

Carbon Reduction Strategy

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COLORADO
Department of Transportation

Colorado Carbon Reduction Strategy

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List of Abbreviations

- ABM - Activity Based Model
- ACT - Advanced Clean Trucks
- ADT - Average Daily Traffic
- AQCC - Air Quality Control Commission
- BIL - Bipartisan Infrastructure Law
- CAB - Colorado Aeronautical Board
- CDOT - Colorado Department of Transportation
- CDPHE - Colorado Department of Public Health & Environment
- CEO - Colorado Energy Office
- CMAQ - Congestion Mitigation and Air Quality Improvement Program
- CRP - Carbon Reduction Program
- DOT - Department of Transportation
- DRCOG - Denver Regional Council of Governments
- EERPAT - Energy and Emissions Reduction Policy Analysis Tool
- EV - Electric Vehicle
- FAC - Freight Advisory Council
- FAST - Fixing America's Surface Transportation Act
- FHWA - Federal Highway Administration
- FTA - Federal Transit Administration
- GHG - Greenhouse Gas
- GVMPO - Grand Valley Metropolitan Planning Organization
- M/HD - Medium/Heavy Duty
- MMT - Million metric tons
- MOU - Memorandum of Understanding
- MOVES - Motor Vehicle Emission Simulator
- MPO - Metropolitan Planning Organization
- NEVI - National Electric Vehicle Infrastructure
- NFRMPO - North Front Range Metropolitan Planning Organization
- NOx - Nitrogen Oxide
- PACOG - Pueblo Area Council of Governments
- PM - Particulate matter
- PPACG - Pikes Peak Area Council of Governments
- REV - Regional Electric Vehicle Plan
- RNG - Renewable natural gas
- RTP - Regional Transportation Plans
- STAC - Statewide Transportation Advisory Committee
- SWP - Statewide Plan
- TDM - Transportation Demand Management
- TERC - Transportation Environmental Resource Council
- TIP - Transportation Improvement Program
- TMO - Transportation Management Organizations
- TNC - Transportation network companies
- TPR - Transportation Planning Region
- VMT - Vehicle Miles Traveled
- ZEV - Zero Emission Vehicle



Executive Summary

The Colorado Department of Transportation (CDOT) has developed this Carbon Reduction Strategy to meet the requirements of the Carbon Reduction Program (CRP), which was established as part of the 2021 Bipartisan Infrastructure Law (BIL). This strategy was developed in consultation with Colorado's five Metropolitan Planning Organizations (MPOs).

Colorado is already seeing the effects of climate change, with an increase in the magnitude and frequency of heat waves, wildfires, and extreme precipitation events. These climate change effects will have wide ranging impacts on Colorado's ecosystems, water resources, agriculture, energy, public health, outdoor recreation and tourism, and transportation infrastructure. As a result of these impending threats, Colorado has taken the initiative to ensure that current and future generations can thrive in the Centennial State. The passage of HB19-1261 in 2019 set statewide greenhouse gas emission reduction targets across all sectors of the economy in Colorado. These targets were recently updated through the passage of SB23-016 in 2023.

Given that transportation is the largest contributor to GHG emissions in Colorado, with light duty vehicles being the largest source of emissions within the transportation sector, Colorado has implemented a wide range of policies, programs, and regulations to decarbonize the transportation sector. In December 2021, Colorado's Transportation Commission adopted the GHG Transportation Planning Standard, a rule which regulates the transportation planning process for the Colorado Department of Transportation (CDOT) and the state's Metropolitan Planning Organizations (MPOs). This rule plays a key role in Colorado's overall strategy of reducing GHG emissions from the transportation sector and is a key organizing principle of Colorado's Carbon Reduction Strategy. Under the GHG Transportation Planning Standard, CDOT and the state's five MPOs are required to achieve individually set GHG reduction levels in 2025, 2030, 2040, and 2050. To determine compliance with the reduction levels, agencies must model their existing transportation networks and all future regionally significant capacity projects in their transportation planning documents. Overall, the standard encourages CDOT and the MPOs to develop long range transportation plans that support travel choices that reduce GHG emissions.

While the GHG Pollution Reduction Planning Standard plays a key role in decarbonization of transportation planning, it is only one tool in Colorado's toolbox to address transportation sector emissions. To reduce emissions across the entire transportation sector, Colorado has developed a range of policies, regulations,

programs, and funding streams that address each component of the transportation sector: light duty vehicles, medium and heavy-duty vehicles, buses, and aviation. Some of these feed into the development of transportation planning documents, while others stand separately, working to decarbonize every part of the transportation sector.

Thanks to the collaboration processes set up as a part of the GHG Transportation Planning Standard and the state's many other transportation related GHG initiatives, Colorado has set up a system by which to increase investment in clean transportation modes and diversify the types of projects that transportation planning agencies develop.

Introduction

Colorado has developed this Carbon Reduction Strategy to meet the requirements of the Carbon Reduction Program (CRP), which was established as part of the 2021 Bipartisan Infrastructure Law (BIL). The CRP provides state Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) with funds for projects designed to reduce carbon dioxide (CO₂) from on-road highway sources. The CRP requires each state to develop a Carbon Reduction Strategy, in consultation with any MPOs, to support the efforts and identify projects and strategies to support the reduction of transportation emissions.

Colorado is slated to receive \$86 million over the next five years under the CRP. The CRP requires that 65% of these funds be allocated to urbanized areas in proportion to their relative shares of Colorado's population. The remaining 35% of funds may be allocated at the state's discretion.

The Carbon Reduction Strategy is meant to include safe, reliable, and cost-effective projects and strategies which support the reduction of transportation emissions. It allows for a variety of strategies, from promoting mode shift out of single occupancy vehicles (SOV) to deploying more energy-efficient street lighting. The Carbon Reduction Strategy may also include strategies for reducing emissions from the construction of transportation assets. The Colorado Department of Transportation (CDOT) has developed a Carbon Reduction Strategy that meets the federal requirements and guidelines and operates within the state's planning processes. Further, this Carbon Reduction Strategy provides an opportunity to highlight the state's collaborative, multifaceted, and multi-agency efforts which work together to reduce transportation emissions across Colorado.



The purpose of this Carbon Reduction Strategy is to summarize CDOT's efforts to reduce GHG emissions, including efforts currently underway, in the planning phase, and anticipated to take place in the future. The Carbon Reduction Strategy will also identify specific transportation related projects and strategies that CDOT and the MPOs are directing their funding towards. The goal of this document is not to make specific commitments to plans, policies, or funding programs at CDOT or the state more broadly; rather, the Carbon Reduction Strategy is intended to serve as a compendium of both current and potential future tools and approaches for CDOT to explore, adopt, and refine in the years ahead. The plan is also a starting point for ongoing conversations within CDOT, across Colorado, and around the Nation.

Colorado's Transportation Planning Process

CDOT conducts a continuous, comprehensive, and cooperative, performance-based, multimodal transportation planning process in accordance with federal and state requirements. The process provides for broad public involvement in the key decisions made for Colorado's transportation system, including the development of both long-term and short-term performance goals and objectives, the identification of strategies to achieve those objectives, and priorities for investment in transportation programs and projects.

CDOT works closely with many planning partners throughout the state, including local officials throughout the 10 rural Transportation Planning Regions (TPRs) and five MPOs. The [Statewide Transportation Advisory Committee](#) (STAC), composed of representatives from each of these planning organizations, meets monthly to advise the Transportation Commission and CDOT on the multimodal transportation matters of the state. Transportation stakeholders are also represented on other statewide planning bodies including the [Statewide MPO Committee](#), [Transit and Rail Advisory Committee](#) (TRAC), the [Freight Advisory Council](#) (FAC), and the [Transportation Environmental Resource Council](#) (TERC).

The planning process results in the development of several required planning documents: the [Regional Transportation Plans](#), [Statewide Transportation Improvement Program](#), [Statewide Transportation Plan](#), Modal Plans, and Functional Plans.

- Regional Transportation Plans (RTPs) have a 20-year minimum time horizon and are developed by the Regional Planning Commissions (RPC) of each of the state's 10 rural TPRs and by the MPOs of each of the five metropolitan areas. RTPs identify a vision for the region, priorities for needs, programs, or



projects, and strategies for achieving the vision. The development of RTPs includes significant stakeholder and public outreach.

- Modal Plans are developed/updated for transit, rail, aviation, and bicycle/pedestrian modes.
- Functional Plans are developed/updated for specific transportation functions, including the Strategic Highway Safety Plan, Statewide Transportation System Management & Operations Plan, Risk-Based Management Plan, State Highway Freight Plan, and Multimodal Freight Plan.
- The Statewide Plan (SWP) integrates the RTPs, modal plans, and functional plans. The SWP identifies a vision, goals, measures, and performance objectives for the transportation system, future needs for the transportation system, trends affecting transportation, and an investment strategy and strategic actions to achieve the vision and goals. The SWP and RTPs have a minimum 20-year time horizon.

Federal transportation legislation requires a performance-based approach to planning. Colorado's multimodal transportation planning process reflects this approach by incorporating extensive use of data and analysis to inform decision-making, including the establishment of performance goals and objectives, the distribution of resources, and project selection.

Climate Change and Colorado

Effects of Climate Change in Colorado

Climate change is a global threat to our social, economic, and environmental well-being that we are experiencing here and now. In Colorado, warmer temperatures and changes in precipitation are causing a decline in snowpack, which ultimately reduces water availability while shortening the season for skiing and other forms of winter recreation essential to Colorado's economy.¹ A decline in snowpack is also leading to an upward movement of high-altitude trees, shrinking the extent of alpine tundra, and possibly causing the loss of niche-dependent species like the American pika. Additionally, rising temperatures cause water to evaporate more quickly from soil - consequently intensifying the length and frequency of Colorado's droughts. With less precipitation to replenish crucial water supplies in addition to higher temperatures,

¹ United States Environmental Protection Agency. "[What Climate Change Means for Colorado](#)". 2016.



Colorado’s farms and ranches may face growing need for irrigation, further lowering the water table; severe heat waves also harm livestock and reduce crop yields.

Higher temperatures and drought also increase the frequency, severity, and extent of wildfires. Before 2002, Colorado had never recorded a fire that burned more than 100,000 acres. By 2021, the state has experienced more than five such fires, and 2020 was the state’s worst year for wildfires on record.² Not only do wildfires lead to loss of life, property, and habitat for Colorado’s wildlife, and forests that sequester carbon, they also harm air quality and increase hospital visits for chest pain, respiratory problems, and heart issues. Further, as was evidenced in the 2021 Glenwood Canyon floods that resulted in the closure of I-70, severe wildfires also increase the risk of heavy flooding that could cause tremendous disruptions in travel and supply chains along essential corridors.

Traffic-related emissions are also a main contributor to poor air quality, particularly in urban areas with high traffic volume. In fact, the Denver Metro and North Front Range regions have been in violation of federal ozone air quality standards for decades. Pollutants emitted from vehicles, including particulate matter (PM) and nitrogen oxides (NOx), have direct impacts on the health of Coloradans, with those who live closest to our busiest roads - often economically disadvantaged and minority populations - breathing in disproportionate amounts of pollution.³ Living in an area with high levels of air pollution is directly linked to higher rates of asthma, pulmonary disease, cardiovascular disease, reproductive complications, and mortality.⁴

Colorado’s Plan to Tackle Climate Change

In recent years, state and local governments have taken the initiative to ensure that current and future generations can thrive in the Centennial State. In 2019, Governor Jared Polis signed [HB19-1261](#), which set statewide greenhouse gas (GHG) emission reduction targets and mandated new considerations for the Air Quality Control Commission (AQCC). In 2023, Governor Polis signed [SB23-016](#), which updated and added additional GHG reduction targets. These targets include:

- Reduce 2025 GHG emissions by at least 26% of 2005 levels

² Ingold, John. “Five charts that show where 2020 ranks in Colorado wildfire history.” The Colorado Sun. 2020.

³ Boehmer, Tegan K. et al. 2013. Residential Proximity to Major Highways – United States, 2010. Centers for Disease Control Morbidity and Mortality Weekly Report.

⁴ Boehmer. 2013. Residential Proximity to Major Highways.



- Reduce 2030 GHG emissions by at least 50% of 2005 levels
- Reduce 2035 GHG emissions by at least 65% of 2005 levels
- Reduce 2040 GHG emissions by at least 75% of 2005 levels
- Reduce 2045 GHG emissions by at least 90% of 2005 levels
- Achieve net zero GHG emissions by 2050

In 2020, transportation became the largest contributor to GHG emissions in Colorado. Light duty vehicles are the largest source of emissions within Colorado’s transportation sector (see Figure 1). “Short Light Duty” refers to passenger cars, light trucks, vans, while “Long Light Duty” refers to large passenger cars - mainly pickup trucks, vans, and SUVs.

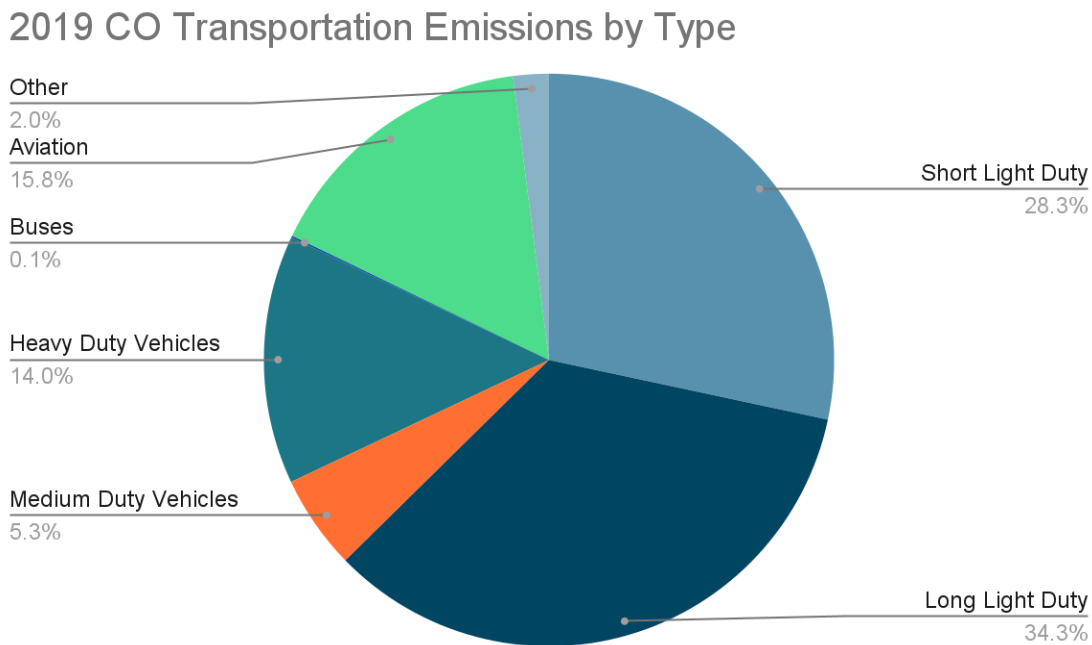


Figure 1 - 2019 transportation emissions by vehicle type in Colorado. Short light duty vehicles represent 28.3% of emissions, long light duty vehicles 34.3%, medium duty vehicles 5.3%, heavy duty vehicles 14%, buses 0.1%, aviation, 15.8%, and other 2%.

Reducing emissions across the transportation sector will require the implementation of projects, programs, policies, and strategies that address each of these sources.

The [Colorado Greenhouse Gas Pollution Reduction Roadmap](#), published in early 2021, identified distinct goals or actions for specific economic sectors to meet the GHG targets of HB19-1261. The Roadmap reports that reducing growth in driving via transportation planning and infrastructure is a critical tool in the state’s battle



against climate change. The subsequent development and implementation of the GHG Transportation Planning Standard turned this recommendation into a requirement and is a key element in Colorado’s strategy for reducing emissions from the transportation sector. The GHG Transportation Planning Standard works alongside several other strategies identified in the Roadmap, including increasing Coloradans’ access to electric vehicles (including trucks and buses), implementing a clean trucking strategy and fleet rules, reducing vehicle miles traveled, developing a Front Range Passenger Rail system, improving land use planning, and creating indirect source rules. As of the fall of 2023, the state of Colorado is currently in the process of updating and developing a new Colorado Greenhouse Gas Pollution Reduction Roadmap, with an updated inventory of emissions and a new set of near-term actions that will guide implementation in the state.

GHG Transportation Planning Standard

Overview

In 2021, the Colorado legislature passed, and Gov. Jared Polis signed Senate Bill 21-260 (SB21-260), a holistic transportation package with a variety of policy provisions intended to make transportation more sustainable, improve equity, and reduce GHG pollution from transportation. SB21-260 made several of the Roadmap recommendations into requirements, including the development of the GHG Transportation Planning Standard. In December 2021, Colorado’s Transportation Commission adopted the GHG Transportation Planning Standard with the goal of improving air quality, reducing smog, and providing more sustainable options for travelers across Colorado. The rule focuses on the connection between public sector-funded transportation projects and vehicle travel; namely that the infrastructure built by agencies, combined with the emissions of vehicles themselves, influences driving patterns and commensurate GHG pollution. The rule governs the role that regional and state governments play in affecting travel through decisions about where and how to build infrastructure.

The GHG Transportation Planning Standard builds on the state’s effort to rapidly deploy electric vehicles by encouraging a future transportation system that improves transit, biking and walking options. While specifically regulating the pollution impacts of transportation projects has not historically been within CDOT’s purview, the establishment of this rule demonstrates the CDOT’s commitment to sustainability and improved capacity to achieve the state’s climate goals.



Notably, all CRP funds used within the state of Colorado are being used or will be used on projects and programs which are part of planning documents that have undergone the plan wide GHG analysis as part of the GHG Pollution Reduction Planning Standard. The GHG Transportation Planning Standard is the key overarching policy which helps ensure that the travel impacts and associated GHG emissions of all the infrastructure built by CDOT and Colorado’s MPOs is headed towards a sector wide decrease in emissions, more transportation options to increase consumer choice, and commensurately a reduction in hours spent sitting in traffic in a single occupancy vehicle (SOV). This approach should reduce vehicle miles traveled (VMT) by creating more transportation options. The GHG Transportation Planning Standard is an essential organizing component of Colorado’s Carbon Reduction Strategy.

Requirements

The rule requires CDOT and the state’s five Metropolitan Planning Organizations (MPOs) to quantify the total GHG emissions expected from their updated transportation plans in 2025, 2030, 2040, and 2050 and show reductions in GHGs over time. The transportation plans must meet set GHG reduction amounts in the compliance years of 2025, 2030, 2040 and 2050 (see Table 1). These reduction levels are achieved relative to the baseline GHG emissions of the MPO’s RTP or CDOT 10 Year Plan adopted as of January 2022. Agencies must use sophisticated travel models, alongside EPA’s Motor Vehicle Emission Simulator (MOVES) model, to make this determination, with each emission reduction target differing for each agency and metro region.



Regional Areas	2025 Reduction Level (MMT)	2030 Reduction Level (MMT)	2040 Reduction Level (MMT)	2050 Reduction Level (MMT)
DRCOG	0.27	0.82	0.63	0.37
NFRMPO	0.04	0.12	0.11	0.07
PPACG	N/A	0.15	0.12	0.07
GVMPO	N/A	0.03	0.02	0.01
PACOG	N/A	0.36	0.30	0.17
CDOT/Non-MPO	0.12	0.36	0.30	0.17
TOTAL	0.43	1.5	1.2	0.7

Table 1 - GHG Transportation Planning Reduction Levels in million metric tons (MMT) of CO₂e.

As specified in the legislative text of SB21-260, the modeling applies to “regionally significant transportation capacity projects”, which are those projects that result in a fundamental change to the way people travel (e.g., new highway lanes). The rule does not apply to state-of-good-repair projects, such as surface treatment overlays or bridge rehabilitation, nor does it apply to the vast majority of rural projects, unless they add significant throughput to the system. Each agency is responsible for modeling the GHG effects of the projects that fall within their boundaries (Figure 2).



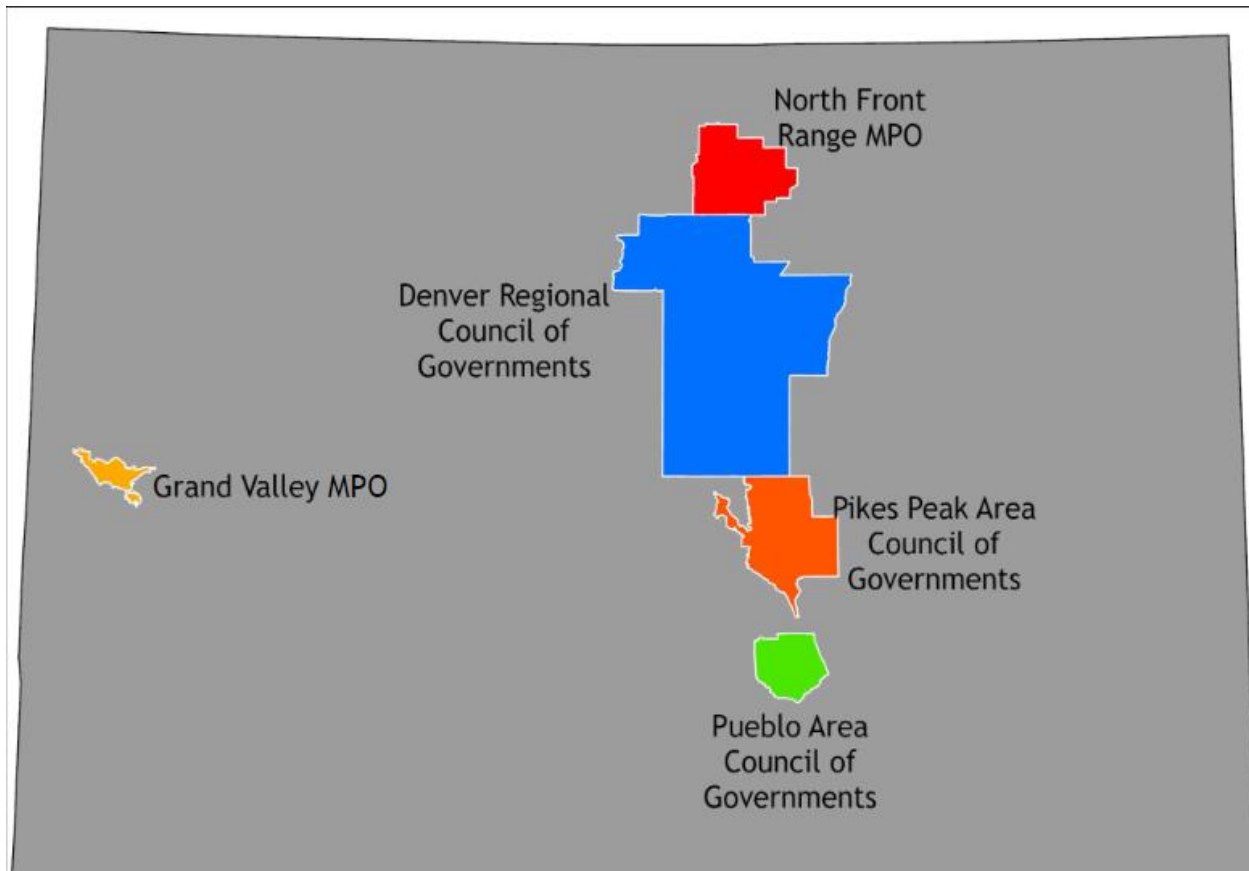


Figure 2 - Agencies only need to model the regionally significant projects that fall within their boundaries. CDOT is responsible for operational emissions from projects outside the MPO boundaries, and MPOs are responsible for operational emissions from

The transportation plans that CDOT must model for compliance include the 10-Year Plan and Four-Year Prioritized Plan. MPOs must model their RTPs and Transportation Improvement Programs (TIPs). If the modeling shows that one of these transportation plans cannot meet the reduction levels in Table 1, agencies can modify their plans to provide more travel choices that have fewer GHG emissions. Agencies may also rely on GHG Mitigation Measures to help them meet the reduction levels through the development of a Mitigation Action Plan. GHG Mitigation Measures are a voluntary component to the Standard and provide a pathway to compliance, but if used require implementation and mandatory reporting to the Transportation Commission. GHG Mitigation Measures are projects and strategies whose GHG and travel benefits cannot be accurately or easily captured in travel demand models. CDOT Policy Directive 1610 outlines the guidelines for selecting, measuring, confirming, verifying, and reporting on GHG Mitigation Measures.



