

MEMORANDUM

To: Emily Dalphy
District Department of Transportation (DDOT)

From: Daniel Markham, P.E.
Tracy Lower, P.E.
Kimley-Horn and Associates, Inc.

Date: September 7, 2017

Subject: High Crash Site Review Summary Memo
Southern Avenue SE and Wheeler Road SE

DDOT has identified several high-crash locations in the District for a safety evaluation to identify potential improvements to mitigate observed crash patterns. Short-term improvements will be identified that can be implemented in the next calendar year and may include signing and marking enhancements or signal timing adjustments. Long-term recommendations will also be identified that could be incorporated as part of planned capital improvement projects, such as intersection modification or streetscape projects.

This memorandum provides a summary of the review of crash data, projects that could impact the intersection, the outcome of the field review meeting, and recommendations for the intersection of Southern Avenue SE and Wheeler Road SE. A total of 88 crashes were provided to Kimley-Horn for review at the location mentioned above. A review of the police report crash descriptions was conducted, and it was determined that 11 (13%) should be removed from the analysis. **Table 1** below, describes the reason for removal and the number of crashes removed for the intersection.

Table 1: Summary of Removed Crashes (2013-2015)

Reason for Removal	Number of Crashes
Crash location could not be determined	5
Greater than 500 feet from study intersection	4
Medical emergency	1
Runaway vehicle	1
TOTAL	11

SOUTHERN AVENUE SE AND WHEELER ROAD SE

Background

The signalized intersection of Southern Avenue SE and Wheeler Road SE is located in the Washington Highlands neighborhood. Southern Avenue SE and Wheeler Road SE are four-lane, two-way minor arterial roadways with posted speed limits of 30 mph within the District. On the Maryland side, Wheeler Road has a posted speed limit of 25 mph. Southern Avenue SE carries more than 15,000 vpd according to 2014 traffic data published by DDOT. Daily traffic volume data was unavailable for Wheeler Road SE; however, peak hour traffic data from 2011 was obtained for this review. AM and PM peak hour traffic volumes and pedestrian counts are summarized in **Figure 1**.

There are no turning restrictions at the intersection. Protected-permissive signals are provided for the left-turn movements from Wheeler Road SE onto Southern Avenue SE in the northbound and southbound directions. WMATA bus stops are located on the northwest and southeast corners of the intersection that serve the 33, 35, 37, A6, A7, D12, D13, D14, NH1, P12, P18, P19, and W14 bus routes.

