

North Sharon Amity Road and Castleton Road Safety Report

by Charlotte Department of Transportation

Signal Request Summary

This document provides an in-depth evaluation of the traffic signal request at the intersection of North Sharon Amity Road and Castleton Road. CDOT staff prepared it in response to comments from Mindy Tyner and Lucy and Thomas Crain during the Citizen’s Forum at the November 26, 2012 City Council meeting.

CDOT staff evaluated site conditions at the intersections of N. Sharon Amity Road/Castleton Road and N. Sharon Amity Road/Craig Avenue. Craig Avenue was evaluated based on roadway network connectivity to Castleton Road, higher roadway classification as a collector street, and presence of existing traffic calming features. The table below outlines the conditions evaluated at the two intersections.

CDOT finds that the intersections at Castleton Rd and Craig Avenue do not meet signal warrants for either traffic volumes or crash history. The report concludes that installation of a traffic signal and construction of left turn lanes at the Craig Avenue intersection with N. Sharon Amity Road can be justified due to other factors. Craig Avenue has existing traffic calming features, existing sidewalk, roadway network connections to Castleton Road, and is classified as a collector street. There is limited sight distance for left turning traffic from Craig Avenue onto N. Sharon Amity Road. Craig Avenue has greater connectivity to McAlway Road and Monroe Road when compared to Castleton Road.

The intersection work would cost between \$800,000 and \$ 1,000,000. All Traffic Safety Program funds authorized through past CIPs are committed to higher priority accident locations, leaving no capacity to add this project. Rather than displace established priorities, CDOT will install two dynamic vehicle speed signs along Sharon Amity Rd. One will be placed at the westbound approach to Craig Avenue and the other at the eastbound approach to Castleton Road. Funding for the installation is available within the department’s current budget.

	Castleton Road	Craig Avenue
<i>Condition Evaluated</i>		
Traffic Volume Threshold	NO	NO
Crash Experience Threshold	NO	NO
Street Connectivity	YES	YES
Pedestrian Connectivity (sidewalk)	NO	YES
Constrained Sight Distance for Turning Traffic	NO	YES
Presence of Left Turn Lanes	NO	NO
<i>Action</i>		
Add dynamic vehicle speed display signs.		

Crash Analysis

On average 18,000 motor vehicle crashes occur each year on Charlotte streets and of those, approximately 65 percent result in property damage without injury and 35 percent result in injury. Less than 0.2 percent of the injury crashes results in fatalities. Taking a more in-depth look at the crash data at the intersection of N. Sharon Amity Road and Castleton Road, there have been a total of 13 crashes in a 4-year period. There were 5 crashes in 2009, 2 crashes in 2010, 3 crashes in 2011 and 3 crashes in 2012. Of the 13 total crashes, 7 involved property damage without injury and 6 involved injury. Of the 6 that involved injury, 2 were considered serious injury crashes.

There is no significant pattern of type or time of day associated with the crashes at N. Sharon Amity Road/Castleton Road. While there is no significant pattern, there have been 3 angle, 2 left-turn different roadway, and 2 right-turn different roadway types of crashes. These are the types of crashes that are typically correctable by installation of a traffic signal.

Lucy and Thomas Crain spoke at the November 26, 2012 Citizen's Forum and discussed a serious injury crash that occurred on February 23, 2012. At approximately 7:00 AM, Thomas Crain made a left turn from Castleton Road onto N. Sharon Amity Road. Vehicle #1, traveling southbound on N. Sharon Amity Rd, struck Mr. Crain as he pulled out. This type of crash is known as a left-turn, different roadway. CMPD conducted a crash reconstruction and determined speed was a factor in the crash. The driver of Vehicle #1 was noted as exceeding the authorized speed limit and exceeding the safe speed. According to the crash report, Vehicle #1 was traveling at 44 mph. Mr. Crain was 18 years old at the time of the crash and the driver of Vehicle #1 was 19 years old.

Taking a more in-depth look at the crash data at the intersection of N. Sharon Amity Road and Craig Avenue, there have been a total of 10 crashes in a 4-year period. There were 5 crashes in 2009, 1 crash in 2010, 2 crashes in 2011 and 2 crashes in 2012. Of the 10 total crashes, 4 involved property damage without injury and 6 involved injury.

There is no significant pattern of type or time of day associated with the crashes at N. Sharon Amity Road/Craig Avenue. While there is no significant pattern, there have been 2 right-turn different roadway types of crashes and 1 left-turn different roadway type of crash. These are the types of crashes that are typically correctable by installation of a traffic signal.

With more than 20,000 intersections in the City, CDOT has developed tools to focus efforts on the most unsafe intersections. One of the tools is the High Accident Location (HAL) list. The HAL is based on a crash rate which is a mathematical formula that accounts for total numbers of collisions and intersection traffic volumes. There are currently 87 ranked intersections on the HAL. Intersections with a crash rate at 1.10 or higher are included. The intersection of N. Sharon Amity Road/Castleton Road has a crash rate of 0.46, while N. Sharon Amity Road/Craig Avenue had a crash rate of 0.35. Neither of these intersections was included on the HAL.

Another tool CDOT uses to prioritize safety locations is the Intersection Safety Warrants list. The list is developed based on specific types of crash patterns such as frontal impact, pedestrian, bicycle, night-time, etc. as means to indicate potential candidate projects for safety treatments. CDOT updates the Intersection Safety Warrants list every two years. N. Sharon Amity Road/Castleton Road is not currently ranked on the Safety Warrants list. The intersection of N. Sharon Amity Road/Craig Avenue is currently listed on the Safety Warrants list.

