

Regional Intergovernmental Council

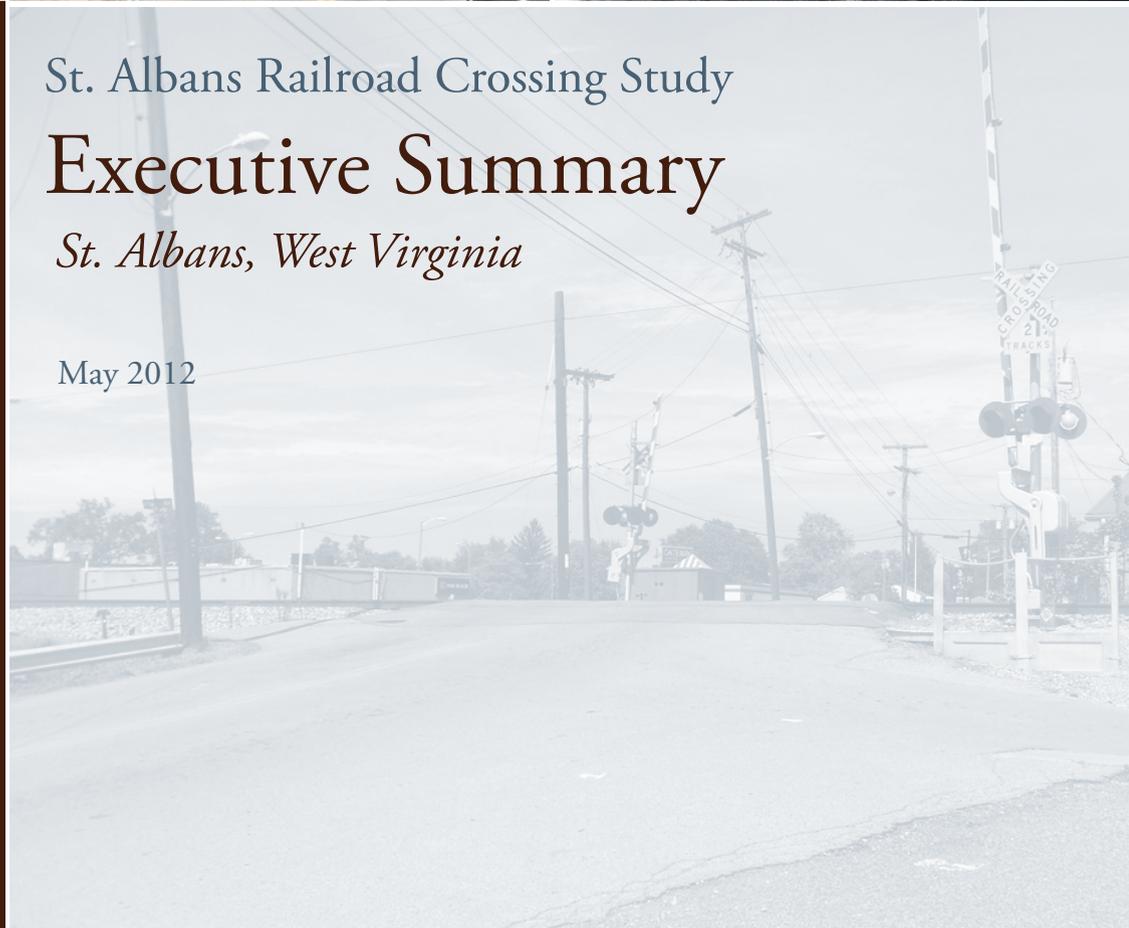


St. Albans Railroad Crossing Study
Executive Summary
St. Albans, West Virginia

May 2012

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Background

This study serves as a follow-up to previous studies undertaken by the Regional Intergovernmental Council. The purpose of this study is to evaluate existing railroad crossings within the City of St. Albans and to identify potential improvements with an emphasis on system capacity and safety.