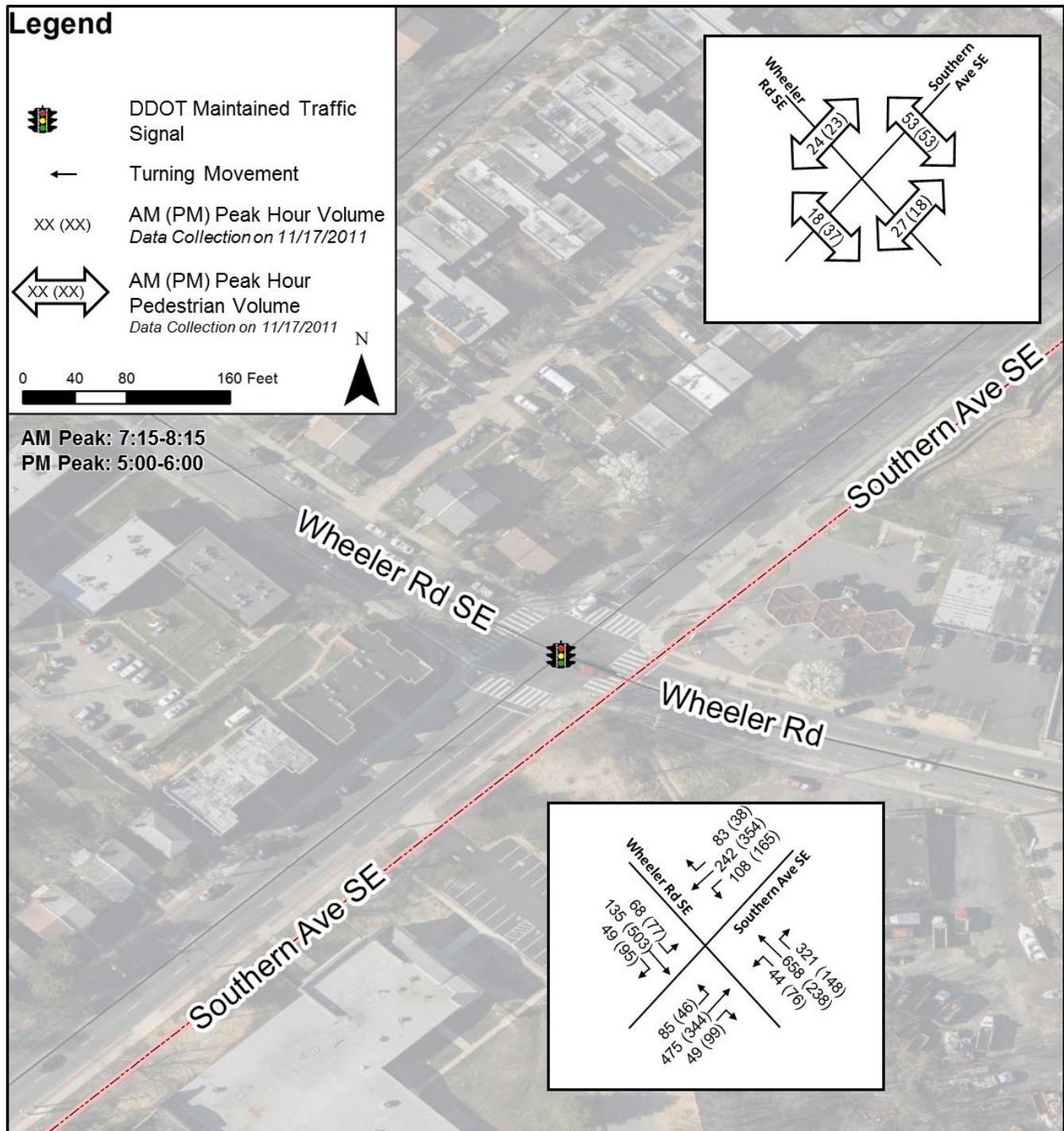
The District of Columbia Metrorail Walkshed Improvement Project evaluated walkability to three metrorail stations on the Metrorail Green Line. One of the stations included in the project was the Southern Avenue Metrorail station. This station is located approximately $\frac{3}{4}$ of a mile from the study intersection at Wheeler Road SE. Priority access improvement projects were identified for the area surrounding the station, including bike lanes, trails, sidewalks, and spot improvements. Although improvements were not identified specifically for the study intersection at Wheeler Road SE, the project identified Southern Avenue SE as a primary route for pedestrians to access the station.

A safety and bike lane project is currently being designed by DDOT for Wheeler Road SE between Southern Avenue SE and Alabama Avenue SE. This corridor was identified in moveDC, the District's long-range multi-modal plan, as a future bike infrastructure corridor. The preliminary plans, dated March 22, 2016, call for a reduction of the cross-section of Wheeler Road SE from four lanes to two lanes. This allows for the marking of buffered bike lanes along the curb in both directions. The buffered space between the travel lanes and the bike lanes is eliminated at intersections where turning lanes are provided, namely Southern Avenue SE, Mississippi Avenue SE, and Alabama Avenue SE.

A streetscape project along Southern Avenue SE between Barnaby Road SE and the United Medical Center is also being evaluated by DDOT. The preliminary design calls for a reduction in the number of travel lanes along Southern Avenue SE to a single lane throughout much of the corridor, with the second lane being repurposed for on-street bike lanes and parking. At the intersection with Wheeler Road SE, the east-side curb (Maryland side) is proposed to be shifted approximately 11 feet east to allow for the designation of a center left-turn lane in both directions along Southern Avenue SE. The proposed 5-lane cross-section would extend approximately 250 feet north and south of the intersection, where it then transitions to the existing curb-to-curb width. Lane designations and bicycle accommodations vary north and south of the intersection at Wheeler Road SE. The preliminary design plan sheet reflecting improvements at Southern Avenue SE and Wheeler Road SE are included in **Attachment A**.

A crash evaluation was conducted for the intersection and a site visit was conducted by DDOT staff, community members, and Kimley-Horn and Associates, Inc. on June 28, 2017. Field observations were reviewed in conjunction with the crash evaluations in order to develop short and long-term recommendations. The following sections summarize the crash evaluation and recommendations.

