

Southwestern Pennsylvania Road Safety Audit



**S.R. 837 (Carson Street) from Station Square to
the West End**

City of Pittsburgh, Allegheny County, PA



September 2013

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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 Carson Street (S.R. 837) from Station Square to the West End in the City of Pittsburgh, Allegheny County, Pennsylvania.

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

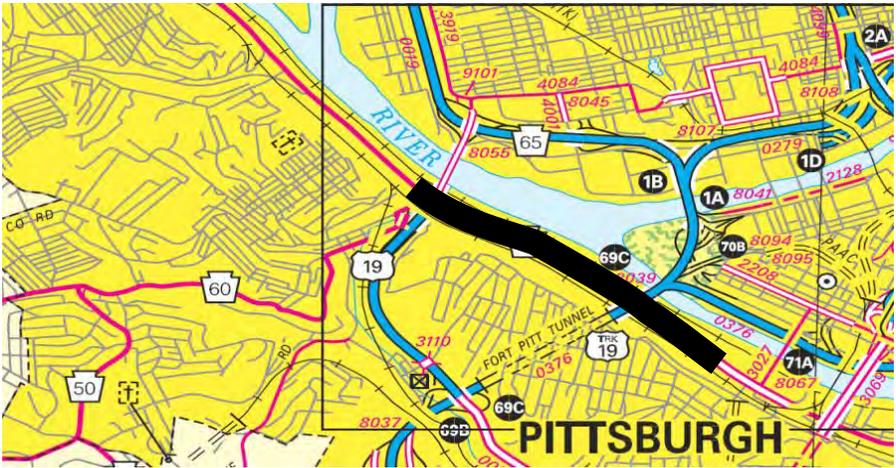
The roadway owner(s) implement improvements as outlined in the formal response.

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

Southwestern Pennsylvania Road Safety Audit Program

<u>Roadway Owner Agency(s)</u>	<u>Roadway Owner Representatives</u>
PennDOT District 11-0	Todd Kravits, P.E., District Traffic Engineer Kathryn Power, E.I.T., District Traffic Engineering Unit
City of Pittsburgh	Patrick Hassett, Assistant Director of Public Works Amanda Purcell, P.E., City Traffic Engineer

<u>RSA Team Members</u>	<u>Agency</u>	<u>Role</u>
Ross Buchan, P.E. Cory Craft Domenic D'Andrea, P.E., PTOE Millie French, P.E. Doug Smith, P.E.	Gannett Fleming PennDOT District 12-0 Southwestern Pennsylvania Commission French Engineering Southwestern Pennsylvania Commission	Transportation Engineer District Safety Engineer Transportation Engineer Transportation Engineer Transportation Planner

Location:	<p>S.R. 837 (West Carson Street) from Station Square Entrance B to West End, City of Pittsburgh, Allegheny County, PA</p> 
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<u>Schedule</u>	<u>Date & Time</u>	<u>Location</u>
Start-up Meeting	Tuesday, August 20, 2013, 10:00AM	Carnegie Library - West End
Preliminary Presentation	Thursday, August 22, 2013, 1:00PM	SPC 5th Floor Conf. Room

<u>Key Person Interviews</u>	<u>Agency / Affiliation</u>	<u>E-mail</u>
Scott Bricker	Bike Pittsburgh	
Patrick Roberts	City Planning	
2 Unnamed Cyclists		

3. OVERVIEW OF THE STUDY AREA

The study area for this RSA was the section of S.R. 837 (Carson Street) from Station Square to the West End in the City of Pittsburgh, Allegheny County, PA. This section of roadway is approximately 1.4 miles in length and contains 3 signalized intersections. S.R. 837 is classified as an Urban Principal Arterial and contains two major gateways into Pittsburgh in this section: the West End Circle/West End Bridge and the Fort Pitt Tunnel and Bridge.

It should be noted that S.R. 51 was under construction north of the West End Bridge during this RSA, with the NB lanes completely closed. The NB ramp from the West End Circle to S.R. 51 was also closed at this time, which impacted traffic patterns. During the RSA, NB S.R. 51 traffic was detoured across the West End Bridge to S.R. 65 and back to S.R. 51 via the McKees Rocks Bridge. Inbound Liberty Bridge traffic was also being detoured during the RSA.