The City of St. Albans is located in Kanawha County, West Virginia approximately 12 miles west of the state capital, Charleston. The population at the time of the 2010 census was 11,044. The downtown area is situated at the confluence of the Kanawha River and Coal River. Business development is mainly situated along the outer roadway network while the inside grid houses mostly residential properties. Police and fire emergency services are located downtown along with several schools, parks, and two large shopping centers. The City of St. Albans also has eleven Historic Places on the National Register. The Main Street Historic District, with its twenty-eight buildings, is a recent addition.

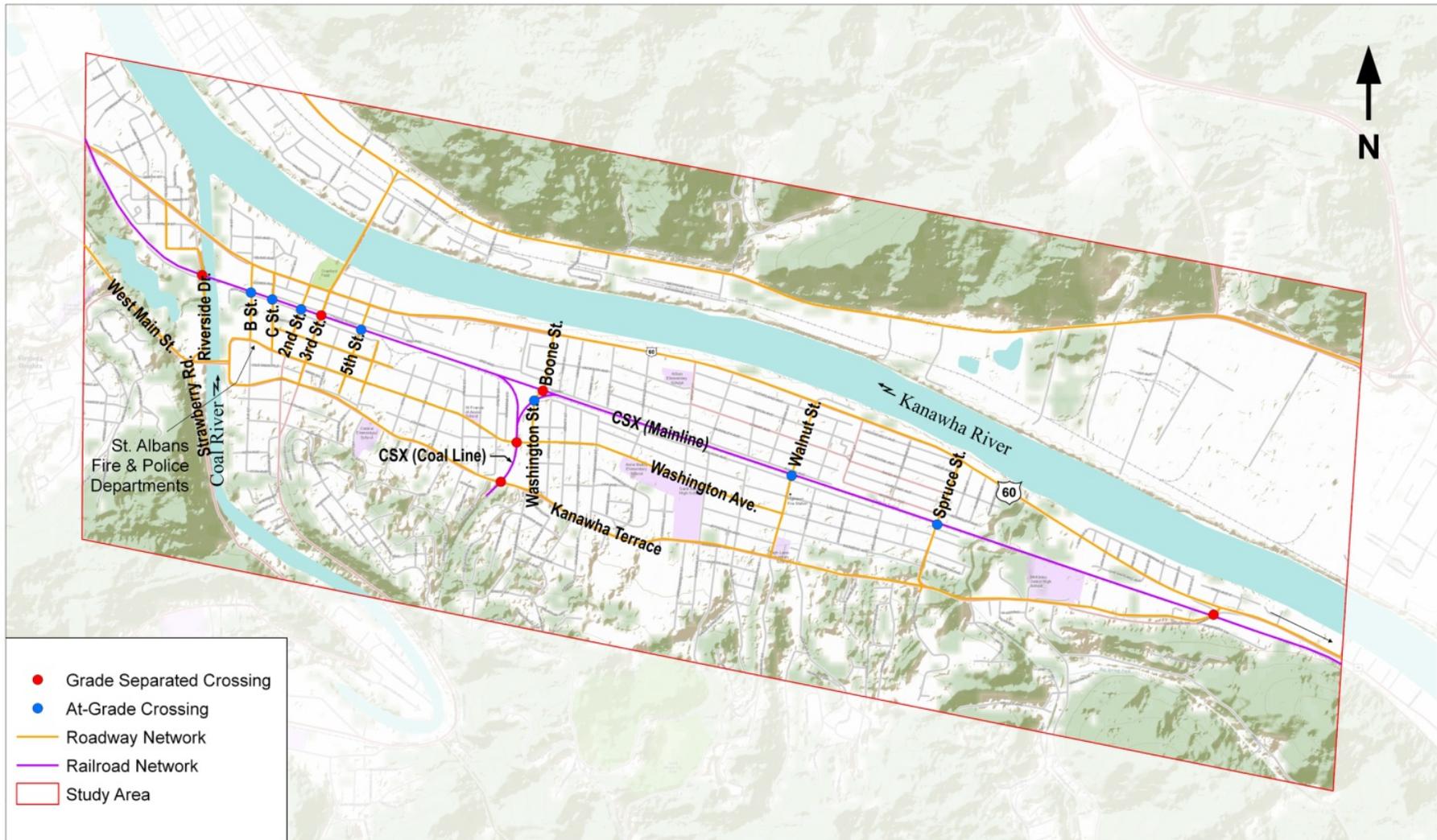
The town can be accessed from the north by an existing bridge over the Kanawha River, known as the Dick Henderson Bridge, at 3rd Street. This crossing links the City to WV 25 in the town of Nitro, WV. The existing bridge will be renovated to a three-lane structure in 2013 as part of a separate project. United States Route 60 (US 60), also known as MacCorkle Avenue, runs parallel to the Kanawha River at the northern end of town. Coal River crossings at US 60 and West Main Street allow access to the west and Pennsylvania Avenue provides a connection to the south. The study boundary is US 60/MacCorkle Avenue to the north, Kanawha Terrace to the south the US 60 and Kanawha Terrace intersection to the east, and Riverside Drive to the west. Roadways within the study area currently owned by the WVDOT are Kanawha Terrace (CR 60/14), Walnut Street (CR 160/7), 3rd Street (CR 6/6), and Riverside Drive (CR 60/2) while other roadways are part of the City of St. Albans municipal system (See Figure 1).

