TPB CLIMATE CHANGE MITIGATION STUDY OF 2021

Findings from Past TPB and COG Studies

Erin Morrow
TPB Transportation Engineer

Transportation Planning Board
March 17, 2021

Agenda Item #12

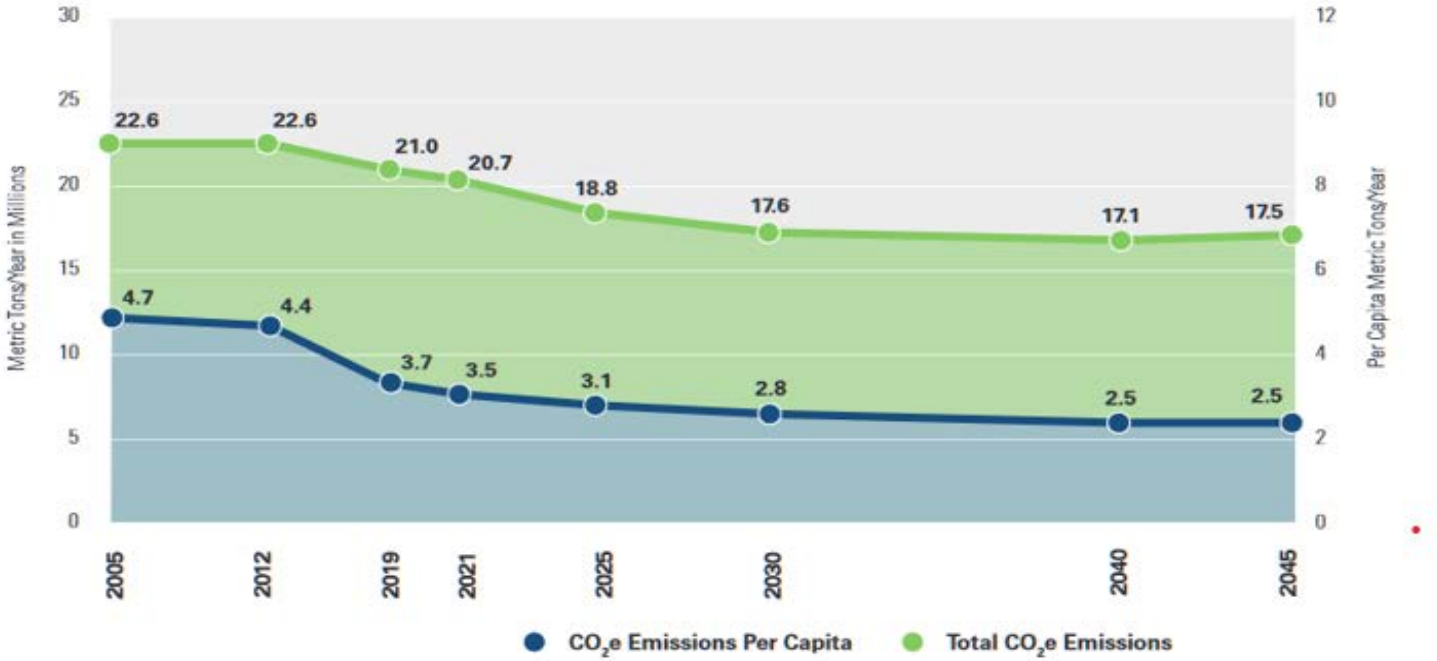
National Capital Region
Transportation Planning Board

Regional Climate Change Goals

The Metropolitan Washington Council of Governments (COG) Board of Directors adopted, and National Capital Region Transportation Planning Board (TPB) affirmed, the following greenhouse gas (GHG) reduction goals for the region:

- By 2012, GHG levels will be 10% below "business as usual" forecasts
- By 2020, GHG levels will be 20% below 2005 levels
- By 2030, GHG levels will be 50% below 2005 levels
- By 2050, GHG levels will be 80% below 2005 levels