Carson Street is a four-lane facility through most of this section. The cross-section does change to two lanes EB and one lane WB for a short time near the Fort Pitt Bridge ramps. The cross-section also changes to a 5-lane section with left turn lanes at the Gateway View Plaza, Station Square Entrance A, and Station Square Entrance B/Commerce Drive traffic signals. Geometry at the West End Bridge and Circle is complex with ramps leading to and from Carson Street and a number of key regional routes and local streets converging. A major project was completed in 2010 that significantly modified traffic operations in this area. Ramps between Carson Street and the Fort Pitt Bridge include a ramp from EB Carson Street to NB I-279/EB I-376 and a ramp from WB I-376 to WB Carson Street (which is a free flow lane addition in the WB direction). Station Square Drive, which is a private facility, runs parallel to Carson Street on the north side of the roadway (between Carson Street and the river) from the signal at Station Square Entrance A to the east and serves as a frontage road in this area.

Average Daily Traffic (ADT) on Carson Street is approximately 27,000 vehicles per day (vpd) between the West End and the Fort Pitt Bridge (7% trucks) and approximately 13,000 vpd between the Fort Pitt Bridge and the Smithfield Street Bridge (3% trucks). ADT on the West End Bridge is approximately 25,000 vpd (6% trucks) and ADT on the Fort Pitt Bridge is approximately 86,000 vpd (9% trucks). The posted speed limit on Carson Street is 35 mph; however, field observations indicate that travel speeds are typically higher than the posted speed limit. There is no on-street parking in this section. Parking areas at Station Square are heavily utilized by both visitors/tourists and by daily commuters. There are heavily used bus stops near the Duquesne Incline and Gateway View Plaza.

Sidewalks are generally available on the north (river) side of Carson Street, but not on the south (Mt. Washington) side. There are public stairways at the West End Bridge and at the Fort Pitt Bridge ramps. There is also a pedestrian bridge over Carson Street at the Duquesne Incline. A shared use pedestrian and bicycle trail, which is part of the Three Rivers Heritage Trail, runs through the Station Square property parallel to Carson Street from Station Square Entrance A to the east. This trail connects to downtown Pittsburgh and Point State Park via the Fort Pitt

Bridge, but there is currently no connection in the trail system from Station Square Entrance A to the west.

Land use can generally be characterized as sporadic/marginal on Carson Street near the West End Bridge. The Pacific Pride gas station, which is at the foot of the ramps to the West End Circle, is notable due to its location and the propensity for traffic to use this as a u-turn location. A temporary traffic signal was installed at this location as part of the S.R. 51 construction project and is likely to be in place at this location for the duration of that project.

Further east in the corridor, Gateway View Plaza is a major traffic generator that takes up the entire area between the Pacific Pride gas station and Station Square Entrance A on the north side of Carson Street. Land use on the south side of the road in this area includes a gentlemen's club, a rehab clinic, a welding supply company, a document management company, and a number of vacant parcels. City Planning staff indicated that there is potential for the area across from Station Square Entrance A to redevelop with a hotel in the near future. Development options on this south side of Carson Street are limited by steep slopes in the area and the narrowness of parcels between the hillside/railroad and the street.

The eastern end of the corridor includes the Station Square complex and associated parking lots. Station Square is home to shopping, restaurants, nightlife, and numerous tourist-oriented attractions such as the Gateway Clipper Fleet, Just Ducky Tours, the inclines, and Segway tours. A new addition to this complex is Highmark Stadium, home to the Pittsburgh Riverhounds soccer team and other events, which seats 3,500. The parking lots at Station Square are also heavily utilized by commuters to the Golden Triangle.

Also of note in this corridor are two Class 1 rail lines that run parallel to Carson Street. One of these rail lines (2 CSX tracks with a siding behind Gateway View Plaza) runs along the river, and the other (2 Norfolk Southern tracks) runs on a "shelf" above the roadway.