CSX Corporation's main track lies just south of US 60 running parallel to the road and intersects the gridded roadway network ten times, six of which are at-grade crossings. This line carries assorted freight including coal and has varied schedules. The line also services Amtrak's Cardinal route three times per week. A major wye joins the CSX main line from the south near

Boone Street. The main stem intersects Washington Avenue and Kanawha Terrace with grade separations and the east leg of the wye forms an at-grade crossing with Washington Street. This line serves the southern West Virginian coal fields and also has sporadic trip frequencies. Based on discussions with CSX representatives, only normal maintenance is planned for these facilities at this time.

Congestion in the city likely comes from the multimodal conflicts between rail and roadways. During the duration that a train is passing on the main line, north-south access is cut off at seven locations. It was noted in field observations that vehicles divert their trips to the grade-separated crossing during this event creating congested conditions that would not likely occur during non-train induced situations.

Figure 1 –Study Area (St. Albans, WV)



Existing Conditions

Within the study limits, there are 39 at-grade intersections, 7 at-grade rail crossings (see Table 1), and 6 grade separated rail crossings. In general, the at-grade intersections are stop controlled with two-lane, two-way roadways with posted speeds of 25 mph. The primary exception to this is US 60/MacCorkle Avenue, which is a five-lane roadway with signalized intersections at key locations. Based on the a railroad crossing inventory performed as part of this study, the Final Report summarizes the existing type of protection at each railroad crossing and identifies deficiencies. Various deficiencies at the grade crossings are present in the study area. Many of the at-grade crossings have poor approach vertical geometry that limits sight distance across the tracks and limits intersection sight distance for side streets located near the crossing and adjacent to the tracks. No advanced railroad crossing pavement markings or stop bars are provided and pedestrian accommodations are typically not present at these crossings. Grade separated crossings typically have lane width and vertical height restrictions. Kanawha Terrace serves as the least restrictive access; however, its intersection with MacCorkle Avenue is located on the east end of the study area and the main traffic generators are located on the west end of the study area. 3rd Street serves as a grade separated connection to the Dick Henderson Bridge, MacCorkle Avenue, and the main retail area of downtown St. Albans; however, lane widths are restricted to 10' each with no shoulders and vertical clearance is restricted to 10'-6".

Review of the train accident history compared with the history of updates to railroad protection devices suggests improvements have been effective. Crossing records indicate significant improvements were made to the crossings in April 2001. Since that time only four (4) accidents are recorded. The previous 25 years have twenty-eight (28) recorded accidents.

Based on vehicle crash records, all but three (3) intersections in the study area have crash rates below average. The MacCorkle/3rd Street intersection is significantly above average with crash types typical for signalized intersections. The Boone/Washington Street/Adams Avenue intersection and Spruce Street/Kanawha Terrace intersection are considered above average. This can partially be attributed to the low volume of vehicles entering these two intersections as well as poor intersection geometry.