Figure 1: Peak Hour Turning Movement Count Data Summary – Southern Avenue SE and Wheeler Road SE



Crash Evaluation and Site Field Review

A total of 77 crashes were documented at the intersections of Southern Avenue SE and Wheeler Road SE between 2013 and 2015. Crash records from Prince George's County were not made available for the crash analysis resulting in an incomplete evaluation of crashes on the westbound Wheeler Road SE approach. There were 47 (61%)

documented as PDO crashes, 15 (20%) involving at least one reported injury, and 14 (18%) unreported or unknown crash severity. There was one fatal crash recorded at the intersection. The fatal crash occurred on the southwestern approach on Southern Avenue within 100 feet of the intersection due to a speeding and erratic driver. The predominant crash type was rear end collisions, accounting for 26 (34%) of the crashes. Other common crash types include angle, side swipe, and fixed object collisions. Five crashes involved a pedestrian and zero crashes involved bicycles. There is no street parking available at the study intersection; however, illegal parking contributed to seven crashes. **Figure 2** summarizes the crash locations and corresponding crash statistics. From the crash data, some of the key issues identified include:

- Rear end and sideswipe same direction crashes were concentrated on Southern Avenue approaches
- Off peak period crashes accounted for the highest number of crashes (57%), and fewer crashes occurred in the AM peak period (9%) than the PM peak period (34%), defined as 6:00-10:00 AM and 3:00-7:00 PM, respectively
- Three crashes within the intersection were attributed to vehicles running a red light

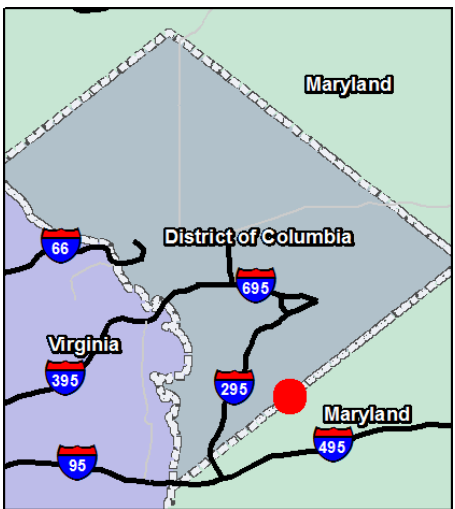
Figure 3 further identifies some key crash types and indicates other field observations noted during the site visit that relate to safety issues at this intersection. Field observations indicated that there are many enforcement issues at this intersection including red light running, queue jumping, failure to yield to pedestrians, and parking. Red light running and queue jumping are made worse by a lack of dedicated left-turn lanes to store left-turning vehicles and allow through traffic to move through the intersections. This has contributed to 13 left-turn crashes, 4 right-angle crashes, and 8 rear-end crashes, totaling 32% of crashes for the intersection. In addition, aggressive turning movements and failure to yield to pedestrians has resulted in 4 pedestrian crashes at this intersection. Lastly, illegal parking was observed on both Southern Avenue SE and Wheeler Road SE, which was observed to contribute to weaving issues involving cars and buses. Illegal parking has contributed to 2 fixed-object crashes and 5 sideswipe crashes.

Other field observations noted include the following:

- The residential building and “Welcome to D.C.” sign on the southwest corner create a sight distance issue for eastbound right turns, which may have contributed to one of the recorded pedestrian crashes
- The Shell gas station on the northeast corner has five entrances within close proximity to the intersection, which has contributed to six crashes
- Bus stops on Southern Avenue SE are closely spaced and contribute to weaving issues
- Illegally parked cars on Southern Avenue SE precluded buses from stopping at the curb
- Overgrown trees block the view of signal heads on the northbound approach
- The eastbound right-turn vehicle path for the A6 bus route conflicts with vehicles traveling northbound on Southern Avenue SE
- Overhead street-lighting is inconsistent at and approaching the intersection

Table 2 provides a summary of the field observations noted during the site visit along with the crash types that might be attributed to the observed issue. Also indicated in the table with each observation are recommendations for further evaluation where additional considerations may be necessary prior to implementation.

