

National Best Practices

Designing and Operating Roads for Older Drivers

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Percent of State Population 65 or older:

1. Florida	18%
2. Pennsylvania	16%
3. West Virginia	15%
4. Iowa	15%
5. North Dakota	15%

MT - 13%
SD - 14%
WY - 12%

Older drivers (65+) involved in fatal crashes

1. Florida	563
2. California	459
3. Texas	413
4. Pennsylvania	294
5. Georgia	267
6. New York	231
7. Illinois	222
8. North Carolina	219
9. Ohio	215
10. Tennessee	194

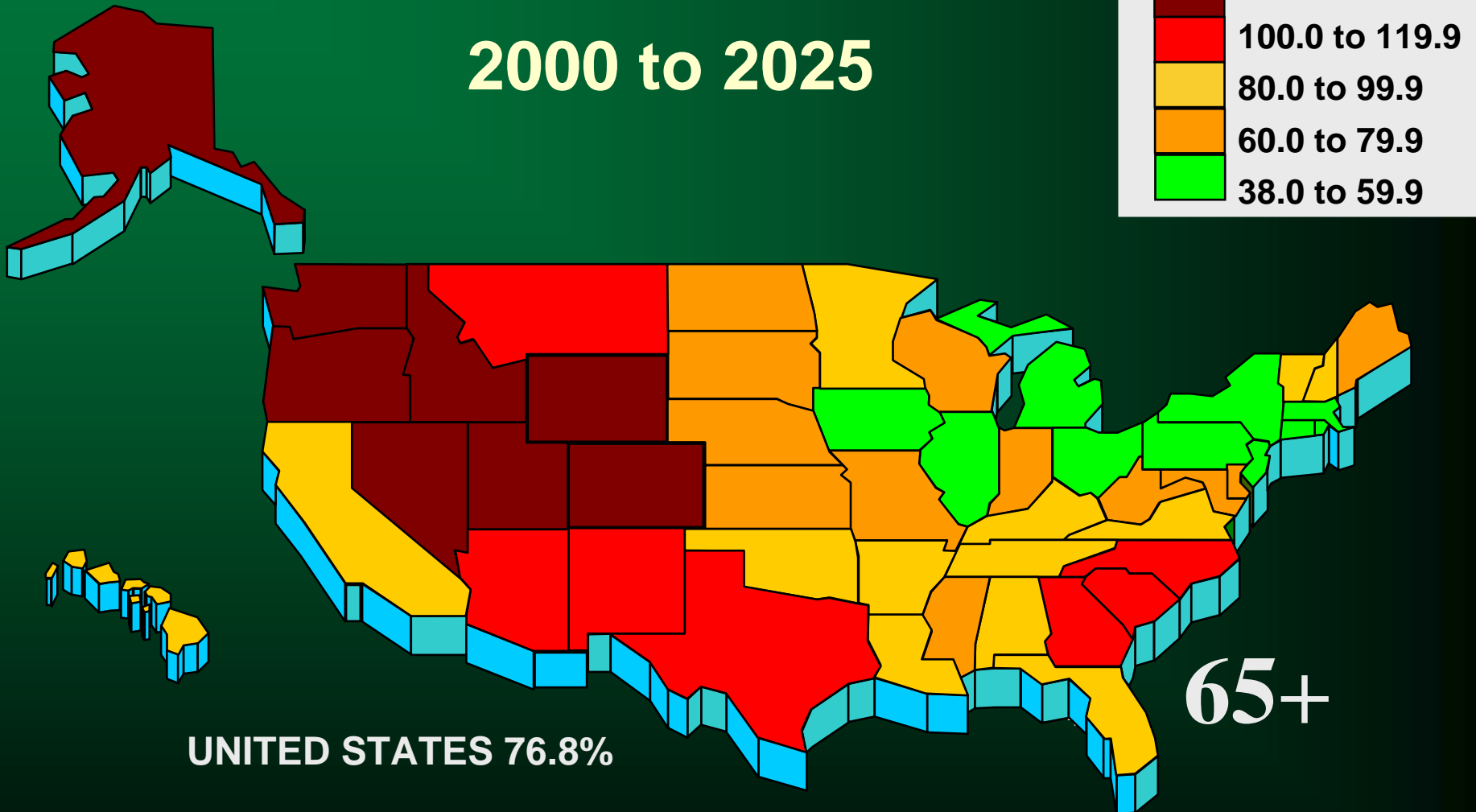
MT - 32

ND - 19

SD - 25

WY - 26

Percentage Increase in Elderly Population: 2000 to 2025



Aged Diminished Capabilities

- VISION
- PHYSICAL MOVEMENT
- COGNITIVE

Aged Diminished Capabilities

Visual Acuity

Cap/ lower case
8" letters

Ability to read signs

all caps
4" letters



Diagrammatic Sign

Current
MUTCD



DOT evaluating: N. Dakota, Michigan

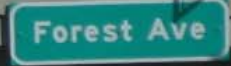


Clearer Lettering

**Font makes a
difference**

