Item 10

Addressing Greenhouse Gas Emissions from Transportation in the Metropolitan Washington Region

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Presentation to the TPB Technical Committee

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What is the TPB?

background | scenario | mitigation | adaptation | next steps

1 The National Capital Region MPO, hosted by MWCOG

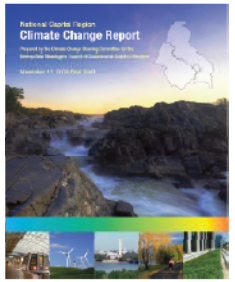
2 Roughly 5 million people and 3000 square miles

3 Long-range transportation planning for the region

Addressing Climate Change

background | scenario | mitigation | adaptation | next steps

1. In May 2007, MWCOG set up a Climate Change regional committee
2. In November 2008, the committee completed a comprehensive multi-sector report with recommended goals to reduce GHG emissions to
   - 2005 levels by 2012
   - 20 percent below 2005 levels by 2020
   - 80 percent below 2005 levels by 2050
3. Work is ongoing on sector-specific studies, including transportation which is 30 percent of GHG



Mitigation vs. Adaptation

- Climate Change Mitigation – employment of measures to *reduce greenhouse gas emissions*

- Climate Change Adaptation – employment of measures that *reduce or avoid climate change impacts*, or create opportunities when changes are positive

Source: ICLEI

Where are we now?

background | scenario | mitigation | adaptation | next steps

Climate Change Mitigation

- Completed “What Would it Take?” Scenario analysis
- Begun implementation of new and support for existing strategies
- Further analysis using recently proposed assumptions and new analysis tools

