



COLORADO
Department of
Transportation



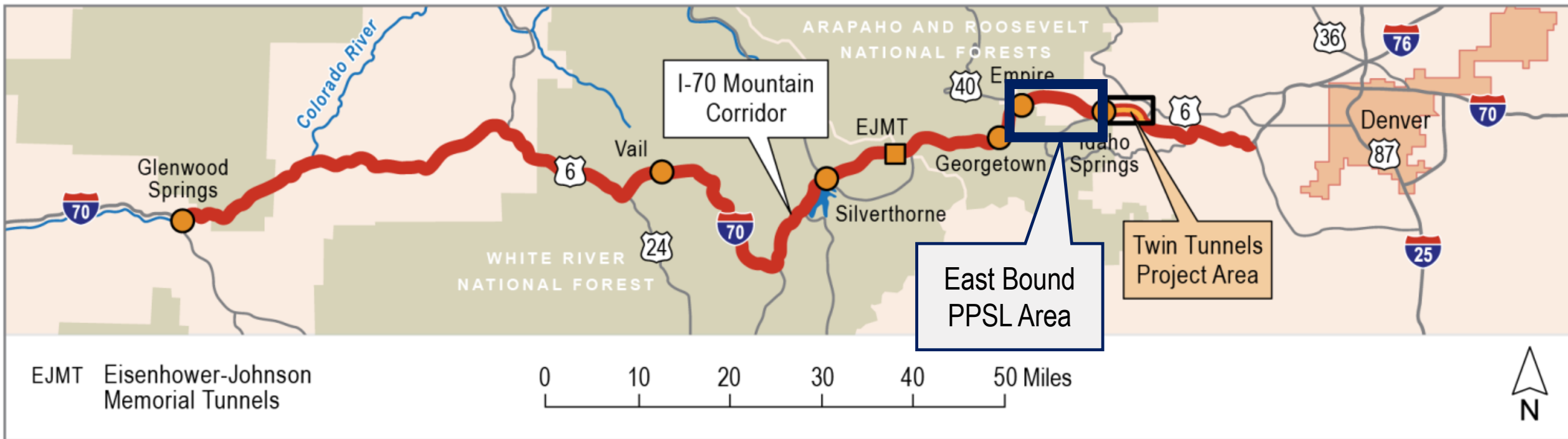
Part Time Shoulder Use

Ryan Rice, TSM&O Director
San Lee, TSM&O Program Manager

July 14, 2016



Mountain Express Lane - MEXL

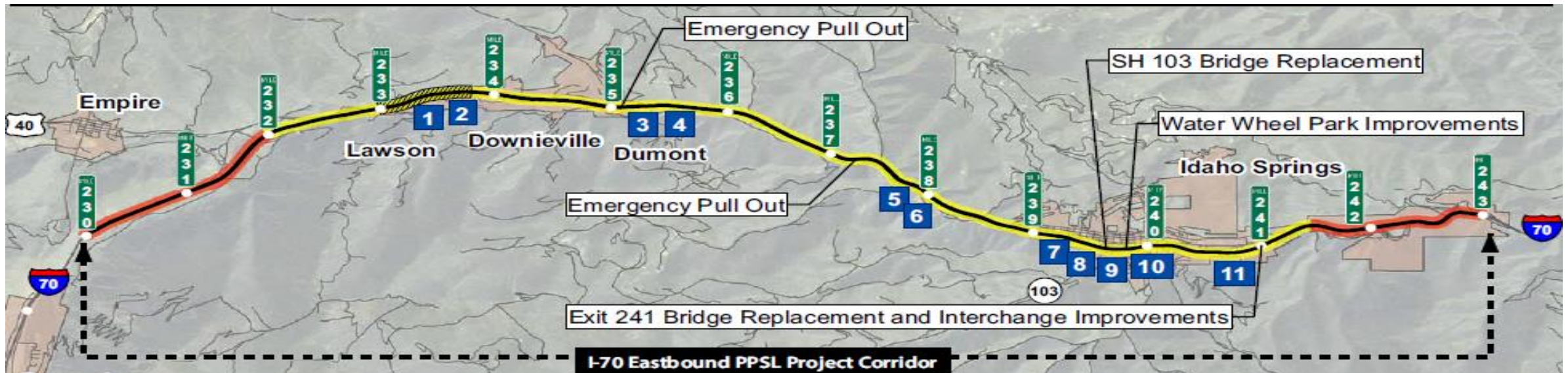




EB PPSL Overview