The rule includes compliance and enforcement provisions such that if any agency still is unable to meet the GHG reduction targets, the Colorado Transportation Commission is required to restrict specific funding streams to be used only on projects that reduce GHG emissions. Funding streams implicated by this provision include both federal dollars provided through the Title 23 program - including those allocated directly to the state DOT and those sub-allocated to MPOs - as well as certain state dollars. Specifically, SB21-260 established that state dollars provided to the state and MPOs through the state's Multimodal Transportation and Mitigation Options Fund (MMOF) would be restricted based on compliance with the GHG Transportation Planning Standard.

GHG Targets, Forecasts, and Analysis Methods

Establishing Targets and Key Modeling Parameters

The GHG reduction targets in Table 1 were calculated using CDOT's statewide activity-based model (ABM). ABMs are powerful and flexible tools that support multi-modal planning, helping evaluate the effects on travel behavior of a wide range of characteristics of regions, people, and travel modes. ABMs allow for a more realistic evaluation of transportation planning's effects on air pollutant emissions, transportation equity, safety, traffic congestion, and numerous other outcomes that are key priorities to transportation policy makers. CDOT's statewide model structure has many features that enhance its ability to evaluate the GHG effects of transportation infrastructure and programs:

- It depicts each person individually, including characteristics important to that individual's travel choices. For example, survey data show that, given existing bicycle infrastructure, women are less likely than men to choose to bicycle. CDOT's ABM can examine scenarios in which bicycle infrastructure is more widespread and safer by adjusting the gender-bias constants to depict greater likelihood of women to bicycle if the system is safer.
- It explicitly depicts the choice between work-from-home and work elsewhere, allowing scenarios in which changes in propensity to work from home are affected by planning activities (programs/infrastructure) or by larger changes in society (e.g., COVID effects.)
- It estimates the trips (number, type, etc.) that people make based on the activities they need to accomplish in a day, and the effect of travel conditions on peoples' choice of how best to accomplish those tasks. This means that, for example, under a scenario examining a large highway expansion that reduces



congestion, a person may decide to leave their home in a vehicle, rather than through other transportation modes.

- It depicts the location of households and jobs at the address level rather than at the coarse “zone” level that is common in older models. This is particularly important for modeling active transportation modes. When driving a car, the difference between a 0.5 mile and a 1.5-mile drive is of little importance, but when walking, such a difference is significant to most people. Detailed geographic depiction of the locations of households and jobs therefore is necessary to accurately estimate peoples’ propensity to use active travel modes.

One of the model’s most important capabilities is the ability to examine “induced demand” for travel. Basic economic theory shows that if a “good” is made “cheaper”, people will consume more of it. Therefore, if automobile travel is made cheaper in terms of taking less time to accomplish, people will drive more. Activity-based models such as CDOT’s provide the sensitivities necessary to examine the degree to which this induced demand occurs as a result of a variety of transportation infrastructure enhancements.

CDOT’s ABM was used to develop the “aggressive yet feasible” GHG reduction targets in Table 1 for the GHG Transportation Planning Standard. The targets were developed by imagining a future where three scenarios worked in conjunction to reduce vehicle miles traveled (VMT): enhancement of active modes of transportation, extensions of transit services, and land use pattern changes (development of denser, mixed-used areas).

CDOT’s Compliance Strategy

On September 15, 2022, the Transportation Commission voted to approve CDOT’s newly updated [10 Year Plan](#) and associated [GHG Transportation Report](#), which shows compliance with the GHG reduction levels in the rule as required by October 1, 2022 by the GHG Transportation Planning Standard and SB21-260. The Transportation Commission also voted via resolution to accept the Denver Regional Council of Governments’ (DRCOG) and the North Front Range Metropolitan Planning Organization’s (NFRMPO) GHG Transportation Reports, which also show compliance with the GHG reduction levels in the rule. These three agencies are in compliance with the GHG Transportation Planning Standard. Any applicable planning documents of the Pikes Peak Area Council of Governments (PPACG), Pueblo Area Council of Governments (PACOG), and Grand Valley Metropolitan Planning Organization (GVMPO)



that are adopted or amended following the October 1, 2022 deadline will be subject to complying with the GHG reduction levels in the GHG Transportation Planning Standard.

CDOT used two different methodologies to determine compliance with the GHG Transportation Planning Standard. For the compliance years of 2025 and 2030, compliance is based on analyzing and modeling the 10-Year Plan. For 2040 and 2050 - years for which CDOT has not yet identified transportation projects - a scenario-based analysis was used.

CDOT was able to meet the required 2025 GHG reduction level through updates to the 10 Year Plan. To meet the required GHG reduction levels in 2030, 2040, and 2050, CDOT relies on a combination of GHG Mitigation Measures from a wide variety of categories, including transit, transportation demand management (TDM), operational improvements, changes to the built environment, and heavy-duty fleet electrification. Table 2 summarizes results across all compliance years.

Table 2 - CDOT’s required reduction levels in the GHG Transportation Planning Standard and how many reductions were achieved through modeling versus GHG Mitigation Measures.

GHG Transportation Planning Standard Component	2025	2030	2040	2050
Required GHG Reduction Amount (MMT)	0.12	0.36	0.30	0.17
Reductions Achieved Through Modeling	0.30	0.21	0.06	0.04
Reductions Achieved Through GHG Mitigations	n/a	0.157	0.249	0.135
Total Reductions Achieved	0.30	0.367	0.309	0.175
Compliance Result	Met	Met	Met	Met

CDOT GHG Emissions Analysis and Compliance - 2025 & 2030

CDOT’s Statewide Travel Model was the primary tool used to demonstrate that the GHG reductions required by 2025 and 2030 were met. The capabilities and sophistication of the Travel Demand Model make it a powerful tool to evaluate the effects on travel behavior of a wide range of characteristics of regions, people and travel modes and therefore permit a realistic evaluation of transportation planning’s



effects on air pollutant emissions. The primary output of the Travel Demand Model is the total estimated VMT for a given year. EPA's MOVES model is necessary to translate this VMT into GHG emissions.

To comply with reduction targets in 2025 and 2030, CDOT made several assumptions within the travel demand model to reflect future changes in travel patterns due to the COVID-19 pandemic and increased investments in multimodal funding. These assumptions are as follows:

- Percentage of Coloradans working from home increased from 6.3% to 20%; during the height of the pandemic as many as 45% of Colorado households had shifted some or all work trips to work-from-home due to COVID-19
- Increased amounts of tele-health and tele-university in rural areas due to broadband expansion
- Changes to average bicycling and walking speed to reflect adoption of e-bikes and a greater perception of bicycle/pedestrian safety, comfort, and convenience among some demographic groups that are currently less likely to use active modes of transportation. This contributes to more trips using these modes and are assumed to occur due to extensive investments in bicycle and pedestrian infrastructure

CDOT also relied on multiple GHG Mitigation Measures to achieve additional necessary reductions in 2030, including increased rural transit service, the electrification of transit buses, TDM strategies, operational improvements, and considerations for future changes in land use development. The travel demand model assumptions, alongside GHG Mitigation Measures, allowed for CDOT to hit the near-term reduction targets.

CDOT GHG Emissions Analysis and Compliance - 2040 & 2050

Given that CDOT does not have a specific list of projects to model beyond the scope of the 10 Year Plan, the Department used scenarios in order to determine the type and level of investments (i.e. funding for transit, biking, and walking infrastructure, and estimated amounts of such infrastructure based on unit costs) that future 10 Year Plans would need to include in order to meet the 2040 and 2050 GHG emission reduction levels. CDOT accomplished this by running the Statewide Travel Model and MOVES, similar to the 2025 and 2030 compliance runs, alongside using the Federal Highway Administration's (FHWA) Energy and Emissions Reduction Policy Analysis Tool



(EERPAT) to show the types of investments that would need to be made in future 10 Year Plans to achieve the targets.

The compliance run for 2040 and 2050 also assumed 20% of Colorado workers would be working from home. Given the Colorado Broadband Office’s focus on improving internet access in non-MPO-areas, CDOT assumed that 40% of non-MPO-area university student trips will be eliminated in favor of on-line class attendance, and that a 2% reduction in “personal business” trips will also occur, simulating additional use of tele-medicine and other at-home substitutes for travel. CDOT also adjusted model parameters to simulate the effect of significant investment in bicycle and pedestrian infrastructure. Notably, the highway network included an additional 40 lane miles added in non-MPO areas. GHG Mitigation Measures were also used to reach the 2040 and 2050 targets, including increased rural transit service, the electrification of transit buses, TDM strategies, operational improvements, and considerations for future changes in land use development.

Colorado’s GHG Reduction Plans, Policies, and Funding Mechanisms

While the GHG Transportation Planning Standard plays a key role in decarbonization through transportation planning, it is only one tool in Colorado’s toolbox to address transportation sector emissions. To reduce emissions across the entire transportation sector, Colorado has developed a range of policies, regulations, programs, and funding streams that address each component of the transportation sector: light duty vehicles, medium and heavy-duty vehicles, buses, and aviation. CDOT has also developed strategies for reducing emissions associated with the construction of transportation infrastructure, including the embodied emissions in materials. Through the development of the Roadmap, the state has set the goal to reduce GHG pollution from the transportation sector by 12.7 million tons by 2030, compared to 2005 transportation emission levels. The policies and programs enumerated throughout this section present Colorado’s current plan to hit the 2030 reduction target, but this list is not exhaustive. Colorado is in an ongoing process of refining, updating, and developing additional strategies to cut emissions and decarbonize the transportation sector.



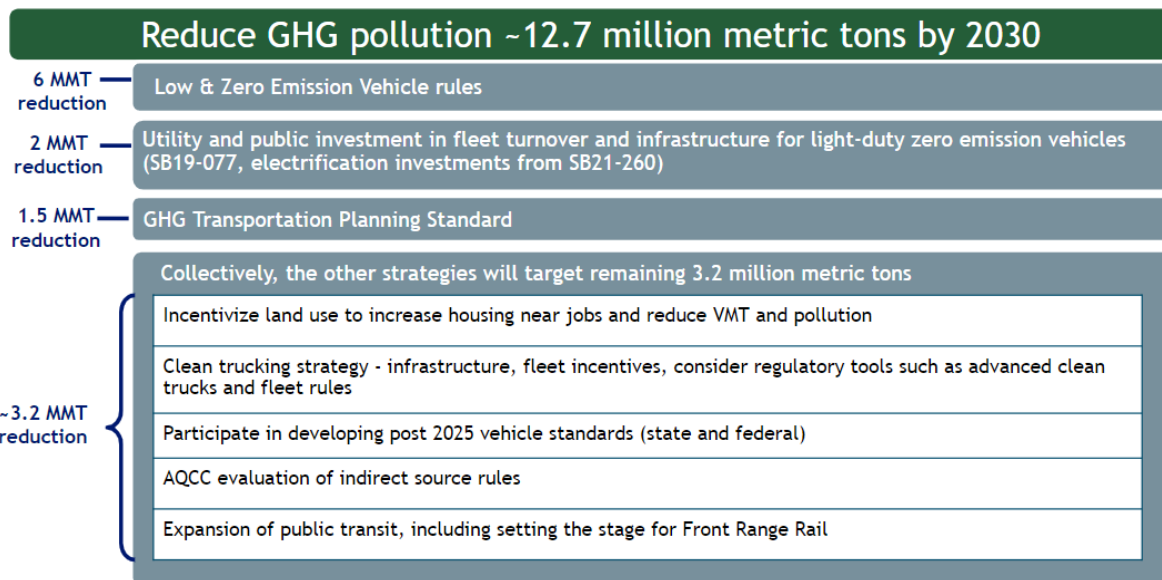


Figure 3 - Summary of Colorado’s current strategy to reduce GHGs 12.7 MMT from the transportation sector by 2030. 6 MMT in GHG reduction will come from low and zero emission vehicle rules, 2 MMT in GHG reduction will come from utility and public investment in fleet turnover and infrastructure for light-duty zero emission vehicles (SB19-077, electrification investments from SB21-260), the GHG Transportation Planning Standard will result in 1.5 MMT in reduction, and approximately 3.2 MMT in reduction from other strategies related to land used, indirect source rule, expansion of public transit, and clean trucking.

Transportation Electrification

Electrifying vehicles is a key component of Colorado’s plan to reduce emissions from transportation. After Governor Polis was elected in 2019, one of his first executive orders ([Executive Order B 2019 002](#)) called for the acceleration of widespread electrification of cars, buses and trucks, and adopted the goal of 940,000 light-duty electric vehicles in Colorado by 2030.

The Colorado Legislature has also been supportive of electrification over the past several years. Notably, [Senate Bill 21-260](#) (Sustainability of the Transportation System) dedicated hundreds of millions of dollars in funding over the next decade to electrify vehicles and give disproportionately impacted communities a larger voice in the transportation planning process. That same year, [Senate Bill 21-230](#) provided \$5 million for the expansion of electric vehicle (EV) charging at state facilities and electrification of the state’s fleets. In 2022, the Legislature passed [Senate Bill 22-193](#), which allocated \$65 million to the new Colorado Electric School Bus Grant Program, while the 2023 legislative session saw the passage of [House Bill 23-1233](#) to eliminate local government and property management association restrictions on EV charger



installations as well as the approval of [House Bill 23-1272](#), which both broadened and extended state tax incentives for the purchase and lease of electric vehicles, electric bikes, and other technologies that support decarbonization.

Further driving the adoption of electric vehicles, the AQCC adopted a Low Emission Vehicle (LEV) Standard in November 2018 and subsequently adopted the Zero Emission Vehicle (ZEV) Standard in August 2019. The LEV regulations apply to model year 2022 and later vehicles, while the ZEV standard applies to model year 2023 and later vehicles; both will allow Colorado to continue improving the sustainability of its transportation system independent of federal government actions. In particular, the ZEV Standards will incentivize automobile manufacturers to make a greater number and variety of clean vehicles available to Colorado consumers and establish a process for tracking and increasing the percentage of ZEVs on the road in the years to come. In October 2023, the AQCC voted to adopt the Colorado Clean Cars standard, which directs vehicle manufacturers to make and sell more electric vehicles, starting with model year 2027. Electric vehicles are defined as zero-emission vehicles, including battery-electric, plug-in hybrid electric, and fuel cell electric vehicles. By model year 2032, the Colorado Clean Cars standard will direct vehicle manufacturers to sell 82% electric vehicles, and also requires new conventional cars and passenger trucks to produce less air pollution.

An emerging focus area for CDOT and its state agency partners is working to reduce emissions from medium- and heavy-duty (M/HD) vehicles. Currently, nearly all freight transportation runs on oil and gas - if we continue with business as usual, freight will become the highest emitting sector globally by 2050. Medium- and heavy-duty vehicles (classes 2b-8) comprise only 9% of all vehicles on the road in the United States, but create 22% of GHG emissions, making them an opportunistic sector in which to reduce emissions. Through the development of the Clean Truck Strategy and Transit ZEV Roadmap and the establishment of new funding resources from the Clean Fleet Enterprise and Clean Transit Enterprise, Colorado is well-positioned to rapidly transition larger, more specialized vehicles to lower and zero emission options in the years ahead. The Air Quality Control Commission's passage of the Advanced Clean Trucks (ACT) rule in April 2023 will further this effort by requiring manufacturers to sell an increasing percentage of M/HD ZEVs in Colorado starting in model year 2027.

Colorado's key plans and policies that CDOT is using to support electrification of the transportation system are listed below. Some policies are well underway while others are just getting started. In an attempt to illustrate CDOT's vision for the future, strategies that are currently in the early planning phase are also included.



Colorado's Electrification Plans and Policies

Colorado Electric Vehicle Plan (2023): The third version of the Colorado EV Plan was released in March 2023 and establishes bold goals for zero emission vehicle adoption statewide. Targets carried over from the previous version in 2020 include the deployment of at least 940,000 light-duty EVs and at least 1,000 transit vehicles by 2030, the full electrification of the light-duty fleet by 2050, and a 100% zero-emission medium- and heavy-duty fleet by 2050. As in previous versions, the plan identifies a number of strategies designed to increase consumer awareness, ensure user equity, and continue to build the necessary charging and fueling infrastructure to support widespread adoption. The 2023 Colorado EV Plan also includes a greater emphasis on non-automotive EVs, such as e-bikes and e-scooters, as well as cross-cutting initiatives focused on equity and engagement, zero-emission vehicle workforce development, and data tracking and reporting. CDOT's role in the implementation of the plan, particularly in relation to transit fleet electrification, workforce development, and collaboration with the freight and delivery sector, will be critical for its success.

Regional Electric Vehicle Plan for the West (REV West) Memorandum of Understanding (MOU): In 2017, the REV West memorandum of understanding was signed by the Governors of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming with the goal of aligning each state's EV plans, policies, and investments to allow for seamless travel across the Intermountain West region. Since then, the group has completed a baseline report on existing policies and infrastructure, developed voluntary minimum standards for EV stations funded with state dollars, and coordinated corridor build-out efforts to connect the member states to one another and neighboring regions. Through the 2019 update of the MOU, the signatory states committed to educating consumers and fleet owners about electric vehicles, coordinating on electric vehicle charging station locations, and encouraging manufacturers to stock and market a wide array of EVs. Since the passage of the Infrastructure Investment & Jobs Act (2021) and Inflation Reduction Act (2022), REV West has also served as a forum for collaborative National Electric Vehicle Infrastructure (NEVI) planning and for providing regional feedback to federal agencies on the unique challenges and opportunities for implementation in the region. REV West has attracted national attention as a model for interstate collaboration, resulting in the creation of similar partnerships in other US regions.

Volkswagen Settlement Beneficiary Mitigation Plan (BMP) (2019): Colorado's Volkswagen Settlement BMP identifies how the state will prioritize and award its \$68.7 million allocation of the national trust fund established in response to the



Volkswagen diesel emissions cheating scandal. It also outlines the specific project eligibility designed to maximize the impact of these dollars on the state's sustainable transportation infrastructure. As of August 2023, the State of Colorado has directed these funds to five eligible mitigation actions:

- EV charging equipment (\$10.3 million)
- Transit bus replacements (\$30.8 million)
- M/HD vehicle replacements (\$21.5 million)
- Diesel Emissions Reduction Act (DERA) Program (\$1.5 million)
- Administrative costs (\$5.4 million)

Following a 2019 revision directed by Executive Order 2019-002, all remaining funds will be focused exclusively on electric and renewable natural gas (RNG) vehicles. CDOT has direct responsibility for the allocation of \$30,896,666 in Settlement Program transit bus replacement grants, and as of August 2023, \$14 million has been awarded for the purchase of 30 vehicles across 9 transit agencies statewide.

FHWA Alternative Fuel Corridor Designations (2016-2023): Under the Fixing America's Surface Transportation (FAST) Act, FHWA solicited nominations from the states for national alternative fuel corridor designations starting in 2016 and followed each subsequent year with a call for updates. Each year since then, CDOT has worked with state and local partners to develop a packet of nominations. Thus far, FHWA has awarded designations for the entirety of I-25, I-70, and I-76 for all five possible fuel types (electric, compressed natural gas, liquified natural gas, propane, and hydrogen). Electric vehicle designations have been granted for sections of US 36, US 40, and US 160, and the entirety of I-270, US 34, US 50, US 285, US 287, US 385, and US 550. In 2023, CDOT nominated the entirety of I-225 and sections of US 24, US 40, and SH 82 for designation as electric vehicle charging corridors. Section 11401 of the Infrastructure Investment and Jobs Act (passed September 2021) created the National Electric Vehicle Infrastructure (NEVI) Formula Program, which provides \$5 billion to build out the national charging network. This funding is initially directed toward designated alternative fuel corridors, and Colorado will receive approximately \$56.5 million over a 5-year period.

EV Equity Study: EVs offer a number of benefits to their users, but these benefits are not shared equally across demographic groups and geographic areas of the state. This study, which was led by the Colorado Energy Office (CEO) and completed in early 2022, accomplished the following:



- defined EV equity and EV equity communities
- provided a summary of local, state, and federal agencies, as well as other private and non-profit organizations involved in equity work with a focus on transportation
- developed thorough summaries of the types of policies and programs that have already been developed to improve EV equity
- completed a detailed analysis of high emitter vehicle replacement programs and a recommendation for how Colorado could implement such a program
- developed mapping overlays for electrified transportation equity indicators in Colorado
- prepared an EV equity toolkit and recommendations

Since completion, staff from CEO, CDOT, and the Colorado Department of Public Health & Environment (CDPHE), and other partner agencies have worked to incorporate tools and recommendations of the study into new and existing grant programs and resources to better support the goal of EV equity across the state.

