

INTRODUCTION

The County has periodically evaluated needs and options for this 4-way-stop intersection since 2008. Today's traffic volumes and anticipated growth are now causing increased concerns about safety and delays. Preliminary analysis and recent experience suggest a roundabout should be a good long-term solution.



Goals

- Improve safety
- Enhance pedestrian usability
- Maintain mobility
- Encourage lower speeds



Tentative Timeline

- 2020:** Feasibility study and preliminary engineering design
- 2021:** Final engineering design, including right-of-way and utility details
- 2022:** Construction



Project Contact

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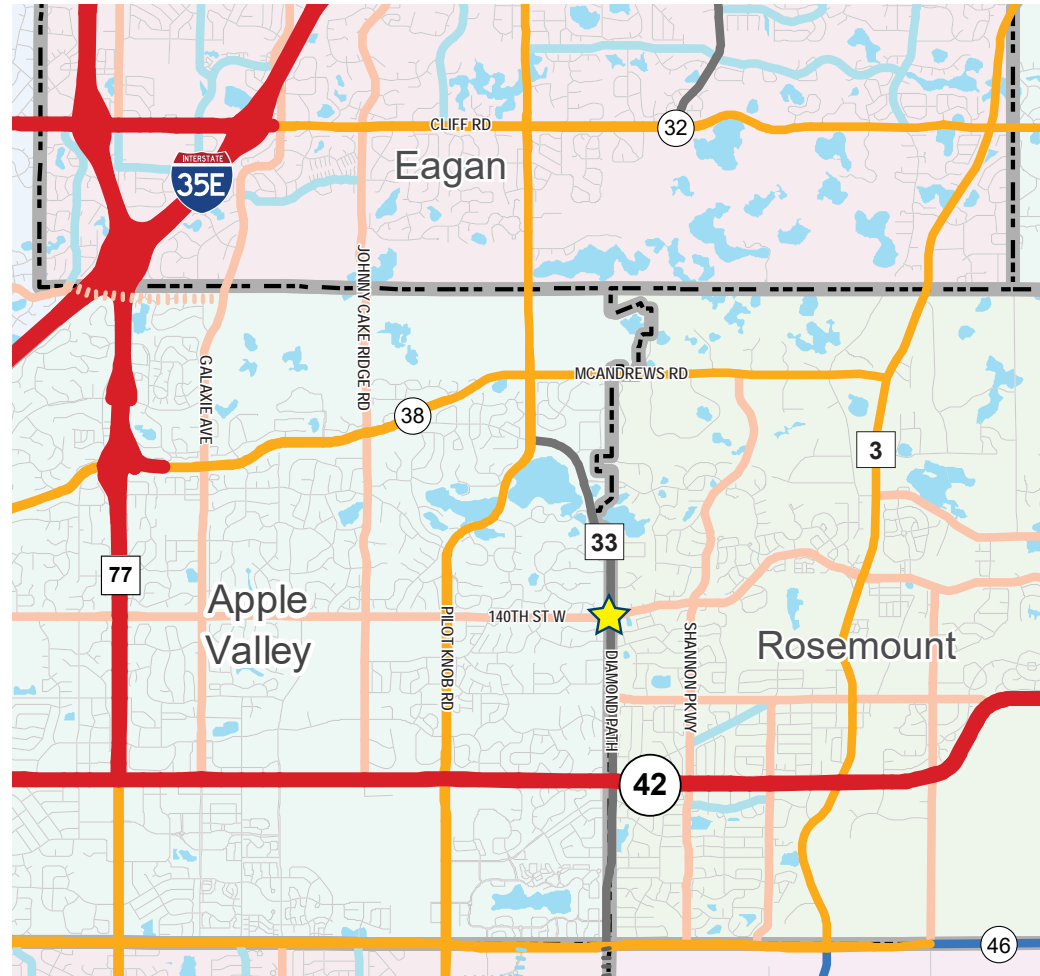
What You Can Do Today

- Review materials
- Talk to project staff
- Provide input

REGIONAL CONTEXT

- Roadway classifications identify the functions for roads before determining street widths, speed limits, intersection control, or other design features.
- Non-transportation factors, such as land use and development, are also considered for planning and designing streets and highways.

Key to Roadway Classifications	
	Principal Arterial
	A-Minor Expander
	Other Arterial
	Major Collector
	Major Collector - planned
	Minor Collector