Series E Modified

Clearview



Michigan: Side-by-Side Comparison



2004: TX - all guide signs

PA - freeway signs (Maint Dept)

2005: MI, VA, AZ, MD, KY, IA

2006-07: AK, OK, WY, AL, AR, IL, NY, OH, WI ++

Cardinal Direction - Enlarge first letter

WEST

EAST

WEST

EAST

EAST

WEST

WEST

EAST

EAST

WEST

WEST

EAST

EAST

WEST

MUTCD requirement since 1997

Bigger Signs



Mississippi DOT
2004 program

Larger lettering - FWY

MUTCD Std
16" / 12"

20" / 15"
Legend



Maryland DOT - Larger Copy at the decision point

Street Name Signs:

large lettering
upper / lower case



Rochester Hills
MI

12 Inch Blades
9 Inch lettering

Brighter Sign Sheeting

FREEWAY ENDS
SIGNAL AHEAD

Jefferson Ave
EAST
EXIT ↓ ONLY

14 FT. 6 IN.

Monroe Ave

Fluorescent
Yellow

High Intensity
Yellow

Fluorescent
Yellow

All signs newly erected

Michigan: Side-by-Side Comparison

Fluorescent Yellow Signs



All signs - TX, MI, IA

Some signs - MD, OK, PA, VA

Also: AK, CO, **MT**, NY, **SD** ...

