



# (Traffic) Engineering 201

Brett Paasch | Traffic Engineer

May 4 2017

# Old Treatments vs New Treatments

## Old

- Two-Way Stop Control
- All-Way Stop Control
- Traffic Signal
- Grade Separated Interchange

## New

- Roundabout
  - Single Lane
  - Multi Lane
- Mini-Roundabouts
- Reduced Conflict U-Turn (RCUT)

# New Tools: Mini Roundabouts



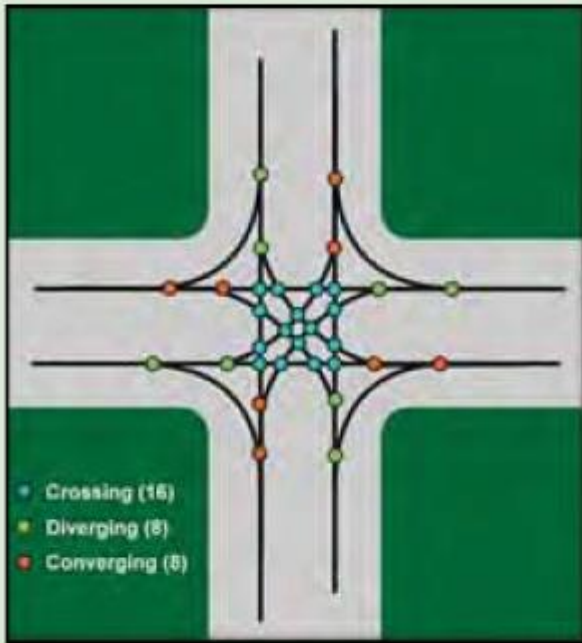
County Road 79 at Vierling Drive, Shakopee MN

- Urban areas with Limited Right-of-Way
- Completely traversable

# New Tools: Mini Roundabouts



*For Vehicles*

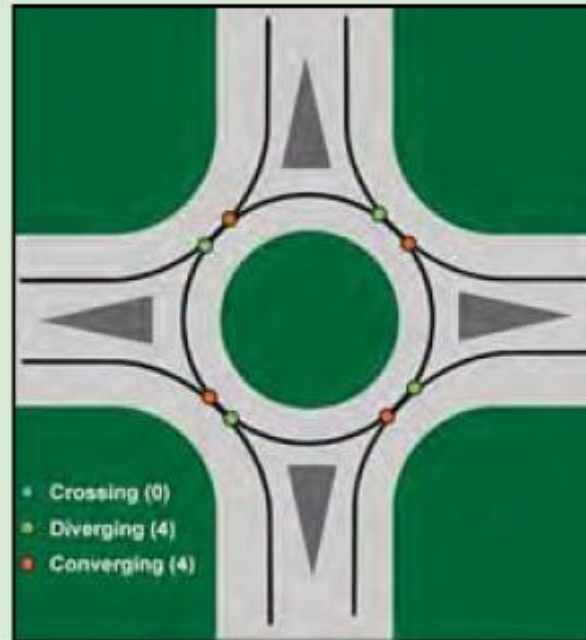


- Crossing (16)
- Diverging (8)
- Converging (8)

