

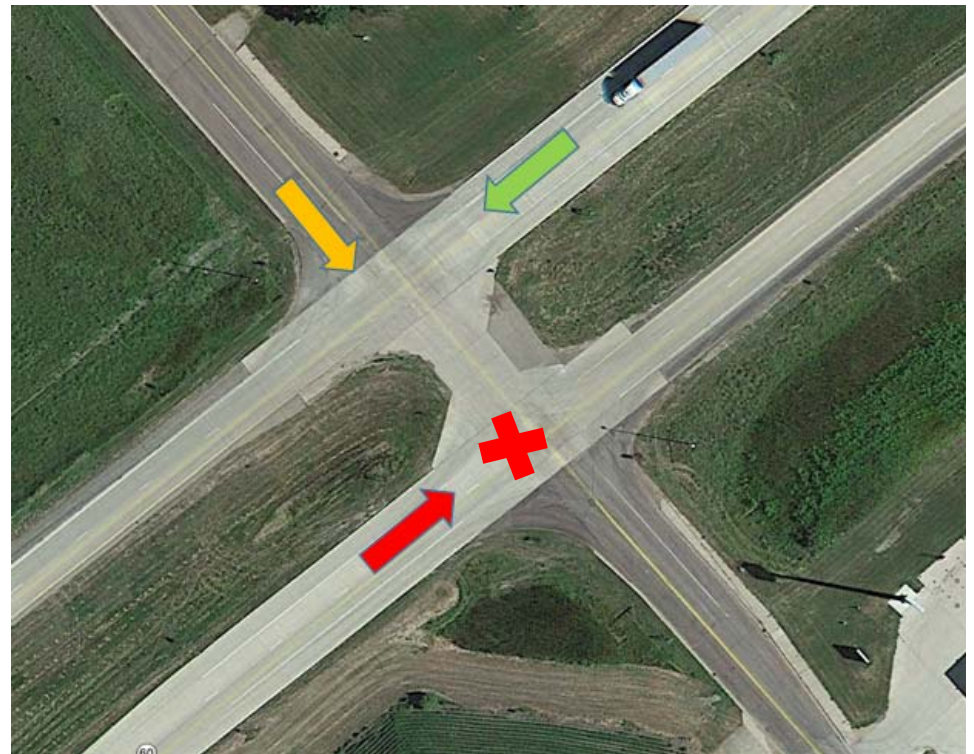
Purpose of Tonight

- Recap of our problem
- How RCUTs work
- Why RCUTs were chosen
- Ultimate Goal: Review design work
 - Are any minor tweaks needed?



Reoccurring Problem: T-Bone Crashes

- 10th Street (Jackson CSAH 9)
 - 67% of crashes are right-angle (T-Bone) crashes
 - Almost exclusively far side crashes
 - 2007-2017 Right Angle Crash Severity:
 - 2 Fatal Crashes (three deceased)
 - 5 Non-Incapacitating Injury
 - 2 Possible Injury
 - 2 Property Damage
- The solution should treat all three accesses



Steps Taken Thus Far

- 2009
 - LED-Enhanced STOP Signs
- 2015
 - LED-Enhanced YIELD Signs
 - Added Emphasis on Mowing

Motorists are still having problems...

- Late 2016/2017
 - Discussions with Jackson County & Heron Lake



Additional Solutions Considered

- Reduced Speed Limit
- Additional Signage
- RICWS (Mountain Lake)
 - Rural Intersection Conflict Warning System
- RCUT: Reduced Conflict U-Turn
 - AKA:
 - RCI (Reduced Conflict Intersection)
 - J-Turn



Reduced Speed Limit

- Lowering a speed limit will not significantly reduce speeds
 - Converse is true as well
- Roadway influences drivers, speed signs don't
 - Individual risk assessment

