CITY OF
FAYETTEVILLE
ARKANSAS

MINI-ROUNDABOUT PILOT PROJECT: FINAL REPORT

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INTRODUCTION

From January 26th through March 21st of 2017, a temporary mini-roundabout was installed in the intersection of North School Avenue and Spring Street in Downtown Fayetteville.

The roundabout was installed as part of an effort to improve pedestrian and bike connectivity from the Fayetteville Square to the Razorback Greenway. Using Tactical Urbanism techniques, City staff developed this pilot project to test possible permanent changes to this corridor. In addition, this project was designed to provide data to ongoing efforts by City staff to determine the relative benefits of a roundabout compared to a four-way stop in Fayetteville's downtown. This report will describe the background and findings from the pilot project.

BACKGROUND

The mini-roundabout design was developed using Tactical Urbanism methodology. Tactical Urbanism is defined as "a city and/or citizen-led approach to neighborhood building using short-term, low-cost, and scalable interventions to catalyze long-term change" (Street Plans Collaborative). These techniques have been used to great success in other cities such as Dallas, Memphis, and Burlington, Vermont. In our own region, these techniques have recently been used to create temporary bike and pedestrian infrastructure in Rogers, Bentonville, and Bella Vista.

City staff, elected officials, regional bike and pedestrian advocacy groups, local business owners, and University representatives attended a Tactical Urbanism workshop in November, 2016 to learn about the methodology and identify possible pilot project types and locations in Fayetteville. Consultants from the Street Plans Collective instructed attendees in the techniques, materials, and rationale behind a Tactical Urbanism approach and led the group in a site planning workshop.

RATIONALE

Participants of the Tactical Urbanism Workshop identified a strategy of implementing bicycle and pedestrian friendly intersection treatments to create a Bicycle Boulevard between Fayetteville's downtown and the Razorback Regional Greenway via Spring Street.

A temporary, mini-roundabout design was selected for the following reasons:

- To create a connection between the bike trail and the Fayetteville square, workshop participants prioritized the creation of a direct route with few required stops for bicyclists and pedestrians. A roundabout allows for clear and purposeful traffic flow without requiring bicyclists or drivers to come to a complete stop. This is particularly important for bicyclists ascending a hill who lose momentum at stop signs and are not able to flow at the pace of traffic.

- Roundabouts have been shown to be safer for pedestrians, bicyclists, and vehicles. They are one of the Federal Highway Administrations Proven Safety Countermeasures because they can significantly reduce (by 78-82%) the number of crashes that result in injuries or fatalities.
- Roundabouts reduce the number of conflict points in an intersection, lower the speeds of vehicles moving through the intersection, and allow for more efficient movement of traffic in all directions. All of these features improve the likelihood that pedestrians and bicyclists would use the Spring Street route to travel from the trail system to Fayetteville's downtown.

Of the seven intersections along Spring Street where a temporary project could be installed, the Spring Street and School Ave intersection was chosen for a mini-roundabout project for the following reasons:

- The lack of compliance with stop signs made this intersection already function like a 4-way yield.
- All four corners of the intersection have existing curb ramps that allowed the addition of crosswalks on all sides while providing full access for strollers and wheelchairs.
- The presence of City offices on one corner of the intersection allowed for regular and continuous observation.
- Businesses located at the intersection expressed an interest in volunteering and monitoring the intersection.
- While adding a roundabout to most of the other intersections along this corridor would require removing one or more parking spaces, the Spring Street and School Ave. installation had no impact on street parking.

PRELIMINARY DATA COLLECTION

Data was collected prior to the mini-roundabout installation with the intersection configured as a four-way stop. During preliminary data collection, it was determined that 32% of automobile drivers did not stop at stop signs and 67% of cyclists did not stop at the stop signs. Speed data was also collected. Normal variances in speed were found.

DESIGN

The roundabout was designed by the City of Fayetteville's Engineering Department in accordance with MUTCD guidelines for roundabout intersection design.

A previous attempt to institute a roundabout treatment - at the intersection of Rupple Road and Morning Mist Drive - used only paint and signage. The Rupple Road intersection treatment had very low compliance rates from motorists. Building on this previous project, staff designed a vertical component to attempt to improve visibility of the roundabout and increase compliance rates from motorists.

Due to the small size of the intersection, a mountable center dome was chosen to accommodate larger vehicles needing to make left turns.

INSTALLATION

The intersection treatment was installed on January 26th, 2017.

