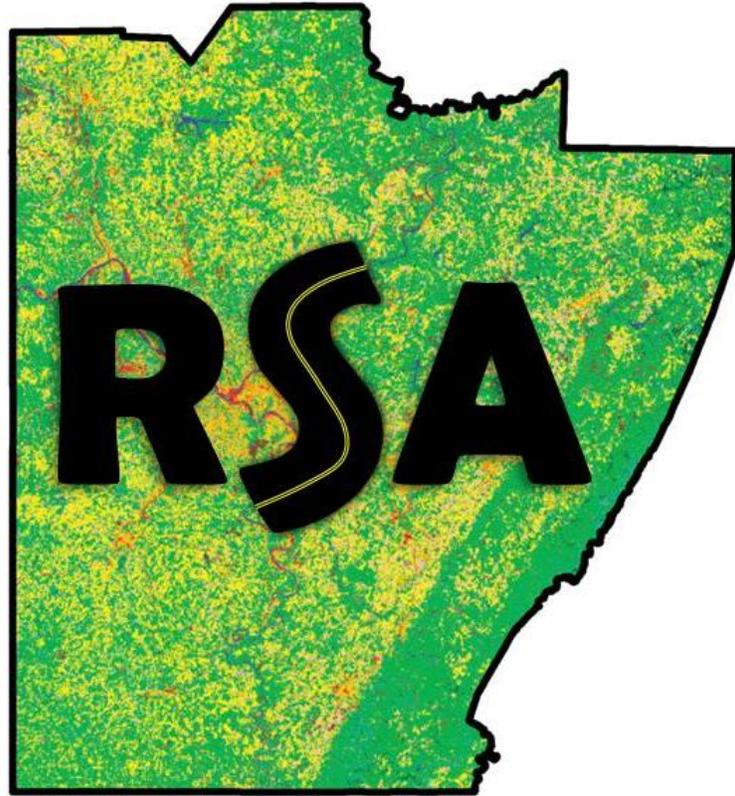


Southwestern Pennsylvania Road Safety Audit



**South Braddock Avenue from Meade Street to
Kenmawr Avenue / Hawkins Village**

**City of Pittsburgh, Edgewood Borough, Swissvale Borough, Rankin
Borough, Allegheny County, PA**



April 2014

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APPENDICES *(provided to RSA team members and roadway owners)*

- RSA Guidelines
- Maps
- Traffic Data
- Crash Analyses
- Previous Studies
- Prompt Lists

This report was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

In accordance with PA Consolidated Statutes Title 75-Vehicles (Vehicle Code) Section 3754 and 23U.S.C. Section 409, this safety study is confidential and is only provided to official agencies with official duties/responsibilities in the project development.

1. BACKGROUND

A Road Safety Audit (RSA) is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users. The aim of an RSA is to answer the following questions:

- What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances?
- What opportunities exist to eliminate or mitigate identified safety concerns?¹

An RSA is a proactive process that provides recommendations which can be implemented in stages as time and resources permit. As a service to its Planning Partners, the Southwestern Pennsylvania Commission (SPC) has developed an RSA program as part of its Transportation Operations & Safety planning efforts. The methodology for this program is summarized below and is based on the 8-step RSA process developed by the Federal Highway Administration.

This document represents the final report for the Road Safety Audit conducted along South Braddock Avenue from Meade Street in the City of Pittsburgh to Kenmawr Avenue / Hawkins Village in the Borough of Rankin, Allegheny County.

2. AUDIT PROCESS

The standard steps involved in a Road Safety Audit are:

Identify the Project

Candidates for Road Safety Audits are submitted to SPC by local municipalities, Counties, and PennDOT Districts. Candidates may include projects that are already in the design stage or may be in-service roads where safety is a concern. SPC reviews RSA candidate proposals and proceeds with setting up RSAs as manpower and budgetary constraints allow. Roadway owners must commit to documenting a formal response (see Step 7) prior to initiation of an RSA.

Select the RSA Team

SPC works with the roadway owner(s) to identify potential members for the independent, multi-disciplinary team. RSA teams typically consist of 3-5 members, with outside specialists consulted as needed. Team make-up typically includes 1-2 consultant members, 1 SPC staff person, and 1-2 PennDOT staff (from outside the District where the project is located). Prior to the on-site RSA activities, SPC collects and compiles relevant data (traffic volumes, maps, aerial photographs, crash data, previous studies, etc.) and provides a binder with this information to each of the RSA team members and to the roadway owner(s).

¹ Source: Federal Highway Administration - <http://safety.fhwa.dot.gov/rsa/>

Conduct a Start-up Meeting

The RSA team conducts a start-up meeting with the roadway owner(s) in order to identify the steps to be taken, review the schedule, and discuss any opportunities and/or constraints identified by the project owner(s). This is also the time for the project owner(s) to share any background information with the RSA team. Desirable information to be provided to the RSA team includes anecdotal crash history such as first responder experiences, potential changes in land use or travel patterns in the project area, public sentiment regarding the study location, and any known constraints.

Perform Field Reviews

The RSA team reviews the data provided by SPC and the project owner(s) and conducts multiple field views of the site (typically during AM and PM peak hours, an off-peak hour, and at night in order to see the site under different conditions). The RSA team drives and walks the site in order to identify geometric, operational, roadway user/human factors, and environmental issues.

Conduct RSA Analysis

Based on its field views, the information provided, consultation with specialists (if needed), and research into applicable design guidelines, the RSA team identifies and prioritizes safety issues within the project area and develops suggestions for enhancing safety.

Present RSA Findings to Project Owner

Once the RSA team has completed its analysis, it presents the findings to the roadway owner(s) in two phases:

- Preliminary Presentation – The RSA team conducts a meeting with the roadway owner(s) and presents its findings. This meeting is an opportunity to constructively discuss the issues and suggestions identified, and for the roadway owner(s) to provide feedback.
- Written Report – Following the preliminary presentation, the RSA team prepares a written report, incorporating roadway owner feedback as appropriate.

Prepare Formal Response

Upon receipt and review of the written report, the roadway owner(s) prepare a formal response (to the project file) documenting plans to address identified issues and reasons for not addressing other issues.

Incorporate Findings

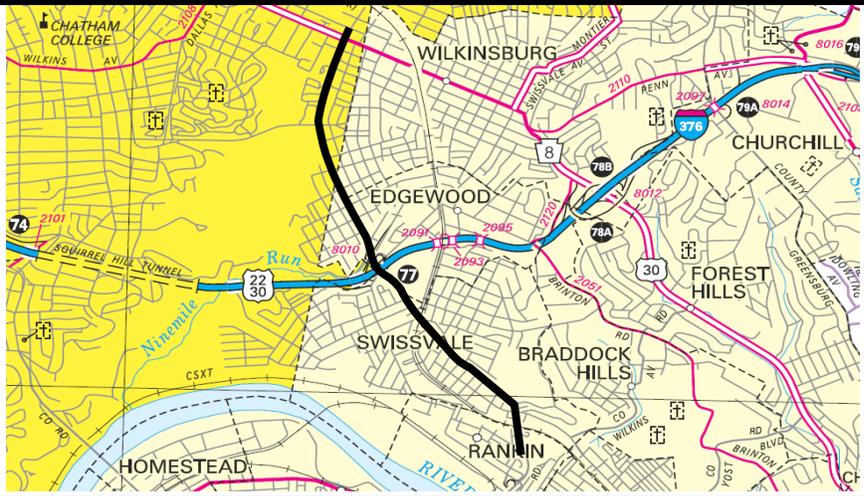
The roadway owner(s) implement improvements as outlined in the formal response.

The following page provides a summary of the RSA participants and schedule for this project.

Southwestern Pennsylvania Road Safety Audit Program

Roadway Owner Agency(s)	Roadway Owner Representatives
City of Pittsburgh	Patrick Hassett, Assistant Director of Public Works Amanda Broadwater, P.E., City Traffic Engineer
Edgewood Borough	Warren Ceconi, Borough Manager Julie Bastianini, Asst. Borough Manager
Swissvale Borough	Darrell Rapp, Councilman
Rankin Borough	Bill Pfoff, Councilman
PennDOT District 11-0	Todd Kravits, P.E., District Traffic Engineer

RSA Team Members	Agency	Role
Ross Buchan, P.E.	Gannett Fleming	Transportation Engineer
Adam Marshall, P.E.	PennDOT District 10-0	Safety/Studies Engineer
Cory Craft	PennDOT District 11-0	Safety Engineer
Kathy Stefani	Southwestern Pennsylvania Commission	Transit Planner
Domenic D'Andrea, P.E., PTOE	Southwestern Pennsylvania Commission	Transportation Engineer
Millie French, P.E.	French Engineering	Transportation Engineer
Doug Smith, P.E.	Southwestern Pennsylvania Commission	Transportation Planner

Location:	South Braddock Avenue from Meade Street to Hawkins Village / Kenmawr Avenue, City of Pittsburgh, Edgewood Borough, Swissvale Borough, Rankin Borough, Allegheny County, PA
	

Schedule	Date & Time	Location
Start-up Meeting	Tuesday, April 15, 2014, 10:00AM	CLASS Conference Room
Preliminary Presentation	Friday, May 9, 2014, 9:00AM	CLASS Conference Room

Key Person Interviews	Agency / Affiliation
Jon McCann	Environmental Charter School
Steve Pellathy	Environmental Charter School
Officer Shannon Leshen	Pittsburgh Police Zone 4
Kim Ritter	School Crossing Guard
Ron Ruppen	CLASS Community Center
Greater Park Place Neighborhood Association Members	
Regent Square Civic Association Members	

3. OVERVIEW OF THE STUDY AREA

The study area for this RSA was the section of South Braddock Avenue from Meade Street in the City of Pittsburgh to Hawkins Village / Kenmawr Avenue in the Borough of Rankin. This corridor is approximately 2.9 miles long. South Braddock Avenue is a locally-owned federal-aid route that is classified as a Minor Arterial between Meade Street and Penn Avenue (S.R. 8) and a Principal Arterial from Penn Avenue to S.R. 837 on the south side of the Monongahela River. Segments of the road are owned by the City of Pittsburgh, Edgewood Borough, Swissvale Borough, and Rankin Borough. The Rankin Bridge over the Monongahela River (just south of the Hawkins Village / Kenmawr Avenue intersection) is owned by Allegheny County.

