



**TO:** Mayor Shaun Sipma  
Members of the City Council

**FROM:** Emily Huettl, PE, Assistant City Engineer

**DATE:** April 1, 2019

**SUBJECT:** 31<sup>ST</sup> AVE SE RECONSTRUCTION DECISION DOCUMENT (4331)

**I. RECOMMENDED ACTION**

1. Recommend council concur with the 31<sup>st</sup> Ave SE Reconstruction Project concepts as currently proposed.
2. Recommend council elect to proceed with Alternative B – Concrete 3-Lane Construction.
3. Recommend council elect to proceed with Option 1 – Roundabout at 31<sup>st</sup> Ave & 13<sup>th</sup> St SE.
4. Recommend council authorize the Mayor to complete and sign the Decision Document.

**II. DEPARTMENT CONTACT PERSONS**

Lance Meyer, City Engineer	857-4100
Emily Huettl, Assistant City Engineer	857-4100
Stephen Joersz, Traffic Engineer	857-4100

**III. DESCRIPTION**

A. Background

31<sup>st</sup> Ave SE from Broadway to 13<sup>th</sup> St has been slowly improved over the decades as development in southeast Minot has occurred. The roadway was constructed as a rural section roadway with a minimal pavement section and poor drainage. Over the past several years, the corridor has experienced a rapid deterioration of pavement condition as traffic volumes have increased. City staff recommended to council that the 31<sup>st</sup> Ave corridor be placed in the North Dakota Department of Transportation’s (NDDOT) Urban Road Program (URP). The project was submitted in 2015 and is now in the program for a 2020 construction start.

Council previously approved the selection of an engineer. The project is currently at 30% design. At this point the Documented CatEx – the required environmental document – is nearly completed and is ready to be submitted. The last remaining item is the City Decision Document. The City is required to concur with the project concepts and select alternatives and options in order for the project to proceed.

B. Proposed Project

There are two alternatives for this project. Alternative A is the no-build, do nothing alternative. Alternative B is to construct the proposed project including urbanizing this corridor to a 3-lane concrete urban arterial. A trunk storm sewer network will be constructed along with the new pavement section. New LED street lighting and a new concrete shared use path will be constructed as well. The corridor will look very similar to the newly constructed 37<sup>th</sup> Ave SE, which was funded by the same NDDOT program.

There is one option, Option 1, that can be selected if Alternative B is selected. Option 1 is the construction of a roundabout at the intersection of 31<sup>st</sup> Avenue SE & 13<sup>th</sup> Street SE.

C. Consultant Selection

Apex Engineering was selected following a competitive RFQ process.

**IV. IMPACT:**

A. Strategic Impact:

31<sup>st</sup> Ave is a strategic corridor for the City. It is classified as a minor arterial, which means the road is designated to carry a large volume of traffic to and from other arterials. 31<sup>st</sup> Ave is the last major roadway improvement planned in southeast Minot in developing areas.

B. Service/Delivery Impact:

The decision to select or forego Option 1 – roundabout or no roundabout – will have an impact on the intersection’s level of service. Level of service qualitatively describes the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety.

The following outlines five key areas to consider when determining the best type of traffic control at the intersection of 31<sup>st</sup> Avenue SW and 13<sup>th</sup> Street SW; operations, safety, right-of-way, cost, and maintenance.

Traffic Operations

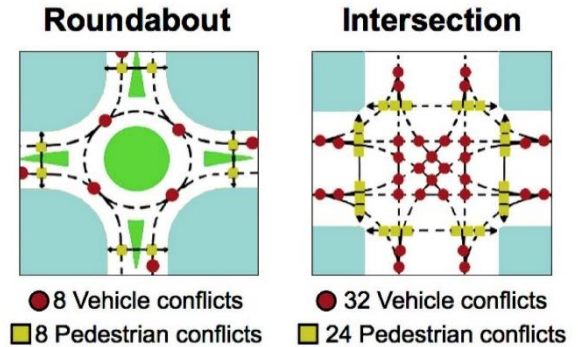
Two scenarios are typically analyzed for traffic operations. One is for existing conditions, how will this intersection handle traffic if it was built tomorrow, and the other is for future projections, how is the intersection anticipated to handle traffic in 20 years. The goal is to pick an intersection traffic control that can maintain acceptable levels of service under both conditions, existing and future. Each of the possible traffic control types; two-way stop, four-way stop, roundabout, and traffic signal; are all anticipated to operate proficiently given existing traffic conditions. However, this is anticipated to worsen in the future as traffic volumes are anticipated to grow. Under future traffic projections, the two-way and four-way stop alternatives operate at a level of service “F”, whereas the roundabout and signal alternatives are anticipated to operate at a level of service of “C” and “B,” respectively in the future.

It is important to note that while the effects of a traffic signal were studied as part of the traffic operations report, existing traffic volumes do not warrant installation. While there is the potential of signal warrants being met in the future, NDDOT has severely limited the ability to install an unwarranted traffic signal on state-aid projects, which is why a signal is not an option being considered with this project. The construction of a roundabout does not require warrants to be met (as compared) to a signal, allowing construction to occur sooner and thus providing more benefit to the intersection users.

