; and

WHEREAS, the Sweetwater Downtown Mobility Plan is a tool that, when adopted and applied, can help preserve and enhance the Highway 11 Downtown Corridor, serve as a guide for planning and development by the City of Sweetwater and the Main Street organization, multi-modal accommodations, green space development, and improving the safety and livability of the area; and

WHEREAS, Sweetwater's historic downtown and Main Street organization are a keystone to Sweetwater's economic development, charming aesthetics, and future growth plans.

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and Board of Commissioners of the City of Sweetwater, Tennessee that the Sweetwater Downtown Mobility Plan attached as Exhibit A are hereby adopted.

Duly Passed by the Mayor and Board of Commissioners of the City of Sweetwater on this the 26th day of June, 2023.



MAYOR

ATTEST: 
RECORDER



TABLE OF CONTENTS

INTRODUCTION..... 1

EXISTING CONDITIONS 2

 I. ROADWAY CHARACTERISTICS..... 2

 II. TRAFFIC COUNTS AND GROWTH TRENDS 2

 III. SAFETY..... 5

 IV. FREIGHT 7

 V. ACTIVE TRANSPORTATION 7

 VI. OTHER RELEVANT PROJECTS..... 9

 HIGH STREET.....9

 SWEETWATER GREENWAY9

 TAP PROJECT9

 RESURFACING.....10

PUBLIC SURVEY RESULTS..... 11

 I. DEMOGRAPHICS..... 11

 II. PRIORITIES 12

 III. TRADEOFFS 13

 IV. MAP POINTS..... 14

NEEDS ASSESSMENT..... 16

 I. COMMON ISSUES AND POTENTIAL SOLUTIONS 16

 PEDESTRIAN CROSSINGS16

 SIDEWALKS.....17

 ADA ACCESSIBILITY18

 SIGHT DISTANCE / ON-STREET PARKING / PARKLETS.....18

 SIGNALS.....20

 RAILROAD CROSSING20

 ACCESS MANAGEMENT22

 DRAINAGE & UTILITY RELOCATIONS22

 UTILIZATION OF ROW23

 SIGNAGE.....23

 II. FOCUS AREAS 24

 MAIN STREET MARKETPLACE, CULHAM STREET, AND BIRD STREET.....24

 MONROE STREET / OLD HIGHWAY 68 SIGNAL25

 PARKING LOT AND WRIGHT STREET27

 GAZEBO & WALNUT STREET.....29

 MAIN STREET CROSS-SECTIONS: MONROE STREET TO MORRIS STREET30

 NORTH MAIN STREET.....31

 III. ENVIRONMENTAL CONSIDERATIONS..... 32

RECOMMENDATIONS 34

- I. MAYES AVENUE TO BIGGS STREET 36
- II. BIGGS STREET TO NORTH STREET 36
- III. NORTH STREET SIGNAL 37
- IV. NORTH STREET TO MILLER STREET 37
- V. MILLER STREET TO MONROE STREET 37
 - BICYCLE LANES38
 - BULB-OUTS38
 - GAZEBO40
 - BRICK SIDEWALK.....41
- VI. MONROE STREET TO CULHAM STREET..... 41
- VII. MAIN STREET MARKETPLACE 41
- VIII.ROUTE TO DUCK PARK..... 41
- IX. ROUTE TO COMMUNITY CENTER..... 42
- X. COST ESTIMATES 42
- XI. POTENTIAL FUNDING OPPORUNITIES..... 46

APPENDIX A: SUMMARY OF OUTREACH ACTIVITIES 49

- STEERING COMMITTEE 49
- STAKEHOLDER ENGAGEMENT..... 49
 - FIRST MEETING49
 - SECOND MEETING51
 - THIRD MEETING.....55
- PUBLIC ENGAGEMENT 57

APPENDIX B: INVENTORY OF EXISTING CONDITIONS 58

APPENDIX C: APPLICATION OF LIDAR 66

- LIDAR OVERVIEW..... 66
- POINT CLASSIFICATION 66

APPENDIX D: CONCEPT PLANS 70

TABLE OF FIGURES

Figure 1: Road Classifications	3
Figure 2: Daily Traffic Counts (2022 AADT).....	4
Figure 3: Historic Traffic Trends on Main St / Hwy 11 (Annual Average Daily Traffic)	5
Figure 4: Crash Data within Study Corridor.....	5
Figure 5: Crashes along Corridor	6
Figure 6: Type of Crashes along Corridor.....	7
Figure 7: Existing Sidewalk Infrastructure.....	8
Figure 8: Sweetwater Greenway.....	9
Figure 9: Sweetwater Resident	11
Figure 10: Survey Descriptors	12
Figure 11: Sweetwater Priorities	13
Figure 12: Survey Mapping Points	15
Figure 13: Pedestrian Crossings.....	16
Figure 14: Sidewalk Observations.....	18
Figure 15: ADA Curb Ramps	18
Figure 16: Intersection Sight Distance	19
Figure 17: North Street Signals	20
Figure 18: Rail Crossing	20
Figure 19: Rail Crossings at Old Highway 68 and Walnut Street.....	21
Figure 20: Railroad Crossing Options	21
Figure 21: Pedestrian Rail Crossing Potential Solutions.....	22
Figure 22: Drainage at Morris Street	23
Figure 23: Existing ROW	23
Figure 24: Possible Typical Sections.....	23
Figure 25: Signage in Sweetwater	24
Figure 26: Pedestrian Safety at Culham and Bird Streets.....	25
Figure 27: Existing Lack of Access Management at the Main Street Marketplace	25
Figure 28: Monroe Street/Old Highway 68 Pedestrian Needs	26
Figure 29: Monroe Street/Old Highway 68 Pedestrian Needs	27
Figure 30: Wright Street Turn-In Reconfiguration Option	27
Figure 31: Wright Street Pedestrian Infrastructure.....	28
Figure 32: Wright Street Aerial View.....	28
Figure 33: Walnut Street Pedestrian Crossings.....	29
Figure 34: Potential Walnut Street Reconfiguration.....	30
Figure 35: Widened Sidewalk Potential Improvements	30

Figure 36: Main Street East Side Potential Improvements.....31
Figure 37: North Main Street East Side Potential Pedestrian Improvements.....31
Figure 38: North Main Street West Side Potential Pedestrian Improvements.....31
Figure 39: Main Street and Sweetwater Creek32
Figure 40: Recommendations Overview35
Figure 41: Existing Parking at the Market at the Mill37
Figure 42: Bulb-Outs / Curb Extensions.....39
Figure 43: Illustrative Improvements.....40

TABLE OF TABLES

Table 1: Traffic Count Locations 4
Table 2: Crashes along Corridor (2017-2021)..... 6
Table 3: Type of Crashes along Corridor 7
Table 4: Tradeoff Options 13
Table 5: Tradeoff Responses..... 14
Table 6: Parking Inventory 19
Table 7: Summary of Cost Estimates..... 43
Table 8: Summary of Cost Estimates for Recommended Improvements..... 43
Table 9: Cost Estimate Components..... 44
Table 10: Items Included in Cost Estimates 45

INTRODUCTION

The Tennessee Department of Transportation (TDOT) awarded the City of Sweetwater a Community Transportation Planning Grant to develop a city-wide community mobility plan that identifies and prioritizes needed transportation improvements. This report documents the project team’s work in data collection, existing conditions analysis, needs assessment, stakeholder and public engagement, and recommendation formulation for this mobility plan. This plan addresses transportation infrastructure improvements for roughly one mile of Main Street / Highway 11 in downtown Sweetwater, Tennessee, located in Monroe County.

The four primary sections of this report cover existing conditions, public survey results, needs assessment, and recommendations. The existing conditions assessment covers roadway characteristics, examines traffic counts and growth trends, presents safety analysis, touches on freight activity, and an inventory of existing active transportation assets. In addition, key recent and upcoming projects set the context for the study. The public survey collected public input on priorities, tradeoffs, and locations of concern. Based on the inventory of existing conditions and the public survey input, the study identified transportation needs and potential solutions. The needs assessment outlines a variety of common issues and drills into specific focus areas, addressing both issues and opportunities. Finally, using input from the public and stakeholders, as well as analysis from the needs assessment, the project team established a set of recommendations that would best meet the identified needs of the City of Sweetwater.

The project vision and goals as developed in the project application and verified by stakeholders provided valuable context in the identification and assessment of needs. The vision of the plan is:

Improvements to transportation infrastructure will make it safer and easier to walk, bike, and drive downtown while managing various user needs to support livability, thriving businesses, events, and associated economic development.

Project goals include:

- Improve pedestrian network connectivity
- Improve access to the downtown area
- Enhance safety
- Enhance livability and economic development
- Promote transportation alternatives such as biking

EXISTING CONDITIONS

The existing conditions assessment covers roadway characteristics, examines traffic counts and growth trends, presents safety analysis, touches on freight activity, and an inventory of existing active transportation assets. In addition, key recent and upcoming projects set the context for the study. Appendix B provides a series of figures detailing an inventory of existing conditions along the corridor, including parking spaces, signage, other observed features, and high-resolution imagery collected by an unmanned aerial vehicle (drone) for the study.

I. ROADWAY CHARACTERISTICS

US 11 / State Route (SR) 2 runs north-south between Chattanooga and Knoxville parallel to I-75. As shown in Figure 1, Highway 11/Main Street (US 11 / SR 2) is a two-lane principal arterial within the city limits of Sweetwater and is a minor arterial outside the city. The speed limit for Highway 11 within the project area is 30 miles per hour (mph). A speed study showed the 85th percentile speed was 25 mph. S. High Street and Oakland Road/SR 322 are both minor arterials as well. Other classified two-lane minor collectors intersecting the study corridor include Morris Street, North Street, and Mayes Avenue. Highway 68 to the south is a principal arterial and intersects Highway 11/ Main Street at a commercial activity center but outside the study area. Culham Street, Bird Street, Wright Street, Walnut Street, Miller Street, and Biggs Street are all local roads. Within the study area, there are eleven intersections along Highway 11/Main Street, two of which have traffic signals at Monroe Street/Old Highway 68 and North Street. Along the corridor, there are eleven crosswalks with five directly crossing Highway 11/Main Street.

II. TRAFFIC COUNTS AND GROWTH TRENDS

Traffic count data was reviewed via the TDOT Transportation Data Management system. Figure 2 provides the traffic count stations along the corridor and on nearby streets. In 2022 the annual average daily traffic (AADT) for this portion of Highway 11 ranged from 7,452 to 8,695 vehicles daily. Data from two station locations on the study area corridor, identified in Table 1, were collected and analyzed. As illustrated in Figure 3, volume along Highway 11 have been relatively stable, with slight fluctuations each year.

As of 2020, the Monroe County population was 46,250, which was a 3.9 percent increase from the 2010 population. The population is forecasted to continue to increase, with the 2040 population estimate of approximately 51,000¹.

Despite this population growth and development in the area, based on the traffic trends and stakeholder input, increasing roadway capacity on Highway 11 is not a primary focus of this study.

¹ <https://tnced.com/county-profiles/>

Figure 1: Road Classifications

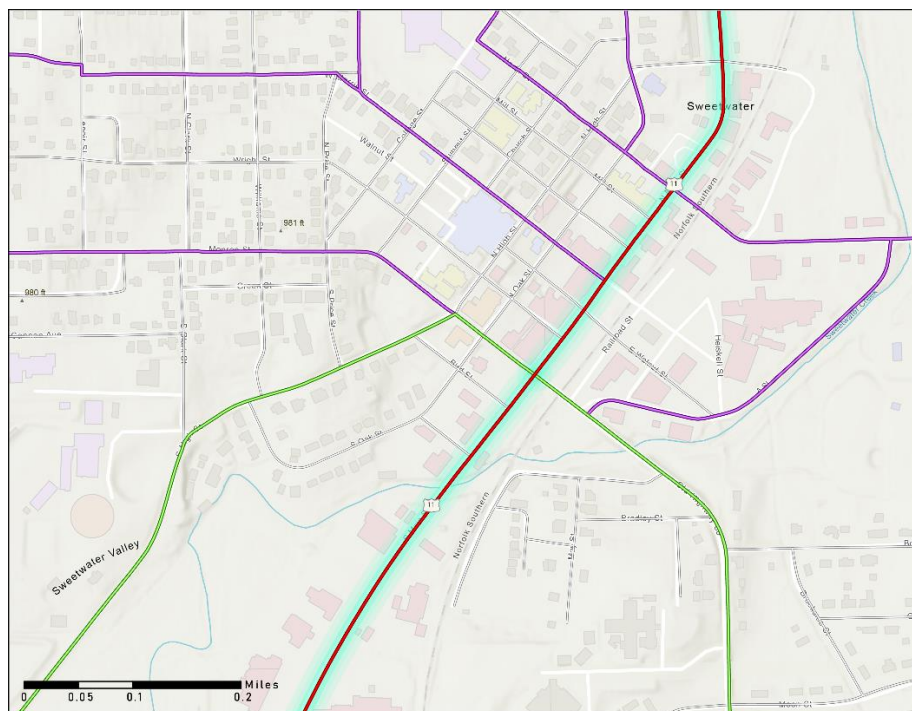
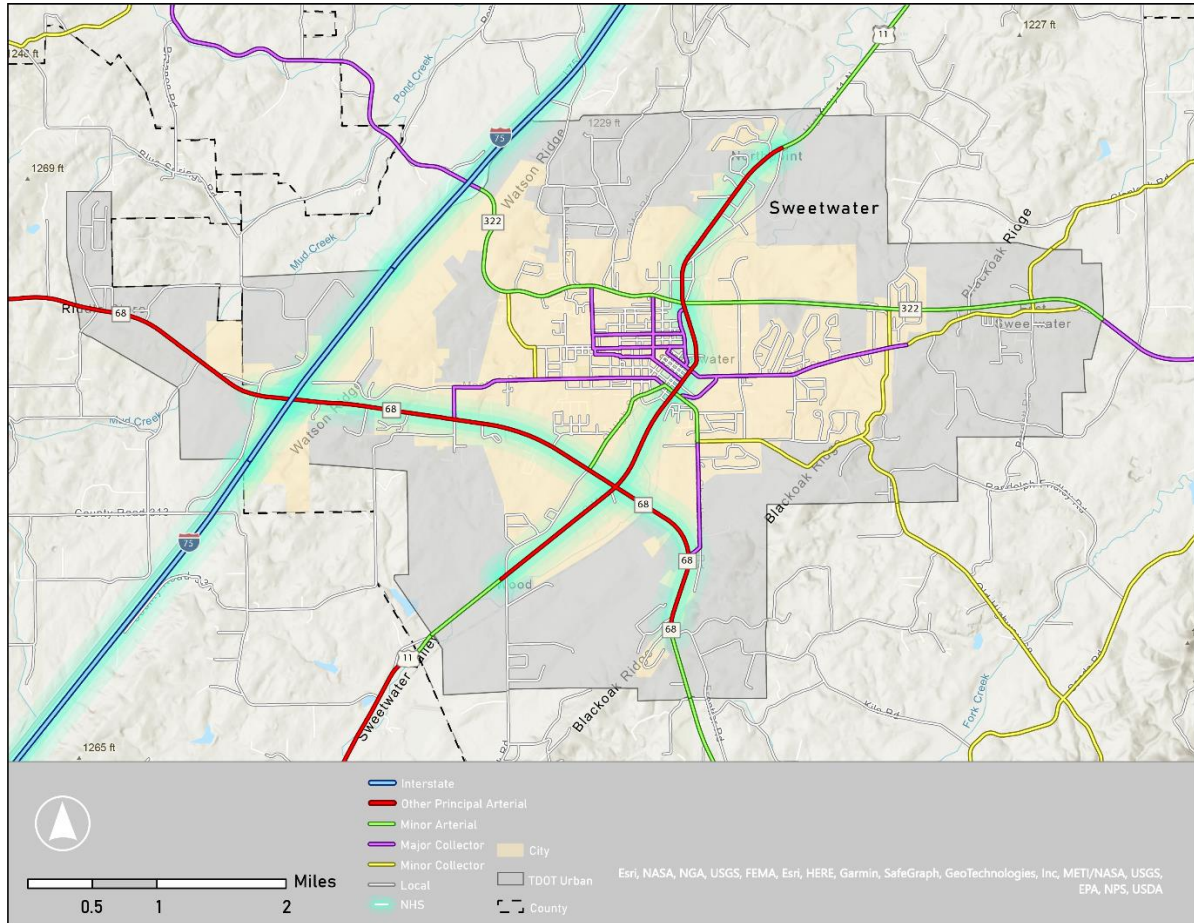
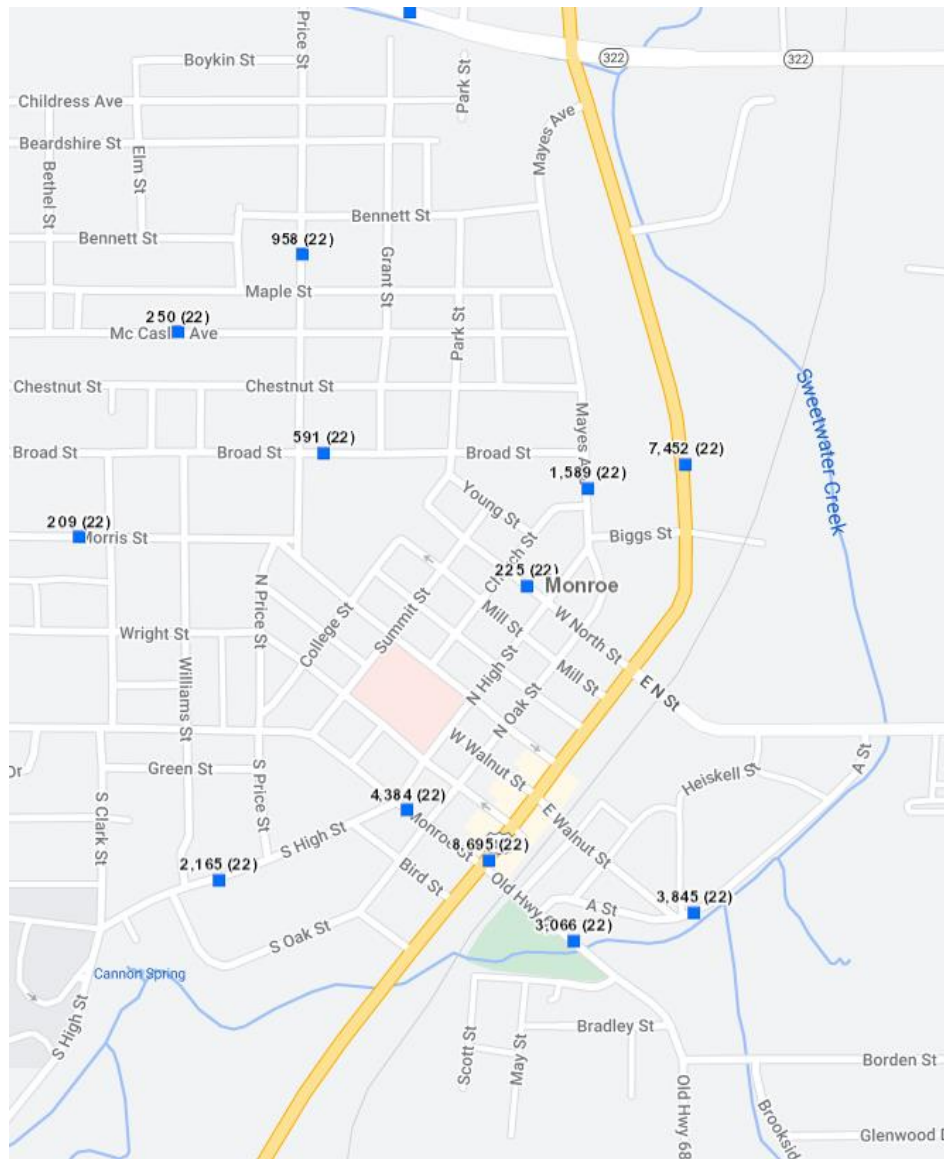


Table 1: Traffic Count Locations

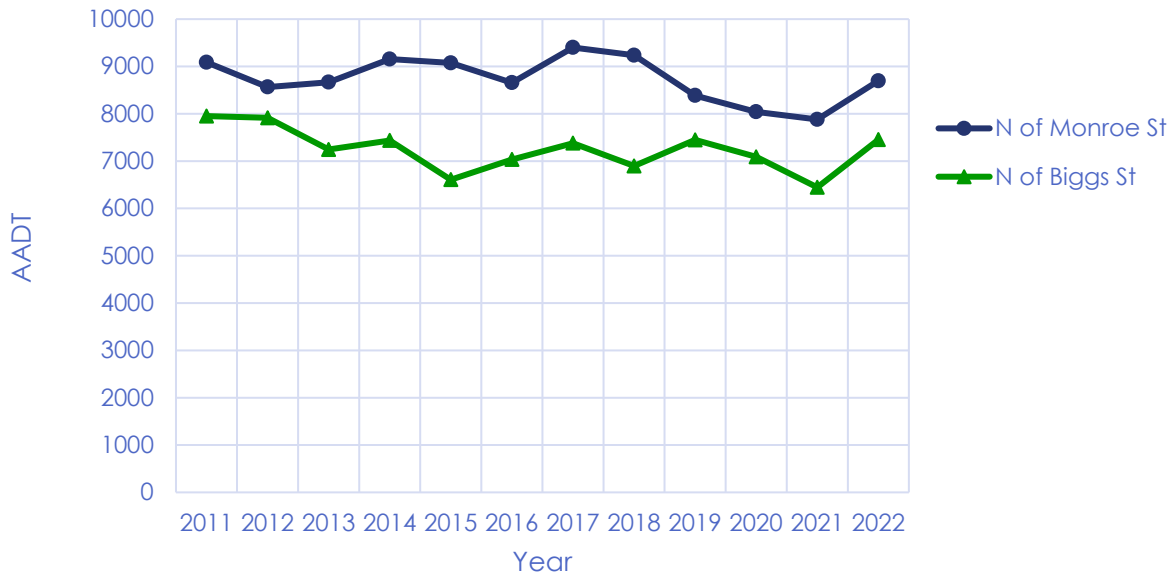
Roadway	Highway 11/Main Street	Highway 11/Main Street
Location	Intersection of Monroe St/Old Hwy 68	North of Biggs St
Station Number	62000073	62000072

Figure 2: Daily Traffic Counts (2022 AADT)



Source: Tennessee Traffic Information Management and Evaluation System (TN-TIMES)

Figure 3: Historic Traffic Trends on Main St / Hwy 11 (Annual Average Daily Traffic)

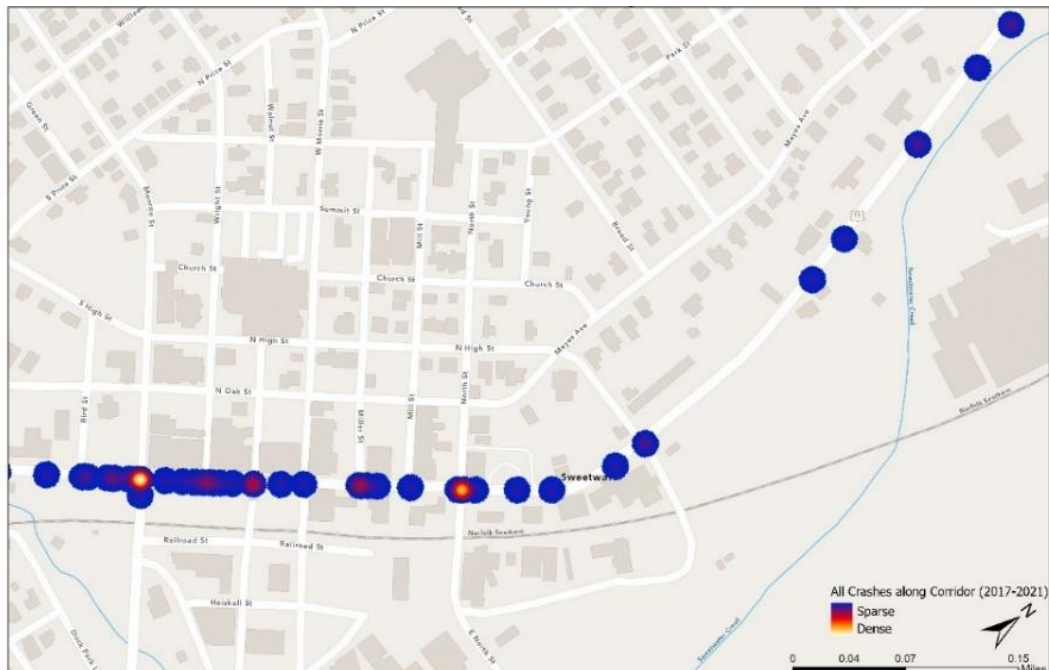


Source: TDOT Transportation Data Management System

III. SAFETY

Many of the concerns regarding safety along the corridor are collisions at intersections in the downtown Sweetwater area. The heat map in Figure 4 shows the concentration of all 82 crashes that occurred along the corridor within the 2017–2021 timeframe. About 68 percent of the

Figure 4: Crash Data within Study Corridor



crashes occurred between Monroe Street and North Street (southern end of the corridor). Of the 82 crashes along the study corridor, 10 involved serious or minor injuries.