*32 Conflict Points*



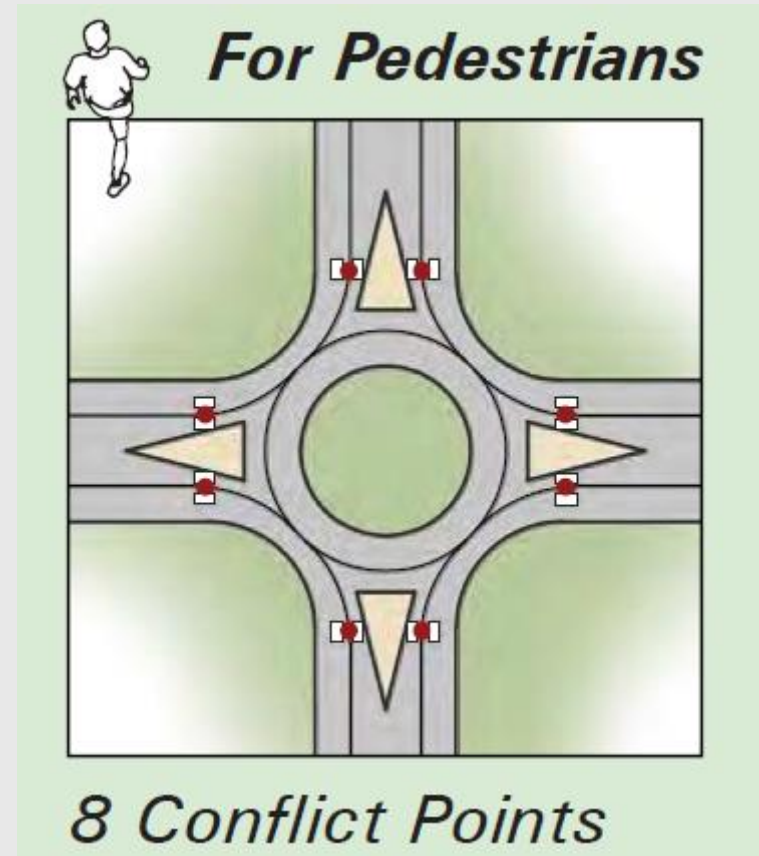
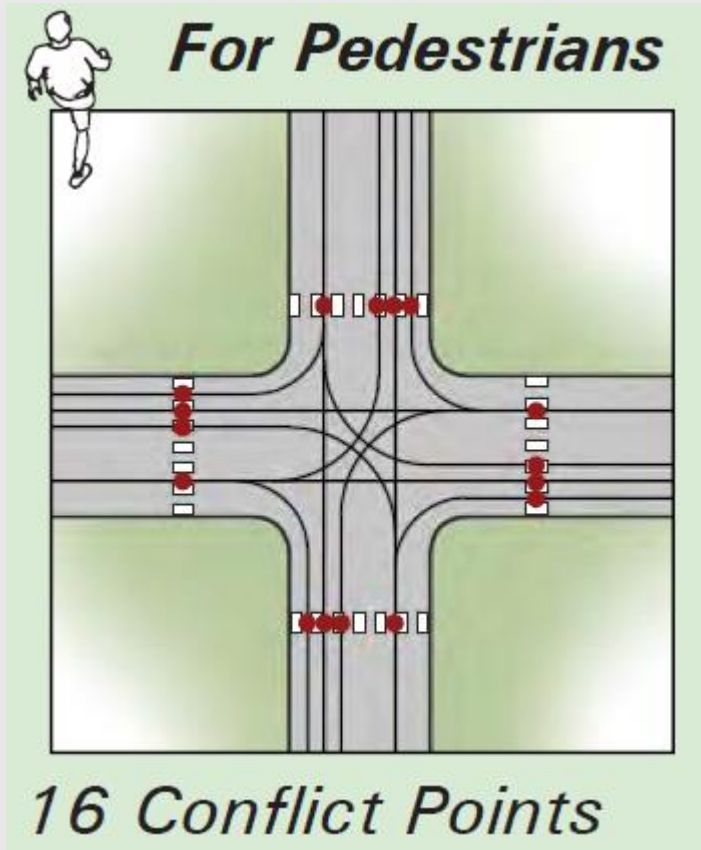
*For Vehicles*



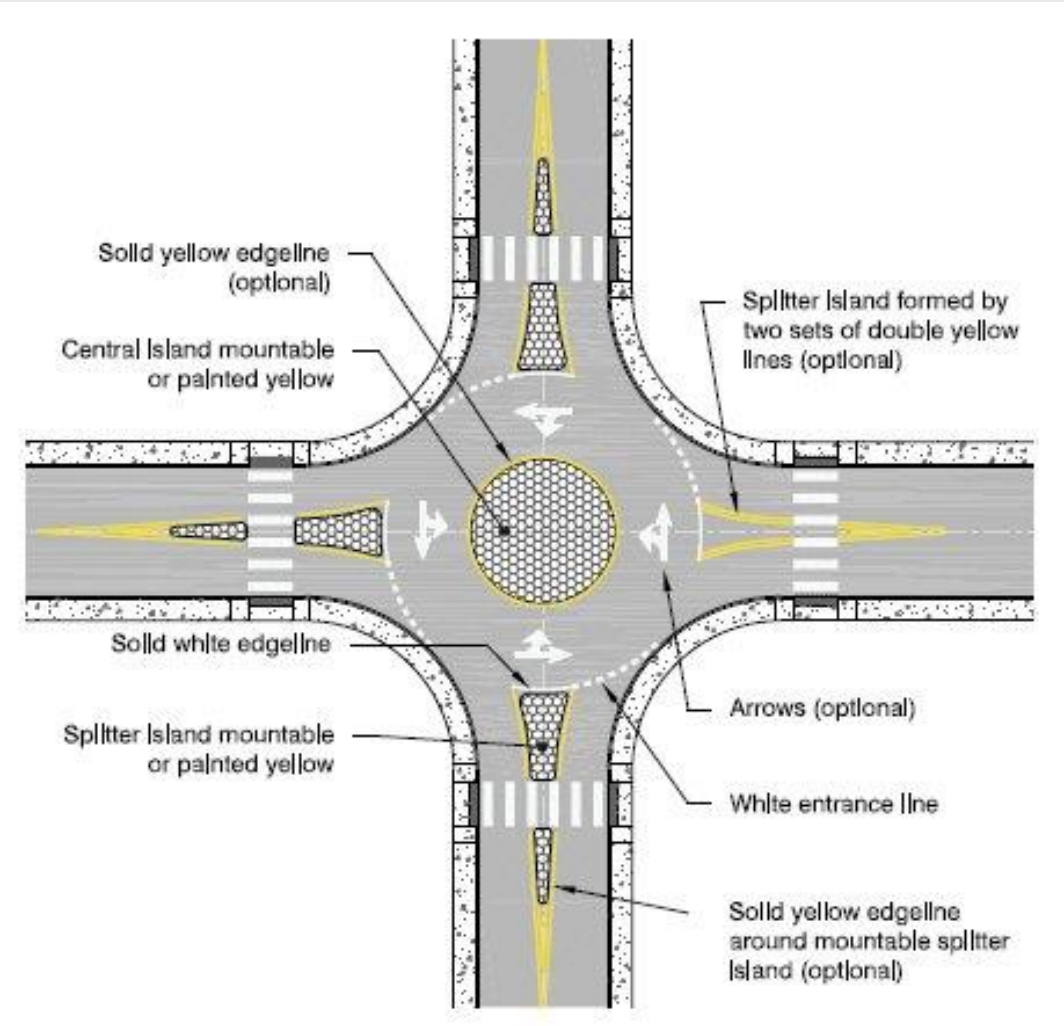
- Crossing (0)
- Diverging (4)
- Converging (4)

