



Willey St-Richwood Ave Intersection Improvement Study

Final Report

Accepted June, 2019

Prepared for

City of Morgantown

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Appendix A: Data Collection Documentation

Appendix B: Pedestrian Signal Warrant Analysis

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Executive Summary

The purpose of the Study is to determine the impact of correcting the subject intersection’s unsafe skew. This skew affects traffic operation in the area and to determine the impact of any correction on the larger transportation network including transit, pedestrians, and bicycles. Specifically, the study intends to identify alternatives that

- Improve traffic operation efficiency and safety.
- Improve pedestrian safety and transit operations.
- Support future development in the study area.

MPO staff held a community meeting for the Study on June 3, 2019 at Crosley’s Banquet Center, 616 Richwood Ave, Morgantown, WV. The meeting was as a part of the June Woodburn Neighborhood Association Meeting, which approximately 10 residents attended.

The following opportunities were identified during the study data collection and evaluation process:

- **Increasing traffic operation capacity**
Currently, the southbound left-turn from Willey St to Richwood Ave and southbound right-turn from Richwood Ave to Willey St movements are prohibited at the intersection of Willey St and Richwood Ave due to safety concerns. Improving the intersection geometry and allowing the prohibited turns will increase the operational capacity of the intersection.
- **Optimizing land use**
The triangle area at the intersection of Willey St-Richwood is used as an unpaved surface parking lot. Many empty parking spaces were observed throughout the day. The triangle area could be used for more productive purposes. (District: Third Ward, Map: 26, Parcel: 412)
- **E Prospect Street (Paper Street)**
A paper street exists between E Prospect St and Willey St. Currently the paper street is marked as a pedestrian walking path across the parking lot in the project area.

The study identified two alternatives to improve the intersection. The following table shows show proposed alternatives address issues identified in the study.

Identified Issues	Countermeasures	
	Alternative 1	Alternative 2
Safety at the Willey St/Richwood Ave intersection	- Converting the Richwood Ave between Willey St and E Prospect St into a one-way street.	- Close the intersection of Willey St and Richwood Ave - Extend sidewalk on Willey St. Provide additional crosswalk on Willey St
Pedestrian crossing Safety on Willey St near the Little General store	- Create a three-way intersection at the E Prospect St and Willey St, including installing pedestrian signal and high-visibility crosswalk. (Information about the pedestrian signal warrant is included in the Appendix B)	
Insufficient lighting on Willey St near the Little General store	- Install light pole at multiple locations in the intersection area. - Enhance existing lighting infrastructure.	
Road safety at the Willey St/Price St intersection	- Install a “slow” sign on Willey St (Southbound) passing Prospect St.	
Pedestrian-vehicle conflict on the parking lot of the Little General store	- further analysis on the impact of potential assessment management at the Little General Store	

Alternative 1-One Way Circle (Short Term)



Alternative 2-Two Way E Prospect St (Long Term)



Study Description

The purpose of the Study is to determine the impact of correcting the subject intersection's unsafe skew on traffic operation in the area and to determine the impact of any correction on the larger transportation network including transit, pedestrians, and bicycles.

Specifically, the study intends to identify alternatives that

- Improve traffic operation, efficiency, and safety.
- Improve pedestrian safety and transit operations.
- Support future development in the study area.

The study area is shown below:



Alternatives considered

- **Signal Warrant.** Evaluate if the existing and proposed traffic pattern meets any warrants for a traffic signal at the study intersection
- **Street Realignment, Street Closure, One-way-street.** Identify and evaluate potential roadway changes on E Prospect, Richwood Ave, and Willey Street.
- **Pedestrian Infrastructure Improvement.** Identify opportunities to improve pedestrian travel in the study area, including enhanced crosswalks, pedestrian signage, lighting, and ADA compliance
- **Access Management.** Evaluate the need for access management in the study area.

