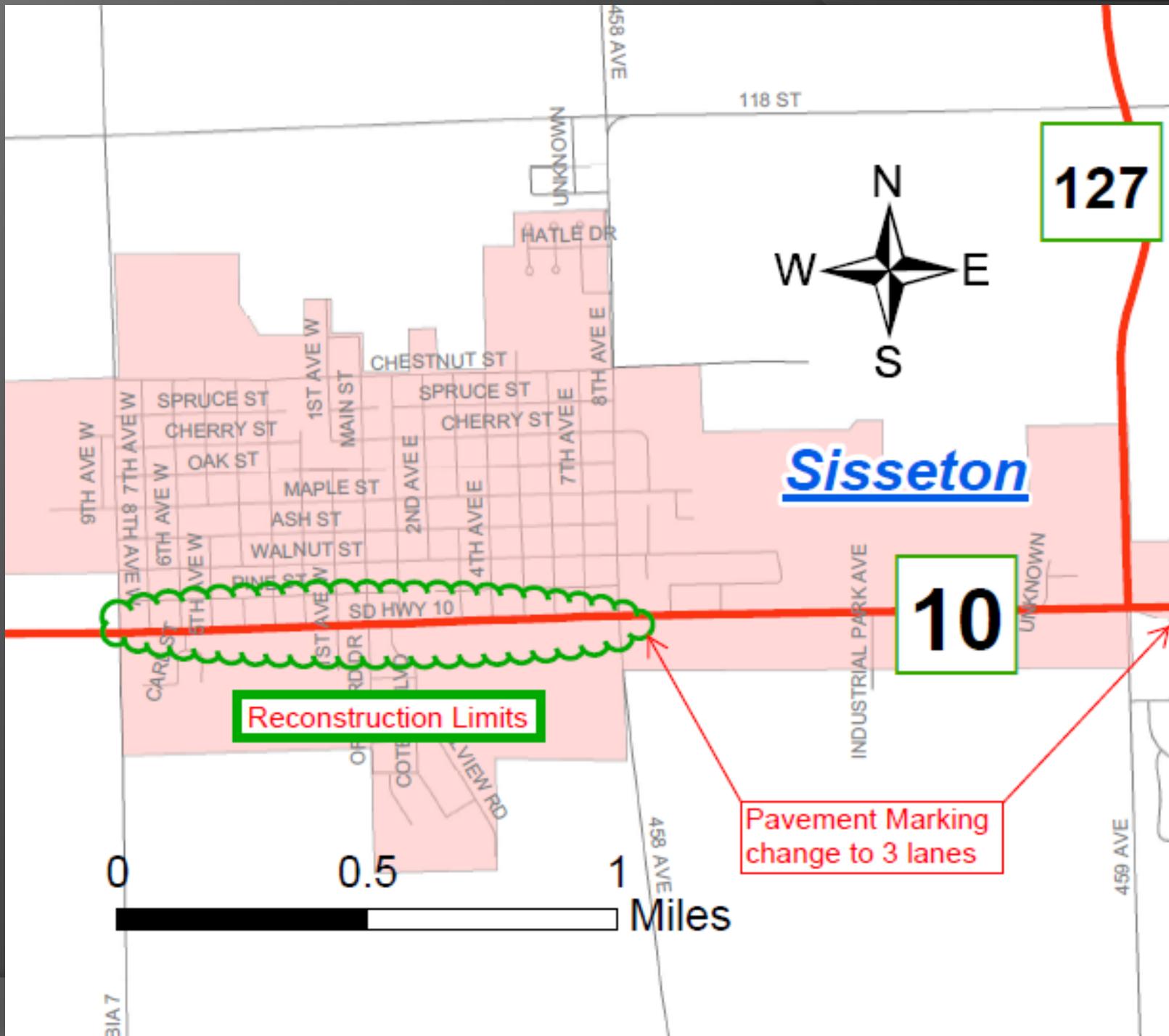


# Sisseton Public Meeting

## SD10 Reconstruction

Mark Malone, P.E.  
SD DOT



# SD10 Grading & Surfacing



- ◎ From 8<sup>th</sup> Ave W to 8<sup>th</sup> Ave E
  - 1 mile plus transition lengths
- ◎ Complete Urban Reconstruction
  - Grading, C&G, Storm Sewer, Sidewalk, Concrete Surfacing
  - Railroad Crossing Upgrade
  - Lighting
  - Traffic Signal OR Roundabout (8<sup>th</sup> St E)

# Why Reconstruction?



- 3 Variables to Consider
  - Pavement Condition - Poor
    - Originally constructed in 1961
    - Last Resurfaced in 1989
  - Capacity
  - Safety

# Why are we here?

- To discuss SD10 through Sisseton
- To involve public in the design process
- Exchange ideas – listen and discuss concerns

# Right of Way



- The project will utilize existing ROW
- Temporary Construction Impacts
- Acquisitions may be necessary for lighting and at intersections
  - This will be discussed in more detail at individual Landowner Meetings

# Encroachments



- ⦿ Encroachments within the public Right of Way need to be addressed prior to Construction
  - Federal Highway Regulations
  - Safety
  - Consistency Statewide
- ⦿ Landowners with encroachments will be notified by SDDOT

# Landowner Meetings



- ⦿ Approximately 1 year from now
- ⦿ Applicable to all affected Landowners
- ⦿ You will be contacted by SDDOT
- ⦿ Discuss your property in particular
  - Design details such as driveway location or width, fence, etc.
  
