



COLORADO

Department of
Transportation



I-70 East Bound Peak Period Shoulder Lane
April 23, 2019



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Transportation

Interstate 70-West of Denver





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Heavy Recreational Traffic on Weekends



Travel from the City to the Mountains

- 30,000 ADT—Peak Weekend Traffic 50,000+
- Twelve Mile Bottleneck-
 - East Bound-US 40 from Winter Park and Grand County feeds into I-70 at Empire Junction, which is carrying traffic from Vail and Summit County. Interstate remains two lanes
 - US 6 leaves Interstate at Floyd Hill, taking traffic to Golden via Clear Creek Canyon. Interstate 70 increases to 3 EB lanes.



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1950s US6 Junction versus 1960s US 6 Junction





P.E.I.S.

PEIS restricts Infrastructure improvements in Clear Creek County.

Mountainous Terrain makes expansion of Interstate very difficult





Operational Improvements

Non-Infrastructure Operational Improvements-Allowed under PEIS

4' Right Shoulder

12' General Purpose Lane

11' Left General Purpose Lane

11' Peak Period Shoulder Lane

1' Shy distance

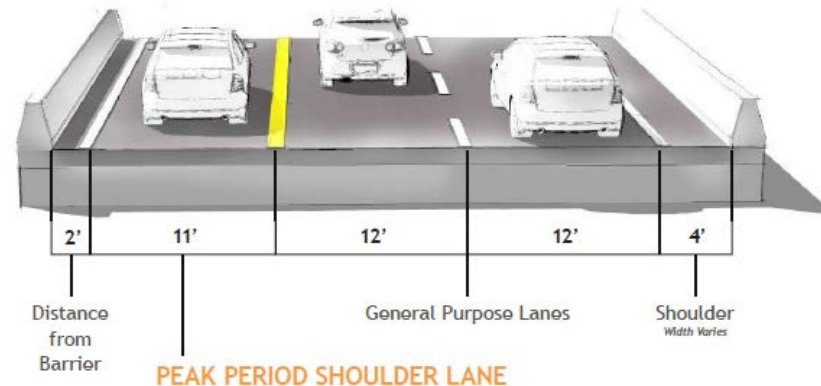
39' Total Section

Constructed with minimal additional pavement

(Primarily Barrier, Retaining Walls)

41' Section in New WB Project

TYPICAL CROSS SECTION 41' Variable Width





Tolling and Operating Protocols

- Traffic and Revenue Study indicated that corridor would support tolls from \$4 to \$30 for the 12 mile trip. Study showed expected “average” revenue to be \$12 per user.
- Initial plan was to invoke Dynamic Tolling, where tolls would vary depending upon traffic volume and congestion levels.
- Negotiated operating protocols with FHWA and Clear Creek County. Initially limited to 73 days of operation per year (20%)
- Expanded to 100 days in year 2.
- Lane must be “swept” before opening. Generally, it’s opened at 9:00 AM so sweeping can occur during low traffic.



Tolling and Operating Protocols

- Dynamic tolling was difficult to implement in real time. Latency of the system was found to be slower than the dynamism of the traffic.
- Toll rates were less elastic than expected. Usage dropped precipitously when tolls were raised above \$8.00.
- Traffic demand varies for somewhat unpredictable reasons.



Tolling and Operating Protocols

- Seasonal Effects-
 - Summer peak lasts longer. Traffic has always been heavier in summer.
 - Winter peak is tied to sunset and the ski areas closing at 4:00 PM.
- Weather Effects-
 - “Powder Days” in winter—bad weather drives demand up.
 - “Rainy Days” in summer –bad weather drives demand down-or makes people head home earlier in the day.
- Unusual Events
 - Bronco Games-Home or away, competitive or not.
 - Special Events-X-Games in Aspen, World Cup Ski Races in Vail-push peak later as those places are 1-2 hours west of lane.
 - Holidays.