Because of its interchange with I-376, South Braddock Avenue often serves as a detour route (and a cut-through/bypass route) during times of construction or heavy congestion at the Squirrel Hill Tunnels, which are just west of the Edgewood/Swissvale Interchange. South Braddock Avenue also serves as the signed route for regional traffic destined for Kennywood amusement park, which is located on S.R. 837.

South Braddock Avenue changes character a number of times between Meade Street and the Rankin Bridge.

- Meade Street to Forbes Avenue – This area is predominately residential and contains two schools (Shadyside Academy and the K-3rd grade Environmental Charter School) near the intersection of South Braddock Avenue and Waverly Street. South Braddock is a two-lane roadway with a posted speed limit of 25 miles per hour (mph) throughout this section. A 15 mph school zone speed limit is in effect near the schools during the morning and afternoon pick-up and drop off periods. There is on-street parking on the northbound side of the road and a bicycle lane on the southbound side of the road. Bicycle “sharrows” are also painted at various points along the northbound travel lane. There are turn lanes at the signalized intersections with Meade Street, Penn Avenue, and Forbes Avenue. Unsignalized intersections include Tuscarora Street, Brashear Street, Waverly Street, Edgerton Avenue/Graymore Road, Kensington Street, Rosemary Road, and Briar Cliff Road.
- Forbes Avenue to Charleston Avenue – South Braddock Avenue remains a two-lane, 25 mph facility in this area, which contains Frick Park and the Regent Square business district in addition to residential neighborhoods. There is parking on both sides of the street throughout most of this section. The 4th-8th grade Environmental Charter School is one block off South Braddock Avenue (to the west) on Henrietta Street, and most of the buses to this school pick up and drop off students on South Braddock. Hutchinson Avenue is the only signalized intersection between Forbes and Charleston. Unsignalized intersections include Guthrie Street, Biddle Avenue, Henrietta Street/Whitney Avenue, Overton Street, Sanders Street, and Charleston Avenue.
- Charleston Avenue to Church Street – This section of South Braddock Avenue contains the interchange with I-376 and the large Edgewood Towne Center development. While the posted speed limit in this area is 25 mph, speeds tend to be higher, because the roadway widens significantly. The interchange is quite complex due to the large number of ramps and local street connections and includes two closely spaced signalized

intersections at the WB I-376 off-ramp and at Monongahela Avenue. Additional signalized intersections in this section are located at the two major entrances to Edgewood Towne Center and at Church Street. Unsignalized intersections include Allenby Avenue, Greendale Avenue, various I-376 ramps, Schoyer Avenue, McClure Avenue, Delmar Way, and the back entrances to Edgewood Towne Center. On-street parking is permitted on both sides of the road between Allenby Avenue and Charleston Avenue and on the southbound side of the road between Edgewood Towne Center's lower entrance and Church Street. Also important to note is the location of the Community Living And Support Services (CLASS) building at the intersection with Allenby Avenue. This facility "offers a unique blend of services to individuals with disabilities to assist their pursuit to play an active role in the communities they wish to join."¹

- Church Street to Rankin – South of Church Street, South Braddock Avenue travels under the Martin Luther King, Jr. East Busway and narrows back down to a 2-lane cross-section with turn lanes at signalized intersections. These signalized intersections include Edgewood Avenue/Waverly Street (which is a different Waverly Street than the one further north in the City of Pittsburgh), Westmoreland Avenue, Roslyn Street, Woodstock Avenue, and Hawkins Village/Kenmawr Avenue. Unsignalized intersections include Dickson Street, Ardmore Street, Calumet Street, Cheyenne Street, Ormond Street, Ellesmere Street, Melrose Street, Vernon Avenue, Bruce Way, Farkas Place, Dalgate Road, the southeastern end of the Busway, 6th Avenue (Rankin), and a few unnamed alleys. South Braddock is stop-controlled at Cheyenne Street, Melrose Street, and Vernon Avenue. Land use is primarily commercial between Church Street and the Swissvale Borough buildings at Roslyn Street and residential south of that point. The Carrie Furnace site, which is on the northwest side of the Rankin Bridge along the Monongahela River, is currently being redeveloped and could generate significant additional traffic in the South Braddock Avenue corridor in the future.

PennDOT's Internet Traffic Monitoring System (iTMS) indicates that the Annual Average Daily Traffic (AADT) between Meade Street and Henrietta Street is approximately 11,650 vehicles per day (vpd) and approximately 10,325 vpd between Henrietta Street and the Rankin Bridge. Bus stops are located throughout the corridor and there are significant volumes of pedestrians in many areas.

4. SAFETY HISTORY

Given the fragmented local ownership of South Braddock Avenue, it is difficult to get comprehensive and consistent crash data for the entire corridor. For this study, reportable crash data was compiled in the City of Pittsburgh using PennDOT's Crash Data Analysis & Retrieval Tool (CDART), which is not always complete for locally-owned roadways. (Reportable crashes are those that result in an injury or fatality, or where a vehicle is required to be towed from the scene.) This data covered the 5-year period from January 1, 2008 through December 31, 2012. Crash data for the same 5-year period was gathered for Edgewood Borough and Swissvale Borough using CDART, and was supplemented with paper crash reports provided by

the municipalities for the period from February 2008 through March 2014. This information was compiled by SPC's Geographic Information Systems (GIS) staff.

Based on this information, the following intersections exhibited the highest number of crashes:

- Sanders Street (24);
- Interchange/Monongahela Avenue (23);
- Hutchinson Avenue (17);
- Allenby Avenue (17);
- Roslyn Street (14);
- Schoyer Avenue (12);
- Woodstock Avenue (10); and,
- Church Street (9).

In addition to minor injuries and property damage only crashes, there were 17 moderate injuries and 1 major injury associated with the crashes during this time period. The major injury involved an inexperienced motorcycle rider in a rear end crash. There were no traffic fatalities reported along the corridor during this 5-year period.

For the 116 crashes compiled using the CDART tool, 44% were Angle crashes, 19% were Rear Ends, 10% were Hit Fixed Object crashes, and 8% involved Pedestrians. Most of the crashes (82%) occurred when the weather was clear and the pavement was dry (78%), which is typical. Thirty-five percent (35%) of the crashes occurred in lighting conditions other than Daylight, which is somewhat higher than usual, but may be indicative of the fact that this corridor is not strictly a commuter corridor.

For the 142 crashes compiled using paper reports, 25% were Rear Ends, 22% were Angle crashes, 18% were Hit Fixed Object crashes, and 12% involved Pedestrians. The breakdown of crashes under various environmental conditions was similar to the data collected using CDART.

Residents, local police, and municipal officials indicate that in addition to reportable crashes, there are many non-reportable "fender benders" along the corridor.

5. AUDIT FINDINGS

The following pages summarize the findings of the RSA team.

Safety Successes

- Motorist and pedestrian education efforts (Pledge to Drive 25, Costumes & Crosswalks, newsletters, social media,.....)
- Pedestrian infrastructure: sidewalks, crosswalks, pedestrian signage, Yield to Pedestrian channelizing devices, ped signal phases and advance intervals,....
- Traffic calming effects of on-street parking
- Retroreflective strips on sign posts



Safety Successes

- Turn restrictions at select locations
- Supplemental signal head for EB Monongahela Avenue approach
- Intersection and signal improvements at Hawkins Village / Kenmawr Avenue
- Effective use of crossing guards and police in school zones



Evaluating Risk to Prioritize Safety Issues

Crash Frequency

Frequent	C	D	E	F
Occasional	B	C	D	E
Rare	A	B	C	D

Negligible

Low

Med

High

Crash Severity

RISK CATEGORY

A = Lowest priority

F = Highest priority

Major Themes

- Signing and pavement markings
- Pedestrian safety
- Traffic signals
- Side street traffic control
- Speed - Traffic calming
- Miscellaneous / Other



EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: Some pavement markings in the corridor are faded, worn, missing or are non-standard. On-street parking stalls are painted in some areas but not in others.