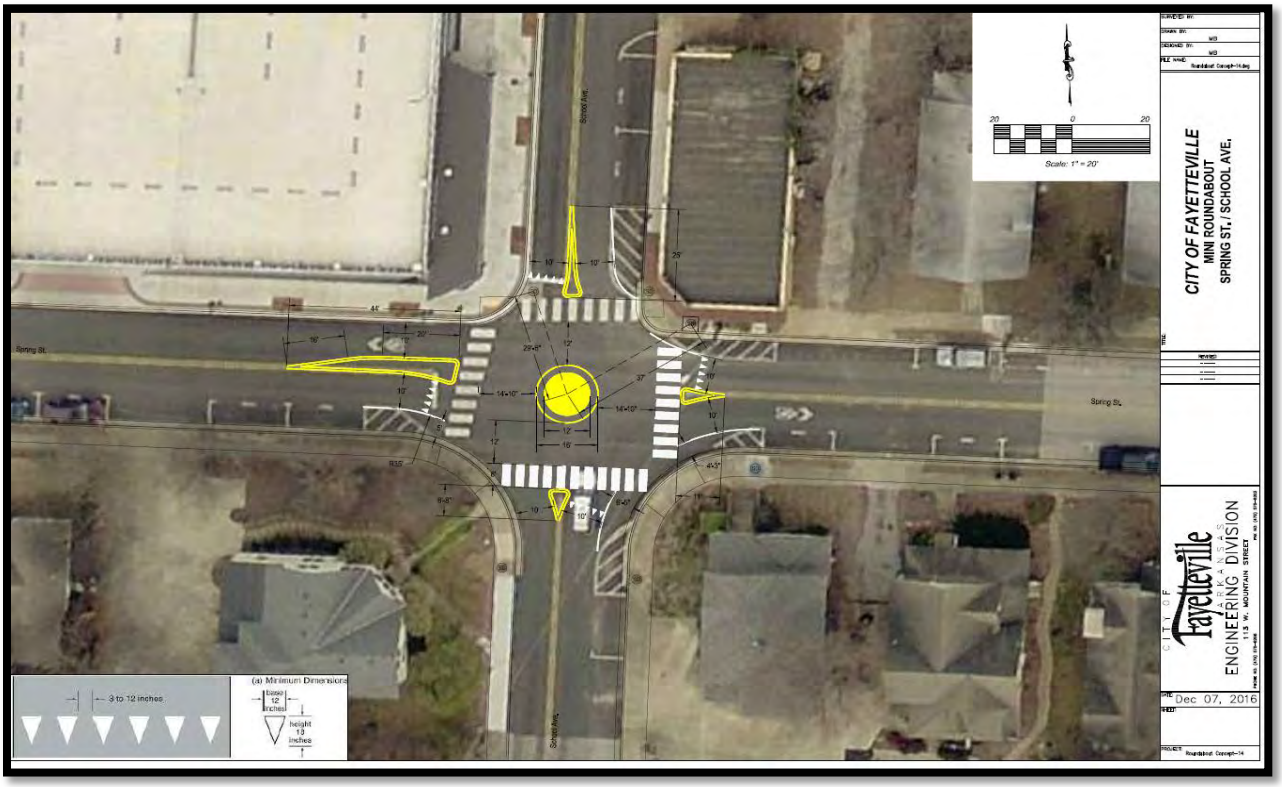
Major components of the roundabout, including the mountable center asphalt dome and the road signs, were installed by the City of Fayetteville's Transportation Department. Members of the Parks and Recreation Department painted the white and yellow striping with equipment normally used to paint ball fields. The Sustainability Department conducted outreach for the event and created stencils for the crosswalks and artwork. Community members and volunteers participated in the event by painting the crosswalks, asphalt dome, and yield markings.

Total cost for installation and removal: $2,674.36

Total staff time for planning, design, installation, and removal: 206.25 hours

Division	Hours
Transportation	89.25
Sustainability	27
Engineering	30
Parks and Recreation	60
Total	206.25

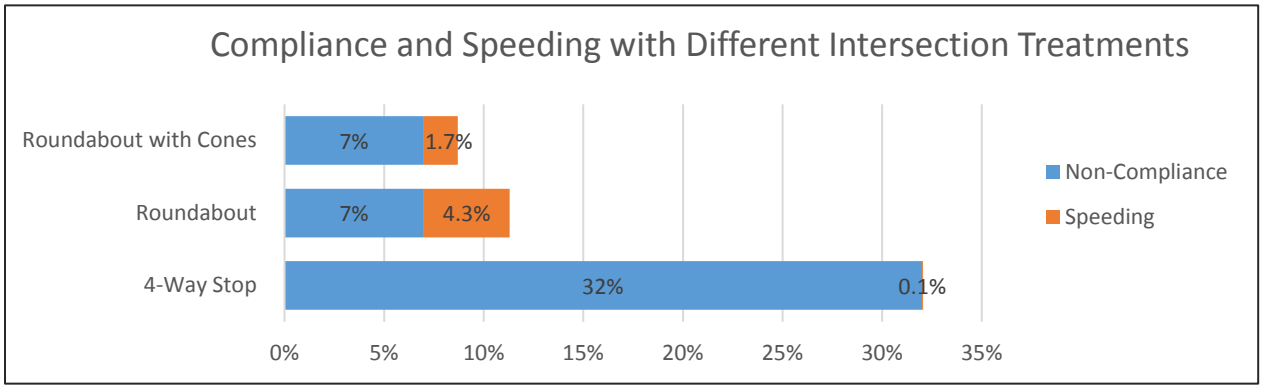
Item	Cost
Street Paint	217.27
Painting supplies	190.07
Asphalt	1107.49
Additional street supplies	751.93
Vehicle & Machine Usage	407.60
TOTAL	2674.36



POST-INSTALLATION DATA COLLECTION

During the installation, data collected showed that the compliance rate with posted signage was higher with the roundabout in place than with the 4-way stop. Alternatively, instances of speeding appeared to be more frequent with the roundabout treatment.