Utilizes shoulder for travel during peak periods of congestion.

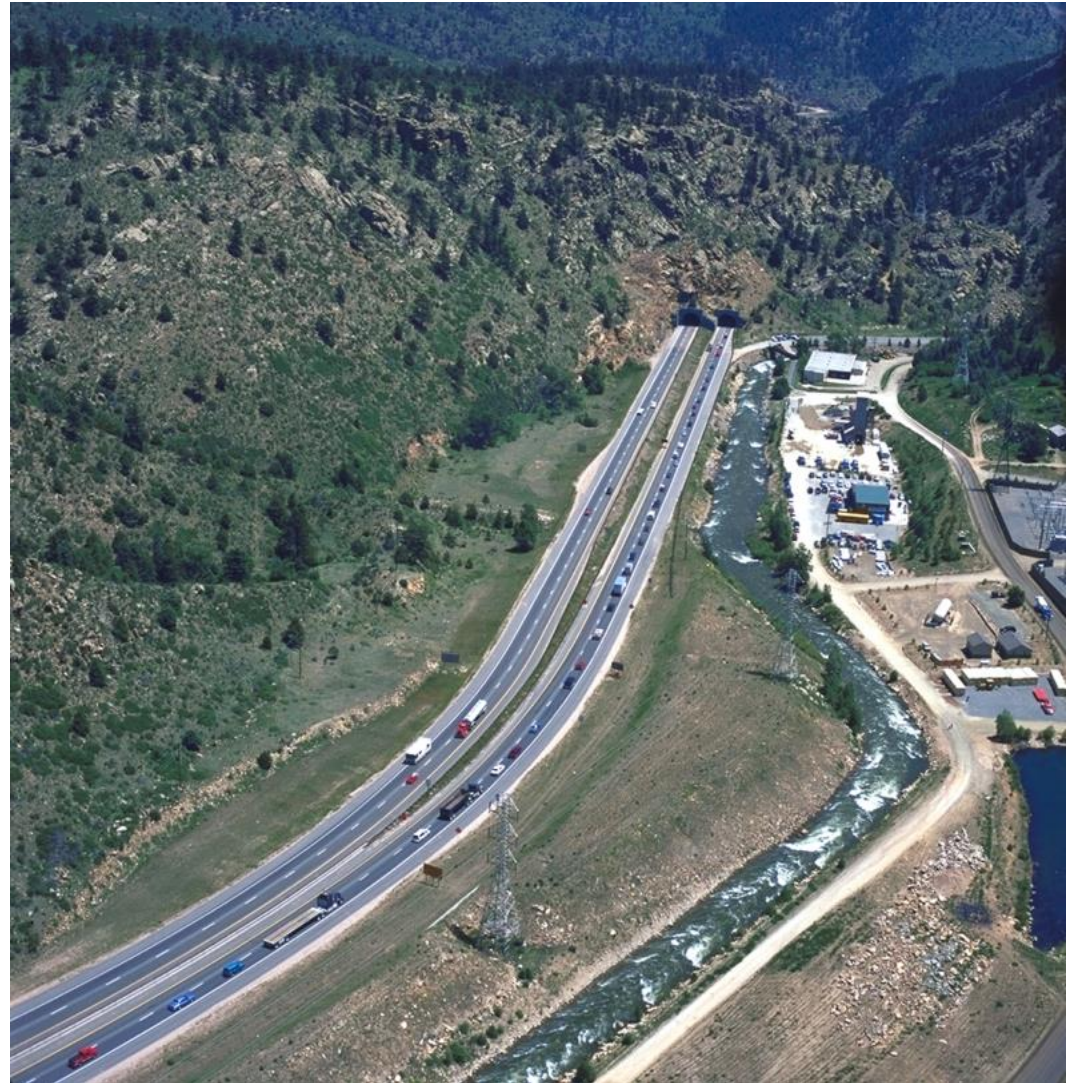
- Begin at US 40 (Empire Junction) Interchange
- End at the Veterans Memorial Tunnel (twin tunnels)
- Includes signing, ITS and ATM outside these limits