On-road GHG Emissions (Visualize 2045)



Visualize 2045 (2018):

- 1.3M more people and 1M more jobs forecasted between 2019 and 2045
- Rate of growth in walk/bike and transit trips is greater than that of auto trips
- Growth in VMT less than in previous long-range plans
- VMT per capita reduced (Region Forward target)
- GHG emissions 23% below 2005 levels in 2045

TPB and COG Climate Change Studies

"What Would it Take?" Scenario Study (WWIT) — May 2010

- Examined transportation sector only
- Proportional reductions in sector's GHG emissions by 2030
- Explored strategies and potential GHG reductions

Multi-Sector Working Group (MSWG) Study — Jan. 2017

- Collaborated with COG and MWAQC
- Examined all sectors for 2020, 2040, and 2050
- Explored strategies and potential GHG reductions

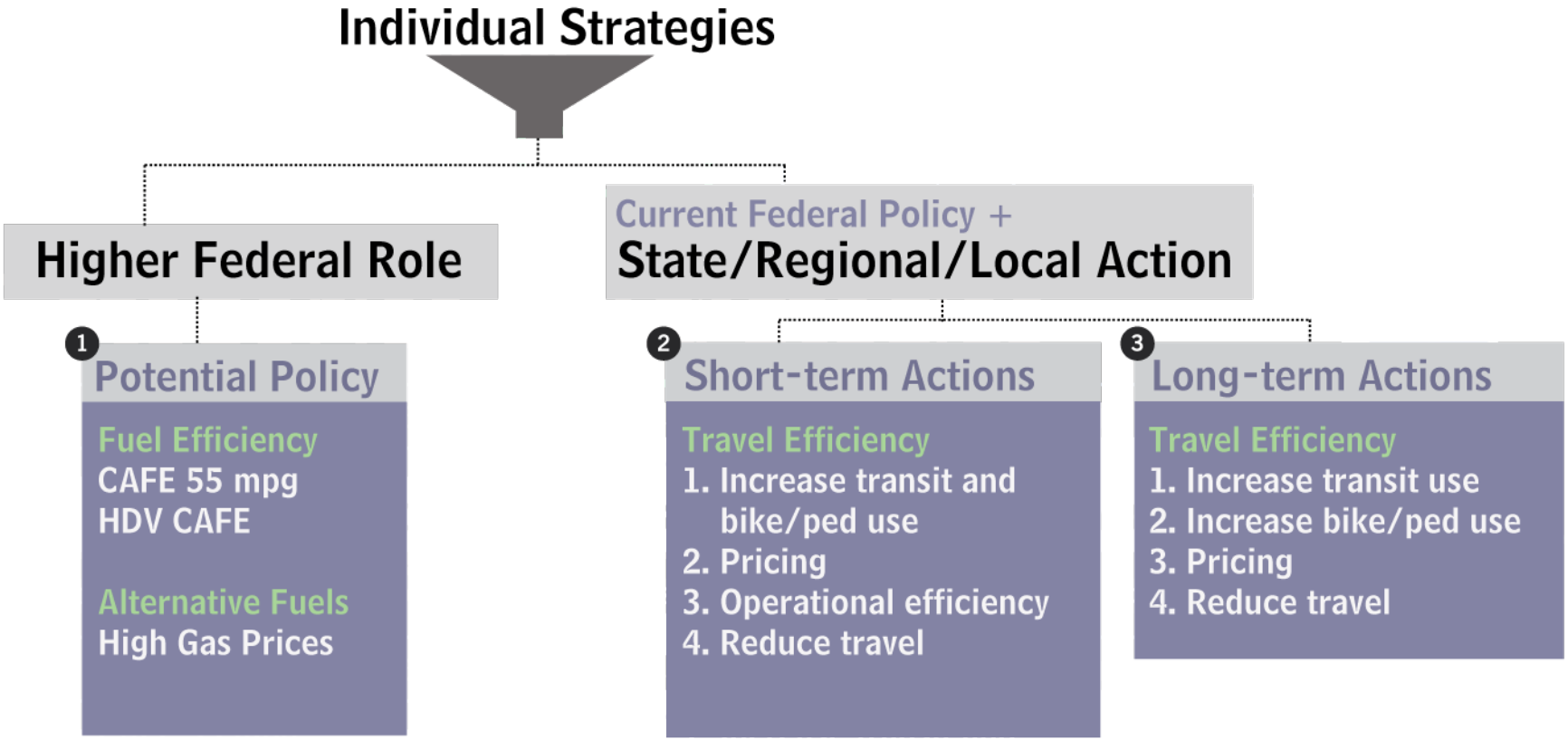
Long-Range Plan Task Force (LRPTF) — Dec. 2017

