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# **Yolo 80 Managed Lanes CARTA Board Meeting**

**February 20, 2025**

**Attachment 7A**

# Agenda

- Overview of Current Constraints and Challenges
- Overview of Types of Separation
- Current Facility Design and Proposed Modifications

# Overview

# Project Goals

Goals for the project remain:

- Safety
- Managing congestion
- Improving traffic time reliability
- Meeting Vehicle Miles Traveled (VMT) commitments

# Causeway Overview

- ▶ The current design is open access – allowing drivers to enter and exit at any point
- ▶ Causeway has very limited space and the project does not include widening the causeway
- ▶ Current design reduces lane widths but maintains 2' inside shoulder and 10' outside shoulder
- ▶ Current design does not have any read points on causeway (4 miles)
- ▶ Caltrans agrees that lane separation or technology on causeway could be considered in the future but reducing shoulders may have safety concerns

# Challenges

- ▶ Open access without read points for 4+ miles is estimated to result in **10 – 15% revenue leakage**
- ▶ Very challenging to install traditional toll gantries on causeway structure
- ▶ The causeway is a chokepoint and will have highest demand for express lanes – managing traffic with pricing will be difficult without read points or lane separation
- ▶ Changes to the design at this point will require a change order/increase in cost. Contract has very limited funding.
- ▶ Implementing lane separation would reduce shoulder widths and trigger the need for Caltrans approval of design exceptions

**How are managed  
lanes separated from  
general purpose lanes?**

# Types of Separation

- ▷ Physical Separation
  - ▷ Concrete Barrier
  - ▷ Pylons/Tubular Delineators
- ▷ Soft Separation
  - ▷ Striped Buffer
  - ▷ Solid or Dashed Stripe



# Barrier Separation

- ▷ Fixed width
- ▷ Favors longer distance trips with minimal intermediate access points
- ▷ Sometimes coupled with reversible lane configuration



I-15 Express Lanes – San Diego

# Pylons or Tubular Delineators

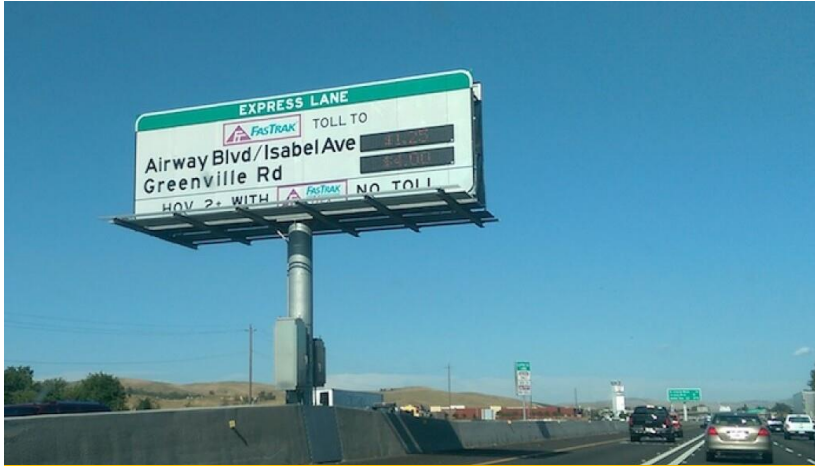
- ▷ Flexible material
- ▷ Return to an upright position after impacts at 70mph
- ▷ Easy to replace



I-405 Express Lanes – Orange County

# Striped Buffers or Lane Stripes

- ▷ Double white lines for buffered systems
- ▷ Single dashed stripe for open access systems



I-580 Express Lanes – Dublin/Pleasanton



I-680 Express Lanes – San Ramon/Danville

# Capacity of Managed Lanes

- **Friction Effect:** ML operations are sensitive to congestion in adjacent GP lanes under certain separation conditions. This **frictional effect** is **stronger** on facilities with minimal physical separation such as the **Continuous Access**<sup>2</sup>
- *Source: Kitae Jang, D. R.-Y. (2009). A Comparative Safety Study of Limited versus Continuous Access High Occupancy Vehicle (HOV) Facilities. California Department of Transportation*

# Safety and Operations Effects

- Violation of crossing the lines are a safety concern. Pylon or barrier separations eliminate the weaving concern.
- Modeling is just starting but it is anticipated that 10% to 15% of managed lane users will evade the tolls on the causeway without separation
- EL performance and travel time reliability will be impacted by travelers using EL as passing lane

