

Moving Cooler

Study Findings

Moving Cooler



Regional Transportation Advisory Committee

November 18, 2009

presented by
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Cambridge Systematics, Inc.

Transportation leadership you can trust.

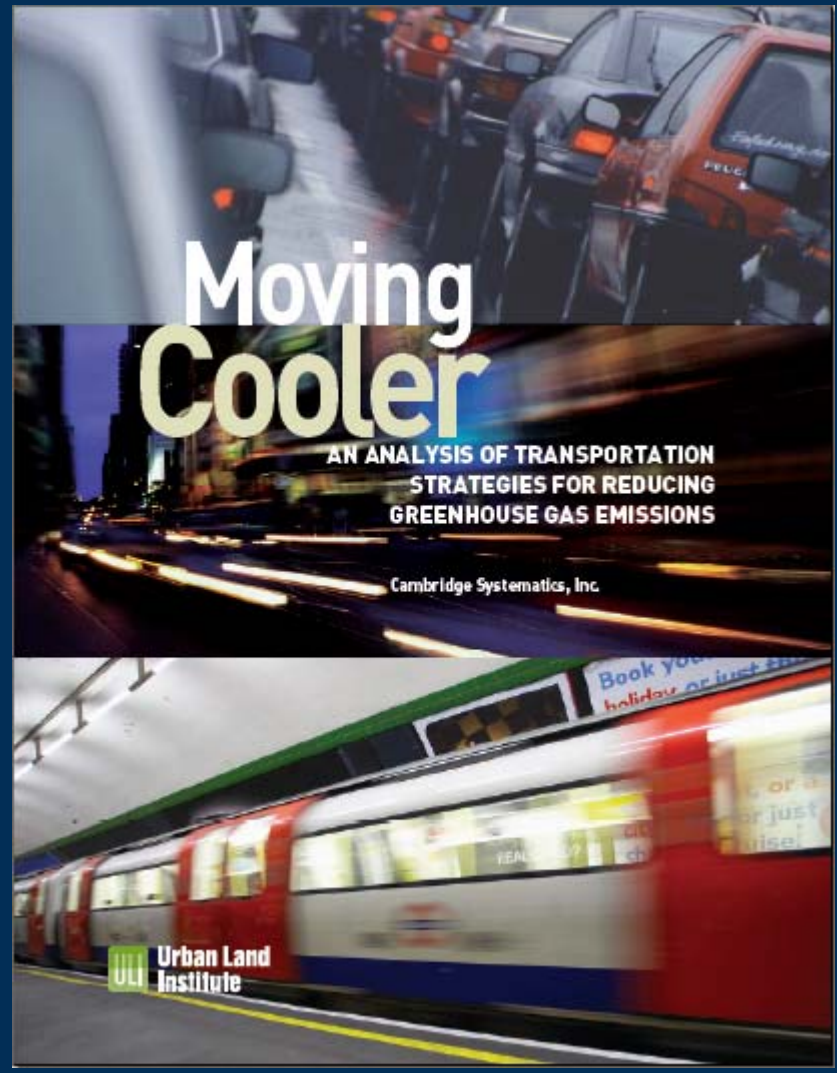
Presentation Agenda

- **Study Scope and Objective**
- **On-Road GHG Emissions Baseline**
- **Strategies Examined**
- **Analytic Approach**
- **Findings**
 - **Individual Strategies**
 - **Bundles**
 - **Economy Wide Pricing**
- **Conclusions**

Stakeholders

- **Multiple Sponsors on Steering Committee**
 - U.S. Environmental Protection Agency
 - U.S. Federal Highway Administration
 - U.S. Federal Transit Administration
 - American Public Transportation Association
 - Environmental Defense
 - ITS America
 - Shell Oil
 - Natural Resources Defense Council
 - Kresge Foundation
 - Surdna Foundation
 - Rockefeller Brothers Fund
 - Rockefeller Foundation
 - Urban Land Institute
- **Diverse group, each with compelling objectives**

Filling the Gap Moving Cooler

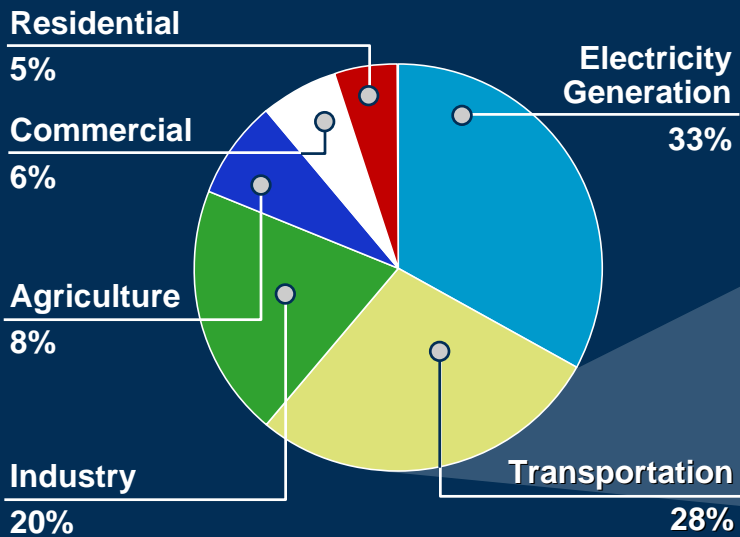


Study Objective

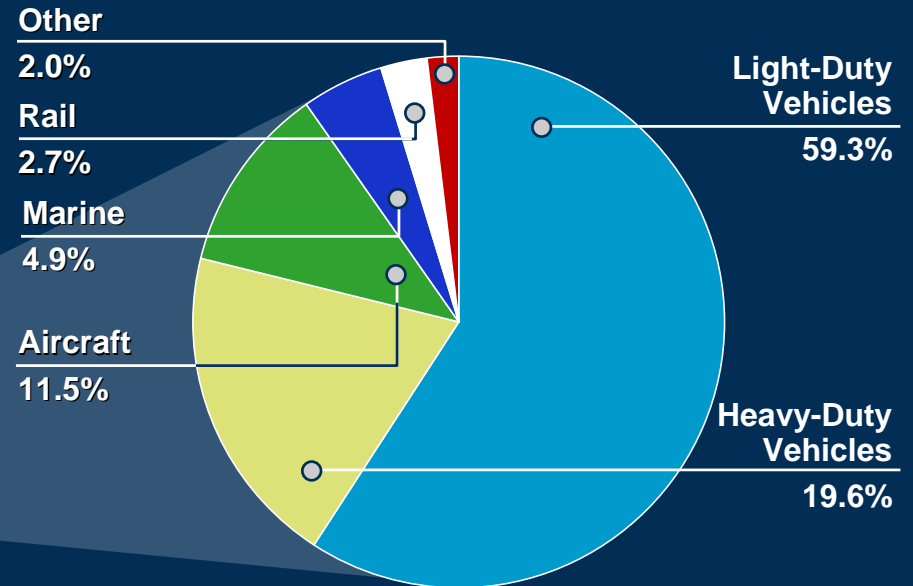
- Examine the **potential** of VMT and travel efficiency strategies to reduce GHG emissions
- Moving Cooler targets 2 of the 4 “legs”
- McKinsey study addresses vehicle technology and fuels

Transportation's Contribution to U.S. GHGs

U.S. GHG Emissions by End Use Economic Sector 2006



U.S. GHG Emissions Breakdown by Mode



Source: Environmental Protection Agency (EPA). "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007," April 2009, <http://epa.gov/climatechange/emissions/usinventory.html>.