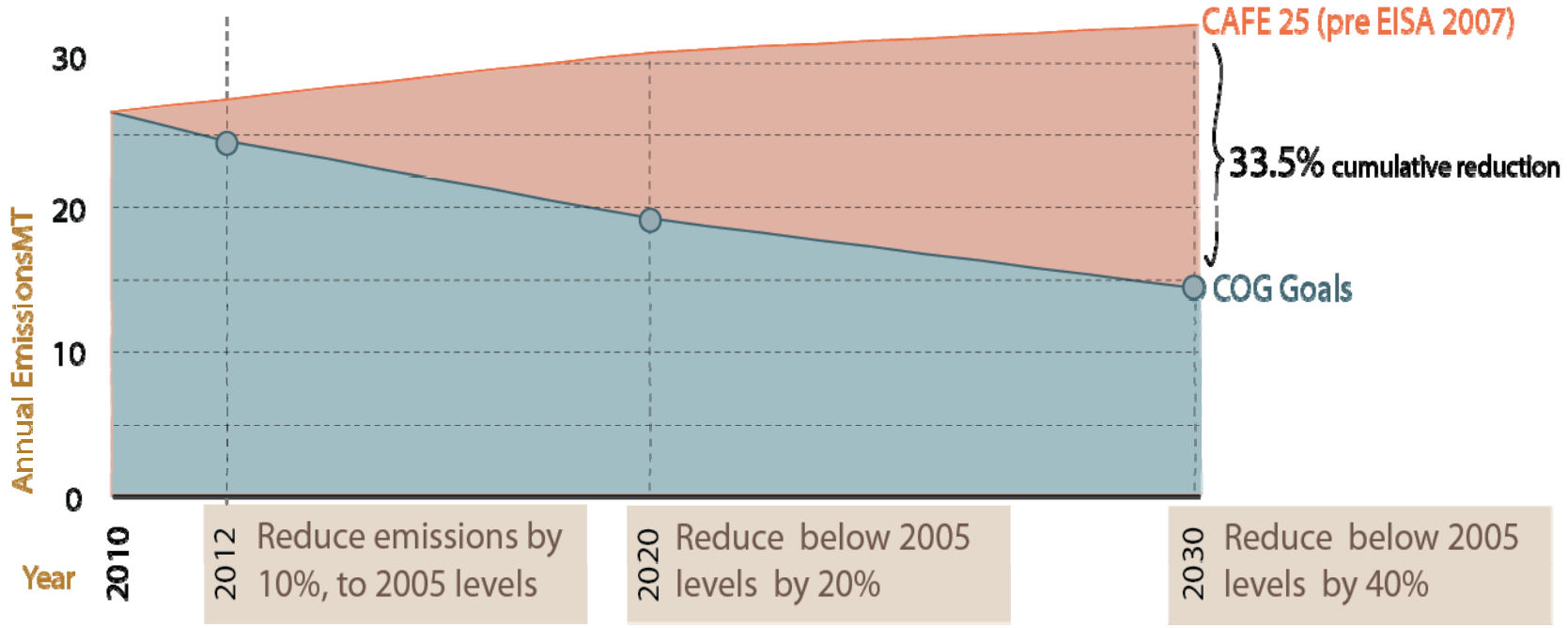
Climate Change Adaptation

- Defining role for TPB in adaptation planning

The TPB "What Would it Take?" Scenario Study

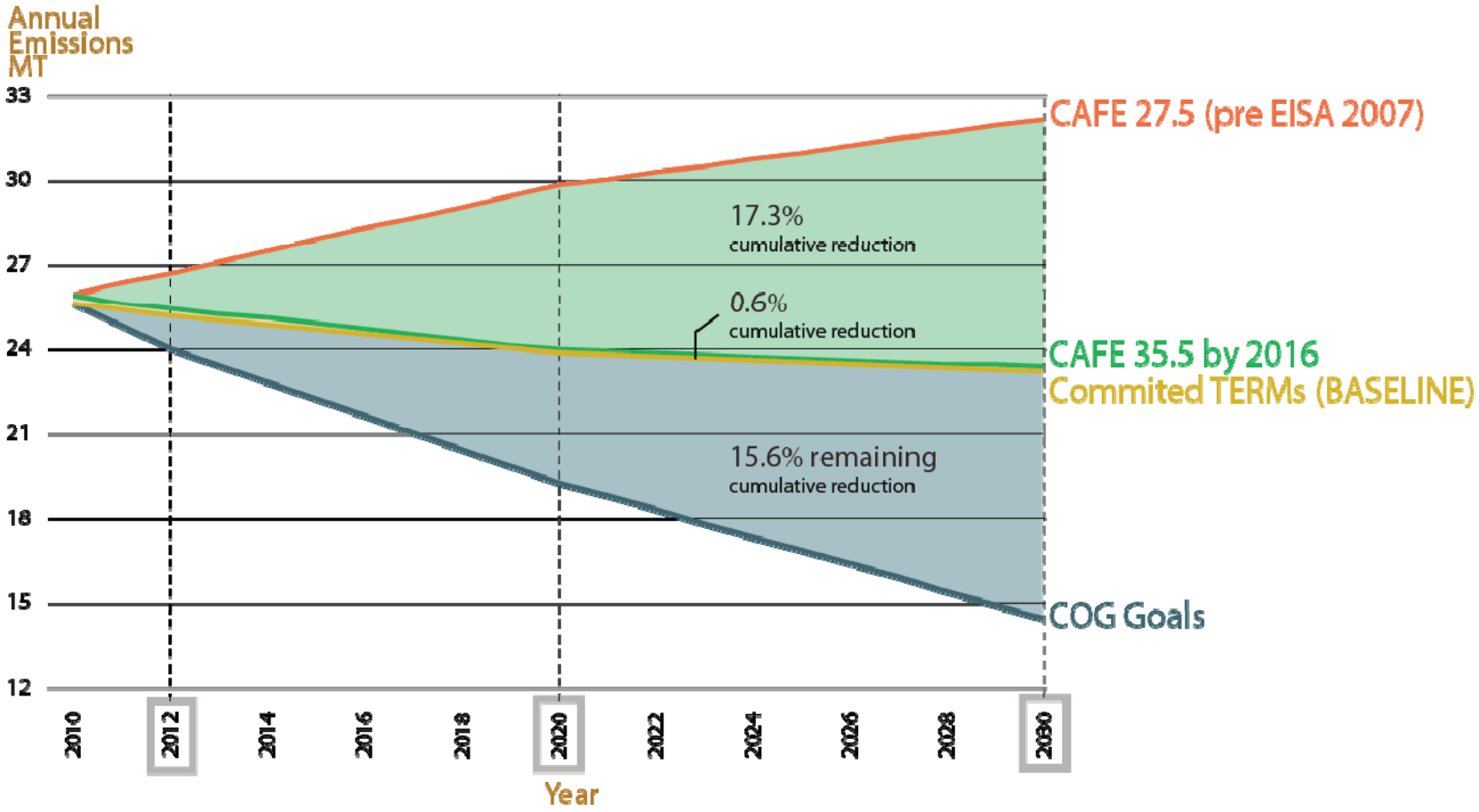
background | scenario | mitigation | adaptation | next steps

What if we had to meet these MWCOG multi-sector goals in the transportation sector?



What is Our GHG Baseline?

background | **scenario** | mitigation | adaptation | next steps



Committed TERMS refers to the full TERM Tracking Sheet, including: Access and service improvements to transit, bike/ped projects, rideshare assistance programs, telecommute programs, traffic improvements, engine technology programs

What are the Emissions Sources?

There are 3 major areas affecting transportation emissions

1 

The composition of the fleet

fuel efficiency, heavy/light duty split

2 

The fuel we put in our fleet

gasoline, diesel, alternative fuels (electricity, ethanol, biofuels)