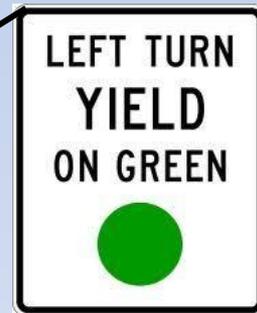


SUGGESTION:

- Restripe faded and worn pavement markings as needed.
- Replace non-standard pavement markings with PennDOT/MUTCD approved markings.
- Paint parking stalls wherever on-street parking is permitted (traffic calming effect), including north of Forbes Avenue and south of Sanders Street.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

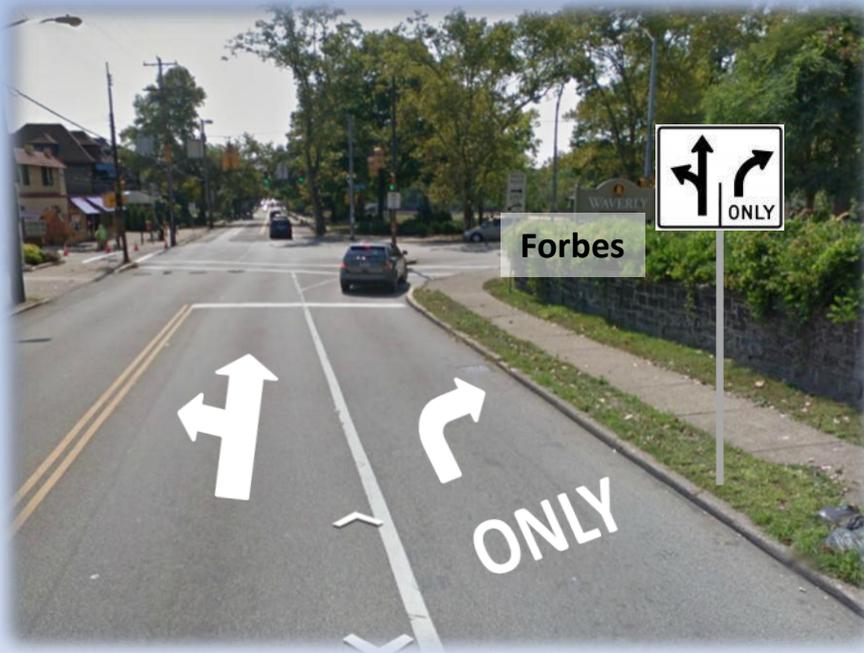
OBSERVATION: Some signs in the corridor have been damaged, defaced, are faded or obscured. Others are non-standard and some are unnecessary. Many signs lack retroreflectivity.



SUGGESTION:

- Replace damaged, defaced and faded signs with new retroreflective signs.
- Replace non-standard signs with MUTCD standard signs.
- Remove unnecessary signs.
- Increase enforcement to prevent vandalism.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
OBSERVATION: Lane designations are unclear or non-existent on many intersection approaches.			

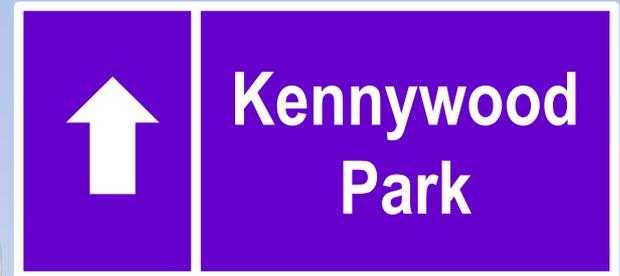


SUGGESTION:

- Enhance lane utilization signage.
- Install lane designation pavement markings on intersection approaches.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: Regional travelers who are unfamiliar with the area may get lost or make unpredictable movements due to gaps in destination signage.



SUGGESTION:

- Provide additional signage for regional destinations like Kennywood and I-376.
- Consider changes in signage on I-376 to better distribute regional traffic to Kennywood.

CONSIDERATIONS:

- On-going/future development of Carrie Furnace site could increase number of unfamiliar drivers.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: There are numerous fixed objects in close proximity to the roadway, including utility poles, trees, old trolley poles, and unnecessary guiderail.



SUGGESTION:

- Remove unnecessary roadside fixed objects.
- Add delineation to mark fixed objects that remain.

CONSIDERATIONS:

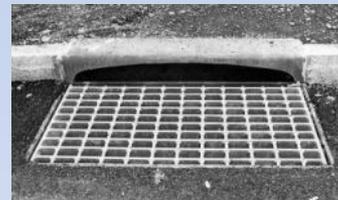
- Use a crashworthy railing or other treatment in lieu of guiderail near Frick Park.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Occasional	Low	Moderate	

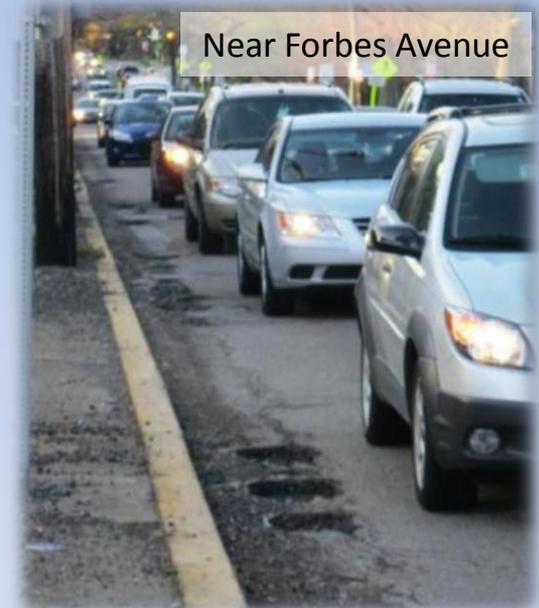
OBSERVATION: Pavement is in poor condition in a number of spots along the corridor, which can create problems for bicyclists and motorcyclists and can cause drivers to swerve unexpectedly or straddle lanes. Pavement has been built up over time resulting in little or no curb reveal and the blocking of drainage inlets. Some inlet grates are not bicycle friendly.



Existing Drainage Grates



Bicycle Safe Grate



SUGGESTION:

- Mill and resurface South Braddock Avenue and provide full height curb.
- Install bicycle safe drainage grates throughout.
- Resurface Church Street and provide an inlet on the north side to prevent water from flowing into the intersection.

CONSIDERATIONS:

- Base repair may be required.
- Replace inlets as needed.
- Full height curb would reduce parking on sidewalks and provide more effective no parking zones.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Occasional	Negligible	Moderate-Low	

OBSERVATION: Pedestrian infrastructure is in need of maintenance. There is extensive concrete cracking and heaving in some areas and debris covering the sidewalks in other areas.



SUGGESTION:

- Review sidewalk ordinances and enforcement policies.
- Develop a systematic plan for ensuring that pedestrian infrastructure is maintained.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
OBSERVATION: Pedestrian facilities do not meet current ADA standards in some locations.			



Hutchinson



McClure



Example of ADA compliant pedestrian accommodations

SUGGESTION:

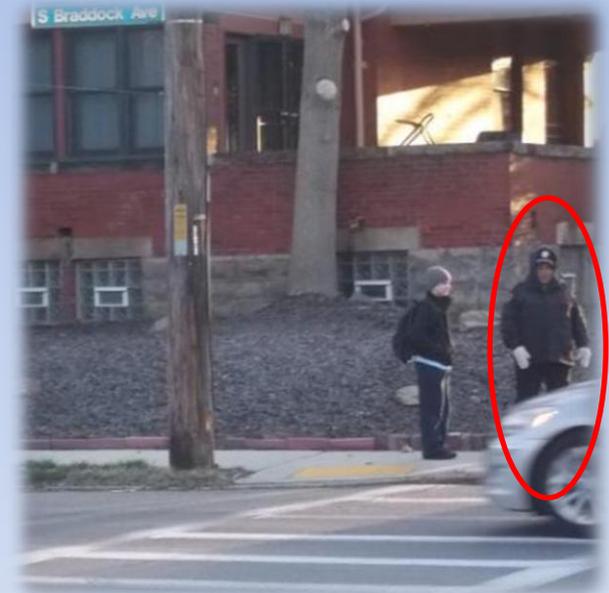
- Modify sidewalks, crosswalks, curb lines, curb ramps, and other infrastructure to meet ADA requirements as other improvements are implemented.

CONSIDERATIONS:

- ADA improvements will need to be considered if a new project is planned that impacts sidewalk or curb lines, including resurfacing projects.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	E
Occasional	High	High	

OBSERVATION: Crosswalk signage and markings are inconsistent (or non-existent in some locations). Yield to Pedestrian signs are used sporadically and placed inconsistently along the corridor. At least one crossing guard was not wearing appropriate retroreflective clothing.