Existing Conditions Analysis

Data Collection Process

MPO staff conducted data collection during the fall of 2018, as described in the following table.

Data Types	Description
Turning movement counts	September 4 (Tuesday) and 5 (Wednesday), 2018. 7:30-10:30 AM, 3:30 -6:30 PM
Pedestrian count	September 11 (Tuesday) and 12 (Wednesday), 2018. 7:30-10:30 AM, 3:30 -6:30 PM
Daily traffic volume	August 29 (Wednesday) and 30 (Thursday), 2018. 48-hour period Station 34 on Willey Street, Station 72 on Richwood Ave
Forecasted traffic volume	MPO Travel Demand Model (West Ridge scenario) future year volume in the intersection area
Crash Data	WV DOH crash data, 2013-2017
Observation	Multiple site visits

Data Collection Summary

Traffic Split

		Willey St, NB			Willey St, SB	
		LT	TH	RT	LT	TH
Willey St & Richwood Ave	AM Peak	--	76%	24%	--	--
	PM Peak	--	58%	42%	--	--
Willey St & Prospect St	AM Peak	4%	96%	--	15%	85%
	PM Peak	5%	95%	--	23%	77%

Pedestrian Counts

- Pedestrian volume average 167/per hour during AM three hours count and 257/per hour during PM three hours count.

Traffic Signal Warrant

- Project site does not meet traffic signal warrant.
- Project site meets the 2009 MUTCD Pedestrian signal warrant, for both four-hour-volume warrant and peak-hour warrant. Detailed traffic signal warrant information is included in the Appendix B: Pedestrian Signal Warrant Analysis.

Crashes

Many crashes occurred at night when it is dark and visibility is low. During the evaluation period (2013-2017), top three crash locations are

- 15 crashes at the intersection of Willey St and Price Street
- 6 crashes at the intersection of Willey St and Richwood Ave
- 4 crashes at the intersection of Willey St and Fife St

Identified Issues

The following issues were identified during the data collection and evaluation process:

- **Safety at the Willey St/Richwood Ave intersection**

The intersection is skewed and on a steep slope. Due to the skew of the intersection and the curvature of Willey Street, motorists entering Willey St from Richwood Ave have limited vision, which increases safety concerns for both motorists and pedestrians.
- **Pedestrian crossing Safety on Willey St near the Little General store**

High pedestrian volumes were observed during AM and PM hours. There is a crosswalk, but in most cases, pedestrians do not use it to cross the street. The location meets the 2009 MUTCD Pedestrian signal warrant, for both four-hour-volumes and peak-hour volumes.
- **Insufficient lighting on Willey St near the Little General store**

Many crashes occurred at night when it is dark and visibility is low. MPO staff observed that in evenings, NB motorists on Willey are often blinded by the lights from the SB vehicles on Richwood Ave, making it difficult for motorists to identify pedestrians crossing the street. While there are street lights attached to utility poles in the intersection area, lighting is not sufficient to provide a safe travel environment for pedestrians.
- **Road safety at the Willey St/Price St intersection**

There is a sight line concern at the intersection of Willey St and Price St. This intersection has exceptionally high crash frequency (rear end and opposite direction angle), compared to other intersections within the project area.
- **Pedestrian-vehicle conflict on the parking lot of the Little General store**

The parking lot of the Little General Store was frequently used by the store customers. Several pedestrian-vehicle near misses were observed due to pedestrians passing through the area.