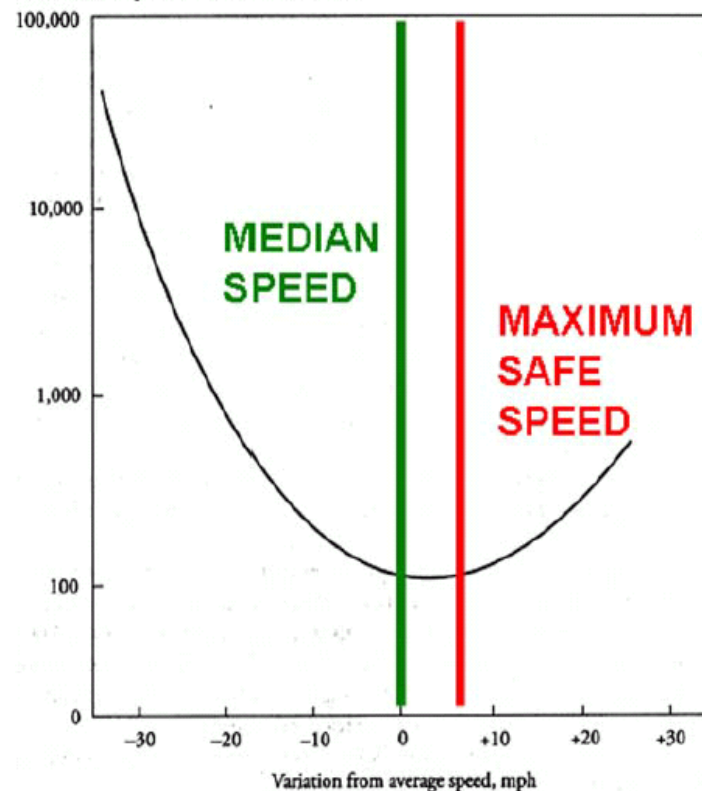
Study Location	Before	After	Sign Change (MPH)	85% MPH Before After	Traffic Change (MPH)
MN 65	SPEED LIMIT 40	SPEED LIMIT 30	-10	34 34	0
MN 65	SPEED LIMIT 50	SPEED LIMIT 40	-10	44 45	+1
US 169 (Extra Enforcement)	SPEED LIMIT 40	SPEED LIMIT 30	-10	41 40	-1
Anoka CSAH 1	SPEED LIMIT 45	SPEED LIMIT 40	-5	48 50	+2
Anoka CSAH 24	SPEED LIMIT 30	SPEED LIMIT 45	+15	49 50	+1
Anoka CR 51	SPEED LIMIT 40	SPEED LIMIT 45	+5	45 46	+1
Hennepin CSAH 4	SPEED LIMIT 50	SPEED LIMIT 40	-10	52 51	-1

Reduced Speed Limit

- Unreasonable speed limits can increase crashes
 - Some will drive posted speed limit
 - Most will drive reasonable speed
 - **CONFLICT**
- Speed limits should match motorists speeds
 - Not what we want motorists to do
- Uniform speed results in safest operation

Figure 8-1. *Deviation from Average Speed vs. the Collision Rate (Solomon Curve)*

Collision rate (per 100 million vehicle miles)



Source: Solomon (1964).