- ⦿ Right of way process to follow

# Construction



- ◎ Construction to begin in 2017
  - Pending Funding & Scheduling
  - 1 construction season
  - SDDOT will obtain additional public comment
- ◎ Sequencing options being reviewed
  - Maintain Two-Way Traffic OR Block Closures
  - Access to businesses will be maintained

# Existing Conditions (SD10)

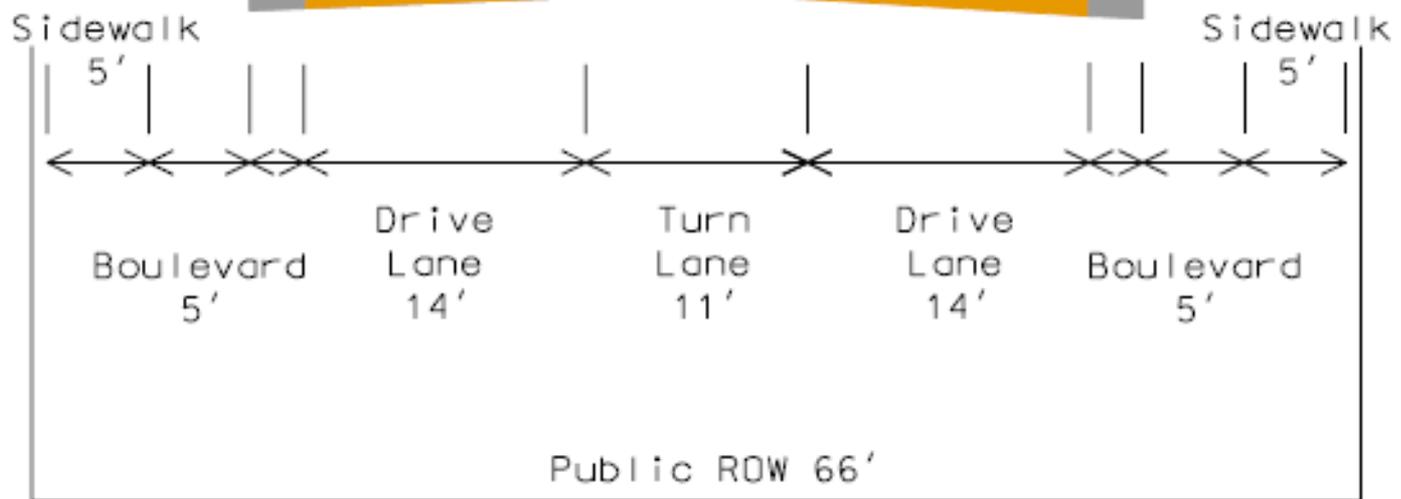
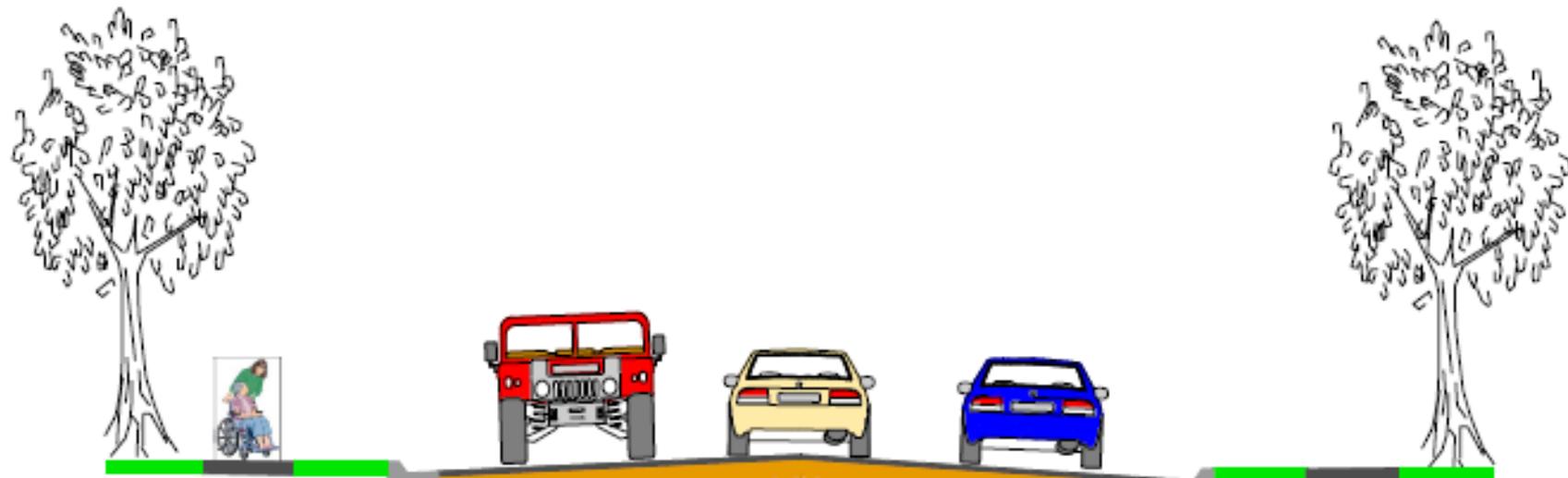


- 4 – 12' Traffic Lanes
- Some Curbside sidewalk
- ROW width = 66' or greater
- Roadway Lighting (poor condition)
- Average Daily Traffic (ADT) – 7,090
  - 20 year projected ADT – 8,225

# Proposed Typical Section



- 2 - 14' Lanes & 1 – 11' Center Turn Lane
- Curb & Gutter
- New Storm Sewer
- Boulevard Sidewalk
- Lighting
- No Parking
- Access Management
  
- Change in pavement markings from 8<sup>th</sup> St E to east of SD127 (4 lanes to 3 lanes)



# Advantages of 3 vs 4 Lanes



## ○ Vehicles

- Provide safe storage for left turning vehicles
- Reduce number of conflict points for left turn vehicles and vehicles entering the roadway
- Reduces Speed Differential
- Traffic Calming
- Snow Storage in Boulevards

# Advantages of 3 vs 4 Lanes contd.



## ⦿ Pedestrian

- Reduce crossing distance
- Reduce top end travel speed (traffic calming)
- Buffer sidewalk from travel lanes
- Improve Safety

