Colorado Transportation Commission

Schedule & Agenda

March 18-19, 2026

Transportation Commission Workshops

Wednesday, March 18, 2026

Time	Topic	Speaker
12:00 p.m.	Optional TC/CTIO Joint Lunch	None
12:30 p.m.	Joint TC/CTIO Workshop on Bustang	Jeff Sudmeier, Kay Kelly, Piper Darlington, Emily Haddaway
1:15 p.m.	Pueblo Area Council of Governments (PACOG) GHG Transportation Report	Darius Pakbaz, Eva Cosyleon (PACOG)
1:45 p.m.	Condemnation Authorization Request– US 160 Elmore's East Project	Keith Stefanik, Julie Constan
2:00 p.m.	Budget Workshop • FY 2026-27 Final Annual Budget Allocation Plan • FY 2025-26 6th Budget Supplement	Jeff Sudmeier, Bethany Nicholas
2:30 p.m.	10-Year Plan Workshop • Public Comment Period • PD-14 Targets	Darius Pakbaz, Marissa Gaughan
3:15 p.m.	Roadside Fire Mitigation Update	Bob Fifer, Jim Fox
3:45 p.m.	Audit Review Committee (ARC)	Frank Spinelli
4:00 p.m.	Adjournment	

Transportation Commission Meeting

Thursday, March 19, 2026

Time	Topic	Speaker
8:00 a.m.	TC Breakfast	None
9:00 a.m.	Call to Order, Roll Call	Herman Stockinger
9:05 a.m.	Public Comments	Various
9:20 a.m.	Comments of the Chair and Commissioners	Commissioners
9:35 a.m.	Executive Director’s Report	Shoshana Lew
9:40 a.m.	Chief Engineer’s Report	Keith Stefanik
9:45 a.m.	CTIO Director’s Report	Piper Darlington
9:50 a.m.	FHWA Report	John Cater
9:55 a.m.	STAC Report	Gary Beedy
10:00 a.m.	Legislative Report	Emily Haddaway

10:05 a.m.	Act on Consent Agenda: Proposed Resolution #1: Approve the Regular Meeting Minutes of February 19, 2026 Proposed Resolution #2: IGA Approval >$750,000 Proposed Resolution #3: Disposal Parcel 140R-Rev1, Steamboat Springs, US 40 Proposed Resolution #4: John "Jack" Thurman Memorial Highway Designation Approval Proposed Resolution #5: R4 Access Appeal Access Application #425127 on SH 85	 Herman Stockinger Lauren Cabot Hope Wright Emily Haddaway Daniel Roussin, Tim Bilobran
10:10 a.m.	Discuss and Act on Proposed Resolution #6: Condemnation Authorization Request - US 160 Elmore's East Project	Keith Stefanik, Julie Constan
10:15 a.m.	Discuss and Act on Proposed Resolution #7: 6th Budget Supplement of FY 2025-26	Jeff Sudmeier and Bethany Nicholas
10:20 a.m.	Discuss and Act on Proposed Resolution #8: FY 2026-27 Final Annual Budget Allocation Plan	Jeff Sudmeier and Bethany Nicholas
10:25 a.m.	Discuss and Act on Proposed Resolution #9: Pueblo Area Council of Governments (PACOG) GHG Transportation Report	Darius Pakbaz
10:30 a.m.	Discuss and Act on Proposed Resolution #10: CDOT GHG Transportation Report	Darius Pakbaz
10:35 a.m.	Recognitions and Other Matters	
10:40 a.m.	Adjournment	None

Bridge and Tunnel Enterprise Board of Directors Meeting

Thursday, March 19, 2026

Time	**Topic**	**Speaker**
10:40 a.m.	Call to Order, Roll Call	Herman Stockinger
10:45 a.m.	Public Comments	Various
10:50 a.m.	Act on Consent Agenda: • Proposed Resolution #BTE1: Approve the Regular Meeting Minutes of February 19, 2026	Herman Stockinger
10:55 a.m.	Discuss and Act on Proposed Resolution #BTE2: Final FY2026-27 BTE Budget Allocation Plan for Adoption	Patrick Holinda
11:00 a.m.	Other Matters	None
11:05 a.m.	Adjournment	None

Information Only

- Project Budget/Expenditure Memo (Jeff Sudmeier)
- March 2026 TC Grants Memo (Anna Dunn & Leslie Welch)
- Statewide Plan and GHG Coordination Committee – Notes from March 3, 2026 (Darius Pakbaz)
- FY 2024-25 Annual Financial Audit (Jeff Sudmeier)

COLORADO
Department of Transportation
Office of Innovative Mobility

Transportation Commission Memorandum

To: Transportation Commission

From: Kay Kelly, Chief of Innovative Mobility
Jeffrey Sudmeier, Chief Financial Officer
Piper Darlington, Director, CTIO
Paul DesRocher, Director, Division of Transit and Rail

Date: March 18, 2026

Subject: Bustang Overview and Financial Outlook

Purpose

To continue dialogue with the Transportation Commission regarding Bustang's operational impact, and to explore revenue options and efficiency measures to support continued service.

Action

Informational

Background

During the February workshop, staff provided TC with an overview of Bustang transit service, reviewing its evolution from inception to now, and illustrating the revenue shortfall associated with maintaining current service levels. During that discussion, Commissioners requested additional detail quantifying Bustang's impact and a breakdown of all available revenue sources that could contribute to the funding shortfall.

Next Steps

Upon providing the requested information during the March workshop and hearing TC feedback, staff will continue to iterate on potential options for reducing the Bustang revenue gap. It is anticipated that future workshops and/or Board sessions will be required after the March discussion.

COLORADO
Department of Transportation
Office of Innovative Mobility

Attachments:

Presentation – Bustang March 2026 TC Workshop

COLORADO
Department of Transportation

Bustang Funding Joint TC/CTIO Workshop

March 18, 2026

Agenda

- Quantifying Bustang Benefits
  - Consumers
  - Society
  - Highway Operations
- Bustang Ridership
- Service Optimization Scenarios
- Funding Sources with Transit Eligibility
- Next Steps

Consumer Costs of Driving vs. Taking Transit

- In Colorado and nationally, Transportation is the second largest monthly household expense behind Housing.*
- The average cost to own and operate a personal vehicle is $12,297 a year or about $1,025 a month (equivalent to **$0.60 to $0.85 per mile**).**

- Bustang offers distance-based fares equivalent to **$0.17 per mile**
- Example - Ft. Collins to Denver
  - Adult (12+) $10
  - Seniors (65+) $7
  - Child (2-11) $5
  - Child (< 2) Free
- 10, 20, 40 ticket packages are also available at 10-25% discounts
- RTD Standard Monthly Pass is $88 or $1,056 annually

*2024 Bureau of Labor Statistics (BLS) Household Expense Data. Costs vary based on location, household size, and lifestyle.

**2024 AAA Your Driving Costs Data. Includes costs associated with vehicle financing, maintenance, insurance, registration, depreciation, parking, unexpected repairs, traffic tickets, tolls, and vehicle fuel efficiency.

Public Transit Creates Positive Externalities

Environmental:

- Improved air quality
- Energy efficiency
- Improved urban form
- Reduced sprawl

Social:

- Enables mobility for non-driving, elderly, disabled and low-income populations
- Reduced social isolation
- Improved public health
- Increased safety

Economic:

- Reduced congestion
- Opportunities for transit-oriented development
- Increasing activity, connections for local transit
- Workforce access to jobs

Economic Returns from Public Transit

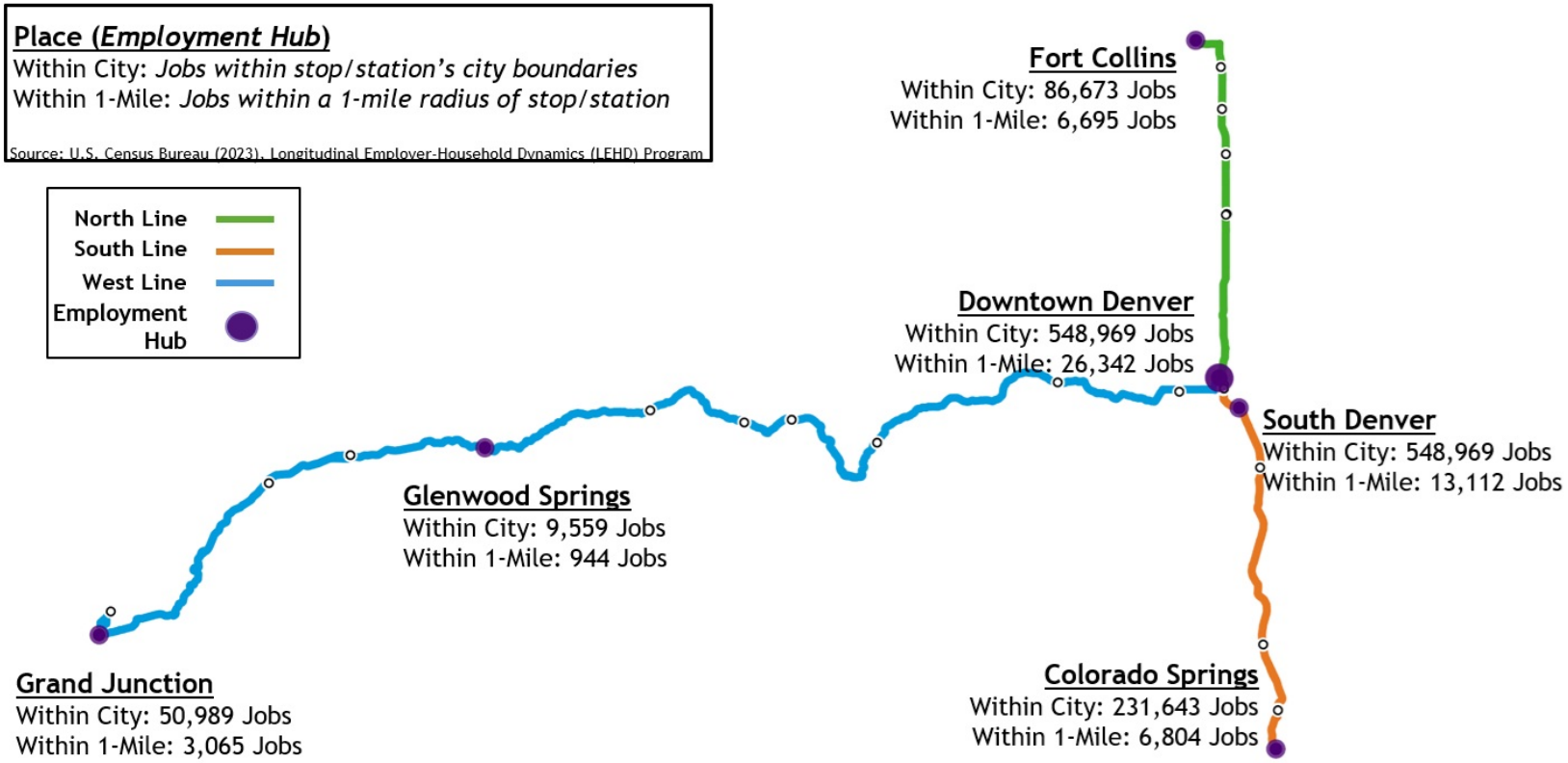
The American Public Transit Association (APTA) estimates that every $1 billion invested in public transportation generates $5 billion in long-term economic value and supports tens of thousands of jobs across the U.S.

Local Example - $500M in public investment at Denver Union Station led to $3.5B in private development, including

- 1.9M sq ft of office space
- 250k sq ft of retail space
- 3,000 residential units
- 750 hotel rooms

https://www.apta.com/wp-content/uploads/APTA-Economic-Impact-of-Public-Transportation-022026.pdf

Bustang Connects Coloradans to Economic Centers & Jobs



Public Transit Makes Roads Safer and More Efficient

- Transit travel has about one tenth (1/10th) the traffic casualty (death or injury) rate as automobile travel.*
- Transit-oriented neighborhoods have about one fifth (1/5th) the per capita crash casualty rate as automobile-oriented areas.*
- Transit tends to have lower overall crime rates than driving, eliminating risky behaviors such as aggressive or impaired driving.*
- Fewer crashes improve roadway operations and reduce costs associated with traffic enforcement and emergency services.**

*Safer Than You Think! Revising the Transit Safety Narrative, 21 December 2025, Todd Litman Victoria, Transport Policy Institute
** Economic Impact of Public Transportation Investment, 2026 February, American Public Transportation Association

CDOT Systems and Bustang

Gov. Polis's Transportation Vision identifies strategies to reduce pollution, advance affordability, and improve quality of life for all Coloradans including;

1. Expansion of transit service
2. Implementing policies to encourage compact land use and walkable communities to reduce the number and distance of vehicle trips
3. Increasing travel choices by investing in bicycle and pedestrian infrastructure and micro mobility services that assist with "first and last mile" connections to transit facilities.

On I-25 and I-70 especially, where transit infrastructure is actively being integrated into the highway, Bustang contributes to identified strategies for affordable, accessible, and convenient transportation across the state.

Service Overview

Bustang Main Line

- Operates along Colorado's busiest corridors (I-70 and I-25)
- Focused on providing express service and meeting demand along corridors

Outrider

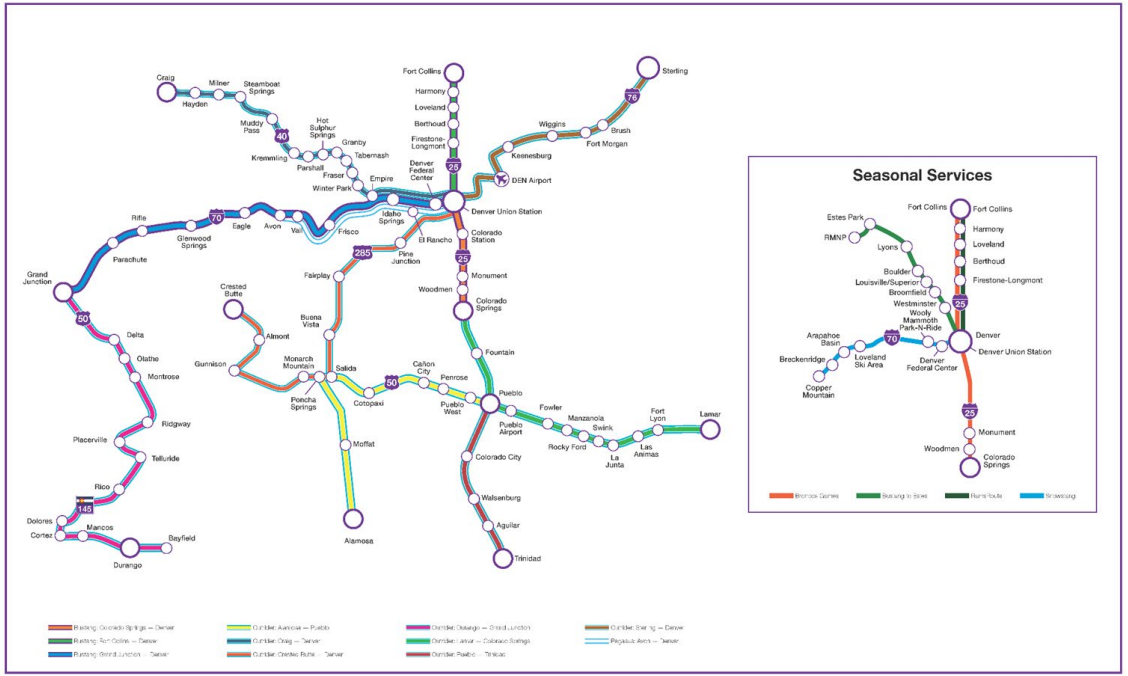
- Rural connector service.
- Focused on providing access and transit connections for rural communities across the state

Pegasus

- Express shuttle service on I-70 West
- Focused on providing a more nimble travel option with mountain express lane access.

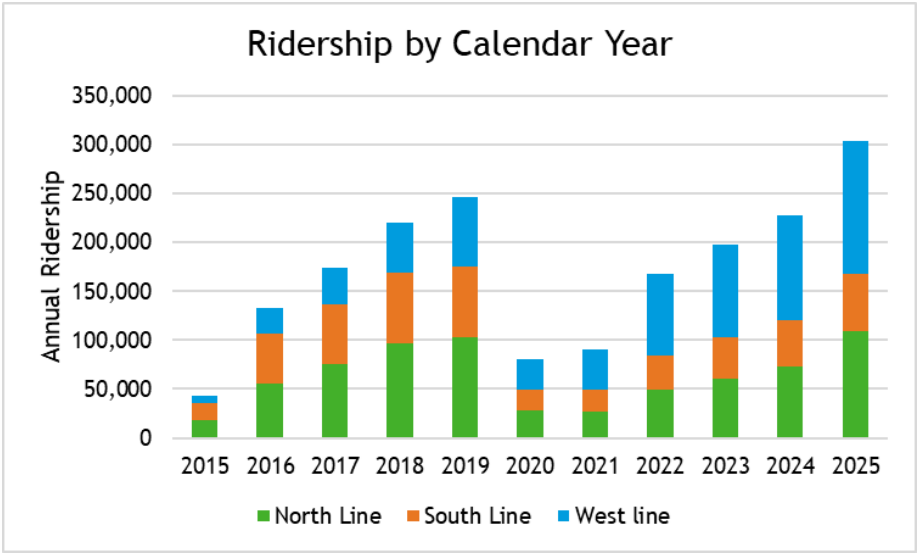
Seasonal Services

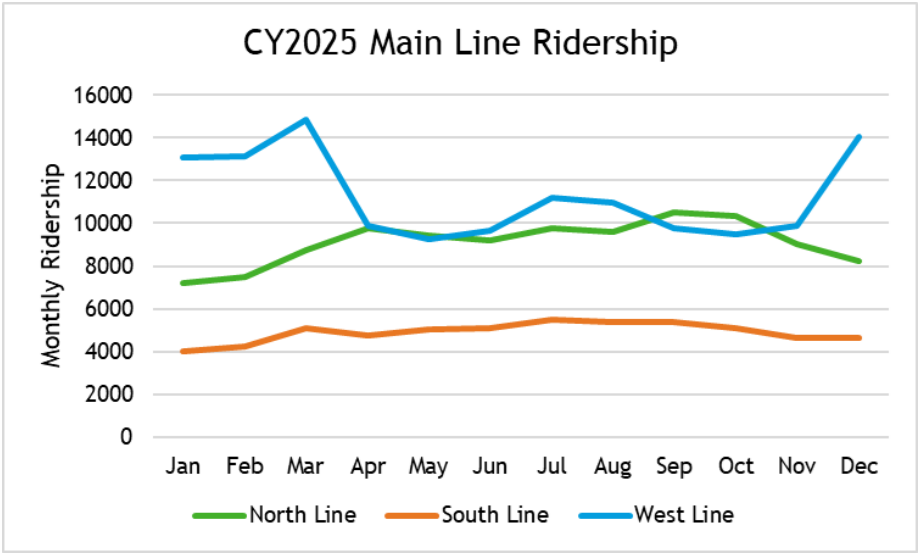
- Event-based services
- Focused on seasonal demand from events