W11-2*



W16-9P



SUGGESTION:

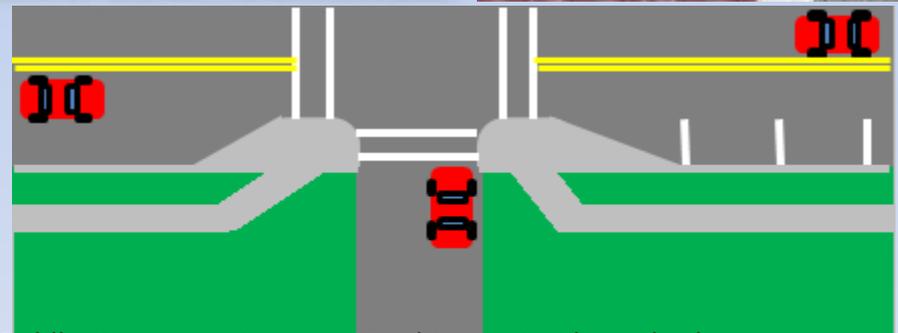
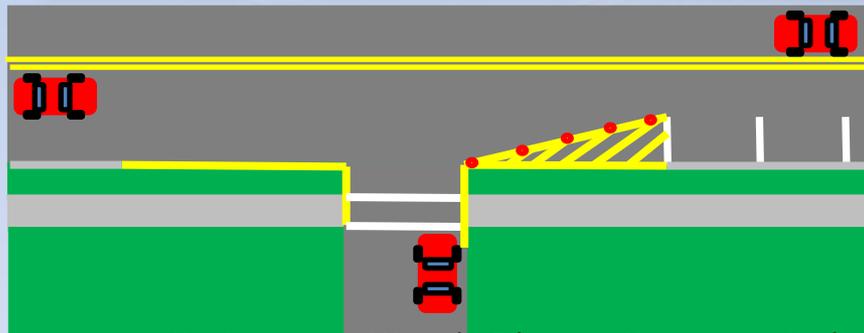
- Install consistent signage at all crosswalks.
- Acquire additional Yield to Pedestrian devices and place them consistently at all unsignalized intersections.
- Ensure that crossing guards wear appropriate retroreflective clothing.
- Consider additional ped-scale lighting for enhanced nighttime visibility.

CONSIDERATIONS:

- Location of crosswalk ahead signs with respect to closely spaced intersections.
- Higher quality, longer lasting paint.
- Education & enforcement.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	E
Occasional	High	High	

OBSERVATION: On-street parking, bus shelters, and vegetation near intersections reduces sight distances for motorists exiting side streets, can obscure pedestrians in crosswalks, and can block the view of stop signs on side street approaches.



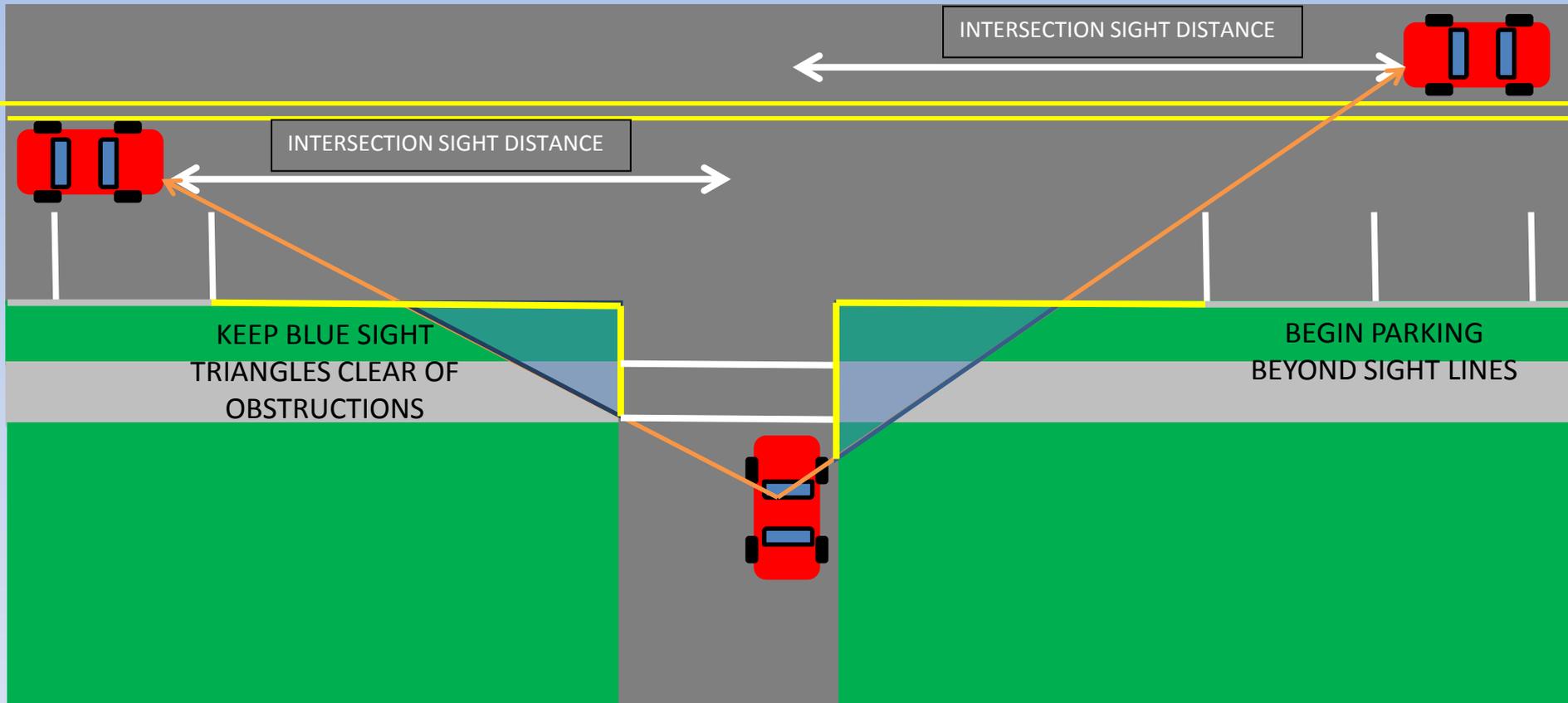
Key Locations: Waverly, Edgerton, Kensington, Guthrie, Biddle, Henrietta, Overton, Hutchinson, Sanders, Charleston

SUGGESTION:

- Restrict parking near intersections through signage and painted curbs.
- Increase parking enforcement.
- Install textured crosswalks to increase visibility.
- Consider the use of bulbouts to restrict parking at intersection corners, increase the visibility of pedestrians, and reduce crossing distances.

CONSIDERATIONS:

- Bulbouts may not be appropriate at intersections with heavy truck or bus turning volumes.
- Bulbout impact on bicyclists.



EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Signal equipment at the intersection of Meade Avenue and S.Braddock Avenue is outdated and not up to current standards. There is only 1 overhead signal head on the EB approach. There is new pavement in this area but crosswalks have not been repainted yet.



SUGGESTION:

- Upgrade signal installations to current standards including 12" lenses, backplates, pedestrian push buttons, and countdown ped heads.
- Consider adding retroreflective tape to signal backplates.
- Paint new crosswalks.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Right turning vehicles from EB Penn Avenue to SB Braddock Avenue often conflict with pedestrians crossing Braddock.



SUGGESTION:

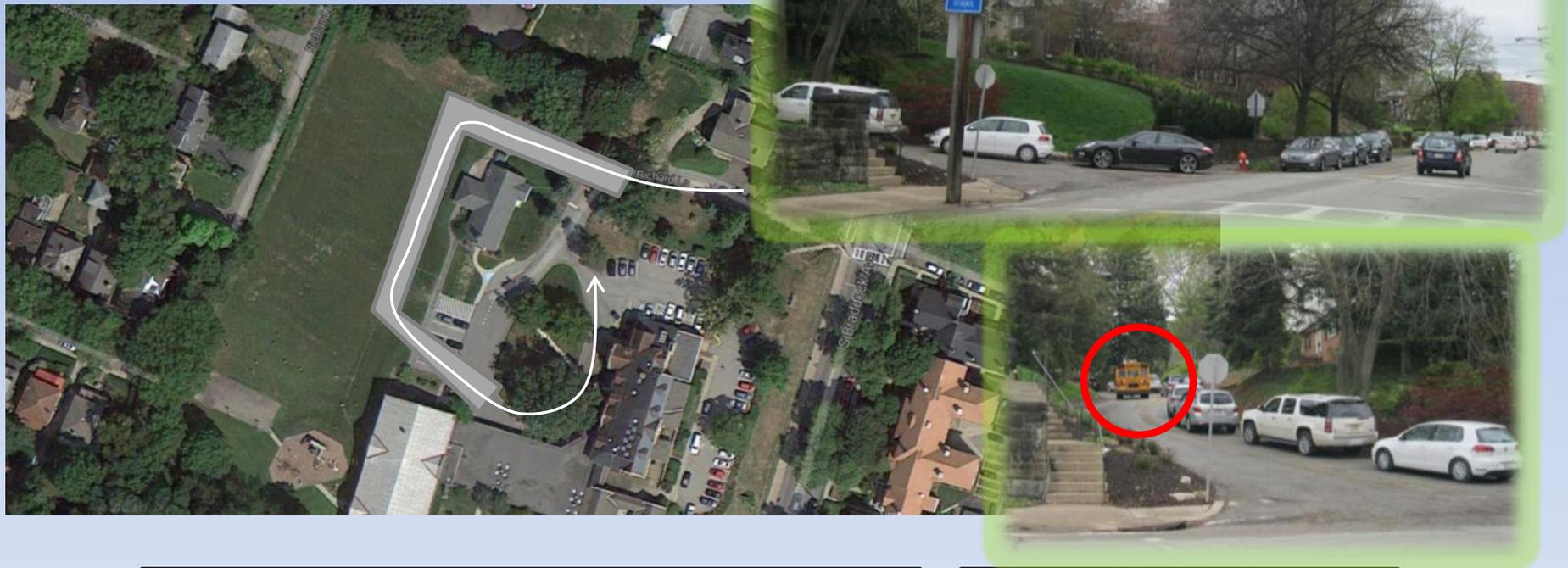
- Provide advance pedestrian intervals at signalized intersections like Penn and Braddock in order to give the pedestrians an advance start into the crosswalk.