- Examined scenarios to improve system performance
- Interrelations between changes in travel and GHG emissions

2030 Climate and Energy Action Plan (CEAP) — Nov. 2020

- Examined select MSWG Strategies for 2030

“What Would It Take?” Study (WWIT)



Source: WWIT Final Results Presentation, May 19, 2010

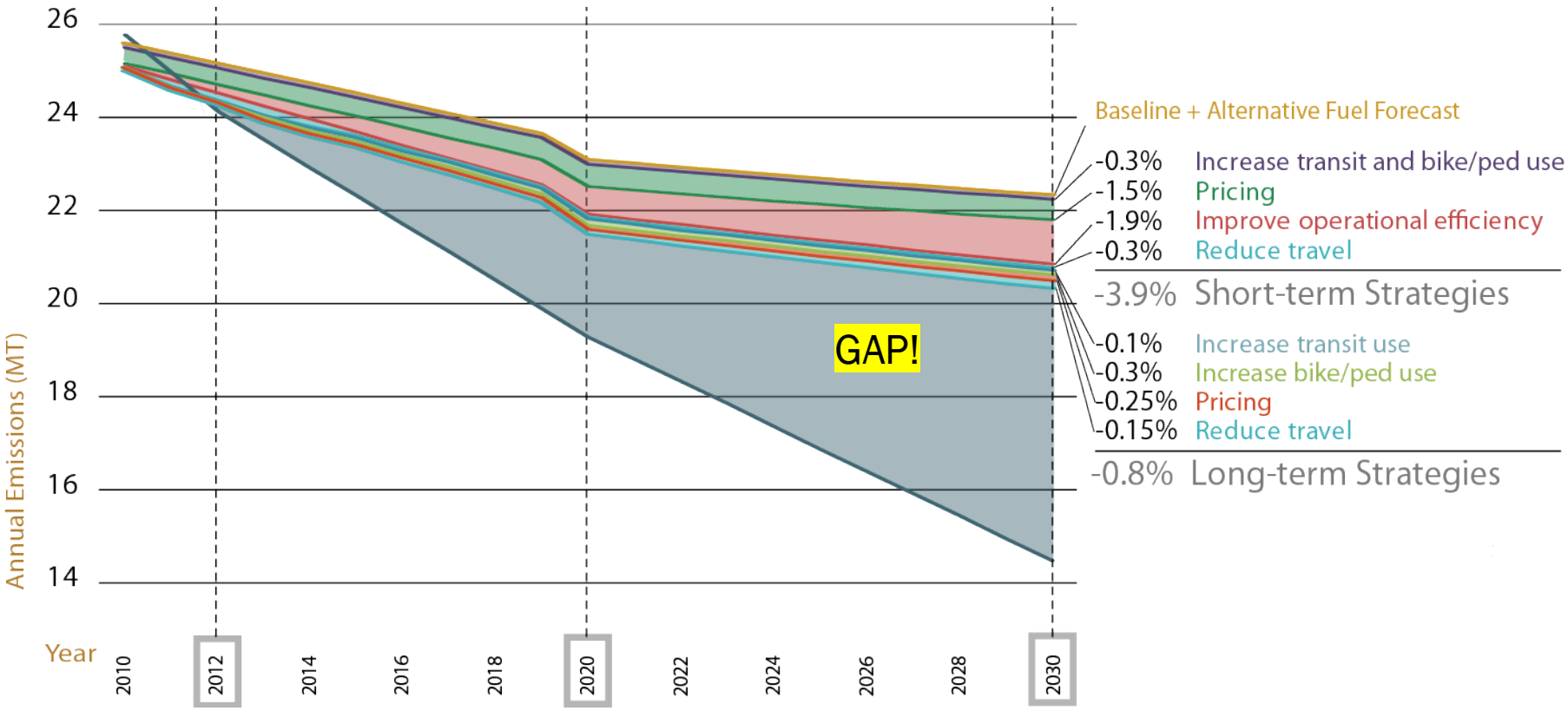
WWIT: Assumed Actions

Significant enhancements to existing policy and funding needed to harness potential local, regional and state strategies

Category	Example Short term Strategy	Reduction (% Off BAU)	Example Long term Strategy	Reduction (% Off BAU)
1. Increase transit use	Implement kiosks, feeder buses & circulators, real-time bus information, bus priority, free transfers, bike stations, improved bike/ped access to transit, bike sharing; improved bike/ped access to transit, bike sharing	-0.30%	Major transit expansion, such as Dulles Rail line and park & ride lots at rail stations	-0.15%
2. Increase bike/ped use			Accelerated completion of the TPB Bicycle and Pedestrian	-0.30%
3. Travel Pricing	Implement parking impact fees, pay-as-you drive insurance, parking cash out subsidies	-1.50%	Variable pricing of new and existing freeway and select arterial lanes	-0.25%
4. Improve operational efficiency	Promote eco-driving (public education campaign), incident management, traffic signal optimization, idling reduction	-1.80%		
	TOTAL	-3.90%	TOTAL	-0.85%