4. SAFETY HISTORY

S.R. 837 has been identified as a high crash corridor in the region based on the number of fatal and major injury crashes. According to PennDOT's crash database, there were 63 reportable crashes in the study area of Carson Street for the 3-year period from January 1, 2010 through December 31, 2012. There were also 134 reportable crashes in the area of the West End Circle. (Reportable crashes are those that result in an injury or fatality, or where a vehicle is required to be towed from the scene. A detailed breakdown of the crash data was included in the RSA binder provided at the start-up meeting.) In addition to property damage and minor/moderate injuries, these 197 crashes resulted in 8 major injuries and 1 fatality. The fatality was in the West End Circle and involved a driver "affected by physical condition" who turned from the wrong lane and collided with a truck.

The two areas of the corridor with the largest clusters of crashes were the West End Circle and the segment between Gateway View Plaza and the ramps to the West End Circle. The section

between the West End and Gateway View Plaza had a variety of crashes including sideswipes, rear ends, and angle crashes. Driver Actions in these crashes included making illegal u-turns, distracted driving, traveling too fast for conditions, and careless lane changes. The predominant crash pattern in the West End Circle was angle collisions between SB vehicles coming off the bridge and WB vehicles from the Circle. Many of these collisions were the result of WB motorists running red lights.

The majority of crashes occurred during clear weather (82%) with dry pavement (80%), which is typical. However, only 56% of crashes occurred during Daylight conditions, which is somewhat unusual. This may indicate that people have more difficulty navigating the complex series of decision points at night. It could also be a result of more visitors, people who are unfamiliar with the area, traveling the corridor during off-peak hours. Another indication that people unfamiliar with the area may have more difficulty is that more crashes occurred on Sunday (35) than any day of the week other than Wednesday (36). Sunday is typically a day with the lowest traffic volumes and lowest number of crashes. Crashes in the West End Circle were actually highest on Sundays and were more frequent in July (tourist season), September, October, and November (football season).

The number of crashes in this area has risen significantly in recent years. There were 47 crashes in 2010, 75 crashes in 2011, and 75 crashes in 2012.

5. AUDIT FINDINGS

The following pages summarize the findings of the RSA team.

Safety Successes

- West End Circle traffic operations upgrades, particularly for SB trucks
- West End pedestrian infrastructure
- Lighting improvements under West End Bridge
- Signal timing provides clearance of “no man’s land” zone within West End Circle
- Event traffic management plan implemented for Steelers home games



Safety Successes

- Free flow right turn from South Main Street approach to Carson Street
- Station Square Drive provides frontage road effect reducing direct access onto Carson Street
- Pedestrian and bicycle infrastructure through Station Square provide alternative to Carson Street



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

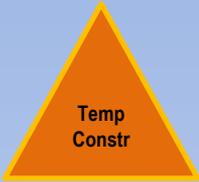
Crash Severity

RISK CATEGORY

A = Lowest priority

F = Highest priority

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
OBSERVATION: Temporary work zone traffic control appears to be ineffective as motorists misunderstand and/or willfully disregard signage and traffic control devices.			

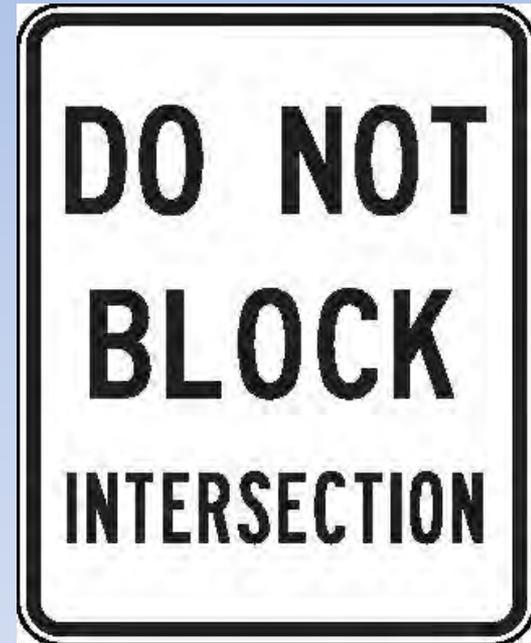
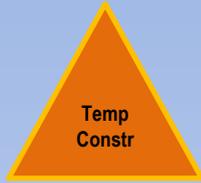


SUGGESTION:

- Review advanced temporary signage for the S.R. 51 North detour and revise as needed.
- Continue police enforcement at the temporary signal near Musk Way and consider extending enforcement hours.