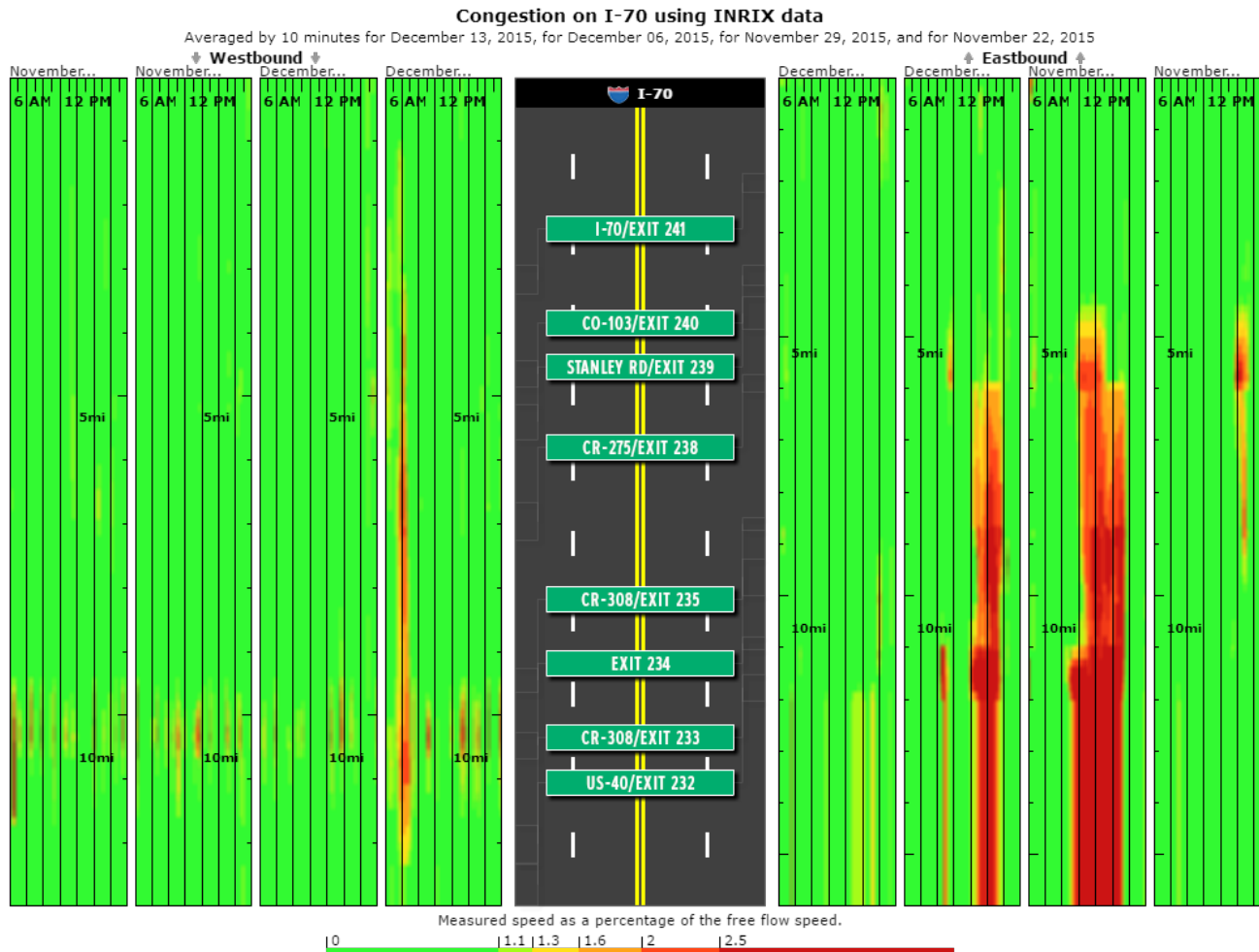
Current Process

- Open lane at 9:00 AM on Saturday-with a toll of \$4
- Raise price to \$5 at late morning
- And \$6 at 1:00 PM
- Close lane at 6 PM, unless special conditions warrant keeping it open.
- Sundays follow same pattern, just \$1 dollar more expensive
- Summer operation extends opening hours to 8 PM or whenever traffic drops. Price increase generally occurs earlier in the day.
- Real time traffic counter in Eisenhower Tunnel, 20 minutes west of lane. This is used to determine when to close lane.
- Lane capacity is about 800 cars per hour. Seldom sees that, regardless of price. System capacity is about 3200 cars per hour.



Performance

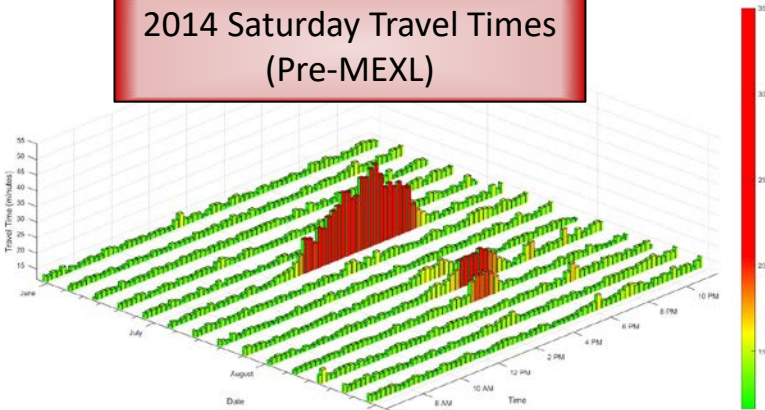
- Massive improvement to non-toll lane traffic speeds.



