



# Age Well – Drive Well

## Engineering our Highways for Older Drivers in Minnesota

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# Statistics

- Older drivers are over-represented crashes
  - Approx. 50% of all fatal crashes involving a driver 80 years or older occur at intersections
  - Compared to 23% for drivers 50 or less
  - Older drivers were involved in only 8% of all traffic crashes in 2011 but accounted for 21% of the traffic fatalities.





# Factors that affect Older Drivers and Their Safety





# Physical Changes

- Strength
- Flexibility
- Range of motion



# Vision Changes

- Visual acuity
- Contrast sensitivity
- Glare sensitivity



# Cognitive Changes

- Working memory
- Selective attention
- Processing speed





# Some Engineering Solutions





What is good for older drivers is generally good for all drivers.





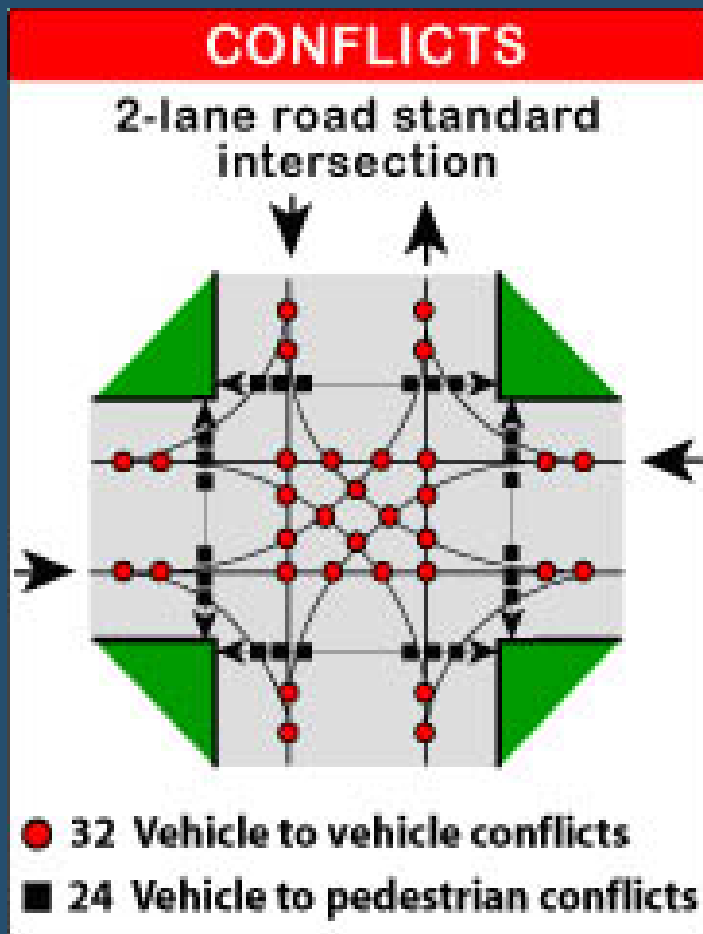


# Specific Focus Areas

- Reduce Opportunities for Crashes (Intersection Conflict Points)
- Make the Turning Movement Easier
- Increase Intersection Recognition
- Increase Sign Visibility
- Improve Contrast
- Improve Signal Systems



# Reducing Conflict Points





# Solution:

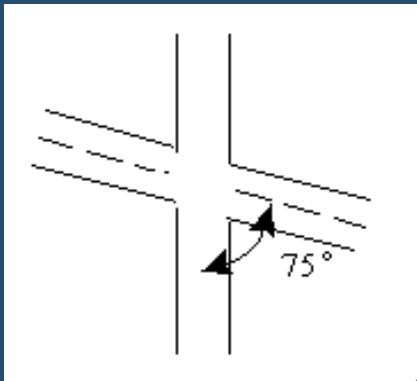
## Make the Turning Movement Easier

Anything you do to simplify the operation of an intersection, *particularly the demands on left-turn traffic*, is an elderly mobility countermeasure.