## ⦿ General

- Improved Green Space
- Improved Aesthetics

# Accident Data in Sisseton

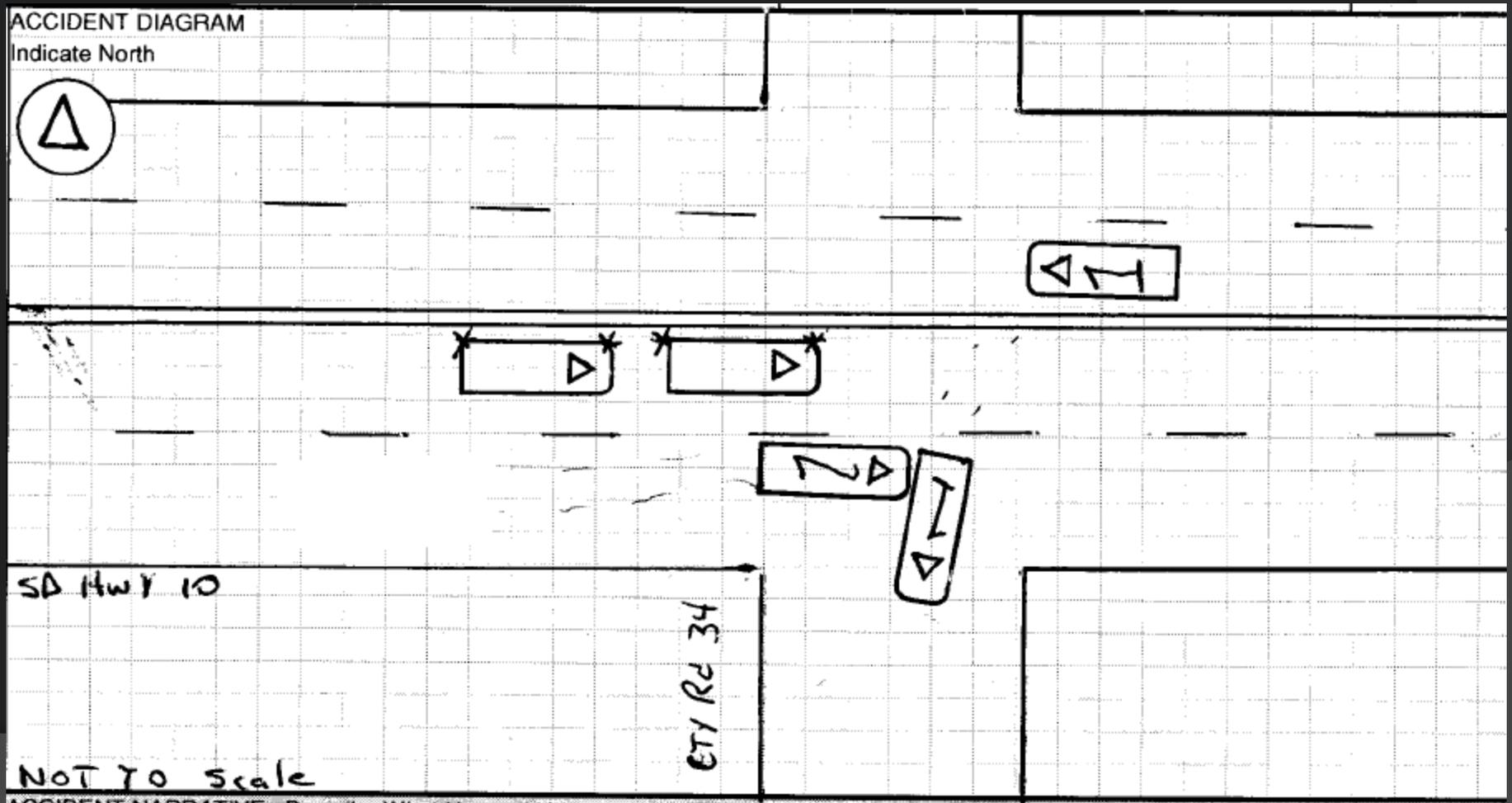
## 2010-2012



- ⦿ Weighted crash rate = 6.23 (crash rate using point system per million vehicle miles travelled)
  - Statewide average for this roadway type = 1.90
  - 36 total crashes
    - 11 Injury crashes
  
- ⦿ At a minimum, 16/36 crashes could be avoided with the 3 lane roadway
  - 5 of these were injury accidents
  - Weighted crash rate without these 16 crashes = 3.43