*8 Conflict Points*

# New Tools: Mini Roundabouts



# New Tools: Mini Roundabouts

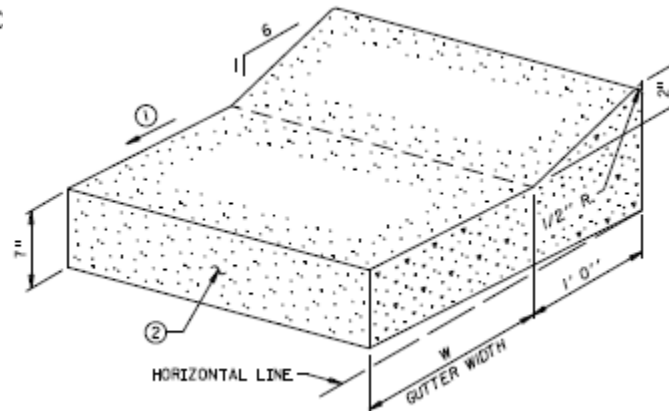
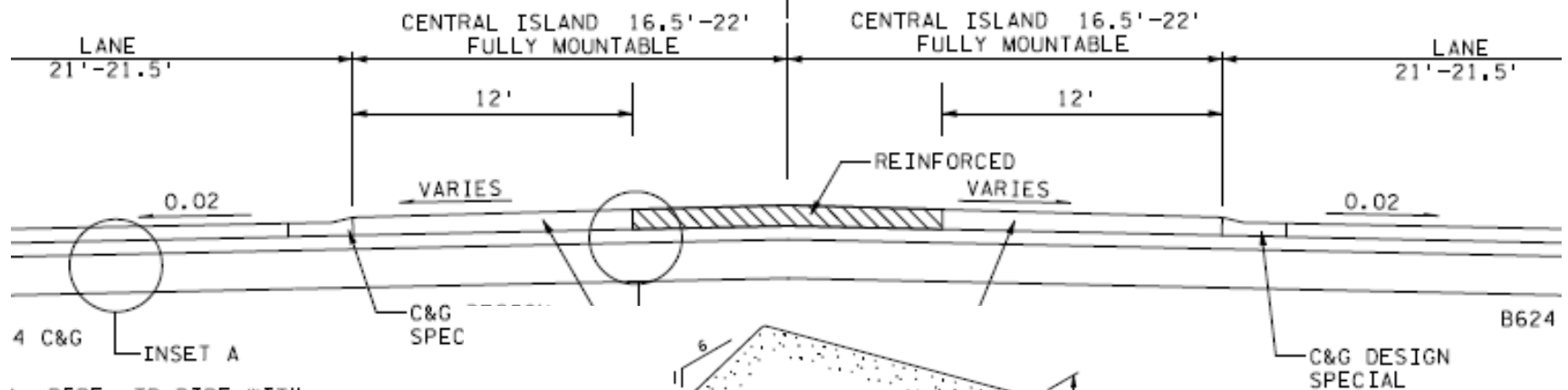


# New Tools: Mini Roundabouts

## PROPOSED TYPICAL SECTION - ROUNDABOUT

STA. 146+32, STA. 149+97

€ TH 4 / 1ST AVE. S. AND 7TH ST. S.



