

## US 71 / CR 90 Reduced Conflict Intersection

### PROJECT HISTORY & BACKGROUND

Over the past decade, the US 71 / CR 90 intersection in Kandiyohi County near Willmar has experienced a crash rate higher than the state average. The overall intersection crash rate is over 1.5 times the average statewide rate and over the critical crash rate.

Minnesota Department of Transportation (MnDOT) will construct a reduced conflict intersection (RCI) at the US 71 / CR 90 intersection. In 2017, MnDOT received special funding from the Highway Safety Improvement Fund to construct an RCI at the intersection. Construction of the RCI is intended to increase safety.

### PROJECT TIMELINE

<b>2009</b>	Closure of the median at 41st Ave and US 71
<b>2015</b>	Funding approved to improve 41st Ave and extend 18th St to improve traffic flow  Intersection Control Evaluation (ICE) Study completed
<b>Spring 2017</b>	Funding was received for reduced conflict intersection (RCI) at US 71 /CR 90
<b>Summer 2017</b>	Construction completed for 41st Ave and 18th St
<b>2018</b>	Preliminary design of RCI at US 71 / CR 90
<b>2019</b>	Final design of RCI at US 71 / CR 90
<b>2020</b>	Project letting of RCI at US 71 / CR 90
<b>2021</b>	Construction of RCI at US 71 / CR 90

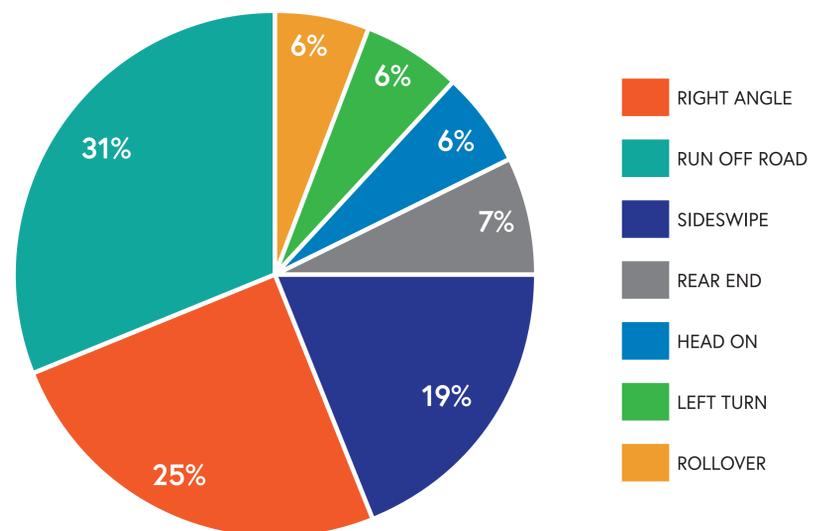
## US 71 / CR 90 Reduced Conflict Intersection

# CRASH HISTORY

	US 71 / CR 90 Intersection	State Average
<b>Total Crashes</b>	<b>16</b>	-
<b>Crash Rate <sup>1</sup></b>	<b>0.47</b>	<b>0.26</b>
<b>Critical Crash Rate <sup>2</sup></b>	<b>0.40</b>	-
<b>Severity Rate <sup>3</sup></b>	<b>0.89</b>	<b>0.42</b>

1. Number of crashes per million entering vehicles.
2. A rate unique to this intersection type and traffic volume; exceeding the critical rate indicates a sustained safety issue.
3. Crash rate adjusted to recognize the severity of crashes that have occurred (i.e. fatalities, personal injuries, and/or property damage).

### US 71 / CR 90 Crash Types



- The US 71 / CR 90 intersection experienced 16 crashes from 2010-2014.
- The intersection crash rate is almost twice the state average rate and higher than the critical crash rate.
- The intersection severity rate is more than double the state average rate, indicating a higher rate of severe crashes.
- The most common types of crashes are run off road, right angle, and sideswipe.

