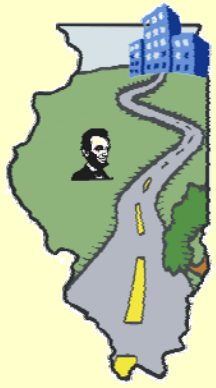




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# Sign Retroreflectivity Regulation



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# Outline

- Background
- Compliance Dates
- Retroreflectivity Compliance
- IDOT Retroreflectivity Rule Compliance
- Rural Sign Upgrade Program

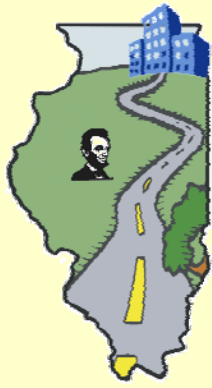


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# Background

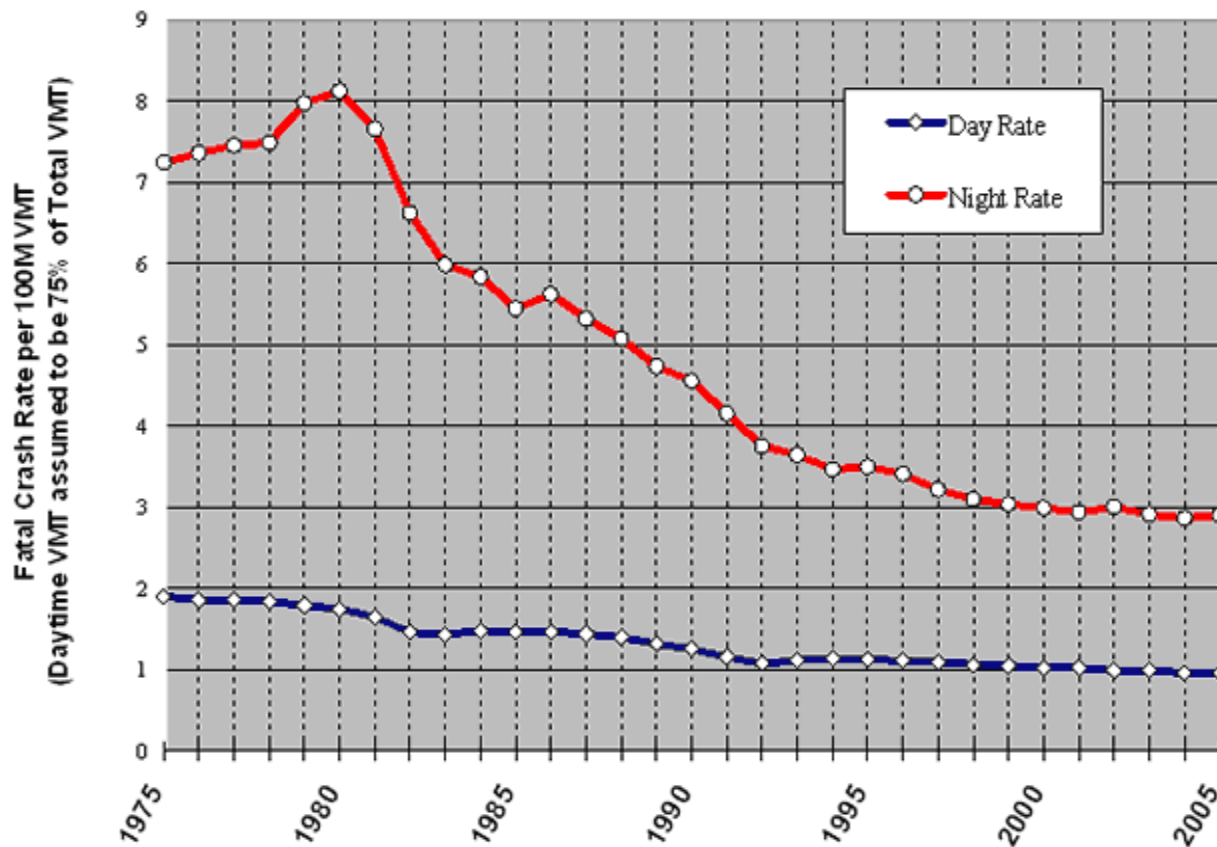
- Crash Rate at Night
- Older Driver Population
- Visual Cues
- Congressional Mandate





