What are greenhouse gases?

Greenhouse gases (GHG) are gases that trap heat in the atmosphere, and include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Greenhouse gases can be good in small amounts, but too much can lead to global warming and climate change. Emissions from passenger and light-duty vehicles account for the largest share of transportation emissions in Colorado.

Why is the NFRMPO involved?

The Colorado Transportation Commission (TC) adopted a rule in 2021 to reduce GHG emissions from the transportation sector. This rule requires the Colorado Department of Transportation (CDOT) and the state's five metropolitan planning organizations (MPOs) to determine the total greenhouse gas emissions expected from their long-range transportation plans and identify strategies to reduce these emissions by set amounts.

How do you measure GHG emissions?

Currently, the NFRMPO does not have the ability to directly measure GHG. Instead, GHG are modeled based on a national simulator developed by the Environmental Protection Agency (EPA), called the Motor Vehicle Emissions Simulator (MOVES). This is the same simulator used for the NFRMPO's ozone modeling.

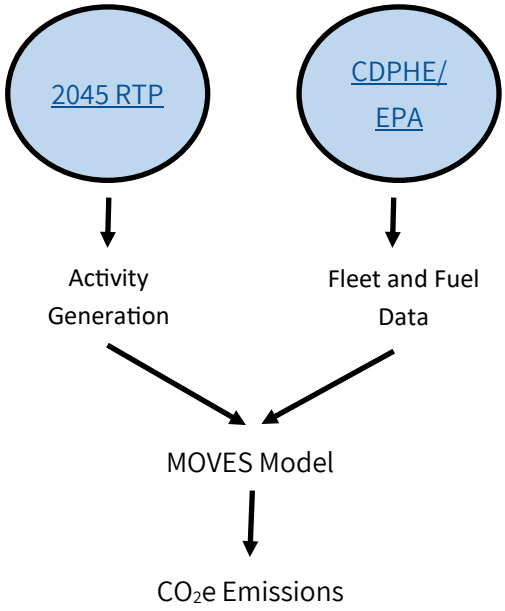
NFRMPO staff trained with the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) on the MOVES model to determine GHG emissions from the agency's long-range transportation plan, the 2045 Regional Transportation Plan (RTP). MOVES evaluates vehicle miles traveled (VMT), average speed, and vehicle mix data from the agency's Regional Travel Demand Model (RTDM) and county-level data.

How does this impact me?

When the NFRMPO undertakes the long-range transportation plan update, staff develop a fiscally constrained list of projects based on feedback and guidance from member communities. Fiscal constraint means there are sufficient funds for each project. To meet the required GHG reduction levels, the projects mix will include more transit projects, bicycle and pedestrian projects, and other strategies that reduce VMT and GHG emissions. The NFRMPO must still ensure fiscal constraint but will evaluate all projects in the Plan for their GHG reduction potential.

GREENHOUSE GAS PLANNING IN THE NORTH FRONT RANGE

Modeling Process



Learn More:

NFRMPO: Air Quality, Greenhouse Gas

CDOT: Greenhouse Gas (GHG) Program

APCD: Climate Change

August 2022

Socioeconomic Context

	2020	2025	2030	2040	2050	Growth (2025-2050)
Population	533,367	583,439	651,400	792,208	950,460	**62.9%**
Households	200,564	236,778	267,658	329,315	398,410	**68.3%**
Employment	303,307	327,944	357,129	416,833	494,949	**50.9%**

What was modeled?

Baseline Plan

The project list is included in Chapter 3, Section 5: Plan Projects.

Updated Plan

The Updated Plan incorporates projects from three NFRMPO Calls for Projects, CDOT investments, and local and regional plans.

Long range strategies include transportation demand management (TDM), improved traffic signals, increased transit, and more active transportation investments.

How is this funded?

The RTP must be fiscally constrained, so the NFRMPO reconsidered how funding was assigned in Chapter 3, Section 4. All strategies have either been funded through recent Calls for Projects and/or are in line with local, regional, and State plans. These funding considerations have been extrapolated into the future. In addition, strategies like active transportation and TDM can be incorporated in future projects.

What happened to the projects that were funded in the 2045 RTP?

The RTP is a long-range plan that looks out at least 20 years and estimates the reasonably anticipated funding in that timeframe. Projects that can be modeled in the RTDM are identified but other projects are identified in categories based on the anticipated funding. Most funding has some flexibility and can be applied to different types of projects allowing for the change in projects in the outyears without 'giving up' already identified projects.

What were the results? The below table shows the impacts from the updated project mix compared to what was modeled for the Baseline Plan. Results are shown by modeled year and by modeled output.

	2025	2030	2040	2050
Person Trip Mode Share (Percentage Point difference)				
Single occupancy in auto	- 2.0%	- 4.3%	- 4.6%	- 5.2%
Shared ride in auto	1.9%	- 0.5%	-0.4%	- 1.0%
Walk	0.2%	3.0%	2.9%	3.6%
Bicycle	- 0.1%	1.6%	1.6%	1.8%
Transit	0.0%	0.1%	0.0%	0.2%
Other non-vehicle	0.0%	0.1%	0.4%	0.4%
Vehicle and Transit Data – Typical Weekday (Percent change)				
Vehicle Miles Traveled	- 2.7%	- 6.2%	- 6.8%	- 5.9%
VMT per capita	- 2.8%	- 6.1%	- 6.8%	- 11.6%
Average vehicle speed (mph)	0.9%	2.7%	4.3%	4.2%
Vehicle Hours Traveled (VHT)	- 3.5%	- 8.9%	- 10.5%	- 19.2%
Hours of vehicle delay	- 8.1%	- 18.9%	- 20.3%	- 26.8%
Transit trips (linked)	- 0.7%	17.0%	16.5%	19.1%
CO2-equivalent (CO2e) Reductions (Million Metric Tons)				
Modeled reductions	0.05 ✓	0.12 ✓	0.11 ✓	0.11 ✓