# Accident Reduction Types

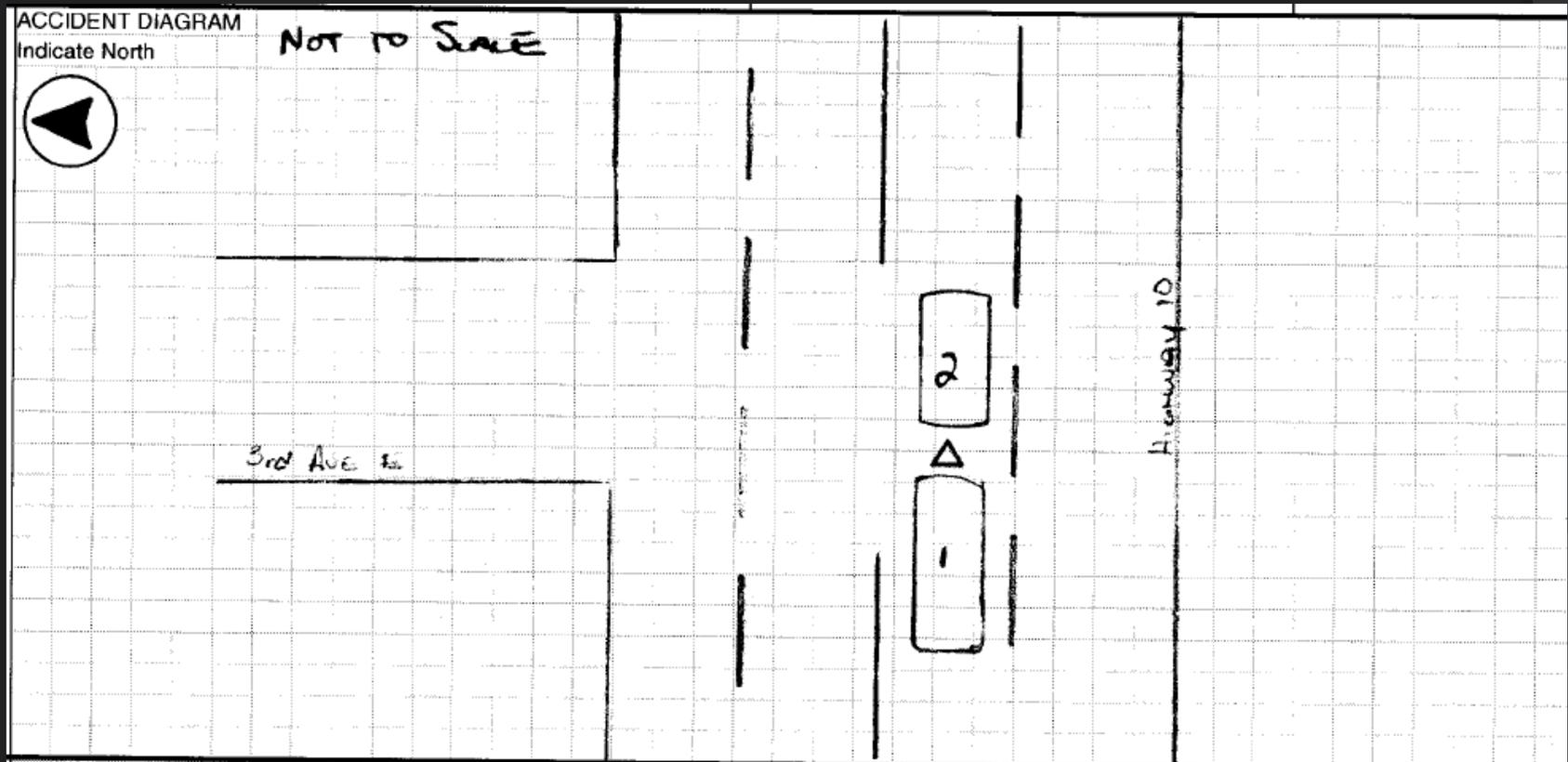
- Hidden vehicle in far lane – 3 times



# Accident Reduction Types



- Rear ending a left turning vehicle – 4 times



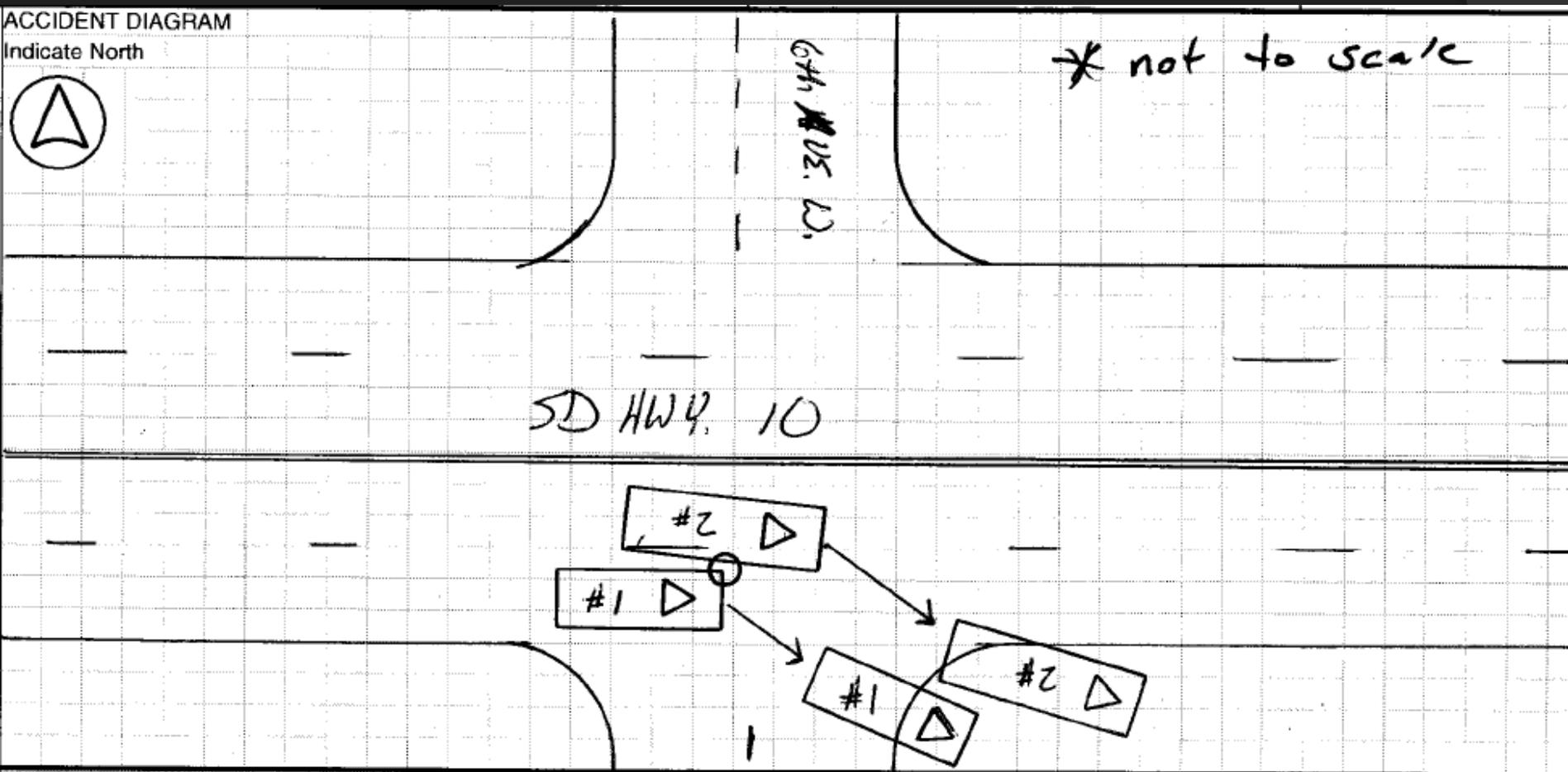
ACCIDENT NARRATIVE: Describe What Happened

VEHICLE #2 WAS AT A COMPLETE STOP PREPARING TO TURN NORTH ONTO 3rd AVENUE EAST.  
VEHICLE #1 CONTINUED STRAIGHT AHEAD IMPACTING VEHICLE #2 IN THE REAR.

# Accident Reduction Types



- Sideswipe vehicle in blind spot – 7 times



# Examples of 3 lane Sections

A photograph showing a road intersection. A school bus is stopped at a red light. There are traffic signs, including a yield sign and a circular sign with a right-turn arrow. A car is visible in the background.

