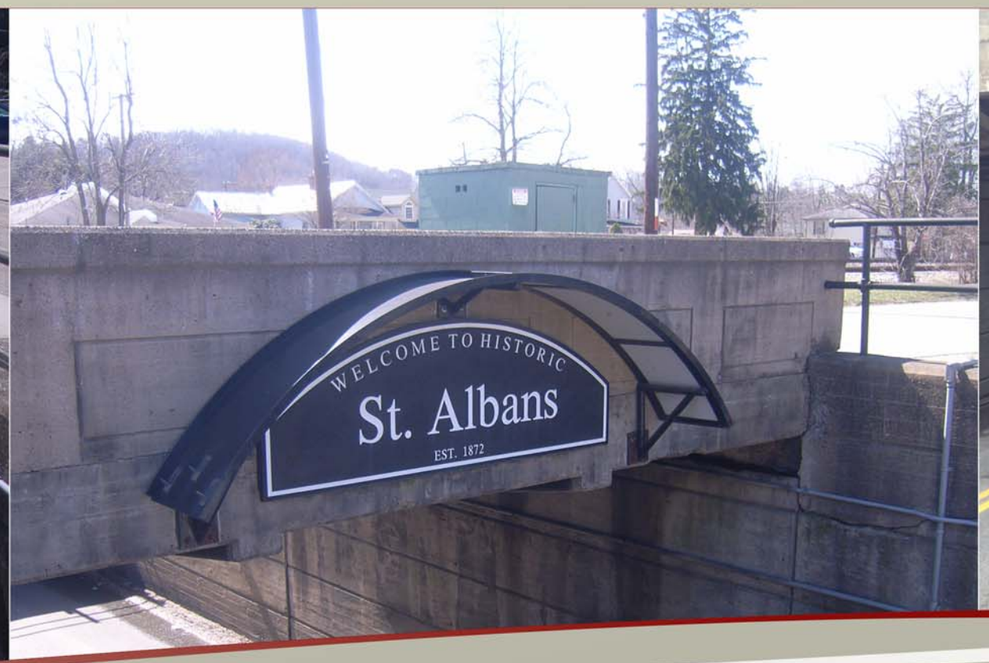
Third Street Corridor Study

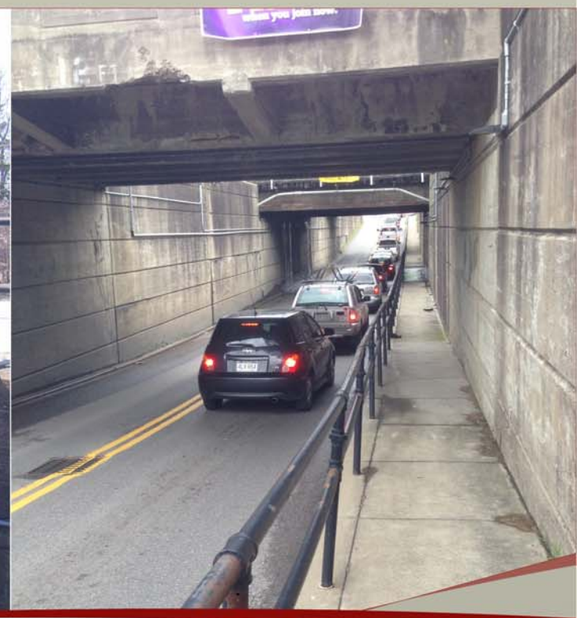
St. Albans, WV

Prepared for:

Regional Intergovernmental Council

March 2016





BURGESS & NIPLE
Engineers ■ Architects ■ Planners

Regional Intergovernmental Council

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Chapter 1:
Executive Summary

The Regional Intergovernmental Council (RIC), in cooperation with the West Virginia Department of Transportation (WVDOT), retained Burgess & Niple, Inc. to lead a transportation planning study of the Third Street corridor in St. Albans from Kanawha Terrace to MacCorkle Avenue (US 60).

RIC's regional long-range transportation plan, *Metro Mobility 2040*, included in its fiscally constrained project recommendations to "Widen and upgrade the Third Street underpass in St. Albans." The underpass consists of three bridges - Third Avenue, Fourth Avenue, and the CSX railroad. In 2012, RIC and HDR Engineering, Inc. completed the *St. Albans Railroad Crossing Study* which evaluated all CSX at-grade and grade separated crossings within St. Albans. The recommendation from this study was to widen and upgrade the Third Street underpass. This recommendation included lowering the vertical profile and reconstructing the walls of the underpass to improve horizontal and vertical clearances. HDR estimated cost of this project to be $9.6 million.

RIC undertook this study to clearly identify and define current transportation problems and needs in the corridor, further examine the Third Street underpass upgrade option, and to determine the most cost effective improvements to address needs in the corridor.

The primary corridor issues and needs identified were:

- Excessive delays, backups, and crashes at the intersection of Third Street and MacCorkle Avenue
- Insufficient width for wider vehicles (buses, trucks, ambulances) to pass each other in the Third Street underpasses
- Insufficient height for tall vehicles (semi-trailer trucks) to pass through the Third Street underpasses. The height is sufficient for other large vehicles (buses, smaller delivery trucks, fire trucks)
- Poor conditions in the underpasses for pedestrians and bicyclists including traffic backups, narrow lane widths, and water and debris falling from railroad tracks above
- The sudden shift in alignment of Third Street at south end of Fourth Avenue underpass

Based on the deficiencies and needs identified by the technical analysis and feedback from stakeholders and the public, the following goals and objectives were identified for the corridor:

- Create an attractive gateway for St. Albans
- Reduce congestion at the intersection of Third Street and MacCorkle Avenue
- Reduce congestion at the intersection of Third Street and 6th Avenue
- Improve pedestrian access and experience across (over/under) railroad tracks
- Improve bicycle access and experience across (over/under) railroad tracks
- Minimal disruption to CSX railroad operations during construction
- Increase access to downtown St. Albans for economic development reasons
- Implement constructible and affordable solutions
- Increase width of underpasses so buses and fire trucks can use underpass without problems
- Improve width and height of underpass so semi-trailer trucks can clear the underpass
- Reduce driveway conflicts between underpass and MacCorkle Avenue

To address the identified problems and needs, and to attempt to achieve the goals identified, a large number of improvement options were considered. These options were reviewed and evaluated and the most effective, feasible, and implementable options were presented as four corridor "Scenarios" for further analysis and evaluation. These Scenarios and their evaluation were presented to stakeholders and the public for review and comment. The Scenarios included improvements such as:

- Convert Third Street to one-way southbound, and add a new traffic signal at Fifth Street and MacCorkle Avenue
- Remove sidewalk in underpass to provide more width for vehicles (relocate pedestrian crossing)
- At-grade pedestrian crossing of railroad, Third Avenue, and Fourth Avenue
- Pedestrian tunnel under the railroad, Third Avenue and Fourth Avenue
- Add turn lanes at MacCorkle Avenue intersection
- Roundabout at MacCorkle Avenue intersection
- Left turn prohibitions at MacCorkle Avenue intersection
- Widen and raise underpasses

Based on the evaluation of the tradeoffs between the improvements included in the four Scenarios, and feedback from stakeholders and the public, the following improvements are recommended for the corridor:

1A. Remove pedestrian sidewalk in underpass to provide wider travel lanes and shoulders and straighten south underpass approach
1B. Construct pedestrian and bicycle tunnels to provide access under Third Avenue, Fourth Avenue, and the railroad
1 Add a westbound right-turn lane at Third Street and MacCorkle Avenue
2 Add a southbound right-turn lane at Third Street and MacCorkle Avenue
3 Make driveway modifications at Third Street and MacCorkle Avenue intersection
4 Make driveway modifications at Go Mart

Figure 1-1 is a schematic illustrating the location of these improvements. An illustration of these improvements overlaid on aerial photography is included in **Appendix B**.

Phasing this project into a series of smaller projects is appropriate given the independent nature of many of the recommendations. Some of the recommendations are more readily implementable and will have greater benefits than others. Suggested priorities for implementing the "pieces" of the recommended scenario are described as follows:

<u>First Priority ($2.5 Million plus low to moderate right-of-way costs)</u>

- Remove sidewalk in underpass to provide wider travel lanes and construct pedestrian/bike tunnels under Third Avenue, the railroad tracks, and Fourth Avenue
- Straighten alignment of Third Street south of Fourth Avenue
- Construct southbound right-turn lane at Third Street and MacCorkle Avenue

<u>Second Priority ($340,000 plus extensive right-of-way costs)</u>

- Construct westbound right-turn lane at Third Street and MacCorkle Avenue.

<u>Third Priority ($140,000)</u>

- Modify driveways near 6th Avenue/Third Street intersection and Third Street and MacCorkle Avenue intersection to provide better spacing and location

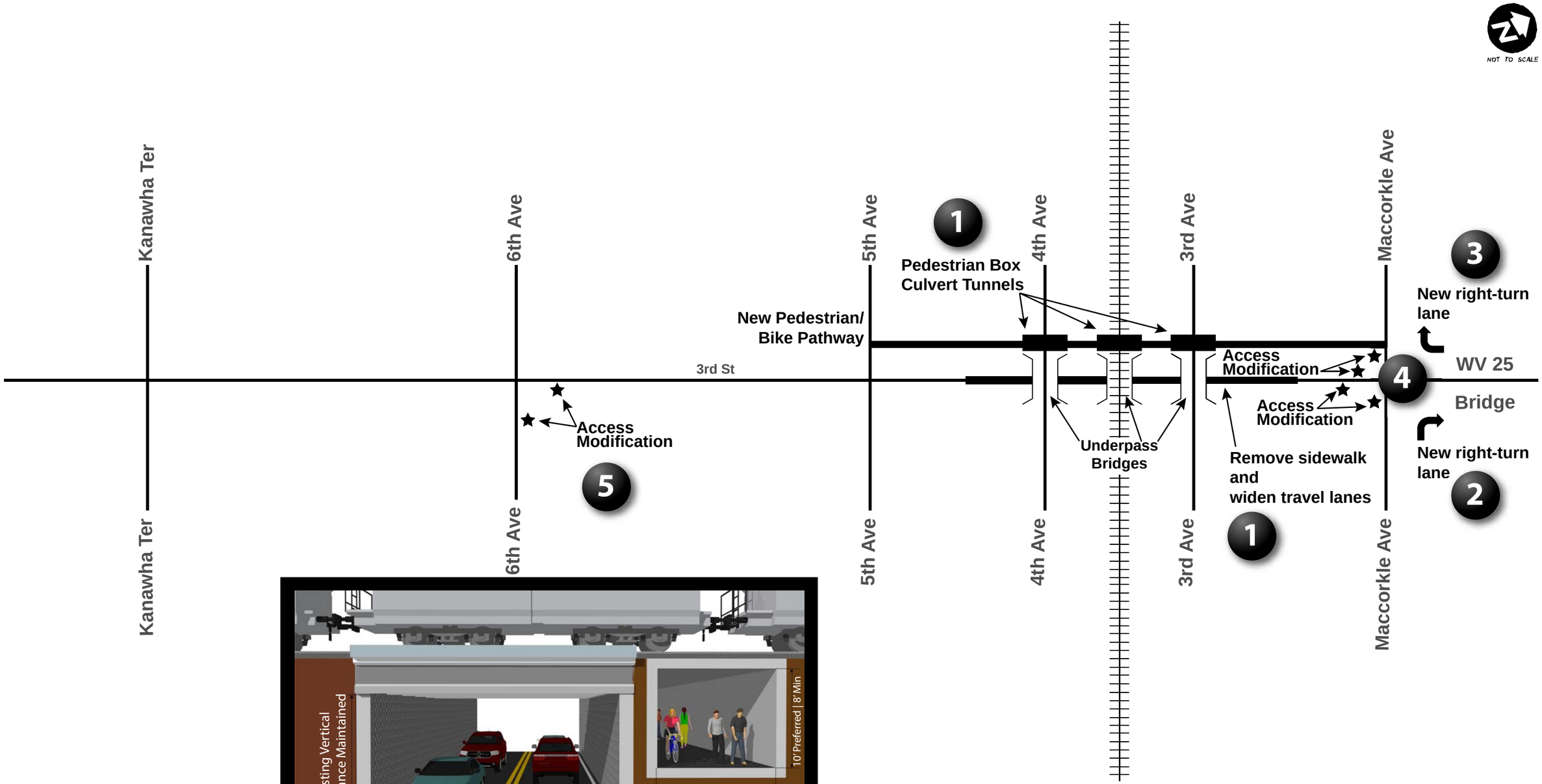


Figure 1-1: Recommended Scenario Schematic

Chapter 2:
Study Scope and Background

The Regional Intergovernmental Council (RIC), in cooperation with the West Virginia Department of Transportation (WVDOT), has conducted a transportation planning study of Third Street in St. Albans from Kanawha Terrace to MacCorkle Avenue (US 60) (see **Figure 2-1**). RIC retained Burgess & Niple to lead the development of this study and to prepare the study report. This report summarizes the planning process, evaluations, findings, and recommendations of the study.

2.1 Study Background

RIC's regional long-range transportation plan, *Metro Mobility 2040*, included in its fiscally constrained project recommendations to "Widen and upgrade the Third Street underpass in St. Albans." The underpass consists of three bridges - Third Avenue, Fourth Avenue, and CSX railroad. In 2012, RIC and HDR Engineering, Inc. completed the *St. Albans Railroad Crossing Study* which evaluated all CSX at-grade and grade separated crossings within St. Albans. The recommendation from this study was to widen and upgrade the Third Street underpass. This improvement includes lowering the vertical profile and reconstructing the walls of the underpass to improve horizontal and vertical clearances. RIC and HDR estimated cost of this project to be $9.6 million. RIC completed this study to further examine this option, explore more cost effective improvements, and comprehensively analyze needs in the corridor. See Section 4 of this report for more details related to previous studies.

2.2 Study Scope

There are two primary purposes for this study:

Clearly identify and define current transportation problems and needs – In order to develop solutions, problems and needs must be well-defined. RIC and the study team have developed a clear understanding of current conditions in the corridor through technical analysis and listening carefully to both stakeholders and the St. Albans community.

Identify cost effective solutions to improve transportation conditions – Available funding for potential improvements is expected to be limited. Therefore, emphasis was placed on identifying the most cost effective and implementable solutions for transportation issues in the corridor.

Figure 2-1: Study Area

Chapter 3: Study Process

The study process is summarized by the graphic in **Figure 3-1** and is detailed below.

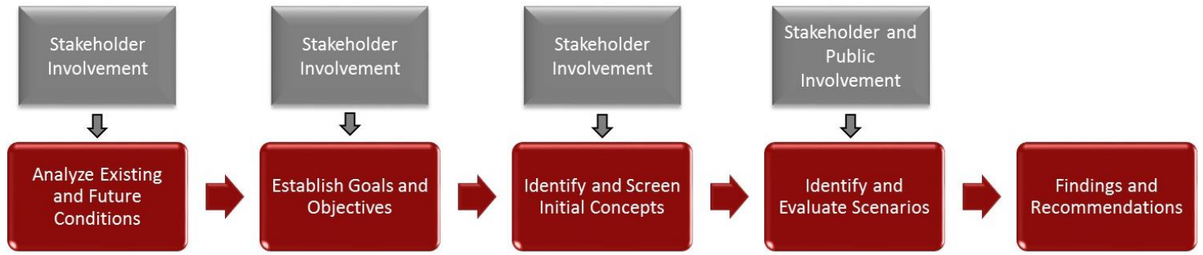


Figure 3-1: Study Process

3.1 Planning Process

This study process involved five main steps:

Existing and Future Conditions Analysis – Corridor conditions for automobiles, bicycles, pedestrians, and transit users were reviewed and evaluated including analysis of traffic volumes, delays and backups, crash data, and environmental conditions. Section 5 includes a detailed summary of the existing conditions analysis.

Traffic forecasts for year 2040 were developed based on RIC's Travel Demand Model and traffic analysis was performed to estimate future expected traffic delays and backups if no improvements are made in the corridor. Section 6 includes a detailed summary of the future conditions analysis.

Establish Goals and Objectives – Goals and objectives for the study were established from the existing conditions analysis, stakeholder input, and public comments. These were used to measure the effectiveness of potential solutions. Section 7 includes a detailed discussion of the corridor goals and objectives.

Identify and Screen Initial Concepts – Initial concepts for corridor improvements were identified through stakeholder input and from ideas developed by the study team. Each concept was reviewed and screened based on how well they addressed the corridor goals and objectives, and the likelihood that concept could be implemented. Initial concepts were either carried forward or eliminated from further analysis. This screening process is documented in Section 8.

Identify and Evaluate Scenarios – Each of the concepts carried forward for further evaluation were packaged into what the planning team called "scenarios." Four total scenarios were developed to illustrate a certain vision for the corridor. Each scenario was analyzed and evaluated based on how well it addressed the corridor goals and objectives, potential difficulty of implementation, and cost. These scenarios were presented to stakeholders and the public for review and comment. Details of the scenario evaluation is provided in Section 9.

Findings and Recommendations – Informed by the evaluation and feedback from stakeholders and citizens on the presented scenarios, and additional discussions with stakeholders, corridor recommendations scenario were presented. The final recommendations included a combination of ideas from the four scenarios developed and evaluated. Cost estimates and an implementation plan were generated for the recommended scenario. See Section 10 of this report for the findings and recommendations.

3.2 Stakeholder and Public Involvement

RIC and the study team aggressively sought input from local stakeholders and citizens to ensure that the study team was well-informed of current conditions in the corridor and that improvement options were well-vetted. The following efforts were undertaken to involve stakeholders and the public in the study process.

Previous involvement – The project team reviewed previous stakeholder and public involvement from the 2012 *St. Albans Railroad Crossing Study*. This helped the project team identify needs, goals, and concerns in the corridor.

Steering Group Meetings – The steering group consisted of stakeholders that will have the greatest influence on the implementation of recommended improvements. The group also included members who would best represent the citizens directly impacted by the recommendations. Members of the steering group included representatives from: West Virginia Division of Highways (WVDOH), RIC, City of St. Albans, St. Albans Chamber of Commerce, and CSX. The group met three times over the course of the project. The first meeting was held on February 12, 2015 and served as a kickoff to the project. Members were asked to provide input on the issues and problems that need to be solved in the corridor as well as keys to successful implementation of improvements. At the second meeting, held on July 28, 2015, the study team presented the draft study goals and objectives and solicited feedback on the initial concepts that were either considered and eliminated or moved forward for further evaluation. On September 21, 2015, the final steering group meeting was held to present the four scenarios developed from the initial concepts and the evaluation of the scenarios. Steering Group meeting summaries are included in **Appendix C**.

Stakeholder Interviews – Over the course of this project, local stakeholders were interviewed one-on-one by both the study team and RIC representatives to solicit input on the corridor. The primary focus of the discussions were existing issues and concerns in the corridor and the stakeholder's ideas for potential improvements that might address issues and concerns. The following stakeholders were interviewed as part of this process. For summaries of the interviews, see **Appendix D**.

- Kanawha County Schools Transportation (March 24, 2015)
- West Virginia Connecting Communities (March 24, 2015)
- Kanawha Valley Regional Transportation Authority (March 25, 2015)
- City of St. Albans (March 25, 2015)
- West Virginia Department of Highways (March 25, 2015)
- Kanawha County Ambulance Authority (April 1, 2015)
- St. Albans Fire Department (April 1, 2015)
- St. Albans Police Department (April 2, 2015)
- John's Cyclery (May 1, 2015)
- CSX (September 14, 2015)

General Public Meeting – One general public meeting helped the study team obtain additional ideas and feedback on improvements under consideration. The meeting was advertised through flyers displayed at local businesses, posts on RIC's website, and press releases to local news and media outlets. The meeting was held on October 6, 2015 to provide the public with an opportunity to ask questions and provide written comments on the four scenarios. At this meeting, eight citizens signed in and four provided written comments at the meeting. Links to the four scenario maps and an online comment form were provided on the RIC website. An additional two citizens provided feedback via the online comment form. Summaries of comments are included in various sections of this report. Public meeting summaries and comment forms are in **Appendix E**.

Chapter 4:
Previous Studies

Several studies have been completed that have a direct bearing on the issues and opportunities in the Third Street Corridor. Presented chronologically, these studies, pertinent conclusions, and recommendations are summarized herein.

4.1 St. Albans Bridge/Underpass Study

URS Corporation, May 2003

The St. Albans Bridge/Underpass Study was conducted to identify potential solutions to the challenges associated with the Kanawha River between the communities of St. Albans and Nitro, and issues associated with multiple crossings of the CSX and Norfolk Southern Railroad lines in St. Albans and Nitro, respectively. The study identified seven potential alternatives for a bridge over the Kanawha River. All alternatives were feasible options, but none stood out as being clearly superior to the others. Even as the study was nearing completion, additional alternatives were recommended. The study concluded that an additional analysis must be conducted to determine the recommended, "Locally Preferred Alternative".

In 2013, a new bridge was constructed over the Kanawha River in the existing location as illustrated in the picture below.

Source: WV Gazette – Chris Dorst

4.2 Bicycle and Pedestrian Plan for Kanawha and Putnam Counties

Regional Intergovernmental Council (RIC), 2008

To address the existing need and opportunity for bicycle and pedestrian facilities in Kanawha and Putnam counties, RIC performed a study to identify bicycle and pedestrian deficiencies within the existing transportation network and develop potential improvements. The result of the study was a comprehensive bicycle and pedestrian plan for Kanawha and Putnam counties that will serve as a planning resource tool for communities interested in enhancing bicycle and pedestrian access, mobility, and safety. The plan identified the following improvements to the bicycle and pedestrian network in the general study area:

- MacCorkle Avenue (US 60), Gateway Shopping Center to Oliver Street:
  - Deficiencies/Opportunities:
    - Sidewalk Continuity.
    - Pedestrian and bicycle activity, especially over bridge.
    - Existing sidewalk deteriorated.
    - Shoulders are sufficient width for bicycle travel, but pavement condition is poor.
  - Potential Improvements:
    - Install sidewalk where missing between the shopping center and Oliver Street.
    - Pave existing shoulders between eastbound lanes and shopping center.
    - Stripe 6-foot wide bicycle lanes using existing shoulders.
    - Use existing shoulders as a "Share the Road" opportunity for bicyclists.
    - At the intersection of B Street install high visibility crosswalks, pedestrian signals, curb ramps, and push buttons.
  - Improvement Goals:
    - Enhance bicycle and pedestrian mobility on MacCorkle Avenue in St. Albans.
    - Enhance access to Gateway Shopping Center.

At the time of this corridor study, a bike lane in each direction has been striped along MacCorkle Avenue for approximately 11 miles from Winfield Road in Amandaville to the Dunbar Toll Bridge in South Charleston.

4.3 St. Albans Railroad Crossing Study

HDR Engineering, Inc., May 2012

The purpose of the St. Albans Railroad Crossing Study was to review the existing transportation system within the City of St. Albans and to identify potential improvements with an emphasis on roadway network capacity and safety. Multimodal conflicts between rail and roadways leads to congestion in the city. When a train is passing on the mainline, north-south access is cut off at seven locations. HDR observed vehicles diverting their trips to the grade-separated crossings when trains are present, creating congestion that doesn't occur in the absence of a train. The following common rail crossing deficiencies were identified:

- Horizontal and vertical clearance restrictions
- Steep approaches to at-grade rail crossings that restrict sight-distance and create potential truck hang-ups on the tracks
- Insufficient signing and pavement markings
- Lack of effective drainage
- Lack of pedestrian facilities
- Lack of protection for obstacles placed within the roadway clear-zone

The study identified and evaluated three alternatives for railroad crossing modifications. The recommended alternative involves the reconstruction of the Third Street underpass to provide additional horizontal and vertical clearances and additional storage for the northbound left-turn at the Third Street and MacCorkle Avenue intersection. Low cost improvements for the Third Street underpass were also identified including the installation of white surface mounted delineators on the bridge abutment and raised sidewalk wall, and an update to existing underpass lighting to provide adequate illumination levels during daytime and nighttime conditions.

The recommended improvements (short- and long-term) have not been implemented at the time of this corridor study.

4.4 Metro Mobility 2040: Kanawha-Putnam Metropolitan Transportation Plan

Michael J. Baker, Jr., Inc., August 2013

The Kanawha-Putnam Metropolitan Transportation Plan (MTP) or "Metro Mobility 2040" is an update to RIC's 2040 Long Range Transportation Plan adopted in 2009. Metro Mobility 2040 is an update of the region's existing regional transportation plan and provides 2040 population and employment forecasts, evaluates current transportation deficiencies and needs, prioritizes projects, and improves multi-modal transportation policies, projects, and initiatives.

Using performance and geographic metrics, improvement projects were prioritized as part of the plan. Data for each project was used to quantify performance, such as reduction in delay and cost effectiveness. The geographic measures evaluated a project's location in the context of community facilities and anticipated growth trends. Based on these metrics, the Third Street underpass in St. Albans is the top priority in Kanawha County.

Metro Mobility 2040 highlights the St. Albans Railroad Crossing Study and outlines the following specific improvements:

- Lower the profile grade to provide a 14'-6" vertical clearance and widen the underpass to provide room for three, eleven-foot lanes, four foot shoulders, and a five foot sidewalk.
- Reconstruct the walls of the existing CSX Bridge, the Third Avenue Bridge, and the Fourth Avenue Bridge.
- Construct a connector (West of Third Street) between the alley (between Fourth Avenue and Fifth Avenue) and Fourth Avenue.
- Construct a connector (East of Third Street) between the alley and Fourth Avenue.
- Identify drainage constraints associated with the lower underpass. It is anticipated that drainage may need to be pumped from the underpass to existing city storm water or storm sewer system.

When implemented, it is expected that these proposed improvements should enhance Third Street as a primary access point to the St. Albans business district and the St. Albans-Nitro Bridge. In addition, this project should reduce vehicular traffic at the at-grade crossings and provide safer, smoother traffic flow.

At an estimated cost of $9.6 million, these recommended improvements have not been implemented. However, this corridor study is a direct result of the Metro Mobility 2040 plan in an effort to further investigate cost-effective alternatives for implementation.

4.5 St. Albans Comprehensive Plan

City of St. Albans, 2015

The St. Albans Comprehensive Plan summarizes the community's current conditions as well as its goals and objectives through 2024. The plan indicated several areas in the vicinity of the Third Street underpass that are hoped to be converted to commercial use. These areas include Third Street from Fourth Avenue to Sixth Avenue and areas along Third Avenue, Fourth Avenue, and MacCorkle Avenue. The plan also indicated that streetscape projects have been completed along central downtown streets. In general, the streetscaping involved moving utilities below ground, adding or improving street lights, and replacing sidewalks.

Major transportation goals outlined in the plan include improving sidewalks and curb ramps throughout the city as well as to support and advocate for WVDOH to complete the Third Street underpass widening outlined in the St. Albans Railroad Crossing Study.

Chapter 5:
Existing Conditions

The following summary of the current conditions in the corridor highlights problems, deficiencies, and needs that should be addressed by improvement concepts.

Available reports, data, and mapping were collected and reviewed and a field review was conducted over the course of one day in March 2015. Existing roadway design, traffic control, speed limits, major drainage structures, and transit stops were identified. A "walkability audit" of the corridor was conducted to assess current pedestrian conditions in an effort to identify existing sidewalk locations and conditions, missing sidewalk sections, availability of curb ramps, American with Disabilities Act (ADA) compliance, street crossing opportunities and locations, and any other factors that could impact the accessibility, comfort, safety, and convenience for pedestrians. A "bikeability" audit was conducted to assess the current roadway cross section throughout the corridor related to bicycle safety, comfort, and accessibility.

5.1 Roadway Characteristics

Third Street is an arterial that runs through the heart of the St. Albans Central Business District and Historic District. Oriented in a north/south direction, Third Street provides direct access to US 60 (MacCorkle Avenue) and the St. Albans-Nitro Bridge that crosses over the Kanawha River connecting St. Albans with Nitro. On its south end, Third Street originates at Pennsylvania Avenue and ends at US 60 (MacCorkle Avenue). The Third Street corridor provides access to many homes and a few businesses. The two-lane roadway has a posted speed limit of 25 miles per hour (25 mph).

CSX Corporation operates a mainline track that runs perpendicular to Third Street. Third Street crosses under the railroad line (grade separated). Third Street also crosses under Third Avenue and Fourth Avenue on either side of the railroad line. Vertical clearance under the bridge is signed as 10'-6". Lanes within the underpass are 10 feet wide with no shoulders. Along the east side of the underpass, adjacent to the northbound lanes, there is a five foot sidewalk with metal a railing. The sidewalk is raised approximately two feet above the roadway surface. With the narrow lanes, and lack of shoulder, the horizontal clearance is very restrictive. Vehicles traveling through the underpass were observed to drive left of the center line as shown in **Figure 5-1**, to avoid the discomfort of driving close to the sidewalk railing or the bridge abutment wall. The yellow centerline in the underpass is worn and faded which is indicative of vehicles repeatedly driving over it. Additionally, there are drainage deficiencies that result in water standing on the sidewalk and pavement. In **Figure 5-1**, the underpass is wet, especially on the edges near the curbs. A pothole has formed in both travel lanes. Additionally, without lighting in the underpass, the area under the bridge is very dark, even during daytime conditions.

Figure 5-1: Third Street at CSX Underpass Looking North

A deficiency in the alignment exists along southbound Third Street just south of the underpass. As previously discussed, the southbound lane is already very narrow so vehicles are traveling as close to the centerline of the road as possible when passing under the bridges. South of the underpass, the Third Street alignment curves sharply to the right as illustrated in **Figure 5-2**. For a vehicle that is already traveling near or on the centerline, this is an abrupt change in alignment. This alignment change coupled with the narrow width between the end of the retaining wall and the centerline (approximately 9 feet), causes vehicles to travel slower than normal to navigate the maneuver. Vehicles traveling too fast may collide with the bridge retaining wall if they over steer or may cross the path of oncoming traffic is no turning maneuver is made.

Figure 5-2: Alignment Change along Third Street near the CSX Bridge Looking South

The next closest grade separated crossings of the CSX rails are at Riverside Drive (to the west) and Boone Street (to the east). Riverside Drive is a two-way, two-lane roadway without a painted centerline and runs on the opposite side of the Coal River from St. Albans. The Boone Street crossing is a two-way, single lane roadway with major drainage deficiencies. Signs direct motorists to "sound horn before entering tunnel." Being outside the Central Business District area and lacking adequate capacity, these two crossings are much less attractive to motorists than the Third Street crossing. According to local stakeholders, when a train event occurs, the Third Street crossing becomes congested as many vehicles divert from at-grade crossings to bypass the train.

Roadway characteristics of Third Street are illustrated in **Figure 5-3**.

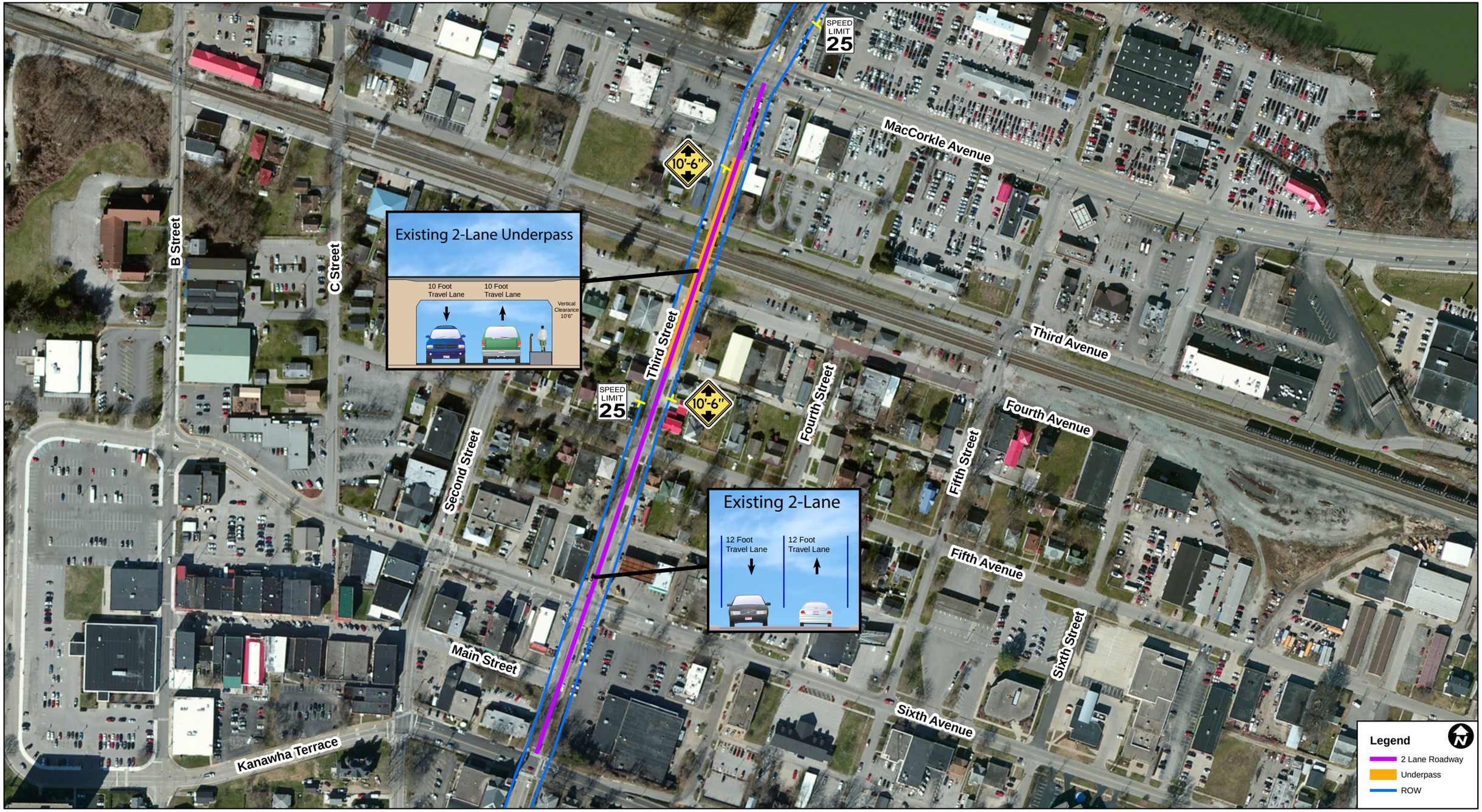


Figure 5-3: Roadway Characteristics

5.2 Study Intersections

There are four primary (4) intersections in the corridor study limits. The following section outlines the characteristics of each of these intersections.

