Pricing Strategy
Implementation
Project
Presentations
SR 51 Corridor Improvement
SR 51 Corridor Improvement Project

- Extents - J St. to Arden Way
- Managed Lane Alternatives (HOV & HOT lanes)
- Auxiliary Lane between E St. and Exposition Blvd.
- SACSIM Pricing Module for Toll Alternatives
- Additional Validation Checks
Test of Tolls along SR 51 Corridor

• From US 50 to near Arden Way
  > Segment 5 = Northbound
  > Segment 6 = Southbound

• Managed lanes
  > One median-side lane each direction
  > Continuous access
  > Tolling in each of 3 AM hours and 3 PM hours

• Solve price aiming for $v/c \approx 0.825$
Test 1: Testing a HOT Alternative

- Set Ratio of Tolls DA:S2+ to 2:1
- Northbound h07 period shown (h08,h16,h17, both directions are similar)

- Most of the congested periods settle into oscillation, due to price adjustment in response to whether v/c is above or below threshold.
- Also, toll adjustments for DA and S2 do not sustain a 2:1 ratio at which they were initialized.

• Toll file settings alone do not force ratio; control in script is required.
• More unknowns than equations.
Test 1: Testing a HOT Alternative

- Set Ratio of Tolls DA:S2+ to 2:1
- Northbound h09 period shown (h15, both directions are similar)

- Shoulder period never congested enough to trigger raise of toll.
- DA:SR+ ratio drifts, but each stops at its minimum setting.
Test 2 for HOT Alternatives

- S2 and S3+ tolls computed at 2:1 ratio from DA toll
- Dampening step size for toll-loops changed
  - was fixed 1/2,
  - changed to 1/2, 1/3, 1/4... (starting over for each feedback loop)
Test 2: Testing a HOT Alternative

- Set Ratio of Tolls DA:S2+ to 2:1
- Northbound h07 period shown (h08,h16,h17, both directions are similar)

- DA:S2+ toll ratio maintained.
- Congested periods oscillate as before.
- Oscillation amplitude decreases...
  - but more iterations would help.
Test 2: Composition of Managed Lanes

Users

Northbound h07

• Almost all users are high value-of-time classes
Test 2: Composition of Managed Lanes Users

Northbound h09

- Some medium value-of-time users also

![Diagram showing feedback iteration and toll loop for h09]
THANK YOU
OUTLINE

Plan
Overview

Analysis using
SACSIM19

Results

Lessons
Learned
WHO IS INVOLVED?

- Strategy Team
- Project Development Team
- Stakeholders, Community, and Users
EXISTING CONDITIONS ANALYSIS

WB I-80 AT BUSINESS 80
AM PEAK HOUR

Local Bus:
- Occupied: 44
- Unoccupied: 96

Capitol Corridor Rail:
- Occupied: 107
- Unoccupied: 253

Commuter Bus:
- Occupied: 286
- Unoccupied: 257

SacRT Blue Line LRT:
- Occupied: 380
- Unoccupied: 1,700

I-80 Vehicles:
- Occupied: 11,350
- Unoccupied: 40,430
## Existing Conditions Analysis

<table>
<thead>
<tr>
<th>Can corridor travelers easily complete these trips using these options?</th>
<th>Private Vehicle</th>
<th>Capitol Corridor Rail</th>
<th>Light Rail</th>
<th>Bus</th>
<th>Walking</th>
<th>Bicycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak hour commute from South Placer (Roseville, Rocklin, etc.) to Sacramento</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Peak hour commute from Sacramento to South Placer</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Midday travel between (both directions) South Placer and Sacramento</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Evening travel between South Placer and Sacramento</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Weekend travel between South Placer and Sacramento</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Weekend Capitol Corridor service is limited to one round trip per day.

Light rail and off-peak bus travel is possible, but requires multiple connections.
PERFORMANCE METRICS

Accessibility

PERFORMANCE MEASURE
- The PSGP would increase accessibility to reliable transit service.

Efficient Land Use

PERFORMANCE MEASURES
- The PSGP would increase regional and corridor VMT and VMT per capita, but reduce VMT in local neighborhoods.
- The PSGP would increase bus and rail service to Downtown Sacramento, particularly from South Placer County communities.

Economic Development

PERFORMANCE MEASURES
- The PSGP would reduce peak hour truck travel times between South Placer County and Downtown Sacramento by 5 percent.
- The PSGP would increase travel choices to tourist and recreational destinations by increasing transit options (e.g., Capitol Corridor) and by reducing peak period corridor delay, which allows for more trip-making flexibility.
- The PSGP includes the Capitol Corridor Third Track Project, which will preserve current Union Pacific Railroad freight operations and reliability for the benefit of goods movement through the region.
- Similar to the weekday benefits to corridor delays and speeds, the PSGP would improve peak weekend travel times.

Air Quality

PERFORMANCE MEASURE
- The PSGP would decrease emissions in the SACOG region, despite a small increase on the corridor.

