Developing Low Carbon Urban Transportation Policies

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CO₂ Emissions by Sector

U.S. CO₂ Emissions by Sector in 2012
Source: Inventory of U.S. GHG Emissions and Sinks: 1990-2012

World CO₂ Emissions by Sector in 2012
Source: IEA, 2014

* Includes emissions from own use in petroleum refining, the manufacture of solid fuels, coal mining, oil and gas extraction and other energy-producing industries.
Transportation Energy Demand by Fuel

Transportation Energy Demand by Region

Achieving Low Carbon Transportation Systems

- Low Carbon Fuels
- Advanced Vehicle Technology
- Increase Low Carbon Travel Activity
- Transportation and Land Use Planning
Projections of Transportation Emissions in North America – Carbon 2050 (Schipper, Ng, Gould, and Deakin, 2010)

Glocalization: Local transportation concerns lower distance traveled and create modal shifts, through significant changes in land use and transportation planning.

Globalization: Strong international cooperation to decrease CO₂ emissions leads to innovations in vehicle technologies and stricter standards.
Policy Assumptions – Carbon 2050

Transportation Technologies and Strategies
- Fuel economy standards
- Advanced vehicle technology
- Alternative transportation fuels
- Intelligent transportation systems

Land Use Planning and Transit
- Public transportation investment
- Transit-oriented development
- Jobs-housing balance
- Urban design

Pricing Instruments
- Fuel and vehicle taxation
- Carbon emission taxation
- Congestion pricing scheme
- Parking pricing strategies
Bus Rapid Transit (BRT) Systems

Other Characteristics

- High speed, high capacity bus service
- Can be implemented quickly, incrementally, and flexibly
- Less costly than light rail and freeway expansion
- Image and branding
Smart Parking

Parking Pricing Strategies
- Demand-responsive
- Variable and dynamic by block, time of day and day of the week
- Smart meters for data collection

Benefits
- Reduce cruising and congestion
- Reduce emissions
- Reduce traffic and travel time for drivers and non-drivers

Pilot Programs in Several Cities
- San Francisco
- New York
- Seattle
Incentives and Social Interaction

Capri and Off-Peak Commuting

- Shifts people in time and space
- Participants avoid peak times to earn credits
- Redeem credits for rewards
- Cash prizes of $2 to $50

Photos: Stanford Capri
Policy Implications for Low Carbon Transportation

Changing Travel Behavior and Shifting Mode Choices

- Seamless multi-modal options
- Incentives can be more effective than penalties
- Introduce sense of social interactions (gaming and competition)
- Targeted policies for different user groups based on behavior

“Nobody wants to always drive but the alternatives are painful.”
(Regular Driver, UC Berkeley Employee)