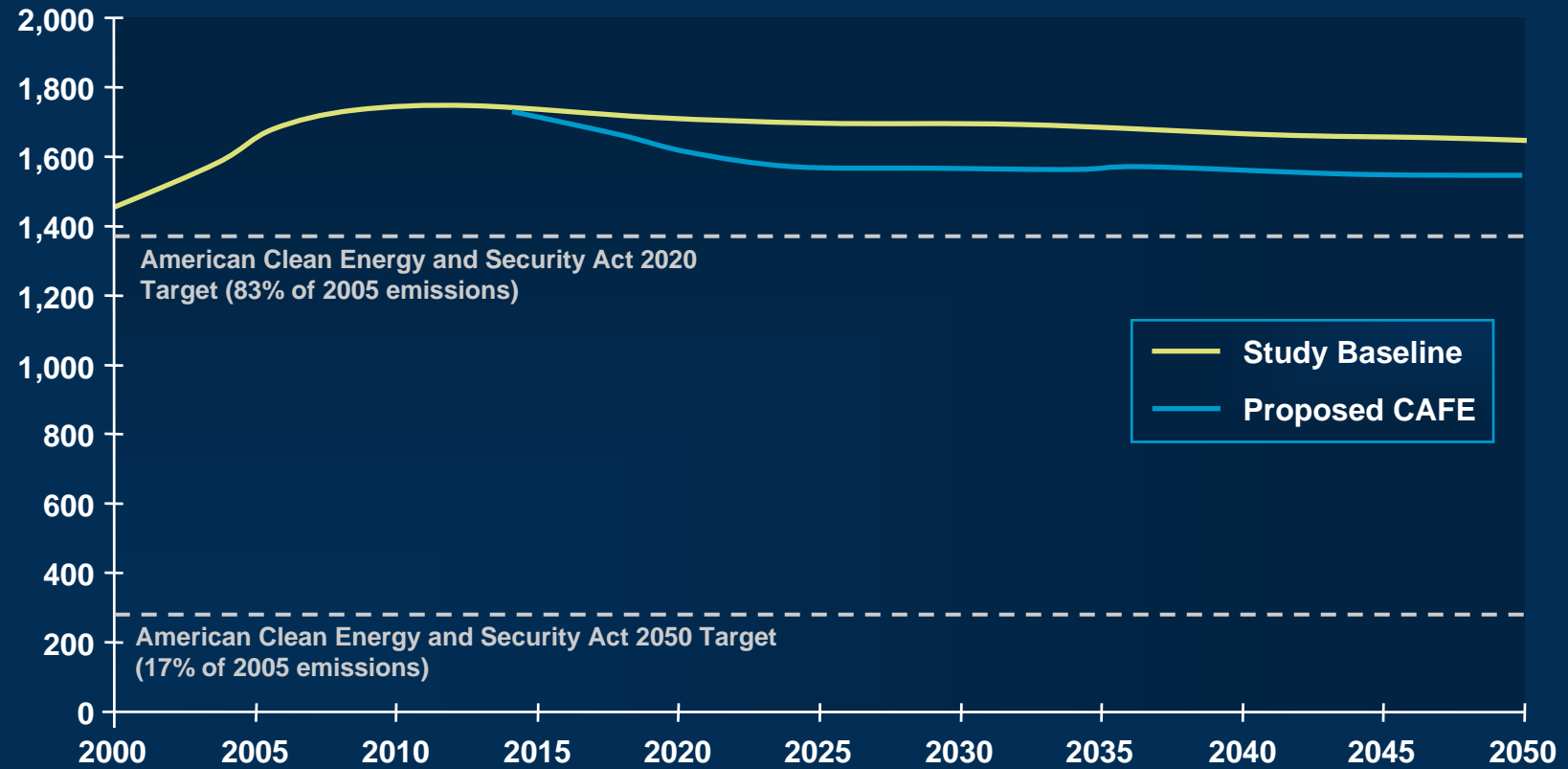
Assumptions for Baseline

<ul style="list-style-type: none"> ● Travel continues to grow 	VMT	1.4%/yr
	Transit ridership	2.4%/yr
<ul style="list-style-type: none"> ● Fuel costs increase 	\$3.70/gal. in 2009*	1.2%/yr
<ul style="list-style-type: none"> ● Fuel economy increases steadily 	Light duty	1.91%/yr
	Heavy duty	0.61%/yr

*AEO high fuel price scenario

Moving Cooler Baseline to 2050

National On-Road GHG Emissions (mmt)



Range of Strategies Examined

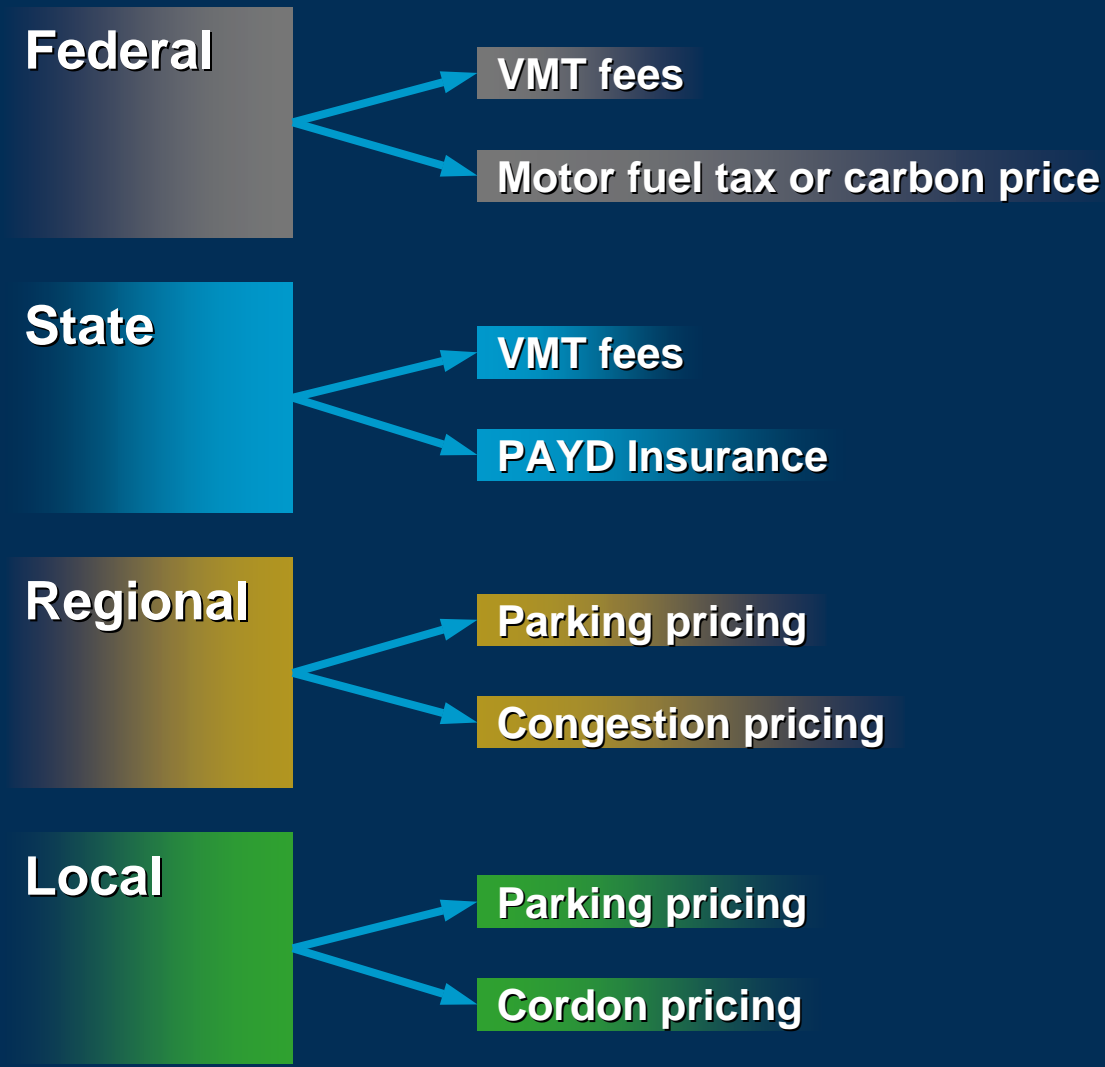
VMT Focus

- Parking, cordon, and congestion pricing
- Economy wide pricing
- Land use and nonmotorized
- Urban transit – fares, LOS and service expansion
- Intercity passenger rail and high-speed rail
- Car sharing, employer based commute
- Consolidated freight facilities
- Rail and marine infrastructure bottlenecks

System Efficiency Focus

- Congestion pricing
- HOV/Managed lanes
- Speed limit reductions
- Eco-driving
- Systems operations and management, bottleneck relief and capacity expansion
- Overweight load permits, WIM screening, truck stop anti-idling
- Truck-only lanes

Example: Pricing Strategies



7 Area Types

	Density/Level of Transit	
Large urban	Hi	Low
Medium urban	Hi	Low
Small urban	Hi	Low
Nonurban		