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

OBSERVATION: Traffic blocks the gas station driveway and partially closed ramp. When the officer tries to change the signal, it must go through a full phase at the gas station whether it is needed or not.



SUGGESTION:

- Install 'Do Not Block Intersection' signs.
- Give traffic officer more control over the signal so that he/she can choose which signal phase to call (i.e. which approach to turn green (if possible)).

CONSIDERATIONS:

- Signal technology may need to be upgraded.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
OBSERVATION: Signage is inconsistent and in varying states of repair throughout the corridor.			



Remove or cover temporary signage not in use



Remove unnecessary or obsolete signage



Replace faded & damaged signs



SUGGESTION:

- Conduct a comprehensive review of signage throughout the corridor.
- Replace damaged, defaced and faded signs.
- Add, replace, or remove signs in order to remedy inconsistencies.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
OBSERVATION: Vegetation blocks numerous signs and restricts the sidewalk width.			



SUGGESTION:
<ul style="list-style-type: none"> • Trim or remove vegetation.

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

OBSERVATION: The pavement has been built up over time resulting in little or no curb reveal and blocked drainage inlets. Drainage off the hillside is a particular seasonal concern.



Between Station Square and West End Bridge

SUGGESTION:

- Remove/mill pavement near drainage inlets to improve water flow.
- Provide curb reveal.
- Raise/replace inlets as part of next resurfacing.

CONSIDERATIONS:

- Ensure bicycle friendly drainage grates.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	B
Rare	Low	Moderate-Low	
<p>OBSERVATION: Guiderail on north side of the roadway near the Gateway View Plaza intersection is not warranted and creates increased chances for hit fixed object crashes.</p>			



SUGGESTION:

- Remove guiderail.

CONSIDERATIONS:

- If guiderail is to remain, there may not be enough room to install proper end treatments.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: There are numerous fixed objects (old trolley poles and light poles) in close proximity to the travel lanes.



SUGGESTION:

- Remove and/or relocate fixed objects whenever possible.
- Delineate fixed objects with retroreflective tape if removal or relocation is not feasible.

CONSIDERATIONS:

- Wider sidewalks and/or a landscaped buffer could provide additional space between traffic and fixed objects.

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

OBSERVATION: Sidewalks are very narrow and do not meet current ADA standards in some locations. There are numerous sidewalk obstructions.



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	B
Rare	Low	Moderate-Low	
OBSERVATION: There are very few wayfinding signs or other informational resources geared toward pedestrians and cyclists.			



SUGGESTION:

- Install wayfinding signs, kiosks, or other informational resources for pedestrians and cyclists in order to shorten travel distances, reduce mid-block crossings and reduce the potential for pedestrians walking in the road.

CONSIDERATIONS:

- Station Square and the South Side are major tourism hubs with many out-of-town visitors who are unfamiliar with the area.

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

OBSERVATION: Pedestrian and bicycle traffic in the corridor is high, but connectivity/accessibility is limited west of Station Square Entrance A. This is particularly problematic for those that would like to use the West End Bridge to connect to trails on the North Shore.



SUGGESTION:

- Close gaps in pedestrian and bicycle infrastructure. Consider alternatives presented in the *Three Rivers Heritage Trail Connector - Pittsburgh to Coraopolis Feasibility Study* completed in July 2013.
- Ensure adequate maintenance where sidewalks do exist.

CONSIDERATIONS:

- Connectivity to regional trail system.
- Code enforcement.

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

OBSERVATION: Stairway structures along the corridor are utilized by bicyclists who must carry their bikes up and down the stairs. These stairways provide important linkages between regional corridors.



SUGGESTION:

- Provide bicycle channels on stairways in order to improve accessibility for cyclists.