Only one crash within the last five years involved a pedestrian. This occurred at Wright Street. The crash occurred in 2019 on a clear day during daylight hours. The pedestrian suffered minor injuries.

Most of the crashes along the corridor occurred at intersections. The top three intersections with the highest number of crashes were: Highway 11 at Monroe Street, Highway 11 at North Street, and Highway 11 at Walnut Street. Of the 82 crashes, 46 (56.1 percent) occurred at intersections, and 36 (43.9 percent) along the roadway (Table 2 and Figure 5 below).

Table 2: Crashes along Corridor (2017-2021)

Crash Locations	Number of Crashes	Percentage
At Intersections	46	56.1%
Along Roadway	36	43.9%
Total	82	100%

The table and graph below show the kind of crashes along the corridor. As mentioned above, of the 82 crashes that occurred along the corridor, 72 (87.8 percent) were reported as property damage only, and 10 (12.2 percent) were reported as injury related.

Figure 5: Crashes along Corridor

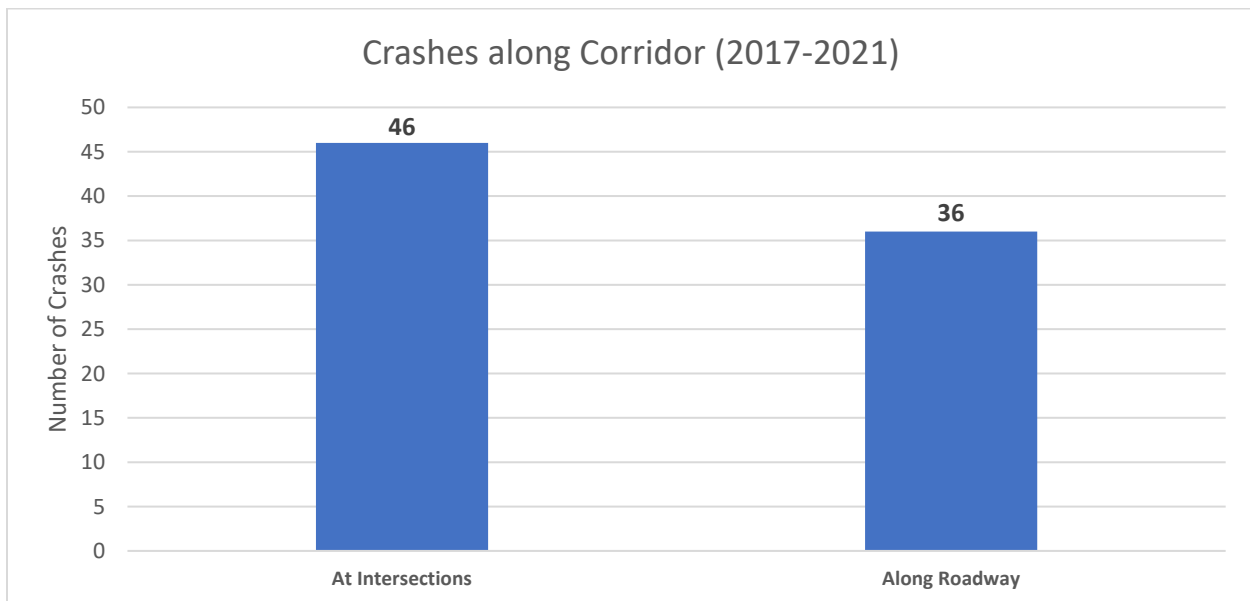
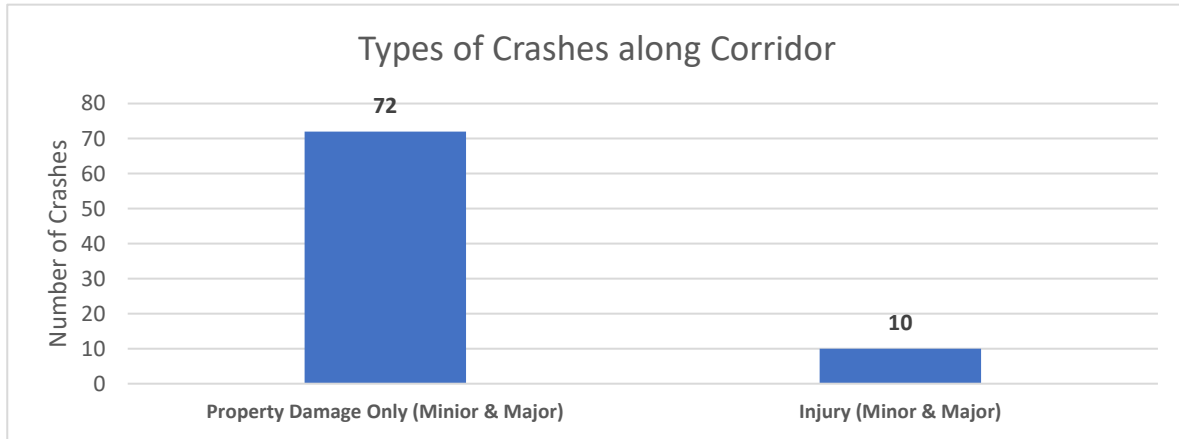


Table 3: Type of Crashes along Corridor

Type of Crash	Number of Crashes	Percentage
Property Damage	72	87.8%
Injury Related	10	12.2%
Total	82	100%

Figure 6: Type of Crashes along Corridor



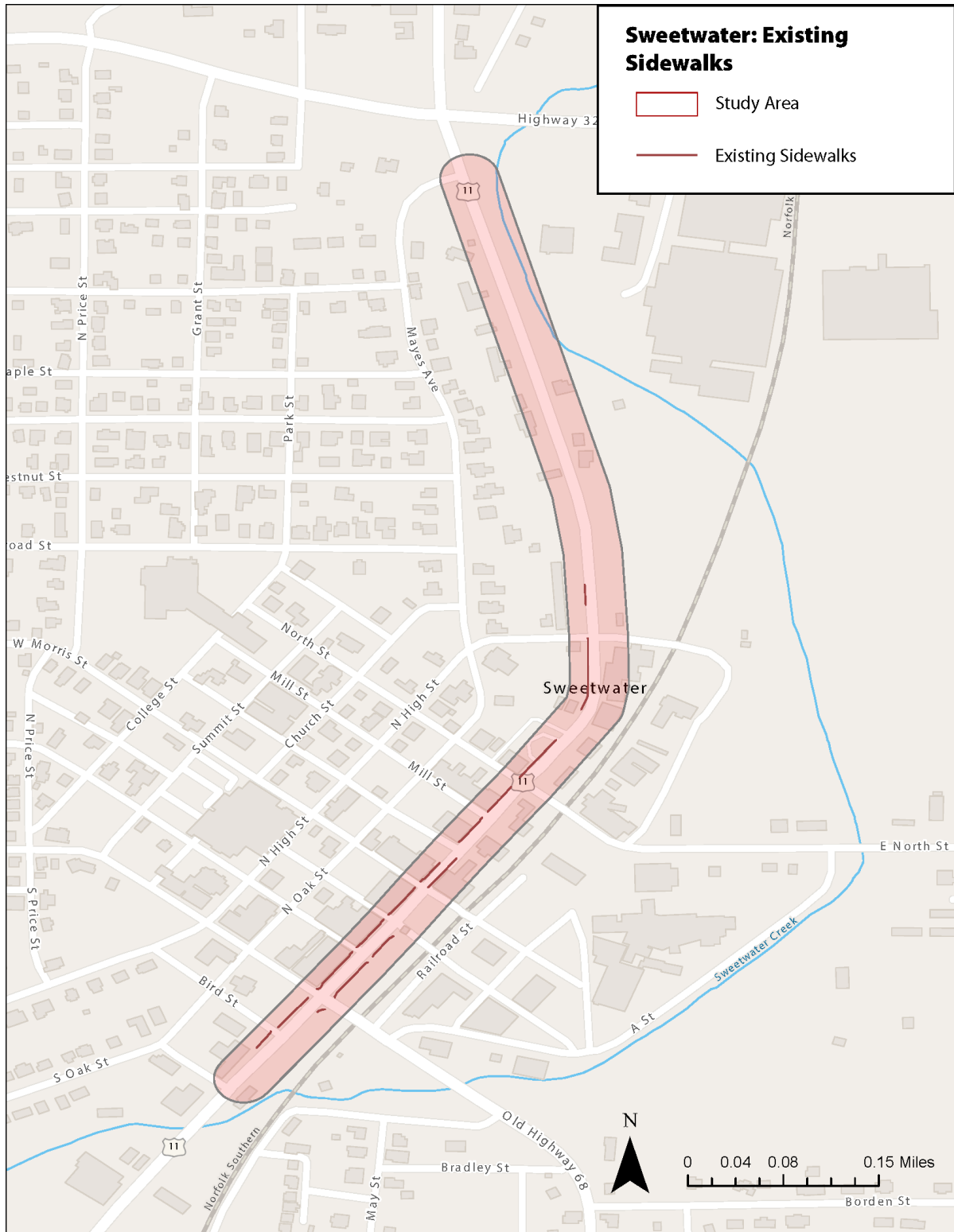
IV. FREIGHT

The traffic volumes along Highway 11/Main Street consists of approximately 6.5 percent trucks. Limited freight generators are present within the study area, although nearby industrial locations and manufacturing facilities like the Aeroflex distribution center are located off SR 322 just north of downtown. Sweetwater serves as an eastern bypass to I-75. Commercial retailers like Walmart, Ingles, and Save A Lot are served by Highway 11/Main Street. A new Dollar General was opened in early 2023 just north of Biggs Street on Highway 11/Main Street as well, which will add to freight and customer traffic. Highway 11/Main Street is used as a thoroughfare for delivery vehicles, requiring parking for large trucks and can cause issues of trucks damaging local signs.

V. ACTIVE TRANSPORTATION

Existing bicycle and pedestrian infrastructure within the study area includes sidewalks that run along Highway 11/Main Street through Sweetwater. There are approximately 0.40 miles of sidewalk in the immediate study area within the Highway 11 corridor with 0.1 miles on the east side of Main Street and 0.3 miles on the west side. This accounts for 25 percent of the study corridor with sidewalks. The map below shows the inventory of existing sidewalks within the study area corridor.

Figure 7: Existing Sidewalk Infrastructure



VI. OTHER RELEVANT PROJECTS

Several key projects set the context for the current study - the High Street improvement, the Sweetwater Greenway, North Main Street improvements, and a TDOT resurfacing project.

HIGH STREET

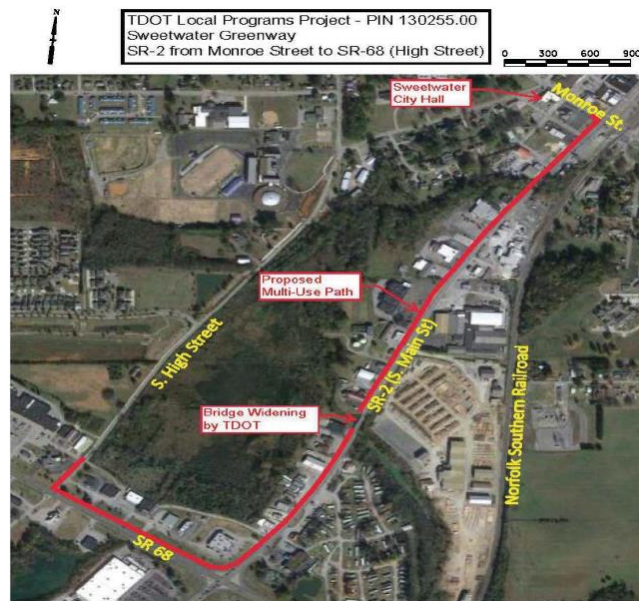
A sidewalk and side path were recently added via the Surface Transportation Program (STP) project on High Street from near SR 68 to Monroe Street.

SWEETWATER GREENWAY

The Sweetwater Greenway (PIN 130255) will complete a pedestrian loop around south Main Street, SR 68, and High Street. The Sweetwater Greenway, which received a Multimodal grant, will run along Main Street from Monroe Street south to SR 68. Portions of the roadway shoulders will be used to include the 10-foot concrete multi-use path. The greenway will consist of bicycle and pedestrian lanes, paths, and other facilities. The proposed alignment is below.

The Sweetwater Greenway overlaps the current study corridor between Monroe Street and Culham Street. Potential improvements on this section will need to be coordinated with and potentially implemented through the Greenway project.

Figure 8: Sweetwater Greenway



TAP PROJECT

The City of Sweetwater was also awarded a Transportation Alternatives Program (TAP) grant to implement pedestrian alternatives along Highway 11/Main Street from North Street to Mayes Avenue. The current study will explore alternatives along this section and provide initial considerations and potential solutions that could potentially be implemented through the TAP grant project.

Given the future multi-use path and pedestrian improvements both north of North Street and south of Monroe Street, the current study will identify potential solutions to provide pedestrian and bicycle connectivity through downtown Sweetwater, in particular between Monroe Street and North Street.

RESURFACING

Another relevant project in the study area is PIN 129095.00 - Resurfacing of SR 2 from the McMinn County line to near SR 322 and the associated PIN 132284.02 – Americans with Disabilities Act (ADA) Curb Ramp Upgrades on various Routes in District 18 & 19. These projects include the Highway 11/Main Street study area. The projects will resurface Main Street and upgrade ADA curb ramps at existing locations.

PUBLIC SURVEY RESULTS

As part of the public engagement effort, a survey was made available to stakeholders and the public between December 1, 2022, and February 4, 2023. Users were asked a series of questions regarding basic demographic information, transportation improvement trade-offs, and locations of identified transportation needs and opportunities in a mapping question. Overall, there were 230 responses to the survey. Below is a summary of survey results that was used to inform the study.

I. DEMOGRAPHICS

Residents were asked basic demographic questions, such as age, gender, and whether they are a resident of Sweetwater. They were also asked to choose from descriptors that they most identify with, ranging from employee status, typical transportation mode, and personal goals for the City of Sweetwater. Of those surveyed, 70 percent of respondents live in Sweetwater. Most respondents were female, and the age distribution was evenly distributed across age groups. Finally, respondents identified with a variety of descriptors – 31.5 percent responded that they were employed, 15.9 percent said they were pedestrians, and 12.2 percent said they were mainly focused on bringing tourism to Sweetwater.

Figure 9: Sweetwater Resident

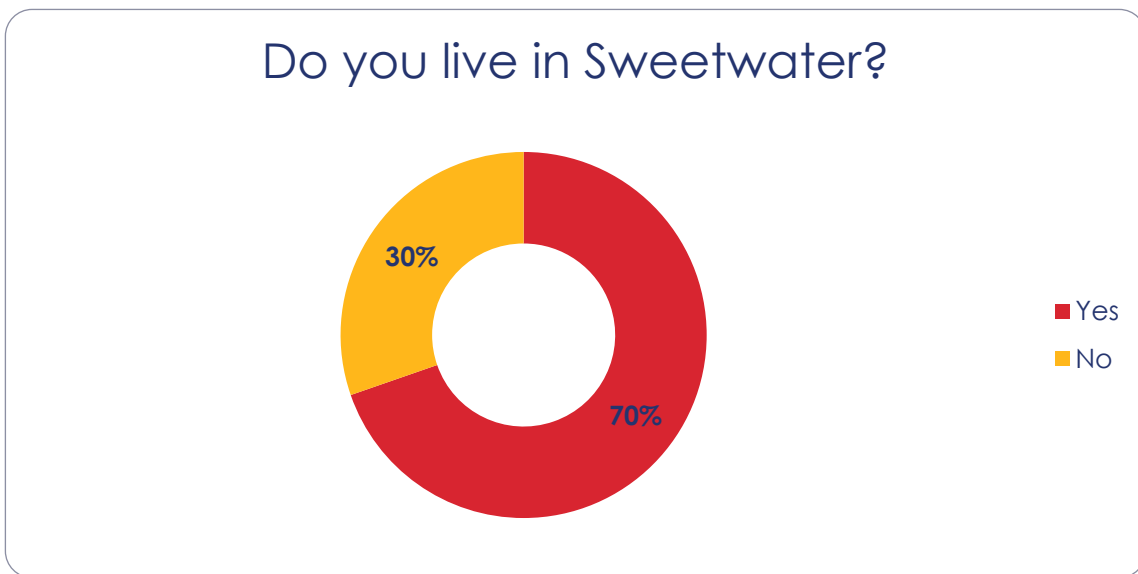
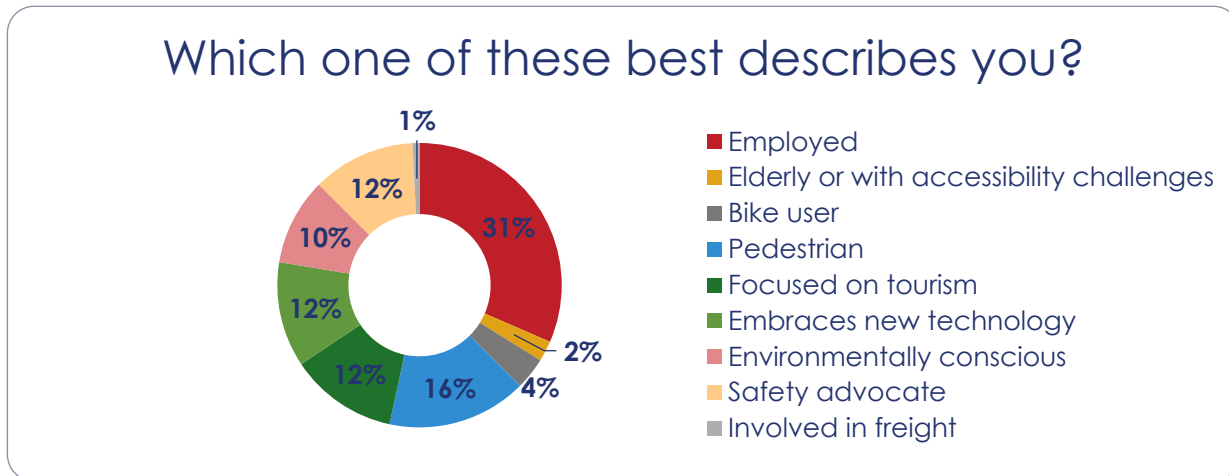