3 Deployment Levels per Measure

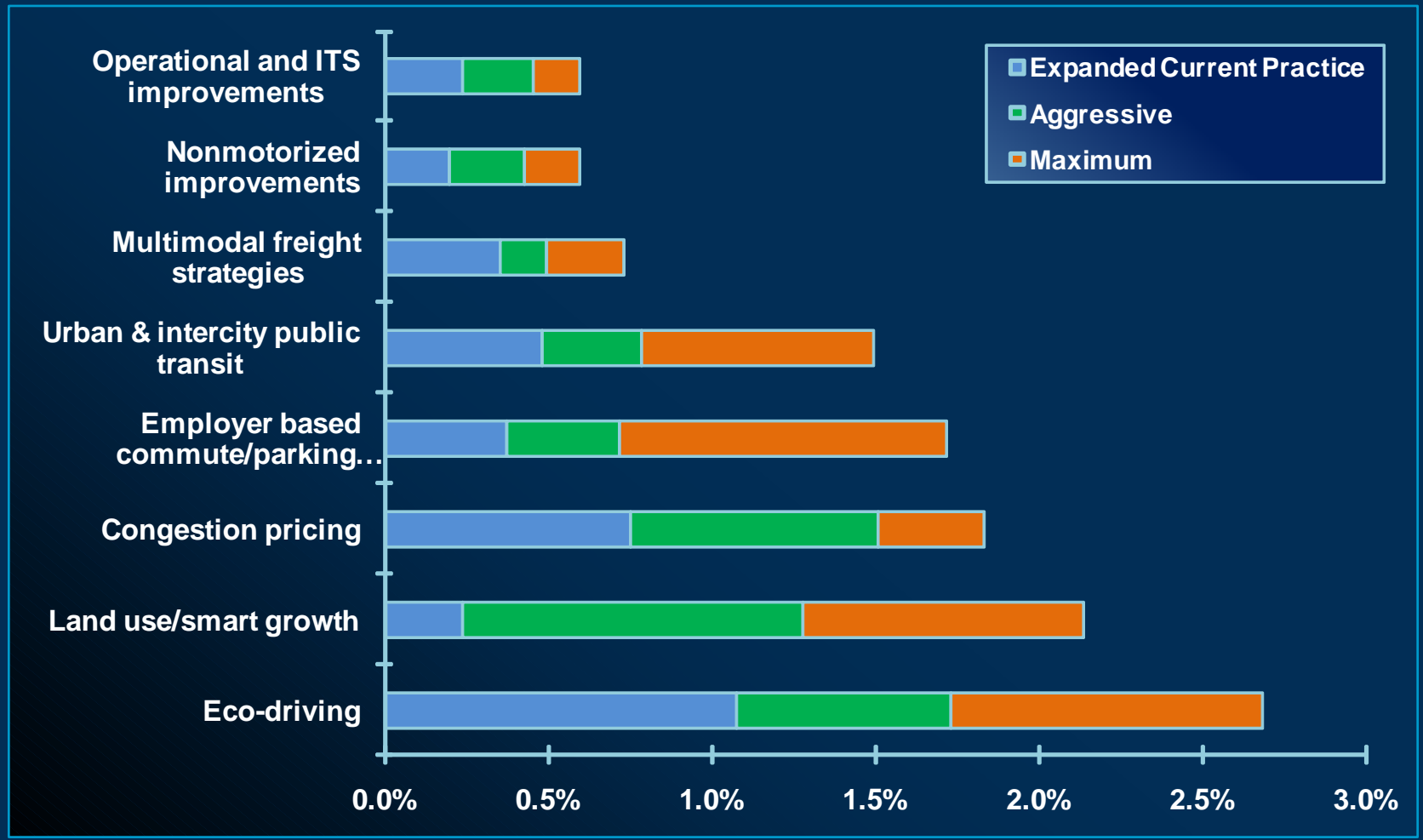
	Sample Parameters (congestion pricing)	
	Scope	Intensity
Expanded current practice	Large urban areas	Peak hour at \$0.45/mile
More aggressive	Large and medium urban areas	Peak hour at \$0.69/mile
Maximum effort	Large, medium, and small urban areas	Peak hour at \$0.69/mile

Findings: Individual Strategies

- Individual strategies achieve varying levels of GHG reductions, ranging from <0.5% to over 4.0% cumulatively to 2050
- Examples
 - Speed limit reductions, eco-driving
 - PAYD insurance, VMT fees
 - Operational and ITS improvements
- Some strategies with marginal GHG benefit meet other important goals

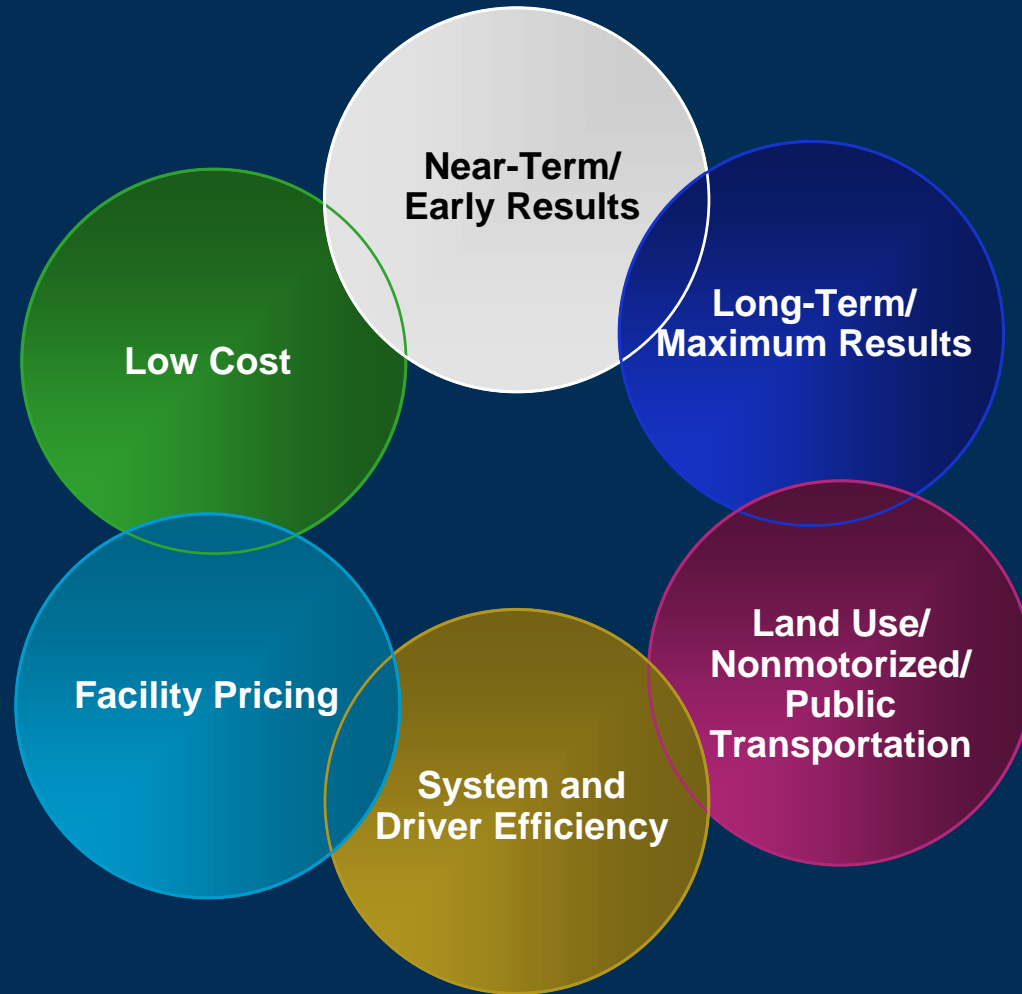
Findings: Individual Strategies (Examples)

