Overview

- Smart Mobility Framework Overview
- Implementation Study Overview
- Focus on active transportation and land use aspects
- Recommendations and Next Steps
Smart Mobility 2010

- Smart Mobility 2010: A Call to Action for the New Decade
  - Integrate the new principles, practices, and tools into Caltrans policies and practice
Definition of Smart Mobility

- Smart Mobility moves **people and freight** while **enhancing** California’s **economic**, **environmental** and **human resources** by emphasizing:
  - convenient and safe multi-modal travel
  - speed suitability
  - accessibility
  - management of the circulation network
  - efficient use of land
Smart Mobility Framework

- **6 Principles**
  - Express the priorities and values of Smart Mobility

- **7 Place Types**
  - Designed as tools for integrating land use context

- **17 Performance Measures**
  - Evaluate sustainability principles
Principles of Smart Mobility

- Location Efficiency
- Reliable Mobility
- Health and Safety
- Environmental Stewardship
- Social Equity
- Robust Economy
Smart Mobility Place Types

- Urban Centers
- Close-in Compact Communities
- Compact Communities
- Suburban Communities
- Rural and Agricultural Lands
- Protected Lands
- Special Use Areas
Place Types and Location Efficiency

- 1. Urban Centers
- 2. Close-in Compact Communities
- 3. Compact Communities
- 4. Suburbs
- 5. Rural Towns
- 5, 6. Agricultural & Protected Lands

Community Design

Regional Accessibility

Strong Presence

Location-Efficient Elements

Weak Presence

Location-Efficient Elements
# Smart Mobility Performance Measures

<table>
<thead>
<tr>
<th>Principle</th>
<th>Performance Measure*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Efficiency</td>
<td>1. Support for Sustainable Growth</td>
</tr>
<tr>
<td></td>
<td>2. Transit Mode Share</td>
</tr>
<tr>
<td></td>
<td>3. Accessibility and Connectivity</td>
</tr>
<tr>
<td>Reliable Mobility</td>
<td>4. Multi-Modal Travel Mobility</td>
</tr>
<tr>
<td></td>
<td>5. Multi-Modal Travel Reliability</td>
</tr>
<tr>
<td></td>
<td>6. Multi-Modal Service Quality</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>7. Multi-Modal Safety</td>
</tr>
<tr>
<td></td>
<td>8. Design and Speed Suitability</td>
</tr>
<tr>
<td></td>
<td>9. Pedestrian and Bicycle Mode Share</td>
</tr>
<tr>
<td>Environmental Stewardship</td>
<td>10. Climate and Energy Conservation</td>
</tr>
<tr>
<td></td>
<td>11. Emissions Reduction</td>
</tr>
<tr>
<td>Social Equity</td>
<td>12. Equitable Distribution of Impacts</td>
</tr>
<tr>
<td></td>
<td>13. Equitable Distribution of Access and Mobility</td>
</tr>
<tr>
<td>Robust Economy</td>
<td>14. Congestion Effects on Productivity</td>
</tr>
<tr>
<td></td>
<td>15. Efficient Use of System Resources</td>
</tr>
<tr>
<td></td>
<td>16. Network Performance Optimization</td>
</tr>
<tr>
<td></td>
<td>17. Return on Investment</td>
</tr>
</tbody>
</table>
SMF Implementation Pilot Study

- Strategies, tools, and methodologies to integrate Smart Mobility principles, concepts, and performance measures into planning practice.

- Three components to pilot study:
  - Literature & Practice in Progress Review
  - I-680 Second Generation Corridor System Management Plan (CSMP) in Contra Costa County (District 4/MTC/CCTA)
  - South Bay Cities Subregional Long Range Transportation Plan in Los Angeles County (District 7/SCAG/Metro/South Bay Cities COG)
Pilot Area 1: Contra Costa I-680 CSMP
Pilot Area 1: I-680 CSMP

*Integrating SMF Principles and Performance Measures Into Existing Caltrans’ Processes*

- Identifies SMF place types along I-680
- Incorporates SMF performance measures as the basis for evaluating corridor performance.
  - Travel Time Reliability
  - HCM 2010 MMLOS Analysis
  - Complete Streets Assessment
- Scenario 5 bicycle and pedestrian improvements
SMF Place Types Analysis
Complete Streets Evaluation

**Roadway**
- Bicycles allowed on roadway: No
- Alternative parallel road: Present
- Alternate parallel trail: Present
- Pedestrian crossing: 2
- Non-pedestrian crossings: 2
- Sides of street with complete sidewalks: Both
- Predominant pedestrian type: Narrow Curb Side
- Continuity of bicycle facility: Both
- Roadway width: 2.2
- Shoulder: None
- Parking: None
- Lanes: 2
- Predominant station type: Sign Post

**Side Hill Avenue Drive**
- Length (m): 2.5
- Shoulders: None
- Parking: None
- Sides of street with complete sidewalks: Both
- Predominant pedestrian type: Narrow Curb Side
- Continuity of bicycle facility: Both
- Roadway width: 2.5
- Predominant station type: Sign Post

**Elevation:**
- Length (m): 2.5
- Shoulders: None
- Parking: None
- Sides of street with complete sidewalks: Both
- Predominant pedestrian type: Narrow Curb Side
- Continuity of bicycle facility: Both
- Roadway width: 2.5
- Predominant station type: Sign Post

**Smart Mobility Framework**

**Overview of Improvement Opportunities**
This segment features long distances between crosswalks that are greater than the median length for the corridor. Approximately half of the bicycle and pedestrian facilities are categorized at B-level or worse. At the Alcosta Blvd ramp interchange, restriping and/or signal adjustment should be considered.
Multimodal LOS Analysis