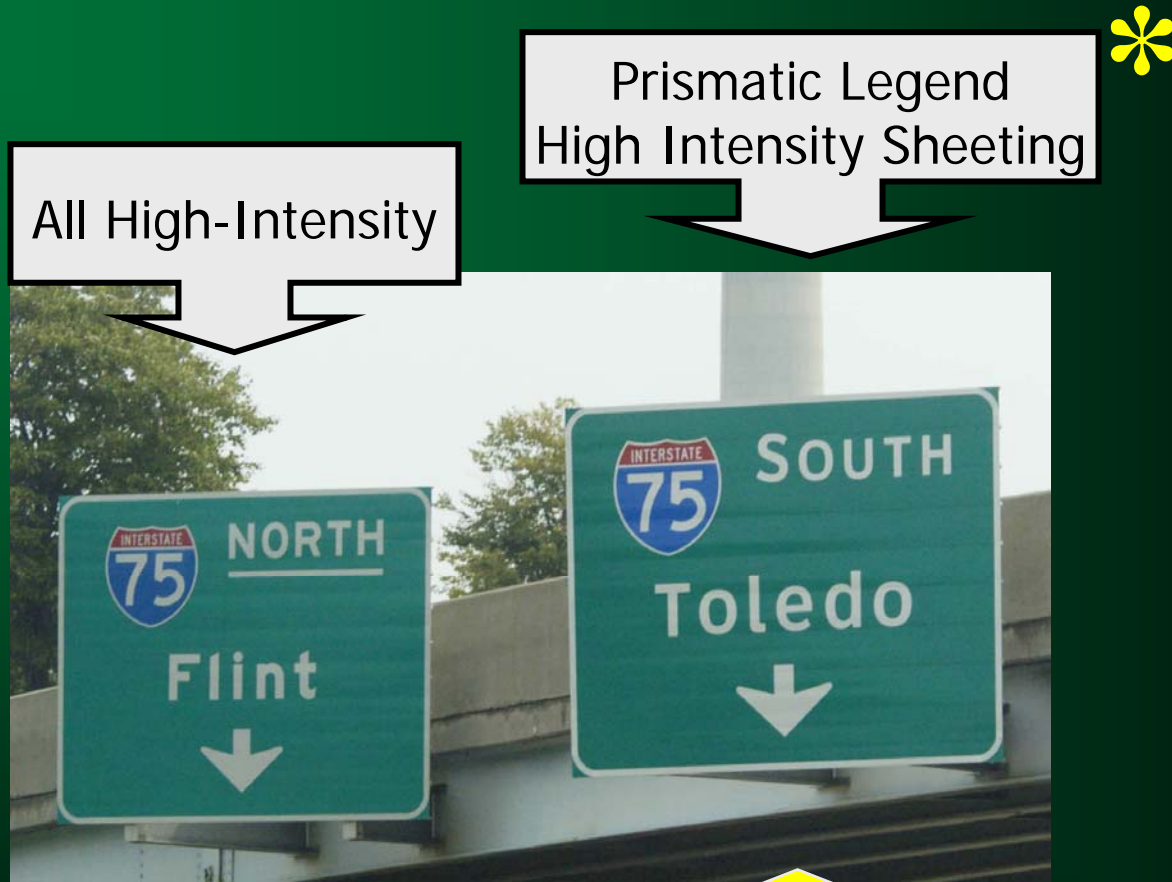
Fluorescent Orange Sheeting



State DOTs using:

VA (1992), TX, NC, NY, MI, AK, CO, **MT**, DC, MO, **SD**, KY...

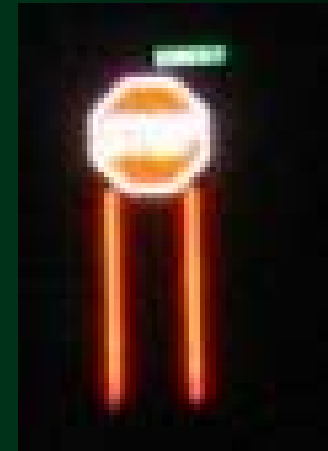
White Prismatic Sheeting on Guide Signs



Current
national
practice

PA, NH, TX, KY, MI, AK, CO, MT, MO
ID, WY, VA, AR, SD, WV ...

Reflective Sheeting on sign supports



MI



Ingham County, MI:

- 2-way to 4-way Stop conversions
- remove sheeting after two years

Lower Mounting Height – WRONG-WAY & DO NOT ENTER



CA wrong-way crashes:

Down from 60 /mo. to 2 /mo.
at 90% of locations

States using this strategy:

CA, ID, VA

Flasher beacons on signs – replacing overhead flashers



Minnesota DOT:

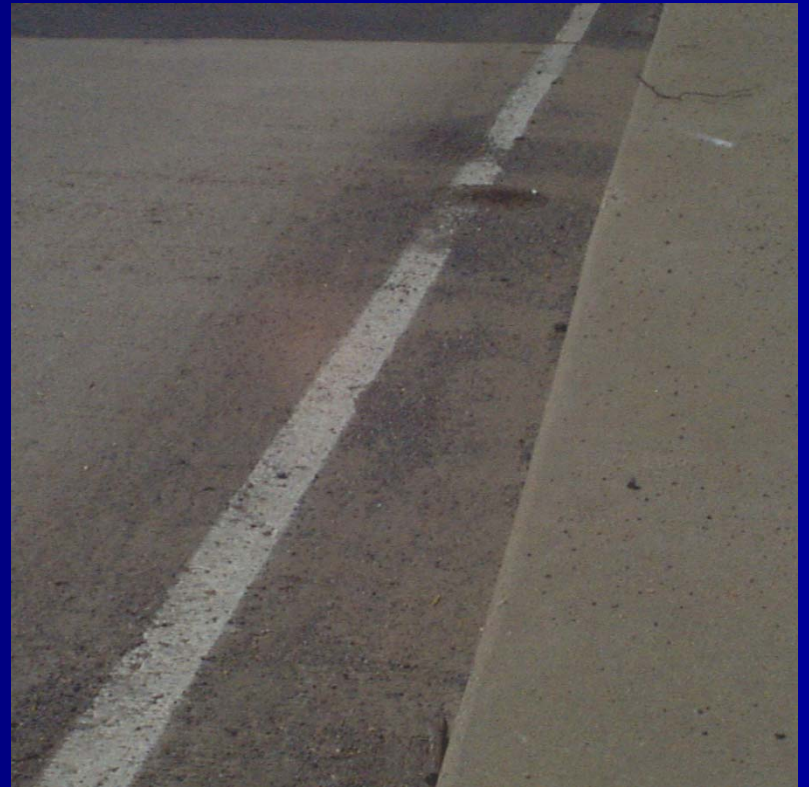
Approx 30 intersections, since 2000

Aged Diminished Capabilities

Contrast Sensitivity

Detectiion in low light:

- curbs, edge of road
- lane lines
- pedestrians



Delineate islands



States that paint nose of islands:

**Center and channelizing islands – AK, IA
Center islands - WI**

Wider lines: 8-inch



Nevada DOT - all freeways

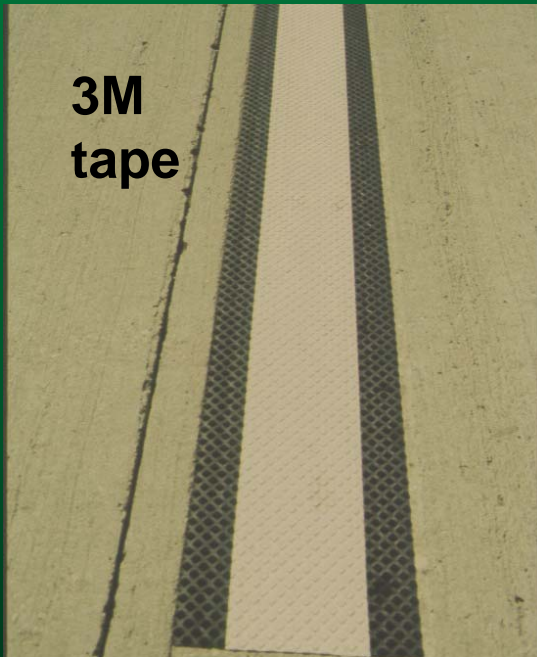
SD - 2-lane roads with narrow shoulder

6-inch lines



22 State DOT's and 6 Toll Roads
routinely use 6" longitudinal lines

Contrast Pavement Markings on concrete pavement



WisDOT: 300+ miles



Penn DOT: 100+ miles

VA – on all concrete pavement

TX - all concrete pavement within Houston ring road



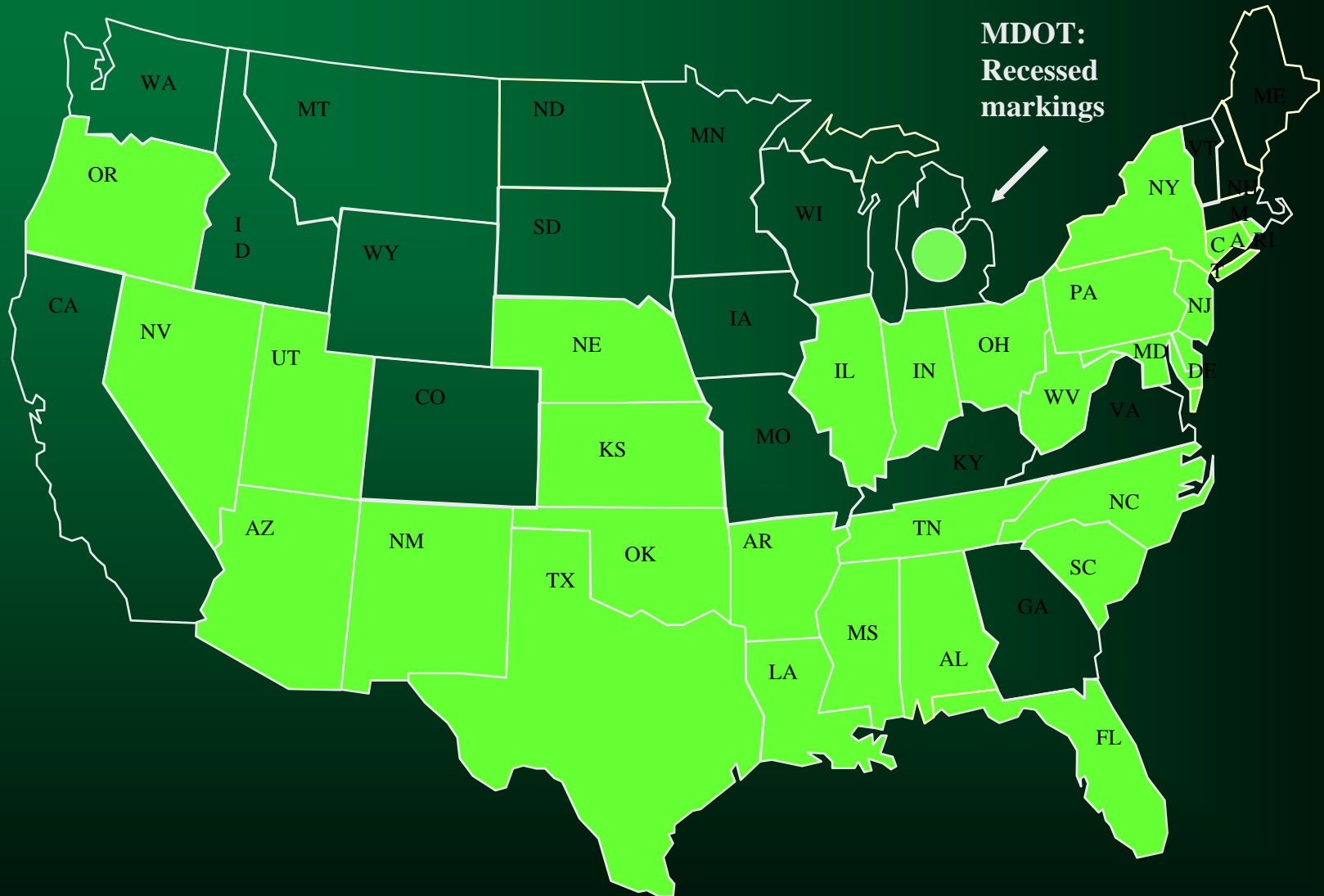
**Make a Line that
Works on a Wet
Night**

Over-sized Glass Beads



Markings that contain large beads will perform well at night under normal film of water, and up to slight drizzle

