

METRO EXPRESSLANES

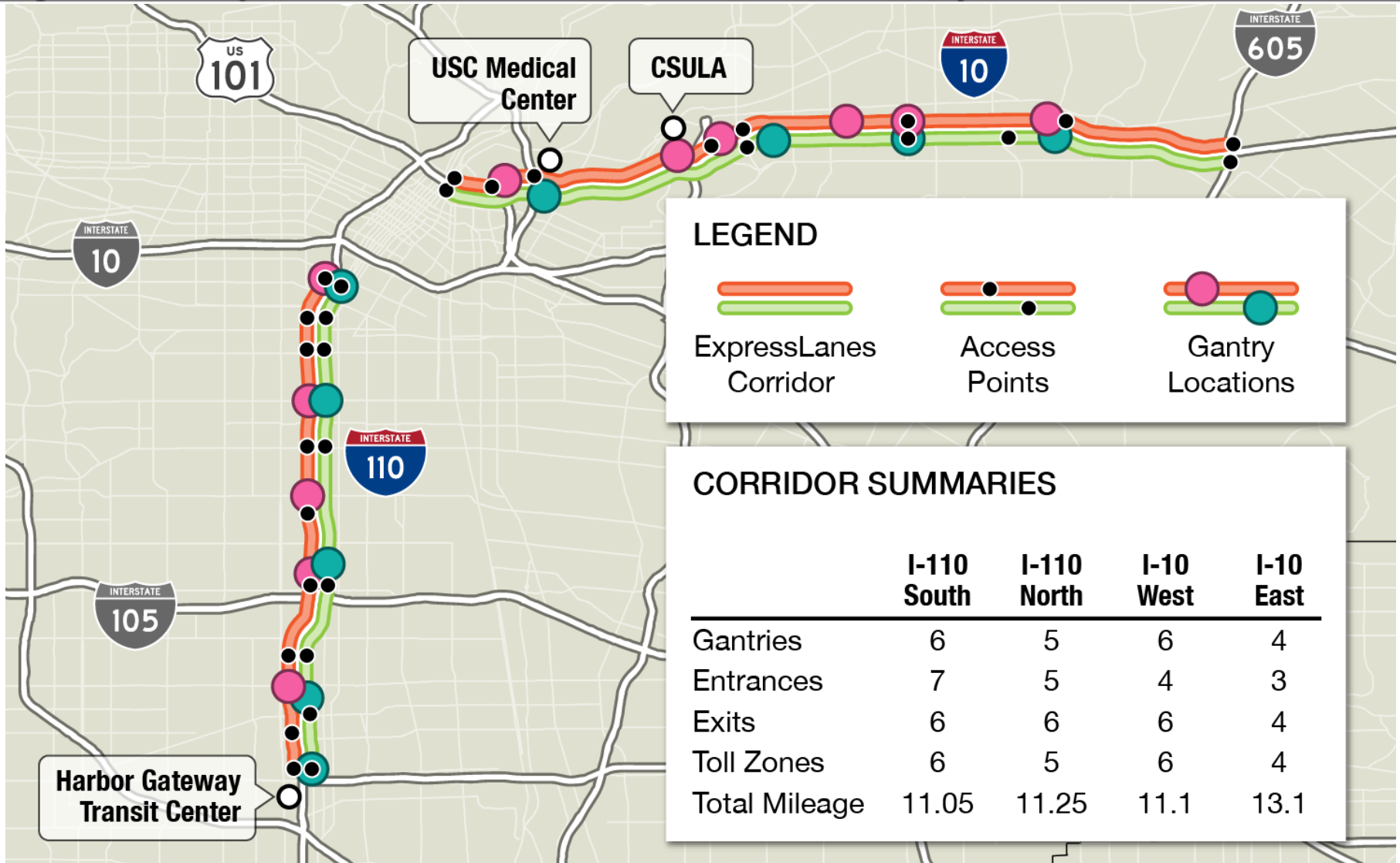
Occupancy Detection System Update
IBTTA/TRB Webinar — November 12, 2020