Cumulative GHG reduction from baseline, 2010-2050



Strategy Bundles

Illustrative Analysis

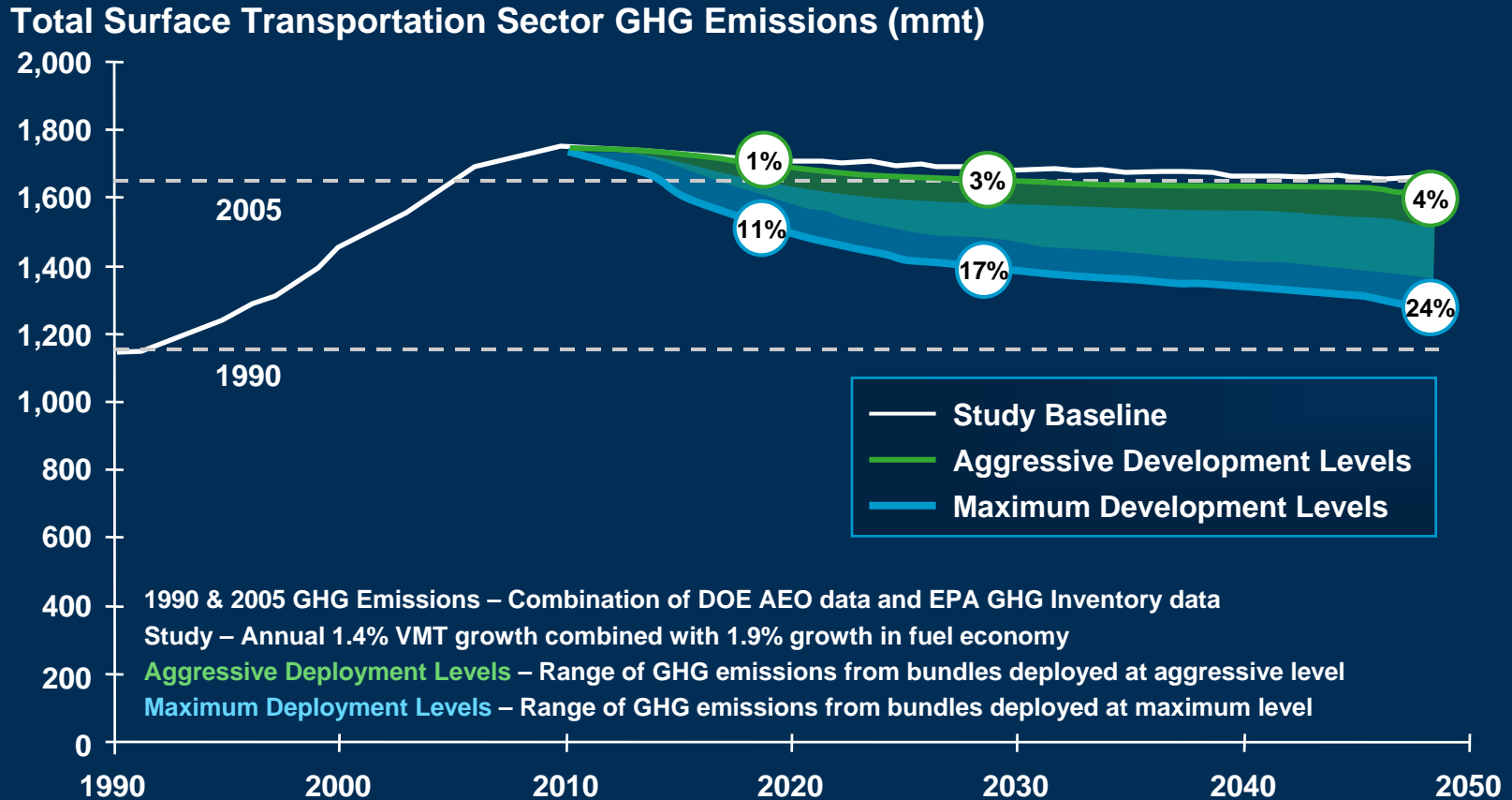


Findings: “Bundles”

- **Combinations of transportation strategies can achieve GHG reductions from transportation (synergies)**
 - **4% to 18% GHG reduction from baseline* in 2050 (aggressive deployment, without economy-wide pricing)**
 - **Up to 24% GHG reduction from baseline* in 2050 (maximum deployment, without economy-wide pricing)**
- **These strategies complement the important (and more significant) reductions anticipated from fuel and technology advancements**

* Projections for on-road surface transportation GHG emissions

Range of Annual GHG Reductions of Six Strategy Bundles (Aggressive and Maximum Deployment)

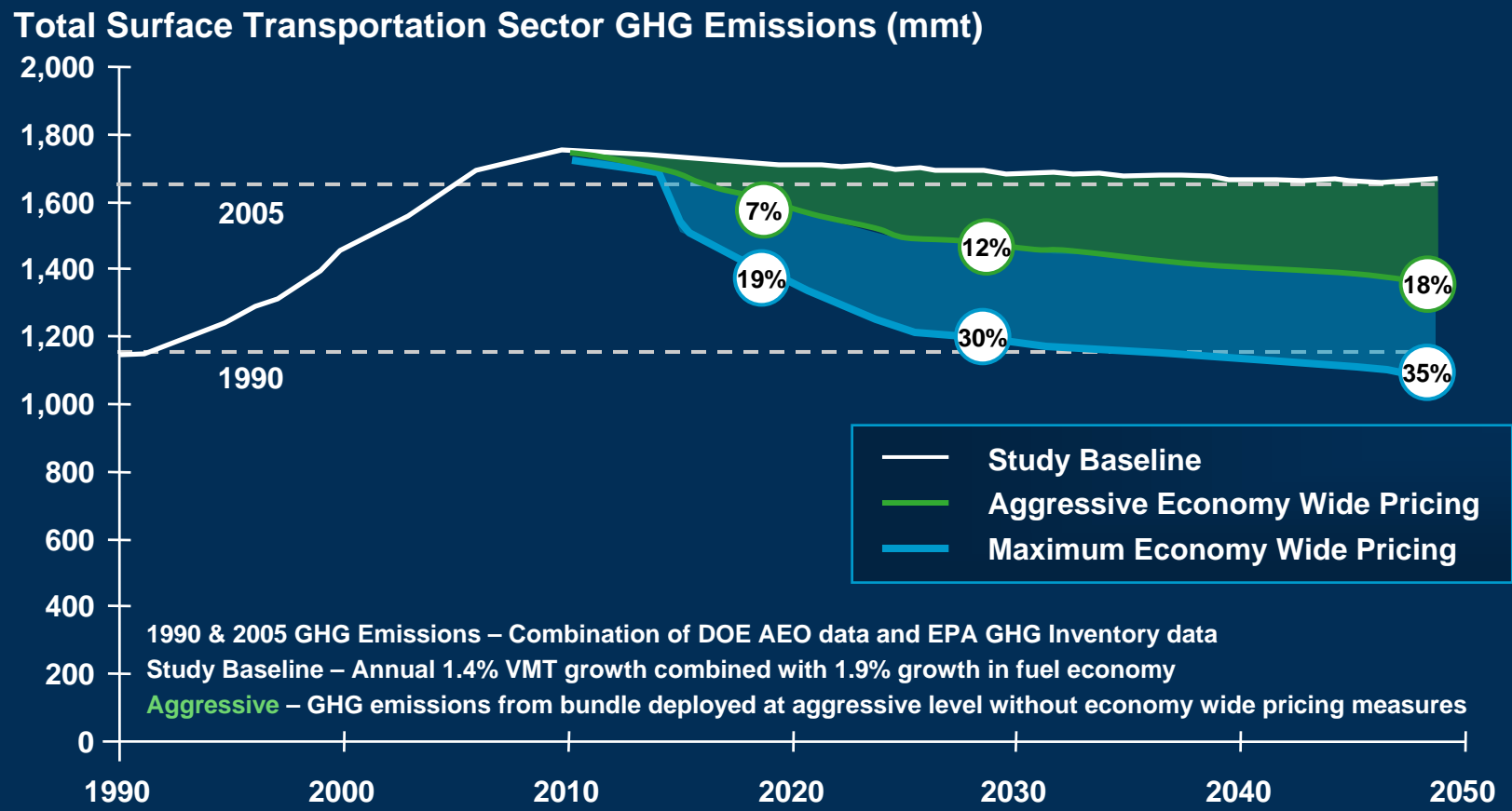


Note: This figure displays the GHG emission range across the six bundles for the aggressive and maximum deployment scenarios. The percent reductions are on an annual basis from the Study Baseline. The 1990 and 2005 baseline are included for reference.