Figure 10: Survey Descriptors

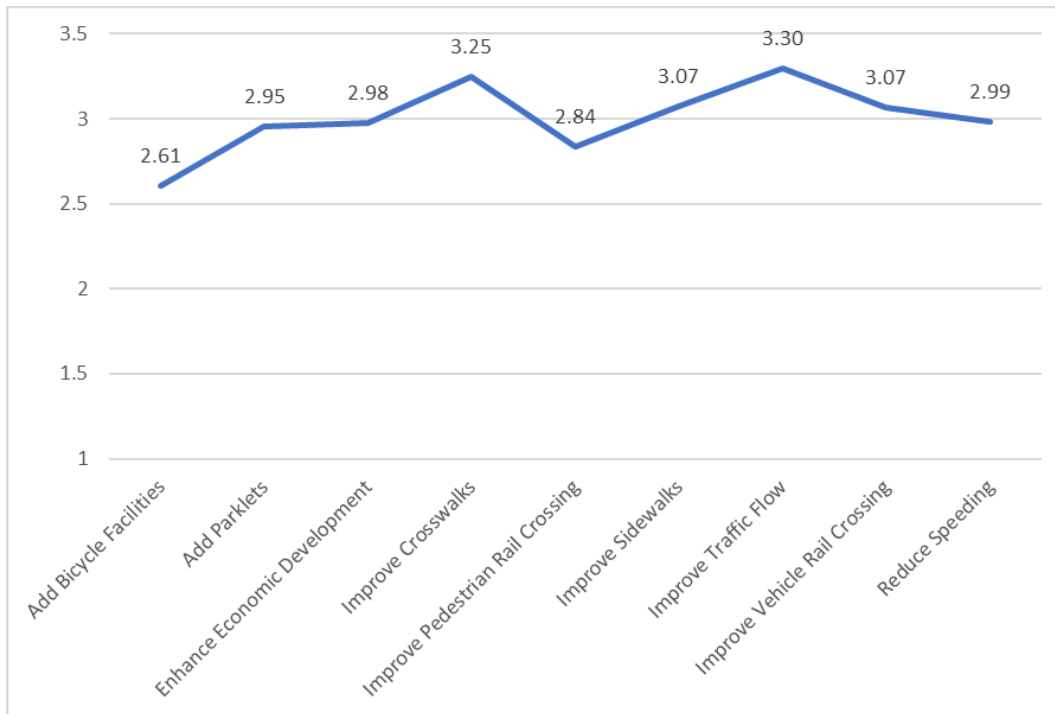


II. PRIORITIES

Figure 11 shows the weighted average score, with a higher value indicating higher priority. When asked what goals the community mobility plan should focus on, the community felt that improving traffic flow was the top priority, followed closely by improving and adding crosswalks. Since the downtown area has many intersections along the corridor, these two directly relate to improving driver and pedestrian safety on the roadway. Improving sidewalks and vehicle rail crossings were both of roughly the same importance. Adding parklets, enhancing economic development, improving pedestrian rail crossings, and reducing speeding followed. Finally, adding bicycle facilities was the last priority of the plan. The specific ranking of the priorities from highest to lowest is:

1. Improve Traffic Flow
2. Improve Crosswalks
3. Improve Sidewalks
4. Enhance Economic Development
5. Add Parklets
6. Improve Pedestrian Rail Crossing
7. Improve Vehicle Rail Crossing
8. Reduce Speeding
9. Add Bicycle Facilities

Figure 11: Sweetwater Priorities



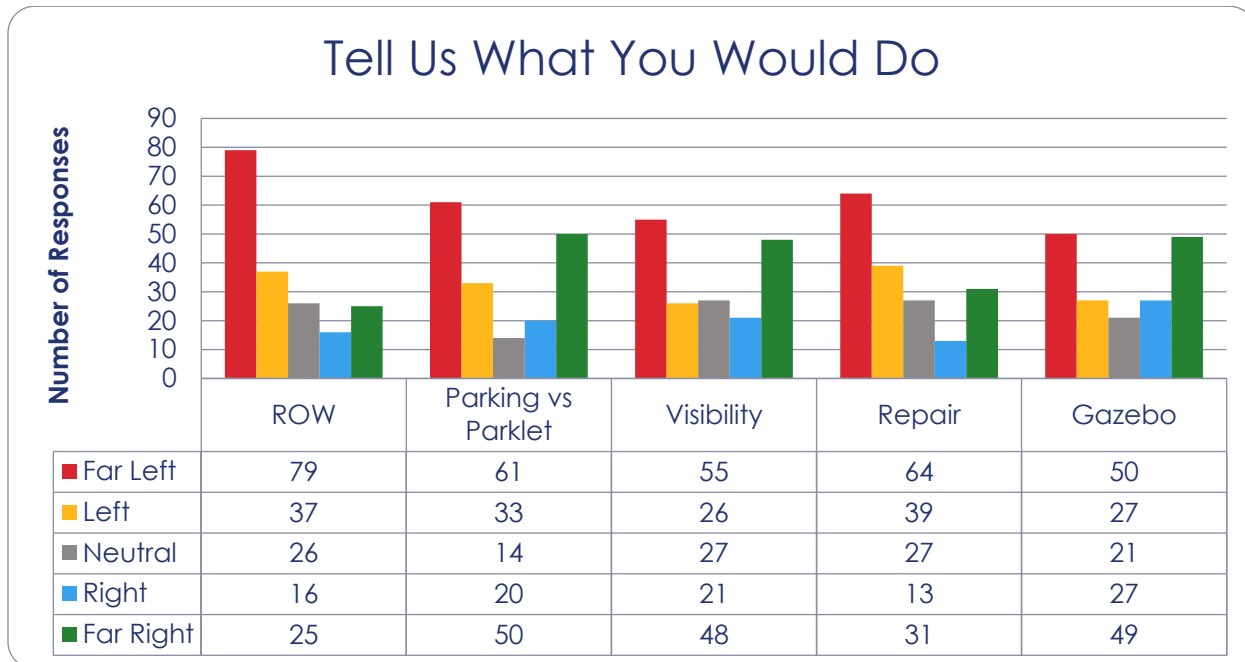
III. TRADEOFFS

Respondents were asked to choose their preferences through a series of tradeoffs: Right-of-Way, visibility, parklets, sidewalk or crosswalk repair, and pedestrian experience around the gazebo. When asked about Right-of-Way (ROW), users preferred using road ROW to widen sidewalks for pedestrians rather than adding bike lanes to facilitate bicycling along Highway 11/Main Street. Respondents were more in favor of maintaining on-street parking downtown, rather than replacing several spots with parklets. Users were more split when asked about visibility, roughly equally favoring improving intersection visibility and preserving on-street parking. Residents significantly favored sidewalk repairs over crosswalk repairs. Finally, respondents equally favored focusing on pedestrian access to the gazebo downtown and maintaining vehicle access in the area.

Table 4: Tradeoff Options

Tradeoffs	Option 1 (Left)	Option 2 (Right)
ROW	Widen sidewalks to provide more space for pedestrians	Add bike lanes to facilitate bicycling along Highway 11/Main St
Visibility	Improve intersection visibility	Preserve on-street parking
Parking vs Parklet	Replace on-street parking with parklets	Keep parking spaces
Repair Infrastructure	Repair sidewalks	Repair crosswalks
Gazebo Location	Improve walking near gazebo	Maintain vehicle access around gazebo

Table 5: Tradeoff Responses



IV. MAP POINTS

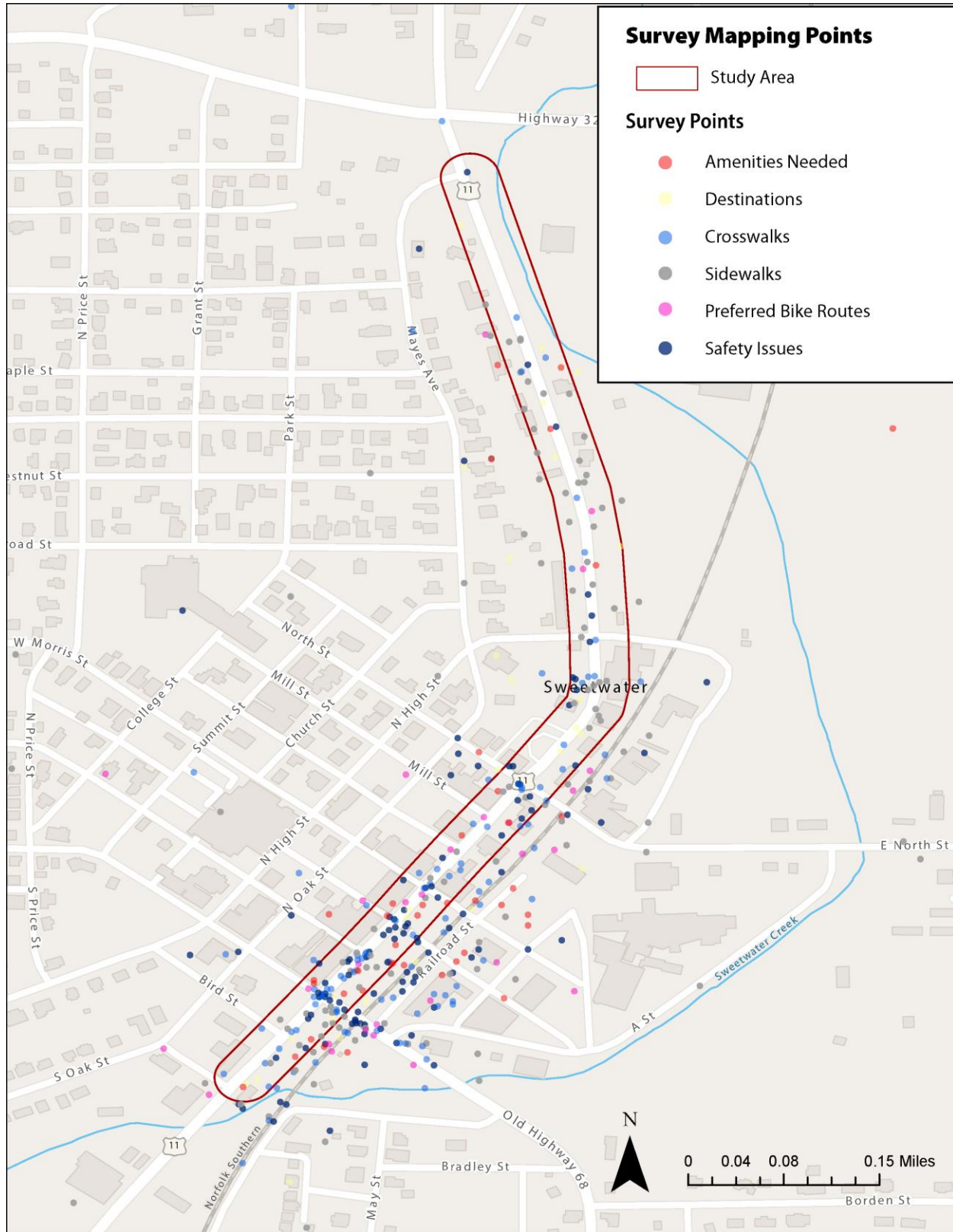
Respondents were asked to use a map to place points where they see opportunities and improvements along the Highway 11/Main Street corridor in Sweetwater. The six categories that users could identify were sidewalks, crosswalks, safety issues, preferred bike routes, needed amenities, and destinations. There were 499 points placed on the map, and 297 of those were accompanied by comments. New or repaired sidewalks made up 27 percent of points on the map, followed closely by crosswalks at 24 percent and safety issues at 23 percent. Preferred bike routes, needed amenities, and destinations made up less than 10 percent of points, respectively.

When looking at location clusters of survey data, there are a few spots that saw a lot of resident feedback. At the Walnut Street/Main Street intersection, respondents highlighted several safety concerns, with the location of the historic gazebo making pedestrian traffic difficult and road patterns allowing for speeding. At Wright Street, North Street and Biggs Street, residents identified visibility issues and unsafe crossings for pedestrians. The intersection of Monroe Street/Old Highway 68 had many highlighted safety concerns, as pedestrians do not have a safe way to cross over to the Marketplace or the Duck Park.

Lack of sidewalks on the northern end of the corridor also was a point of concern. Residents desired more connectivity from downtown to Sweetwater Market at the Mill and Towns Toffee, as well as further south to the Marketplace. Sidewalk quality was also a concern, particularly in the downtown area with historic brick sidewalks beginning to break down. Preferred bike routes followed similar patterns as preferred sidewalks, with a desire to connect the entire corridor, from Highway 322 down to SR 68. However, bike routes were not as popular as sidewalk improvements.

Below is a map of all survey points collected, broken out by category.

Figure 12: Survey Mapping Points



NEEDS ASSESSMENT

I. COMMON ISSUES AND POTENTIAL SOLUTIONS

In response to stakeholder interest and in conjunction with public input, the study identified transportation needs related to a variety of issues. The team evaluated the needs and identified potential solutions. The issues and needs were categorized in several areas, listed below:

- Pedestrian Crossings
- Sidewalks
- ADA
- Sight Distance / On-Street Parking Parklets
- Signals
- Railroad Crossing Access Management
- Drainage and Utility Relocations
- Utilization of ROW
- Signage

PEDESTRIAN CROSSINGS

Project stakeholders highlighted concerns about the high volume of pedestrian crossings along Highway 11/Main Street in the downtown area in conflict with vehicular traffic on Highway 11/Main Street. Stakeholders and residents highlighted concerns about the need for improvements to creating safe pedestrian crossings and vehicle compliance. Stakeholders and survey respondents also expressed a desire to add pedestrian crossings, particularly serving the Main Street Marketplace and along north Main Street. Survey respondents also signaled a desire for a crossing to Towns Toffee and the Marketplace north of downtown.

Figure 13: Pedestrian Crossings

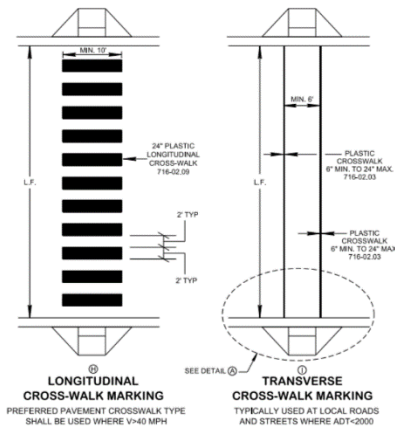


There are five striped crossings present at intersections crossing Main Street. Two signalized intersections have crosswalks. The remaining crosswalks are at unsignalized intersections that are side street stop controlled. Current crosswalks crossing Main Street appear to be consistent with TDOT standard T-M-4 in width and zebra stripe design. However, side street crossings are of a narrower, ladder design.

Potential pedestrian crossing improvements include pedestrian refuge islands and speed tables or raised crosswalks. However, pedestrian refuge islands are more appropriate for multilane routes (e.g., two lanes in each direction) with depressed rural medians and raised crosswalks could be more applicable to local streets than state routes.

For safety and operational reasons, it is advisable to limit the number of crossings not located at signalized intersections. If crossings are essential at non-signalized intersections or mid-block crossings, pedestrian crossing distance should be minimized and rectangular rapid flashing beacons (RRFB) or pedestrian hybrid beacons (PHB), formerly known as high intensity activated crosswalk beacons (HAWK), should be added. RRFBs activate yellow flashers when pedestrians push an activation button, warning drivers of the presence of a pedestrian wanting to cross. Pedestrian hybrid beacons flash red then hold solid red to signal drivers to stop for pedestrians.

The Manual on Uniform Traffic Control Devices (MUCTD) recommends pedestrian hybrid beacons when more than 20 pedestrians cross per hour and that pedestrian hybrid beacons should be installed 100 feet from stop- or yield-controlled side streets or driveways to avoid conflict with pedestrians while crossing. Another reference is the Federal Highway Administration (FHWA) Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations². This reference outlines the type of crossing based on AADT, number of lanes, and speed. Crash data is another factor to consider when choosing the appropriate type of crossing. Given these considerations, Main Street qualifies for pedestrian hybrid beacons. However, given the relatively close spacing of crosswalks downtown, particularly at Wright Street, Walnut Street, and Morris Street, RRFBs may be more appropriate there for consistency. Conversely, a pedestrian hybrid beacons could be applicable for a mid-block crossing on North Main Street.



Pedestrian Crossing Summary

- Minimize number of crossings not located at signalized intersections (Monroe Street and North Street)
- Minimize crossing distance by adding curb extensions or bulb-outs
- Add rectangular rapid flashing beacons (RRFB) or pedestrian hybrid beacons for crossings not located at signalized intersections or for mid-block crossings

SIDEWALKS

Overall, a focus should be to add or improve sidewalks to connect downtown and other sites of interests. Currently, sidewalks are limited to a stretch of Main Street in the downtown corridor from Culham Street to North Street. On the northern end of the corridor, Towns Toffee and the Sweetwater Market at the

² https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/STEP-guide-improving-ped-safety.pdf

Mill are pedestrian attractions that could benefit from sidewalks. On the southern end, the Main Street Marketplace could also benefit from sidewalks. There are also issues of sidewalk quality, particularly for ADA compliance. Wider sidewalks could provide more room for pedestrians to maneuver.

Figure 14: Sidewalk Observations



ADA ACCESSIBILITY

Sidewalk, crossing, and curb ramp improvements are needed to ensure compliance with the Americans with Disabilities Act (ADA). Considerations include providing a sufficiently wide (four-foot) clear path and minimal (less than 2 percent) cross-slope on sidewalks and curb ramps with maximum 1:12 slope.

Survey respondents highlighted the historic brick sidewalk between Monroe Street/Old Highway 68 as requiring ADA compliance repairs.

Figure 15: ADA Curb Ramps

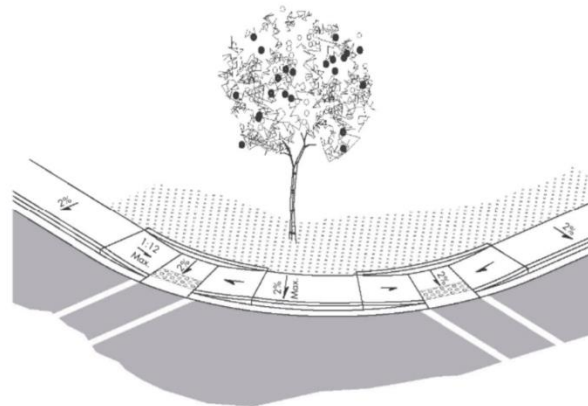


Figure 3-28. Parallel Curb Ramps

© 2021 by the American Association of State Highway and Transportation Officials.

Source: *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, pg. 3-47, fig. 3-28

SIGHT DISTANCE / ON-STREET PARKING / PARKLETS

There are approximately 35 on-street parking spaces along Main Street, 50 on-street parking spaces along side streets, 75 parking spaces in the parking lot between Walnut Street and Monroe Street, and

almost 200 in other parking lots downtown. The table below shows a breakdown of current spaces, including those spaces marked as ADA accessible.

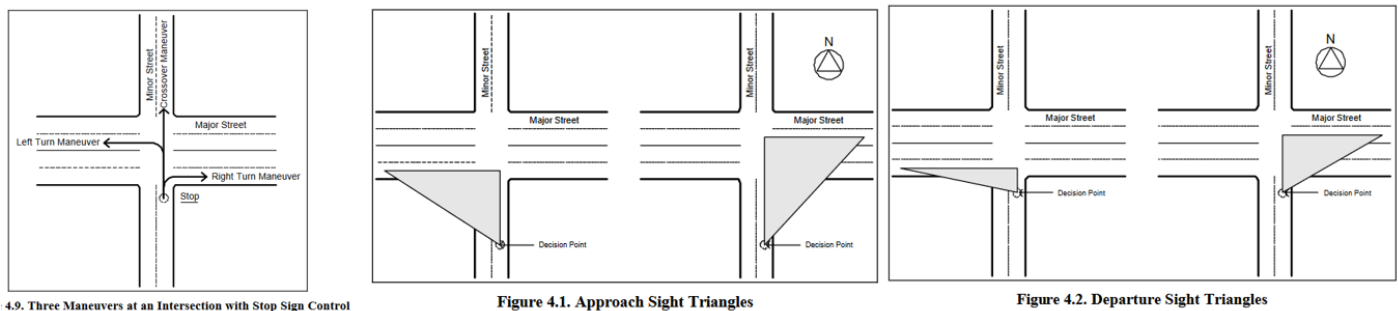
Table 6: Parking Inventory

Type	Location	# of Total Spaces	# of ADA Accessible Spaces
On-Street	Main St	35	4
On-Street	Side Streets	51	3
Lot	Between Walnut St and Monroe St	74	5
Lot	Other lots	199	13

There is a desire to preserve as much parking in the study area as possible. Parking allows residents and visitors to access downtown attractions on a daily basis. In addition, during special events, parking is at a premium. However, some parking spaces will need to be removed to allow for sufficient visibility at crossings and intersections. Intersection sight distance requires adequate clearance for drivers on both the mainline and side street to see vehicles on other approaches. Pedestrian visibility is also an important factor.

In addition, reconfiguration of the streetscape might require reallocation of space currently used for on-street parking. Parking mitigation measures include increasing signage to other parking lots in downtown and potential shuttle service to off-site parking during major events.

Figure 16: Intersection Sight Distance



Source: NACTO Sight Distance Studies https://nacto.org/docs/usdg/sight_distance_study_lowa.pdf

Stakeholders have proposed converting several downtown parking spaces into small parklets, defined as a small seating area or green space created as a public amenity on or alongside a sidewalk, especially in a former roadside parking space.

The current intersections at Wright Street, Walnut Street, and Morris Street with Main Street have inadequate sight distance. Because the side street stop bar locations are set given fixed building footprints, the short-term fix would be to remove parking spots 25 feet from the intersections to provide additional lines of sight.

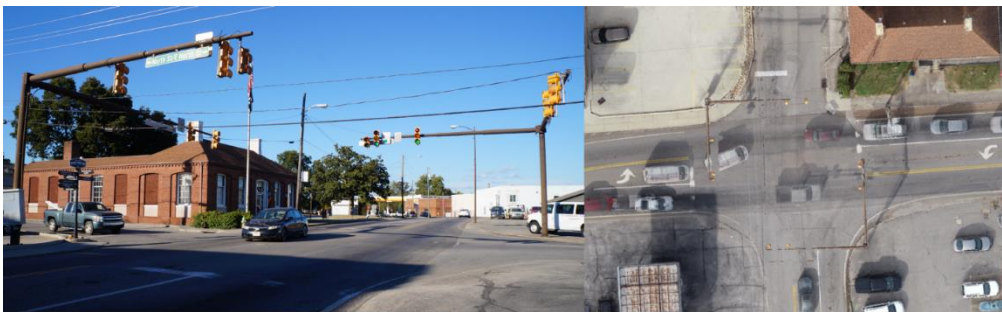
In addition to sight distance and parklets, on-street parking might be impacted and reduced by the need to move crosswalks away from drainage grates in the near term.

SIGNALS

There are two traffic signals in the study area, one at Monroe Street/Old Highway 68 and one at North Street. Pedestrian signals exist at the Monroe Street intersection. The signal technology at the North Street intersection is outdated. Potential improvements at North Street include:

- Add flashing left turn yellow arrow
- Update signal heads to LED
- Add pedestrian signals and crosswalks
- Update the fixed-time signals with actuated signals by using the necessary vehicle detection (e.g., inductive loops, video detection, radar detection, etc.) on the mainline and side roads

Figure 17: North Street Signals



Another additional solution for signals along the corridor includes upgrading signal cabinets.

