Redefining Street Performance Metrics
Expanding Perspectives

Presented by:
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Streets Matter
Traditional Paradigm

Does not include all modes
Does not address community value tradeoffs
Plan has unknown costs and is rarely implemented
New Transportation Planning Paradigm

- Community Values: Balance the tradeoffs
- Constraints: Recognize limits (funding, environmental, etc.)
- Complete Streets or Layered Networks: Serving all modes (people and goods)
Perspectives

To a driver: LOS A
To an economist: LOS F

To a driver: LOS F
To an economist: LOS A
• Existing Conditions:
  - LOS E (75 seconds of delay)

• New Development:
  - Worsens to LOS F (85 seconds of delay)
• Balancing Objectives

  • Reducing vehicle travel time

  • Increasing pedestrian crossing times, delay, and exposure to vehicles

  • Increasing distances between land uses

  • Increasing stormwater runoff

  • Removing riparian habitat

  • Increasing heat island effect
Choices and Consequences

Pedestrian Fatality Rates for Collisions at Different Speeds

By Reid Ewing and Eric Dumbaugh
Choices and Consequences

At 40 mph the driver’s focus is on the roadway in the distance.

At 30 mph the driver begins to see things at the road edges in the background.

Source: Smart Mobility Framework, Caltrans, 2009
Choices and Consequences

Early 20th Century

21.5%
Dedicated to driving & parking
Choices and Consequences

Early 21st Century

37.5%
Dedicated to driving & parking
Principles for Network Planning

• Consist of a **multimodal network**
• Be planned as multimodal **layered networks** serving passengers and goods
• Have a **high degree of connectivity** to help provide multiple routes and choices
• Have a **network density** appropriate to the land use patterns and urban form that are served
• Be planned with recognition of the role of roadways as public spaces that help **shape urban environments**
• Be planned with consideration of **environmental, social, and economic issues**
The Office of Community Planning is conducting this planning project, in partnership with the U.S. Environmental Protection Agency (USEPA), and in collaboration with other state project partners: the Governor’s Office of Planning & Research (OPR) and the California Department of Housing & Community Development (HCD). It will produce a planning guide that will further integration of smart growth concepts into transportation in California.

The intent is to develop a planning framework that will help guide and assess how well plans, programs, and projects meet a definition of “smart mobility.” The goal is to ensure the applicability of the framework for Caltrans as well as for partner agencies. It will be used to guide development of products as well as assess how well products meet “smart mobility” principles and criteria.

Ideally, the framework should be able to be applied to various levels of plans, programs, or projects (e.g., Regional Transportation Plan and Blueprint Plan, General Plans, corridor plans, specific development proposals, etc.) in all parts of the state (i.e., urban, suburban, and rural).

For more information on the Smart Mobility Framework (SMF), see below:

- Project Fact Sheet - May 2010
- Smart Mobility 2020: A Call to Action for the New Decade
- Planning Horizons Presentation: July 2010
- Video - Smart Mobility Framework Presentation at Planning Horizons
- Switch to Smart Mobility Framework (SMF) by Chris Reardon of Caltrans
- SMF Location Efficiency and Place Types by Ellen Greenberg of ARUP
Smart Mobility Principles

1. Location Efficiency
2. Reliable Mobility
3. Health and Safety
4. Environmental Stewardship
5. Social Equity
6. Robust Economy
# Smart Mobility Performance Measures (Part 1)

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

<table>
<thead>
<tr>
<th>Method</th>
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<tbody>
<tr>
<td>Auto Transit Bicycle Pedestrian</td>
<td>Auto</td>
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<tr>
<td>PEQI</td>
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<tr>
<td>BEQI</td>
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<td>Charlotte MMLOS</td>
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<td>Florida DOT MMLOS</td>
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<td>HCM 2010</td>
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<td>Fort Collins MMLOS</td>
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<tr>
<td>Person Delay</td>
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<td>Auto Trips Generated</td>
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Method Type:
- Checklist
- Checklist/Computational
- Computational
- Other
What are we getting at?
Is this a nice place to walk or bike?
Is transit convenient?
Are tradeoffs between modes considered for improvements?

Older methodologies:
pedestrian density, delay

Newer methodologies:
comfort/experience

Issues to consider:
Staying ahead of the curve
Embedded preferences in methodologies
Sensitivity to different considerations
Will these approaches create desired environments?
Linking analysis and tools
Resources – MMLOS Toolkit

- [http://www.fehrandpeers.com ASAP Tools – Complete Streets](http://www.fehrandpeers.com)

**Multimodal Level of Service Toolkit**

**HCM 2010 – Bicycle LOS**

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**Overview**

The 2010 Highway Capacity Manual (HCM 2010) provides detailed instructions on calculating LOS for bicycles on urban streets (at the link, segment and facility levels) and at signalized and 2-way stop intersections. (It also offers instructions on calculating LOS on two-lane highways and off-street facilities, which are not discussed here.) Bicycle LOS is integrated into HCM 2010’s Multi-Modal LOS, allowing the comparison of trade-offs between modes.

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**How to measure**

The performance evaluation of urban street facilities for bicyclists includes two measures:

1. **Bicycle LOS score** is based on cyclists’ perception of their travel experience. It includes the following:
   - Volume and speed of auto traffic in the outside lane (shared with or closest to bicyclists)
   - Volume of heavy vehicle traffic
   - Number and width of all lanes in the direction of travel
Recommendations

• View transportation network performance through ‘multiple lenses’
• Align transportation performance measures and thresholds with community values and constraints
• Consider people movement and goods movement within a layered network
• Recognize transportation network influence on the urban form, public health, environment, economy, and quality of life