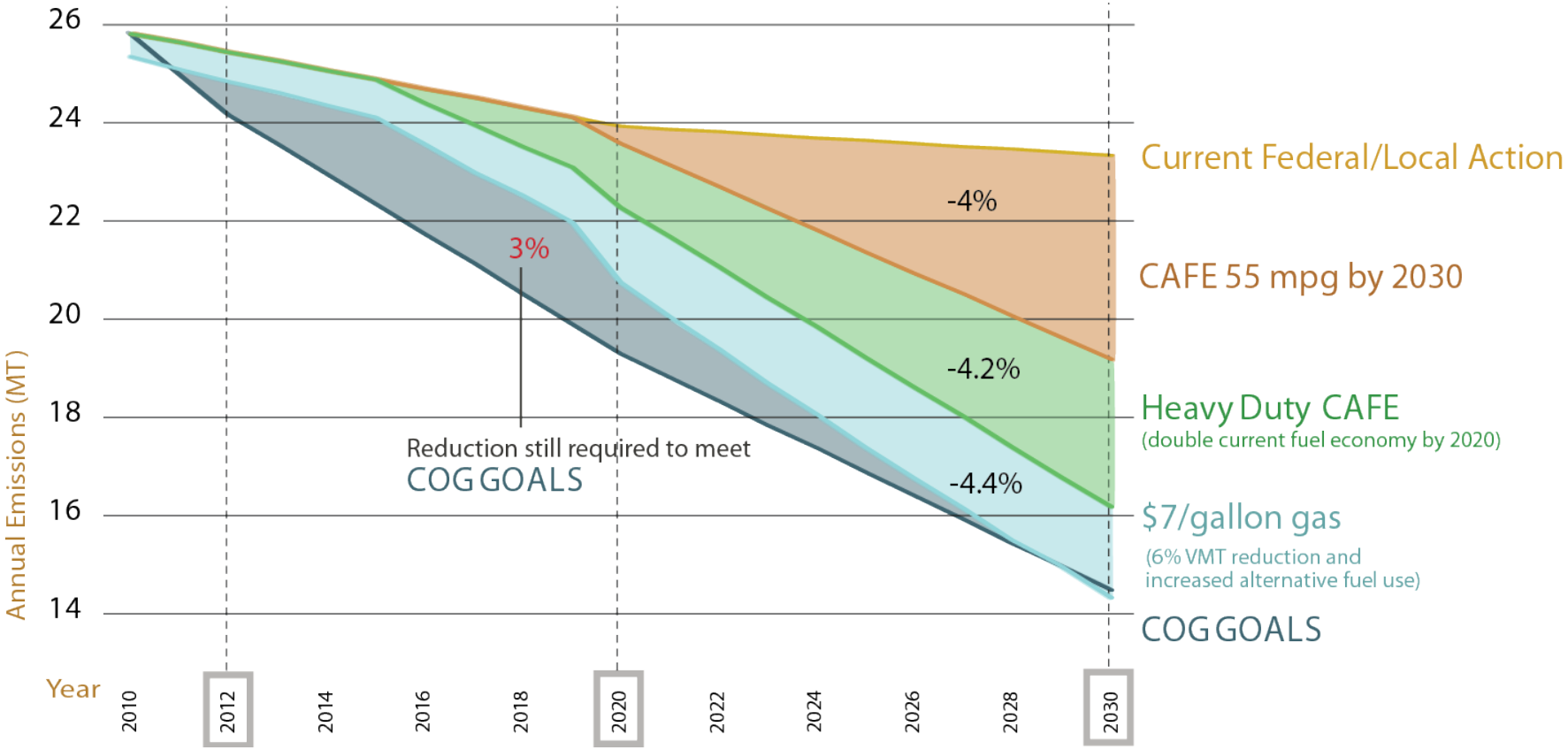
WWIT: Findings 1

Local/State/Regional actions contribute to GHG reductions, but fall far short of regional goals

