Public Transportation and GHGs: APTA Guidance and Tools

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Private vehicles are the largest contributor to a household’s carbon footprint.

Current household emissions in typical two-car household:
- Private Vehicles: 55%
- Natural Gas: 20%
- Electricity: 25%

Potential Savings:
- Private Vehicles: 25%
- Natural Gas: 20%
- Electricity: 25%

Potential 30% savings from eliminating one car and taking public transportation.

Value of Public Transportation as a Climate Change Strategy

• Potential for immediate action
• Supports efficient land use patterns & general reduction in travel demand by individual cars
• Reduces congestion and improves fuel economy
• Preserves mobility in a climate of rising fuel prices
A Smaller Carbon Footprint

Public transportation cuts carbon emissions by 37 million metric tons each year.

Equal to New York; Washington, DC; Atlanta; Denver; and Los Angeles households combined stopping use of electricity.
Transit’s GHG Paradox

Regional Transportation GHG Emissions

- Less Transit
  - Transit Emissions
  - Other Transportation Emissions

- More Transit
  - Transit Emissions
  - Other Transportation Emissions

Source: T. Papandreou, LA Metro
Public Transportation is reducing its own carbon footprint
Guidance and Tools for Measuring and Managing Transit’s GHG Emissions

Quantifying Greenhouse Gas Emissions from Transit

Abstract: This Recommended Practice provides guidance to transit agencies for quantifying their greenhouse gas emissions, including both emissions produced by transit and the potential reductions of emissions through efficiency and displacement by using a standard methodology for transit agencies to report their greenhouse gas emissions in a transparent, consistent, and cost-effective manner.

Keywords: carbon footprinting, climate change, greenhouse gas emissions, inventory reporting, mode shift, congestion reduction, land use multiplier.

Scope and purpose: This Recommended Practice provides guidance to transit agencies for quantifying their greenhouse gas emissions, including both emissions produced by transit and the potential reductions of emissions through efficiency and displacement. It lays out a standard methodology for transit agencies to report their greenhouse gas emissions in a transparent, consistent, and cost-effective manner. It ensures that agencies can provide an accurate public record of their emissions, may help them comply with future state and federal legal requirements, and may help them gain credit for their “early action” to reduce emissions.

Guidelines for Climate Action Planning

Abstract: This Recommended Practice presents reasons why agencies should undertake climate action planning, lays out a framework for approaching such planning, and discusses considerations to keep in mind as an agency goes through the planning process.

Keywords: climate action plan (CAP), emissions, greenhouse gases (GHGs), sustainability.

Summary: Climate action planning presents transit agencies with the opportunity to engage with jurisdictional partners to demonstrate and ensure consideration of the impacts of transit to provide substantial reductions of GHGs at a local, regional, and global scale. Transit has a unique role in climate action planning, as it provides more carbon-efficient transportation than personal automobiles. Additionally, transit facilitates greater use of non-motorized modes such as walking and bicycling and creates larger “co-benefits,” such as lower-energy homes and neighborhoods. Modeling of these combined benefits has shown that transit can reduce regional GHG emissions equal to many times those of its riders. Transit, thus, emerges as a key GHG reduction tool and needs to increase rather than decrease its carbon footprint as long as it does so due to system expansion and increased ridership, rather than due to reduced efficiency. Since they have a focus on automobile-based strategies such as low-carbon fuels and battery and engine technologies while disregarding the direct and indirect emission reductions attributable to transit, statewide and regional approaches to the transportation sector to date have undervalued the ability of transit to reduce regional GHG emissions.

This document is designed to help transit agencies review this trend.

Scope and purpose: This Recommended Practice is one of a series of sustainability and urban design standards designed to support APTA members as they work to advance their sustainability practices. The purpose of this document is to provide guidance on the methods and factors that should be considered in climate action planning.

www.apta.com/sustainability
APTA Recommended Practice
Quantifying GHG Emissions from Transit

Quantifying Greenhouse Gas Emissions from Transit

Abstract:
This Recommended Practice provides guidance to transit agencies for quantifying their greenhouse gas emissions, including both emissions generated by transit and the potential reduction of emissions through efficiency and deployment of new or existing technologies. It lays out a standard methodology for transit agencies to report their greenhouse gas emissions in a transparent, consistent, and cost-effective manner. It ensures that agencies can provide an accurate and reliable record of their emissions, which helps them comply with future state and federal legal requirements and can help them quantify their “entry actions” to reduce emissions.

Keywords: carbon footprinting, climate change, greenhouse gas emissions inventory reporting, mode shift, congestion reduction, fuel use measurement

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This Recommended Practice provides guidance to transit agencies for quantifying their greenhouse gas emissions, including both emissions generated by transit and the potential reduction of emissions through efficiency and deployment of new or existing technologies. It lays out a standard methodology for transit agencies to report their greenhouse gas emissions in a transparent, consistent, and cost-effective manner. It ensures that agencies can provide an accurate and reliable record of their emissions, which helps them comply with future state and federal legal requirements and can help them quantify their “entry actions” to reduce emissions.

This Recommended Practice represents a consensus viewpoint of those parties concerned with its provisions, namely, transit operators representing agencies, manufacturers, consultants, engineers, and others involved in the process. The provisions of this Recommended Practice are not intended to represent a complete body of laws, regulations, or practices. Where general guidelines are given for the implementation of the guidelines, agencies are encouraged to implement those guidelines in a manner consistent with their respective local, state, and national laws and regulations.