Metro



System Map



Policies and Operations



1 Use transponder to declare vehicle occupancy

2 Do not cross the double-white barriers

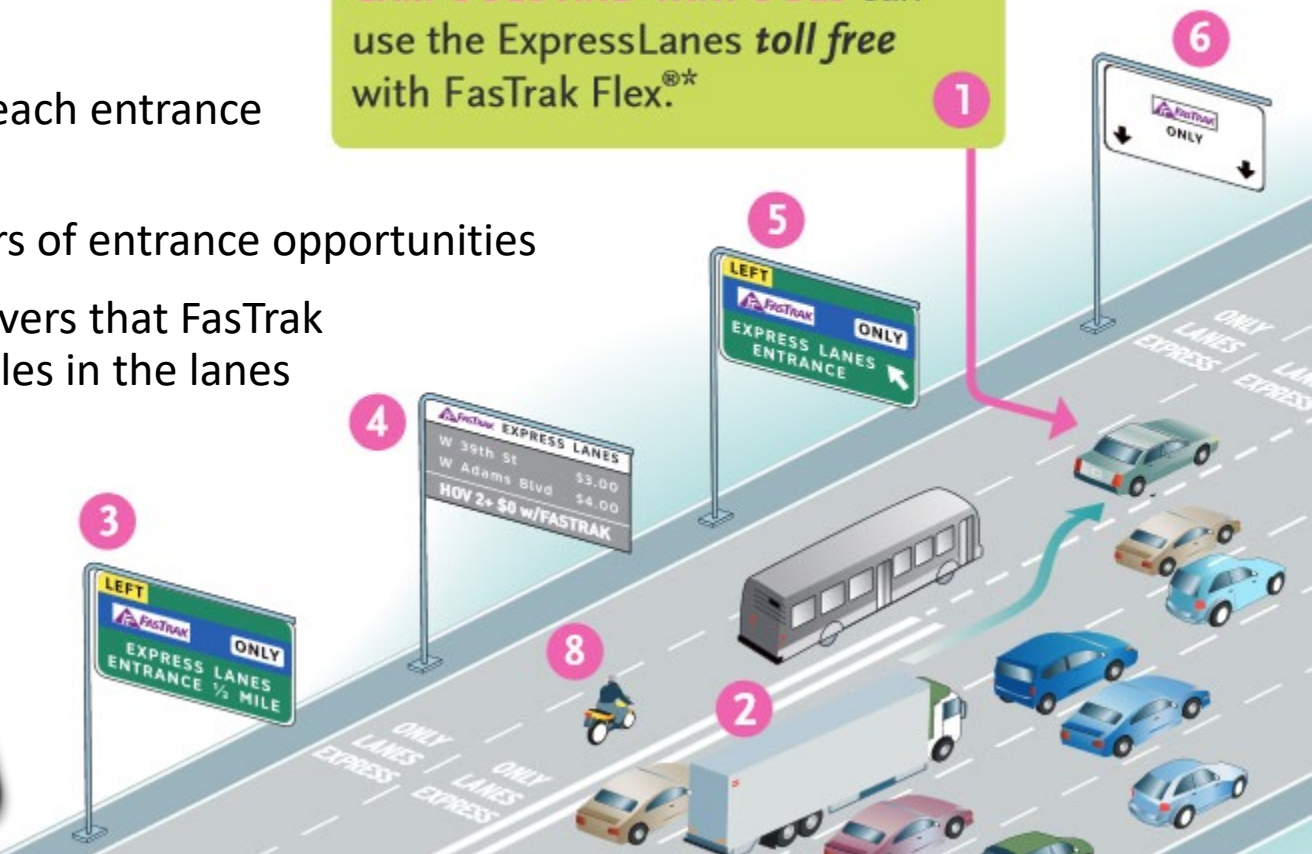
3 Guide signs alert drivers of entrances ahead