# New Tools: Mini Roundabouts



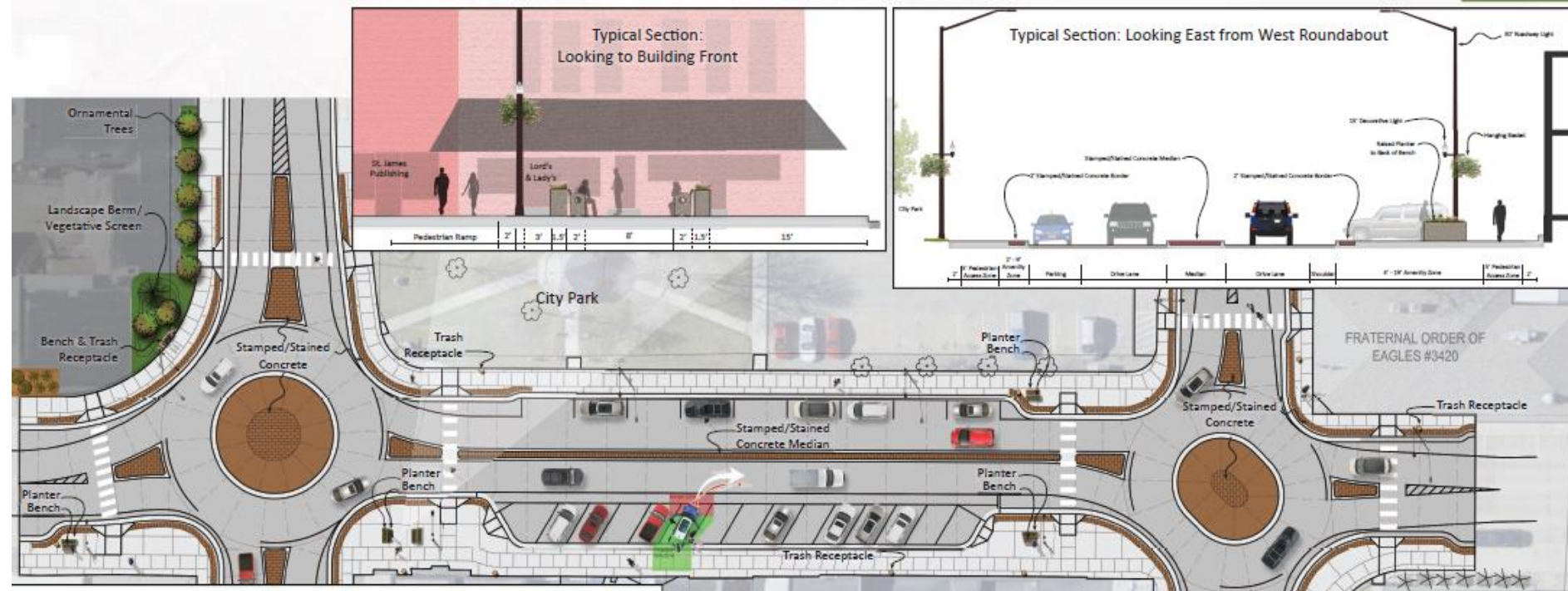


# New Tools: Back-In Angle Parking

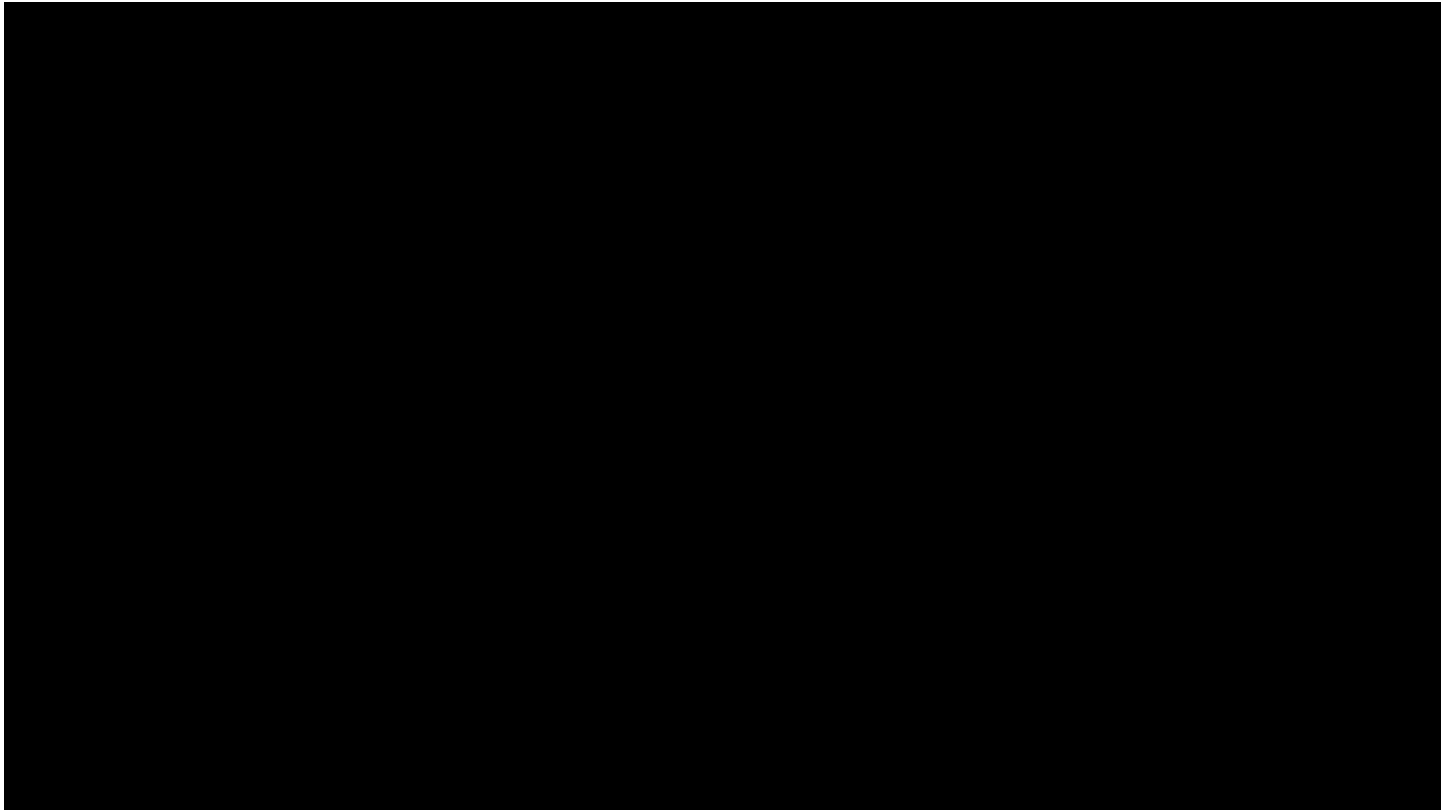
- Eliminates blind backing
- Protects cyclists from car doors
- Increases parking capacity