PPSL - MEXL Project Benefits

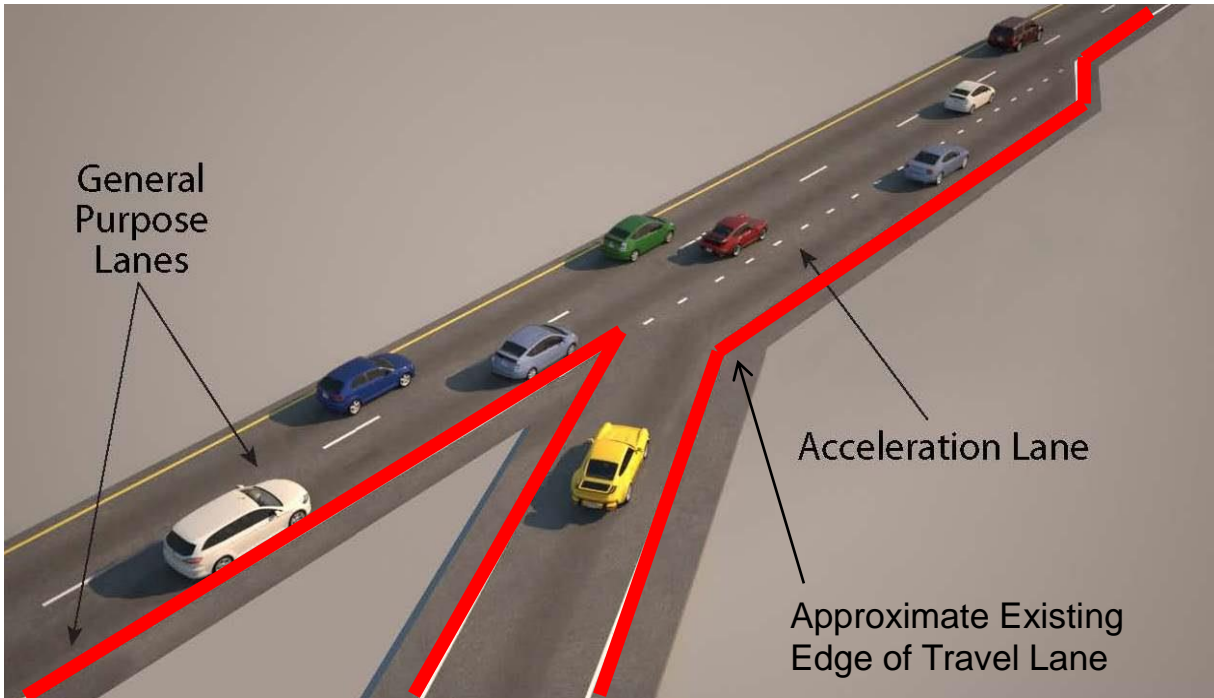
- Provide short-term eastbound operational improvements
- Relieve traffic congestion during peak periods
- Be implemented within a short time frame
- Keep construction within the existing highway footprint
- Be implemented in advance of longer-term major improvements to the I-70 Mountain Corridor