Third Street and Kanawha Terrace

As illustrated in **Figure 5-4**, this signalized intersection provides the following lane configuration:

- Northbound approach (Third Street): One shared left, through, and right-turn lane
- Eastbound approach (Kanawha Terrace): One shared left, through, and right-turn lane
- Southbound approach (Third Street): One shared left, through, and right-turn lane
- Westbound approach (Kanawha Terrace): One shared through and left-turn lane and one exclusive right-turn lane with approximately 75 feet of storage

There is available on-street parking along eastbound Kanawha Terrace (west of the intersection).

The southbound approach has a significant uphill grade. Some vehicles roll slightly back down the hill when transitioning from the brake to the accelerator. Another concern with the significant grade is sight distance for the northbound left-turn movement. With permitted-only phasing, vehicles may find it difficult to see oncoming northbound through traffic.

The signalized intersection has mast arm signal supports with two signal heads for each approach. All left-turns have permitted-only phasing.

In general, lane line and arrow pavement markings are in good condition with some minor fading and cracking in places. Kanawha Terrace appears to have been repaved fairly recently.

Crosswalks are provided across all four approaches with curb ramps on all corners. The study team found that curb ramps are not ADA compliant. In general, a ramp is not ADA compliant if it does not provide the appropriate truncated dome landing, adequate slope and cross-slope, or does not align perpendicular to its counterpart at the opposite end of the crosswalk. ADA compliancy was based on observations only (i.e., no measurements were taken). Pedestrian push buttons and countdown heads are provided to cross Kanawha Terrace (parallel to Third Street), but are not provided to cross Third Street. The ladder-style crosswalks are in relatively good condition without any major cracking or fading.

Third Street and Sixth Avenue

As illustrated in **Figure 5-5**, this signalized intersection provides the following lane configuration:

- Northbound approach (Third Street): one exclusive left-turn lane and one shared through and right-turn lane with approximately 100 feet of storage
- Eastbound approach (Sixth Avenue): one exclusive left-turn lane and one shared through and right-turn lane with approximately 100 feet of storage
- Southbound approach (Third Street): one shared left, through, and right-turn lane
- Westbound approach (Sixth Avenue): one exclusive left-turn lane with approximately 150 feet of storage, one exclusive through lane, and one exclusive right-turn lane with approximately 125 feet of storage

On-street angle parking is provided along westbound Sixth Avenue west of the intersection.

The signalized intersection has mast arm signal supports for each approach. Two signal heads are provided for each approach with the exception of the westbound direction which has three signal heads. All left-turns at the intersection have permitted-only phasing (no turn arrow signal phases).

In general, lane line and arrow pavement markings are in good condition. Sixth Avenue appears to have been repaved fairly recently.

As a result of the northbound approach having a left-turn lane, a slight lane shift exists between the northbound and southbound approaches. While the lane shift is acceptable in terms of design requirements, the northbound through lane south of the intersection does not align with the northbound through lane on the north side of the intersection, requiring the driver to make a shift through the intersection. The lane shift is not severe, but should be considered when implementing improvements.

There are crosswalks and curb ramps for the four approaches and corners of the intersection, respectively. Curb ramps do not appear to be ADA compliant (no measurements were taken). Pedestrian push buttons and countdown heads are provided to cross Sixth Avenue (parallel to Third Street). With the resurfacing of Sixth Street, the ladder-style crosswalk markings were restriped and are still in good condition.

Third Street and Fifth Avenue

As illustrated in **Figure 5-6**, this unsignalized intersection provides the following lane configuration:

- Northbound approach (Third Street): one left, through, and right-turn lane
- Eastbound approach (Fifth Avenue): one left, through, and right-turn lane
- Southbound approach (Third Street): one left, through, and right-turn lane
- Westbound approach (Fifth Avenue): one left, through, and right-turn lane

Stop control is provided along the eastbound and westbound approaches. There are no striped stop bars for either approach.

Curb ramps are provided to cross both Third Street and Fifth Avenue. Curb ramps do not meet ADA requirements. No crosswalks are marked.

Third Street and MacCorkle Avenue

This signalized intersection provides the following lane configuration as illustrated in **Figure 5-7**:

- Northbound (Third Street): one exclusive left-turn lane with approximately 75 feet of storage and one shared through and right-turn lane
- Eastbound (MacCorkle Avenue): one exclusive left-turn lane (within the two-way left-turn lane), one exclusive through lane, and one shared through and right-turn lane
- Southbound (St. Albans-Nitro Bridge): one exclusive left-turn lane with continuous storage and one shared through and right-turn lane
- Westbound (MacCorkle Avenue): one exclusive left-turn lane (within the two-way left-turn lane), one exclusive through lane, and one shared through and right-turn lane

This intersection was reconstructed as part of the St. Albans-Nitro Bridge project. New mast arms and signal heads were installed as part of the project. Mast arms with two signal heads are provided for each approach. Back plates are provided on all signal heads. All left-turn movements have protected/permitted signal phasing.

Figure 5-4: Third Street and Kanawha Terrace Intersection

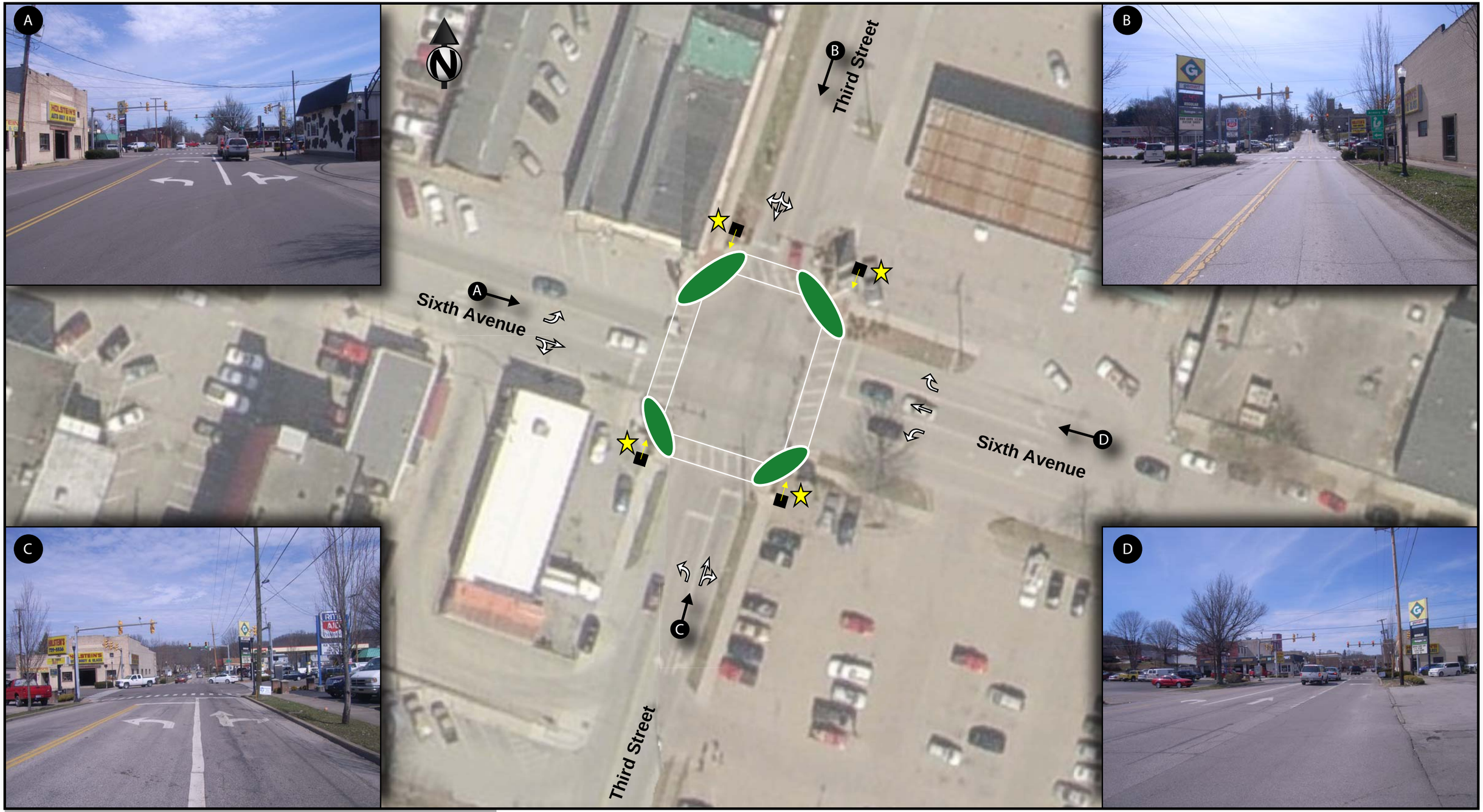


Figure 5-5: Third Street and Sixth Avenue Intersection

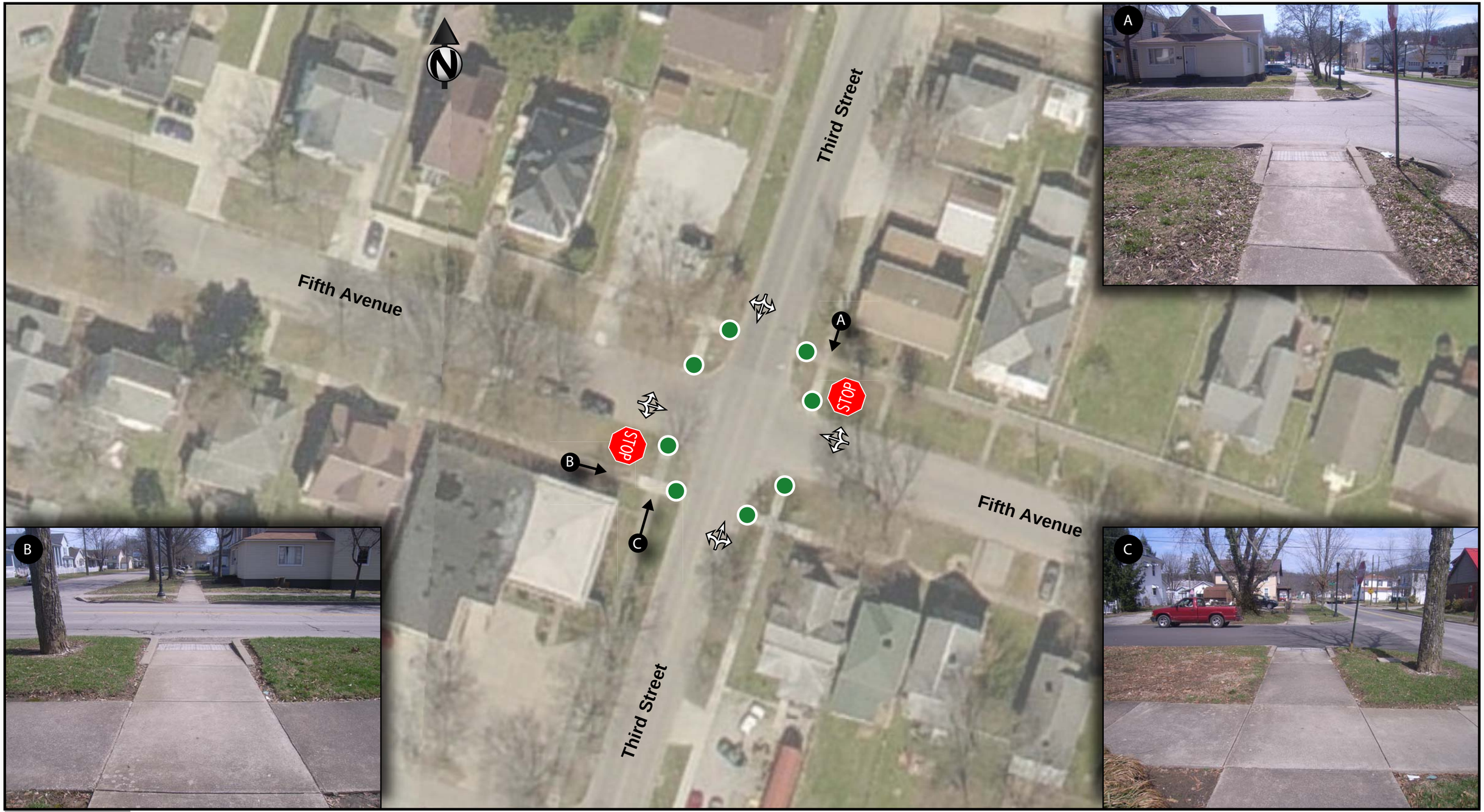


Figure 5-6: Third Street and Fifth Avenue Intersection

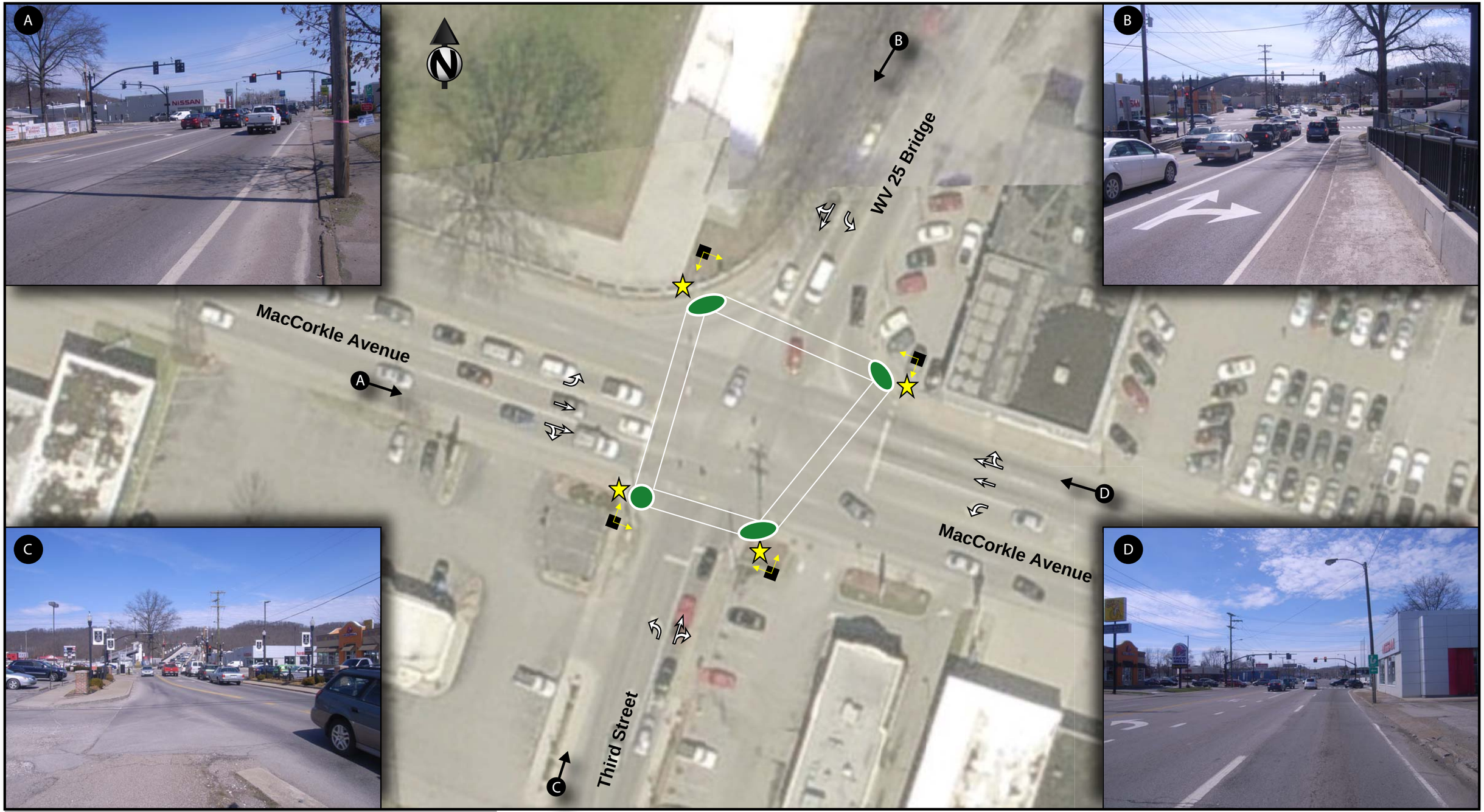


Figure 5-7: Third Street and MacCorkle Avenue Intersection

With the recent resurfacing of the intersection, the pavement markings are in great condition near the intersection. However, lane lines and arrow pavement markings that weren't included in the reconstruction are worn and faded.

Crosswalks with curb ramps are provided across all legs of the intersection. Curb ramps appear to meet ADA requirements. Pedestrian push buttons are provided to cross MacCorkle Avenue (parallel to Third Street). There are countdown heads at all crosswalks. However, field observations revealed that the Walk signal is never illuminated on the approaches to cross Third Street (parallel to MacCorkle Avenue). Without push buttons, the Walk sign should be shown during green time for through movements on MacCorkle Avenue.

Bike lanes are provided along both sides of MacCorkle Avenue. The details of the bike lanes will be discussed in following sections.

5.3 Driveways

There are not a lot of driveways in the corridor, but some driveways have deficiencies worth noting.

The driveways to the Go Mart at the intersection of Third Street and Sixth Avenue are wide and uncontrolled. Driveways that are too wide create confusion for motorists who may have a hard time deciding where to enter or exit the driveway. Safety is also a concern for pedestrians at wide driveways because they have a greater distance to cross where they are vulnerable to being struck by a vehicle using the driveways. Both the access along Third Street and the access along Sixth Street are too wide. According to the West Virginia Division of Highways (WVDOH) *Manual on Rules and Regulations for Constructing Driveways on State Highway Rights-Of*-Way, the maximum width for a two-way commercial driveway is 50 feet. National Cooperative Highway Research Program's (NCHRP) *Report 659: Guide for the Geometric Design of Driveways* also surveyed 16 state transportation agencies and one local agency and determined that the maximum desirable width for a commercial driveway is approximately 50 feet. Further research from the Transportation Research Board *Access Management Manual* indicates that for high intensity driveways serving retail uses, the drive should provide at a maximum, one entry lane (12-13 feet wide) and two exit lanes (11-13 feet wide) for a total width of no more than 39 feet. The Go Mart driveways along both Third Street and Sixth Avenue are at least 60 feet wide. Additionally, because of the wide driveway, the sidewalk is terminated along Sixth Street at the Go Mart property as illustrated in **Figure 5-8** creating a missing critical link in the overall pedestrian network.

Figure 5-8: Go Mart Driveway along Sixth Avenue

Another concern with some driveways in the corridor is their proximity to intersections. *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO) states that driveways located close to an intersection cause drivers to monitor more than one access connection at a time. By eliminating the driveway within the area of an intersection, the driver workload is simplified and the risk for collisions is reduced. The driveway of the Tim Horton's at the corner of Third Street and MacCorkle Avenue is too close to Third Street and MacCorkle Avenue intersection as illustrated in **Figure 5-9**.

Figure 5-9: Driveway within Functional Area of Third Street and MacCorkle Avenue Intersection

Figure 5-10 summarizes the locations of driveways within the corridor that have access concerns.

5.4 Bicycle and Pedestrian Facilities

A walkability audit was conducted along the Third Street corridor from Kanawha Terrace to MacCorkle Avenue. When reviewing sidewalk conditions, the study team considered the following factors from the *Pedestrian Road Safety Audit Guidelines and Prompt Lists* developed by the Federal Highway Administration (FHWA):

- Presence, design, and placement of sidewalk facilities
- Quality, condition, and obstructions of sidewalk facilities
- Continuity and connectivity of sidewalk facilities
- The ability of sidewalk facilities to accommodate all pedestrians including those with specific needs

The study team did not find any missing sections in the sidewalk network along Third Street. Third Street serves as an important link in the pedestrian network through St. Albans. Through the pedestrian crossing at MacCorkle Avenue, the sidewalk along Third Street provides a direct connection to the St. Albans/Nitro bridge. The bridge, which has a sidewalk along the west side, provides a connection for pedestrians between St. Albans and Nitro. Additionally, the completeness of the sidewalk system along Third Street provides connections to sidewalks on intersecting corridors which helps pedestrians to travel throughout the City of St. Albans.

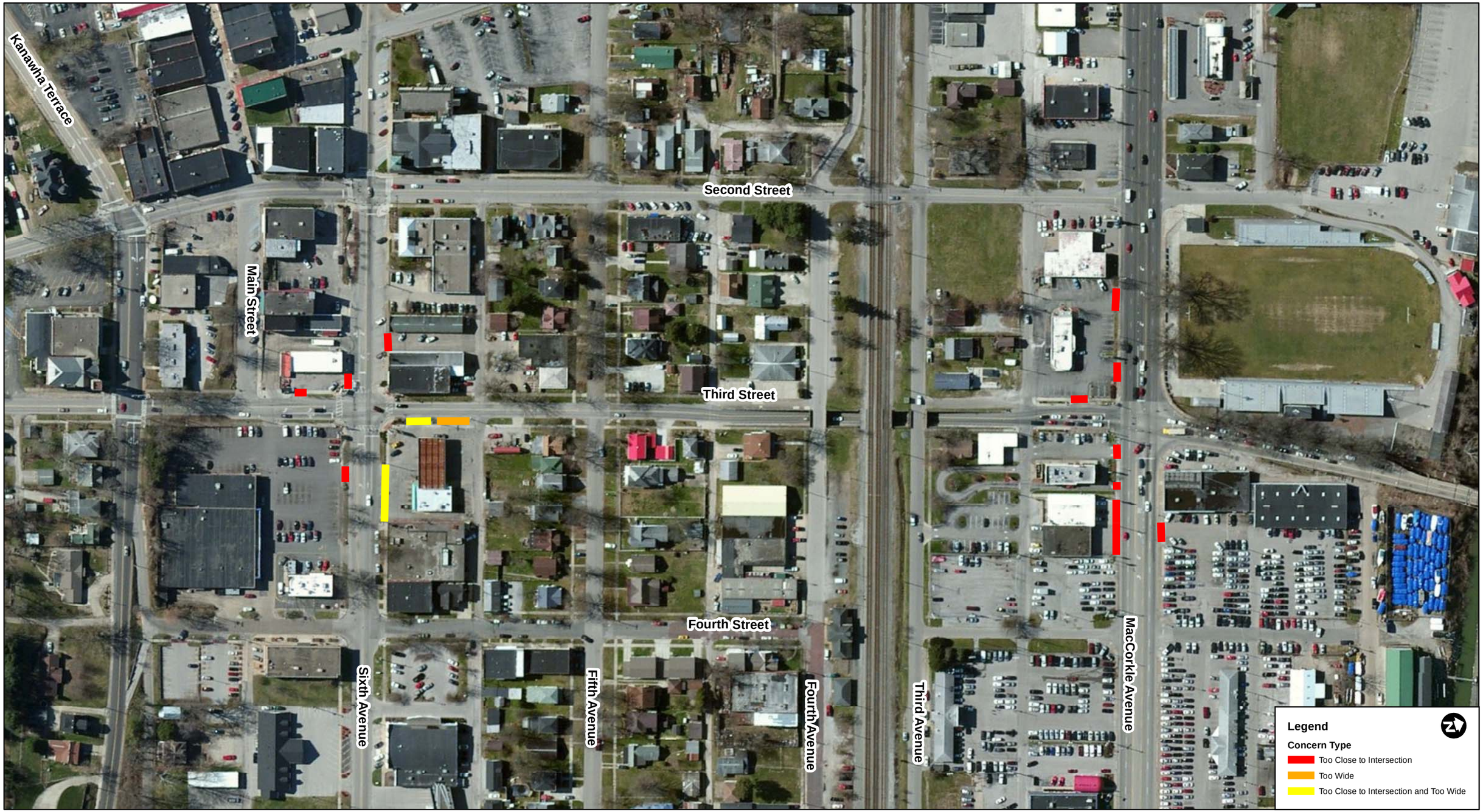


Figure 5-10: Access Point Concerns

Most of the sidewalks are even and free of tripping hazards with curb ramps provided at intersections. However, at the intersection of Third Street and MacCorkle Avenue, sidewalks were covered in dirt and debris like the area illustrated in **Figure 5-11**. The dirt and gravel make it difficult to walk on the sidewalk, especially in wet conductions. Additionally, the dirt is encroaching on the truncated dome portion of the ramp. When dirt fills the spaces in between the domes, the warning mat becomes less effective for the visually impaired.

Along Third Street between Kanawha Terrace and Main Street, tree roots have pushed the concrete panels of the sidewalk up, creating an uneven walking surface and a potential tripping hazard as illustrated in **Figure 5-12**. Asphalt was placed between the uneven pieces of concrete in an attempt to even the sidewalk. However, the sidewalk is still uneven.

Additionally, the steep profile of Third Street between Kanawha Terrace and Main Street make the sidewalks on both sides of the roadway difficult to traverse, especially in a wheelchair. There is no curb ramp at Main Street, as illustrated in **Figure 5-13**.

Figure 5-11: Gravel and Dirt on Sidewalk at the Third Street and MacCorkle Avenue Intersection

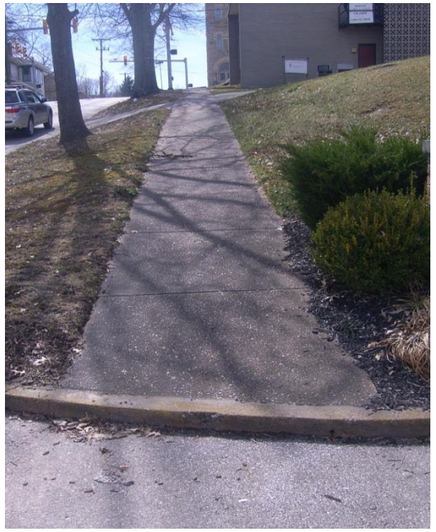


Figure 5-13: Steep Sidewalk at Main Street

Figure 5-14: Parked Car Partially Blocking Sidewalk along Third Street near Sixth Avenue

Another problem with the sidewalk along the Third Street corridor is a lack of separation between the Rite Aid parking lot and the sidewalk. As a result, vehicles park too far forward and block a portion of the sidewalk as shown in **Figure 5-14**. When a vehicle is blocking the sidewalk, visually impaired pedestrians and pedestrians in wheelchairs may have difficulty navigating the sidewalk.

Figure 5-12: Uneven Sidewalk along Third Street near Kanawha Terrace

As previously discussed, there are curb ramps located at all four corners of the Third Street and Sixth Avenue intersection. As illustrated in **Figure 5-15**, the wide curb ramps span the entire corner giving no direction to visually impaired pedestrians as to where to cross. The preferable design is to provide channelized ramps for each crosswalk to give clear guidance for pedestrians.

Figure 5-15: Curb Ramp at Third Street and Sixth Avenue

Sidewalk is provided along Third Street south of Fourth Avenue and north of Third Avenue. In an effort to deter pedestrians from crossing the CSX railroad tracks, at grade pedestrian facilities are not provided between Third Avenue and Fourth Avenue. Additionally, CSX has posted signs near the edge of their right-of-way prohibiting pedestrians from crossing the tracks as illustrated in **Figure 5-16**.

Figure 5-16: CSX Sign at Railroad Tracks

For pedestrians to cross the tracks, a sidewalk is provided in the underpass along the east side, adjacent to the northbound travel lane. The five foot wide sidewalk is elevated from the vehicular travel way and is protected by a metal railing. As previously discussed, the underpass does not have adequate lighting, even during daytime hours. The perceived safety by pedestrians is severely diminished as a result of the lack of lighting. Additionally, under the train bridge, slurry and dirt from the train cars is deposited on the sidewalk making it difficult to walk through as illustrated in **Figure 5-17**. With the aforementioned draining issues, the sidewalk collects standing water which also makes the underpass facility unappealing to pedestrians and bicyclists. While the sidewalk width meets the minimal ADA requirement, the metal railing and bridge wall make the actual clear space approximately 4 feet making it potentially uncomfortable for just a pedestrian passing another pedestrian. This space is even less comfortable for people in wheelchairs. For these reasons, even though a crossing grade-separated from the trains is provided, many pedestrians prefer to cross illegally at the tracks above Third Street or legally at adjacent parallel streets that cross at-grade (i.e. 2nd Street).

Figure 5-17: Pedestrian Walkway Under Train Bridge along Third Street

As previously detailed, existing crosswalks are marked along the following approaches at study area intersections (refer to **Figures 5-4, 5-5, 5-6,** and **5-7** for more details):

- Third Street and Kanawha Terrace – all approaches
- Third Street and Sixth Avenue – all approaches
- Third Street and MacCorkle Avenue – all approaches

A summary of the presence and condition of sidewalks is provided in **Figure 5-18**.

The study team also conducted a bikeability audit to determine the state of bicycle facilities throughout the corridor. The following topics from the *Bicycle Road Safety Audit Guidelines and Prompt Lists* developed by the FHWA in May 2012 were considered when reviewing bicycle accommodations:

- Presence and availability of bicycle facilities
- Design and placement of bicycle facilities
- Operations of vehicular traffic suitable for bicycle activity
- Quality and condition of bicycle facilities
- Vertical or horizontal obstructions
- Adequate clear zone provided for bicycle activity

On Third Street there are no designated bicycle facilities (i.e., dedicated bike lane, multiuse path, etc.) or any special signs or pavement markings to indicate the existence of bike routes or shared lane use between vehicles and bicycles. In a recent project, exclusive bike lanes were added along MacCorkle Avenue in both directions. As illustrated in **Figure 5-19**, some of the bike lane markings are already faded and worn and the bike lane is often filled with gravel and debris, making it unattractive for a bicyclist to use.

The St. Albans Renaissance Group provided a "Share the Road!" map that highlights three bike routes throughout the City of Saint Albans. The study team found that these routes are not signed. The roadways that were selected for bike routes have wide lanes making room for vehicles to pass bicycles without encroaching into the adjacent opposing travel lane. Along the posted bicycle route, the posted vehicular speed limit is 25 mph which also encourages bicycle activity since vehicles are traveling at slower speeds than other urban roadways (i.e., MacCorkle Avenue). As indicated in **Figure 5-20**, the easy and moderate routes run along Sixth Avenue. The moderate route uses a small segment of Third Street to access Main Street. The easy route continues along C Street and Fourth Avenue.

Third Street provides a connection between the bike routes on Sixth Avenue and Fourth Avenue with the bike lanes on MacCorkle Avenue. Even though the posted speed limit along Third Street is only 25 mph, biking on Third Street is unattractive because of the underpass. Bicyclists indicated they do not like riding on the sidewalk provided in the underpass because of the collection of debris and slurry from the trains and because of the narrow distance between the bridge wall and the railing. They also dislike riding in the travel lane because of the traffic congestion they encounter, specifically when traveling northbound. When they are stopped in the travel lane within the underpass they are likely to get debris and slurry dropped directly on them as a result of passing traffic or trains overhead. When possible, they avoid the underpass and use an at-grade crossing to cross the tracks.

Figure 5-19: Bike Lane along MacCorkle Avenue at Third Street

5.5 Transit Services

The Kanawha Valley Regional Transit Authority (KVRTA) provides transit services in St. Albans. KVRTA provides service along Third Street, Sixth Street, B Street, and MacCorkle Avenue through Route 1 – St. Albans/West Charleston as illustrated in **Figure 5-21**. The primary path for Route 1 uses Sixth Street to Kanawha Terrace (indicated by a solid line on **Figure 5-21**). However, an alternate route to Route 1 serves areas along Third Street and MacCorkle Avenue (indicated in a dashed line on **Figure 5-21**). This alternate route operates once in the morning, once in the afternoon peak period (5:00 PM hour), and once at midnight on weekdays. During the weekends, this alternate route is run more than three times per day.

During weekday peak periods, Route 1 operates on approximately 30 minute headways and 60 minute headways during other times of day.

In Fiscal Year 2014 (July 2013 through June 2014), Route 1 served approximately 693,000 passengers or approximately 57,800 passengers per month.