Source: Functional Classification System, Metropolitan Council, May 2018

STUDY OVERVIEW

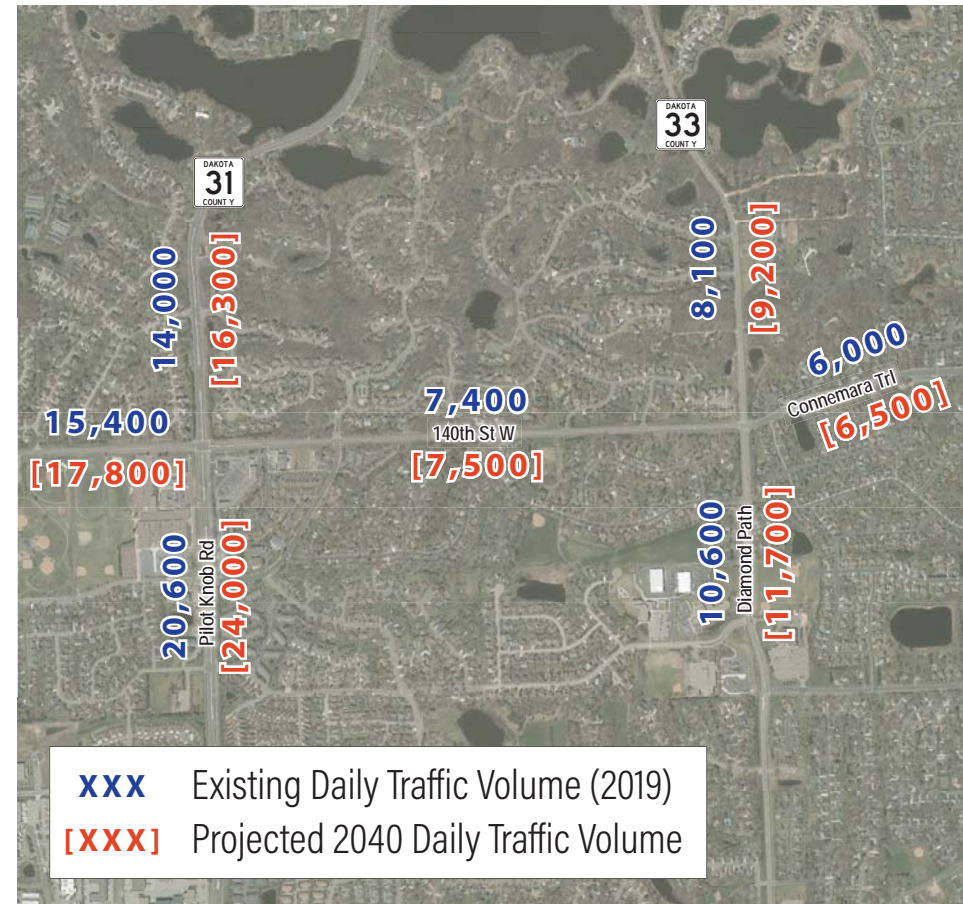
The primary focus of this study is the intersection of Diamond Path and 140th Street/Connemara Trail to determine:

How is the 4-way stop working now?
How will it work in the future?
Is a roundabout appropriate for this location?

Other intersection considerations:

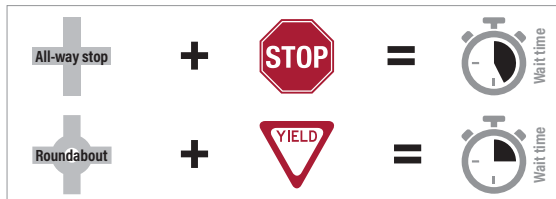
- Connemara Trail was recently converted from a 4-lane to a 3-lane roadway
- 140th Street is currently a 4-lane roadway but traffic volumes are compatible with a 3-lane roadway
- Diamond Path, north of 140th Street/Connemara Trail, does not have a sidewalk or trail
- The roundabout would be similar to the one north of Farmington at Highway 3 (Chippendale Ave) and 195th St/190th St

Daily Traffic Volumes



OPERATIONS

At this 4-way stop intersection, the typical maximum backup is 5 vehicles. A roundabout would likely have the same backup length but traffic flow would improve (shorter wait times).