3 

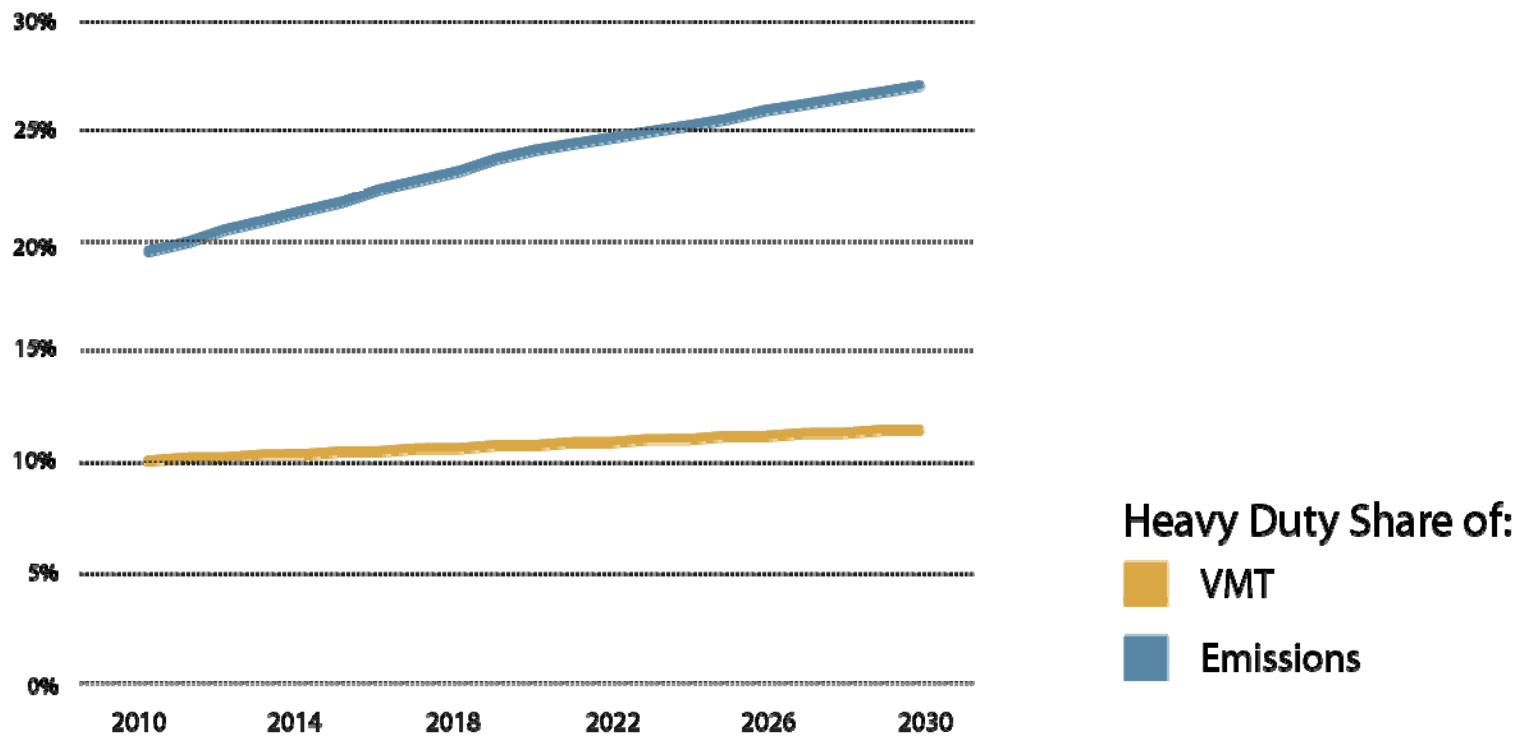
How we use our fleet

trip lengths, purpose, and mode, vehicle occupancy, congestion

What Does Our Fleet Look Like?

background | scenario | mitigation | adaptation | next steps

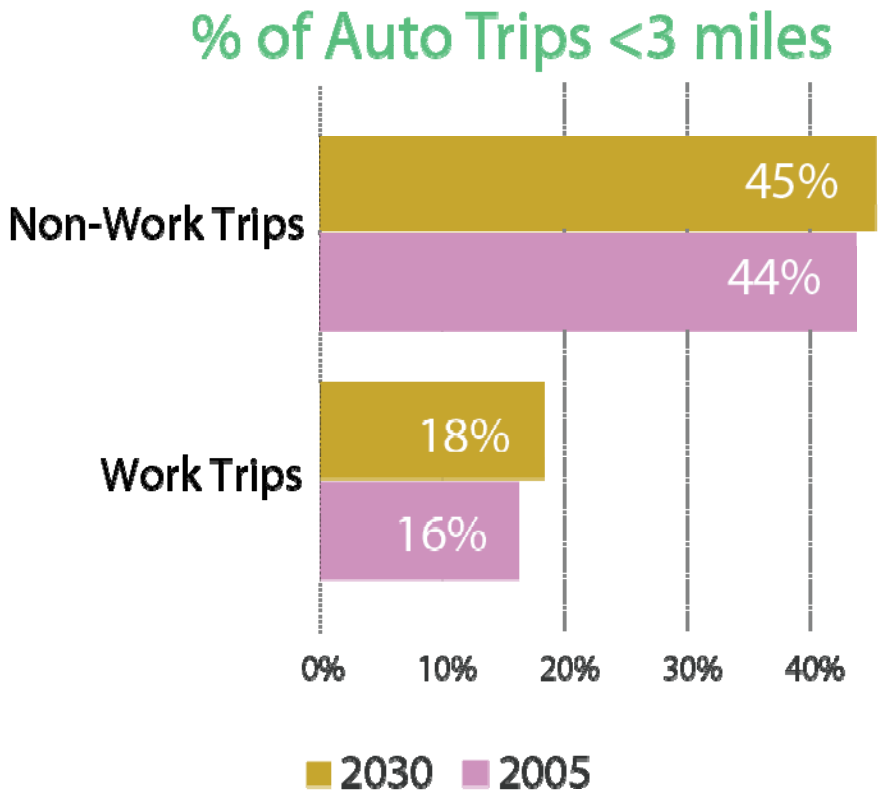
Heavy Duty Share of Total Vehicle Miles of Travel (VMT) and CO_2 Emissions



How Do We Use The Fleet?

