Climate Planning and Transportation
How can we enhance collaboration across units of government?

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Partnering on a shared vision

Making a strong system possible through planning, coordination, and operations

Long-range planning
Supporting cities and townships for the prosperity of the region

Environmental protection
Protecting public waterways and parklands to sustain our environment

Transportation services
Connecting people to places and keeping the economy moving
1. Climate Action Plans
   - Are our climate goals aligned?

2. GHG Scenario Planning Tool
   - What is the GHG Scenario Planning Tool?
   - What transportation strategies are included?
Collaboration is key

- Effective climate action often involves collaboration between various stakeholders, including local businesses, community groups, and other levels of government.
Effective Climate Change Action

Collaboration is key

- **Shared Responsibility**: Emission reduction is a shared responsibility.
- **Efficiency**: Coordinated efforts can *prevent redundancy* and *improve the efficiency of programs* aimed at reducing emissions.
- **Consistent Regulations**: Without alignment, policies may be inconsistent or even contradictory across different jurisdictions.
- **Broad Impact**: The impact of emissions on climate change is not confined to local or state boundaries.
- **Economic Opportunities**: Collaboration across different levels of government can create more substantial incentives for businesses and industries to invest in greener technologies and practices.
The Federal Framework

**Convenient**
- Planning
- Telework
- Travel Demand Management
- Active Mobility
- Pool Riding

Improve Community Design and Land-use Planning

**Efficient**
- Operational Improvement
- Public Transportation
- Rail & Shipping
- Vehicle Fuel Economy

Increase Options to Travel More Efficiently

**Clean**
- Clean Electricity
- Sustainable Biofuels E-fuels
- Clean Hydrogen

Transition to Zero Emission Vehicles and Fuels

US National Blueprint for Transportation Decarbonization (2023)
The Inflation Reduction Act

Beyond Electrification in U.S. Transportation Policy

• **Inflation Reduction Act (IRA):** The IRA supports transportation electrification and offers tax credits for zero-emissions vehicles, though some argue it overlooks broader environmental impacts of car dependency.

• **Electric Cars and Emissions:** Electric vehicles can reduce carbon emissions, but their impact is contingent on factors such as electricity sourcing and vehicle size.

• **Sustainable Transportation Future:** For long-term sustainability, a less car-dependent future is needed with improved public transit, incentives for electric bikes, and a focus on walkable, resource-efficient urban planning.
The State’s Framework

Transportation Strategies

- Increase funding for non-motorized transportation
- Increase transit services
- Plan land use and transportation together
- Continue exploring opportunities for a clean fuel standard
- Expand regional charging
- Develop a Minnesota EV plan
Minnesota's Climate-Conscious Transportation Bill

A New Direction

• The newly passed Minnesota transportation bill includes climate-conscious provisions like funding for public transit and a climate-centric approach to infrastructure planning.

• The bill aims to reduce carbon emissions through a shift towards electric vehicles and better public transit, funded by a 0.75% metro-area sales tax.

• The law requires evaluation and mitigation of greenhouse gas emissions for significant transit-related projects, supplementing efforts in cities like Rochester which is investing in EV infrastructure and public transit improvements.
Hennepin County’s Framework

Transportation Strategies

• **Reduce vehicle miles traveled** in Hennepin County and throughout the region

• Promote **electric vehicle** infrastructure regionally

• Use transportation investments to support broader county goals including **reducing disparities**, **improving health**, **enhancing livability**, and **growing the economy**
City of Minneapolis’ Framework

Transportation Strategies

• Provide safe, easily accessible and low-cost transit throughout the City
• Reduce greenhouse gas emissions caused by vehicles by 30% by 2030 along with other harmful emissions*
• Reduce vehicle miles traveled (VMT) by 2.5% annually through 2030*
The Greenhouse Gas Scenario Planning Tool
Scenario selection

- Create custom scenario
- Use preset scenarios

**Building Energy**

- Retrofit existing homes: Cities can incentivize homeowners to retrofit for energy efficiency. We assume retrofitted homes use 33% less energy.
- Energy efficient new-build homes: We assume LEED-Gold or equivalent new single family homes use 64% less energy.
- Clean electricity: This strategy models CO2 equivalent emissions decrease due to decarbonizing the electric grid.
- Smart technology in residential homes: This strategy assumes technologies can reduce residential electricity use by 11%.
- Increase multifamily housing stock: This strategy models energy savings due to smaller footprint of multifamily homes.
- Reduce residential floor area: This strategy models energy savings due to reduced floor area. Business as usual is a 5% increase in floor area.
- Retrofit existing commercial buildings: This strategy assumes retrofitted commercial buildings use 25% less energy.
- Smart grid electrification: This strategy assumes technologies can reduce non-residential building electricity use by 11%.

% of existing homes retrofitted

- 0% 20% 40% 60% 80% 100%

% new homes built to LEED-Gold standards

- 0% 20% 40% 60% 80% 100%

% percent of grid decarbonized

- 0% 20% 40% 60% 80% 100%

% homes using smart technology

- 0% 20% 40% 60% 80% 100%

% single family construction replaced as multifamily

- 0% 20% 40% 60% 80% 100%

% increase in floor area

- 0% 5% 10% 15%

% commercial buildings retrofitted

- 0% 20% 40% 60% 80% 100%

% industrial buildings using smart grid

- 0% 20% 40% 60% 80% 100%
GHG Mitigation Strategies

- Compact Land Use and Planning
- Energy Efficient Technology
- Conservation and Sustainable Behavior
- Clean Energy Supply
- Sequestering Carbon
The Greenhouse Gas Scenario Planning Tool

- Vehicle electrification
- Telework
- Road pricing
- Compact development
- Transit
What is Business As Usual?