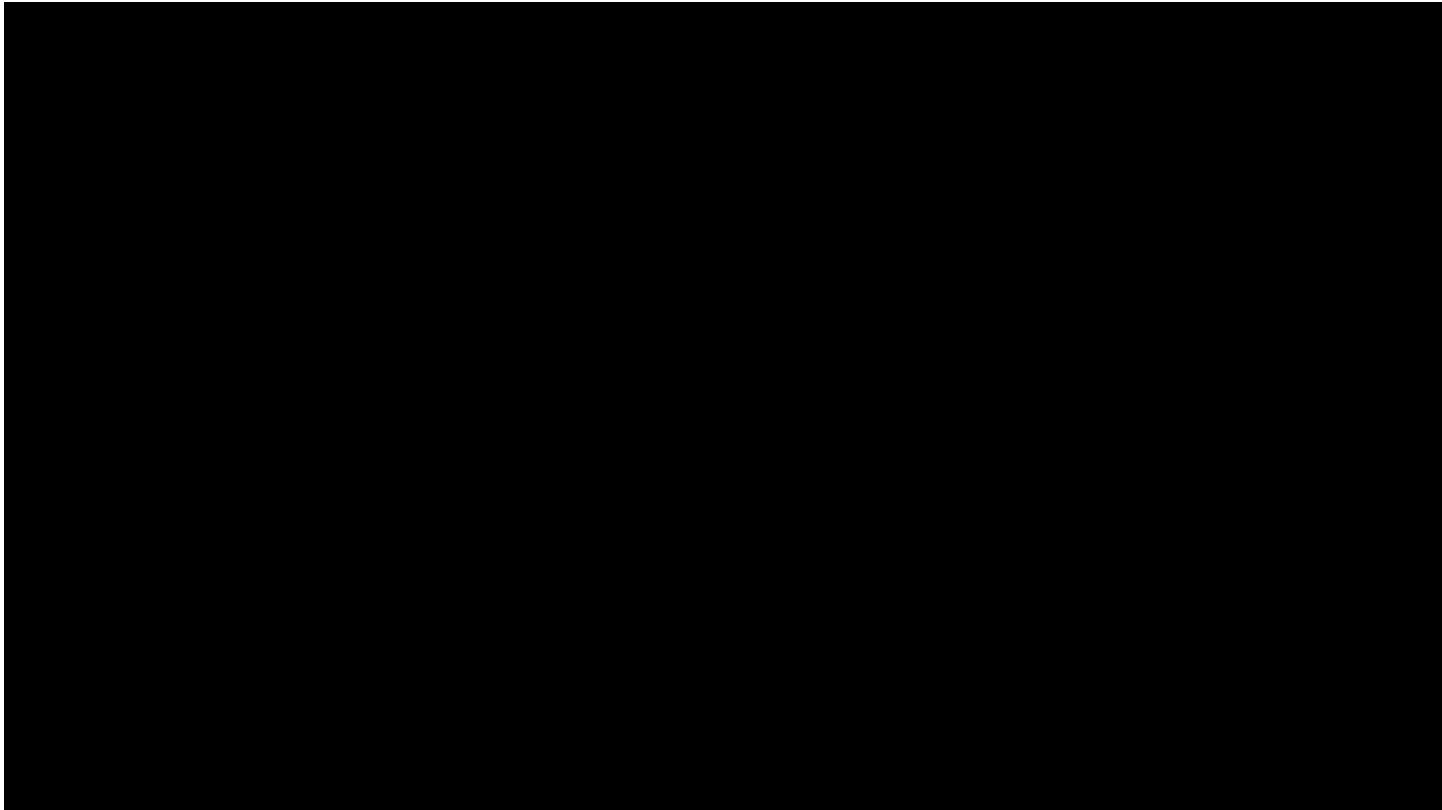
# New Tools: Back-In Angle Parking



# New Tools: Back-In Angle Parking



# New Tools: Back-In Angle Parking



# New Tools: Reduced Conflict U-Turn (RCUT)



## ► Current D7 Locations:

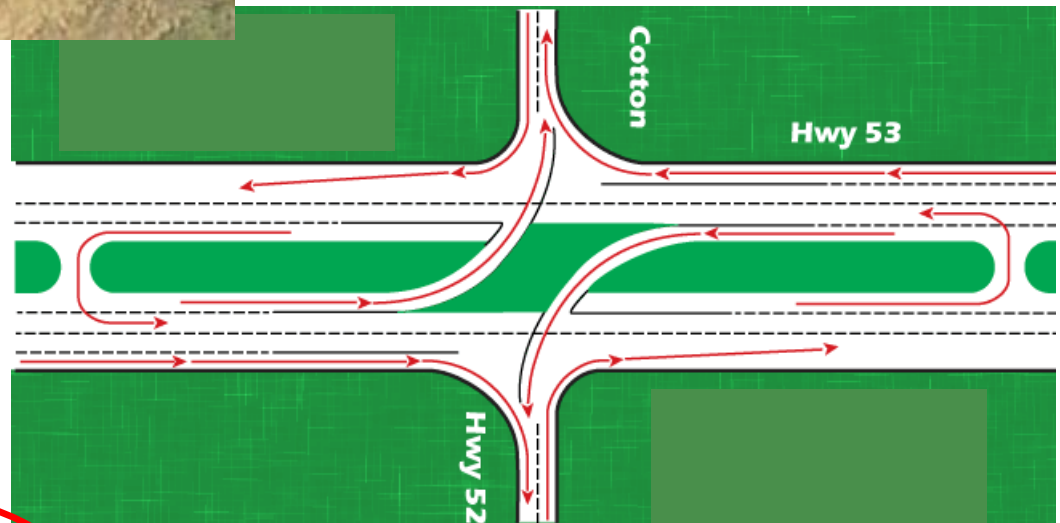
- US 169, Saint Peter
  - TH 22 (North JCT)
  - St. Julien Street
- US 169 & Le Sueur CR 28
- US 14 & Blue Earth CR 17

## National Experience:

- Fatal Crashes: -70%
- Injury crashes: -42%
- Alternative to interchanges