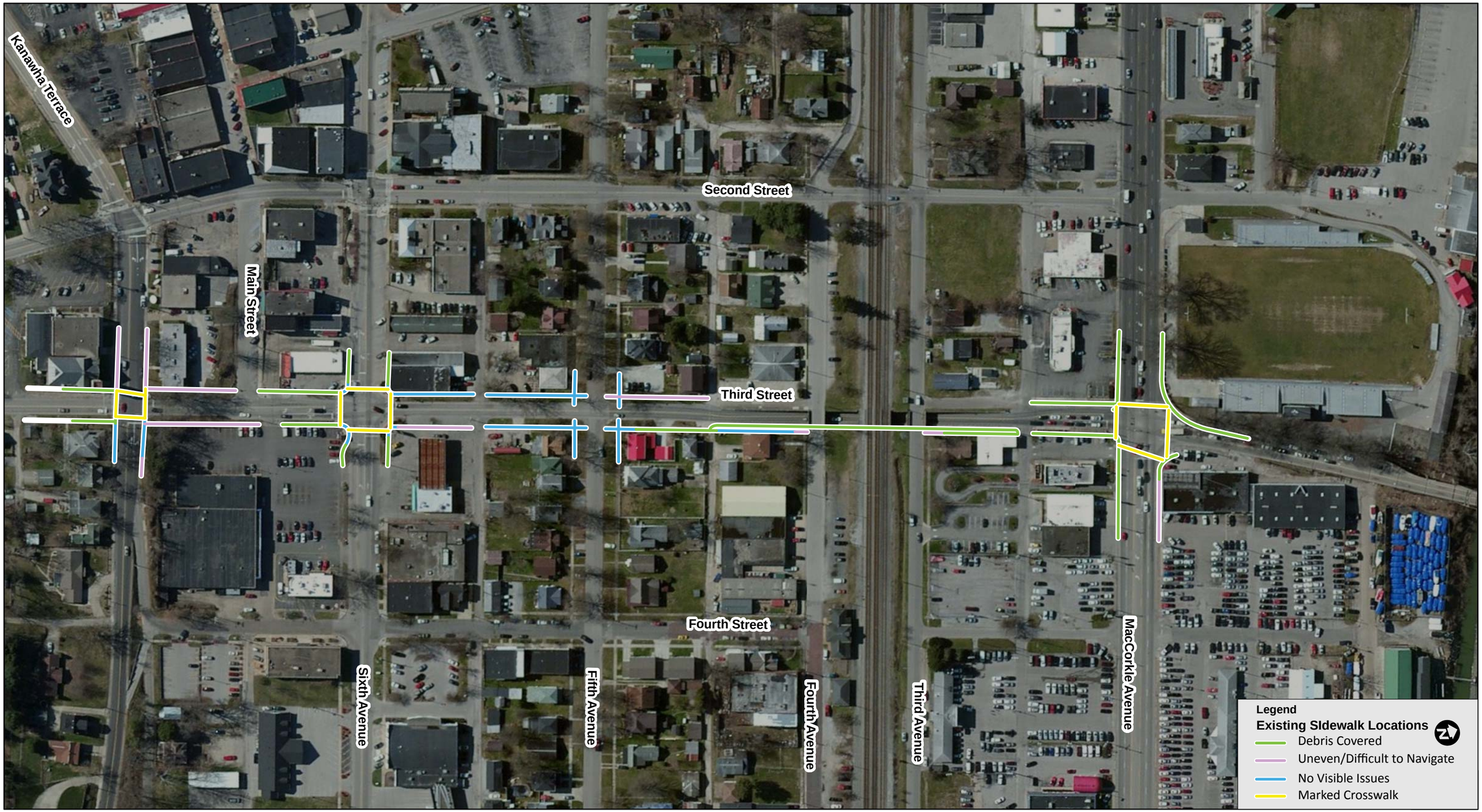
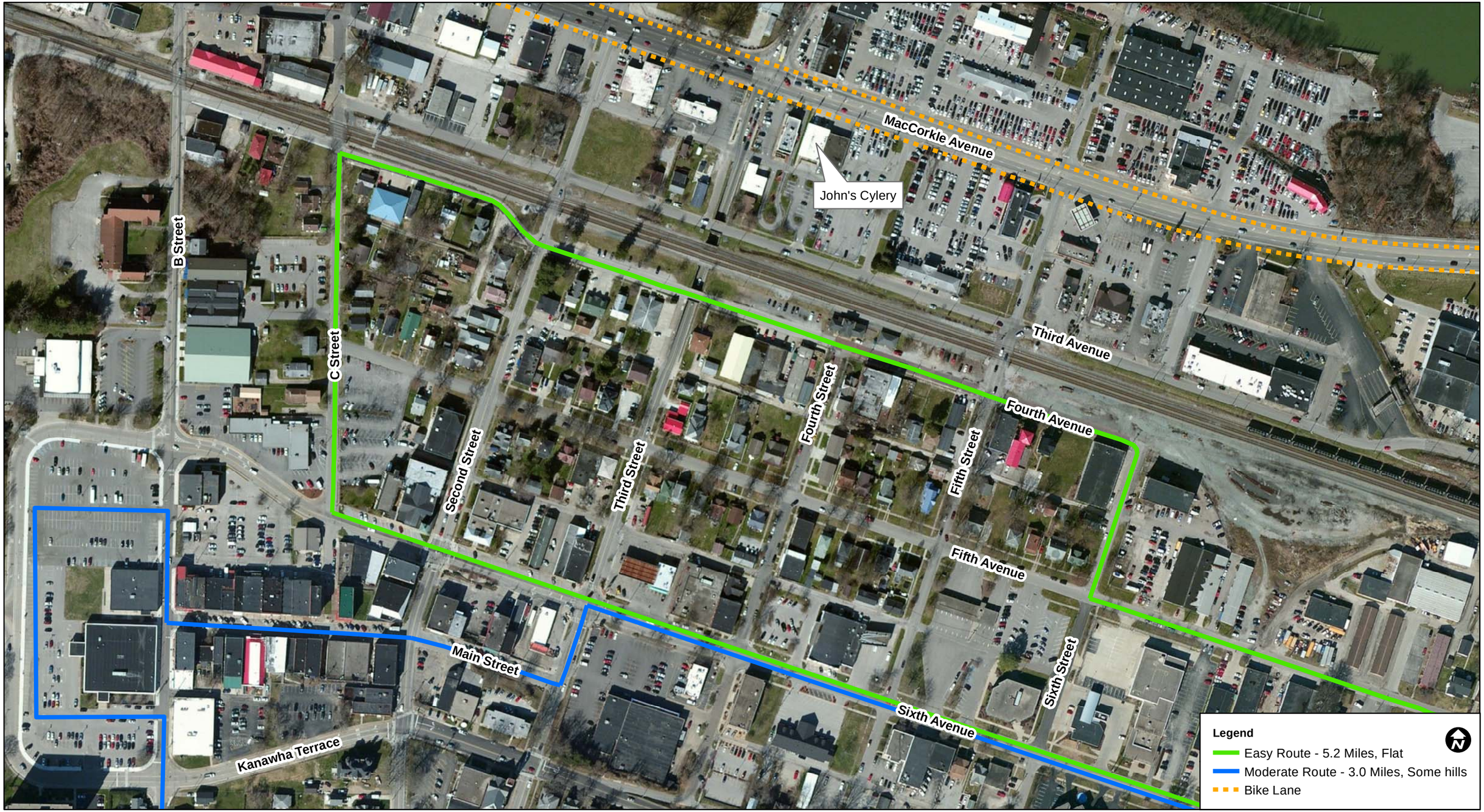
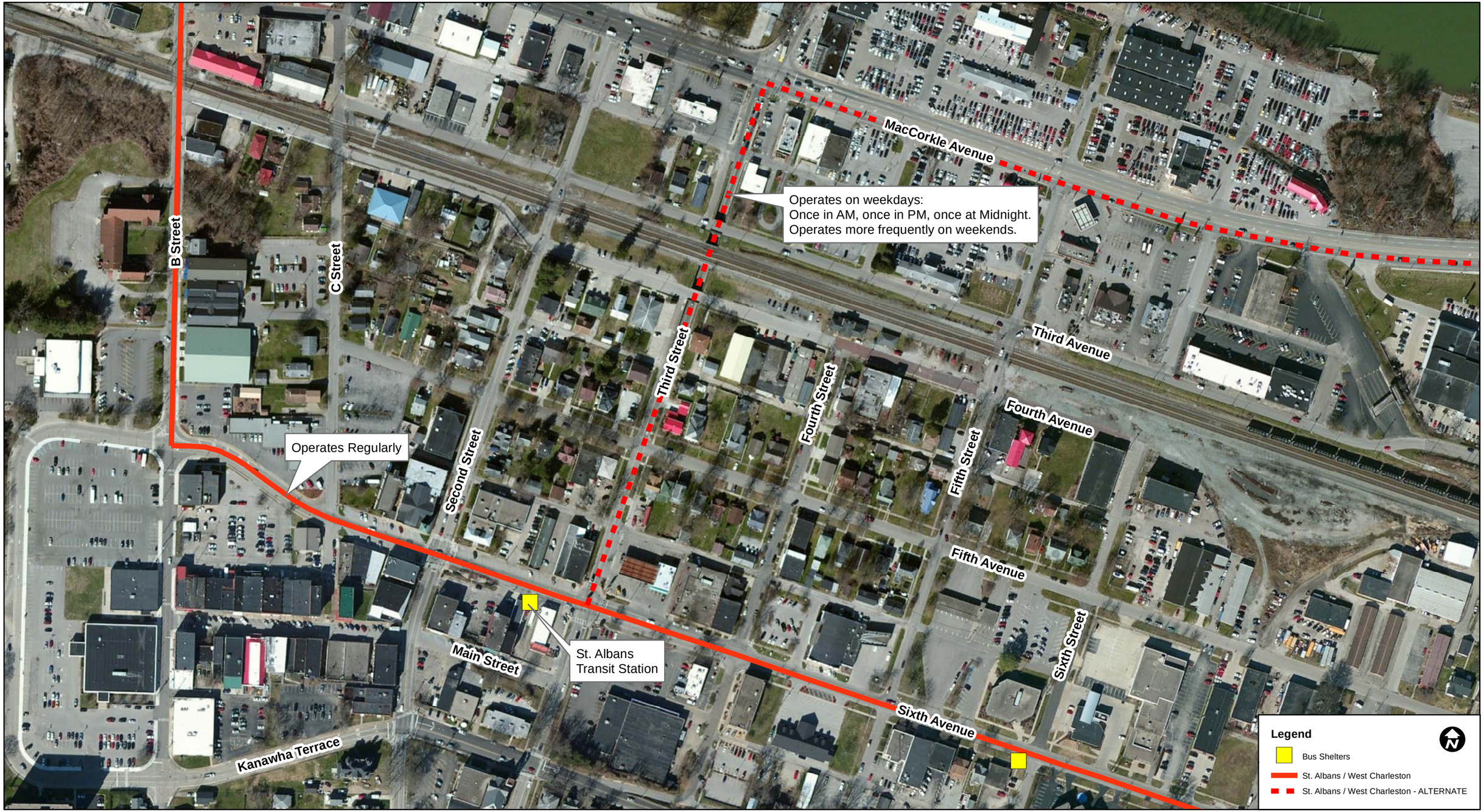


Figure 5-18: Sidewalk Inventory



Source of Data: St. Albans Renaissance Group "Share the Road" Map

Figure 5-20: St. Albans Bike Routes



Source of Data: Kanawha Valley Regional Transit Authority (KVRTA)

Figure 5-21: KVRTA Routes and Bus Shelters

KVRTA operates on a flag stop system. There are designated stops along the route, but buses may also be flagged for a stop at most places along the route. No designated stops are located on Third Street. However, bus shelters are located at the St. Albans Transit Station near the intersection of Third Street and Sixth Avenue as well as at the corner of Sixth Avenue and Sixth Street.

According to the *Highway Capacity Manual* (HCM), the level of service (LOS) score for transit users combines traveler perceptions when walking to a transit stop, waiting for a transit vehicle, and riding on the vehicle. Because KVRTA operates as a flag stop system, transit users are not required to walk long distances between stops. However, with infrequent service along Third Street and MacCorkle Avenue, many transit users walk to Sixth Avenue or B Street to ride the bus. For example, if a transit user's trip originates at the corner of Third Street and MacCorkle Avenue, the transit users walk at least a quarter mile to either Sixth Avenue or B Street to catch the bus. If traveling from MacCorkle Avenue to B Street, transit users cross the tracks. Continuous sidewalk is provided throughout most of the Third Street corridor which makes walking to transit stops easier for pedestrians. The waiting component is based on the frequency of transit (how often routes run), service reliability, and the presence of shelters and benches which make waiting time more comfortable. No data was provided about the service reliability but given the one hour headway and lack of shelters and benches along the route, a low LOS score is likely for transit along Third Street. The riding-on-the-vehicle satisfaction is determined by average travel speed and passenger loads. This data was not provided as part of this analysis. The study team did not determine an official transit LOS score assignment because it was outside the scope of this project. Given the aforementioned information, it is assumed that the transit LOS in the corridor is mediocre.

5.6 Existing Traffic Volume Analysis

Counts from the 2012 *St. Albans Railroad Crossing Study* were used to analyze existing conditions. The West Virginia Division of Highways (WVDOH) collected traffic counts in 2014 to provide insight for areas that were not counted in the previous study. Existing AM and PM counts for the Third Street intersections are summarized in **Figure 5-22**. Volumes for the other intersections are summarized in **Appendix F**. The raw traffic counts from WVDOH are in **Appendix G**. The following section details the modeling and analysis procedures used to determine the level-of-service (LOS) for the study intersections.

Model Boundaries and Data

The operational analyses models for the St. Albans Third Street Corridor study were developed in Transmodeler (Version 4.0). The models for the current study update models from an earlier Third Street corridor study. These previous models were developed in 2012 using Transmodeler 3.0.

Figure 5-23 shows the boundaries of the microscopic models developed for this study. The model area is bounded by Kanawha Terrace Road to the South, Washington Street to the East, MacCorkle Avenue to the North and B Street to the West. Data used for model development and analysis includes: Origin-Destination seed matrices from the 2012 study, intersection turning movement counts and traffic signal timings at key intersections.

Model Development

Existing network models were developed for the AM and PM peak hours. The street network in Transmodeler is represented as links and nodes; and activity centers/actual parking lots are represented as origin/destination zones. Link information includes number of lanes, and link functional classification. Node information includes node geometry, including permitted turns, turn bay lengths and signal control parameters. Zones are connected to the road network via centroids which act as loading/unloading points for vehicles in the model. During the model development process it was ensured that all the Centroid-Zones connect to the road network at existing driveways.

Origin-Destination Matrices

Travel demand data in the model was represented as Origin-Destination matrices. The model area for the current study is smaller in size than the 2012 railroad crossing study. Therefore the matrices from the 2012 study were revised to reflect a smaller study area. WVDOH collected turning movement counts at several intersections in the study area in December 2014. The OD-matrices from the 2012 study were used as seed matrices for the assignment process. These seed matrices were updated to reflect the latest turning movement counts.

The study area matrix from 2012 was used as a seed matrix for traffic assignment in the OD matrix-estimation process. The traffic assignment in the model resulting from the seed matrix is compared to field observed link and turning movement counts. The estimation process, improves the seed matrices by synthetically populating individual cells in the matrix based on such comparison. The output of OD-matrix estimation is a new "synthetic trip table." Traffic assignment resulting from this synthetic trip table should closely match the field counts.

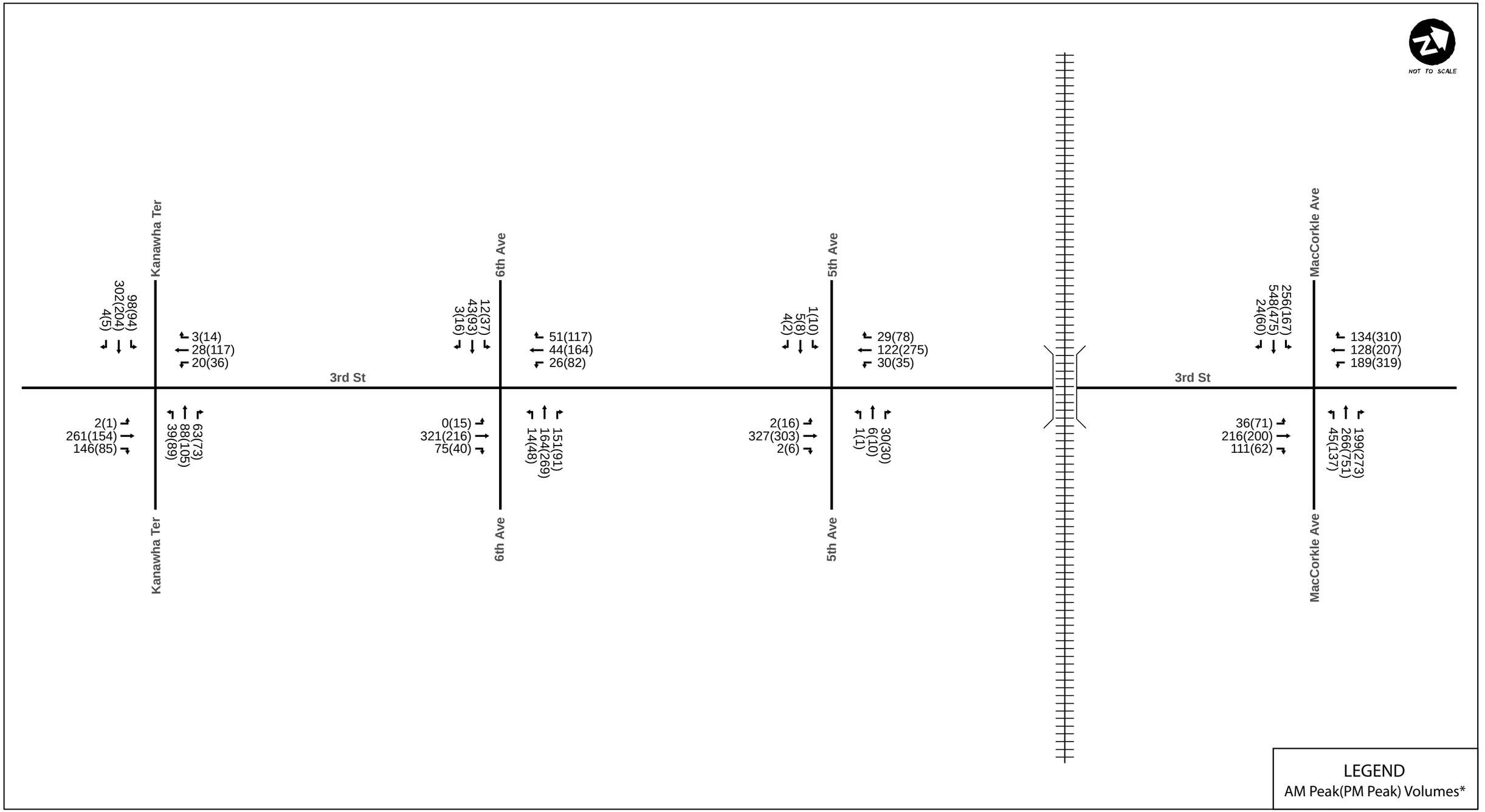
Assignment in Transmodeler

Transmodeler has several routines to assign travel demand specified in an OD-matrix. The synthetic matrix obtained from the estimation procedure was assigned using the equilibrium assignment procedure. The assignment procedure takes into account link characteristics in terms of their functional classification and delays at intersection nodes due to traffic controls. The functional classification system is an abstract representation of a roadway capacity perception in the real world. During the assignment process, a link classified as a "major" arterial will get preference over a link classified as "minor" arterial. Similarly, links classified as "Minor" arterial will get preference over "Collector" and "local" roadways. Internally each link is constrained by roadway capacities derived from speed-density curves based on functional types. The functional types from the 2012 study were reviewed for accuracy and were considered to be an accurate representation.

User Equilibrium uses an iterative process to achieve a convergent solution, in which no travelers can improve their travel times by shifting routes. In each iteration, TransModeler computes network link flows, which incorporate link capacity restraint effects and flow-dependent travel times.

Model Calibration and Validation

The study team calibrated the models alongside the assignment process. Calibration of the models included two phases: parameter calibration and route calibration. Due to low congestion levels in the modeled area, volume replication and path choice were chosen as the primary targets of calibration. Parameter calibration is aimed at fine tuning the model parameters while route calibration is aimed at identifying meaningful alternatives among several viable paths between OD-pairs.



Source of Data: West Virginia Division of Highways (WVDOH)

Figure 5-22: Existing Peak Hour Volumes

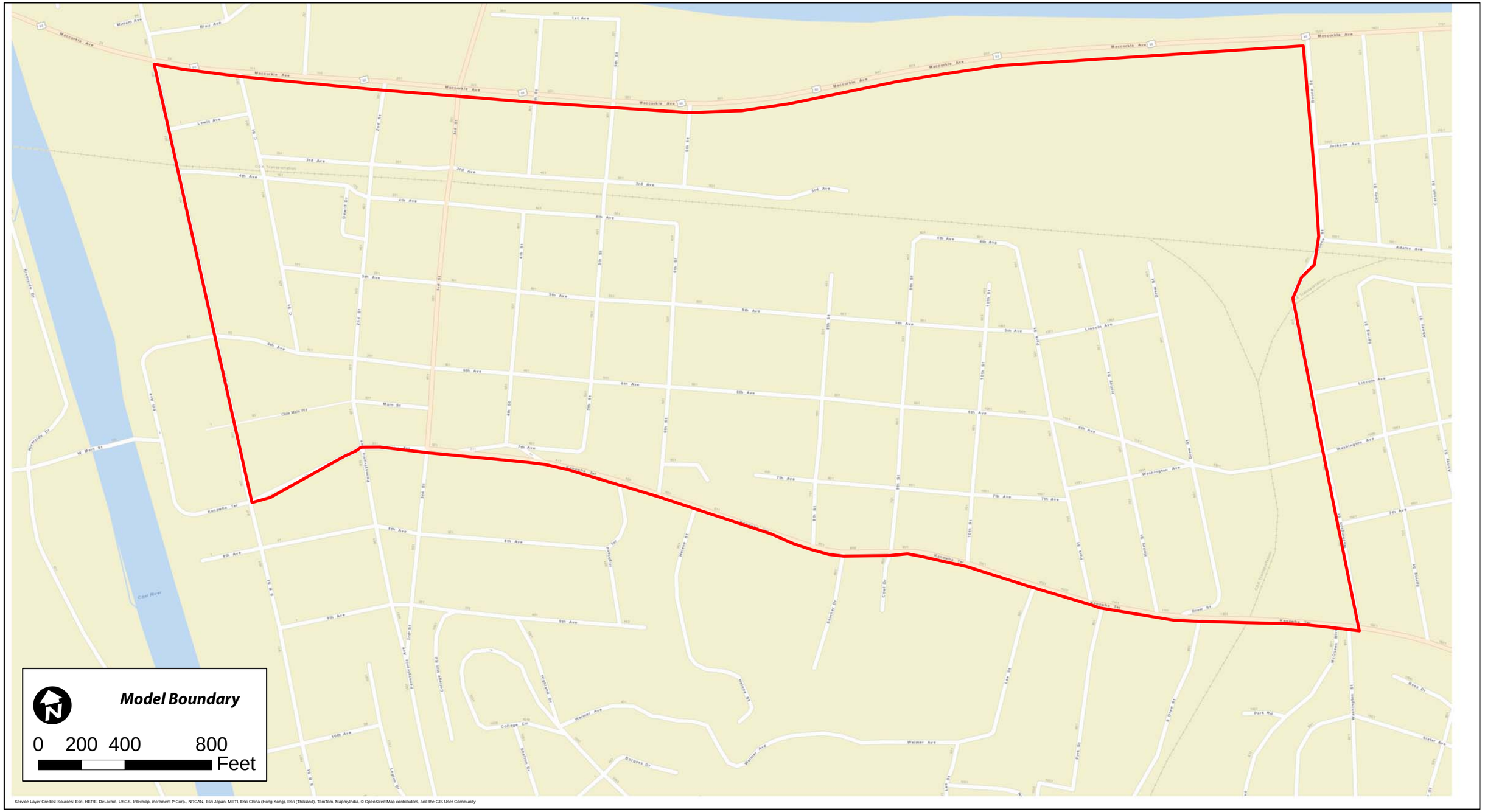


Figure 5-23: Model Boundary

Parameter Calibration

Major model parameters in Transmodeler can be classified as following:

- Driver behavior parameters
- Vehicle fleet parameters
- Road class parameters

Driver behavior parameters (including car following and lane-change parameters) directly affect the driving behavior of vehicles in the model. Vehicle fleet parameters describe attributes associated with each vehicle type modeled. Some of the parameters affect the models' performance on a global scale while some of them have a local effect. Road class parameters allow for defining link specific speed-density functions and capacity constraints.

The first pass of calibration ensured that the lane change look-ahead parameter associated with "Mandatory Lane Changes" is reasonable. The default setting for value for this parameter in Transmodeler is "8." A value of 8 indicates that vehicles should start making lane changes at least 8 links upstream from the mandatory lane they should be in which enables them to be on their desired path. Much of the modeled network for the St. Albans study area has a single travel lane between intersections. The lane change parameter therefore only effects the operations on MacCorkle Avenue. Visual inspections indicated that the default parameter is suitable for the lane changing behavior in the model.

Additional links were added to the 2012 sub-area model network to ensure that all the focus streets and relevant intersections were modeled in the current study. Due to the low volumes on these new links and the connectivity they provide to the major arterials like MacCorkle Avenue and Kanawha Terrace, they were designated as "Local" roads in the functional classification system of the model.

Route Choice and Calibration

In Transmodeler, a path is selected for each individual vehicle. Drivers traveling between the same origin-destination pair do not necessarily follow the same path, nor do they necessarily choose the minimum cost path. The route choice method determines how the path costs will be computed and how paths are assigned to each driver. For the study area models "deterministic shortest path" was used as the route choice model because of the nature of the network, its scope and viable options between OD- pairs. The deterministic shortest path as a route choice is ideal for the study area models as there is little or no variation in the paths one may choose between any given origin-destination pair. Link capacities and functional classification parameters are used in the determination of the shortest path.

Simulation-based dynamic traffic assignment was selected as an option in the simulation settings. The idea behind the simulation-based dynamic traffic assignment is that by running the simulation iteratively and averaging output travel costs with input travel costs between each iteration, the network loading will converge toward user equilibrium, where vehicles "learn" from prior iterations and choose better paths each simulation until no one can improve their travel time significantly by switching to an alternative path. User Equilibrium is achieved after this condition is satisfied.

Goodness-of-fit

Two goodness-of-fit statistics, correlation coefficient and Root Mean Squared-Error, were used to compare the model assignment to observed traffic counts.

Correlation Coefficient

Correlation coefficient (r^2) indicates how closely model predicted data matches observed data. Its value lies between 0 and 1. A correlation coefficient value closer to 1 is desirable. The formula for the term is:

$$r^2 = \left[\frac{n\sum_i (Count_i)(Volume_i) - \sum_i Count_i \sum_i Volume_i}{\sqrt{(n\sum_i Volume_i^2 - (\sum_i Volume_i)^2)(n\sum_i Count_i^2 - (\sum_i Count_i)^2)}} \right]^2$$

where n is the total number of links with a count, $Count_i$ is the observed volume (by direction) on link i, and $volume_i$ is the estimated volume (by direction) on link i. The overall correlation value is 0.94 in the AM peak hour and 0.92 in the PM peak hour, which is reasonable considering the value is for turning movements at intersections.

Root Mean Squared Error

A high value of correlation coefficient, although desirable, is not adequate to ensure that the model is accurate as it is primarily an overview statistic. Therefore a second statistic, RMSE, which shows if the model has any systematic errors was used in conjunction with the correlation-coefficient. In general it is desirable to have a value of RMSE closer to zero. The value computed for the AM peak hour is 3.2% and for the PM peak hour is 4.5%. Further investigation revealed that turning movements with counts less than 20 vph contributed to a lot of the error percentage reported. The high volume (greater than 50 vph) turning movement counts had a lower RMSE%. Overall it was a very well calibrated model.

Operational Analysis Summary

LOS is evaluated on the basis of control delay in seconds per vehicle. **Table 5-1** and **Table 5-2** define LOS for the different "grades" of service.

Table 5-1: Signalized Intersection LOS Descriptions

Level of Service	Control delay per vehicle (in seconds)	Description
A	< 10	Most vehicles do not stop.
B	10 – 20	Good progression; more vehicles stop than at LOS A.
C	20 – 35	The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	35 – 55	Many vehicles stop, and the proportion of vehicles not stopping declines. Occasionally, all vehicles on an approach will not clear the intersection during the green.
E	55 – 80	Considered the limit of acceptable delay. Frequently, all vehicles on an approach will not clear the intersection during the green.
F	> 80	Considered unacceptable to most drivers.

Table 5-2: Unsignalized Intersection LOS Descriptions

Level of Service	Control delay (sec)
A	< 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 – 50
F	> 50

Table 5-3 summarizes the operational analysis results from the models developed for the study area. These results are for the average of 10 different model runs performed for both the AM and PM peak hours. Statistics reported in the table include the average delay per vehicle experienced on each approach (seconds per vehicle), approach and intersection level of service.

Most of the corridor operated at very good levels of service in the AM and PM peak hours. The most problematic location with respect to traffic operations is at the intersection of 3rd Street and MacCorkle Avenue. Visual inspections of the animation indicate queues at this intersection in the northbound direction in the AM peak hour and in the southbound direction in the PM peak hour. All other intersections in the study area show no visible queuing. Additionally, drivers entering MacCorkle Avenue from unsignalized northbound approaches at Fifth Street and Sixth Street experience significant delay (LOS E).

Table 5-3: Existing Conditions Operations Summary

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Kanawha Terrace and B Street*	EB	1.1	A	5.0	A
	NB	13.3	B	12.5	B
	SB	13.0	B	12.4	B
	Overall	2.8	A	2.7	A
Kanawha Terrace and Second Street	EB	17.7	B	15.8	B
	WB	6.4	A	6.4	A
	NB	23.4	C	21.5	C
	SB	20.7	C	23.5	C
	Overall	18.0	B	17.1	B
Kanawha Terrace and Third Street	EB	6.7	A	5.4	A
	WB	5.0	A	4.8	A
	NB	38.3	D	30.1	C
	SB	24.0	C	30.1	C
	Overall	18.2	B	16.8	B
Kanawha Terrace and Fourth Street*	EB	2.0	A	2.0	A
	WB	0.0	A	0.0	A
	Overall	0.5	A	0.5	A
Kanawha Terrace and Sixth Street*	EB	0.5	A	0.0	A
	WB	0.0	A	0.0	A
	SB	9.6	A	10.7	B
	Overall	0.5	A	0.6	A
Sixth Avenue and B Street*	WB	5.0	A	3.0	A
	NB	14.5	B	13.8	B
	SB	13.2	B	16.2	C
	Overall	5.9	A	4.0	A
Sixth Avenue and C Street*	EB	0.7	A	7.2	A
	WB	0.0	A	0.0	A
	NB	10.2	B	12.7	B
	SB	10.4	B	16.0	C
	Overall	1.8	A	2.0	A
Sixth Avenue and Second Street	EB	6.6	A	6.6	A
	WB	6.9	A	8.9	A
	NB	22.6	C	22.8	C
	SB	21.0	C	24.5	C
	Overall	14.2	B	15.3	B
Sixth Avenue and Third Street	EB	6.1	A	5.6	A
	WB	6.8	A	6.3	A
	NB	31.1	C	25.6	C
	SB	21.1	C	31.0	C
	Overall	19.3	B	18.0	B

Table 5-3: Existing Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Sixth Avenue and Fourth Street*	EB	0.0	A	0.0	A
	WB	0.8	A	7.5	A
	NB	8.2	A	12.2	B
	SB	9.3	A	12.4	B
	Overall	2.0	A	3.0	A
Sixth Avenue and Fifth Street*	EB	7.8	B	8.2	A
	WB	7.4	A	7.5	A
	NB	12.2	B	19.3	C
	SB	11.8	B	18.2	C
	Overall	9.5	A	14.0	B
Sixth Avenue and Sixth Street*	EB	0.5	A	0.8	A
	WB	0.4	A	0.4	A
	NB	10.3	B	11.2	B
	SB	9.9	A	10.7	B
	Overall	1.3	A	1.1	A
Fifth Avenue and C Street*	WB	8.7	A	8.8	A
	NB	0.0	A	0.0	A
	SB	7.3	A	7.6	A
	Overall	2.9	A	2.4	A
Fifth Avenue and Second Street*	EB	7.4	A	7.3	A
	WB	7.4	A	8.1	A
	NB	7.8	A	7.9	A
	SB	7.2	A	8.3	A
	Overall	7.7	A	8.1	A
Fifth Avenue and Third Street*	EB	6.2	A	16.3	C
	WB	10.9	B	12.1	B
	NB	0.5	A	8.0	A
	SB	8.0	A	7.9	A
	Overall	4.5	A	9.8	A
Fifth Avenue and Fourth Street*	EB	0.1	A	0.5	A
	WB	0.1	A	0.5	A
	NB	7.3	A	9	A
	SB	7.3	A	9	A
	Overall	2.3	A	3.2	A
Fifth Avenue and Fifth Street*	EB	8.2	A	8.6	A
	WB	7.7	A	8.5	A
	NB	8.7	A	8.9	A
	SB	8.2	A	10.9	B
	Overall	8.4	A	9.9	A
Fifth Avenue and Sixth Street*	EB	2.5	A	7.4	A
	WB	2.3	A	7.5	A
	NB	12.3	B	8.6	A
	SB	11.8	B	9.8	A
	Overall	4.0	A	8.1	A

Table 5-3: Existing Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Fourth Avenue and C Street*	EB	10.3	B	13.8	B
	WB	9.0	A	10.2	B
	NB	0.8	A	7.7	A
	SB	2.4	A	7.3	A
	Overall	4.0	A	9.9	A
Fourth Avenue and Second Street*	EB	10.1	B	11.0	B
	WB	9.4	A	10.7	B
	NB	0.5	A	7.6	A
	SB	0.5	A	7.4	A
	Overall	1.2	A	8.4	A
Fourth Avenue and Fourth Street*	EB	0.5	A	0.5	A
	WB	0.5	A	0.8	A
	NB	7.3	A	9.0	A
	Overall	2.1	A	3.2	A
Fourth Avenue and Fifth Street*	EB	8.2	A	12.6	B
	WB	7.3	A	9.0	A
	NB	0.5	A	0.8	A
	SB	0.5	A	0.6	A
	Overall	0.8	A	1.2	A
Third Avenue and C Street	EB	11.6	B	14.8	B
	WB	9.3	A	5.0	A
	NB	0.5	A	7.3	A
	SB	1.2	A	7.9	A
	Overall	4.9	A	2.5	A
Third Avenue and Second Street*	EB	10.1	B	10.5	B
	WB	10.1	B	12.8	B
	NB	0.1	A	7.5	A
	SB	0.5	A	7.4	A
	Overall	3.3	A	6.7	A
Third Avenue and Fourth Street*	EB	2.3	A	7.6	A
	WB	0.0	A	0.0	A
	SB	7.3	A	9.6	A
	Overall	1.3	A	1.6	A
Third Avenue and Fifth Street*	EB	6.8	A	12.4	B
	WB	4.1	A	20.6	C
	NB	6.2	A	8.1	A
	SB	0.1	A	7.7	A
	Overall	3.3	A	8.8	A

Table 5-3: Existing Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Third Avenue and Sixth Street*	EB	1.1	A	1.4	A
	SB	6.5	A	10.2	B
	Overall	1.8	A	2.2	A
MacCorkle Avenue and B Street	EB	18.4	B	16.7	B
	WB	8.0	A	9.4	A
	NB	22.9	B	23.1	C
	SB	20.5	C	20.6	C
	Overall	17.0	B	14.6	B
MacCorkle Avenue and C Street*	EB	0.5	A	0.5	A
	WB	0.4	A	0.5	A
	NB	13.7	B	26.3	D
	SB	20.1	C	14.6	B
	Overall	1.0	A	2.0	A
MacCorkle Avenue and Second Street*	EB	0.5	A	0.5	A
	WB	0.3	A	0.5	A
	NB	17.6	C	25.4	D
	SB	18.4	C	28.8	D
	Overall	1.6	A	2.0	A
MacCorkle Avenue and Third Street	EB	35.0	D	31.8	C
	WB	25.9	C	47.3	D
	NB	84.6	F	55.6	E
	SB	65.6	E	72.9	E
	Overall	47.7	D	51.7	D
MacCorkle Avenue and Fourth Street*	EB	0.0	A	0.0	A
	WB	0.3	A	0.5	A
	NB	11.2	B	18.32	C
	SB	21.1	C	16.13	C
	Overall	0.2	A	0.5	A
MacCorkle Avenue and Fifth Street*	EB	0.5	A	0.5	A
	WB	0.3	A	1.5	A
	NB	43.3	E	14.8	B
	SB	16.5	C	11.6	B
	Overall	2.0	A	1.9	A

Table 5-3: Existing Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
MacCorkle Avenue and Sixth Street*	EB	0.4	A	0.3	A
	WB	0.6	A	0.9	A
	NB	10.2	B	38.2	E
	SB	11.5	B	33.31	D
	Overall	1.2	A	1.6	A
MacCorkle Avenue and Boone Street*	EB	0.0	A	0.0	A
	WB	0.3	A	9.5	A
	NB	13.2	B	11.6	B
	Overall	0.4	A	1.0	A

*Unsignalized intersection analysis

5.7 Crash Analysis

WVDOH provided crash data for the Third Street Corridor from 2011 through 2013. 68 crash records were provided for the three year period. Due to limitations in the data provided, only 59 crashes were identified within the study area. It is important to note that the data in this study only includes crashes that actually occurred on Third Street itself. If a crash occurred on a side street at an intersection with Third Street, it is not included.