# Timing of Decision

- Roadway construction is underway
- Modifications will require issuing a change order to contractor
- Decision needed soon to allow time for development/design of CCO, contract negotiations, ordering materials, and technology inclusions in the forthcoming toll system Request for Proposals

# Physical Separation

## Advantages

- No weaving in/out
- Improved safety
- Reduced violation
- Easier to enforce
- Protection of express lanes revenue
- More reliable travel time for all users, including transit vehicles
- More effective use of dynamic pricing
- Pylons allow emergency/incident response

Eliminates flexibility for shorter trips\*

**Concrete barriers require more physical space than pylons**

Pylons increase maintenance and operation costs

Weaving locations may lead to more bottlenecks if not carefully designed

## Disadvantages

# Soft Separation

## Advantages

- Minimal to no additional space required
- Provides flexibility for emergency/incident response
- Reduced maintenance costs

- Weaving creates operational and safety challenge
- Increased violation
- Harder to enforce
- Less reliable travel time
- Less reliable revenue stream
- Additional gantries are needed**

## Disadvantages



# **CURRENT DESIGN AND PROPOSED MODIFICATIONS**

# Yolo 80 Proposed Configuration



EB Reader		
#	Location (Sta.)	Spacing (Mile)
1	297+00	0.64
2	330+75	1.80
3	426+00	0.98
4	478+00	0.42
5	500+00	1.54
6	581+10	4.11
7	798+00	0.51
8	825+00	

WB Reader		
#	Location (Sta.)	Spacing (Mile)
1	798+00	
2	763+00	0.66
3	581+20	3.44
4	500+00	1.54
5	482+00	0.34
6	443+00	0.74

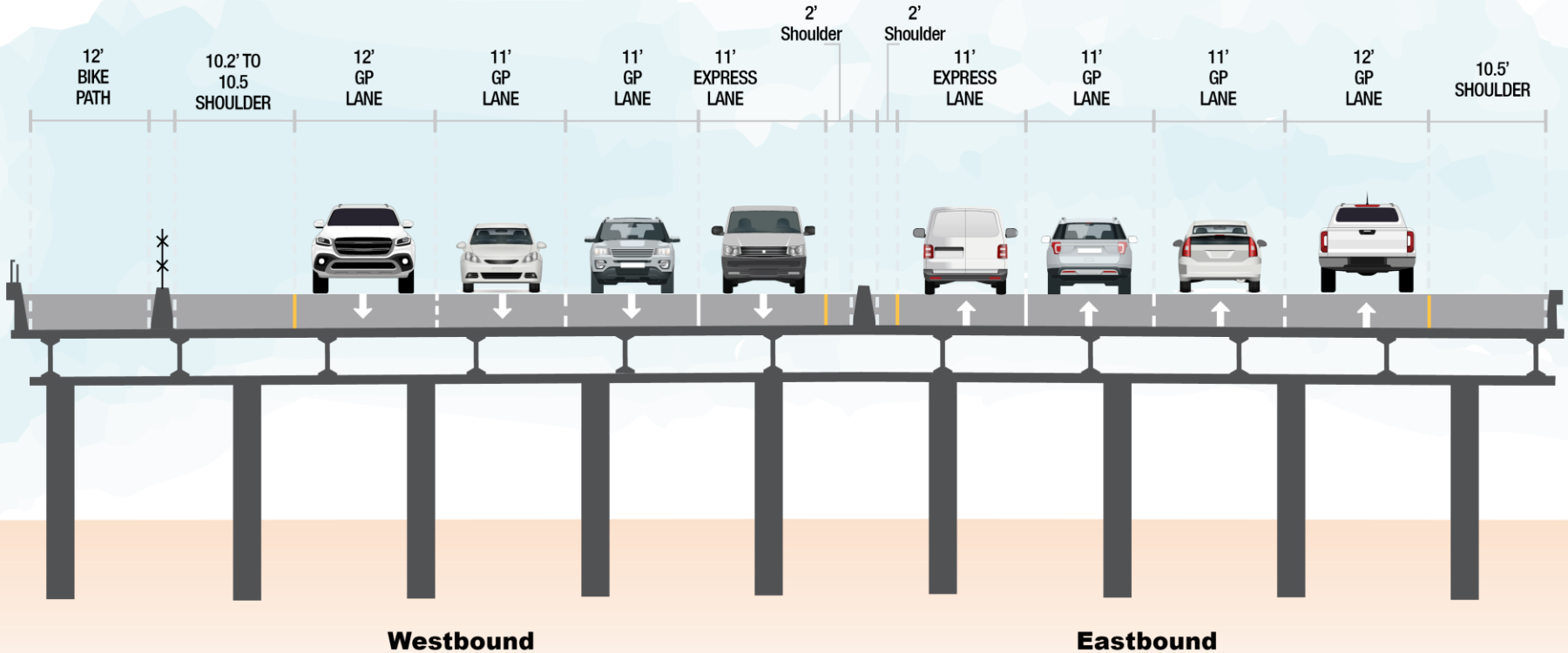
- ▷ Total Length: 17 miles
- ▷ Number of Toll Gantries
  - ▷ 8 EB Toll Points
  - ▷ 6 WB Toll Points
- ▷ Longest spacing: 4 miles on Causeway