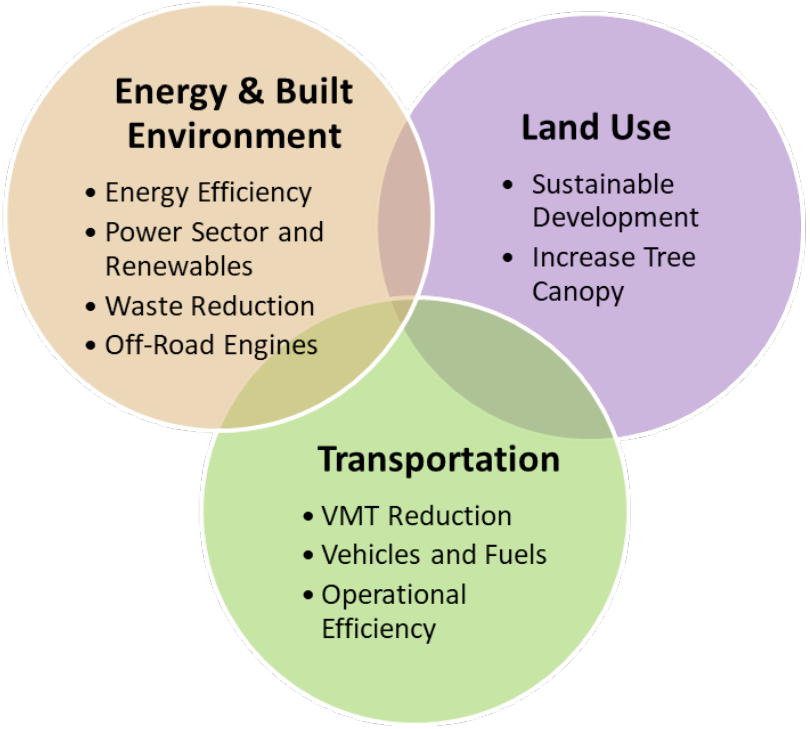


WWIT: Findings 2

Systemic measures can provide substantial, dependable GHG reductions to cover the gap



