



Climate Change and Transportation

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Transportation and Climate Change

- **What would be the impact of the State's Climate Action Program on Transportation?**
- **What is the role or contribution of transportation agencies in this effort?**

Transportation & Climate Change

- **Lessons learned from the Air Quality Conformity rules.**
- **Entirely feasible to reduce GHG emissions while expand and creating an efficient and effective transportation system.**
- **Sustainable transportation means sustaining environmental quality as well as sustaining the economy - together leads to quality of life and livable communities.**

California Department of Transportation Climate Action Program

Short term: concern with the impact of transportation on climate and mitigation measures to reduce GHG emissions.

Long term: concern with the impact of climate change on transportation system and the vulnerability of the transportation facilities and adaptation measures.

Adaptation Challenge

- **Averaging climate change impact globally is likely to obscure regional solutions.**
- **To evaluate Vulnerability of the transportation system, we need:**
 - **Reliable, comprehensive assessment of the microclimate changes,**
 - **Magnitude – Will these changes be moderate or severe?**
- **Then, the vulnerability of transportation systems or facilities can be assessed**
- **There no single or simple answer to these questions**

California Department of Transportation Climate Action Program

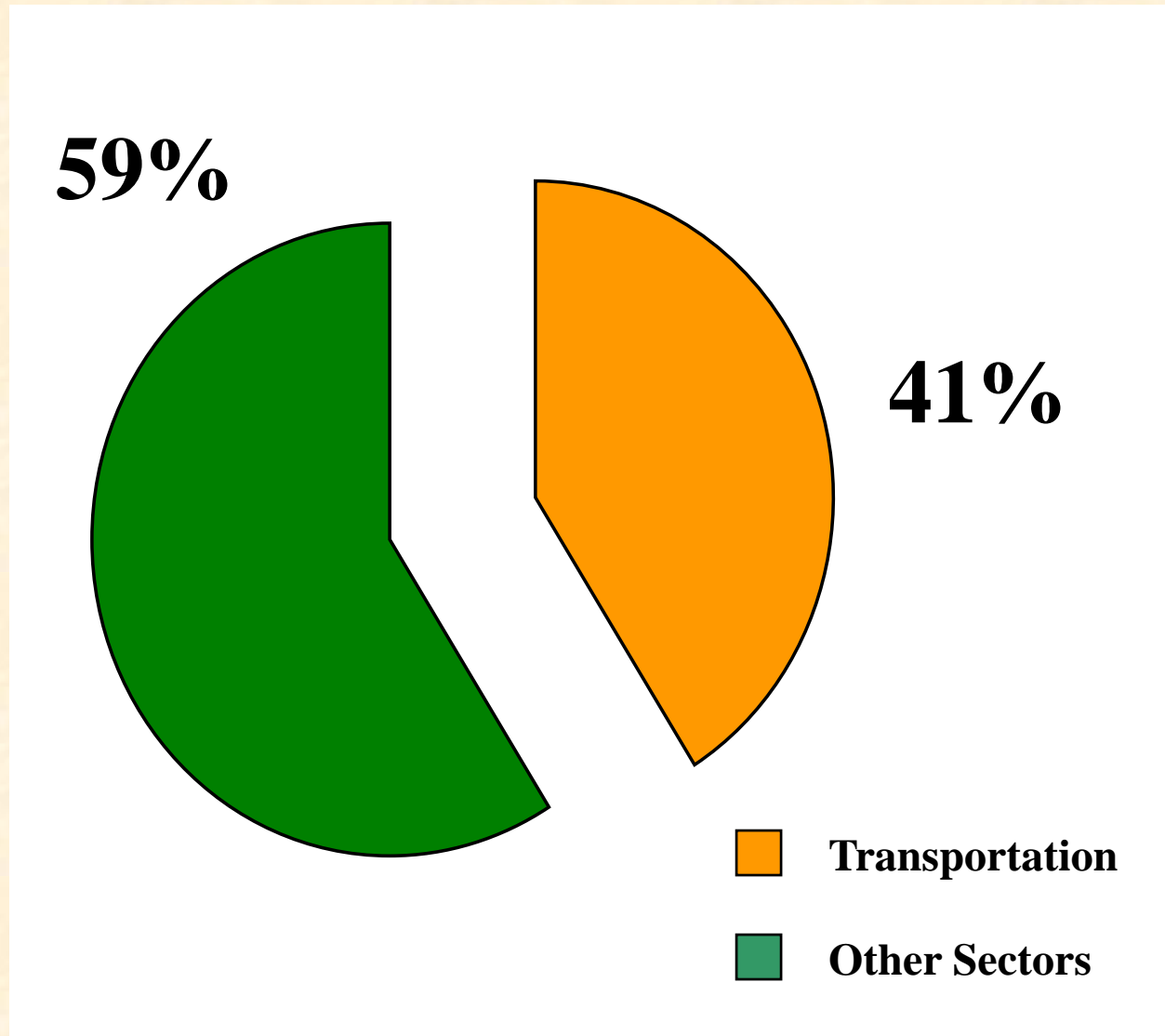
Objective:

- **Stabilize CO2 Emission from Transportation**

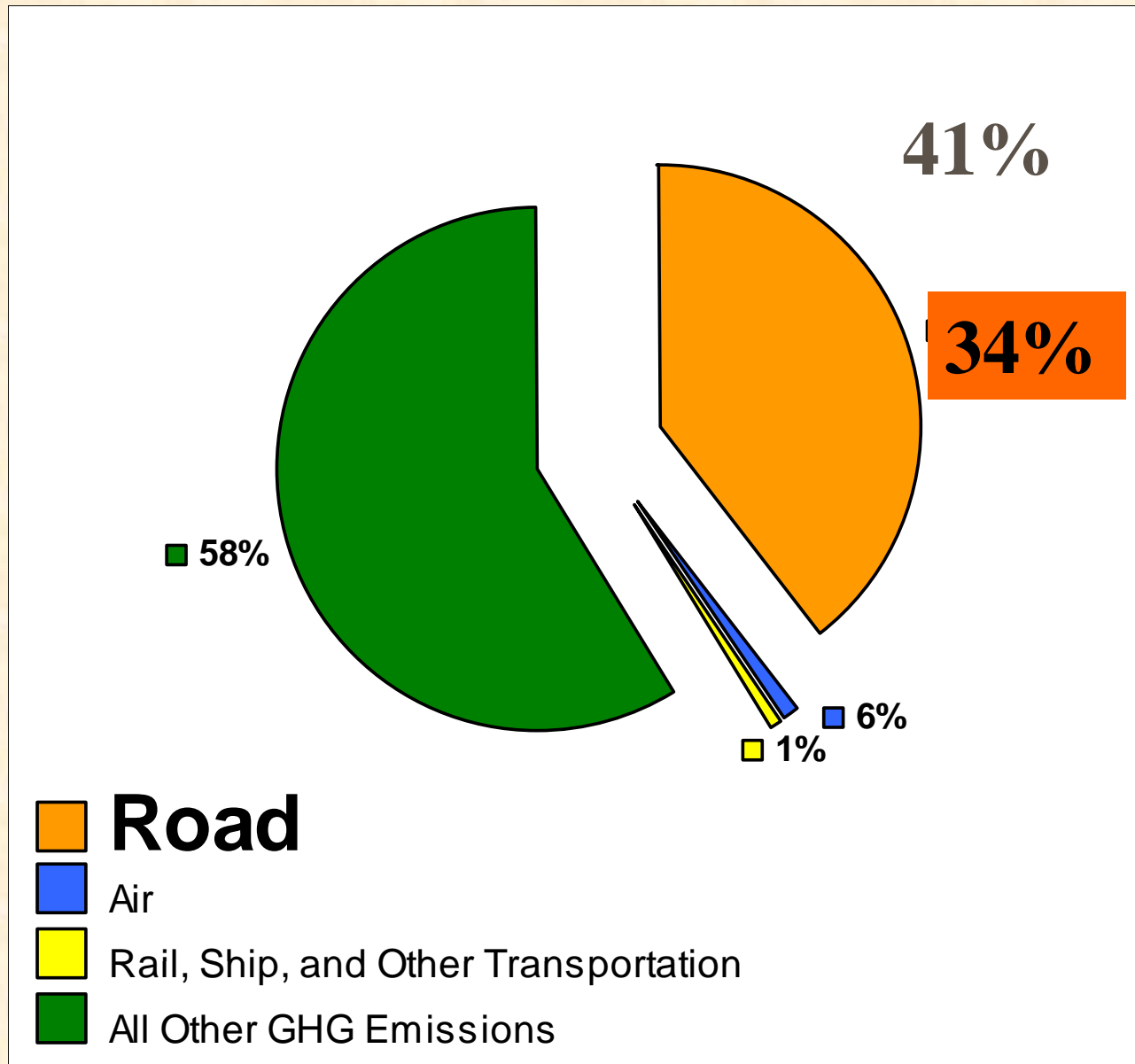
Approach:

- **Vehicle and Fuel Technology**
- **Transportation System Efficiency**
- **Non-Vehicular Conservation Measures**

California Global Warming Emissions (2002)

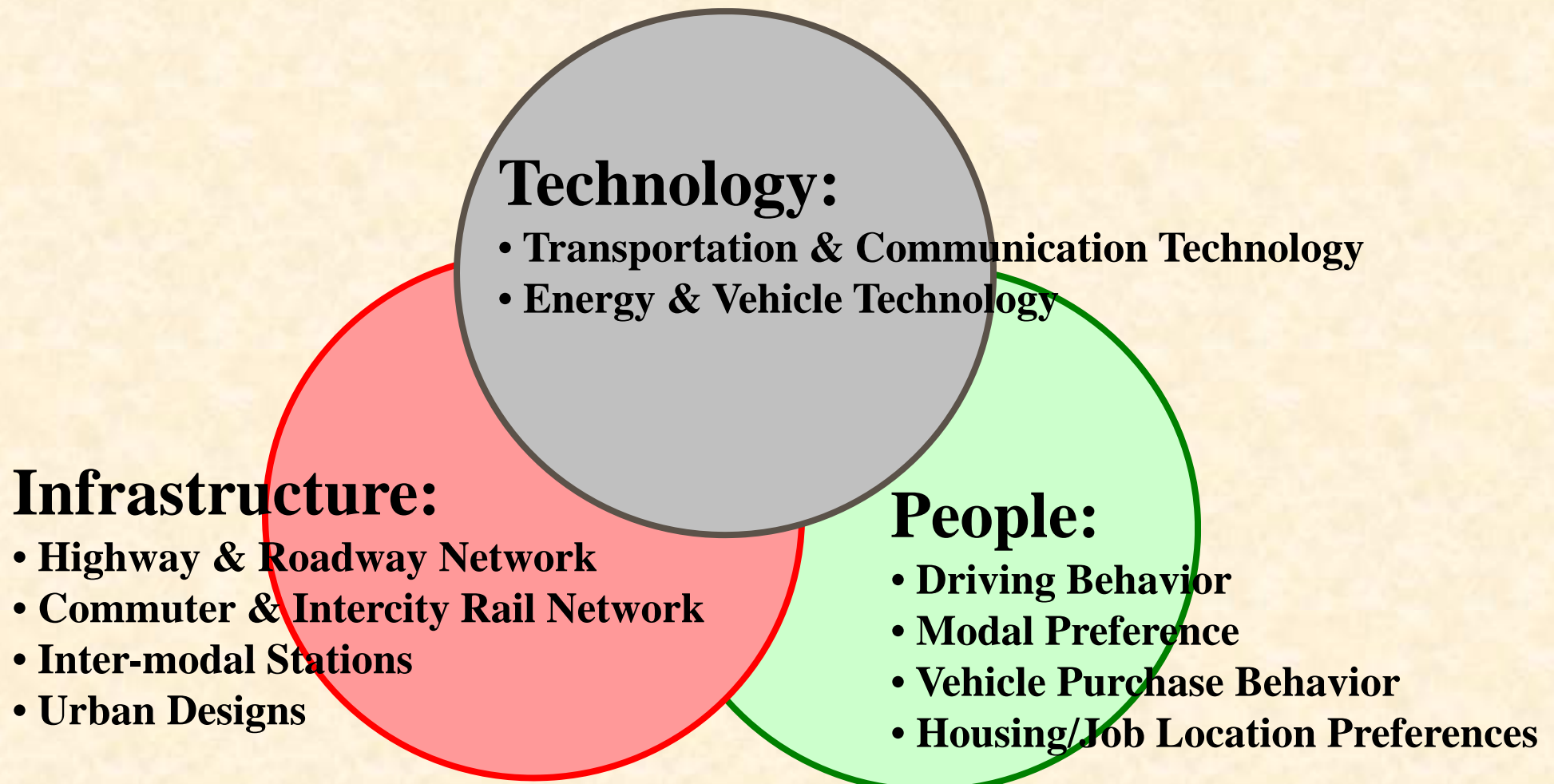


California Global Warming Emissions (2002)



Transportation Operations

Movement of People, Goods, and Services are made possible by three interacting systems (simplified).



Technology is Important



Transportation nearly entirely depends on fossil fuel (97%).