# INTERSECTION CONTROL EVALUATION (ICE) FINDINGS

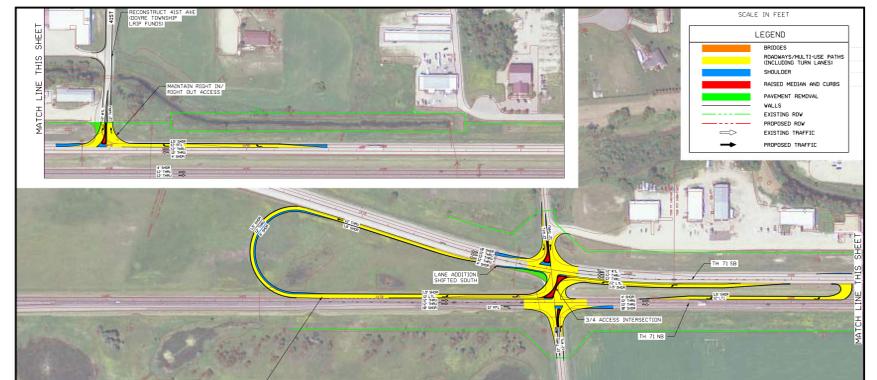
An Intersection Control Evaluation (ICE) is used to determine the optimal control for an intersection based on an objective analysis. Four alternatives were considered.

## #1: 3/4 Access Intersection at 37th Avenue



- ✓ Access reduction & removal of conflicting traffic movements
- ✓ Compatible with the Dovre Township LRIP grant and maintains frontage road access
- ✗ Eastbound to northbound motorists will need to use US 71/48th Ave intersection
- ✗ Increase of motorists using 41st Ave to access US 71
- ✗ Very long distance for a U-turn backtrack movement required for westbound motorists wanting to access southbound US 71

## #2: Reduced Conflict Intersection at 37th Avenue



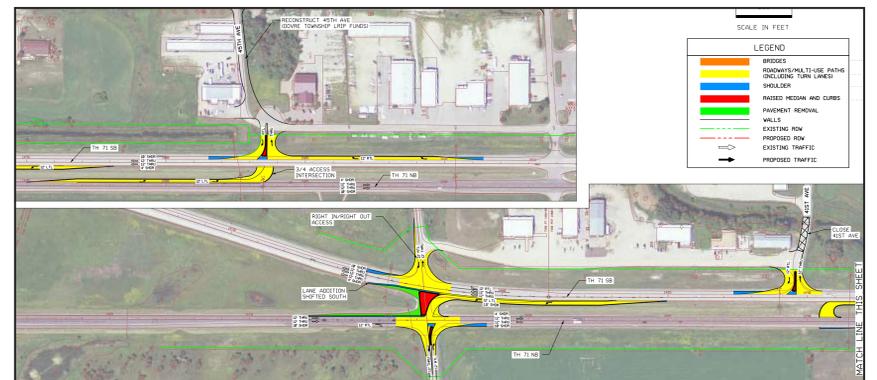
- ✓ Reduces severity of crashes and right angle crashes
- ✓ Compatible with the Dovre Township LRIP grant and maintains frontage road access
- ✓ Reduces amount of diverted traffic using 48th Ave
- ✗ Diverts motorists; may have negative public perception
- ✗ Adds motorist travel time
- ✗ May increase sideswipe crashes; additional conflict introduced with the northbound lane change/weaving area

## #3: Offset T-Configuration with 3/4 Access at 41st Street



- ✓ Reduces severity of crashes and right angle crashes
- ✓ Reduces merging conflict with TH 23 entrance ramp
- ✓ Compatible with the Dovre Township LRIP grant and maintains frontage road access
- ✓ Most efficient traffic operation scenario
- ✗ Diverts motorists; may have negative public perception
- ✗ Eastbound to northbound motorists will need to use US 71/48th Ave intersection
- ✗ Adds motorist travel time
- ✗ May increase sideswipe crashes
- ✗ U-turns will need to occur at 41st Ave