Figure 2: Crash Analysis Summary Figure – Southern Avenue SE and Wheeler Road SE



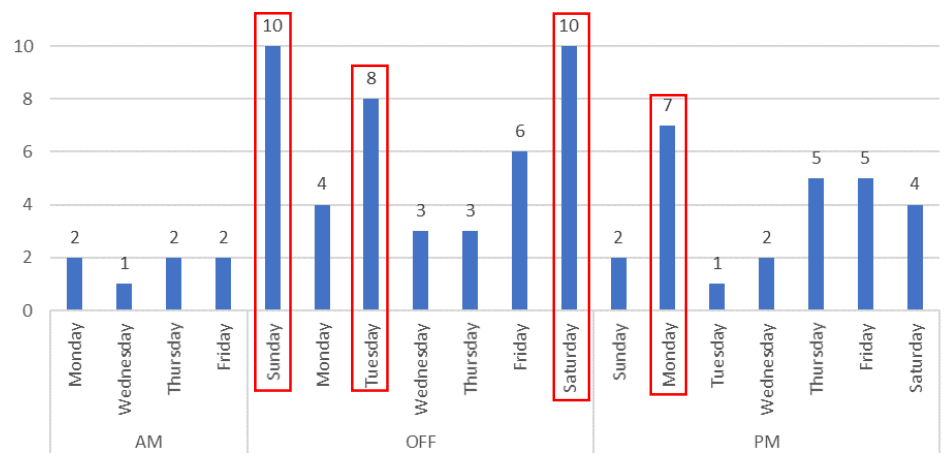
Legend

Intersection Study Area

Collision Type

- Angle
- Fixed Object
- Head On
- Pedestrian
- Rear End
- Sideswipe OD*
- Sideswipe SD**
- Bicycle
- Parking

*Opposite Direction **Same Direction



Crash Summary

- One fatal crash (2013) was due to erratic and speeding driver.
- Rear end and sideswipe same direction crashes were concentrated on Southern Avenue SE.
- Signalized intersection, but 29% of all crashes were angle crashes.

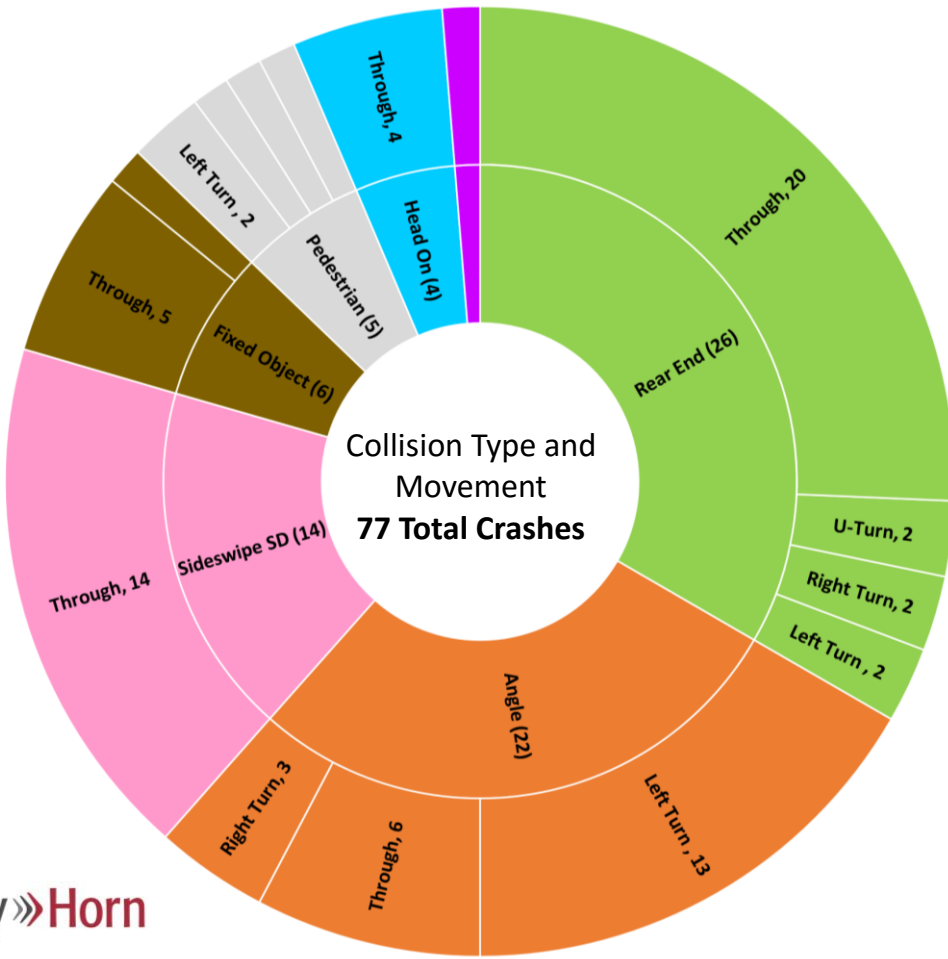
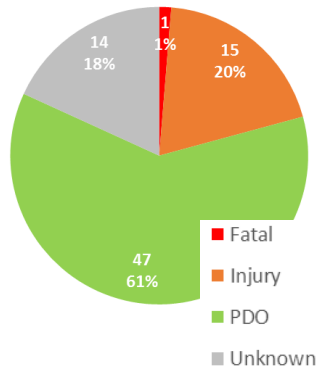