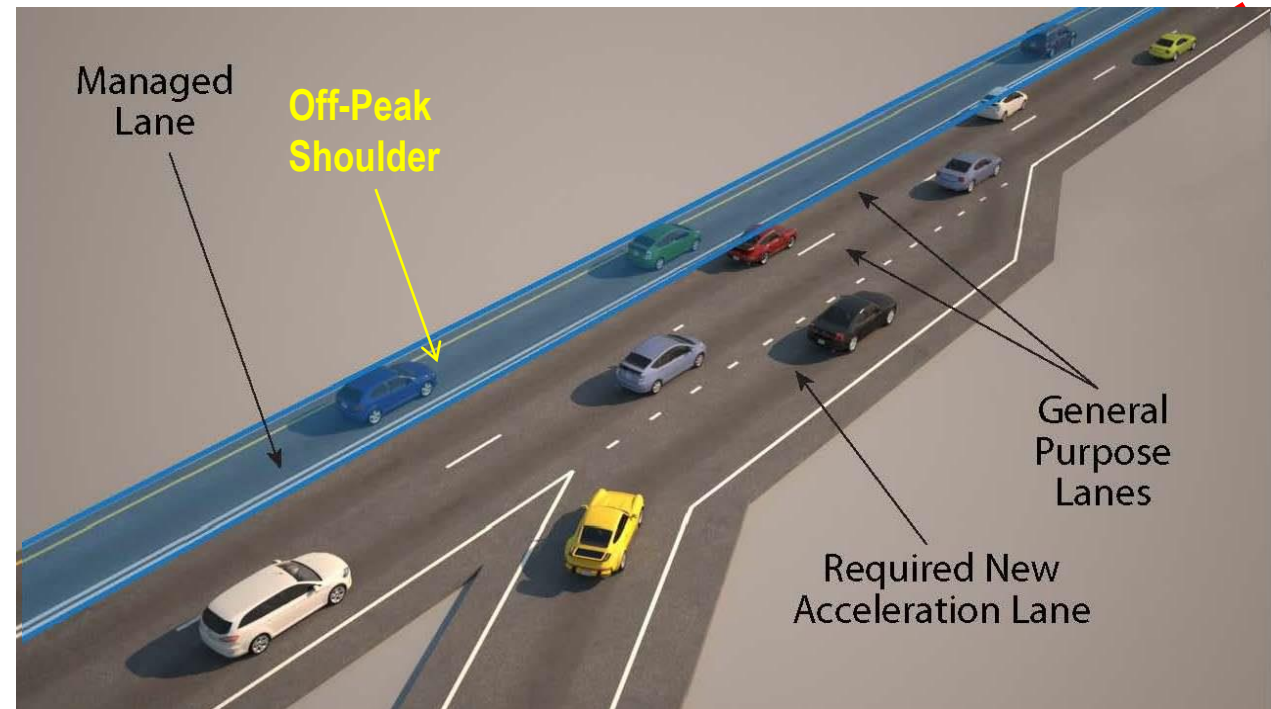
Left PPSL Design

Pre MEXL



Left Side Benefits

- Add acceleration lane
- No general purpose lanes shifts between on-peak and off-peak

