



Redefining Street Performance Metrics

Expanding Perspectives



Presented by:

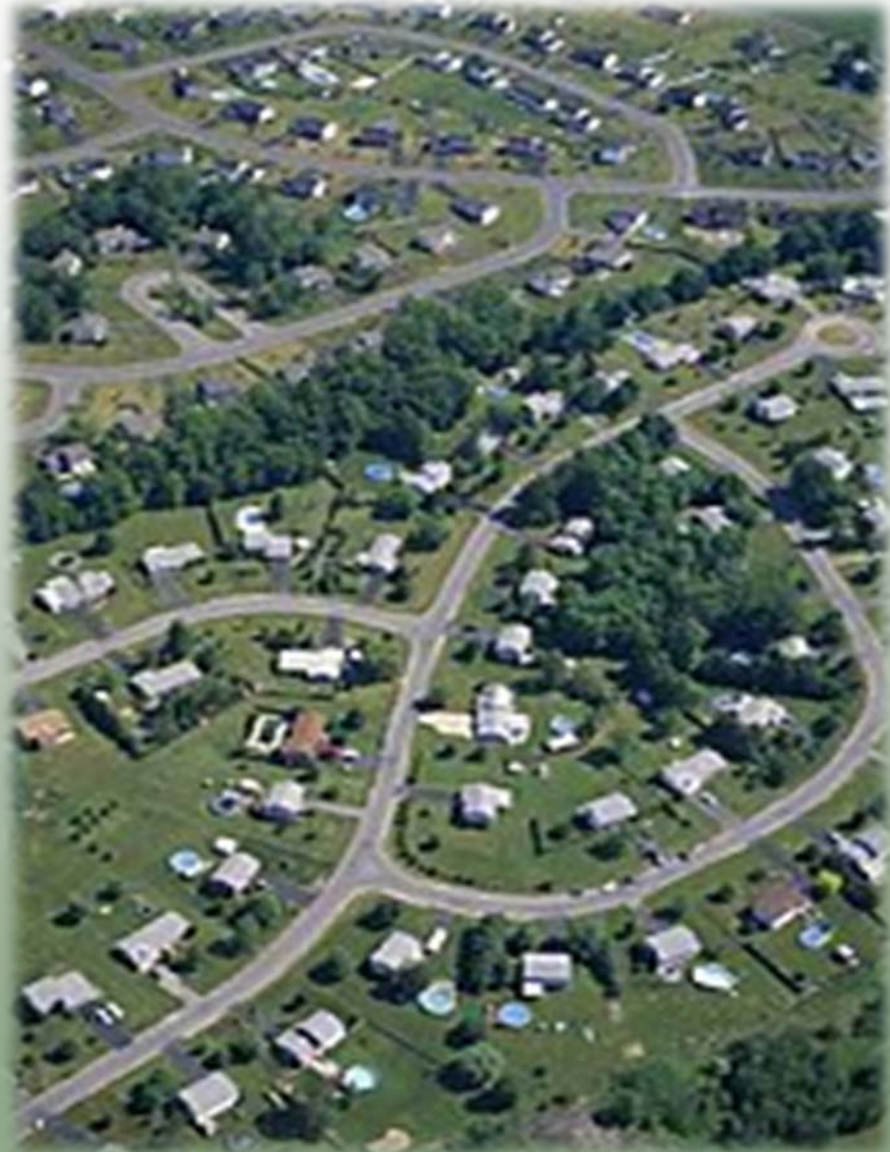
Sohrab Rashid, TE

APA – San Diego - Complete Streets - June 2012

Streets Matter



Streets Matter



Traditional Paradigm

Traditional Transportation Planning Process