Crash Trends for Study Corridor

Eight of the 59 crashes were injury crashes and 51 only involved property damage. No fatalities were reported.

Figure **5-24** summarizes the collision type for the 59 crashes.

Nearly half (42%) of the crashes were rear end collisions. This pattern could indicate that congestion is a contributor to crashes. From the information provided, it could not be determined if pedestrians or bicyclists were involved in any of the reported crashes.

Figure 5-25 summarizes the lighting conditions for the 59 reported crashes. The vast majority of crashes (78%) occurred under daylight conditions indicating that lighting during nighttime conditions (or lack of lighting) was not a major contributor to crashes.

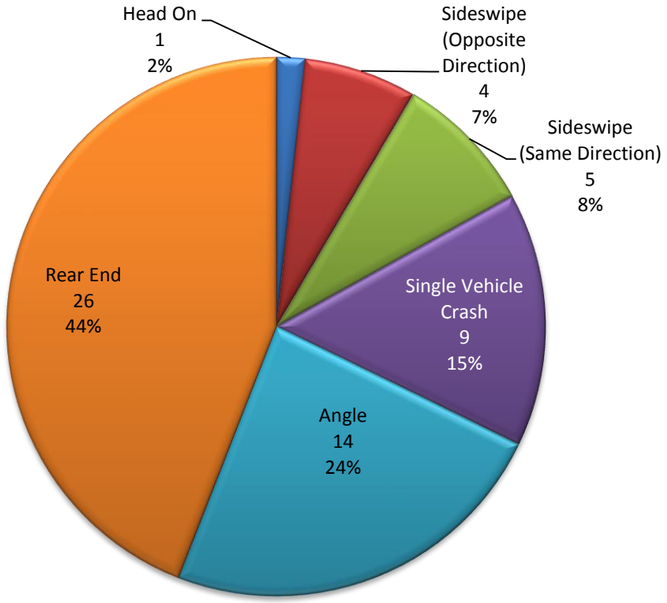


Figure 5-24: Crashes by Collision Type

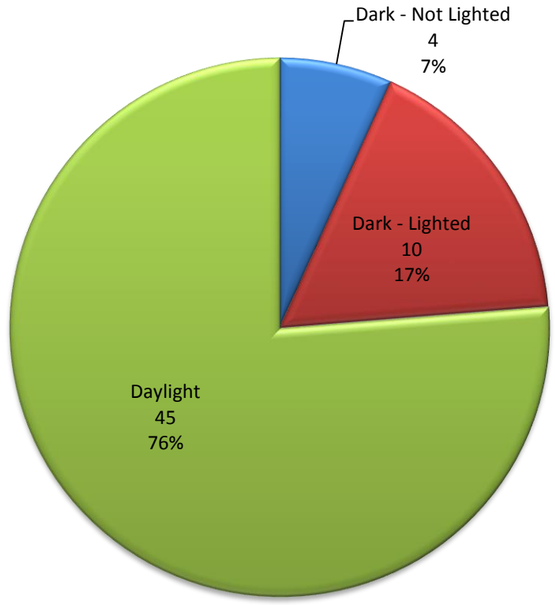


Figure 5-25: Crashes by Lighting Condition

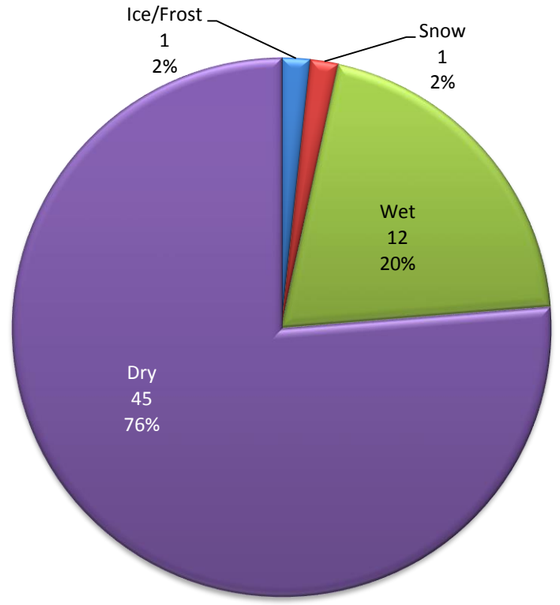


Figure 5-26: Crashes by Roadway Condition

The roadway conditions for each of the 59 crashes are illustrated in **Figure 5-26**. With 76% of the crashes occurring under dry roadway conditions, it is unlikely that adverse weather conditions are major causes of crashes.

Figure 5-27 illustrates the number of crashes sorted by the hour in which they occurred. Seven crashes occurred in both the 15:00 hour (3 PM) and 17:00 hour (5 PM). The peak hour for vehicular volume was observed to be 5:00 PM to 6:00 PM which coincides with the hour when the highest number of crashes were observed in the corridor.

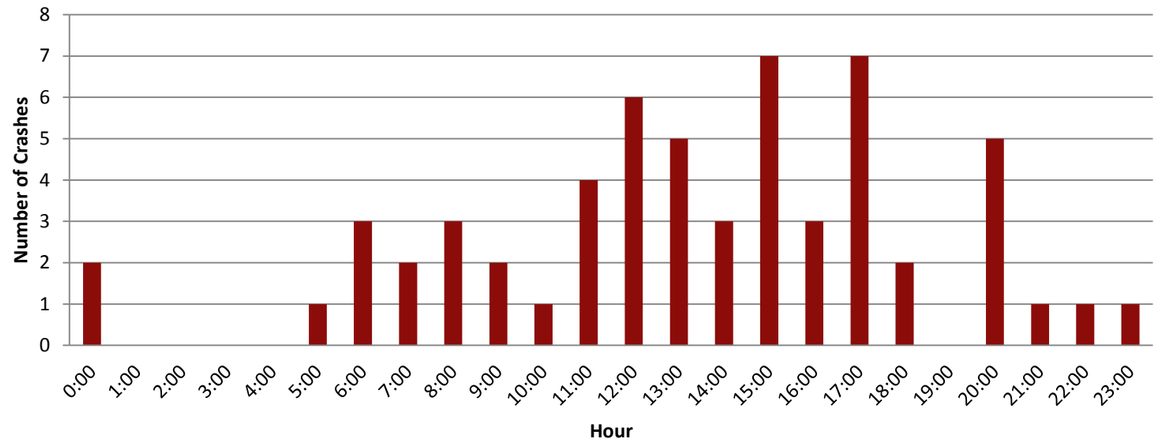
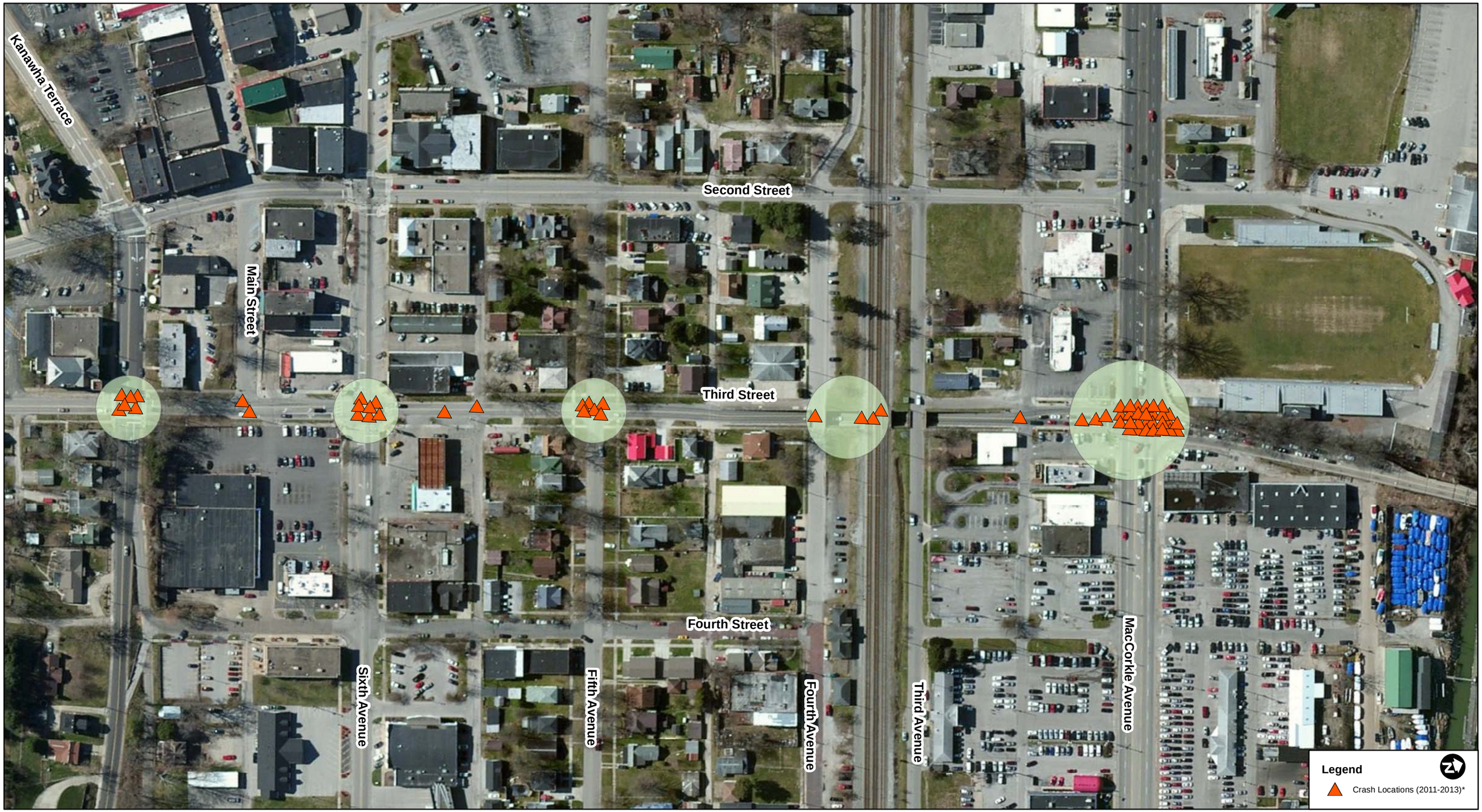


Figure 5-27: Crashes by Hour of Occurrence

High Vehicular Crash Locations

Figure 5-28 illustrates the locations in the corridor with the highest number of crashes, based on the 59 of 68 crashes that could be physically located.

31 of the located crashes occurred at the intersection of Third Street and MacCorkle Avenue over the three year period. Only four of those 31 crashes resulted in injuries. Over half of the crashes (19) were rear end collisions indicating that congestion along the Third Street and St. Albans/Nitro Bridge approaches may be a contributor to the crashes. The remaining 12 crashes were sideswipes in the same direction (4), single vehicle crashes (4), and angle collisions (4). This information only includes crashes reported along Third Street, and does not include crashes from MacCorkle Avenue. It is assumed that the actual number of total crashes that occurred at this intersection is higher than the 31 discussed here.



Source of Data: West Virginia Division of Highways (WVDOH)

*Data only includes crashes occuring on 3rd Street

Figure 5-28: Locations with Highest Number of Crashes (2011-2013)

Four of the located crashes occurred within the underpass area. Two of the crashes were single vehicle crashes and two were sideswipe in the opposite direction. The sideswipe collisions are likely a result of the underpass's narrow travel lanes. Without more information, the study team was unable to determine the cause or details surrounding the single vehicle collisions. After discussions with emergency responders through stakeholder interviews, the study team believes that more crashes occur in the underpass than are reported. Many incidents involving minor property damage, such as the clipping of side view mirrors, go unreported.

Six of the located crashes occurred at the Third Street and Fifth Avenue intersection in 2011 through 2013. Three of these crashes were angle collisions. Two crashes were rear end collisions and one crash involved a single vehicle. None of the crashes resulted in injury. Given current traffic volumes, these crash frequencies are not unusual for an unsignalized intersection.

Seven of the located crashes occurred at the Third Street and Sixth Avenue intersection between 2011 and 2013. Of the seven crashes, three resulted in injuries. Three crashes were rear end collisions (3), three were angle collisions (3) and one was a single vehicle collision. Given the volume of traffic at this intersection, this is not considered an unusually high frequency of crashes.

Six of the located crashes occurred at the intersection of Third Street and Kanawha Terrace. Three of these crashes were angle collisions. The other three were a rear end collision, a single vehicle crash, and a head on collision. Four of the seven crashes, occurred under wet pavement conditions. Given the steep profile of Third Street, wet pavement could be a contributor to crashes at this intersection. However, six crashes in a three year period are not considered an unusually high frequency.

Train Crashes

The *St. Albans Railroad Crossing Study* discussed crashes involving trains in St. Albans, The study team obtained this data from the Federal Rail Administration (FRA) for the years 1976 through 2010. During this 34 year time period, 32 crashes were reported with four resulting in fatalities. In April 2001, crossbucks were added/upgraded at all at-grade crossings with bells and flashing lights installed at select crossings. From 1976 to 2001 (prior to the crossing upgrades), there was an average of 1.1. crashes per year (28 total crashes) with nearly half (13 crashes) occurring at the Second Street crossing. Between 2001 and 2010, there were 0.4 crashes per year (4 total crashes). Of the four crashes occurring after 2001, three occurred at B Street and one occurred at Fifth Street. Each crash is summarized below:

- **B Street Crossing – February 21, 2010**: At approximately 10:45 AM on a clear day, a 64 year-old male pedestrian trespassed and was struck by a freight train moving at 49 mph. The gates, bells, and lights were operational. The pedestrian was killed as a result of the crash.
- **B Street Crossing – November 13, 2006**: On a cloudy night at approximately 8:50 PM, a 33 year-old female drove her vehicle around the gates as a train approached. The car was struck by the train traveling at 10 mph. No injuries and only minor damage to the passenger car were reported. The gates, bells, and lights were operational.
- **Fifth Street Crossing – January 14, 2006**: At approximately 3:05 PM on a clear day, a passenger car was stuck on the tracks as a freight train approached. The train struck the unoccupied vehicle. The gates, bells, and lights were operational and no injuries were reported.
- **B Street Crossing – December 12, 2003**: On a clear day at approximately 5:00 PM, a 21 year-old male drove his vehicle around the gates as a freight train approached. The car was struck by the train traveling at 41 mph. There were no injuries and only minor damage to the passenger car. The gates, bells, and lights were operational.

Train crash history does not indicate that there is a severe crash problem at the adjacent crossings to Third Street.

5.8 Environmental Overview

The following environmental overview (provided by WVDOH) allows the WVDOH and RIC to consider potential environmental impacts of improvement options in this area. Capital projects that result from this study will undergo a more detailed environmental review by the WVDOH Engineering Division, Environmental Section under the requirements of the National Environmental Policy Act (NEPA). A more detailed environmental review will be required for any identified projects funded by state or federal monies regardless if the project is located inside or outside existing State-owned right-of-way (ROW), and would be performed in consultation with the FHWA, as well as several other local, state and federal agencies.

While the core study area for this plan is the Third Street corridor from Kanawha Terrace to MacCorkle Avenue, the environmental overview covers a larger study area bounded by B Street on the west, Kanawha Terrace on the south, Boone Street on the east, and MacCorkle Avenue on the north.

Threatened or Endangered Species

The FHWA, WVDOH, and United States Fish & Wildlife Service (USFWS) entered into a *Memorandum of Understanding* (MoU) concerning the review and protection of Federally listed endangered/threatened and proposed/candidate species, as well as eagles. Part of this review consists of the WVDOH screening project or study areas against a Geographic Informational System (GIS) database of threatened and endangered species information. The GIS database concerning threatened and endangered species is maintained in consultation and cooperation with the WVDOH, USFWS and West Virginia Department of Natural Resources (WVDNR).

The study area was checked against the threatened and endangered species GIS layers. The database review did not indicate any threatened or endangered species within the study area. However, the Kanawha River is known to include federally listed mussels. The study area is located within the buffer zone of the Kanawha River. The Coal River also contains a known mussel population and the study area is located within the buffer zone as well.

For any proposed construction project in the study area, the WVDOH Engineering Division, Environmental Section would complete additional consultation with the USFWS and the WVDNR concerning federally listed species.

Cultural Resources

Part of the environmental overview also consists of consultation with the West Virginia State Historic Preservation Office (WVSHPO) concerning cultural resources. The WVDOH and the WVSHPO work together to identify, recognize, preserve and protect West Virginia's cultural resources. The WVSHPO maintains a database of sites that are listed on the National Register of Historic Places (NRHP).

The study area is a mix of residential and commercial development. A search of WVSHPO's records indicates that several individual properties and one area within the study area are listed on the NRHP. The St. Albans Main Street Historic District was listed on the NRHP on November 2, 2000. The district is roughly bounded by Main Street between Second Street and B Street. Individual properties listed on the NRHP within the study area and the dates which they were listed, include the St. Albans C&O Railroad Depot (July 1997), St. Albans Post Office (November 1994), St. Mark's Episcopal Church (November 1977), William E. Mohler House (February 1983) and The Beeches or Huntington-Skinner House/Woman's Club of St. Albans (April, 1979). A screenshot of the results is presented in **Figure 5-29**. Archaeological sites are not included with this information.

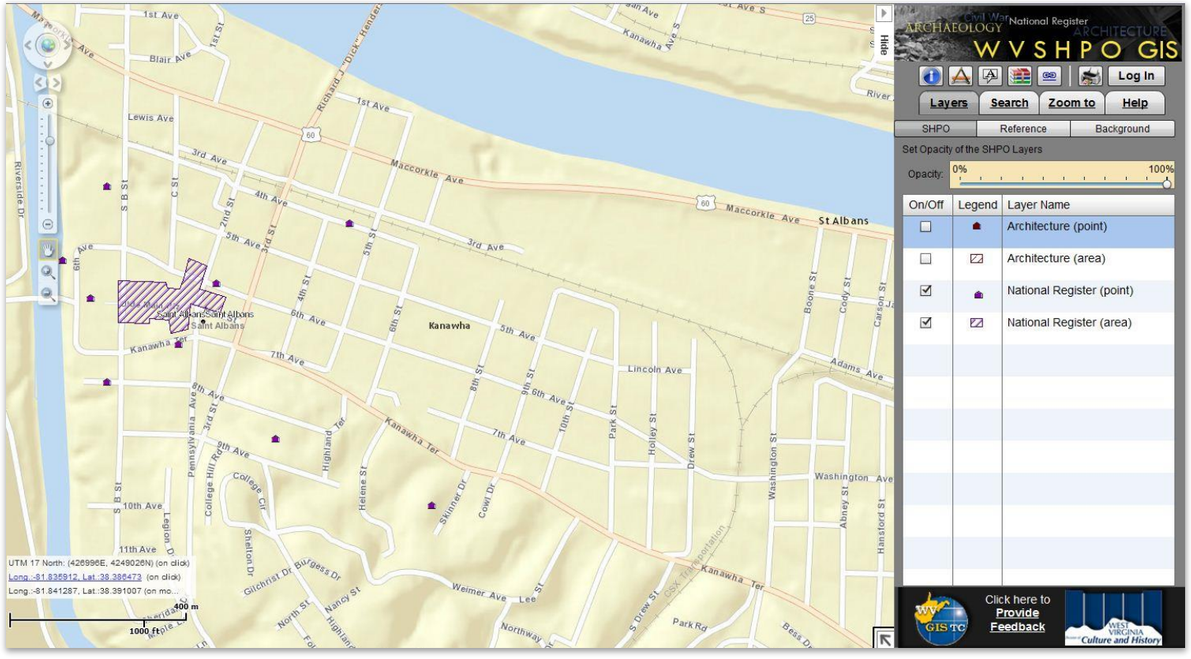


Figure 5-29: WVSHPO GIS of Study Area

The Third Street underpass is located beneath two city bridges and one CSX Corporation railroad bridge. These three structures are over 50 years old and would have to be assessed to determine if they are eligible for listing on the NRHP. A photograph of the railroad bridge is illustrated in **Figure 5-30**.

An environmental planning overview letter, dated April 15, 2015, was sent to the WVSHPO regarding this study. Their response, dated June 8, 2015 is found in **Appendix H**.

Figure 5-30: Third Street Underpass with CSX Corporation Railroad Bridge (Facing North)

The WVSHPO recommended their office be consulted regarding a scope of work to fully survey and evaluate the study area for National Register eligibility. Furthermore, the WVSHPO reports that five previously documented archaeological resources (46KA80, 46KA82, 46KA282, 46KA52 and 46KA53) are located within the study area. These resources include prehistoric habitation sites and a frontier fort site. The locations and limits of the archaeological sites are not public information, and therefore not included in this document.

For any projects that are advanced from this study, the WVDOH Engineering Division, Environmental Section would complete a review under NEPA of the project area. Individual properties would be assessed for their historical and/or architectural significance. Additional consultation with the WVSHPO would be performed.

Public and Recreational Properties

The study area is located near the center of St. Albans. Many drivers use the Third Street corridor to access St. Albans. As previously stated, the project area is almost entirely residential or commercial development.

The St. Albans High School football field, Jim Crawford Field, is located at the southern end of the Dick Henderson Memorial Bridge, at the intersection with MacCorkle Avenue. St. Albans Little League has a baseball/softball field located on the north side of Kanawha Terrace in the southeastern corner of the study area. Additionally, there is a small playground at the intersection of Boone Street and Adams Avenue on the eastern side of the study area. This playground may be associated with a housing development that is located on Cody Street.

Central Elementary School is located near the middle of the study area on Kanawha Terrace, and is adjacent to State ROW. Although not identified as a public school, Saint Francis of Assisi Church School is located along Sixth Avenue. St. Albans Library is also located on Sixth Avenue.

United States Environmental Protection Agency EnviroMapper®

The WVDOH utilized the United State Environmental Protection Agency (USEPA) EnviroMapper® tool to identify known sites concerning the following:

- Air releases
- Drinking water
- Toxic releases
- Hazardous wastes
- Water discharge permits
- Superfund sites

This information is limited to documented sites within the study area. There is potential for additional sites. However, no additional work was performed to identify other potential sites.

A total of 32 sites were identified on USEPA EnviroMapper®. Information concerning each site is found in **Appendix I**. A screenshot of the project study area is presented in **Figure 5-31**.

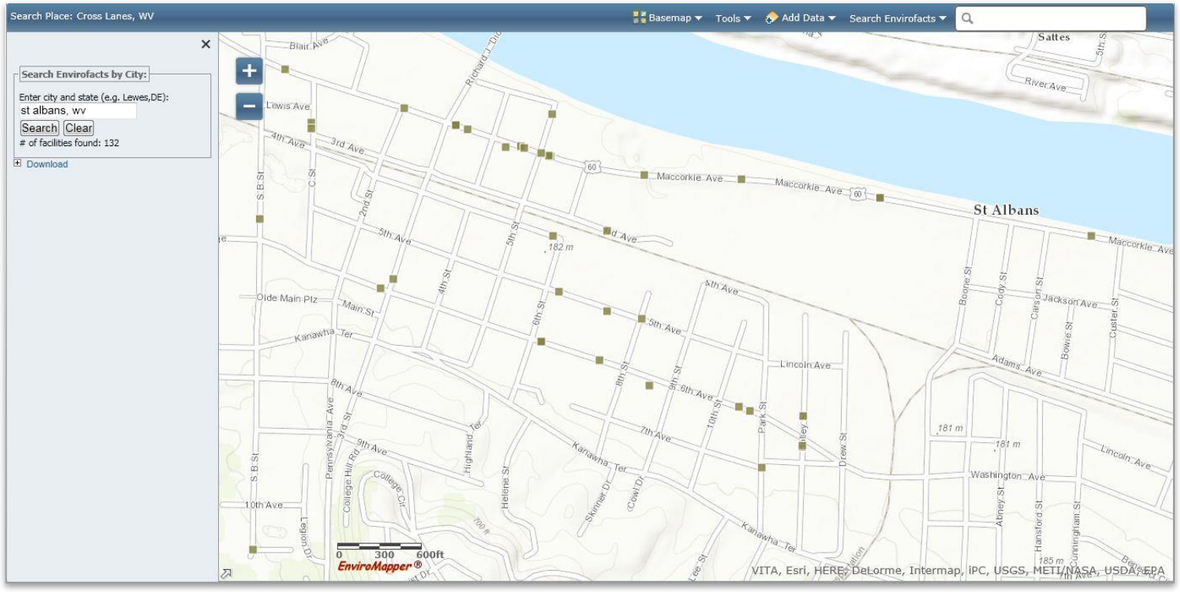


Figure 5-31: USEPA EnviroMapper® of Study Area

2010 US Census Data

The study team accessed information from the 2010 Census and 2009-2013 American Community Survey for both Kanawha County and the State of West Virginia. The 2010 Census data is broken down into two separate tracts for the study area, 135, and 138. A 2010 census map is shown in **Figure 5-32**.

The 2010 Census and 2009-2013 American Community Survey data state the following for St. Albans (Tract 135 and Tract 138):

- Population of 11,044
- 6% minority population (4% and 3%)
- 5.4% below the poverty level (2.7% and 26.7%)
- $46,563 median household income
- 1.9% of population speaks a language other than English

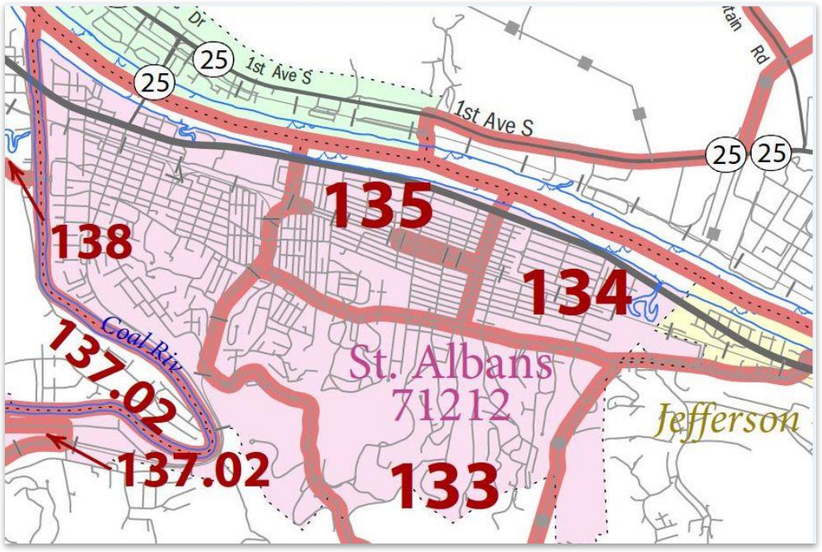


Figure 5-32: 2010 St. Albans Census Map

The following 2010 Census data was obtained for Kanawha County, and the State of West Virginia, respectively:

- Population of 193,063 / 1,852,994
- 11% / 6.5% minority population
- 11% / 18% below the poverty level
- $46,085 / $41,043 median household income
- 4.6% / 2.4% of population speaks a language other than English

5.9 Stakeholder Input

As previously discussed, a key component of this project was stakeholder input. Stakeholder interviews were conducted to solicit feedback on the current issues and needs in the corridor. During the interview, stakeholders were asked to identify current issues and problems in the corridor. The list of stakeholders interviewed was discussed in Section 3. Key problems in the corridor identified by stakeholders include the following:

- The newer KVRTA buses must be rerouted because they cannot fit in the underpass because they are too wide
- Congestion at Third Street and MacCorkle Avenue intersection
- Congestion at Third Street and Sixth Avenue intersection
- Fire trucks avoid using the underpass whenever possible because it is too narrow
- As a result of congestion at Third Street and MacCorkle Avenue intersection, police officers are trained not to use the underpass in emergency situations
- The sidewalk in the underpass is not well used because it is dirty with mud and debris from the railroad tracks
- Bike lanes along MacCorkle Avenue are usually filled with gravel and debris making them virtually unusable

The feedback provided by stakeholders further verified the results of the existing corridor conditions analysis and the field reviews and identified the need for improvements in the corridor.

Chapter 6:
Traffic Forecasts and Future Traffic Operations

The study team developed traffic forecasts for the corridor to evaluate and predict future traffic conditions if no improvements are made. Additionally, the team used these forecasts to ensure that any improvements made will meet future capacity needs. The future year selected for this study is 2040. The following section describes the 2040 volume development process and the analysis of the future year volumes under "Do Nothing" conditions.

6.1 Traffic Forecasts

The regional travel demand model (TDM) traffic forecasts for the study area were developed by RIC. **Figure 6-1** illustrates the future growth in traffic volumes (percentage per year) estimated from the TDM data for the St. Albans study area between the years 2010 and 2040. The land in the vicinity of the study area is more or less fully developed. Therefore, most of the growth on the roadways in the St. Albans study area comes from growth in pass-through traffic, redevelopment, and new developments outside the zones of influence. Several links in the study area indicate negative growth while several others in the study area indicate positive total growth percentage over the 30 year span:

- Growth on Third Street varies from negative 0.11 percent per year to negative 0.20 percent per year
- Growth on MacCorkle Avenue varies from 0.4 percent per year to 0.6 percent per year
- Growth on Kanawha Terrace varies from negative 0.15 percent per year to positive 0.54 percent per year
- Growth on Sixth Avenue varies from negative 0.11 percent per year to negative 0.68 percent per year.

The cutline volumes across the study area for the 24 hour time periods were extracted from the 2010 and 2040 (E+C) TDM. The difference in the cutline volumes provides an estimate of how much the overall study area traffic grows. This growth estimate comes to about 16% for the 30 year span or about 0.53 percent per year.

The study team developed a count based OD-matrix for the St. Albans study area to determine traffic forecasts for the St. Albans intersections. This count based OD-matrix is a synthetic matrix that adjusts TDM based sub-area matrices to match the existing counts. Synthetic matrices for the current study are estimated by adjusting the synthetic matrices from the *St. Albans Railroad Crossing Study* to match the comprehensive count data set including 2014 and 2012 counts. Once a reasonable 2014 count based sub-area matrix is estimated, the team applies growth of 0.55% per year to each ij pair in the 2014 count based matrix to determine the 2040 sub-area matrix. Intersection turning movements for the future year are determined by assigning the forecasted horizon year OD-matrices using the equilibrium assignment procedure in Transmodeler.

Figure 6-2 summarizes the 2040 AM and PM peak hour intersection turning movement volumes for the Third Street intersections. These volumes are representative of "Do Nothing" conditions. Future volumes for the other intersections for all scenarios can be determined from the Transmodeler files included in **Appendix J**.

6.2 Future "Do Nothing" Traffic Operations

The study team conducted an analysis of future volumes under existing geometric conditions ("Do Nothing" conditions) to establish a baseline for assessing the impact of proposed improvements on traffic operation. **Table 6-1** summarizes the future "Do Nothing" conditions analysis results generated by Transmodeler. These results are the average of 10 different model runs for both the AM and PM peak hours. Statistics reported in the table include average delay per vehicle experienced on each approach (seconds per vehicle), and approach and intersection LOS. It is important to note that while no geometric modifications were made, the team optimized signal timings for the analysis.