BUSTANG · BUSTANG OUTRIDER · PEGASUS · SNOWSTANG · COLORADO Department of Transportation

Bustang Main Line Ridership

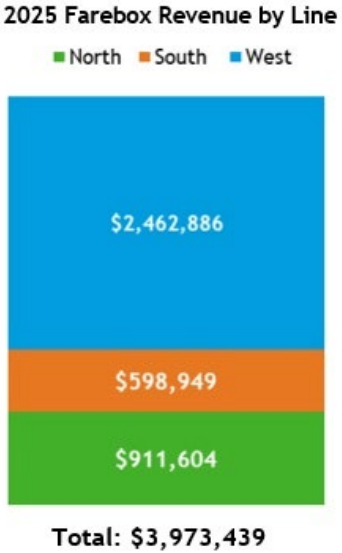


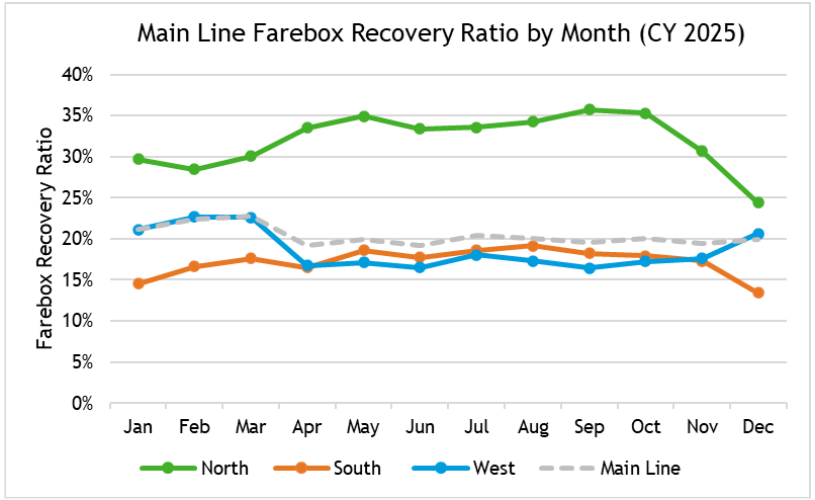


- 2025 ridership above pre-pandemic levels
  - 2019: 246,000 riders
  - 2025: 303,000 riders

- First full year of post-expansion data
- Total 2025 ridership by line:
  - North Line: 109,000 riders
  - South Line: 59,000 riders
  - West Line: 135,000 riders

Bustang Main Line Farebox



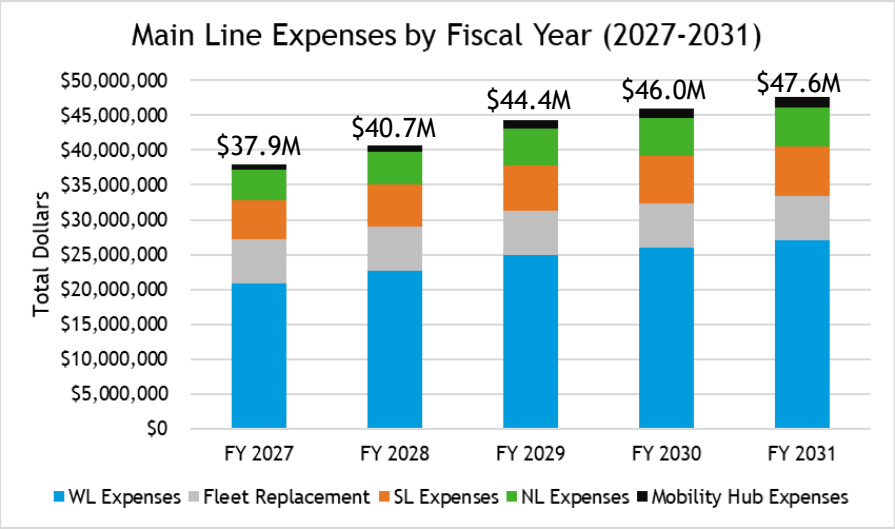


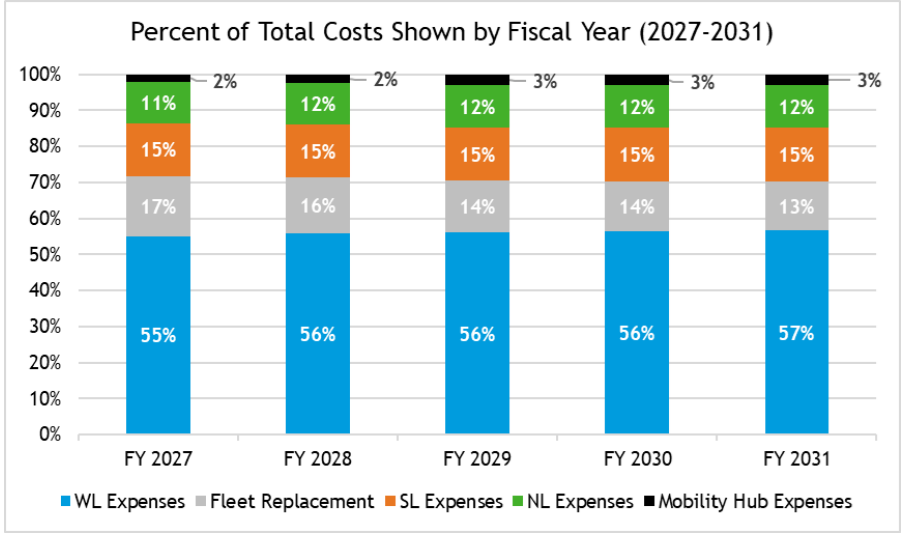
National Trends

Type	Average Length (miles)	Farebox Recovery Ratio	Data Year (most recent)
Commuter Bus	30	24%	2024
Bus	10	7%	2024
Bustang Main Line	North/South - 65 West - 240	20%	2025

Source: Federal Transit Administration (FTA), National Transit Database (NTD) Report (2024)

Bustang Main Line Expenses





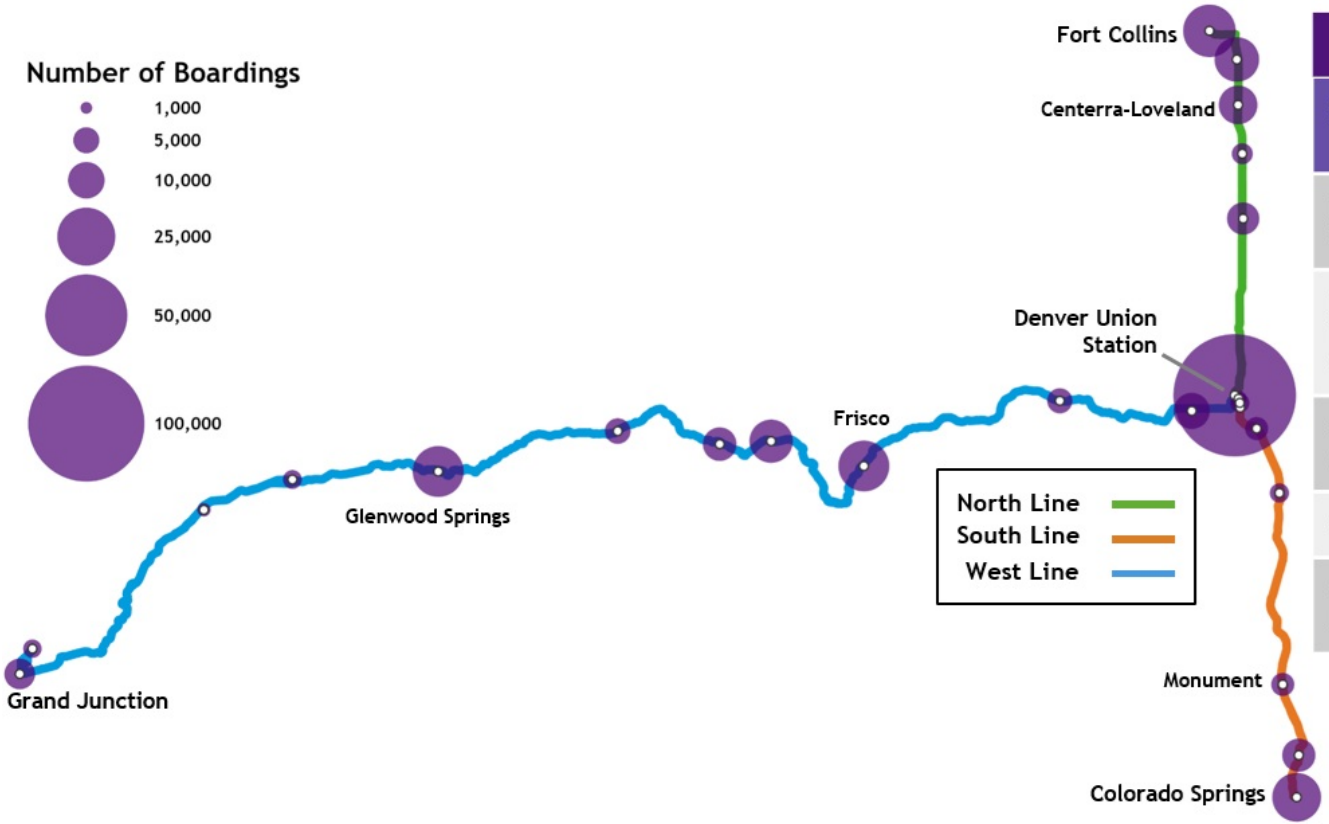
Includes:

- Main Line expenses (direct operating and planned expenses (admin))
- Bustang fleet replacement costs
- Mobility Hub expenses

Excludes:

- Outrider expenses, Pegasus expenses, Seasonal Service expenses and other planned expenses (admin) for all Bustang services

Bustang Main Line Boardings by Stop (2025)

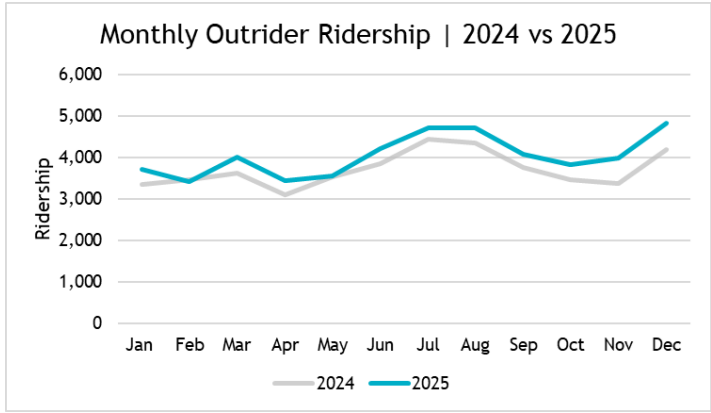


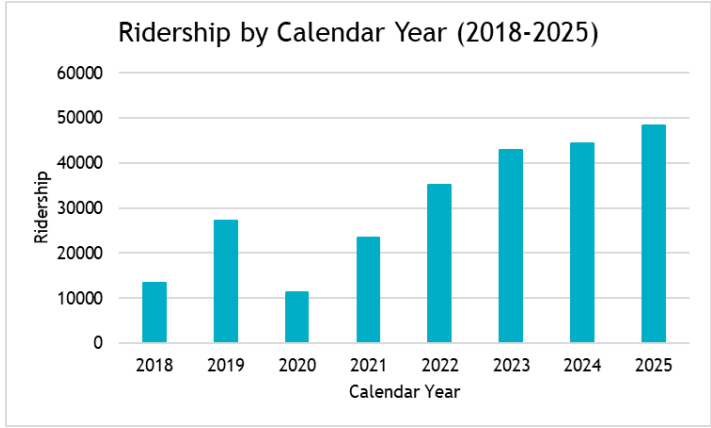
Most Boardings in 2025	
Stop	**Total Boardings**
Denver Union Station	110,655
Fort Collins Downtown Transit Center	20,608
Frisco Transfer Center	19,245
Glenwood Springs	19,076
Colorado Springs Downtown Terminal	17,620

Outrider Performance Overview

Outrider Route	2025 Ridership	% Change vs. 2024	Recent Service Changes
Crested Butte - Denver	18,900	+10%	Second round trip added 2/2025
Craig - Denver	13,600	+9%	-
Durango - Grand Junction	5,200	+7%	-
Lamar - Colorado Springs	4,500	+14%	-
Alamosa - Pueblo	2,500	0%	Stop added 2/2026 (Cañon City)
Sterling - Denver	1,700	+160%	Stop added (DEN) 10/2024, Weekend service added 2/2026
Trinidad - Pueblo	1,500	+13%	-
Sterling - Greeley	300	+133%	Service discontinued 1/2026
Outrider Total	**48,400**	**+9%**	**-**

Note: Telluride - Grand Junction, not shown, service was discontinued in February 2025. Ridership included in Outrider total calculations. 1,200 riders in 2024 and 100 riders in 2025.

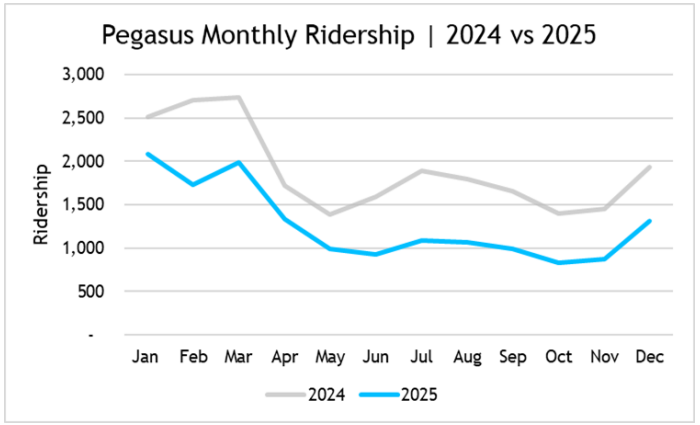


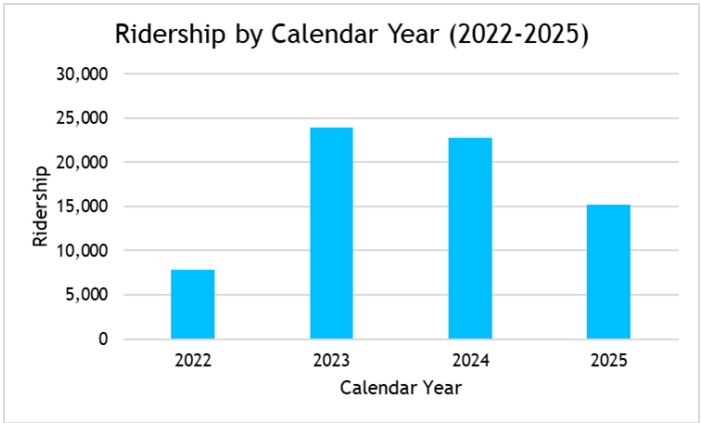


Pegasus Performance Overview

Pegasus Service		
2025 Ridership	% Change vs. 2024	Recent Service Changes
15,200	-33%	El Rancho Stop Added

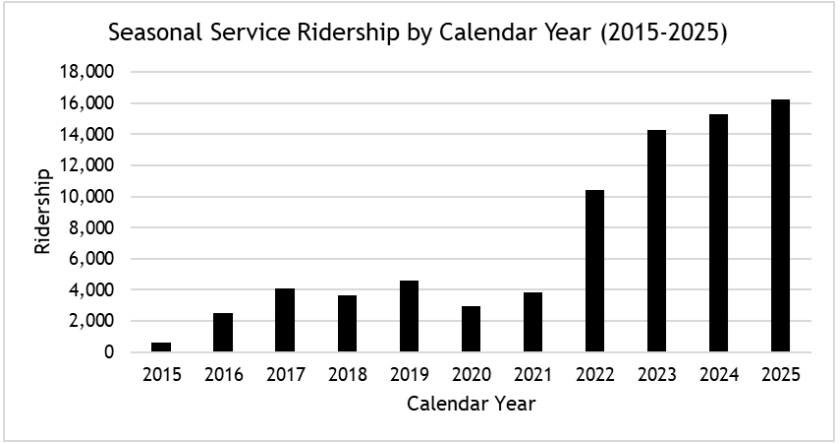
- Pegasus's declining ridership, along with growth on the West Line appear to be making Bustang West Line and Pegasus competing services, not complimentary.
- Pegasus and Bustang West Line share the same route (Denver-Avon) and nearly identical stops
- Prior to current service levels, Pegasus supplemented West Line service during periods of minimal schedule overlap
- Pegasus is a mitigation action for the Floyd Hill project





Seasonal Services Performance Overview

Seasonal Service	2025 Ridership	% Change vs. 2024	Recent Service Changes
Snowstang	8,900	+7%	-
Bustang to Estes	3,200	-4%	-
RamsRoute	2,100	-3%	-
Bustang to Broncos	2,100	+36%	-
Seasonal Services Total	**16,300**	**+6%**	-



RamsRoute

SNOWSTANG

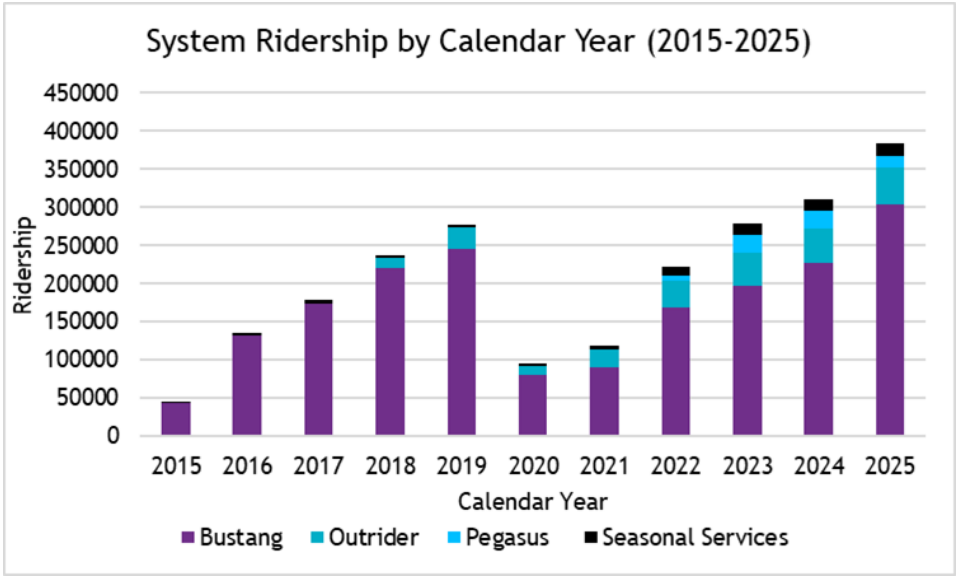
BUSTANG TO ESTES

Bustang to Broncos

Bustang System Performance Summary

Service	2025 Ridership	% Change vs. 2024
Bustang Main Line	303,400	+33%
Outrider	48,395	+9%
Pegasus	15,200	-33%
Seasonal Services	16,300	+6%
Bustang Total	**383,300**	**+24%**

- 2.3 million riders over 10 years
- Six consecutive years of service growth
- Recovered pre-pandemic ridership starting in 2024



Operating Efficiency Measures

System Optimization

- Elimination of Telluride-Grand Junction and Sterling-Greeley routes
- Improved scheduling on North Line with introduction of Mobility Hubs and Express Lanes
- Upcoming Outrider Request for Proposals (RFP) to renegotiate rates and operators

Establishing Partnerships

- Snowstang partnerships with resorts have a 60/40 cost share
- Outrider exploring partnerships with local jurisdictions for service expansion
- Idaho Springs Mobility Hub slip ramp design configuration

Transit System Expansion

- CTE formula grants have implemented Transit Connections Study recommendations through local operators - Granby to Grand Lake, etc.