Colorado Low-Carbon Hydrogen Roadmap: Fuel cell electric vehicles (FCEVs) offer the potential to significantly increase the fueling speed, range, and variety of electric vehicles available to fleets and individuals (particularly for heavy-duty vehicles with long range needs) while still producing zero tailpipe emissions (and, if fueled by green hydrogen, zero emissions overall). However, the market for both hydrogen fuel production and vehicles is still nascent in Colorado and a coordinated effort between the public and private sectors is likely necessary for it to take hold. CEO commissioned Energy & Environmental Economics (E3) to develop a Low-Carbon Hydrogen Roadmap, which identifies opportunities, barriers and recommended actions for the deployment of hydrogen in the state over the next 15-year period. In order to overcome current barriers and incentivize the deployment of hydrogen, the roadmap identified several recommended actions:

- Develop a state hydrogen plan
- Investigate regional hydrogen hubs
- Develop pilot projects in the electricity generation sector
- Develop pilot projects in the gas distribution sector
- Issue a Request for Information (RFI) to potential Colorado hydrogen market participants, which would assess the feasibility of developing pilots and/or geographically based hydrogen hubs in the state based on the interest and information received



In February 2022, to pursue these opportunities further, the states of Colorado, New Mexico, Utah, and Wyoming signed an MOU to coordinate, develop, and manage a regional clean hydrogen hub - the Western Inter-States Hydrogen Hub (WISHH). WISHH will work to compete for a portion of the \$8 billion allocated in the 2021 Infrastructure Investment and Jobs Act towards four or more regional hydrogen hubs.

Colorado Clean Truck Strategy: In July 2020, Colorado Governor Jared Polis signed a memorandum of understanding (MOU) along with the governors of California, Connecticut, Washington D.C., Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington to work collaboratively to advance the market for electric trucks and buses. Through this MOU, the agencies committed to collaborating on a balanced approach to clean trucking. Together, CDOT, CEO, and CDPHE initiated a Clean Truck Strategy process in the fall of 2020 to engage with a variety of stakeholders, solicit public input on how to address the challenge, and identify appropriate strategies for achieving the state's M/HD electrification goals. The final draft was released in May 2022 and included 35 individual action items for the state to pursue moving forward. One action identified by the Clean Truck Strategy was a rulemaking on the Advanced Clean Trucks and Low NOx Omnibus rules in Colorado, a measure subsequently adopted by the AQCC in April 2023. These regulations will take effect starting with model year 2027 vehicles.

Medium and Heavy Duty Vehicle Study: This [study](#) provides an overview of the national landscape of M/HD vehicles, Colorado-specific considerations, opportunities for state policy support, how to lower cost and speed up deployment, and modeling takeaways and implications. As the state begins to develop a detailed plan for M/HD ZEV deployment, it will be critical for the state to work with a wide variety of stakeholders to determine a suite of policies that will lead to meaningful emissions reductions. A series of three public meetings took place in November 2021 in order to continue soliciting public feedback. The Clean Truck Strategy, which provides a comprehensive roadmap for state agencies and partners to support a successful transition to zero-emission medium- and heavy-duty vehicles, was published in 2022.

Advanced Clean Trucks Rule: In 2020, the California Air Resources Board passed an Advanced Clean Trucks rule, which requires vehicle manufacturers to sell an increasing percentage of zero-emission trucks between 2024 and 2030 and requires fleet owners of a certain size to track and report their purchase and use of such vehicles. According to the rule, 50% of Class 4-8 straight truck sales and 15% of all other truck sales need to be zero-emission by 2030 to avoid penalties. Partial credits



may be received for plug-in hybrid vehicles with a minimum battery range of 75 miles. The State of Colorado [adopted this rule](#) in April, 2023, under Section 177 of the Federal Clean Air Act.

Colorado Transit Zero-Emission Vehicle Roadmap (2021): In 2021, CDOT worked with local transit agencies, stakeholders, and other state agencies to develop a statewide plan to transition 1,000 of Colorado’s transit vehicles to zero-emissions vehicles by 2030 and 100% of the fleet to ZEVs by 2050. The resulting Roadmap describes the current state and national landscape for transit ZEVs and identifies the technical, institutional, and financial barriers to rapid implementation. The Roadmap lays out 38 implementation strategies to overcome these barriers and establishes a foundation for future ZEV investments via the Clean Transit Enterprise and other state and federal funding sources.

Clean Transit Enterprise: SB21-260 created the Clean Transit Enterprise within CDOT to support public transit electrification planning efforts, facility upgrades, fleet motor vehicle replacement, as well as construction and development of electric motor vehicle charging and fueling infrastructure. The bill allows the enterprise to impose a clean transit retail delivery fee to fund its operations, which will result in a total of approximately \$134 million in revenue by FY2032 that can be used to issue grants, loans or rebates to support the electrification of public transit.

Fuels Impact Enterprise: SB23-280 created the Fuels Impact Enterprise to administer programs and impose fees that are related to the transportation of fuel within the State. The Enterprise imposes a new fuels impact reduction fee on fuel product manufacturers to fund the fuels impact reduction grant program. The fee is equal to \$0.006125 per gallon of fuel products delivered during the previous calendar month for sale or use in Colorado. The fee is collected and deposited in the fuels impact enterprise hazardous materials infrastructure cash fund until the fund has an available balance of \$15 million or more. The fuels impact enterprise provides grants to certain critically impacted communities, governments, and transportation corridors for the improvement of hazardous mitigation corridors and to support key commercial freight corridors, local and state government projects related to emergency responses, environmental mitigation, or projects related to the transportation of fuel within the state.

Colorado Freight Plan: The Colorado Freight Plan looks at the state’s freight network as a whole and identifies opportunities to improve efficiency and resiliency in the system. The freight plan focuses on infrastructure investment opportunities to



improve safety, mobility, and efficiency. Improving routing efficiency can reduce Commercial Motor Vehicle detours miles significantly and eliminate congestion bottlenecks. The freight plan also overlaps with planning efforts on medium and heavy-duty electrification and truck parking opportunities, hybrid refrigerated trailers, and alternative fuel and energy source infrastructure. The freight plan is also looking at strategies to reduce the impacts of the industry on disproportionately impacted communities.

Scenic Byways: In an effort to promote sustainable travel across the state, the Colorado Tourism Office, CEO, CDOT, Department of Local Affairs (DOLA) and other agencies are working together to make traveling Colorado’s scenic byways in an electric vehicle (EV) as convenient as in a conventional vehicle. This entails installing a sufficient supply of charging infrastructure, with dual-port DC fast charging stations at least every 100 miles within the start and terminus of the byways. When byways are less than 100 miles, a dual-port fast charging station must be available within 15 miles of the start or terminus of the byway. As of May 2023, the Colorado Scenic and Historic Byways Commission has recognized 13 of the 26 Colorado Scenic & Historic Byways as Colorado Electric Byways.

See Appendix A3 for funding mechanisms and opportunities directed towards zero emission vehicles.

Transit and Rail

Increasing transit options is critical to reducing VMT, and in turn, GHG emissions. Public transportation (such as bus and rail) generates only a third of the emissions of urban and suburban driving per person-trip.⁵ Although public transportation options have historically been limited outside of urban centers, Colorado is increasingly providing new options for residents to travel from Denver and the Front Range to other parts of the state.

Improving Coloradans’ access to public transit will not only reduce GHG emissions but provide a more financially viable option for many of the state’s lower income communities. Between 2018 and 2019, Denver-area households spent more than 16% of their income on transportation. In less populated areas of the state, that number is

⁵ Madsen, Travis; Frommer, Matt; Geller, Howard. [Colorado Pathways to Reducing Carbon Pollution from the Transportation Sector](#). 2020.



significantly higher.⁶ For example, moderate income residents of Larimer County spent about 25% of their income on transportation in 2017.⁷

Since the launch of Bustang in 2015, Outrider in 2018, Snowstang in 2019, and Pegasus in 2022, the ridership on Colorado’s state-owned and operated interregional bus system has increased by more than 300 percent. Bustang brings passengers from Denver to Colorado Springs, Fort Collins and Glenwood Springs, and CDOT provides several funding opportunities to help local transit agencies expand service and electrify their fleets. Outrider operates primarily in more rural parts of the state. Snowstang, a bus service that provides travel from Denver to Loveland Ski Area, Arapahoe Basin, Steamboat Resort, and Howelsen Hill (Steamboat Springs), is another option to reduce emissions associated with recreational ski travel.

CDOT has set aside \$170 million in the 10-Year Plan to support Bus Rapid Transit (BRT) projects on major arterials in the Denver metropolitan region. CDOT is currently developing projects on Federal Boulevard, Colorado Boulevard, and East Colfax Avenue in collaboration with local partners, DRCOG, and RTD. Additionally, CDOT is working with partners in northern Colorado on the CO 119 BRT project between Boulder and Longmont, and on preliminary projects supporting transit enhancements and an eventual BRT service on CO 7.

CDOT will be conducting Town Halls and Stakeholder Summits across the state in fall/winter 2023 to gather information that will be used to inform updates to the required Federal Transit Administration (FTA) Intercity and Regional Bus Plan, statewide Bicycle/Pedestrian interconnectivity plan, statewide Transportation Demand Management plan and to develop a comprehensive new state transit plan. In addition, CDOT will continue to support and advance efforts on the Front Range Passenger Rail project in coordination with the Front Range Passenger Rail District and are exploring passenger rail opportunities in other parts of the state, including mountain rail service from Denver to Steamboat, Craig, and Hayden.

Colorado Transit Plans and Policies

Statewide Transit Plan: Every four to five years, CDOT, in coordination with urban and rural regional planning partners, updates the Statewide Transit Plan. The Statewide Transit Plan is an element of the State’s larger Statewide Transportation

⁶ [Consumer Expenditures for the Denver Metropolitan Area: 2018-19](#). U.S. Bureau of Labor Statistics. 2020.

⁷ [Quality of Life - Cost of Housing + Transportation as % of Income](#). Larimer County. 2017.



Plan and establishes the framework for creating an integrated statewide transit system that meets the mobility needs of Coloradans. The plan summarizes the current state of transit services across Colorado, identifies the demographic, economic, and social trends impacting transit needs and gaps, and documents and prioritizes the investments needed to meet existing and future transit demand. The 2045 Statewide Transit Plan was published in June 2020.

Mobility Hubs: As identified in the 2020 Statewide Transit Plan, mobility hubs are a key component of the state’s plan to increase access to transportation and carpooling. Sometimes walking to a bus stop or train station is the most cumbersome part of a trip. CDOT is resolving this issue with the development of mobility hubs, which create a shared space for all modes of travel, ensuring first/last mile connections. The amenities provided in any given mobility hub vary based on the land uses around it. Efforts to provide better connectivity to existing services, like Bustang and Bustang Outrider, are underway and being planned along I-25 and I-70. As part of the development of these new hubs, CDOT plans to improve bus stop and transit center amenities with the goal of making these locations well-lit, wheelchair accessible, and protected from the elements.

State Rail Plan: Colorado’s rail system is a critical component of our multimodal transportation system. The Plan’s goals include providing greater mobility and connectivity options and advancing environmental quality. It identifies proposed freight and passenger rail improvements and investments in concert with industry stakeholders. Among its new initiatives is developing feasible alternatives for Mountain Rail. Introducing a new transportation system for Northwest Colorado improves mobility options in addition to advancing a just transition for the region.

Front Range Passenger Rail: For several decades, Colorado communities have discussed the concept of a Front Range passenger rail system as a means of improving connectivity between Colorado’s fastest-growing urban areas and increasing travel choices along the I-25 corridor. In 2017, the Southwest Chief and Front Range Passenger Rail Commission was formed to facilitate the development of such a system, and in 2021, Senate Bill 21-238 created a Front Range Passenger Rail District with the purpose of planning, developing and constructing the rail system. The 180-mile corridor has the potential to make a lasting impact on both travel choice and future land use and development patterns across Colorado.

See Appendix A4 for funding mechanisms and opportunities directed towards transit projects.



Active Transportation

Active transportation is any human-powered mode of transportation, such as walking or biking. Not only are these modes zero-emission - they're good for human health. Although public transit and active transportation are often viewed independently, there is a strong correlation between them. Studies show a higher level of physical activity among public transportation riders, likely because every trip on public transportation is multimodal.

The benefits of active transportation are well-known; however, many people don't achieve them due to fear that it isn't safe, either in their own neighborhood or near their destination. Safe and convenient opportunities to walk, bike and scooter expand the transportation network of people without access to cars.

Several CDOT efforts are improving access to and safety of active transportation in Colorado. For example, the Revitalizing Main Streets grant program, which provides funding for small multimodal and economic resiliency projects, helps to encourage active transportation and improve safety.

Colorado Active Transportation Plans and Policies

Statewide Bicycle & Pedestrian Plan: This document was developed in 2012 and subsequently updated in 2015 in conjunction with the 2040 Statewide Transportation Plan development process. It focused on improving cycling and pedestrian infrastructure and programs across Colorado via the development of specific performance measures and investment decision criteria. Among the benefits of bicycle and pedestrian investments identified by the plan were enhanced multimodal efficiency and reduced carbon-based VMT. The most recent plan was incorporated into the 2045 Statewide Transportation Plan, as it used a broader multimodal approach than previous plans.

CDOT plans to update the Bicycle and Pedestrian Plan for Colorado, as well as funding and implementing network connectivity improvements along major arterial roadways.

Key elements of this action involve: updating the Statewide Bicycle and Pedestrian Plan, better integrating the Bicycle and Pedestrian Plan into the overall Statewide Transportation Plan, updating the Colorado Downtown Streets Guidebook, and improving statewide data on bicycle and pedestrian facilities in order to identify existing gaps in bicycle and pedestrian networks.



CDOT will also focus on funding and implementing local and regional bicycle and pedestrian priorities, with a particular focus on implementing network connectivity improvements on major arterial roadways. These roadways often have higher rates of pedestrian and bicyclist injuries and fatalities, and several are also planned for bus rapid transit and other transit improvements in the coming years. Ensuring safe access for bicyclists and pedestrians will be critical for ensuring the success of transit on these routes, in addition to increasing the use of walking and biking for transportation more broadly.

See Appendix A5 for funding mechanisms and opportunities directed towards active transportation projects.

Transportation Demand Management

TDM is the use of strategies and policies that encourage people to take alternative modes of transportation and reduce their number of trips in single occupancy vehicles - leading to improved mobility, reduced congestion, and lower emissions from vehicles. The Colorado Greenhouse Gas Pollution Reduction Roadmap identifies both TDM and the promotion of teleworking practices as key near-term actions required to reduce emissions from the transportation sector and meet the state's 2025 and 2030 climate targets.

Colorado's Transportation Management Organizations (TMOs) and Associations (TMAs) are at the forefront of TDM implementation in the state. TDM activities are also conducted by Metropolitan Planning Organizations and transit providers.

Colorado TDM Plans and Policies

CanDo Community Telework Program: Local communities can play a vital role in promoting work practices and standards that encourage employees to work from home. The CanDo Community Telework Program was developed by CDOT and other state agencies during the COVID-19 pandemic to support communities in the creation of innovative TDM programs. The Community Telework program became the basis for the CDOT's TDM Innovation grants, which expanded the scope beyond just telework to address the emerging gaps in travel and transportation demand management practices that were highlighted in the wake of the pandemic.

Strategic TDM Grant Program: In 2021, CDOT's Office of Innovative Mobility developed a Strategic TDM Grant Program to support communities and organizations across the state in developing creative and high-impact projects and programs that



reshape commutes, expand travel alternatives, and offer Coloradans more flexibility and choice around how they travel. Through this grant program, CDOT is supporting the 10 existing TMOs in the state in expanding their outreach efforts, along with providing seed funding to establish three new TMOs in areas of the state that currently do not have a TMO resource - Glenwood Springs, Fort Collins and the US34 corridor. The program has also funded 20 innovative TDM project ideas across the state ranging from trailhead shuttles that ease traffic congestion in popular recreation destinations to the development of model TDM ordinances for communities.

Statewide TDM Plan: This document was developed over two phases between 2015 and 2019 and identifies strategies for mitigating congestion in the statewide transportation system. Phase I created an inventory of existing TDM programs across Colorado and categorized them by type, while Phase II identified gaps and opportunity areas while making recommendations on the implementation of future TDM programs and projects. CDOT continues to encourage integration of TDM measures into projects and will be creating a TDM toolkit to assist with deployment of TDM strategies.

CDOT Policy Directive 1601: The purpose of this Policy Directive is to establish fair and consistent procedures regarding the review and evaluation of requests for new interchanges and major improvements to existing interchanges on the state highway system. Applications for new interchanges must implement TDM strategies, with a goal of reducing average daily traffic (ADT) by 3% or greater in MPO boundary areas and 1% or greater ADT reduction outside MPO boundaries. This TDM requirement is intended to implement appropriate TDM strategies that preserve the functionality of interchanges on state highways in order to maximize the benefit created by new infrastructure investments. These TDM strategies will reduce vehicle miles traveled, highway congestion, and subsequent GHG emissions.

See Appendix A6 for funding mechanisms and opportunities directed towards TDM projects.

Emerging Mobility and Business Models

The technology involved in transportation is constantly evolving, and so are transportation strategies and business models. The State of Colorado has taken a proactive approach to determining what these might be by enacting legislation and conducting studies that pave the way for innovation in our transportation system. CDOT's Office of Innovative Mobility (OIM) specifically focuses on planning and



funding forward-thinking efforts that reduce GHG emissions and VMT. For example, OIM is currently developing an e-bike safety campaign to distribute safety information to riders ahead of the surge of e-bikes on Colorado roadways.

Below are studies and legislation that enable innovation in our transportation and help to ensure that the players responsible for GHG emissions and diminished air quality contribute their fair share in reversing these trends.

Colorado Mobility Plans and Policies

Mobility Choice Blueprint Study (2019): CDOT, DRCOG, the Regional Transportation District (RTD), and the Denver Metro Chamber of Commerce collaborated on this study to develop a joint vision and coordination process for the planning and deployment of mobility technologies in the Denver Metro Area. The [study](#) identified 34 distinct tactical actions for the partner agencies to pursue in support of improved quality of life and economic vitality between 2020 and 2030. Since the completion of the study, the collaboration has established a new [Advanced Mobility Partnership \(AMP\)](#) to ensure ongoing collaboration and a forum for developing new tactical actions moving forward.

SB 19-239 Emerging Mobility Impact Study (2019): This document was the result of the SB19-239 stakeholder process directed by the Colorado State Legislature and managed by CDOT and its partners. The report compiled existing data, research, and best practices related to emerging transportation systems and business models, summarized the input of stakeholders and interested parties, and identified key recommendations for mitigating the negative impacts of these services. CDOT reported the results of this effort to the State Legislature in early 2020, and some recommendations from the study were subsequently adopted as elements of SB21-260. New and innovative business models identified by the report include transportation network companies (TNCs), peer-to-peer carshare, business-run carshare, taxis, rental cars, and residential delivery services. Although most of the carshare opportunities that exist today are operated by a carshare company, peer-to-peer (P2P) vehicles (which are typically privately owned or leased with the sharing system operated by a third-party) provide another option for carsharing.

Land Use and Air Quality

Although air quality is healthy in many parts of the state, the Denver Metro Area has been in violation of EPA air quality standards for many years. Denver's location at the



foot of the Rocky Mountains makes it prone to temperature inversions in which warm air traps cooler air near the ground, preventing pollutants from rising into the atmosphere. Through much of the 1970s and early 1980s, there was a visible “brown cloud” of pollution hanging over the city. Since 1995, many pollutants in Denver’s air have been drastically reduced, leaving the Denver Metro Area only in violation of ozone standards. However, ozone pollution is still a serious problem, and state agencies (in collaboration with Metropolitan Planning Organizations and local governments) are working hard to improve air quality in the nonattainment area.

Land use, or how humans choose to develop the built environment, has a significant impact on transportation patterns and air quality. The arrangement of streets, public transportation infrastructure, and types of buildings all influence a city’s GHG emissions. Although the remnants of historic land use decisions have an impact on how our cities are built, today, how jurisdictions plan for future growth provides an opportunity to influence VMT and GHG emissions. Rising housing costs also play a role in determining how far people live from where they work and spend their free time.

CDOT is increasingly recognizing that transportation decisions can influence land-use planning decisions made at local and regional levels. Designing communities with Complete Streets that allow for and encourage biking, walking, transit, and other low-carbon modes of transportation will decrease emissions. Encouraging dense development and discouraging sprawl can occur through several means, including a “fix-it-first” funding approach that prioritizes the maintenance of existing facilities, as well as investment in facilities and multimodal infrastructure that serve infill development and Transit-Oriented Development (TOD) over expansion and sprawl.

In order to explore opportunities in the land use space, a Land Use Planner and Analyst was brought on staff at CDOT in 2021 with a goal of encouraging CDOT investment in transportation decisions that reduce GHG emissions and VMT from land use patterns.

Below are plans, policies and funding mechanisms that CDOT employs to influence land use decisions around the state. As the State of Colorado is only beginning to understand its role in the land use space, it is likely that transportation’s interactions with land use will play a growing role in CDOT’s future plans and policies.

Colorado Air Quality and Land Use Plans and Policies

Air Quality Action Plan: The purpose of CDOT’s Air Quality Action Plan is to document CDOT’s efforts to reduce air pollution from the transportation sector. The plan



describes three performance measures that CDOT reports on each year to determine if the cumulative impact of its activities might be improving air quality. These include:

- Statewide motor vehicle criteria pollutant and GHG emissions
- Statewide on-road gasoline consumption
- Statewide GHG tailpipe emissions (uses a different calculation method than measured in the first bullet)

To reduce ozone from the transportation sector, the state has introduced a vehicle inspection and maintenance program in the North Front Range, more stringent inspection and maintenance cut-points in the Denver area, and tighter emissions requirements for older collector vehicles.

Collaboration with Local Governments on Transit-Oriented Development: CDOT has partnered with many local governments on federal grants to plan and implement TOD. CDOT's "mobility hub" and Bus Rapid Transit projects are at the core of this effort to boost multimodal networks around the state and work with local governments to develop TOD around those stations and corridors.

Greenhouse Gas Pollution Reduction Standard: This GHG policy recognizes that incentivizing positive land use patterns offers an opportunity to mitigate GHG emissions. Thus, an option on the GHG mitigation measure menu was for CDOT and MPOs to incentivize local governments to increase zoning density in locations that qualify as "infill" or transit-oriented development. Both CDOT and DRCOG have utilized this option in their Mitigation Action Plans.