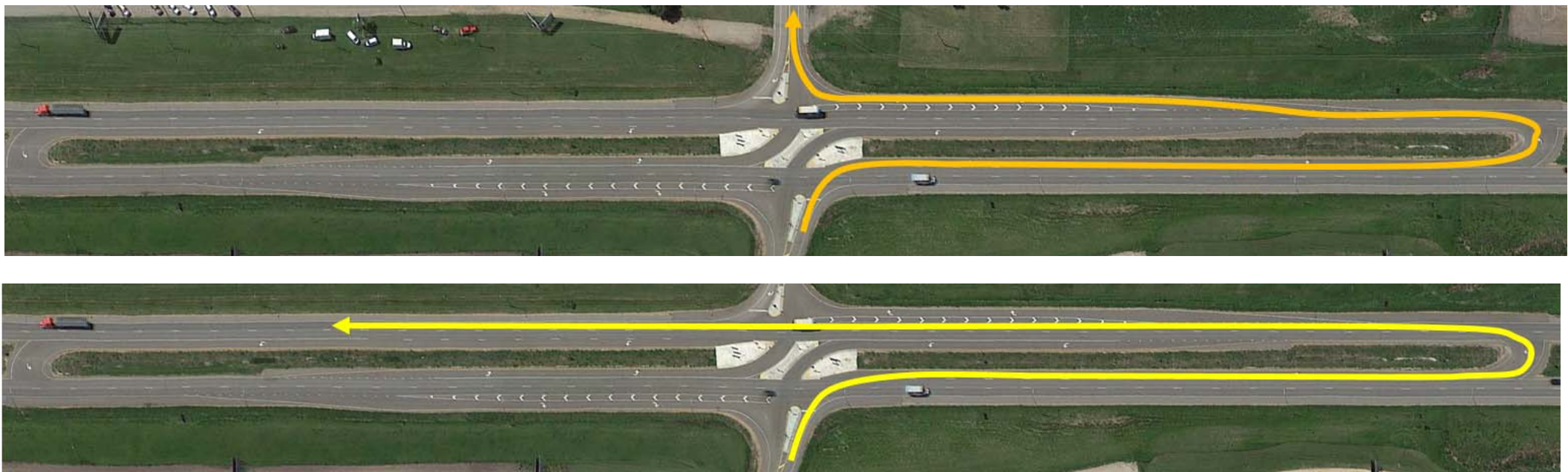
Signs/Flashing Lights

- Signs/Flashing Lights
 - 47,000+ Signs
 - Driver Apathy
- RICWS (Mountain Lake)
 - Experimental System (\$200k)
 - Mixed Results
 - Mountain Lake & MnDOT exploring other options



RCUT: Reduced Conflict U-Turn (AKA: J-Turn)

- Highway Users: Nothing changes
- Side Road Users: Must all turn right; make U-turn to turn left or cross highway



RCUT Benefits

Safety:

- Maryland study
 - Fatal crashes reduced 70%
 - Injury crashes reduced 42%
- Minnesota experience
 - 13+ in operation
 - Eight studied by MnDOT in 2017
 - Fatal & Serious Injuries eliminated
 - Right angle crashes reduced 77%
 - Injury crashes reduced 50%
 - Total crashes reduced by 15%

Lower Cost

- 10+ RCUTs vs. 1 interchange
- Fully funded by MnDOT
- No additional land required

Faster to Construct

- One summer vs. two+

What about trucks?

- Designed with trucks in mind
- Iowa State study #1 (impacts)
 - Data used from four states
 - MD, MN, MO, WI
 - Crashes changed from right angle to sideswipe crashes
 - **No increase in truck crashes**
 - **No crashes involving U-turns**



What about trucks?, cont'd

Iowa State study #2 (behavior)

- RCUT vs. Traditional (control)
- Exposure Time
 - Longer at RCUT (in aggregate)
 - 13.7 sec vs. 10.9 sec
 - Consistent vs. Inconsistent
 - Broken into two phases (merging and U-turn) at RCUT
- Despite more exposure
 - No increase in crashes (study #1)



Figure 12: Exposure time at control sites

What about trucks?, cont'd

Iowa State study #2 (behavior)

- Evasive Maneuvers
 - Control had +22% more
 - Control: 0.33 / large vehicle
 - RCUT: 0.27 / large vehicle
- Semi in:
 - Top picture: 20+ sec.
 - Others observed: 30+ sec.



What about ag equipment?