background | scenario | mitigation | adaptation | next steps

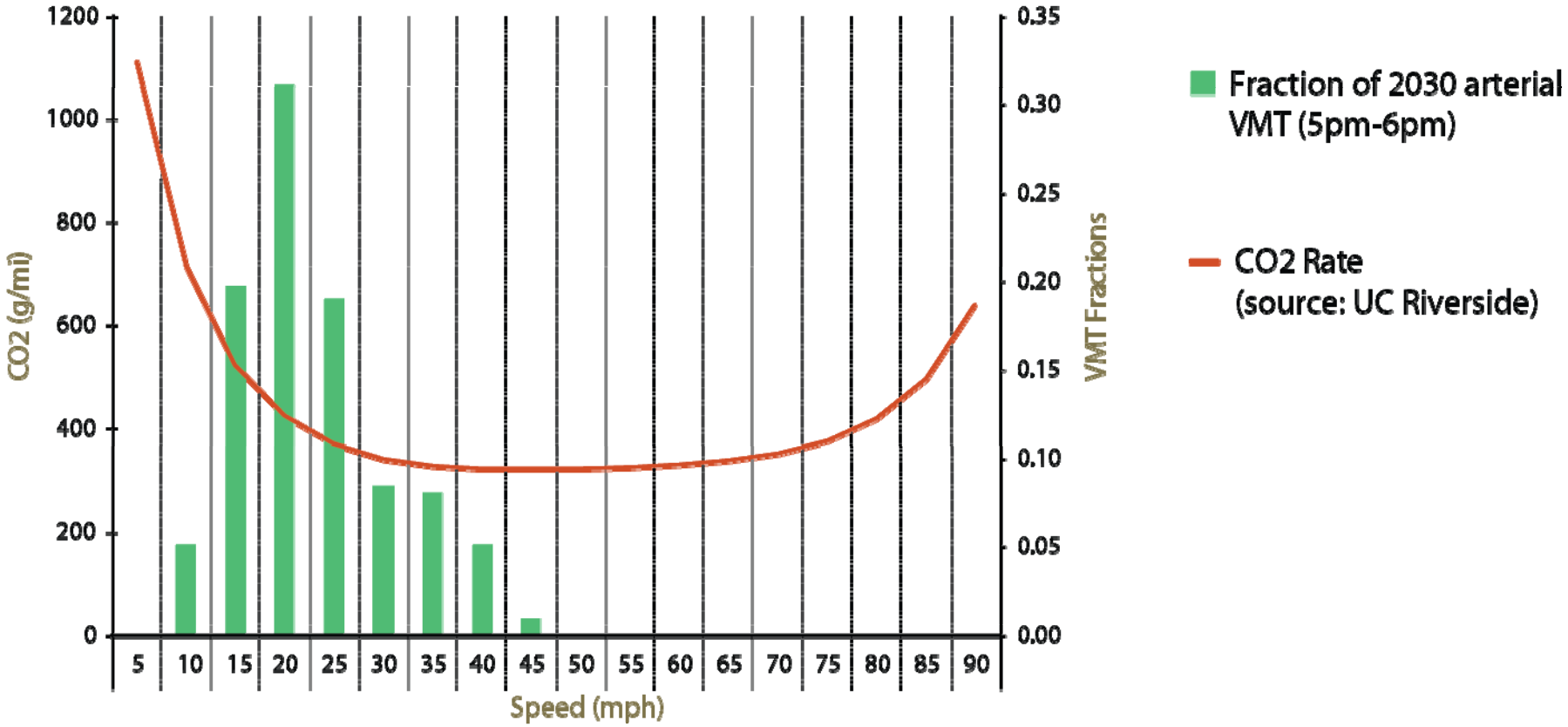
Many of our trips are short.



How Do We Use The Fleet?

background | scenario | mitigation | adaptation | next steps

Congestion affects CO_2 emissions and is widespread.



How Can We Reduce CO_2?

1
fuel efficiency

Enhanced CAFE
HDV CAFE
Local tax incentives
Cash for Clunkers

2
alternative fuel

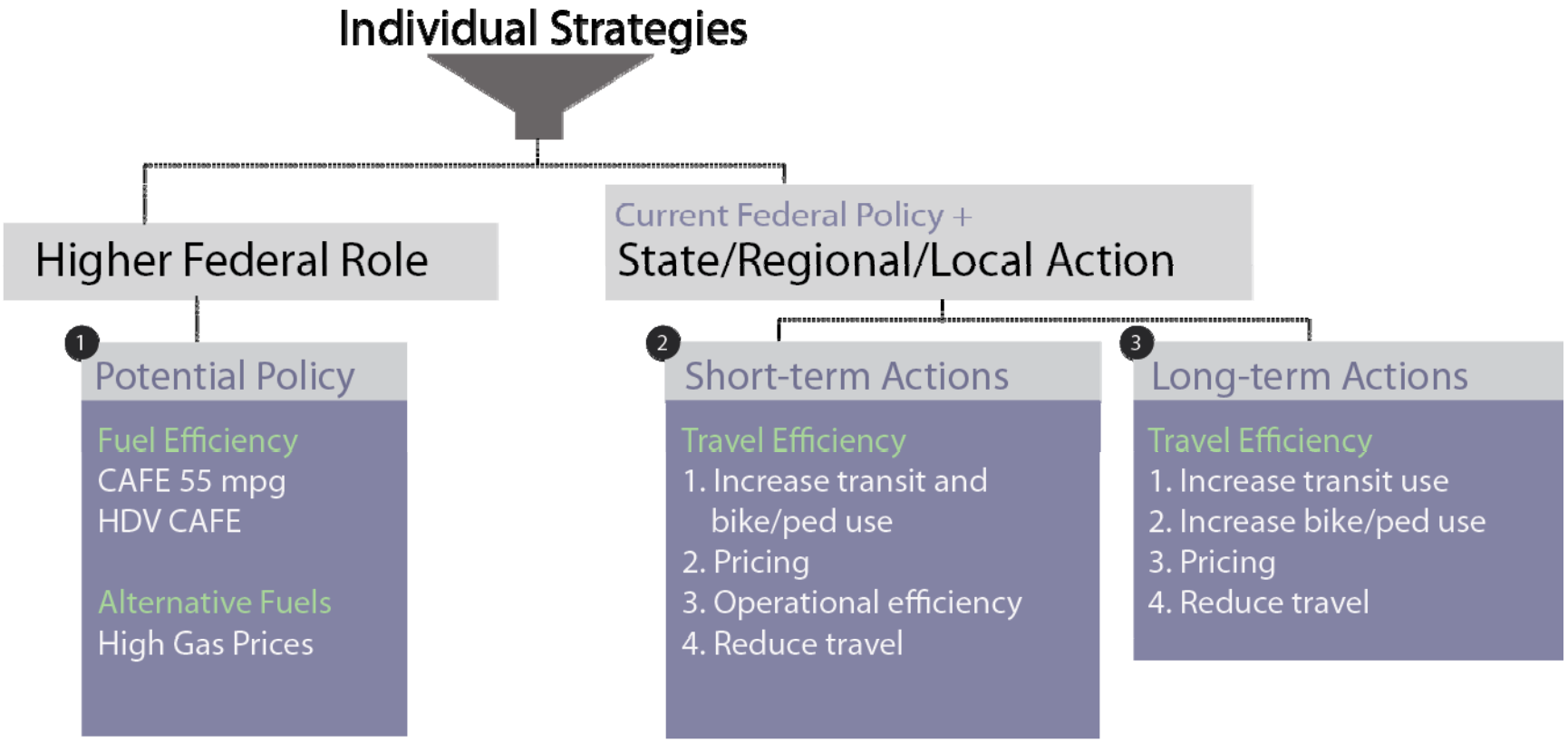
DOE Forecasts:
Current regulation
High price case