- 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

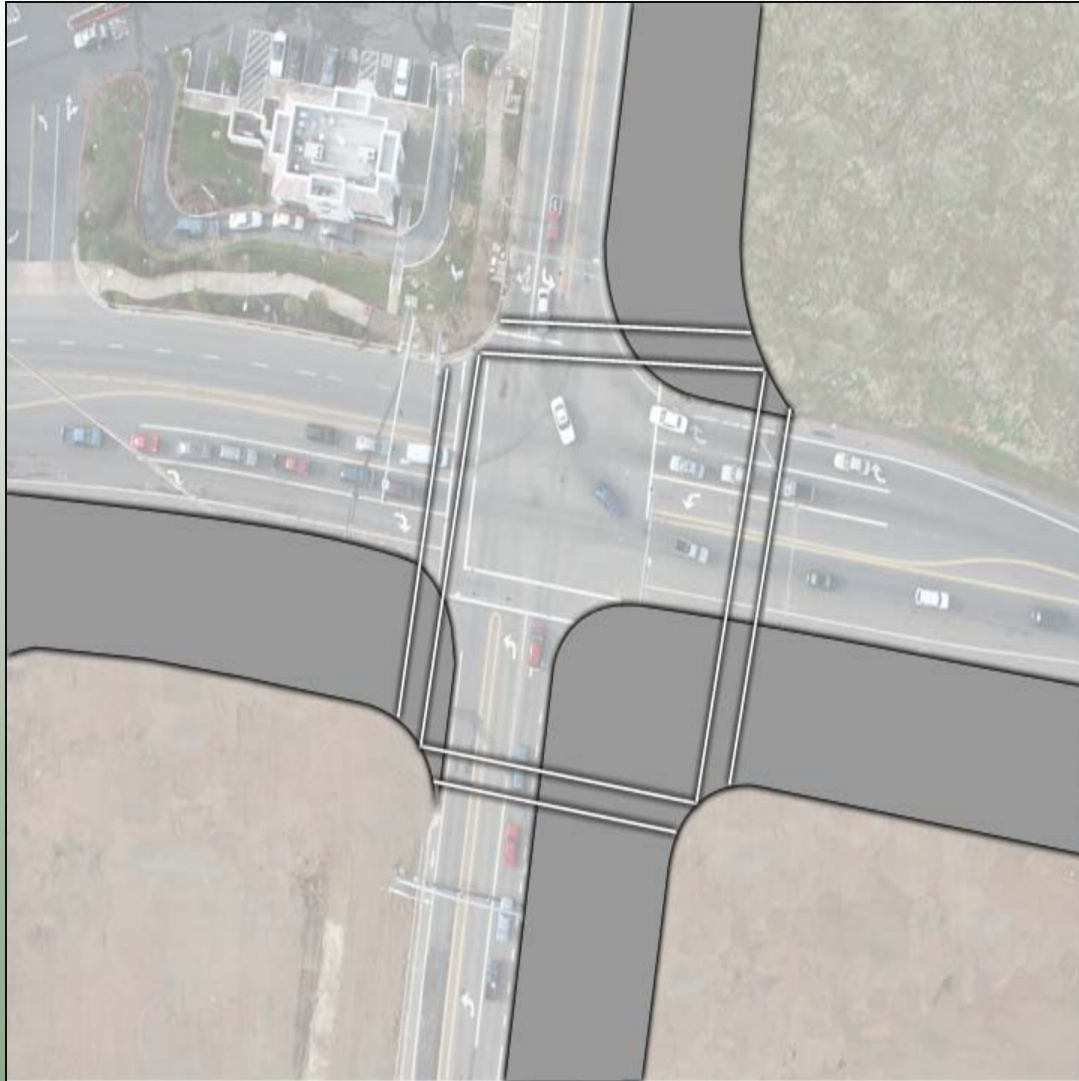


Choices and Consequences



- **Existing Conditions:**
 - LOS E (75 seconds of delay)
- **New Development:**
 - Worsens to LOS F (85 seconds of delay)