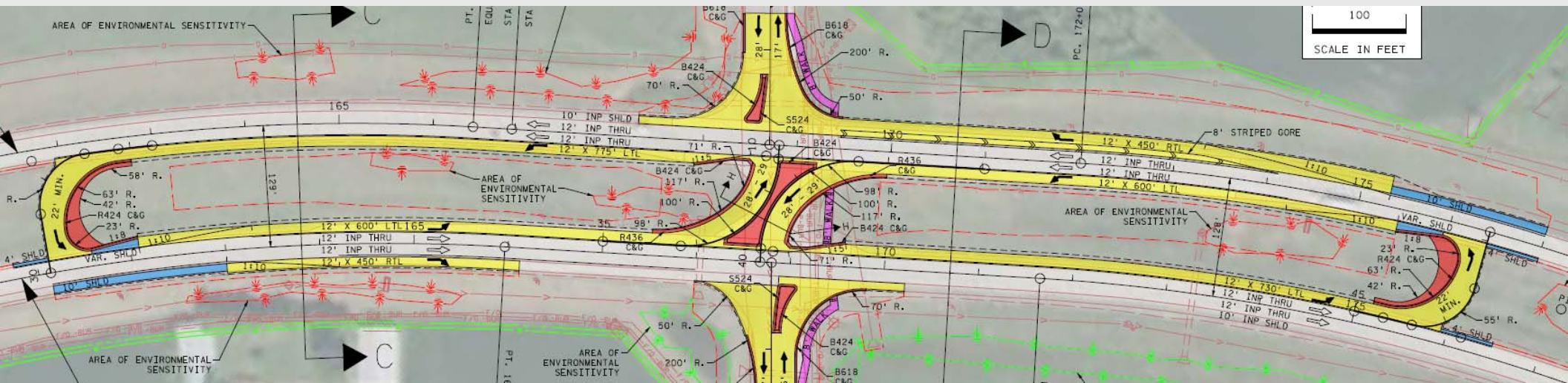
- Designed to accommodate ag equipment
- RCUT locations with ag use
 - Cologne (part of studies)
 - Vermillion (part of studies)
 - Le Sueur
 - Eagle Lake
- Iowa State study #1 (impacts)
 - No increase in ag equipment crashes
- Iowa State study #2 (behavior)
 - Data collected Sept. 29 – Oct. 12



Why RCUTs for Heron Lake?

RCUTs are a proven solution that:

- Are safe for all vehicle types
- Solve our crash problem
- Maintain access to Heron Lake