1601 Interchange Policy: As part of CDOT's policy regulating new interchanges on highways, CDOT requires a certain amount of TDM strategies. Two options on the TDM strategy menu are mixed-use development and transit-oriented development. This offers credit to those local governments that are implementing positive land use patterns.

Grant Opportunities: CDOT has incorporated land use criteria into several grant programs, including the Revitalizing Main Streets Program and the Transportation Alternatives Program. Additionally, CDOT has partnered with the Colorado Department of Local Affairs (DOLA) and Colorado Energy Office (CEO) on the Strong Communities Program, which funds transportation and other infrastructure projects that boost housing in infill locations and transit-oriented development.



See Appendix A7 for funding mechanisms and opportunities directed towards air quality funding opportunities.

Aviation

The aviation industry is responsible for only about 2.5% of global CO₂ emissions. However, expected increases in aviation activity worldwide and growing travel demand could cause that share to increase significantly - unless action is taken to address the industry's GHG emissions.

Recognizing aviation's forecasted growth in activity and emissions, the industry is taking significant steps towards reducing its impact globally. Refinements to aircraft and powerplant design, and extensive progress on new propulsive technologies (including sustainable aviation fuels (SAF) and new battery-electric, hybrid and hydrogen fuel cell-powered aircraft) have the potential to facilitate the aviation sector's growth while making progress towards the industry's goal of being carbon neutral by 2050.

The mission of CDOT's Division of Aeronautics is to support airports and aviation as part of Colorado's multimodal transportation system while also promoting aviation education and safety. In accomplishing this mission, the Division has consistently been a nationally innovative and pioneering leader in aviation development. The Colorado Aeronautical Board (CAB) and Division are committed to making the state's aviation system as efficient, accessible and environmentally responsible as possible.

Although the aviation industry is just beginning to attempt to reduce GHG emissions, CDOT's Division of Aeronautics is already laying the groundwork for improving sustainability in our skies.

Colorado Aviation Plans and Opportunities

Alternatively Powered Aircraft Airport Infrastructure Study: In January 2023, the CAB approved \$400,000 of funding for an alternatively powered aircraft airport infrastructure study. This study will report on emerging new aviation propulsive technologies and aircraft, as well as the benefits these aircraft will provide for cleaner, more efficient and more accessible aviation mobility statewide. The results will also show how the Division can support our system of 66 publicly owned airports to be ready for these aircraft when they enter service in the next 10 years.



In February 2023, following a complicated procurement process, the Division entered into an agreement with the National Renewable Energy Laboratory (NREL) to conduct this study, which is now underway. Specifically, this effort will:

- Review and summarize existing research and case studies on alternatively powered aircraft (fixed wing, non-eVTOL) and related airport infrastructure needs.
- Quantify the current state and development timeline of alternatively powered regional air mobility (RAM) and general aviation (GA) training aircraft.
- Analyze Colorado’s intrastate travel patterns and demand and identify Colorado airports likely to support regional air mobility aircraft.
- Analyze and identify Colorado airports likely to support battery-electric GA training aircraft.
- Identify baseline airport infrastructure needs to support alternatively powered aircraft technology at identified airports serving both RAM and general aviation flight training
- For identified airports, develop a high-level inventory of existing electrical utility service and capacity, and compare to baseline needs. Compare existing conditions and develop high level per-airport costs to develop projected necessary infrastructure needs and potential funding sources.
- Identify at a high level the federal and state policies and funding mechanisms that will need to be evaluated to facilitate the development of this infrastructure.

The study is being coordinated with a study committee that consists of representatives from industry, utilities, aircraft manufacturers, airports and other state agencies. The final study report is expected to be completed in late 2024.

Construction

Construction contributes to climate change and environmental degradation in many ways, through both building practices and material choice. For example, cement (an ingredient in concrete) is responsible for an estimated 7% of global CO2 emissions. As a result, the construction industry is grappling with how to improve sustainability.

In order to build and maintain Colorado’s roads, bridges, and tunnels, CDOT purchases large quantities of building materials. As CDOT continues to reduce GHG emissions from its projects, new requirements for building practices and the purchase of materials will be critical. A small selection of fully electric construction vehicles are



now available for use, and building materials are getting greener by the day. The benefits of these innovations in construction will not come passively; in order to achieve them, CDOT will need to make intentionally greener choices going forward.

However, awarding projects to contractors that already have the capacity to make use of more sustainable (and potentially more expensive) building materials and equipment may have the unintended consequence of excluding smaller, less established businesses. In all of CDOT's projects, environmental sustainability should not be valued over equity; rather, sustainability and equity should be regarded with similar importance, and both should be considered during implementation.

Colorado Construction Plans and Policies

House Bill 21-1303: The “Buy Clean Colorado Act” directs CDOT to establish policies that reduce GHG emissions over time by accounting for and limiting the global warming potential (GWP) of key construction materials in state-funded building and transportation projects. The eligible construction materials include asphalt and asphalt mixtures, cement and concrete mixtures, and steel. CDOT must collect Environmental Product Declarations, which provide quantified environmental data using predetermined parameters and is third-party verified. By January 1, 2025, CDOT must establish a policy with GWP limits for each eligible material. The goal of HB 21-1303 is to encourage manufacturers of construction projects to reduce their GHG emissions and ultimately require architects, engineers, and contractors to specify greener construction materials where those materials are practical and economical. These regulations do not apply to the upkeep of public projects (including roads, highways and bridge projects); however, CDOT could choose to voluntarily consider the GWP of materials used in these types of projects. Additionally, the Office of the State Architect and CDOT are both required to strive to achieve continuous reduction in greenhouse gas emissions in construction materials over time.

Colorado Executive Order D 2022 2016 - “Concerning the Greening of State Government”: In April 2022, Governor Polis issued an Executive Order establishing new goals around the sustainability of Colorado's state government. By fiscal year 2024-2025, Colorado seeks to achieve at least a 26% reduction in GHG emissions from State operations, including a 15% reduction in energy use per square foot in State facilities, 7% of the electricity consumed at State facilities shall be renewable, a 15% reduction in GHG emissions from State vehicles, and 7.5% reduction in GHG emissions from special use vehicles. CDOT has sought to reach these goals through a variety of



measures, including the replacement of petroleum-only light fleet vehicles with hybrids and battery-electric vehicles while installing additional electric vehicle supply equipment. CDOT's heavy fleet operates hybrid aerial lift trucks and electric street sweepers, and CDOT subscribes to two community solar photovoltaic gardens and has one 125 kWp rooftop system located at the Headquarters building. CDOT has also completed a solicitation to enter into a 20-year subscription agreement with an Xcel Energy Solar* Rewards Community Program Solar Garden for approximately 3 million kWh annually.

CDOT Projects Targeting GHG Reduction

In order to comply with the GHG Transportation Planning Standard, as well as the transportation sector goals of Colorado's GHG Pollution Reduction Roadmap, emphasizing and prioritizing investments in projects that reduce the carbon intensity of Colorado's transportation network is one of CDOT's key priorities.

Transit

CDOT's 10 Year Plan has a major focus on multimodal projects that improve access to travel options beyond the single-occupant vehicle, including the expansion of CDOT's transit service Bustang, new mobility hubs where commuters can catch the bus or connect with a carpool, and a thoughtful integration of transit elements into roadway projects.

Bustang Service Expansion

- 10 Year Plan Project ID(s): 2718, 2755, 2690, 2736, 2773
- Location(s): I-25 North from Fort Collins to Denver, I-25 South from Colorado Springs to Denver, and I-70 West from Grand Junction to Denver
- Description: Implement enhanced levels of service on I-70 and I-25 that will allow Bustang to serve more people and provide increased flexibility to residents and visitors of Colorado. By 2025, service on the I-25 North/South corridor, Fort Collins to Denver and Colorado Springs to Denver, will increase by 100% on weekdays and 200% on weekends. Service along I-70 West, Grand Junction to Denver, will increase approximately 250%. This expansion allows Bustang to serve more people and provide increased flexibility for existing riders.



Outrider Service Expansion between Pagosa Springs and Durango

- 10 Year Plan Project ID(s): 2523
- Location(s): US 160 from Pagosa Springs to Durango
- Description: CDOT's Outrider program builds and expands transit service to connect rural areas to primary corridors. Expand CDOT's Outrider bus service between Pagosa Springs and Durango.

New Essential Bus Service - Outrider Service Expansion between Craig and Frisco, Craig and Grand Junction

- Project ID(s): 1032, 2125
- Locations: CO 9, US 40, I-70
- Description: CDOT's Outrider program builds and expands transit service to connect rural areas to primary corridors. Purchase of two vehicles and operating costs to provide Outrider bus service between Craig and Frisco, as well as Craig and Grand Junction. New transit service provides additional mobility options for people who live and work in the Region to access jobs, goods, and services, which often positively influences personal health and quality of life. The service will also provide transit access to the Yampa Valley Regional Airport.

CO 119: Bus Rapid Transit Enhancements

- 10 Year Plan Project ID: 2601, 0057
- Location: CO 119 from Boulder and Longmont
- Description: A project that includes operational, intersection, safety, and transit improvements including BRT facilities.
- GHG Benefit: Heavy traffic congestion along CO 119 has negative impacts on air quality and GHG pollution. Enhancing BRT service frequency and reliability on this corridor will provide accessible multimodal travel options for the public and can reduce GHG emissions.

Federal Blvd. BRT

- 10 Year Plan Project ID (s): 2638
- Location: Federal Blvd. (US 287 and CO 88) between 120th Ave. in Westminster and Dartmouth Ave. in Denver, including connections to the Wagon Rd. Park and Ride and Englewood Station.



- Description: Construction of an 18-mile BRT route on Federal Blvd., including dedicated bus-only lanes between 120th Ave. and 50th Ave. and 20th Ave. and Dartmouth Ave. Other BRT improvements will include new stations, transit signal priority, pedestrian infrastructure, and frequent headways for better and more reliable service.

Colorado Blvd. BRT

- Project ID (s): 2638
- Location: Colorado Blvd. (CO 2) between the 40th and Colorado Station (near I-70) and the Colorado Station (near I-25), with potential connections north and south on CO 2
- Description: Construction of a 7-mile BRT route on Colorado Blvd. between the A-Line commuter rail at the 40th and Colorado Station and light rail at the Colorado Station. BRT improvements will include new stations, transit signal priority, pedestrian infrastructure, and frequent headways for better and more reliable service.

East Colfax Ave. BRT Extension

- Project ID (s): N/A
- Location: East Colfax Avenue in Aurora between I-225 and E-470
- Description: Planning and future implementation of a 5.5-mile BRT or enhanced transit route on Colfax Ave. Transit improvements may include transit signal priority, enhanced bus stops or stations, pedestrian infrastructure, and more frequent service.

Castle Rock Mobility Hub

- 10 Year Plan Project ID: 2714
- Location: Douglas County
- Description: Construction of a new transit station near Castle Rock. A high percentage of residents in Douglas County commute to Denver and may require additional mobility options. This new transit station will connect residents, commuters, and visitors to cities along the I-25 corridor and will enable more people to utilize transit services.



Fountain Mobility Hub

- 10 Year Plan Project ID: 2703
- Location: 1-25 Exit 128 in Fountain
- Description: Construction of a new mobility hub to support existing and future transit operations. Mobility hubs improve access to transit and often have supporting amenities to make transit easier to use and more attractive.

Bicycle and Pedestrian Projects

CDOT's Revitalizing Main Streets program supports infrastructure projects that provide open spaces for mobility and community activities, enhancing active transportation safety and strengthening the connection of people to main streets and economic hubs. The program funds infrastructure improvements to make walking and biking easy. Below is an abridged list of projects that have been granted funds in 2023, the full list can be found at this [link](#).

Town of Poncha Springs - The town of Poncha Springs is currently segmented into quadrants due to highway 285 and 50. A first attempt to integrate the quadrants for active transportation traffic is the construction of the first pedestrian crossing and refuge island across highway 50. Construction of this new crossing will include concrete curbs, refuge elevated island, flashing beacons, signage, an ADA compliant walkway.

Colorado City Metro District - This project will connect Colorado City's 'downtown area' with 80 acres of hiking, walking, biking and outdoor recreation area that winds through residential and open space areas. This will happen by installing asphalt walking paths, including ADA compliant ramps at trail heads, connecting Greenhorn Park to the 'downtown area', and park amenities such as a restroom, benches, and bike racks.

Town of Silverthorne - This project will enhance the multi-mobility connection in Silverthorn's downtown core by filling gaps in the pedestrian and biking infrastructure along 3rd Street, a site identified in their Master Plan for improvement. These improvements will include constructing ADA compliant ramps, intersection signage, new pedestrian crossings, street lighting and other traffic calming measures.

Jefferson County - This project will improve pedestrian access, mobility and safety along Buffalo Park Road between Wilmot Elementary and Evergreen High School. New



sidewalks and a protected crosswalk will launch an active transportation corridor in a heavily trafficked area for local youth.

Use of Carbon Reduction Program Funds

CDOT

CDOT's approach to using the federal Carbon Reduction Program funding is to apply this funding to eligible projects and project elements within CDOT's 10 Year strategic capital plan. This plan, which is required to comply with CDOT's GHG Transportation Planning Standard, includes significant investment in transit and mobility hubs which provide an excellent nexus with the intent of these dollars. The GHG Transportation Planning Standard is driving CDOT's long range transportation plans towards providing more options for travelers other than single occupancy vehicles, while simultaneously improving air quality and reducing smog.

MPOs

Colorado's five MPOs approaches to using their Carbon Reduction Program fund allocations varies. For instance, Colorado's largest MPO which serves the Denver region, DRCOG, used a competitive process to solicit eligible projects from across the region. PPACG is using Carbon Reduction Program funds for projects with cost overruns before awarding to new projects.

All MPOs in Colorado are subject to the GHG Transportation Planning Standard, which requires each MPO's fiscally constrained RTPs, as well as the TIPs for MPOs in nonattainment areas, a GHG analysis which demonstrates a reduction in GHGs over time. As per the requirements of the use of CRP funds, they must only be used on projects identified in the TIP, as well as be consistent with the RTPs. This overlap between the GHG Transportation Planning Standard and the requirements of the CRP funds ensures consistency with Colorado's overall strategy to reduce GHG transportation emissions from the infrastructure that transportation agencies invest in. As of the fall of 2023, NFRMPO and DRCOG have both shown compliance with the GHG Transportation Planning Standard. The GHG Transportation Planning Standard gives PPACG, PACOG, and GVMPO additional time to comply, it is expected that these MPOs will show compliance in the next two years. NFRMPO and DRCOG took different approaches to complying with the GHG Transportation Planning Standard; it is likely that the other three MPOs will take approaches appropriate to their local context to reduce transportation GHG emissions in their areas.



Refer to section A1 in the appendix for more information on how Colorado’s MPOs are spending CRP funding. Refer to section A2 in the appendix for additional information on how the MPO’s have complied or are planning to comply with the GHG Transportation Planning Standard, as well as other local efforts to reduce transportation GHG emissions.

Public and Stakeholder Coordination

MPO Coordination and Public Engagement

The Rules, Policies and Programs listed in this document will typically undergo their own independent public engagement process. This can look different depending on the type of program being developed. In some cases, they will go through a formal rulemaking process allowing for public engagement. In others a public review process may be through a Commission hearing, or posting a document on a website where comments are considered in the final draft of a document. Because these programs are complex, and the stakeholders may be different, Colorado finds this type of public engagement to be the most useful. Rather than conducting public engagement specific to the Carbon Reduction Program funds, Colorado is relying on the existing public engagement processes that are a part of CDOT and the MPO’s planning processes, as all projects that use CRP funds are part of transportation plans which are publicly vetted.

Given that the GHG Transportation Planning Standard is one of the key organizing principles of this Carbon Reduction Strategy, the following section explains the specific public process and MPO coordination that occurred during the development of the GHG Transportation Planning Standard and subsequent Policy Directive.

Even before beginning formal rulemaking proceedings specific to the GHG Transportation Planning Standard, CDOT staff convened a set of key experts with different vantage points and viewpoints to begin developing high-level concepts for the rule. This included MPOs; representatives from different parts of the state, both urban and rural; and both proponents and skeptics of the rule, in concept. This GHG Advisory Group has now evolved into a more technical group of staff, during the implementation phase, that now maintains a key role in working through ongoing modeling and compliance matters.



Colorado’s choice to initiate this regulatory process through the state Transportation Commission – with staff support from CDOT – was significant. This rule is housed with the state’s transportation planning rules, established through the Transportation Commission. Before the formal rulemaking process began, regional public meetings were held throughout the state. CDOT also met with equity organizations in workshops, a coalition of environmental groups, and other groups as requested.

During the rulemaking process itself, the Transportation Commission and CDOT followed the state Administrative Procedures Act. Rulemaking in Colorado is governed by the State Administrative Procedure Act (“APA”), C.R.S. § 24-4-101 et seq., which requires advance public notice of permanent rulemaking and at least one public rulemaking hearing to receive public input on the proposed rule. The APA requires that an agency create and consult with a representative group of stakeholders affected by and interested in the subject matter of the rule when rulemaking is contemplated or in progress. Members of the public may also request a regulatory analysis and/or a cost-benefit analysis of a rule. Notably, the Colorado Transportation Commission requested that staff far exceed public outreach requirements for rulemaking, which mandate one public hearing. CDOT held 10, with both virtual and in-person options, across the state.

After the rule was adopted, CDOT staff worked with the Transportation Commission to develop and approve Policy Directive 1610 - GHG Mitigation Measures. The Policy Directive has been updated several times since it was initially adopted to keep the calculation methodology current, and the language relevant as CDOT and the MPOs have been using the Policy Directive to demonstrate compliance.

CDOT has also formalized two groups, one of which is outlined in the Rule - Interagency Consultation Team (IACT), and another that has proved necessary for ongoing communication and collaboration - Statewide Modeling Coordination Group (SMCG). These two groups meet approximately quarterly to discuss implementation and compliance issues as they arise.

To develop this Carbon Reduction Strategy, CDOT worked with the state’s five MPOs over a period of several months to discuss the content, structure, and approach for this document. Meetings were held in the spring and summer of 2023 to discuss the initial approach of the Carbon Reduction Strategy. Following these discussions, CDOT developed guidance for the MPOs on how to develop their sections of this report. CDOT staff also communicated with the MPO staff to ensure the most up to date information on the use of Carbon Reduction Program funds, as well as how those



funds fit into the MPO's long range transportation plans and associated upcoming or existing compliance with the GHG Transportation Planning Standard. The MPOs also played a key role in reviewing, editing, and finalizing this Carbon Reduction Strategy.

Conclusion

With the passage of Senate Bill 21-260 and the Infrastructure Investment and Jobs Act, both state and federal support for clean transportation are in a phase of major growth. Executive leadership at CDOT have been strong advocates for multimodal and sustainable transportation planning, and CDOT's Division of Transportation Development and Office of Innovative Mobility are growing at a rapid pace. By increasing investment in clean transportation modes and diversifying the types of projects that CDOT supports, the CDOT is paving the way for a more sustainable, equitable, and multimodal transportation system of the future.

During the last several years, CDOT has emerged as more than a transportation department - it is now a leader in the state's fight against climate change. The passing of the Greenhouse Gas Pollution Reduction Planning Standard in 2021 set a strong precedent for CDOT to play a prominent role in regulating the environmental impact of the state's transportation system in the coming years.

Transportation is now the leading cause of GHG emissions in Colorado, and it is time for CDOT to broaden its purview beyond traditional transportation planning. While the state has made a significant effort to promote some aspects of a clean transportation system (such as electric vehicles), other sectors are only just beginning to plan for a more sustainable future. Greenhouse gas emissions from air travel, passenger rail, and construction will all need to be lowered. How connected and autonomous vehicles will impact air pollution and travel patterns also remains to be seen, but the outcomes are not inevitable - transportation leaders in the state (and beyond) need to ensure these systems are benefitting people and the environment. The State is now undertaking development of Colorado's GHG Pollution Reduction Roadmap 2.0 and responding to recent legislation that adds interim GHG target years.⁸

By expanding CDOT's reach and continuing to collaborate with key state agencies and MPOs, CDOT is well-positioned to continue driving innovation and reducing GHG emissions from our transportation system.

⁸ [Senate Bill 23 - 016.](#)



Appendix

A1 - MPO Carbon Reduction Activities

DRCOG Carbon Reduction Program Funds

In early 2022, DRCOG began the process of allocating Carbon Reduction Program funding to projects within the DRCOG boundary through several Calls for Projects. Overall, DRCOG has programmed \$29.4 million Carbon Reduction Program funds in FY 2022-2027 to 19 projects. Project types include bicycle and pedestrian, bus service, rapid transit, transit passenger facilities, traffic signal upgrades, studies which are associated with Transportation Alternatives (TA), transit and multimodal facilities.