Future Service Scenarios

Scenario	Overview	Impact	FY 27 Annual Budget*	FY 27 Funding Gap
No Action	Continue at existing service levels for FY27	• Results in significant budget shortfall • Maintains current routes and frequencies	$47.8 M	$25.3 M
1	**Significantly Reduce Service** to align with 2023 revenue levels	• Reduces operating budget to available revenue • Focus on optimizing service to budget available • Significant service reductions (N, S, W, Pegasus, Outrider)	$22.5 M	$0
2	**Reduce and Optimize Service** to invest in best performing routes, reduce service on other routes	• Reduces operating budget by $5-10M per year • Optimize all routes and invest in highest performers • Some service reductions (N, S, W, Pegasus, Outrider)	$37-42 M	$15-20 M
3	**Optimize and Targeted Expansion** of high performing service and invest in targeted new service opportunities	• Results in significant budget shortfall • Optimizes current routes and frequencies • Allows for targeted expansion opportunities (5%)	$50.6 M	$28.1 M

*Proposed one-time reallocation of roll-forward funding could increase available FY 27 budget by up to $21.1 M.

Federal Funding Sources with Transit Eligibility

- Federal Sources
  - STBG and Carbon Reduction (state allocations)
    - Limited to capital costs, whereas majority of funding gap is operating funds.
    - Would require reallocation of funds from CDOT capital construction program (10-Year Plan and asset management).
  - CMAQ (state allocation)
    - Limited to non-attainment area and to capital costs. Operating is eligible but only for new service and only for 3 years.
    - Already proposed for reallocation to Bustang.
  - FTA various programs
    - FTA 5311(f) funding is already allocated to Bustang Outrider.
    - Allocation of additional FTA funds would require reallocation of funds from local transit grant programs. Additionally, there are limitations on eligibility.

State Funding Sources with Transit Eligibility

- State Sources
  - General Fund
    - General Fund transfers to CDOT were already significantly cut in FY 26 and FY 27.
    - $10 M was already allocated to Bustang in FY 26 and $6 M is allocated annually in the 10-Year Plan beginning in FY 27.
    - Allocation of additional General Fund would require reallocation of funds from CDOT capital construction program (10-Year Plan).
  - HUTF
    - HUTF revenue has very limited transit eligibility.
    - Would require reallocation of funds from CDOT maintenance and operations program, which already faces a significant funding shortfall.
  - MMOF / FASTER Transit
    - State share of MMOF and a portion of FASTER transit already allocated to Bustang.
    - Allocation of additional FASTER transit funds would require reallocation of funds from local transit grant programs.

Enterprise Funding Sources with Transit Eligibility

- NAAPME
  - SB 21-260 Retail Delivery Fee and SB 21-260 Rideshare Fee
    - Limited revenue stream, approximately $13 M annually.
    - Could be considered for grant funding, but would not be ongoing funding.
    - Would be problematic for CDOT to be an applicant from a TABOR perspective.
- CTE
  - SB 21-260 Retail Delivery Fee
    - Bustang is generally not eligible with funds dedicated to local transit ZEV grant programs.
  - SB 24-230 Oil and Gas Production Fee
    - Bustang is generally not eligible with 80% statutorily directed to local transit grant programs and 20% statutorily directed to passenger rail.

Enterprise Funding Sources with Transit Eligibility (continued)

- CTIO
  - SB 24-184 Congestion Impact Fee
    - Could be considered for funding, but funds are spread thin between competing needs including Front Range Passenger Rail and Mountain Rail projects.
    - TABOR considerations related to ownership/partnership structure with CDOT.
  - Toll Revenue
    - Could be considered for funding, subject to existing corridor restrictions and availability of net toll revenue after accounting for debt service, maintenance and operating costs and other planned projects.
    - TABOR considerations related to ownership/partnership structure with CDOT.

Next Steps

- Continued follow up with TC and CTIO Boards on funding strategies
- Ongoing engagement with stakeholders
- Consideration and potential action on proposal for additional FY27 CDOT funding by the Transportation Commission
- Engagement with Attorney General's Office on legal questions and paths forward

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission

From: Darius Pakbaz - Director of Transportation Development, Chris Laplante - Air Quality and Climate Section Manager, Libba Rollins - GHG Program Manager

Date: March 5, 2026

Subject: CDOT Staff Recommendation - 2026 PACOG GHG Transportation Report for the 2050 Long Range Transportation Plan

Purpose

CDOT staff recommends approval by the Transportation Commission of the 2026 Pueblo Area Council of Governments (PACOG) GHG Transportation Report for the 2050 Long Range Transportation Plan.

Action

Staff is recommending acceptance of the March 2026 PACOG GHG Transportation Report through resolution at the March 19, 2026 Transportation Commission Meeting.

Background

CDOT staff have been working collaboratively with PACOG since the adoption of the GHG Transportation Planning Standard to support compliance. As part of that effort, in 2022 the TC provided a $300,000 grant to PACOG to enhance their Travel Demand Modeling (TDM) platform to better support modeling sensitivity to bicycle and pedestrian mode choice, remote work and induced demand. PACOG's March 2026 submission of a GHG Transportation Report represents their first demonstration of compliance required by the Standard. PACOG provided materials and a presentation to the TC at the March 18, 2026 workshop after a request from CDOT to delay the proposed February 2026 workshop to allow for more time for CDOT review and collaboration on improvements to the GHG report and associated modeling. PACOG participates in the Statewide Model Coordination Group, which agreed on a set of modeling standards, as codified in the March 21, 2025 memorandum "Modeling Requirements to Estimate Greenhouse Gas Emissions" (Modeling Requirements) as well as the March 14, 2025 memorandum "Process for APCD/CDOT Review of GHG Estimates by MPOs/CDOT" (GHG Emissions Calculation Requirements).

CDOT reviewed PACOG's GHG Transportation Report, "Pueblo Area Council of Governments Greenhouse Gas Transportation Report 2026", and makes the following observations:

- PACOG presented its model updates to CDOT and received approval of its improved modeling structure.
- PACOG's report presents a variety of analysis describing the results of PACOG's model runs for the years 2030, 2040 and 2050, both baseline and compliance scenarios.
- PACOG's approach to depicting in their model the various programs and projects in their updated plan has been reviewed together with CDOT. The greenhouse gas emission totals presented in Table 2 of the GHG Transportation Report demonstrate compliance with the Standard. As PACOG is using their updated model for the first time, and as PACOG's limited staff have required them to rely on consultant assistance for model development and operations, CDOT modeling staff require more interaction with PACOG's model and modeling process in order to fully understand how the PACOG model has been built and operated. Therefore, CDOT's recommendation for acceptance is dependent on PACOG working with CDOT modelers to conduct further evaluation of the PACOG model calibration, input assumptions, operational methods, etc., prior to the next submission of a GHG Transportation Report to the TC.
- CDOT management finds the planned approaches to achieve compliance through the selected strategies align with the goals of the Standard through increasing emphasis on multimodal, bicycle and pedestrian, transit and compact land use. Some of the plan elements include:

    - Planned construction of the I-25 Exit 108 Purcell Boulevard Mobility Hub.
    - Receipt of a $1 million grant award from the Clean Transit Enterprise (CTE) SB24-230 Formula Grant Program with potential for continuous grant support to expand local transit by over 170,000 vehicle revenue miles annually by 2030
    - Pueblo River Trails Master Plan Update.
    - Zoning code amendments to comply with state strategic growth legislation related to accessory dwelling units (HB24-1152) and minimum parking requirements (HB24-1304).
    - Focus on high density residential and mixed-use development along the western N. Pueblo Blvd. corridor.
    - Construction on 11 new bus stops and upgrades to 56 existing stops on Pueblo's wet side.

In summary, CDOT recommends approval by the Transportation Commission of the March 2026 GHG Transportation Report with a recommendation that PACOG work closely with CDOT modeling staff to refine their travel demand and GHG emissions modeling methods, as appropriate, prior to their next GHG Transportation Report submittal.

Next Steps

The Commission will vote on acceptance of the report by resolution.

Attachments

B - PACOG Transportation Commission Memo

C - Presentation to the Transportation Commission Workshop

D - PACOG GHG Transportation Report

PR #9 - Proposed Resolution #10 PACOG GHG Transportation Report

Transportation Commission Memorandum

To: State of Colorado Transportation Commission.

CC: Shoshanna Lew, Executive Director, CDOT.
Herman Stockinger, Deputy Executive Director, CDOT.
Sally Chafee, Chief of Staff, CDOT.
Darius Pakbaz, Director, Division of Transportation Development.

From: Eva Cosyleon, PACOG MPO Manager

Date: March 6, 2026

Subject: PACOG 2050 Long Range Transportation Plan (2050 LRTP) Compliance with Greenhouse Gas Planning Standard.

Purpose

The Pueblo Area Council of Governments (PACOG) serves as the designated Metropolitan Planning Organization (MPO) for the Pueblo Urbanized Area in accordance with 23 U.S.C. §134 and its implementing regulations under 23 CFR Part 450. In this role, PACOG is responsible for carrying out a continuous, comprehensive, and cooperative transportation planning process for the region.

PACOG is currently in attainment for federal air quality standards. Under applicable federal transportation planning regulations, the PACOG MPO is required to maintain a fiscally constrained Long Range Transportation Plan (LRTP) that is updated at least every five years and includes a planning horizon of no less than 20 years.

In addition to federal planning requirements, Senate Bill 21-260 and the Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions (2 CCR 601-22) require Colorado MPOs to evaluate and reduce greenhouse gas (GHG) emissions from transportation. These rules establish region-specific GHG reduction targets for the 2030, 2040, and 2050 analysis years and require MPOs to prepare and submit a GHG Transportation Report demonstrating compliance with those targets as part of the adoption of a new or amended LRTP.

The purpose of this memo is to summarize PACOG's compliance with these state GHG requirements through the development of the 2050 Long Range Transportation Plan, supported by an updated Pueblo Planning Model and accompanying GHG Transportation Report, and to transmit the results of that analysis to the Transportation Commission for consideration.

Action

Anticipated acceptance of the PACOG Greenhouse Gas (GHG) Report at the March 2026 Transportation Commission Meeting.

Background

Pursuant to Senate Bill 21-260 and the Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions (2 CCR 601-22), the PACOG 2050 Long Range Transportation Plan (LRTP) is required to demonstrate compliance with state-established greenhouse gas (GHG) emission reduction targets for the 2030, 2040, and 2050 analysis years. To meet this requirement, the Pueblo Area Council of Governments (PACOG) prepared a GHG Transportation Report (attached) for submittal to the Transportation Commission.

To support this analysis, PACOG implemented a comprehensive update to the Pueblo Planning Model (PPM) as part of the 2050 LRTP development process. These updates were specifically designed to align the regional travel demand model with Colorado's GHG modeling requirements and to improve the model's sensitivity to travel behavior, operational strategies, and multimodal investments relevant to emissions analysis. The updated model framework extends the planning horizon to 2050, incorporates interim analysis years for 2030 and 2040, aligns Traffic Analysis Zones with CDOT's statewide model, and integrates updated observed traffic data, including separate treatment of autos, single-unit trucks, and multi-unit trucks.

The PPM update also introduced several structural enhancements that materially improved the model's ability to evaluate GHG-related strategies. These enhancements include the addition of a transit network and transit assignment, the implementation of an explicit mode choice model to represent auto, transit, and non-motorized travel decisions by trip purpose, and expanded traffic assignment that accounts for time-of-day travel and truck passenger car equivalents. Collectively, these improvements allow the model to more accurately reflect how changes in transportation infrastructure, services, and policies influence vehicle miles traveled (VMT) and emissions outcomes.

For GHG compliance, PACOG evaluated emissions using a Baseline Plan and an Updated Plan. The Baseline Plan represents the adopted 2045 LRTP and it's supporting fiscally constrained programs, assuming continuation of existing policies and travel behavior trends. The Updated Plan builds on this baseline by incorporating additional funded transportation projects and targeted operational and policy strategies intended to reduce VMT and shift travel to more efficient modes.

Key behavioral adjustments evaluated between the Baseline and Updated Plans include increased work-from-home participation, informed by American Community Survey data and stratified by income, as well as increased non-motorized travel, reflecting recent trends in walking, bicycling, and micro-mobility and continued local investment in multimodal infrastructure. These assumptions were applied consistently across all compliance years using PACOG's GHG Scenario Builder and were supported by enhanced model outputs designed for integration with CDOT and CDPHE emissions analysis tools.

Based on the results of the updated Pueblo Planning Model and the associated GHG analysis, the 2050 LRTP meets or exceeds PACOG's required GHG reduction targets for all applicable analysis years. As a result, the PACOG MPO demonstrates compliance with the state GHG rule, and a Mitigation Action Plan is not required at this time.

Next Steps

The Transportation Commission is anticipated to accept the PACOG Greenhouse Gas (GHG) Transportation Report at the March 19, 2026, Meeting. The PACOG Board of Directors is anticipated to adopt the PACOG 2050 Long Range Transportation Plan at its April 22, 2026, meeting.

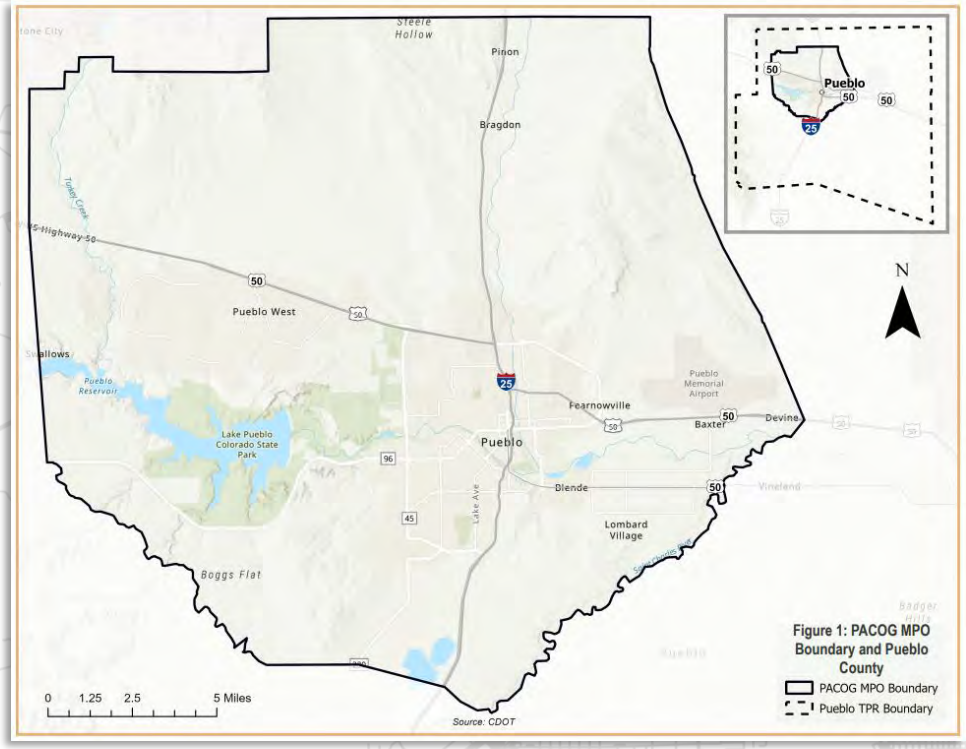
2050 Long Range Transportation Plan

Pueblo Area Council of Governments - Greenhouse Gas Transportation Report

Transportation Commission Presentation

March 18, 2026

PACOG Overview



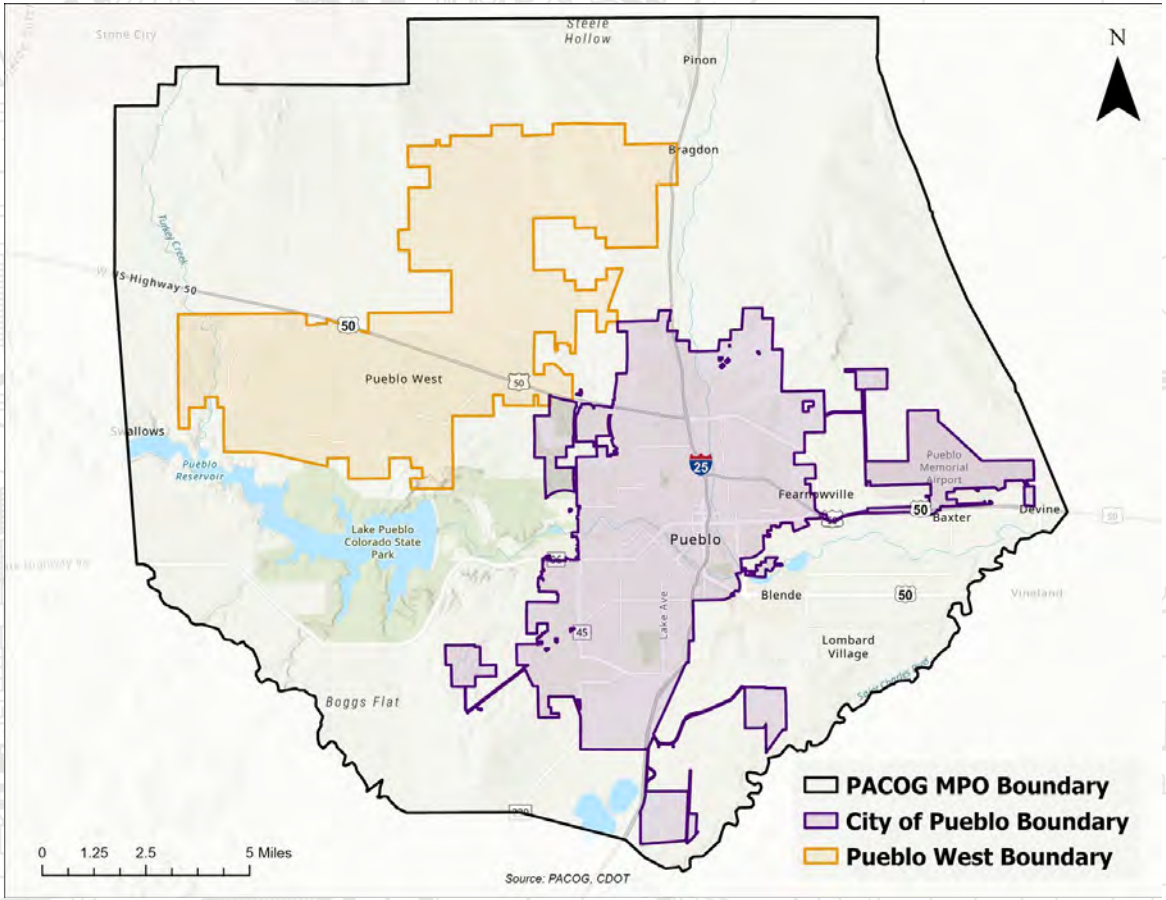
PACOG MPO

- 152,000 residents (2024 estimate)
- 347 square miles

Areas Covered

- City of Pueblo
- Pueblo West Metropolitan District
- Blende
- Devine
- Baxter
- Bragdon
- Lombard Village
- Piñon

PACOG Area Highlight



Purpose of the LRTP

A 25-year long-range vision for the Pueblo region's transportation system that provides a realistic, implementable roadmap to realizing an accessible, safe, and multimodal transportation system.