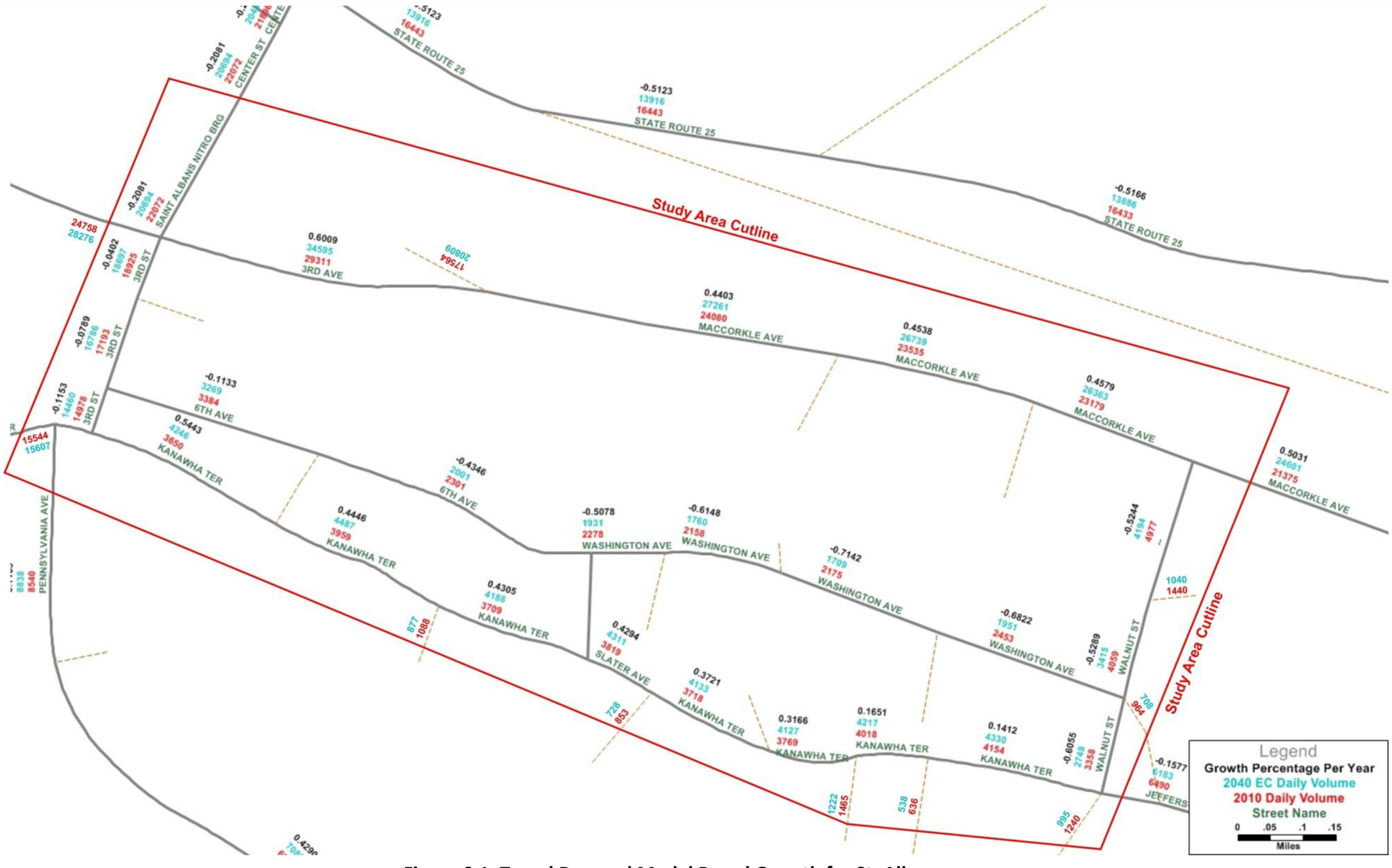
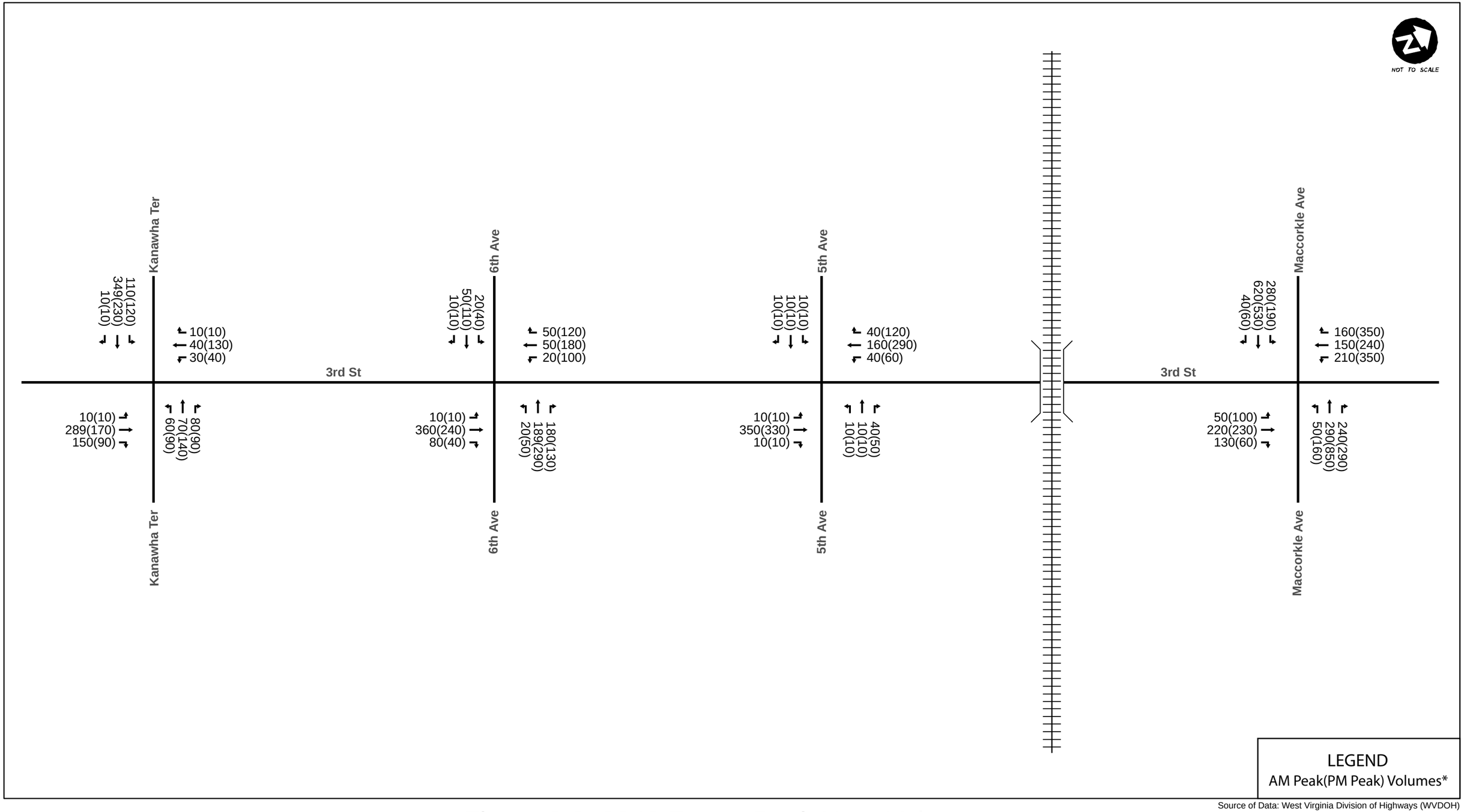


Figure 6-1: Travel Demand Model Based Growth for St. Albans



Source of Data: West Virginia Division of Highways (WVDOH)

Figure 6-2: 2040 Future Peak Hour Volumes

Table 6-1: "Do Nothing" Conditions Operations Summary

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Kanawha Terrace and B Street*	EB	6.3	A	9.6	A
	NB	15.0	C	14.4	B
	SB	14.3	B	15.4	C
	Overall	7.4	A	12.9	B
Kanawha Terrace and Second Street	EB	22.1	C	21.4	C
	WB	9.9	A	9.4	A
	NB	27.6	C	24.7	C
	SB	24.2	C	28.4	C
	Overall	20.7	C	20.8	C
Kanawha Terrace and Third Street	EB	11.2	B	10.6	B
	WB	10.7	B	9.5	A
	NB	42.7	D	34.3	C
	SB	26.7	C	32.1	C
	Overall	20.6	C	17.8	B
Kanawha Terrace and Fourth Street*	EB	4.6	A	3.2	A
	WB	2.1	A	4.4	A
	Overall	4.4	A	3.3	A
Kanawha Terrace and Sixth Street*	EB	2.9	A	4.2	A
	WB	1.1	A	4.1	A
	SB	10.7	B	15.8	C
	Overall	2.0	A	6.9	A
Sixth Avenue and B Street*	WB	10.0	B	8.2	A
	NB	19.0	C	15.7	C
	SB	17.3	C	20.6	C
	Overall	11.5	B	11.2	A
Sixth Avenue and C Street*	EB	3.1	A	9.7	A
	WB	1.7	A	4.4	A
	NB	12.6	B	18.0	C
	SB	15.0	C	19.4	C
	Overall	5.1	A	5.2	A
Sixth Avenue and Second Street	EB	8.0	A	10.9	B
	WB	10.9	B	10.9	B
	NB	25.5	C	25.2	C
	SB	27.0	C	29.0	C
	Overall	16.3	B	17.3	B
Sixth Avenue and Third Street	EB	10.6	B	7.7	A
	WB	12.3	B	9.5	A
	NB	34.4	C	29.8	C
	SB	23.3	C	34.3	C
	Overall	22.0	C	23.7	C

Table 6-1: "Do Nothing" Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Sixth Avenue and Fourth Street*	EB	3.9	A	3.1	A
	WB	6.4	A	12.3	B
	NB	13.8	B	15.4	C
	SB	13.5	B	17.2	C
	Overall	7.5	A	5.8	A
Sixth Avenue and Fifth Street*	EB	7.9	A	8.4	A
	WB	7.4	A	7.5	A
	NB	14.0	B	21.2	C
	SB	13.7	B	26.1	D
	Overall	9.5	A	14.3	B
Sixth Avenue and Sixth Street*	EB	1.7	A	2.9	A
	WB	2.1	A	5.9	A
	NB	15.7	C	13.8	B
	SB	11.7	B	13.7	B
	Overall	5.6	A	3.4	A
Fifth Avenue and C Street*	WB	13.3	B	11.1	B
	NB	3.0	A	3.3	A
	SB	10.5	B	13.6	B
	Overall	7.2	A	4.8	A
Fifth Avenue and Second Street*	EB	12.4	B	10.1	B
	WB	8.5	A	11.3	B
	NB	13.2	B	10.5	B
	SB	9.3	A	13.4	B
	Overall	12.6	B	11.2	B
Fifth Avenue and Third Street*	EB	8.4	A	20.7	C
	WB	15.2	C	16.5	C
	NB	5.9	A	11.0	B
	SB	9.5	A	11.5	B
	Overall	9.6	A	14.3	B
Fifth Avenue and Fourth Street*	EB	4.5	A	3.4	A
	WB	5.8	A	3.2	A
	NB	12.6	B	14.2	B
	SB	12.1	B	11.3	B
	Overall	7.6	A	8.0	A
Fifth Avenue and Fifth Street*	EB	10.2	B	12.5	B
	WB	12.8	B	12.9	B
	NB	13.8	B	11.2	B
	SB	9.3	A	13.0	B
	Overall	11.9	B	12.8	B
Fifth Avenue and Sixth Street*	EB	6.6	A	12.3	B
	WB	6.1	A	9.7	A
	NB	17.1	C	11.5	B
	SB	14.4	B	15.0	B
	Overall	7.3	A	12.1	B

Table 6-1: "Do Nothing" Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Fourth Avenue and C Street*	EB	14.9	B	16.5	C
	WB	14.3	B	13.8	B
	NB	5.2	A	13.6	B
	SB	3.9	A	11.8	B
	Overall	6.9	A	12.8	B
Fourth Avenue and Second Street*	EB	12.0	B	14.3	B
	WB	14.9	B	16.3	C
	NB	4.8	A	9.5	A
	SB	6.1	A	10.4	B
	Overall	9.5	A	11.5	B
Fourth Avenue and Fourth Street*	EB	3.4	A	4.8	A
	WB	3.2	A	5.4	A
	NB	11.7	B	12.4	B
	Overall	6.1	A	8.7	A
Fourth Avenue and Fifth Street*	EB	9.5	A	14.8	B
	WB	11.2	B	10.1	B
	NB	2.7	A	3.1	A
	SB	6.1	A	6.2	A
	Overall	8.2	A	4.8	A
Third Avenue and C Street	EB	15.7	C	17.8	C
	WB	11.7	B	6.9	A
	NB	4.8	A	12.8	B
	SB	4.9	A	13.0	B
	Overall	6.8	A	13.2	B
Third Avenue and Second Street*	EB	14.7	B	14.3	B
	WB	15.5	C	16.4	C
	NB	3.7	A	11.8	B
	SB	3.9	A	10.8	B
	Overall	4.5	A	11.8	B
Third Avenue and Fourth Street*	EB	5.4	A	11.9	B
	WB	1.5	A	3.3	A
	SB	12.7	B	15.4	C
	Overall	2.9	A	6.7	A
Third Avenue and Fifth Street*	EB	7.9	A	15.7	C
	WB	5.3	A	25.6	D
	NB	9.4	A	9.5	A
	SB	6.1	A	11.0	B
	Overall	7.4	A	12.0	B

Table 6-1: "Do Nothing" Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Third Avenue and Sixth Street*	EB	1.5	A	1.4	A
	SB	7.2	A	10.3	A
	Overall	2.0	A	2.3	A
MacCorkle Avenue and B Street	EB	19.8	B	19.1	B
	WB	9.3	A	15.0	B
	NB	26.3	C	26.8	C
	SB	24.3	C	23.2	C
	Overall	19.9	B	19.2	B
MacCorkle Avenue and C Street*	EB	2.6	A	2.6	A
	WB	4.7	A	5.6	A
	NB	17.4	C	30.5	D
	SB	21.4	C	16.5	C
	Overall	4.4	A	7.2	A
MacCorkle Avenue and Second Street*	EB	4.4	A	6.5	A
	WB	5.2	A	3.4	A
	NB	20.4	C	28.3	D
	SB	21.8	C	33.5	D
	Overall	6.5	A	4.2	A
MacCorkle Avenue and Third Street	EB	36.4	D	34.8	C
	WB	31.4	C	49.9	D
	NB	89.3	F	58.8	E
	SB	69.6	E	76.6	E
	Overall	53.5	D	54.0	D
MacCorkle Avenue and Fourth Street*	EB	3.4	A	5.9	A
	WB	3.9	A	3.0	A
	NB	17.2	C	23.2	C
	SB	26.0	D	19.7	C
	Overall	5.6	A	4.8	A
MacCorkle Avenue and Fifth Street*	EB	4.4	A	4.1	A
	WB	4.4	A	6.0	A
	NB	46.6	E	19.9	C
	SB	18.2	C	15.1	C
	Overall	5.6	A	9.2	A

Table 6-1: "Do Nothing" Conditions Operations Summary (Continued)

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
MacCorkle Avenue and Sixth Street*	EB	4.8	A	3.2	A
	WB	4.0	A	4.5	A
	NB	12.2	B	41.7	E
	SB	15.4	C	35.6	E
	Overall	4.4	A	7.5	A
MacCorkle Avenue and Boone Street*	EB	2.5	A	4.6	A
	WB	2.4	A	11.5	B
	NB	18.5	C	14.4	B
	Overall	2.9	A	8.7	A

*Unsignalized intersection analysis

Operations at study area intersections are expected to be worse in 2040 if no improvements are made in the corridor. These analysis results will be compared to the operations of potential improvements to measure their effectiveness in improving traffic flow along Third Street.

Chapter 7:
Goals, Objectives, and Evaluation Criteria

This section of the report presents the goals and objectives, which establish the foundation for the evaluation of improvement options in the corridor. Also described in this section is the evaluation criteria, which further define how the goals and objectives are to be measured.

7.1 Study Goals and Objectives

Based on the deficiencies and needs identified by the existing and future conditions analysis and feedback from the steering group and stakeholders, the following study goals and objectives were identified for the corridor study area:

- Create an attractive gateway for St. Albans
- Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue
- Reduce congestion at the intersection of Third Street and 6th Avenue
- Improve pedestrian access and experience across (over/under) railroad tracks
- Improve bicycle access and experience across (over/under) railroad tracks
- Minimal disruption to CSX railroad operations during construction
- Increase access to downtown St. Albans for economic development reasons
- Constructible and affordable solutions
- Improve horizontal (width) clearance so buses can use underpass without problems
- Improve horizontal (width) clearance so semi-trailer trucks can use the underpass without problems
- Improve horizontal (width) clearance so fire trucks can use the underpass without problems
- Improve vertical (height) of underpass so taller vehicles can clear the underpass
- Reduce driveway conflicts between underpass and MacCorkle Avenue

At the public meeting held in October 2015, citizens were asked to comment on their agreement with the goals and objectives. Of the six comments received, three agreed with the goals and objectives, two agreed with some of the goals and objectives, and one citizen did not provide a response to this question. The two citizens that agreed with some of the goals and objectives for the corridor indicated that access for semi-trailer trucks should not be a goal or objective because they felt it would increase issues rather than solve the traffic problem. Because the majority of respondents agreed with most of the goals and objectives, no modifications were made.

7.2 Critical Success and Failure Factors

In addition to goals and objectives, critical success and failure factors were also identified related to the ultimate implementation of improvements. While a certain concept might address the goals and objectives, if it is highly unlikely to be implemented, it is not a viable concept. The following critical success/failure factors were identified through discussions with stakeholders:

- Failure to demonstrate need for improvements
- Opposition from business owners
- Opposition from local residents
- Lack of funding
- Non-cooperation from CSX

7.3 Evaluation Criteria

To better measure the level at which the concept or scenario meets the corridor goals and objectives, more quantifiable Evaluation Criteria were defined for each goal (see **Table 7-1**). To solicit input on the goals an evaluation criteria, and to better define the importance of each goal to stakeholders, an electronic survey was sent to a cross section of stakeholders including representatives from RIC, WVDOH, KVRTA, City of St. Albans, St, CSX, and Kanawha County Schools. Respondents were specifically asked to rate the importance of each goal on a scale of 1-5. A copy of the survey is included in **Appendix K**. The level of importance will be used to help prioritize concepts or scenarios. The goals with the highest "importance" ranking will be given more weight in the evaluation of concepts and alternatives.

Table 7-1: Scenario Evaluation Criteria

Goal	Importance*	Evaluation Criteria
Constructible and affordable solutions	4.3	Provides a solution that meets identifiable needs, has a cost that is in reasonable proportion to the benefits, adverse environmental impacts, and adverse impacts to adjacent properties and stakeholders.
Minimal disruption to CSX railroad operations during construction	4.3	Provides a solution that will maintain safe rail operations throughout the construction process. It is anticipated that a project that requires more than 48 hours of interruption to railroad traffic flow will be unacceptable.
Improve horizontal clearance (width) so buses can use underpasses without problems	4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail).
Improve horizontal clearance (width) so fire trucks can use the underpass without problems	4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail).
Creates an attractive gateway for St. Albans	4.0	Provides a noticeable, distinctive, and aesthetic entry to St. Albans on Third Street.
Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue	3.8	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the highly traveled and urban location for this intersection, users expect to experience delay at this intersection. Therefore, LOS D or better for all approaches is considered preferred. LOS E on an approach or approaches, with an overall LOS D, would be considered acceptable for this intersection.
Increase access to downtown St. Albans for economic development reasons	3.8	Provides acceptable travel times between downtown St. Albans (Main Street) and MacCorkle Avenue and the WV 25 Bridge using Third Street. Acceptable travel time is less than 2 minutes.
Improve vertical (height) of underpass so taller vehicles can clear the underpass	3.7	Provides at least 14.5 feet of vertical clearance under bridges.
Reduce congestion at the intersection of Third Street and Sixth Avenue	3.7	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the less traveled and neighborhood/central business district location for this intersection, users would not expect to experience significant delay at this intersection. Therefore, LOS C or better for all approaches is considered preferred. LOS D on an approach or approaches, with an overall LOS C, would be considered acceptable for this intersection.
Improve pedestrian access and experience across (over/under) railroad tracks	3.3	Provides reasonably good conditions for pedestrians such as: good lighting, adequately wide sidewalk, lack of debris on sidewalk, ADA compliant pathways, and a reasonably direct walking route across the railroad tracks.
Improve horizontal clearance (width) so semi-trailer trucks can use the underpasses without problems	3.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail).
Reduce driveway conflicts between underpasses and MacCorkle Avenue	3.2	Meets TRB Access Management Manual guidance for driveway spacing and design.
Improve bicycle access and experience across (over/under) railroad tracks	3.0	Provides reasonably good conditions for biking such as: a reasonably comfortable location for cyclists to ride, lack of debris/mud in path of the cyclist, and a reasonably convenient route across the railroad tracks for cyclists.

*Based on a Stakeholder Survey on the importance of each goal. The value represents the average score for that goal on a scale of 1 (not important) to 5 (highest importance).

Chapter 8:
Alternatives Development

The process for developing and refining alternatives for this study started with a large number of initial concepts. The study team evaluated these concepts to systematically reduce and refine them into "scenarios" for detailed analyses. Sources for the concept included previous studies, stakeholder input, and the study team's experience and research.

8.1 Initial Concepts

Early in the study process, there were no limitations for types of improvements to consider. During interviews, stakeholders were encouraged to provide ideas for potential solutions for the corridor. Ideas included: widening the underpass, removing the sidewalk in the underpass to widen the travel lanes, constructing an exclusive southbound left-turn lane at Sixth Avenue, and filling in the underpass to create an at-grade crossing. Additional ideas were generated through brainstorming sessions with the study team. All concepts were compiled into a list for further evaluation and screening.

8.2 Initial Concept Screening

The study goals and objectives and the critical success/failure factors were used to screen concepts. If a concept did not meet an important goal or if an objective had a critical failure factor, it was eliminated from consideration. **Table 8-1** summarizes the concepts that were considered but eliminated. The study team identified goals addressed by the concept, the critical success/failure factors, and potential reasons to eliminate each concept

8.3 Development of Scenarios

The concepts that were not eliminated were included in one of four "scenarios". Scenarios are a set of concepts packaged together to illustrate a certain vision for the corridor. The scenarios are developed to allow for further evaluation of concepts and are not intended to be alternatives from which to "pick one." Concepts from different scenarios can be "mixed and matched" as appropriate in the final recommendations.

Table 8-2 summarizes the concepts that were carried forward into scenarios. Similar to **Table 8-1**, the goals addressed by the concept as well as critical success and failure factors were identified for each concept.

The final scenarios carried forward for further evaluation are discussed in Section 9 of this report.

Table 8-1: Initial Concepts Considered and Eliminated

Concept	Goals Potentially Addressed*	Critical Success/Failure Factors Potentially Applicable**	Comments
Pedestrian overpass	4, 5, 7	2, 3, 4	High cost and impacts and inconvenient for pedestrians (very little usage anticipated).
Overpass connecting to Second Street	2, 4, 6, 7, 9, 10, 11, 12, 13	2, 3, 4	Cost and impacts expected to be significantly higher than benefits.
New underpass along another street	2, 4, 5, 7, 9, 10, 11, 12	1, 2, 4, 5	Cost and impacts expected to be significantly higher than benefits; deters from creating a gateway into St. Albans; underpass more convenient at Third Street because of the WV 25 Bridge
Make Third Street an at-grade railroad crossing	8, 9, 10, 11, 12	2, 3, 5	Significant CSX opposition and lack of grade separated crossing for emergency vehicles. Increases traffic delay due to trains, since grade separated crossing is eliminated. Although the concept allows for greater horizontal and vertical clearances on Third Street, there are adjacent crossings that provide the same clearances, so there is no true net benefit.
Make Third Street reversible within the underpass	6, 7, 8, 9, 10, 11	2, 3	Hard to regulate with number of driveways and accesses along Third Street and difficult to enforce. Won't improve operations at Third Street and MacCorkle Avenue
Overpass at Third Street	2, 4, 6, 7, 9, 10, 11, 12, 13	2, 3, 4	Cost and impacts expected to be significantly higher than benefits.

***Goals and Objectives**

1. Create an attractive gateway for St. Albans
2. Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue
3. Reduce congestion at the intersection of Third Street and 6th Avenue
4. Improve pedestrian access and experience across (over/under) railroad tracks
5. Improve bicycle access and experience across (over/under) railroad tracks
6. Minimal disruption to CSX railroad operations during construction
7. Increase access to downtown St. Albans for economic development reasons
8. Constructible and affordable solutions
9. Improve horizontal (width) clearance so buses can use underpasses without problems
10. Improve horizontal (width) clearance so semi-trailer trucks can use the underpasses without problems
11. Improve horizontal (width) clearance so fire trucks can use the underpass without problems
12. Improve vertical (height) of underpass so taller vehicles can clear the underpass
13. Reduce driveway conflicts between underpasses and MacCorkle Avenue

****Critical Success/Failure Factors**

1. Failure to demonstrate need for improvements
2. Opposition from business owners
3. Opposition from local residents
4. Lack of funding
5. Non-cooperation from CSX

Table 8-2: Initial Concepts Considered and Included in Scenarios

Concept	Goals Potentially Addressed*	Critical Success/Failure Factors Potentially Applicable**	Comments
Widen underpass	1, 2, 4, 5, 7, 9, 10, 11, 12, 13	2, 4, 5	Could provide significant benefits. Feasibility/costs need to be further explored.
One-way in Underpass	2, 3, 6, 7, 8, 9, 10, 11, 13	2, 3	Could be a very cost effective improvement. Impacts of eliminating outbound grade separated crossing of railroad needs to be explored.
Remove existing sidewalk in the underpass to widen travel lanes	4, 5, 6, 7, 8, 9, 10, 11	--	Would provide adequate horizontal width/clearance. Effectiveness and desirability of alternative pedestrian crossing treatments of railroad need to be explored.
Add southbound left-turn lane at Sixth Avenue	3	--	Would improve operations at this intersection. Feasibility/costs need to be further explored.
Reconfigure driveway access along Sixth Avenue	3, 8	2	Could provide some benefits. Impacts to property owners would need to be evaluated.
Signalize and improve intersection of MacCorkle Avenue/Fifth Street from added traffic with one-way configuration	2, 8	2	Would be required under a southbound one-way Third Street scenario.
Realign south approach of underpass for improved sight distance and safety	3, 7	2, 3, 5	Would correct deficiency in alignment. Would require modifications to bridge retaining wall.
Roundabout at MacCorkle Avenue	1, 2, 7, 13	1, 2, 3, 4	Could provide significant benefits at this intersection and eliminate the need for a northbound left turn lane. Impact to properties and cost could be excessive. Feasibility/costs need to be further explored.
Lengthen northbound left-turn lane at MacCorkle Avenue	2	1, 2, 4	Could provide some benefit. Feasibility/costs need to be further explored.
Add southbound right-turn lane and westbound right-turn lane at MacCorkle Avenue	2	2, 3, 4	Could provide significant benefits. Feasibility/costs need to be further explored.
Pedestrian tunnel	4, 5, 7	1, 3, 4, 5	Would provide an alternative crossing location for pedestrians if sidewalk in current underpass were removed. Feasibility/costs needs to be further explored.
Special pedestrian at-grade crossing	4, 5, 7	3, 5	Could encourage more walking. Feasibility/costs needs to be further explored. CSX would have to be in support
Restricting movements at Third Street/MacCorkle Avenue	2, 8, 13	2, 3	Could provide significant benefits. Impacts need to be further explored.

***Goals and Objectives**

1. Create an attractive gateway for St. Albans
2. Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue
3. Reduce congestion at the intersection of Third Street and 6th Avenue
4. Improve pedestrian access and experience across (over/under) railroad tracks
5. Improve bicycle access and experience across (over/under) railroad tracks
6. Minimal disruption to CSX railroad operations during construction
7. Increase access to downtown St. Albans for economic development reasons
8. Constructible and affordable solutions
9. Improve horizontal (width) clearance so buses can use underpasses without problems
10. Improve horizontal (width) clearance so semi-trailer trucks can use the underpasses without problems
11. Improve horizontal (width) clearance so fire trucks can use the underpass without problems
12. Improve vertical (height) of underpass so taller vehicles can clear the underpass
13. Reduce driveway conflicts between underpasses and MacCorkle Avenue

****Critical Success/Failure Factors**

1. Failure to demonstrate need for improvements
2. Opposition from business owners
3. Opposition from local residents
4. Lack of funding
5. Non-cooperation from CSX

Chapter 9:
Evaluation of Scenarios

Four scenarios were developed that include improvement concepts that meet the goals and objectives in the corridor. Each scenario is assessed using the evaluation criteria defined in Section 7.

9.1 Scenario Features

Each of the four scenarios feature a combination of concepts that create a different vision for the corridor. The following discussion of each scenario highlights its features. Exhibits illustrating each scenario in detail are included in **Appendix L**. The exhibits in the appendix are "to-scale" renderings of the scenario with estimated right-of-way and property impacts illustrated; and typical cross sections of the scenario are also shown.

Scenario A

A schematic of Scenario A is illustrated in **Figure 9-1**.

In Scenario A, Third Street is converted to a one-way roadway (from MacCorkle Avenue to Sixth Avenue) with a single lane in the southbound direction. This conversion allows adequate horizontal clearance for vehicles in the underpasses without requiring modifications to the walls, bridges, or sidewalk. The existing 20-foot travel way would be converted to one 12-foot southbound travel lane with a 2-foot shoulder adjacent to the sidewalk and a 6-foot shoulder adjacent to the west wall. The 6-foot shoulder can to serve as a bike lane to provide a connection between the bike lanes on MacCorkle Avenue to the published bike routes in St. Albans. The one-way conversion of Third Street would extend to the Sixth Avenue intersection. This location was the logical terminus because Sixth Avenue is more suitable to carry higher traffic volumes than Fifth Avenue (the roadway immediately south of the underpass which is primarily residential and has on-street parking). Additionally, the signal at Sixth Avenue will accommodate the larger number of vehicles that are expected to be turning at the intersection. Signs would direct traffic destined for westbound MacCorkle Avenue to use B Street and those destined for the WV 25 Bridge or eastbound MacCorkle Avenue to use Fifth Street.

Under this scenario, the existing sidewalk in the underpass would be maintained. This scenario assumes that CSX will take measures to ensure the sidewalk is kept clean of dirt and debris from trains and from birds.

Under Scenario A, operations at the intersection of Third Street and MacCorkle Avenue are expected to be significantly improved. Without northbound Third Street traffic, the other approaches can be provided more green time which will allow more vehicles to be accommodated per cycle. However, traffic volumes on other streets will increase from any diverted northbound traffic. These northbound drivers currently access MacCorkle Avenue using Third Street and would need to use an alternate street to reach MacCorkle Avenue (such as Fifth Street or Second Street).

Improvements are proposed at this location to offset an expected increase in traffic volumes at the intersection of Fifth Street and MacCorkle Avenue. Left-turns are currently prohibited from northbound Fifth Street onto MacCorkle Avenue. However, with additional traffic on northbound Third Street, left-turns are allowed at this location in Scenario A. Both the north and south approaches of Fifth Street at MacCorkle Avenue would be widened to provide an exclusive left-turn lane and shared through and right-turn lane. Additionally, a new traffic signal is proposed at the intersection. The signal will be synchronized with the other signals along MacCorkle Avenue to avoid affecting through traffic on MacCorkle Avenue.

An exclusive southbound left-turn lane can be constructed at Sixth Avenue within the existing curb as a benefit of converting Third Street to a one-way movement. Additionally, the Go Mart driveways would be reconfigured to better meet the guidelines outlined in the WVDOH *Manual on Rules and Regulations for Constructing Driveways on State Highway Rights-of-Way*. The direct access on Third Street will be closed with access provided by the alley located between Fifth and Sixth Avenues. The driveway on Sixth Avenue will be narrowed and moved to the eastern edge of the property to provide a larger separation between the driveway and Third Street and Sixth Avenue intersection.

In summary, Scenario A provides the following features:

- Third Street converted to one-way southbound within the existing curb
- Southbound left-turn lane at Sixth Avenue
- New traffic signal and widened approaches at Fifth Street and MacCorkle Avenue
- Potential for bike lane on Third Street
- Reconfiguration of Go Mart Driveway on Sixth Avenue

Scenario B

A schematic of Scenario B is illustrated in **Figure 9-2**.

The major concept of Scenario B is to remove the pedestrian sidewalk within the underpass to provide wider travel lanes. The 25-foot wide underpass would be converted into two 11-foot, 6-inch travel lanes with 1-foot shoulders adjacent to the walls. This improvement would allow wider vehicles to use the underpass while bridge structures and underpass walls remain intact and unmodified. A sharp shift in the roadway alignment exists along southbound Third Street south of the underpass, which is exacerbated by this reconfiguration of travel lanes. For this reason, Scenario B mitigates this deficiency by reconstructing the west wall of the underpass and the south approach.

A special at-grade pedestrian crossing is proposed in this scenario to accommodate pedestrians crossing the CSX rail lines via Third Street. The existing sidewalk along Third Street would connect to a gated at-grade pedestrian crossing of the CSX tracks. The crossing would include cross-buck and warning signs, arms, lights, and a bell that are actuated by the presence of a train. There could be parallel fencing alongside the tracks to make it difficult for pedestrians to cross anywhere other than the provided railroad crossing location.

This scenario prohibits direct left-turns onto MacCorkle Avenue from both Third Street and the WV 25 Kanawha River Bridge, which will mitigate congestion at the intersection of Third Street and MacCorkle Avenue. Eliminating left-turns will provide more green time to other movements, which will minimize delay and congestion The WV 25 Bridge approach could be reconfigured to provide an exclusive through lane and an exclusive right-turn lane which will improve operations. In Scenario B, drivers heading from St. Albans to westbound MacCorkle Avenue would use the signal at B Street, and eastbound bridge traffic would use Third Street, to Sixth Avenue, to Fifth Street.

Another improvements included in Scenario B is the construction of an exclusive southbound left-turn lane on Third Street at Sixth Avenue. This improvement widens the north approach of the intersection and reconstructs the sidewalk. As part of this scenario, access to Go Mart along Third Street would be closed to construct sidewalk on the east side of Third Street. Go Mart will still be accessible by its entrance on Sixth Avenue as well as from the adjacent alley.