## MN Experience:

- Fatal Crashes: -100%
- Injury Crashes: -50%



# New Tools: Reduced Conflict U-Turn (RCUT)

- *Q: Why are we putting raised concrete medians and pork chops in RCUTs? It causes drifting in open areas and makes more work when it comes to snow removal because they need to be cleaned off.*

- *A: To keep motorists honest.*

*It's more work, but RCUTs are saving lives!*



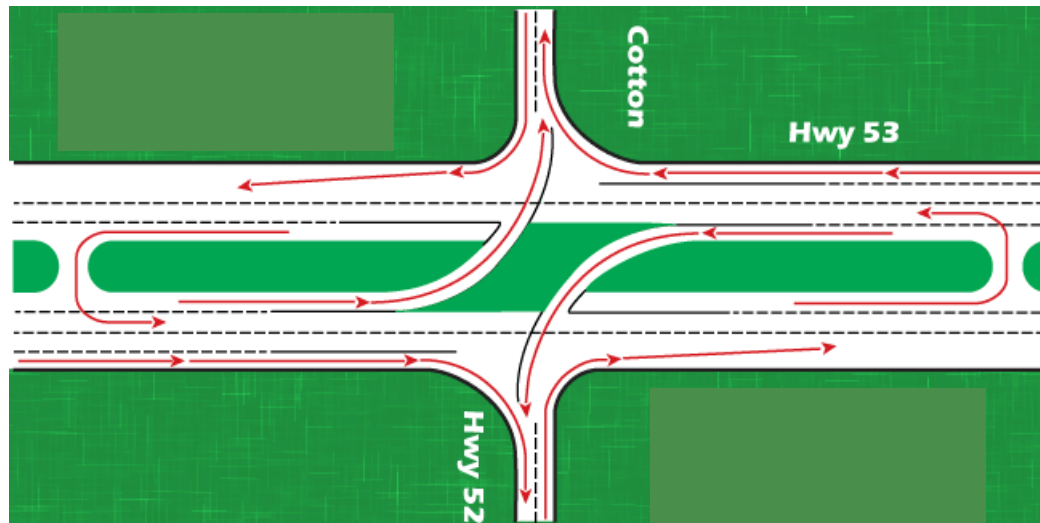
# New Tools: Reduced Conflict U-Turn (RCUT)