- ◎ 3 Lane Section can be safe and efficient up to 20,000+ vehicles/day
  - US12 in Milbank – 8000 ADT
  - Melgaard Rd from 5<sup>th</sup> St to Dakota St in Aberdeen – 8000 ADT
  - Roosevelt St from 6<sup>th</sup> Ave to 8<sup>th</sup> Ave in Aberdeen – 8200 ADT
  - 18<sup>th</sup> St in Sioux Falls in front of Sanford – 18,000 ADT

# Milbank



- Changed from 4 to 3 lanes in 2005
- Currently has up to 8,000 veh./day
- Total accidents decreased from 99 to 37 (63% reduction)
  - 99 accidents from 2000-2002 and 37 from 2006-2008



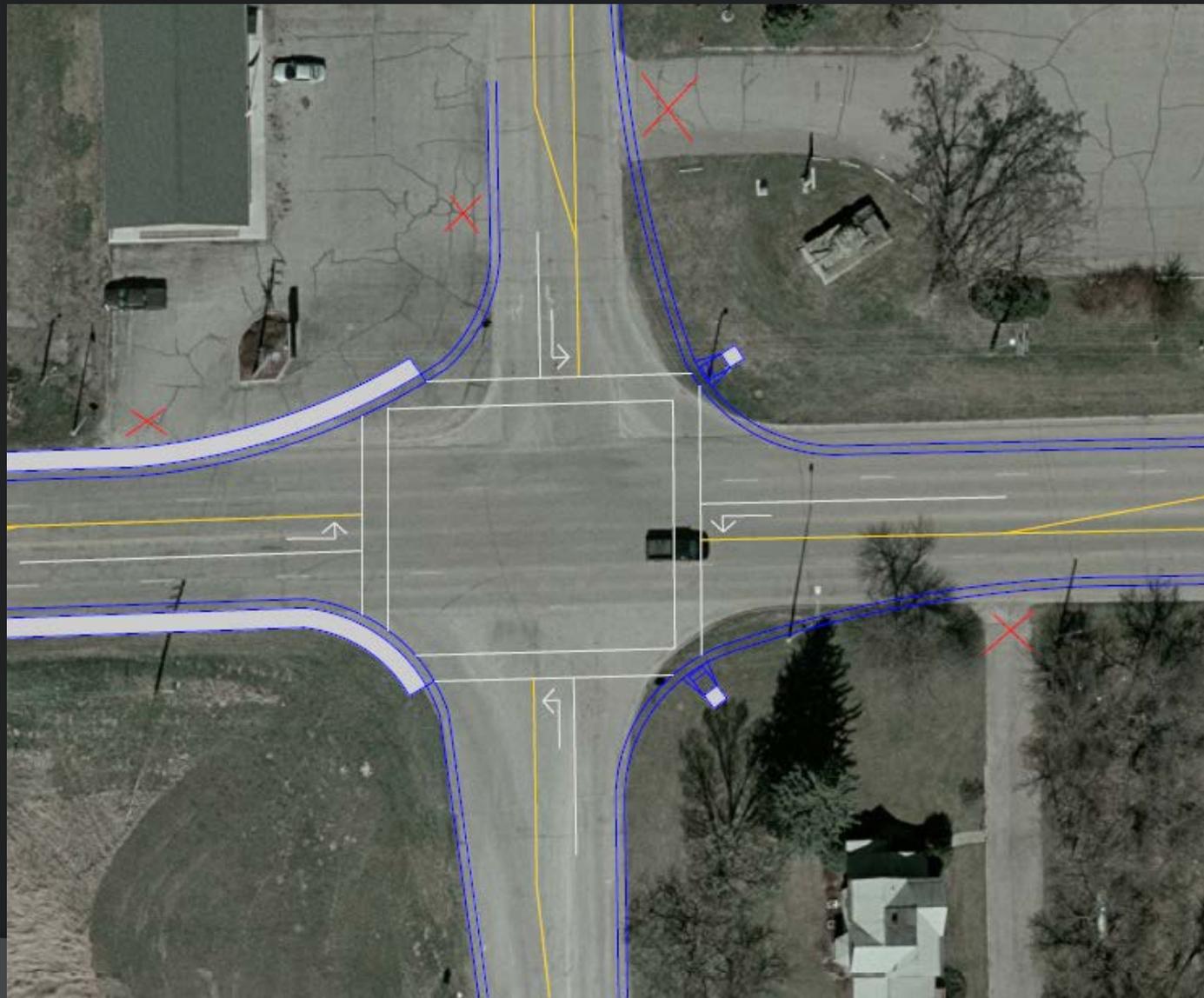
# QUESTIONS ON 4 LANE TO 3 LANE CONVERSION?

# Intersection of SD10 & 8<sup>th</sup> St E



- ◎ Traffic analysis performed
  - Existing 2 way stop controlled
    - Unacceptable level of service
  - 4 way stop controlled
    - Unacceptable level of service
  - Traffic Signal
    - Viable Option
  - Roundabout
    - Viable Option

# Signal Layout



# Roundabout Layout



# Public Opinion Survey



- ◎ Insurance Institute for Highway Safety
- ◎ Drivers' views Before Construction
  - 31% in favor
  - 41% strongly oppose
- ◎ Drivers' views After Construction
  - 63% in favor
  - 15% strongly opposed
- ◎ Reasons cited for concern:
  - Fear of the unknown
  - Safety concerns
  - Confusion on how to maneuver