In attempts to modify the intersection based on observations of speeding, cones were place around corners of the intersection to further encourage drivers to slow before entering the intersection. Average rate of observed speeding was 4.3% without cones, 1.7% with cones present.



In the chart above, the blue bar indicates non-compliance with the existing intersection type. For the 4-way stop, non-compliance indicates failing to stop or rolling through the stop. For the roundabout, non-compliance indicates incorrect left turns, failing to yield to other vehicles, or failing to stay within the yellow and white lines.

Date Observed	Vehicles counted	Complied with Markings	Drove over Center	Made left over center	Appeared to be speeding	Cones Present
2/15/17	169	89%	1%	2%	7%	No
2/28/17	190	97%	2%	0%	3%	No
3/3/2017	213	93%	6%	5%	3%	No
3/9/2017	230	90%	1%	4%	2%	Yes
3/16/17	230	96%	2%	1%	3%	Yes
3/20/17	73	92%	16%	1%	0%	Yes

SAFETY

According to Fayetteville Police records from 2011 to 2015 there were six automobile accidents and one accident involving a pedestrian at the 4-way stop intersection of Spring Street and School Avenue.

There were no accidents in the intersection during the pilot period. The Transportation Department did receive complaints regarding motorists' failure to yield and near-accidents at the intersection while the roundabout was installed.

Complaints regarding pedestrian safety were made at various times during the installation. Despite the addition of two crosswalks, the removal of the stop condition and the free turning movements of automobiles appeared to have a negative impact overall comfort and perceived pedestrian safety.

PUBLIC PERCEPTION AND MEDIA

City media releases regarding the project were issued in advance of the installation and removal of the roundabout. Media coverage included articles in Arkansas Democrat Gazette and the Fayetteville Flyer, a radio segment on KUAF and KFSM local news, as well as social media attention from the national 'Tactical Urbanism' group, Street Plans.

"I never stop at the intersection when riding my bike. I just slow and look. Yield signs could do the job but a roundabout would be cool."
–cyclist comment

An online public perception survey was conducted prior to and during the installation. There were 191 survey responses collected. 86% of respondents said that they most often drove when navigating the intersection while 6.5% walked and 6% ride a bicycle.

"I think the move to add more roundabouts is a great idea! You will probably have resistance at first but keep them coming." -pedestrian comment

Survey responses from walkers and cyclists were predominantly in favor of installing the roundabout. Motorists' responses were more mixed with 41% of respondents indicating they felt roundabouts were less safe than four-way stops.

"I avoid roundabouts whenever possible, and I think they make little senses at an intersection so small"
–motorist comment

Many survey comments raised concerns about inconvenience to motorists, practicality of a roundabout for this location, and a general lack of driver education about navigating roundabouts in Fayetteville and the State of Arkansas.

"Because there is little traffic at Spring and School when I normally use the roundabout, it seems to work well."
–motorist comment

CONCLUSION & LESSONS LEARNED

The roundabout pilot project succeeded in creating a short-term change to an intersection to help guide future intersection designs in Fayetteville. Data collection before, during, and after the installation are allowing City staff to better understand how roundabouts could be used and optimized in the future.

Compliance rates for all modes of transportation were improved over the 4-way stop condition, though motorist speeding increased.

For bicyclists, the roundabout appeared to improve ease of travel between the Razorback Greenway and Downtown Fayetteville. Comments from bicyclists were almost universally positive and bicyclist compliance with intersection design increased with the roundabout treatment.

In the intersection of Spring Street and School Avenue, speeding motorists and general failure to yield did create uncomfortable and potentially unsafe conditions at times. The placement of traffic cones at the corners of the intersection to narrow the lanes and turning radiuses did serve as effective traffic calming to improve pedestrian comfort. Any future roundabout installation would take these findings into consideration. Additionally, raised crosswalk elements should be considered to provide added traffic calming and increase pedestrian comfort.

The Spring Street and School Avenue installation, with the vertical component of an asphalt dome, resulted in much higher compliance than the previous project at Rupple Road and Morning Mist Drive. Future treatments may benefit from a more incremental or stepped process that includes evaluation of signage and paint with more intensive physical traffic controls added as needed.

Community interest in the project exceeded staff expectations and City staff have received a number of requests for installations since the mini-roundabout was completed. To address the general interest in Tactical Urbanism and neighborhood-building projects, the City will be developing a Tactical Urbanism permitting process to allow community-led pilot projects to demonstrate short-term improvements to the built environment.