2050 LRTP Vision Statement

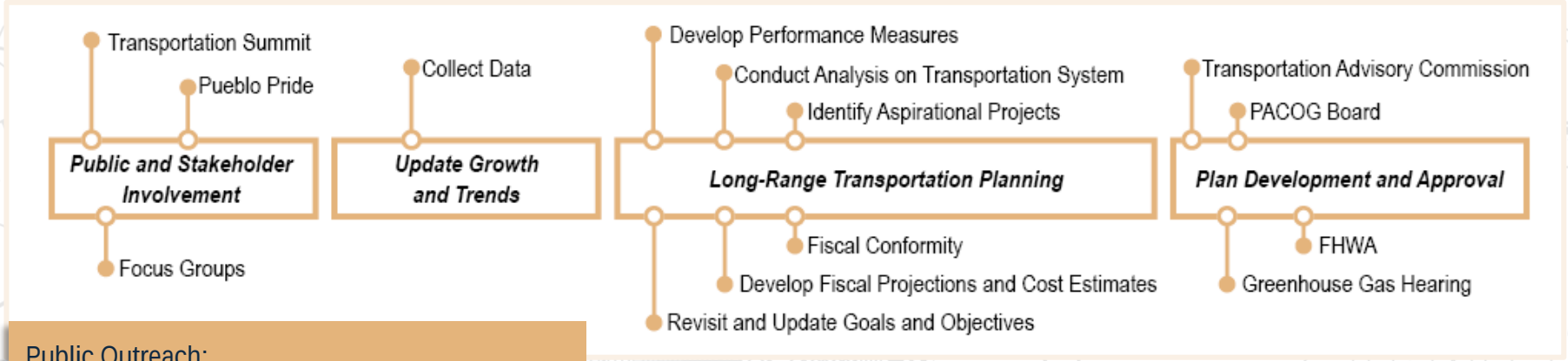
Our region is brought together through a connected, safe, multimodal, and accessible system.

2050 LRTP Process

Fiscally constrained projects from 2025-2029: $463 million

Transportation Commission:

Workshop: March 18, 2026
Hearing: March 19, 2026



Public Outreach:

- Community Survey: 168 responses
- Interactive Map: 132 comments
- Public Open House: 14 attendees
- Pueblo Pride Pop Up: 200+ touchpoints
- Focus Groups: Active Transportation, Youth

PACOG Board:

Adoption of the 2050 LRTP Planned for April 23, 2025

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Plan Updates

Pueblo Area Council of Governments
- Complete Streets Initiative (2026)
- Bicycle and Pedestrian Master Plan Update (2026)

Pueblo County
- Comprehensive Safety Action Plan (2025)
- Pueblo County Unified Development Code (4/10/25)

City of Pueblo
- Comprehensive Safety Action Plan (2025)
- Unified Development Code Update (2025-2026)
- HB 24-1304 – Transit Oriented Communities (Minimum Parking)
- Roadway Classifications Update
- Arkansas River Master Plan (2025)
- Roundabout Construction

Pueblo Transit
- Areas of Persistent Poverty Study (2025)
- Zero Emissions Transition Plan (2025)

Local plans updated since 2045 RTP include a greater focus on:

- Denser, more-compacted land-use
- Multimodal transportation
- Improved transit service and amenities
- Protecting vulnerable road users.

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Transportation

MPO

- Complete Streets Initiative
- Roundabout education campaign
- Bicycle and Pedestrian Masterplan
- Support of Front Range Passenger Rail

City of Pueblo

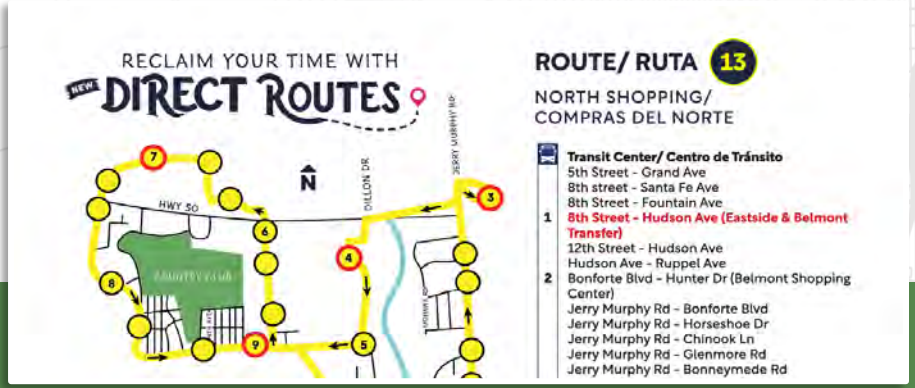
- RAISE grant – 24th street bridge design, new corridor to west Pueblo, shorten trips
- Comprehensive Safety Action Plan
- SS4A 2024 Supplemental Grant

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Transportation

Pueblo Transit

- Pueblo Transit $15 M grant for new vehicles
- Areas of Persistent Poverty Study
- Northside/Southside Shopping routes
- Youth & Veterans ride free
- Transit MyRide App
- Colorado State University Hydrogen Fuel Station
- 11 new bus stops and 56 existing transit stops upgraded on Pueblo's west side



PACOG 2050 LRTP Moves the Region

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Transportation

Pueblo County:

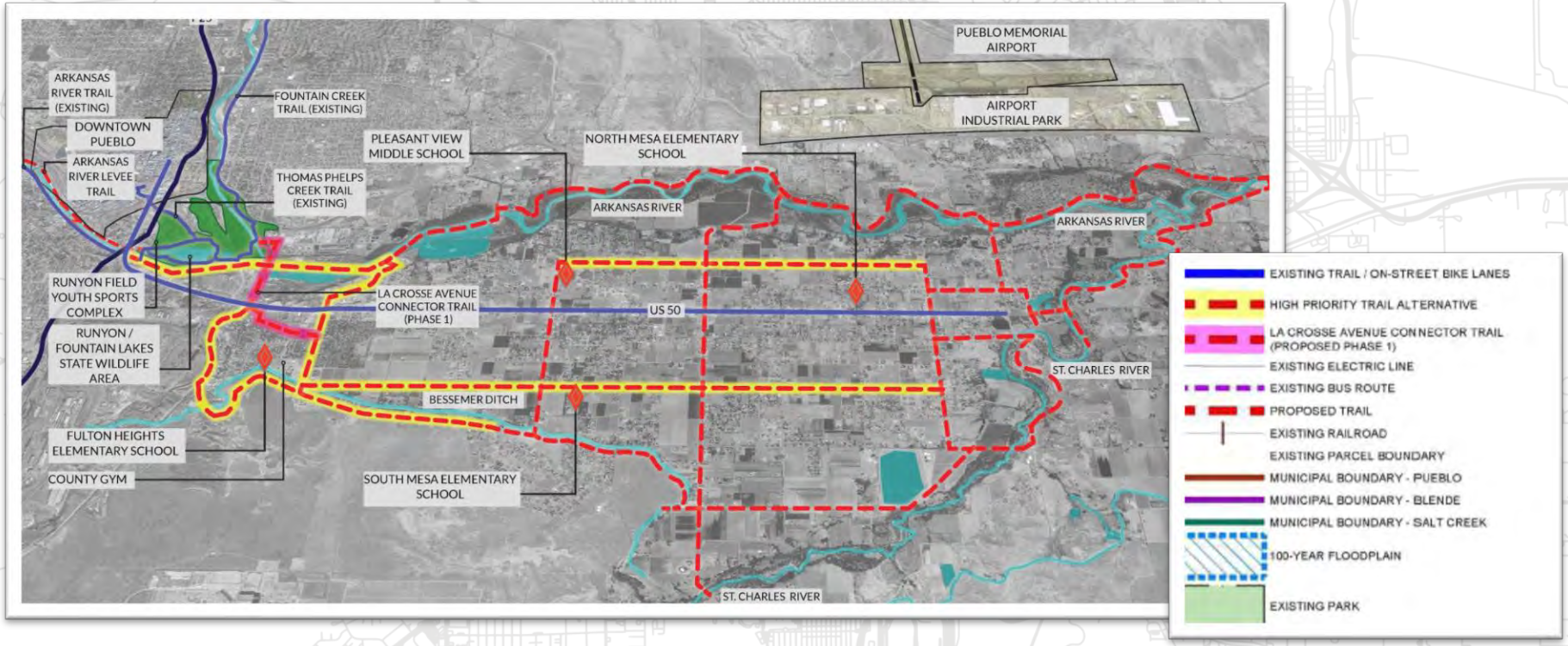
- Medal of Honor Boulevard
- RAISE Grant:
  - Medal of Honor Multimodal Trail,
  - Trailhead and Mobility Hubs
  - Waterworks Park Multimodal access
  - Transit connectivity and expansion

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Transportation

I-25 and Dillon Dr Flyover

Pueblo River Trails Master Plan Update



What's Changed Since the 2045 LRTP?

Local Government Initiatives: Land Use

- Pueblo Regional Comprehensive Plan, adopted 2022, includes elements in the development plan that allows for greater density and mixed use within the City's urban core and along arterial and collector streets.
- Zoning code amendments to comply with state strategic growth legislation.
  a. House Bill 24-1152, Accessory Dwelling Units
  b. House Bill 24-1304, Minimum Parking Requirements.
- Updating the Zoning and Subdivision code to create a Unified Development Code
- High Density residential and mixed-use development along the western N. Pueblo Boulevard corridor.

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Land Use - High density and mixed used develepment: Pikes Peak Park

Mixed Use residential/ commercial development. 73.93 acres intended to facilitate development of diverse residential housing options and commercial services for residents. The Planned Unit Development contains provisions for 619 residential dwelling units and 446 commercial mixed-use dwelling units.

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Land Use - High density and mixed-use develepment: Pueblo Springs Apartments

199 dwelling units, 18.55 acres, southwest of the intersection of Pueblo Boulevard and 31st street

Kaiser Permanente, Pueblo North Medical Offices, 3107 Bonaventure Ct.

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Land Use- Infill and Adaptive Reuse

St. Patrick Church, built in 1882, repurposed for a pediatric therapy center

Newly renovated apartment units about Solar Roast and Analog, 220 N. Main Street

What's Changed Since the 2045 LRTP?

Local Government Initiatives: Land Use - Commercial Development

GHG Action Scenarios

Strategies	Baseline Assumptions (2030, 2040, 2050)	2030 Compliance	2040 Compliance	2050 Compliance
Work from home participation	Income 1: 1% Income 2: 3% Income 3: 6% Income 4: 11% *Weighted Average: 5%*	Income 1: 10% Income 2: 15% Income 3: 30% Income 4: 30% *Weighted Average: 20%*	Income 1: 10% Income 2: 15% Income 3: 30% Income 4: 30% *Weighted Average: 20%*	Income 1: 10% Income 2: 15% Income 3: 30% Income 4: 40% *Weighted Average: 20%*
Transit frequency	Existing service levels (30/60 minutes)	20 / 45 minutes	20 / 45 minutes	20 / 45 minutes
Transit speed	50% of vehicular speed	65% of vehicular speed	65% of vehicular speed	65% of vehicular speed
Increase in non-motorized travel over 2020 calibration	1% of trips	5.5% of trips	5.5% of trips	5.5% of trips

Breakdown of income levels
Income 1: less than $41,999
Income 2: $41,999 to $49,999
Income 3: $50,000 to $65,999
Income 4: over $65,999

Baseline/Updated Plan Comparison

Person Trip Mode Share

	Change	Change	Change
	2030	2040	2050
Vehicle: Drive Alone	-3.9%	-3.2%	-3.4%
Vehicle: Shared Ride (2+ People)	-0.6%	-1.3%	-1.2%
Transit	0.3%	0.5%	0.5%
Vehicle Trips Diverted to Non-Motorized	4.2%	4.1%	4.2%

- Drive alone trips decrease
- Shared ride trips decrease
- Transit use grows gradually over time
- Walking and biking see consistent growth
- Overall shift to more sustainable travel

Baseline/Updated Plan Comparison

Vehicle and Transit Data: Typical Weekday

	Change 2030	Change 2040	Change 2050
Vehicle Miles Traveled (VMT)	-378,296	-434,158	-266,784
VMT per Capita	-2.0	-2.2	-1.4
Transit Boardings	5,182	11,333	11,423

- Total driving is reduced
- Driving per person decreases
- Transit ridership increases
- Changes are meaningful but gradual

Greenhouse Gas Emission Results

Regional Areas	2030 GHG Emissions	2040 GHG Emissions	2050 GHG Emissions
Baseline Plan: 2045 LRTP	0.540	0.326	0.217
Updated Plan: 2050 LRTP	0.494	0.297	0.202
PACOG Reduction from Baseline Plan	0.046	0.029	0.015
PACOG Required Reductions	0.030	0.020	0.010
2 CCR 601-22			
Pass/Fail	**Pass**	**Pass**	**Pass**

Presentation Recap

- A Plan Reset for a Changing Pueblo Region
- What Has Changed Since 2045
- Improved Tools and Data
- GHG Performance and Ongoing Strategy
- **What's Next**

Thank You!

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2026

PACOG 2050 LRTP

Moves the Region

GREENHOUSE GAS TRANSPORTATION REPORT

Accessibility Statement

PACOG and the consultant Team (Bohannan Huston Inc.) strive to meet accessibility in our work products to comply with federal, state, and local regulations as a matter of best practice. If you encounter accessibility barriers with our work, please contact us directly so we can make appropriate accommodations: accessibility@bhinc.com.

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Acronyms and Abbreviations

ACS	American Community Survey
APCD	Air Pollution Control Division
CCR	Colorado Code of Regulations
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CO2e	carbon dioxide equivalent
DOLA	Colorado Department of Local Affairs
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
LRTP	Long Range Transportation Plan
MMT	Million Metric Tonnes
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
MUT	Multi-unit trucks
PACOG	Pueblo Area Council of Governments
PPM	Pueblo Planning Model
SB	Senate Bill
SUT	Single-Unit trucks
TAZ	Traffic Analysis Zone
TC	Transportation Commission
VMT	Vehicle Miles Traveled

Introduction

This document outlines the actions taken by the Pueblo Area Council of Governments (PACOG) to incorporate regional greenhouse gas (GHG) reduction strategies into the planning and modeling of the PACOG 2050 Long Range Transportation Plan (LRTP). This document satisfies state requirements for Metropolitan Planning Organizations (MPOs) to develop a GHG Transportation Report (Report) as outlined in the Code of Colorado Regulations (2 CCR 601-22).

To ensure compliance, the Pueblo Planning Model (PPM) and the Environmental Protection Agency Motor Vehicle Emission Simulator (MOVES) air quality model were used to quantify GHG emissions.

The planning measures, modeling methods, and emissions analysis results documented in this Report demonstrate that the 2050 LRTP meets these regulations. The analysis concludes that no additional GHG mitigation measures or Mitigation Action Plan is currently needed for PACOG to satisfy GHG reduction requirements.

Background

Colorado Greenhouse Gas Requirements

In June 2021, the Colorado legislature passed Senate Bill (SB) 21-260 titled *"*Sustainability of the Transportation System*."* The bill created new sources of funding for transportation and also directed the Transportation Commission (TC) to adopt implementation guidelines and procedures to address GHG emissions in transportation planning.

Subsequently, the TC adopted the "Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions" (2 CCR 601-22) in December 2021. These rules address the GHG reduction requirements outlined in SB21-260 by setting GHG reduction targets for CDOT and each Colorado MPO across multiple forecast years. CDOT, working with Cambridge Systematics, used the Energy Emissions Reduction and Policy Analysis Tool, along with CDOT's statewide travel demand model

and the MOVES model, to develop the initial GHG baseline estimates and reduction targets, shown in **Table 1**.

Table 1: GHG Transportation Planning Reduction Levels in MMT of CO2e

Note: MMT = million metric tonnes; MPO = metropolitan planning organization; N/A = not applicable

Regional Areas	2025 Reduction Level (MMT)	2030 Reduction Level (MMT)	2040 Reduction Level (MMT)	2050 Reduction Level (MMT)
Denver Regional Council of Governments (DRCOG)	0.27	0.82	0.63	0.37
North Front Range Metropolitan Planning Organization (NFRMPO)	0.04	0.12	0.11	0.07
Pikes Peak Area Council of Governments (PPACG)	N/A	0.15	0.12	0.07
Grand Valley Metropolitan Planning Organization (GVMPO)	N/A	0.02	0.02	0.01
Pueblo Area Council of Governments (PACOG)	**N/A**	**0.03**	**0.02**	**0.01**
CDOT/Non-MPO	0.12	0.36	0.30	0.17
Total	**0.43**	**1.50**	**1.20**	**0.70**

Source: Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions (2 CCR 601-22)

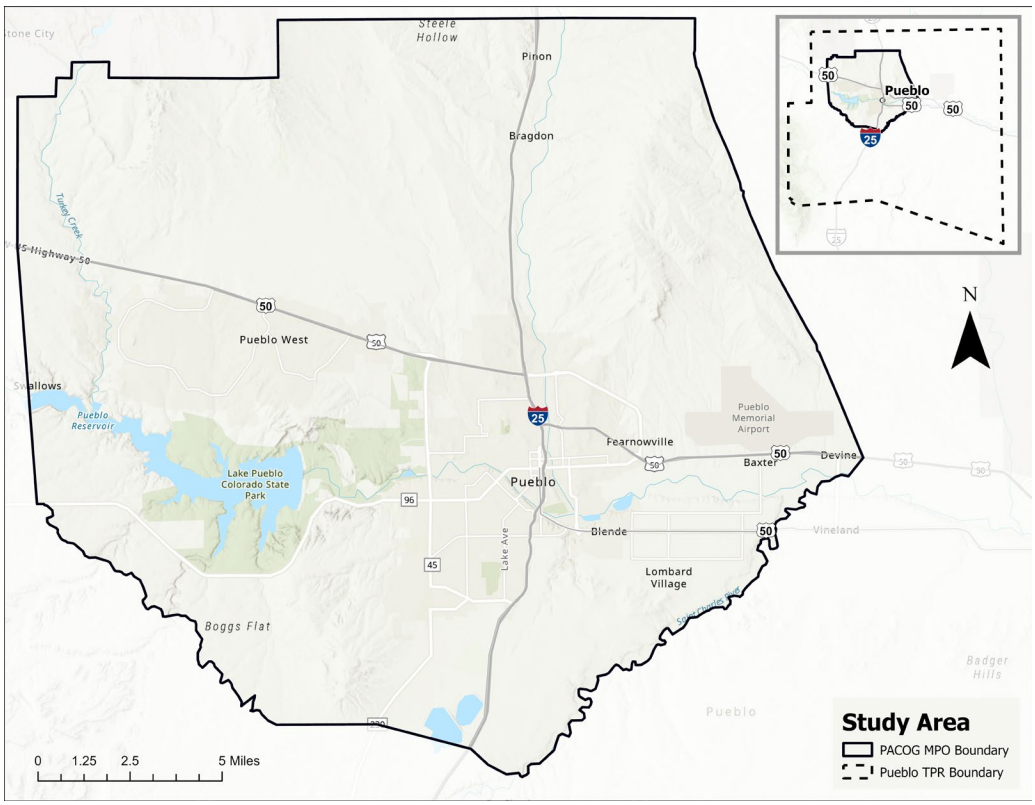
2 CCR 601-22 requires PACOG to model GHG emissions from transportation projects included in their plans and to take steps to reduce GHG emissions compared to what would be expected under the previously adopted 2045 LRTP (Baseline Plan). PACOG has specific GHG reduction targets in three forecast years: 2030, 2040, and 2050. Currently, the 2050 LRTP is the only applicable planning document used to model future GHG emission reductions and demonstrate compliance with Rule 8.02.5.3, as no prior plans were adopted since October 1, 2022.