RAILROAD CROSSING

Norfolk Southern railroad operates parallel to Highway 11/Main Street and crosses Monroe Street/Old Highway 68, Walnut Street, Morris Street, North Street, and Biggs Street near the study area. While the study area encompasses Main Street, project stakeholders expressed interest in studying connections from Main Street across the railroad tracks on Walnut Street and Old Highway 68. The two crossings are currently equipped with vehicle barrier gates in conjunction with flashing-light signals to prohibit vehicles on the road from crossing the railroad tracks when a train is passing. The safety devices and pavement condition at the vehicle railroad crossings are generally adequate. There is no fencing blocking pedestrian access to the railroad tracks or pedestrian accommodation across the railroad tracks.

Figure 18: Rail Crossing

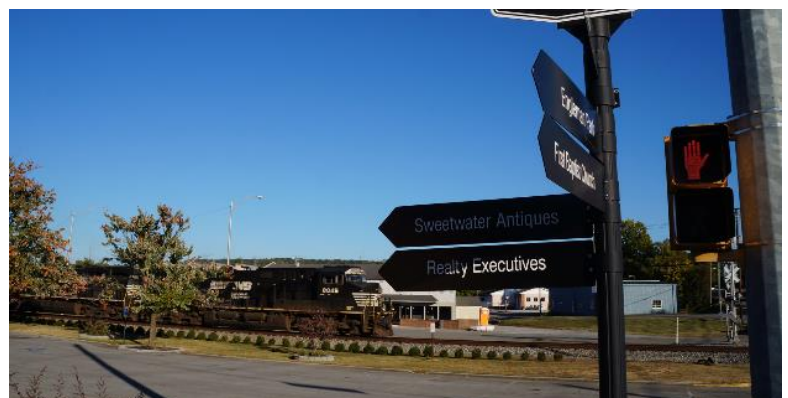


Figure 19: Rail Crossings at Old Highway 68 and Walnut Street



The FHWA/Federal Railroad Administration (FRA) *Highway-Rail Crossing Handbook* notes “non-motorist crossing safety should be considered at all highway-rail crossings, particularly at or near commuter stations and at non-motorist facilities, such as bicycle/walking trails, pedestrian only facilities, and pedestrian malls.”

A pedestrian railroad crossing along Old Highway 68 would connect the Main Street Marketplace and Duck Park. Pedestrians cross the railroad at Walnut Street to access downtown shops, the gazebo, and rail car on the one side and the visitor center and future community center on the other. These pedestrian rail crossings will need to tie into new sidewalks connecting to Main Street.

As indicated in Figure 20, a variety of aspects and options associated with adding pedestrian railroad crossings include pedestrian surface/sidewalk across the track, gates with skirt, swing gates, flashers, fencing, and channelization. Fencing would increase safety by keeping pedestrians off the railroad tracks. Channelization would then direct pedestrians to cross at designated crossings.

Figure 21 illustrates potential solutions for pedestrian railroad crossings at Old Highway 68 and Walnut Street, along with potential improvements at the gazebo and pedestrian refuge islands on Main Street. There are proposed crossing on both sides of Walnut Street and on the north side of Old Highway 68. New sidewalk connects the crossings to existing sidewalks. New fencing would be installed along the railroad tracks, small mast arms for pedestrians and gates (red lines) would be installed. Although potentially providing the most direct access between the Main Street Marketplace and Duck Park, a pedestrian crossing on the south side of Old Highway 68 is prohibited by a railroad switch and adjacent utilities. A crosswalk across Old Highway 68 between Railroad Street and A Street would provide access to Duck Park. Pedestrian crossings are illustrated on both sides of Walnut Street to serve both the parking lot (south side) and rail car (north side) attractions.

Figure 20: Railroad Crossing Options

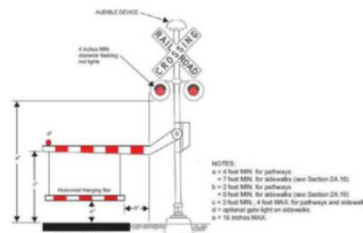


Figure 59. Diagrammatic Example of Pedestrian Gate with Skirt

Source: Gabree, S & Chase, Stephanie & daSilva, Marcos. *Effect of Gate Skirts on Pedestrian Behavior at Highway-Rail Grade Crossings*, FRA, Washington, DC, 2013.

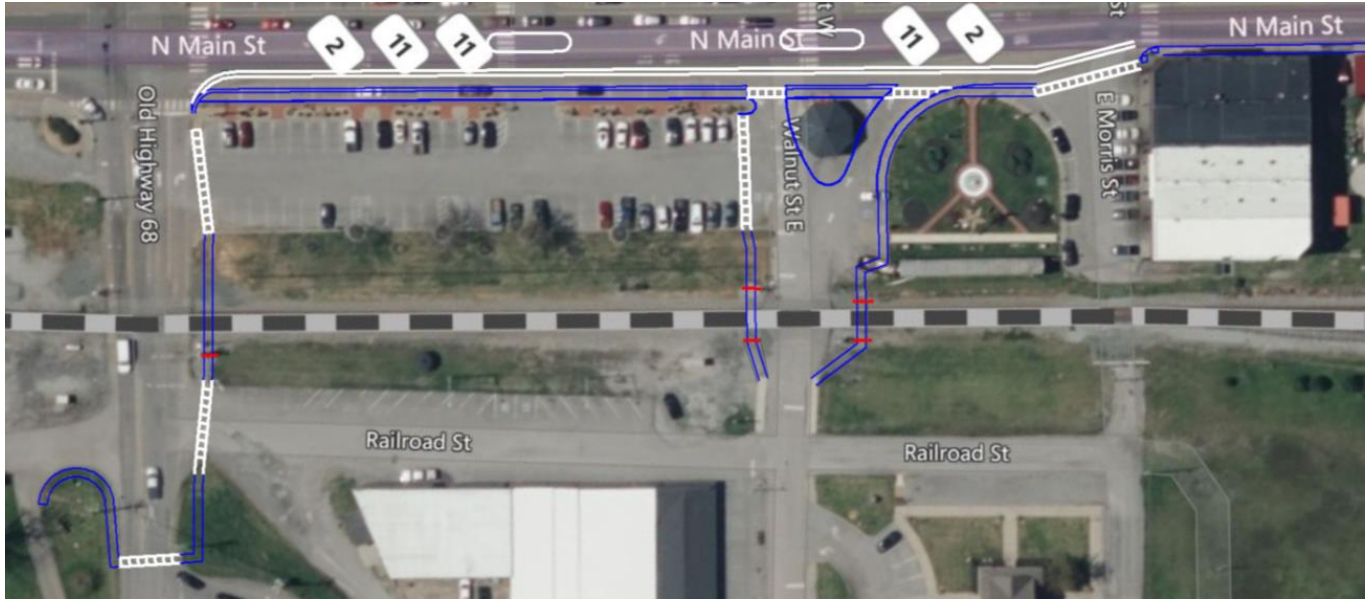


Figure 60. Illustrative Example of Pedestrian Gate with Skirt (DART Blue Line Lynn Haven Avenue Crossing, Dallas, TX)

Source: Brent Oplon.

However, the Walnut Street pedestrian railroad crossings might need to be consolidated into one due to cost.

Figure 21: Pedestrian Rail Crossing Potential Solutions



ACCESS MANAGEMENT

Access management is a term for a set of techniques that control several elements of a street, such as the spacing, design, and operation of driveways, turns, medians, and intersections³. The TDOT Highway System Access Manual outlines methodologies, guidance, and criteria for managing access to the highway system. Access management is needed to clearly define the road, designate specific locations for vehicles to access the roadway from adjacent parcels, delineate vehicular and pedestrian spaces, reduce conflicts, increase safety, and simplify traffic operations. In some locations this would require adding curb and gutter. Pedestrian fencing could help discourage pedestrians from jaywalking. Specific locations that could benefit from access management include the Main Street Marketplace, parking lot between Old Highway 68 and Walnut Street, gazebo, the Old Mill, and open lots on north Main Street.

DRAINAGE & UTILITY RELOCATIONS

³ https://ops.fhwa.dot.gov/access_mgmt/what_is_accsmgmt.htm

Drainage appears to be a potential issue with improving pedestrian facilities, as many surface drains conflict with crosswalks. In the short term, ADA curb cuts and pedestrian crossings should be modified to avoid the existing drainage structures in the road. In the long term, drainage grates should be designed in coordination with the streetscape to avoid crosswalks.

In addition, utility poles and fire hydrants need to be relocated to maintain a four-foot clear path sidewalk to meet ADA criteria for persons in wheelchairs.

Drainage itself is an issue, with stakeholders noting that water pools near the Bird Street intersection.

Figure 22: Drainage at Morris Street



UTILIZATION OF ROW

The ROW varies considerably along Main Street within the study area (see Figure 23). On certain sections, there is ample underutilized width that can be dedicated to particular uses. A major decision would be what to do with the approximately 62 feet of pavement that is Main Street. There is between 12 and 15 feet of “unused” pavement, especially on the railroad side. Figure 24 shows possible typical sections, including a two-way center turn lane or a bike lane.

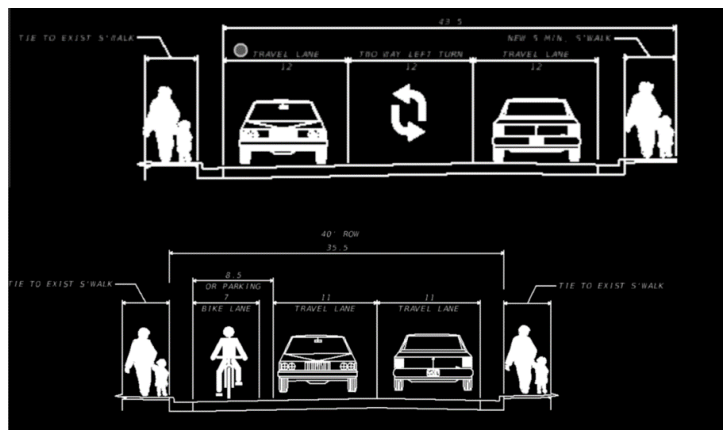
Figure 23: Existing ROW



A few ways the ROW could be utilized include:

- Curb extensions
- Pedestrian refuge islands
- On-street parallel parking
- Bike lanes
- Adding sidewalk or increasing sidewalk width, especially on the rail side

Figure 24: Possible Typical Sections



SIGNAGE

Although there is signage both for wayfinding and pedestrian safety downtown, there are opportunities for improvement. Pedestrian crossing warning signs exist, alerting drivers to the presence of crosswalks. However, there is too much information on single signposts, when combined with wayfinding signage to the hospital. According to the MUCTD, signs that require different decisions by drivers, cyclists or pedestrians are required to be spaced sufficiently so the user can make the

appropriate separate decisions⁴. Therefore, the pedestrian signs and hospital wayfinding should be separated.

Wayfinding signage could also be added to direct travelers to additional parking opportunities, particularly to parking lots up the hill near the hospital. This could be valuable in conjunction with any reduction of on-street parking spaces on Main Street to allow for intersection clearance, pedestrian facilities, and parklets.

Stakeholders shared that trucks hit decorative signage banners when mounted on light poles perpendicular to the road. While the project team did not observe this given the buffer between light poles and travel lanes (in the form of on-street parking), such clearance will be considered in the recommendations.

Figure 25: Signage in Sweetwater

Signage Summary

- Reduce information overload by placing pedestrian warning signage and hospital wayfinding signage on separate signposts
- Add wayfinding signage to additional parking locations
- Ensure clearance between travel lane and decorative signage banners



II. FOCUS AREAS

The study focused on several areas of interest that were identified by the stakeholder committee in Sweetwater. The Main Street Marketplace is an open area where food trucks and other vendors set up shop, and festivals and other large events are held. This study focuses on access management, parking, and circulation, particularly when large festivals are held at the Marketplace.

The gazebo is a gathering spot for local festivals and music events. The study focused on pedestrian safety, roadway access, and circulation issues at the gazebo. The Monroe Street signal and Wright Street were also areas of interest. Possible cross-sections on Main Street were examined. Finally, North Main Street is the third area of interest. While these are the areas of interest, the study focused on the larger context of Sweetwater as well – looking at the larger interaction of Main Street/Highway 11, railroad crossings, and parking.

MAIN STREET MARKETPLACE, CULHAM STREET, AND BIRD STREET

The main activity center south of downtown along the study corridor is the Main Street Marketplace, which is a central point for food trucks and other vendors. There is limited pedestrian infrastructure here with no marked crossings or sidewalks at the Marketplace, except for the crosswalk along the northside of the Old Highway 68 signalized intersection. Stakeholders expressed a desire for easier access to the Marketplace from the west side of Main Street, potentially at Bird Street. However, as noted in the

⁴ MUTCD 2A.16.03

Pedestrian Crossings section above, it is advisable to minimize the number of non-signalized pedestrian crossings. Given the presence of pedestrian signals but lack of crosswalk on the south side of the Monroe Street/Old Highway 68 signalized intersection (see next section), a near-term solution to enhancing pedestrian connectivity to the Marketplace would be to stripe the crosswalk at the signal.

Access management for the Marketplace itself will likely entail new sidewalk along the east side of Main Street and specific access points on Main Street (perhaps across from Bird Street) and on Old Highway 68. However, the close spacing of the signal, railroad crossing, and opposite parking lot entrance present operational challenges.

On the west side of Main Street, sidewalks, ADA curb ramps, and side street crosswalks are needed between Culham Street and Monroe Street.

Figure 26: Pedestrian Safety at Culham and Bird Streets



Figure 27: Existing Lack of Access Management at the Main Street Marketplace



MONROE STREET / OLD HIGHWAY 68 SIGNAL

This is the only signalized intersection within the study area that has pedestrian signal heads, which provide designated and protected phases for pedestrians to cross Main Street. However, several needs

exist at this intersection. The northeast quadrant requires a pedestrian landing at the ends of the crosswalks. Drainage may be insufficient at the drainage grate, which may have necessitated the rock surface. Pedestrian-friendly options include a painted cut-out with bollards or permeable surfaces. In addition, the southern leg of Main Street has a pedestrian signal head but no crosswalk. Stakeholders also noted that drivers often have difficulty seeing pedestrians trying to cross the street at this intersection. On-street parking will need to be removed to ensure adequate sight distance.

Figure 28: Monroe Street/Old Highway 68 Pedestrian Needs



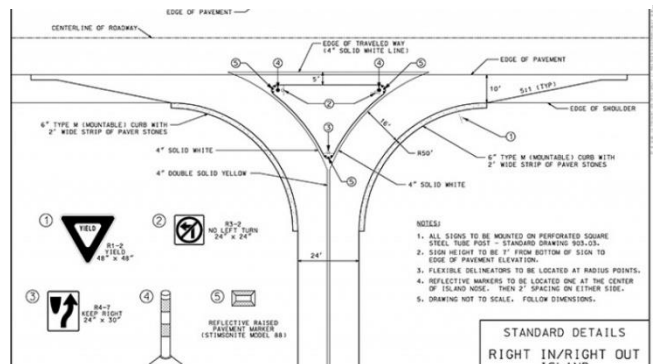
Figure 29: Monroe Street/Old Highway 68 Pedestrian Needs



PARKING LOT AND WRIGHT STREET

As noted in the Pedestrian Crossings section, signalized intersections are the safest place to cross major streets, and crossings at other locations should be minimized. A crosswalk exists across Main Street on the south side of Wright Street and a driveway to the parking lot. A pedestrian refuge island will help reduce the crossing distance pedestrians need to traverse and will allow them a chance to find gaps in traffic one direction at a time. However, there are numerous conflict points in such a configuration. The fact that Wright Street is one-way away from Main Street does help with a few conflicts. Two options for increasing safety and improving traffic operations at this location would be to close the parking lot driveway or make

Figure 30: Wright Street Turn-In Reconfiguration Option

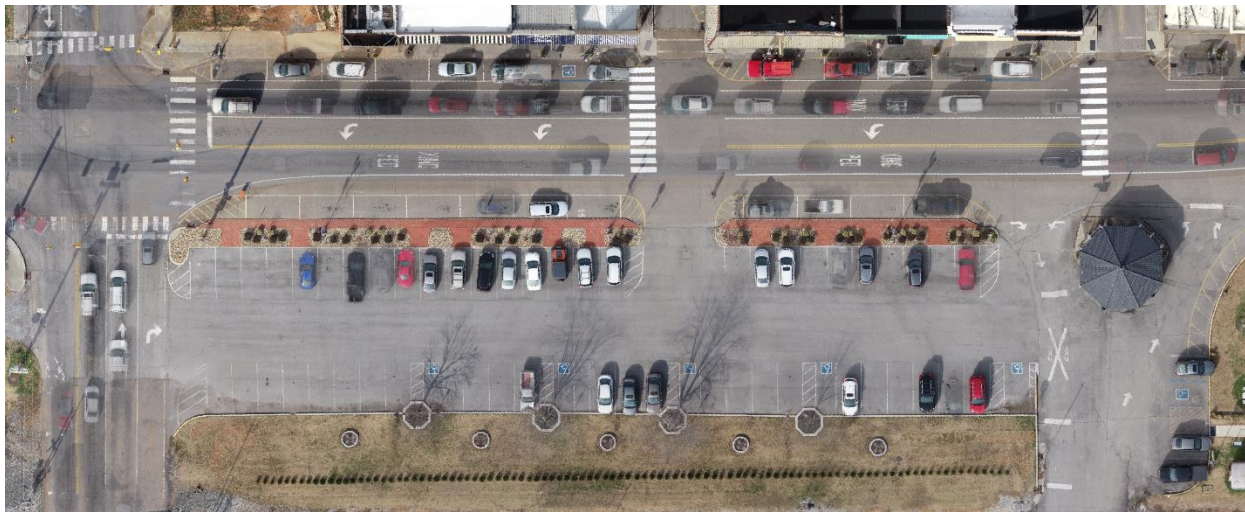


both the driveway and the Wright Street approach right-in, right-out only (see figure, via Missouri DOT), which would prohibit left turns.

Figure 31: Wright Street Pedestrian Infrastructure



Figure 32: Wright Street Aerial View



GAZEBO & WALNUT STREET

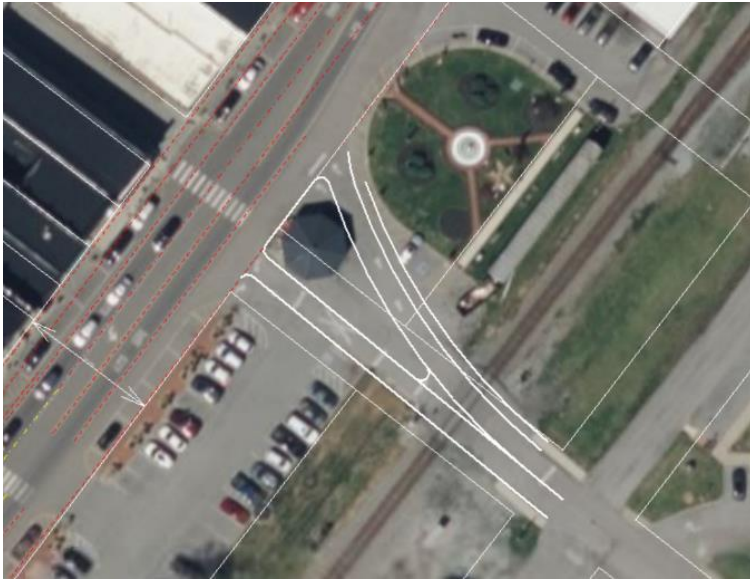
Stakeholders and survey respondents noted conflicting pedestrian and vehicular needs around the gazebo at Walnut Street. A variety of issues observed elsewhere in the study area were also seen at the Walnut Street crossing – differing crosswalk designs, drainage grates in the crosswalks, tactile pads only facing one crosswalk, and utilities restricting a four-foot clear path. As noted elsewhere, recommendations include adding a pedestrian refuge island and moving the crosswalk away from drainage grates.

Regarding the gazebo itself, its location within the Walnut Street right-of-way and Main Street’s clear zone is not ideal. Depending on community sentiment, it should be moved out of the street to a new location. If that is not an option, Wright Street around the gazebo should be converted to a right-in, right-out to prevent left turns. In the near term, this can be done via striping. Longer-term, the layout could be defined by curb and sidewalk. Over both timeframes, an adequate crosswalk landing is needed to ensure pedestrians do not end up in the middle of the street or a “no-mans-land”. Figure 34 below shows a preliminary potential right-in, right-out configuration around the gazebo.

Figure 33: Walnut Street Pedestrian Crossings



Figure 34: Potential Walnut Street Reconfiguration



MAIN STREET CROSS-SECTIONS: MONROE STREET TO MORRIS STREET

Given the variety of issues and needs previously discussed, two potential solutions exist for utilizing ROW to improve the pedestrian experience on Main Street through the heart of the downtown.

- Widen the existing sidewalk on the west side of Main Street in front of storefronts from Monroe Street to Mill Street by removing on-street parking on the west side of Main Street. This wider sidewalk would make it easier for pedestrians and persons in wheelchairs to pass and could even enable outside dining or sitting, with a greater buffer from traffic than parklets would allow.
- On the east side of Main Street beyond the brick pavers, add a sidewalk, curb, and bike lane by removing parking.

Figure 35: Widened Sidewalk Potential Improvements



Note: Hwy 11 / SR 2 are labeled

Figure 36: Main Street East Side Potential Improvements



Note: Hwy 11 / SR 2 are labeled

NORTH MAIN STREET

Currently, sidewalks are limited to a stretch of Main Street in the downtown corridor from Culham Street to North Street. Members of the public identified the need to provide new sidewalks on the northern end of the corridor, connecting to Towns Toffee and the Sweetwater Market at the Mill. Stakeholders also expressed a desire for a crosswalk across Main Street along this section.