# TYPICAL SECTION 1

## Current Proposal

### Causeway West

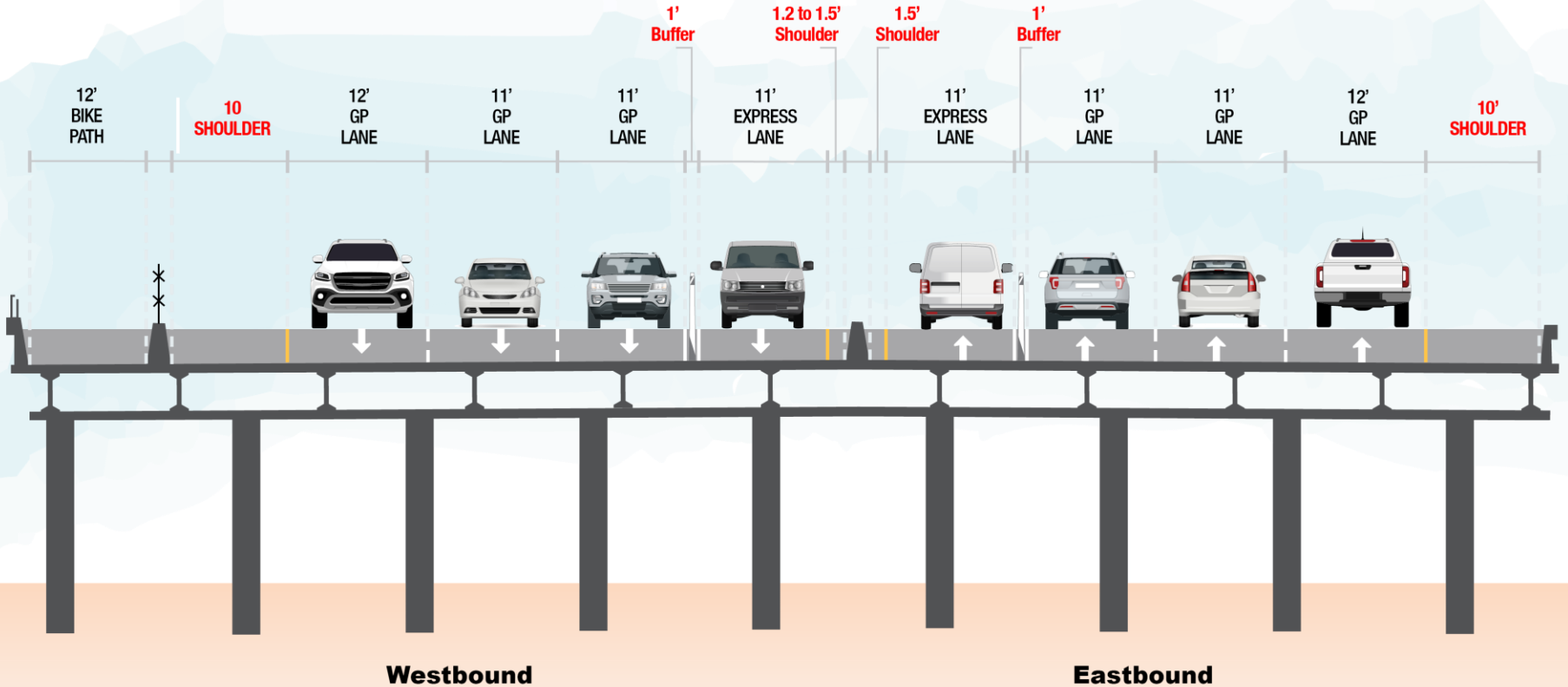
Note: Inside shoulder and lane widths have been reduced to add the express lane