CONSIDERATIONS:

- Width of stairs.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	
<p>OBSERVATION: Direct driveway access onto Carson Street and lack of connectivity between adjacent parcels between Station Square and the West End creates additional turning movement conflicts.</p>			



<p>SUGGESTION:</p> <ul style="list-style-type: none"> • Encourage access management and interconnectivity of adjacent parcels wherever possible.

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

OBSERVATION: A gravel area between Carson Street and Station Square Drive (near the Fort Pitt Bridge) appears to be used as a cut through, which could create turning movement conflicts.



SUGGESTION:

- Replant this area (and regrade as necessary) in order to eliminate cut-through traffic.

CONSIDERATIONS:

- Right-of-way / ownership

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Traffic signal equipment at Gateway View Plaza is old and the pedestrian accommodations are outdated. The signal is not coordinated with the adjacent traffic signals and appears that it may be operating on recall or pretimed since the red indication was observed on Carson Street without vehicles being present on the minor approach.



SUGGESTION:

- Upgrade signal to current standards including mast arms, backplates, pedestrian push buttons, countdown ped heads, and audible signals at appropriate locations.
- Consider adding backplates with retroreflective tape.
- Coordinate traffic signal with adjacent signal at Station Square Entrance A.
- Add street name signage.

CONSIDERATIONS:

- New development impacts

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	
OBSERVATION: Future development/redevelopment in the area will have impacts to the transportation system, roadway users and infrastructure.			



SUGGESTION:

- Develop a detailed corridor plan to guide implementation of transportation improvements as development / redevelopment takes place.

CONSIDERATIONS:

- Redevelopment could provide opportunities to implement various “complete streets” improvements.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Occasional	Medium	Moderate-High	
<p>OBSERVATION: High speed traffic along this section of Carson Street, particularly between the West End and the Fort Pitt Bridge, conflicts with vehicles making turns from through lanes and with bus stops, which creates potential for rear end and sideswipe crashes.</p>			



SUGGESTION:

- Consider traffic calming techniques to reduce speeds.
- Increase aggressive driving enforcement.

CONSIDERATIONS:

- Carson Street serves as a multimodal gateway into the City. A “complete streets” outlook should be considered in order to create a boulevard rather than freeway environment.
- Big Picture / Long Term – additional park-n-ride capacity and improved transit service west of the City could help reduce single-occupancy vehicle traffic on the Parkway West and through the West End.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Traffic volumes are higher in the West End Circle because of vehicles entering from the West End in order to access S.R. 51 South / I-376 West.

Encourage these movements



Discourage this movement



SUGGESTION:

- Add additional guide signage at intersections in the West End to encourage drivers from the West End to utilize the Steuben Street ramp to S.R. 51 South / I-376 West instead of entering the West End Circle.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Rare	Medium	Moderate	

OBSERVATION: Signal visibility can be hampered by large trucks, the overpass and morning sun glare for northbound motorists on the South Main Street approach to the West End Circle.



SUGGESTION:

- Install a supplemental signal head on the right side of this approach.
- Consider installation of an advance signal "red" ahead sign on this approach.

CONSIDERATIONS:

- Locating the signal head so it does not get struck.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Occasional	Low	Moderate	

OBSERVATION: Signs approaching the West End Bridge from Carson Street WB are confusing. Overhead signs indicate that both lanes can be used for West End but other signs say that the left lane is for thru and right lane is for right turns only.



SUGGESTION:

- Replace the overhead West End sign on WB Carson Street with a new sign that indicates:
 - PA 51 South, US 19 South West, I-376, West End & Airport (left).
 - US 19 North, West End Bridge & North Shore (right).

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	C
Occasional	Low	Moderate	
<p>OBSERVATION: Significant queuing occurs on the northbound approach of South Main Street because of current lane designations. Motorists destined for the West End Bridge may not realize that they can use either lane.</p>			



<p>SUGGESTION:</p> <ul style="list-style-type: none"> • Replace overhead sign with a sign that reads: <ul style="list-style-type: none"> • South 837, To East 376, Downtown & West End Bridge (right lane).
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EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Frequent	Low	Moderate-High	

OBSERVATION: Advance signs are confusing. Traffic is often in the wrong lane when approaching the signal at the bridge.