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APTA Recommended Practice
Quantifying Net GHG Emissions from Transit

Emissions Produced by Transit ('Debit')
- Emissions from Transit
  - Tailpipe emissions from transit vehicles
  - Electricity use for traction
  - Maintenance yards, stations, offices and other stationary sources

Emissions Displaced by Transit ('Credit')
- Mode Shift to Transit
  - Avoided car trips from private autos
- Congestion Relief
  - Improved fuel efficiency from reduced congestion

Land-Use Multiplier
- Compact land-use -> shorter trips, more walk/bike trips
- Trip chaining
- Lower car ownership

Greenhouse Gas Impact of Transit
Quantifying Transit’s GHG “Credit”
The Land-Use Multiplier

- Transit enables compact development patterns resulting in shorter and fewer motor vehicle trips
  - Facilitates bicycle and pedestrian travel
  - Trip chaining
  - Related impacts of reduced car ownership
Quantifying Transit’s GHG “Credit”
The Land-Use Factor

- APTA *Recommended Practice* offers guidance on two approaches:
  1. Use of a default national factor
  2. Locally-specific analysis

- More examples and data points create better understanding

- TCRP Project H-46 will result in refinement of analysis and tools
**Objective:** Understand the complex interrelationship between transit and land use patterns to better foster compact development as well as transit’s contribution to, and the benefit they receive from, compact development

**Method:** Statistical analysis of land use patterns in relation to transit systems complemented with a qualitative case study analysis

**Anticipated Work Products:** calculator tool, guidebook, addendum to APTA’s guidance on quantifying greenhouse gas (GHG) emissions, and webinars

**Timeline:** October 2011 to October 2013.
TCRP H-46 Work Benefits

• Provide a more robust evidence of the effect that transit has on land use
• Better tools to estimate the effect of transit on land use related to VMT/GHG impacts
• Clear guidance about how to plan for and promote compact development
• Specific Benefits to Transit, MPOs, Local Governments
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Summary: Climate action planning presents transit agencies with the opportunity to engage with jurisdictional partners to demonstrate and ensure consideration of the strong potential of transit to provide substantial reductions of GHGs at a local, regional, and global scale. Transit has a unique role in climate action planning, as it provides more carbon-efficient transportation than personal automobiles. Additionally, transit facilitates greater use of non-motorized modes such as walking and bicycling and creates large "co-benefits," such as lower-energy homes and neighborhoods. Modeling of these combined benefits has shown that transit can reduce regional GHG emissions equal to many times those it emits. Transit, thus, emerges as a key GHG reduction tool that needs to increase rather than decrease its carbon footprint as long as it does so due to system expansion and increased ridership, rather than due to reduced efficiency. Since they have focused on automobile-based strategies such as low-carbon fuels and battery and engine technologies while disregarding the direct and indirect emission reductions attributable to transit, statewide and regional CAPs approaches to the transportation sector to date have underestimated the ability of transit to reduce regional GHG emissions. This guidance document is designed to help transit agencies reverse this trend.

Scope and purpose: This Recommended Practice is one of a series of Sustainability and Urban Design Standards documents designed to support APTA members as they work to advance their sustainability practices. The purpose of this document is to provide guidelines on the methods and factors that should be considered in climate action planning.
• Why do a CAP?
• Supporting internal sustainability efforts
• Improving cost-effectiveness, including new revenues
• Preparing for the effects of climate change
• Demonstrating the environmental benefits of transit
• Demonstrating leadership
APTA Recommended Practice Document
Guidelines for Climate Action Planning

Plan-Do-Check-Act Cycle

Strategic Planning

Monitoring & Improvement

Options Analysis & CAP Development

Implementation

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This Recommended Practice represents a common viewpoint of these parties concerned with its provisions, names, terms, operation, governing agencies, manufacturers, consultants, engineers and general interest groups. The application of any standards, practices or guidelines contained herein is voluntary in some cases, federal and state regulations, other agencies and industry standards may require implementation in certain cases. In these cases, the guidance recommended here should not be considered mandatory. These guidelines are not intended to be all-inclusive or authoritative in nature, but rather to represent a broad consensus of the industry. Individual agencies or their contractors, may be required to implement additional or different practices than those given in this document.

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APTA Recommended Practice Document
Guidelines for Climate Action Planning

- Acknowledges industry differences with flexibility to consider:
  - **Scope**: Recognize agency authority in considering CAP objectives and actions
  - **Scale**: Considering agency role in reducing it’s own emissions output (debit), vs. how an agency can impact regional transportation and land use policies (credit)

What Authority Does the Agency Have?

- Land Use + Transportation (includes Transit, and other modes)
- Transportation (includes Transit, and other modes)
- Transit
Industry Participation

- Barbara Thomson, First Environment
- Betsy Delaney, First Environment
- Brian Laverty, PB
- Craig Bilderback, Veolia Transportation
- Cris Liban, Los Angeles MTA
- Cynthia Hoyle, Champaign-Urbana MTD
- Dan Locke, Utah Transit Authority
- Dave Gillespie, New Jersey Transit
- David Erne, Booz Allen Hamilton
- Ed Buchanan, Utah Transit Authority
- Eric Hesse, TriMet
- Erik Johanson, SEPTA
- Gary Prince, King County Metro
- Joan LeLacheur, WMATA
- Joe Speaks, Booz Allen Hamilton
- Justin Antos, AECOM Transportation
- Karl Peet, Chicago Transit Authority
- Liz Zelasko, FTA
- Mark Minor, Regional Transportation Authority (Chicago)
- Marty Mellera, San Francisco MTA
- Monica Hale, SAIC
- Projjal Dutta, New York MTA
- Tim Papandreou, San Francisco MTA
- Tina Hodges, FTA
- Trish Webb, TransLink
- Val Menotti, BART