Preliminary evaluation indicates two possible alternatives:

- Sidewalk on the east side of Main Street. This would require a retaining wall with handrail along Sweetwater Creek. Options discussed for this portion include a boardwalk. However, boardwalks might be particularly applicable in a wetlands setting, rather than along a creek itself. (See Figure 37)
- Sidewalk on the west side of Main Street. This would require a retaining wall from Biggs Street to the Big Orange Car Wash. (See Figure 38)

Figure 37: North Main Street East Side Potential Pedestrian Improvements

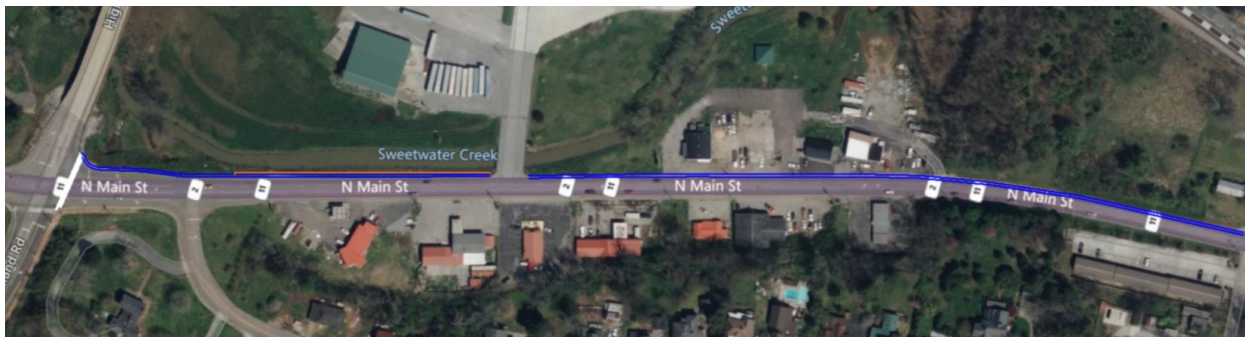


Figure 38: North Main Street West Side Potential Pedestrian Improvements



Note: Hwy 11 / SR 2 are labeled

Figure 39: Main Street and Sweetwater Creek



III. ENVIRONMENTAL CONSIDERATIONS

As potential improvements to the streetscape between Monroe Street and North Street, in conjunction with the adjacent multimodal and TAP projects, as they proceed through planning and implementation, a variety of environmental aspects should be considered.

National Environmental Policy Act (NEPA)

The likely Class of Action is a C-List or Programmatic Categorical Exclusion. Scope, design, and specific to this area, impacts to historic properties, would determine this.

Section 401 and 404 Permitting (Clean Water Act)

According to the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory and aerial imagery, Sweetwater Creek is along the study area and comes close to potential areas of disturbance at the southern and northern terminus. Project Ecologists may need to make a site visit to confirm conditions and determine if any additional aquatic features are located within the study area.

Protected Species (Endangered Species Act)

Several federally protected bat and clam species, as well as several State protected species, have potential to occur in the study area; however, existing development along the corridor likely prevents suitable habitat for any of the protected species. Project Ecologists may still need to make a site visit to confirm conditions and evaluate potential project impacts to protected species. The project may require some initial coordination with USFWS, Tennessee Department of Environment & Conservation (TDEC), and Tennessee Wildlife Resources Agency (TWRA).

Floodplains

Based on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 127 of 575 (Monroe County), Map #47123C0127D, most of the study area is within/near a 100-year floodplain for which Base Flood Elevations have been determined. The Regulatory Floodway for Sweetwater Creek is close to the study area. Project details would help determine if the proposed work would encroach upon the floodway.

Cultural Resources (National Historic Preservation Act)

A Section 106 Assessment would be needed to identify and discuss historic and archaeological resources and potential impacts to these resources. Potential impacts to historic properties may include, but are not limited to, direct physical and visual impacts and indirect impacts consisting of reasonably foreseeable effects caused by the project but occurring later in time or further removed. If

impacts to the historic downtown cannot be avoided, a historian will need to work with the project team to minimize and potentially mitigate these impacts.

Farmland Protection and Policy Act (FPPA)

Due to study area and project size, an exemption would apply to the FPPA.

Environmental Justice

Environmental Protection Agency (EPA) EJSscreen indicates portions of the study area may qualify as Environmental Justice (EJ) populations; however, based on scope of work, it is unlikely additional evaluation is needed as the proposed activities would not likely have the potential to cause disproportionately high or adverse effects on low income or minority populations. This would be confirmed during the NEPA review.

Air Quality

Monroe County is in attainment for all regulated criteria pollutants. Categorical Exclusions do not require Mobile Source Air Toxic evaluations. No additional air quality would be needed.

Noise

The proposed project would qualify as Type III in accordance with the FHWA noise regulation and TDOT's noise policy. A noise study would not be needed for the proposed sidewalk improvements.

Section 4(f) (Department of Transportation Act)

Additional investigation would be needed to determine what properties would qualify for protection under Section 4(f). Preliminary review has identified several historic properties as areas of potential concern. Section 4(f) impacts, if any, would be identified and confirmed during the NEPA review.

ROW Impacts

ROW acquisition could impact the level of NEPA document to be prepared. ROW acquisition over one acre would elevate the NEPA document to a D-List Categorical Exclusion, which requires FHWA approval. Additionally, ROW and easement impacts to historic properties could impact the historic/architectural assessment, as well as Section 4(f) concerns.

Hazardous Materials

As plans are developed, the project area should be assessed for presence of hazardous materials, underground storage tanks, etc.

RECOMMENDATIONS

Feedback from project stakeholders and the public along with project evaluation resulted in the following recommended projects. The recommendations identified below reflect public and stakeholder preference for safe and separated facilities for bicyclists and pedestrians, expansion of existing greenways and sidewalks, improved access management and traffic flow, and the need for improved pedestrian crossings.

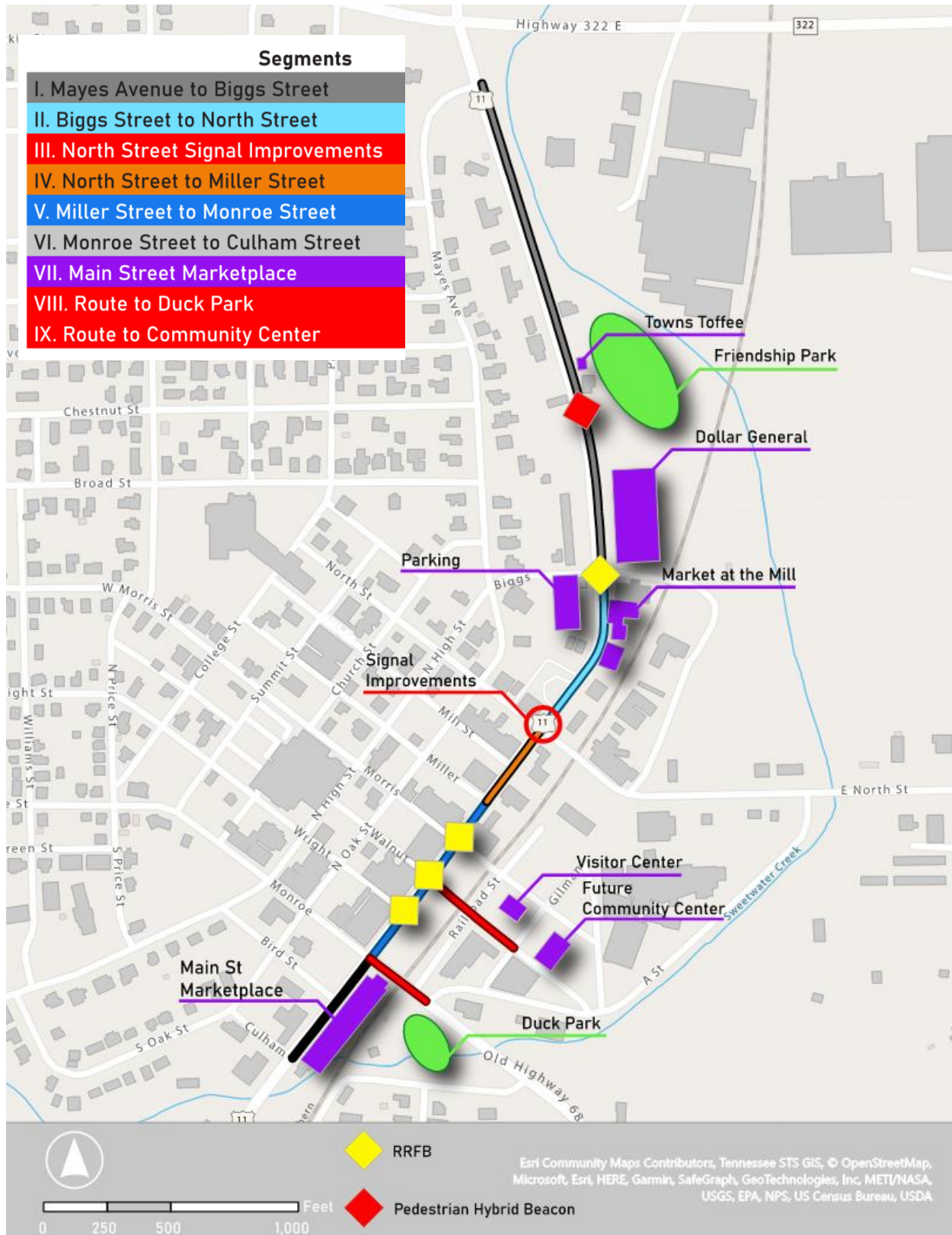
Figure 40 presents an overview of the recommendations. From the north to the south end of the corridor, improvements and alternatives are grouped into nine segments, which are detailed in the following sections.

- I. Mayes Avenue to Biggs Street
- II. Biggs Street to North Street
- III. North Street Signal Improvements
- IV. North Street to Miller Street
- V. Miller Street to Monroe Street
- VI. Monroe Street to Culham Street
- VII. Main Street Marketplace
- VIII. Route to Duck Park
- IX. Route to Community Center

Appendix D includes the concept plans, which are broken into three sheets, which vary by alternative.

- | | |
|------------|--|
| Sheet 1: | Culham Street to Morris Street |
| Sheet 2: | Between Morris Street and Biggs Street |
| Sheet 3: | Biggs Street to Mayes Avenue |
| Sheet 1A: | Bicycle Lane Alternative. Walnut Street Remains Open |
| Sheet 1A1: | Bicycle Lane Alternative. Walnut Street Closed |
| Sheet 2A: | Bicycle Lane Alternative |
| Sheet 3A: | Sidewalk on East Side |
| Sheet 1B: | Bulb-Out Alternative. Walnut Street Remains Open |
| Sheet 1B1: | Bulb-Out Alternative. Walnut Street Closed |
| Sheet 2B: | Bulb-Out Alternative |
| Sheet 3B: | Sidewalk on West Side |

Figure 40: Recommendations Overview



I. MAYES AVENUE TO BIGGS STREET

The first segment is from Mayes Avenue to Biggs Street, which is within the extent of the TAP project. The main need to be addressed is increased pedestrian infrastructure to connect businesses north of town, such as Towns Toffee, to downtown Sweetwater.

One alternative would be to add a new sidewalk on the west side of Main Street. This alternative would require a retaining wall from Biggs Street to the Big Orange Car Wash due the existing shoulder slope.

The second alternative for pedestrian connectivity would be to build out a sidewalk on the east side of Main Street. This would require a retaining wall with a handrail along Sweetwater Creek.

Given the challenge of grading the west side sidewalk, new Dollar General on the northeast corner of the Main Street and Biggs Street intersection, and the presence of Towns Toffee and Friendship Park on the east side of Main Street, the east side sidewalk is recommended.

A mid-block crossing on this section would facilitate pedestrian access to business and destinations on opposite sides of the street. As described in the Pedestrians Crossing section in the Needs Assessment, a pedestrian hybrid beacon would be installed at this location.

II. BIGGS STREET TO NORTH STREET

The second segment, also located within the TAP project extent, is Biggs Street to North Street. This section involves adding a crosswalk across Main Street with RRFB at Biggs Street near the new Dollar General. Crossings are also added across Biggs Street on both sides of Main Street. Sidewalks are added on both sides of Main Street between Biggs Street and North Street.

The sidewalk on the east side of Main Street would serve the Market at the Mill and enhance its connection to downtown. This sidewalk would require removing current diagonal parking spaces along the roadway (see Figure 41). This existing parking encroaches on the roadway clear zone⁵ and requires departing drivers to back up onto the roadway curve as the road transitions from a downtown to more suburban character, potentially causing safety and operational issues.

To replace displaced parking spaces at the Market at the Mill, a new parking lot is proposed on the southeast corner of the Main Street at Biggs Street intersection. The lot could contain 78 parking spaces, including 4 accessible spaces, 18'x8' spaces and 24' aisles.

⁵ <https://highways.dot.gov/safety/rwd/provide-safe-recovery/clear-zones/clear-zones>

Figure 41: Existing Parking at the Market at the Mill



III. NORTH STREET SIGNAL

Recommended improvements to the North Street signalized intersection include:

- Add flashing left turn yellow arrow on all approaches to minimize confusion regarding left turn yield on green
- Update signal heads to LED
- Add pedestrian signals and crosswalks
- Update the fixed-time signals with actuated signals by using the necessary vehicle detection (e.g., inductive loops, video detection, radar detection, etc.) on the mainline and side roads

IV. NORTH STREET TO MILLER STREET

New sidewalk with curb and gutter between North Street and Miller Street on the east side of Main Street would facilitate pedestrian connectivity between segments to the north and downtown. In addition, curb and gutter would help define the roadway and provide access management. A bulb-out at Mill Street is also recommended to ensure the crosswalk intersects a pedestrian landing. In the bicycle lane alternative, to provide bicycle lanes north of Miller Street could require additional ROW. The bicycle lane alternative currently assumes bicycle lanes drop at Miller Street, with sharrows indicating bicyclists are to take a full lane between North Street and Miller Street (see sheet 2A in Appendix D).

V. MILLER STREET TO MONROE STREET

In downtown Sweetwater, stakeholders and members of the public expressed a desire for enhanced pedestrian and bicycle infrastructure. Two alternatives were proposed for the main section of downtown between Monroe Street/Old Highway 68 and Miller Street – bicycle lanes and bulb-outs. Two sub-areas within this segment include the gazebo and the brick sidewalk adjacent to the parking lot.

BICYCLE LANES

A bicycle lane alternative proposes bike lanes on this full segment. This alternative would be to install designated bicycle lanes in the central stretch of downtown from Monroe Street to Miller Street. On both sides of the road there would be a bicycle lane painted green. On-street parking would remain largely untouched and would be located between the bicycle lanes and the sidewalk. One parking space would be removed on the east side of the street at Walnut Street to help improve safety and sight distance.

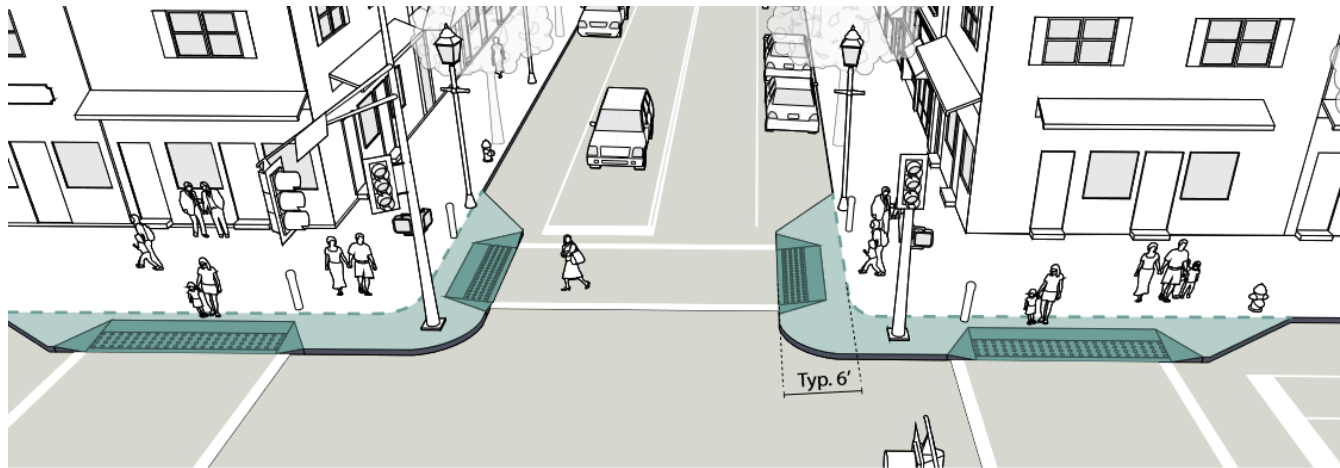
Although bicyclists are allowed to ride on the sidewalk in the City of Sweetwater, the bicycle lanes would provide a designated path for cyclists to access and traverse downtown. Ideally, bike lanes would be fully buffered and protected from vehicular traffic. However, ROW and geometric constraints inhibited the feasibility of such measures on this segment. Nevertheless, a two-foot buffer was utilized adjacent to retained on-street parking spaces to mitigate door zone conflicts.

BULB-OUTS

Initially, a widened sidewalk alternative was proposed to utilize existing ROW, including on-street parking spaces to widen sidewalks, which would provide additional space for pedestrians to walk, pass, and mingle, as well as amenities such as vegetation and benches (from Monroe Street to Morris Street). The sidewalk on the west side of Main Street would be widened to 10 feet to allow for both pedestrian and cyclist traffic through the downtown area. On-street parking would be removed on this side of Main Street to allow for the wide pathway. Planters would be placed along the widened pathway for greenery and beautification.

However, on-street parking spaces provide valuable loading access for business owners and parking for customers. Given the strong desire of stakeholders to retain some on-street parking while also enhancing pedestrian amenities and safety, the widened sidewalk alternative was adapted into a bulb-out alternative, which extends the sidewalk into on-street parking lanes to narrow the roadway and provide additional pedestrian space and visibility along Main Street just near the intersection corners. See figure below.

Figure 42: Bulb-Outs / Curb Extensions



Source: <https://media.alexandriava.gov/docs-archives/localmotion/info/gettingaround/alexandria-complete-streets-design-guidelines.pdf>

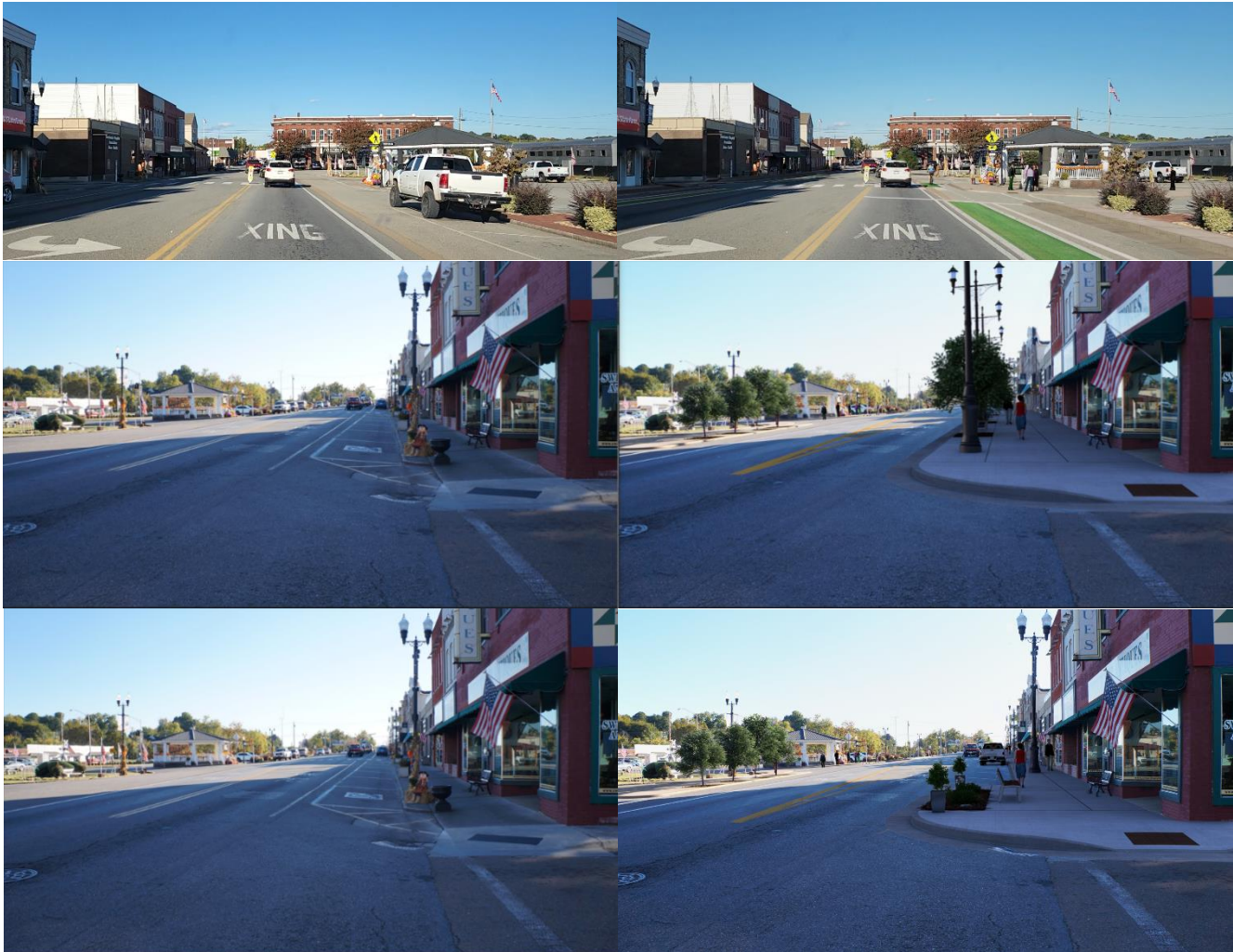
Bulb-outs would function to shorten the length of crosswalks. Stakeholders suggested creating pedestrian refuge islands along the corridor in between the two directions of traffic to shorten the distance pedestrians must travel across traffic. However, according to TDOT guidelines, pedestrian refuge islands do not align with the design guidelines of state routes. Instead, the team recommends finding ways to reduce crossing distances for pedestrians. This includes curb extensions, as well as widening sidewalks on either side of the road.

For locations where crosswalks across Main Street are not present, bulb-outs function to enhance urban design by providing space for landscaping, vegetation, and pedestrian amenities such as benches.

It was assumed that utilities such as light poles and drainage grates would not be moved. As indicated in the concept plans, crosswalks are proposed to shift out away from drainage grate.

The figure below contains potential before and after illustrations for the bike lanes, widened sidewalks, and bulb-outs.

Figure 43: Illustrative Improvements



GAZEBO

At Walnut Street and Main Street, the gazebo is a central gathering place in Sweetwater. However, it currently is located in the center of a busy intersection with no pedestrian facilities, making it a difficult and dangerous location to access. Regardless of the bicycle lanes or bulb-out alternative, one alternative for the gazebo is to build out sidewalks around the gazebo to allow more pedestrian access. Walnut Street would be transformed into a right-in, right-out intersection, which would prohibit left turns and reduce conflicts.