3
travel efficiency

Telecommuting
Bike/ped facilities
Improved transit
Bike and Car-sharing
Car and Vanpooling
Pricing
Eco-driving
Incident Management
Signal optimization

Categories of Strategies

background | scenario | mitigation | adaptation | next steps

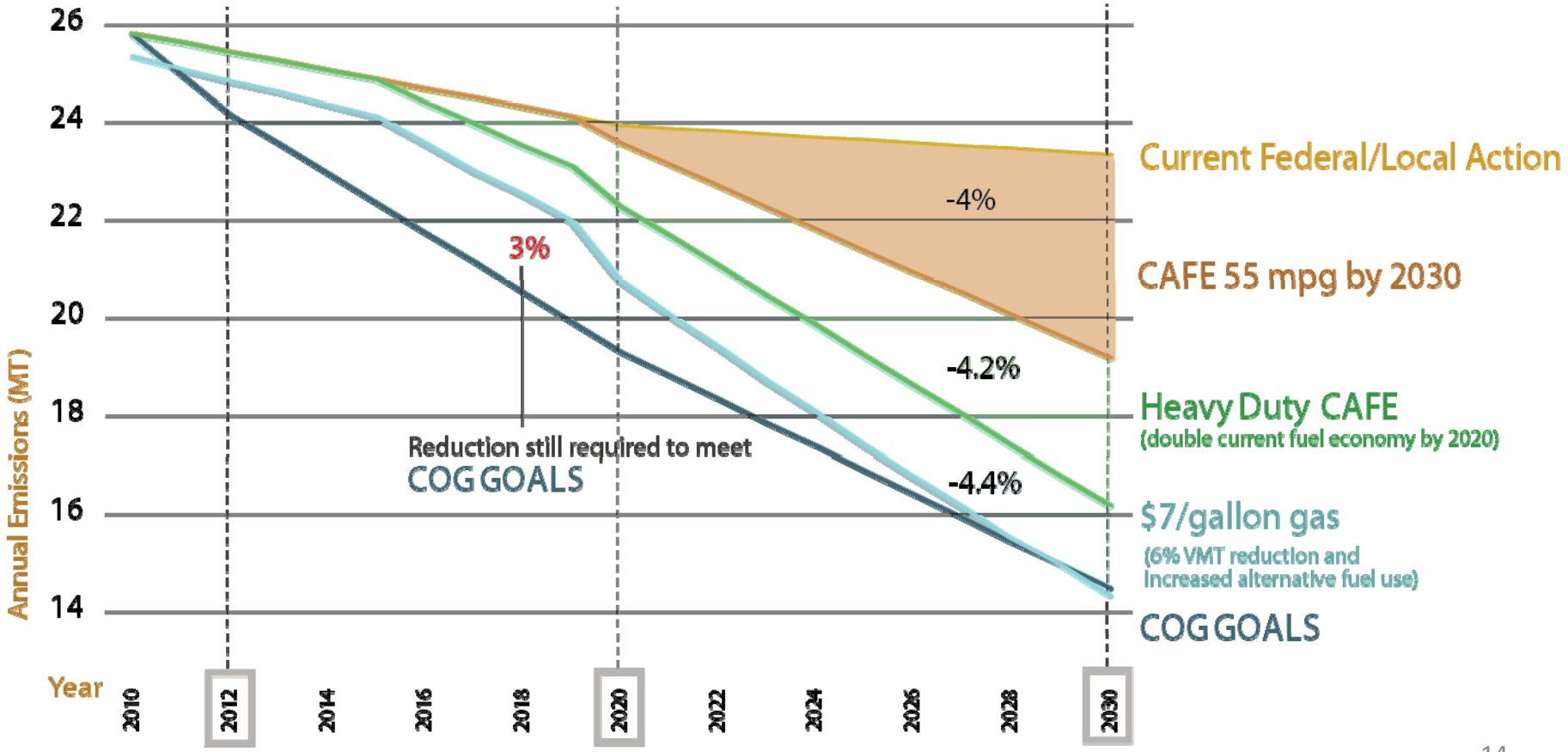


All groups combine additive strategies to the full extent currently possible.