Figure 3: Summary of Field Observations and Associated Crash Types – Southern Avenue SE and Wheeler Road SE

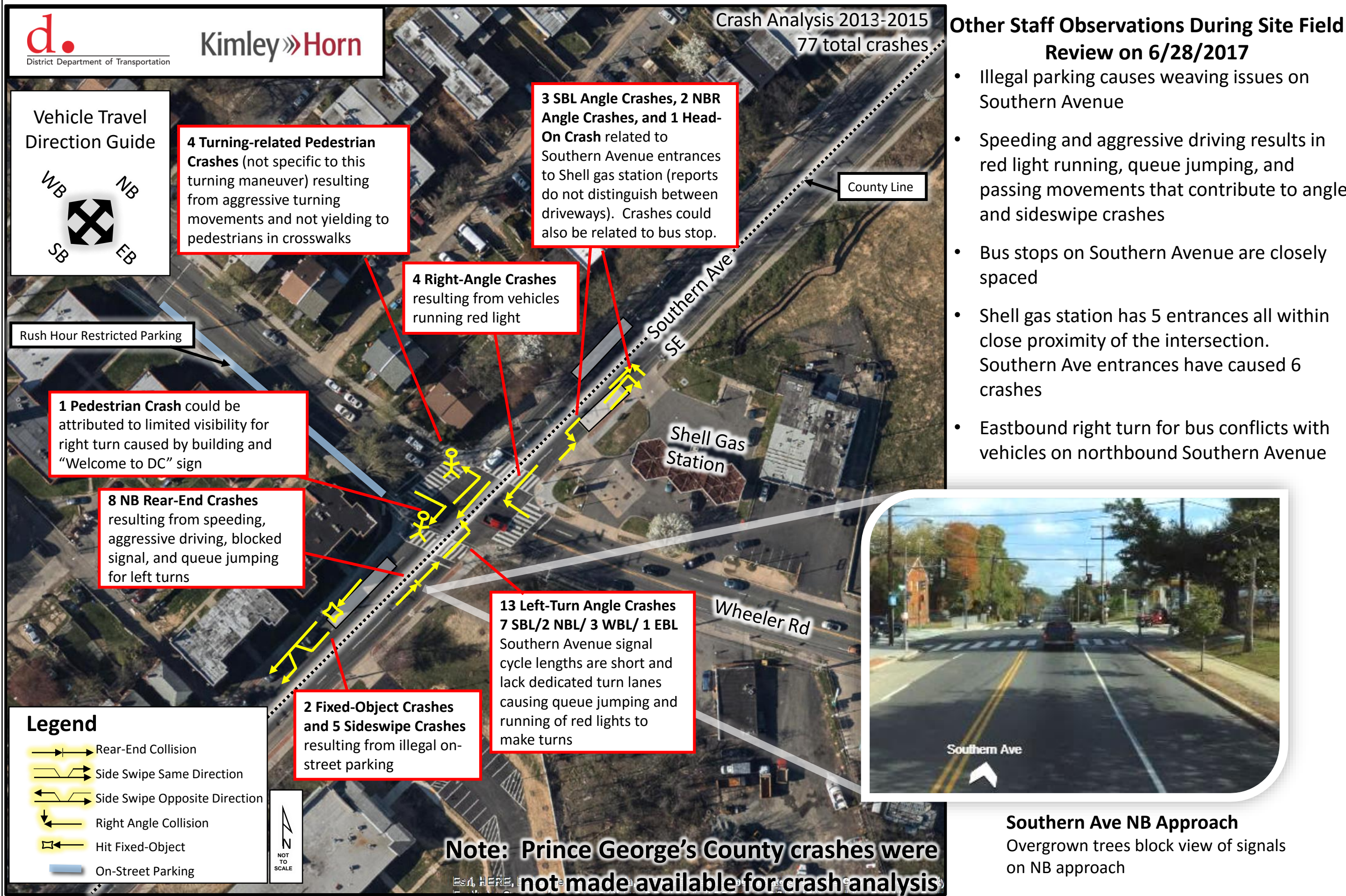


Table 2: Summary of Field Review Notes and Related Crash Types – Southern Avenue SE and Wheeler Road SE

Site Visit Notes <i>(provided by DDOT staff, community members, and Kimley-Horn)</i>	Location	Related Crash Types										Further Analysis
		Sideswipe	Rear End	Parking	Bicycle	Left Turn	Right Turn	Pedestrian	Angle	U-turn	Fixed Object	
Left-turn signal green time is extremely short. The lack of dedicated left-turn lanes and inefficient utilization of the leading left-turn phase result in vehicles jumping the queue from 5-6 cars back to make the light. Many drivers speed and/or dangerously cross oncoming traffic to make the turn and many vehicles simply run the red light. Vehicles also attempt aggressive left-turn movements at the end of the protected phase (i.e. running red light) and block opposing through traffic.	All approaches, particularly NB/SB					X			X			
Parking enforcement is needed on Wheeler Rd and Southern Ave, especially north and west of intersection. Wheeler Rd is rush-hour restricted, but cars were parked on both sides. Southern Ave is No Parking Anytime, but the outside lane SB was completely parked.	Both Streets	X		X							X	
Need for tree trimming, particularly on SE corner of intersection to make signals visible.	Southern Ave NB approach		X			X	X		X			
Evaluate high-intensity activated walk (HAWK) signal at 9 th St/Southern Ave.								X				
Speed evaluation needed on Southern Ave (30 mph posted).			X									X
There is a sight distance issue with the building and sign on the SW corner for EB traffic on Wheeler Rd.	Wheeler Rd EB		X			X	X		X			
There is a major enforcement issue with red light running.									X			
Due to illegally parked cars, there is a weaving issue going SB on Southern Ave. Vehicles speed to jump into the left lane, and buses are often forced to wait after loading at the far-side bus stop.	SB Southern Ave	X	X	X							X	
Pedestrians do not obey ped signals, which caused multiple dangerous situations and more aggressive turning movements by drivers who missed the turn phase as a result.	All approaches					X	X	X	X			
Red Light Photo Enforcement should be considered.												X
Traffic was very aggressive in all directions through this intersection.												
NE corner has 5 entrances in close proximity to the intersection.	Shell Gas Station											