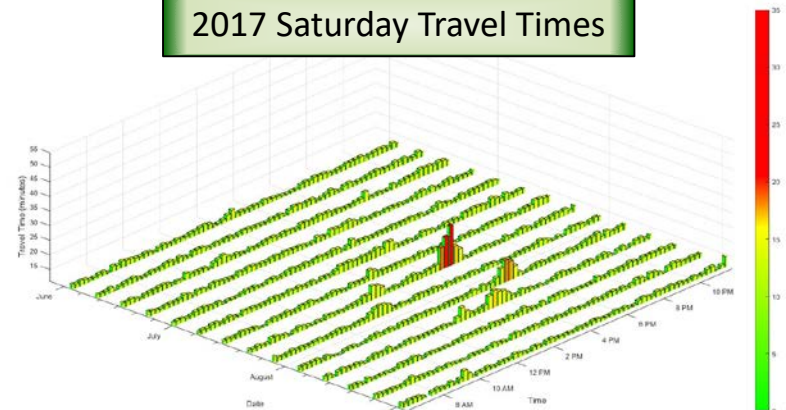


I-70 Mtn. Express Lanes – Findings

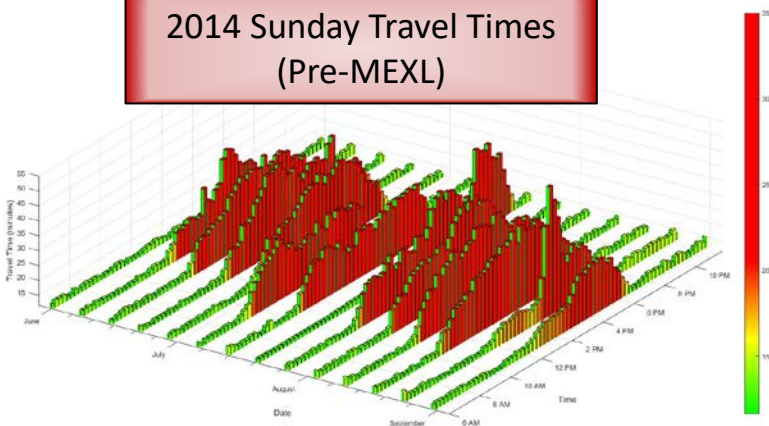
2014 Saturday Travel Times
(Pre-MEXL)



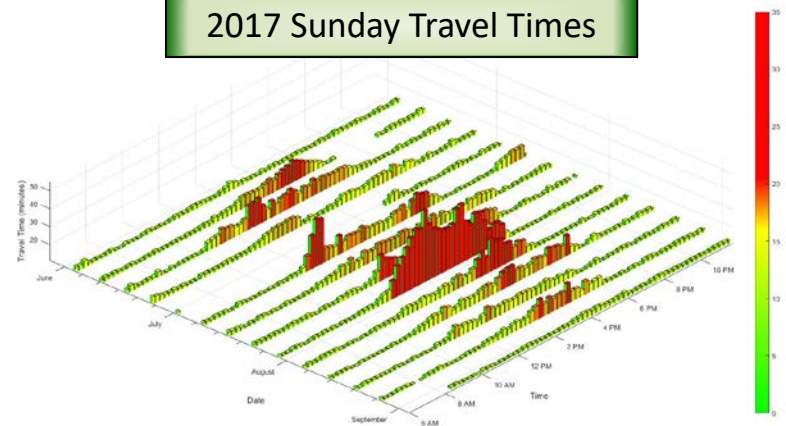
2017 Saturday Travel Times



2014 Sunday Travel Times
(Pre-MEXL)



2017 Sunday Travel Times





Surprises

- Price sensitivity inelastic-lane usage more a function of perceived congestion, than price—until price raised above \$8.
- Revenue is growing as public acceptance grows.
- Two peak days per week, with only a few peak hours per day, limits revenue. Generates around \$100k per month-with very obvious seasonal impacts (summer and winter are better than fall, which is better than spring. Sundays are better than Saturdays)
- Even when traffic doesn't warrant it, the lane is opened, weather permitting most every weekend. A predictable opening helps train the public. It doesn't open during blizzards.
- The Yellow Left Shoulder Stripe helps compliance during non-operation hours.



Moving Forward

- Construction of westbound lane to commence this summer.
- Section slightly wider—both general purpose lanes are 12', and shy distance at median is 2' rather than 1'.
- Existing EB Median Shoulder will be used for construction of WB—but EB Lane will continue to function on weekends.
- We continue to explore real time dynamic pricing, but this corridor's predictable traffic patterns-and lack of alternate routes-limit the benefits of this approach.



Questions?

