# ELECTROCHROMIC WINDOWS

#### **OPPORTUNITY**

What is the potential benefit to Land Ports of Entry?

## **PROVIDE DIRECT LINE OF SIGHT**

AN UNINTERRUPTED VISUAL PATH BETWEEN THE OBSERVER AND THE AREA UNDER SURVEILLANCE

#### TECHNOLOGY

How do electrochromic (EC) windows work?



#### **TRANSITION FROM CLEAR TO DARK** USING PHOTOSENSOR READINGS AND SUN PATH CALCULATIONS

#### M&V

Where did Measurement and Verification occur?

**LAWRENCE BERKELEY NATIONAL LABORATORY** measured glare reduction and occupant satisfaction with electrochromic windows provided by SageGlass at the Donna Land Port of Entry along the Texas border with Mexico.

#### RESULTS

How did electrochromic windows perform in M&V?



GLARE THRESHOLD<sup>2</sup>

#### NIGHTTIME VISIBILITY REDUCED

WITH INCREASED INTERIOR REFLECTION<sup>3</sup>

### **100%** USER PREFERENCE

OVER CONVENTIONAL WINDOWS<sup>4</sup>

#### Daylight Glare Probability (DGP) in Vehicle Inspection Booths Facing West

Booth with EC windows has much lower glare throughout a sunny afternoon





0.40 to 0.45Disturbing glare
0.35 to 0.40Perceptible glare
< 0.35Imperceptible glare

DGP is a metric for visual comfort, with values from 0 to 1, representing the probability that a person would experience disturbing glare in a particular situation.

#### DEPLOYMENT

Where does M&V recommend deploying electrochromic windows?

# LAND PORTS OF ENTRY

And other facilities where window glare compromises mission-critical outdoor visibility\*

<sup>1</sup>Electrochromic Window Demonstration at the Donna Land Port of Entry. Eleanor S. Lee (LBNL), May 2015, p.4
<sup>2</sup>Ibid, p.4
<sup>3</sup>Ibid, p.4
\*Subject to evaluation and approval by GSA-IT and Security



The GPG program enables GSA to make sound investment decisions in next generation building technologies based on their real world performance. www.gsa.gov/gpg