# Roundabouts, New Concept?

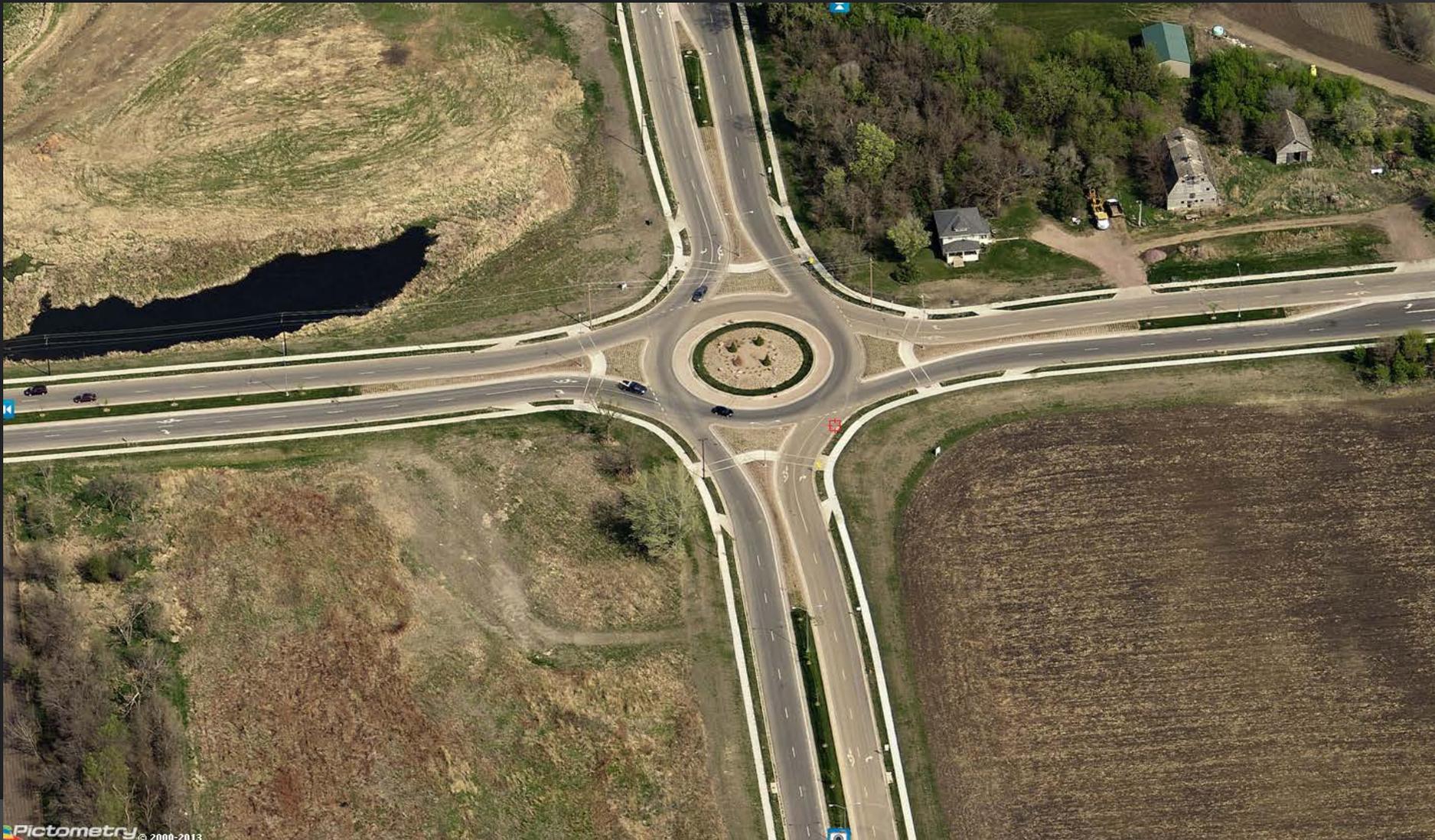


## ◎ NO

- UK has an estimated 25,000
- France has more than 30,000
- USA – By 2011, there were about 3,000, but that number is still growing

# Sioux Falls

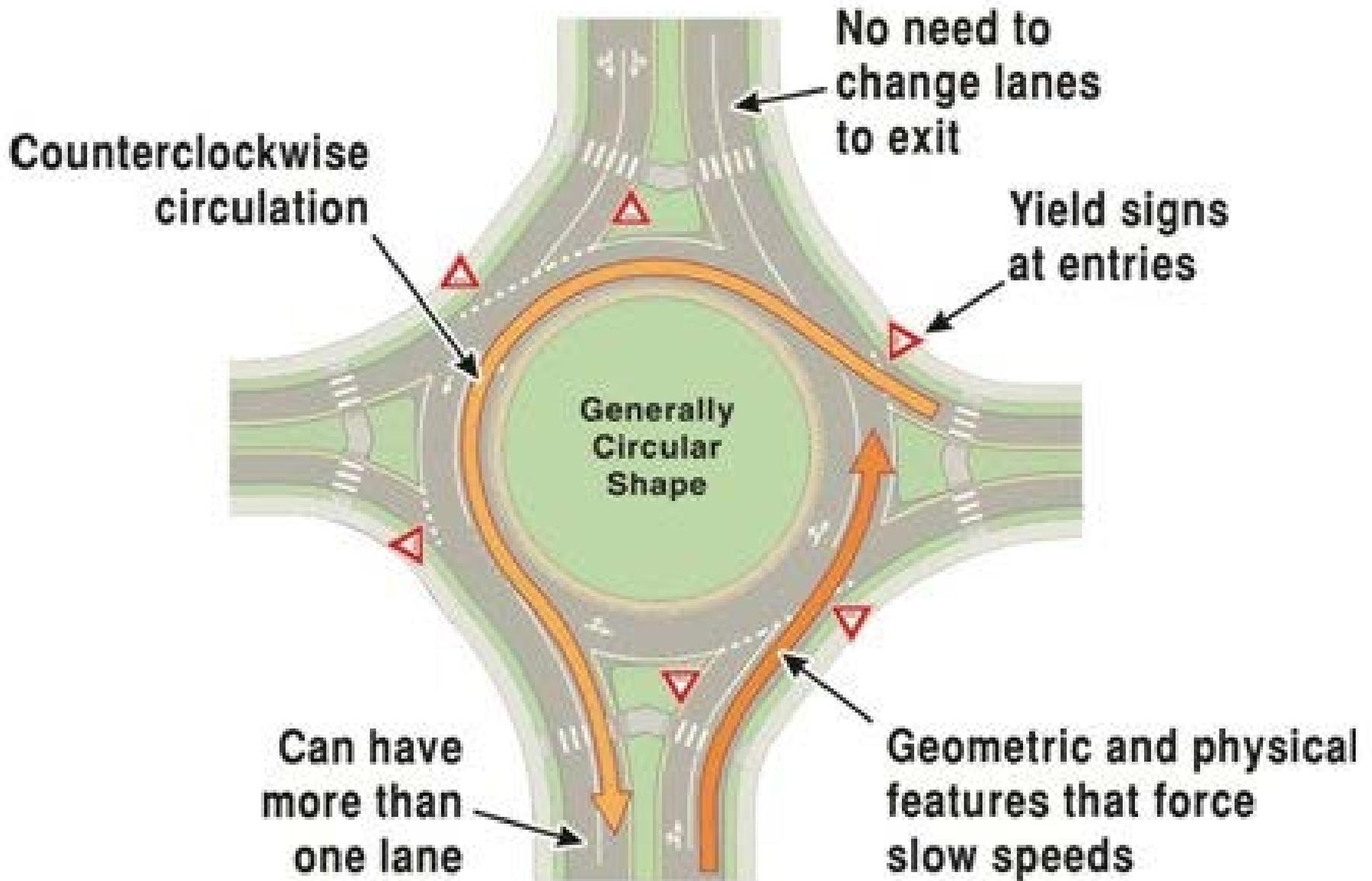
## 69<sup>th</sup> St & Southeastern Ave