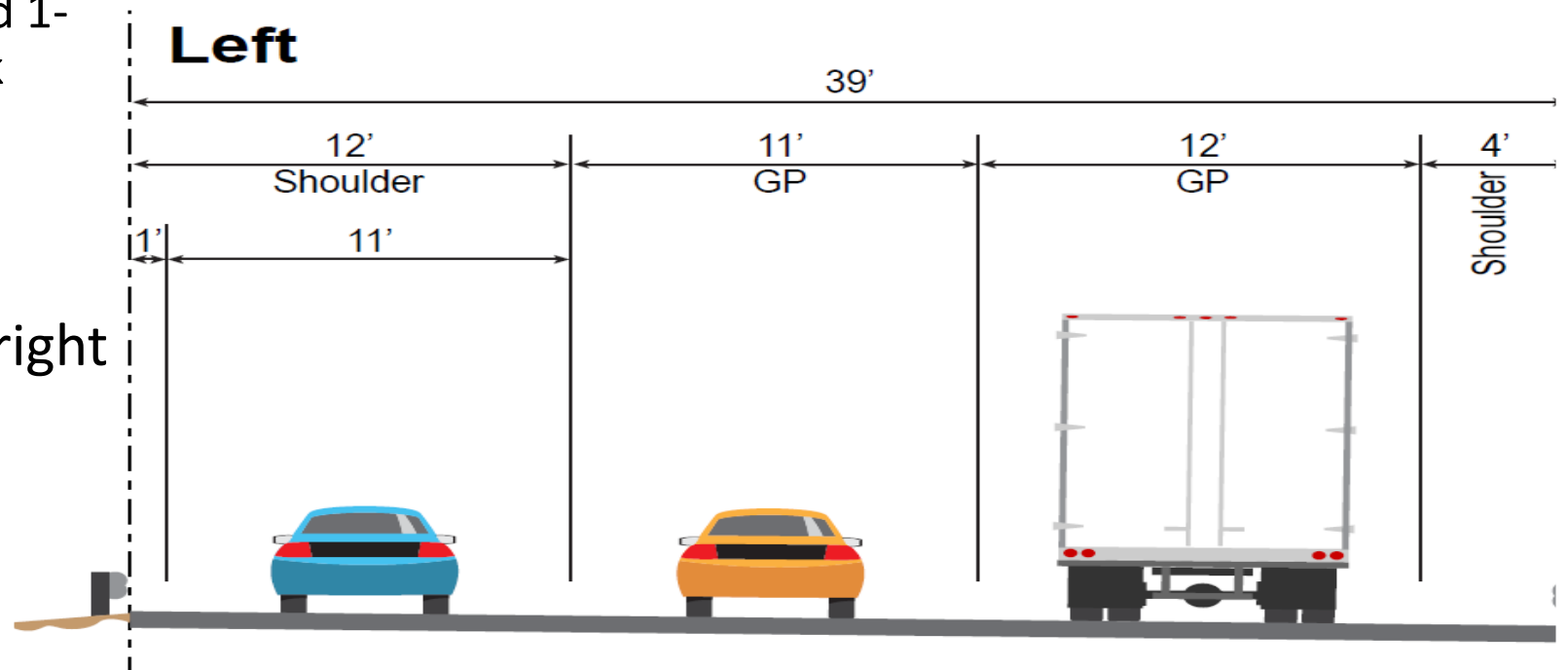




Design

Typical Section

- 12-foot inside (left) shoulder
 - 11-foot managed lane and 1-foot shoulder during peak times.
- 11-foot general purpose center lane
- 12-foot general purpose right lane
- 4-foot minimum outside (right) shoulder





PPSL Construction

- Widening to accommodate a PPSL
- Replace SH 103 and Exit 241 bridges
- Construct / rehabilitate retaining walls
- Construct emergency pull outs
- Provide signage throughout corridor
- Widen on-ramps as needed
- Provide water quality treatment measures