# TYPICAL SECTION 1

Option 1: 1-Foot Buffer

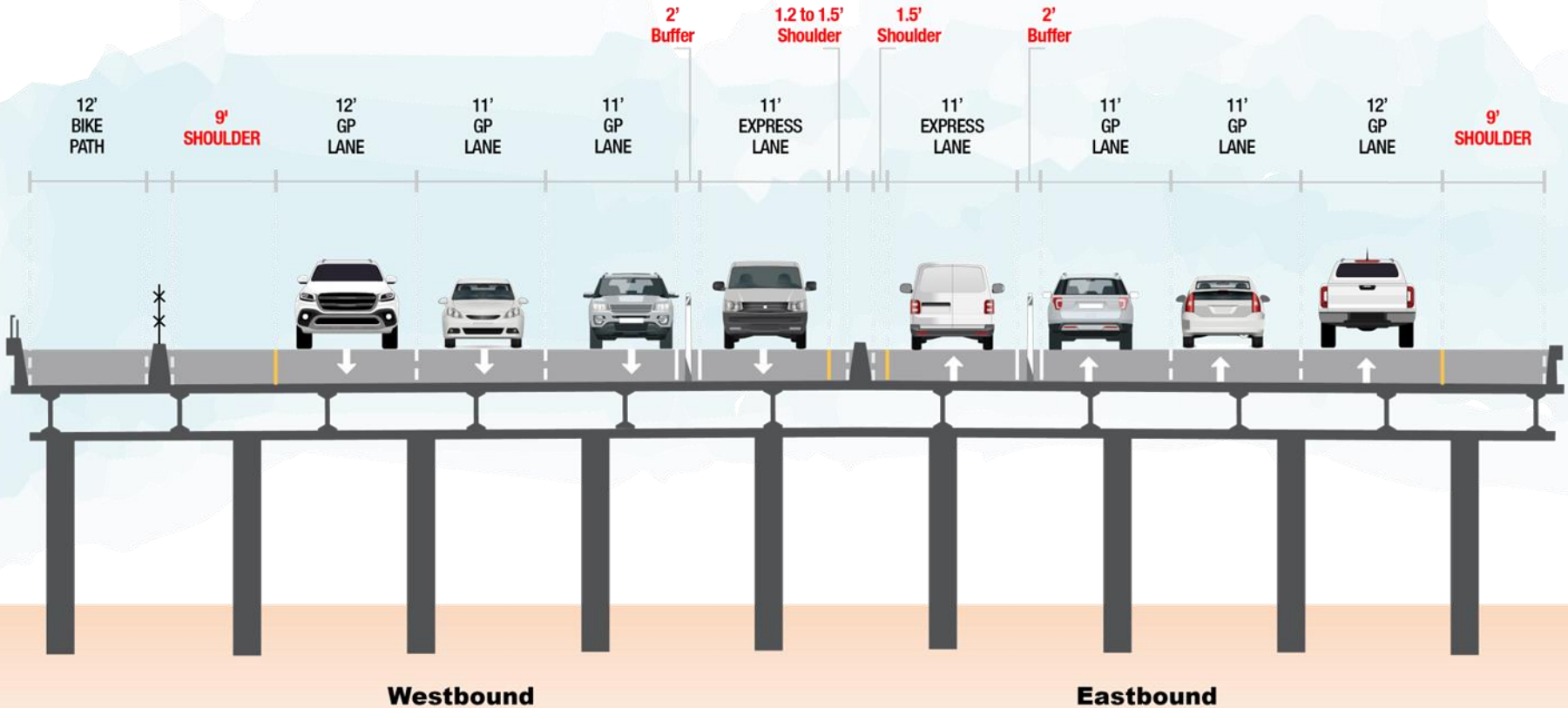
## Causeway West



# TYPICAL SECTION 1

Option 2: 2-Foot Buffer

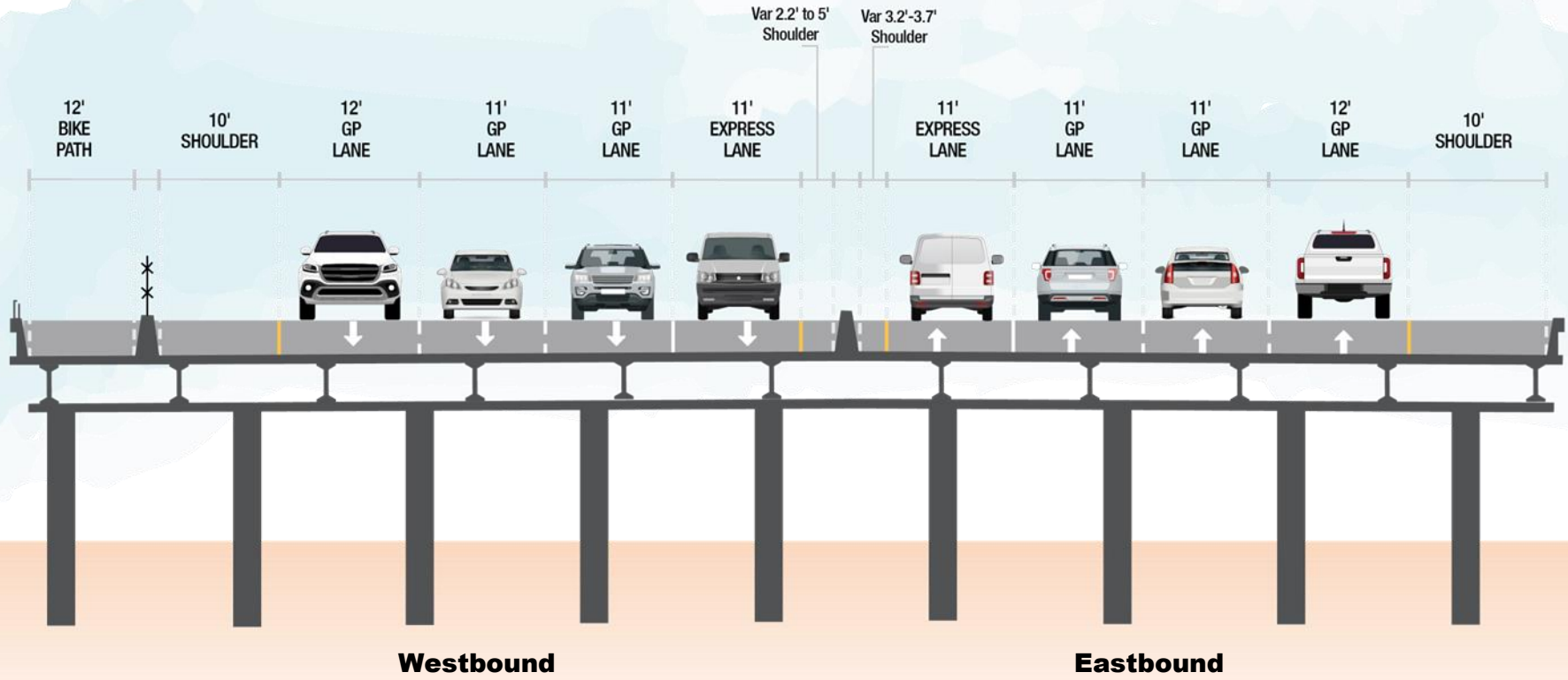
## Causeway West



# TYPICAL SECTION 3

Current Proposal

Causeway East



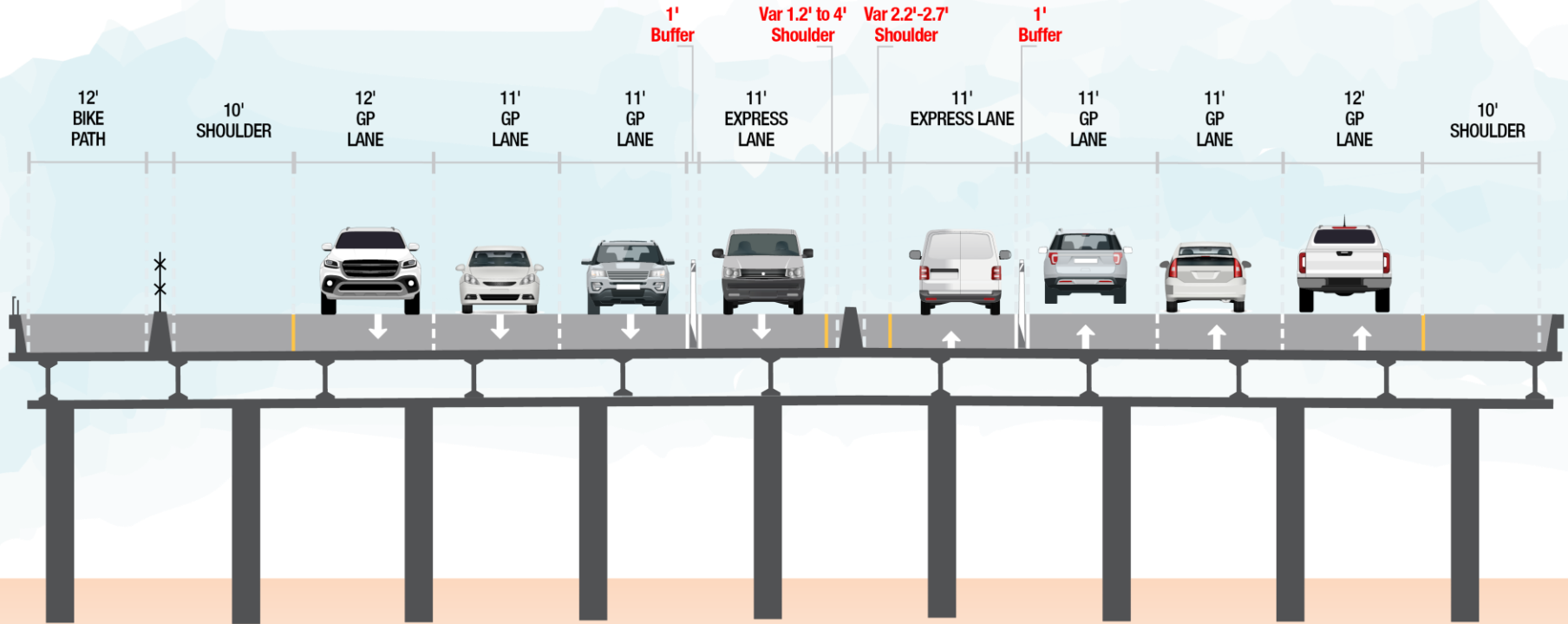
Westbound

Eastbound

