



Center for
Clean Air Policy

Dialogue. Insight. Solutions.

CCAP Transportation Emissions Guidebook (+ Freight Solutions Dialogue)

Steve Winkelman

Director, Transportation Program

Greg Dierkers

Consultant

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Freight Solutions Dialogue

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- Hosted by CCAP, US DOT Center for Climate and Environmental Forecasting, US EPA
- Goal: Enable freight emissions reduction opportunities consistent with economic, air quality, energy, EJ goals
- Speakers on reduction opportunities for trucks, rail and marine (PPTs on our website)
- Calculated potential GHG savings in 2025

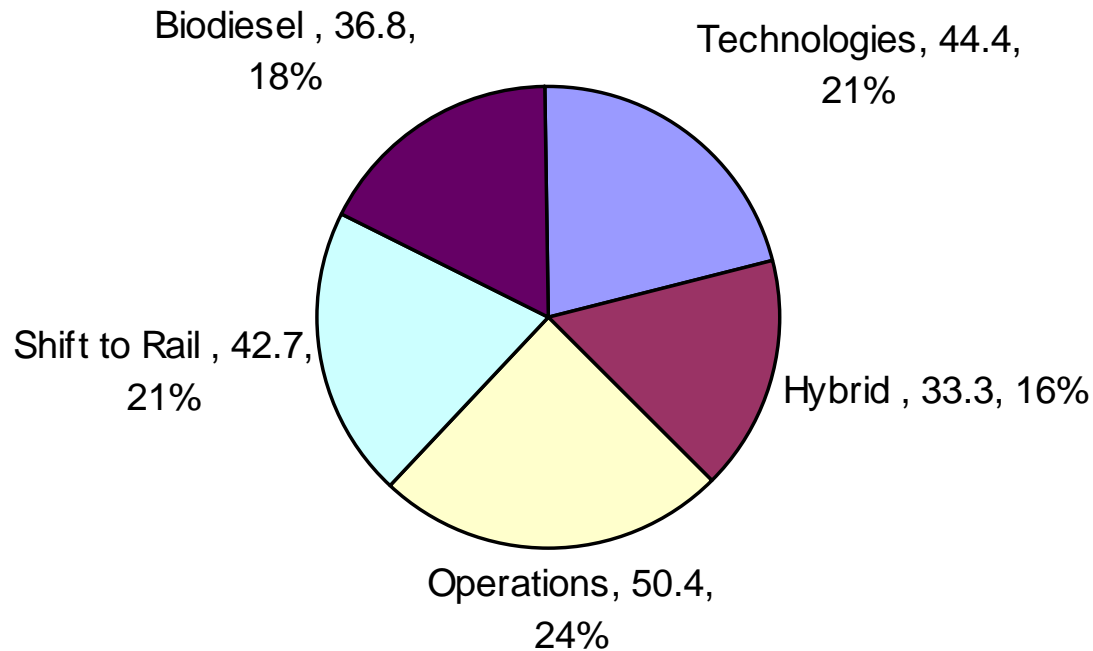
Potential Freight GHG Savings in 2025

	Trucks*	Rail	Marine	Total
Baseline MMTCO2 (2025)	518	41	64	623
Measures	208	3	13	224
Baseline w/measures	310	38	51	399
Baseline relative to 2005	146%	113%	101%	138%
Base w meas rel to 2005	87%	104%	80%	88%