Multi-Sector Working Group (MSWG)



- Existing policies and plans analyzed for projected 2020, 2040, and 2050 reductions
- Additional strategies analyzed at “viable” and “stretch” levels for 2040 and 2050 reductions, respectively

MSWG: Assumed Actions

Concentrate more of the region's anticipated growth in walkable, mixed-use, transit-oriented activity centers

- 2040: Future growth within each jurisdiction concentrated in: 1) Activity Centers with premium transit; 2) other locations with premium transit; or 3) other Activity Centers without premium transit
- 2050: Future regional growth optimized by re-distribution across jurisdictional boundaries, and concentrated as above

Vehicle and fuels strategies

- 2040: 15% zero emissions vehicles (e.g. EVs) in on-road light-duty fleet (LDV) and public sector heavy-duty fleet (PSHD); reduce on-road fuel emissions by 10% by reducing carbon content of fuel
- 2050: 25% zero emissions vehicles in on-road LDV fleet and PSHD; reduce on-road fuel emissions by 15% by reducing carbon content of fuel

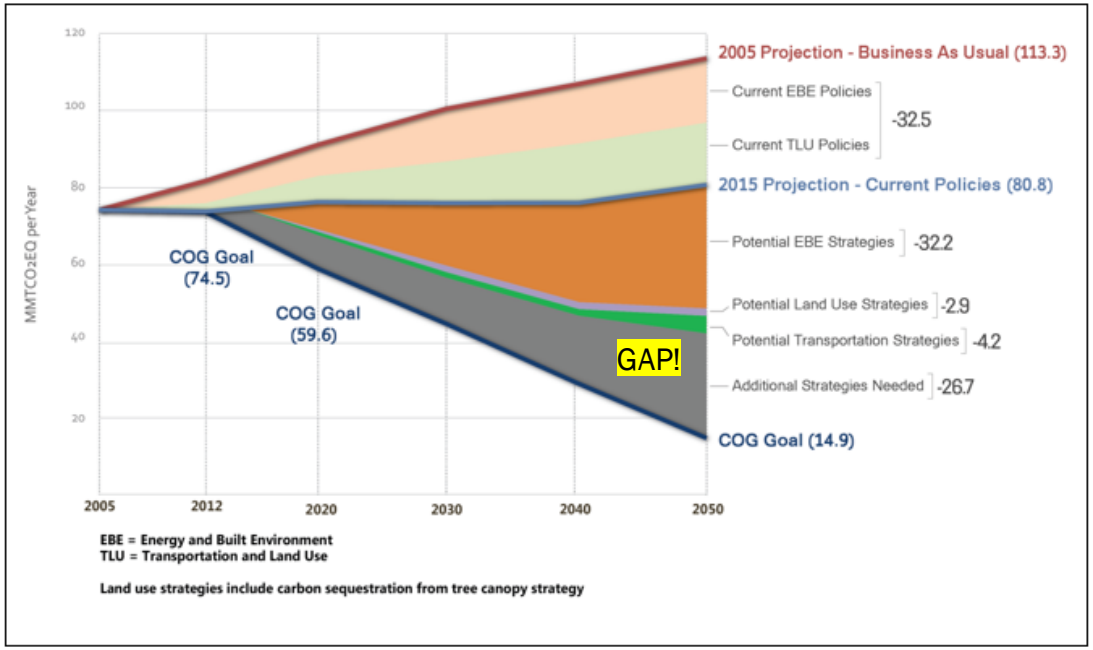
MSWG: Assumed Actions

Travel demand management, transit, and pricing strategies

- 2040: $50/month subsidy for 80% of employers; increased parking charges in 90% of Activity Centers; $5 cordon pricing entering downtown DC; reduce transit fares by 25% regionally
- 2050: $80/month subsidy for 100% of employers; increased of parking charges in 100% of Activity Centers; $5 cordon pricing entering downtown DC; $0.10/mile VMT charge; reduce transit fares by 40% regionally