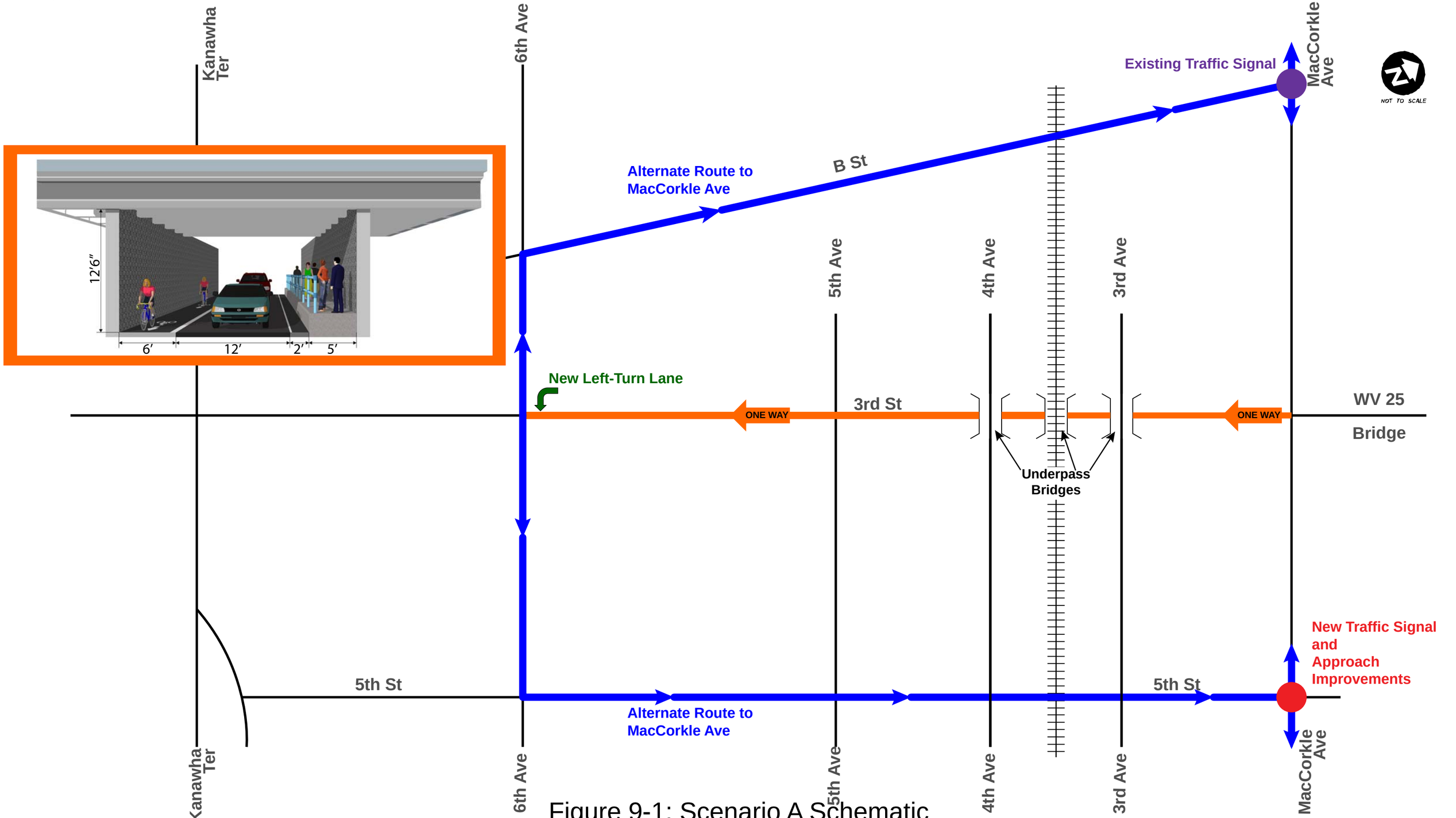


Figure 9-1: Scenario A Schematic

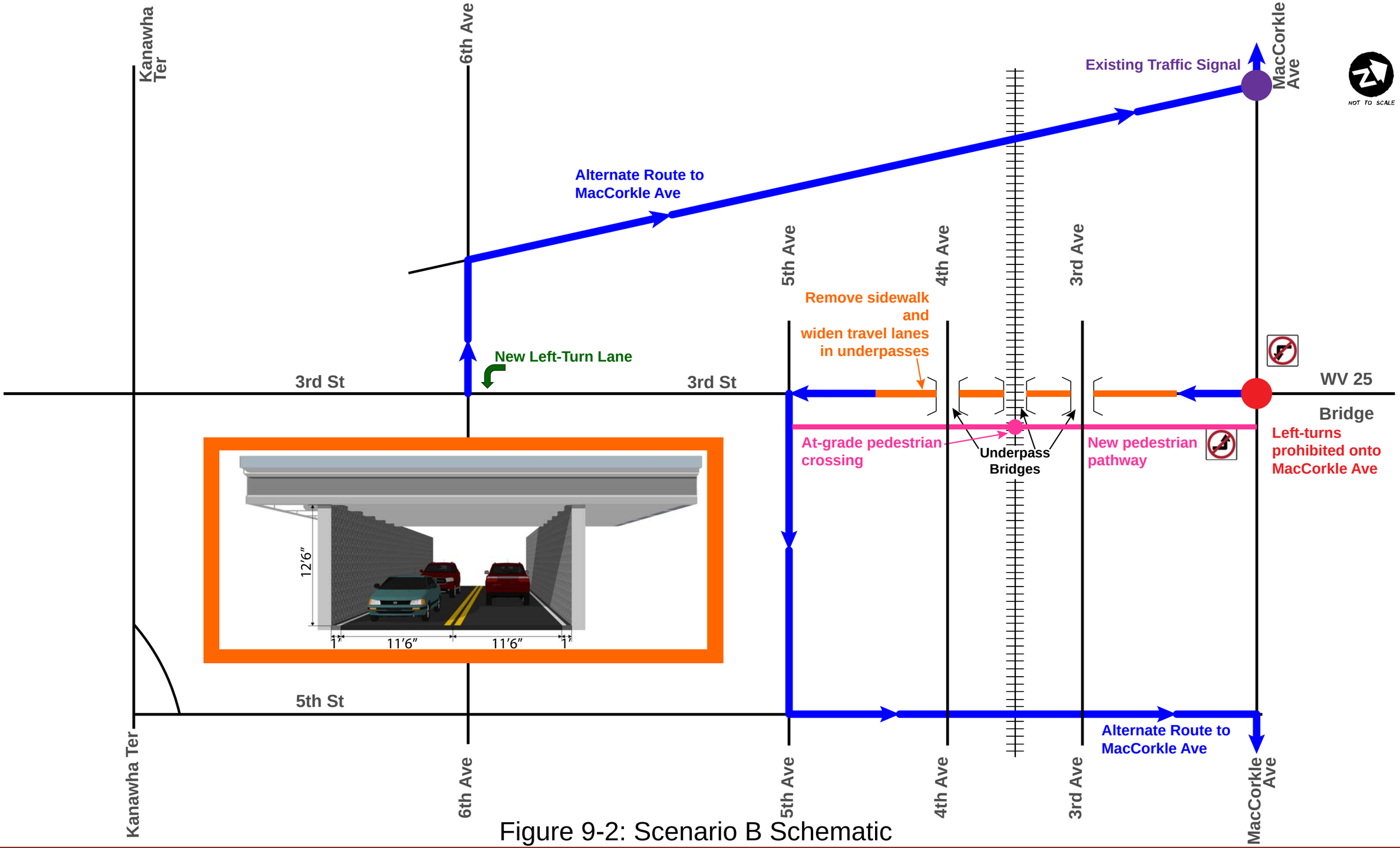


Figure 9-2: Scenario B Schematic

In summary, Scenario B provides the following features:

- Existing pedestrian sidewalk within underpass removed and the travel lanes widened without changes to structures
- At-grade pedestrian crossing at Third Street
- Left-turns prohibited from Third Street and WV 25 Bridge onto MacCorkle Avenue for improved intersection operations
- Southbound left-turn lane at Sixth Avenue
- Realigned south approach to the underpass

Scenario C

A schematic of Scenario C is illustrated in **Figure 9-3**.

In Scenario C, the pedestrian sidewalk is removed in the underpass to provide wider travel lanes, and the south approach and retaining walls are modified to correct the existing alignment deficiencies. Scenario C also provides the southbound left-turn lane at Sixth Avenue and modifications to the Go Mart access on Third Street.

Scenario C proposes a pedestrian pathway that would include tunnels under Third Avenue, the railroad, and Fourth Avenue (see example illustrated in **Figure 9-4).** This is in lieu of the at-grade pedestrian crossing proposed in Scenario B. The tunnel (likely standard culvert sections) would be installed along the west side of Third Street to avoid the building impacts that would occur on the east side. The tunnel would have lighting and pedestrians will be protected from dirt and debris created by the railroad tracks above. The only enclosed portions of the proposed pathway are under Third Avenue, Fourth Avenue, and the railroad tracks. This will minimize cost and maximize natural light. The unenclosed portions will consist of retaining walls on both sides. The tunnel and adjoining path will be able to accommodate bicycles in addition to pedestrians. A CSX representative indicated that there are examples in which a pedestrian tunnel of this kind has been constructed with little to no impact to rail operations.

Figure 9-4: Pedestrian Tunnel Example in

Scenario C also proposes a roundabout at the intersection of Third Street and MacCorkle Avenue. The roundabout would improve traffic operations at the intersection and would likely improve traffic safety at this intersection, which is the highest location for crashes in the Third Street corridor. The roundabout is expected to decrease the occurrence of injury crashes at the intersection. There are significant property impacts with the roundabout given the large footprint of the roundabout and the addition of approaching turn lanes. The roundabout would provide an attractive gateway into St. Albans, which is an additional benefit of its inclusion in the corridor.

In summary, Scenario C provides the following features:

- Existing pedestrian sidewalk in underpass removed and the travel lanes widened without changes to structures
- Pedestrian tunnels under Third Avenue, Fourth Avenue, and the railroad
- Roundabout at Third Street and MacCorkle Avenue for improved intersection operations
- Southbound left-turn lane at Sixth Avenue
- Realigned south approach to the underpass

Scenario D

A schematic of Scenario D is illustrated in **Figure 9-5**.

Under this scenario, the railroad underpass is reconstructed and widened to provide adequate vertical and horizontal clearance. This is consistent with recommendations from the 2012 *St. Albans Railroad Crossing Study* (see Section 4 for more details). The sidewalk will be reconstructed within the underpass to ensure that pedestrians are protected from dirt and debris from the trains above. Two 11-foot travel lanes and a 6-foot shoulder would be on both sides of the underpass to give adequate horizontal clearance to walls and the sidewalk. To obtain adequate vertical clearance, the profile within the underpass will be lowered and the roadway bridges above will be reconstructed. It is unknown if the railroad tracks and bridge would need to be raised to meet vertical clearance needs or if the profile can be lowered to keep the current railroad profile without detailed preliminary engineering.

At the intersection of Third Street and MacCorkle Avenue, the northbound left-turn lane would be extended by 200 feet as part of the reconstruction of the underpass. This improvement minimizes the occurrence of left-turning congestion of the through lane, while also preventing queues blocking the entrance to the left-turn lane. Additional improvements for this intersection include the construction of exclusive right-turn lanes for westbound and southbound approaches. These additional lanes are expected to significantly improve operations at the intersection.

Similar to the other scenarios, Scenario D includes the exclusive southbound left-turn lane at Sixth Avenue and the modifications to the Go Mart access on Third Street.

In summary, Scenario D provides the following features:

- Wider underpass to provide wider travel lanes and pedestrian sidewalk
- Taller underpass to provide adequate vertical clearance
- Lengthened northbound left-turn lane at MacCorkle Avenue
- Southbound and westbound right-turn lanes at Third Street and MacCorkle Avenue intersection for improved operations
- Southbound left-turn lane at Sixth Avenue

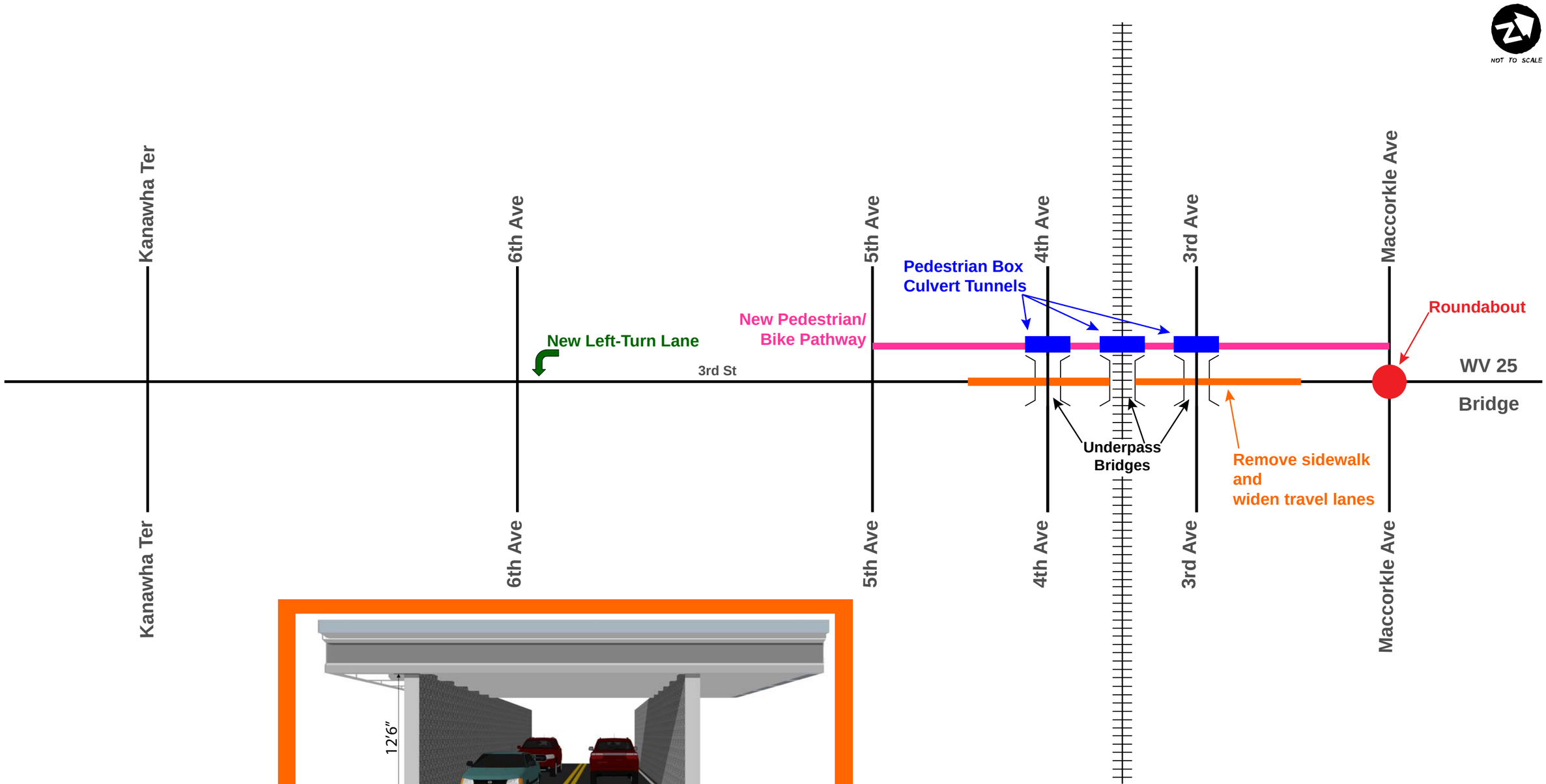


Figure 9-3: Scenario C Schematic

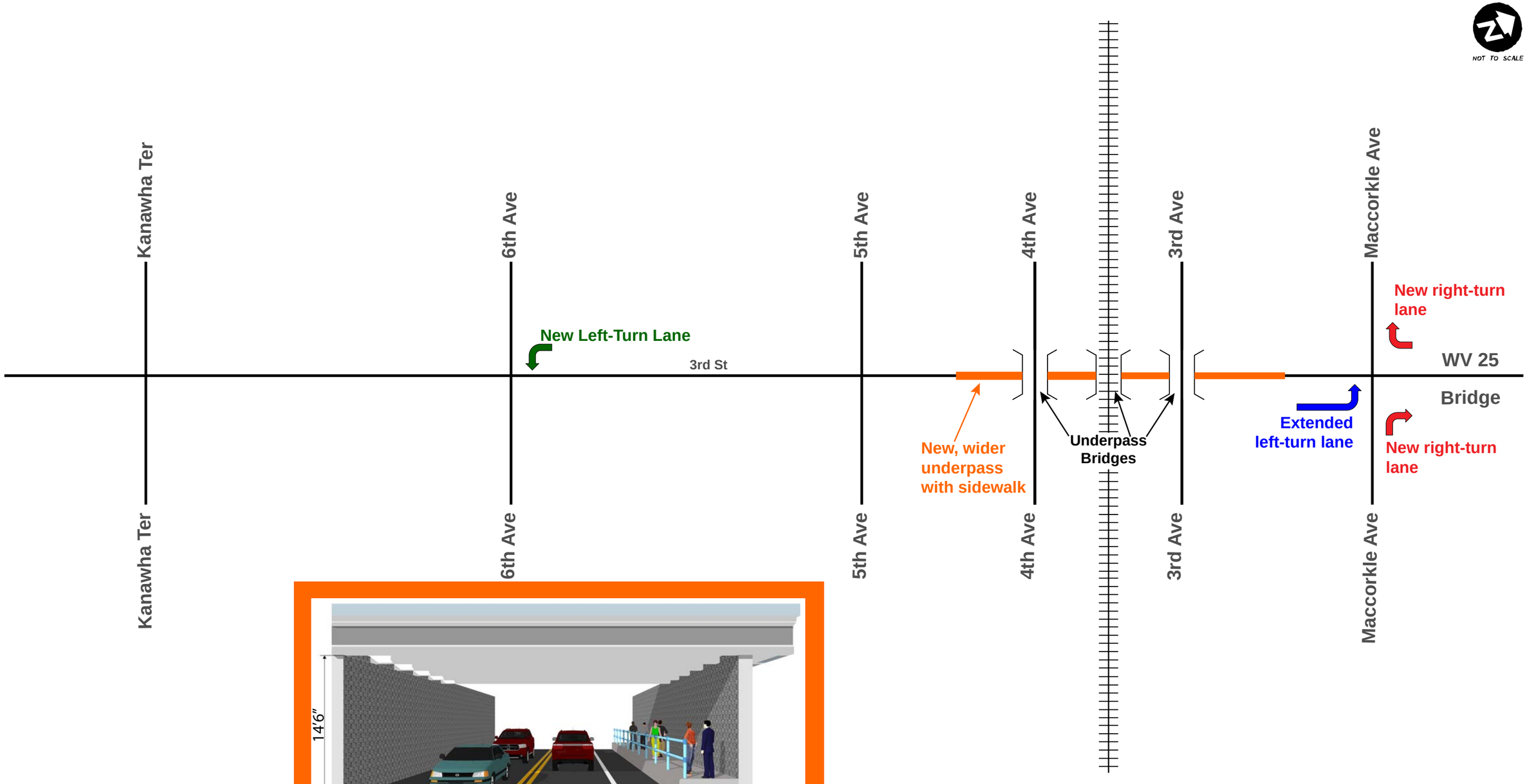


Figure 9-5: Scenario D Schematic

9.2 Scenario Traffic Operations

The study team predicted future traffic operations of each scenario under the traffic forecasts presented in Section 6. A total of 10 separate *TransModeler* simulations were performed for the corridor for each scenario to account for the stochastic nature (different results occur in each simulation) of the microscopic model. The average result is presented here.

Table 9-1 summarizes the intersection operational analysis results for the four scenarios for the AM and PM peak hours. Statistics reported in the table include average delay per vehicle for each approach (seconds per vehicle), and approach and intersection LOS.

Table 9-1: Scenario Operational Analysis Summary

Intersection	Approach	AM Peak Hour								PM Peak Hour							
		Scenario A		Scenario B		Scenario C		Scenario D		Scenario A		Scenario B		Scenario C		Scenario D	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Kanawha Terrace and B Street*	EB	6.5	A	6.1	A	3.6	A	2.5	A	7.8	A	8.3	A	10.6	B	6.0	A
	NB	14.6	B	18.1	C	18.3	C	18.4	C	15.8	C	13.5	B	14.4	B	15.1	C
	SB	15.6	C	14.7	B	16.3	C	18.4	C	14.8	B	13.7	B	15.5	C	17.7	C
	Overall	8.2	A	11.2	A	7.8	A	6.1	A	8.3	A	11.1	B	13.8	B	14.0	B
Kanawha Terrace and Second Street	EB	19.9	B	22.0	C	23.5	C	19.2	B	20.9	C	16.9	B	17.1	B	19.9	B
	WB	10.3	B	11.2	B	10.1	B	10.5	B	12.1	B	11.4	B	8.0	A	11.9	B
	NB	27.4	C	28.3	C	26.8	C	27.4	C	24.1	C	25.6	C	26.8	C	26.0	C
	SB	23.9	C	26.2	C	22.1	C	21.8	C	26.4	C	27.8	C	25.1	C	26.4	C
	Overall	23.2	C	22.3	C	19.5	B	23.2	C	19.0	B	22.8	C	22.3	C	19.9	B
Kanawha Terrace and Third Street	EB	11.8	B	8.8	A	10.0	A	8.0	A	8.6	A	10.4	B	7.2	A	8.0	A
	WB	10.5	B	9.4	A	10.1	B	7.2	A	8.9	A	8.1	A	7.0	A	10.4	B
	NB	42.3	D	40.4	D	39.7	D	43.6	D	34.3	C	35.1	D	33.5	C	35.6	D
	SB	28.0	C	26.2	C	28.7	C	29.2	C	31.5	C	33.7	C	33.8	C	35.7	D
	Overall	22.4	C	22.4	C	19.9	B	20.8	C	18.9	B	20.8	C	17.9	B	22.7	C
Kanawha Terrace and Fourth Street*	EB	3.4	A	3.6	A	4.9	A	5.5	A	4.9	A	6.1	A	4.5	A	3.4	A
	WB	2.1	A	3.4	A	4.5	A	5.1	A	3.5	A	2.5	A	3.4	A	1.9	A
	Overall	2.6	A	3.5	A	4.7	A	5.2	A	4.0	A	5.5	A	3.9	A	3.1	A
Kanawha Terrace and Sixth Street*	EB	2.3	A	1.8	A	5.0	A	6.2	A	2.9	A	4.4	A	1.2	A	4.7	A
	WB	5.4	A	2.2	A	3.6	A	1.1	A	5.9	A	3.4	A	1.5	A	3.2	A
	SB	12.4	B	13.3	B	12.1	B	12.7	B	11.8	B	12.3	B	14.0	B	16.5	C
	Overall	3.7	A	5.3	A	3.7	A	5.1	A	7.5	A	8.1	A	3.4	A	9.8	A
Sixth Avenue and B Street*	WB	6.1	A	7.0	A	9.3	A	6.4	A	8.8	A	5.8	A	7.8	A	4.6	A
	NB	19.2	C	17.3	C	15.7	C	20.4	C	16.2	C	18.2	C	16.3	C	16.6	C
	SB	16.7	C	14.7	B	14.7	B	15.1	C	19.5	C	20.0	C	17.8	C	19.2	C
	Overall	10.6	B	8.7	A	11.6	B	10.8	B	11.8	B	9.6	A	10.9	B	5.2	A
Sixth Avenue and C Street*	EB	2.9	A	3.1	A	4.5	A	5.7	A	9.9	A	12.7	B	11.7	B	11.0	B
	WB	3.3	A	3.9	A	1.2	A	2.6	A	1.7	A	2.6	A	4.4	A	3.8	A
	NB	11.5	B	14.9	B	14.3	B	14.9	B	15.4	C	17.4	C	14.4	B	18.7	C
	SB	14.8	B	14.1	B	15.2	C	13.0	B	17.1	C	21.0	C	21.3	C	18.0	C
	Overall	6.2	A	4.8	A	4.6	A	6.3	A	6.8	A	6.9	A	7.3	A	7.9	A
Sixth Avenue and Second Street	EB	8.8	A	9.1	A	10.0	A	10.3	B	9.4	A	7.9	A	12.0	B	8.2	A
	WB	10.9	B	9.1	A	12.3	B	8.6	A	11.7	B	11.9	B	12.7	B	13.2	B
	NB	25.7	C	27.3	C	26.2	C	24.1	C	28.6	C	26.1	C	26.9	C	24.1	C
	SB	22.2	C	23.2	C	23.7	C	25.5	C	30.3	C	30.5	C	27.1	C	29.9	C
	Overall	19.1	B	16.3	B	19.8	B	16.1	B	18.8	B	16.6	B	17.0	B	19.6	B

Table 9-1: Scenario Operational Analysis Summary (Continued)

Intersection	Approach	AM Peak Hour								PM Peak Hour							
		Scenario A		Scenario B		Scenario C		Scenario D		Scenario A		Scenario B		Scenario C		Scenario D	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Sixth Avenue and Third Street	**EB**	8.5	A	7.3	A	9.8	A	11.3	B	7.0	A	10.5	B	10.4	B	10.2	B
	WB	12.3	B	12.5	B	9.5	A	11.2	B	7.5	A	11.6	B	11.9	B	7.7	A
	NB	36.0	D	34.8	C	35.1	D	34.9	C	30.8	C	27.2	C	29.7	C	30.6	C
	SB	26.9	C	27.0	C	25.3	C	25.6	C	34.4	C	34.6	C	36.7	D	34.2	C
	Overall	20.7	C	23.6	C	24.3	C	20.9	C	22.1	C	20.7	C	19.9	B	19.6	B
Sixth Avenue and Fourth Street*	**EB**	3.5	A	1.4	A	1.0	A	3.2	A	4.3	A	5.6	A	2.2	A	2.5	A
	WB	3.0	A	5.0	A	6.2	A	6.5	A	10.1	B	11.5	B	9.3	A	13.4	B
	NB	10.5	B	13.7	B	13.4	B	10.4	B	17.5	C	16.1	C	17.8	C	14.3	B
	SB	11.5	B	11.0	B	14.4	B	14.3	B	15.8	C	17.3	C	17.7	C	14.3	B
	Overall	7.6	A	4.5	A	3.9	A	3.6	A	5.5	A	8.3	A	4.4	A	6.8	A
Sixth Avenue and Fifth Street**	**EB**	8.0	A	9.0	A	10.8	B	11.1	B	7.9	A	14.0	B	12.4	B	9.6	A
	WB	7.9	A	10.2	B	10.3	B	9.3	A	8.9	A	9.2	A	9.3	A	8.8	A
	NB	39.6	E	15.2	C	17.5	C	15.3	C	45.2	E	23.1	C	24.1	C	24.2	C
	SB	28.7	D	15.5	C	17.5	C	15.2	C	26.0	D	28.6	D	28.5	D	29.0	D
	Overall	10.3	B	12.1	B	12.3	B	13.3	B	10.5	B	14.9	B	14.5	B	14.5	B
Sixth Avenue and Sixth Street*	**EB**	4.8	A	2.2	A	5.6	A	3.2	A	6.4	A	5.4	A	3.8	A	4.3	A
	WB	5.7	A	3.5	A	5.0	A	3.8	A	5.8	A	4.7	A	4.1	A	1.6	A
	NB	11.9	B	15.7	C	15.9	C	16.1	C	12.6	B	15.1	C	14.1	B	14.5	B
	SB	12.6	B	12.9	B	13.2	B	11.8	B	14.3	B	12.0	B	14.1	B	14.7	B
	Overall	9.2	A	4.8	A	8.9	A	9.2	A	8.8	A	10.5	A	4.6	A	6.8	A
Fifth Avenue and C Street*	**WB**	14.4	B	10.4	B	12.6	B	10.5	B	12.8	B	12.6	B	13.7	B	14.7	B
	NB	4.1	A	3.3	A	4.1	A	1.2	A	3.1	A	1.3	A	1.7	A	2.8	A
	SB	8.3	A	13.0	B	12.3	B	11.8	B	9.1	A	9.4	A	9.6	A	13.4	B
	Overall	8.5	A	8.0	A	6.7	A	3.9	A	8.4	A	5.6	A	6.7	A	5.6	A
Fifth Avenue and Second Street*	**EB**	9.8	A	9.2	A	11.9	B	9.7	A	11.6	B	9.9	A	9.5	A	10.5	B
	WB	11.4	B	10.9	B	12.5	B	8.7	A	10.5	B	10.8	B	12.1	B	9.7	A
	NB	12.7	B	9.0	A	12.5	B	11.1	B	10.6	B	11.3	B	10.9	B	13.2	B
	SB	13.1	B	9.1	A	9.0	A	10.9	B	10.9	B	9.9	A	13.4	B	9.7	A
	Overall	11.2	B	9.9	A	11.1	B	9.1	A	11.4	B	10.9	B	10.8	B	10.2	A
Fifth Avenue and Third Street*	**EB**	9.6	A	11.5	B	8.6	A	7.8	A	20.2	C	19.3	C	19.2	C	21.3	C
	WB	12.3	B	15.2	C	16.6	C	13.0	B	16.6	C	14.4	B	15.5	C	15.9	C
	NB	--	--	3.9	A	3.6	A	2.4	A	--	--	11.6	B	9.6	A	9.2	A
	SB	13.5	B	9.7	A	11.8	B	10.3	B	10.1	B	13.8	B	13.4	B	12.5	B
	Overall	11.0	B	9.9	A	11.2	B	9.5	A	17.5	C	13.9	B	15.5	C	14.2	B
Fifth Avenue and Fourth Street*	**EB**	5.0	A	4.1	A	4.1	A	2.5	A	5.8	A	2.8	A	2.5	A	1.5	A
	WB	1.7	B	4.4	A	2.4	A	4.0	A	3.2	A	4.8	A	4.3	A	5.9	A
	NB	11.5	B	11.5	B	9.6	A	13.1	B	12.5	B	12.3	B	14.8	B	13.7	B
	SB	10.9	B	10.8	B	11.6	B	9.8	A	12.5	B	14.7	B	14.9	B	12.2	B
	Overall	3.5	A	8.6	A	7.8	A	4.2	A	8.0	A	7.5	A	6.9	A	8.0	A

Table 9-1: Scenario Operational Analysis Summary (Continued)

Intersection	Approach	AM Peak Hour								PM Peak Hour							
		Scenario A		Scenario B		Scenario C		Scenario D		Scenario A		Scenario B		Scenario C		Scenario D	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Fifth Avenue and Fifth Street*	EB	11.2	B	10.3	B	13.2	B	12.6	B	14.4	B	10.5	B	12.8	B	11.0	B
	WB	9.4	A	12.4	B	9.0	A	11.5	B	12.5	B	10.2	B	14.2	B	13.5	B
	NB	25.6	D	13.6	B	13.5	B	13.3	B	19.6	C	12.6	B	14.6	B	14.6	B
	SB	26.4	D	14.1	B	14.1	B	10.8	B	20.4	D	12.3	B	14.9	B	13.5	B
	Overall	14.2	B	11.2	B	10.3	B	11.5	B	15.8	C	12.0	B	14.2	B	12.5	B
Fifth Avenue and Sixth Street*	EB	4.6	A	8.1	A	5.4	A	7.2	A	9.2	A	8.6	A	10.6	B	12.9	B
	WB	4.7	A	5.1	A	5.9	A	3.6	A	9.6	A	8.9	A	13.1	B	8.7	A
	NB	15.1	C	14.2	B	14.2	B	18.1	C	11.7	B	9.9	A	10.4	B	12.7	B
	SB	13.0	B	16.7	C	13.0	B	15.2	C	15.2	C	13.1	B	15.4	C	11.9	B
	Overall	5.1	A	9.7	A	9.8	A	6.3	A	10.8	B	9.8	A	11.9	B	10.9	B
Fourth Avenue and C Street*	EB	15.9	C	12.8	B	14.1	B	11.9	B	14.8	B	18.4	C	18.9	C	18.3	C
	WB	10.6	B	14.9	B	11.1	B	10.9	B	14.7	B	16.1	C	12.8	B	13.8	B
	NB	6.7	A	3.0	A	5.5	A	4.0	A	12.5	B	10.0	B	12.9	B	11.8	B
	SB	8.1	A	4.9	A	5.2	A	8.1	A	12.8	B	8.5	A	10.1	B	10.6	B
	Overall	8.5	A	5.9	A	7.2	A	7.1	A	13.2	B	11.4	B	12.8	A	12.6	B
Fourth Avenue and Second Street*	EB	11.3	B	14.1	B	12.1	B	15.7	C	16.5	C	15.3	C	14.1	B	13.1	B
	WB	12.8	B	12.6	B	13.6	B	15.4	C	14.1	B	11.8	B	14.6	B	13.6	B
	NB	5.3	A	4.1	A	3.6	A	3.7	A	10.2	B	9.3	A	8.8	A	11.2	B
	SB	3.7	A	3.6	A	3.5	A	3.6	A	8.8	A	10.3	B	10.1	B	12.5	B
	Overall	4.4	A	5.8	A	4.9	A	4.2	A	10.6	B	10.3	B	10.3	B	12.6	B
Fourth Avenue and Fourth Street*	EB	5.5	A	5.4	A	2.5	A	6.5	A	1.9	A	1.6	A	2.9	A	3.9	A
	WB	6.0	A	6.5	A	2.2	A	4.1	A	4.3	A	5.4	A	4.1	A	3.9	A
	NB	13.2	B	10.1	B	10.4	B	10.2	B	12.3	B	12.5	B	14.6	B	13.7	B
	Overall	7.0	A	9.1	A	4.7	A	5.7	A	8.3	A	4.9	A	6.7	A	7.4	A
Fourth Avenue and Fifth Street*	EB	13.3	B	13.8	B	11.2	B	13.3	B	17.0	C	17.3	C	15.5	C	16.0	C
	WB	12.1	B	12.3	B	11.2	B	13.2	B	10.7	B	10.3	B	12.2	B	13.4	B
	NB	3.3	A	6.3	A	3.4	A	4.2	A	2.6	A	2.7	A	2.2	A	6.5	A
	SB	3.0	A	3.2	A	5.5	A	3.3	A	3.1	A	5.7	A	5.6	A	2.7	A
	Overall	4.1	A	9.8	A	5.8	A	6.6	A	4.5	A	4.5	A	6.0	A	5.0	A
Third Avenue and C Street	EB	15.4	C	13.7	B	13.9	B	14.8	B	16.7	C	19.7	C	17.8	C	15.8	C
	WB	12.0	B	10.6	B	11.1	B	11.9	B	8.0	A	6.8	A	10.2	B	8.1	A
	NB	4.4	A	1.8	A	5.7	A	4.5	A	13.1	B	10.5	B	11.0	B	11.5	B
	SB	4.7	A	3.1	A	4.1	A	3.6	A	12.8	B	9.6	A	12.3	B	12.6	B
	Overall	10.0	A	6.4	A	9.7	A	8.3	A	12.6	B	8.3	A	13.1	B	12.2	B

Table 9-1: Scenario Operational Analysis Summary (Continued)