Planning Area

PACOG provides regional planning and programming services for the multimodal transportation systems (automobile, transit, biking, walking, freight, and rail). Following federal guidelines, PACOG collaborates regularly with local, state, and federal governments to ensure transportation projects and plans are comprehensive, coordinated, and continuously updated. The PACOG MPO boundary, as shown on **Figure 1**, covers portions of Pueblo County, including the City of Pueblo, Pueblo West, and Blende (Census Designated Place). Additionally, Colorado City, Beulah Valley, Avondale, and Boone are Census Designated Places included within PACOG's Transportation Planning Region (TPR).

The PACOG's GHG analysis focuses specifically on the transportation network and projects within its MPO boundaries. CDOT evaluates transportation projects outside the five MPOs separately and incorporates them into their statewide modeling to meet GHG reduction targets for non-MPO areas of the state.

Figure 1: PACOG MPO Boundary (2025)



The Long Range Transportation Plan and the Pueblo Planning Model

Every five years since 1988, PACOG has updated its LRTP, which looks ahead at least 20 years. The LRTP sets the region's transportation vision and goals, assesses the current transportation system, and identifies strategies to effectively use public funds to achieve those goals. It provides decision-makers a framework to consider the broader social, economic, and environmental effects of transportation and land-use choices. All regionally significant transportation projects within the PACOG MPO boundary must be included in the LRTP.

The PPM is an important tool used to develop the LRTP. It accounts for factors such as where people live and the density of housing, where people work, and how people choose to travel (that is, car, walk, bike, bus). The model analyzes how population, employment, and land -use changes over time have the potential to affect the transportation network. Proposed projects for the LRTP are then incorporated into the PPM to determine how they impact future travel and whether they help achieve the plan's goals such as reducing GHG emissions. The PPM ultimately estimates future traffic volumes, average travel speeds, and typical travel patterns.

Updated for the 2050 LRTP, the PPM supports GHG analysis and was used along with the Environmental Protection Agency (EPA) Motor Vehicle Emission Simulator (MOVES) model to demonstrate conformity with 2 CCR 601-22. PACOG received funding from CDOT’s American Rescue Plan Act (ARPA) fund to support updates to the four-step travel demand model and completion of modeling requirements to meet the GHG standard for transportation planning. The following represent key updates to the PPM:

- **Extended Model Forecast Horizon**: Extends the planning horizon to 2050 (five years beyond the previous 2045 horizon). Adds interim scenarios for 2030 and 2040, along with the 2020 base year and the 2050 planning horizon. The 2050 planning horizon scenario replaces the 2045 horizon for the 2050 LRTP cycle.

- **Updated Observed Traffic Data**: Integrates 2023 traffic count data by autos, Single-Unit (SUT) trucks, and Multi-Unit (MUT) trucks.
- **Zone System Revisions**: Aligns zonal coverage with CDOT's Traffic Analysis Zone (TAZ) structure to improve geographic resolution and consistency between CDOT and PACOG for base and forecast land-use assumptions.
- **Zonal Data Updates**
    - Updates socioeconomic data (population, households, median income, group quarters) using the 2020 U.S. Census data and 2023 projections from the Colorado Department of Local Affairs (DOLA).
    - Updates employment data using 2020 Quarterly Census Employment and Wages from the Colorado Department of Labor and Employment, including 2021 employment point data.
    - Trip-generation disaggregation values and trip-distribution targets use the 2010 Pueblo Front Range Household Survey. (An updated statewide travel survey is in progress.)
- **More Detailed Truck Vehicle Classes**: Earlier model versions collapsed SUT and MUT into a single truck class in later steps. The 2024 model carries SUT and MUT through all steps and outputs.
- **Transit Network / Model**: Now includes transit routes, stops, and service characteristics to support transit skimming for mode choice modeling and transit assignment. Expands roadway network details and attributes to support transit modeling.
- **Mode Choice Modeling**: Adds an explicit representation of auto vs. transit choices by trip purpose and journey characteristics to improve sensitivity to future scenarios. This addition significantly affects outputs and downstream steps, including Production-Attraction to Origin-Destination conversion.
- **Expanded Traffic Assignment**: Provides traffic flow outputs for AM peak, PM peak, the remaining 22 off-peak hours, and daily totals. Reports vehicle classes separately for autos, SUT, and MUT. Applies a Passenger Car Equivalent (PCE) methodology to account for trucks' higher capacity usage. Includes daily transit route assignment with corresponding outputs and reports.

- **Updated User Interface, Analysis, and Reporting**: Updates and expands reporting for the new components to summarize mode choice and transit assignment results. Now customizes and produces GHG reporting/output in comma-separated values format for easy import to Excel to support the GHG emissions calculations process.

In conformity with Rule 8.02.2.1, PACOG has prepared and published (on a publicly accessible website) a calibration and validation report for the PPM. The PACOG 2024 Model Update/Validation Methodology Report (June 2024) (**Appendix A**) documents detailed information about the 2024 PPM update, including model components, key parameters, and addresses how the model accounts for induced travel demand associated with changes to the transportation system.

Pueblo Area Greenhouse Gas Emissions Analysis

Since the PACOG is in attainment for national air quality standards, this is the first time the PACOG conducted a GHG analysis. This analysis compares GHG emissions for the PACOG "Baseline Plan" and "Updated Plan." The results, shown in **Table 2**, detail the GHG emissions for both plans across the various compliance years in million metric tonnes (MMT). The table highlights the "PACOG Reductions," which represent the difference in emissions between the two plans.

In addition to the emissions data, **Table 2** shows the GHG Reduction Levels established in 2 CCR 601-22 for PACOG for each compliance year. The 2050 LRTP meets or exceeds the required GHG Reduction Levels in each of the three compliance years, demonstrating compliance with 2 CCR 601-22.

Baseline Plan: The Baseline Plan represents the adopted 2045 LRTP and supporting programs, using updated socioeconomic forecasts for population, housing, and employment, used as the reference condition for greenhouse gas analysis.

The 2045 LRTP was adopted by the CDOT TC in February 2020; amended by PACOG in December 2021.

Updated Plan: The Updated Plan represents the 2050 LRTP and builds on the Baseline Plan using the same socioeconomic assumptions while incorporating additional funded projects and targeted operational and policy strategies to reduce vehicle travel and demonstrate achievable greenhouse gas emissions reductions.

The 2050 LRTP is expected to be adopted by the PACOG Board in April 2026.

Table 2: PACOG GHG Emission Results, Million Metric Tonnes (MMT)

Regional Areas	2030 GHG Emissions	2040 GHG Emissions	2050 GHG Emissions
Baseline Plan: 2045 LRTP	0.540	0.326	0.217
Updated Plan: 2050 LRTP	0.494	0.297	0.202
PACOG Reduction from Baseline Plan	0.046	0.029	0.015
PACOG Required Reductions 2 CCR 601-22	0.030	0.020	0.010
Pass/Fail	**Pass**	**Pass**	**Pass**

Note: Some numbers in this chart may not sum correctly due to rounding.

Source: Pueblo Planning Model and 2 CCR 601-22

Baseline Plan Model

The **Baseline Plan** represents the transportation network and programs adopted in the PACOG 2045 LRTP before the GHG Transportation Planning Standard (2 CCR 601-22) became effective.

Baseline Plan Model Network

The Baseline Plan includes roadway, transit, and non-motorized projects that were fiscally constrained and adopted in the 2045 LRTP, along with continuation of existing policies and trends. No projects or strategies that advanced after adoption of the 2045 LRTP are included in the Baseline Plan.

The travel modeling for the adopted 2045 LRTP consisted of a 2020 base year and a single 2045 horizon year. To enable comparison between the Baseline and Updated Plan, the Baseline Plan horizon year was disaggregated into 2030, 2040, and 2050, with projects assigned to the corresponding staging year. A summary of the PACOG GHG Strategy Scenario Sensitivity Modeling (May 2025) (**Appendix B**) documents the process to develop the 2030, 2040, and 2050 staging years. Projects are listed in **Table 3** below, and further detail on project limits is in **Appendix B**:

Table 3: Baseline Plan Project Summary

Project	Funding Program	Planning Horizon	Total Programmed Cost
I-25 through Pueblo	RPP; SB1	2021-2024	$3,728,633
U.S. 50B Mill and Overlay I25 to 36th Lane	CWP	2021-2024	$378,000
ADA Improvements in the Pueblo TPR Area	ADA	2021-2024	$1,350,162
U.S. 50 Scour Critical Counter Measures K-18-BY, BZ	CBP	2021-2024	$541,160
U.S. 50B - I 25 to 26th Lane	CBP	2021-2024	$2,077,893
S Pueblo - PURHAR-0.1 FRNT	BRO	2021-2024	$523,377
Santa Fe Ave Streetscape Phase 1B	MMO; TAP	2021-2024	$261,349
Arkansas River Trail Phase 4	MMO; TAP	2021-2024	$970,618
Minnequa Lake Trail Connection	TAP; MMO	2021-2024	$388,000
City of Pueblo Prairie Avenue MM Upgrades	MMO	2021-2024	$1,300,000
U.S. 50 West	RPP	2021-2024	$1,469,963
U.S. 50C Drainage Improvements	RPP; SUR	2021-2024	$1,710,922
I-25 Dillon Frontage Road	RPP	2021-2024	$4,200,000
Elizabeth - U.S. 50 to Ridge Drive	SUR	2021-2024	$1,600,000
U.S. 50B Mill and Overlay I25 to 36th Lane	SUR	2021-2024	$19,030,001
U.S. 50A Pueblo County Line to West of Purcell Blvd	SUR	2021-2024	$13,340,700
SH 47A Preventative Maintenance	SUR	2021-2024	$1,372,500
I-25 and U.S. 50B Interchange	SUR	2021-2024	$161,732
Pueblo West SDS Trail North Park	TAP	2021-2024	$513,176
City of Pueblo Northern Avenue Phase 3	TAP	2021-2024	$625,000
Joe Martinez Trail in Pueblo West	TAP	2021-2024	$1,081,741
Arkansas Levee Construction	TAP	2021-2024	$634,328
SH 96A West of Pueblo Safety Improvements	-	2025-2030	$11,500,000
I-25 Improvements North of 13th Street	-	2025-2030	$28,000,000
SH 47 Four Lane Extension to US 50B	-	2025-2030	$8,000,000
I-25 Exit 108 Replace Single Box Culvert	-	2025-2030	$11,000,000
U.S. 50C Drainage Improvements	-	2025-2030	$5,500,000
SH 45 North Extension Study	-	2025-2030	$1,000,000
Dillon Drive East of I-25 Frontage Road Improvements	-	2025-2030	$3,000,000
U.S. 50B Continuous Left Lane at U.S. 50C	-	Beyond 2030	$2,000,000
U.S. 50B Drainage Improvements Pueblo to Granada	-	Beyond 2030	$30,000,000
Pueblo Boulevard Improvements, Multiple Segments	-	Beyond 2030	$23,800,000
Pueblo Boulevard Phase 2 Improvements	-	Beyond 2030	$51,700,000
U.S. 50B East Guardrail Improvements	-	Beyond 2030	$3,000,000
SH 78 Bridge and Shoulder Widening	-	Beyond 2030	$4,000,000

U.S. 50C Drainage Improvements	-	Beyond 2030	$5,500,000
Interstate 25 and U.S. 50B Corridor Improvements	-	Beyond 2030	$262,000,000
U.S. 50A Capacity and Interchange Improvements	-	Beyond 2030	$50,000,000
SH 78 Raised Median and Intersection Improvements	-	Beyond 2030	$3,400,000

Baseline Plan Socioeconomic Data

For both the Baseline Plan and the Updated Plan, the socioeconomic data inputs used in the greenhouse gas modeling are the same. Population, housing, and employment forecasts are based on 2020 U.S. Census data and updated 2023 projections from the Colorado State Demographer's Office and are applied consistently across all scenarios and compliance years. Using identical socioeconomic assumptions ensures that differences in greenhouse gas emissions between the Baseline Plan and the Updated Plan are attributable to changes in transportation projects, policies, and operational strategies rather than differences in underlying growth assumptions.

Baseline Plan Model Validation and Calibration

Model calibration and validation were conducted to ensure the PPM accurately reflects observed travel patterns in the Pueblo region. Validation used traffic count data for autos, SUT, and MUT vehicles and incorporated 2020 CDOT counts and other local datasets. Screenline analysis and trip length frequency distributions were used to benchmark the model. Transit validation used route-level ridership and on-board survey data.

Updated Plan Model

The **Updated Plan** represents the Draft 2050 LRTP and builds upon the Baseline Plan by incorporating additional projects, network enhancements, and system-level strategies that advanced following adoption of the 2045 LRTP.

Model Changes to the Updated Plan

A clear distinction is maintained between projects included in the Baseline Plan and those included in the Updated Plan. The additions to the Updated Plan include new or modified roadway and transit connections, expanded active transportation investments, and policy or operational strategies intended to reduce vehicle miles traveled (VMT) and GHG emissions. The Updated Plan was developed for 2030, 2040, and 2050 compliance years.

The project list presented in **Table 4** below identifies the highway/streets and transit projects modeled in the Updated Plan. The PACOG GHG Strategy Scenario Sensitivity Modeling (May 2025) includes the Updated Plan project list (**Appendix B**).

Table 4: Updated Plan Project Summary

Category	Improvement	Implementation Year(s)
Fixed Route Transit	Shopping Shuttle Bus Route(s)	2030, 2040, 2050
Highway/Streets	Medal of Honor Blvd (Purcell Blvd-Pueblo Blvd)	2030, 2040, 2050
Highway/Streets	Drew/Dix Split Diamond Interchange	2030, 2040, 2050
Highway/Streets	Pueblo Blvd FR (Medal of Honor Blvd-Spaulding Ave)	2030, 2040, 2050
Highway/Streets	Spaulding Ave (31st St-24h St; Pueblo Blvd-Pueblo Blvd FR)	2030, 2040, 2050
Highway/Streets	Spaulding Ave (24th St)	2040, 2050
Highway/Streets	24th St (Tuxedo Blvd-Atlanta Ave)	2040, 2050
Highway/Streets	Mc Carthy Blvd (CO96/ Thatcher Ave-CO78/ Northern Ave)	2040, 2050
Highway/Streets	Bandera Pkwy (CO96/Thatcher Ave-Siena Dr)	2040, 2050
Highway/Streets	Red Creek Springs Rd (Mc Carthy Blvd-Bandera Pkwy)	2040, 2050
Highway/Streets	Lehigh Ave (Mc Carthy Blvd-Bandera Pkwy)	2040, 2050
Highway/Streets	Baltimore Ave (Kachina Dr-29th St)	2040, 2050
Highway/Streets	Spaulding Ave (31st St-11th St)	2040, 2050
Highway/Streets	18th St (Spaulding Ave-Perry Ave)	2040, 2050
Highway/Streets	Baker Stesmer Rd (Lowell Ave-24th St)	2050
Highway/Streets	Hollywood Dr Extension (Farabaugh Ln-Unnamed1 and Unnamed2)	2050
Highway/Streets	Little Burnt Mill Dr Connection (Rambo Trail-Salt Creek Crossing)	2050
Highway/Streets	Unnamed Loop1 Connection (Lake Ave-CO 78/Northern Ave)	2050
Highway/Streets	Bandera Pkwy (Bridal Trail-Unnamed Loop1)	2050
Highway/Streets	Bridal Trail Extension (Bandera Pkwy-Unnamed Loop1)	2050
Highway/Streets	Unnamed Loop2 (Unnamed Loop1-Little Burnt Mill Dr)	2050

Modeling with the GHG Scenario Builder

The 2024 PPM introduced a GHG Scenario Builder tool that allows users to assess the effects of policy and operational strategies on regional GHG emissions, including changes to work-from-home participation, transit service levels, transit frequency, and active transportation enhancements.

The GHG analysis conducted for the 2030, 2040, and 2050 forecast years compared the Baseline against the Updated Plan.

Three primary strategies were applied in the GHG Scenario Builder to develop the Updated Plan compliance scenarios:

- Work-from-home participation by income level
- Transit frequency and speeds
- Non-motorized travel mode

These strategies were selected to represent feasible measures applicable within the PACOG region. Model outputs were formatted in accordance with CDOT and Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) requirements to facilitate MOVES processing. **Table 5** below summarizes GHG strategies selected for the 2030, 2040, and 2050 Updated Plan compliance scenarios and justification for the relevant aspects that support the GHG strategy assumptions follow.

Table 5: Supplemental GHG Strategies

Strategies	2030, 2040, 2050 Baseline Assumptions	2030 Compliance Supplemental	2040 Compliance Supplemental	2050 Compliance Supplemental
Work from home participation*	Income 1: 1% Income 2: 3% Income 3: 6% Income 4: 11% Weighted average: 5%	Income 1: 10% Income 2: 15% Income 3: 30% Income 4: 30% Weighted average: 20%	Income 1: 10% Income 2: 15% Income 3: 30% Income 4: 30% Weighted average: 20%	Income 1: 10% Income 2: 15% Income 3: 30% Income 4: 30% Weighted average: 20%
Transit frequency	Existing service levels (30 / 60 minutes)	20 / 45 minutes	20 / 45 minutes	20 / 45 minutes
Transit speed	50% of vehicular speed	65% of vehicular speed	65% of vehicular speed	65% of vehicular speed
Increase in Non-motorized travel Over 2020 Calibration**	1% of trips	5.5% of trips	5.5% of trips	5.5% of trips

*Income 1 = less than $41,999, Income 2 = $41,999 to $49,999, Income 3 = $50,000 to $65,999, Income 4 = over $65,999

**Percent of total trips up to 5 miles in length

Work from Home

Work-from-home participation represents a systemic change in travel behavior that has emerged since the adoption of the 2045 LRTP and has been incorporated into both regional and statewide planning practice. Expanded access to remote technologies, changes in employer policies, and increased acceptance of hybrid work arrangements have reduced the frequency of commute trips for a portion of the workforce and altered overall travel demand. The concept of working from home encompasses a wide range

of employment arrangements beyond full-time remote work, including self-employed individuals, home-based businesses, part-time employment, non-standard work hours, and hybrid schedules of working from home at least one day per week. These shifts have influenced travel behavior that may not have been captured in previous models.