Choices and Consequences

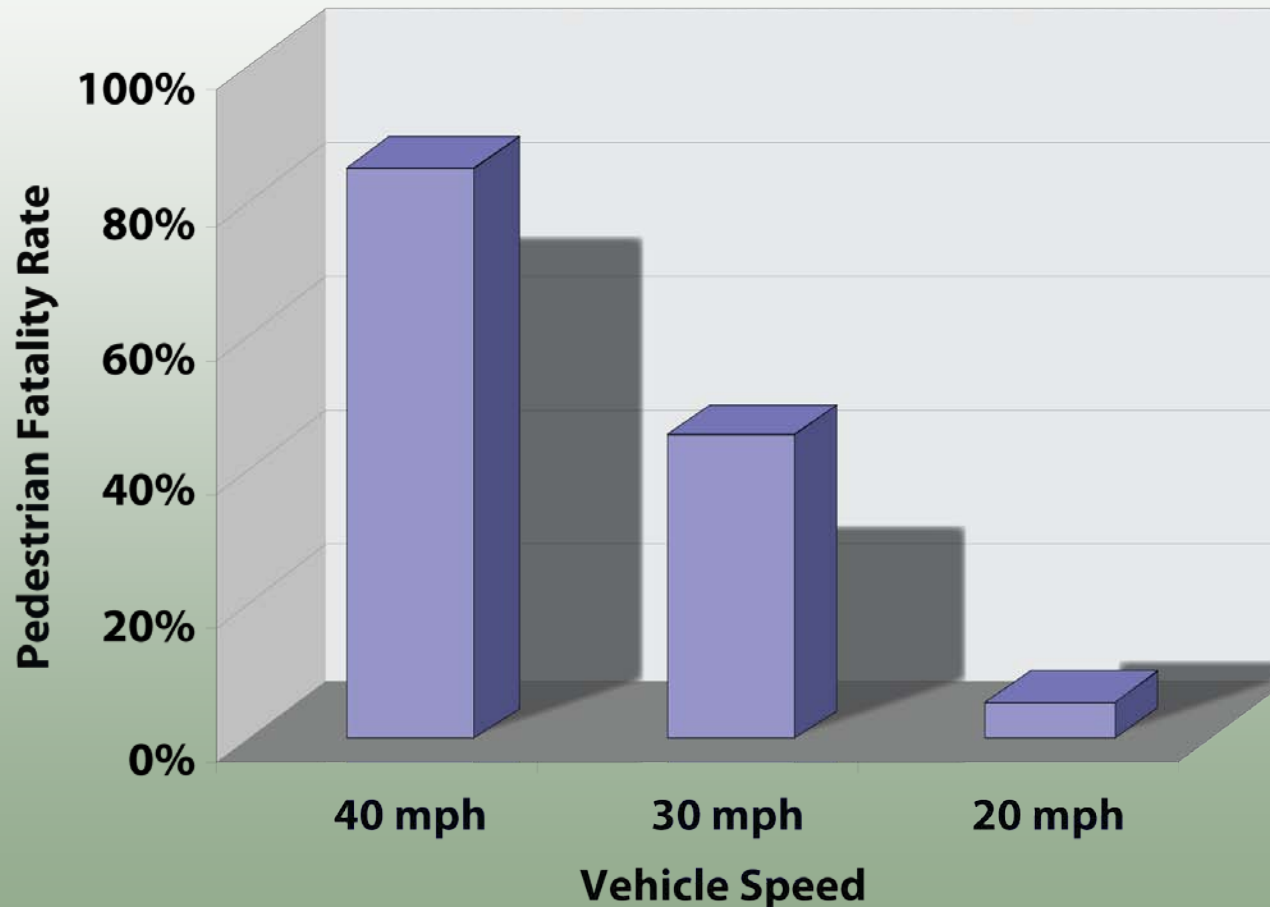


• **Balancing Objectives**

- *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



Source: The Built Environment and Traffic Safety - A Review of Empirical Evidence,
Journal of Planning Literature, Volume 23 Number 4, May 2009
By Reid Ewing and Eric Dumbaugh