Group 1: Higher Federal Role

background | scenario | mitigation | adaptation | next steps

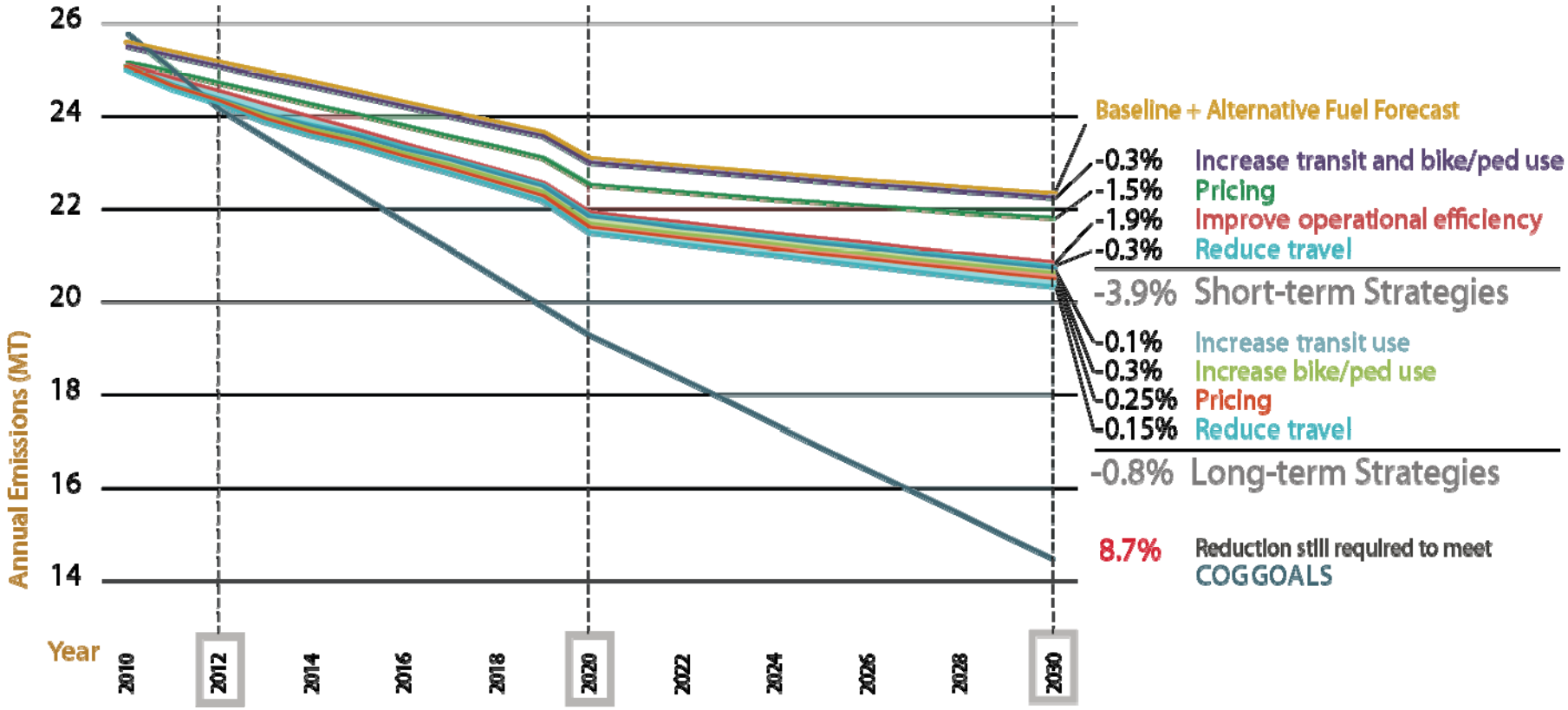
Aggressive federal measures would almost get us there.



Group 2: State/Regional/Local Action (Current Federal Role)

background | scenario | mitigation | adaptation | next steps

Many strategies can be done soon, almost meeting the 2012 goal



Strategy Development (Current Federal Role)

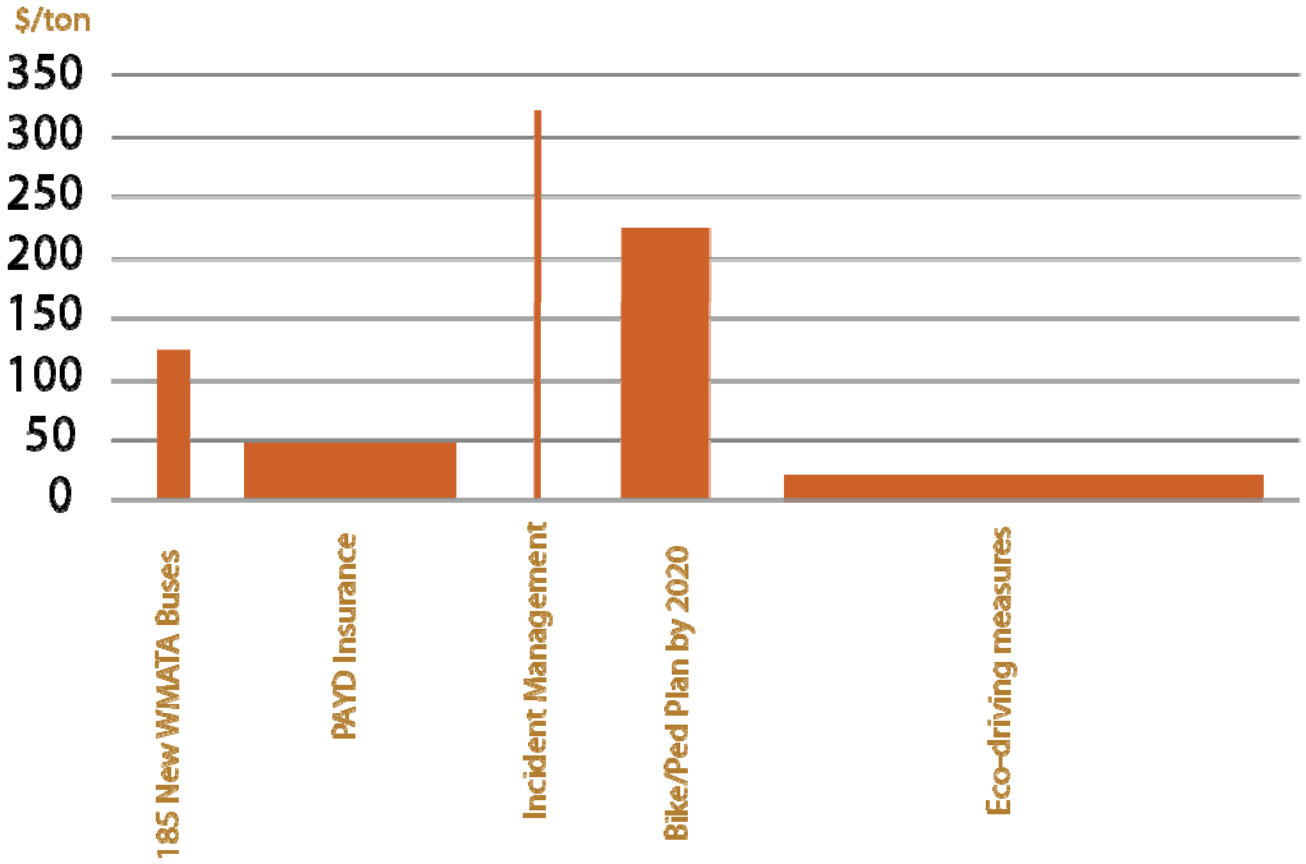
background | scenario | mitigation | adaptation | next steps