# TYPICAL SECTION 3

## Option 1: 1-Foot Buffer

# Causeway East



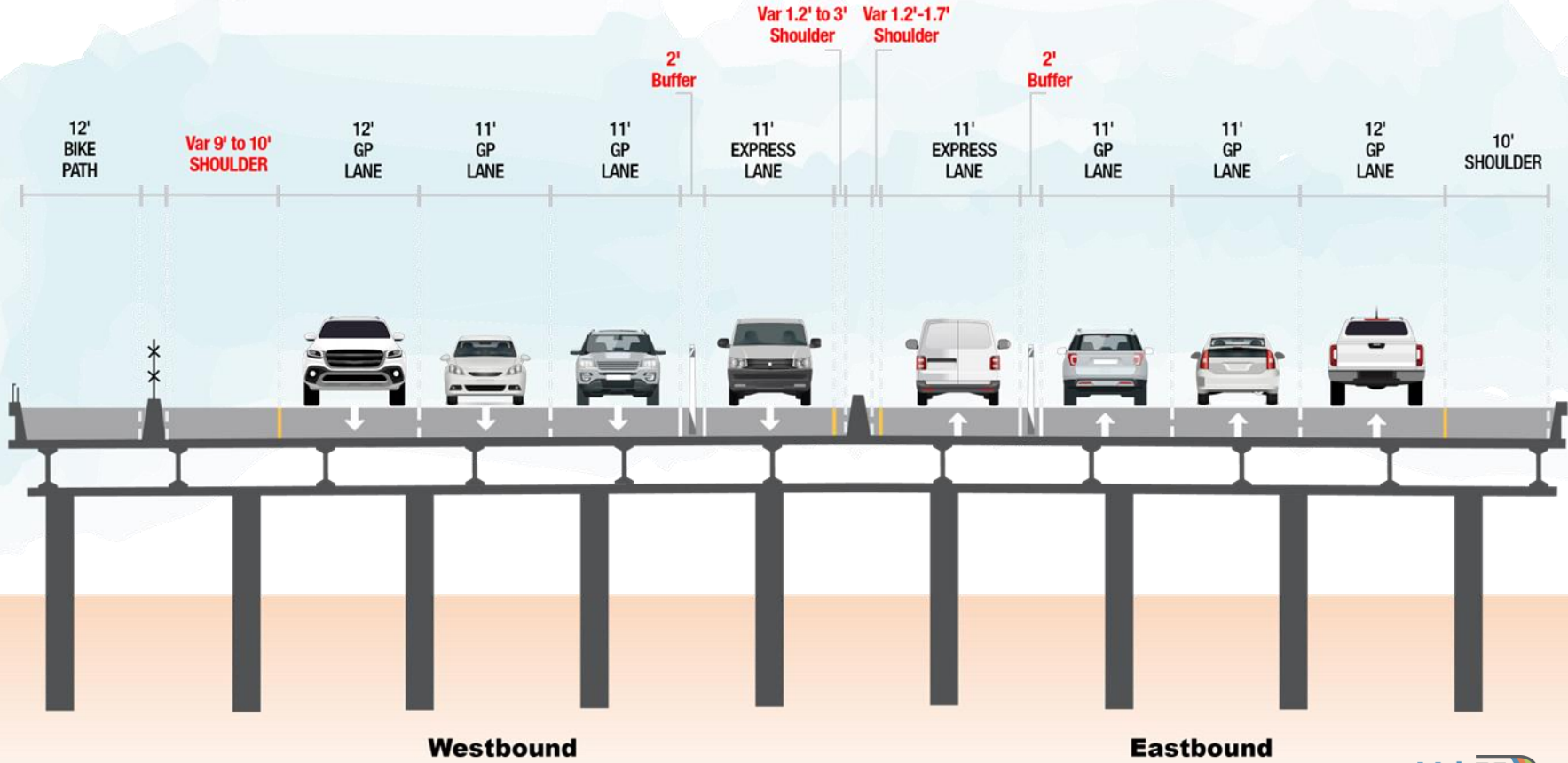
Westbound

Eastbound

# TYPICAL SECTION 3

Option 2: 2-Foot Buffer

Causeway East



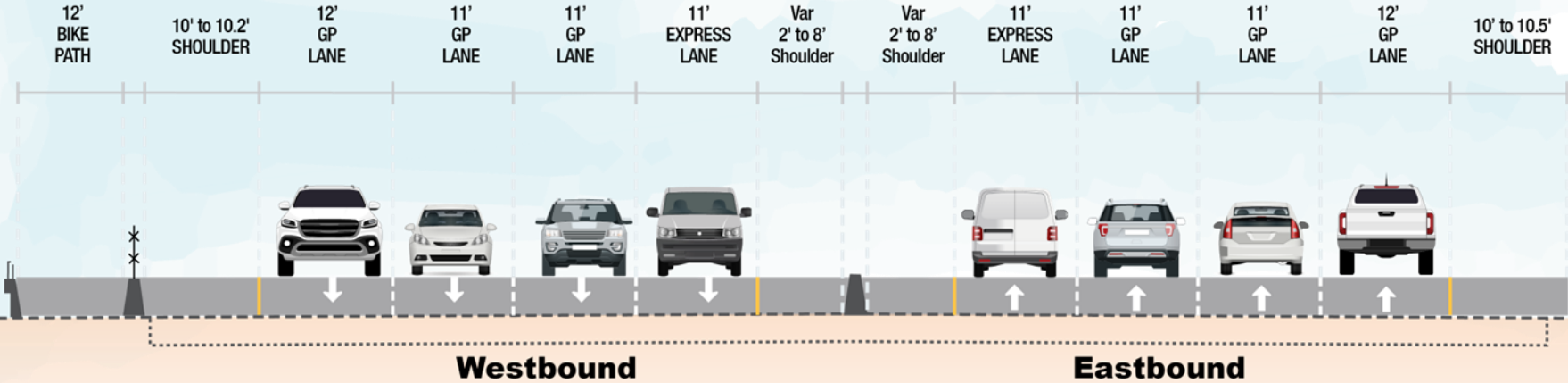
Westbound

Eastbound



Outside the Causeway limits

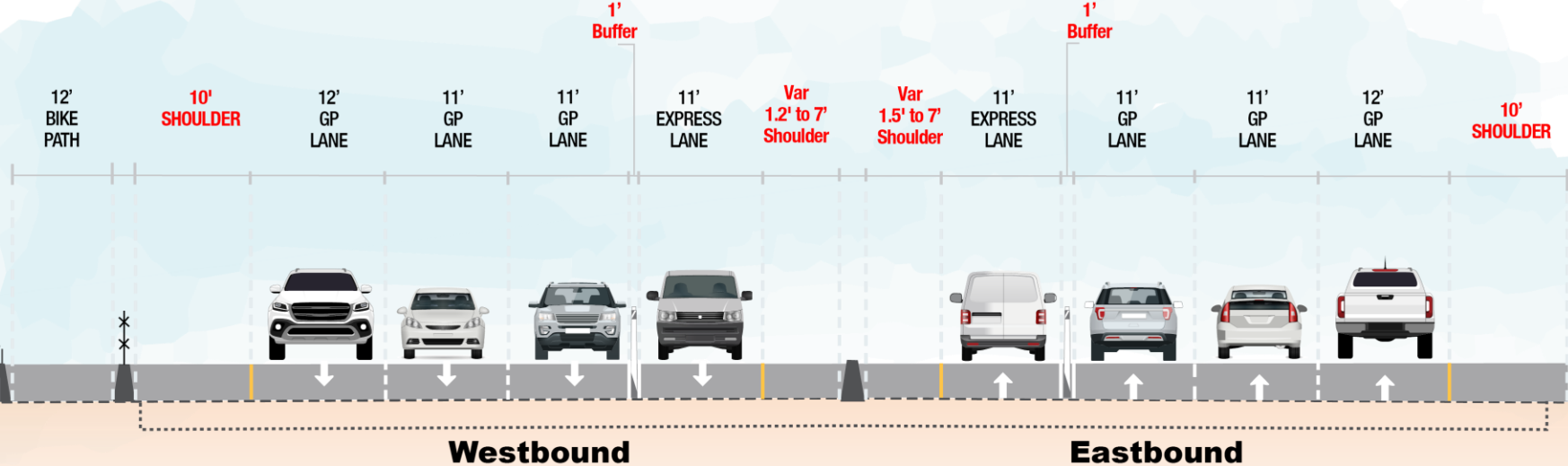
