# Retroreflective Traffic Signal Backplates





VDDT Virginia Department of Transportation

June 2014

**Traffic Engineering** 

# PURPOSE

- ➔ Enhance visibility of traffic signals
- Improve overall safety and operations at signalized intersections
- ➔ Increase crash savings to motoring public
  - \$129 million/year if installed at all VDOT signals

## WHAT ARE RETROREFLECTIVE BACKPLATES?

- ➔ Backplates surround the signal housing to improve visibility of the signal
- → Retroreflective backplates have a 1- to 3-inch yellow retroreflective border around the perimeter of the backplate
- → Option in 2009 MUTCD (first issued as Interim Approval in 2004)





Manual on Uniform Traffic Control Devices, 2009

**15%** REDUCTION IN VEHICULAR CRASHES<sup>1</sup>

**29%** REDUCTION IN FATAL AND

# • WHY USE RETROREFLECTIVE BACKPLATES?

- One of the nine FHWA proven safety countermeasures
- ➔ Low cost, systematic improvement
- → Reduces unintentional running of red lights and other driver violations of traffic signals
- ➔ Increases traffic signal visibility
  - Contrasts against the dark backplate
  - Distinguishes between background lighting, signs, and visual distractions
  - Increases recognition during times of limited visibility (night, fog, heavy precipitation)
  - Draws attention to the intersection during power outages
  - Draws attention to the intersection after long roadway sections without signals



<sup>1</sup> Miska, E., P. de Leur, and T. Sayed. "Road Safety Performance Associated with Improved Traffic Signal Design and Increased Signal Conspicuity." ITE, 72nd Annual Meeting, Philadelphia, PA. Washington, DC, 2002

<sup>2</sup> El-Basyouny, K. and Sayed, T. "A full Bayes multivariate intervention model with random parameters among matched pairs for before-after safety evaluation." Accident Analysis and Prevention, Vol. 43, No. 1, Oxford, N.Y., Pergamon Press, (2011) pp. 87-94.

#### WHY USE RETROREFLECTIVE BACKPLATES IN VIRGINIA?

- ➔ Consistent with VDOT Business Plan for FY14-FY15 Objective 1.3
- → Supports Virginia's Strategic Highway Safety Plan
- ➔ Enhances intersection safety
- Intersection crashes are an Emphasis Area for Virginia

#### WHERE HAVE RETROREFLECTIVE BACKPLATES BEEN IMPLEMENTED?

- Ohio DOT<sup>3</sup>
- Massachusetts DOT<sup>3</sup>
- South Carolina DOT<sup>3</sup>
- Oklahoma<sup>3</sup>
- Florida DOT<sup>4</sup>
- Texas DOT
- Washington DOT
- Kentucky Transportation Cabinet
- Indiana DOT
- Connecticut DOT
- Chesapeake, VA
- Madison, WI
- Frankfort, KY
- Indianapolis, IN
- Manhattan, KS

### RETROREFLECTIVE TRAFFIC SIGNAL BACKPLATES IN USE



Traffic signals during the daytime







## WHAT IS THE ANTICIPATED COST?

- \$6,000 \$12,000 per intersection (preliminary estimate) →
  - Materials, traffic control, labor, and equipment
  - HSIP Open Container: UPC 105593



- WHAT IS THE ANTICIPATED IMPLEMENTATION PLAN?
- Begin on the Corridors of Statewide Significance →
- Four-year pilot program (anticipated start date 7/1/2014) →
- Systemic implementation along corridors →
  - Approximately 25% of all VDOT signals
  - Statewide coverage, all Districts



#### **VDOT Corridors of Statewide Significance**



\* Includes parallel routes

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