The second alternative for the gazebo would be to close Walnut Street to vehicular traffic. The area around the gazebo would be turned into a pedestrian plaza. Planters and tables would be placed around the area as well, which would invite pedestrians to utilize this space without cars.

A subvariant of this alternative would close Walnut Street and relocate the gazebo. Although the new location would be determined by stakeholders, one option would be to place it in front of the nearby trolley car, which would maintain the symmetry of the area.

To reduce conflicts, enhance pedestrian experience, and increase safety, and in line with stakeholder sentiment, it is recommended that Walnut Street be closed. This recommendation does not necessitate moving the gazebo – the pedestrian plaza could be implemented whether or not the gazebo is moved.

BRICK SIDEWALK

Through the public survey feedback, many residents of Sweetwater were concerned about the brick sidewalk that runs along the downtown parking lot starting at Old Highway 68 and ending at the gazebo. The bricks are uneven, and the steep grade of the area makes the sidewalk too steep to comply with ADA regulations. Using data collected by the drone for this study, the project team visualized the elevation of the sidewalk (see Appendix C). The analysis concluded that, given the constraints, adding five-foot minimum width a sidewalk that meets cross-slope requirements would require a short retaining wall at the edge of the parking lot.

VI. MONROE STREET TO CULHAM STREET

The Sweetwater Greenway is an ongoing multimodal project to construct a pedestrian path along Main Street from Monroe Street to SR 68 and along SR 68 to High Street. The proposed trail will be a shared use path with a minimum of 10 feet in width. The northernmost section of this proposed greenway is in this project’s study area between Monroe Street and Culham Street. The Sweetwater Greenway should evaluate and implement the pedestrian improvements contemplated in this plan on the west side of Main Street Between Monroe Street and Culham Street. Although pedestrian crossings at unsignalized intersections should be minimized, and the newly marked crossing at the Monroe Street signal provides access, a new crosswalk with RRFB on this segment could enhance pedestrian connectivity and access.

VII. MAIN STREET MARKETPLACE

Currently, the Main Street Marketplace lacks proper parking management and access management. To manage access to the state route (Main Street) and preserve intersection operations at the Monroe Street intersection, a Main Street Marketplace driveway should not be placed too close to the intersection. TDOT’s Driveway Rules Manual⁶ recommends driveways not be placed within 200 feet of an intersection of two arterials. A potential configuration for the Main Street Marketplace that acknowledges this constraint, would be a single driveway on Main Street well away from the intersection. The driveway accesses a parking lot with 17 striped parking spaces and two accessible spaces. An additional driveway is shown on Old Highway 68 to allow food trucks and other vendors to access the site and to access additional parking spaces on the northern side of the property for vendor parking. In between the two parking areas are food truck and seating areas. Curb, gutter, and sidewalks are also shown on the Marketplace side of Main Street. In addition, a crosswalk should also be installed across Main Street at Monroe Street on the southern end of the signalized intersection.

VIII. ROUTE TO DUCK PARK

The railroad operates parallel to Main Street in Sweetwater. While there are flashing beacons and clear crossings for cars, there is no mechanism for safe pedestrian crossings or fencing to ensure

⁶ https://www.tn.gov/content/dam/tn/tdot/traffic-engineering/2016_Driveway_Rules_Manual.pdf

pedestrians cannot get on the tracks. Sweetwater should install decorative fencing along the railroad to ensure that pedestrians are not able to access the rail lines outside of designated street crossings.

Duck Park is a key attraction downtown. To provide a safe pedestrian route to Duck Park, sidewalk along Old Highway 68 and into the park are needed, as well as a crosswalk across Old Highway 68 and a pedestrian rail crossing on the north side of Old Highway 68.

IX. ROUTE TO COMMUNITY CENTER

To connect downtown, the gazebo, and historic rail car with the visitor center and new community center, a pedestrian railroad crossing and crosswalks across the visitor center driveways and Gliman Street are needed. Note that the cost estimates include a single pedestrian railroad crossing at Walnut Street.

X. COST ESTIMATES

Cost estimates were developed for the alternatives and recommendations. Cost estimates were developed based on 2021 prices. Note that costs might have increased since. Table 7 summarizes the total cost estimate for each segment, along with the associated alternative and an indication of whether the segment is included within the other Transportation Alternatives Program (TAP) project or Multimodal project extents.

Table 8 summarizes the cost estimates for the recommended improvements. Among the alternatives, the sidewalk is recommended on the east side of Main Street from Mayes Avenue to Biggs Street. Bulb-outs are recommended between Miller Street and Monroe Street. In addition, it is recommended to close Walnut Street to vehicular traffic.

Table 9 details the various components included within total cost. These include the following components, some of which are calculated as a percentage of construction costs.

- Construction cost subtotal: cost of detailed items
- MOT: Maintenance of Traffic
- Mob.: Mobilization (5%)
- Other: Other Items and Annual Inflation (10%)
- Contingency: Construction Contingency (30%)
- CEI: Construction Engineering & Inspection (10%)
- Utilities
- PE: Preliminary Engineering (10%)

Note that no ROW was assumed to be required.

Although the recommendations assume existing drains will not move (for example, in shifting crosswalks at Wright Street, Walnut Street, and Morris Street), some elements require drainage structures. For example, new sidewalk with curb and gutter includes catch basins and drainage pipe.

In addition, the standard approach is to include utilities costs. However, most recommendations assume utilities would not move (e.g., light poles). Therefore, utility costs might be less than estimated.

Table 10 identifies detailed items and quantities included within each estimate.

Table 7: Summary of Cost Estimates

ID	Segment	Alternative	Other Project	Total Cost
I_A	Mayes Ave to Biggs St	East side	TAP	\$1,150,000
I_B	Mayes Ave to Biggs St	West side	TAP	\$1,470,000
II	Biggs St to North St		TAP	\$1,110,000
III	North Street Signal			\$264,000
IV	North St to Miller St			\$196,000
V_A	Miller St to Monroe St	Bike Lanes		\$921,000
V_B	Miller St to Monroe St	Bulb-Outs		\$982,000
V_C	Miller St to Monroe St	Bike Lanes, Close Walnut St		\$968,000
V_D	Miller St to Monroe St	Bulb-Outs, Close Walnut St		\$1,050,000
VI	Monroe St to Culham St		Multimodal	\$256,000
VII	Main Street Marketplace			\$467,000
VIII	Route to Duck Park			\$786,000
IX	Route to Community Center			\$707,000

Table 8: Summary of Cost Estimates for Recommended Improvements

ID	Segment	Alternative	Other Project	Total Cost
I_A	Mayes Ave to Biggs St	East side	TAP	\$1,150,000
II	Biggs St to North St		TAP	\$1,110,000
III	North Street Signal			\$264,000
IV	North St to Miller St			\$196,000
V_D	Miller St to Monroe St	Bulb-Outs, Close Walnut St		\$1,050,000
VI	Monroe St to Culham St		Multimodal	\$256,000
VII	Main Street Marketplace			\$467,000
VIII	Route to Duck Park			\$786,000
IX	Route to Community Center			\$707,000
	Total			5,986,000



Table 9: Cost Estimate Components

ID	Segment	Alternative	Total Cost	Const. Sub	MOT	Mob.	Other	Contingency	CEI	ROW	Utilities	PE
I_A	Mayes Ave to Biggs St	East side	\$1,150,000	\$645,500	\$25,900	\$33,600	\$70,500	\$163,000	\$93,900	-	12,900	103,000
I_B	Mayes Ave to Biggs St	West side	\$1,470,000	\$720,900	\$28,900	\$37,500	\$78,700	\$177,000	\$104,000	-	209,000	115,000
II	Biggs St to North St		\$1,110,000	\$560,000	\$37,500	\$29,100	\$61,200	\$202,000	\$87,500	-	53,400	96,200
III	North Street Signal		\$264,000									
IV	North St to Miller St		\$196,000	\$93,900	\$4,000	\$5,150	\$10,800	\$35,700	\$15,500	-	9,400	17,000
V_A	Miller St to Monroe St	Bike Lanes	\$921,000	\$432,700	\$17,400	\$22,500	\$47,300	\$110,000	\$63,000	-	159,000	69,300
V_B	Miller St to Monroe St	Bulb-Outs	\$982,000	\$464,000	\$18,600	\$24,100	\$50,700	\$120,000	\$67,700	-	162,000	74,500
V_C	Miller St to Monroe St	Bike Lanes, Close Walnut St	\$968,000	\$451,000	\$18,100	\$23,500	\$49,300	\$117,000	\$65,900	-	170,000	72,500
V_D	Miller St to Monroe St	Bulb-Outs, Close Walnut St	\$1,050,000	\$493,000	\$19,800	\$25,600	\$53,800	\$131,000	\$72,300	-	174,000	79,600
VI	Monroe St to Culham St		\$256,000	\$128,700	\$5,200	\$6,700	\$14,100	\$46,400	\$20,100	-	12,900	22,100
VII	Main Street Marketplace		\$467,000	\$208,200	\$8,400	\$10,800	\$22,700	\$75,000	\$32,500	-	73,400	35,800
VIII	Route to Duck Park		\$786,000	\$395,500	\$15,900	\$20,600	\$43,200	\$143,000	\$61,800	-	38,100	68,000
IX	Route to Community Center		\$707,000	\$356,100	\$14,300	\$18,500	\$38,900	\$128,000	\$55,600	-	34,700	61,100

No ROW assumed. Utilities assumed but could be reduced.



Table 10: Items Included in Cost Estimates

	Unit	I_A	I_B	II	III	IV	V_A	V_B	V_C	V_D	VI	VII	VIII	IX
		Mayes Ave to Biggs St	Mayes Ave to Biggs St	Biggs St to North St	North Street Signal	North St to Miller St	Miller St to Monroe St	Miller St to Monroe St	Miller St to Monroe St	Miller St to Monroe St	Monroe St to Culham St	Main Street Marketplace	Route to Duck Park	Route to Community Center
		East Side	West Side				Bike Lanes	Bulb Outs	Bike Lanes, Close Walnut St	Bulb Outs, Close Walnut St				
Concrete Sidewalk (4 ")	SF	13,280	13,820	11,930	-	3,620	13,520	16,600	14,540	18,230	6,240	4,500	1,550	360
Concrete Combined Curb & Gutter	CY	200	320	270	-	90	190	180	190	190	110	130	50	-
Concrete Driveway	SF	630	1,680	1,050	-	-	210	210	210	210	-	210	-	-
Concrete Curb Ramp	SF	150	300	250	-	350	1,400	1,200	1,200	1,200	350	100	300	250
Removal of Rigid Pavement, Sidewalk, etc.	SY	2,060	2,470	6,010	-	650	2,160	2,450	2,710	3,180	990	1,530	300	360
Ornamental Fence	LF	-	-	-	-	-	-	310	-	-	-	-	440	450
Parking Lot(s)	SY	-	-	2,270	-	-	-	-	-	-	-	450	-	-
Cast in Place retaining wall (5 ft avg ht)	SF	480	610	-	-	-	270	280	270	280	-	-	-	-
Safety Rail	LF	480	-	-	-	-	-	-	-	-	-	-	-	-
Grassed Area	SF	-	-	-	-	-	1,350	850	5,330	5,330	-	-	-	-
Seed or Sod	SY	940	430	850	-	0	-	-	-	-	-	-	-	-
Rectangular Rapid-Flashing Beacon (RRFB)	EA	1	1	-	-	-	3	3	3	3	-	1	-	-
Pedestrian Hybrid Beacon (PHB)	EA	1	1	-	-	-	-	-	-	-	-	-	-	-
Flashing Yellow Left-Turn Arrow	EA	-	-	-	8	-	-	-	-	-	-	-	-	-
Upgrade Signal Heads to LED	EA	-	-	-	8	-	-	-	-	-	-	-	-	-
Add Pedestrian Signals and Crosswalks	LS	-	-	-	1	-	-	-	-	-	-	-	-	-
Updated to Actuated Signals	LS	-	-	-	1	-	-	-	-	-	-	-	-	-
Railroad Pedestrian Crossing	EA	-	-	-	-	-	-	-	-	-	-	-	1	1
Pavement Markings	LS	23,800	23,800	26,700	-	5,000	39,100	41,100	41,100	41,100	-	10,000	12,220	12,612
Cut Volume	CY	520	550	1340	-	150	480	550	610	610	220	340	70	10
Fill Volume	CY	520	550	1340	-	150	480	550	610	610	220	340	70	10
Clearing and Grubbing	AC	0.5	1	1.25	-	0.25	0.5	0.75	0.75	0.75	0.25	0.5	0.25	0.25
18" Concrete Drainage Pipe	LF	2150	2210	1370	-	0	0	0	0	0	0	620	-	-
Catch Basin - assumes 1 every 300'	EA	8	8	5	-	1	1	3	1	1	3	4	-	-
Endwall	EA	2	2	0	-	0	0	0	0	0	0	0	-	-
Adjustment of Existing Catch Basin	EA	-	-	-	-	1	12	9	12	12	0	0	-	-
Capping Existing Catch Basin	EA	-	-	-	-	1	1	3	1	1	3	1	-	-
RipRap	CY	4	4	0	-	0	0	0	0	0	0	0	-	-
Trees	EA	0	-	-	-	-	13	-	23	23	0	0	-	-
Benches	EA	0	-	-	-	-	-	-	6	6	-	9	-	-
Erosion And Sediment Control	LS	61,500	69,300	53,400	-	9,400	39,300	42,400	42,400	45,300	12,900	19,900	38,100	34,700

XI. POTENTIAL FUNDING OPPORTUNITIES

To fund the recommended improvements, a variety of state and federal funding opportunities are available. Given the nature of the recommended improvements and the study area, active transportation programs have the highest potential.

Grant/Program	Agency	Examples of Eligible Activities	Funding
Multimodal Access Grant Program	TDOT Multimodal Division	Multimodal Access Grant funding is available to improve transportation access for pedestrians, bicyclists, and transit users along State Routes using the following improvement types: sidewalks; pedestrian crossing improvements; bicycle facilities; multi-use paths; transit stop amenities; complete streets, road diet or traffic calming measures; improvements that address ADA noncompliance; pedestrian-scale lighting; and other improvements which primarily improve access for multimodal users.	95% state; 5% local match State portion may not exceed \$950,000
Transportation Alternatives Program	TDOT Local Programs Office	All facilities must be hard-surfaced, ADA compliant, and provide adequate connectivity and separation from vehicular traffic. Sidewalk facilities must be a minimum of 5 feet wide and shared-use facilities must be a minimum of 10 feet wide. Funds can be used for sidewalks, walkways or curb ramps, bike lane striping, wide paved shoulders, bike parking and bus racks, traffic calming for the safety of bike/ped traffic, off-road trails, bike, and pedestrian bridges/underpasses, and ADA compliance.	20% local match for construction; Preliminary engineering, design, and ROW expenses are responsibility of local government
Recreational Trails Program	Tennessee Department of Environment and Conservation	Provides grant funding for land acquisition for trails, trail maintenance, trail construction, trail rehabilitation, and for trail head support facilities. All grant projects MUST be on publicly owned land.	20% local match
Local Parks and Recreation Fund	Tennessee Department of Environment and Conservation	Provides for the purchase of land for parks, natural areas, greenways, and the purchase of land for recreational facilities. Funds may also be used for trail	50% local match

		development and capital projects in parks, natural areas, and greenways.	
FastTrack Infrastructure Program	Tennessee Department of Economic and Community Development	Grants made to local governing bodies for public infrastructure improvements must be for specific infrastructure projects benefiting one or more companies committed to creating new jobs and/or making new capital investments. Covers infrastructure such as rail, public roadway, port, airport, site, water, sewer, gas, and telecommunication improvements.	Local matching based on community's ability to pay At-Risk County – 35% premium to projects
Community Development Block Grant	Tennessee Department of Economic and Community Development	Provide essential, pressing community development needs in underserved areas; the funds can be applied for community livability projects.	100% federal
Highway Safety Improvement Program	Federal Highway Administration	The FAST Act continues the overarching requirement that HSIP funds be used for safety projects that are consistent with the State's Strategic Highway Safety Plan and that correct or improve a hazardous road location or feature or address a highway safety problem. The FAST Act specifically identifies the following activities on the inclusion list: installation of vehicle-to-infrastructure communication equipment; pedestrian hybrid beacons; and roadway improvements that provide separation between pedestrians and motor vehicles, including medians and pedestrian crossing islands.	90% federal 10% local match
Surface Transportation Block Grant Program	Federal Highway Administration	In general, STBG projects may not be on local roads or rural minor collectors. There are a number of exceptions to this requirement, such as the ability to use up to 15 percent of a state's rural suballocation on minor collectors. Other exceptions include bridge and tunnel projects; safety projects; fringe and corridor parking facilities/programs; recreational trails, pedestrian and bicycle projects, and safe routes to school projects; boulevard/roadway projects largely in the ROW of divided highways;	80% federal 20% local match

		inspection/evaluation of bridges, tunnels, and other highway assets; port terminal modifications; and projects.	
Tennessee Built Environment Grants	Tennessee Department of Health	These grants aim to increase access to safe and publicly accessible places that provide opportunities for physical activity for a diverse group of users, including those who live, visit, work, play, worship, and learn in the community.	Up to \$85,000 grant
Community Grant Program	People for Bikes	Focuses most grant funds on bicycle infrastructure projects, such as: bike paths, lanes, trails, and bridges; mountain bike facilities; bike parks and pump tracks; BMX facilities; and end-of-trip facilities such as bike racks, bike parking, bike repair stations, and bike storage. Some advocacy projects are also funded, such as: programs that transform city streets, such as Ciclovias or Open Streets Days; and campaigns to increase investment in bicycle infrastructure.	Up to \$10,000 grant
Greenway Foundation Grant Program	TennGreen (Tennessee Parks and Greenways Foundation)	This organization provides competitive grants to complete or repair a greenway or trail project.	Grants range from \$500 to \$2,500 and must be matched.
Active Transportation Infrastructure Investment Program	Federal Highway Administration	To connect people with public transportation, businesses, workplaces, schools, residences, recreation areas, and other community activity centers.	\$1B (total program) 80% Federal Share; 100% Federal Share for Disadvantaged Communities
Safe Streets & Roads for All	Federal Highway Administration	This program will provide funding directly to local and tribal governments to support their efforts to advance “vision zero” plans and other improvements to reduce crashes and fatalities, especially for cyclists and pedestrians.	\$1B (total program) 80% Federal Share
Strengthening Mobility and Revolutionizing Transportation (SMART) Grant	Federal Highway Administration	The SMART Grant program will be a programmed competition that will deliver competitive grants to states, local governments, and tribes for projects that improve transportation safety and efficiency.	\$500M (total program) Match unknown at this time (assume 80% Federal Share)

APPENDIX A: SUMMARY OF OUTREACH ACTIVITIES

This appendix summarizes outreach activities conducted through the course of the study and as part of engagement of stakeholders and the public. The following sections detail the steering committee that guided the study, the stakeholder committee that met three times to inform the plan, and public engagement, which consisted of an online survey and in-person engagement.

STEERING COMMITTEE

To guide the study, the project team formed a steering committee to coordinate between the project team, TDOT, and the City of Sweetwater. The committee helped guide outreach by identifying important stakeholders and identifying community goals and issues. In general, throughout the course of the plan, the steering committee met bi-weekly.

The project team kicked off the project on October 5, 2022 to review the scope and schedule of the project and identify next steps for planning activities and public engagement.

STAKEHOLDER ENGAGEMENT

FIRST MEETING

Date: November 29, 2022

Time: 10:30 – 11:30 AM Eastern

Location: MS Teams & City Hall

Attendees

Jessica Morgan	City Recorder
Jon Campbell	City Planner
Josh Issac	Main Street Director
Hayley Isbill	City Tourism Director
Jim Fairweather	MS Chair, Sw Hospital Bd, Fairweather Financial Owner
Sarah Loebner	Towns Toffee Owner
Sam Moser	City Commissioner
Heather Carroll	Downtown Air B&B owner, Business Owner- Remedies Organics
Jaclyn Cleveland	SHS Faculty (not present)
Jessica Hall	Historic District Resident
Wes Isbill	Utility Planner, SUB
Eddie Byrum	Chief of Police
Kevin Watson	Police Captain
TDOT	Ronda Sawyer, Troy Ebbert, Masonya Osei
HNTB	Kai Zuehlke, Rashidi Jackson, Garth Lynch, Maddy Clowse

Agenda

- Introductions
- Project Overview
- Survey Preview
- Project Vision & Goals
- Questions

Notes

- Survey
 - The survey can be completed on mobile
 - Excessive duplicate survey responses can be identified and screened
- Vision, Goals, and Needs
 - Need for increased visibility at pedestrian crossings, both in terms of lighting and sight distances.
 - Brick paver sidewalk between Monroe St and Walnut St near the parking lot are aesthetically appealing but are uneven and have substantial cross slope
 - Create a pedestrian thoroughfare but also minimize amount of asphalt between highway and buildings themselves. Soften the “no man’s land” between highway and businesses.
 - City is looking into adding flashers, both in-pavement at crosswalks and solar-powered, pole-mounted

Action Items

- Next stakeholder meeting to be scheduled
- List of deliverables
 - Summary of Outreach Activities
 - Assessment and Analysis Memo
 - Final Report
 - Final Presentation

Note that this study will result in planning-level recommendations, including an implementation plan, maps of potential projects, project cost estimates, and possible funding sources. The maps will detail existing conditions and the alignment of potential improvements, such as possible crosswalk reconfigurations, pavement markings, ADA curb ramps, pedestrian refuge islands, new sidewalk, and new curb and gutter, and on-street parking spaces to re-purpose.