Sponsor	Project Name	TIP-ID	Project Description	Project Type	2023 Funding	2024 Funding	2025 Funding	2026 Funding	2027 Funding	Total Funding
Littleton	Mineral Station Area Multimodal Improvements	2022-033	Design and construction of Mineral Station Area Improvements - path improvements from LRT station bridge to the Mary Carter Greenway Trail and bike facilities along Platte River Parkway and Carson Drive to the Mary Carter Greenway Trail at South Platte Park.	Bicycle/ Pedestrian	\$223 k	\$0	\$733 k	\$0	\$0	\$956 k

Sponsor	Project Name	TIP-ID	Project Description	Project Type	2023 Funding	2024 Funding	2025 Funding	2026 Funding	2027 Funding	Total Funding
Aurora	Aurora Multimodal Access Improvements	2022-045	Design and construct sidewalks to fill in gaps near transit at Havana St. at 17th Ave, Havana St. at Montview Blvd, Colfax Ave. at Laredo St., Havana St. at 13th Ave, Havana St. at 4th Way, Yale Ave. from Peoria St. to Xanadu Way, and Chambers Rd. from Hampden Circle to Nassau Ave.	Bicycle/ Pedestrian	\$368 k	\$65 k	\$1,791 k	\$0	\$0	\$2,000 k
Aurora	Smith Rd. Multimodal Improvements: Peoria St. to Powhaton Rd.	2022-044	Design two-way cycle track and 8' sidewalk from Peoria to Chambers, 8' sidewalk and 4' shoulder from Chambers to Picadilly, and 14' shared-use path from Picadilly to Powhaton.	Bicycle/ Pedestrian	\$1,000 k	\$1,000 k	\$0	\$0	\$0	\$2,000 k
Parker	Parker Rd. Multi-Use Path: East Side Gaps from Pine Rd. to Stroh Rd.	2022-072	Construct a 10' wide shared-use path to fill in sidewalk gaps along Parker Rd. in key locations from Pine Dr. to Stroh Rd.	Bicycle/ Pedestrian	\$0	\$0	\$1,096 k	\$0	\$0	\$1,096 k

Sponsor	Project Name	TIP-ID	Project Description	Project Type	2023 Funding	2024 Funding	2025 Funding	2026 Funding	2027 Funding	Total Funding
Jefferson County	Jefferson County Bicycle Plan Implementation	2022-040	Construct bicycle facilities and signage throughout unincorporated areas in the County based on priorities identified in the Jefferson County Bicycle Plan	Bicycle/ Pedestrian	\$165 k	\$168 k	\$168 k	\$0	\$0	\$501 k
Thornton	Big Dry Creek Trail: 136th-144th	2024-016	Construct a multi-use path with gravel shoulders along Big Dry Creek.	Bicycle/ Pedestrian	\$0	\$0	\$150 k	\$1,125 k	\$1,125 k	\$2,400 k
Superior	McCaslin Blvd Multiuse Underpass at Rock Creek Pkwy - Precon	2024-043	Design a multi-use underpass at McCaslin Blvd north of Rock Creek Pkwy.	Bicycle/ Pedestrian	\$0	\$0	\$0	\$500 k	\$0	\$500 k
Denver	South Platte River Trail Improvements: Bayud-Phil Milstein Park	2024-009	Widen existing 8' trail to 12' concrete trail with 4' crusher fine shoulder, and relocate 2500' feet of trail across the South Platte River to separate it from interstate traffic. Project also includes a pedestrian plaza and trail amenities.	Bicycle/ Pedestrian	\$0	\$0	\$0	\$4,250 k	\$4,250 k	\$8,500 k

Sponsor	Project Name	TIP-ID	Project Description	Project Type	2023 Funding	2024 Funding	2025 Funding	2026 Funding	2027 Funding	Total Funding
Douglas County	Douglas County Transit Pilot	2024-054	Project will initiate pilot projects identified in the Douglas County Transit & Multimodal Feasibility Study.	Bicycle/ Pedestrian	\$0	\$0	\$0	\$500 k	\$500 k	\$1,000 k
Golden	Downtown Golden Traffic Signal Update	2022-039	Upgrade signals, including bicycle detection, at 10 intersections in downtown Golden.	Traffic Signals/ ITS	\$369 k	\$0	\$0	\$0	\$0	\$369 k
Boulder	Baseline Rd. Multimodal Improvements: 30th St. to Foothills Pkwy.	2022-062	Design and construct multimodal improvements including bus stop improvements, separated bike lanes, bike parking, curb extensions, and intersection and crossing improvements.	Transit; Bike/Ped	\$293 k	\$0	\$878 k	\$0	\$0	\$1,171 k
Denver	East Colfax BRT - Design	2022-031	Environmental and design for a fixed-guideway center-running bus rapid transit line along Colfax Ave. between Civic Center Station and Yosemite St.	Rapid Transit	\$1,155 k	\$2,845 k	\$0	\$0	\$0	\$4,000 k
Adams County	120th Ave. Safety and Multimodal Corridor Study -	2022-043	Study to identify, evaluate, and prioritize short, medium, and long term projects along the corridor to reduce crashes, decrease traffic	Study	\$240 k	\$80	\$0	\$0	\$0	\$320 k



Sponsor	Project Name	TIP-ID	Project Description	Project Type	2023 Funding	2024 Funding	2025 Funding	2026 Funding	2027 Funding	Total Funding
	US-85 to Tower Rd.		congestion, and accommodate non-motorized transportation.							
Commerce City	E. 64th Ave. Corridor Study: SH-2 to Quebec Pkwy.	2022-048	Study for complete streets improvements to enable improved multimodal transportation.	Study	\$38 k	\$38 k	\$0	\$0	\$0	\$76 k
Thornton	Thornton Protected Bike Facility Study	2022-052	Feasibility study of three corridors for protected bike facilities.	Study	\$204 k	\$0	\$0	\$0	\$0	\$204 k
Douglas County	Douglas County Integrated Transit & Multimodal Feasibility Study	2022-069	Needs assessment and pilot project identification for transit and multimodal options in Douglas County.	Study	\$67 k	\$133 k	\$0	\$0	\$0	\$200 k
Westminster	Federal Blvd. Bus Stop Improvements: 70th Ave. to 92nd Ave.	2022-053	Design and construct concrete bus pads and bus stop amenities at 12 bus stops along Federal Blvd.	Transit Passenger Facilities	\$170 k	\$170 k	\$0	\$0	\$0	\$340 k
Broomfield	Industrial Ln. Bikeway Phase 2	2020-019	Construct Phase 2 of the Industrial Ln. bikeway, from US-36 at the Midway Multi-use Bridge over BNSF to the US-36/Flatiron Station	Bicycle/ Pedestrian	\$2,186 k	\$0	\$0	\$0	\$0	\$2,186 k

Sponsor	Project Name	TIP-ID	Project Description	Project Type	2023 Funding	2024 Funding	2025 Funding	2026 Funding	2027 Funding	Total Funding
Mead	3 rd J/Welker Intersection Improvements	2022-021	Construct turn lanes, sidewalk, bike lanes, raised median, and traffic signal	Roadway Op. Improvements	\$1,600 k	\$0	\$0	\$0	\$0	\$1,600 k

Table 3 - A list of DRCOG's projects receiving Carbon Reduction Program funds in FY 2022-2027.

NFRMPO Carbon Reduction Program Funds

Beginning in FY2023, the NFRMPO began distributing Carbon Reduction Program (CRP) funds for the Fort Collins Transportation Management Area (TMA) and the Greeley Urban Area. In January 2023, the NRMPO Planning Council awarded \$2.1M in CRP funds to four projects as outlined in the table below.

Sponsor	Project Name	Project Description	Total Funding	CRP Funding	Funding Programs
Loveland	Willow Bend	Construction of 10' wide, 1-mile trail with two bridges, one pedestrian-activated signalized crossing.	\$3,456,792	\$528,396	CRP, TA, MMOF
Windsor	11th St Multimodal Improvements	Construct new buffered bike facilities, add bicycle lane signage, roadway striping enhancements, existing RRFB modifications, raised concrete medians and bulb-outs, and ADA-compliant ramp improvements along 11th St from Greeley No. 2 to Sagewood Dr.	\$1,480,787	\$290,394	CRP, MMOF
Fort Collins	Siphon Overpass	Construct grade separated crossing and 0.8 miles of trail.	\$5,555,050	\$195,431	CRP, MMOF
Larimer County	North LCR 17 Expansion - Shoulder Widening	Expand one (1) mile section of LCR 17 between Willox Lane and US 287/SH 14 from a two-lane facility to a two lane facility with six (6) foot shoulders/bike lanes.	\$2,737,726	\$1,091,920	CRP, TA, PNF, STBG

Table 4 - NFRMPO projects receiving Carbon Reduction Program funds.



These projects, which had been previously awarded funding through NFRMPO Calls for Projects, were identified as being priority projects which would help increase active transportation (non-SOV) travel and demonstrated a GHG emission reduction benefit. In late 2023, the NFRMPO will hold the 2023 Call for Projects which will award approximately \$2.5M in CRP funds to projects which meet the intention of the CRP program by demonstrating a GHG emissions reduction benefit, as well as assist in ensuring accomplishment of the five goals outlined in the 2050 RTP:

- **Safety** - Reduce the number of roadway related fatalities and serious injuries within the region
- **Regional Health** - Improve economic development, residents' quality of life, and air quality
- **Mobility** - Moves people and goods efficiently and reliably on a continuous transportation system
- **Multimodal** - Improve accessibility of and access to transit and alternative modes of transportation
- **Operations** - Optimize operations, planning, and funding of transportation facilities

In addition, the Planning Council has set aside \$100,000 of CRP funds annually starting in FY2024 to support new and existing TMOs. These funds will need to show a vehicle trip reduction and extensive outreach to ensure the NFRMPO meets requirements set out in the GHG Transportation Planning Standard and in line with the requirements of the funding programs.

The NFRMPO incorporates considerations of air quality improvements, both for ozone and GHG, into the various plans, programs, and strategies implemented through the organization. With the short-term programming of CRP funds to invest in active transportation and TDM strategies, as well as the long-term strategies outlined in the 2050 RTP, the NFRMPO expects to see a decrease in overall trips taken and miles driven, increase in active transportation and transit usage, and a decrease in VMT.

PACOG Carbon Reduction Program Funds

At the time of the development of this report, PACOG has awarded Carbon Reduction funds to the Medal of Honor Boulevard Multi-modal trail, a new trail that will connect Pueblo West to the City of Pueblo (Figure 4). This project was awarded using both Carbon Reduction Program Funds and MMOF. This new trail offers commuters the



ability to choose different modes rather than by motor vehicle, which could result in reduced emissions.

In October 2023, PACOG released a call for projects that includes MMOF and Carbon Reduction funds. Projects selected will be based on the criteria set by the state and federal guidelines as well as PACOG’s goals to create better coordination within the region, how projects can be connected to everyday destinations, and incorporating walk audits with the ADA Commission members.

PACOG intends to meet the GHG Transportation Planning Standard through short-term planning and long-term planning processes. MMOF and Carbon Reduction funding will be awarded to projects and plans that invest in active transportation and/or transit that demonstrate connectivity and access that will result in more users which will contribute to the reduction of GHG emissions. The Complete Streets Policy will be a sustainable long-term application for the region to implement a network that reduces vehicle use, provides mode choice, and is safe for all users. The 2050 LRTP will develop projects and plans that will address growth needs, determine methodologies that encourage transit ridership, transit-oriented development, land-use planning, safety, and active transportation within fiscal constraint.



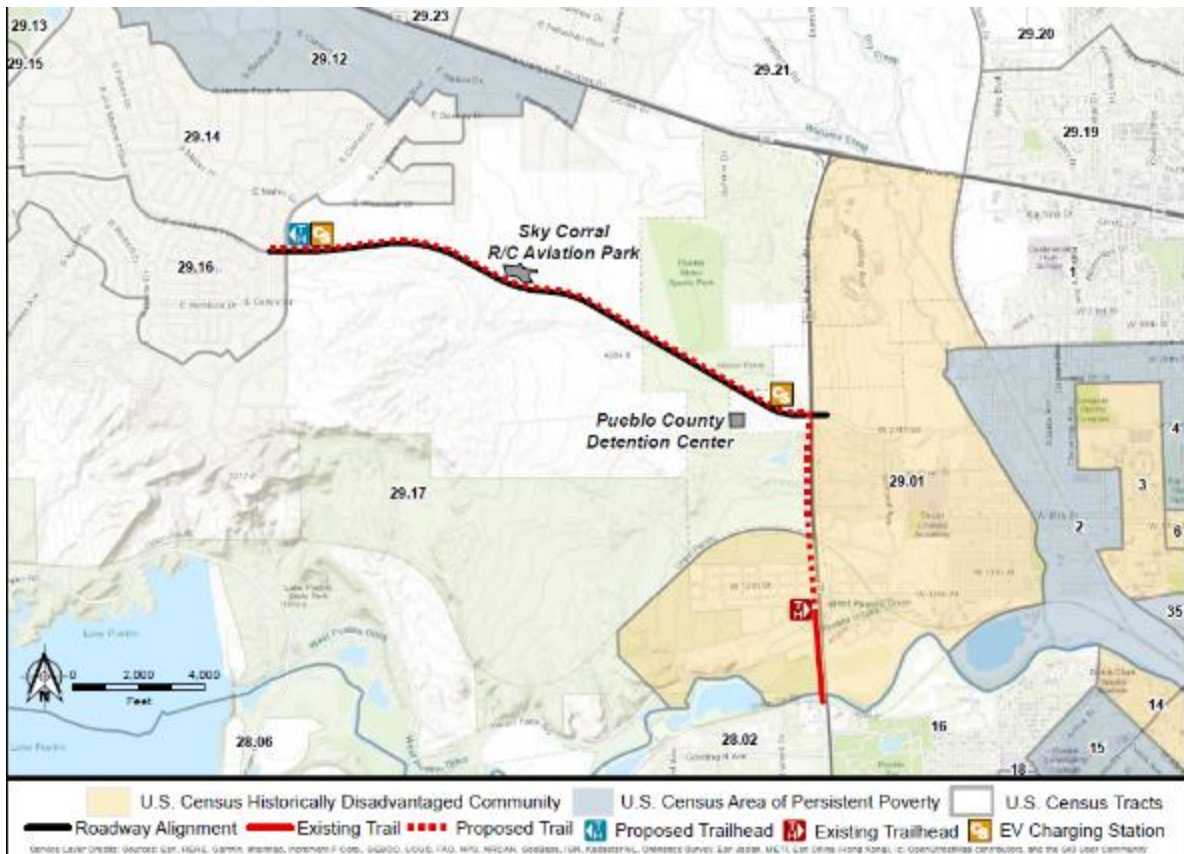


Figure 4 - A recipient of Pueblo's CRP funds - the Medal of Honor Boulevard Multi-use Trail.

PPACG Carbon Reduction Program Funds

Carbon Reduction Program funding in the TIP utilized the scoring criteria defined during the 2045 LRTP development process. These criteria include Vehicle Delay, which awards points for projects that reduce congestion on strategic, regional, and NHS corridors, and awards negative points for projects that increase congestion on those corridors. Congestion was defined as a change in the PM peak volume/capacity ratio. In addition, the scoring criteria awarded points for projects that positively impact air quality, projects that support infill (projects within or connecting to a major population or employment center), and projects that support mobility and connectivity related to transit or alternate modes. Beyond this, PPACG has not implemented criteria beyond the federal eligibility requirements for CRP funding. Projects were scored by staff and selected for funding by the Transportation Advisory Committee. These recommendations were then adopted by the Board of Directors. PPACG policy is to fund projects with cost overruns before awarding new projects.



- Colorado Springs Mountain Metropolitan Transit, Two Battery Electric Buses for Service Expansion, \$1,612,000: This project provides funds to acquire two new battery electric buses (BEBs) and charging infrastructure to support an expansion of transit service within Colorado Springs.
- Colorado Springs Mountain Metropolitan Transit, MMT Vehicle Purchase 5307, \$2,694,827: This CRP funding was awarded to an existing project with a cost overrun to augment FTA 5307 funding for the purchase of up to nine hybrid transit vehicles.
- Town of Monument, Jackson Creek Parkway Expansion, \$200,000: CRP funding was added to this project to purchase solar lights along a stretch of roadway that is being improved. Improvements include lane widening as well as bicycle and pedestrian infrastructure near a high school.
- El Paso County, Wetland Bank: Akers Drive, \$1,241,850: CRP funding was added to this project, which is experiencing a cost overrun. This project provides the design and construction of approximately 20 acres of mitigation for inclusion in the El Paso County Wetland Umbrella Mitigation Bank.

GVMPO Carbon Reduction Program Funds

As of November 2023, none of GVMPO's funding has been allocated to projects yet.

A2 - Other MPO GHG Emission Reduction Activities

DRCOG

DRCOG Metro Vision Plan

The counties and municipalities of the Denver region have been advancing a shared aspirational vision of the future of the metro area for more than 60 years. The DRCOG Board of Directors adopted the first Metro Vision plan (Metro Vision 2020) in 1997 and, since then, has continued the dialogue about how best to achieve the plan's evolving vision. For more than 20 years the DRCOG Board of Directors has committed to addressing regional challenges through shared aspirations that outline its communities' desired future and integrated plans that collectively serve as a comprehensive guide for the development of the region. Metro Vision outlines outcomes, objectives and initiatives established by the DRCOG Board of Directors to ensure the coordinated efforts of DRCOG's many partners meet the evolving needs of the region's existing and future residents.



The current Metro Vision, adopted unanimously in 2017, guides the work of DRCOG and its partners' shared actions to move the region toward a shared future expressed in five overarching themes. The themes organize 14 interrelated, aspirational future outcomes that DRCOG, local governments and partners will work toward together. The five themes are:

- An efficient and predictable development pattern
- A connected multimodal region
- A safe and resilient natural and built environment
- Healthy, inclusive, and livable communities
- A vibrant regional economy

Along with these organizing themes are several specific performance measures to measure progress towards identified outcomes, including increasing the non-single occupant vehicle mode share to work, reducing daily vehicle miles traveled per capita, reducing traffic fatalities, and reducing surface transportation-related greenhouse gas emissions per capita.

DRCOG 2050 Regional Transportation Plan

DRCOG originally adopted its 2050 Metro Vision Regional Transportation Plan ([2050 RTP](#)) in April 2021. In response to the state Greenhouse Gas Transportation Planning Standard (GHG rule), DRCOG significantly revised the 2050 RTP and adopted an updated plan in September 2022.

The 2050 RTP helps DRCOG and its many partners implement the shared aspirational vision of Metro Vision and sets the long-range vision and investment framework for the region's multimodal transportation system. The 2050 RTP performs multiple functions as the region's multimodal transportation plan, including:

- Setting the region's long-range vision for transportation over the next 20-plus years.
- Reflecting a broad set of public and stakeholder input.
- Demonstrating enough available revenue and identifying how funds will be spent on projects and programs identified in the 2050 RTP across all modes of transportation.
- Conforming to all applicable federal requirements, especially for fiscal constraint, regional air quality conformity, public engagement, and others.



- Ensuring that transportation decisions don't negatively affect low-income and minority communities more than other areas and provide at least as much benefit compared with the entire region.
- Incorporating the 10 federal planning factors into the planning process: economic vitality; safety; security; accessibility and mobility; environment; multimodal connectivity; system management and operations; system preservation; resilience and reliability; and travel and tourism.
- Linking investment priorities to achieving performance measure targets.

To comply with the GHG rule and reduce future surface transportation greenhouse gas emissions, DRCOG committed to meaningful changes to planned regionally significant transportation projects, analyzed the effects of programmatic investments and re-evaluated land use and travel parameters in light of more recent observed data. Through this process, DRCOG engaged the public and stakeholders to determine the changes. Project and program investment changes made to the 2050 RTP included:

- Freeway managed lane projects: Modify C-470 and Central I-25 projects to focus on safety, operational, transit and other multimodal aspects and associated greenhouse gas benefits; redirect/finance CDOT funds to advance bus rapid transit corridors and fund additional regional multimodal programmatic investments.
- DRCOG-directed funded roadway projects: Modify the scope of several projects to remove "six laning" components and re-focus those projects on multimodal, safety and complete streets investments.
- Bus rapid transit network: Advance four bus rapid transit corridors and complete five bus rapid transit corridors by 2030. These include East Colfax Avenue, East Colfax Avenue Extension, Colorado 119, Federal Boulevard and Colorado Boulevard; advance Broadway Avenue/Lincoln Avenue bus rapid transit corridor from 2040-2050 to 2030-2039.
- Additional multimodal programmatic investments: allocate and finance \$900 million made available through the specified project changes to fund additional multimodal programmatic investments (\$500 million by 2030, \$200 million more by 2040, \$200 million more by 2050). These changes also incorporate sponsor-requested project-based amendments as part of DRCOG's routine call for amendments to the 2050 RTP.

As adopted in April 2021, DRCOG's fiscally constrained 2050 RTP contains over \$15 billion in regional programmatic funding. These investments are shown as lump sums across various programs and individual projects are not yet identified in these



programs. Programmatic funding categories include transit investments, active transportation, safety/Vision Zero, transportation demand management and intelligent transportation investments, all of which are key strategic investments to improve the region's multimodal transportation system, improve air quality and reduce greenhouse gas emissions.

DRCOG staff evaluated the programmatic 2050 RTP funding, which was not yet reflected in the travel model, and determined there was approximately \$1.34 billion of investment associated with greenhouse gas emission reductions. Based on this information and in coordination with CDOT and North Front Range MPO travel modelers, DRCOG staff developed a method to reflect these investments in the travel model.

DRCOG also made updates to land use data reflecting recent observed development activity. DRCOG compiles point-level housing data from a variety of local and proprietary sources. When the 2050 RTP was adopted in 2021, the most recent observation available was 2018. This was the same for point-level employment data licensed from the Colorado Department of Labor and Employment and subject to additional processing and cleaning at DRCOG. DRCOG staff use this data as a supplementary UrbanSim model input applied during the scheduled development step. DRCOG was able to incorporate housing and employment data through 2020, along with preliminary data from proprietary housing datasets to update those observations into 2022. DRCOG staff also incorporated insights from these same proprietary housing datasets to include anticipated housing construction through 2028. To accommodate these observations of more multifamily housing in more dense locations and counties, DRCOG staff had to make several adjustments to the previous county forecasts.

Additionally, factors influencing work-from-home rates were updated to reflect observed changes in behavior due to technological advancements, transportation demand management efforts from DRCOG and DRCOG's partners, and the effects of the COVID-19 pandemic.

Finally, to achieve additional emission reductions and meet the reduction requirements defined in the GHG rule, DRCOG also developed a Mitigation Action Plan, which includes further commitments to land use planning efforts, complete streets standards and other strategies to reduce greenhouse gas emissions from on-road transportation sources.



More detail about the assumptions, methodology, results and GHG reductions associated with each of these strategies is contained in DRCOG’s Greenhouse Gas Transportation Report ([Appendix T](#) to the 2050 RTP).

Regional Bus Rapid Transit (BRT) Network and Partnership

The DRCOG region has committed to implement a regional Bus Rapid Transit network of 11 BRT corridors. This BRT network is included in DRCOG’s [2050 Metro Vision Regional Transportation Plan](#), CDOT’s [Statewide Transportation Plan](#), and in applicable local plans. As a critical part of meeting the GHG rule (and federal air quality conformity requirements), the region has committed to an assertive implementation schedule for the regional BRT network - five corridors open for revenue service by 2030, another five by 2040, and the final one by 2050.

The regional BRT network, which is based on RTD’s [Regional BRT Study](#), is in various stages of implementation that span the spectrum from conceptual visioning, “pre-NEPA” planning, NEPA/project development, to near construction. There is a clear need to leverage economies of scale, resource efficiencies, and creativity in planning, project development, financing, and construction to meet the planned implementation schedule. And while each BRT corridor has unique context, there is also an opportunity to define a systemwide framework around common issues relating to design standards, operations, fare payment, branding, and many others.