The following opportunities were identified during the data collection and evaluation process:

- **Increasing traffic operation capacity**

Currently, the southbound left-turn from Willey St to Richwood Ave and southbound right-turn from Richwood Ave to Willey St movements are prohibited at the intersection of Willey St and Richwood Ave due to safety concerns. Improving the intersection geometry and allowing the prohibited turns will increase the operational capacity of the intersection.
- **Optimizing land use**

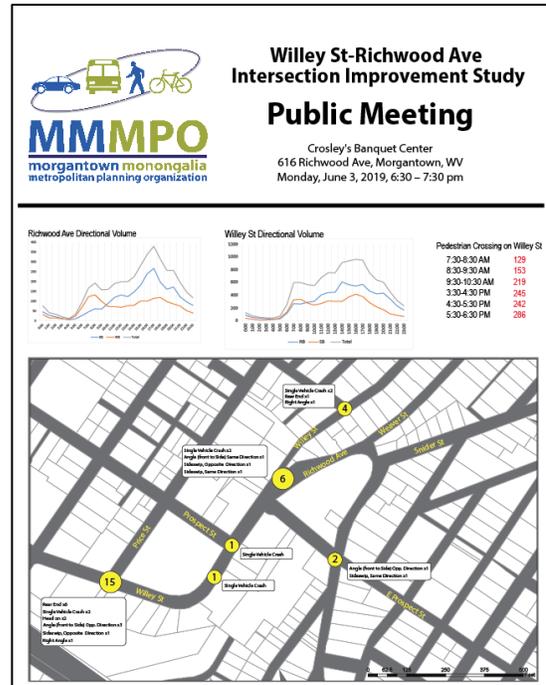
The triangle area at the intersection of Willey St-Richwood is used as an unpaved surface parking lot. Many empty parking spaces were observed throughout the day. The triangle area could be used for more productive purposes. (District: Third Ward, Map: 26, Parcel: 412)
- **E Prospect Street (Paper Street)**

A paper street exists between E Prospect St and Willey St. Currently the paper street is marked as a pedestrian walking path across the parking lot in the project area.

Community Involvement

MPO staff held a community meeting for the Study on June 3, 2019 at Crosley's Banquet Center, 616 Richwood Ave, Morgantown, WV. The meeting was as a part of the June Woodburn Neighborhood Association Meeting, which approximately 10 residents attended.

Materials presented during the meeting included: 1) major findings from data analysis and site observation, 2) information about traffic volume, pedestrians, and crash data, and 3) alternatives for the intersection improvement. Materials were available on the MPO's website for review. Interested participants were encouraged to submit their comments online at www.planttogether.org/comments before June 17, 2019.



Public Comments Summary

Alternative Preference

Both proposed alternatives will bring positive changes to the intersection. When funding is sufficient for both alternatives, Alternative 2 is preferred over Alternative 1. By completely closing the Willey St/Richwood Ave intersection, Alternative 2 presents a safer condition for both vehicle drivers and pedestrians, and is seen as a more intuitive option which will be easier for users to adapt to.

Pedestrian Safety

The study adequately addressed pedestrian issues in the intersection areas at the planning level. The safety of pedestrians crossing Willey St should continue to be a major consideration during engineering design process. Channelizing pedestrian crossing on Willey Street through engineering design may improve the travel environment for both pedestrians and vehicles.

The type of pedestrian crossing signal should be more specifically identified.

Land Use

Transportation improvements should coordinate with future land use development. It appears that Alternative 2 provides more opportunity for land development, as it allows more direct access to parcel 412 on E Prospect St from both directions. Land use strategies in the study area should be clarified before making a final decision on the street improvements.

The Little General Store located in the intersection area attracts considerable pedestrian and vehicle traffic. Potential impact to the store caused by roadway improvements should be considered.

Turning signals

Install a sign requiring right-turn vehicles use right turn signal at the intersection for traffic approaching from downtown and turning into Richwood Ave.