Safety

PERFORMANCE MEASURE
- The PSGP could reduce the risk for collisions by reducing congestion and, in turn, the potential for congestion-related collisions. The PSGP could also reduce the risk for bicyclist- and pedestrian-involved collisions by improving active transportation facilities, especially near freeways.
CANDIDATE PROJECTS

Roadway Project
Transportation Systems Management Project
Transit Project
Bicycle/Pedestrian Project
ANALYSIS TOOL

- Existing Conditions – the 2016 model
- Existing plus project conditions / PSGP Conditions
BICYCLE & PEDESTRIAN PROJECTS

- Off-Street Trail
- On-Street Bicycle Facility
- Freeway Crossing Enhancement
- Grid Improvements
BICYCLE & PEDESTRIAN MODEL CODING

Bike paths, trails, and bike lanes
Bike crossing over the freeways
New transit facilities
- Commuter buses
- BRTs
  - High Frequency
  - Higher speed
- Capitol Corridor extension
- Capitol Corridor station
- Park and Ride lot
ROADWAY/TSM PROJECTS

- Freeway Capacity
- Express Lanes
- Local Road Capacity
  - Interchange Improvement
  - Ramp Meter
  - Weigh Station
ROADWAY/TSM PROJECTS
MODEL CODING

Local Roadway improvement
HOV lanes
Aux Lanes
Manage Lanes/HOT lanes
• Add toll IDs to appropriate segments of the corridor
• Edit toll_coding.xlsx
• Peak Period Toll for SOV in the HOT lanes
• Utilize toll optimization loop
RESULTS

**PERFORMANCE MEASURES**

- **The PSGP would reduce person hours of delay (PHD).**
  - **CORRIDOR DELAY**
    - **DAILY**
      - AM: 8%
      - PM: 10%
    - **PM**
      - AM: 9%
      - PM: 10%
  - 30% reduction in delay on I-80 at the American River

- **The PSGP would improve travel time reliability.**
  - **SCREENLINE RELIABILITY**
    - AM: 3%
    - PM: 13%
  - 27% increase in reliability on Highway 65 at Galleria Boulevard

- **The PSGP would increase person throughput.**
  - **VEHICLE PERSON TRIPS**
    - AM: 15%
    - PM: 19%
  - **TRANSIT PERSON TRIPS**
    - AM: 75%
    - PM: 69%

- **The PSGP would increase vehicle speeds.**
  - **SCREENLINE SPEEDS**
    - AM: 2%
    - PM: 7%
  - 2% increase in overall Gateway Corridor speeds

- **The PSGP would increase transit seat utilization.**
  - **VEHICLE SEAT UTILIZATION**
    - AM: NO CHANGE
    - PM: NO CHANGE
  - **TRANSIT SEAT UTILIZATION**
    - AM: 3%
    - PM: 6%

- **The PSGP would decrease traffic in local neighborhoods.**
  - 5 of the 10 screenings would experience decreased neighborhood traffic

- **The PSGP would increase vehicle travel demand.**
  - **TOTAL VMT (in 1,000s)**
    - **EXISTING**
      - 59,277
    - **PSGP**
      - 59,491
  - **VMT PER CAPITA**
    - **EXISTING**
      - 24.0
    - **PSGP**
      - 32.4

- **The PSGP would improve the capacity and quality of transit service.**
  - Improvements to:
    - Capitol Corridor rail
    - SacRT Blue Line LRT
    - Regional intercity bus routes
    - New BRT corridors
  - 38% increase in peak hour transit service serving the Gateway Corridor
LESSONS LEARNT FROM THE MODEL

What's great?
- Tolling component
- Additional time periods
- Additional value of time users

CHALLENGES
- Lack of documentation
- New model structure
- New output structure
- BRT Coding
- Transit Sensitivity
- Toll coding
- Toll Sensitivity
LESSONS LEARNT FROM THE MODEL

POTENTIAL IMPROVEMENTS

• Documentations
• Faster run time
  • Without toll optimization – 19 hours, 1 minute
  • With toll optimization – 50 Hours, 28 minutes
• Include HOV violators
• Vehicle time period vs transit time period
• Sensitivity testing
  • Transit
  • Tolling
THANK YOU!
RESULTS

Peak Period Speed and Reliability - PSGP Conditions

<table>
<thead>
<tr>
<th>SCREENLINE LOCATIONS</th>
<th>AM</th>
<th>PM</th>
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<tbody>
<tr>
<td>1. U St.</td>
<td>58</td>
<td>60</td>
</tr>
<tr>
<td>2. American River</td>
<td>60</td>
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</tr>
<tr>
<td>3. Howe Ave.</td>
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</tr>
<tr>
<td>4. Madison Ave.</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>5. Antelope Rd.</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>6. Douglas Blvd.</td>
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<td>60</td>
</tr>
<tr>
<td>7. Sierra College Blvd.</td>
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<td>60</td>
</tr>
<tr>
<td>8. Newcastle Rd.</td>
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<table>
<thead>
<tr>
<th>SCREENLINE</th>
<th>AVG. SPEED (MPH)</th>
<th>TRAVEL TIME INDEX</th>
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<tbody>
<tr>
<td>EB</td>
<td>AM: 1.12, PM: 1.52</td>
<td></td>
</tr>
<tr>
<td>WB</td>
<td>AM: 1.11, PM: 1.65</td>
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<td>EB</td>
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<td>WB</td>
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<td>EB</td>
<td>AM: 1.23, PM: 1.87</td>
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<td>WB</td>
<td>AM: 1.25, PM: 1.95</td>
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</tr>
<tr>
<td>EB</td>
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</tr>
<tr>
<td>WB</td>
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<td>EB</td>
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<tbody>
<tr>
<td>EB</td>
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<td>WB</td>
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<tr>
<td>EB</td>
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<tr>
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<td>AM: 0.94, PM: 0.94</td>
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RESULTS

* 2% increase in corridor VMT but 1% reduction in regional GHG emissions