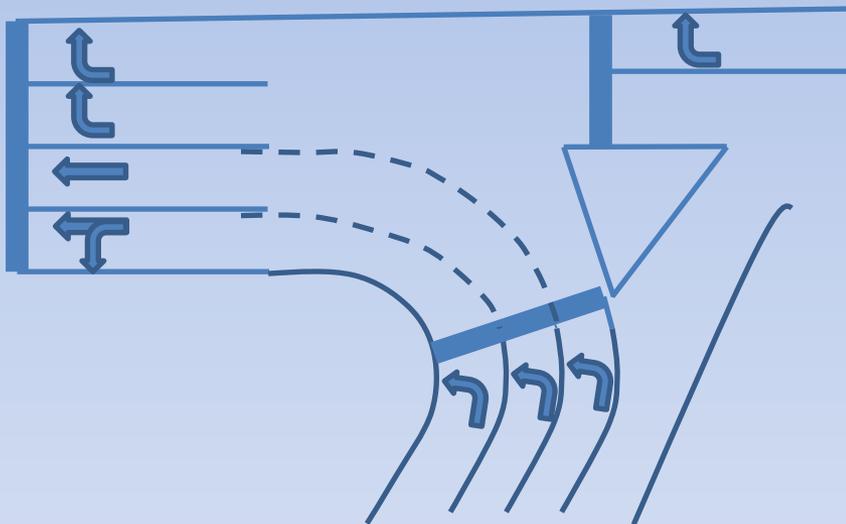
SUGGESTION:

- Replace overhead signs with signs that read:
 - South US 19, PA 51, To West I-376, McKees Rocks & Airport (left lane).
 - To North I-279, US 19, West End Bridge & North Shore (center and right lanes).

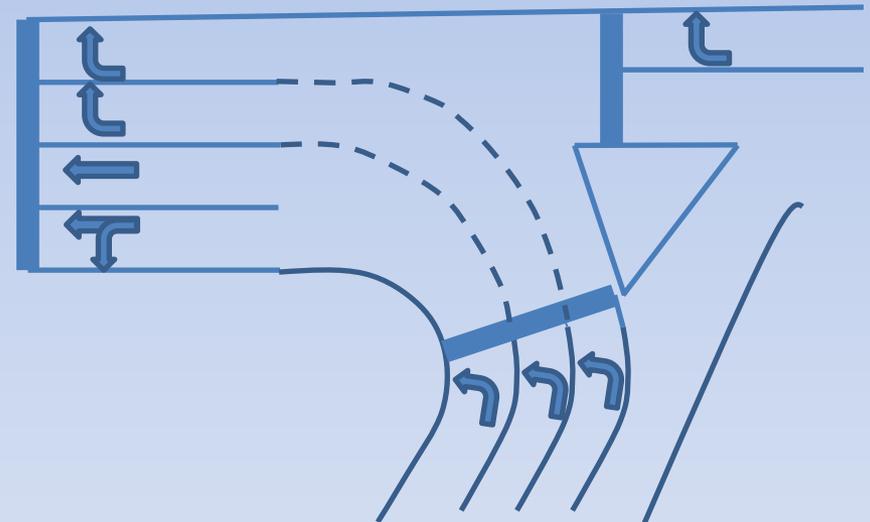
EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Frequent	Low	Moderate-High	

OBSERVATION: Tracer lines do not match the current signal plans. Most vehicles in the middle left turn lane are destined for the West End Bridge, but the current tracer lines do not direct them into those lanes.

EXISTING



PROPOSED



SUGGESTION:

- Modify triple left tracer lines so that:
 - Left lane leads to left turn lane and left/thru turn lane.
 - Middle lane leads to the inside right turn lane.
 - Right lane leads to outside right turn lanes.