Key partners (Aurora, CDOT, Denver, Boulder County, DRCOG, CDOT, FTA, and RTD) are part of a Regional BRT Partnership to lead the implementation of the regional BRT network and to coordinate the work of individual BRT corridor planning and project development efforts. Key foundations of the Regional BRT Partnership are:

- Developing and implementing the regional BRT network is more than a single agency can lead or undertake alone;
- Different agencies will lead various individual BRT corridor planning and project development efforts;
- All stakeholders will have the opportunity to participate fully in each corridor, regardless of which agency is leading a particular corridor, and
- Regional BRT network implementation is not just a multi-agency planning partnership, but will also require a multi-agency funding partnership of federal, state, local, and other funding sources.



Senior staff from the partnership agencies have been meeting monthly starting in Spring 2023 to define the framework of the partnership effort and the specific issues, resources, timelines, and other components important to this effort.

Active Transportation Plan

DRCOG completed the Denver region's first active transportation plan in 2019. DRCOG worked with partners throughout the region to develop an active transportation vision, tools and products to support the development of a robust active transportation network. The Active Transportation Plan envisions a safe, comfortable and connected network, and highlights opportunities and implementation strategies to improve active transportation across the Denver region. The Board of Directors unanimously adopted the plan on Jan. 16, 2019. The Active Transportation Plan:

- supports access to safe, comfortable and connected active transportation facilities (such as shared-use paths, bike lanes and sidewalks) for people of all ages, incomes and abilities;
- encourages active transportation options for rural, suburban and urban communities;
- encourages active transportation facilities that connect the network and region efficiently and comfortably, including those that provide connections to transit; and
- supports the Denver region's vision to improve safety, reduce vehicle miles traveled, decrease the number of people driving alone and improve the region's air quality.

Bicyclists and pedestrians are involved in 3 percent of all crashes, but 24 percent of all traffic-related fatalities involve a pedestrian or bicyclist. Bicyclists and pedestrians are some of the most vulnerable users of the transportation system, so keeping active mode users safe from vehicle traffic is important. Research has demonstrated that planning for and implementing facilities to increase the safety of people who walk and bicycle also improves safety for drivers. Bicycle and pedestrian trips are expected to increase at a faster rate than both population and vehicle miles traveled, so as more people choose active transportation, supporting the implementation of safe, comfortable and connected facilities is critical.

Safe, connected and accessible active transportation networks are especially important for households without motor vehicles, older adults, and people with mobility disabilities. In the Denver metro area, 59 percent of the population are



interested but concerned when it comes to bicycling, so improving the comfort of bicycle facilities is a key component in encouraging more people to choose active transportation. The region's aging population underscores the importance of safe and accessible alternatives to driving. Older adults who no longer feel safe driving, or who do not have the physical or financial ability to drive, are often limited from performing daily activities if they cannot travel on their own, causing impacts like social isolation and inactivity.

The Active Transportation Plan is available [here](#).

Transportation Demand Management Strategic Plan

DRCOG staff worked extensively and closely with stakeholders and partner agencies region wide to develop the region's Transportation Demand Management Strategic Plan. The plan provides the region with a framework to improve efficiency and mobility for travelers of all ages, incomes and abilities by identifying actions to enhance and expand sustainable, multimodal travel choices, reduce traffic congestion and provide air quality benefits.

As part of the stakeholder and public engagement plan, DRCOG hosted six stakeholder workshops with key stakeholders. Stakeholders included regional transportation partners, air quality partners, academia, community advocacy groups, environmental justice partners and industry partners.

The purpose of the Transportation Demand Management Strategic Plan is to:

- Describe the current state of transportation demand management in the region, including existing programs and services offered by DRCOG and partners.
- Encourage a suite of transportation demand management strategies, including infrastructure, mobility services, parking and pricing, land use, incentives, and marketing and education.
- Support statewide greenhouse gas emissions reduction goals.
- Envision safe and comfortable travel choices throughout the region.

The plan identifies specific recommendations for DRCOG to lead and implement that will advance the Denver area's progress toward the plan's four goals. Each recommendation includes its significance to regional goals, equity considerations and next steps. The plan is accompanied by a Transportation Demand Management Toolkit, a practitioner resource which outlines various transportation demand



management strategies. The draft plan has been released for public comment in October 2023 and is anticipated to move forward for approval by the end of the calendar year.

The TDM Strategic Plan will be available [here](#).

Climate Pollution Reduction Grant

Through the Environmental Protection Agency's Climate Pollution Reduction Grant program, the Denver-Aurora-Lakewood Metropolitan Statistical Area received a \$1 million planning grant to develop climate action plans in coordination with stakeholders throughout the region. The Denver Regional Council of Governments Board of Directors voted unanimously on April 19, 2023 to accept the role of lead agency for the [Climate Pollution Reduction Grant](#).

The grant is being used to pay for a full-time staff person for the four-year grant program and to hire a consultant to assist with technical work. DRCOG is convening monthly stakeholder meetings with local government staff, coordinating with the Colorado Energy Office and developing a public outreach program, focusing on low-income and disadvantaged communities.

The planning grant funds are designated for the completion of the following products:

- Priority Climate Action Plan due March 1, 2024.
- Comprehensive Climate Action Plan due Aug. 1, 2025.
- Status Report due Aug. 1, 2027, at the close of the four-year grant period.

Completion of the above deliverables is a prerequisite for any eligible agency to compete in the second phase of the Climate Pollution Reduction Grant program in April 2024, which will competitively award \$4.6 billion for implementation projects across the country. The Environmental Protection Agency anticipates awarding individual grants between \$2 million and \$500 million, with funding tiers allowing comparably sized projects to compete against one another.

NFRMPO

NFRMPO 2050 Regional Transportation Plan (RTP) and GHG Transportation Report

The 2050 Regional Transportation Plan (RTP) is a fiscally constrained plan identifying projects to enhance the existing multimodal transportation system and address ozone and GHG emissions. The GHG Transportation Report, developed in conjunction with



the 2050 RTP, demonstrates the 2050 RTP and the FY2024-2027 Transportation Improvement Program (TIP) comply with the Colorado GHG Transportation Planning Standard.

The GHG analysis of the 2050 RTP includes the roadway, transit, and non-motorized facility improvements along with other GHG-reducing strategies, identified in the 2050 RTP and modeled using the 2019 Base Year Regional Travel Demand Model (RTDM). The 2050 RTP relies on four categories of strategies and various improvements within each category for achieving GHG Reductions set forth through the GHG Planning Standard.

- Transit
 - Updated transit network to match local plans and efforts, including the Fort Collins Transportation Master Plan, Connect Loveland, and Greeley on the Go
 - Expanded Bustang operations on the North Line
 - Acknowledgement of additional funding opportunities
 - LinkNoCo, NFRMPO's premium transit analysis, recommendations
- Transportation Demand Management
 - TDM program based on local plans and efforts
 - Impact of the NFRMPO Planning Council setting aside TMO funding
 - Increase in work from home in all compliance years
- Operations
 - Arterial signal timing improvements by 2030 and additional signal timing improvements through 2050
- Active Transportation
 - Expansion of the local bicycle and pedestrian network by 2030 and increasing to 2050
 - Completion of RATCs by 2045
 - Better representation of bicycle and pedestrian links in the Travel Model to make walking/biking more appealing

The GHG Transportation Report identifies specific impacts each of the strategies will have as they are incorporated in the 2050 RTP. Based on the commitment to these GHG Strategies, the NFRMPO region expects to see a decrease in overall trips taken and miles driven, increase in active transportation and transit usage, and a decrease in vehicle miles traveled (VMT).



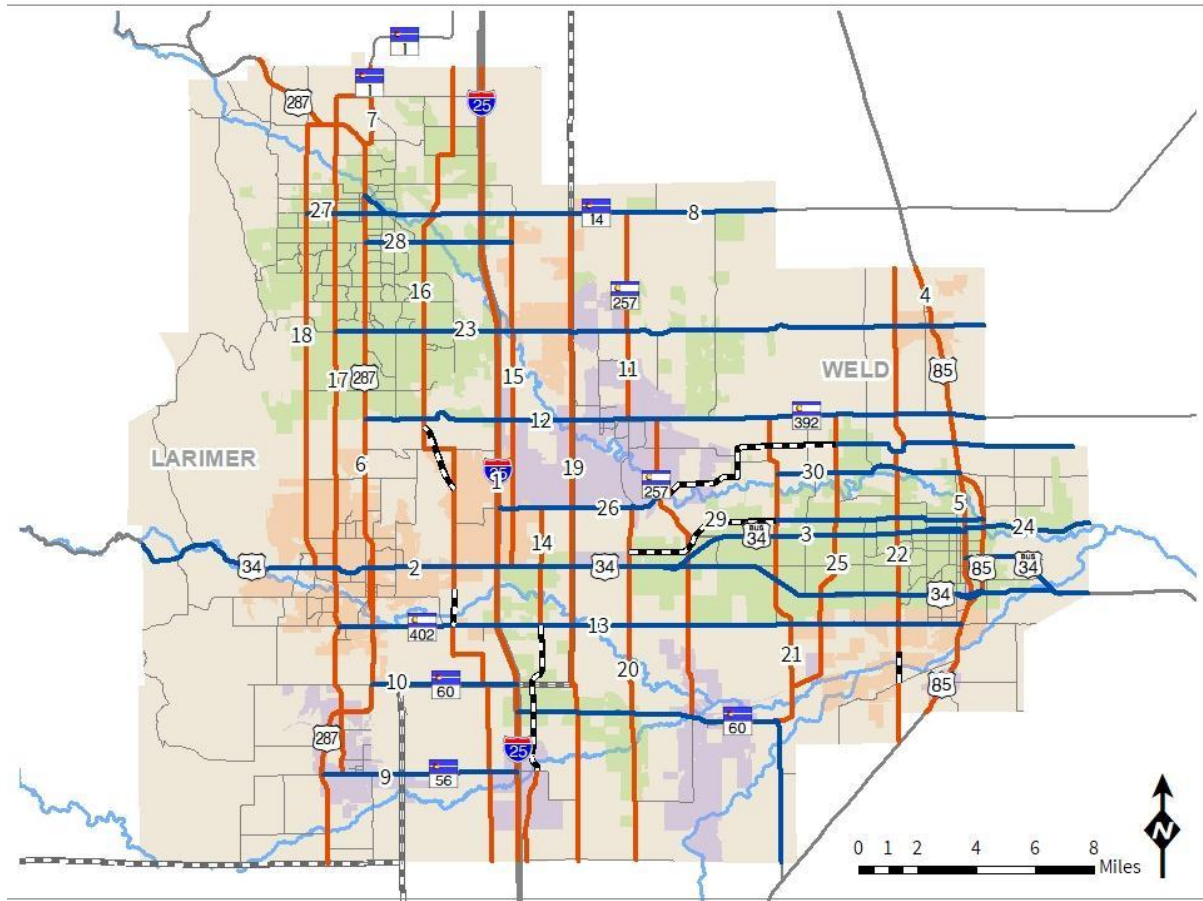
In 2022, the Colorado Transportation Commission provided funding for the NFRMPO to improve its RTDM, specifically with an eye toward induced demand, improved work from home components, and better and more current data. These funds have improved the NFRMPO's ability to have holistic discussions about the future of multimodal transportation in the region.

The adopted 2050 RTP GHG Transportation Report is available [here](#).

Overview of the 2050 Regional Transportation Plan (RTP)

The NFRMPO region has seen continuous and rapid growth in both population and jobs. To accommodate this growth, the region must continue investing in a multimodal transportation system including roadways, freight and railroad systems, transit networks, and bicycle and pedestrian infrastructure. The 2050 RTP focuses investing in the transportation networks connecting multiple communities within the region. To assist in this process, the NFRMPO has created sets of regional priority corridors: Regionally Significant Corridors (RSCs), Regional Transit Corridors (RTCs), and Regional Active Transportation Corridors (RATCs) (Figures 5, 6, and 7, respectively).





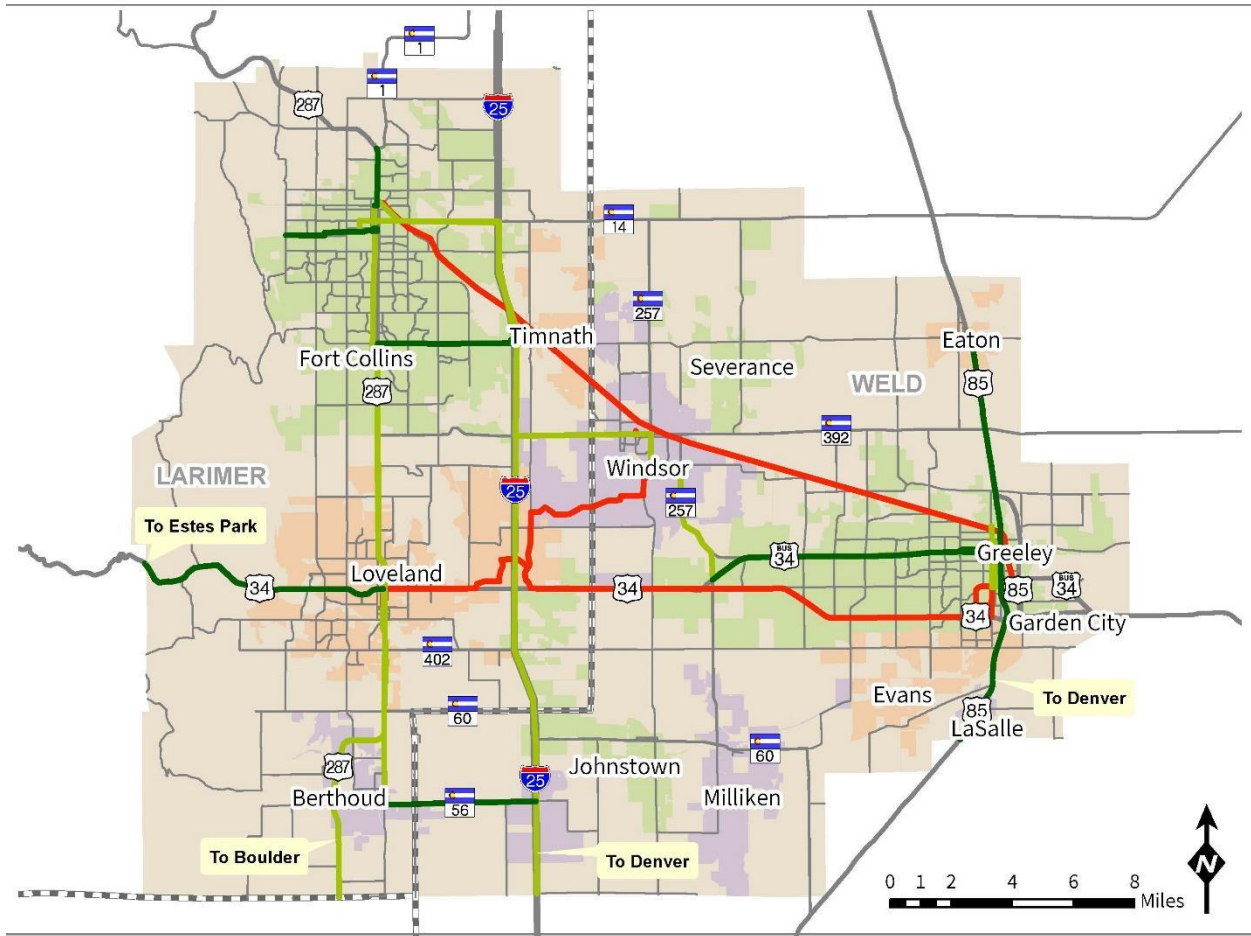
Legend

- Proposed RSCs - Unconstructed
- Proposed RSCs - East/West
- Proposed RSCs - North/South
- County Boundary
- NFRMPO Planning Area

March 2023
Sources: CDOT, NFRMPO



Figure 5 - A map of NFRMPO's Regionally Significant Corridors.



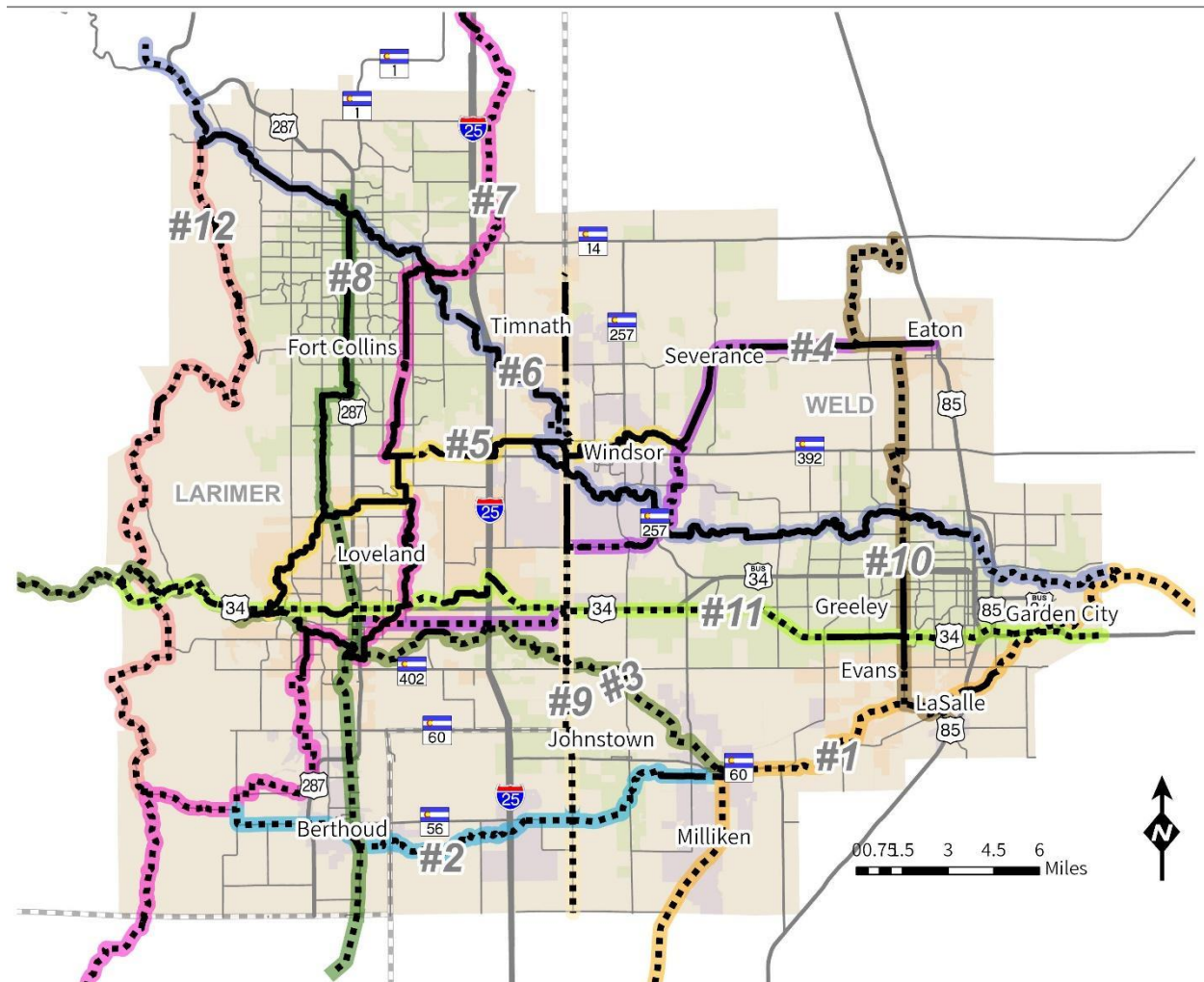
Legend

- Local Priorities
- Existing Service
- Premium Transit Analysis
- County Boundary
- NFRMPO Planning Area

May 2023
 Sources: CDOT, NFRMPO

Figure 6 - A map of NFRMPO's Regional Transit Corridors.





May 2023
Sources: CDOT, NFRMPO
North Front Range Metropolitan Planning Organization

Legend

- Existing or Interim Alignment
- Proposed Alignment
- 1: South Platte/American Discovery Trail
- 2: Little Thompson River
- 3: Big Thompson River
- 4: Great Western/Johnstown/Loveland
- 5: North Loveland/Windsor
- 6: Poudre River Trail
- 7: Front Range Trail West
- 8: BNSF Fort Collins/Berthoud
- 9: Johnstown/Timnath
- 10: Eaton/LaSalle
- 11: US34 Parallel
- 12: Carter Lake/Horsetooth Foothills

Figure 7 - A map of NFRMPO's Regional Active Transportation Corridors.

The 2050 RTP is a fiscally constrained plan, which means the total estimated cost of operating, maintaining, and improving the transportation system does not exceed the forecasted revenue over the horizon of the Plan. The forecasted revenue represents the amount of public and private funding for transportation that is reasonably



anticipated from 2024 through 2050. The Fiscally Constrained Plan for the 2050 RTP illustrates how the anticipated revenues will be allocated based on eight expenditure categories: Roadway Operations and Maintenance, Intersection Improvements, RATC and RTC Operations, Maintenance and Expansion, RSC and Non-RSC capacity Projects, and GHG reduction strategies. The GHG Reduction Strategies category primarily funds TDM and Operations strategies but also includes other strategies not funded through the other expenditure categories. Table 5 below lists each of the 2050 RTP expenditure categories and the corresponding percentage of the funded projects which are anticipated to help achieve the reductions outlined in the GHG Transportation Report.

Expenditure Category	Proportion of Expenditure Category Achieving GHG Strategies	Total Funded Expenditure Category (2024-2050)	\$ Contributing to GHG Strategies
Roadway Operations & Maintenance	6%	\$6,510.17	\$390.61
Intersection Improvement Projects	9%	\$787.93	\$67.35
Regional RATC Operations, Maintenance, and Expansion	85%	\$435.38	\$370.08
RTC Local: Operations, Maintenance, and Local System Expansion	62%	\$2,790.97	\$1,730.40
RTC Regional: LinkNoCo & Bustang	61%	\$631.47	\$387.63
Regionally Significant Corridor (RSC) Capacity Projects	5%	\$1,419.05	\$70.95
Non-RSC Capacity Projects	5%	\$621.00	\$31.05
GHG Reduction Strategies	100%	\$91.00	\$91.00
TOTAL	24%	\$13,286.98	\$3,139.07

Table 5 - NFRMPO’s 2050 RTP expenditure categories.