# Sioux Falls

## Career Ave at University Center



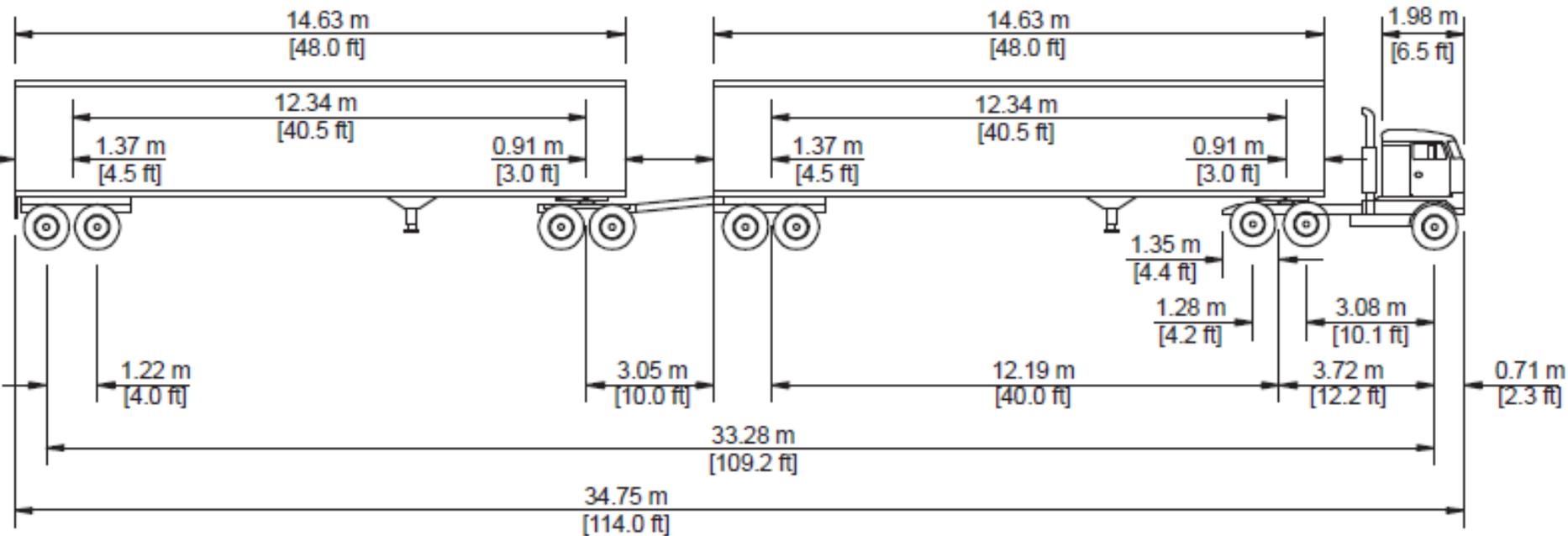


# Design Vehicle



## WB-109D

(longer than legal load without special permit)





# Pedestrians



## ◎ Peds

- Shorter crossing paths
- Consider one direction of travel at a time (1/2 of this particular design)
- Refuge between lanes (1/2 of this particular design)
- Lower vehicle speeds
  - Vehicle speeds predict both the frequency as well as the severity of pedestrian injuries.

# Bicycle Accommodations



- Shared lanes should end in advance of roundabout
- Cyclists may act as a vehicle or a pedestrian



# Emergency Vehicles



- ⦿ How do I allow emergency vehicles to get around me?
  - #1 Rule
    - Don't stop in the roundabout
  - #2 Rule
    - Don't stop in the roundabout
  - Pull over prior to the roundabout or past the roundabout to let emergency vehicles pass

# Intersection Existing Crash Data



- ◎ 5 from 2010-2012
  - 2 injury crashes
- ◎ 14 crashes since 2004
  - 6 injury crashes
  - Indicates consistency
- ◎ Predictive crash methodology (Highway Safety Manual)
  - 1.03 crash/year (lower than existing crash rate)

# Roundabout Safety Facts



- According to Federal Highway Administration Intersection Statistics
  - 90% reduction in fatalities
  - 76% reduction in injuries
  - 35% reduction in all crashes
- Single Lane Roundabouts are the safest at-grade intersection possible

# Roundabout Crash Analysis



## ● Predictive Methodology – Highway Safety Manual

- Use Existing Geometry and predicted crash numbers (1.03 crash/year)
- Crash Modification Factor – 0.61
- Anticipated crashes – 0.63 crash/year
- Compare to existing crash data - ~1.6 crash/year

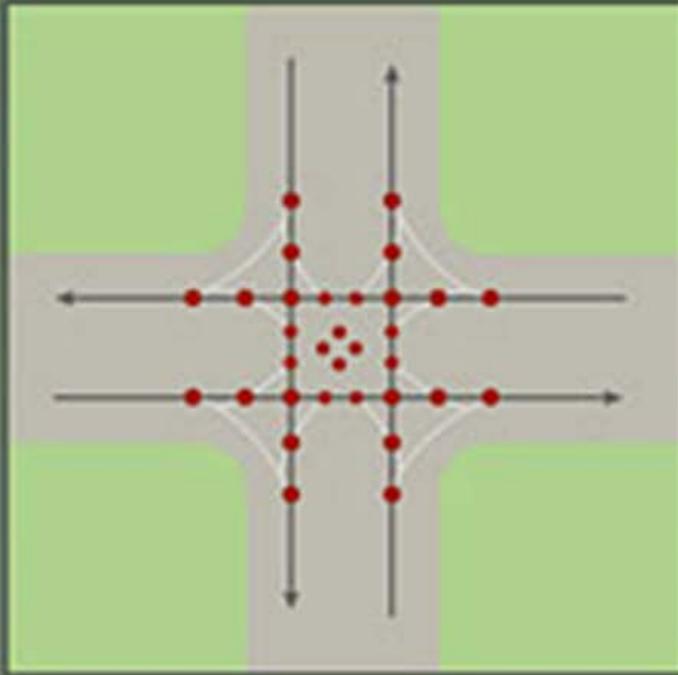
## ● Anticipate reduction to ~1 crash per year