Economy-Wide Pricing

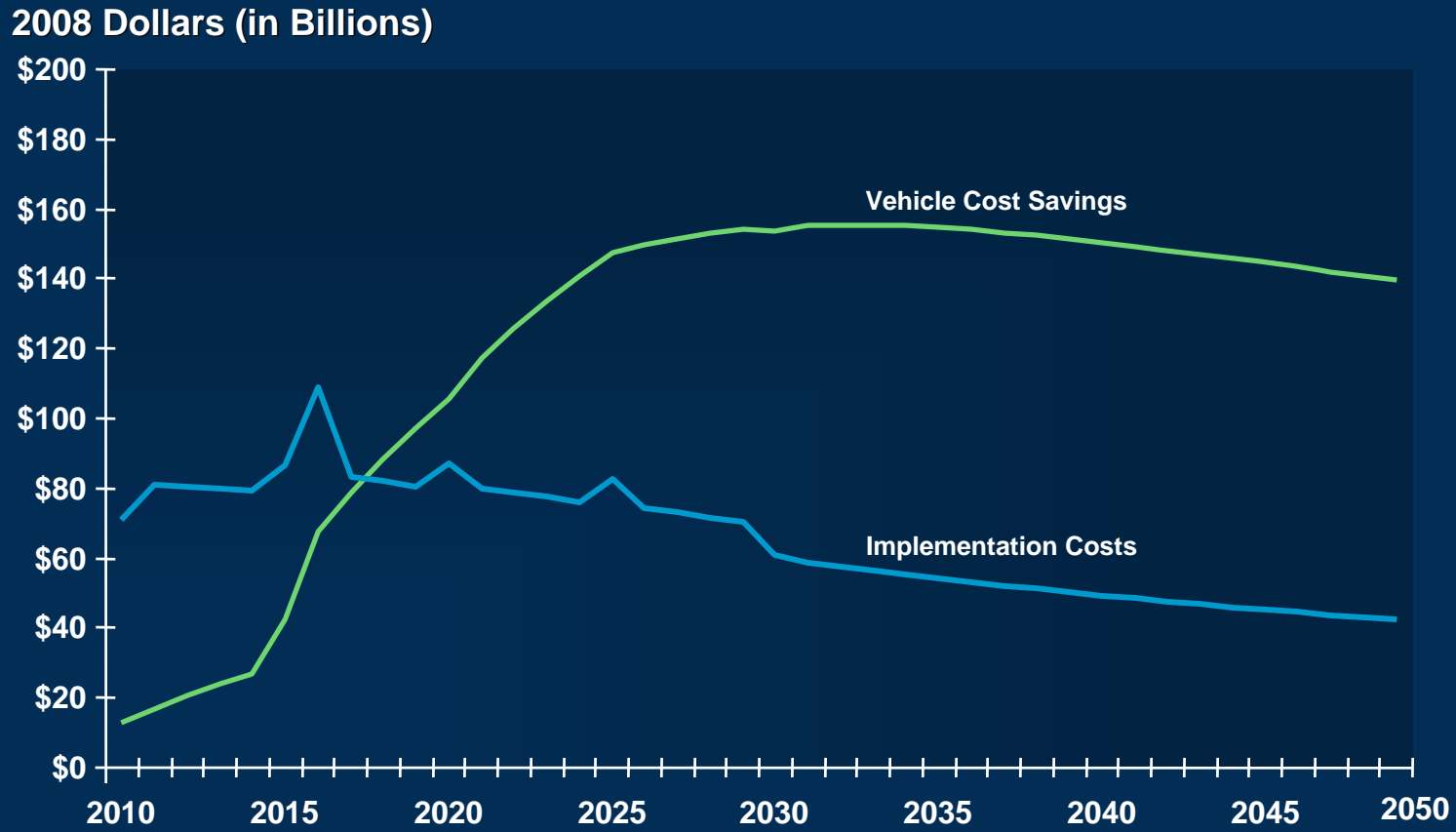
- **Mechanisms – Carbon pricing, VMT fee, and/or Pay As You Drive (PAYD) insurance**
- **Strong economy-wide pricing measures added to “bundles” achieve additional GHG reductions**
 - Aggressive deployment - additional fee (in current dollars) starting at the equivalent of **\$0.60 per gallon** in 2015 and increasing to **\$1.25 per gallon** in 2050 could result in an additional **17% reduction** in GHG emissions in 2050
- **Two factors would drive this increased reduction**
 1. Reduction in VMT
 2. More rapid technology advances

Economy-Wide Pricing



- Economy wide pricing strategies are overlaid on bundles resulting in a doubling or more of GHG reductions

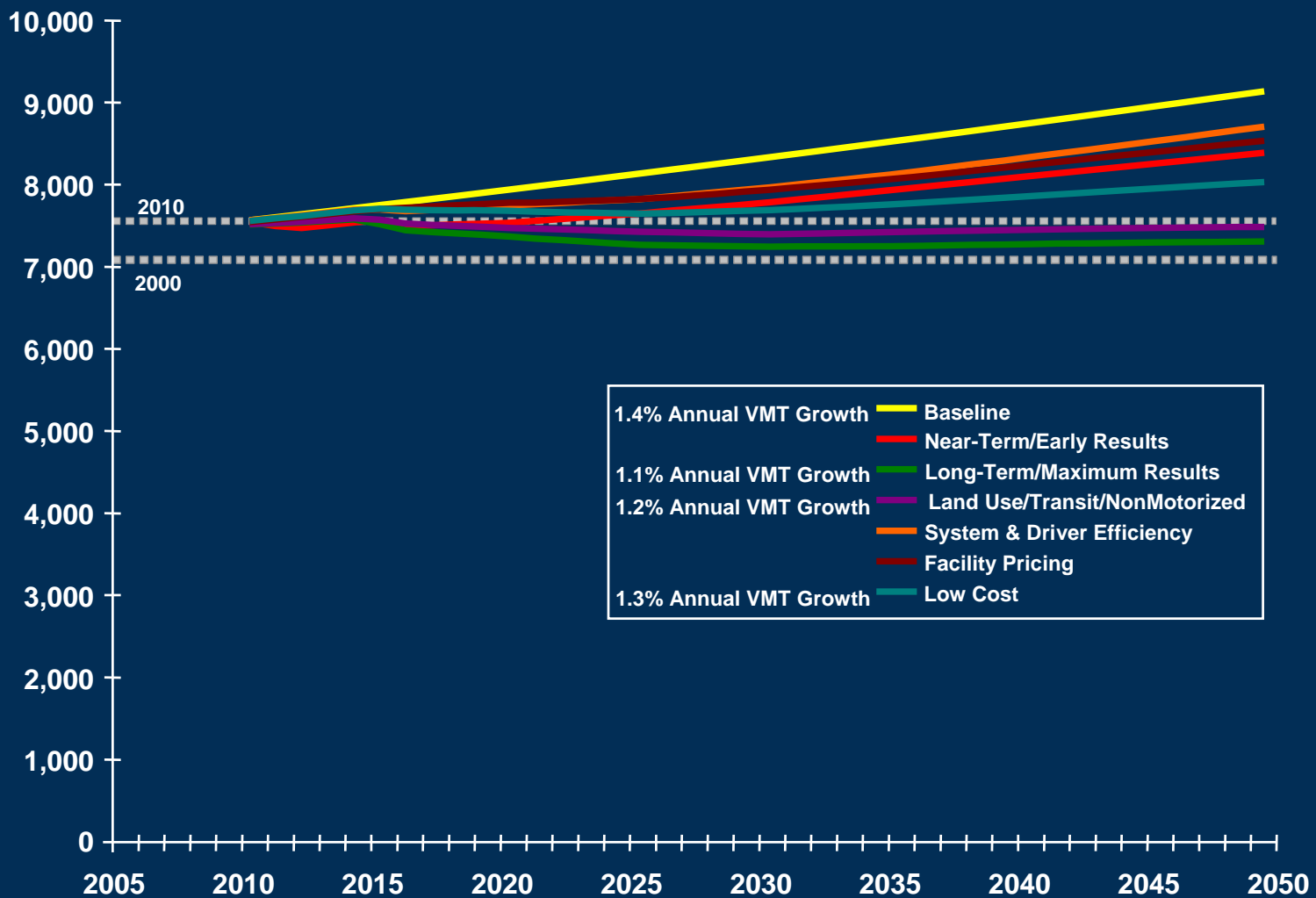
Direct Vehicle Costs and Costs of Implementing Strategy “Bundles”



Note: This figure displays estimated annual implementation costs (capital, maintenance, operations, and administrative) and annual vehicle cost savings (reduction in the costs of owning and operating a vehicle from reduced VMT and delay). Vehicle cost savings DO NOT include additional costs and savings that could be experienced as a consequence of implementing each bundle, such as changes in user fees, travel time, safety, environmental quality, and public health.