EBR for A6 bus conflicts with vehicles on NB Southern Ave.	NB Southern Ave	X					X					
Pedestrian conflicts with heavy turning volumes, drivers observed not stopping for pedestrians in crosswalks during red phase.								X				
Street light fixtures on the east curb of Southern Ave are located ~30 feet away from the crosswalk.								X				
No signage for parking restrictions on the east side or curb of NB Southern Ave and Wheeler Rd SE and on the west side or curb of SB Southern Ave, north of Wheeler Rd.		X	X	X								

Short-Term Recommendations



Illegal parking on Southern Ave SE recommended to be addressed with additional signage and parking enforcement

the intersection.

Figure 4 illustrates the short-term improvements for the intersection. To address enforcement issues with parking and failure to yield to pedestrians, it is recommended that additional no parking signs be installed on Southern Avenue SE and that “Yield to Pedestrians” signs be installed at each approach. It is also recommended that periodic parking enforcement occur by the Department of Public Works (DPW) at this location to monitor and address illegal parking activity. To address signal visibility, it is recommended that retroreflective backplates be installed on traffic signal heads and that trees be trimmed. To reinforce the allowable vehicular movements in each travel lane, it is recommended that through-right and through-left pavement markings be installed along all approaches to

In order to address aggressive turning movements, queue jumping, red light running, and pedestrian conflicts, it is recommended that signal operations for the intersection be evaluated as well as intersection control parameters, lane assignments, left-turn phasing, and right turn on red restrictions. The intersection evaluation should consider the proposed roadway reassignments along Southern Avenue SE and Wheeler Road SE. It should be noted that addressing these improvements may require coordination with Prince George’s County. It is recommended that a speed study be completed along Southern Avenue and Wheeler Road SE to evaluate prevailing speeds and whether a reduction to 25 mph should be considered. Given the proposed changes in roadway geometry along both corridors, an evaluation before and after implementation may be necessary to account for changes in driver behaviors that may occur once the improvements are in place.