CONSIDERATIONS:

- Capacity / congestion.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Shadyside Academy traffic blocks the bicycle lane on S.Braddock Avenue during dismissal periods and can queue all the way to Penn Avenue. Buses often enter the driveway travelling in the wrong direction in order to get around queued traffic.



SUGGESTION:

- Work with Shadyside Academy to stagger pick-up times for parents.
- Expand the driveway/parking footprint to provide improved on-site circulation.

CONSIDERATIONS:

- Impacts to on-site recreational space.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	
OBSERVATION: Student dismissal and associated afternoon school traffic begins (2:45-3:00PM) before the school zone speed limit is in effect (3:30PM) near Shadyside Academy and the K-3 Environmental Charter School.			

**IMMEDIATE
ACTION ITEM**



SUGGESTION:

- Adjust the timings of these traffic control devices so they begin flashing earlier in the afternoon.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Buses picking up students at the K-3 Environmental Charter School often block NB traffic near Waverly Street because there isn't an adequate staging area for buses to get out of the travelway.



SUGGESTION:

- Establish time of day parking restrictions (2:30PM - 4:00PM) along the NB curbline (near The Heidelberg) in order to provide space for buses to get out of the travelway.

CONSIDERATIONS:

- Impacts to residents.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Motorists use the no parking / loading zone in front of the K-3 Environmental Charter School to get around queued NB traffic and to make a right turn onto Brashear Street, which can cause conflicts with vehicles picking up and dropping off students.



SUGGESTION:

- Provide pavement markings and signs to delineate this as a school loading zone.

CONSIDERATIONS:

- Potential traffic calming effects.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Sight distances on both sides of the Edgerton Avenue approach are limited by parked vehicles and large trees.



SUGGESTION:

- Prohibit left turns out of Edgerton Avenue onto S.Braddock Avenue.
- Consider converting Edgerton to a one-way street away from S.Braddock Avenue.
- Provide striped crosswalks at this intersection.

CONSIDERATIONS:

- Potential location for bulbouts.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: Narrow roadway widths and on street parking on Kensington Avenue and Rosemary Avenue cause vehicular conflicts for two-way operations.



SUGGESTION:

- Consider converting Kensington and Rosemary into a one-way pair system.

CONSIDERATIONS:

- Impacts to residents and park access.
- Potential location for bulbouts.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Motorists traveling NB on South Braddock Avenue do not anticipate parked vehicles around the bend near Forbes Avenue and often “cut the corner”.



SUGGESTION:

- Install additional pavement markings to keep through vehicles in the proper lane and to restrict parking near the curve.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Traffic signal heads at Forbes Avenue do not have backplates and are subject to low visibility due to sun glare.



SUGGESTION:

- Upgrade signal installations to current standards including 12" lenses, backplates, pedestrian push buttons, countdown ped heads and audible signals at appropriate locations.
- Consider adding retroreflective tape to signal backplates.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Occasional	Low	Moderate	

OBSERVATION: Traffic signal timings and phasing lead to congestion on EB Forbes Avenue and on adjacent side streets.



SUGGESTION:

- Evaluate the cycle length to provide sufficient time for the EB queue to clear.

CONSIDERATIONS:

- S.Braddock Avenue congestion.
- All pedestrian phase.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: Due to the close proximity of schools, neighborhoods, churches, and the park, a large number of pedestrians use the busy intersection of Braddock and Forbes. A marked bicycle lane on the north side of Forbes Avenue begins just west of this intersection.



SUGGESTION:

- Modify the curb line in the northwest quadrant of this intersection to shorten pedestrian crossing lengths and provide a wider sidewalk.

CONSIDERATIONS:

- Approaches feeding WB Forbes are all 1-lane approaches.
- Cost & drainage modifications.
- Could allow bike lane to be extended.
- Should be combined with new signal design to minimize any potential capacity impacts.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: The existing overhead pedestrian sign at Biddle Avenue is somewhat ineffective. Many motorists seem to ignore it, possibly because the lights remain active long after the pedestrians have cleared the roadway.



SUGGESTION:

- Adjust timing of the lights so they are only on while pedestrians are crossing.
- Add a blankout 'YIELD' sign that will light up only when activated.

CONSIDERATIONS:

- Retrofitting 'YIELD' sign to existing system.
- Pedestrian crossing times that are ADA appropriate.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: Even though the 4-8 Environmental Charter School is one block off South Braddock on Henrietta Street, many student pick-ups and drop offs occur on S.Braddock Avenue and there are a lot of school students crossing the street in this area.



SUGGESTION:

- Establish a 15mph School Zone speed limit and provide school zone warning signs along S.Braddock Ave. near Henrietta Street and Biddle Avenue.
- Investigate the feasibility of having NB buses turn left onto Henrietta St., drop students off at the school entrance, and circulate back around to Hutchinson.

CONSIDERATIONS:

- Location of school zone warning signs given ped crossing signs at Biddle Ave.
- Impact on local streets.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: Traffic in and out of the GetGo gas station creates additional turning movement conflicts at the intersection of South Braddock Avenue and Hutchinson Avenue.



SUGGESTION:

- Work with GetGo to control access at this intersection. Access points should be as far from the intersection as possible.

CONSIDERATIONS:

- Coordination and cooperation with property owner.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: Motorists were observed running the red light at Hutchinson Avenue. Because of the long cycle length, pedestrians often do not wait for the Walk signal, and the all ped phase comes on after the pedestrians have already crossed, which can frustrate motorists.



SUGGESTION:

- Revise the cycle length and signal timing at this intersection.
- Eliminate the exclusive ped phase and incorporate concurrent ped phases with an advance pedestrian interval.
- Install No Turn on Red signs on all approaches.

CONSIDERATIONS:

- Potential community resistance to elimination of the all pedestrian phase.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	

OBSERVATION: The Sanders Street intersection has the highest number of crashes of all intersections in the corridor over the past 5 years.



SUGGESTION:

- Install pavement markings to provide a NB left turn lane at Sanders.
- Convert the west side of Sanders to one-way away from S.Braddock.
- Add supplemental lane utilization signing.
- Increase police enforcement of turn restrictions.

CONSIDERATIONS:

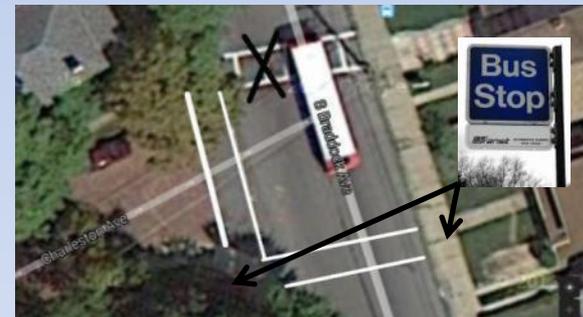
- Adjust on-street parking as needed.
- Other treatments (bulbouts, textured crosswalks, etc.)

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: Vehicle speeds tend to be higher than desired, particularly between Sanders Street and the Parkway East. This makes it particularly difficult for pedestrians to cross the street at Charleston Avenue, which has bus stops on the north side.



Gateway Signage Example:



SUGGESTION:

- Relocate the crosswalk and bus stops to the southern side of the Charleston Avenue intersection.
- Consider “Regent Square” gateway signage as a traffic calming measure.
- Install electronic speedminder signs NB and SB to make motorists more aware of their speed.

CONSIDERATIONS:

- Cost
- Space limitations
- Other treatments (bulbouts, textured crosswalks, etc.)

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: Port Authority bus stops are located under the Parkway on-ramp where S.Braddock Avenue is at one of its widest points, which makes access difficult for pedestrians.



SUGGESTION:

- Move bus stops further north near Allenby Avenue / CLASS facility.
- Install crosswalks and other pedestrian infrastructure at the Allenby Avenue / CLASS intersection.

CONSIDERATIONS:

- Access for people with disabilities.
- Shelter for people waiting on buses.
- Port Authority has talked about the potential for bus stop consolidation.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: Guide signage for SB traffic destined for the Parkway East to Monroeville is unclear and can result in additional turning movements at nearby intersections.



SB approach signing



Missing I-376 East signage at Monongahela



SUGGESTION:

- Enhance existing SB guide signage with supplemental post mounted guide signing at Monongahela Avenue.

CONSIDERATIONS:

- Sight distance and pedestrian visibility.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: The NB right lane between I-376 and Allenby Avenue abruptly ends without much advance warning. This lane can be used for passing by aggressive drivers.