Large Bead STATES

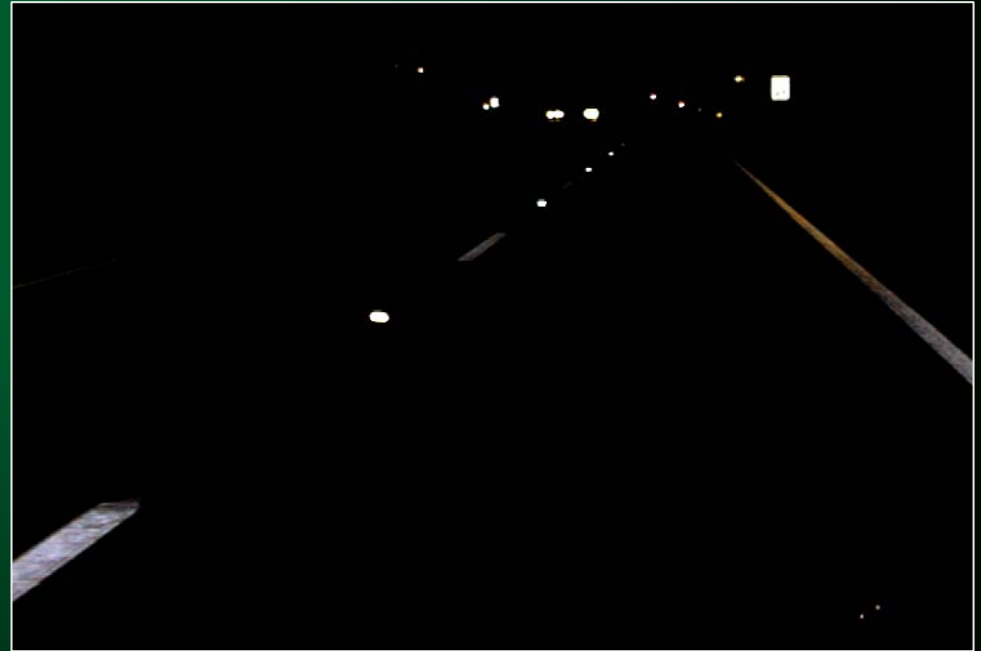


Raised Pavement Markers



Ohio DOT policy

- use RPM on all roads
- replace on 2-4 yr cycle



Florida DOT

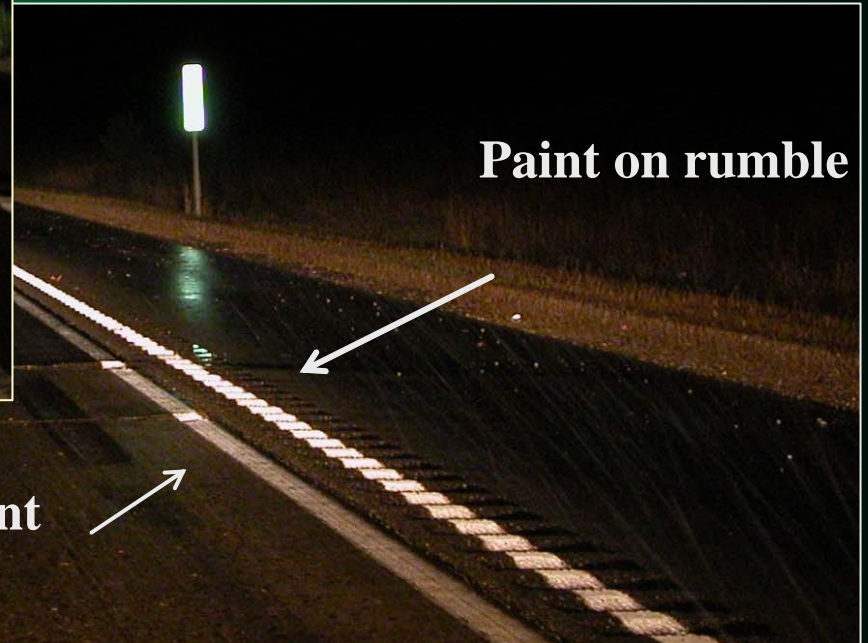
RPMs at 40' spacing

3M Wet-Night Tape - as RPM



Missouri DOT - full 10' skip lines on Interstate.
Mich DOT - full use on all Interstate skip lines in Detroit area