Overall, the existing St. Albans transportation network currently operates well in terms of progression and level of service (LOS). In general, the signalized intersections and stop-controlled minor approaches at unsignalized intersections operate at LOS C or better with several notable exceptions. The US 60/MacCorkle Avenue with 3rd Street intersection currently operates at LOS E during both the AM and PM peak hours; the US 60/MacCorkle Avenue with Kanawha Terrace intersection operates at LOS D during the PM peak hour; and W. Main Street with Riverside Drive operates at LOS E during the AM peak. Each of these intersections serves as a gateway to downtown St. Albans. The 3rd Street and Kanawha Terrace corridors also have grade separated crossings which indicates drivers tend to utilize these corridors to access downtown instead of alternative routes with at-grade crossings.

During the AM peak hour, there is a noticeable increase in delay along the 3rd Street corridor for the train scenario. This indicates that drivers tend to modify their trip patterns to avoid the at-grade crossings and utilize the underpass with 3rd Street. However, during the PM peak hour with train scenario, there appeared to be greater increases in delay on the roadway network parallel to 3rd Street. This is likely due to the difference in travel patterns and congestion at the MacCorkle Avenue with 3rd Street intersection.

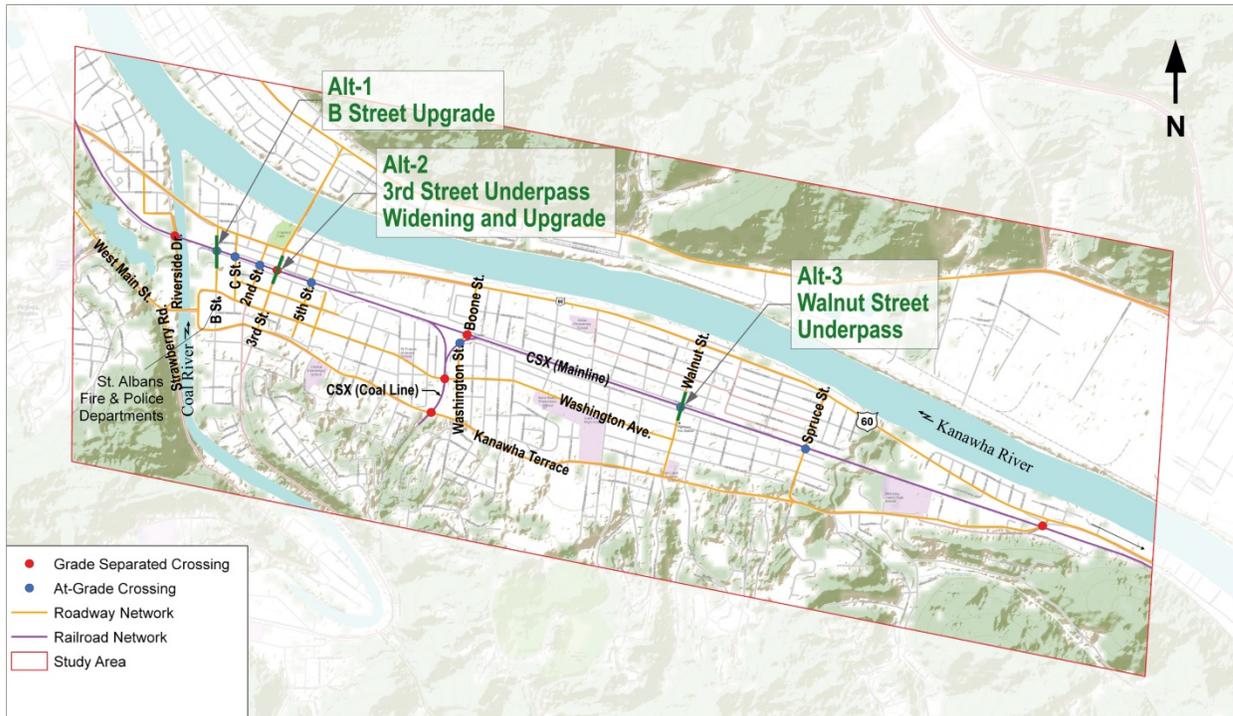
Table 1: Rail Crossing Summary

At-Grade Rail Crossings	Vehicles per Day (ypd)
B-Street Crossing	4,900
C-Street Crossing	600
2nd Street Crossing	1,900
5th Street Crossing	5,000
Boone Street Crossing, East Wye	1,000
Walnut Street	6,900
Spruce Street	1,000