- *Q: RCUTs make motorists turn right, cross at least two lanes of traffic in a very short distance, then turn left into traffic that is usually doing at least 65 mph*
  1. *How is that safer than using a normal cross over?*
  2. *Especially for loaded semis?*

# New Tools: Reduced Conflict U-Turn (RCUT)

## 1. *How is that safer than using a normal cross over?*

- Breaks crossing/left turns into two steps
- Changes crashes from T-bone to rear end or sideswipe





# New Tools: Reduced Conflict U-Turn (RCUT)

## 2. *Especially for loaded semis?*

Studied by Iowa State for MnDOT:

- Trucks not over-represented in RCUT crashes
- Increases truck exposure by ~2 seconds but...

Exposure time is broken into two stages

- Prevents trucks storing in median (reduces evasive maneuvers)



# Old Tool vs. New Tool: Rumbles & Mumbles

## Rumbles

- Corrugated pattern
- Nuisance noise
- D7 Standard

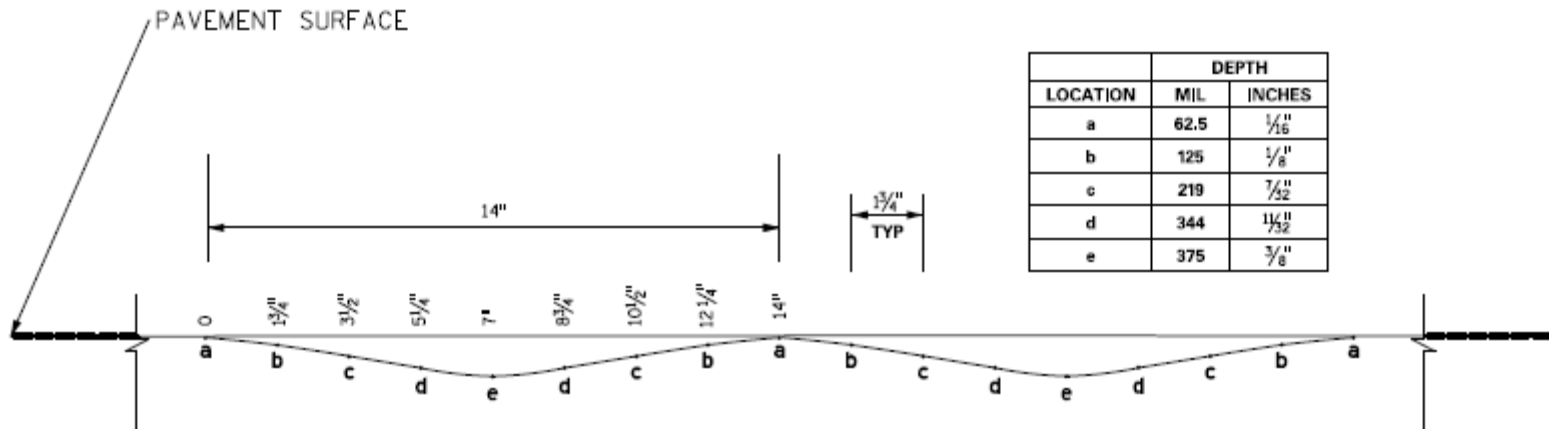


## Mumbles

- Sinusoidal pattern
- Reduced outside noise
- Noise-sensitive areas only



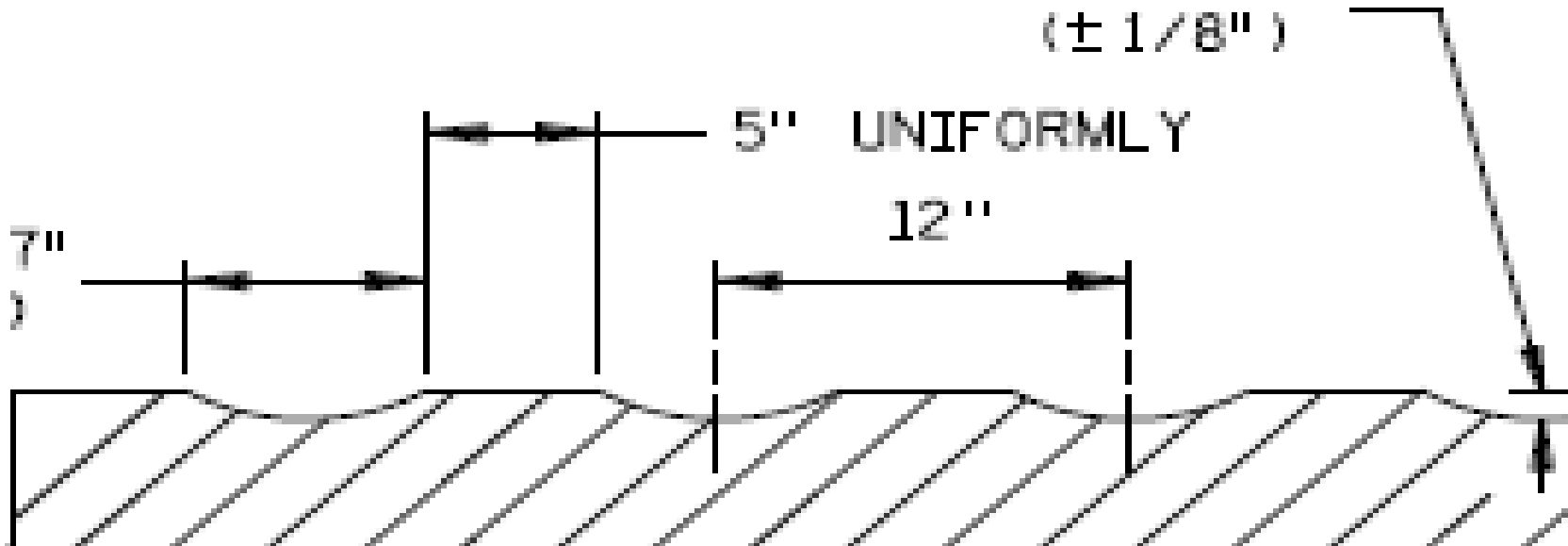
# Old Tool vs. New Tool: Rumbles & Mumbles



DEPTH  $\frac{3}{8}$ "  