Painting the rumbles: freeway



Michigan pilot: 100+ freeway miles

Painting the rumbles: 2-lane



1,100 lane miles



Mississippi DOT: statewide pilot

Aged Diminished Capabilities

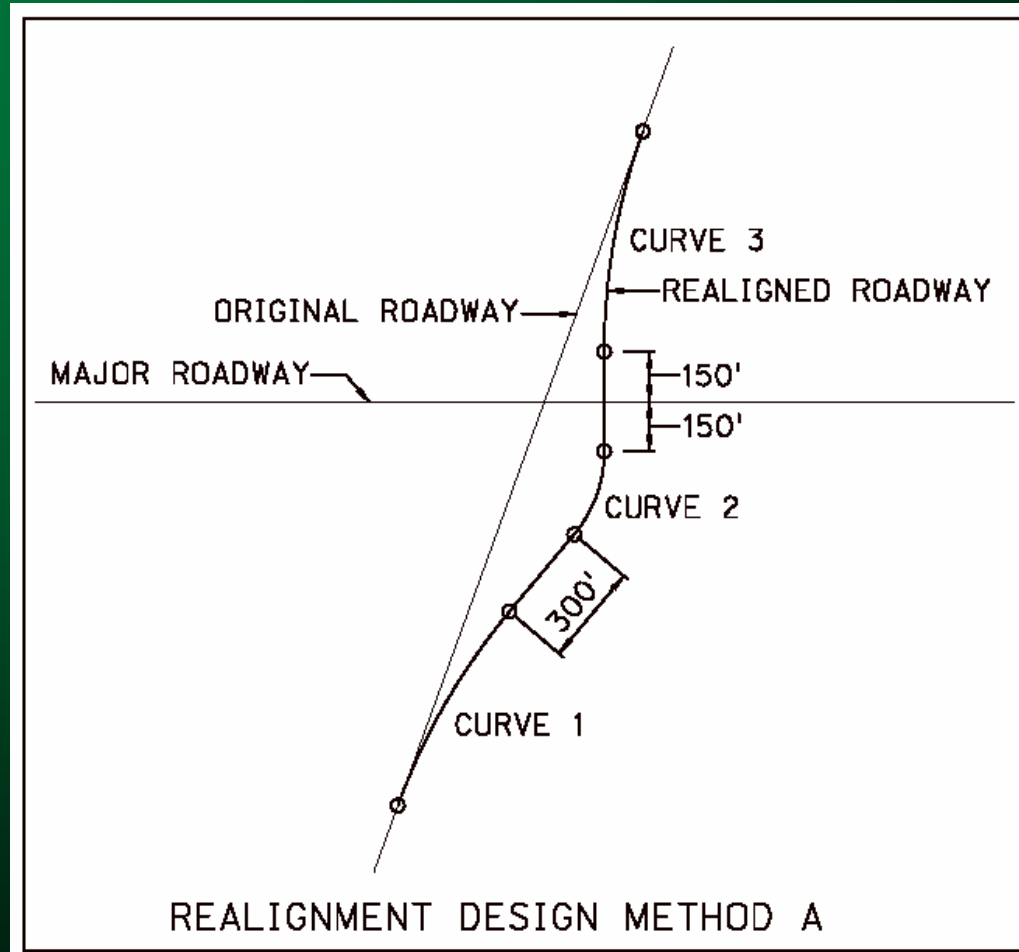
Physical: Upper body strength, range of motion