Alternatives

To address the deficiencies, low cost improvements, which can be implemented as stand-alone projects, and three alternatives were identified (See Figure 2). Low cost improvements include items such as lack of pavement markings or missing signing. In addition to the alternatives, the study team identified an improvement outside of the immediate railroad crossings. This project would realign Spruce Street to form a plus intersection with Shrewsbury Drive on Kanawha Terrace. This project would enhance the operations and safety at the Kanawha Terrace intersection and allow for right-turn movements from Spruce Street onto Kanawha Terrace.

Figure 2 - Alternative Locations



Alternative 1: B Street Upgrade

During the existing conditions survey, B Street was identified as having a significant traffic volume and poor roadway profile approaches to the railroad tracks. The profile restricts stopping sight distance across the tracks and causes low profile trucks to hang up on the crossing. Alternative 1 focuses on improving the railroad approach grades along B Street. This is accomplished by raising the roadway profile starting approximately 400' south of the railroad

and ending approximately 400' north of the railroad. It is also recommended the 4th Avenue/3rd Street intersection be shifted southward away from the railroad tracks. Sidewalks would be reconstructed on one side of B Street which is consistent with the existing condition.

With the improved access at B Street, it is recommended C Street be closed to vehicular traffic. C Street currently has a relatively low traffic volume (600 vpd). Eliminating this crossing will reduce the number of conflict points along the railroad which will enhance safety and reduce future maintenance costs.

Anticipated impacts of this alternative include two commercial buildings located southeast of the railroad tracks. Due to the raised profile grade and the close proximity of the buildings to B Street, it is anticipated the entrance to the southernmost building and the parking lot for the northernmost building will no longer be able to connect with B Street.

Alternative 2: 3rd Street Underpass Widening and Upgrade

Alternative 2 focuses on improvements to the existing 3rd Street underpass. 3rd Street is the primary access to the St. Albans business district providing access to US 60 (MacCorkle Avenue) and the Dick Henderson Bridge between St. Albans and Nitro. As identified during the existing condition phase of this project, horizontal and vertical clearance restrictions are present. Horizontal clearance restrictions result in narrow lane widths, inability to provide adequate storage for vehicles at the MacCorkle Avenue intersection and drainage issues. Vertical restrictions result in taller vehicles rerouting to at-grade crossings.

Improvements to 3rd Street include lowering the profile grade to provide a 14'-6" vertical clearance and widening the underpass to provide room for 3- 11' lanes, 4' shoulders and a 5' sidewalk. To provide vertical clearance, the profile will begin lowering immediately north of 5th Avenue. It then crosses under 4th Avenue, CSX Railroad and 3rd Avenue connecting back into the existing roadway immediately south of the MacCorkle Avenue intersection. This alternative requires the existing CSX Bridge, 3rd Avenue Bridge, and 4th Avenue Bridge to be replaced and walls to be reconstructed.

Widening the roadway template and lowering the grade will result in impacts to the east-west alley located midway between 4th and 5th Avenues. This alley will no longer connect with 3rd

Street. West of 3rd Street a connector is proposed between the alley and 4th Avenue. A combination of the widened 3rd Street template and the alley connector will impact the doctor's office at this location. East of 3rd Street, a connector is proposed between the alley and 4th Avenue. This connector would impact a detached garage located on the law office property. Two additional residential properties would also be impacted since their current driveway accesses could no longer connect with 3rd Street. North of the railroad Lewis Avenue will no longer connect to 3rd Street. Adjacent properties are commercial and currently have additional access points to the local street system.

Because the underpass is being lowered, it is anticipated drainage may need to be pumped from the underpass to the existing city drainage system. Other drainage options may include connecting into the existing 3rd Street underpass drainage or constructing a new outlet pipe to the Kanawha River. A backflow preventer would be needed since the underpass is lower than the Kanawha River storm events. If this alternative is selected to move forward, additional study is warranted during the design study phase to determine the most cost effective and feasible method of providing the necessary drainage outlet.