Evaluation of Site Conditions

North Sharon Amity Road is primarily a 4-lane undivided thoroughfare that carries approximately 19,000 vehicles per day. Castleton Road is a residential street with stop sign control at its intersection with N. Sharon Amity Road. The City has dozens of thoroughfares with similar characteristics to N. Sharon Amity Road. While these types of roadways have been transportation workhorses over numerous decades to move traffic, they were not the best facilities for addressing pedestrian and bicycle crossing opportunities and often do not provide left-turn storage for turning vehicles. Due to limited right of way, these types of roadways can be very difficult and expensive to retrofit to improve these conditions. Retrofitting these types of roadways usually has substantial impact on adjacent properties.



N. Sharon Amity is a major thoroughfare with a posted speed limit of 35 miles per hour (mph). Castleton Road is a residential street with a posted speed limit of 25 mph. Castleton Road is stop-sign controlled at its intersection with N. Sharon Amity Road. Castleton Road has connectivity to Craig Avenue on both the north and south sides of N. Sharon Amity Road. Craig Avenue is classified on the west side of N. Sharon Amity Road as a collector street and has a posted speed of 30 mph. Craig Avenue is stop-sign controlled at its intersection with N. Sharon Amity Road and there is an overhead caution flasher due to limited sight distance created by the curve on N. Sharon Amity Road.

Vehicle speeds were evaluated on N. Sharon Amity Road near the intersection with Castleton Road. CDOT performed speed evaluations using the radar method. In addition, the Charlotte-Mecklenburg Police Department (CMPD) collected speed data using speed trailers. The CMPD provided targeted speed enforcement immediately following the November 26th Council Meeting. Based on CDOT's radar method and CMPD speed trailers, the 85th percentile speed was approximately 42 mph. The 85th percentile speed term means the majority of traffic is traveling at that speed or less and is a common method for reporting speeds.

Sight distance was evaluated for vehicles making left, right, and through movements to/from Castleton Road. There were no sight distance limitations for the left, right, and through movements from Castleton Road. Sight distance for left turns from N. Sharon Amity Road to Castleton Road was also evaluated. When vehicles were stopped to make simultaneous left turns onto Castleton Road, there

were sight distance limitations. This situation is common on undivided roadways because of the lack of offset for the turns.

Sight distance was evaluated for left, right and through movements to/from Craig Avenue. There is a curve on N. Sharon Amity Road that limits sight distance for vehicles turning left from the eastbound Craig Avenue. There is an existing overhead caution flasher that displays red indication for Craig Avenue and yellow indication for N. Sharon Amity Road. The flasher is in place due to limited sight distance of the intersection from a curve in the roadway on N. Sharon Amity Road.

Findings

As demonstrated at the November 26, 2012 Citizen Forum, there is strong interest from the community in slowing vehicle speeds along N. Sharon Amity Road and making it easier to turn to/from intersecting streets and driveways. CDOT has also received requests from residents seeking opportunities to improve pedestrian accommodations along Sharon Amity Road including making it easier to cross the street.

CDOT evaluated the intersections of N. Sharon Amity Road/Castleton Road and N. Sharon Amity Road/Craig Avenue for traffic signal warrants. Although neither of these intersections met traffic signal warrants based on traffic volumes or crash experience, CDOT took into consideration the roadway network, pedestrian crossing opportunities, and roadway geometry. CDOT determined installation of a traffic signal and construction of left turn lanes could be justified at the Craig Avenue intersection with N. Sharon Amity Road/Craig Avenue. Craig Avenue has existing traffic calming features, existing sidewalk, roadway network connections to Castleton Road, and is classified as a collector street. In addition, there is limited sight distance for left turning traffic from Craig Avenue onto N. Sharon Amity Road and a traffic signal would improve safety for that vehicular movement. Craig Avenue has greater connectivity to McAlway Road and Monroe Road when compared to Castleton Road.

CDOT estimates the construction of turn lanes and traffic signal to be approximately \$800,000 to \$1,000,000 depending on more in-depth engineering design. Historically, the City funded the Traffic and Pedestrian Safety Program through the CIP for projects such as this. Currently, all program funds are committed to projects at intersections with higher crash rates.

Actions

Instead of pursuing a signal installation out of sequence with higher priorities, CDOT will add dynamic speed display signs along Sharon Amity Rd at both the westbound approach to Craig Avenue and the eastbound approach to Castleton Road. Such devices display individual vehicle speeds in comparison to the speed limit. CDOT has installed these devices exclusively within school zones. Due to the speeding pattern, we are willing to make an exception to the practice. The estimated cost of installation is approximately \$15,000. Funding is available within the department's current budget.

CDOT will continue to work with the CMPD regarding on-going efforts to reduce speeding with use of speed trailers and enforcement along N. Sharon Amity Road. If the intersection approaches the threshold of becoming a high accident location, we will add it to the list of priorities for future funding.

The City's Traffic Calming Program expects to initiate a "road conversion" study of several corridors in spring 2013. This study will determine if N. Sharon Amity from Providence Road to Monroe Road is a candidate for a road conversion similar to what was done on Selwyn Avenue. N. Sharon Amity's existing traffic volumes and peaking characteristics may present challenges but we believe it worthwhile to include the corridor in this study.

Data Source

CDOT's crash data comes from an electronic database populated by crash reports entered by the CMPD. CDOT receives the raw data from CMPD and processes the information to locate the crash site and verify the accuracy of many variables including the crash type. Data reported in this paper is collected within the City of Charlotte limits. The data is current to December 2012.