Vehicle queues were also taken into consideration. Studies have shown that extensive vehicle queueing has a tendency to increase a driver’s willingness to attempt or shoot an inadequate gap in traffic. This is certainly not ideal and can increase the crash potential for an intersection. If the existing two-way stop on 31<sup>st</sup> Avenue was kept, the 2040 traffic forecasts anticipate the east approach will routinely experience queues of over 20 vehicles. One benefit of a roundabout is that it can service approaches on a more equal basis. Meaning, that under 2040 traffic forecasts, that the maximum queue for any one approach during the day only anticipated to be between 8 to 10 vehicles long.

### Safety

A roundabout provides the opportunity to decrease (practically eliminate) the number of left-turn/angle crashes and significantly decrease the frequency of severe and fatal crashes. Part of this benefit is due to the fewer overall conflict points and elimination of the high severity conflict points (i.e. left-turns) compared to the traditional four-legged intersection.



An additional safety benefit provided by a roundabout would be traffic calming along 13<sup>th</sup> Street SE. The current two-way stop control allows for 13<sup>th</sup> Street SE traffic to travel a mile-long stretch without the need to stop or yield. This tends to increase speed of travel.

### Right-of-Way

The stop and traffic signal options will be able to be designed and constructed within the existing 31<sup>st</sup> Avenue SW and 13<sup>th</sup> Street SW right-of-way. If the roundabout option is selected, additional right-of-way on both the north and south side of 31<sup>st</sup> Avenue SW west of 13<sup>th</sup> Street SW will need to be purchased to allow for the construction. Roundabouts typically have wider intersections compared to the traditional four-legged intersection. The additional right of way required would be a small triangle shaped area in each corner of the intersection. Primarily to be able to fit the sidewalks and paths within the right of way adjacent to the roadway.

### Cost

A Minnesota Department of Transportation study (*A Study of the Traffic Safety at Roundabouts in Minnesota*; October 2017) found that “roundabouts have a comparable initial construction costs and lower life-cycle costs than a traffic signal with similar capacity.” The comparable initial construction cost is primarily an offset of the additional concrete and median needed for a roundabout and the installation of a traffic signal for a signalized intersection. The lower life-cycle cost is largely attributed to the additional monthly and yearly maintenance costs needed to keep a traffic signal operational.

### Maintenance

The Engineering Department does acknowledge that if the roundabout option for 31<sup>st</sup> Avenue SW at 13<sup>th</sup> Street SW is selected, there will need to be a fundamental shift on how this intersection is maintained (i.e. swept of debris, cleared of snow, etc.) and will require some extra effort from the Public Works Department. The design team will work with the Public Works Department to enhance operations as much as practical.

### Recommendation

After considering the above factors, the Engineering Department recommends that Council elect to include Option 1 – the construction of the roundabout. Additionally, comments received at the public meeting and submitted from the public were overwhelmingly in favor of the roundabout. The public meeting was well attended by residents in the project area.

C. Fiscal Impact:

<u>Project Costs</u>	
Estimated Construction Cost of Alternative B	\$ 7,900,000
15% Contingency	\$ 1,200,000
Estimated Cost of Option 1	\$ 50,000
<u>Engineering</u>	<u>\$ 1,200,000</u>
Total	\$10,350,000

<u>Project Funding</u>	
Federal Funds	\$ 6,444,000
City Share	\$ 3,906,000

The costs above are based on the 30% design. With an estimated \$6.444 million available in federal funds, the City's cost share will be approximately \$3.906 million. The City has budgeted to have \$3 million in cash reserves available for this project. Traditionally the City has funded federal cost share on arterial roadways with general obligation bonds. That type of funding would be necessary for costs exceeding the City's available \$3 million. That need is dependent on the amount of the budgeted project contingency that is actually used. These costs will be refined when actual construction bids are received.

**V. ALTERNATIVES**

Alt 1. Council could select Alternative A, the no-build, do nothing alternative. This would end the proposed project. By not moving forward, the federal funds would not be used and eventually go back to the federal government or other cities in the program. At some point, 31st Avenue SE must be reconstructed. The cost will be there in the future, but without a federal share.

Alt 2. Council could choose to forego Option 1 – the roundabout. This would leave two-way stop, four-way stop, and traffic signal as possible traffic control types. As previously discussed, the NDDOT has severely limited the ability to install an unwarranted traffic signal on state-aid projects. Two-way stop and four-way stop would be the remaining options. Leaving a two-way stop, as it is currently, does not do anything to increase safety and both the two-way and four-way stops do not provide an acceptable level of service in the future.

**VI. TIME CONSTRAINTS**

By completing the Decision Document, the project can move into final design. This would allow for bidding and award of the project to keep to the 2020 construction schedule.

At the end of 2020, the federal transportation program has a rescission built into the bill which rescinds all funding not obligated. Meaning, if we do not bid the project by end of federal fiscal year 2020, the City will lose over \$6 million for this project. We will then start over building up our account until the project can be programmed. The condition of 31st Ave SE is in such poor condition; we would have to build the project on our own at some point without federal funding. That will be too large of a burden on City resources if the federal funding is lost.

**VII. LIST OF ATTACHMENTS**

- A. Project Location Map
- B. Proposed Roundabout Layout
- C. Decision Document

Additional project information can be found at [www.minotroads.com](http://www.minotroads.com).