## #4: Partial 3/4 Access Configuration with 3/4 Access at 45th Avenue



- ✓ Reduces severity of crashes and right angle crashes
- ✓ Compatible with the Dovre Township LRIP grant and maintains frontage road access
- ✓ Reduces merging conflict with TH 23 entrance ramp
- ✓ Maintains frontage road access and will serve to reduce the eastbound left turn at 48th Ave
- ✗ Requires a modification to Dovre Township LRIP grant
- ✗ Diverts motorists and may have negative public perception
- ✗ Adds additional access to US 71 that doesn't exist today
- ✗ May increase sideswipe crashes
- ✗ U-turns will need to occur at 45th Ave

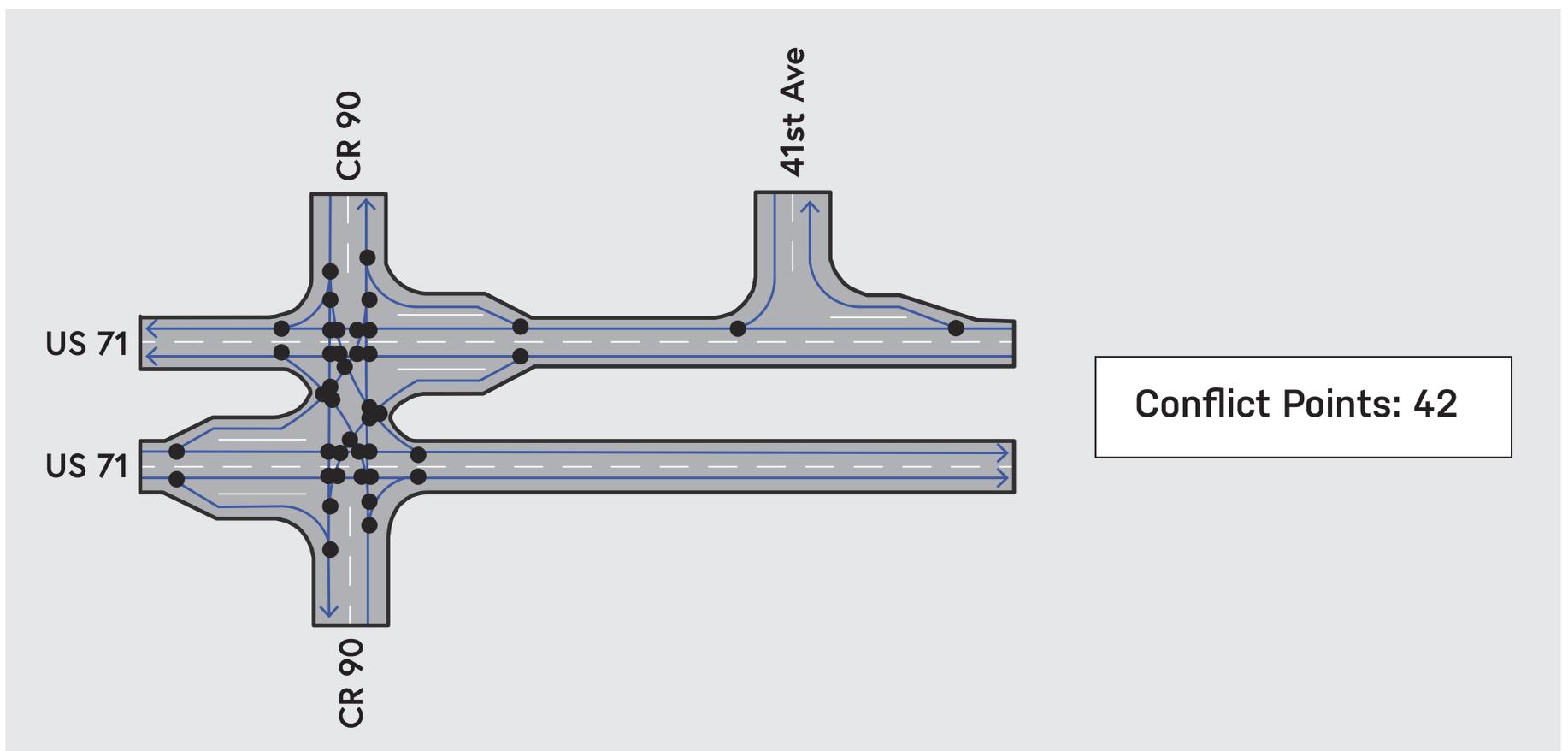
## US 71 / CR 90 Reduced Conflict Intersection