Choices and Consequences

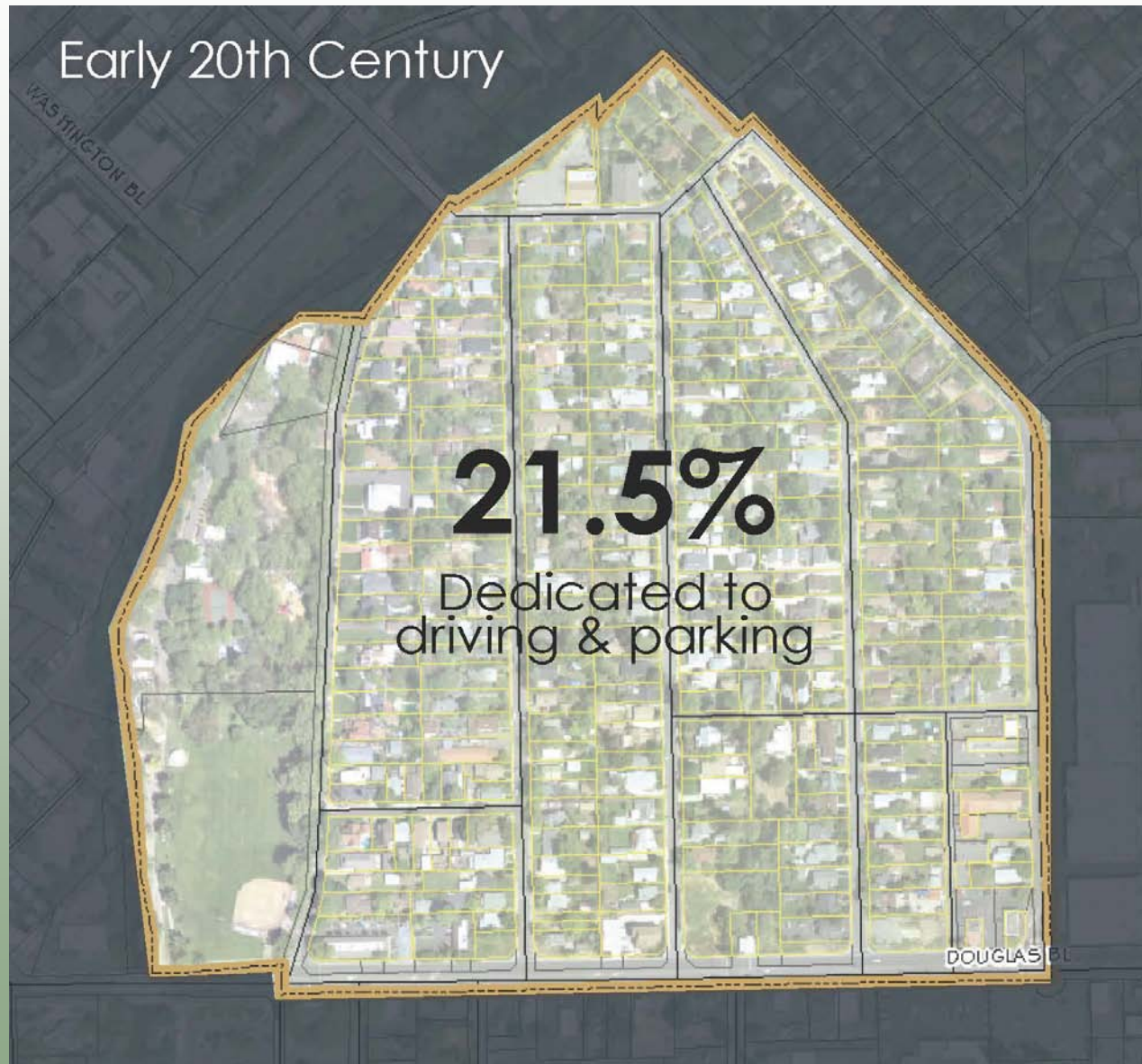


At **40 mph** the driver's focus is on the roadway in the distance.