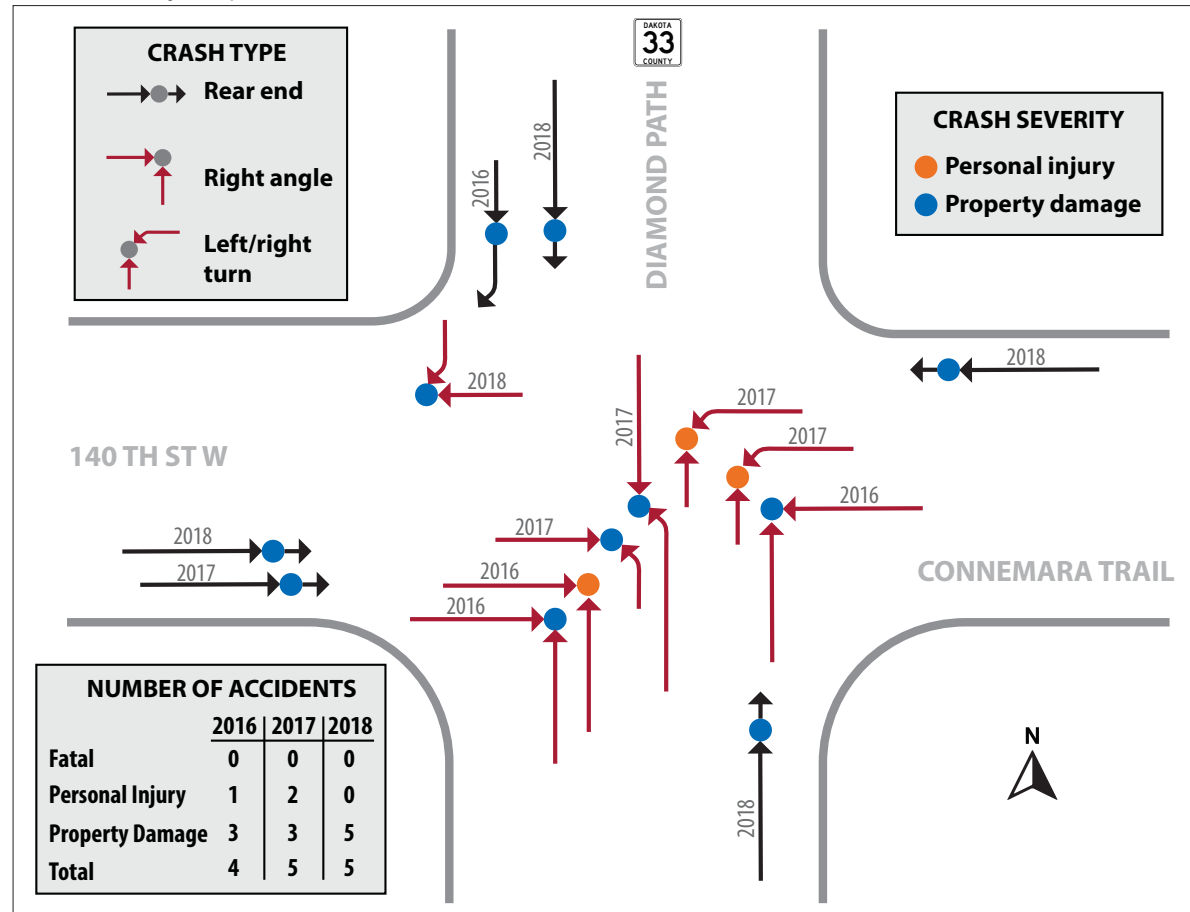


**Safety is the primary need
at this intersection.**



SAFETY

High number of right-angle and turning crashes. These type of crashes are not typical at an all-way stop-controlled intersection.




CONFLICT POINTS


The high number of crashes at this intersection may be due to the high number of lanes and resulting conflict points.

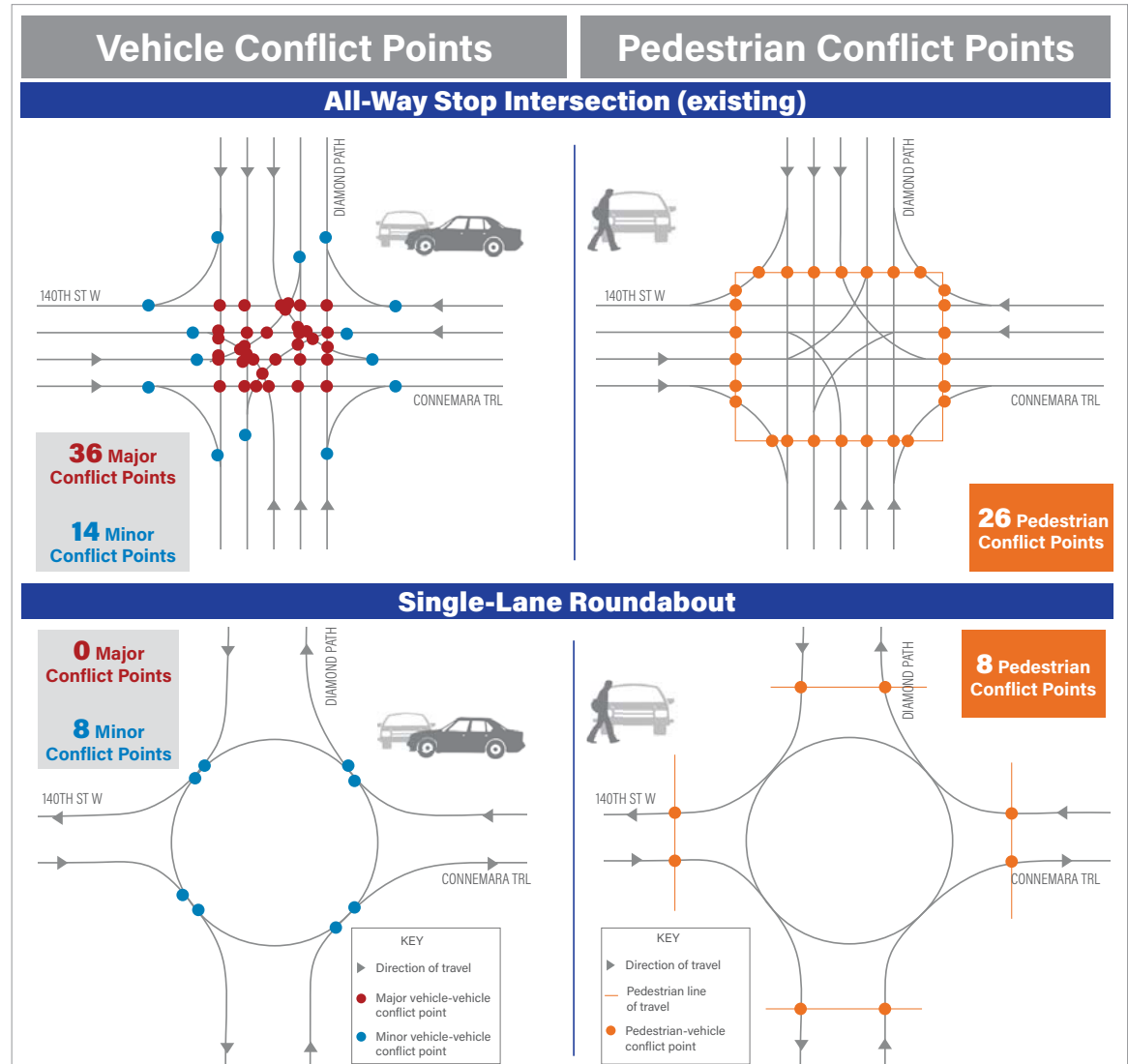
A roundabout would:

- reduce the number of minor and major conflict points for both vehicles and pedestrians
- reduce the number of right-angle crashes, which tend to be more severe

**Roundabouts
reduce crash risk
by reducing the
number of
conflict points.**

 **Major Conflict Points:**
More likely to cause severe collisions such as T-bones and turning crashes, resulting in major injury or property damage

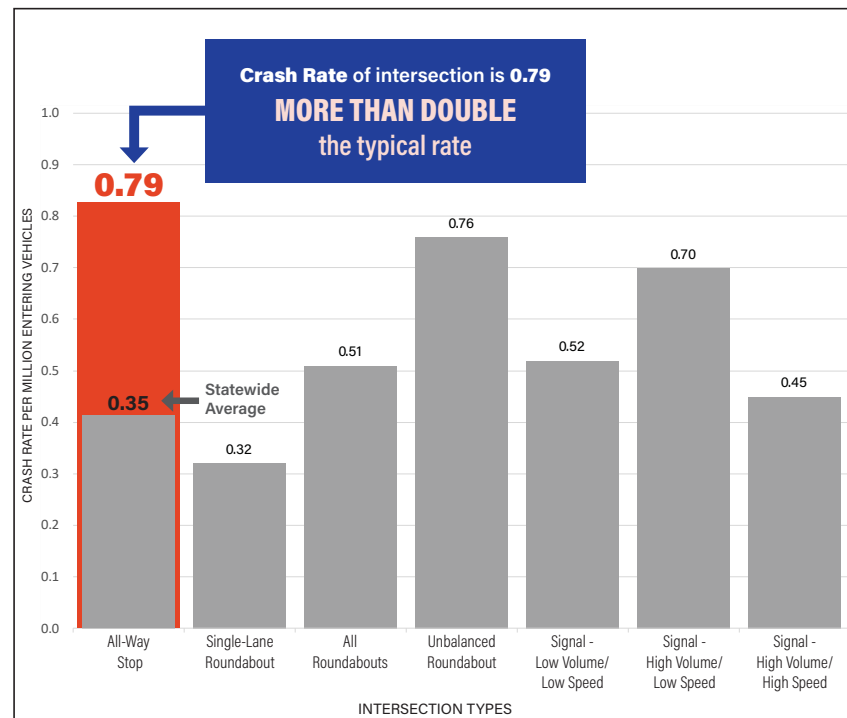
 **Minor Conflict Points:**
More likely to cause minor collisions such as slow-speed rear-end crashes, resulting in minor injury or property damage



CRASH RATES

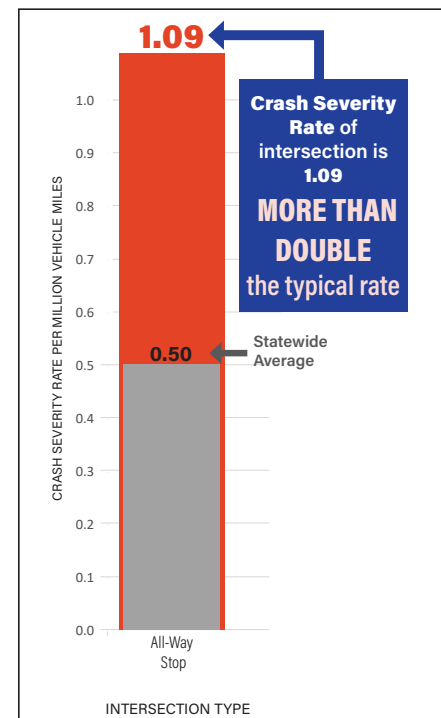
Intersection Crash Rate

Crash rate is the number of crashes per million vehicles entering the intersection. At this intersection, the crash rate is **more than double** that of a typical all-way stop intersection.