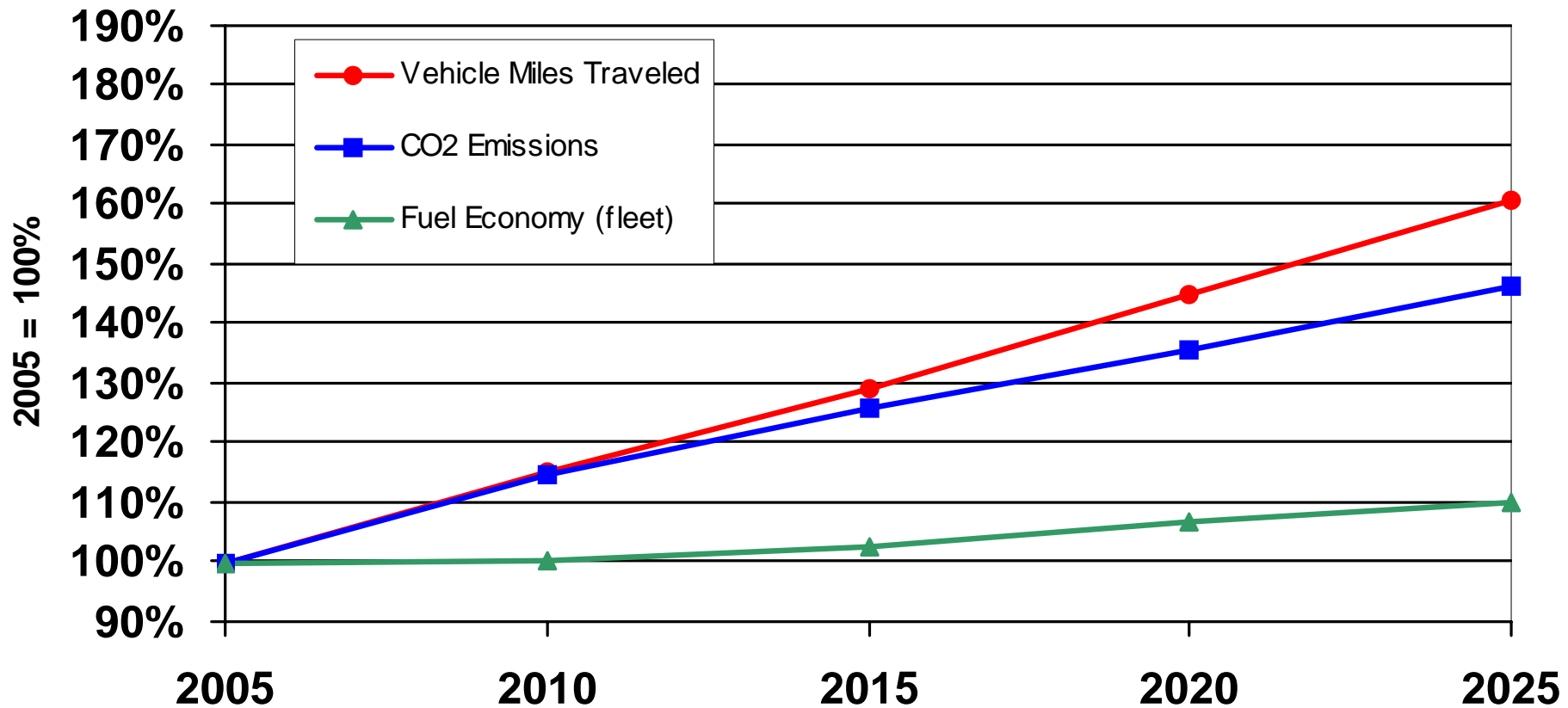
*includes shift to rail

Note: Need to get well below 1990 levels (in all sectors) to minimize climate disruptions.
Current transportation emissions 27% above 1990 levels.

Truck Emission Reductions in 2025 (MMTCO₂ , %)



Freight Truck Forecast (EIA)



Truck to Rail Mode Shift

- Truck VMT to increase 60% over 20 years (EIA)
 - Fleet efficiency to increase 10%
- Rail ton-miles to increase 39% over 20 yrs
 - Fleet efficiency to increase 22%
- Rail uses 14% of truck energy use per avg ton-mile
 - Depends on the commodity (full range is 8-49%)
- Potential shift depends on market considerations (commodity, origin/destination) and available infrastructure
 - We assumed 10% in our calculation based on AASHTO

Sources: EIA (2004), Vanek & Morlok (2000), CCAP

AAHSTO “Bottom Line” Freight Rail Report: 2020 Impacts

- Truck VMT savings: 6-15%
- Private investment: \$132 billion
- Public investment: \$53-83 billion (\$2.6 to \$4.0/yr)
- Net savings: \$380 - \$1,000 billion
 - Reduced hwy need: \$ 10 - 27 billion
 - Highway user cost savings \$238 - 635 billion
 - Shipper cost savings \$162 - 401 billion
- Need **clear national freight policy** to realize benefits
 - Based on partnership among RRs, states, & federal govt

Freight Solutions Dialogue: Participant Findings

- Improvements in **technologies and fuels** critical in the short term to reduce exposure to pollution
- Improvements in **freight infrastructure planning, operations and logistics** critical to achieve structural changes that can reduce emissions over the long term
- A **national freight plan** is needed to provide a long-term vision for goods movement
- The plan needs to be supported by **national policy that can be implemented at state and local levels.**