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# Crash Trends

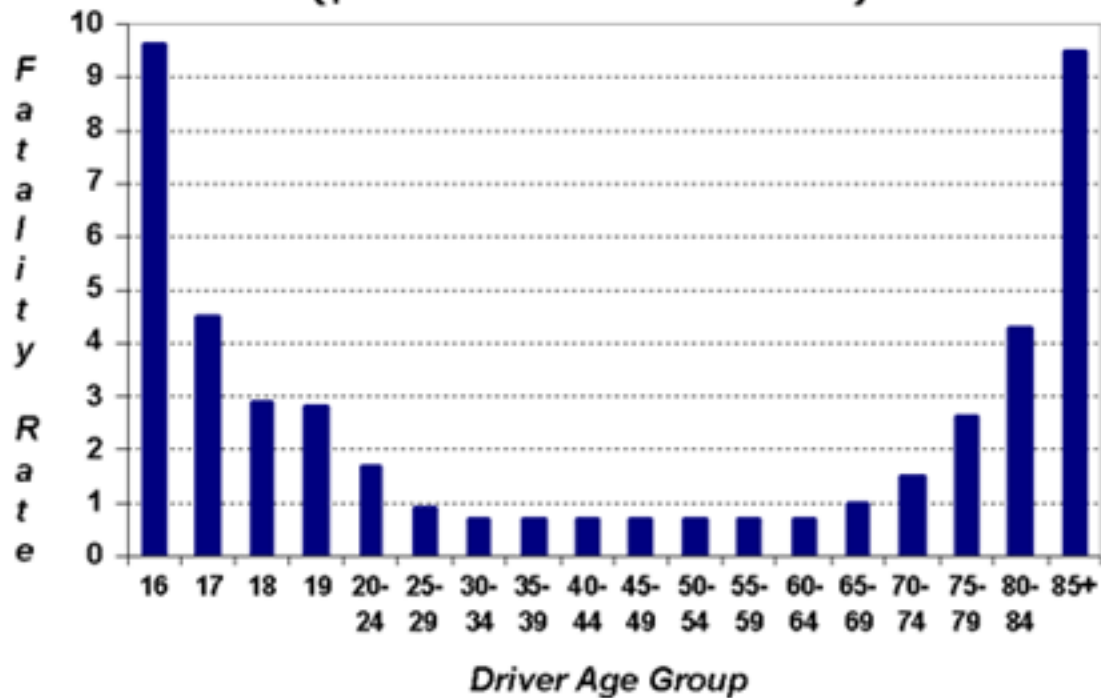




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# Fatalities by Age

## Driver Fatality Rate (per 100 million VMT)

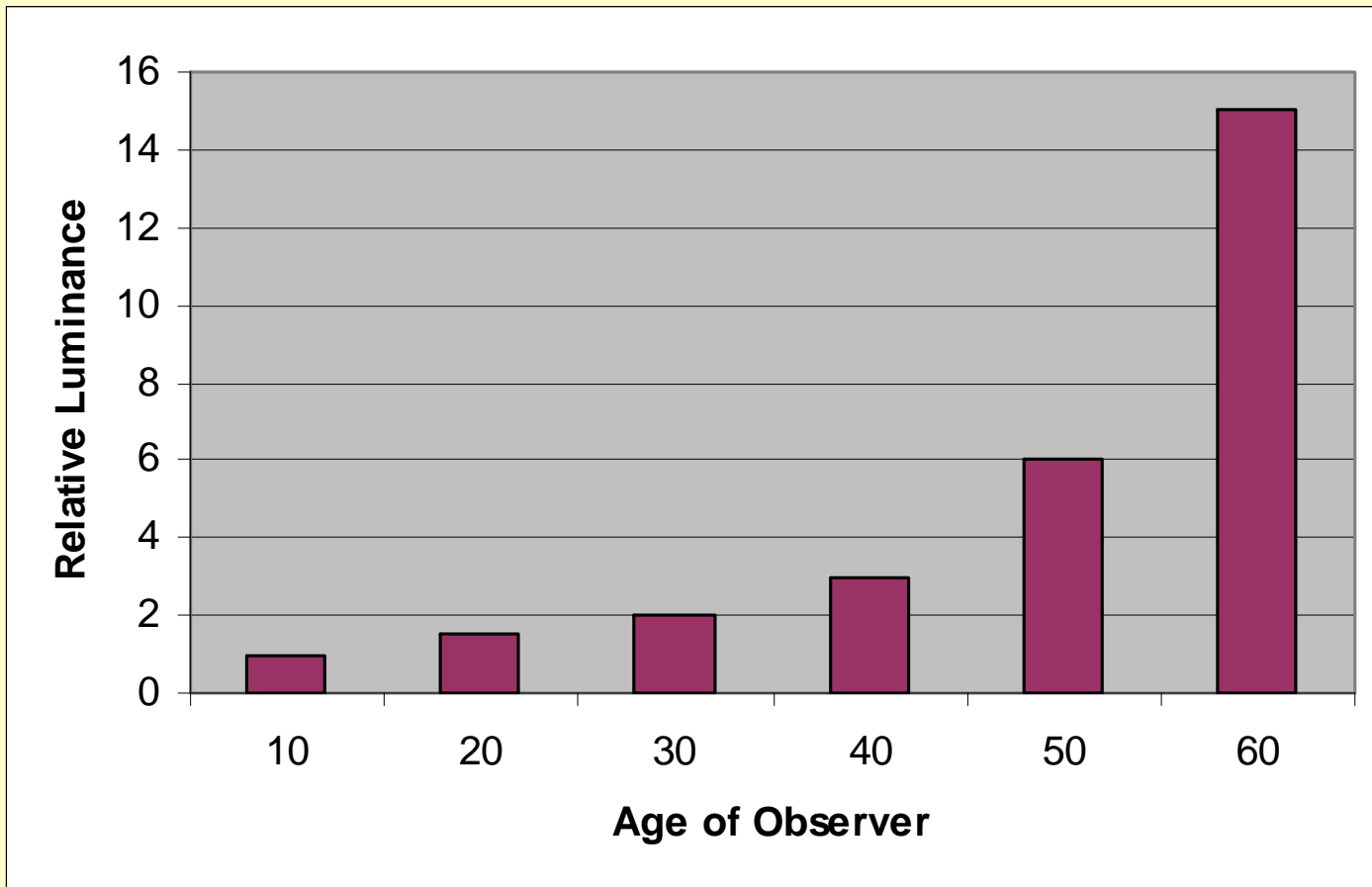


Source: FARS 2001 and NHTSA 2001



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# Needed Light by Age

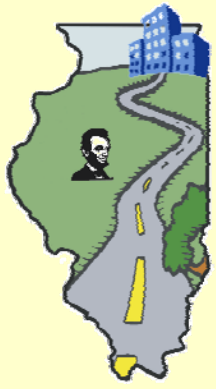




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# Visual Cues





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# Visual Cues

## DAYTIME

- Trees
- Telephone Poles
- Fence
- Pavement Marking
- Delineators
- Signs



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# Visual Cues





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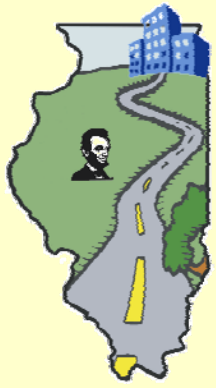
# Visual Cues

## DAYTIME

- Trees
- Telephone Poles
- Fence
- Pavement Marking
- Delineators
- Signs

## NIGHTTIME

- Pavement Marking
- Delineators
- Signs



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# Congressional Mandate

## 1993 DOT Appropriations Act

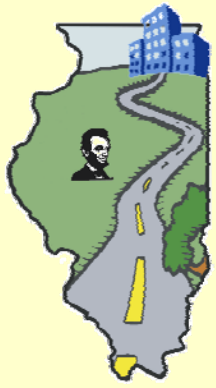
- The Secretary of Transportation shall revise the MUTCD to include a standard for a minimum level of retroreflectivity that must be maintained for traffic signs and pavement markings which apply to all roads open to public travel.