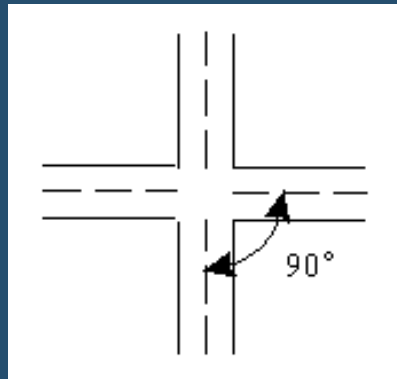


# Realign skewed intersections

Before



After





# NCHRP Report 572- Roundabouts in the US (2007)

Intersection Type	Change in Total Crashes after Conversion	Change in Severe Injury after Conversion
All Four-Way Intersections	<b>-35%</b>	<b>-76%</b>
Signalized urban	<b>SIMILAR</b>	<b>-60%</b>
Signalized Suburban	<b>-67%</b>	<b>TOO FEW</b>
All-Way Stop Controlled	<b>SIMILAR</b>	<b>SIMILAR</b>
Two-Way Stop Controlled Urban	<b>-72%</b>	<b>-87%</b>
Two-Way Stop Controlled Suburban	<b>-32%</b>	<b>-71%</b>
Two-Way Stop Controlled Rural	<b>-29%</b>	<b>-81%</b>





# Solution: Intersection Recognition



# Intersection Recognition

- Flasher beacons on signs



# Rural Intersection Lighting







# Advance street name signs





# Solution: Increased Sign Visibility



# Increased Sign Visibility

- Larger Signs
- Open Lettering Study



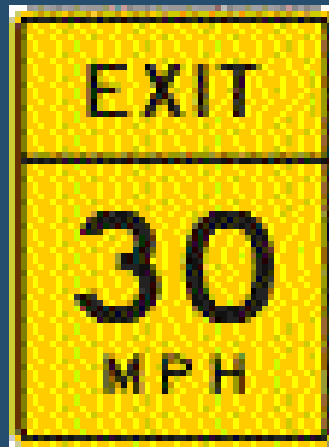
# Retroreflective Signs

- Brighter signs
  - Prismatic sheeting that returns nearly twice as much reflected light



# Use of Color

- Use fluorescent yellow or fluorescent yellow-green for ALL yellow signs



# Identify Curves

- Use chevrons to delineate curves.





# Solution: Improve Contrast





# Improve Contrast

- Rumble stripes







# Improve Contrast

- Contrast markings



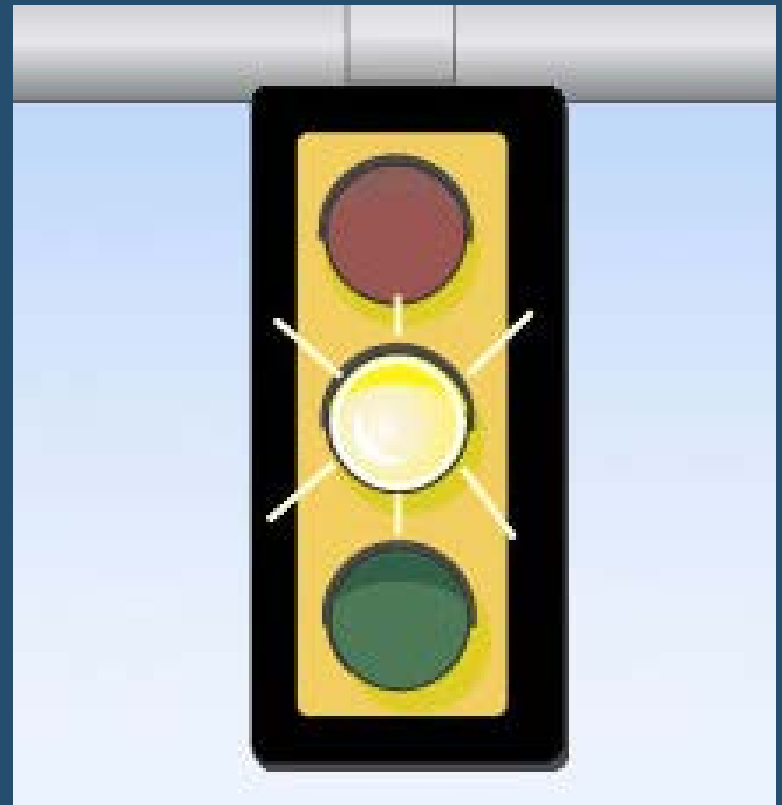


# Solution: Signal Improvements



# Signal improvements

- LED signals
  - Brighter than incandescent bulbs
- Background shields
  - Easier to see in cluttered environments
- Left turn signal phases
  - protects left turners from opposing traffic
- All-red clearance intervals
  - Extra time to insure the intersection is clear



# Signal improvements

- 12" Lens
- Mast arms instead of span wire
- Supplemental signal heads
  - always 2 signal indications for left turn





# Questions ?





# Contact Information

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