Alternative 3: Walnut Street Underpass

Alternative 3 replaces the existing at-grade crossing at Walnut Street with a grade separated underpass. Walnut Street serves as local road primarily connecting residential neighborhoods north and south of the railroad and has a significantly higher traffic volume (6900 vpd) compared with adjacent crossing at Boone Street (1000 vpd) and Spruce Street (1000 vpd). The nearest grade separated crossings are Boone Street to the west and Kanawha Terrace to the east; however, geometric, and drainage deficiencies at Boone Street limit its use to a local shortcut unsuitable for large vehicles or emergency vehicles.

To construct the Walnut Street underpass, the roadway profile would begin to lower in the vicinity of Lincoln Avenue, located south of the railroad, and continue northward crossing under the railroad. North of the tracks, it would connect back with the existing roadway profile near the access road located midway between McKinley Avenue and Grant Avenue. A CSX bridge and walls would need to be constructed in each quadrant to limit impacts to adjacent properties. The underpass would provide 2-11' lanes, 4' shoulders and a raised 5' sidewalk.

South of the railroad, Wilson Avenue and the access road located midway between Lincoln Avenue and Wilson Avenue would no longer connect directly to Walnut Street. One-way connector roadways, matching the existing roadway network, would need to be constructed between Wilson and Lincoln Avenues immediately east and west of Walnut Street. South of the railroad, anticipated property impacts include the Highlawn Fire Station and three residential properties.

North of the railroad, Adams Avenue, McKinley Avenue and the Access Road midway between them would no longer connect directly to Walnut Street. Connector roadways, matching the exiting roadway network, would need to be constructed between Adams Avenue and McKinley Avenue east and west of Walnut Street. North of the railroad, anticipated property impacts include five residential properties.

Because the underpass would be lower than the surrounding roadway network, it is anticipated drainage may need to be pumped from the underpass to the existing city drainage system. Another drainage option may include constructing a new outlet pipe to the Kanawha River. A backflow preventer would be needed since the underpass is lower than the Kanawha River storm events. If this alternative is selected to move forward, additional study is warranted during the design study phase to determine the most cost effective and feasible method of providing the necessary drainage outlet.

With the construction of a grade separated access at Walnut Street, it is recommended the Boone Street underpass be closed. Eliminating this crossing will remove the at-grade conflict point at the east Wye and eliminate the mainline underpass which has geometric, and drainage deficiencies. This will provide additional safety and reduce maintenance cost.

Table 2 provides a summary of construction costs for each alternative as well as a summary of residential and commercial property impacts.



Table 2: Alternative Conceptual Cost and Property Impacts Summary

Alternative	Property Impact ¹		Constr. Cost \$1,000s	Utility Cost \$1,000s	Right-of-Way Cost \$1,000s	Total Cost \$1,000s
	Commercial	Residential				
Alternative 1 (B-Street At-Grade)	2	0	\$884	\$279	\$810	\$1,973
Alternative 2 (3rd Street Underpass)	2	2	\$7,308	\$381	\$1,500	\$9,189
Alternative 3 (Walnut Street Underpass)	1	8	\$6,580	\$237	\$3,000	\$9,817
Spruce/ Kanawha Terrace Improvement	0	1	\$558	\$36	\$204	\$798

Note 1: Property impacts include impacts to garages and driveways

Conclusion

Based on the findings of this study, any single alternative or combination of alternatives would enhance safety and improve the local transportation network in the study area; however, the purpose of this study is to develop a recommendation for one viable alternative. Based on the Alternatives Evaluation Matrix, Alternative 2 had the lowest score of 6.8. With reconstruction of the Dick Henderson Bridge currently underway, the 3rd Street corridor will serve as a Gateway to St. Albans which is consistent with the City’s vision. This alternative also provides improvements to the US 60 (MacCorkle Avenue)/ 3rd Street intersection which is the heaviest volume intersection in the City. For these reasons, it is recommended that Alternative 2, 3rd Street Underpass Widening and Upgrade, be implemented.



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