Tolling Overview

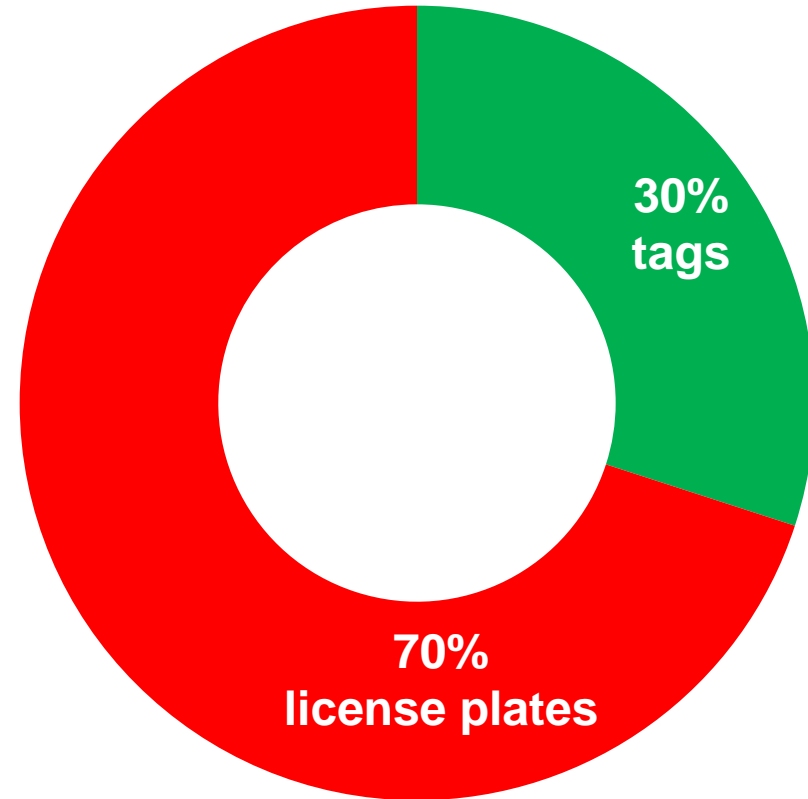
10-mile segment

One ingress, two egresses

3 toll points

Tolls ranged from \$3 - \$8

Switchable, sticker or video





Tolling Strategies





Dynamic Tolling for MEXL

170 East I70 PPSL Test Corridor (126)

Zoom Scale Flip View East Select All LUS (12) Select All VSL (0) Select All VMS (0) Select All VMS (7) 0 Selections Turn On Turn Off

2 ● ● ● 5.807 %

Map (I 70) Toggle Street View

3

1

East Bound Idaho Springs

EXPRESS ONLY

EXPRESS LANE TOLL TO US-6 \$1.50

US-40

Exit 232

IDAHO SP 7M
DEN/C470 27M
I70/125 45M

4

5 Ready to Pls

Speed (mph) Occupancy (%) Density (GP) Density (ML) Streaming Camera(s)

Last Update Time: 11/17/15 14:16

MM	02:15 PM	02:14 PM	02:13 PM	02:12 PM	02:11 PM
217.85	-1	-1	-1	-1	-1
218.1	-1	-1	-1	-1	-1
218.7	-1	-1	-1	-1	-1
219.7	-1	-1	-1	-1	-1
221.1	-1	-1	-1	-1	-1
222.36	-1	-1	-1	-1	-1
223	-1	-1	-1	-1	-1
232.6	24.36	24.02	29.78	35.77	38.77
234.6	67.94	62.5	45.38	51.43	66.59
239.6	28.97	28.92	43.9	35.93	40.87
242	40.79	45.54	52.35	36.24	58.65
242.8	87.86	65.46	89.03	39.93	136.24
243.35	68.38	78.08	34.91	68.53	97.22
246.66	-1	-1	-1	-1	-1

6

Events Alarms Log Toll History Toll Schedule

Id	Common Name	Start Time	End Time	Toll Rate	Global Override
9209, 8214, 8230	EMPIRE EAST GP1, 070E23	11/17/15 12:00:00 AM	11/17/15 11:59:00 AM	\$1.50	GLOBAL

Mile Marker: 233.31, Direction: East, Lane #: 2, Lane Type: HS 1

Corridor Management Events CSP Incidents 170 East I70 PPSL Test Corridor (126) External Systems



Video Detection and Data

Overview Video Settings Manage Units / Cameras Map Administration Data **ONLINE DOCUMENTATION**