MSWG: Findings

Grouped Strategy	Viable Reduction 2050 Goal	Stretch Reduction 2050 Goal
Building Energy Efficiency	15%	18%
Power Sector and Renewables	10%	14%
Land Use and Tree Canopy	2%	3%
Vehicles and Fuels	2%	4%
Travel Demand Management and Pricing	<1%	2%
Total	29%	40%



Additional national, state, local strategies needed to close the gap

Long Range Plan Task Force (LRPTF)

- Study purpose: identify potential long-term improvements in the multi-modal system performance outcomes *(not Climate Change focused)*
- 10 alternative scenarios of land use and transportation projects/programs/policies evaluated
- Scenario evaluation metrics included changes in VMT, VHD, and GHG emissions

LRPTF: Assumed Actions

Multimodal
1. Regional Express Travel Network
2. Operational Improvements & Hotspot Relief
3. Additional Northern Bridge Crossing/Corridor

Transit
4. Regionwide High-Capacity Transitways
5. Regional Commuter Rail Enhancements
6. Metrorail Regional Core Capacity Improvements
7. Transit Rail Extensions

Policy-Focused
8. Optimize Regional Land Use Balance
9. Transit Fare Policy Changes
10. Amplified Travel Demand Management (for commute trips)

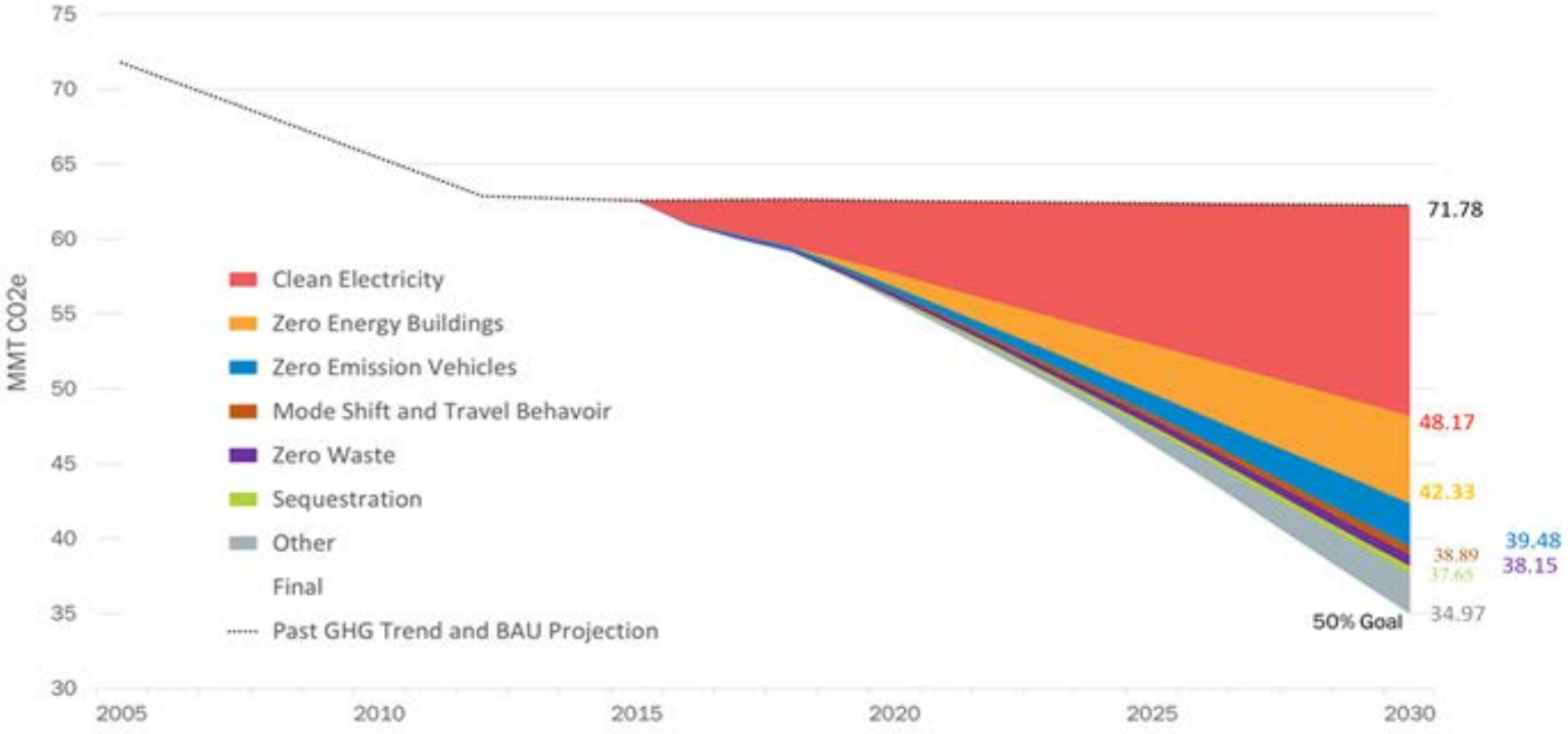
LRPTF: Findings

	Change in 2040 CO2 Emissions (annual)	Change in 2040 Daily VHD	Change in 2040 Daily VMT	Change in 2040 Daily VMT per Capita
10. Amplified Employer-Based Travel Demand Management	-7%	-24%	-6%	-6%
8. Optimize Regional Land-Use Balance	-4%	-18%	-3%	-6%
6. Metrorail Regional Core Capacity Improvements	-2%	-9%	-1%	-1%
7. Transit Rail Extensions	-1%	-3%	-1%	-1%
9. Transit Fare Policy Changes	-1%	-2%	-1%	-1%