CCAP Freight Solutions Online

www.ccap.org/transportation/fsd.htm



CCAP Transportation Emissions Guidebook

- Everyone is struggling with what to do about, and how to quantify transportation sector GHGs
- CCAP has assisted with GHG plans for CA, CT, MA, ME, NJ, NY and Puget Sound
- The Guidebook is an organized collection of the materials, resources and tools we used to calculate GHG reductions and design policy recommendations for the transportation sector for those governments



Goal: Help users quantify savings of: Air Pollution, Greenhouse Gases and Fuel

- Web-based tool that includes links to models, case studies, implementation ideas and technical references
- Audience:
 - State and local policy makers
 - Land use and transportation planners
 - Energy and environmental analysts
- Funding: US EPA, US DOT, Surdna Foundation



Structure of the Guidebook

- **Policy Briefs**
- **Guidebook Emissions Calculator**
 - Allows user to customize with local data
 - Allows user to compare benefits from a variety of policies
- **Technical Appendices**
 - Background information (policy context, emissions trends, etc.)
 - Overview of modeling issues and tools

Elements of each Policy Brief

- Policy description
- Quantification methodologies
- Sample calculation (and spreadsheet link)
- Summary tables (energy, emissions, fuel savings, etc.)
- Implementation issues (case studies)
- Technical references (modeling tools, data sources, web sites, reports)



Part I: Land Use, Transit & Travel Demand Management

19 policy briefs divided into four sections:

1. Land Use
2. Transportation Alternatives
3. Fiscal Tools & Incentives
4. State & Local Programs

Part I Policy Brief Topics Include:

- Transit-Oriented Development
- Bicycle and Pedestrian Infrastructure
- Targeted Infrastructure Funding
- Location Efficient Mortgage
- Pay-As-You-Drive Insurance
- Safe Routes to School Programs
- Comprehensive Smart Growth Policies



Part II: Vehicle Technology & Fuels

21 policy briefs divided into two sections:

1. Passenger Vehicles
2. Freight & Intercity Travel

Part II Policy Brief Topics Include:

- GHG Emission Standards
- Feebates
- Biofuels Standards
- Speed Reduction Programs
- Hybrid Vehicles
- Truck Stop Electrification
- Intermodal Freight Initiatives

Annual CO₂ Savings: Top 10 Measures

Policy	Tonnes/yr
GHG Tailpipe Emission Standards	2,550,956
Comprehensive Smart Growth	358,273
Freight Mode Shift	140,375
Pay-As-You-Drive Insurance	94,231
Biodiesel Standards	41,360
Fuel Tax	38,860
Improved Transit Service	17,914
Road Pricing	13,814
Municipal Parking Programs (with parking pricing)	13,256
Speed Reduction Programs	10,953

Based on default data developed by CCAP (see Guidebook for details)

Sample Policy Brief:

Locomotive Idle Reduction

Description

Support the adoption of idle reduction strategies for locomotives. Technologies currently available include:

- Automatic engine stop-start controls (AESS)
- Auxiliary power unit (APU)
- Diesel-driven heating system (DDHS)

Quantification Methodology

- User can specify number of locomotives, idling hours, idling level -- or simply use default values
- Fuel saved calculated from idling reduction
- Emission factors applied to estimate emissions avoided

Sample Calculation Results

- Assumptions
 - 100 engines, avoiding 3,000 hours of notch 1 idling/year
- Results
 - 10,000 tons CO2 reduced per year
 - 300 tons NOx, 17 tons VOC avoided per day
 - Savings of \$1,500,000

Locomotive Anti-Idling Measures	CO2 (annual metric tons)	N2O (annual metric tons)	CH4 (annual metric tons)	Annual Fuel Cost Savings	Annual Fuel Savings (Gallons)
Total	10,661	na	na	\$1,575,000	1,050,000

Locomotive Anti-Idling Measures	NOx	PM-10	PM-2.5	SO2	CO	VOC
Annual Emission Reductions (Tons)	290.850	7.350	6.367	17.776	49.350	16.800
Tons Per Day	0.797	0.020	0.017	0.049	0.135	0.046

CCAP Guidebook On-Line

www.ccap.org/trans.htm

Thanks

For more information:

Steve Winkelman

Center for Clean Air Policy

Director, Transportation Program

swinkelman@ccap.org

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