

# Managing Retroreflectivity

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# Managing Retroreflectivity

## 1. Assessment Methods

- A. Visual Inspection Method
  - Calibrated Sign Procedure
  - Comparison Panel Procedure
  - Consistent Parameter Procedure
- B. Measure Retroreflectivity Method

## 2. Management Methods

- Control Signs
- Blanket Replacement
- Expected Sign Life

# Assessment Methods

- Calibrated Sign Procedure
  - “Calibrate” eyes with calibration signs
  - Before leaving the yard, inspector visually inspects a representative of sign to *calibrate their eyes*.



# Assessment Methods

- Calibrated Sign Procedure (con't)
  - Must have retroreflectivity levels at least that of MUTCD minimum retro values.
  - Mounted on rack or yard fence.
  - Covered when not in use to preserve values.





# Assessment Methods

- Calibrated Sign Procedure (Con't)
  - Any Vehicle, any age inspector.
  - View rack with same vehicle to be used during inspection.
  - View calibration signs from inspection vehicle at typical viewing distance --- 100 to 600 feet --- before leaving the yard.
  - Use low beams
  - Conduct evaluations at roadway speeds from travel lane.

# Assessment Methods

- Calibrated Sign Procedure (Con't)
  - Look for signs less bright than the calibrated signs AND mark less bright for replacement.
  - Inventory of signs useful for marking replacements
  - Evaluate BOTH colors of the sign.

# Assessment Methods

- Comparison Panel Procedure
  - Tie to minimum values by *comparison panels*.
    - Small panels at near desired retro.
    - Clipped to sign - viewed from a distance.
    - Evaluate signs compared to panels.



# Assessment Methods

- Comparison Panel Procedure (con't)
  - Panels must have retro level at least that of MUTCD minimum retro values.
  - Procedure must be done at night.
  - Any vehicle, any inspector age is OK.
  - The “initial” inspection occurs at roadway speeds with low beams.



# Assessment Methods

- Comparison Panel Procedure (con't)
  - When a marginal sign is spotted,
    - Safely pull over to inspect the sign (w/ vest, etc)
    - Install comparison panel on the sign,
    - Evaluate from at least 25 feet,
    - Hold a flashlight near inspector's ear/eyes.
  - Evaluate BOTH colors on a sign.

# Assessment Methods

## Comparison Panel Procedure (con't)

- Use retroreflectometer to find signs at minimum levels.
- Cut panels from these signs
- No known supplier of the panels.

Use flashlight at NIGHT at minimum distance – 25 Ft.



# Assessment Methods

- Consistent Parameter Procedure
  - Simulates conditions of research FHWA used for developing minimum retro levels - Key Assumptions.
    - Dark, rural, straight, flat roadway.
    - No ambient light, glare, or visual complexity.
    - Inspector needs to be at least 60 years old.

# Assessment Methods

- Consistent Parameter Procedure (con't)
  - SUV or Truck used to be equipped with VOA cutoff headlamps.
    - VOA = Visually Optically Aimable



- Inspection occurs at roadway speeds.
- Two person crew:
  - Driver
  - Inspector (60 yrs old) judges signs.



# Assessment Methods

- Measure Sign Retroreflectivity
  - Uses portable hand-held instrument
  - Receive proper training
  - Consistent protocol
  - Compare reading to minimum values
  - Measure in-service signs, comparison panels, or calibration signs.
  - Measurement done annually or every other year.

# Assessment Methods

- Measure Sign Retroreflectivity (con't)



# Assessment Methods

- Measure Sign Retroreflectivity (con't)
  - Note each type of sheeting.
  - Measure each color.
  - Multiple measurements & compute average.
  - Develop a measurement protocol.
  - Use an inventory.

# Management Methods

- Three management methods:
  1. Control Signs
  2. Blanket Replacement
  3. Expected Sign Life



# Management Methods

- Control Signs
  - Based on measurements of a set of control signs.
  - Control signs can be in-service signs or signs in yard orientated similar to those they represent.
  - Periodically monitor control signs.
  - As control signs approach minimum levels it is time to replace.

# Management Methods

- Blanket Replacement

- All signs in a specific area are replaced at the same time when the effective service life is reached.
  - Geographic area
  - Route or corridor
  - Jurisdiction
- All signs of a specific type are replaced at the same time when the effective service life is reached.
- Advantage --- All signs replaced
- Disadvantage --- Potential waste

# Management Methods

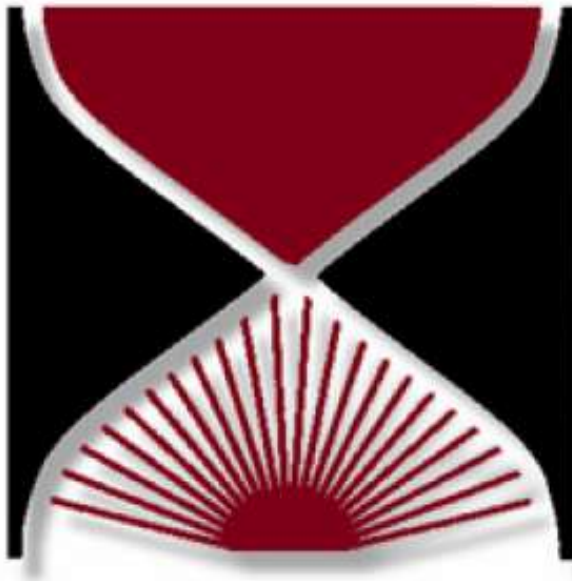
- Expected Sign Life

- Find the life of the sheeting in your area.
- Expected life based on:
  - Warranty information.
  - Measure in-field signs, removed signs or control signs with known install date and compare to minimum levels.
  - Use data from weathering rack.



# Management Methods

- AASHTO Data:
  - <http://www.ntpep.org>



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**AASHTO's  
National Transportation  
Product Evaluation  
Program**

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# Managing Retroreflectivity

- More Information/Resources:
- Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition.
- [www.fhwa.dot.gov/retro](http://www.fhwa.dot.gov/retro)
- Colorado LTAP
- Maintaining Traffic Sign Retroreflectivity FHWA-SA-07-020.

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