Camera: I-25 191.45 NB : 0.7 mi S of Ridgeway Pkwy Alert

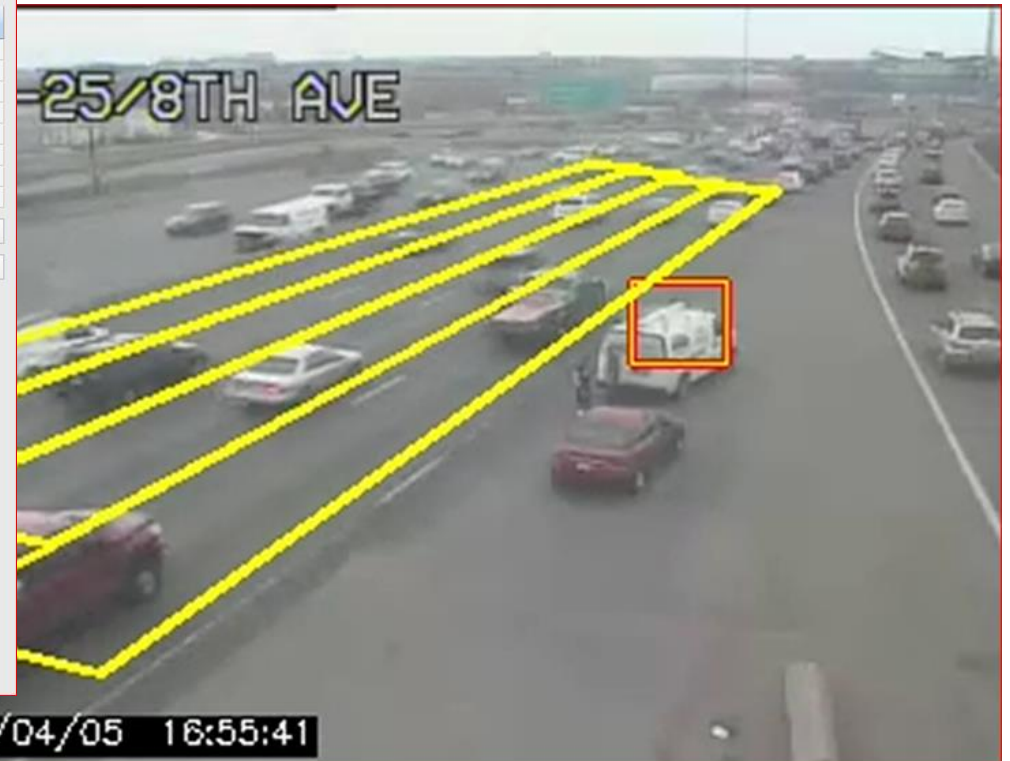
I-25 191.45 NB : 0.7 mi S of Ridgeway Pkwy (Lone Tree-DA)

Side	Speed (mph)	Flow Rate (vph)	Occupancy (%)
SB	72	4020	10
NB	68	3360	9

Lane	Speed (mph)	Flow Rate (vph)	Occupancy (%)
1: (NS-1)	64	540	6
2: (NS-2)	70	1080	11
3: (NS-3)	68	1140	12
4: (NS-4)	68	600	6
5: (FS-1)	77	1260	12
6: (FS-2)	71	1980	21
7: (FS-3)	72	720	7
8: (FS-4)	65	60	0

PTZ Mode: Automatic Preset Selection vp: [406.26]

2016/05/25 14:25:59





Traffic Incident Management

TIM Program

- Corridor Manager and Incident Manager
- Motorist Assistance Patrol
- Heavy Tow
- Winter Operations Plan

Benefits to TIM since MEXL

- Emergency Response Lane
- Traffic Diversion for Lane Blockage
- More participation from Local Agencies and First Responders (JOA)



2016 Winter Season Summary

Data

32 days of operation

Typically open 9am to 7pm

1 million vehicles

23 incidents (4 in MEXL)