( $\pm \frac{1}{8}$ " )

5" UNIFORMLY  
12"

WIDTH 7"  
( $\pm \frac{1}{2}$ " )



# New Tool: Centerline Tube Delineators



## Interim Safety Project:

Tube Delineators with 8' Buffer from Nicollet to North Mankato

### Results:

- 100% Reduction in Severe Crashes
- 80% Reduction in All Injury Crashes
- 78% Reduction in Cross/Median Crashes
- 38% Reduction in All Crashes

# Q&A – Traffic Calming

- Q: *How is the paint going out on the east leg on the Madison Avenue Roundabout supposed to be traffic calming? (All those painted rectangles)*
- A: Optical speed bars

# Q&A – Traffic Calming

Eastbound:



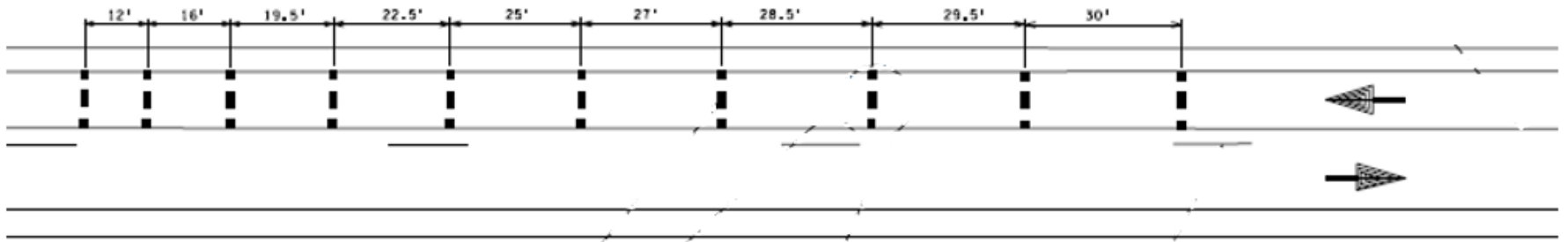
Westbound:



# Q&A – Traffic Calming

- Q: *How is the paint going out on the east leg on the Madison Avenue Roundabout supposed to be traffic calming? (All those painted rectangles)*
- A: Optical speed bars
  - Used where motorists should reduce speed
  - Space between bars should decrease (4 bars/sec.)
  - Effectiveness? Inconclusive.
    - 0 to 5 MPH reduction

# Q&A – Traffic Calming





# Thank you!

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