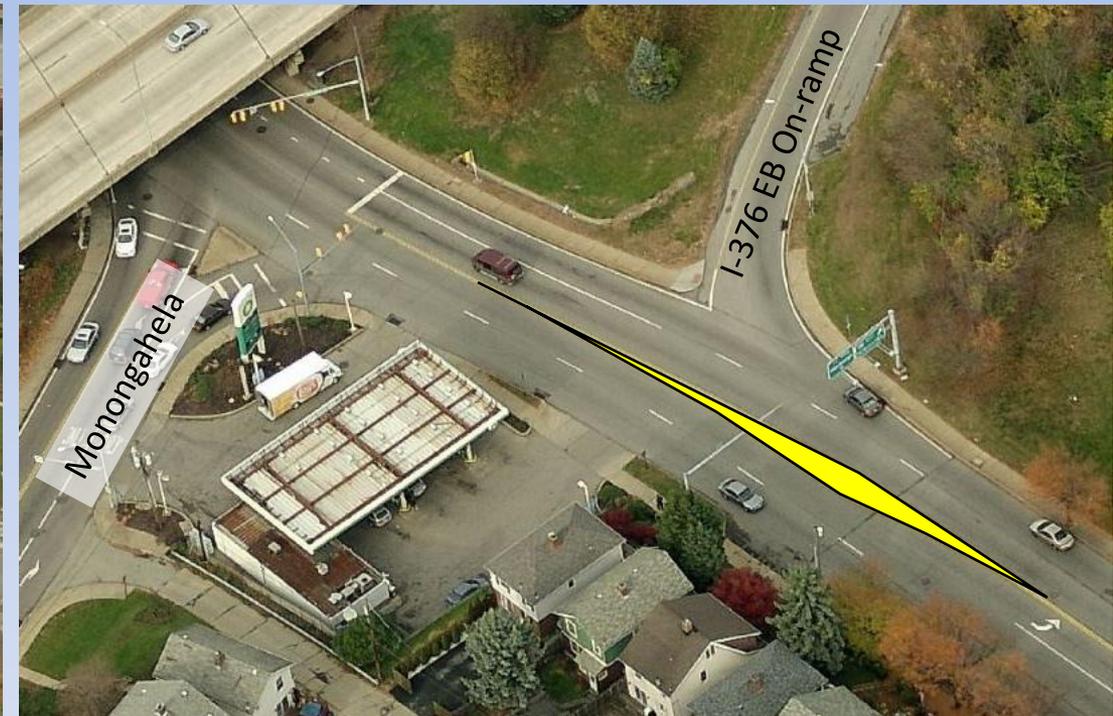
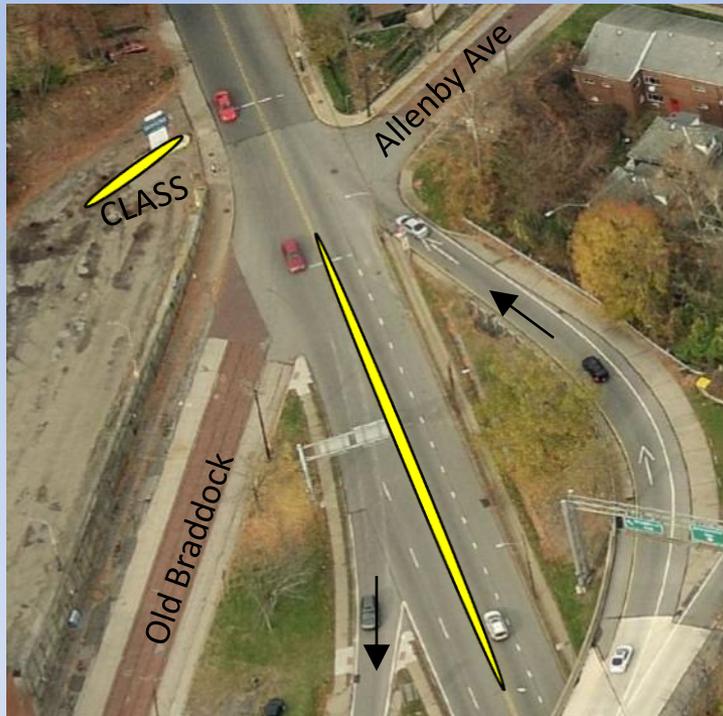


SUGGESTION:

- Provide pavement markings, signage and flexible delineator posts to improve lane designation in this area.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	

OBSERVATION: The complex interchange ramp configuration can create confusion for motorists, resulting in u-turns and other undesirable maneuvers. Ramps create many conflict points on South Braddock Avenue.



SUGGESTION:

- Install median treatments such as mountable concrete curb and/or delineator posts to prevent undesirable movements near the Monongahela/B.P. intersection and the Allenby Ave / CLASS entrance.
- Increase enforcement of illegal turns.

CONSIDERATIONS:

- Maintaining full access at Allenby Avenue.
- Current and future use of Old Braddock.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	

OBSERVATION: The complex interchange ramp configuration can create confusion for motorists, resulting in U-turns and other undesirable maneuvers. Ramps create many conflict points on South Braddock Avenue. Merging onto I-376 is difficult due to heavy traffic and short ramps.



Option 1a

SUGGESTION:

- Consider long-term modifications to the ramps including closing the EB off-ramp that outlets near Allenby and the EB on-ramp from Monongahela, realignment of the Monongahela/Braddock intersection, and addition of a SB left turn phase at this location.

CONSIDERATIONS:

- On-going Parkway East study
- Right-of-way required (Swissvale owns land where gas station sign sits)

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	

OBSERVATION: The complex interchange ramp configuration can create confusion for motorists, resulting in U-turns and other undesirable maneuvers. Ramps create many conflict points on South Braddock Avenue. Merging onto I-376 is difficult due to heavy traffic and short ramps.



Option 1b

SUGGESTION:

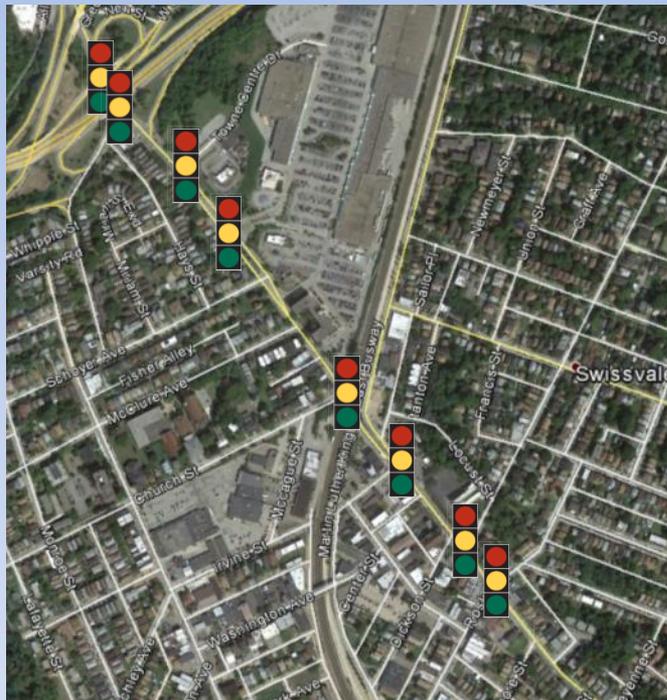
- Consider long-term modifications to the ramps including changing the direction of the existing off-ramp that outlets near Allenby in order to eliminate the WB on-ramp that induces existing U-turns.

CONSIDERATIONS:

- Need for SB left turn lane.
- Changes at Old Braddock (park entrance, etc.) could generate additional traffic.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Traffic signals do not appear to be adequately coordinated from the Parkway interchange to Roslyn Street, resulting in unnecessary delay and aggressive driving.



SUGGESTION:

- Retime and coordinate traffic signals.

CONSIDERATIONS:

- Review and adjust clearance intervals at the Parkway interchange to avoid vehicles getting trapped between closely spaced signals and to preclude red light running.
- Need to reestablish communications between signals.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: The overhead I-376 bridge structures restrict SB motorists' sight distance for signal heads at Monongahela Avenue.



SUGGESTION:

- Install a supplemental signal head on the vertical signal pole in the southwest quadrant of the Monongahela Avenue intersection (BP corner).

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: The supplemental signal head for right turning traffic on the Monongahela Avenue approach can be blocked by large vehicles.



SUGGESTION:

- Move the stop bar further south to prevent vehicles from blocking this signal head.

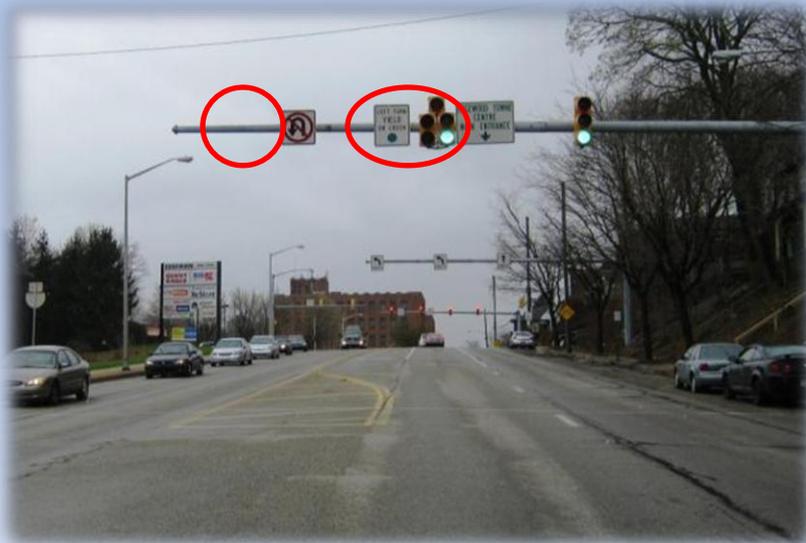
CONSIDERATIONS:

- Potential for queue to block I-376 on-ramp.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: The 5-section signal head at the lower entrance to Edgewood Town Centre is not properly aligned over the left turn lane. SB through vehicles get trapped in the left turn lane for the upper entrance at times.