Risk of Fatal or Serious Injury Crashes

Fortunately, there have been no fatal or serious injury crashes at the intersection. But we must consider the risks. The number of personal injury crashes (not serious) is a concern for the future, resulting in a crash severity rate of 1.09, **double the statewide average**.



The many conflict points and crash history at the intersection indicate more safety risk than typical for an all-way stop.



WHY A ROUNDABOUT?



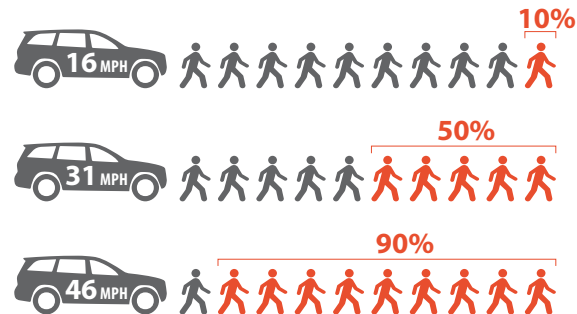
What is it?

A roundabout is a one-way circular intersection where traffic flows around a center island. At entry, drivers yield to traffic in the roundabout. All drivers must yield to pedestrians in crosswalks.

Advantages:

- Fewer injury crashes & fatalities
- Increased pedestrian safety
- Less vehicle delay and pollution

Risk of serious injury in pedestrian-vehicle crash



(Source: AAA Foundation for Traffic Safety 2011)

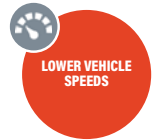
Benefits

- All vehicles move through the intersection at 15-20 mph
- Greater human interaction between drivers and pedestrians
- Two-stage pedestrian crossing
- Simplified decision making for drivers and pedestrians
- Effective in moving heavy left turning traffic
- Reduces traffic congestion, delays, and serious injury crashes

Challenges

- Footprint may be larger than a traditional intersection
- Right-of-way needs
- Driver understanding of yield upon entry
- Aggressive driving

Dakota County Goals Addressed



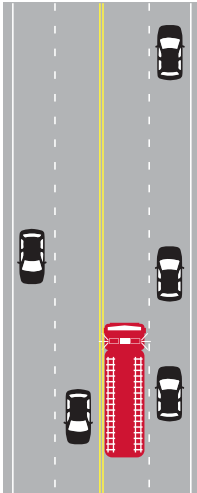
140th Street — Possible 4-Lane to 3-Lane Conversion

- Can handle existing and future traffic (up to 16,000 vehicles/day)
- 19-47% reduction in crashes
- Reduced conflict chances, 3 vs. 6
- Safer street crossings
- Fewer lanes to cross
- Traffic calming
- Improved emergency response time

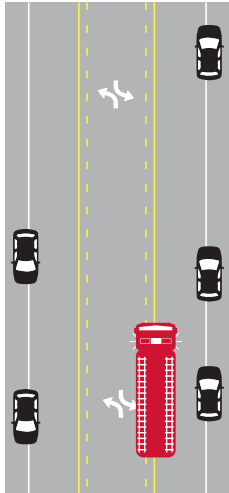
Crossing only one lane of traffic at a time reduces the risk of crashes and serious injuries.
— AARP