Regional Active Transportation Plan (ATP)

The Regional Active Transportation Plan (ATP), adopted in July 2021, is a vision for improved active transportation in Northern Colorado. Active transportation, as defined in the ATP, is any human-powered and human-scaled modes of transportation planning including pedestrian (walk or wheelchair), bicycle, scooter, skateboard, or other personal mobility devices.

The ATP includes:

- A consolidated summary of the existing bicycle and pedestrian infrastructure, data, and design standards throughout the region;
- Segment by segment analysis of each regional active transportation corridor (RATC), including needs, opportunities, and barriers;
- Best practices and recommended action steps in various topic areas including emerging micro mobility solutions such as electric assist bikes (e-bikes); and
- Updated tools, analysis, and guidance supporting local and regional planning and funding efforts.

The ATP focuses analysis and investment efforts along the RATC network. The RATCs collectively have been developed to one day serve as the spine for active transportation travel between and through the local communities. The RATC network is not categorized as recreation-, school-, or commuter-oriented due to the complex and ever-changing nature of how trips are made and how these facilities are used. Part of any trip, regardless of purpose, which can be converted to an active mode helps the region achieve its transportation and air quality goals.

In addition to identifying and analyzing the RATC network as it can provide connections between communities within the region, the ATP includes a robust outline of strategic local connections to the regional trail network. By identifying strategic connections and how the bicycle and pedestrian, trail, and multi-use path within local communities will be constructed to integrate with regional facilities, the ATP sets the region up for success in the build out and utilization of active transportation facilities.

NFRMPO staff worked with local communities to develop a list of strategic local connections and visions for each of the RATCs. The NoCo Bike & Ped Collaborative maintains the list of these projects, ensuring bicycle and pedestrian projects, improvements, and strategies are being incorporated into the planning process.



Link: <https://nfrmpo.org/wp-content/uploads/2021-regional-active-transportation-plan.pdf>

Transportation Demand Management (TDM) Action Plan

The NFRMPO adopted the TDM Action Plan in December 2022, laying out strategies to reduce single-occupant vehicle (SOV) trips in Northern Colorado. The plan included goal- and vision-setting efforts, and analysis of current needs, programs, and efforts, identification of partner agencies for ongoing partnerships and implementation, and development of a transportation management organization. The planning effort analyzed different commuting trends, population, and local, regional, and state efforts. Based on these analyses, the Plan recommended the following goals:

1. Enhance partnerships and collaboration between local communities, businesses, regional and State agencies, and other interested parties;
2. Create and enhance regional TDM programming to optimize people throughput;
3. Improve data collection to support new and expanded investments and programming;
4. Invest in infrastructure and resources to provide additional options and help people make more informed transportation choices; and
5. Communicate the purpose, benefits, and successes of providing mobility options.

The TDM Action Plan recommended setting up and supporting Transportation Management Organizations (TMO) in Northern Colorado. Whereas TDM are the strategies themselves, TMOs are the implementers of these strategies, specifically through outreach, marketing, and piloting/supporting projects and programs. Currently, TMOs within the State are concentrated in the Denver/I-70 corridors with support from the Denver Regional Council of Governments (DRCOG) and CDOT.

NFRMPO's Planning Council has set aside Multimodal Transportation and Mitigation Options Funds (MMOF) to initiate the first TMO in Northern Colorado, matched with a CDOT Office of Innovative Mobility (OIM) TDM Seed Funding grant. Together, these grants will support a new, standalone organization to work with businesses, community groups, and other major stakeholders along the US34 corridor between Estes Park and Kersey. The NFRMPO will administer the funds, allowing the TMO to focus on programming and community support. Because this is the first TMO in Northern Colorado, it is expected the organization will evolve based on identified needs.



In addition, the Planning Council has set aside \$100,000 of Carbon Reduction Program (CRP) funds annually starting in FY2024 to support new and existing TMOs. As with the MMOF and OIM grants, these funds will need to show a vehicle trip reduction and extensive outreach to ensure the NFRMPO meets requirements set out in the GHG Planning Standard and in line with the requirements of the funding programs.

Link: <https://nfrmpo.org/wp-content/uploads/2022-tdm-action-plan.pdf>

PPACG

Strategy of policies/activities being developed within the Pikes Peak region that reduce carbon emissions by facilitating the use of alternatives to single-occupant vehicle trips. These policies/activities include and are not limited to:

- Development of a Regional Complete Streets toolbox resource
- Enhance regional TDM (Travel Demand Management) strategies
- Recommendations from the PPACG Active Transportation Plan
- Review the Congestion Management Process (CMP) and strengthen the process as necessary
- Updated Regional Transit Plan
- Integration of carbon-reducing projects into the project selection process for the TIP and RTP

Long Range Transportation Plan Strategies

Complete Streets - Development of a Regional Complete Streets toolbox resource to encourage local jurisdictions to implement appropriate context sensitive solutions for their jurisdiction as appropriate. This activity is envisioned to be consistent/compliant with federal IIJA requirements for MPOs to utilize a portion of their planning funds on Complete Street activities.

Travel Demand Management (TDM) - Denver has several Transportation Management Agencies that facilitate TDM strategies within the Denver region. PPACG, in close coordination with Colorado Springs Mountain Metro Transit (MMT) and other stakeholders, is investigating what TDM looks like in the Pikes Peak Region. Is it a consolidated effort that is centralized through MMT with PPACG assistance, or does the region look to develop Transportation Management Agencies similar to the network that is in place in the Denver urbanized area? MMT and PPACG intend to do a study of the current TDM strategies being implemented in our area and assess best practices that have been implemented in other parts of the country to determine



what TDM strategies would possibly be successful in our region. This study depends on funding availability through grants from the State or other sources in 2024.

Active Transportation Plan - PPACG has kicked off our update to the Regional Active Transportation Plan. The active transportation plan is intended to serve the following functions:

- Describe the need and potential for the development of pedestrian, bicycle, and micro-mobility systems in the region.
- Identify regional priority projects and/or corridors, significant gaps, and timely opportunities.
- Complement and enhance member government active transportation plans and initiatives.
- Help provide coordination, data, or other services at the regional level that would be impractical for individual member governments.
- Consolidate and potentially update existing bicycle and pedestrian infrastructure maps to provide a regional view of active transportation.
- Provide local agencies with tools to support active transportation planning and projects to include potential funding opportunities.
- Identify and list active transportation projects that would potentially become part of the LRTP.

Once completed, PPACG will include specific projects in the PPACG carbon reduction strategy and provide a link to the completed Active Transportation Plan. It is anticipated all projects identified in the Active Transportation Plan will have the benefit of reducing carbon in the region.

Congestion Management Process (CMP) - PPACG, as the federally designated Transportation Management Area (TMA) for the Pikes Peak Urbanized Area, is required to have a CMP that outlines a regional approach for congestion that provides a range of management strategies that meet state and local needs. A TMA is an MPO with over 200,000 in population. The TMA designation adds additional responsibilities/requirements for the MPO.



Figure 4: Critical Multimodal Corridors and Hubs

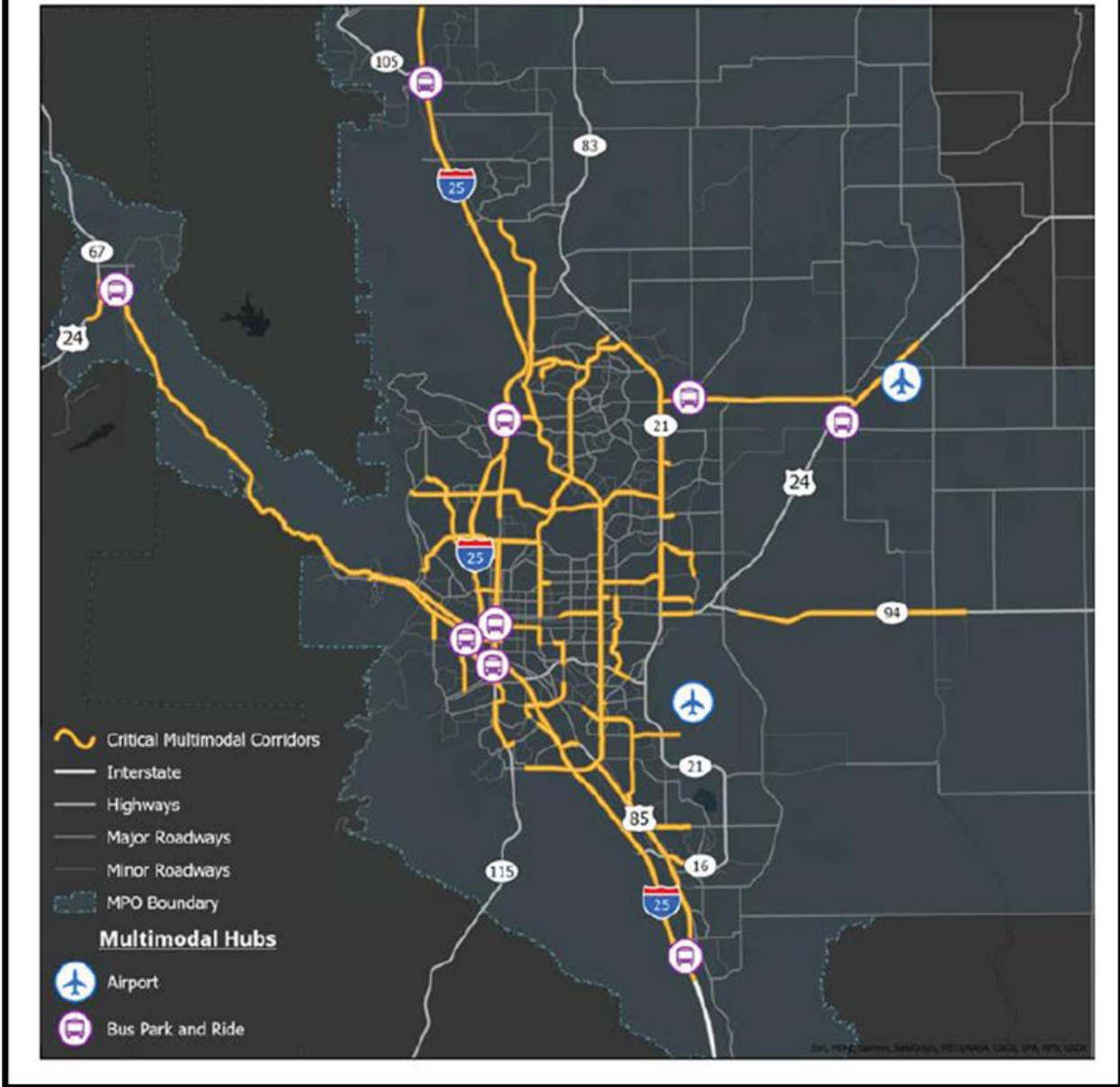


Figure 8 - Map of active transportation and transit corridors from the adopted PPACG Congestion Management Process.

2050 Long Range Transportation Plan, Transit Plan - Transit is an integral part of the region's carbon reduction strategy. PPACG coordinates and collaborates with MMT on developing a regional transit plan that optimizes available funding to provide greater transit options that reduce single occupancy trips.



2050 Long Range Transportation Plan

As the federally-designated metropolitan planning organization (MPO) for the Colorado Springs area, the Pikes Peak Area Council of Governments (PPACG) is responsible for developing and maintaining a regional, long-range transportation plan (LRTP). Long-range transportation plans are required to comply with federal and state laws for regional and statewide planning, in order for the region to be eligible for federal transportation funding. All Regionally Significant transportation projects that could significantly alter transportation or air quality within the metropolitan planning area must be included in the plan. As PPACG is currently in attainment, LRTPs are written every five years with planning horizons of at least 20 years. PPACG is currently in the initial stages of developing the 2050 LRTP.

The LRTP provides the foundation for all other aspects of transportation decision-making by establishing the vision and goals for regional transportation, evaluating the system as a whole, and identifying strategies for implementation. It also presents an opportunity for decision-makers to understand the broader social, economic, and environmental impacts of transportation and land-use decisions.

The 2050 LRTP will comply with the GHG Planning Rule. GHG analysis conducted includes the roadway, transit, and non-motorized facility improvements along with other GHG-reducing strategies. GHG strategies for the region are still in development. However, strategies identified during the development of the Congestion Management Process are being integrated into the LRTP.

The LRTP will utilize an updated Travel Demand Model, which is currently in development. Updates to the Travel Demand Model include verification of the functional class, capacity, speed limit, number of lanes, and other link attributes in PPACG's GIS roadway network data; edits to the intersection geometry with the correct number and length of turn lanes as well as the correct intersection control type; importing signal timing from PPACG-supplied synchro files for signalized intersections within the Travel Demand Model; import new TAZs and assign connectors in accordance with network access points; improving pedestrian, bicycle, and transit trip assignment functionality; ensuring model compliance and integration with the CDOT-specified PopGen2 population synthesizer; and helping PPACG staff identify and implement multi-modal population characteristics that will more accurately model pedestrian, bike, and transit trip choice in the region. All of these will help PPACG more accurately model travel and GHG impacts in the region.



GVMPO

GVMPO 2050 Regional Transportation Plan (RTP) and GHG Transportation Report

The GVMPO falls under 2 CCR-22 -Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions and was involved in the 2021 rulemaking which added GHG Emissions reduction requirements to the long-range plan. Per this rule, GVMPO will have to comply with the following in the next long-range model and plan:

Regional Area	2025 Reduction Level (MMT)	2030 Reduction Level (MMT)	2040 Reduction Level (MMT)	2050 Reduction Level (MMT)
GVMPO	N/A	.02	.02	.01

Table 6 - GVMPO's GHG Reduction Levels from Table 1 in the GHG Transportation Planning Standard.

In 2023, the GVMPO began updating the Travel Demand Model (model) for the 2050 Regional Transportation Plan. In 2024, the GVMPO will update the long-range plan with the development of the 2050 Regional Transportation Plan (2050 RTP). The 2050 RTP is a fiscally constrained plan identifying projects to enhance the existing multimodal transportation system and will address ozone and greenhouse gases (GHG). As part of the 2050 RTP, the GVMPO will develop a GHG Transportation Report that demonstrates that the 2050 RTP complies with the GHG reduction requirements.

Overview of the 2050 Regional Transportation Plan (RTP)

The GVMPO region has seen continuous and steady growth in both population and jobs. To accommodate this growth, the region must continue investing in a multimodal transportation system including roadways, freight and railroad systems, transit networks, and bicycle and pedestrian infrastructure. The 2050 RTP focuses on investing in the transportation networks connecting multiple communities within the region. The following plans/policies have recently been completed to help inform the 2050 RTP:

- City of Grand Junction Complete Streets Policy (2018)
- City of Grand Junction 4th and 5th Street Feasibility Study (2022)
- City of Grand Junction Pedestrian and Bicycle Plan (2023)
- City of Grand Junction EV Readiness Plan (2023)



- City of Grand Junction Sustainability Plan (2024)
- City of Grand Junction Urban Trails Master Plan (updated annually)
- City of Fruita Active Circulation Plan (2022)
- City of Grand/Mesa County Junction Circulation Plan (2018)
- Mesa County Coordinated Transit and Human Services Transportation Plan (2022)
- Mesa County Riverfront Trail Connection Conceptual Design (2024)
- Grand Valley Transit Strategic Plan (2018)
- Grand Valley Transit Onboard Survey, Counts, and Analysis (2023)
- North Avenue Enhanced Transit Corridor Study (2022)

The GHG analysis of the 2050 RTP will include regionally-significant improvement projects along with other GHG-reducing strategies that will be identified in the 2050 RTP and modeled. The GHG Transportation Planning Reduction Levels will be looked at for the years 2025, 2030, 2040, and 2050 and compared to the RTP as adopted in 2018. The 2050 RTP and mitigation measures will rely on various strategies and improvements in order to achieve the GHG Reductions set forth through the GHG Planning Standard. These may include:

Transit

- Update the model to include transit system
- Model different scenarios with increased transit frequency or modified routes
- Long and short-term transit project list

Active Transportation and Transportation Demand Management

- Travel Demand Management programming based on local plans and efforts
- An increase in work from home in all evaluation years
- The addition of mode choice in the model
- Prioritization of active transportation projects to help guide expansion of the local bicycle and pedestrian network
- Acknowledgement of funding opportunities and funding needs to meet GHG reduction goals

The GHG Transportation Report will identify specific impacts for each of the strategies that are incorporated in the 2050 RTP. Based on the commitment to these GHG Strategies, the GVMPO region expects to see a decrease in overall trips taken



and miles driven, increase in active transportation trips, transit usage, and a decrease in vehicle miles traveled (VMT).

Travel Demand Management

GVMPO and partner agencies will develop additional Travel Demand Management strategies through the process of developing the 2050 RTP. However, the following are currently being implemented in the region to reduce single-occupancy vehicle trips and encourage use of other modes of transportation:

- Colorado E-bike Rebate Program
- City of Grand Junction E-bike to Work Ownership Program
- City of Grand Junction Shared Micromobility Pilot Study with Bird and Lime
- Mesa County Biannual Bike Month and commuter incentive programs
- District 51 Biannual Walk & Wheel to School Challenge
- District 51 Safe Routes to School App and Education Campaign
- Grand Valley Transit: Employer Pass Program
- Grand Valley Transit: Colorado Mesa University Student Free Pass Program
 - Also available to Colorado Mesa University Tech students
- Grand Valley Transit: District 51 Middle and High School Free Pass Program
- Grand Valley Transit: Kids Ride Free Program
- Grand Valley Transit: Fare Free Days
 - In 2023, 52 days were Fare Free + 30 additional days for veterans
- Grand Valley Transit: Travel Training

Active Transportation Funding

GVMPO and partner agencies have been actively trying to fund multimodal transportation projects across the region. GVMPO led the call for projects for Multimodal Transportation and Mitigation Options Fund (MMOF) and Carbon Reduction Program (CRP) funding in 2022 and will continue to lead the process in future years. In 2022, due to the low amount of \$547,206, partner agencies were not interested in the allocated CRP funding because it would federalize a project thereby significantly increasing the cost of the project and administrative requirements. However, as this funding pot has increased with another annual allocation, there is more interest in these funds. Additionally, GVMPO staff served on the selection committee for CDOT's allocation of Transportation Alternatives Program (TAP) funding. Partner agencies also pursued Revitalizing Main Streets (RMS) funding for multimodal projects.



In the current 2024-2027 TIP, federal, state and local funds have been used to fund the following infrastructure projects:

- City of Grand Junction North Avenue Enhanced Transit Corridor Study and Multimodal Improvements
 - TAP, MMOF, Senate Bill 1, Senate Bill 267, and local funds
- City of Grand Junction 4th-5th Street Corridor Enhancements
 - ARPA and Local
- City of Grand Junction Crosby Avenue Multimodal and Roadway Improvements
 - RMS and local funds
- Mesa County Orchard Avenue Multimodal and Roadway Improvements
 - RMS and local funds
- Mesa County 32 1/2 Road Phase 2 Corridor Design
 - MMOF and local funds
- Mesa County Clifton to Palisade Riverfront Trail Connection Conceptual Design
 - MMOF
- Palisade Connecting our Community Multimodal Improvements
 - RMS, MMOF, and local funds
- Palisade US 6 Multimodal Improvements
 - TAP and local funds

The GVMPO incorporates considerations of air quality improvements, both for ozone and GHG, in the various plans, programs, and strategies implemented through the GVMPO and partner agencies. With the short-term programming of active transportation and transit funds, in addition to the long-term strategies that will be outlined in the 2050 RTP, the GVMPO expects to see a decrease in overall trips taken and miles driven, increase in active transportation trips, transit usage, and a decrease in VMT.

PACOG

PACOG 2050 Long Range Transportation Plan (LRTP) and the GHG Planning Rule

The Pueblo Area Council of Governments (PACOG) Metropolitan Planning Organization (MPO) will begin the procurement process for the 2050 Long Range Transportation Plan (LRTP) in summer of 2024. Leading up to this update, PACOG received Multimodal Transportation and Mitigation Options, Coronavirus State and Local Recovery (MMOF-ARPA-SLFRF) funds from Colorado Department of Transportation (CDOT) to update their Travel Demand Model. They began this update in June 2023, which is their initial step to begin the 2050 (LRTP), which is to be adopted by May



2026. The 2050 LRTP will be a fiscally constrained plan that will provide a list of upcoming projects that will benefit Pueblo's existing and future transportation system. Public engagement and local agency coordination will play a pivotal role in determining what the region's priorities will be over the next 25 years. This engagement and coordination, along with their Transportation Improvement Plan (TIP), the complete streets initiative and current projects will create a comprehensive, and connected transportation system that will address greenhouse gas (GHG) emissions.

The PACOG/MPO maintains a four-step travel demand model in TransCAD and has begun to include 2020 Census Data. This will include updating the current base year to 2023 as the baseline for a Greenhouse Gas Model and modeling out to 2050 (with interim benchmark years of 2030 and 2040). In addition to the standard update process of incorporating newer data on traffic counts, road network, land-use, and other model inputs, the update includes other modeling requirements for plan updates to meet the GHG Standard for Transportation Planning. This will include transit fixed-route services and multimodal networks, converting to a mode choice model, and running the Environmental Protection Agency Motor Vehicle Emission Simulator (MOVES).

The model update will determine whether PACOG's plan will meet GHG gas emissions benchmarks for 2030, 2040, and 2050. Should these benchmarks not be met, PACOG will submit mitigation measures to offset these emissions and possible changes may need to be made to project priorities. However, PACOG is proactively planning projects that prioritize the reduction of GHG Emissions. Last year PACOG awarded over \$5 million dollars in multimodal projects that are not only needed but would offset any potential greenhouse gas emissions and create an improved broader multimodal network.

Active Transportation Plan

Over the last few years the CDOT's Multimodal Transportation and Mitigation Options Fund (MMOF) has created an opportunity for PACOG to improve and expand their multimodal system and meet several goals found in the [Pueblo Regional Bicycle and Pedestrian Master Plan](#) that was adopted in December of 2020. This plan examined the existing bicycle and pedestrian network to determine how current users navigate the network and identify barriers that prevent connectivity and access. From the data, program and infrastructure recommendations were provided to create a more comprehensive network. The five program recommendation elements are: education,



encouragement, enforcement, engineering, and evaluation. These elements were selected to promote a sustainable and methodical plan that will provide local agencies with tools for better planning and designing when creating new projects or improving existing infrastructure. The plan also gives examples of different bicycle infrastructure and where they can best be constructed.