Existing



Proposed



SUGGESTION:

- Relocate the 5-section signal head over the SB left turn lane.
- Install an additional 3-section signal head over the left-most SB thru lane.
- Modify the overhead lane utilization signage.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: There is evidence of heavy pedestrian traffic in the median at Schoyer Avenue. The SB ped crossing sign at that location (which is intended as an advance warning sign for the McClure Avenue intersection), seems to indicate an intended pedestrian crossing there.

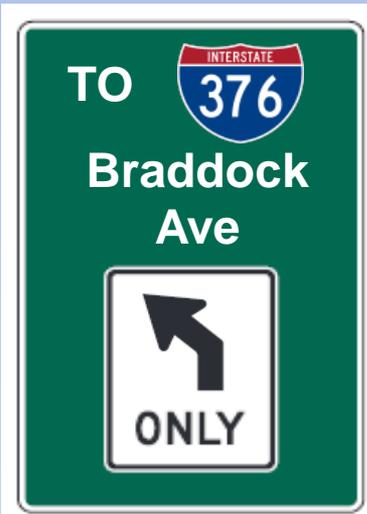


SUGGESTION:

- Provide clearer guidance to pedestrians (including moving this particular sign) that the Edgewood Town Centre main entrance, McClure Avenue & Church Street are the designated crossing points.
- Install No Pedestrian signage and an enhanced median treatment if pedestrians are not to cross at Schoyer Avenue.
- Upgrade pedestrian signal heads and infrastructure at Church Street.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: The NB overhead signage at Edgewood Avenue is faded and does not provide clear guidance to motorists.



SUGGESTION:

- Simplify overhead signs.
- Change the diagonal upward arrow on the I-376 sign at the intersection to a downward diagonal arrow.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	

OBSERVATION: Stop signs at Cheyenne Street, Melrose Street, and Vernon Avenue are not consistent with South Braddock Avenue's designation as a principal arterial (serving as a major regional traffic route between I-376 and the Mon Valley).



SUGGESTION:

- Eliminate stop control at Melrose and Vernon and convert these streets to one-way operation away from Braddock.
- Maintain the stop control at Cheyenne due to approach grades.

CONSIDERATIONS:

- Traffic calming techniques may be needed to control speeds.
- One way operation of side streets could provide additional space for on-street parking.
- Signals at Woodstock, Rosslyn, and Waverly may need to be adjusted to accommodate additional Melrose-Vernon traffic.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Rare	High	Moderate-High	

OBSERVATION: The Kenmawr Bridge is in need of major rehabilitation. There is a weight restriction that precludes buses from crossing it, although large trucks were observed ignoring the weight restriction. Sidewalks have been closed and a fenced pathway has been created in the roadway. This bridge provides important pedestrian connectivity to the busway.



SUGGESTION:

- Replace the bridge and provide adequate pedestrian accommodations on both sides of the roadway leading to the MLK East Busway.

CONSIDERATIONS:

- Cost
- Ownership issues
- Redevelopment of the Carrie Furnace site will put additional pressure on this bottleneck.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
OBSERVATION: The Stop sign at the SB Rankin Bridge on-ramp is inappropriate traffic control for the lane arrangement.			



SUGGESTION:

- Replace the Stop sign with an Added Lane (W4-3) sign.
- Install a short section of delineator posts to separate traffic.

CONSIDERATIONS:

- Potential traffic increase due to Carrie Furnace redevelopment.

6. CONCLUSION

The road safety audit program is conducted to identify opportunities for improvements in safety for transportation system users. The safety issues identified during this audit and documented in this report, along with the outlined improvement strategies, should enhance the overall safety of the study area. The full impact of the improvement strategies will be realized when they are combined, but time and budget constraints may dictate when remedial strategies are implemented.

The citizens in the local community, the municipalities, and PennDOT have already deployed various safety enhancements in this corridor including motorist and pedestrian education campaigns, Yield to Pedestrian channelizing devices and other pedestrian infrastructure, retroreflective strips on sign posts, supplemental signal heads, turning restrictions at select locations, and the use of crossing guards and police in school zones. As part of the audit, the following strategies were identified as ways to further enhance safety:

Immediate

- Adjust the timing of the school zone speed limit devices near Shadyside Academy and the Environmental Charter School to begin earlier in the PM. (M)

Short-Range

- Repaint faded and worn pavement markings and replace non-standard markings with MUTCD-approved markings. (M)
- Paint parking stalls wherever on-street parking is permitted. (M)
- Provide enhanced lane utilization signage and install lane designation pavement markings at intersections with turn lanes. (M)
- Replace damaged, defaced, faded and missing signs. (P & M)
- Remove non-standard, duplicative, and unnecessary signs. Replace non-standard signs with MUTCD-approved signs where appropriate. (M)
- Increase enforcement to prevent vandalism of signs, reduce illegal turns, decrease the occurrences of parking in restricted areas. (M)
- Provide additional wayfinder/tourist-oriented signage for regional destinations such as Kennywood and to guide travelers to I-376. (P)
- Consider changes to I-376 signage to better distribute regional traffic to Kennywood. (P)
- Remove, relocate or delineate roadside fixed objects such as utility poles, trees, old trolley poles and unnecessary guiderail. (M)
- Install bicycle safe drainage grates throughout the corridor. (M)
- Review sidewalk ordinances and enforcement policies with regard to sidewalk maintenance and develop a systematic plan to address maintenance. (M)
- Install consistent signage at all crosswalks and use Yield to Pedestrian devices consistently at all unsignalized intersections. (M)

Key: (M) – Municipal implementation item
(P) – PennDOT implementation item
(PAAC) – Port Authority implementation item

- Ensure that crossing guards and other personnel doing traffic control always wear appropriate retroreflective clothing. (M)
- Calculate minimum sight distances at all intersections and mid-block pedestrian crossings and restrict parking adjacent to these areas. (M)
- Provide advance pedestrian intervals at all signalized intersections with concurrent pedestrian phases. (M)
- Work with Shadyside Academy to stagger pick-up times for parents in the afternoon peak. (M)
- Establish time of day parking restrictions along the NB curblineline at Waverly Street (near The Heidelberg apartments) to provide space for school buses to get out of the travelway during the afternoon school peak. (M)
- Install pavement markings and signs to delineate the school loading zone in front of the K-3 Environmental Charter School. (M)
- Prohibit left turns out of Edgerton Avenue onto South Braddock Avenue. (M)
- Provide crosswalks at the Edgerton Avenue intersection. (M)
- Consider converting Edgerton Avenue to a one-way street away from South Braddock Avenue. (M)
- Consider converting Kensington Avenue and Rosemary Avenue into a one-way pair system. (M)
- Install additional pavement markings on the northbound side of South Braddock Avenue just north of Forbes Avenue in order to keep through traffic aligned properly and to restrict parking near the horizontal curve at this location. (M)
- Evaluate the signal timing, phasing and cycle length at Forbes Avenue. (M)
- Adjust the timing of the overhead pedestrian warning device at Biddle Avenue and supplement with a blankout “Yield”. (M)
- Investigate the feasibility of rerouting northbound school buses so they would drop students off in front of the 4th-8th Environmental Charter School. (M)
- Establish a 15 mph school zone speed limit and provide school zone warning signs near Henrietta Street and Biddle Avenue. (M)
- Work with GetGo to consolidate the number and width of direct access points onto South Braddock Avenue. (M)
- Revise the signal timing and cycle length at the Hutchinson Avenue intersection and eliminate the exclusive pedestrian phase. Incorporate concurrent pedestrian phases with advance pedestrian intervals and install No Turn on Red signs on all approaches. (M)
- Install pavement markings and lane utilization signage to provide a northbound left turn lane at Sanders Street. (M)
- Convert the west side of Sanders Street to one-way operation away from South Braddock Avenue. (M)
- Relocate the crosswalk and bus stops at Charleston Avenue to the southern side of the intersection. (M & PAAC)