Scanning traffic,
turning movement
becomes
more difficult



Make the
Turning Motion
Easier

Re-align Skewed Intersections



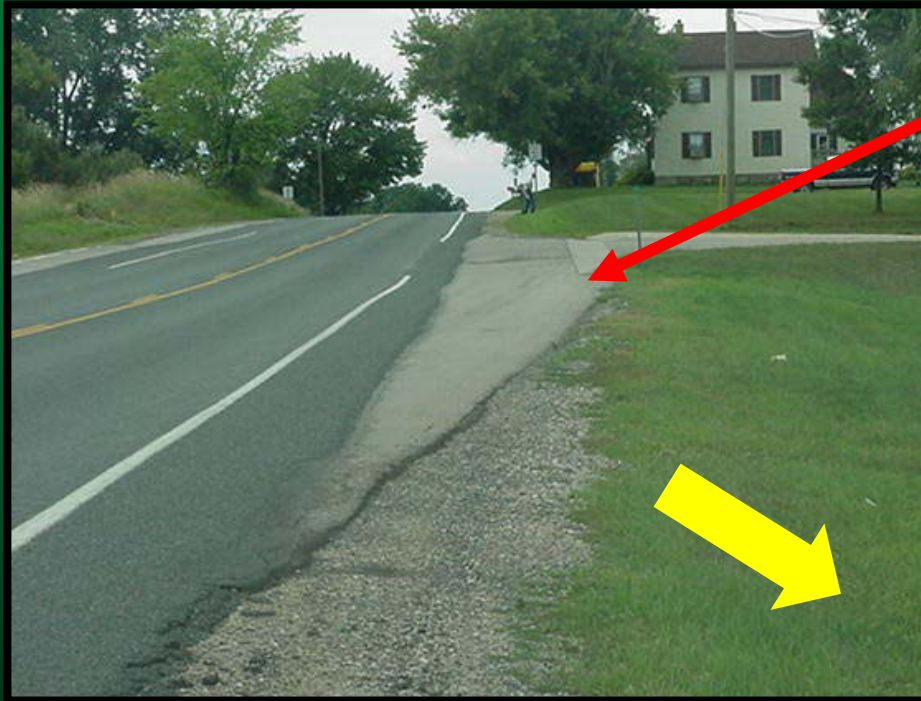
Nebraska DOT – 2004 policy to realign major intersections

Separate the right turn traffic



**Iowa DOT:
more and longer turn lanes**

Separate the right turn traffic



Right turn taper

Wide shoulder



**Michigan DOT
Muskegon TSC**

**Wide shoulder allows drivers to exit
mainline, then slow and make easy turn**

Aged Diminished Capabilities

Cognitive

- Selective Attention
- Divided Attention
- Perception – Reaction Time
- Working Memory

Aged Diminished Capabilities Divided Attention

process info
from
multiple sources
simultaneously



Aged Diminished Capabilities

Selective Attention

continuously focus
on the most
critical information



Intersections:

Compared to drivers age 40-49:

- drivers age 65-69 are **2.3 times** more at risk for multiple-vehicle crashes at intersections

drivers age 85+ are **10.62 times** more at risk

**Provide Advance
Information**

Advance Street Name Signs

Troy, MI



urban

rural



Iowa

Advance Street Name

- supplemental plaques



Ingham County, MI - all roads, 1980+



Advance Lane Assignment



Ground-mounted signs
& markings

Overhead signs

Advance Signal Signs – Activated Flashers



Common design criteria:

- high-speed
- isolated or unexpected intersection
- limited sight distance

MnDOT test:

- Red Light violations ↓ 29%
- Truck violations ↓ 63%

Maryland DOT:

- Rt angle crashes ↓ 62%
- Rear end crashes ↓ 36%

15+ states

Help the Left-turners



4-lane to 3-lane conversion



All LTs cross one lane only

Crashes ↓ 24 %
Crashes age 65+ ↓ 28 %



Iowa DOT has converted 20+ corridors

Offset Left Turn Lanes



Florida DOT –
very wide offsets



North Dakota DOT –
since 1999 wherever possible



Offset right turn lane

Michigan



Benefits to crossroad LT traffic:

- sight distance to trailing vehicles
- commitment from turning vehicle

Experienced states:

WI, MO, KY, **MT**

Remove / Relocate
the Left Turn

ROUNDBABOUTS Eliminate left turn, head-on crashes



Roundabouts - Clearwater, FL

21.5% of residents are aged 65 +
1.7 x the national average

*Through
Community
Involvement:*

*Clearwater has built 5 modern
low-speed roundabouts.*

Seven are in design...

and 5 more are in the pipeline.



Roundabouts - Clearwater Beach, FL

*32% of residents are aged 65 +
2.6 x the national average*



Acacia roundabout:

- By petition of residents and store owners
- Petition included \$3000

Roundabouts in America:



ADOPTED:

**State DOT's that now consider roundabout option
in every new or re-design:**

MD, NY, KS, WI, MN, VA

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