Work-from-home assumptions in the Updated Plan are informed by American Community Survey (ACS) Journey-to-Work data[1]. ACS Table B08119 shows an increase in work-from-home participation in the Pueblo Metro Area following the pandemic period. Between 2015–2019 and 2020–2024, the share of workers reporting that they usually worked from home increased from approximately 3 percent to 9 percent, while total employment also grew over the same period. This increase indicates a long-term shift in commuting behavior rather than a short-term anomaly.

Note: ACS Table B08119 reports the number of workers who identify working from home as their primary work location, rather than those who do so only a few days per week. As a result, the table captures full-time or predominant remote work but undercounts hybrid schedules where workers split time between home and an external workplace. It is assumed that ACS Table B08119 provides a conservative estimate for work-from-home participation but does not fully reflect weekday participation under hybrid schedules.

The ACS data show a differentiation in work-from-home participation by income level. Lower-income categories below $35,000 account for smaller shares of workers who usually work-from-home. Participation increases in middle-income categories and reaches its highest level among workers earning $75,000 or more. This pattern demonstrates that even in a smaller metro area like Pueblo, work-from-home participation is associated with income levels. Therefore, modeling differentiated work from home participation rates by income is consistent with observed data.

The modeled work-from-home participation in the Updated Plan align with ACS evidence when applied as effective weekday participation rather than permanent remote

[1] [1] U.S. Census Bureau, American Community Survey, Table B08119, 5-Year Estimates, 2015–2019 and 2020–2024.

work. Lower modeled rates (10-15 percent) for lower-income groups are assumed to remain modest, consistent with ACS findings, and higher modeled rates (30 percent) for upper-income groups reflect the concentration of ACS-reported work-from-home participation in those income ranges and account for hybrid schedules. This approach results in commuting levels for most workers while representing reductions in peak-period travel among higher-income, telework-capable occupations.

Note: While higher-income workers are assumed to have higher work-from-home participation rates, they represent a smaller share of Pueblo's workforce. Nearly 60 percent of workers fall into the two lowest income categories. As a result, when participation rates are weighted by the distribution of workers across income groups, the higher participation rates applied to upper-income workers reflect hybrid work patterns within a smaller proportion of the labor force.

Statewide Colorado data from the same ACS table reinforce the income-based pattern observed in Pueblo. In Colorado overall, the share of workers who usually worked from home averaged 21 percent from 2020-2024. In comparison, the workforce-weighted average of the work-from-home participation in the Updated Plan is 20 percent. This consistency supports the use of statewide context to validate the Pueblo-specific modeling assumptions.

Work-From-Home Implementation Measures

Since 2023, the City of Pueblo has had a significant uptick in the number of households with access to Fiber Optic internet. Fiber optic service provides high-speed and consistent internet access which greatly increases the opportunity for citizens to access and work jobs which allow for Work-From-Home or Hybrid schedules. Combined with the local power company's efforts to underground its infrastructure, increasing the reliability of uninterrupted electricity access, Pueblo expects to see a steady increase in the percentage of its population with access to employment opportunities that provide work-from-home benefits.

Transit Frequency and Speed

The Updated Plan assumes increased transit frequency and improved operating speeds relative to the Baseline Plan. In the Baseline Plan, transit service frequency varies by route and by time of day. Most routes operate at 60-minute headways during both peak and off-peak periods, while select routes provide enhanced peak hour service with 30-minute headways. In the model, increased transit frequency is applied as a systemwide factor across bus routes to capture the potential benefits of more frequent service. Higher frequency reduces perceived travel time and improves convenience, making transit more attractive for a wider range of trips. While this approach supports overall transit performance, more targeted service changes can be evaluated separately by defining new or modified transit routes with specific operating characteristics.

Additionally, improved transit operating speeds reflect investments that reduce travel time while vehicles are in motion. These improvements may include strategies such as transit signal priority, dedicated or separated rights-of-way, and faster boarding and alighting. Within the model, transit speed is represented through in-vehicle travel time assumptions applied to roadway links. Baseline conditions assume that transit vehicles operate at a lower effective speed than that of general traffic, while future scenarios allow this relationship to shift as transit receives greater operational priority. Increasing transit speeds in the model reflects how these improvements can enhance travel time competitiveness and support higher transit use.

These assumptions are supported by transit investments and policies outlined in the Draft 2050 LRTP, including planned service expansions, route refinements, and operational improvements identified through coordination with local transit providers (LRTP Chapter 7: Transit). Implementation of these improvements is anticipated through a combination of federal transit funding programs (e.g., FTA Sections 5307 and 5339), state transit programs, and local operating and capital funding. Improvements to transit operating speed reflect strategies such as improved stop spacing, signal priority, and other operational enhancements that are consistent with planned LRTP policies and ongoing transit planning efforts.

The following transit projects, drawn from the Draft 2050 LRTP, represent key investments that support the region's implementation of expanded transit access.

Transit Implementation Measures

- I-25 Exit 108 Purcell Boulevard Mobility Hub
- Pueblo Transit $15M grant for new vehicles
- Zero Emissions Transition Plan (2025)
- Route restructuring (Northside/Southside shopping routes)
- Youth Ride Free program
- MyRide App (service usability & reliability)
- 11 new bus stops + 56 upgraded stops on west side
- CSU Hydrogen Fuel Station (supports fleet transition)
- Funding from CTE Grant Program

Non-motorized Travel

Mode choice modeling is used to capture how people choose from available transportation options for different types of trips. In the 2020 calibrated model and the Baseline Plan model, a 1 percent active transportation mode share is applied to all trip purposes by shifting short-distance auto trips of up to five miles in length to non-motorized modes. The Baseline assumption of 1 percent represents a conservative condition because non-motorized modes were an approximation that were not explicitly modeled and because robust local survey data were not available to support calibration. Updated Plan assumptions reflected in the model include an increased percentage of trips made using non-motorized transportation modes.

The mode choice assumptions in the Updated Plan reflect observed and anticipated regional and state-wide growth in walking and bicycling. One contributing factor is the increased use of electric bicycles and scooters, which has expanded the practical range of active modes and made them viable for a broader range of users and longer trip lengths. The availability of these devices, supported by state and local incentive programs, has helped lower physical and time-related barriers to bicycling or walking for everyday travel.

In addition, Colorado has emphasized active transportation through policy, funding, and infrastructure investment. Statewide and local plans increasingly prioritize walking and bicycling, and many communities have adopted multimodal or complete streets approaches that improve connectivity and user comfort. Continued investment in sidewalks, bikeways, shared-use paths, and related facilities has made active modes more competitive with motorized travel and encouraged higher participation rates.

The increase in the assumed non-motorized mode share reflects a refinement of earlier conservative modeling assumptions, in addition to better reflect cumulative infrastructure improvements, supportive land use patterns, expanded access to electric bicycles and scooters, and policy commitments that make short trips under five miles increasingly feasible by active modes.

Increases in non-motorized travel assumed in the Updated Plan are supported by active transportation investments and policies included in the Draft 2050 LRTP (LRTP Chapter 6: Active Transportation). These include fiscally constrained bicycle and pedestrian projects, application of Complete Streets principles, and continued coordination with CDOT and local partners on active transportation implementation. Funding sources that support these improvements include the Transportation Alternatives Program, Highway Safety Improvement Program, CDOT multimodal programs, and local capital improvement programs. While individual sidewalk or bicycle projects may not be modeled specifically, their cumulative effect is reflected through increased non-motorized mode share assumptions in the Updated Plan. Additionally, PACOG is kicking off an update to the region’s current bicycle and pedestrian master plan which should also support non-motorized travel throughout the region as additional projects and linkages will be determined.

The following active transportation projects, drawn from the Draft 2050 LRTP, represent key investments that support the region’s implementation of non-motorized travel opportunities.

Active Transportation Implementation Measures

- Medal of Honor Boulevard Multimodal Corridor
- RAISE-funded trail connections:
    - Medal of Honor Multimodal Trail
    - 11th Street Trail connection
    - Mobility hubs
    - Waterworks Park access
- Pueblo River Trails Master Plan update
- Complete Streets initiative (2026)
- Bicycle & Pedestrian Master Plan update (2026)

Non-Modeled Land Use and Trip Reduction Context Supporting Updated Plan Assumptions

The land use forecasts used in both the Baseline and Updated Plan models reflect development conditions that have materially changed since adoption of the 2045 LRTP. The forecasts incorporate updated population and employment projections from DOLA and reflect coordination with member jurisdictions to account for adopted plans, entitled projects, and anticipated future development patterns. However, additional alternative land use scenarios or further land use changes were not modeled specifically in the Updated Plan.

Since 2045, PACOG member jurisdictions have advanced a coordinated set of land use policies, development regulations, and private investments that support shorter trip lengths, improved access to daily needs, increased viability of transit, walking, and bicycling. These actions provide contextual support for the Updated Plan's assumed reductions in vehicle travel and increases in non-motorized and transit use, even where individual land use changes cannot be directly represented in the travel demand model.

Adopted Plans and Regulatory Updates

Since adoption of the 2045 LRTP, multiple jurisdictions within the PACOG region have adopted or initiated comprehensive plan and development code updates that prioritize compact growth, mixed-use development, and multimodal accessibility. These include:

- Adoption of the Pueblo Regional Comprehensive Plan (2022), which directs higher-density and mixed-use development toward the urban core and along arterial and collector corridors.
- Ongoing updates to zoning and subdivision regulations to create a Unified Development Code, improving alignment between land use and multimodal transportation planning.
- Implementation of zoning code amendments to comply with recent state legislation, including:
    - House Bill 24-1152 (Accessory Dwelling Units), supporting incremental residential density in established neighborhoods.
    - House Bill 24-1304 (Minimum Parking Requirements), reducing excess parking supply and supporting more compact, walkable development patterns.

High-Density, Mixed-Use, and Infill Development

Recent and ongoing development activity within the PACOG region further reinforces the Updated Plan's assumptions regarding trip length reduction and mode shift. The increased non-motorized mode share is especially effective to reflect land use scenarios that emphasize density and infill development, where new trips are generally shorter and more conducive to active transportation. Examples include:

- Pikes Peak Park, a planned mixed-use development encompassing approximately 74 acres with over 600 residential units and associated commercial services.
- Pueblo Springs Apartments, a multifamily residential development providing nearly 200 dwelling units in proximity to arterial corridors.
- The Cottages on the Boulevard, a higher-density residential development designed to support future mixed-use opportunities.
- Downtown infill and adaptive reuse projects, including conversion of historic structures and renovation of upper-story residential units along Main Street, increasing residential proximity to employment, services, and transit.

Implications for Travel Behavior and GHG Reduction

Collectively, these land use initiatives support:

- Shorter average trip lengths by co-locating housing, employment, and daily services.

- Increased feasibility of walking and bicycling for short trips.
- Improved transit access and ridership potential through higher residential and employment densities along key corridors.
- Reduced dependence on single-occupancy vehicle travel.

While these land use changes are not modeled independently in the Updated Plan, they reinforce the feasibility of the assumptions related to work-from-home participation, transit use, and non-motorized travel. As such, they represent an important supporting context for the Updated Plan's demonstrated compliance with the GHG reduction targets established in 2 CCR 601-22.

Relationship to the 2050 LRTP

The Updated Plan is directly aligned with the policies, strategies, and fiscally constrained investments described in the Draft 2050 LRTP, available at www.pacogmovestheregion.com. The Updated Plan translates adopted and anticipated investments, programs, and policies into modeled assumptions that reflect their combined influence on regional travel behavior and emissions outcomes consistent with 2 CCR 601-22.

Policies, Programs, and Funding

The Updated Plan represents a reasonable and achievable pathway for the PACOG region to meet the GHG reduction targets established in 2 CCR 601-22. While the scenario is expressed in the model through changes in travel behavior – such as increased transit use, higher non-motorized mode share, and reduced vehicle travel – it is grounded in adopted plans, fiscally constrained projects, and established funding programs that support implementation of these outcomes.

The Updated Plan builds upon the Baseline Plan by incorporating projects, programs, and policy directions that have advanced since adoption of the 2045 LRTP and are reflected in the Draft 2050 LRTP. These actions include both regionally significant transportation investments and system-level strategies that influence travel behavior but cannot always be represented as individual projects within the travel demand model. Examples of these elements are listed in **Table 6**.

Table 6: Policies, Programs, and Funding that Support Modeled Strategies

Modeled Strategy	2050 LRTP Policies/Programs	Funding/Implementation Mechanism
Work from Home Participation	Observed post-2020 trends reflected in the PACOG model update as well as statewide and adjacent MPO best practices	Empirical assumption (ACS-based), not project dependent.
Increased transit frequency & speed	Transit service expansion noted in the 2050 LRTP; Pueblo Transit route refinements since 2045 LRTP (ongoing)	FTA 5307/5339, local operating funds, IIJA discretionary transit programs.
Increased non-motorized travel	Fiscally constrained bike/ped projects in the 2050 LRTP; Complete Streets policies	TAP, HSIP, CDOT Multimodal, local capital programs

Model Output Summary

Table 7 presents key inputs and outputs from the PPM for the three compliance years for the Baseline Plan and the Updated Plan. The table identifies demographic data and travel forecasts for all of Pueblo County.

Compared to the Baseline Plan, the Updated Plan has a slight increase in non-motorized trips, a slight decrease in vehicle trips, and a slight decrease in VMT reflecting the previously described Updated Plan scenarios. Additionally, the increase in transit ridership reflects the fact that transit service was increased between the Baseline Plan and Updated Plan.

Table 7: Modeling Output Summary

Category	Baseline Plan 2030	Baseline Plan 2040	Baseline Plan 2050	Updated Plan 2030	Updated Plan 2040	Updated Plan 2050
Socioeconomic Data						
Population	182,758	193,288	198,327	182,758	193,288	198,327
Households	72,315	76,153	79,350	72,315	76,153	79,350
Population Employed	80,382	84,768	86,914	80,382	84,768	86,914
Lane Miles by Roadway Type						
Interstate	194	194	194	194	194	194
Expressway	326	326	326	326	326	326
Principal Arterial	301	373	380	314	387	404
Minor Arterial	393	470	481	396	481	491
Collector	306	1,006	1,095	310	1,016	1,128
Ramps	19	23	23	19	23	23
Centroid Connectors	659	684	684	664	684	689
Total Lane Miles	**2,197**	**3,074**	**3,182**	**2,222**	**3,111**	**3,255**
Person Trip Mode Share						
Vehicle: Drive Alone	71.9%	71.1%	71.4%	68.0%	67.9%	68.0%
Vehicle: Shared Ride (2+)	26.6%	27.5%	27.3%	26.0%	26.2%	26.1%
Transit	0.5%	0.3%	0.3%	0.8%	0.8%	0.8%

Category	Baseline Plan 2030	Baseline Plan 2040	Baseline Plan 2050	Updated Plan 2030	Updated Plan 2040	Updated Plan 2050
Vehicle Trips diverted to Non-Motorized	1.0%	1.0%	1.0%	5.2%	5.1%	5.2%
Vehicle and Transit Data (Daily)						
Vehicle Miles Traveled (VMT)	5,615,909	6,193,646	6,223,802	5,237,613	5,759,488	5,957,018
VMT per Capita	30.7	32.0	31.4	28.7	29.8	30.0
Transit Boardings	2,465	2,606	2,673	7,170	6,831	7,059

Source: Pueblo Planning Model

Table 8: Modeling Output Comparison

Category	Change 2030	Change 2040	Change 2050
Socioeconomic Data			
Population	0	0	0
Households	0	0	0
Population Employed	0	0	0
Lane Miles by Roadway Type			
Interstate	0	0	0
Expressway	0	0	0
Principal Arterial	13	14	24
Minor Arterial	3	11	10
Collector	4	10	33
Ramps	0	0	0
Centroid Connectors	5	0	5
Total Lane Miles	**24**	**37**	**73**
Person Trip Mode Share			
Vehicle: Drive Alone	-3.9%	-3.2%	-3.4%
Vehicle: Shared Ride (2+)	-0.6%	-1.3%	-1.2%
Transit	0.3%	0.5%	0.5%
Vehicle Trips Diverted to Non-Motorized	4.2%	4.1%	4.2%
Vehicle and Transit Data (Daily)			
Vehicle Miles Traveled (VMT)	-378,296	-434,158	-266,784
VMT per Capita	-2.0	-2.2	-1.4
Transit Boardings	4,705	4,225	4,386

Quantification of GHG Emissions

GHG emissions are quantified by multiplying the PPM outputs (in VMT) and MOVES emission rates (in grams per mile) of carbon dioxide equivalent (CO_2e). Key steps in this process are described below.

PACOG defined the geographic extents of the GHG compliance area to be consistent with the PACOG planning area boundary shown on **Figure 1**. Roadway links outside this area were clipped at the boundary edge and removed from the analysis. CDOT reviewed the boundary and split links for consistency (**Appendix C**). The remaining roadway links were imported into a Microsoft Access (Access) database provided by CDPHE APCD in conjunction with CDOT. Key datasets within the database included:

- **MOVES Emission Rates**: CDOT conducted MOVES modeling, with review from APCD. The resulting emission rates were disaggregated to include a unique rate for each combination of hour, speed, vehicle type, and road type. **Appendix E** includes additional details on the MOVES modeling methodology.
- **Hourly VMT and Speed Distribution**: PACOG developed a process specific to the PACOG GHG compliance area in collaboration with CDOT and APCD. It defines how traffic volumes and speeds are distributed throughout a 24-hour day. **Appendix F** documents the hourly assignments.

PACOG used the Access database to calculate the predicted total annual GHG emissions. This process was completed for the “Baseline” and “Updated” plans for the horizon years 2030, 2040, and 2050. Results were sent to CDOT and APCD for verification (**Appendix G**). **Table 2** shows the resulting GHG emissions necessary to demonstrate compliance with 2 CCR 601-22 for the three compliance years.

Public Participation

The PACOG Public Participation Plan guides public participation activities for all plans and programs. The 2050 LRTP included two phases of public participation, with the first involving more significant public and stakeholder outreach through social media, focus

groups, an online survey, public open houses, and pop-up events as described in **Chapter 2: Uplifting our Communities**. The first phase also included an interactive map that allowed the public to provide specific input related to their lived experience using the current roadway network. Public comments were used to determine overlap with planned fiscally constrained projects and aspirational projects included in the 2050 LRTP.