Direct combustion of fuels accounts for 2/3 of primary energy use & GHG emissions.



Number of vehicles projected to triple by 2050.

Fuel and Vehicle Technology

Fortunately, emerging technologies can help to meet the climate challenge.

- **Greater vehicle fuel economy (CAFÉ).**
- **Introduction of new fuel and vehicle types (i.e. biofuels, electricity, hydrogen, fossil fuel/low carbon).**
- **Combination of both fuel and vehicle changes (i.e. more efficient hybrid vehicles).**



California's Motor Vehicle Greenhouse Gas Emissions Regulations: Overview

AB 1493 Regulations: Fleet-Average Emission Standards

Tier	Year	CO ₂ -equivalent emission standards (g/mi)	
		PC/LDT1	LDT2
Near-term	2009	323	439
	2010	301	420
	2011	267	390
	2012	233	361
Mid-term	2013	227	355
	2014	222	350
	2015	213	341
	2016	205	332

~22% reduction in 2012

~30% reduction in 2016

Transportation System Efficiency

1) Institutional change – Integrating GHG reduction measures into transportation investments decisions (mainstreaming).

2) Strategic Planning

Short Term:

- Congestion Relief
- Operational Improvements/ITS
- Alternative Modes
- Demand Management

VMT Management

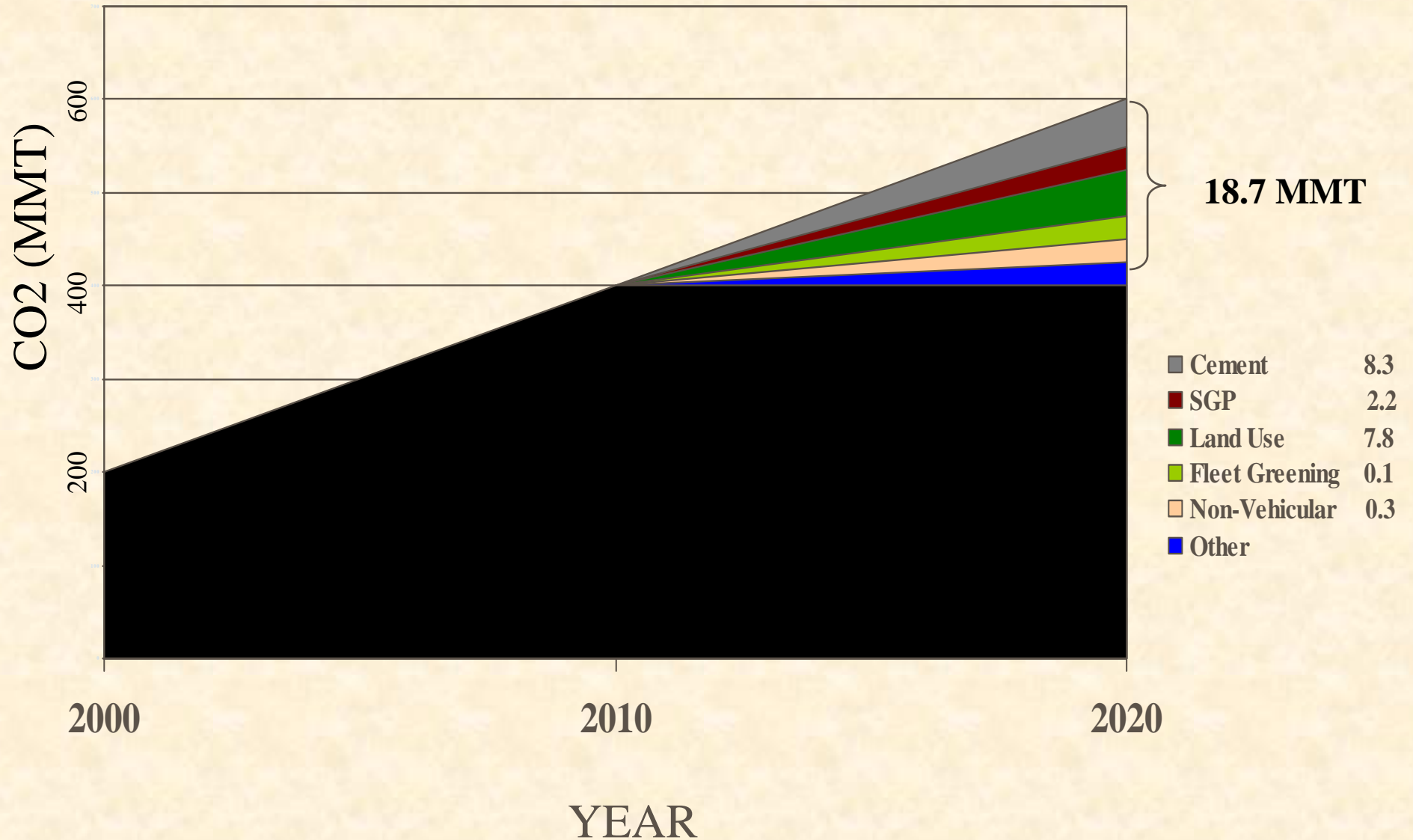
Long Term:

- Urban Design

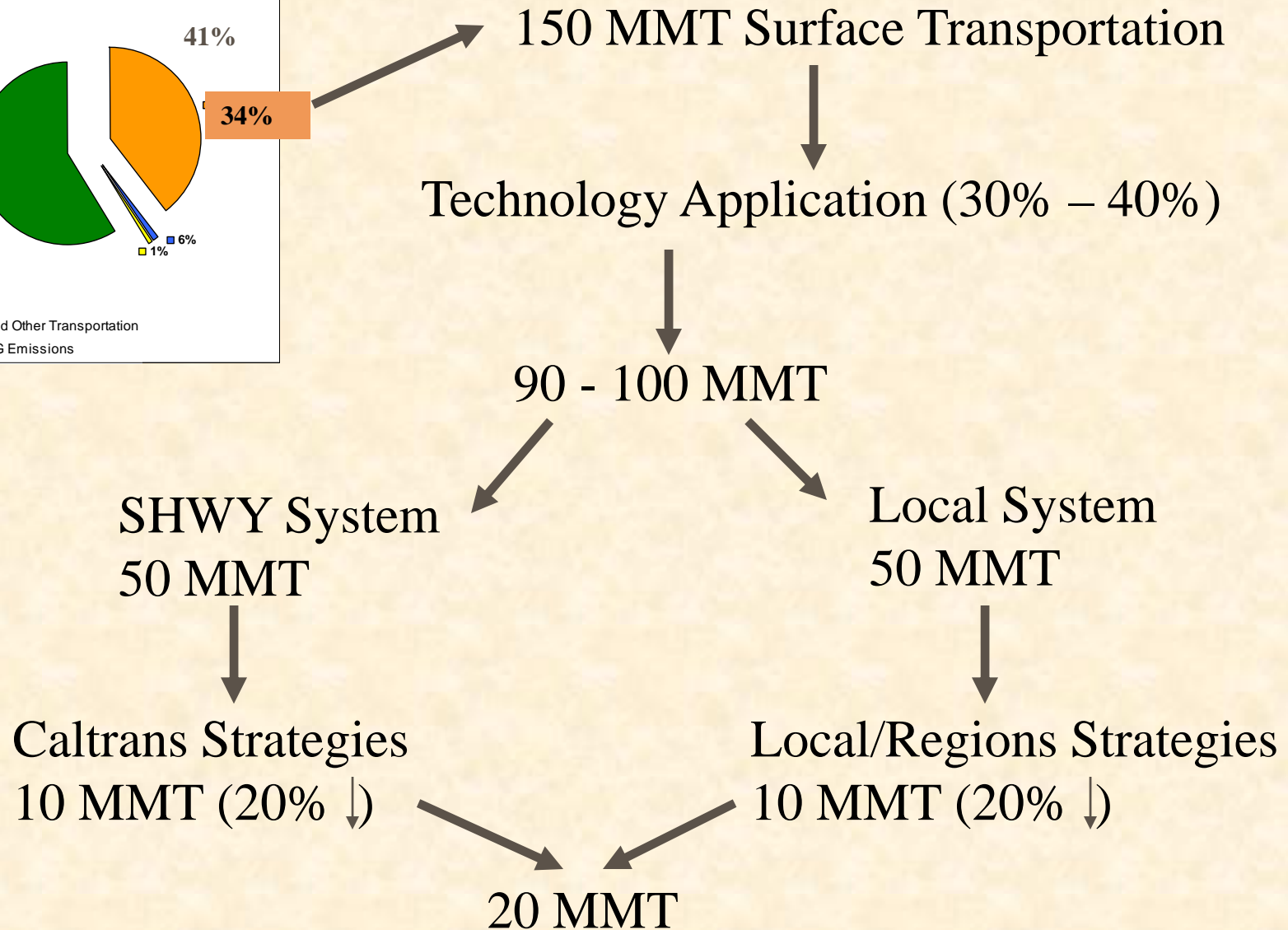
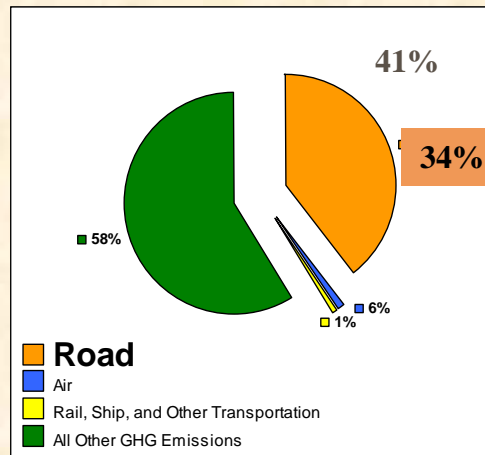
VMT Reduction