Emergency Vehicle Access

BEFORE
4 Lanes

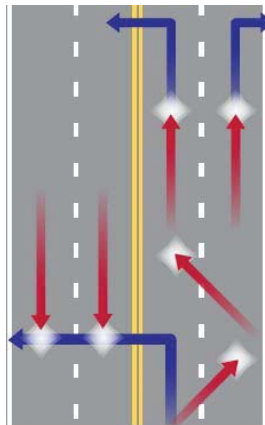


AFTER
3 Lanes

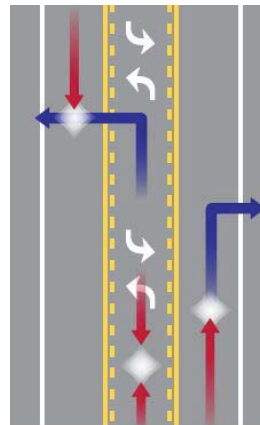


Conflict Points

BEFORE
4 Lanes

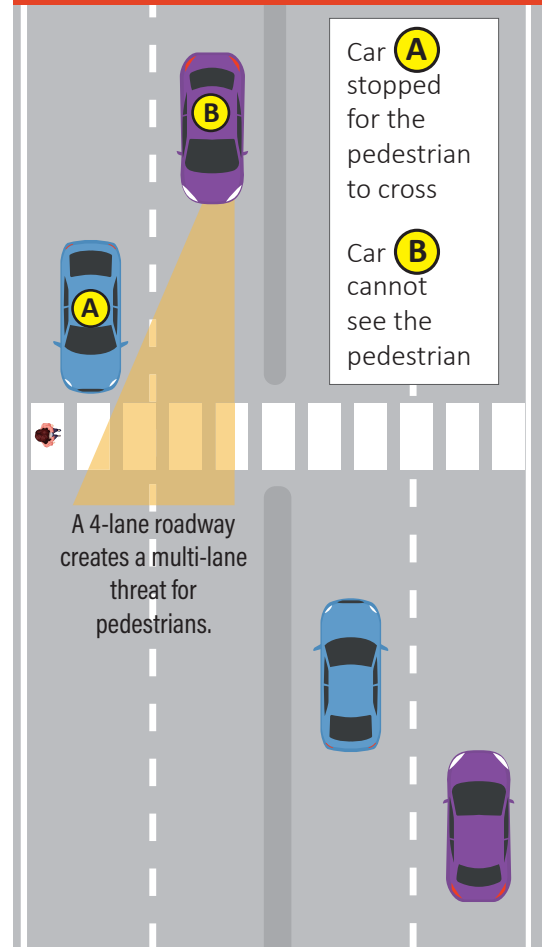


AFTER
3 Lanes

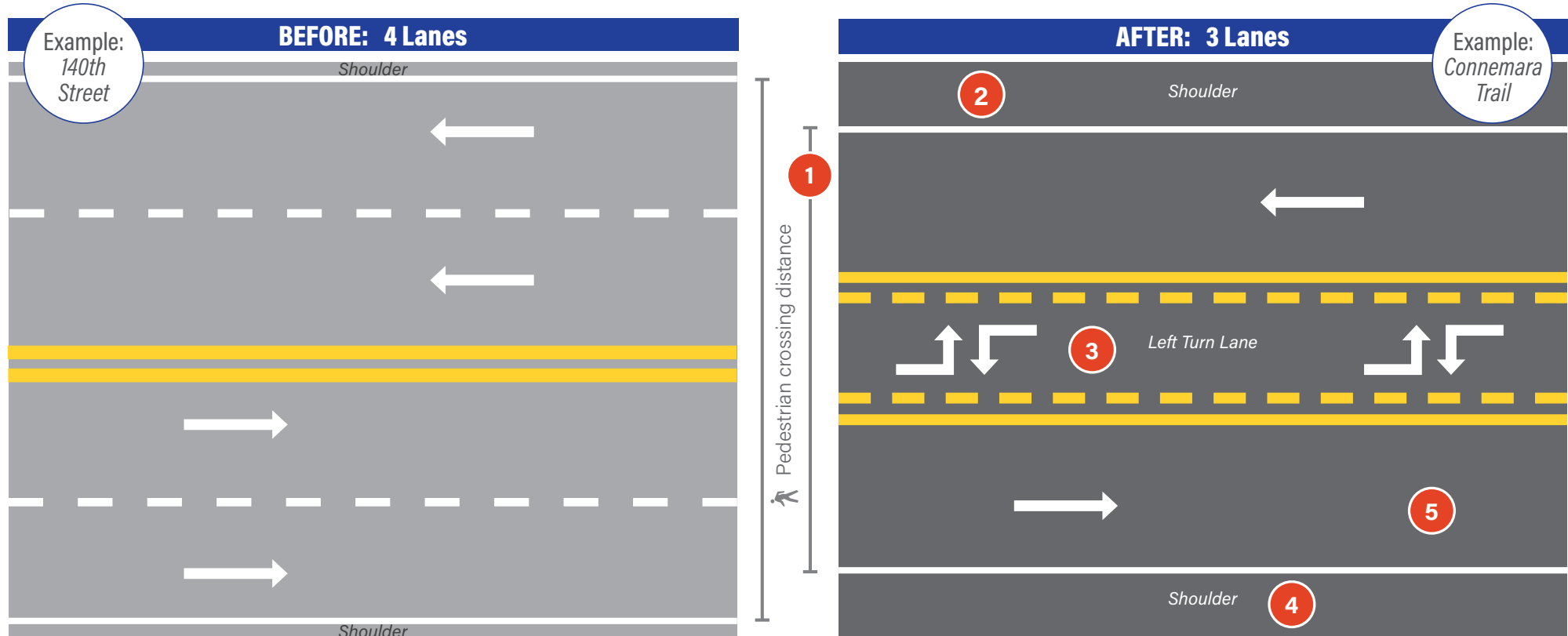


A 4-lane roadway has more conflict points than a 3-lane.