Urban Area VMT per Capita - Bundles at Aggressive Deployment (All VMT)

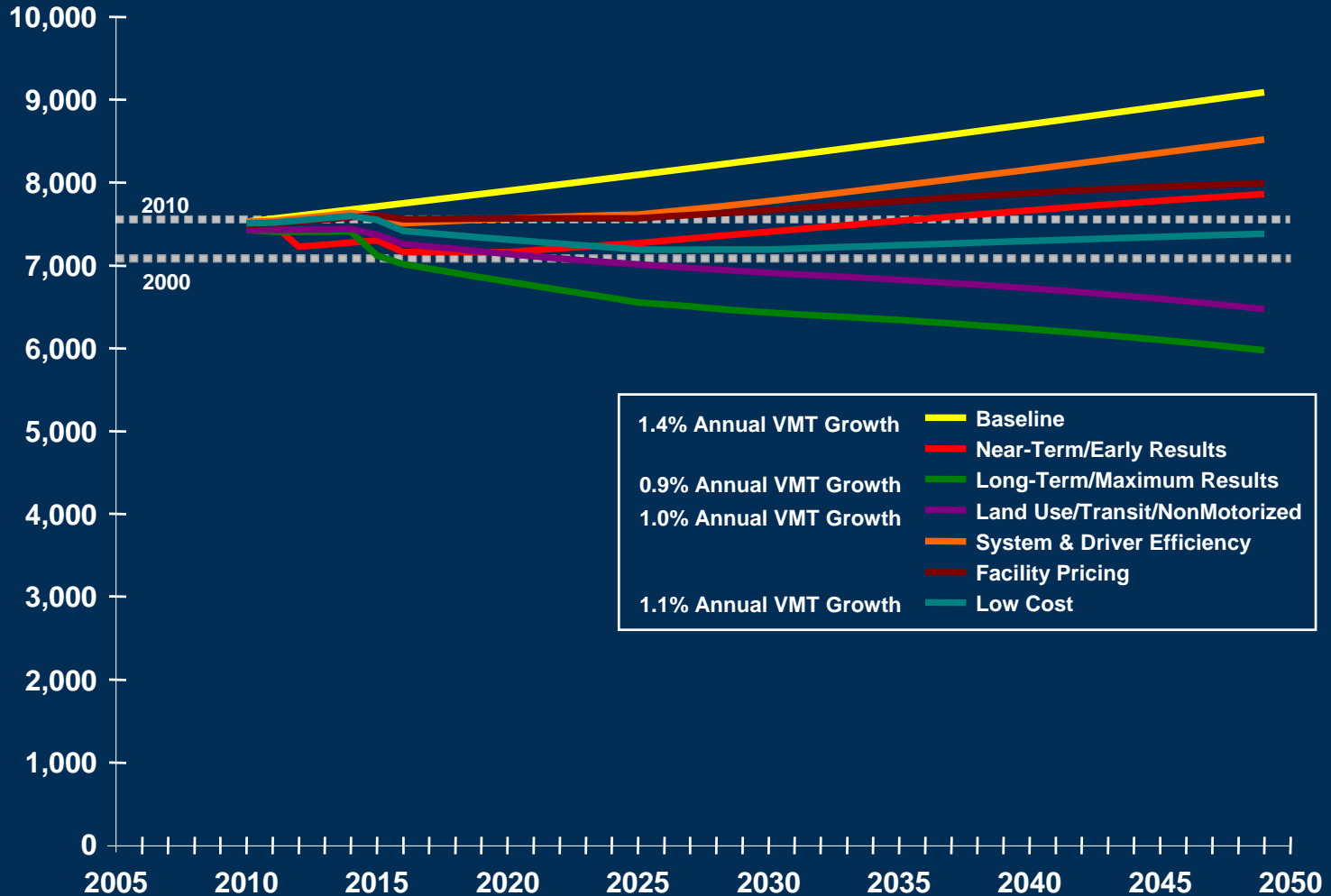
Annual VMT per Capita



Note: This chart displays changes in annual VMT per capita for defined urbanized areas based on 2000 Census. It assumes that these areas do not change in geographic size or that new areas are added through 2050.

Urban Area VMT per Capita Bundles at Maximum Deployment (All VMT)

Annual VMT per Capita



Note: This chart displays changes in annual VMT per capita for defined urbanized areas based on 2000 Census. It assumes that these areas do not change in geographic size or that new areas are added through 2050.

Conclusions – Study Findings

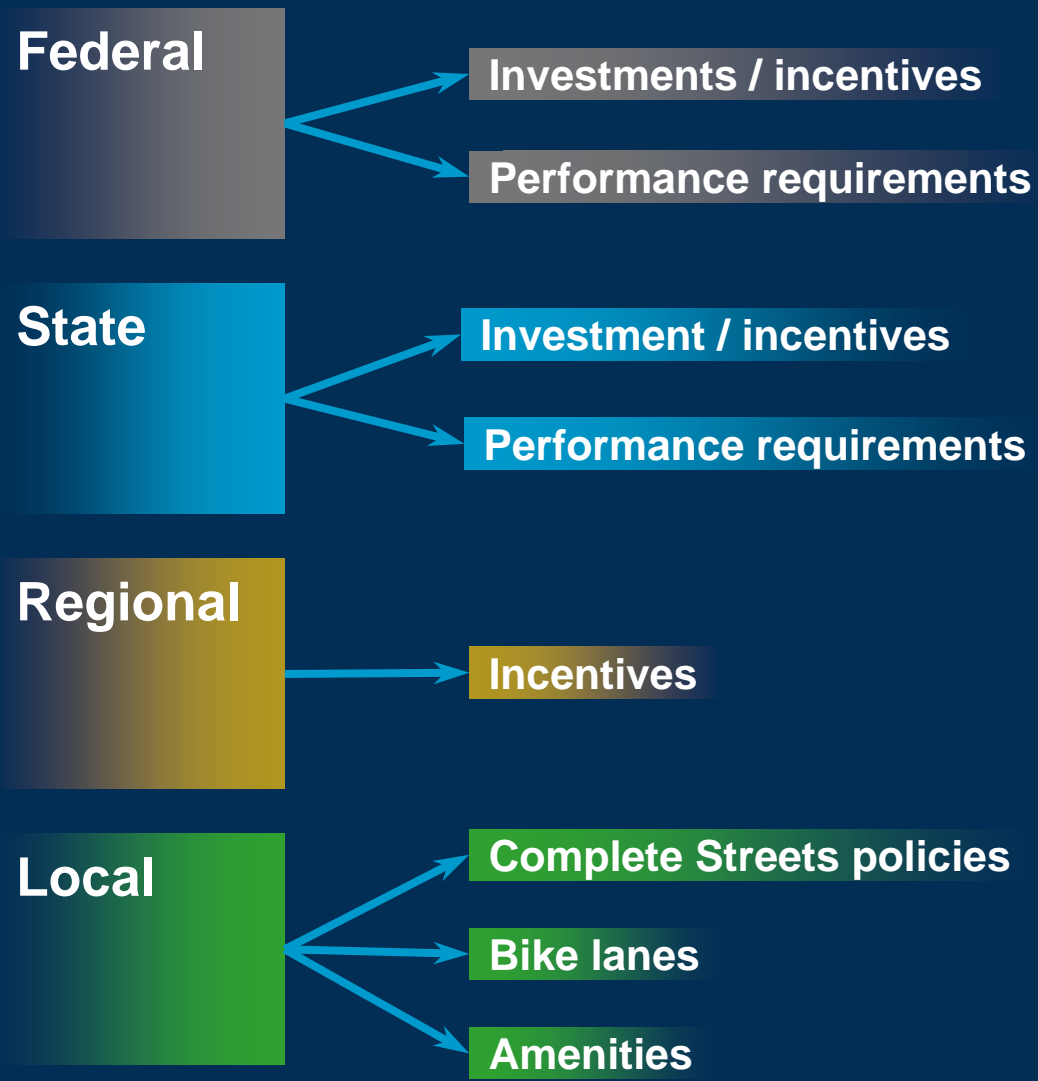
- Some strategies are effective in achieving **near-term** reductions, reducing the cumulative GHG challenge in later years
- Investments in land use and improved travel options involve **longer timeframes** but would have enduring benefits
- Many strategies contribute to other **social, economic and environmental goals** while reducing GHGs
- Some strategies have **significant equity implications** that should be examined and addressed

For More Information...