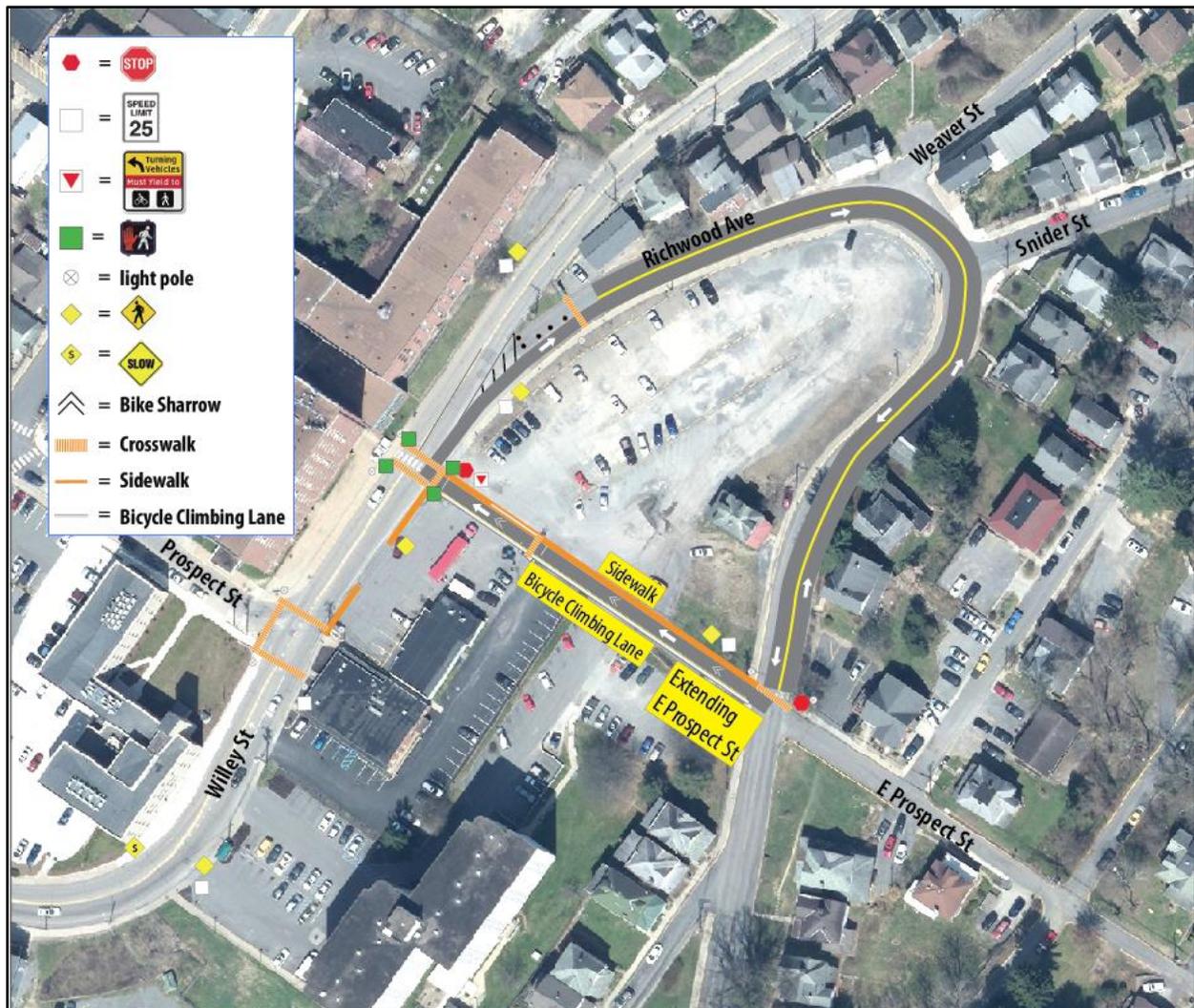
Public comments are documented in the Appendix D.