- Supplement regulatory speed limit signs with speedminder ITS devices in key locations in order to provide feedback to drivers. (M)
- Review bus stop locations and consider relocations and/or consolidation of stops, particularly those near the I-376 interchange. (PAAC & M)
- Install crosswalks and other pedestrian infrastructure at the Allenby Avenue / CLASS intersection. (M)
- Enhance existing southbound guide signage with a supplemental post-mounted sign at Monongahela Avenue directing motorists to I-376 East. (P)
- Provide pavement markings, signage and flexible delineator posts to improve northbound lane designation between I-376 and Allenby Avenue. (M)
- Install a supplemental signal head on the vertical signal pole in the southwest quadrant of the Monongahela Avenue intersection (for southbound traffic). (M)
- Consider adjusting the location of the northbound stop bar on South Braddock Avenue at Monongahela Avenue to prevent large vehicles from blocking the supplemental signal head. (M)
- Relocate the 5-section signal head over the southbound left turn lane at the lower entrance to Edgewood Towne Center and install an additional 3-section head over the left-most southbound through lane. Modify the overhead lane utilization signage for clarity. (M)
- Provide clearer guidance to pedestrians at the Schoyer Avenue intersection. (M)
- Upgrade pedestrian signal heads and pedestrian infrastructure at the Church Street intersection. (M)
- Replace the overhead signs for northbound traffic at Edgewood Avenue. (M)
- Change the diagonal upward arrow on the I-376 sign for northbound traffic at Edgewood Avenue to a downward diagonal arrow. (P)
- Replace the Stop sign at the southbound Rankin Bridge on-ramp with an Added Lane (W4-3) sign and install a short section of delineator posts to separate traffic on this approach. (M)

Mid-Range

- Install median treatments to prevent undesirable turning movements near the Monongahela Avenue and Allenby Avenue / CLASS intersections. (M)
- Mill and resurface South Braddock Avenue to provide a better roadway surface and restore full height curb. (M)
- Resurface Church Street and provide an inlet on the north side of the roadway in order to prevent water from flowing into the intersection at South Braddock and Church. (M)
- Consider the use of textured crosswalks and bulbouts to increase the visibility of pedestrians and reduce pedestrian crossing distances at crosswalks. (M)
- Consider additional pedestrian-scale lighting improvements for enhanced nighttime visibility. (M)
- Upgrade the signal installation at Meade Street to provide 12" lenses, backplates, painted crosswalks, pedestrian push buttons and countdown pedestrian heads. (M)

Key: (M) – Municipal implementation item
(P) – PennDOT implementation item
(PAAC) – Port Authority implementation item

- Upgrade the signal installation at Forbes Avenue to provide 12” lenses, backplates, painted crosswalks, pedestrian push buttons, countdown pedestrian heads, and audible pedestrian signals. (M)
- Consider providing Regent Square “gateway” signage to provide a visual cue to motorists that they need to reduce speeds as they travel north from I-376. (M)
- Retime and coordinate traffic signals between I-376 and Roslyn Street. (M)
- Eliminate stop controls on South Braddock Avenue at Melrose Street and Vernon Avenue and convert these streets to one-way operation away from South Braddock Avenue. (M)
- Replace the Kenmawr Bridge and provide adequate pedestrian accommodations on both sides of the roadway leading to the East Busway. (P & M)

Long-Range

- Modify existing sidewalks, crosswalks, curbs, pedestrian push buttons, and other infrastructure to meet ADA requirements as other improvements are implemented. (M)
- Work with Shadyside Academy to consider internal improvements for on-site traffic circulation. (M)
- Modify the curb line on the north side of Forbes Avenue to shorten pedestrian crossing distances and provide a wider sidewalk and/or an extension of the bike lane. (M)
- Consider long-term modifications to the I-376 Edgewood / Swissvale Interchange including eliminating and or redesigning ramps. (P)

ADDITIONAL INFORMATION RELATED TO PEDESTRIAN INFRASTRUCTURE

§ 212.501. School zone speed limits.

(a) Establishment. A 15 miles per hour school zone speed limit may be established in a school zone during the normal hours that walking students are arriving at or leaving school, under 75 Pa.C.S. § 3365(b) (relating to special speed limitations).

(1) To establish a school zone, local authorities shall be responsible to prepare and submit a drawing showing the locations where students walk along or across roadways that are adjacent to school property, the hours that students are going to or from school and the proposed limits for the school zone to the Department for approval.

(2) The Department is responsible for approving the establishment of all school zones, including the locations and hours of operation, except local authorities shall be responsible for approving school zones at the following locations:

(i) On local highways when the municipality has received municipal traffic engineering certification under Chapter 205 (relating to municipal traffic engineering certification).

(ii) On State-designated highways when the municipality has entered into an agreement with the Department thereby transferring to the local authorities the authority to install traffic-control devices without specific Department approval.

(iii) On highways in cities of the first and second class, except not on expressways.

(3) The duration of a 15 miles per hour school zone speed limit should be only long enough to include the time that walking students routinely arrive at or leave school.

(b) Posting. A school zone speed limit shall be posted on official traffic-control devices as follows:

(1) At the beginning of the school zone speed limit, one of the following signs or groups of signs shall be posted either on the right side of the roadway or over the roadway:

(i) A Speed Limit Sign (R2-1) with the appropriate school zone speed limit, with a School Panel (S4-3) mounted above the Speed Limit Sign (R2-1) and a When Flashing Sign (S4-4) mounted below the Speed Limit Sign (R2-1), with two flashing speed limit sign beacons.

(ii) A Speed Limit Sign (R2-1) with the appropriate school zone speed limit, with a School Panel (S4-3) mounted above the Speed Limit Sign (R2-1) and a Restricted Hours Panel (R10-20A) mounted below the Speed Limit Sign (R2-1).

(iii) A School Speed Limit When Flashing Sign with a blank-out "15" and flashers as illustrated in the Traffic Signal Design Handbook (Department Publication 149M).

(2) An End School Zone Sign (S5-2) shall be posted on the right side of the roadway to define the end of the school zone speed limit.

(3) **The limits of a school zone may extend beyond the school property lines to improve the sight distance or to encompass a school crosswalk, except that the length of the zone may not be greater than 1,600 feet.**

Source: <http://www.pacode.com/secure/data/067/chapter212/s212.501.html>

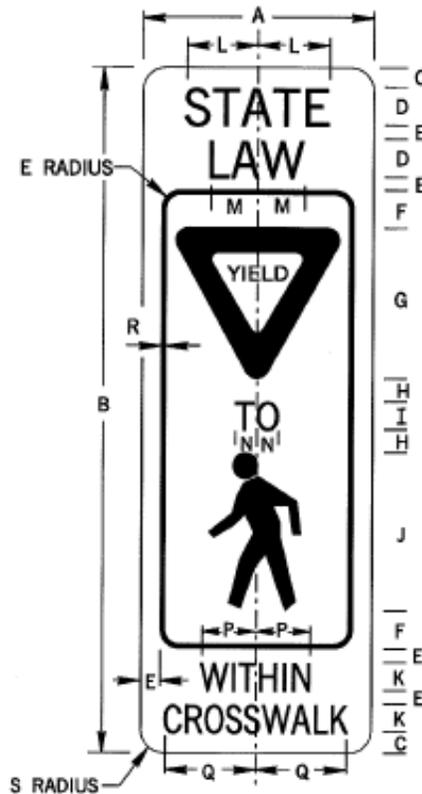
Note: The distance from the Charter School property to the corner of South Braddock and Henrietta Street is approximately 150'. The distance from Henrietta Street to Biddle Street (middle of intersection to middle of intersection) is approximately 405', and from Biddle to Guthrie is an additional 550'. The distance from Henrietta Street to Overton Street (middle of intersection to middle of intersection) is approximately 660'.

R1-6

IN-STREET PEDESTRIAN CROSSING SIGN

(a) Justification. The In-Street Pedestrian Crossing Sign (R1-6) is authorized for use on the face of a Yield to Pedestrian Channelizing Device which may be positioned on the centerline of low-speed roadways in a marked unsignalized crosswalk to remind drivers that they must legally yield the right of way to pedestrians in the crosswalk. The Yield to Pedestrian Device shall satisfy national breakaway requirements and the Department's specification, and be of a type approved by the Department and listed in Bulletin 15.

(b) Placement. When used, the R1-6 sign /Yield to Pedestrian Device shall be placed in the roadway at the crosswalk location on the center line, on a lane line, or on a median island. It should not be positioned on roadways with a speed limit greater than 35 mph or with a clear roadway width of less than 20 feet. In addition, it should not be used at locations where it will adversely affect the turning radius of motor vehicles.



DIMENSIONS - IN																
SIGN SIZE A x B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S
12" x 36"	1	2D	0.75	2	7.8	1.2	1.5D	8.2	1.5C	3.7	2.5	1.1	2.8	4.7	0.25	1.5

COLOR:

YIELD SYMBOL AND THE YIELD LEGEND:
RED (REFLECTORIZED)

OTHER LEGEND, SYMBOL AND INTERNAL BORDER:
BLACK (NON-REFLECTORIZED)

BACKGROUND:

OUTSIDE OF BORDER:
FLUORESCENT YELLOW-GREEN (REFLECTORIZED)

INSIDE OF BORDER:
WHITE (REFLECTORIZED)

APPROVED FOR THE SECRETARY OF TRANSPORTATION

By : *John C. Rome* Date : 02-29-12
Chief, Traffic Engineering and Permits Section
Bureau of Maintenance and Operations

8.5 Crosswalks

Crosswalks are a critical part of the pedestrian network. A crosswalk is defined as "the portion of a roadway designated for pedestrians to use in crossing the street" (Institute of Transportation Engineers, 1998). **Crosswalks are implied at all intersections whether or not they are marked.** Midblock crossings include all marked crosswalks that do not occur at intersections. Midblock crossings are only created if a marked crosswalk is provided. *The agency responsible for the roadway must ensure that all marked and unmarked crosswalks and midblock crossings are optimized for the safety and accessibility of all pedestrians.*