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# Compliance Period

- 4 Years to Implement a Sign Management/Assessment Method (Jan. 2012)
- 7 Years from Date of Final Rule for Ground Mounted Signs (Jan. 2015)
- 10 Years from Date of Final Rule for Overhead Signs and Street Signs (Jan. 2018)
- Need to Start Now!



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# Assessment or Management Methods

- Visual Nighttime Inspection (A)
- Measured Sign Retroreflectivity (A)
- Expected Sign Life (M)
- **Blanket Replacement (M) - IDOT**
- Control Signs (MA)
- Other Methods (MA)





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# Visual Nighttime Inspection

- Trained Inspectors at Operating Speed
- Low Beam Headlight
- Evaluation at Typical Viewing Distance
- 3 VNI Methods
  - Calibration Signs
  - Comparison Panel
  - Consistent Parameter



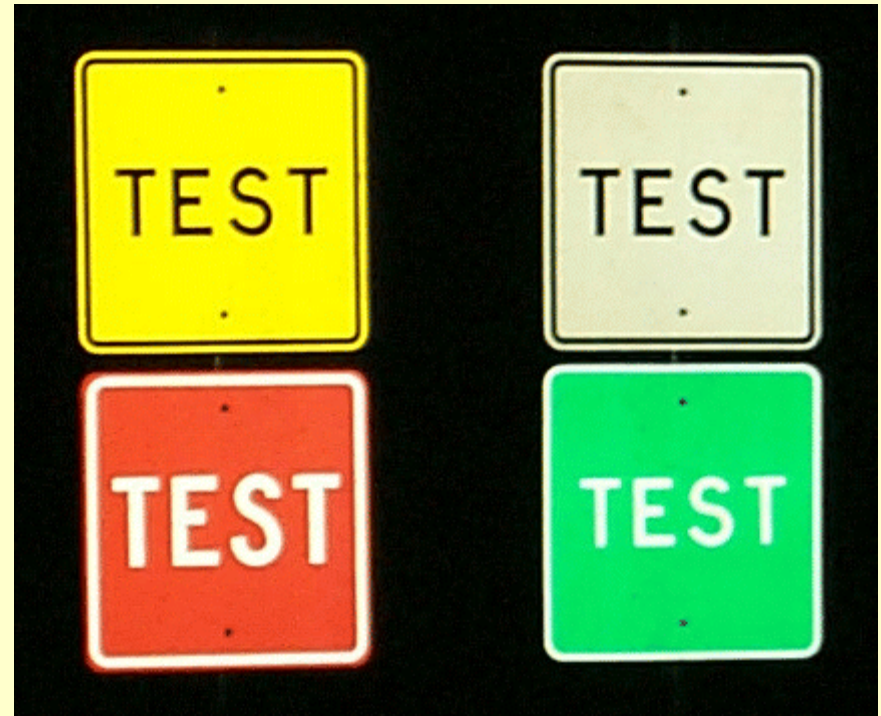


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# Visual Nighttime Inspection

## Calibration Signs

- Calibration Sign for Each Color
- Same Vehicle Used
- Periodic Calibration





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# Visual Nighttime Inspection



## Comparison Panel

- Attached to Sign
- Both Viewed by Inspector



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# Visual Nighttime Inspection

## Consistent Parameter

- Full-size SUV or Pick Up
- Model Year 2000 or Newer
- Inspector 60+ Years Old



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# Measured Sign Retroreflectivity

- ASTM E1709 Procedure
- Use Certified Retroreflectometers
  - Delta RetroSign
  - RoadVista 922
- Cost Prohibitive???



