In August 2018, the City and County of Denver installed three temporary neighborhood traffic circles along W 35th Avenue in West Highland, as shown in the map below. These are the first-ever traffic circles in Denver, and they represent an exciting option for calming traffic at appropriate locations throughout the city. This summary report presents very early findings, after one month of operation, on the performance of the circles.

Why is the City doing this project?

The City is planning to convert W 35th Avenue, from Sheridan Boulevard to Navajo Street, into a neighborhood bikeway (NBW), which is a bicycle-priority local street. Details of this plan, which include a number of proposed neighborhood traffic circles, as well as plans for other neighborhood bikeways in Denver can be found at www.denvergov.org/neighborhood-bikeways. The minor construction associated with the W 35th Avenue NBW is expected to occur in 2019.

Temporary traffic circles were installed along the corridor in 2018 for two reasons: to begin to create a NBW along W 35th Avenue; and to test a traffic calming treatment that is new to Denver before making a costlier, longer-term investment. The evaluation project will keep the circles in place for approximately six months.

The traffic circles along W 35th Avenue are primarily intended to:

- Reduce, or maintain, low motorist speeds. Desired motorist speeds along NBWs are 20 miles per hour (mph).
- Efficiently get people, and especially bicyclists, where they want to go. Maintain a slow street while allowing bicyclists to avoid stopping along W 35th Avenue.
WHAT IS A NEIGHBORHOOD TRAFFIC CIRCLE?

Neighborhood traffic circles are used in many cities around the country, and are typically built at the intersections of local streets for traffic calming purposes. They have the following characteristics:

- All vehicles must yield at entry to vehicles, pedestrians, and bicyclists already in the traffic circle.
- Neighborhood traffic circles (like the ones on W 35th Avenue) often have stop control on side streets, and vehicles entering from a stop-controlled street must stop and then yield to those already in the traffic circle. In contrast, roundabouts have yield control on all approaches.
- Because the circles are designed to be large enough to reduce vehicle speeds, large vehicles may not be able to make left-turn movements using the circles. Large vehicles should plan to use adjacent intersections to make left-turn movements.
- With the exception of Denver Fire Department vehicles, left turns in front of the circle are not permitted.

Seattle has a long-standing traffic circle program, with over 1,200 circles that have led to a 94 percent reduction of all types of crashes.
Project Evaluation

The W 35th Avenue traffic circles have helped create a unique street character that prioritizes people on bikes. As discussed in this section of the report, while the neighborhood traffic circles show promise as a traffic calming tool in Denver, more time, data, and evaluation are needed to make a final conclusion about their performance and how they might be paired with other traffic calming treatments.

This evaluation represents initial results after the first month of operation, which is a limited time frame for travel behavior and perceptions to fully normalize. The evaluation is based on both measured speeds and results from an online survey. Because travel behavior can take up to six months to normalize, the City will continue to evaluate the traffic circles moving forward.

Have the circles affected motorist speeds?

The speeds for all three intersections are summarized in Figure 1 in the following way:

- Approaching, Departing, and Corridor Average: speeds approaching or traveling towards each circle (Approaching); speeds departing or traveling away from each circle (Departing); and the average of all speeds collected for the circle.
- The 85th percentile speeds: this statistic represents the speed at which 85 percent of motorists are traveling at, or below. Most jurisdictions expect 85th percentile speeds to closely match posted speeds. The posted speed of W 35th Avenue is 25 mph, though the City would prefer that motorists operate at 20 mph, per NBW design guidelines.

Intersection Summary

Before traffic circle installation, the 85th percentile speeds near each intersection were at or below the posted speed of 25 mph.

Based on initial data results, the traffic circles do not appear to have a large impact on vehicle speeds. At most locations, the “After” speeds were the same or very similar to the “Before” conditions. At Julian Street, departing vehicle speeds were higher, with an 85th percentile speed of 27 mph. This is most likely due to the change in traffic control (stop sign directions) at this intersection.

While 85th percentile “After” speed is equal to or around 25 mph at each circle, this is higher than the desired corridor speed of 20 mph.

Given their location at intersections, it is difficult for traffic circles to substantially reduce speeds in the middle of a block. The City may consider additional traffic calming treatments, per the plans for the full NBW project, to work in concert with the circles.

What does the community think about the circles?

To understand perceptions about W 35th Avenue related to the traffic circle project, the City conducted surveys before and after the installation. While survey respondents were self-selecting and not necessarily representative of the W 35th Avenue community, these results give the City an initial idea of what people think about the circles. Sixty-eight people responded to the “Before” survey and 125 people responded to the “After.”

Survey respondents were given the option to provide general feedback. While many survey respondents liked the neighborhood traffic circles and thought they slow speeds and are an effective traffic calming tool, many expressed concern or confusion about the traffic circles. One issue that was brought up was the confusion caused by the side street stop-control, something that may be unexpected for most people.

Motorist Speeds

People were asked to note whether they perceived changes in speed after the installation of the traffic circles. A clear majority (91 percent) of the respondents perceived no change or decrease in motorist speed, while 9 percent perceived an increase in speed after the installation of the traffic circles.
Figure 1: Data Evaluation Results

Raleigh Street
Before and After 85th Percentile Speeds (MPH)

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Newton Street
Before and After 85th Percentile Speeds (MPH)

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Julian Street
Before and After 85th Percentile Speeds (MPH)

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BEFORE  AFTER
**Safety And Comfort**

People were asked to compare their level of bicycling comfort before versus after traffic circle installment. Forty-eight percent noted that W 35th Avenue is more comfortable for bicycling after the installation. However, 27 percent are less comfortable riding on W 35th Avenue in the “After” condition (Fig. 3).

By potentially slowing motor vehicle speeds, traffic circles can help create a safer environment for all roadway users. Based on comparing “Before” and “After” surveys, bicyclists felt less safe after the installation of the traffic circles. Eighty-one percent of bicyclists felt safe riding along W 35th Avenue prior to the installment of the traffic circles. After installation, 78 percent felt safe (Fig. 4).

**Figure 3. Bicycling Perceptions of Comfort After Installation**

Drivers and pedestrians were also asked in the “Before” and “After” survey to describe their perception of safety while navigating W 35th Avenue. The percent of drivers and pedestrians feeling safe markedly decreased after the traffic circles were installed (Figs. 5 and 6).

This decrease in perception of safety may be attributed to unfamiliarity with the traffic circle as the “After” data was collected only after one month of installation.
NEXT STEPS

The City and County of Denver’s neighborhood traffic circle evaluation project along W 35th Avenue is notable in many ways:

- It is the first phase of a longer-term plan to make W 35th Avenue one Denver’s first NBWs.
- It is one of the City’s first demonstration projects, where thorough evaluation is core to the process.
- It has allowed the City to test a new, low-cost temporary product.
- It has been a forum for coordination between Denver Public Works and the Denver Fire Department, the continuation of which is critical for future traffic calming implementation.

While initial results show promise, the evaluation described in this report indicates that more information is needed. The data collected thus far does not provide conclusions about the long-term impacts of the traffic circles. In general, it can take up to six months for travel behavior to normalize, and the data collected for this report was gathered only one month after installation.

In order to better understand long-term trends like vehicle speeds and community perceptions, the City will continue to evaluate the circles, having a dialogue with the W 35th Avenue community during the process.