**TYPICAL SECTION 2**  
Current Proposal



# Outside the Causeway limits

## TYPICAL SECTION 2

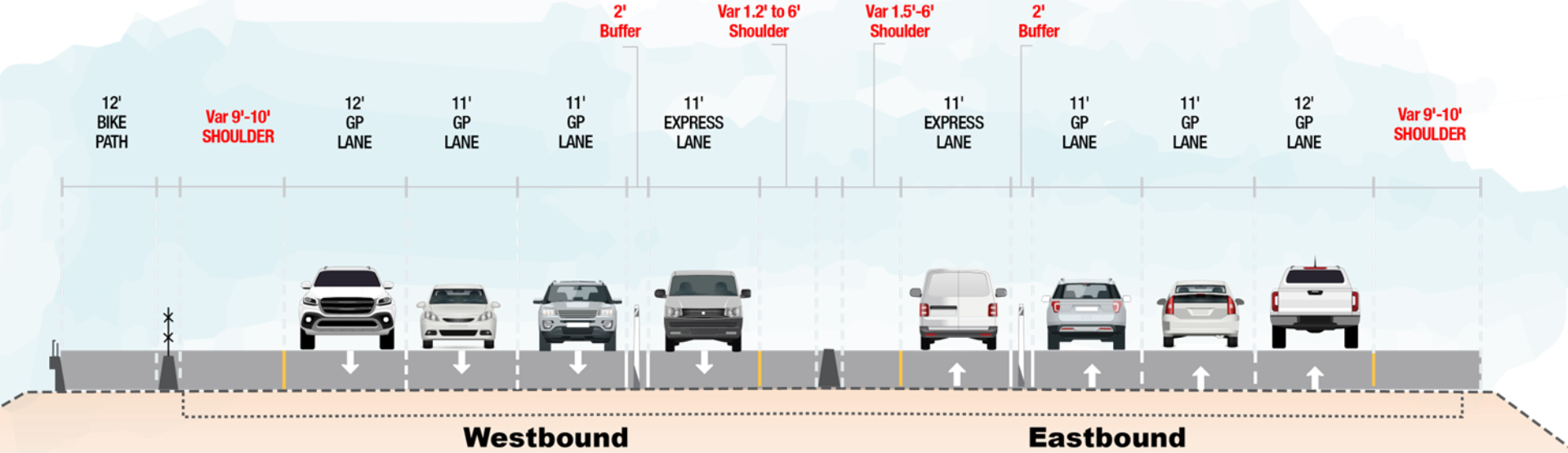
### Option 1: 1-Foot Buffer



# Outside the Causeway limits

## TYPICAL SECTION 2

### Option 2: 2-Foot Buffer



# Additional Toll Readers

- Without delineators, additional toll readers would be needed
- Installing toll gantries on the Causeway would be challenged by the structural design requirements and environmental constraints
- Additional power and communications infrastructure would be needed
- Opportunity to use other technologies to toll traffic in the lane using license plate readers

# License Plate Cameras

- Supplemental toll read along Causeway
- Mounted to the side with no mast arm
- Uses license plate read technology
- Correlates with registered toll tag account for toll verification
- Provide toll system redundancy
- Requires lane closure when maintenance is needed, but could be performed at night or during off-peak