4 Message signs before each entrance display current prices

5 Guide signs alert drivers of entrance opportunities

6 White signs remind drivers that FasTrak is required for all vehicles in the lanes

CARPOOLS AND VANPOOLS can use the ExpressLanes *toll free* with FasTrak Flex.^{®*}

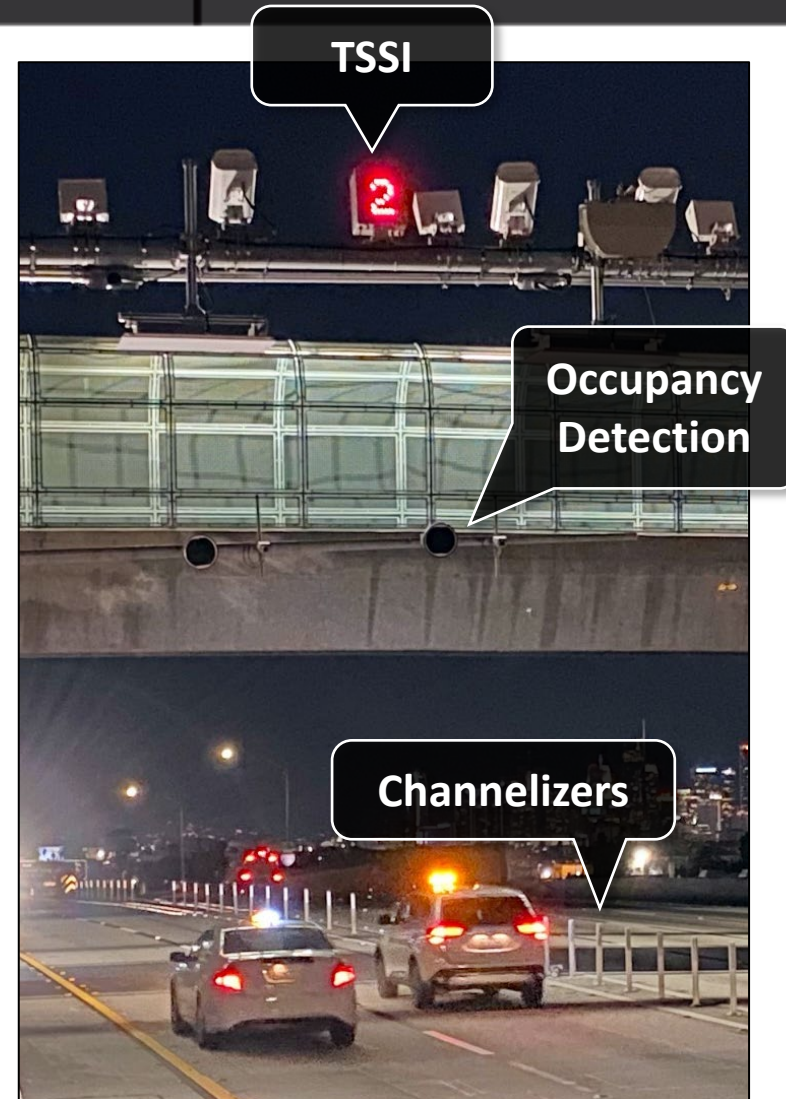


Enforcement and Challenges

- Dedicated CHP enforcement, \$3.2 million annual budget
- Channelizers to discourage illegal ingress/egress
- Transponder Switch Setting Indicators (TSSI) for occupancy declaration enforcement
- Limited areas for enforcement stops
- 25-30% misrepresentation



Transponder Switch Setting Indicator (TSSI) showing a switch setting of "2" for passing vehicle



System Design



Installation of cameras and illuminators on the ODS overhead gantry at the I-110 North location