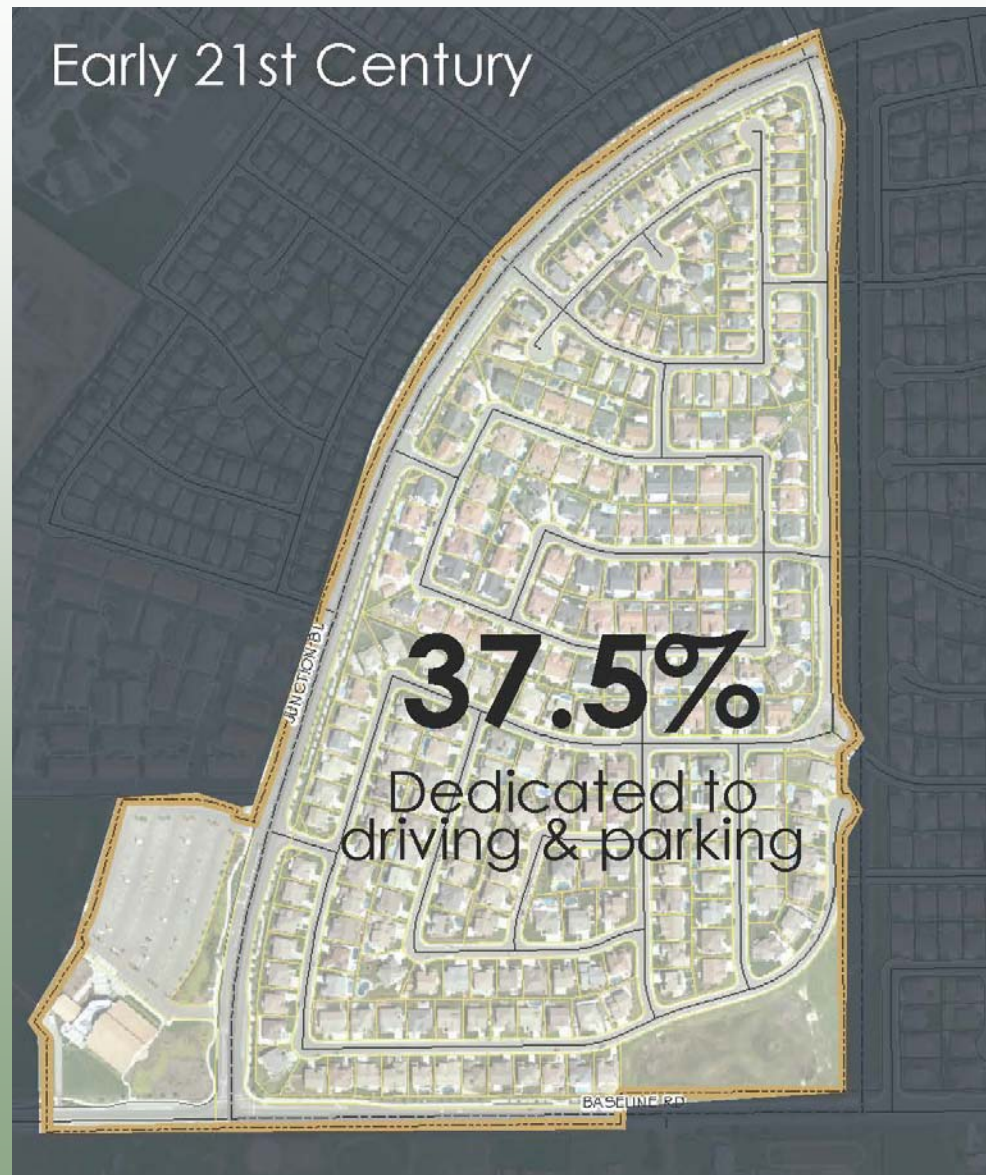


At **30 mph** the driver begins to see things at the road edges in the background.

Choices and Consequences



Choices and Consequences



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**



Smart Mobility Framework

The screenshot shows a web browser window displaying the California Department of Transportation (Caltrans) website. The address bar shows the URL: <http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html>. The browser's address bar also shows "California Department of Tr...".