Intersection	Approach	AM Peak Hour								PM Peak Hour							
		Scenario A		Scenario B		Scenario C		Scenario D		Scenario A		Scenario B		Scenario C		Scenario D	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Third Avenue and Second Street*	EB	15.9	C	14.7	B	11.6	B	11.6	B	14.3	B	15.8	C	14.0	B	15.2	C
	WB	12.4	B	14.3	B	14.9	B	15.5	C	18.3	C	16.7	C	17.3	C	18.1	C
	NB	2.9	A	4.5	A	4.4	A	3.0	A	9.5	A	13.2	B	9.3	A	12.8	B
	SB	4.3	A	5.4	A	2.2	A	3.0	A	10.5	B	10.2	B	12.0	B	12.3	B
	Overall	5.8	A	8.3	A	6.4	A	7.5	A	12.1	B	11.9	B	13.1	B	13.2	B
Third Avenue and Fourth Street*	EB	7.4	A	4.9	A	4.6	A	7.8	A	8.8	A	13.3	B	9.5	A	13.1	B
	WB	2.7	A	1.9	A	4.9	A	5.5	A	3.0	A	2.1	A	2.6	A	2.1	A
	SB	13.0	B	10.0	B	10.1	B	10.7	B	10.8	B	13.7	B	14.1	B	14.7	B
	Overall	7.0	A	3.5	A	5.9	A	6.5	A	6.3	A	7.2	A	3.4	A	3.3	A
Third Avenue and Fifth Street*	EB	8.6	A	10.8	B	9.5	A	10.9	B	18.1	C	17.6	C	16.6	C	16.6	C
	WB	9.4	A	8.9	A	9.3	A	7.2	A	25.2	D	24.7	C	24.3	C	24.4	C
	NB	8.3	A	9.5	A	11.7	B	10.0	A	13.7	B	9.1	A	13.2	B	12.0	B
	SB	5.5	A	5.7	A	4.8	A	5.3	A	11.2	B	11.4	B	11.5	B	11.4	B
	Overall	7.8	A	8.0	A	5.0	A	7.9	A	13.8	B	12.2	B	11.6	B	11.6	B
Third Avenue and Sixth Street*	EB	1.4	A	1.4	A	1.4	A	1.4	A	1.3	A	1.3	A	1.3	A	1.3	A
	SB	7.1	A	7.1	A	7.1	A	7.1	A	10.4	B	10.3	B	10.4	B	10.3	B
	Overall	1.9	A	1.9	A	1.9	A	1.9	A	2.4	A	2.4	A	2.4	A	2.4	A
MacCorkle Avenue and B Street	EB	20.2	C	22.5	C	20.5	C	20.7	C	18.7	B	19.8	B	19.3	B	20.0	B
	WB	12.6	B	11.1	B	12.8	B	12.2	B	14.5	B	14.3	B	12.5	B	13.3	B
	NB	24.3	C	26.2	C	27.0	C	25.0	C	24.7	C	25.9	C	25.7	C	26.0	C
	SB	26.0	C	23.2	C	24.6	C	25.9	C	23.7	C	21.9	C	23.6	C	22.6	C
	Overall	18.8	B	22.9	C	20.5	C	22.4	C	19.2	B	19.5	B	17.8	B	15.7	B
MacCorkle Avenue and C Street*	EB	6.4	A	2.4	A	3.2	A	3.6	A	4.0	A	5.2	A	4.8	A	5.2	A
	WB	3.7	A	2.9	A	4.5	A	2.6	A	5.6	A	2.2	A	4.3	A	5.2	A
	NB	19.7	C	17.3	C	17.3	C	15.6	C	31.3	D	28.5	D	31.1	D	29.0	D
	SB	24.3	C	24.4	C	23.6	C	25.0	D	16.4	C	16.5	C	16.6	C	17.8	C
	Overall	6.4	A	3.3	A	9.8	A	2.9	A	5.5	A	4.4	A	6.3	A	14.2	B
MacCorkle Avenue and Second Street*	EB	1.6	A	2.6	A	5.5	A	4.2	A	3.4	A	4.8	A	4.3	A	3.5	A
	WB	4.3	A	4.3	A	1.7	A	3.7	A	2.1	A	3.0	A	3.8	A	1.8	A
	NB	23.5	C	19.5	C	21.8	C	19.9	C	27.0	D	29.6	D	30.7	D	27.2	D
	SB	23.5	C	22.3	C	22.8	C	21.5	C	31.4	D	30.5	D	30.1	D	32.1	D
	Overall	3.2	A	2.8	A	5.1	A	6.1	A	4.9	A	3.8	A	6.6	A	4.5	A
MacCorkle Avenue and Third Street	EB	11.6	B	12.0	B	4.2	A	23.4	C	14.9	B	18.1	B	5.5	A	25.7	C
	WB	16.9	B	13.7	B	10.4	B	20.8	C	37.1	D	21.9	C	14.5	B	28.4	C
	NB	--	--	20.8	C	14.4	B	38.2	D	--	--	20.8	C	14.0	B	38.8	D
	SB	16.5	B	17.2	B	4.5	A	19.9	B	25.3	C	19.9	B	34.2	D	22.3	C
	Overall	14.6	A	14.8	B	4.5	A	24.5	C	28.6	C	20.4	C	18.0	C	27.3	C

Table 9-1: Scenario Operational Analysis Summary (Continued)

Intersection	Approach	AM Peak Hour								PM Peak Hour							
		Scenario A		Scenario B		Scenario C		Scenario D		Scenario A		Scenario B		Scenario C		Scenario D	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
MacCorkle Avenue and Fourth Street*	EB	2.3	A	2.9	A	5.2	A	3.3	A	4.9	A	5.6	A	1.4	A	5.9	A
	WB	2.1	A	1.6	A	6.1	A	5.9	A	2.1	A	6.3	A	4.1	A	4.9	A
	NB	12.3	B	13.8	B	12.8	B	14.9	B	21.4	C	23.6	C	23.4	C	22.5	C
	SB	23.4	C	23.6	C	24.8	C	23.3	C	20.9	C	17.8	C	19.1	C	17.2	C
	Overall	6.0	A	2.3	A	8.8	A	4.6	A	8.9	A	9.8	A	9.2	A	8.6	A
MacCorkle Avenue and Fifth Street*	EB	16.8	B	5.4	A	1.6	A	4.4	A	20.3	C	6.3	A	4.2	A	4.5	A
	WB	18.2	B	3.2	A	2.9	A	3.2	A	19.5	B	5.6	A	4.5	A	4.0	A
	NB	32.8	C	45.7	E	47.3	E	46.3	E	16.0	B	16.0	C	18.0	C	18.2	C
	SB	10.5	B	22.1	C	20.1	C	18.7	C	10.9	B	13.2	B	12.8	B	15.3	C
	Overall	19.2	B	3.3	A	4.7	A	4.2	A	17.8	B	8.2	A	6.9	A	7.3	A
MacCorkle Avenue and Sixth Street*	EB	2.1	A	4.5	A	2.0	A	6.2	A	4.4	A	1.6	A	6.1	A	4.5	A
	WB	4.8	A	3.4	A	5.2	A	5.8	A	5.8	A	4.9	A	6.9	A	3.7	A
	NB	15.7	C	11.8	B	13.9	B	11.8	B	41.1	E	39.8	E	43.5	E	40.5	E
	SB	17.3	C	17.2	C	15.7	C	14.5	B	34.6	D	35.2	E	34.6	D	34.7	D
	Overall	5.9	A	5.6	A	3.9	A	8.8	A	5.9	A	4.4	A	11.9	B	5.3	A
MacCorkle Avenue and Boone Street*	EB	5.3	A	2.7	A	2.6	A	3.0	A	5.0	A	5.2	A	2.6	A	2.2	A
	WB	2.8	A	5.1	A	4.6	A	3.4	A	14.1	B	10.8	B	14.8	B	10.8	B
	NB	18.0	C	17.8	C	15.5	C	15.1	C	17.4	C	12.9	B	16.9	C	15.7	C
	Overall	6.9	A	5.9	A	8.5	A	6.8	A	9.3	A	6.9	A	2.9	A	2.7	A

*Unsignalized intersection analysis

** Signalized intersection analysis in Scenario A, unsignalized intersection analysis in Scenarios B, C, and D

These levels of service and delays are used to measure the ability of the scenarios to meet goals and objectives defined at the onset of this study.

9.3 Scenario Cost of Construction

The study team estimated construction costs for each of the four scenarios. These estimates do not include costs of right-of-way acquisition, utility relocation, or environmental mitigation, but do include, maintenance of traffic estimates, contingency, and miscellaneous costs such as mobilization, field office, and other costs usually captured through a lump sum quantity.

The four scenarios are not meant to be "all or nothing." Rather, concepts from each scenario may be mixed and matched to create the ultimate recommendation. For this reason, scenario construction costs were broken down by concept as detailed below. It is important to note that in all cost estimates, it is assumed that when major restriping is proposed existing pavement is milled and overlaid with new asphalt pavement. Full depth pavement is only estimated in areas where new pavement is proposed. All costs outlined herein should be considered preliminary. A more detailed preliminary engineering study should be conducted to better determine the construction costs of the final recommended solution. The cost estimates do not include right-of-way costs. Cost estimate calculations are provided in **Appendix M**.

The estimated construction costs for Scenario A were $1.2 million which includes the following:

- Convert Third Street to one-way southbound - $1,100,000
- Access modifications at Go Mart - $80,000

The estimated construction costs for Scenario B were $1.2 million which includes the following:

- MacCorkle Avenue intersection modifications - $190,000
- Remove sidewalk and widen travel lanes in underpass and realign southbound approach- $440,000
- Construct southbound left-turn lane at Sixth Avenue and access modifications at Go Mart - $250,000
- At-grade pedestrian crossing - $240,000

The estimated construction costs for Scenario C were $3.5 million which includes the following:

- Roundabout at MacCorkle Avenue intersection - $1,270,000
- Remove sidewalk and widen travel lanes in underpass and realign southbound approach - $400,000
- Construct southbound left-turn lane at Sixth Avenue and access modifications at Go Mart - $250,000
- Pedestrian tunnel - $1,590,000

The estimated construction costs for Scenario D were $6.4 million which includes the following:

- MacCorkle Avenue intersection modifications - $560,000
- Widen underpass and reconstruct Third Avenue and Fourth Avenue Bridges - $5,620,000
- Construct southbound left-turn lane at Sixth Avenue and access modifications at Go Mart - $260,000

9.4 Scenarios Evaluation

The evaluation criteria used to evaluate the scenarios was defined in Section 8 of this report. A matrix evaluation of each scenario under each goal is shown in **Figures 9-6** through **9-9**. The following symbols were used to summarize how well a particular scenario addresses a certain goal. Explanations for the ratings are provided within the evaluation matrix.

Fully addresses goal

Mostly addresses goal

Somewhat addresses goal

Does not address goal

Goal	Evaluation	Importance*	Evaluation Criteria
Feasible and affordable solutions		4.3	Provides a solution that meets identifiable needs, has a cost that is in reasonable proportion to the benefits, adverse environmental impacts, and adverse impacts to adjacent properties and stakeholders. ***Anticipated to cost in the $1.0 – 1.5 Million range plus minor right-of-way costs. Low cost and has minimal impacts to properties.***
Minimal disruption to CSX railroad operations during construction		4.3	Provides a solution that will maintain safe rail operations throughout the construction process. It is anticipated that a project that requires more than 48 hours of interruption to railroad traffic flow will be unacceptable. ***No impacts to CSX operations during construction anticipated.***
Improve horizontal clearance (width) so buses can use underpasses without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Single southbound lane meets these requirements.***
Improve horizontal clearance (width) so fire trucks can use the underpass without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Single southbound lane meets these requirements.***
Creates an attractive gateway for St. Albans		4.0	Provides a noticeable, distinctive, and aesthetic entry to St. Albans on Third Street. ***Entry into St. Albans will appear wider and less constrained as one-way. Aesthetic appearance of bridges would not change.***
Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue		3.8	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the highly traveled and urban location for this intersection, users expect to experience delay at this intersection. Therefore, LOS D or better for all approaches is considered preferred. LOS E on an approach or approaches, with an overall LOS D, would be considered acceptable for this intersection. ***All approaches operate at LOS B or better during the AM peak hour at LOS D or better during the PM peak hour.***
Increase access to downtown St. Albans for economic development reasons		3.8	Provides Improved travel times between downtown St. Albans (Main Street) and MacCorkle Avenue and the WV 25 Bridge using Third Street. Acceptable travel time is less than 2 minutes. ***Estimated travel time from MacCorkle Avenue to Main Street is approximately 90 seconds.***
Improve vertical (height) of underpass so taller vehicles can clear the underpass		3.7	Provides at least 14.5 feet of vertical clearance under bridges. ***Underpass bridges are not improved. Vertical clearances would not be increased.***
Reduce congestion at the intersection of Third Street and Sixth Avenue		3.7	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the less traveled and neighborhood/central business district location for this intersection, users would not expect to experience significant delay at this intersection. Therefore, LOS C or better for all approaches is considered preferred. LOS D on an approach or approaches, with an overall LOS C, would be considered acceptable for this intersection. ***Provides a small improvement in operations. However, the intersection does not currently experience unacceptable congestion.***
Improve pedestrian access and experience across (over/under) railroad tracks		3.3	Provides reasonably good conditions for pedestrians such as: good lighting, adequately wide sidewalk, lack of debris on sidewalk, ADA compliant pathways, and a reasonably direct walking route across the railroad tracks. ***Scenario assumes that some improvements will be made to reduce railroad sludge and drainage that falls on sidewalk underneath. Sidewalk width remains the same, but offset to adjacent traffic will increase.***
Improve horizontal clearance (width) so semi-trailer trucks can use the underpasses without problems		3.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Single southbound lane meets these requirements.***
Reduce driveway conflicts between underpasses and MacCorkle Avenue		3.2	Reduces driveway access points. The preferred result would be to meet TRB Access Management Manual guidance for driveway spacing and design. ***Closes one access.***
Improve bicycle access and experience across (over/under) railroad tracks		3.0	Provides reasonably good conditions for biking such as: a reasonably comfortable location for cyclists to ride, lack of debris/mud in path of the cyclist, and a reasonably convenient route across the railroad tracks for cyclists. ***Provides excellent bike access into St. Albans. New signal at 5th Street should provide better access to MacCorkle Avenue for outbound bike traffic. Scenario assumes that some improvements will be made to reduce railroad sludge and drainage that falls on cyclists.***

*Based on a Stakeholder Survey on the importance of each goal. The value represents the average score for that goal on a scale of 1 (not important) to 5 (highest importance).

Figure 9-6: Scenario A Evaluation

Goal	Evaluation	Importance*	Evaluation Criteria
Feasible and affordable solutions		4.3	Provides a solution that meets identifiable needs, has a cost that is in reasonable proportion to the benefits, adverse environmental impacts, and adverse impacts to adjacent properties and stakeholders. ***Anticipated to cost in the $1.0 – 1.5 Million range plus minor right-of-way costs. Low cost and has minimal impacts to properties. CSX has indicated it would require the closure of three other at-grade crossings to support this Scenario.***
Minimal disruption to CSX railroad operations during construction		4.3	Provides a solution that will maintain safe rail operations throughout the construction process. It is anticipated that a project that requires more than 48 hours of interruption to railroad traffic flow will be unacceptable. ***Minimal impacts to CSX operations during construction anticipated.***
Improve horizontal clearance (width) so <u>buses</u> can use underpasses without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Removal of sidewalk provides the necessary width.***
Improve horizontal clearance (width) so <u>fire trucks</u> can use the underpass without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Removal of sidewalk provides the necessary width.***
Creates an attractive gateway for St. Albans		4.0	Provides a noticeable, distinctive, and aesthetic entry to St. Albans on Third Street**.** ***Entry into St. Albans will appear wider and less constrained for auto traffic. Aesthetic appearance of bridges would not change.***
Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue		3.8	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the highly traveled and urban location for this intersection, users expect to experience delay at this intersection. Therefore, LOS D or better for all approaches is considered preferred. LOS E on an approach or approaches, with an overall LOS D, would be considered acceptable for this intersection. ***All approaches operate at acceptable LOS. Some minor increases in delay occur at other intersections due to traffic rerouting as a result of restricting left-turns onto MacCorkle Avenue.***
Increase access to downtown St. Albans for economic development reasons		3.8	Provides acceptable travel times between downtown St. Albans (Main Street) and MacCorkle Avenue and the WV 25 Bridge using Third Street. Acceptable travel time is less than 2 minutes. ***Estimated travel time from MacCorkle Avenue and Main Street is approximately 90 seconds.***
Improve vertical (height) of underpass so taller vehicles can clear the underpass		3.7	Provides at least 14.5 feet of vertical clearance under bridges. ***Underpass bridges are not improved. Vertical clearances would not be increased.***
Reduce congestion at the intersection of Third Street and Sixth Avenue		3.7	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the less traveled and neighborhood/central business district location for this intersection, users would not expect to experience significant delay at this intersection. Therefore, LOS C or better for all approaches is considered preferred. LOS D on an approach or approaches, with an overall LOS C, would be considered acceptable for this intersection. ***Provides a small improvement in operations. However, the intersection does not currently experience unacceptable congestion.***
Improve pedestrian access and experience across (over/under) railroad tracks		3.3	Provides reasonably good conditions for pedestrians such as: good lighting, adequately wide sidewalk, lack of debris on sidewalk, ADA compliant pathways, and a reasonably direct walking route across the railroad tracks. ***Would provide a somewhat shorter route for pedestrians, and would avoid the narrow sidewalk with sludge and drainage issues under the railroad underpass. Would require pedestrians to cross an active railroad, causing delay for pedestrians (must wait for the train).***
Improve horizontal clearance (width) so <u>semi-trailer trucks</u> can use the underpasses without problems		3.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Removal of sidewalk provides the necessary width.***
Reduce driveway conflicts between underpasses and MacCorkle Avenue		3.2	Reduces driveway access points. The preferred result would be to meet TRB Access Management Manual guidance for driveway spacing and design. ***Closes one access.***
Improve bicycle access and experience across (over/under) railroad tracks		3.0	Provides reasonably good conditions for biking such as: a reasonably comfortable location for cyclists to ride, lack of debris/mud in path of the cyclist, and a reasonably convenient route across the railroad tracks for cyclists. ***No major change for bicycle access. Wider lanes and larger offset to walls should improve rider comfort under the bridges. Scenario assumes that some improvements will be made to reduce railroad sludge and drainage that falls on cyclists.***

* Based on a Stakeholder Survey on the importance of each goal. The value represents the average score for that goal on a scale of 1 (not important) to 5 (highest importance).

Figure 9-7: Scenario B Evaluation

Goal	Evaluation	Importance*	Evaluation Criteria
Feasible and affordable solutions		4.3	Provides a solution that meets identifiable needs, has a cost that is in reasonable proportion to the benefits, adverse environmental impacts, and adverse impacts to adjacent properties and stakeholders. ***Estimated to cost in the $3.5 million range plus right-of-way acquisition costs. Roundabout has major property impacts at Third Street/MacCorkle intersection. Would have significant benefits by addressing the safety and congestion problem at that intersection. The bike/pedestrian tunnel would require significant costs and have some property impacts but would provide a significantly improved bike/pedestrian connection and allow for the removal of the sidewalk in the underpass to meet other goals. Minor impacts at Sixth Avenue.***
Minimal disruption to CSX railroad operations during construction		4.3	Provides a solution that will maintain safe rail operations throughout the construction process. It is anticipated that a project that requires more than 48 hours of interruption to railroad traffic flow will be unacceptable. ***Some impacts to CSX operations to complete the tunnel/culvert installation are anticipated. Construction methods are available to minimize impacts. Not anticipated to be more than a few hours of impact.***
Improve horizontal clearance (width) so buses can use underpasses without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Removal of sidewalk provides the necessary width.***
Improve horizontal clearance (width) so fire trucks can use the underpass without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Removal of sidewalk provides the necessary width.***
Creates an attractive gateway for St. Albans		4.0	Provides a noticeable, distinctive, and aesthetic entry to St. Albans on Third Street. ***Roundabout central island design would provide an excellent gateway design opportunity. Entry into St. Albans will appear wider and less constrained for auto traffic. Aesthetic appearance of bridges would not change. Would be more attractive and comfortable for pedestrians and bikes.***
Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue		3.8	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the highly traveled and urban location for this intersection, users expect to experience delay at this intersection. Therefore, LOS D or better for all approaches is considered preferred. LOS E on an approach or approaches, with an overall LOS D, would be considered acceptable for this intersection. ***All approaches operate at an acceptable LOS.***
Increase access to downtown St. Albans for economic development reasons		3.8	Provides acceptable travel times between downtown St. Albans (Main Street) and MacCorkle Avenue and the WV 25 Bridge using Third Street. Acceptable travel time is less than 2 minutes. ***Estimated travel time from MacCorkle Avenue and Main Street is less than 90 seconds.***
Improve vertical (height) of underpass so taller vehicles can clear the underpass		3.7	Provides at least 14.5 feet of vertical clearance under bridges. ***Underpass bridges are not improved. Vertical clearances would not be increased.***
Reduce congestion at the intersection of Third Street and Sixth Avenue		3.7	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the less traveled and neighborhood/central business district location for this intersection, users would not expect to experience significant delay at this intersection. Therefore, LOS C or better for all approaches is considered preferred. LOS D on an approach or approaches, with an overall LOS C, would be considered acceptable for this intersection. ***Provides a small improvement in operations. However, the intersection does not currently experience unacceptable congestion.***
Improve pedestrian access and experience across (over/under) railroad tracks		3.3	Provides reasonably good conditions for pedestrians such as: good lighting, adequately wide sidewalk, lack of debris on sidewalk, ADA compliant pathways, and a reasonably direct walking route across the railroad tracks. ***Would provide a safe and attractive crossing for pedestrians. Culvert would be shallower than current crossing which will reduce crossing distance.***
Improve horizontal clearance (width) so semi-trailer trucks can use the underpasses without problems		3.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Removal of sidewalk provides the necessary width.***
Reduce driveway conflicts between underpasses and MacCorkle Avenue		3.2	Meets TRB Access Management Manual guidance for driveway spacing and design. ***Roundabout layout would require reconfiguration of properties in this area, elimination of driveways in this section is assumed.***
Improve bicycle access and experience across (over/under) railroad tracks		3.0	Provides reasonably good conditions for biking such as: a reasonably comfortable location for cyclists to ride, lack of debris/mud in path of the cyclist, and a reasonably convenient route across the railroad tracks for cyclists. ***Would provide a separate, two-way, safe and convenient crossing of railroad tracks.***

* Based on a Stakeholder Survey on the importance of each goal. The value represents the average score for that goal on a scale of 1 (not important) to 5 (highest importance).

Figure 9-8: Scenario C Evaluation

Goal	Evaluation	Importance*	Evaluation Criteria
Feasible and affordable solutions		4.3	Provides a solution that meets identifiable needs, has a cost that is in reasonable proportion to the benefits, adverse environmental impacts, and adverse impacts to adjacent properties and stakeholders. ***Estimated to cost in the $6.4 million range plus right-of-way acquisition costs. Minor impacts at Sixth Avenue. Major right-of-way impacts are not anticipated to reconstruct bridge, but adding turn lane on MacCorkle would have significant impacts to the property on the northeast corner. Would have significant benefits by addressing nearly all identified goals. May be difficult to justify expenditure of funds.***
Minimal disruption to CSX railroad operations during construction		4.3	Provides a solution that will maintain safe rail operations throughout the construction process. It is anticipated that a project that requires more than 48 hours of interruption to railroad traffic flow will be unacceptable. ***Impacts to CSX operations to complete underpass installation are anticipated. Construction methods are available to minimize impacts. However, limiting impacts to less than 48 hours may not be possible.***
Improve horizontal clearance (width) so buses can use underpasses without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Reconstruction of the underpass would provide the necessary width.***
Improve horizontal clearance (width) so fire trucks can use the underpass without problems		4.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Reconstruction of the underpass would provide the necessary width.***
Creates an attractive gateway for St. Albans		4.0	Provides a noticeable, distinctive, and aesthetic entry to St. Albans on Third Street. ***Entry into St. Albans will appear wider and less constrained for auto traffic. Aesthetic appearance of bridges would be improved. Would be more attractive / inviting for pedestrians and bikes.***
Reduce congestion at the intersection of Third Street / WV 25 Bridge and MacCorkle Avenue		3.8	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the highly traveled and urban location for this intersection, users expect to experience delay at this intersection. Therefore, LOS D or better for all approaches is considered preferred. LOS E on an approach or approaches, with an overall LOS D, would be considered acceptable for this intersection. ***All approaches operate at acceptable LOS.***
Increase access to downtown St. Albans for economic development reasons		3.8	Provides acceptable travel times between downtown St. Albans (Main Street) and MacCorkle Avenue and the WV 25 Bridge using Third Street. Acceptable travel time is less than 2 minutes. ***Estimated travel time from MacCorkle Avenue and Main Street is approximately 90 seconds.***
Improve vertical (height) of underpass so taller vehicles can clear the underpass		3.7	Provides at least 14.5 feet of vertical clearance under bridges. ***Reconstruction of the roadway and railroad bridges in conjunction with lowering the Third Street roadway profile would provide the necessary vertical clearance.***
Reduce congestion at the intersection of Third Street and Sixth Avenue		3.7	Provides preferred intersection levels of service (LOS) and has traffic queues that do not create blockages or other problems. Given the less traveled and neighborhood/central business district location for this intersection, users would not expect to experience significant delay at this intersection. Therefore, LOS C or better for all approaches is considered preferred. LOS D on an approach or approaches, with an overall LOS C, would be considered acceptable for this intersection. ***Provides a small improvement in operations. However, the intersection does not currently experience unacceptable congestion.***
Improve pedestrian access and experience across (over/under) railroad tracks		3.3	Provides reasonably good conditions for pedestrians such as: good lighting, adequately wide sidewalk, lack of debris on sidewalk, ADA compliant pathways, and a reasonably direct walking route across the railroad tracks. ***Would provide a wider and more attractive alternative for pedestrians than current conditions.***
Improve horizontal clearance (width) so semi-trailer trucks can use the underpasses without problems		3.2	Provides vehicular travel lanes at least 11 feet wide with at least 1 foot offset to horizontal obstructions (the bridge abutments/sidewalk rail). ***Reconstruction of the underpass would provide the necessary width.***
Reduce driveway conflicts between underpasses and MacCorkle Avenue		3.2	Meets TRB Access Management Manual guidance for driveway spacing and design. ***All accesses are closed between the underpass and MacCorkle Avenue in this scenario.***
Improve bicycle access and experience across (over/under) railroad tracks		3.0	Provides reasonably good conditions for biking such as: a reasonably comfortable location for cyclists to ride, lack of debris/mud in path of the cyclist, and a reasonably convenient route across the railroad tracks for cyclists. ***The proposed 6 feet wide shoulders within the underpass will provide a much more comfortable location for cyclists to ride than current conditions.***

* Based on a Stakeholder Survey on the importance of each goal. The value represents the average score for that goal on a scale of 1 (not important) to 5 (highest importance).

Figure 9-9: Scenario D Evaluation

It is important to consider other factors that will impact the feasibility of implementing the scenario such as construction costs, impacts to adjacent properties, difficulty of implementation. For evaluation purposes, a scenario that has estimated **construction costs** less than $2 million is considered "Low" cost; $2-5 million is considered "Medium" cost, and over $5 million is considered "High" cost. The **impacts to properties** include building impacts, impacts to operations or access, and impacts to the CSX track or operations. The **difficulty of implementation** is based on the likelihood of obtaining funding, right-of-way, environmental clearance, and CSX cooperation. Each of these were gauged on a level of either low, medium, or high as detailed for each scenario below.

Scenario A

An overall evaluation of Scenario A for these additional factors is illustrated in **Figure 9-10**.

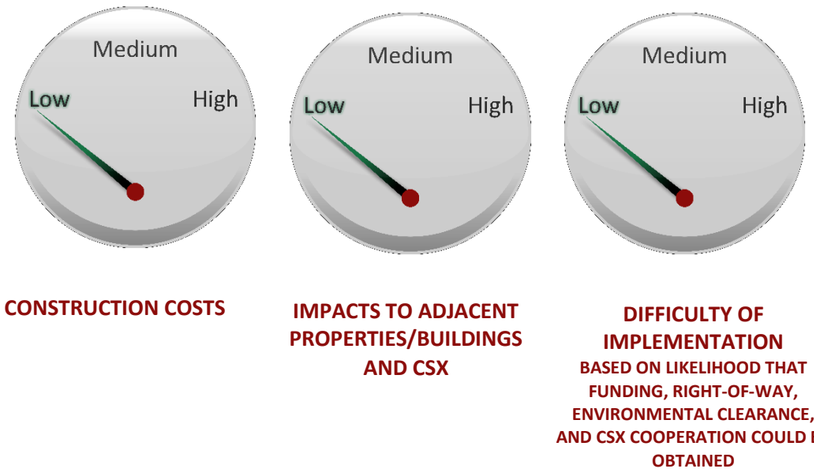


Figure 9-10: Scenario A Construction Costs, Property Impacts, and Difficulty of Implementation

The estimated cost of construction is in the $1 to $1.5 million range. With this scenario, there are no anticipated impacts to properties adjacent to Third Street with the exception of the access modifications at the Go Mart and there are minor property impacts at the intersection of Fifth Street with MacCorkle Avenue. Additionally, CSX operations will not be affected by the recommended conversion of Third Street to one-way southbound. For these reasons, the impacts to properties/buildings and CSX were deemed to be low. Given the scenario has low construction costs and low impacts to properties/buildings and CSX, little no environmental clearances, and no involvement required by CSX, the difficulty of implementation was also rated to be low. Expected opposition will likely come from residents and business owners directly affected by the one-way conversion.

Scenario B

An overall evaluation of Scenario B for these additional factors is illustrated in **Figure 9-11**.

The estimated cost of construction is in the $1 to 1.5 million range. The property impacts are expected to be minor with the realignment of the south approach, construction of a southbound left-turn lane at Sixth Avenue and modification of the Go Mart access. With the elimination of left-turns onto MacCorkle Avenue at Third Street, the existing curb is expected to remain unmodified. Therefore, there are no property impacts at this location. CSX operations would be minimally affected during the construction of the at-grade pedestrian crossing. For these reasons, the impacts to properties/buildings and CSX were rated to be low. While many of the features of this scenario are expected to be easily implemented, a CSX representative has indicated that for CSX to agree to allow the construction of the at-grade pedestrian crossing, three other at-grade (vehicular or pedestrian) crossings in the St. Albans area must be closed, which does not appear to be a realistic possibility. This resulted in the difficulty of implementation of this scenario to be high.

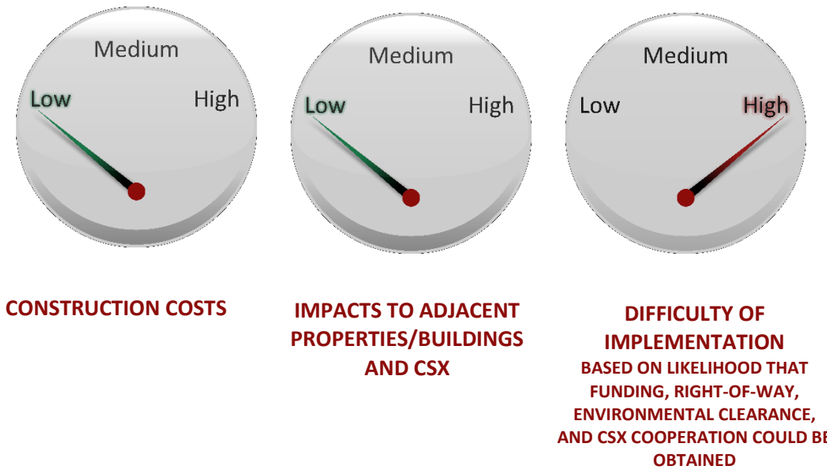


Figure 9-11: Scenario B Construction Costs, Property Impacts, and Difficulty of Implementation

Scenario C

An overall evaluation of Scenario C for these additional factors is illustrated in **Figure 9-12**.

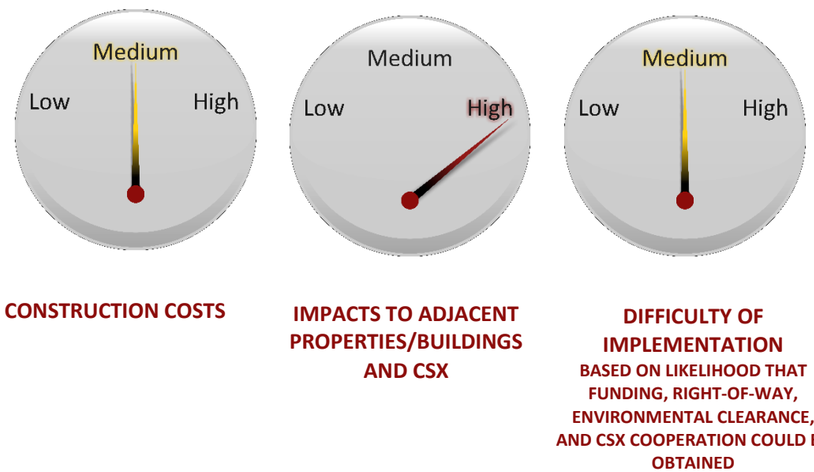


Figure 9-12: Scenario C Construction Costs, Property Impacts, and Difficulty of Implementation

This scenario has the second highest construction cost among the four scenarios, costing approximately $4 million. As with Scenario B, the realigning of the south underpass approach, construction of southbound left-turn lane at Sixth Avenue, and access modifications at Go Mart are expected to have minimal property impacts. The pedestrian tunnel is expected to have moderate property impacts but will mostly affect access to properties, not require a significant amount of right-of-way acquisition. As previously discussed, several similar pedestrian tunnels have been conducted with little to no impacts to CSX operations. However, the roundabout at MacCorkle Avenue is expected to have significant property impacts including impacts to the school-owned football field and several buildings near the intersection. For this reason, impact to properties/buildings and CSX for this scenario is high. Given the amount of property impacts and the associated environmental clearances with acquiring school property, the difficulty of implementation for this scenario was deemed to be medium. Opposition would likely occur by property owners at the MacCorkle Avenue intersection that are directly impacted by property or building takes required by the roundabout.

Scenario D

An overall evaluation of Scenario D for these additional factors is illustrated in **Figure 9-13**.

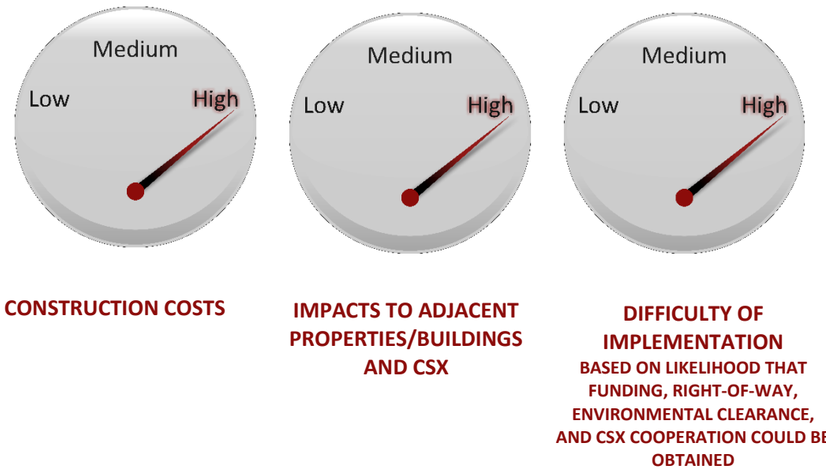


Figure 9-13: Scenario D Construction Costs, Property Impacts, and Difficulty

The estimated construction cost for Scenario D is approximately $6.4 million, making it the highest construction cost among all the scenarios. Significant property and building impacts are expected after the reconstruction of the underpass roadway and railroad bridges, and the construction of exclusive southbound and westbound right-turn lanes at the MacCorkle Avenue intersection. Additionally, the railroad track may need to be raised to improve vertical clearance in the underpass after the modification of the railroad bridge. According to CSX, this act would require profile adjustment on a long section of track and cause large impacts to rail operations. For these reasons, the impacts to properties/buildings and CSX for this scenario were deemed to be high. With the high construction costs and high impacts to properties/buildings and CSX, the difficulty of implementation for this scenario was also rated to be high. A CSX representative indicated that they would not be absolutely opposed this scenario, although CSX also indicated that they were concerned about the impacts to railway operations during construction. It is expected that acquiring the right-of-way to construct the westbound right-turn lane at Third Street and MacCorkle Avenue would be a difficult and costly process. It appears that the southbound right-turn lane could be constructed with minimal impacts to the school property.