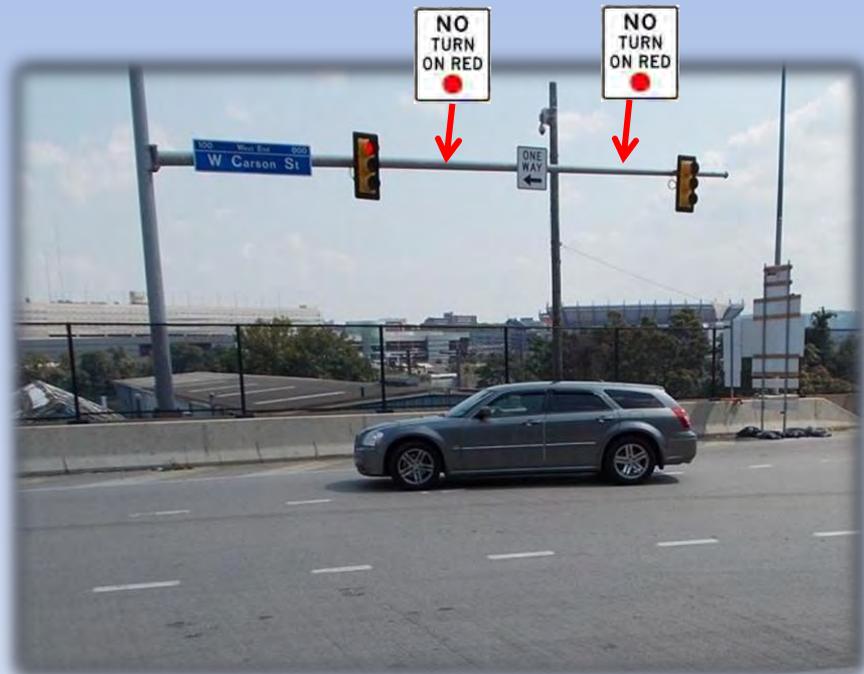
CONSIDERATIONS:

- Coordinate with changes to advanced signage and signal plans.
- Consider adding supplemental in-lane pavement markings.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	D
Frequent	Low	Moderate-High	

OBSERVATION: Numerous motorists were observed making left turns onto Carson Street from South Main Street during the red phase (from all 3 turn lanes). A pedestrian crossing phase is programmed to “WALK” across these left turns on red. This creates vehicle-ped conflicts.

VIDEO
AVAILABLE



SUGGESTION:

- Install NO TURN ON RED signs and/or red arrow signal heads on South Main Street approach.
- Consider installing Automated Red Light Enforcement devices.

CONSIDERATIONS:

- Could have capacity impacts.
- Potential confusion for free flow right turning motorists.

EXPECTED FREQUENCY	EXPECTED SEVERITY	RISK RATING	E
Occasional	High	High	

OBSERVATION: Signal heads for the actuated ped signal on the ramp to S.R. 51 North are optically programmed but may be confusing to motorists who see the right turn green arrows to the West End Bridge during the overlap phase. This could be contributing to the high rate of angle crashes.



SUGGESTION:

- Eliminate signal heads at pedestrian crossing and replace with a ped crossing sign (W11A-2). Keep the ped push button for actuation and use it to call a NB advance phase to allow pedestrian crossings without a conflicting SB right turn movement from the bridge. (NB vehicles are prohibited from making left turns.)
- Consider replacing the 5-section signal heads on this approach with 3-section heads that do not contain a green ball indication (all heads have arrows).

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.

PennDOT and the City of Pittsburgh have already deployed various safety enhancements in the Carson Street corridor including lighting upgrades, ADA compliant pedestrian infrastructure, signal timing improvements, and post-event traffic management plans.

As part of the audit, the following strategies were identified as ways to further enhance safety in this corridor:

Temporary Construction Conditions

- Review advanced temporary signage for the S.R. 51 North detour and revise as needed. (DOT)
- Continue police enforcement near Musk Way and consider extending enforcement hours. (DOT/PITT)
- Install 'Do Not Block Intersection' signs at the temporary traffic signal near Musk Way. (DOT)
- Investigate the possibility of giving the traffic officer more control over the temporary signal so that he/she can choose which signal phase to call. (DOT)