There are many barriers that Pueblo cyclists face such as the Arkansas River, Fountain Creek, I-25, Hwy 50 and multiple railroad lines that make it difficult to traverse throughout the city and county. The MMOF awarded projects will bridge some of these gaps, such as the Westside Trail/ Wildhorse Creek Trail (Figure 9). This trail will extend the current Wildhorse Creek Trail from 18th Street to 24th Street. Several developments are planned in this area, and providing this extension will help residents to connect to places of employment and the broader community. Another MMOF project that was awarded is the Northern Avenue Phase 3 which extends a current multi-use trail further east to commercial areas and north to the Colorado State Fair (Figure 10). This project will also update driveways and intersections to make them ADA compliant.



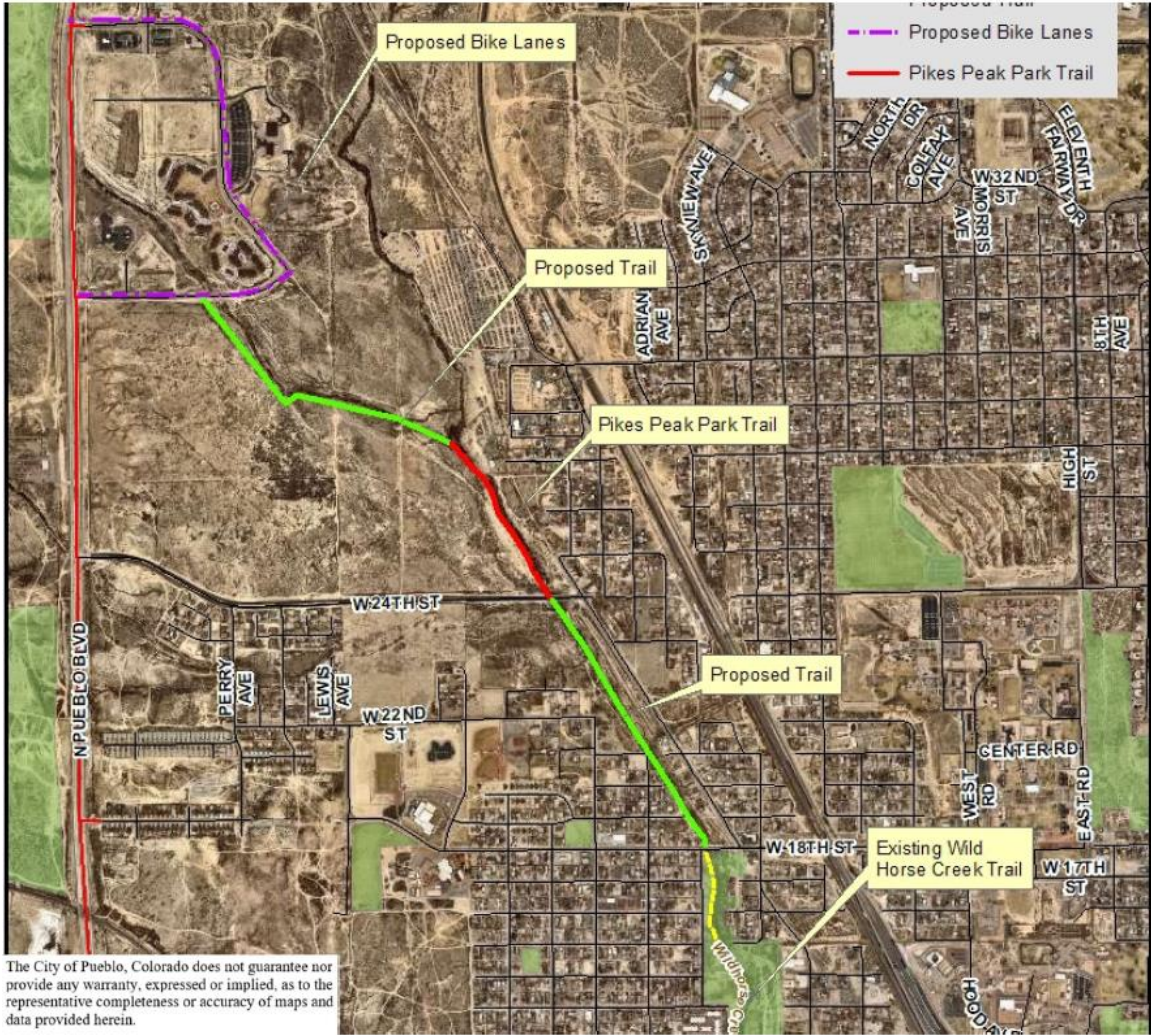


Figure 9 - A map of Westside Trail/Wildhorse Creek Trail.

Northern Avenue - Cambridge Avenue to Prairie Avenue



Prairie Avenue - Northern Avenue to Amherst Avenue

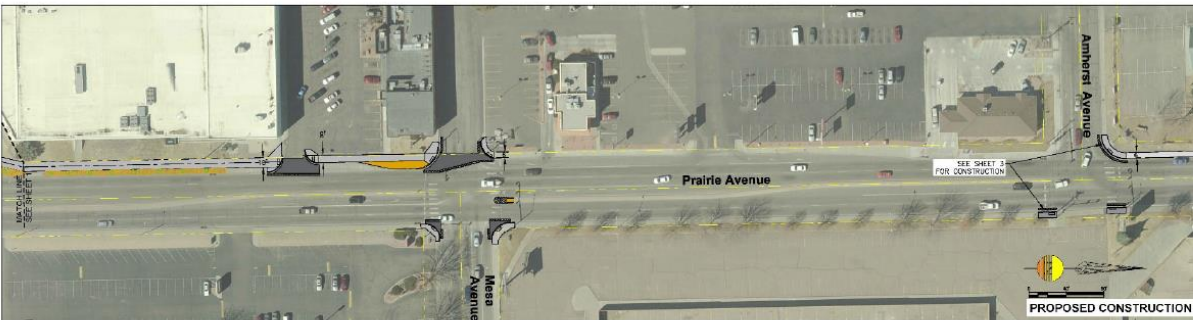


Figure 10 - Northern Avenue Phase 3, Multi-use Trail.

Pueblo Transit

Pueblo Transit was also awarded MMOF to supply a subsidized vanpool to employers who are outside of existing transit routes. Employers located at the airport industrial park as well as CS Wind, a windmill manufacturing company south of the city, will be able to utilize this opportunity. The data collected from the vanpools will help Pueblo Transit to determine if service is needed and to secure funding to extend routes to these major regional employers.

Other work

PACOG is actively working on a Complete Streets Initiative with both the City of Pueblo and Pueblo County. This initiative will help guide these jurisdictions to incorporate better planning, designing, and building streets that will enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. This will allow for a mobility shift that will encourage different mode choices rather than single occupancy vehicles thus reducing carbon emissions. They are also ensuring that the Regional Bicycle and Multi-Use Trail Map is updated



frequently to account for new bike lanes, routes, or trail connections so users are aware of these changes that enhance connectivity and access. This map also shows proposed connections to show missing links as well as opportunities for new developments to incorporate infrastructure into the network.



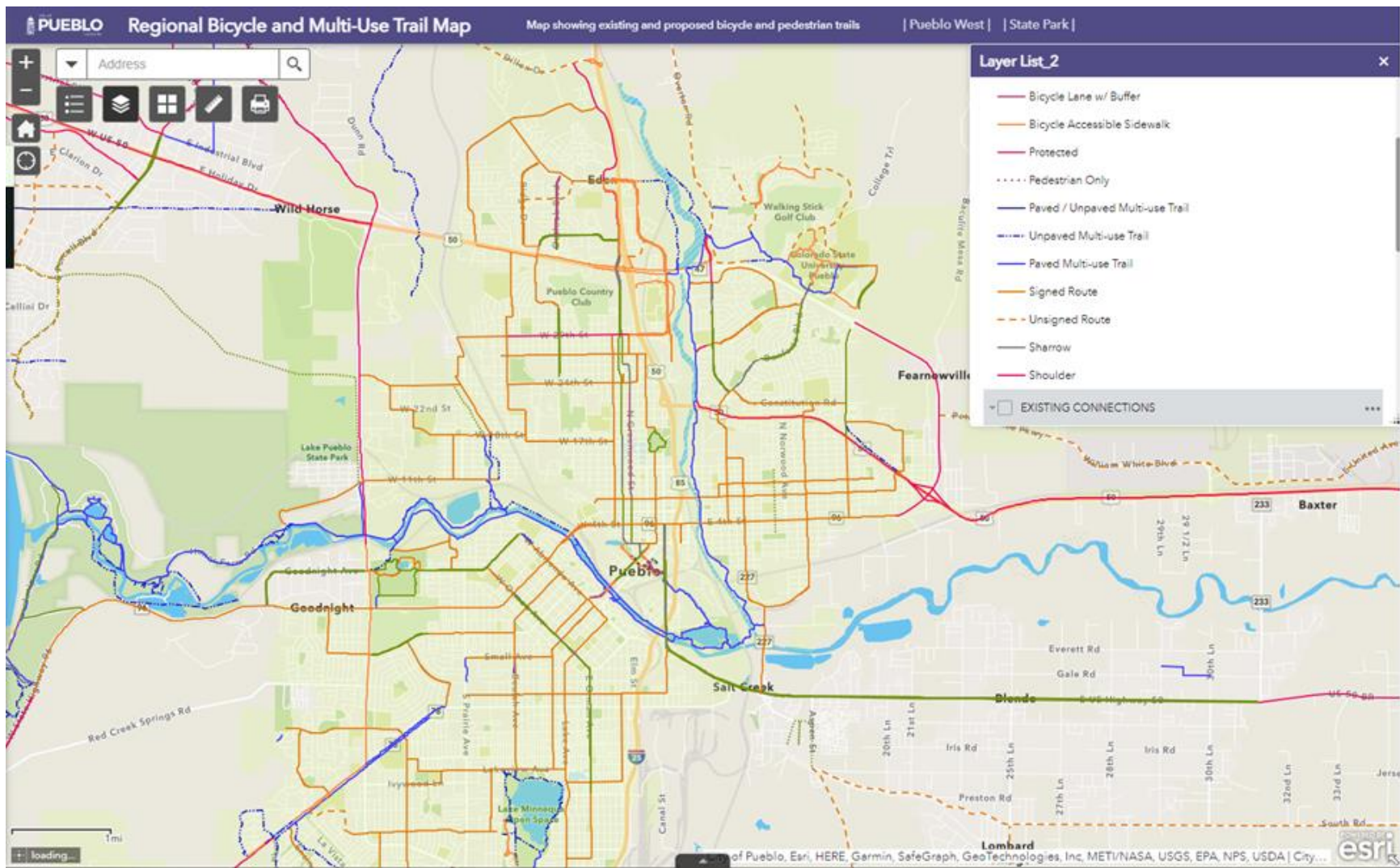


Figure 11 - A map displaying PACOG's regional bicycle and multi-use trail network.

A3 - Electrification Funding Opportunities

Colorado Electric Vehicle Grant Fund: EV owners in Colorado pay a \$50 annual registration fee, \$20 of which is directed to this fund. These dollars are then used by CEO to fund the Charge Ahead Colorado Program for the installation of Level 2 and DC Fast-Charging infrastructure across the state. SB 21-260 included a gradually increasing road usage equalization fee for electric vehicles between 2022 and 2032, when it will total \$96 dollars. The fee for plug-in hybrid electric vehicles will increase from \$3 to \$27 between 2022 and 2032. The additional new funding produced by these increases will be dedicated to road maintenance rather than the Colorado Electric Vehicle Grant Fund, which will continue receiving \$20 per registration.

Charge Ahead Colorado Program: The Charge Ahead Colorado Program is a joint effort of the CEO and the Regional Air Quality Council (RAQC) that was established in 2013. It is funded through a combination of dollars from the Colorado EV Grant Fund, federal CMAQ program, and VW Settlement BMP and awards grants to support the purchase and installation of EV charging equipment at public buildings, workplaces, retail locations, and other sites statewide. The program has funded more than 3,000 charging projects statewide over the past decade.

Alt Fuels Colorado Program: The Alt Fuels Colorado Program was established in 2014 using \$30 million in federal CMAQ funds evenly divided between vehicle grants managed by the RAQC and fueling/charging station grants managed by the CEO. In its first three years, the program supported the construction of eight new compressed natural gas (CNG) fueling stations along the I-25 corridor and on the Western Slope while also supporting the purchase of 869 alternative fuel vehicles within the Denver / North Front Range Ozone Nonattainment Area. As the market for CNG has changed over time, the program has increasingly focused on the development of EV charging infrastructure. In 2019, the Colorado Energy Office announced a grant award for ChargePoint to build DC fast-charging at 34 sites connecting Colorado's major highway corridors. As of August 2023, 31 of the 34 sites have opened to the public and the remainder are anticipated to open by the end of 2023.

DCFC Plazas Program: In 2020, the Colorado Energy Office issued a new offering for DC fast-charging plazas at high-volume urban locations such as airports, downtowns, entertainment venues, and other locations that support the electrification of taxi and TNC fleets. Between 2020 and 2023, this program awarded a total of 18 projects, 7 of which have already been completed. The latest round of the DCFC Plazas Program in 2023 was funded through a combination of federal NEVI dollars and funding from the



state's Community Access Enterprise. In August 2023, more than \$17 million in awards were announced for 36 charging locations across the state.

ZEV Transition Planning Grants: These grants fund the development of agency plans, studies, and analyses to prepare for and accelerate the deployment of zero-emission transit vehicles and support the infrastructure, facilities, training, and organizational investments necessary to make such deployments successful. Since the first call for projects in 2021, CDOT has awarded a total of \$288,000 to support transition planning projects at 7 transit agencies statewide.

Clean Transit Enterprise: Created by Senate Bill 21-260, the Clean Transit Enterprise is housed within CDOT for the purpose of supporting clean public transit through electrification planning efforts, facility upgrades, fleet motor vehicle replacements, and construction and development of associated electric motor vehicle charging and fueling infrastructure. For the last several years, funds from the Volkswagen Settlement have supported Colorado's transition to zero-emission transit vehicles. Funding from the new Clean Transit Enterprise will allow the state to scale up its efforts to meet the target of 1,000 zero-emission transit vehicles in Colorado by 2030 and a full zero-emission fleet by 2050.

Clean Fleet Enterprise: Created by Senate Bill 21-260, the Clean Fleet Enterprise is housed in CDPHE for the purpose of supporting the electrification of fleets by providing funding for the purchase of zero-emission delivery trucks, school buses, taxi and TNC fleet vehicles, and other private and government fleet vehicles.

Community Access Enterprise: Created by Senate Bill 21-260, the Community Access Enterprise is housed in CEO for the purpose of providing funding to reduce and mitigate the adverse environmental and health impacts of air pollution and GHG emissions created by delivery vehicles in local communities. Additionally, the Enterprise will support the installation of EV charging stations and create rebates for low-income households to replace older, high-polluting gasoline cars with EVs and electric bikes.

Infrastructure Investment and Jobs Act (IIJA): This federal legislation, which became law on November 15, 2021, is expected to rebuild America's roads, bridges and rails, expand access to clean drinking water, ensure access to high-speed internet, tackle the climate crisis, advance environmental justice, and invest in communities that have too often been left behind. For Colorado specifically, the IIJA will:



- **Improve the safety of our transportation system.** Local and tribal governments in Colorado will be eligible to compete for \$6 billion in funding for a new Safe Streets for All program which will provide funding directly to these entities to support their efforts to advance “vision zero” plans and other improvements to reduce crashes and fatalities, especially for cyclists and pedestrians.
- **Improve sustainable transportation options.** Based on formula funding alone, Colorado would expect to receive about \$950 million over five years under the IIJA to improve public transportation options across the state. In the first year, this represents about a 34% increase over 2021 FAST Act formula transit funding levels.
- **Build a network of EV chargers to facilitate long-distance travel and provide convenient charging options.** Under the IIJA, Colorado can expect to receive about \$56.5 million over five years to support the expansion of an EV charging network in the state. Colorado will also have the opportunity to apply for grants out of the \$2.5 billion available for EV charging.
- **Modernize and expand passenger rail and improve freight rail efficiency and safety.** The IIJA includes \$66 billion above baseline to eliminate the Amtrak maintenance backlog, modernize the Northeast Corridor, and bring world-class rail service to areas outside the northeast and mid-Atlantic. Additionally, Colorado will be eligible to compete for \$5 billion for rail improvement and safety grants and \$3 billion for grade crossing safety improvements.

EV Incentives for Consumers (Including Low-Income): Colorado has historically led the nation in terms of its incentives for electric motor vehicles, but in the past these were largely limited to new privately-owned passenger cars, trucks, and SUVs. The passage of House Bill 23-1272 increased the existing passenger vehicle incentive to \$5,000 while adding new incentives for used vehicles, lower-cost EVs, and electric passenger and cargo bicycles. New grant programs funded by the Community Access Enterprise also include low- and moderate-income offerings. Many of these new incentives and grants can be stacked with federal tax credits and/or local electric utility rebates, significantly bringing down the cost for consumers to transition to zero-emission options.



A4 - Transit and Rail Funding Opportunities

Zero Fare for Better Air: Designed to reduce ground level ozone by increasing use of public transit, this collaborative, statewide initiative was made possible by SB 22-180, in partnership with CEO. During the summer months of June, July, and August - many transit agencies across Colorado offered zero fares during Colorado's high ozone season.

Federal Transit Administration (FTA) Funding Programs: The Federal Transit Administration partners with state and local governments to provide over \$11 billion in annual grants and discretionary funding to create and enhance public transportation systems. In 2015, the Fixing America's Surface Transportation (FAST) Act was signed into law and supported transit funding through fiscal year 2020 via grants such as the FTA Metropolitan & Statewide Planning and Non-Metropolitan Transportation Planning grants (5303, 5304, 5305), Buses and Bus Facilities Formula Program (5339(a)), Buses and Bus Facilities Program (5339(b)), and the Low or No Emissions Vehicle Program (5339(c)).

FASTER Transit Program: The Funding Advancement for Surface Transportation and Economic Recovery Act of 2009 (FASTER) generates revenue through vehicle registration fees and fines and provides around \$200 million annually to support hundreds of statewide mobility and safety projects. FASTER supports the construction and maintenance of safer highways, roads, streets, bridges, and transit systems and services under the FASTER Safety Program, the Colorado Bridge Enterprise, and the FASTER Transit Grants Program. FASTER Safety has program funding of \$67.5 million annually.

A5 - Active Transportation Funding Opportunities

Transportation Alternatives Program (TAP): A subset of the Surface Transportation Block Grant Program created under the 2015 FAST Act, the TAP provides partial federal funding for programs and projects defined as transportation alternatives (e.g., pedestrian and bicycle facilities, wildlife management, and the repurposing of former Interstate System right-of-ways). In Colorado, each CDOT region is responsible for screening and scoring their respective TAP projects, and eligible applicants must provide at least 20% of the total project costs in matching funds. CDOT expects to distribute an estimated \$6.7 million in federal TAP funds each year during fiscal years 2021, 2022 and 2023. The call for projects during fiscal years 2024 through 2026 has already been conducted and is closed.



Safe Routes to School Program (SRTS): SRTS is a federal program that provides grants to projects that enable and encourage children to walk or bicycle to and from school. Administered through the state DOTs - who are afforded flexibility in their selection of projects and use of funds - the program provided \$2.49 million to Colorado infrastructure and education projects in 2018. In the 2023 fiscal year grant cycle, over \$3 million in funding was awarded to seven applicants.

Revitalizing Main Streets Program: CDOT and state agency partners developed this program in 2020 to support infrastructure projects that provide open spaces for mobility, community activities, and economic development in the wake of the COVID-19 pandemic. These “quick win” activities are improving safety and creating new community spaces to encourage healthy activity and mobility in Colorado’s towns and cities. Although the primary goals of this program are to maintain safe public health measures while facilitating economic recovery, an increase in walking and biking in urban areas is also likely to have air quality benefits that may endure beyond the current health crisis. In March 2021, CDOT launched the Revitalizing Main Streets Grant Program with two separate applications, initially providing \$30 million for larger transportation safety infrastructure grants and smaller multimodal and economic resiliency projects across more than 100 communities in Colorado. In December 2021, Governor Polis presented his budget proposal for fiscal year 2022-2023 to the Joint Budget Committee, which includes \$40 million to continue supporting this program.

A6 - TDM Funding Opportunities

Transportation Management Organization (TMO) Support Grant: Released in July 2021, the TMO Support Grant seeks to enable Colorado’s nine, existing TMOs to expand, enhance, and pilot programs and projects that provide specialized knowledge and capacities to businesses and communities as they evaluate, plan, and implement voluntary trip reduction strategies.

TDM Innovation Grant: Released in October 2021, the TDM Innovation Grant was developed to support communities and organizations in developing creative programs and tools that reduce single occupancy vehicle (SOV) travel and ultimately improve regional air quality, ease congestion, and reduce greenhouse gas emissions.



TDM Seed Funding Grant: Released in October 2021, the TDM Seed Funding Grant is designed to provide initial funding to allow for the creation of dedicated and permanent TDM programs in areas with demonstrated transportation challenges and a lack of existing TDM capacities.

A7 - Air Quality Funding Opportunities

Congestion Mitigation and Air Quality Improvement Program (CMAQ): The CMAQ program is administered by FHWA and provides flexible funding to state and local governments for the reduction of congestion and improvement of air quality in areas that do not meet or have not met National Ambient Air Quality Standards. To date, the CMAQ program has provided over \$30 billion in funding for more than 29,000 projects to DOTs, MPOs, and other sponsors working to meet the requirements of the Clean Air Act (CAA). The annual funding allocated to Colorado is approximately \$50 million, and between 2016 and 2018, funds were primarily allocated to congestion reduction and traffic flow improvements, travel demand management, alternative fuels and vehicles, and bicycle and pedestrian facilities and programs. Starting in FY21, the Transportation Commission approved annual allocations of between 2% and 5% of the total to a Statewide CMAQ pool focused on transportation electrification projects.

Nonattainment Area Air Pollution Mitigation Enterprise: Rapid and continued growth in retail deliveries made by motor vehicles and in rides arranged through transportation network companies has increased traffic congestion and air pollution, along with the adverse environmental and health impacts that result from such pollution. In response, Section 52 of Senate Bill 21-260 created a Nonattainment Area Air Pollution Mitigation Enterprise for the purpose of mitigating transportation-related emissions in ozone nonattainment areas. The Enterprise is authorized to impose air pollution mitigation fees on rides and retail deliveries to provide funding for projects that reduce traffic, including those that encourage alternatives to driving alone or that directly reduce air pollution.