GHG Stabilization Wedges



GHG Inventory & Reduction Scenario



12% of total emissions; 20% after technology application;
20% of CAT early action and scoping plan.

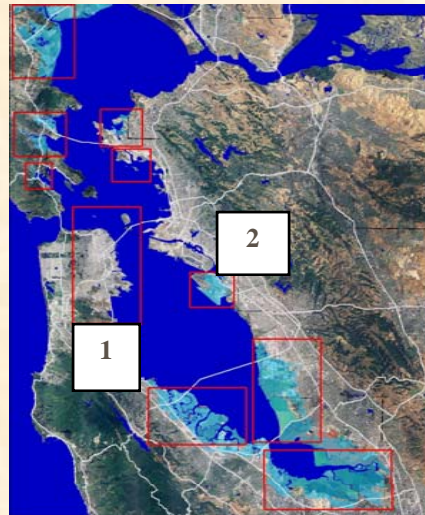


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Adaptation (Impact of Climate Change on Transportation)

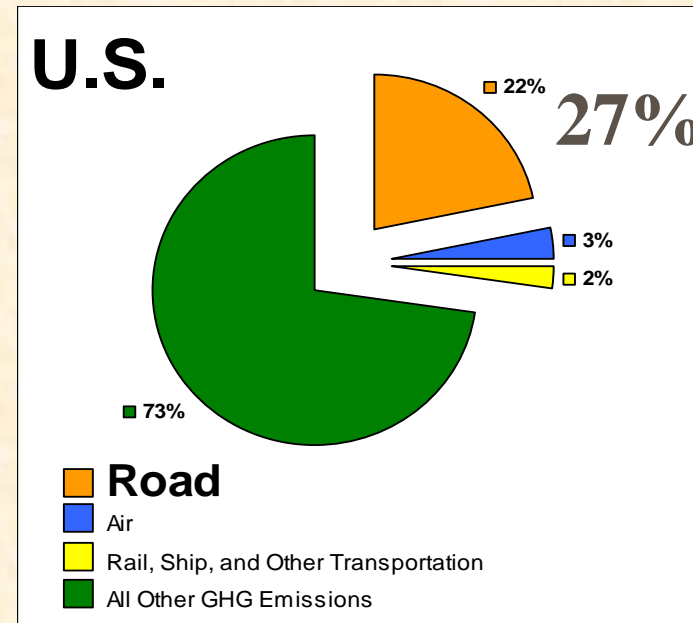
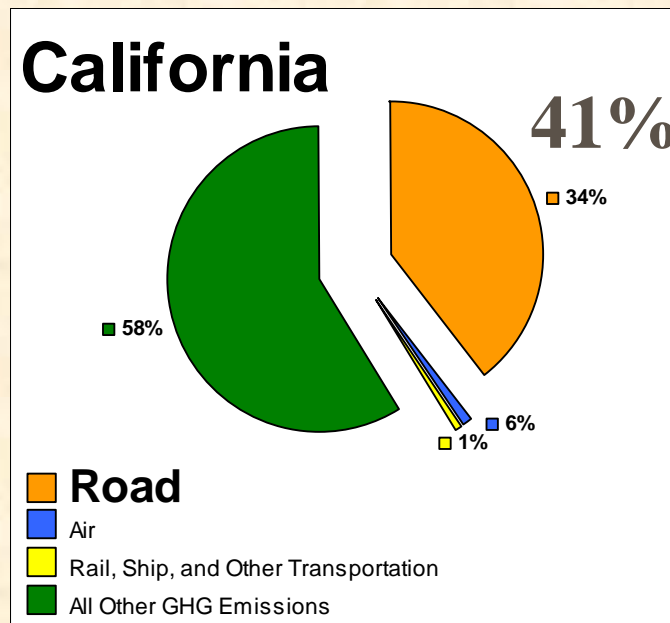
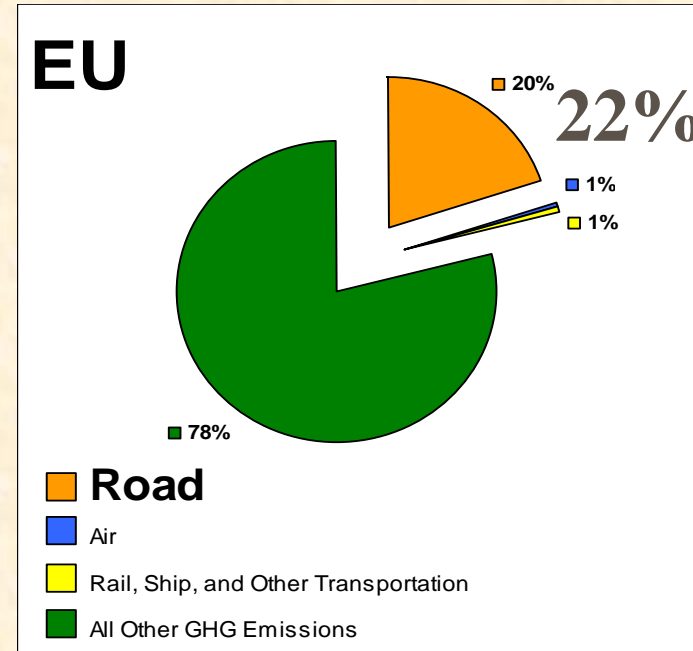
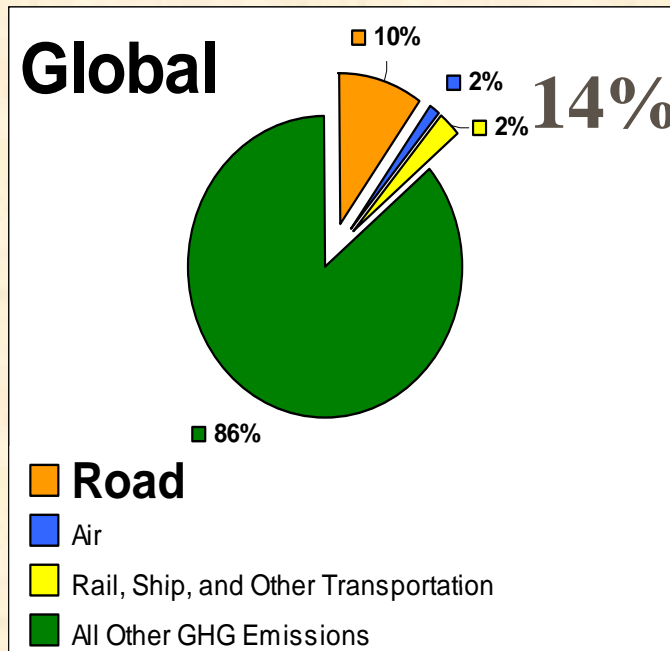


