

Understanding GHG Emissions from Transportation

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Local Climate and Energy Program



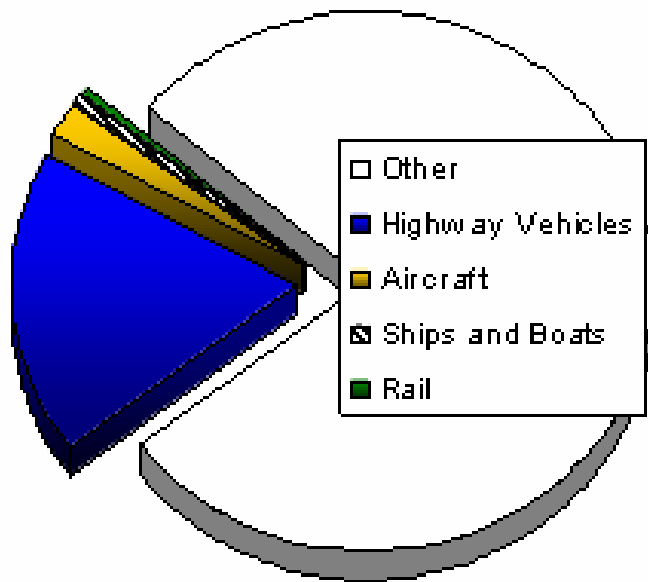
Why prepare an inventory?



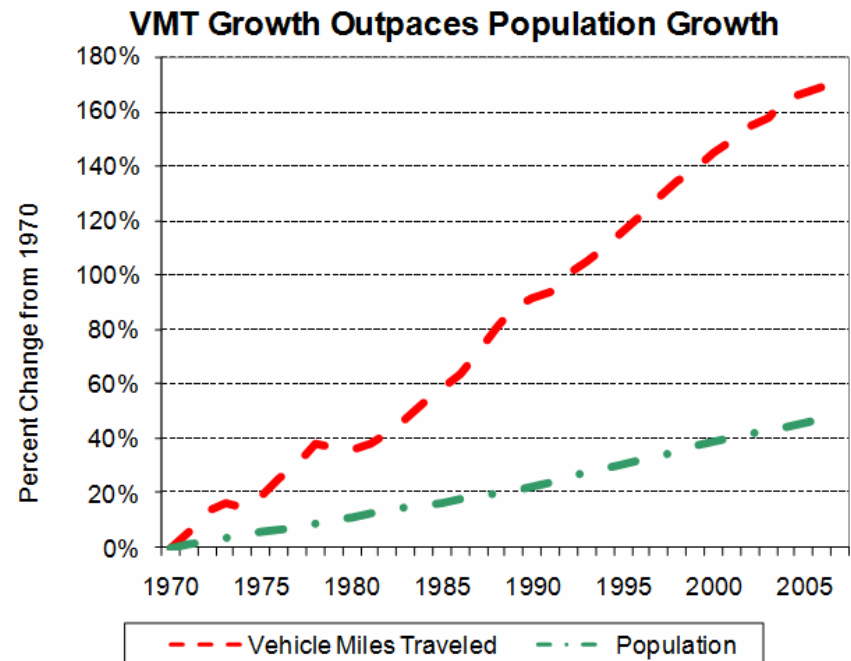
- To identify the greatest sources of GHG emissions within your region
- To understand emission trends
- To quantify the benefits of specific activities that result in GHG emissions
- To provide a basis for developing an action plan
- To track progress at reducing emissions
- To set goals and targets for future reductions



Why Does it Matter?



2006 US GHG Emissions



Regional Greenhouse Gas Inventory Guide



- Covers inventory basics and background
 - baselines, timelines, boundaries
- Methods for emissions from:
 - stationary energy production and consumption,
 - industrial processes,
 - waste,
 - agriculture and forestry
 - Transportation
 - CO₂ from vehicles
 - CH₄ and N₂O from vehicles
 - Aviation
 - Rail
 - Marine



- Draft version is available—seeking “beta testers”⁴

GHG Inventory Methods: Motor Vehicles



- Use models such as Mobile6 or MOVES or calculate based on VMT data, vehicle mix, and emissions factors
- Multiple Approaches for Determining VMT
 - ▶ Regional transportation models
 - ▶ County level models or traffic counts
 - ▶ Downscale state VMT data
 - ▶ Estimate VMT based on population density
- Vehicle Mix
 - ▶ Based on vehicle registrations
 - ▶ State vehicle mix

GHG Inventory Methods: Motor Vehicles



- CO₂ Emissions Factors
 - ▶ Use modeled emissions factors by vehicle type
 - ▶ Assume average fuel economy by vehicle type and use national carbon content emissions factors
- CH₄ and N₂O Emissions Factors
 - ▶ Very small fraction of GHG emissions, <0.5%
 - ▶ Can use national proportion of CH₄ and N₂O to CO₂ as rough estimate
 - ▶ Can be calculated if vehicle age distribution and emissions control technologies data available

GHG Inventory Methods: Rail and Marine



- Rail
 - ▶ Nationally, rail is 1% of total GHG emissions
 - ▶ Public transit/light rail: use energy consumption data from National Transit Database
 - ▶ Inter-city rail (Amtrak) and freight rail: use utility sales data

- Marine
 - ▶ Small emissions (nationally), methods evolving
 - ▶ Some models are available
 - ▶ NY Port Authority has done some quantification

GHG Inventory Methods: Aviation and Airports



- Transportation Research Board—Guidebook on Preparing Airport GHG Inventories

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf

- Contains Methods for:
 - ▶ Aircraft
 - ▶ Ground Support Equipment
 - ▶ Ground Access Vehicles
 - ▶ Stationary Sources (e.g. building energy use)
 - ▶ Waste Management
 - ▶ Fire Training
 - ▶ Construction

Infrastructure Impacts



- 2008 National Research Council Report identified major potential climate impacts on transportation infrastructure:
- “climate predictions used by transportation planners and engineers may no longer be reliable, in the face of new weather and climate extremes”
- Recommendation: create an “inventory” of critical infrastructure that is vulnerable to climate change



EPA Climate Updates



- Mandatory Reporting Rule
<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>
- Endangerment Finding
<http://www.epa.gov/climatechange/endangerment.html>
- Notice of Intent: GHG Standards for Vehicles
<http://www.epa.gov/otaq/climate/regulations.htm>
- Renewable Fuels Standard
<http://www.epa.gov/OMS/renewablefuels/>
- Recovery Act Funding—Clean Diesel Program
<http://www.epa.gov/otaq/diesel>