Recommendations

Alternative Description

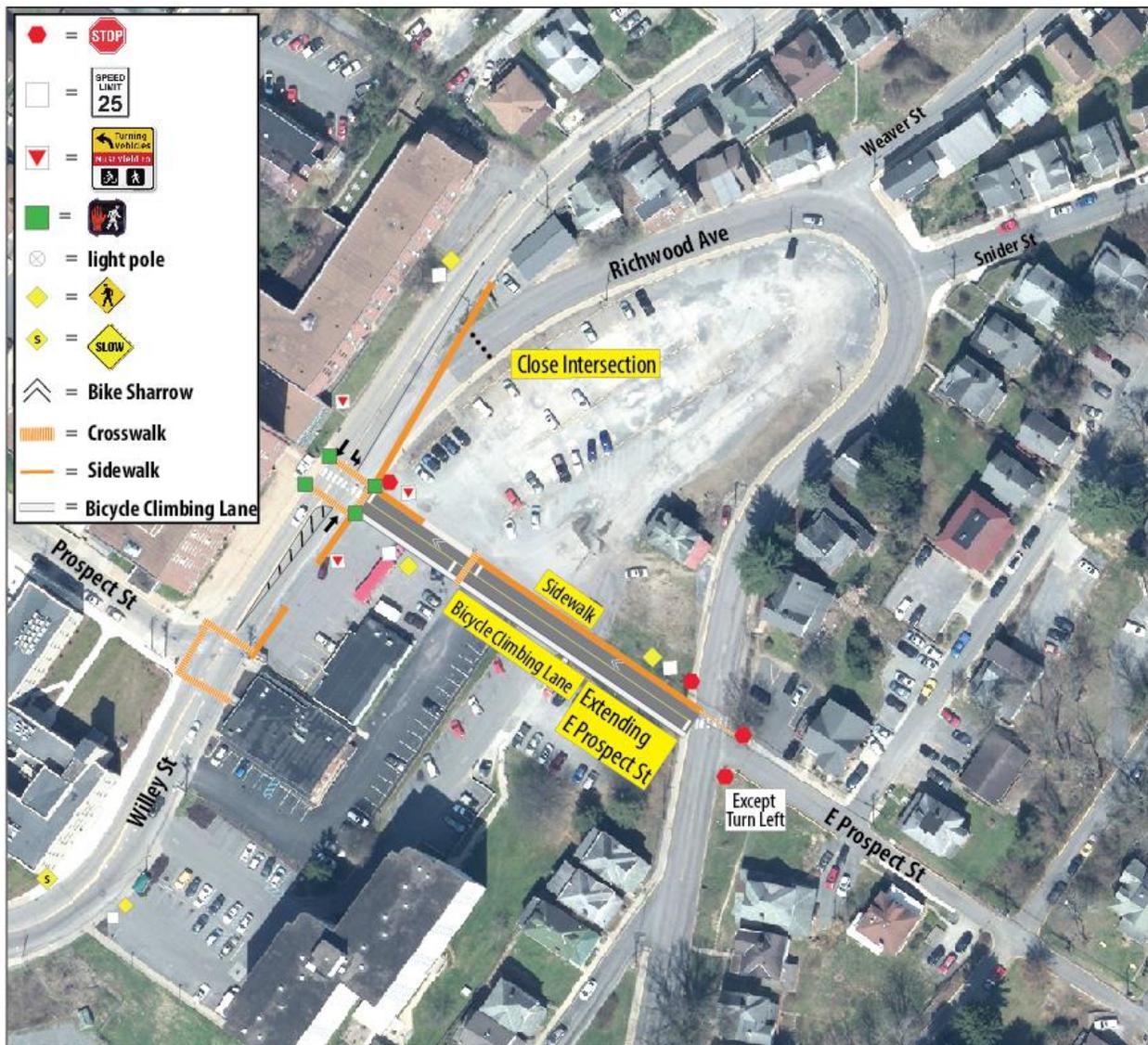
Alternative 1-One Way Circle (Short Term)