# CONFLICT POINTS

Conflict points are locations where highway users' paths diverge, merge, or cross, creating the opportunity for a potential crash.

RCIs reduce the number of crossing conflict points, which is the most dangerous type of conflict point.

### EXISTING US 71 / CR 90 INTERSECTION



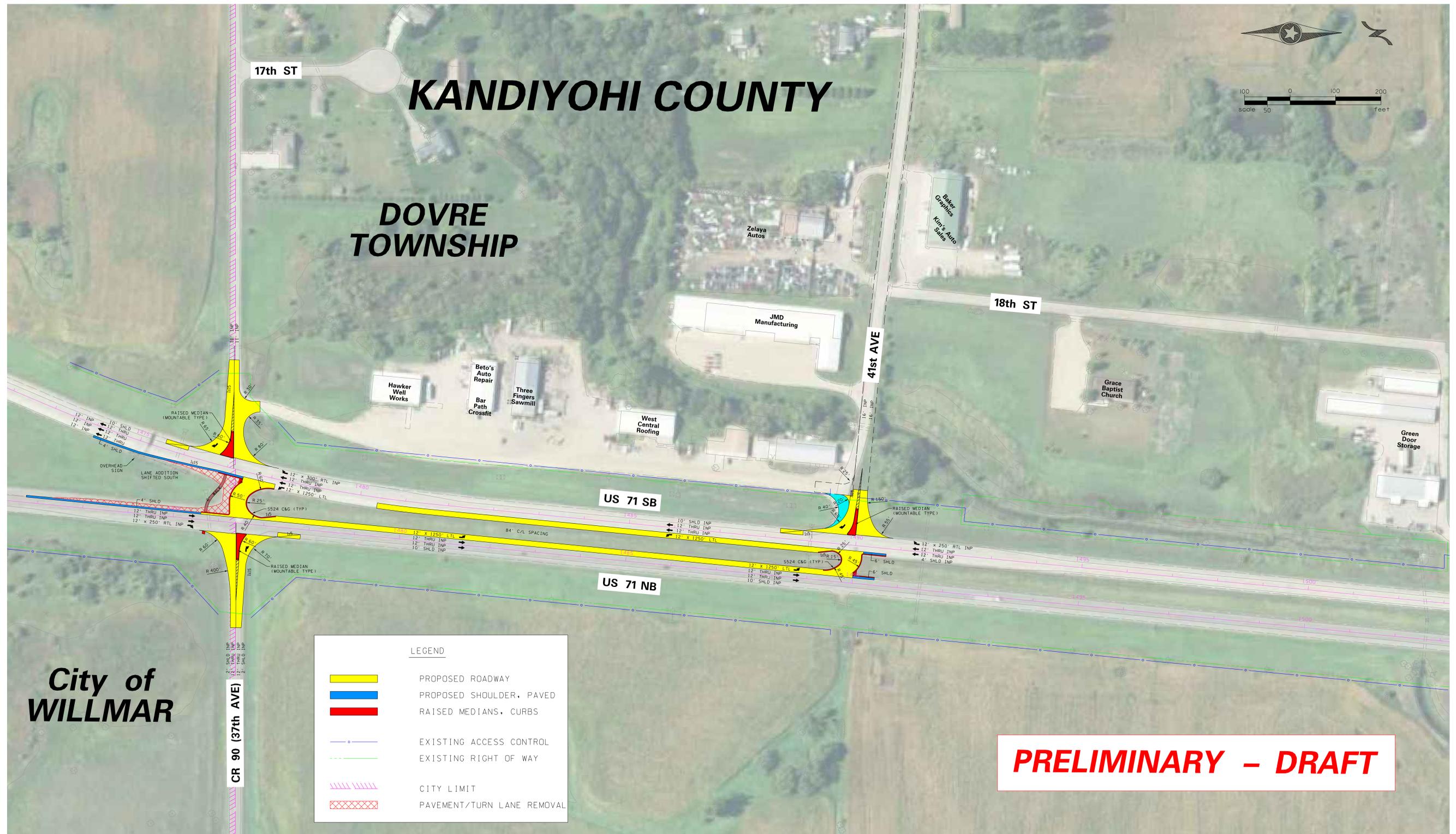
### US 71 / CR 90 REDUCED CONFLICT INTERSECTION (RCI)