The second phase of public engagement will begin in January 2026 to present the findings from the 2050 LRTP process and draft documents. The draft document will be available at pacogmovestheregion.com. Additionally, a public open house will be held to present the key findings from the plan.

The PACOG Board will entertain adoption of the 2050 LRTP, which will include this report, at their regular monthly meeting in April 2026. A summary of public comments submitted during the public comment period will be presented, and the public will be encouraged to attend.

Continued Efforts to Reduce Greenhouse Gas

Although compliance was achieved, the PACOG MPO and partner governments will continue to seek opportunities to reduce GHG emissions as growth and development in the region continues to occur. Efforts may include:

- Increased frequency of transit service
- Funding for a sustainability study
- Travel demand management
- Zero-emission vehicles
- Regionally significant multimodal projects

Appendix A. PACOG 2024 Travel Model Update Methodology Report

2024 MODEL Update/Validation

Pueblo Planning Model Methodology Report

PACOG MOVES THE REGION

2024 MODEL UPDATE

June 2024

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List of Acronyms

AADT	Average Annual Daily Traffic
ACS	American Community Survey
BPR	Bureau of Public Roads
CDOH	Colorado Department of Highways
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health & Environment
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning Satellite
GUI	Graphical User Interface
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HHTS	Household Travel Survey
LOS	Level of Service
LRP	Long Range Plan
MMT	Million Metric Tons
MPO	Metropolitan Planning Organization
MUT	Multi-Unit Trucks
NAICS	North American Industry Classification System
NCHRP	National Cooperative Highway Research Program
NHTS	National Household Travel Survey
OTIS	Online Traffic Information System
PACOG	Pueblo Area Council of Governments
PEL	Planning and Environmental Linkages
PRMSE	Percent Root Mean Square Error
QCEW	Quarterly Census of Employment & Wages
QRM	Quick Response Manual
RMSE	Root Mean Square Error
CO	Colorado State Highway
SUT	Single-Unit Trucks
TAZ	Traffic Analysis Zone
TCRP	Transit Cooperative Research Program
TIP	Transportation Improvement Plan
TLFD	Trip Length Frequency Distributions
TMIP	Travel Model Improvement Program
TRB	Transportation Research Board
USDOT	United States Department of Transportation
UTPS	Urban Transportation Planning System
VDF	Volume Delay Function
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled

1 Introduction

1.1 The Need for Travel Demand Models

Since the passage of the 1962 Highway Act, urban areas within the United States have been required to base their transportation investments on a comprehensive, cooperative, and continuing transportation planning process. While various congressional acts have modified the specific legal requirements over the years, the essential requirement for a logical, rational transportation planning process remains a prerequisite for Federal transportation funding assistance, and in many areas, for state participation in funding transportation improvement projects.

One significant element of the transportation planning process involves projecting future transportation needs for the next 20 to 30 years. The most accepted method of projecting these future transportation needs, and for evaluating alternative improvement strategies to serve the projected travel demand needs, is using travel demand models. Travel demand models use socioeconomic land use data to estimate the demand for travel, and they use a coded representation of the transportation system to simulate the ability of the transportation system to serve the estimated travel demand.

When travel demand models are provided with projections of future socioeconomic land use data, they can be used to forecast the projected performance of alternative transportation improvement strategies. The reliability of these models is directly related to the likelihood that the input data correctly represents how land will develop in the future. The accuracy of traffic models is assessed by comparing the traffic volumes estimated by a model to observed traffic counts for a specific base year, for which socioeconomic land use data is also available. The development of a consistent base year database containing a transportation network and socioeconomic data is critical to the development and validation of a travel forecasting model.

1.2 Background of the PACOG Travel Model

The 2020 Pueblo Area Council of Governments (PACOG) travel demand model has profited from development and application in the last fifteen years. It has been updated and enhanced in this 2024 cycle in several important ways. These elements will be presented and discussed in this report, and include:

1. **Extended Model Forecast Horizon** – The new modeling system accommodates forecasts out to 2050, extending the model horizon an additional five years from the previous 2045 limit.
2. **Updated Observed Traffic Data** – The model integrates 2020 traffic count data by auto, Single Unit (SUT) and Multi Unit (MUT) truck.
3. **Zone System Revisions** – Zonal coverage was changed to match CDOT's Traffic Analysis Zone (TAZ) structure to provide better geographic resolution, and total consistency between the DOT and PACOG regarding base and forecast land use assumptions.
4. **Zonal Data Update** – Socioeconomic data was updated for population, households, median income, and group quarters (2020 Census). Employment data updated using the 2020 Quarterly Census of Employment & Wages (QCEW), data obtained from the Colorado Dept. of Labor & Employment, including employment point data (2021). Trip generation disaggregation values, and trip distribution targets utilize the 2010 Pueblo Front Range Household Survey data. An updated statewide travel survey is in progress.
5. **More Detailed Truck Vehicle Classes** – Previous versions of the model used Single Unit (SUT) and Multi Unit (MUT) trucks in trip generation and internal trip distribution, but then collapsed this category into a generic truck category in later model steps. This version carries SUT and MUT classes through all model steps and outputs.

6. **Addition of Transit Network** –Transit routes, stops, and service characteristics are included in the PACOG model for the first time. The additional transit network information is used to support transit skimming used in Mode Choice modeling and later in transit assignments. Roadway network detail and data attributes were expanded to support transit modeling as well.

7. **Added Mode Choice Modeling** – This is a new model component that was added to improve the model's sensitivity to anticipated future scenarios. This component explicitly models individual choices related to traveling by auto and transit depending on trip purpose and characteristics of the journey to the destination location. Addition of the mode choice step significantly changed outputs and subsequent model steps related to Production-Attraction to Origin-Destination (PA-OD) conversion.

8. **Expanded Traffic Assignment** – The PACOG model provides traffic flow outputs for am and pm peak hours, the remaining 22 Off Peak hours, and daily totals. Outputs for vehicle classes are now split into Autos, SUT, and MUT. The process adds a Passenger Car Equivalent (PCE) methodology that accounts for the fact that trucks use more road capacity than autos. A daily transit route assignment is added as well, with transit outputs and reporting.

9. **User Interface, Analysis, and Reporting** – The PACOG model's original reporting capabilities were updated to work with the new components/updates. Several new reporting outputs were added to summarize mode choice and transit assignment results. Additionally, the various roadway traffic assignment results can be summarized and processed for further greenhouse gas analysis. As part of the greenhouse gas analysis capabilities, the user interface allows users to apply some general assumption changes affecting travel demand/mode choice which can be applied in special model scenario runs. Reporting capability now includes customized Greenhouse Gas (GHG) reporting/output.

The PACOG travel model extent covers the entirety of Pueblo County which is almost 2,400 square miles. The base year is 2020. The validated 2020 base year model presented in this report captures the movements of over 169,000 persons in 67,000+ households. The entire PACOG model is implemented using Caliper Corporation's TransCAD computer software package, Version 9.0.

The PACOG travel demand model has a long history. The original PACOG travel model was specified in a mainframe Urban Transportation Planning System (UTPS) platform and was developed and maintained by the then Colorado Department of Highways (CDOH). The model was transitioned to the MPO in 1984 after migration to the MinUTP software platform. The first survey-supported comprehensive update of the model by PACOG was completed in February 1994. Migration of the MinUTP model to the Colorado Department of Transportation's preferred Caliper Corporation software, TransCAD, was completed in 2002 to support use for the New Pueblo Freeway Environmental Impact Statement. The 2014 model update continued with the TransCAD software platform, while integrating, within TransCAD, key functionality established in the 1994 work. In 2020, updating model parameters with a 2020 base year and recent household survey data paved the way for long range planning. The current 2024 update took a significant step forward in adding the first transit network with a supporting mode choice module. Additionally, the truck model was broadened to two classes of trucks and the model reporting capability expanded to produce data input files to Greenhouse Gas (GHG) models. The Covid-19 pandemic, spanning the years 2020 through 2022, has challenged the effort to prepare a representative 2020 base year. The PACOG travel demand model addressed these years by adjusting the work from home component of socioeconomic forecasting, and reviewing traffics counts from years 2020-2023 for identification of a "mid-point" base year best representing 2020. The result is a base year that captures 2020 while staying true to the changing travel patterns that emerged in the past four years.

During three decades of evolution, the PACOG model has continued to provide the agency with the capability to capture existing and future traffic for planning purposes as well as a tool for numerous traffic studies. The 2024 updated PACOG travel model extent with the revised zone system is shown below in **Figure 1**.

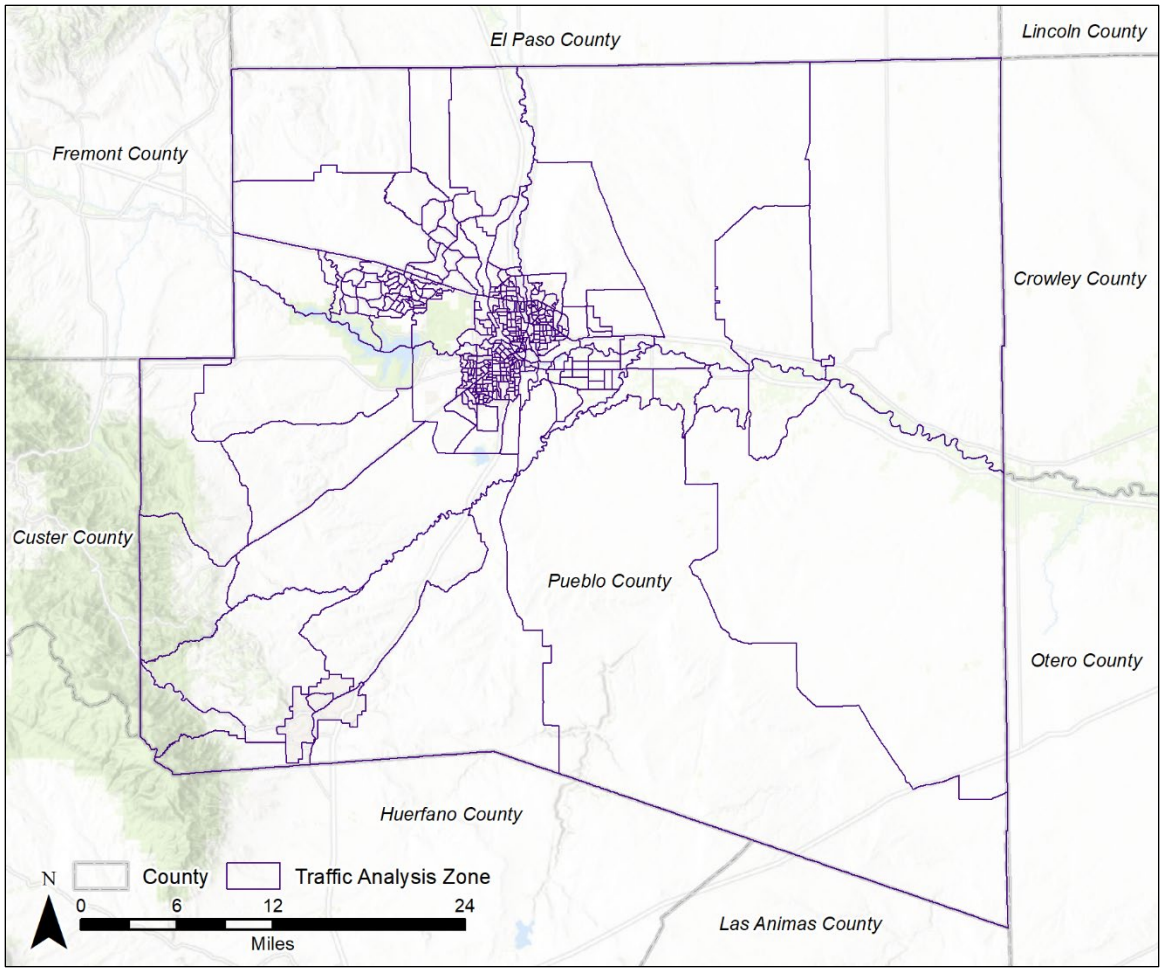

Figure 1: PACOG TAZ Layer and Travel Model Extent

1.3 The Traffic Forecasting Modeling Process

Standard four-step traffic forecasting models have the following basic components:

- Trip Generation
- Trip Distribution
- Mode Split
- Traffic Assignment

The PACOG travel model incorporates these four basic modeling components listed above to produce travel demand forecasts. The model contains three time periods. The am peak is 7:30 am - 8:30 am and the pm peak is 4:30-5:30 pm. The off-peak is composed of all other times of the day. These three time periods are summed to produce daily modeled traffic. A base year of 2020 and future year of 2050 are provided in the model. Intermediate years can be generated.

The process flow of the PACOG model will be described using the four-step model sequence. Information about data acquisition, processing and use will also be included in this report. The goal is to capture the details of the update and address issues related to their integration in the model.

2 Traffic Analysis Zones and Socioeconomic Data Development

2.1 Overview

The transportation demand side of the PACOG travel model was developed using an enhanced Traffic Analysis Zone (TAZ) layer covering the MPO extent, which is Pueblo County. This TAZ layer is consistent with the CDOT Statewide Travel Model. The 2024 update purposely adopted this TAZ system to streamline communication between the PACOG and statewide models.

2.2 Traffic Analysis Zones

A TAZ summary of zone type is presented in **Table 1**, and shows a total of 393 zones, including the eight external zones/stations.

Table 1: PACOG 2024 Traffic Analysis Zone Summary

Zone Type	TAZ ID Sequence	TAZ Count
Regular Traffic Analysis Zone	1 through 385	385
External Zones	401 through 408	8
Total		**393**

The Traffic Analysis Zone GIS database holds the master ID and the input attributes as shown in **Table 2**. The socioeconomic forecasts prepared for the model update are joined to this basic TAZ level layer during each model run.

Table 2: Zonal Attributes for the TAZ Layer

Attribute	Description
ID	PACOG Zone ID
Area	Area in Square Miles
County_ID	FIPS County ID
ST_ID	FIPS State ID
MPO	All TAZ are PACOG
Area_Type	Area Type (1 through 5)
Area_Type Description	Area Type (1=CBD, 2=Fringe, 3=Urban, 4=Suburban, 5=Rural)

2.3 Socioeconomic Data Development

2.3.1 Overview of Data Sources

Covid-19 Discussion

A wide array of data was used to update the TAZ layer for the PACOG model. An issue that needed discussion at the outset of the update was how to handle data selection for the year 2020 given the fluctuations that occurred during the Covid-19 pandemic. In every part of the country, reductions in traffic, employment, and travel in general occurred during the span of time when Covid-21 was active – in general years 2020 through 2022+. Data from these years needed to be reviewed and adapted thoughtfully. The challenge, then, was to assert a strategy for capturing a base year, call it ***2020****, that would serve as a reasonable starting point for future year scenarios. On the observed traffic side, the decision was made to utilize 2022 and 2023 observed traffic to capture a realistic base year. On the household and population side, the recently released Census 2020[1] information on households and population was available, represented conditions in 2020, and was used; this information was verified,

[1] *U.S. Census 2020 Data, https://data.census.gov/, accessed December 2023.*

and adjusted, using the Colorado Department of Local Affairs[2] (DOLA) forecasts. PACOG 2020 households and population are also consistent with the CDOT statewide model. Employment base year and forecasts required both a point employment database from the CDOT Statewide Model, LODES employment summaries, DOLA summaries and data from the Colorado Quarterly Census of Employment & Wages (QCEW). Employment data was also verified, and adjusted, using the DOLA forecasts. PACOG staff also collaborated on the systematic collection and review of GIS files useful in model development; these included current streets, city boundaries, traffic counts, and transit route information. These GIS layers, combined with state and national data such as U.S. Census 2020 data and selected CDOT state travel model files, were used. **Table 3** shows the standard attributes developed from the various sources cited above for the 2020, 2030, 2040 and 2050 study years.

Table 3: Socioeconomic Attributes

Attribute	Description
TAZ	Traffic Analysis Zone ID
DISTRICT	District ID for Summary
AREA_TYPE	Area Type ID for Link Speed/Capacity Lookup
POP	Total Population
POPINHH	Population in Households
GQPOP	Population in Group Quarters
HH	Number of Households
INC	Median Income
HHSIZE	Average Household Size
TOTEMP	Total Employment
RETAIL	Retail Employment
BASIC	Basic Employment
SERVICE	Service Employment
GOVERNMENT	Government Employment
ELEM_ENROLL	Elementary School Enrollment
SEC_ENROLL	High School Enrollment
COLL_ENROLL	Collage Enrollment
ST	State (FIPS)
CNTY	County (FIPS)

2.3.2 Household & Population Data Development

The fundamental requirements for the socioeconomic data development are information on the number of households, the number of persons in households, the median household income, and the number of persons in group quarters. These attributes were available to the project from the 2020 U.S. Census with attributes available at the Census block, block group, or tract level, all of which can be aggregated into the PACOG TAZ geography. **Figure 2** shows the scale of the geographic aggregation process for block-to-TAZ; almost 6,000 Census blocks were used to populate the 385 PACOG TAZs.