Short-Range

- Conduct a comprehensive review of signage. Replace signs that are damaged, defaced, or faded. Add and/or remove signs to ensure there are no inconsistencies. (PITT/DOT)
- Trim or remove overhanging vegetation around signs and along sidewalks. (PITT)
- Remove/mill pavement near drainage inlets to improve water flow. (DOT)
- Review sidewalk ordinances and enforcement policies with regard to sidewalk maintenance and develop a systematic plan to address maintenance. (PITT)
- Install wayfinding signage, kiosks, or other informational resources for pedestrians. (PITT)
- Provide bicycle channels on public stairways in order to improve accessibility for cyclists. (DOT)
- Remove and/or relocate roadside fixed objects, including old trolley poles, whenever possible. Delineate fixed objects with retroreflective tape if removal or relocation is not feasible. (PITT)
- Remove the guiderail on the north side of Carson Street on the east side of the Gateway View Plaza intersection. (DOT)

- Work with the property owner to replant (and regrade if necessary) the buffer area between Carson Street and Station Square Drive that appears to be used as a cut-through near the Fort Pitt Bridge. (PITT/DOT)
- Increase aggressive driving enforcement, particularly between the Fort Pitt Bridge and the West End. (PITT)
- Provide additional guide signage at intersections in the West End to encourage drivers to utilize alternate routes to access S.R. 51 South and I-376 West instead of entering the West End Circle. (DOT)
- Install a supplemental signal head on the right side of the South Main Street approach to the West End Circle and consider installation of a “Red” Signal Ahead ITS sign to improve signal awareness and visibility on this approach. (PITT)
- Replace existing guide signage on the WB Carson Street approach to the West End Circle to make it clear that vehicles to the West End and Airport should be in the left lane and vehicles to the West End Bridge and North Shore should be in the right lane of this ramp. (DOT)
- Replace existing guide signage on the South Main Street approach to the West End Circle to make it clear that both lanes be used to access the West End Bridge. (DOT)
- Replace existing railroad overpass-mounted guide signage on the NB approach to the West End Circle to make it clear that the center and right turn lanes can both access the West End Bridge. (DOT)
- Replace existing left turn “tracer line” pavement markings to guide NB left turning traffic into the proper lanes. (PITT)
- Install No Turn On Red signs (R10-11) or red arrow signal heads on the NB approach to the West End Circle. (PITT)
- Eliminate the optically programmed signal heads at the pedestrian crossing on the west side of the West End Circle (ramp to WB S.R. 51 which is currently closed) and replace with a pedestrian crossing sign (W11A-2). Modify the signal phasing to call a NB advance phase when the pedestrian push button is actuated at this location. (PITT)
- Replace the two 5-section signal heads on the WB approach of the West End Circle with 3-section heads that do not contain a green ball indication (arrows only). (PITT)

Mid-Range

- Upgrade the signal installations at Gateway View Plaza and Station Square Entrance A to current standards including, backplates, pedestrian push buttons, countdown ped heads, detection, and communications/coordination. Consider adding street name signage and retroreflective tape to signal backplates. (PITT)
- Raise/replace inlets and provide full height curb along both sides of the roadway during the next scheduled resurfacing project. (DOT)
- Work with property owners to improve the interconnectivity of adjacent parcels of land and reduce the number of driveways with direct unsignalized access on Carson Street. (DOT / PITT)
- Provide improved pedestrian and bicycle connections between Station Square and the West End neighborhood. Consider alternatives presented in the *Three Rivers Heritage*

Trail Connector - Pittsburgh to Coraopolis Feasibility Study completed in July 2013. (DOT/PITT)

- Consider installing automated red light enforcement devices on the NB approach to the West End Circle. (PITT)

Long-Range

- Modify sidewalks, crosswalks, curb lines, curb ramps, and other pedestrian infrastructure to meet ADA requirements as other improvements are implemented. (PITT/DOT)
- Develop a detailed corridor plan to preserve existing capacity and guide implementation of transportation improvements as development / redevelopment takes place. Consider a “complete streets” approach to calm traffic and provide an urban boulevard environment rather than a freeway environment for this corridor. (PITT)
- Investigate travel demand management opportunities such as additional park-n-ride capacity and improved transit service west of the City in order to reduce single-occupancy vehicle traffic on the Parkway West and through the West End. (PAT/DOT/PITT)

Note: (DOT) PennDOT implementation item; (PITT) City of Pittsburgh implementation item; (PAT) Port Authority implementation item