Conflict Points: 28  
(33% reduction from existing)

Estimated Crash  
Reduction: 37%

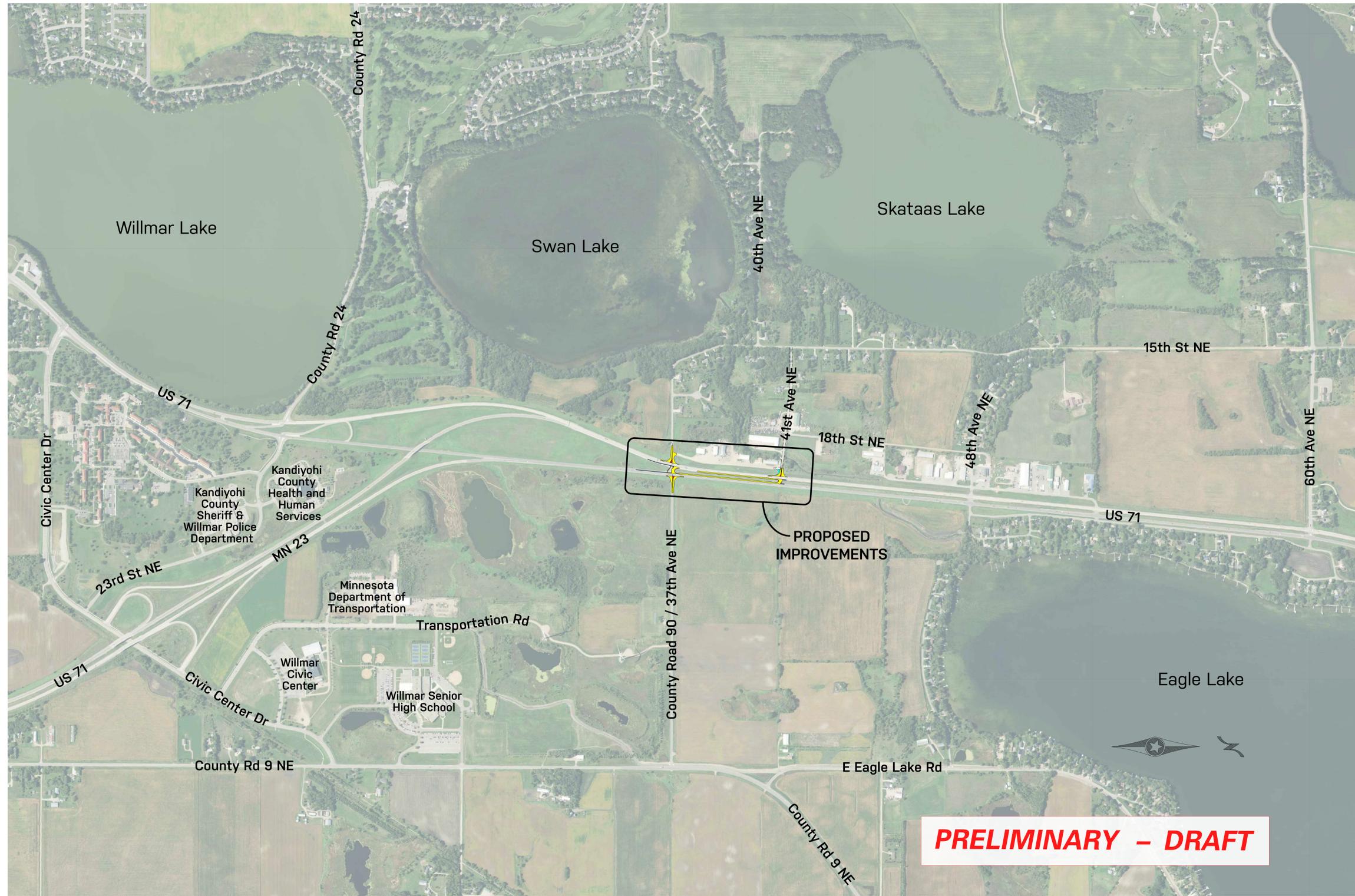
# US 71 / CR 90 Reduced Conflict Intersection