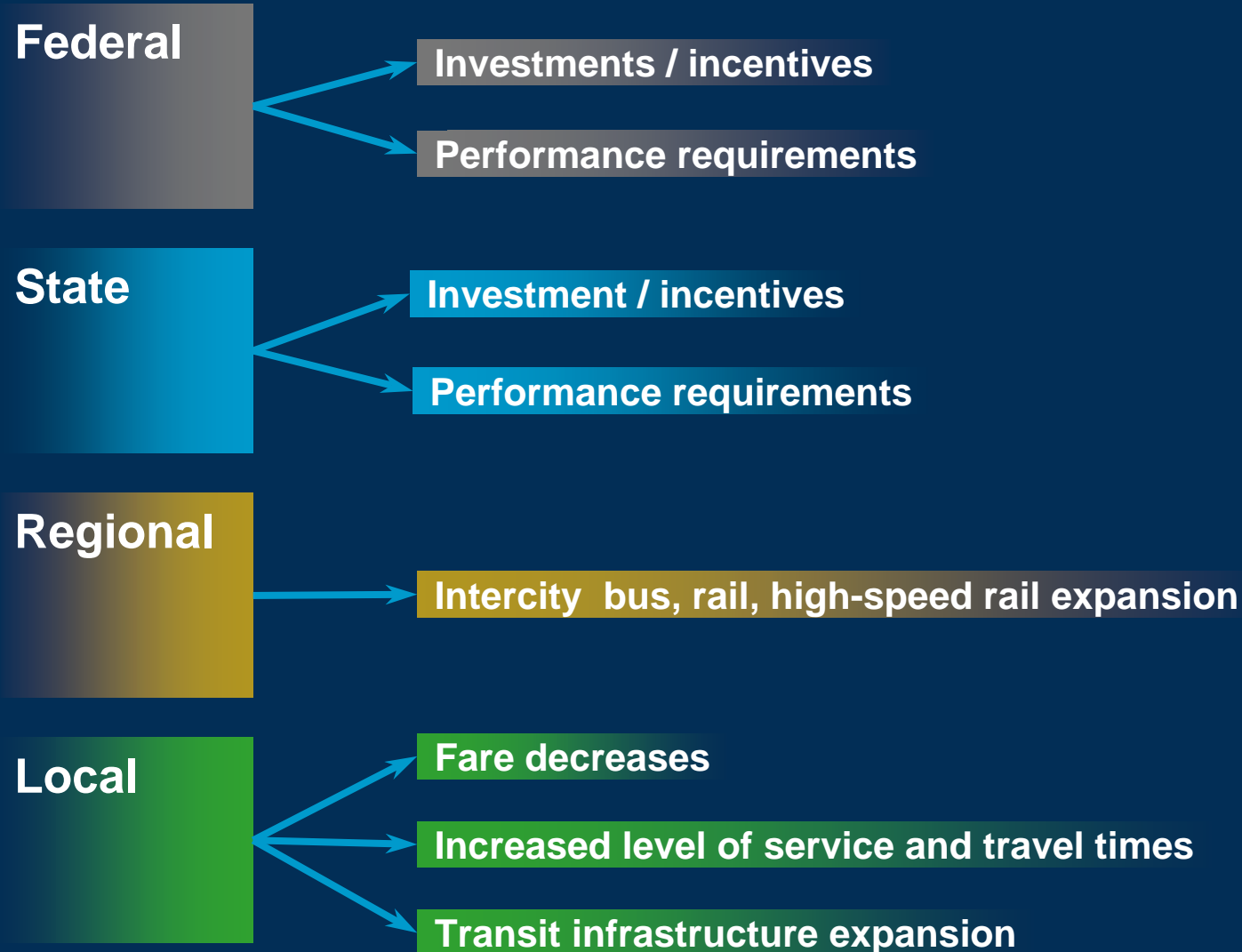
- <http://movingcooler.info>
- <http://www.uli.org/Books>
- cporter@camsys.com

EXTRA SLIDES

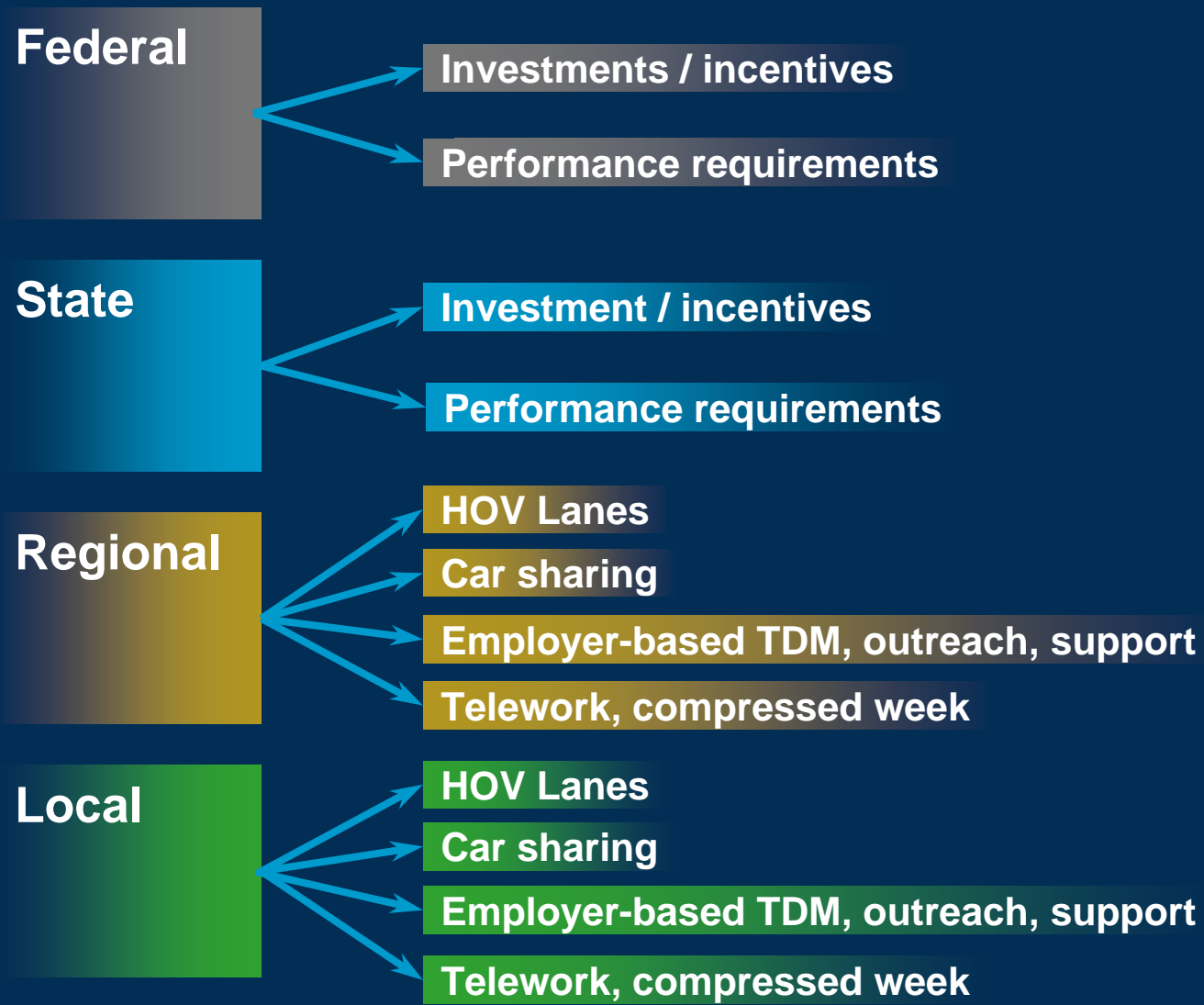
Nonmotorized Transportation Strategies



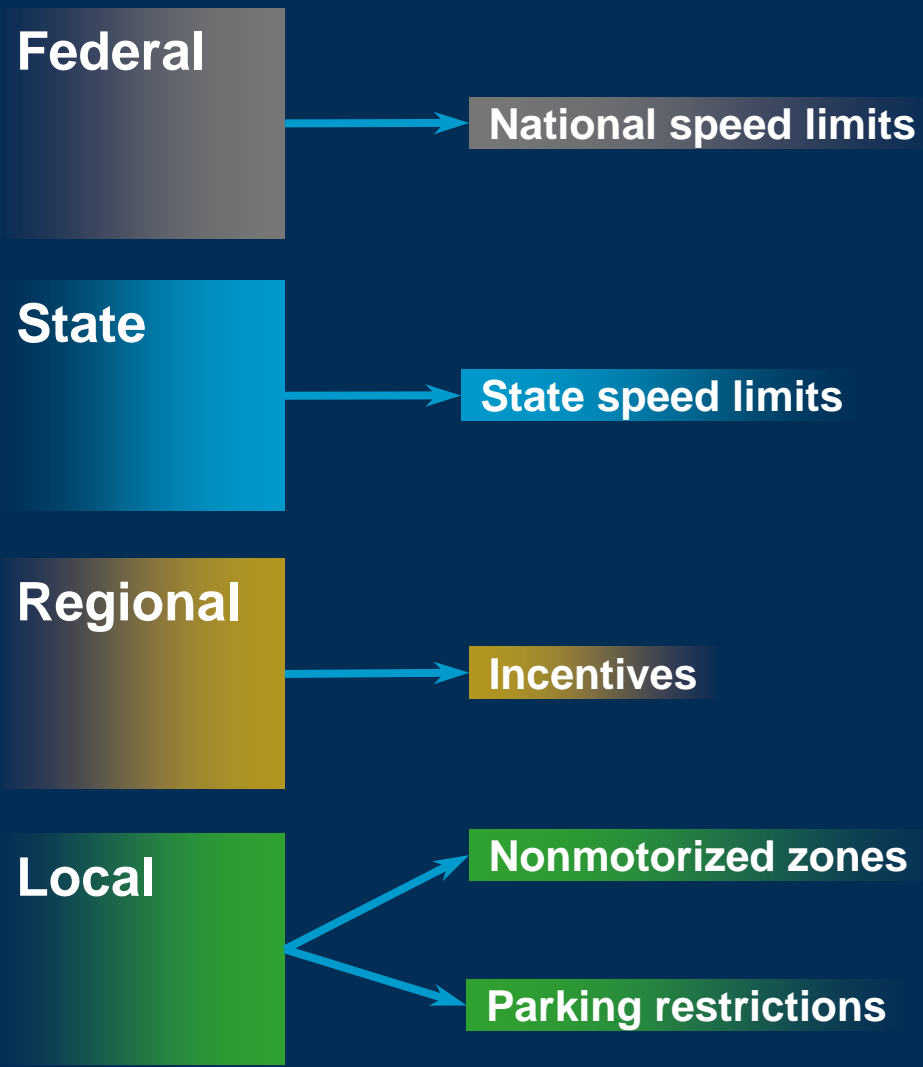
Public Transportation Improvement Strategies