# Crash Analysis – Sioux Falls Roundabouts

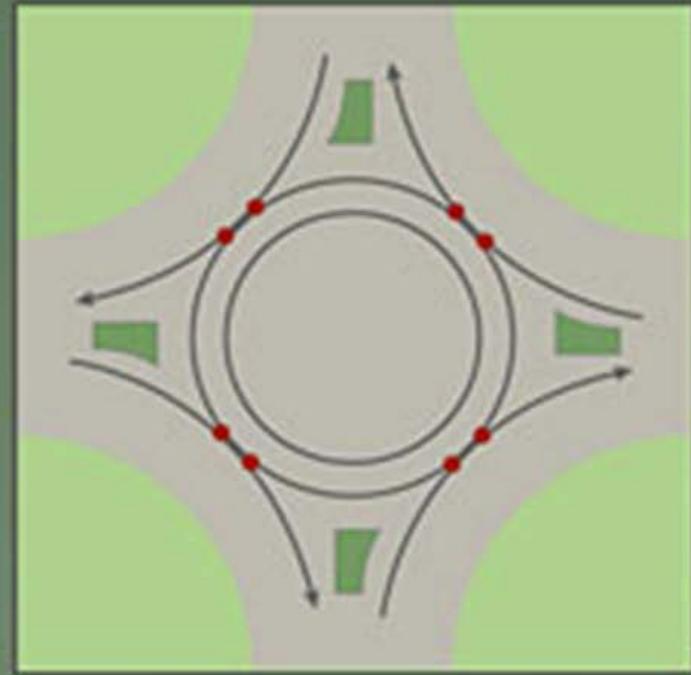


- ◎ Career Avenue University Center Roundabout
  - Opened in November 2008
  - 2,800 vehicles are entering daily
  - 0 crashes to date
- ◎ 69<sup>th</sup> Street and Southeastern Avenue Roundabout
  - Opened in August 2011
  - 4,200 vehicles are entering daily
  - 1 crash meeting State reporting thresholds to date
    - 1 single vehicle crash - DUI

With roundabouts, head-on and high-speed right angle collisions are virtually eliminated.



[ Traditional intersection ]



[ Roundabout ]

● Potential vehicle conflict point

**32 conflict points**

**8 conflict points**

# Traffic Signal Crash Statistics



- ◎ Statewide Avg – 1.0 crash/million vehicles entering
  - Sioux Falls – 0.8 crash/million vehicles entering
- ◎ 9,920 veh/day entering (existing volumes)
  - Anticipated Crashes = 3.6 crashes per year
- ◎ 11,510 vehicles/day entering (20 year ADT)
  - 20 Year Anticipated Crashes = 4.2 crashes per year

# Construction Impact Differences



# ROW Impact Differences

The background of the slide features a photograph of a road intersection. A school bus is visible in the middle ground, and a car is in the distance. Traffic signs, including a roundabout sign, are also present. The image is overlaid on a dark green background with a pattern of white chevrons pointing to the right.

- Initial ROW research indicates little or no additional ROW acquisition will be necessary.
- This is true for a signal AND a roundabout.

# Traffic Signal Advantages



- Driver expectancy
- Snow plowing easier
- Visually impaired pedestrians – easier
- LOS A
- Less ROW impacts

# Signal vs Roundabout



- ⦿ Roundabout easier for able-bodied pedestrians
  - Worry about 1 direction of traffic
  - Shorter crossing distance
- ⦿ Lower Speeds in Roundabout
  - Rarely stopped – always moving
- ⦿ Level of Service – A for both (20 yr projected ADT)
  - Avg additional delay of 2.5 sec/veh for a signal
  - 2,652 hrs/year

# Signal vs Roundabout



- ◎ Predictive Safety – minor leg stop control to roundabout
  - Benefit \$2.536M (40 yr life cycle)
- ◎ Initial Construction cost difference - \$25,000 more for roundabout (ROW not included)

# Signal Maintenance Costs

## City Expense

- ◎ Total Costs to the city of Sisseton are going to average \$3,000-\$5000 per year
- ◎ Signal Parts
  - Controller – 5 year life
    - \$3,500
  - Load Switches – 3-5 year life
    - \$350 ea – signal has 10
  - Power Source – 5 year life
    - \$800
  - Detector Units – 5-8 year life
    - \$350 – signal has 4
  - Management Malfunction Unit – 5 year life
    - \$1,800
  - On-Site technical support
    - \$2,000 service call per visit
- ◎ Electricity Costs

# Environmental, Social & Economic Concerns



## ○ Section 4(f) Property

- Project action will include all possible planning to avoid and minimize harm to publicly owned parks, recreational areas, wildlife & waterfowl refuges, or public & private historical sites.

## ○ Section 106

- Section 106 of the National Historic Preservation Act requires Federal actions to take into account the effects of project undertakings on historic properties.

## ○ Contaminated Materials

- Project undertaking will take into account contaminated soils with relation to existing aboveground and underground storage tanks within or adjacent to project's area of potential effect.

## ○ Wetlands

- Federal regulations require that unavoidable wetland impacts caused by highway construction be mitigated. If you are interested in creating or restoring wetlands on your property, please complete the Wetland Mitigation Registry Form in the handouts.

# SDDOT Preferred Alternatives



- ◎ 3 lanes of traffic
- ◎ Roundabout
  - Alternate is traffic signal
- ◎ WHY?
  - Safety
  - Operational level of service
  - Life cycle cost analysis
- ◎ SDDOT would like your input

## Website

[http://sddot.com/dot/publicmeetings/pubmeet\\_sd10sisseton.aspx](http://sddot.com/dot/publicmeetings/pubmeet_sd10sisseton.aspx)

Comments Due Fri. **April 26, 2011**

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Questions?