Pedestrian Crossing Safety



4-Lane to 3-Lane Conversion is Possible on 140th Street by Restriping Only



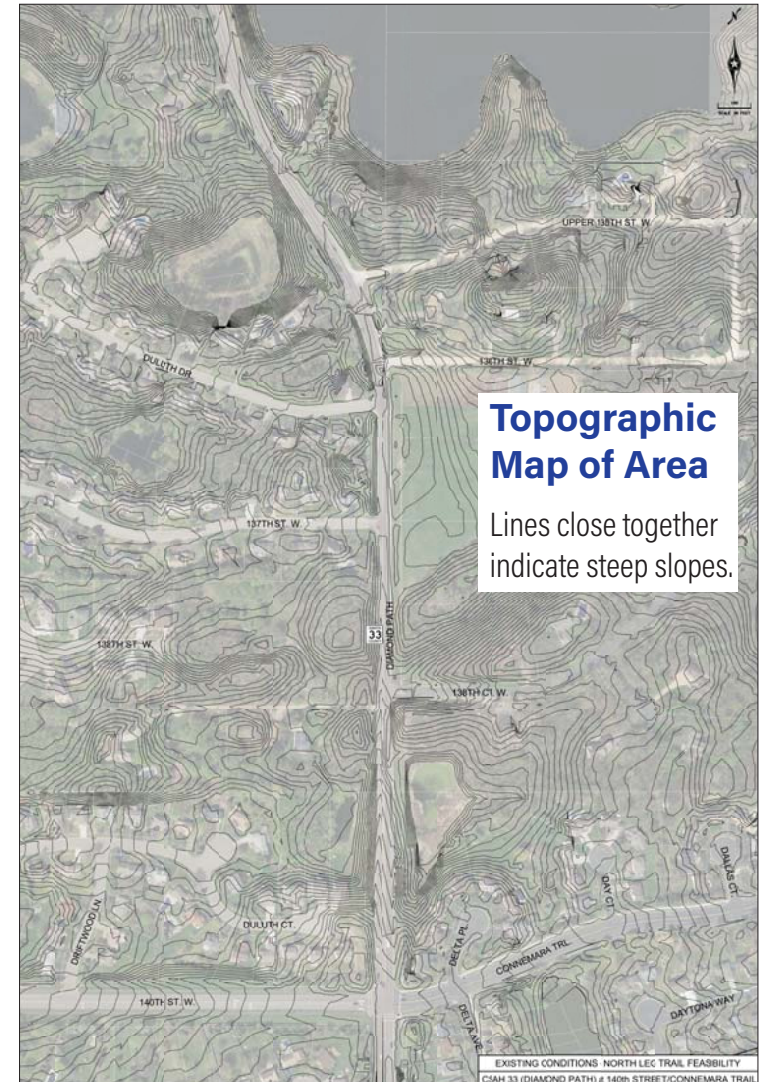
A 4-lane to 3-lane conversion reduces the number of lanes on a roadway to better utilize available space. Benefits include increased safety, reduced conflict points, and improved mobility.

Benefits of 3 Lanes

- 1 Shorter pedestrian crossing distance
- 2 Wide shoulder for bicycles & emergency pull-off
- 3 Protected left turns
- 4 Buffer zone between moving vehicles & pedestrians
- 5 Allows left turns to not impede through-traffic

TRAIL CONSIDERATIONS

- Design for new roundabout will connect existing trails and provide crossings at all four streets.
- Currently there are no trails north of 140th Street/Connemara Trail (wide shoulder is sometimes used).
- New trails and roadway improvements to the north will be planned in studies beginning in 2024.
- Diamond Path (CR 33) to the north includes challenging terrain (grades and water features).
- Current roundabout design will anticipate possible trail connections to the north.
- **What do you think?** Are trails or roadway improvements needed to the north?