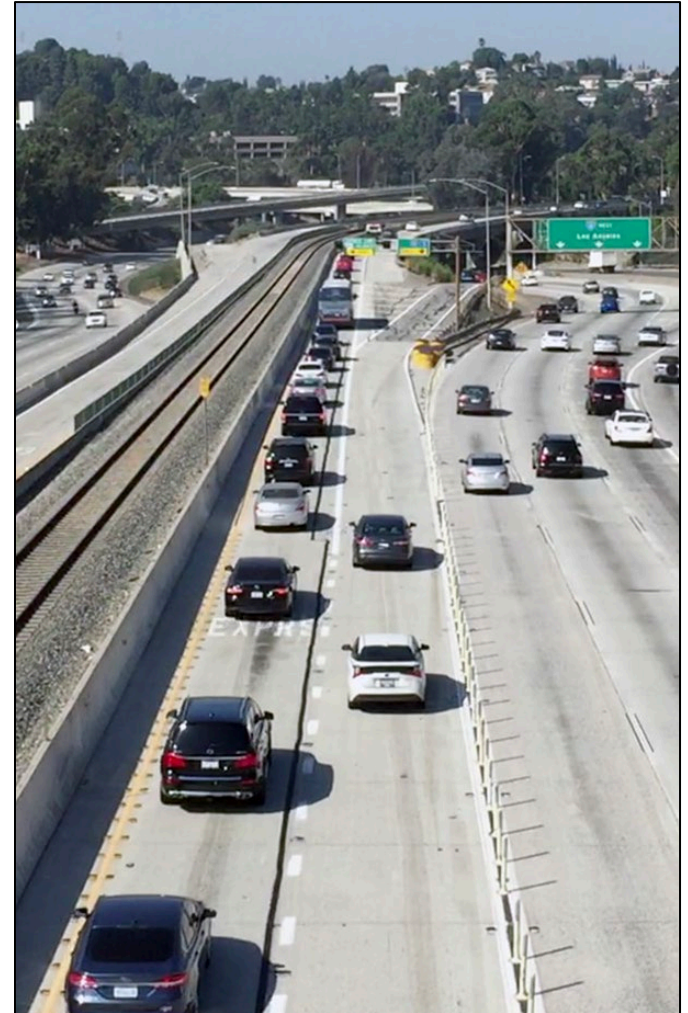
- Integrated with back office system and roadside system
- Uses laser triggers, front/side view cameras, and imperceptible near-infrared flash
- Each site requires:
 - A toll collection gantry
 - An overhead ODS gantry
 - A side ODS ground-level structure