1. Inventory and baseline forecast: regional travel demand model, Mobile 6.2, and off-model analysis for CAFE
2. Identified strategies: 37 strategies, including those already considered for reducing criteria pollutants and other measures considered feasible
3. Individual strategy analysis: VMT reduction strategies analyzed using travel forecasting procedures and sketch planning methods; Traffic flow improvements analyzed using CO2 emissions changes by speed developed by UC Riverside
4. Grouped strategies: all regional strategies assumed to be additive (further study needed on this)

Cost-Effectiveness

background | scenario | mitigation | adaptation | next steps

Some strategies are both cost-effective and effective.



1 million tons of cumulative reduction 2010-2030

(width of bar indicates 20 year CO_2 reduction effectiveness)

Assumes current federal/local action

USG assumes the Social Cost of CO_2 to be $21 in 2010 rising to $45 in 2050.

Benefit-Cost Analysis

background | scenario | mitigation | adaptation | next steps

EXAMPLE

Bike-sharing

Modest CO_2 benefits are a contributing factor to large overall benefits.

Costs	**$231,000,000**
Capital	$16,000,000
Operating	$75,000,000
Increased Accidents	$145,000,000
Benefits	**$625,500,000**
User Cost Savings	$197,000,000
Travel Time Savings	$378,000,000
Reduced Accidents (from reduced VMT)	$1,300,000
Public Health	$2,000,000
Increased Access	$38,000,000
Congestion Reduction	$3,500,000
Environmental Benefits	$5,700,000
CO_2	66,000 tons

All numbers over 20 year horizon from 2010-2030

What Actions Can the TPB Take Now?

background | scenario | **mitigation** | adaptation | next steps

TPB can begin designing some actions that the region could consider for the near-term:

1. Begin an eco-driving public education campaign
2. Continue to support incident management programs
3. Accelerate the TPB Bike/Ped Plan completion
4. Promote expansion of pay-as-you-drive insurance to the whole region
5. Promote state/local incentives to accelerate use of fuel efficient/ alternative fuel vehicles for both public fleets and private use
6. Strengthen long-term focus on mixed use activity centers and transit-oriented development

Eco-Driving

background | scenario | **mitigation** | adaptation | next steps

COG/TPB partnered with the I-95 Corridor Coalition for the "Drive Green, Save Green Campaign"

http://i95coalition.org/i95/CoalitionEcoDrivingCampaign/tabid/216/Default.aspx

Eco-driving information is available on the COG website (528 views since July)

http://www.mwcog.org/transportation/ecodriving/

A study in Denver, CO showed that drivers can improve fuel economy by 10%

Incident Management

background | scenario | mitigation | adaptation | next steps

The Metropolitan Area Transportation Operations Coordination (MATOC) Program is designed to provide real-time situational awareness and information to support management of transportation operations in the National Capital Region, especially during emergencies and other incidents with significant impacts on travelers.

Projected CO_2 Reduction by 2030:
124,000 tons
(over 20 year horizon)

New Fuel Economy Standards

- Higher fuel economy standards for light-duty vehicles beginning with MY 2012
  - Fuel economy levels equivalent to 35.5 mpg by MY 2016 and 54.5 mpg by MY 2025
- First ever fuel efficiency standards for heavy-duty trucks beginning in 2014
- Reductions required for both fuel use and greenhouse gas emissions by 2018
  - Combination tractors – approximately 20%
  - Heavy-duty pick-up trucks and vans – approximately 15%
  - Vocational vehicles- approximately 10%