## PREFERRED DESIGN

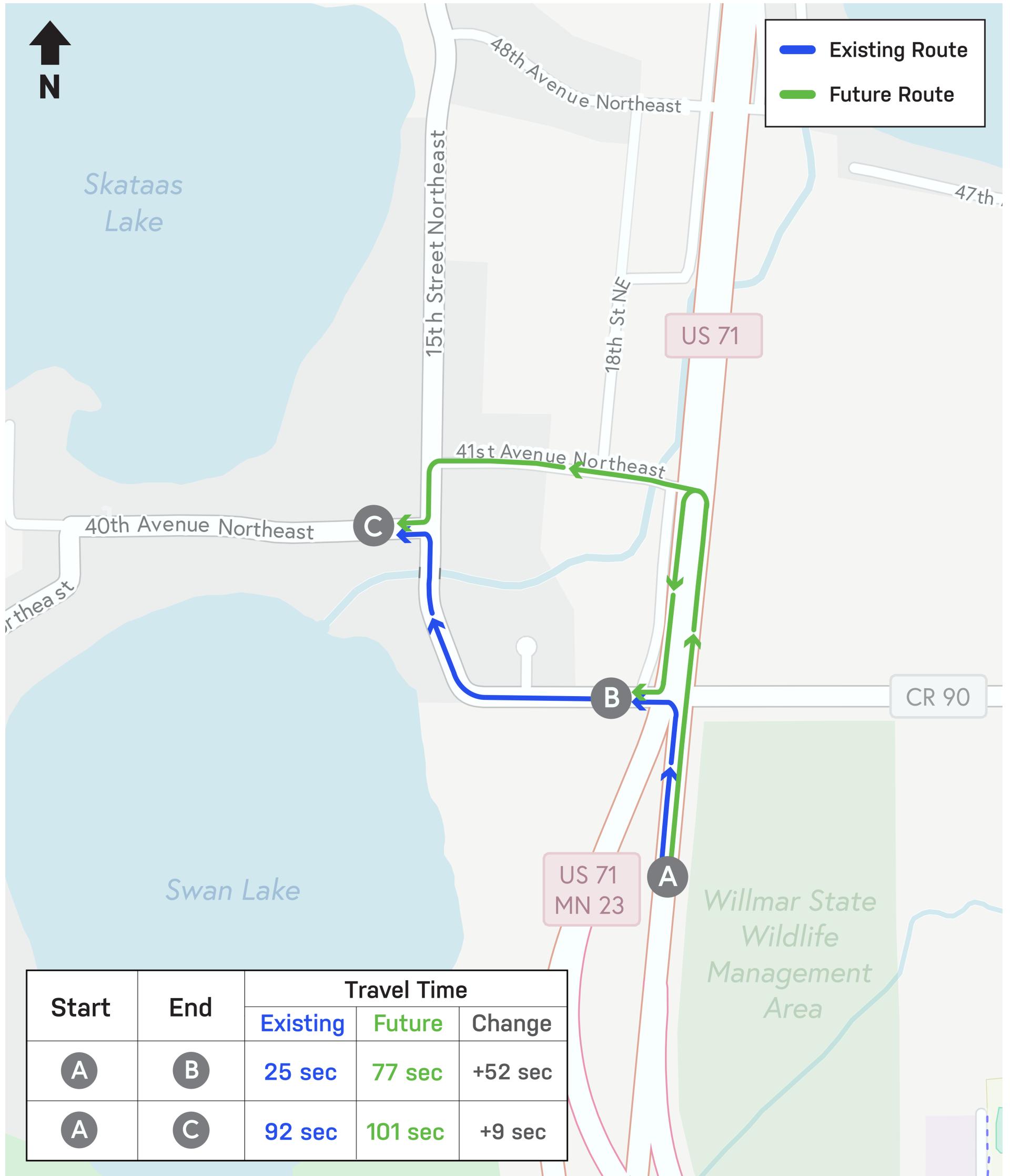


# US 71 / CR 90 Reduced Conflict Intersection

## PROJECT AREA



# CHANGE IN TRAVEL TIMES



# REDUCED CONFLICT INTERSECTIONS (RCIs)

## WHAT ARE THEY?

RCIs are intersections that decrease fatalities and injuries caused by broadside crashes on four-lane divided highways. An example of an RCI is a J-turn, also known as a reduced conflict u-turn or RCUT.

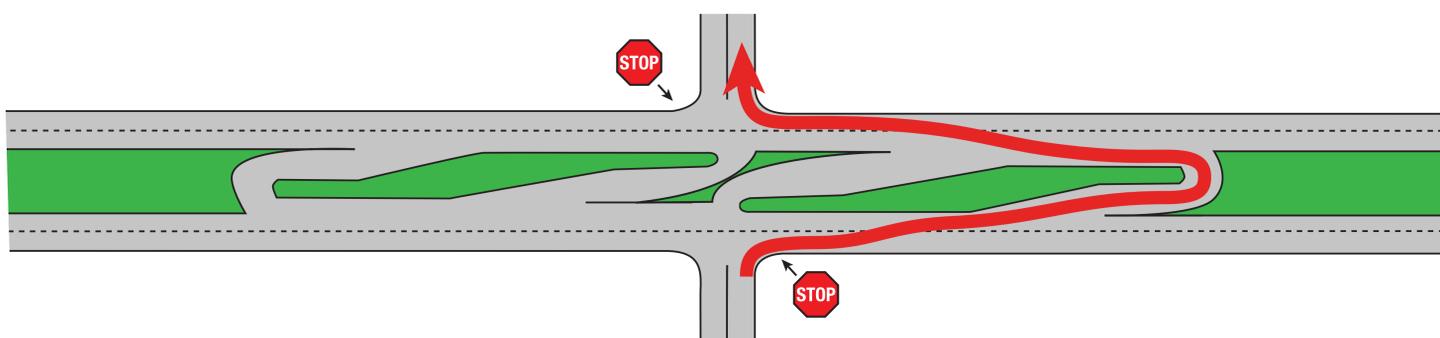
## WHY DO THEY WORK?

With an RCI, drivers from the side street only have to be concerned with one direction of traffic on at a time. You don't need to wait for a gap in both directions to cross a major road. Traditional four-lane divided highway intersections have an elevated risk of severe right-angle crashes, especially for drivers attempting to cross all four lanes of traffic or turn left.

A study of before & after conditions at eight RCIs constructed in Minnesota since 2010 found:

- A 100% reduction of fatal and serious injury right-angle crashes
- A 77% reduction of all right angle crashes (of all severities)
- A 50% reduction of injury crashes

**Crossing a rural divided highway using a Reduced Conflict Intersection**



**Left hand turn onto a divided highway using a Reduced Conflict Intersection**