Implementation Strategy

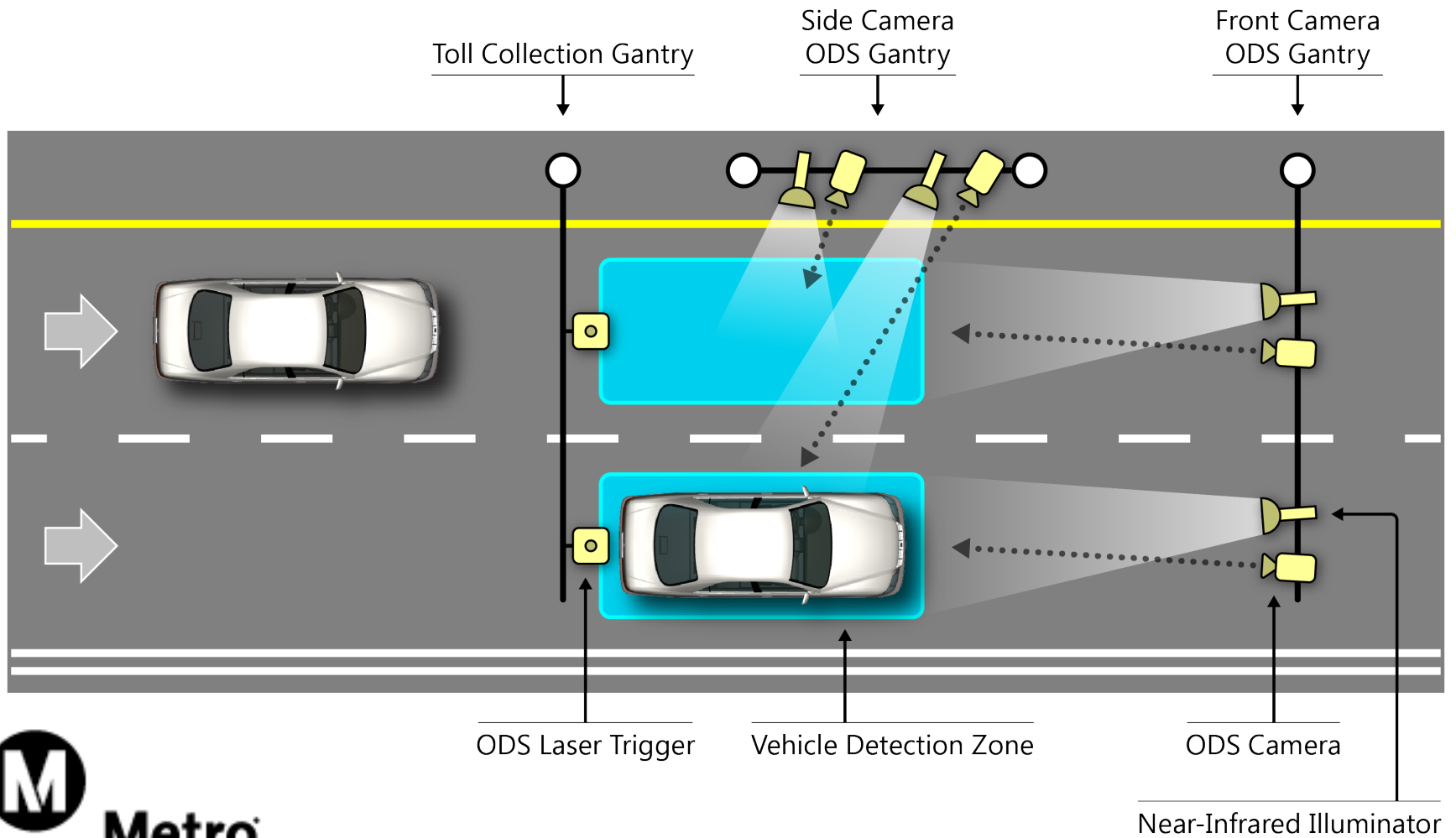
- Initial results from limited 2015 test:
 - 14,093 vehicles analyzed over 24 hours
 - 95% of vehicles captured by system
 - 85% accuracy of occupancy determination
- Installed at the highest-demand locations on each corridor:
 - One-lane location on I-10
 - Two-lane location on I-110
- Cost of \$11.25 million for:
 - Implementation of system
 - Operation and maintenance for one year



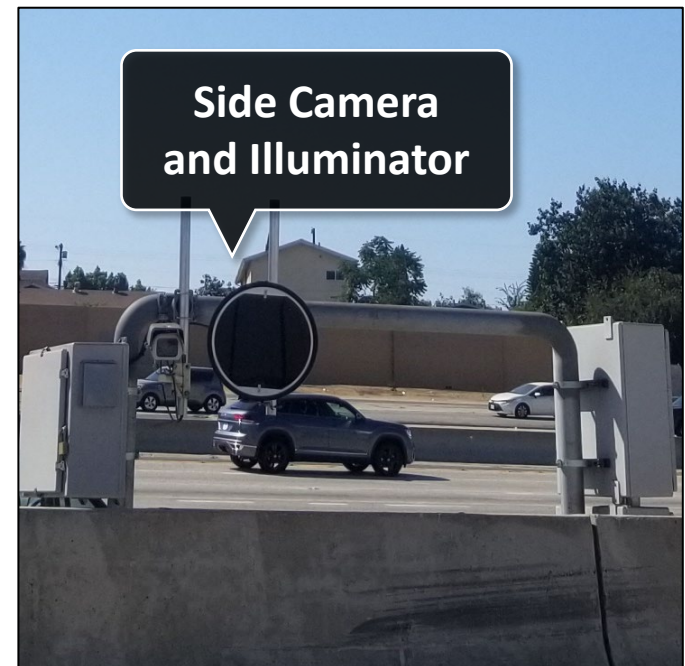
I-10 West at I-710 is one of our highest-demand segments