GHG Baseline with New Fuel Economy Standards

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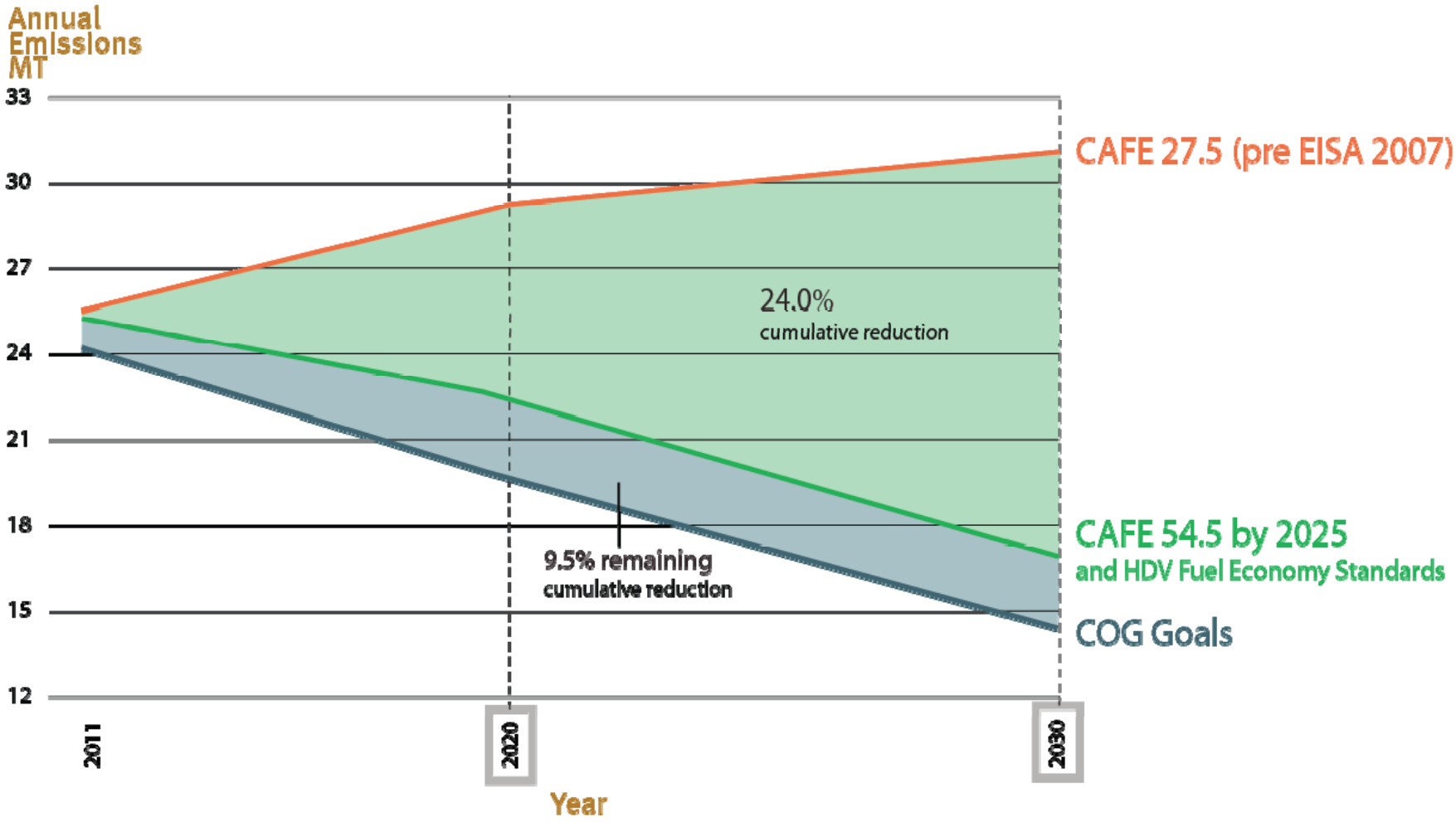

Challenges Related to New Fuel Economy Standards

- How will the economy and the price of new technology vehicles affect fleet turnover?
  - Average LDV age increased from 2005 to 2008 and again in 2011
- How will the new CAFE standards impact driving trends?
- Increased fuel economy makes travel efficiency measures less effective for GHG reduction
  - Co-benefit analysis will become important

Further Study on Climate Change Mitigation

1. Use the MOVES model
2. Analyze additional strategies (broader transit, pricing, freight)
3. Analyze strategies in bundles
4. Consider second order demand effects of all strategies
5. Conduct comprehensive benefit-cost analysis
6. Estimate life cycle emissions for the entire CO2 inventory

MOVES

- MOVES (Motor Vehicle Emissions Simulator) is a much stronger tool than Mobile6.2 for estimating CO_2 emissions
  - Emission rates vary by speed
  - Calculates CO_2 emissions from vehicle starts
  - New 35.5 mpg CAFE standards for MY 2012-2016 are built into the model
  - MOVES cannot yet model newer fuel economy standards
- CO_2 emissions estimates are higher with MOVES
  - Annual emissions in 2020 are 8 percent higher
  - Annual emissions in 2030 are 13 percent higher

Adaptation Planning: Possible Climate Change Impacts

- Warmer average temperatures
- Increased precipitation variability
- Increase in number and severity of severe storms and increase in intensity of hurricanes
- Sea level rise

Source: COG/DEP

Adaptation Planning: Challenges for MPOs

- Role for MPOs not clearly defined
- Uncertainties in climate forecasting for local impacts
- Challenges in identifying vulnerable infrastructure
- One role identified for the TPB: help strengthen regional capabilities for managing weather-related incidents (e.g. major snowstorms)

Federally Funded Adaptation Projects

background | scenario | mitigation | adaptation | next steps

- FHWA Climate Change Adaptation Peer Exchanges (2008-2012)
- Assessing Vulnerability and Risk of Climate Change Effects on Transportation Infrastructure: Pilot of the Conceptual Model (FHWA) (2009-2012)
- FHWA/AMPO Climate Change Webinars (2011-2013)
- Transit Climate Change Adaptation Assessment Pilots (FTA) (2011-2012)
- TPB monitoring and/or participating in these activities

Next Steps

background | scenario | mitigation | adaptation | next steps

1 Further study GHG inventory modeling and strategy analysis

2 Expand work on climate change adaptation planning

3 Support state/regional/local actions to mitigate GHG emissions and manage weather related events

Contact and Info

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For the scenario final and technical reports and presentations: www.mwcog.org/clrp/elements/scenarios