The website header includes the Caltrans logo and navigation links: Home, Travel, Business, Engineering, News, Maps, Jobs, About Caltrans, Contact Us. The main navigation bar reads: "Caltrans... We're Here to Get You There".

The page title is "Smart Mobility Framework". The breadcrumb trail is: Caltrans > Transportation Planning > Planning Offices > Office of Community Planning > Smart Mobility Framework.

TRANSPORTATION PLANNING

- Division of Transportation Planning Home
- Planning FAQs
- Planning Offices
- Jobs & More - Caltrans Planners
- About Us & Organization Charts
- Contact Us

OFFICE OF COMMUNITY PLANNING LINKS

- ADA Strategic Plan
- ATLC
- Environmental Justice & Community-Based Transportation Planning Grants Programs
- Complete Streets
- Context Sensitive Solutions
- EJ and CBTP Tool Box
- Environmental Justice and Title VI Program
- Local Development - Intergovernmental Review (LD-IGR)
- OCP HQ Staff Contact List
- Public Participation
- Smart Mobility Framework
- Land Use/Transportation Data & Tools
- OCP Staff Contact List

Smart Mobility FRAMEWORK

The Office of Community Planning is conducting this planning project, in partnership with US 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 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 and Blueprint Plans, 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:

- [Phase 1 Report - January 9, 2009](#)
- [Draft SMF Handbook - May 11, 2009](#)
- [SMF Stakeholder Workshop - June 16, 2009](#)
- [Project Management Team & TAC Meeting - November 19, 2009](#)
- [Project Fact Sheet - May 2010](#)
- [Smart Mobility 2010: A Call to Action for the New Decade](#)

PLANNING HORIZONS PRESENTATION: JULY 2010

- [Video](#) - Smart Mobility Framework Presentation at Planning Horizons
- [Intro to Smart Mobility Framework \(BMF\)](#) by Chris Ratekin of Caltrans
- [BMF Location Efficiency and Place Types](#) by Ellen Greenberg of ARUP

The bottom right corner of the browser window shows a zoom level of 50%.

Smart Mobility Principles

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

Smart Mobility Performance Measures (Part 1)

Principle	Performance Measure
Location Efficiency	1. Support for Sustainable Growth
	2. Transit Mode Share
	3. Accessibility and Connectivity
Reliable Mobility	4. Multi-Modal Travel Mobility
	5. Multi-Modal Travel Reliability
	6. Multi-Modal Service Quality
Health and Safety	7. Multi-Modal Safety
	8. Design and Speed Suitability
	9. Pedestrian & Bicycle Mode Share

**Smart Mobility
FRAMEWORK**



Smart Mobility Performance Measures

Smart Mobility Performance Measures (Part 2)

Principle	Performance Measure
Environmental Stewardship	10. Climate and Energy Conservation
	11. Emissions Reduction
Social Equity	12. Equitable Distribution of Impacts
	13. Equitable Distribution of Benefits
Robust Economy	14. Congestion effects on Productivity
	15. Efficient Use of System Resources
	16. Network Performance
	17. Return on Investment

**Smart Mobility
FRAMEWORK**



Matrix of MMLOS Methodologies

Method	Modes			
	Auto	Transit	Bicycle	Pedestrian
PEQI				•
BEQI			•	
Charlotte MMLOS			•	•
Florida DOT MMLOS	•	•	•	•
HCM 2010	•	•	•	•
Fort Collins MMLOS	•	•	•	•
Person Delay	•	•	•	•
Auto Trips Generated	•	•	•	•

Method Type
Checklist
Checklist/Computational
Computational
Other

MMLOS

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://asap.fehrandpeers.com/tools/complete-streetslayered-networks/mmls-toolkit/>
- <http://www.fehrandpeers.com> ASAP Tools – Complete Streets

Multimodal Level of Service Toolkit

HCM 2010 – Bicycle LOS



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.

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

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**