



June 13, 2016

Taylor Nielsen
Ogden City Engineering
2549 Washington Blvd.
Ogden, Utah 84401

Re: Intersection of Monroe Blvd and North Street

Dear Taylor,

The intersection at Monroe Blvd. and North Street is currently a 4-way stop controlled intersection. Monroe Blvd. is a 5 lane road that runs north and south and is an arterial road. North Street is a 2 lane road that runs east and west and is a collector road. The posted speed limit for both of these roads is 35 MPH. The North Street project will be constructed in the summer of 2017 and the intersection will either be a signalized intersection or will be a two lane roundabout. The purpose of this letter report is to generally compare roundabouts and signalized intersections.

North Street Project

Ogden City is working with CRS Engineers to perform the design work of the road widening project on North Street. As part of this project CRS performed a signal warrant at the intersection of Monroe Blvd. and North Street. The intersection meets the criteria for a signalized intersection. To perform this signal warrant study traffic counts were taken on March 9th 2016. From these counts it was observed there were approximately 5,200 vehicles per day entering the intersection from North Street and approximately 7,000 vehicles per day entering the intersection from Monroe Blvd. The traffic count data is used when analyzing the intersection to determine how well the roundabout will perform versus a signalized intersection. With these traffic counts it is anticipated that either the roundabout or signalized intersection would handle the traffic in an acceptable manner. Below are addressed some advantages and disadvantages of roundabouts and signalized intersections.

Comparisons

The following statements are general statements about roundabouts versus signalized intersections. The "Roundabout: An Informational Guide" published by the Federal Highway Administration is used as an aid to generally compare roundabouts and signalized intersections. To determine which solution will work best for Ogden City the intersection should be modeled as a signalized intersection and then a roundabout.

In general a roundabout will reduce the amount of delay a vehicle will experience at an intersection. A vehicle approaching a roundabout will yield to other vehicles and may not need to come to a complete stop. A vehicle approaching the signalized intersection may have a green light and experience no delays or the vehicle may arrive on a red light and have to wait until the next green light.

In general single lane roundabouts are considered safer than signalized intersections. Double lane roundabouts introduce additional conflict points between vehicles which may cause additional crashes than a single lane roundabout. The number of accidents may not be decreased with a single or dual lane roundabout but the severity of the accident is typically reduced. Roundabouts cause motorists to slow down prior to entering the roundabout which means crashes will generally occur at a lower speed resulting in fewer severe or fatal accidents.

On the southwest corner of Monroe Blvd. and North Street is the Ogden Weber Applied Technology School. The school may generate a large amount of pedestrians which would impact the way the intersection functions. A signalized intersection would provide a time for pedestrians to cross the road instead of looking for a gap when no vehicles are approaching to cross the road.



Ogden City has mentioned that in the future they would like to add bicycle lanes to Monroe Blvd. Studies have been performed and are mentioned in the "Roundabout: An Informational Guide" regarding bicycles and how they function in roundabouts compared to a signalized intersection. The studies show there are more crashes at roundabouts involving bicycles than at signalized intersections. Consequently there were more bicyclists killed or seriously injured at the roundabouts than the signalized intersections.

A signalized intersection would require minimal right of way in order to install the signal poles and other equipment. The right of way footprint for a roundabout is much larger and therefore more costly. Monroe Blvd. is a 5 lane road which means the roundabout would most likely be a two lane roundabout. The two lane roundabout requires more right of way to be purchased than a single lane roundabout or a signalized intersection.

Intersections located on a roadway corridor within a coordinated signal network may operate more efficiently as a signalized intersection. The coordinated signal system allows users to travel along a corridor of road and arrive at the intersection while the light is green. The traffic lights are synchronized with a predetermined time when they will turn green based upon the distance and speed from the previous light. For example a group of vehicles traveling together will arrive at an intersection together. After this group of vehicles leaves the intersection they will arrive at the next intersection in a given amount of time based upon the traveling speed. The signal at which the group will be arriving at will turn green in that given amount of time. This minimizes the delay time the users experience at an intersection and allows the users to travel along the corridor more efficiently. Monroe Blvd. is a 5 lane road which makes it a candidate for a coordinated signalized system. The intersecting streets to Monroe are 2 lane roads and are minor roads compared to Monroe Blvd.

Located on the northwest corner of the intersection is a PRV station owned by Ogden City. In order to construct the roundabout this PRV station may need to be relocated which could be a costly endeavor. The estimated cost to relocate the PRV station and associated piping could range from \$90,000 - \$110,000. If the signalized intersection is constructed the PRV station would be protected in place.

Conclusion

Without modeling the intersection it appears the signalized intersection will function in an effective manner. The advantages of the signalized intersection are;

- Less Right of Way is required for a signalized intersection.
- Adding bicycle lanes to Monroe encourages the use of bicyclists and the safest intersection for them is a signalized intersection.

To determine which option would best meet the needs of Monroe Blvd. and North Street an analysis should be done at the intersection. The analysis should include;

- Modeling the intersection as a roundabout as well as a signalized intersection. The traffic counts obtained from the signal warrant analysis would be used as the existing traffic volumes.
- Compare the results of the roundabout modeling to the signalized intersection modeling.
- Prepare drawings showing the roundabout to determine the amount of right of way that will be needed.
- Analyze the data to present a recommendation of which option is best.

If you have any questions about this letter please feel free to contact me.

Sincerely,
CRS Engineers

A handwritten signature in black ink that reads "Corey Nelson".

Corey Nelson, PE, PTOE
Transportation Engineer
(801) 913-4167

corey.nelson@crsengineers.com