22 minutes to clear incident

Results

15% more throughput

18% faster travel in GP lanes

Reduced traffic on local roads

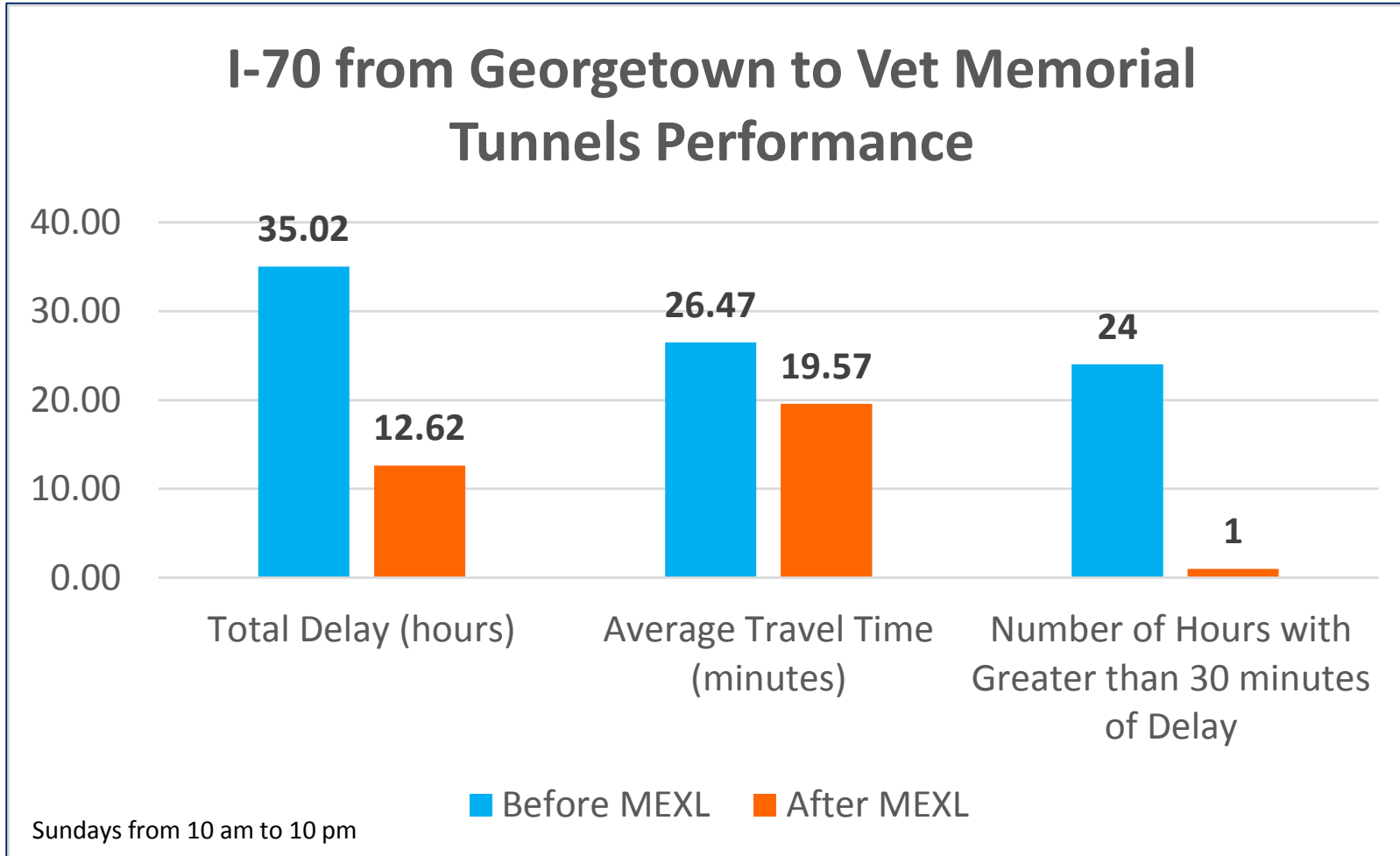
Lessened duration of congestion

Improved corridor conditions



Performance Highlights

March 2015 and 2016





Lessons Learned and Best Practices