4. Regionwide Bus Rapid Transit and Transitways	-1%	-2%	<-1%	<-1%
2. Operational Improvements and Hotspot Relief	-1%	-8%	2%	2%
5. Regional Commuter Rail Enhancements	0%	-2%	<-1%	<-1%
1. Regional Express Travel Network	0%	-11%	<1%	<1%
3. Additional Northern Bridge Crossing/Corridor	1%	-3%	1%	1%

2030 Climate Energy Action Plan (CEAP)

- 2030 scenario for the plan analyzes the technical potential for metropolitan Washington to reach a 50% reduction in GHG emissions from 2005 levels by 2030
- This scenario leverages results from a previous scenario analysis conducted by COG's Multi-Sector Working Group and results have been updated based on new data and progress since that time
- On-road transportation strategies include Zero Emission Vehicle (ZEV) and Mode Shift and Travel Behavior (MSTB) actions
  - ZEV strategies are based on the "high electric vehicle (EV) adoptions rates from the National Renewable Energy Laboratory's "Electrification Futures Study" i.e., adoption rates of greater than 20% for light-duty cars, 9% for light-duty trucks, 4% for medium/heavy-duty trucks, and 30% for transit buses.
  - MSTB strategies are from the MSWG study and include increasing transit, carpooling, and non-motorized travel; bringing jobs and housing closer together; and travel demand management (teleworking, transit benefits).

CEAP 2030 Scenario Analysis: Findings



Zero Emission Vehicles: 2.85 MMT CO2e in 2030

Mode Shift and Travel Behavior: 0.59 MMT CO2e in 2030

Erin Morrow

TPB Transportation Engineer
(202) 962-3793
emorrow@mwcog.org

mwcog.org/tpb

Metropolitan Washington Council of Governments
777 North Capitol Street NE, Suite 300
Washington, DC 20002