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# Retroreflectometers

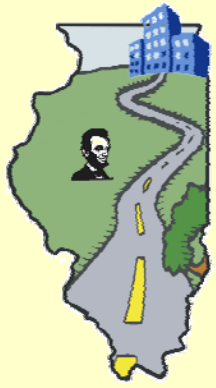




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# Expected Sign Life

- Determine Expected Life Based on Geography
- End of Life Based on Minimum Values
- Replace Signs Prior to End of Life
- Periodic Inspections to Verify



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# Blanket Replacement

- Area/Corridor, or Specific Type Replaced at Specific Intervals
- No Need to Track Individual Signs
- Intervals Based on Expected Sign Life
- Essentially the Expected Sign Life method implemented on an area or strategic basis



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# IDOT Compliance with the Min. Retroreflectivity Rule

- **Blanket Replacement Method**
  - We are assuming a 15 year life cycle on our prismatic sheeting
  - Replace all signs within a county in a year
  - Each county would be done once every fifteen years
  - This would be less than one county per year for most districts
  - Would replace an est. 4,400 signs per year statewide at a cost of an est. \$ 250,000.00
  - Leaving time for repair of damaged signs and special projects.



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# IDOT Compliance with the Min. Retroreflectivity Rule

- **Blanket Replacement Method**
  - Randomly selected signs would be tested to confirm compliance
  - If a district currently performs inspections they could continue, but wouldn't have to judge retroreflectivity.
  - Interstate guide signs would be a separate program.



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# IDOT Compliance with the Min. Retroreflectivity Rule

- **Blanket Replacement Method**

- Advantages

- Low likelihood of a sign getting missed
    - Fuel and manpower savings in reduced travel time to replace individual signs on a district wide basis
    - Reduced manpower needs to track individual signs
    - Reduced dependence on accurate sign inventories and inspections.



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# IDOT Compliance with the Min. Retroreflectivity Rule

- **Blanket Replacement Method**

- Disadvantages

- At first, some waste from replacing signs that aren't 15 years old
    - Some small waste due to replacing signs replaced due to damage
    - Countered by high fuel cost savings and reduced manhour costs



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# Control Sign

- Control Sample Represents Total Population
- Field Signs or Specific Location
- Use an Assessment Method
- Population Replaced Based on Control



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# Other Methods

- Based on Engineering Study
- Technology
- Combinations



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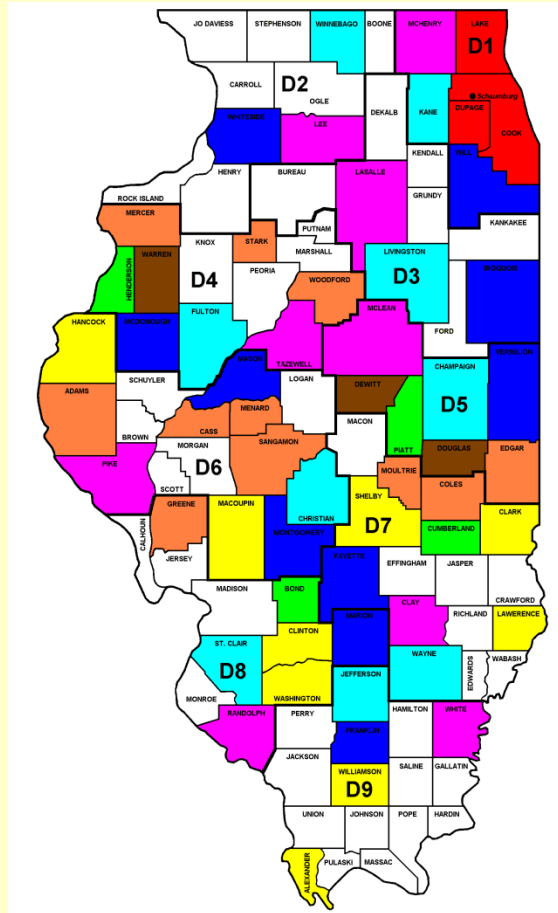
# Best Practices

- Place Stickers on Back of Signs
- Use High Intensity or **Prismatic**
- Routine Sign Inspections
- Prioritize Signs



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# Sign Upgrades





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# Statistics

- 55 of 102 Approved for Sign Upgrade Funding
- Excellent Bid Prices
  - 30" Stop Sign Average Price = \$23.96
  - 30" Diamond Warning Average Price ~\$26.00
  - 24"x30" Speed Limit Average Price = \$20.69
- Nearly 100% Participation in Each County



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# QUESTIONS?

[www.fhwa.dot.gov/retro](http://www.fhwa.dot.gov/retro)