SECOND MEETING

Date: March 15, 2023

Time: 12:00 PM Eastern

Location: City Hall & Webex

Attendees

Jessica Morgan, City Recorder
Jon Campbell, City Planner
Josh Issac, Main Street Director
Hayley Isbill, City Tourism Director
Jim Fairweather, MS Chair, Sw Hospital Bd, Fairweather Financial Owner
Sarah Loebner, Towns Toffee Owner (not present)
Sam Moser, City Commissioner
Heather Carroll, Downtown Air B&B owner, Business Owner- Remedies Organics
Jaclyn Cleveland, SHS Faculty
Jessica Hall, Historic District Resident (not present)
Wes Isbill, Utility Planner, SUB
Eddie Byrum, Chief of Police
Kevin Watson, Police Captain
TDOT: Troy Ebbert, Ronda Sawyer, Will Rogers
HNTB: Kai Zuehlke, Garth Lynch, Maddy Clowse

Agenda

- Welcome
- Next Steps
- Technical Memorandum Walk-Through
 - Existing Conditions
 - Other Projects
 - Survey Results
 - Needs Assessment

Meeting Notes

- Next Steps
 - The next steps were reviewed, including developing and refining recommendations, a final stakeholder committee meeting, a second public engagement, and finalizing the report.
- Existing Conditions
 - Roadway Characteristics

- Roadway classification, laneage, speed limit, and volume of Main Street were summarized
- Traffic Counts and Growth Trends
 - Historic traffic counts on Main Street were reviewed. Historic counts did not show significant growth. Roadway capacity is not a primary issue, although traffic flow is a priority.
 - Add 2022 counts (**action item**)
 - Note in report that Dollar General is going in and could add trips (**action item**)
- Safety
 - Crash frequency over the last five years was summarized
 - Evaluate nonmotorized crashes (**action item**)
- Freight
 - Freight generators and truck movements were briefly considered
- Active Transportation
 - Existing sidewalk locations were reviewed
- Other Projects
 - High Street
 - The recently completed sidewalk/trial project was noted
 - Sweetwater Greenway
 - It was acknowledged that the Multimodal grant projects will construct the Sweetwater Greenway from Monroe Street southward, continuing down to Hwy 68 and will connect to high Street
 - TAP Project
 - It was noted that on the north end of the study area from North Street northward, the TAP project will add sidewalk
 - Given these other projects, it was noted the CMP will serve an important role in charting pedestrian connectivity between Monroe Street and North Street.
 - Resurfacing and ADA Curb Ramp Upgrades
 - The resurfacing and curb ramp projects were discussed
 - Pedestrian refuge islands at non-signalized intersections would not be approved
 - Pedestrian refuge islands would be OK at midblock crossings
- Survey Results
 - Priorities
 - The ranked priorities were reviewed
 - Tradeoffs
 - The tradeoff results were reviewed
 - Railroad and utilities want to close Walnut Street
 - Map Points
 - The summary of map points was reviewed
- Needs Assessment

- Issues
 - Pedestrian Crossings. Topics discussed included
 - Longitudinal vs transverse markings
 - High reflectivity pavement markings
 - Need for adequate lighting
 - Add flashing beacons at existing crosswalks at unsignalized intersections (**action item**)
 - Raised crosswalks / speed tables. Not an option on a state route and not likely to be favored by shop owners, residents, visitors, and truck drivers.
 - Add bulb out / curb extensions (**action item**)
 - Sidewalks
 - Sidewalk needs were presented
 - ADA
 - ADA requirements were summarized
 - Five-foot sidewalks and paths are preferable
 - Sight Distance / On-Street Parking / Parklets
 - Tradeoffs between on-street parking and intersection sight distance was reviewed
 - Forty-two parking spaces will be added at the new community center
 - Parklets are more common for local roads than state routes
 - Signals
 - Traffic signal needs were presented, including
 - North Street
 - Update the fixed-time signals with actuated signals by using the necessary vehicle detection (e.g., inductive loops, video detection, radar detection, etc.) on the mainline and side roads.
 - In General
 - Upgrades to signal cabinets and IP signal communication should be considered to connect the signals along the corridor to each other and to any Traffic Control Center (TCC)
 - Actuated signals should be implemented for all signalized intersections along the corridor
 - Railroad Crossing Access Management
 - Railroad crossing needs were presented
 - There is a desire for any fencing to be decorative
 - Drainage and Utility Relocations
 - Drainage and utility relocation needs were discussed and are considered long term
 - Access Management

- Assessment management needs were reviewed
 - Utilization of Right-of-Way
 - Options for utilizing right-of-way were reviewed
 - Designed loading areas are desired
 - City ordinance allows bicyclists on sidewalks, but bike lanes would provide alternative option for bicyclists
 - Add visualization to final document showing what limited on-street parking or bike lanes would look like (**Action Item**)
 - Signage
 - Signage needs were discussed
 - Importance of limiting the amount of signage and maximizing aesthetic appeal of signage were stressed
- Focus Areas
 - Main Street Marketplace
 - Needs and options for the Main Street Marketplace were discussed.
 - Culham Street and Bird Street are part of the multimodal grant but should be in the CMP also
 - Monroe Street
 - Needs at the Monroe Street signal were reviewed
 - Parking Lot and Wright Street
 - Options for the parking lot and the Wright Street / parking lot driveway intersection were discussed, including:
 - Making parking lot right in, right out
 - Not adding a second crosswalk, but focus on improving one
 - Cross slope on brick
 - Gazebo and Walnut Street
 - Options for the gazebo and Walnut Street were discussed, including:
 - Moving the gazebo out of the street
 - Making Walnut Street right in, right out
 - Closing Walnut Street and converting to pedestrian, including a single pedestrian rail crossing
 - Main Street Cross-Sections
 - The bike lane and widened sidewalk alternatives were reviewed.
 - North Main Street
 - Add sidewalk on west side of Main Street from North Street to the Market at the Mill (**action item**)
 - Dollar General going in on the west side of Main Street north of Biggs Street will be an attraction
 - Consider mid-block crossing with flashing beacons to connect attractions on the east and west sides of Main Street (**action item**)

THIRD MEETING

Date: May 9, 2023

Time: 10:00 AM Eastern

Location: City Hall & Webex

Attendees

Jessica Morgan, City Recorder

Jon Campbell, City Planner

Josh Issac, Main Street Director

Hayley Isbill, City Tourism Director (not present)

Jim Fairweather, MS Chair, Sw Hospital Bd, Fairweather Financial Owner

Sarah Loebner, Towns Toffee Owner

Sam Moser, City Commissioner

Heather Carroll, Downtown Air B&B owner, Business Owner- Remedies Organics

Jaclyn Cleveland, SHS Faculty (not present)

Jessica Hall, Historic District Resident

Wes Isbill, Utility Planner, SUB

Eddie Byrum, Chief of Police (not present)

Kevin Watson, Police Captain

Savannah Frank, City Planning Admin Asst.

TDOT: Troy Ebbert

HNTB: Kai Zuehlke, Rashidi Jackson, Garth Lynch, Maddy Clowse

Agenda: Plan Recommendations

- Recommendations Overview
- Before/After Photos
- Concept Plans
- Potential Funding Opportunities
- Summary of Recommendations
- Next Steps

Meeting Summary

Recommendations Overview

- Mayes Ave to Biggs St (Tap Project extent)
 - Sidewalk (east side)

- Pedestrian hybrid beacon near Towns Toffee
- Biggs St to North St (TAP Project extent)
 - Sidewalk on east side past Market at the Mill
 - Sidewalk on the west side serving new parking area
 - RRFB and crosswalks at Biggs St
- North Street Signal Improvements
- North St to Miller St
 - Sidewalk on east side
 - Bulb-out at Mill St
- Miller St to Monroe St
 - Widened sidewalk
 - Parking lot: retaining wall and right-in, right-out
 - Pedestrian improvements at gazebo (close Walnut St and convert to pedestrian plaza or keep Walnut St open right-in, right-out)
 - RRFBs and shifted crosswalks at Morris St, Walnut St, and Wright St
- Monroe St to Culham St (Multimodal Project): Sidewalk on the west side
- Main Street Marketplace
- Route to Duck Park
 - Pedestrian railroad crossing
 - Sidewalk
 - Crosswalks
- Route to Community Center
 - Pedestrian railroad crossing
 - Crosswalks

Concept Plans

- A discussion occurred regarding the concept plans. The stakeholder members discussed and provided feedback on the different options and the ones that needs to be made final recommendations.

Funding Opportunities

- Project team showed a list of potential state and federal funding sources

Next Steps

- Final Report
- Final Presentation

PUBLIC ENGAGEMENT

As part of the project process, the project team conducted two public engagement opportunities where the public had a chance to provide comments on the study. The project team had an online survey, and attended the Blooms, Bluegrass, and Barbeque festival. The sections below provide additional information for the outreach efforts.

The public survey input period started on December 1st, 2023 through February 4th, 2023. The project team received 230 survey responses during that time period. These responses assisted the project team with identifying gaps within the study area, areas where the public wanted to see improvements, and what kind of improvements they wanted within the study area of Sweetwater. For a more detail review of the public survey data, please visit the Public Survey Results section of this document.

For the in person public engagement, the project team attended the Blooms, Bluegrass, and Barbeque Festival in the Sweetwater on May 5th, 2023. During the festival, the project team presented draft recommendations for the Main Street Mobility Plan. The project team presented festival attendees' different recommendations throughout the corridor. Most attendees were in favor of most of the proposed recommendations. The main takeaways from the festival were that people wanted Downtown Sweetwater to be more walkable and safer for all users. However, some did not want to lose on street parking or move the gazebo from its current location.

APPENDIX B: INVENTORY OF EXISTING CONDITIONS

Figure B - 1



Figure B - 2

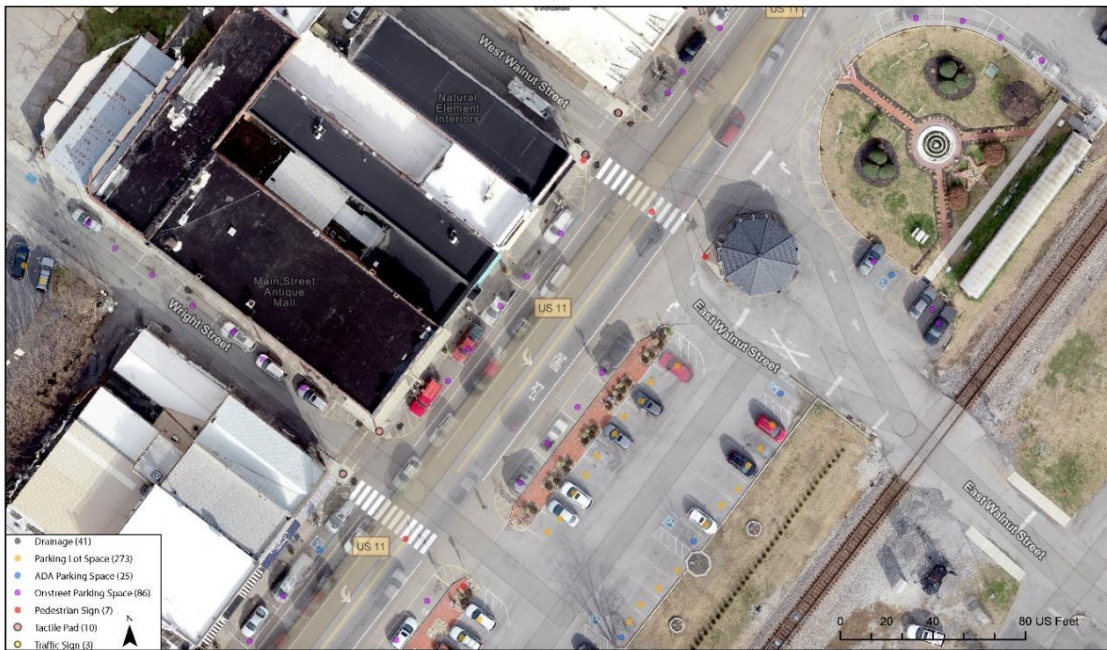


Figure B - 3

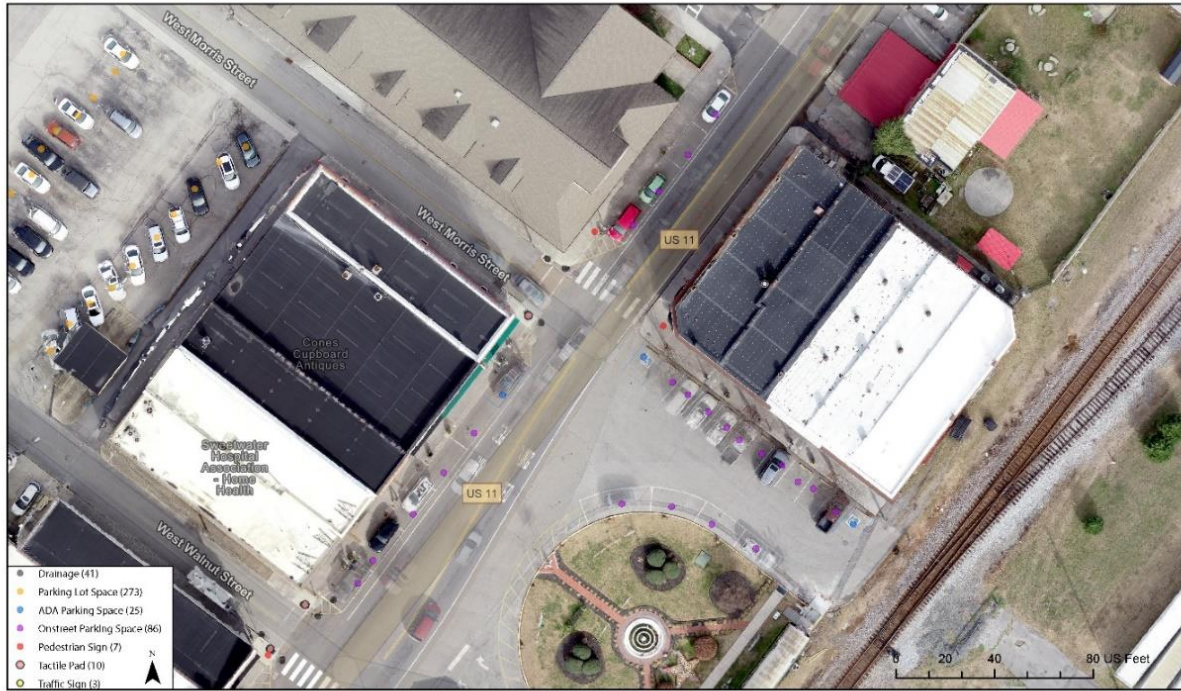


Figure B - 4



Figure B - 5



Figure B - 6



Figure B - 7



Figure B - 8

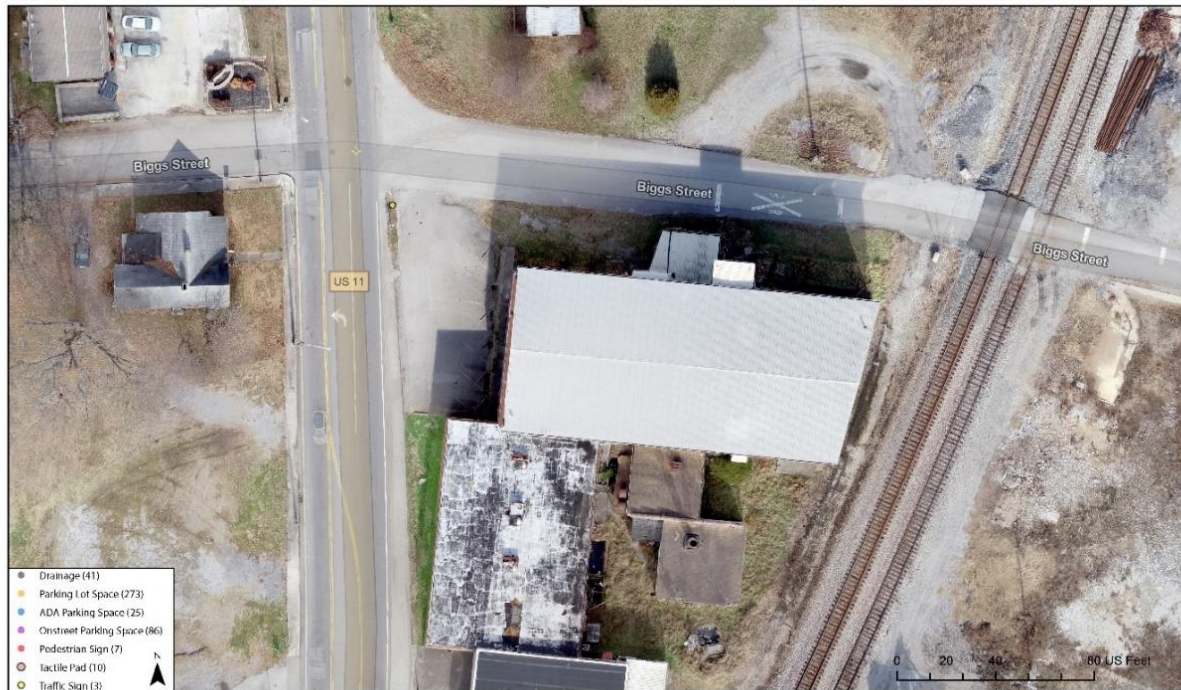


Figure B - 9



Figure B - 10



Figure B - 11



Figure B - 12



Figure B - 13



Figure B - 14



Figure B - 15

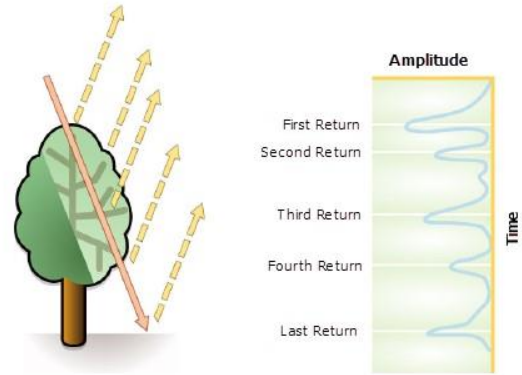


APPENDIX C: APPLICATION OF LIDAR

A drone was flown to collect high-resolution aerial imagery to inform this study. Beyond the imagery, this appendix summarizes the analysis of lidar data to inform the analysis and recommendations related the roadway profile and sidewalk cross slope downtown.

LIDAR OVERVIEW

Lidar (light detection and ranging) is an optical remote-sensing technique that uses laser light to densely sample the surface of the earth, producing highly accurate x,y,z measurements. Lidar, primarily used in airborne laser mapping applications, is a cost-effective alternative to traditional surveying techniques such as photogrammetry. Lidar produces mass point cloud datasets that can be managed, visualized, analyzed, and shared using GIS.



POINT CLASSIFICATION

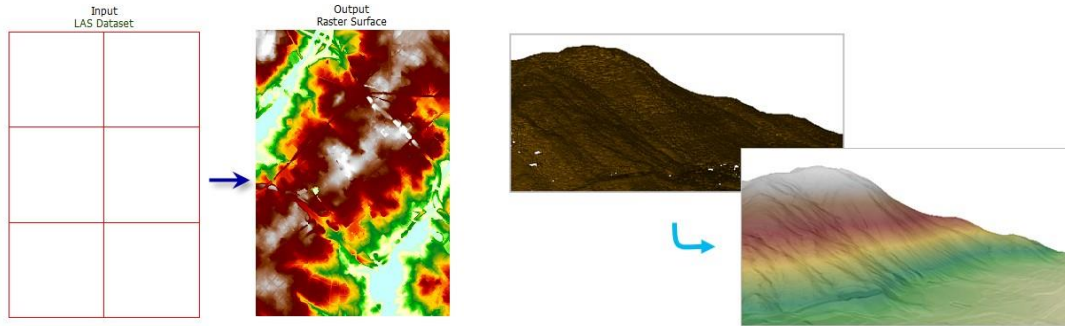
Every lidar point that is post-processed can have a classification that defines the type of object that has reflected the laser pulse. Lidar points can be classified into a number of categories including bare earth or ground, top of canopy, and water. The different classes are defined using numeric integer codes in the LAS files.

LAS dataset file can be utilized as follows:

- Displayed in 2D or 3D as points using elevation or point attribute renderers based on certain lidar filters applied to the point cloud
- Rendered as a triangulated surface model (TIN)
- Visualized using elevation, slope, aspect, or contour lines based on certain lidar filters
- Used as input to many 3D Analyst analysis tools
- Have the point classification edited⁷

⁷ Source: Esri Lidar and LAS dataset, 3D Analyst toolbox, Raster Surface toolset documentation

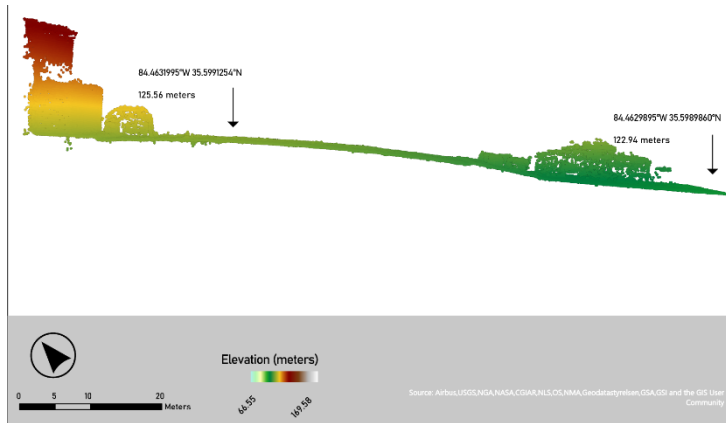
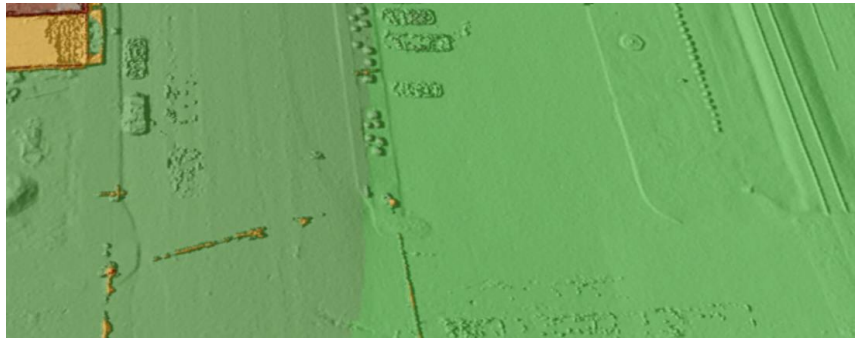
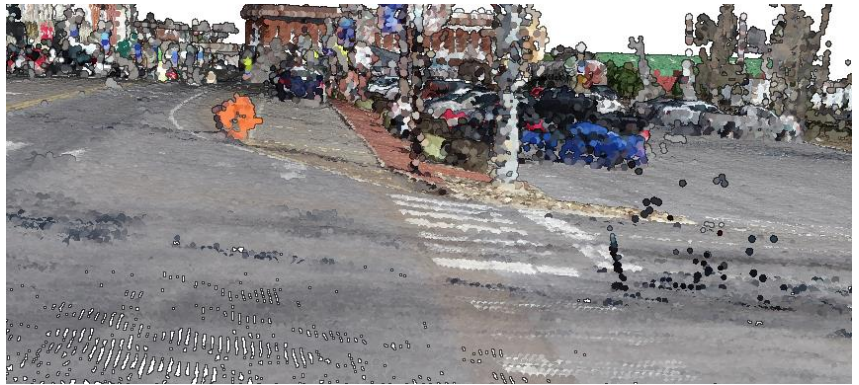
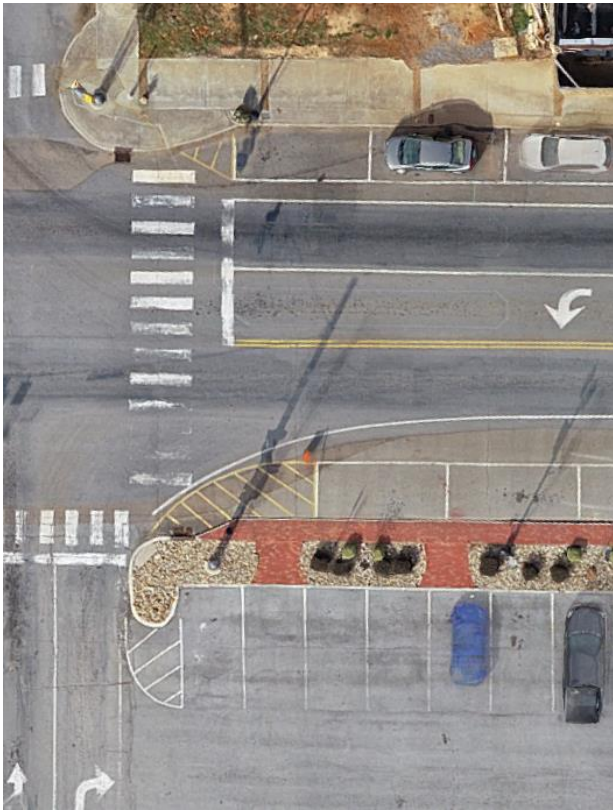
LAS Dataset to Raster Creates a raster using elevation, intensity, or RGB values stored in the lidar points referenced by the LAS dataset.