**Travel Forecasting**

- Travel forecasting is the process of predicting how people will travel in the future. It is used to help decision-makers make informed choices about transportation investments and policies.

- The Met Council maintains a **regional travel demand forecast model**. This model is used to forecast travel for all types of transportation, including cars, buses, trains, and bicycles.

- The model is regularly updated to reflect changes in regional transportation networks, demographics, travel patterns, and best practices.

- The current regional travel demand forecast model is called an "**activity-based model**." This means that it simulates transportation decisions made by individuals, ranging from long-term (e.g., where to live and work) to short-term (e.g., how to get to work).
What is Business As Usual?

GHG Scenario Planning Tool converts transportation demand forecasts to 2040 to GHG emissions based on:

- Existing and forecasted transportation mode shares
- Existing and forecasted technology shares (i.e., gasoline, diesel, hybrid EVs, plug-in hybrid EVs, & battery EV for passenger vehicles)
- Existing and forecasted fuel efficiencies
- Well-to-wheel (W2W) GWP factors per quantity of fuel
Transportation Emissions Results from the Model

Source: Ramaswami et al., manuscript under consideration
Reducing Vehicle Miles Traveled

Compact Development

- Compact development can reduce vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions by concentrating residential, business, and recreational areas, which shortens travel distances and promotes walkability and public transit use, thus minimizing the reliance on personal vehicles and the associated emissions.

- Examples of Actions
  - Multifamily Zoning
  - Mixed Development
  - Transit Oriented Development
Urban Development Scenarios

Average Weekday VMT/Per Capita

- Business As Usual: 23.8
- High Growth + Compact Growth: 22.3
- High Growth + Dispersed Growth: 23.5
- Low Growth + Compact Growth: 22.8
- Low Growth + Dispersed Growth: 23.6
High Growth + Compact Growth

High Growth + Dispersed Growth

Low Growth + Compact Growth

Low Growth + Dispersed Growth

Percent Difference in Average Weekly Vehicle Miles Traveled (VMT) Compared to Business As Usual

% difference from Business as Usual

Note: Business As Usual VMT is 90,806,600 miles
Carbon Emissions Per Capita Are Much Lower in Urban Areas with Higher Population Density

Annual carbon emissions per capita, in tons (2013)

Note: Includes all urban areas in database with populations of 5 million or more, except the Hong Kong special administrative region and the country of Singapore.

Chart: Urban Institute • Source: Author’s analysis using data from Daniel Moran et al., “Carbon Footprints of 13,000 Cities,” Environmental Research Letters 13, no. 6 (June 2018) and A. Florczyk et al., "GHS Urban Centre Database 2015," multitemporal and multidimensional attributes, R2019A (European Commission: 2019). • Get the data • Created with Datawrapper
Transportation GHG Emissions vs Population Density

Sources
Transportation emissions data from Google Environmental Insights Explorer
Land use and population data from the Metropolitan Council
Post not affiliated to any organization
Cumulative Vehicle Miles Traveled by County

Hennepin

Anoka

Olmsted

Scott

Crow Wing

Washington

Clay

Pine

Rice

Benton

Stearns

Goodhue

Cass

Blue Earth

Lyon

Wright

Saint Louis

Aitkin

St Louis

Winona

Mower

Dakota
Reducing Vehicle Miles Traveled

Telework

- Telework reduces vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions by eliminating commute trips, thus decreasing the use of fuel and subsequently reducing the release of harmful emissions into the atmosphere.
Reducing Vehicle Miles Traveled

Road Pricing

• By implementing road pricing, governments can effectively discourage excessive private vehicle usage, thereby reducing the total vehicle miles traveled (VMT) and subsequently lowering greenhouse gas (GHG) emissions.

• **Examples of Actions**
  • Pay-per-Mile Insurance
  • VMT Fees
  • Gas Taxes
Electric Vehicles

- Electric cars can significantly reduce greenhouse gas emissions as they produce no tailpipe emissions and, depending on the source of electricity used for charging, can have substantially lower well-to-wheel emissions compared to conventional internal combustion engine vehicles.
Make Driving Cleaner

New bill

- Minnesota’s new climate bill mandates 100% clean energy by 2040, upping the renewable energy requirement to 55% by 2035.
- Utility companies are given "off-ramps" if meeting the targets becomes unfeasible, but also face streamlined permitting processes and pay standards for workers on large-scale projects.
- Despite opposition suggesting the bill would increase costs and reduce reliability, analyses of state-level clean energy standards show improved grid reliability and reduced costs for consumers.
Reducing Vehicle Miles Traveled

Transit

• Transit can reduce vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions by offering efficient public transportation alternatives, which can decrease the number of private vehicle trips, leading to lower overall emissions from personal vehicles.

• **Examples of Actions**
  • Improve Transit Service
    • Frequency
    • Coverage
  • Increase Transit Ridership
    • Fuller Buses
Improving Transit

Transit

- **Better Bus Route Program**: improves high ridership local routes with simplified alignments, better ADA accessibility, and adequate operator rest times.

- **Bus Lanes and Corridor Improvements Projects**: implement bus lanes and Transit Signal Priority (TSP), reducing dwell times.

- **Bus Rapid Transit** (BRT) lines like the METRO A Line, C Line, and D Line enhance speed and reliability in busy transit corridors.

- **Network Next** envisions the 2040 bus network with new BRT lines, extended service hours, and new routes in underserved areas.

- **Transit Signal Priority** (TSP) aids in reducing bus delays at signalized intersections.

- Metro Transit collaborates with cities and counties on **high-ridership corridors' improvements** including bus lanes, TSP, and bus stop consolidation.

- **Stop consolidation** and **ADA compliance** are focused areas for better bus routes.

- Waiting experiences are enhanced with **increased shelter availability** and transit information.
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