SURVEY & UTILITIES



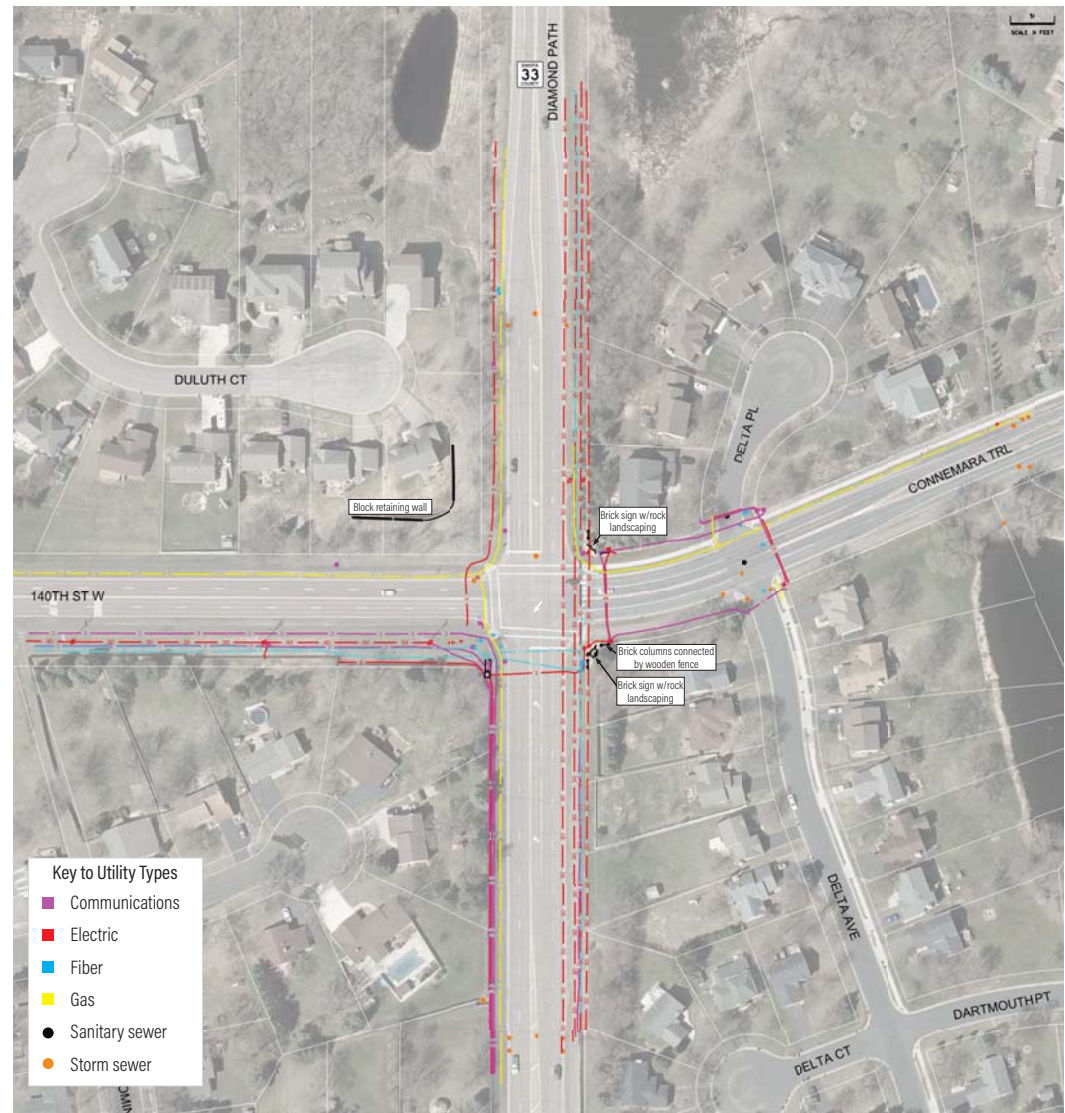
Survey of the intersection area was completed in Fall 2019.



There are numerous utilities around the intersection.



The alternatives will review impacts to properties, utilities, and structures.



COUNTY ROAD 33 **Roundabout Feasibility Study**

Dakota
transportation
we get you there

 **ROSEMOUNT**
SPIRIT OF PRIDE AND PROGRESS

 **BOLTON
& MENK**

 **Apple
Valley**

FEB 6, 2020 – PHOTOS OF ROUNDABOUT DESIGN DISCUSSION AT OPEN HOUSE



INTERSECTION TRAFFIC CONTROL



All-way stops are used for

- Moderate traffic volumes.
- Balanced traffic.
- Speed limits of 40 mph or less.

Drawbacks

- Inefficient and cause delay.
- Multiple lanes can increase crash risk.
- Increased crash risk when disregarded.
- Constant stopping/acceleration is noisy.



Traffic signals are used for

- Consistently high volume of traffic.
- Collector or arterial corridor intersections.

Drawbacks

- Introduces additional decision making.
- Increased crash risk when disregarded.
- Increased risk of fatal or serious injury crashes.
- Creates delay, particularly for higher volume movements.
- Higher speeds.









Roundabouts are used for

- Moderate to high traffic volumes.
- Improving traffic flow.

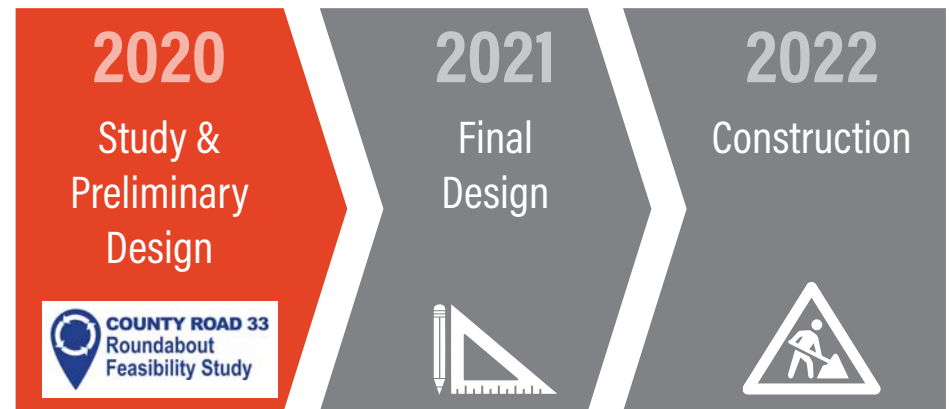
Drawbacks

- May have higher construction cost and right-of-way needs.
- Potential for more property damage crashes.
- Not suitable for six-lane or principal arterial roadways.

NEXT STEPS

-  Review input from this open house
-  Develop roundabout alternatives
-  Evaluate the impact of each alternative
-  Meet with residents & stakeholders
-  Determine & refine recommended alternative
-  Next open house in April/May

Long Term Plan



After completion of the feasibility study, preliminary design will occur. Next year the design will be finalized with construction currently planned for 2022.