Site Layout



Field Equipment



Sample Images



	Before Redaction	After Redaction and Enhancement
Front View	 A black and white photograph of a car's front interior. A driver is visible behind the steering wheel. A grey rectangular box redacts a portion of the dashboard and windshield area.	 The same front view of the car interior, but with enhanced contrast and clarity. The redacted area is no longer present, and the overall image quality is improved.
Side View	 A black and white photograph of a car's side interior. A driver is visible. A grey rectangular box redacts a portion of the driver's face and the side window area.	 The same side view of the car interior, but with enhanced contrast and clarity. The redacted area is no longer present, and the overall image quality is improved.

Challenges

- Second row side-view obstructions
- Tinted windows
- Third row seating not visible
- Child car seats
- Image redaction
- Exclusion and Manual Review Lists

The I-10 West location includes channelizers to guide drivers through the detection zone



Schedule



Activity	Date Accomplished
Preliminary design work started	June 2017
Deployment plan reviewed and approved by Metro Board	January 2018
Full design plans prepared	May 2018
Design plans approved by Caltrans	August 2018
Fabrication of structures complete	August 2019
Roadside equipment installation complete	March 2020
Integration testing complete	September 2020
System Tuning and Calibration	In progress
System Go-Live	TBD

Public Education and Outreach



The screenshot shows a web browser window with the URL `metroexpresslanes.net`. The website has a dark blue header with the **METRO EXPRESSLANES** logo on the left and navigation links (Login, Contact Us, Alerts(2), and a search icon) on the right. Below the header is a secondary navigation bar with links: Pay a Violation, How it Works, Offers & Discounts, About Us, and FAQ. The main content area has a large heading **Occupancy Detection System**. Below this is a bold announcement: **Starting June 1, 2020 Metro ExpressLanes will begin testing the Occupancy Detection System along the 1-10 and I-110 ExpressLanes.*** A teal-colored subheading **Coming Soon!** follows. The text explains that the system uses cameras to detect the number of persons in a vehicle and compares it to the transponder switch setting. It notes that the system will correct instances where a transponder has been incorrectly set to the toll-free HOV mode when there are not enough passengers present to qualify for toll-free travel. A **Please note** states: **cameras will detect car seats, passengers and small children in the backseat. Any facial images will be redacted for privacy purposes.** Below this, it states that the registered owner of the vehicle with the wrong occupancy setting will receive an Occupancy Correction Notice of Toll Evasion Violations, as indicated in the chart below:

First Notice: Occupancy Correction	Toll amount + \$4 processing fee If the notice remains unpaid, a past due notice will be mailed out
Second Notice: Past Due	Toll amount + \$4 processing fee + \$21 past due penalty If the notice remains unpaid, a delinquent notice will be mailed out
Third Notice: Delinquent	Toll amount + \$4 processing fee + \$21 past due penalty + \$30 delinquent penalty If the notice remains unpaid, a hold may be placed on the vehicle's registration and/or sent to collections

References

- Metro ExpressLanes Web Page about ODS:
<https://www.metroexpresslanes.net/occupancy-detection-system/>
- Preliminary ODS Results from 2015 Test:
<http://onlinepubs.trb.org/onlinepubs/Conferences/2016/ML/S6-McCune.pdf>
- Metro Board Report on Occupancy Detection System:
<https://metro.legistar.com/LegislationDetail.aspx?ID=3311995&GUID=0209DF40-5829-4D6B-A871-FE487AFF53A3>
- ODS Information and Specifications from Vendor:
<https://downloads.conduent.com/content/usa/en/brochure/vehicle-passenger-detection-system.pdf>
- LA Times article on occupancy mis-representation:
<https://www.latimes.com/local/lanow/la-me-ln-toll-lane-cheating-20170929-story.html>

Questions



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