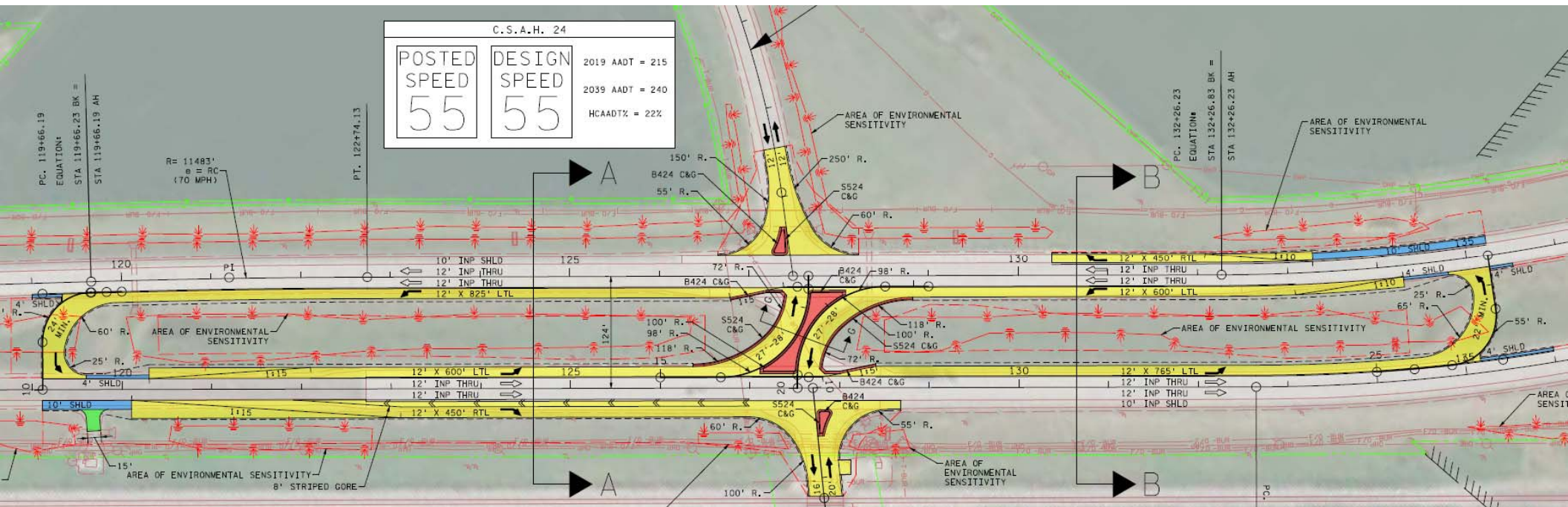


Progress to Date / Next Steps

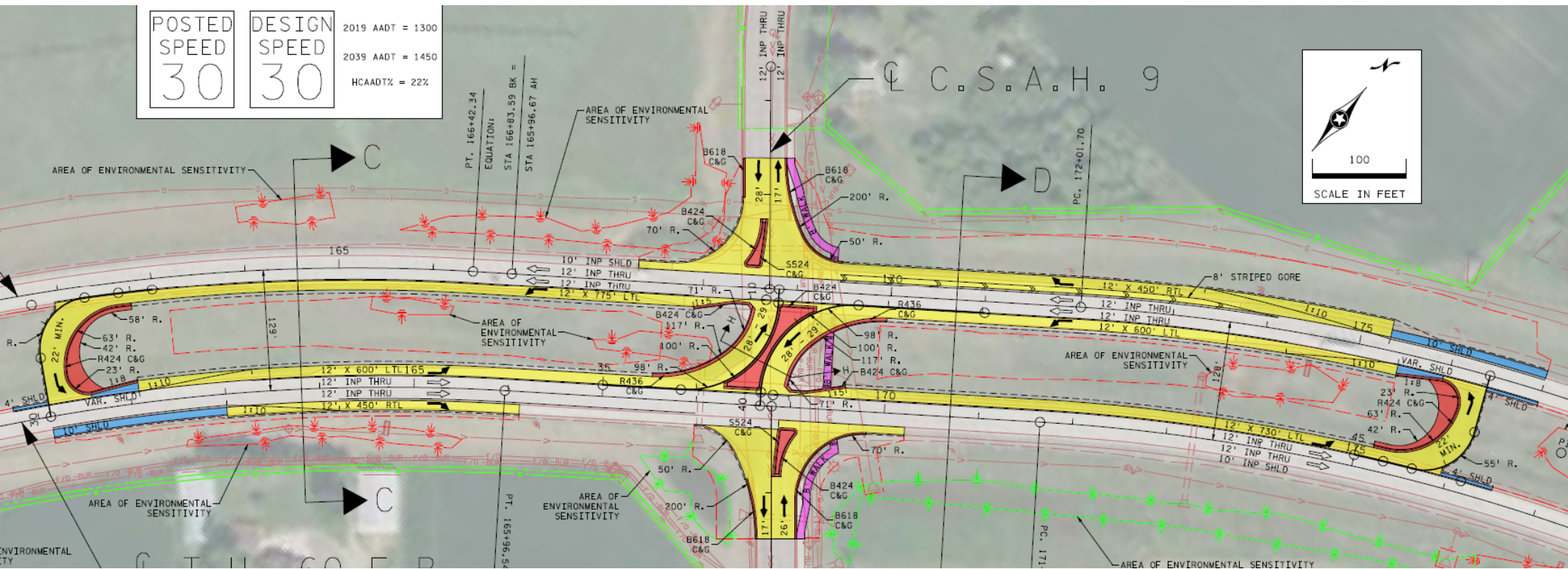
- *City Council & County Board RCUT Support*
 - *Summer 2017*
- *Preliminary Design*
 - *Winter 2017/2018*
- Final Design
 - Spring/Summer 2018
- Construction
 - Summer 2019



Jackson CSAH 24 J-Turn (West Side)



10th Street (CSAH 9) J-Turn



[illegible]

-CL CHAPMAN AVE.