9.5 Public Comments on Scenarios

A public meeting was held on October 6, 2015 to obtain feedback on the scenarios. The scenarios and evaluations were presented to participants. Attendees were asked what they liked and disliked about each scenario. Some participants were not able to attend, but viewed the information on RIC's website and completed the online survey form. The six responses are summarized below. Completed comment forms are included in **Appendix E**.

Scenario A

Table 9-2 summarizes citizen responses about what they liked about Scenario A.

Table 9-2: Comment Responses –Liked Features of Scenario A

Feature	Number of Respondents
"Nothing"	2
Wider Travel Lane	1
Construction of Southbound Left-Turn Lane on Third Street at Sixth Avenue	1
Improved Traffic Flow	1
Minimal Impact to Structure	1

*Respondents may list more than one feature

Table 9-3 summarizes the disliked features of Scenario A.

Table 9-3: Comment Responses – Disliked Features of Scenario A

Feature	Number of Respondents
One-Way Traffic – No Way Outbound with Train	3
One-Way Traffic – Driver Confusion	1
One-Way Traffic – General	1
Signal at Fifth Street and MacCorkle Avenue	1
Does Not Meet Goals and Objectives	1
Too Much Traffic on Local Streets	1
"Nothing"	1

*Respondents may list more than one feature

Of the six responses, only one citizen was in favor of converting Third Street into one-way southbound. Citizens cited the lack of outbound route from St. Albans when a train is present as the major reason for their opposition to this scenario.

Scenario B

Table 9-4 summarizes citizen responses about what they liked about Scenario B.

Table 9-4: Comment Responses – Liked Features of Scenario B

Feature	Number of Respondents
Elimination of Sidewalk in Underpass	2
Wider Travel Lanes with Two-Way Traffic	1
Creation of Pedestrian Crossing Across Tracks	1
Construction of Southbound Left-Turn Lane on Third Street at Sixth Avenue	1
"Nothing"	1

*Respondents may list more than one feature

Table 9-5 summarizes the disliked features of Scenario B.

Table 9-5: Comment Responses – Disliked Features of Scenario B

Feature	Number of Respondents
Left-Turn Restrictions at Third Street and MacCorkle Avenue	4
Closure of Other Crossings for At-Grade Pedestrian Crossing	3

*Respondents may list more than one feature

Citizens supported the idea of an at-grade pedestrian crossing across the tracks, but did not feel it would provide enough benefit to warrant the closure of three other at-grade crossings per CSX public projects requirements. Additionally, citizens indicated that the left-turn restrictions at Third Street and MacCorkle Avenue would create driver confusion, especially for drivers unfamiliar with the St. Albans area, and would put more traffic on the residential streets which would be unfavorable for homeowners in the area.

Scenario C

Table 9-6 summarizes citizen responses about what they liked about Scenario C.

Table 9-6: Comment Responses – Liked Features Scenario C

Feature	Number of Respondents
Roundabout at Third Street and MacCorkle Avenue	2
Pedestrian Tunnel	2
Elimination of Sidewalk in Underpass	1
Wider Travel Lanes with Two-Way Traffic	1
Construction of Southbound Left-Turn Lane on Third Street at Sixth Avenue	1
Construction of Westbound Right Turn Lane at Third Street and MacCorkle Avenue	1

*Respondents may list more than one feature

Table 9-7 summarizes the disliked features of Scenario C.

Table 9-7: Comment Responses – Disliked Features of Scenario C

Feature	Number of Respondents
Roundabout – Property Impacts and Construction Costs	2
Roundabout – Will Not Improve Traffic Flow	2
Roundabout – Increased Confusion	1
Pedestrian Tunnel	1
"Nothing"	1

*Respondents may list more than one feature

While some respondents supported the idea of a roundabout, many felt the property impacts, construction costs, increased driver confusion, and perceived inability to improve traffic flow far outweigh its benefits. There were mixed reviews about the pedestrian tunnel. Two citizens were in favor of the feature while another thought few pedestrians would use the tunnel, making it a waste of money.

Scenario D

Table 9-8 summarizes citizen responses about what they liked about Scenario D.

Table 9-8: Comment Responses – Liked Features of Scenario D

Feature	Number of Respondents
Construction of Southbound Left-Turn Lane on Third Street at Sixth Avenue	2
Construction of Westbound Right Turn Lane at Third Street and MacCorkle Avenue	2
Construction of Southbound Right Turn Lane at Third Street and MacCorkle Avenue	2
Wider Underpass	2
Wider Travel Lanes with Two-Way Traffic	1
Pedestrian Accommodations within Underpass	1
Extended Northbound Left-Turn Lane at Third Street and MacCorkle Avenue	1
Minimal Property Impact	1

*Respondents may list more than one feature

Table 9-9 summarizes the disliked features of Scenario D.

Table 9-9: Comment Responses – Disliked Features of Scenario D

Feature	Number of Respondents
Construction Costs	4
Long-Term Construction Impacts	2
Improvement not Making a Large Enough Impact in Congestion	1
Improvement not Impacting Signal Timing	1

*Respondents may list more than one feature

Citizens supported the wider underpass and the construction of extended or additional exclusive turn lanes at the intersections of Third Street with MacCorkle Avenue and Sixth Avenue. However, they were not in favor of the construction costs associated with these improvements, knowing it would be harder to get funding. Some also cited a lengthy construction period, specifically with the reconstruction of the underpass as reasoning to avoid this concept.

General Comments

Many respondents, both those who attended the Public Meeting, and those who did not, realized the need for a "hybrid" solution in the form of various concepts from multiple scenarios.

Chapter 10: Recommendations

The following recommendations are a combination of consideration of technical analysis, feedback from stakeholders and the public, and the judgment of the study team.

10.1 Recommended Scenario Features

The Recommended Scenario has the following features as illustrated in **Figure 10-1** and the large exhibit in **Appendix B**:

1) **Remove sidewalk in underpass to provide wider travel lanes and construct pedestrian/bike tunnels under Third Avenue, the railroad tracks, and Fourth Avenue; and realign Third Street south of Fourth Avenue** – The recommended scenario removes the pedestrian sidewalk in the underpasses to provide additional width for vehicular traffic. The sidewalk would be replaced with pedestrian tunnels paralleling Third Street passing under Third and Fourth Avenues and the railroad tracks to improve pedestrian and bicycle linkage. Removing the sidewalk in the underpasses will provides roadway width for one 11-foot, 6-inch travel lane and a 1-foot shoulder in each direction. At this width, wider vehicles, including the newer KVRTA buses and fire trucks, should be able to use the underpass without issue. The walls of the underpass, roadway, and railroad bridges would remain intact and unmodified. It should be noted that this recommendation does not include an increase of vertical clearance in the underpass. However, the only apparent benefit of improving vertical clearance is so that semi-trailer trucks could then use the underpass to access St. Albans, which was not a high priority of the stakeholders and was actually a goal that was not supported by public participants.

   The recommended scenario also improves the alignment of Third Street just south of the Fourth Avenue underpass, which requires reconstruction and realignment of the west retaining wall. There will be minor property impacts as a result of the south approach realignment. A relatively short portion (approximately 60 feet) of the west retaining wall would also have to be reconstructed and realigned to provide a smooth lane shift north of the Third Avenue underpass.

   Pedestrians must still be accommodated along Third Street to meet a primary corridor goal. The recommended scenario includes a new pedestrian and bicycle path that extends from Fifth Avenue and MacCorkle Avenue to accommodate pedestrian traffic. The path would pass under Fourth Avenue, the railroad tracks, and Third Avenue through relatively short tunnels constructed of precast box culverts. Between the tunnels/culverts the path would be open with retaining walls on either side, to provide a less confined space and natural light during the day. Lighting the tunnels is an importation element of the scenario. WVDOH rendered the pedestrian tunnel shown in **Figure 10-2**.

   Of the two concepts considered – an at-grade pedestrian crossing (Scenario B) and a pedestrian tunnel (Scenario C) – the pedestrian tunnel was most favored by both the public and CSX. A CSX representative said that similar past projects have been conducted with little to no interruption to CSX operations.

   Additionally, the tunnel would be shallower than the existing underpass which would make the route more convenient for pedestrians and bicycles than passing through the existing underpasses. This scenario also eliminates water and debris falling on pedestrians and cyclists in the underpasses and the sludge on the sidewalk from the railroad above.

Figure 10-2: Pedestrian Tunnel Rendering

   Eliminating either (or both) the Third Avenue or Fourth Avenue bridges over Third Street could be considered to save on construction costs. This would reduce the number of culverts needed and the overall length of retaining walls needed. The disadvantage of this idea is that traffic would no longer be able to traverse St. Albans using these two streets. While this option was not specifically evaluated, and is not necessarily recommended, this option could be considered if there is a desire to reduce the costs and impacts of the project.

   The pedestrian/bike path is placed on the west side of Third Street to minimize impacts to properties of the retaining wall and tunnel construction. However, some accesses will still be impacted. The alleys parallel to Third Street and the access from Lewis Avenue to Third Street will be closed. It appears as though the property on Lewis Avenue will still have access on Lewis Avenue and will not be largely impacted by the closing of the adjacent alley or access to Third Street. The property on Fourth Avenue will be impacted by the closing of the adjacent alley. Parking to the property is configured such that the primary access is the alley. Therefore, parking for this property will need to be reconfigured which may result in a fewer number of parking spaces.

2) **Exclusive westbound right-turn lane at Third Street and MacCorkle Avenue** – Stakeholders and local residents agree that the intersection of Third Street and MacCorkle Avenue is often congested, and this is also in line with the study team's technical analysis. In order to mitigate this congestion, the recommended scenario includes the construction of a westbound right-turn lane. Currently, the westbound approach has one exclusive left-turn lane, one exclusive through lane, and one shared through and right-turn lane. With the large volume of vehicles turning right at this intersection to travel across the WV 25 Bridge in conjunction with the large number of through vehicles, a significant amount of green time is required to accommodate this demand. By adding the exclusive westbound right-turn lane, more vehicles can be served on this approach. This allows for the redistribution of green time for other approaches which improves the overall operation of the intersection. While this improvement alone will not completely mitigate congestion at the intersection, operations are improved.

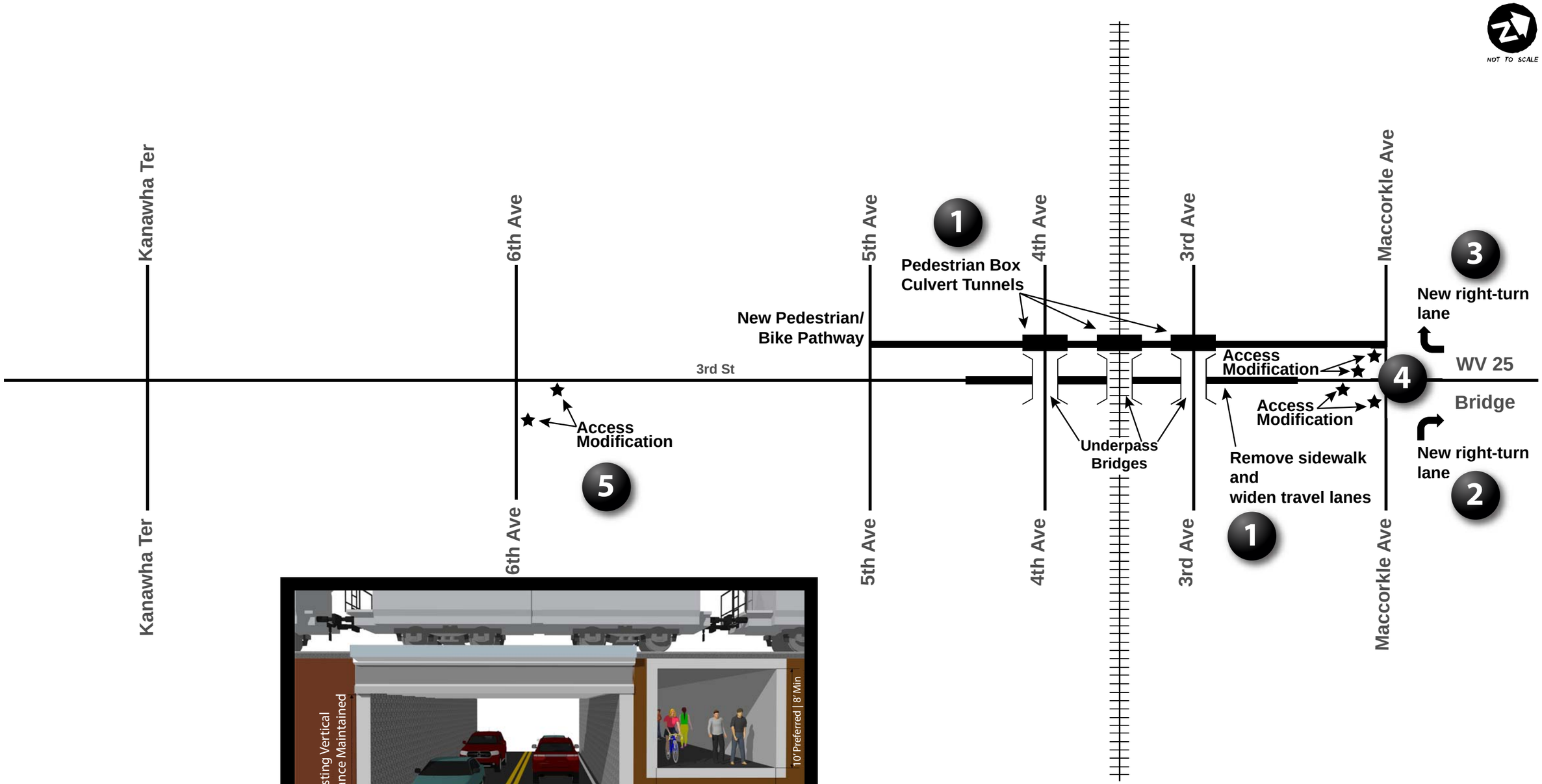


Figure 10-1: Recommended Scenario Schematic

In order to construct this turn lane, there will be significant property impacts. The Love Nissan dealership will be most impacted with the partial take of their building being likely. An option to attempt avoid Love Nissan would be to shift the alignment of MacCorkle Avenue south, but significant impacts would likely result to properties on the south side of MacCorkle Avenue, which will likely affect more than one property owner and significantly increase construction costs. Given the close proximity of the building to the roadway (the building abuts the sidewalk), it is unlikely that even an alignment shift would preserve the entire building. The managers of Love Nissan could not be reached for comments.

Many of the members of the public that participated supported the added westbound right-turn lane.

3) **Exclusive southbound right-turn lane at Third Street and MacCorkle Avenue** – The construction of an exclusive southbound right-turn lane at Third Street and MacCorkle Avenue is included in the recommended scenario to improve intersection operations. Traffic counts (see Section 5) show that there are as many right-turning vehicles as left-turning vehicles during the PM peak hour. More vehicles can be accommodated in a shorter amount of green time with an exclusive right turn lane. This allows more green time to be allocated to other approaches improving the overall intersection operations. Analysis shows that constructing this turn lane in conjunction with the westbound right-turn lane reduces congestion at this intersection.

   There would be minor encroachment onto the school-owned property (including the high-school football field) due to construction of a right turn lane. However, it appears that the lane could be added with no detrimental impacts to buildings or operations of the property. A small retaining wall is likely required to minimize property impacts.

   Many of the citizens were in favor of the added southbound right-turn lane. No negative comments were received about the improvement.

4) **Access modifications at Third Street and MacCorkle Avenue intersection** – As detailed in Section 5, several driveways are too close the intersection of Third Street and MacCorkle Avenue. This intersection is the highest crash location in the study corridor. Movements to and from driveways are likely the cause of a number of the crashes that occur here. While it is not feasible to close all of these driveways, it is recommended that modifications be made to improve traffic flow and safety along MacCorkle Avenue and Third Street. Vehicular access from Lewis Avenue to Third Street will need to be permanently closed as a result of the construction of the pedestrian/bike path. Traffic can still access Lewis Avenue through its connection with Second Street.

   The study team recommends that both the Tim Horton's driveway on Third Street and the eastern-most driveway on MacCorkle Avenue be converted to a right-in/right-out configuration. Vehicles will still be able to access the Tim Horton's via Lewis Avenue and the western driveway on MacCorkle Avenue. Similarly, Lewis Avenue, on the east side of Third Street, should also be converted to a right-in/right-out access. Safety and traffic flow should improve after eliminating left-turns at these locations that are close to the intersection. The study team recommends that both driveways on MacCorkle Avenue be closed because Taco Bell can be accessed by Lewis Avenue from either Third Street or Fourth Street.

   There will be likely opposition from the owners of the Tim Horton's, Taco Bell, and other businesses that are affected by the closing and modification to the Lewis Avenue accesses to Third Street. However, these access modifications should be made to improve safety along Third Street and MacCorkle Avenue.

5) **Access modifications to Go Mart** – The driveways to the Go Mart at the intersection of Third Street and Sixth Avenue are wide and uncontrolled and do not meet the maximum width regulations outlined in the WVDOH *Manual on Rules and Regulations for Constructing Driveways on State Highway Rights-Of-Way*. Additionally, driveways on both Sixth Avenue and Third Street are too close to the Third Street and Sixth Avenue intersection. It is recommended that the driveway on Sixth Avenue be narrowed and located on the east side of the property which will provide as much space as possible between the access and the intersection. This improvement also allows for the sidewalk network, which was previously missing a large link along the Go Mart property due to the wide driveway, to be completed along Sixth Avenue. It is also recommended that the driveway on Third Street be closed because Go Mart can still be accessed by the adjacent alley. Sidewalk and a landscape buffer will be provided to create a uniform streetscape along Third Street.

   The cost and physical impacts of this improvement appear to be minimal. No specific public comments about the access modifications were received. There may be opposition from the owners of the Go Mart, but to improve safety, pedestrian accommodations, and aesthetics in the corridor, these modifications are recommended.

It is important to note that an exclusive southbound left-turn lane at the Third Street and Sixth Avenue intersection was considered in all scenarios, but was not included as part of the Recommended Scenario. While many citizens were in favor of the improvement, the operational benefit of adding the turn lane was minimal compared to the construction costs and property impacts. Existing and "Do Nothing" technical analyses did not indicate a congestion problem at this location. For these reasons, the study team does not recommend an exclusive southbound left-turn lane.

10.2 Recommended Scenario Traffic Operations

The future traffic operations for the recommended scenario was predicted assuming traffic forecasts presented in Section 6. A total of 10 separate Transmodeler simulations were performed for the corridor to account for the stochastic nature (different results occur in each simulation) of the microscopic model.

Table 10-1 summarizes the intersection operational analysis results for the AM and PM peak hours for the Third Street intersections. The operations summary was not presented for those intersections, because improvements to Third Street are not expected to impact operations at adjacent intersections. Statistics reported in the table include average delay per vehicle experienced on each approach (seconds per vehicle) and approach and intersection level of service.

Table 10-1: Recommended Scenario Operations Summary

Intersection	Approach	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
Kanawha Terrace and Third Street	EB	13.9	B	11.9	B
	WB	12.5	B	8.6	A
	NB	41.8	D	35.2	D
	SB	29.8	C	34.1	C
	Overall	24.0	C	22.9	C
Sixth Avenue and Third Street	EB	13.4	B	11.1	B
	WB	14.4	B	9.8	A
	NB	37.9	D	33.4	C
	SB	27.4	C	37.7	D
	Overall	26.5	C	24.7	C
Fifth Avenue and Third Street*	EB	13.1	B	22.7	C
	WB	18.3	C	18.5	C
	NB	8.2	A	12.2	B
	SB	13.2	B	13.3	B
	Overall	13.9	B	14.5	B
MacCorkle Avenue and Third Street	EB	23.5	C	26.1	C
	WB	22.0	C	29.3	C
	NB	38.5	D	38.9	D
	SB	20.2	B	22.3	C
	Overall	21.4	C	27.3	C

*Unsignalized intersection analysis

The recommended scenario provides improved operations comparing analysis results to the "Do Nothing" Conditions presented in Section 6.

10.3 Recommended Scenario Construction Cost Estimates

The study team estimated construction costs for the recommended scenario. Cost estimates do not include cost of right-of-way acquisition, utility relocation, or environmental mitigation, but do include maintenance of traffic estimates, contingency, and miscellaneous costs such as mobilization, field office, and other costs usually captured through a lump sum quantity.

It is assumed existing pavement will be milled and overlaid with new asphalt pavement for proposed restriping. Full depth pavement is only assumed in areas where new lanes are recommended outside of existing pavement limits. The costs outlined herein are considered preliminary. A more detailed preliminary engineering study should be conducted to better determine the construction costs of the final recommended solution. These cost estimates are more refined than the scenario cost estimates as impacts were further explored. Cost estimate calculations are included in **Appendix N**.

The estimated construction costs for the recommended scenario were $3 million which includes the following:

Recommended Improvement		Estimated Construction Cost
1A	Remove pedestrian sidewalk in underpass for wider travel lanes and realign south approach	$620,000
1B	Pedestrian tunnel	$1,610,000
2	Westbound right-turn lane at Third Street and MacCorkle Avenue	$340,000
3	Southbound right-turn lane at Third Street and MacCorkle Avenue	$290,000
4	Access modifications at Third Street and MacCorkle Avenue intersection	$60,000
5	Access modifications at Go Mart	$80,000

10.4 Recommended Scenario Implementation

Phasing this project into a series of smaller projects is appropriate given the independent nature of many of the recommendations. Some of the recommendations are more readily implementable than others. Suggested priorities for implementing the "pieces" of the recommended scenario is described as follows and is illustrated in **Figure 10-3** (or on a to-scale map in **Appendix O**):

- **First Priority: Remove sidewalk in underpass to provide wider travel lanes and construct pedestrian/bike tunnels under Third Avenue, the railroad tracks, and Fourth Avenue; realign Third Street south of Fourth Avenue; and Construct southbound right-turn lane at Third Street and MacCorkle Avenue –** The top four corridor goals (as rated by stakeholders) are met with the completion of this recommendation (see Section 7). The solution improves horizontal clearances in the underpass, causes minimal disruption to CSX railroad operations during construction, and is more feasible and affordable than a complete reconstruction of the three Third Street overpass structures as recommended in the *St. Albans Railroad Crossing Study*. Therefore, these improvements were identified as the first priority for implementation. The solution also provides a significantly improved route for pedestrians and bicyclists to travel along Third Street from Fifth Avenue to MacCorkle Avenue.

  While constructing the southbound right-turn lane alone will not completely mitigate congestion at the Third Street and MacCorkle Avenue intersection, there would be a noticeable benefit to motorists. The southbound right-turn lane is thought to be easier to construct than the westbound right-turn lane because it only has minor impacts to the school-owned property on the northwest corner of the intersections versus significant impacts (including building impacts) to the property on the northeast corner. For these reasons, constructing a southbound right-turn lane was identified as the second priority.

  The estimated construction cost for first priority improvements is $2,520,000 (plus minor right of way costs).

- **Second Priority: Construct westbound right-turn lane at Third Street and MacCorkle Avenue** – Construction of this westbound right-turn lane would be the final step in providing adequate capacity at the intersection of Third Street and MacCorkle Avenue. This turn lane in conjunction with the southbound right-turn results in overall intersection delay and backups being at an acceptable level. This turn lane was considered lower priority than the southbound right-turn lane because it is anticipated to be more difficult to construct. The significant impacts to the Love Nissan building is expected to draw strong opposition which could delay or block the project development. The estimated construction cost for this second priority improvement is $340,000 (plus major right-of-way costs).

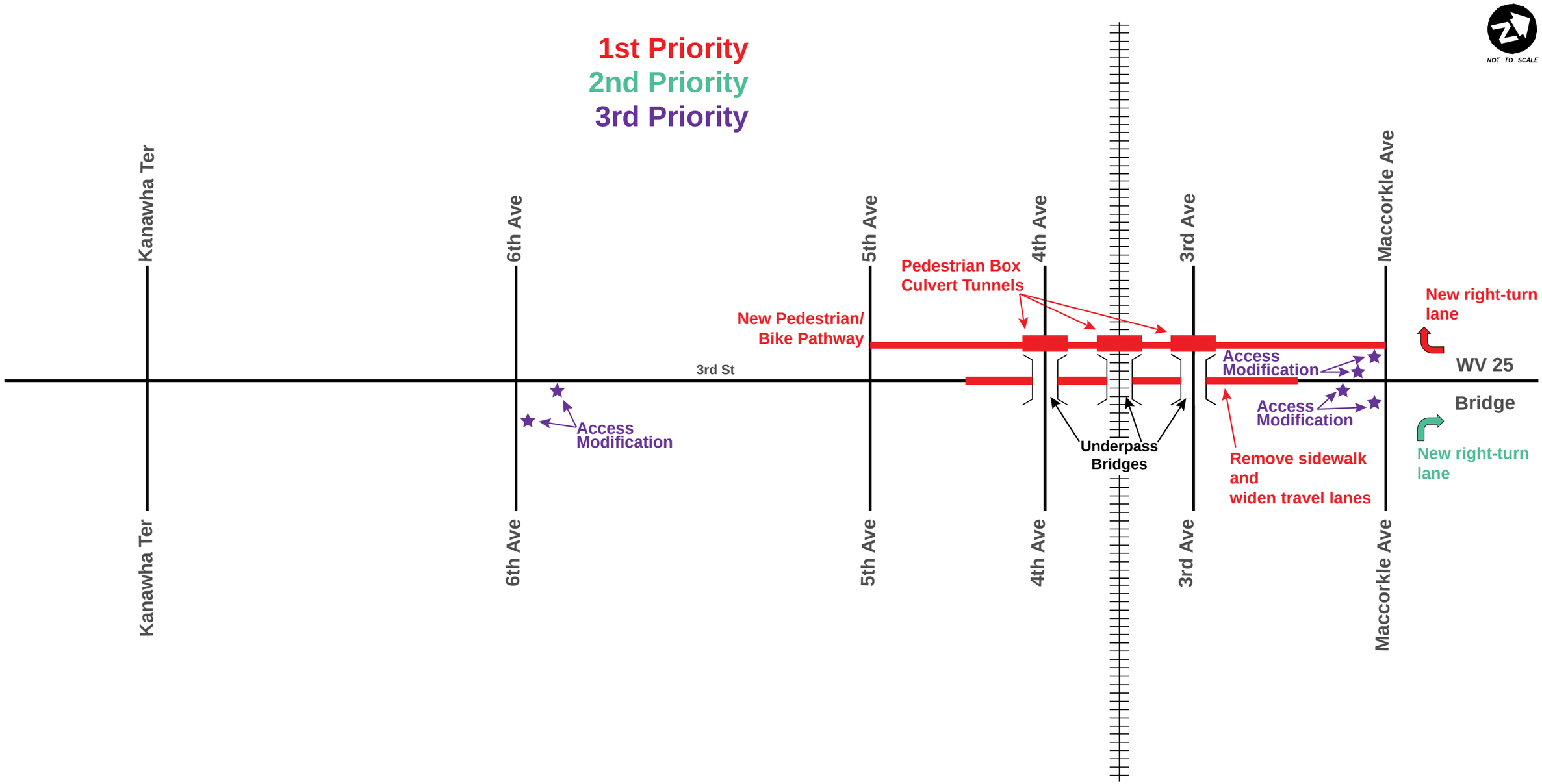


Figure 10-3: Recommended Scenario Implementation Priorities

- **Third Priority**: **Modify access at Go Mart and the Third Street and MacCorkle Avenue intersection** – These low-cost improvements would improve safety and traffic flow in these areas by reducing vehicle conflicts in the functional area of these heavily traveled intersections. The access modifications to the Go Mart property would also significantly improve pedestrian traffic conditions along Go Mart's frontage. Coordination with adjacent property owners will be necessary to implement these improvements. These improvements are dependent on reaching an agreement with property owners, which may be difficult to attain. Furthermore, the modified access does not provide as much benefit as other recommendations; thus the access modifications were classified as third priority. The estimated construction costs for the third priority improvements is expected to be $140,000.

10.5 Other Short-Term Recommendations

The following are other recommendations to address needs in the corridor for any recommended scenario. Many of these improvements can be done in the near-term for relatively low costs. Cost estimates were not made for these recommendations.

Traffic Control Improvements

The following improvements are recommended based on problems and needs discussed in Section 5:

- **Update pavement markings** – Ensure that pavement markings are well visible, especially in low-light and wet conditions. Consider using thermoplastic (on asphalt) or epoxy (on concrete) for long lasting, highly visible markings.

Pedestrian Improvements

The following pedestrian improvements are recommended based on field reviews and problems outlined in Section 5:

- **Implement a sidewalk maintenance program** – The sidewalk maintenance program would ensure that sidewalks are kept clean of debris, snow, and vegetation. This program could be supported by the City of St. Albans and could rely on citizens to report locations that are damaged or in need of cleaning. These reports would be funneled to appropriate personnel at WVDOH or City of St. Albans who would be dispatched to make the repairs.
- **Install parking blocks in the Rite Aid parking lot to prevent parked vehicles from blocking the sidewalk** – There is no separation between the parked vehicles in the Rite Aid parking lot and the sidewalk along Third Street. The study team observed parked vehicles obstructing the sidewalk. Installing parking blocks will ensure vehicles cannot extend onto the sidewalk.
- **Fix uneven sidewalk** – The sidewalk inventory also indicated several areas of uneven sidewalk which creates a tripping hazard. Efforts should be made to reconstruct the sidewalk in these locations. Uneven sidewalk areas could also be reported through the sidewalk maintenance program.
- **Update curb ramps, push buttons, and pedestrian heads to comply with ADA guidance** –Many of the curb ramps, push buttons, and pedestrian heads are not compliant with ADA standards. These should be upgraded to provide safer spaces for pedestrians, especially those with disabilities. The study team recommends ADA compliant ramps for areas where curb ramps do not currently exist. Field reviews indicated that the Walk signal on the pedestrian heads did not illuminate for pedestrians to cross Third Street (parallel to MacCorkle Avenue). Without push buttons for this movement, the Walk sign should be shown every time the through movements on MacCorkle Avenue are given green time. This deficiency should be addressed.

Bicycle Improvements

The following bicycle improvements are recommended based on field reviews and problems outlined in Section 5:

- **Install new signage for the published bike routes through St. Albans** – As detailed in Section 5, there are several bike routes in St. Albans that are published on maps by the St. Albans Renaissance Group. However, the study team found that these routes were not well marked. Consideration should be given to installing signage and pavement markings along the routes to emphasize the routes for both motorists and bicyclists.
- **Implement a bike lane maintenance program** – The bike lane maintenance program would ensure that bike lanes on MacCorkle Avenue are kept clean of debris so that bicyclists do not encounter obstacles along their path. Damaged bike route signs could also be monitored and reported through this program. The City of St. Albans could support this program, relying on citizens to report locations that are in need of cleaning or signs that are damaged or missing. These reports would be funneled to appropriate personnel at WVDOH who would be dispatched to make the repairs.

Transit Improvements

The following transit improvements are recommended to address problems and needs identified in Section 5:

- **Improve signage at bus stops** – Illegible bus stop signage should be replaced. Signage should publicize the service and routes that are served by the stop. Post mounted route information signs could be installed to allow transit users to see the schedule and map of the route served by the stop.
- **Enhanced transit stops** – The study team recommends additional designated transit stops with enhanced amenities for passengers. Recommended amenities include large sidewalk area, shelters, benches, and trash receptacles. Shelters and benches provide places for passengers to more comfortably wait (out of precipitation) for the bus and are especially recommended when service is less frequent (like it is in St. Albans).
- **Route buses along Third Street** – Once the improvements are completed in the underpass, KVRTA's new buses should have no difficulty using the underpass. Infrequent service along Third Street encourages passengers to walk longer distances to catch a bus. Consideration should be given to providing service to Third Street more frequent than three times per weekday.

10.6 Deficiencies Not Addressed

Several other existing deficiencies were identified in Section 5, but were not addressed in the recommendations.

At the intersection of Kanawha Terrace and Third Street, the significant grade creates a sight distance concern for the northbound left-turn movement. With permitted-only phasing, drivers may find it difficult to see oncoming northbound through traffic coming up the hill. Permitted-only phasing could be converted to split or protected-only to remedy this concern. However, because there is no known crash problem at this location and the intersection is operating acceptably, this modification is not recommended at this time. Should it become a problem in the future, the split phasing is the cheapest and easiest solution to implement, but intersection operations may be negatively affected.

As a result of the northbound approach having a left-turn lane, a slight lane shift exists between the northbound and southbound approaches at the intersection of Third Street and Sixth Avenue. The northbound through lane south of the intersection does not align with the northbound through lane on the north side of the intersection, requiring drivers to make a shift through the intersection. This shift would be eliminated with the construction of a southbound left-turn lane at this intersection. However, there is not a crash problem at this location and the shift is not extreme, so it is not recommended that the Third Street alignment be modified.

Field reviews indicated a steep profile of Third Street between Kanawha Terrace and Main Street which makes the sidewalks on both sides of the roadway difficult to traverse, especially in a wheelchair. It appears that there is no simple solution to improving

the profile of the sidewalk. Any improvement would require significant earthwork and would likely affect the profile of Third Street itself. It is not recommended that the sidewalk profile be modified at this time. In the future, if major reconstruction is planned along Third Street, consideration should be given to improving the sidewalk profile.

There appear to be drainage deficiencies in the underpass that result in water standing on the pavement. Standing water can result in premature deterioration of pavement. The standing water was also noticed on the existing sidewalk which - combined with dirt and sludge from the railroad above - create a mud-covered path for pedestrians. With the Recommended Scenario, the pedestrians are removed from the existing underpass and are protected by the box culverts from dirt and debris from the railroad. For this reason, drainage improvements were not included in the Recommended Scenario. However, to preserve the life of the pavement in the underpass, consideration should be given to making drainage improvements in the underpass.

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