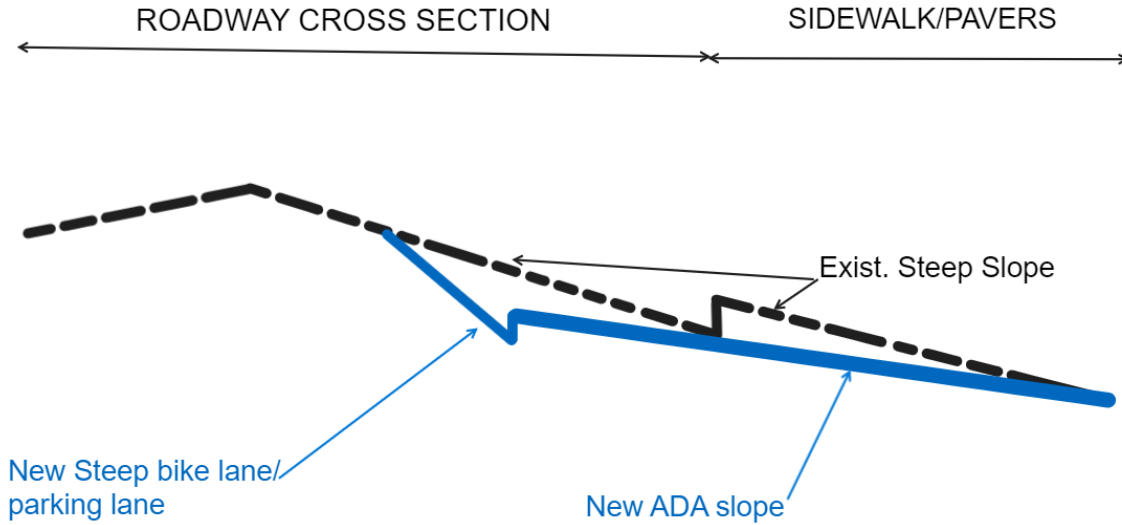
Raster Surface Hillshade tool creates a shaded relief from a surface raster by considering the illumination source angle and shadows.



Point cloud classification values observed, and elevation values derived from the LAS dataset.



Utilizing the point cloud data, the Main Street roadway cross section, including the brick pavers down to the parking lot, was examined. Standard cross slope for a roadway tangent section is 1.5 – 2%. However, Main Street has up to 10% slope. In order to level the brick pavers and provide a sidewalk that meets cross slope requirements, the roadway would need to drop even more steeply than it currently does. Therefore, the concept includes a short retaining wall at the edge of the parking lot to facilitate the level sidewalk.



APPENDIX D: CONCEPT PLANS

Sheet 1: Culham Street to Morris Street

Sheet 2: Between Morris Street and Biggs Street

Sheet 3: Biggs Street to Mayes Avenue

Sheet 1A: Bicycle Lane Alternative. Walnut Street Remains Open

Sheet 1A1: Bicycle Lane Alternative. Walnut Street Closed

Sheet 2A: Bicycle Lane Alternative

Sheet 3A: Sidewalk on East Side

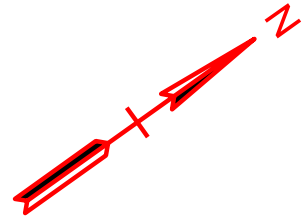
Sheet 1B: Bulb-Out Alternative. Walnut Street Remains Open

Sheet 1B1: Bulb-Out Alternative. Walnut Street Closed

Sheet 2B: Bulb-Out Alternative

Sheet 3B: Sidewalk on West Side

TYPE	YEAR	PROJECT NO.	SHEET NO.



LEGEND

- CURB AND GUTTER
- CURB RAMP
- ✕ ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETScape SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING



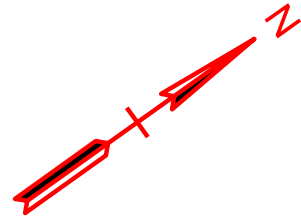
MATCH LINE - SEE NEXT SHEET



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SWEETWATER MOBILITY
CONCEPT PLAN
- 1A -
BICYCLE LANE ALTERNATIVE
WALNUT ST. REMAINS OPEN

TYPE	YEAR	PROJECT NO.	SHEET NO.



LEGEND

- CURB AND GUTTER
- CURB RAMP
- ✕ ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETScape SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING

MATCH LINE - SEE NEXT SHEET

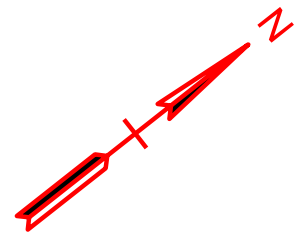


STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SWEETWATER MOBILITY
CONCEPT PLAN
- 1A1 -
BICYCLE LANE ALTERNATIVE
WALNUT ST. CLOSED

\$\$\$\$\$DATE\$\$\$\$\$TIME\$\$\$\$\$
C:\CADD\LIB\PLW\KARIM\SEDIV\DO229846\TDOT_BORDERS.DGN

TYPE	YEAR	PROJECT NO.	SHEET NO.
---	---	---	---
---	---	---	---
---	---	---	---



LEGEND

- CURB AND GUTTER
- CURB RAMP
- ✕ ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- ▭ DRIVEWAY
- ▭ GRASSED AREA
- ▭ FOOD TRUCK
- ✶ RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- ✶ PEDESTRIAN HYBRID BEACON
- ✶ STREETSCAPE SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING

MATCH LINE - SEE PREVIOUS SHEET



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

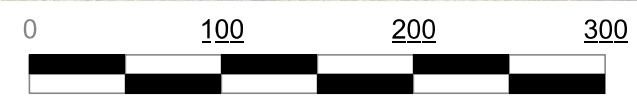
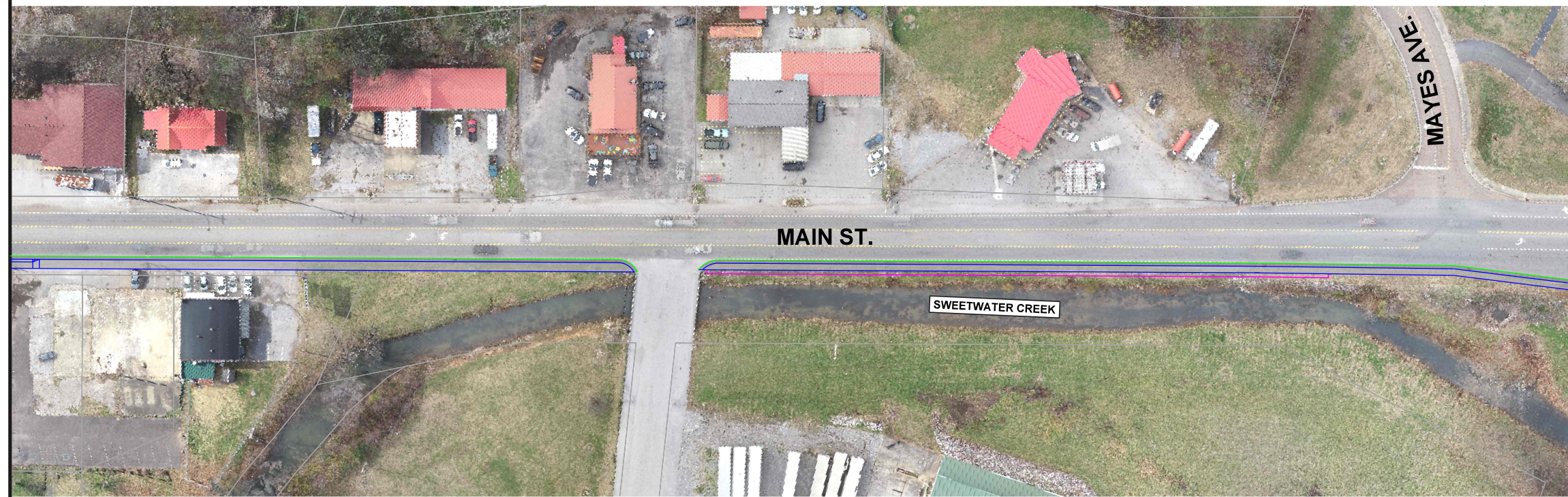
SWEETWATER MOBILITY
CONCEPT PLAN
- 2A -
BICYCLE LANE ALTERNATIVE

\$\$\$\$DATE\$\$\$\$\$\$\$\$TIMES\$\$\$\$\$\$\$\$
 C:\CADD\LIB\PL\KARIM\SE\DIV\DO229846\TDOT_BORDERS.DGN

MATCH LINE - SEE PREVIOUS SHEET



MATCH LINE - SEE ABOVE



TYPE	YEAR	PROJECT NO.	SHEET NO.
---	---	---	---
---	---	---	---
---	---	---	---

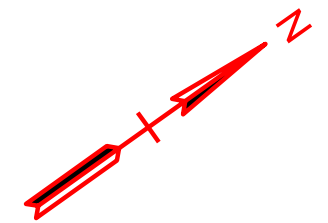
LEGEND

- CURB AND GUTTER
- CURB RAMP
- ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETScape SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

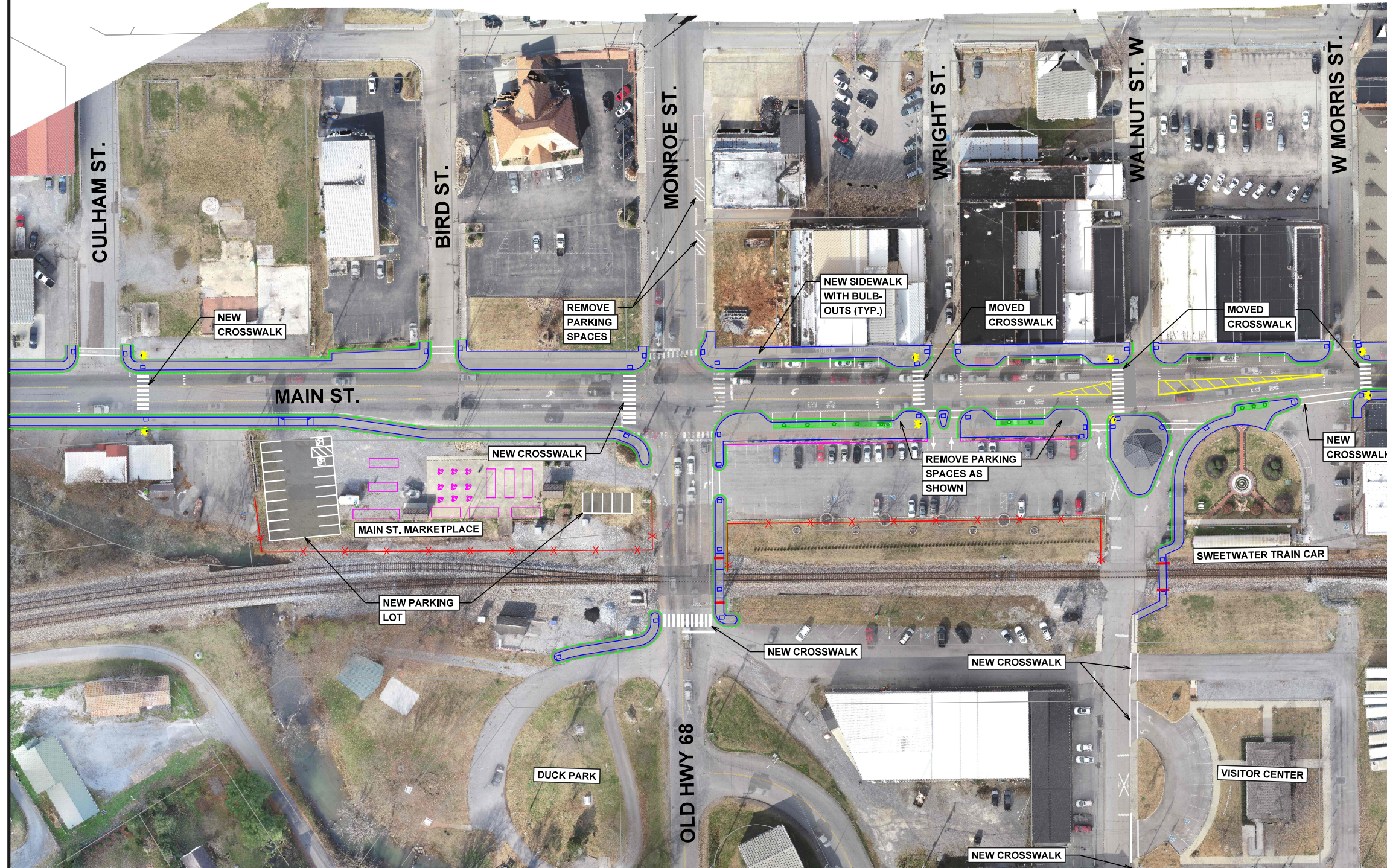
SWEETWATER MOBILITY
 CONCEPT PLAN
 - 3A -
 SIDEWALK ON EAST SIDE

TYPE	YEAR	PROJECT NO.	SHEET NO.



LEGEND

- CURB AND GUTTER
- CURB RAMP
- ✕ ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETSCAPE SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING



MATCH LINE - SEE NEXT SHEET

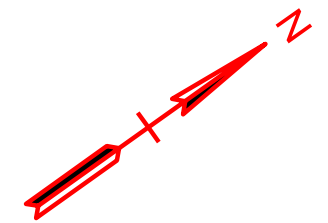


STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SWEETWATER MOBILITY
CONCEPT PLAN
- 1B -
BULB-OUT ALTERNATIVE
WALNUT ST. REMAINS OPEN

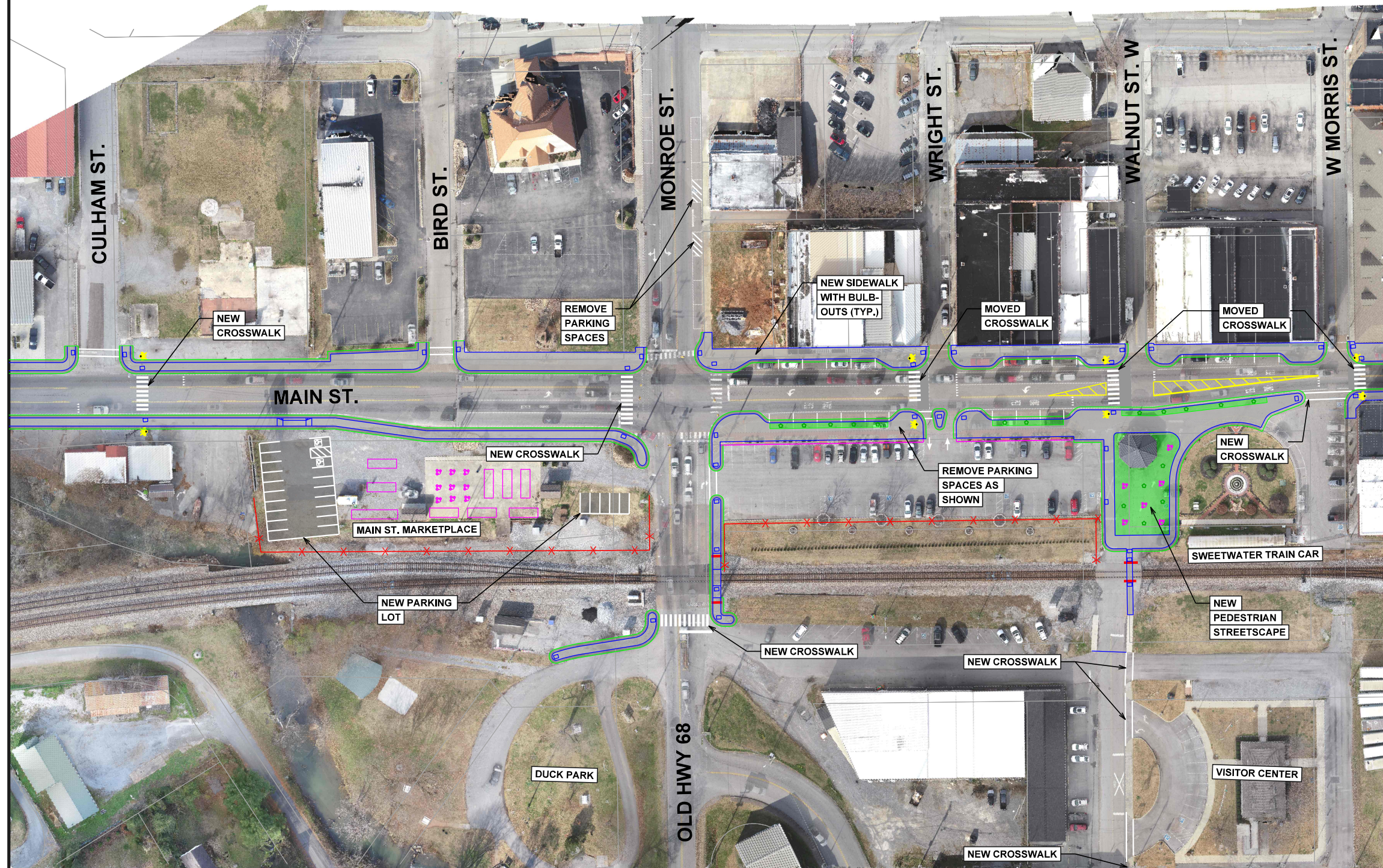
\$\$\$\$\$DATE\$\$\$\$\$TIME\$\$\$\$\$C:\CADD\LIB\PLW\KARIM\SEDIV\DOT29846\TDOT_BORDERS.DGN

TYPE	YEAR	PROJECT NO.	SHEET NO.



LEGEND

- CURB AND GUTTER
- CURB RAMP
- ✕ ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETSCAPE SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING



MATCH LINE - SEE NEXT SHEET



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

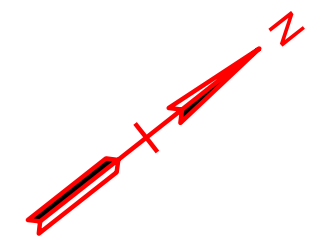
SWEETWATER MOBILITY
CONCEPT PLAN
- 1B1 -
BULB-OUT ALTERNATIVE
WALNUT ST. CLOSED

\$\$\$\$\$DATE\$\$\$\$\$TIME\$\$\$\$\$
C:\CADD\LIB\PLW\KARIM\SEDIV\DOT\BORDERS.DGN

TYPE	YEAR	PROJECT NO.	SHEET NO.
---	---	---	---
---	---	---	---
---	---	---	---

LEGEND

- CURB AND GUTTER
- CURB RAMP
- ✕ ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETSCAPE SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING



MATCH LINE - SEE PREVIOUS SHEET



MATCH LINE - SEE NEXT SHEET



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SWEETWATER MOBILITY
CONCEPT PLAN
- 2B -
BULB-OUT ALTERNATIVE

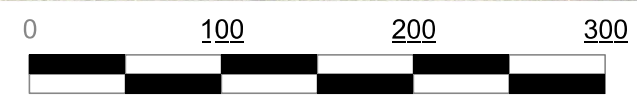
\$\$\$\$\$DATE\$\$\$\$\$TIME\$\$\$\$\$
C:\CADD\LIB\W\KARIM\SEDIV\DOT_29846\TDOT_BORDERS.DGN

\$\$\$\$DATE\$\$\$\$\$\$\$\$TIMES\$\$\$\$\$\$\$\$
 C:\CADD\LIB\PL\KARIM\SE\DIV\DO229846\TDOT_BORDER.DGN

MATCH LINE - SEE PREVIOUS SHEET



MATCH LINE - SEE ABOVE



TYPE	YEAR	PROJECT NO.	SHEET NO.

LEGEND

- CURB AND GUTTER
- CURB RAMP
- ORNAMENTAL FENCE
- RETAINING WALL
- SIDEWALK
- DRIVEWAY
- GRASSED AREA
- FOOD TRUCK
- RECTANGULAR RAPID-FLASHING BEACON (RRFB)
- PEDESTRIAN HYBRID BEACON
- STREETSCAPE SEATING
- PLANTER/LANDSCAPING
- PEDESTRIAN GATED RAIL CROSSING

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

SWEETWATER MOBILITY
 CONCEPT PLAN
 - 3B -
 SIDEWALK ON WEST SIDE