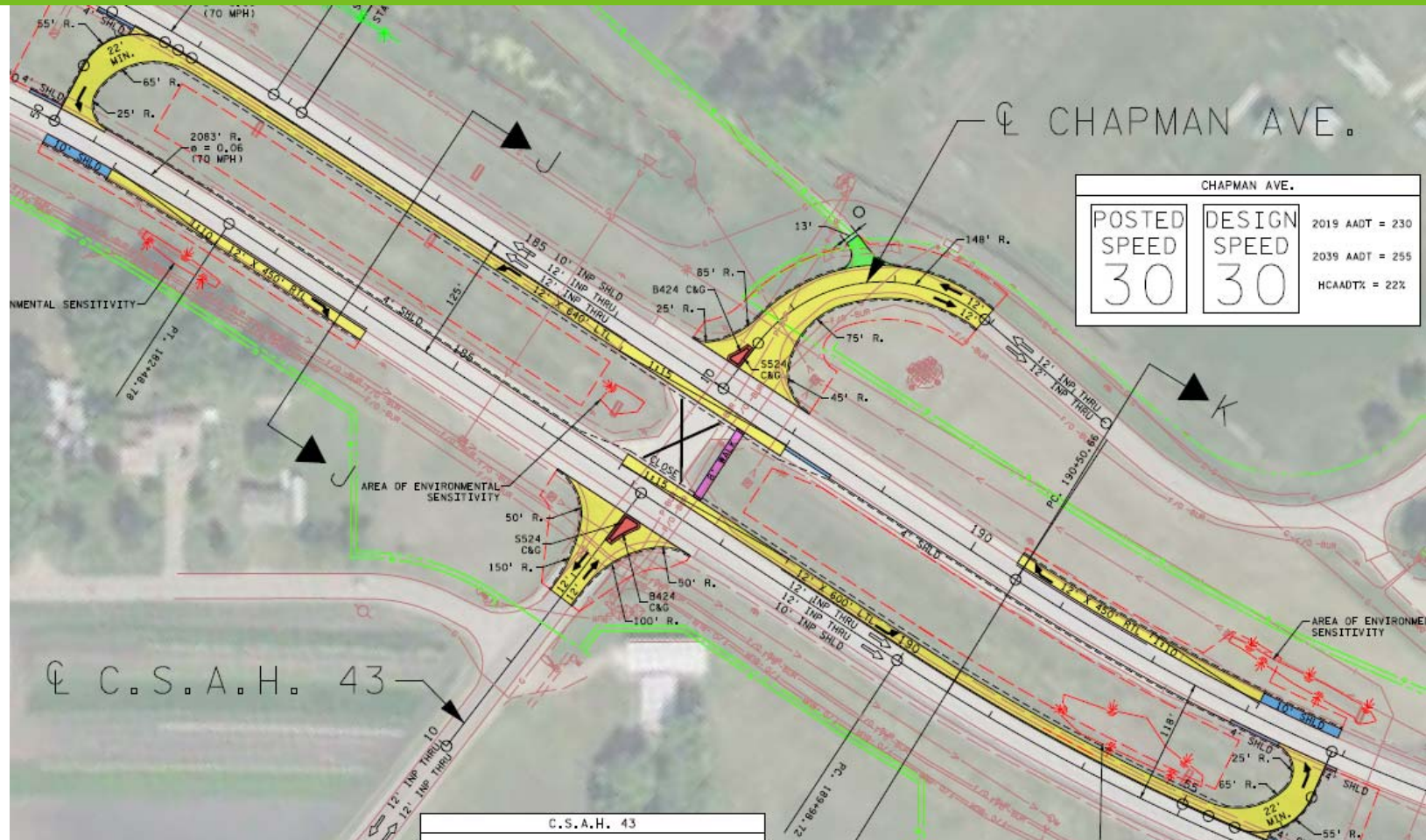
CHAPMAN AVE.	
<div> <div>POSTED</div> <div>SPEED</div> <div>30</div> </div>	<div> <div>DESIGN</div> <div>SPEED</div> <div>30</div> </div>
	2019 AADT = 230 2039 AADT = 255 HCAADTX = 22%

2019 AADT = 230
2039 AADT = 255
HCAADT% = 22%

Q. C. S. A. H. 43

SAWCUT AND REMOVE A
PORTION OF THE EXISTING
LEFT TURN LANE.
REMAINING PAVEMENT TO

1st Street/CSAH 43 (East Side) Option 2



Thank you for coming!

Scott M. Thompson, P.E.

scott.m.thompson@state.mn.us

507-304-6156