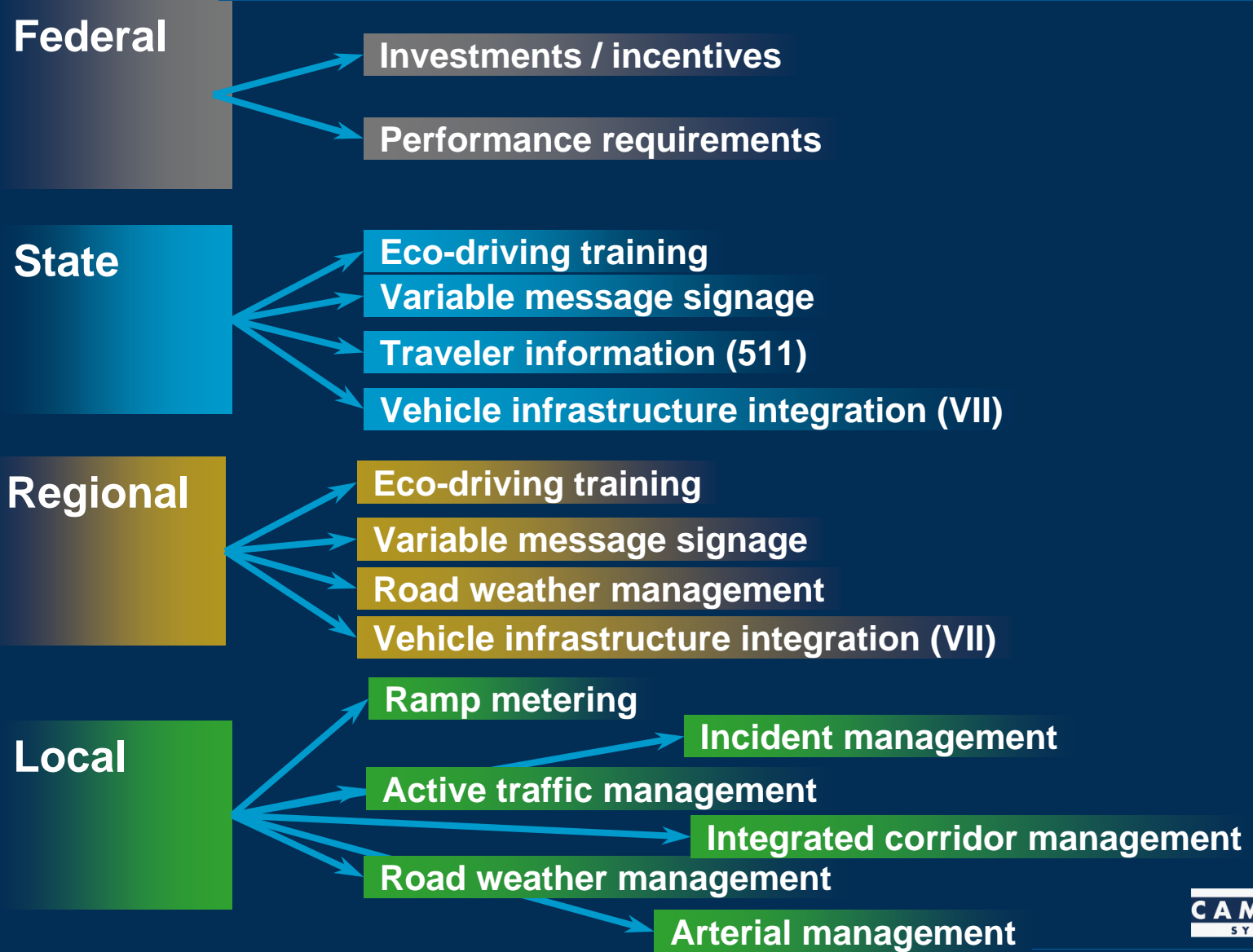
Regional Ride-sharing, Commute Measures



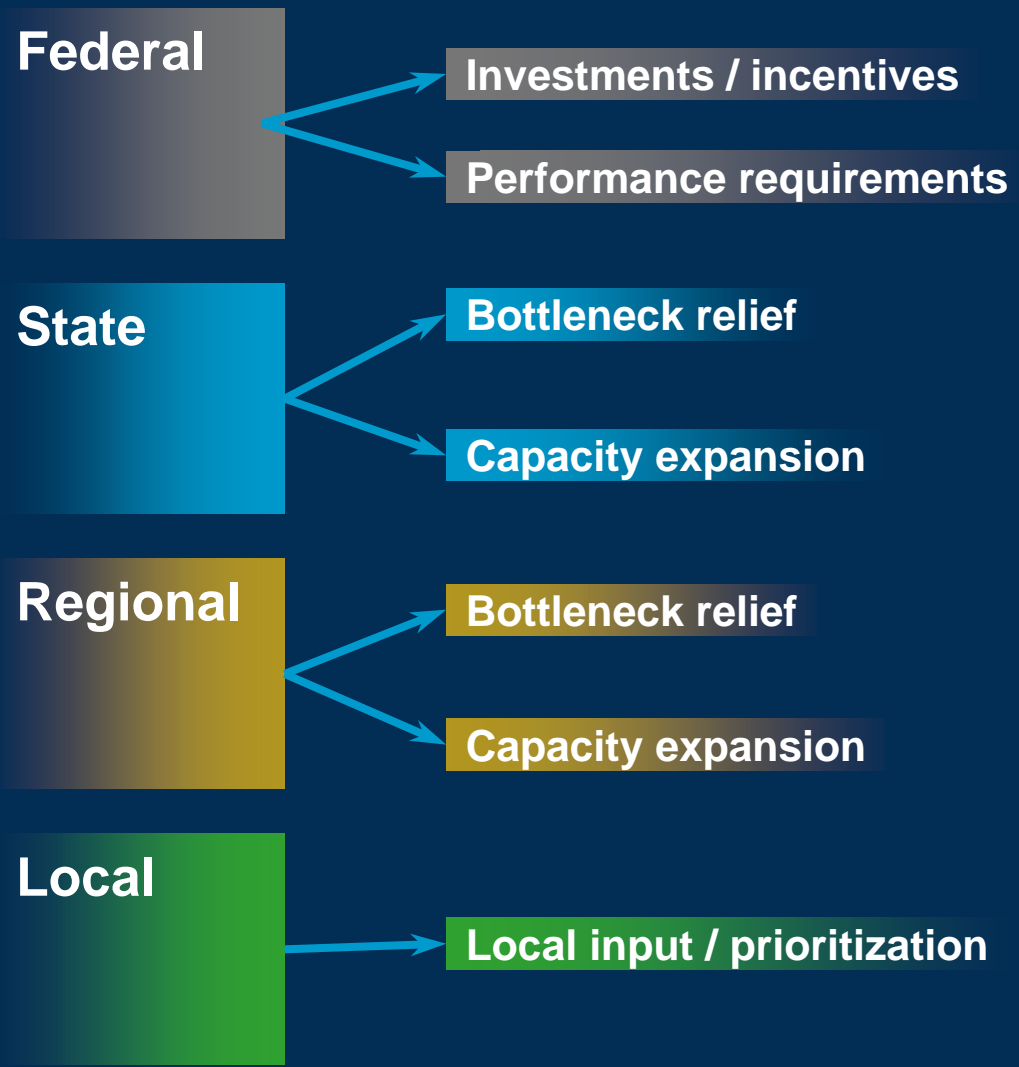
Regulatory Measures



Operational/ITS Strategies



Capacity/Bottleneck Relief



Freight Sector Strategies