Additionally, field observations noted that the eastbound right-turn movement for buses conflicts with vehicles stopped on the northbound approach to Wheeler Road SE. It is recommended that a turning template for a typical WMATA bus be evaluated for this movement. Based on the outcome of the evaluation, the northbound stop bar location may need to be adjusted.

Long-Term Recommendations

Figure 5 illustrates the long-term recommendations for the intersection. It is recommended that red light photo enforcement be evaluated for this intersection in coordination with MPD. This should further address aggressive driving and red light running behaviors. To address the sight distance issue on the eastbound Wheeler Road SE approach, it is recommended that the “Welcome to D.C.” sign be relocated. To address some of the weaving issues, coordination with WMATA is recommended to evaluate the potential for relocation of bus stops. The majority of the bus routes served at this intersection have bus stops at the intersection of Southern Avenue SE and 9th Street SE, which is approximately 625 feet to the south. It is recommended that the driveway entrances to the Shell Gas Station be consolidated in order to reduce angle crashes resulting from turns into and out of the gas station. Lastly, it is recommended that street lighting be evaluated and additional lights be installed to meet or exceed minimum lighting standards at all crosswalk locations.

Although outside the study area for this intersection, it is also recommended that a high-intensity activated crosswalk (HAWK) be evaluated for the intersection of Southern Avenue SE and 9th Street SE based upon feedback provided during the field observations.





Implementation

As outlined above, short and long-term recommendations and considerations have been identified for the intersection of Southern Avenue SE and Wheeler Road SE. While some of these may only require the installation of standard signs and pavement markings, others will require further evaluation or perhaps engineering drawings to account for changes in geometry or signal modifications. Below is an outline of a preliminary guide to carry forward the implementation of recommended improvements. A general timeframe for implementation is provided; however, this will be influenced by the scale of the recommendation, cost, and available funding. As streetscape and other roadway infrastructure projects arise in the vicinity of this intersection, opportunities to incorporate these recommendations into the design of these projects should be considered.

Short-Term Recommendations

- “No Parking” and “Yield to Pedestrian” signage
- Pavement markings
- Retroreflective backplates
- Tree trimming
- Parking enforcement