- Highway Capacity Manual 2010 Urban Street methodology
- Captures the interaction among all modes (auto, transit, bicycle, and pedestrians) on parallel arterials

Table 7: LOS results for Diamond Boulevard – from Willows Shopping Center to Willow Pass Road

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Link</th>
<th>Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>LOS</td>
<td>Score</td>
</tr>
<tr>
<td>Transit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bike</td>
<td>4.15</td>
<td>D</td>
</tr>
<tr>
<td>Ped</td>
<td>3.18</td>
<td>C</td>
</tr>
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</table>
I 680 CSMP Scenario 5

- Trip-making reduced by 1.5% per day due to bicycle/pedestrian improvements
- Reduction in Average Daily Emissions
- Reflected in B/C ratio change from prior scenario
Pilot Area 2: Sub-regional Plan

*Integrating SMF into sub-regional transportation and land use planning processes*

- To apply sustainability principles and performance measures to assess future land use strategies and transportation projects
- To develop a tool to test performance measures that are sensitive to sustainability benefits land use and transportation decisions
Performance Measures

- Proximity to Jobs (30 min by transit, 20 min by drive)
- Mode share (NEV, bike, ped, transit)
- Safety (number of crashes, number of vulnerable users)
Dashboard Tool

**Traditional Transportation**
- **Traditional LU**
  - MOV: 42%
  - Work: 8%
  - Other: 16%
  - Bicycle: 4%
  - Transit: 11%
- **Innovative LU**
  - MOV: 42%
  - Work: 8%
  - Other: 16%
  - Bicycle: 4%
  - Transit: 11%

**Transportation Carbon Emissions (CO2)**
- Existing: 8,237.68
- Trad LU Trad Trans: 6,168.42
- Innov LU Trad Trans: 6,229.56
- Trad LU Innov Trans: 6,975.47
- Innov LU Innov Trans: 5,918.15

**Daily VMT per Capita**
- Existing: 13.86
- Trad LU Trad Trans: 12.88
- Innov LU Trad Trans: 13.46
- Trad LU Innov Trans: 12.19
- Innov LU Innov Trans: 11.84
# Report Card

<table>
<thead>
<tr>
<th>Measure</th>
<th>Metric</th>
<th>Existing</th>
<th>Traditional LU</th>
<th>Innovative LU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Landuse: B</td>
<td>Qualitative Assessment</td>
<td>Directional Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transportation: C</td>
<td>Traditional</td>
<td>Innovative</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transportation</td>
<td>Transportation</td>
</tr>
<tr>
<td>Average Proximity to Employment</td>
<td>percent of regional jobs available in 30 min drive</td>
<td>24.1%</td>
<td>↑</td>
<td>C</td>
</tr>
<tr>
<td>(within 30 min drive)</td>
<td></td>
<td></td>
<td></td>
<td>↑</td>
</tr>
<tr>
<td>Average Proximity to Employment</td>
<td>percent of regional jobs available in 30 min transit</td>
<td>2.0%</td>
<td>↓</td>
<td>C</td>
</tr>
<tr>
<td>(within 30 min transit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEV, Bicycle, Walking Facilities</td>
<td>Qualitative</td>
<td>Low</td>
<td>Low</td>
<td>D</td>
</tr>
<tr>
<td>Percentage of Trips by Transit</td>
<td></td>
<td>3.3%</td>
<td>↑</td>
<td>C</td>
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<tr>
<td>Percentage of Trips by NEV</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>F</td>
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<tr>
<td>Percentage of Trips by Bicycling</td>
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<td>1.0%</td>
<td>=</td>
<td>D</td>
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<tr>
<td>Percentage of Trips by Walking</td>
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<td>9.1%</td>
<td>↑</td>
<td>C</td>
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<tr>
<td>Vehicle Hours of Delay per Day</td>
<td>Daily VHD</td>
<td>1,062.00</td>
<td>↑↑</td>
<td>C</td>
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<tr>
<td>Vehicle Miles Traveled (VMT) per Day</td>
<td>Daily VMT</td>
<td>570,873</td>
<td>↑</td>
<td>C</td>
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<tr>
<td>Vehicle Hours Traveled per Day</td>
<td>Daily VHT</td>
<td>15,740</td>
<td>↑↑</td>
<td>C</td>
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<tr>
<td>Daily VMT per Capita by Speed Range</td>
<td>Daily VMT per capita by Speed Range</td>
<td></td>
<td></td>
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<tr>
<td>65+ mph</td>
<td>8.2</td>
<td>↑</td>
<td></td>
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<tr>
<td>45-65 mph</td>
<td>0.3</td>
<td>↑</td>
<td></td>
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</tr>
<tr>
<td>35-45 mph</td>
<td>1.8</td>
<td>↑</td>
<td></td>
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<tr>
<td>25-35 mph</td>
<td>1.7</td>
<td>↑</td>
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<tr>
<td>Under 25 mph</td>
<td>0.6</td>
<td>↓</td>
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</tr>
<tr>
<td>Number of Crashes (per/1000)</td>
<td>reduction in crashes</td>
<td>23</td>
<td>-66%</td>
<td>C</td>
</tr>
</tbody>
</table>
Recommendations \ Next Steps

- Conduct additional pilot studies
- Apply SMF Place Types
  - To identify and prioritize projects and programs.
- Apply SMF Performance Measures
  - Select subset of the 17 SMF performance measures
- Expand Caltrans District 4 Complete Streets Guidelines
- Identify data needs for calculating Multimodal LOS.
- Develop better tools that are sensitive to active transportation and innovative transportation
Questions

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