- Converting the Richwood Ave between Willey St and E Prospect St into a one-way street. (two way access only for traffic to Weaver St and Snider St)
- Extending E Prospect St to Willey St as a one-way street.
- Create a standard stop-controlled T intersection at the E Prospect St and Willey St.
 - Free-flow on Willey St and stop-control on E Prospect St
 - Improving lighting for pedestrian safety
 - Install pedestrian signal (HAWK) and high-visibility crosswalk
- Provide additional crosswalks on Willey St near the intersection Willey St and Prospect St.
- Add pedestrian warning signs in the intersection area.
- Reduce the speed limit on Willey St and Richwood Ave to 25 MPH in the intersection area.
- Add an additional driveway to access the parcel 412 (District 3, Map: 26)
- Install a “slow” sign on Willey St (Southbound) passing Prospect St.



Alternative 2-Two Way E Prospect St (Long Term)

- Close the intersection of Willey St and Richwood Ave
- Extend E Prospect St to Willey St as a two-way street.
- Create a four-way intersection at Richwood Ave and E Prospect St
 - Free flow for right-turn traffic from E Prospect St to Richwood Ave and left-turn traffic from Richwood Ave to E Prospect St.
- On the extended E Prospect St
 - Install right turn/left turn vehicles-yield-to-pedestrian signs
- Create a three-way intersection at the E Prospect St and Willey St.
 - Free-flow on Willey St and stop-control on E Prospect St
 - Add dedicated left-turn bay on Willey St.
 - Install pedestrian signal (HAWK) and high-visibility crosswalk
- Extend sidewalk on Willey St. Provide additional crosswalk on Willey St near the intersection Willey St and Prospect St.
- Reduce the speed limit on Willey St to 25 MPH in the intersection area.
- Add an additional driveway to access the parcel 412 (District 3, Map: 26)
- Install a “slow” sign on Willey St (Southbound) passing Prospect St.



Alternative Comparison

The first table shows how proposed alternatives address identified issues in the study. The second table compares the advantages and disadvantages of the proposed alternatives:

Identified Issues	Countermeasures	
	Alternative 1	Alternative 2
Safety at the Willey St/Richwood Ave intersection	- Converting the Richwood Ave between Willey St and E Prospect St into a one-way street.	- Close the intersection of Willey St and Richwood Ave - Extend sidewalk on Willey St. Provide additional crosswalk on Willey St
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Insufficient lighting on Willey St near the Little General store	- Install light poles at multiple locations in the intersection area. - Enhance existing lighting infrastructure.	
Road safety at the Willey St/Price St intersection	- Install a “slow” sign on Willey St (Southbound) passing Prospect St.	
Pedestrian-vehicle conflict on the parking lot of the Little General store	- Further analysis of the impact of potential change. Work with the management at the Little General Store	

	Advantage		Disadvantage	
	Alt 1	Alt 2	Alt 1	Alt 2
Safety	Better sight-distance for the turning vehicles from E Prospect St (currently Richwood Ave)		Pedestrians need to cross at the extended E Prospect St to get to the Little General Store.	
	More intuitive right-turn from Willey St to Richwood Ave			
	Safer pedestrian crossing on Willey St and Richwood Ave			
	More defined walking path in the parking lot			
		Safer pedestrian travel on Willey St through new sidewalk connection		
Traffic Operation	Allowing right-turn from E Prospect St to Willey, which is currently prohibited (right-turn from Richwood Ave to Willey St)		Increasing travel time for residents living close to the intersection.	
		Allowing left-turn from Willey to E Prospect St, which is currently prohibited (left-turn from Willey St to Richwood Ave)	Less room for freight movement in the parking lot	

Next Steps

The following steps have been identified after the completion of this study:

Identify land use strategies at parcel 412 (District 3, Map: 26) and it's surrounding area, including desirable access point to potential development on that parcel from Richwood Ave and E Prospect St.

Conduct engineering level design based on the information presented in this report, including an impact analysis. Work with the management at the Little General Store located near the intersection. Consider the utilization of the existing use such as ingress/egress, parking, on-site maneuvering, and delivery accommodation.