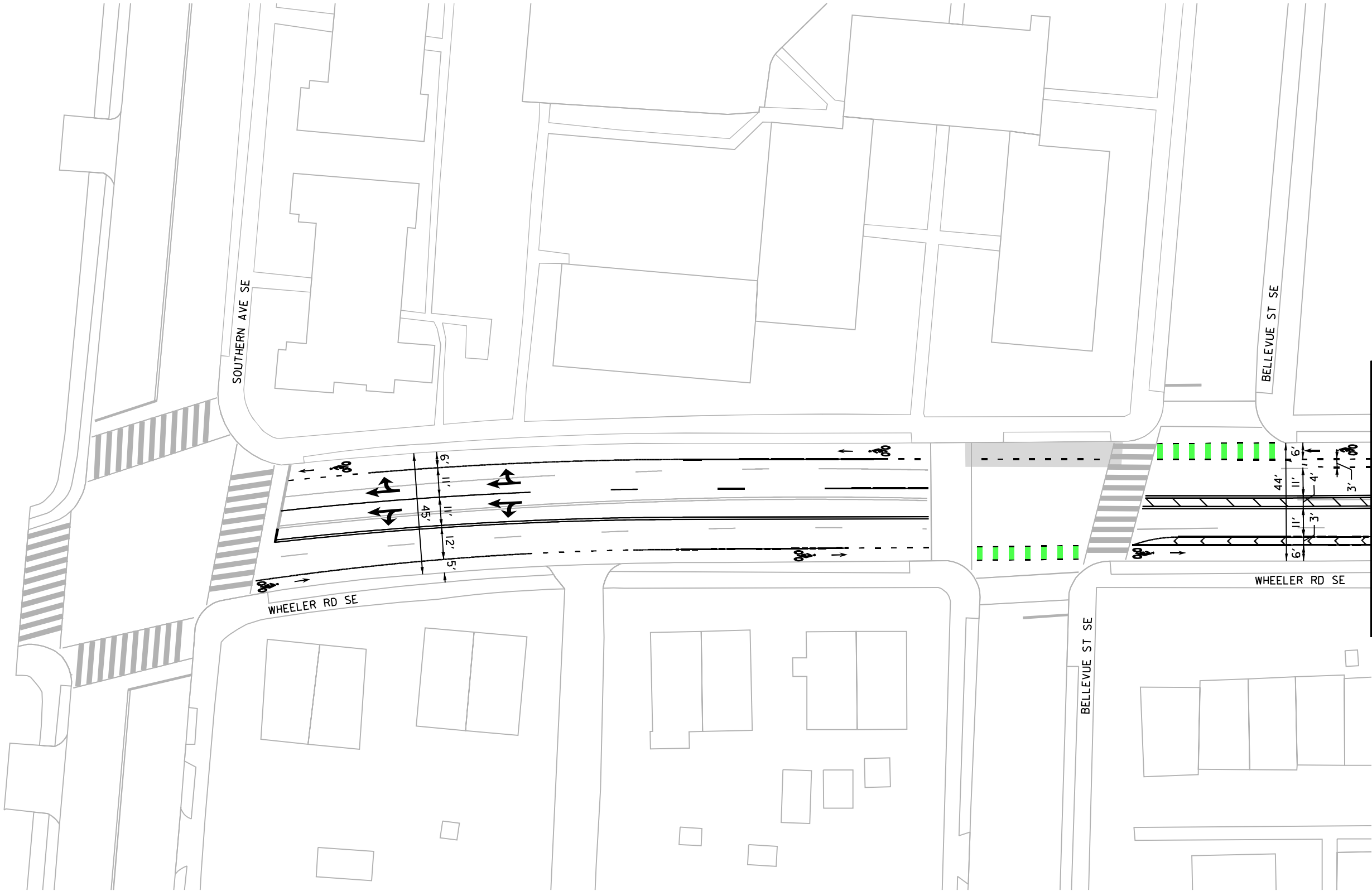
Improvements to Evaluate Prior to Implementation

- Signal operations, lane reassignments, and right turn on red restrictions
- “Welcome to D.C.” sign relocation
- Bus turning radius
- Bus stop locations
- Red light photo enforcement
- HAWK at Southern Ave and 9th St

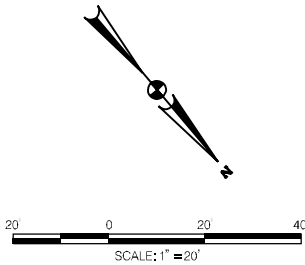
Long-Term Recommendations

- Gas station access points
- Street lighting





- SIGNING AND PAVEMENT MARKING LEGEND**
- ▲ PROPOSED SIGN ASSEMBLY TO BE INSTALLED
 - ◌ EXISTING U-POST SIGN ASSEMBLY
 - ◌ SIGN PANEL(S) MOUNTED ON STREET LIGHT POLE
 - ◌ SIGN PANEL(S) MOUNTED ON TRAFFIC SIGNAL POLE
 - SIGN PANEL TO BE INSTALLED
 - × SIGN PANEL TO BE REMOVED
 - R,E. REMOVE EXISTING MARKINGS





District Department of Transportation

NO.	DESCRIPTION	NAME	DATE
REVISIONS			

D.C. DEPARTMENT OF TRANSPORTATION
POLICY, PLANNING, AND SUSTAINABILITY ADMINISTRATION
BICYCLE AND PEDESTRIAN PROGRAM

WHEELER RD SE
(LOCATION: SOUTHERN AVE SE TO ALABAMA AVE SE)

SIGNING AND STRIPING
LAYOUT PLANS – SHEET 1

PROJECT ENG. DTN
DESIGNED BY DAG
CHECKED BY DAG
DRAWN BY DAG
PROJECT MGR. JAG

DIVISION CHIEF

DATE 03-22-2016
FILE d:\wheeler_rdesign
SHEET 1 OF 2