San Francisco - Oakland Bay Area – One meter sea level rise scenario



Photo of Land Slide, February 2007 - Humboldt County, CA, State Highway 96

Carbon Dioxide from Transportation



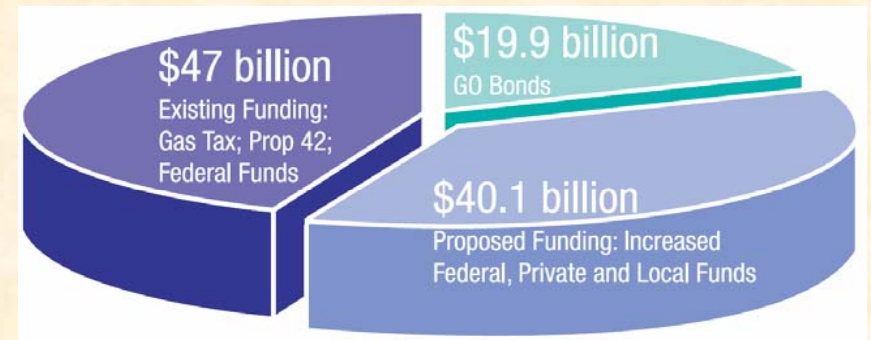
Governor's Strategic Growth Plan

\$107 Billion transportation infrastructure investment



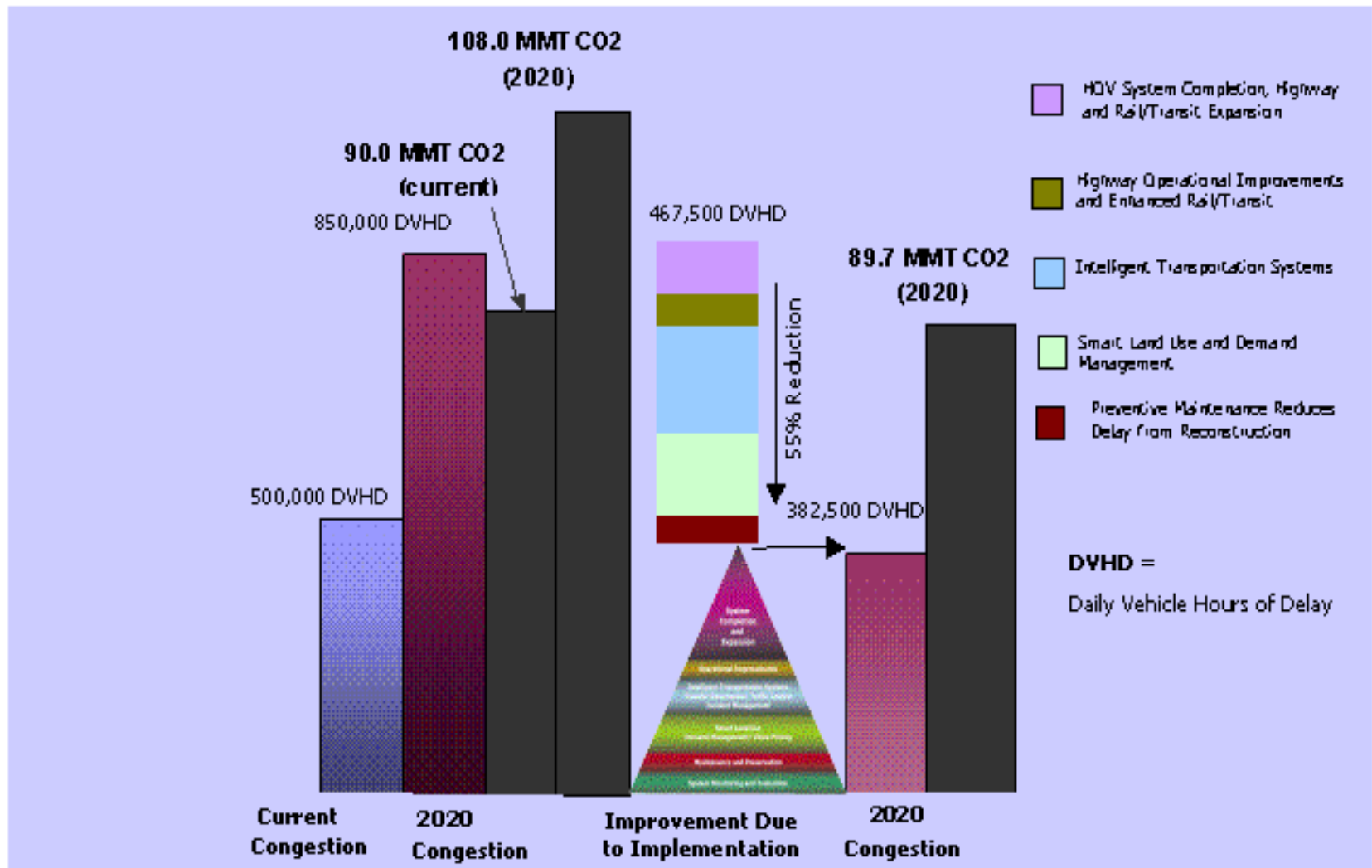
The SGP Targets:

- Significant decrease in congestion below today's levels
- 600 miles new commuter lines
- 150% increase in intercity rail ridership
- 310,000 more transit ridership
- 550 new HOV lanes miles
- 750 new highway lane miles
- 8500 miles of separated bike and pedestrian paths



Outcome of Strategic Growth Plan

Outcome of Strategic Growth Plan



Conceptual Framework for Reducing Congestion that Needs to be Verified Through Experience

* Numbers reflect SHWY system