[2] *Colorado Department of Local Affairs (DOLA), https://demography.dola.colorado.gov/, accessed December 2023.*

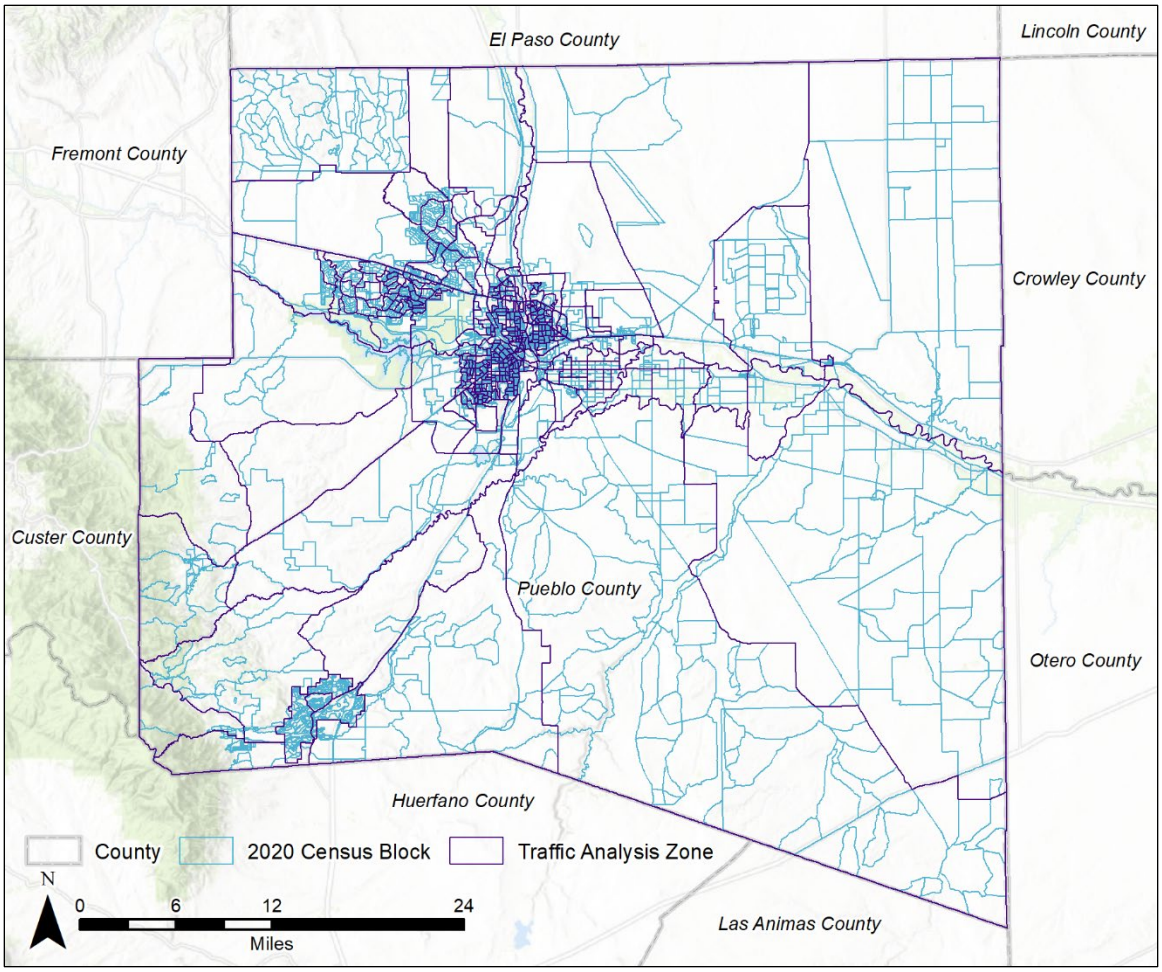

Figure 2: Census Block and PACOG TAZ Geography

Median income and group quarter location and population were derived from the Census tract layer. Group quarters facilities include college/university dormitories, health/rehab centers, assisted living, and correctional facilities, Persons in group quarters make up about 3% of the total population in Pueblo County. The Census values for group quarters were cross-checked with local maps and information and converted to PACOG TAZ geography. Forecasts utilized the DOLA totals for households, population, and jobs as control totals.

2.3.3 School Populations

School data is a small but key component of the travel model. School enrollment is required for trip generation. The enrollment numbers are required at three levels of academics:

- Kindergarten through 8th grade – 2020 enrollment was 16,990.
- High School – 2020 enrollment was 12,390.
- College/University – 2020 enrollment was 8,400.

The key data source used was the Colorado Public Health & Environment online school location GIS point file[3]. Both public and non-public schools in the K-12 level are included in this geodatabase. A secondary data collection investigation was conducted into "hybrid" schools, such as the GOAL

[3] *CDPHE CDOE School Locations and District Office Locations | CDPHE CDOE School Locations and District Office Locations | Colorado Department of Public Health and Environment (arcgis.com)*, accessed September 2023.

Academy system which combines online learning platforms with in-person support at student drop-in classrooms; GOAL serves about 5,900 students in Pueblo County. According to a GOAL administrator, on an average weekday 10-25% of the GOAL students report to a "bricks and mortar" location[4]. The GOAL Academy schools, and drop-in locations were identified, added to the geodatabase, after once adjustment by the percentage of students who are typically on-site. Forecasting for school attendance is done using the observed ratio of students to households. Colorado State University and Pueblo Community College enrollment is found on their websites.

2.3.4 Employment Data Development

The employment data task was to develop TAZ level employment by the four categories for all study years. The 2007 North American Industry Classification System[5] (NAICS) was used to establish four categories of employment as shown in **Table 4.**

Table 4: PACOG Employment Categories by NAICS Code

Employment Category	NAICS Range
BASIC	<= 425120
RETAIL	441110 - 454390
SERVICE	481111 - 814110
GOVERNMENT	> 814110

The employment categories can be described as follows:

- **Basic** includes farming, forestry, fishing, mining, oil and gas extraction, major construction and manufacturing of all kinds including food, tobacco, lumber and paper, printing, chemicals, medical and optical goods, and wholesale trade.
- **Retail** includes the sale of building materials, hardware, garden, mobile homes, general merchandise, food, automotive, gasoline, clothing, furniture, eating and drinking places, and miscellaneous.
- **Government** includes public administration and other.
- **Service** includes information, finance and insurance, real estate, and rental services, professional and technical, educational, health care, entertainment, accommodation, transportation, and warehousing.

Data sources were the CDOT Statewide Model 2015 job establishments point file, the Colorado 2020 Quarterly Census of Employment & Wages (QCEW), LODES[6] quarterly workforce indicators, and DOLA county level employment totals by category and by control totals. The CDOT point data was factored to 2020 DOLA totals then converted into the PACOG four employment categories to establish employment by classification at the zonal level. Growth rates by the employment categories were tied to the DOLA economic forecasts which include growth expectation by sector.[7]

[4] *Telephone call to GOAL regional administrative offices, September 2023.*

[5] North American Industry Classification System (NAICS) U.S. Census Bureau, accessed November 2023.

[6] Longitudinal Employer-Household Dynamics (LODES) data, https://lehd.ces.census.gov/data/#lodes, accessed November 2023.

[7] Labor Force Economic Forecasts, *https://gis.dola.colorado.gov/economy-labor-force/economic-forecasts/, accessed December 2023.*

2.3.5 Summary

In summary, DOLA control totals guided the socioeconomic development of the PACOG Model. Local, state, and national data provided input data, corroboration of values and control totals. **Table 5** shows the resulting totals for the four study years. **Table 6** shows the growth rates. Over the span of the 30-year forecast available, population grows 15%, households grow 20% and employment grows 17%.

Table 5: Colorado Department of Local Affairs (DOLA) Totals for Pueblo County

Socioeconomic Attribute	2020	2030	2040	2050
Population	168,311	178,217	188,514	193,446
Households	65,911	72,315	76,153	79,350
Employment	74,593	80,382	84,768	86,914

Table 6: Colorado Department of Local Affairs (DOLA) Growth Rates for Pueblo County

Socioeconomic Attribute	2020-2030	2030-2040	2040-2050	2020-2050
Population	6%	6%	3%	15%
Households	10%	5%	4%	20%
Employment	8%	5%	3%	17%

To summarize the socioeconomic data development step:

- Census 2020 provides a solid basic framework for the population, households, income, and group quarters model components.
- Colorado DOT statewide model employment point data is used as the primary input for employment data.
- County level growth by Colorado DOLA provides control totals for population, households, and employment.

2.4 Travel Model External Zones/Stations

Travel to and from locations outside of the PACOG region is captured using information from traffic flows located at the eight major external stations or portals to the region. In the current update, the previous all truck traffic vehicle class was expanded from all trucks to truck traffic by two size classifications, Single and Multi-Unit Trucks.

2.4.1 The Eight PACOG Model External Stations

The updated 2020 PACOG model captures eight external station or points as listed in **Table 7**. These points represent the major locations where highways link Pueblo County with all areas outside of the county. **Figure 3** shows the station locations.

Table 7: PACOG Model External Stations

External Stations	TAZ ID
Interstate 25 (North)	401
State Highway 96 (East)	402
US Highway 50 (East)	403
Interstate25 (South)	404
State Highway 165 (West)	405
State Highway 78 (West)	406
State Highway 96 (West)	407
US Highway 50 (West)	408

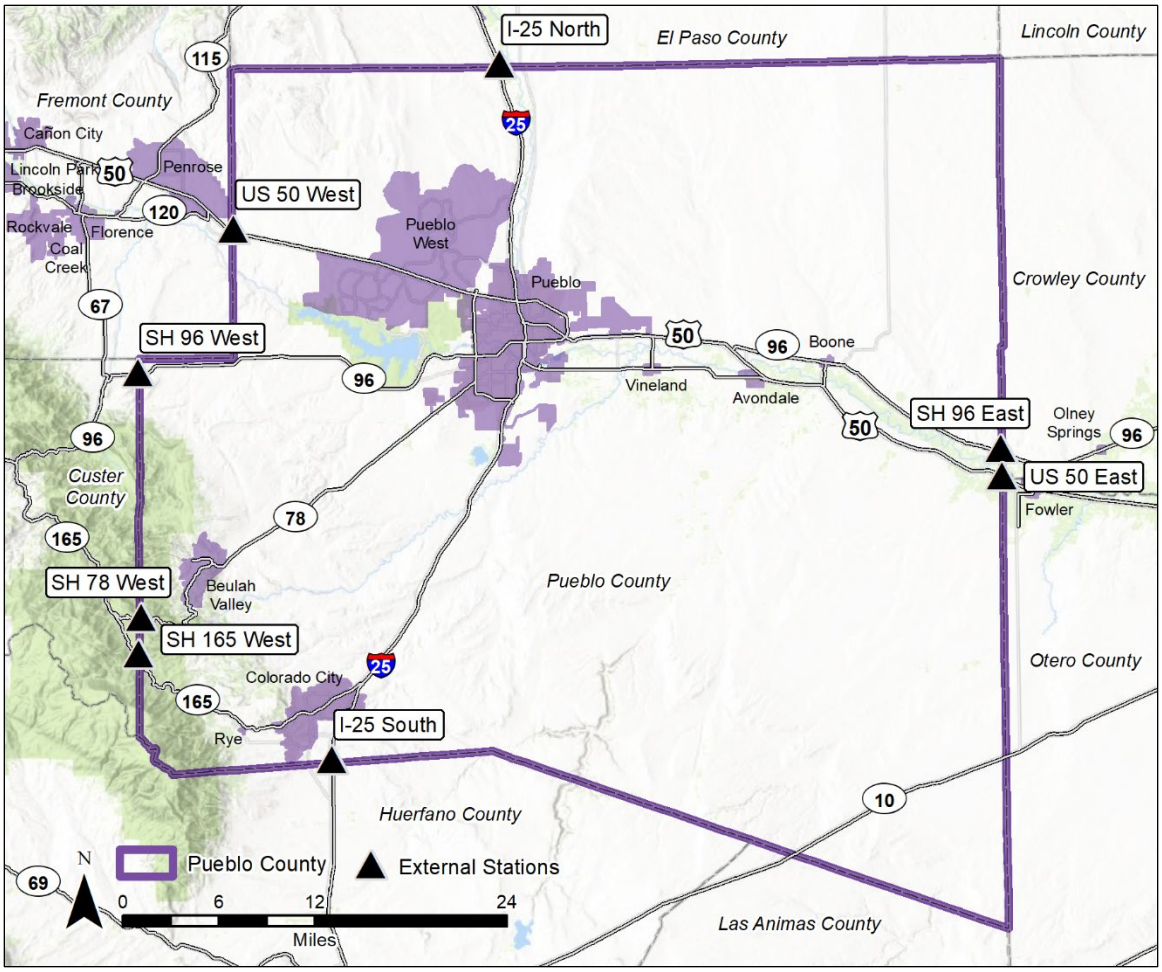

Figure 3: Location of PACOG External Stations

2.4.2 Estimating Base Year External Station Volumes

To estimate traffic volumes at the external stations for the 2020 base year, the following process was used:

- Available data for total traffic (AADT) and for SUT and MUT trucks were collected and tabulated. Analysis on the trend for observed traffic in Pueblo County was conducted to understand the impact of the Covid-19 pandemic with 2022-2023 traffic data selected for use.
- Through-traffic percentages were developed for each external-external pair to represent the external-external traffic share of total traffic at each external point.

A spreadsheet capturing the process was created for use in replicating the trip table approach for future years. The following data resources were used to develop the external station traffic volume estimates:

- 2022 Average Annual Daily Traffic (AADT) values were obtained from the Colorado Department of Transportation (CDOT) database, which is available online.[8] The database provides historic and current traffic count data for CDOT facilities, and includes all highways represented by external stations in the PACOG model.
- Growth rates developed by CDOT.

[8] http:www.cdot.com (Colorado Department of Transportation), accessed in 2023.

These data resources enabled the establishment of the 2020 estimated external station baseline counts summarized in **Table 8**. Truck percentages were also available for major highways from the CDOT database.

Table 8: PACOG Model External Station Observed Traffic

Route Location	External Zone	2-Way Traffic Autos	2-Way Traffic SUT	2-Way Traffic MUT
Interstate 25 (North)	401	26,000	1,000	3,000
State Highway 96 (East)	402	1,000	40	40
US Highway 50 (East)	403	3,000	140	370
Interstate 25 (South)	404	7,000	360	1,000
State Highway 165 (West)	405	1,000	30	30
State Highway 78 (West)	406	1,000	40	30
State Highway 96 (West)	407	1,000	30	60
US Highway 50 (West)	408	8,000	160	370

Source: Colorado DOT Online Transportation Information System (OTIS)

2.4.3 Estimating Future External Station Volumes

To estimate external traffic for future years, annual growth factors were obtained from CDOT. For consistency with statewide forecasts, 20-year growth factors from the CDOT web site were used to derive annual growth factors for each of the CDOT highways. First, a one-year, annual growth rate (F_1) was calculated for each CDOT 20-year facility growth factor (F_{20}) using a simple interest formulation, where: the annual growth (i) was calculated as the 20th root of the CDOT 20-year factor, minus 1 (e.g. i= F20^(1/20)-1 so for a 20-year factor F20 of 1.570, i = 0.0228). Using the calculated annual growth rate value, required growth factors could be calculated using: $F_n = (1+i)^n$.

Table 9 summarizes the calculated equivalent annual growth factors. These rates were used to prepare a 2050 traffic estimate for the external stations of the Pueblo model.

Table 9: External Station Future Year Traffic Counts Estimation

Route Location	External Zone	2-Way AADT	20-Yr Factor	Annual Factor	2-Way ADT
		2020	$F_{20} = (1+i)^{20}$	$F_A = (1+i)^1$	2050
Interstate 25 (North)	401	29,000	1.4	1.017	40,600
State Highway 96 (East)	402	1,000	1.52	1.0212	1,500
US Highway 50 (East)	403	3,700	1.08	1.0039	4,000
Interstate 25 (South)	404	8,100	1.31	1.0136	10,600
State Highway 165 (West)	405	800	1.29	1.0128	1,000
State Highway 78 (West)	406	1,000	1.32	1.014	1,300
State Highway 96 (West)	407	1,000	1.49	1.0201	1,500
US Highway 50 (West)	408	8,100	1.35	1.0151	10,900
Total		**56,120**			**71,500**

2.5 Area Type

Five distinct area types were updated from the legacy Pueblo model and adjusted to fit the revised 2020 zone system. A review of the model documentation shows that area type is used in the link speed assumptions and the trip distribution step. The area type designation is related to population/employment density as well as to the density of the street grid. Central Business District (CBD) zones have a dense street grid compared to outlying areas and feature significant walkability. CBD Outlying area type maintains some of the features of CBD, while being slightly less dense. Urban areas have a regular street grid and feature less walkability than CBD and CBD Outlying. The suburban and rural area types move toward a street grid and design most consistent with the auto mode.

Table 10 shows the number of TAZs by area type in the Pueblo model. **Figure 4** shows the area type in plot form with **Figure 5** illustrating a close-up of this attribute in the urban area. The area type has been permanently saved on the TAZ and link layer for use in the model update.

Table 10: Number of TAZs by Area Type

Area Type	Number of TAZs
Central Business District (CBD)	10
Outlying CBD	16
Urban	109
Suburban	217
Rural	33
Total	**385**

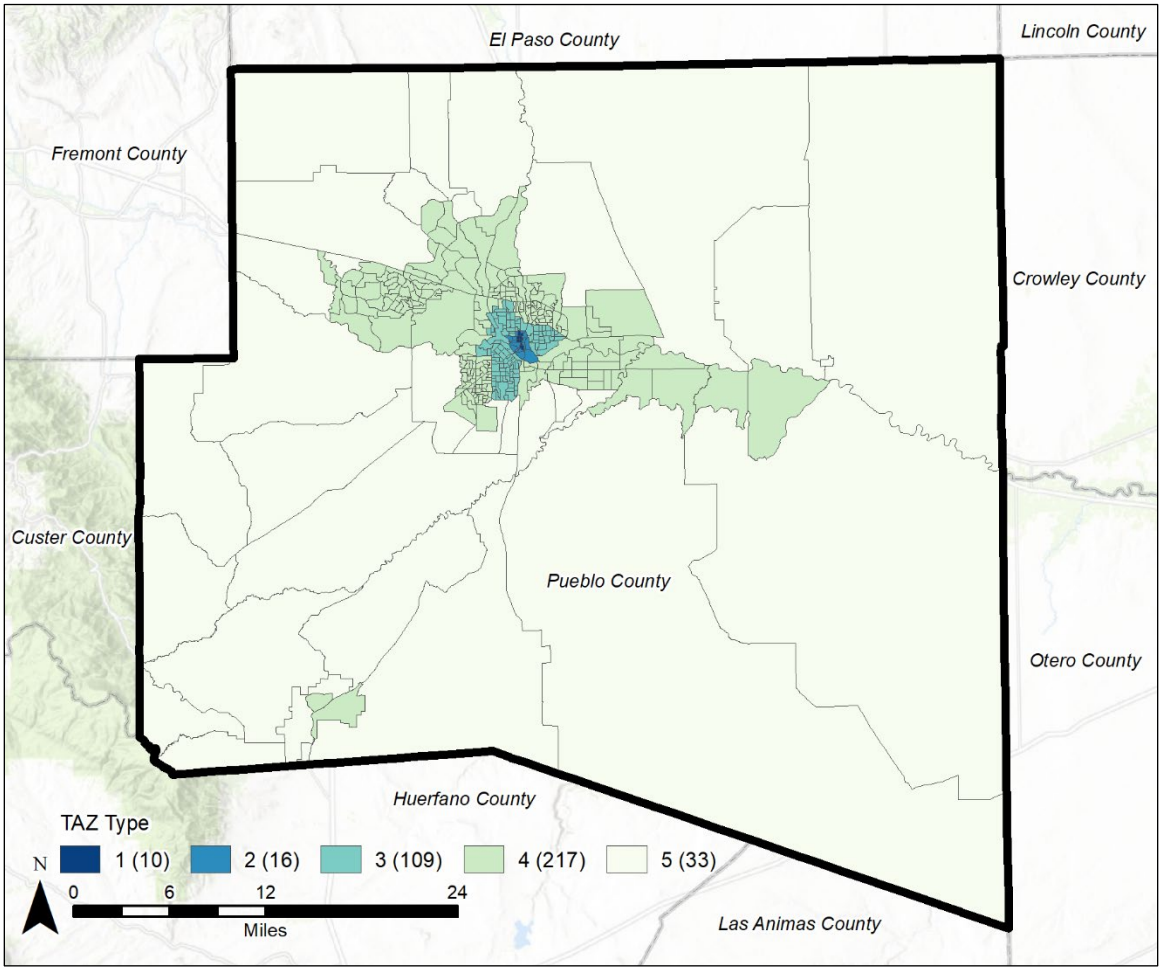

Figure 4: Area Type

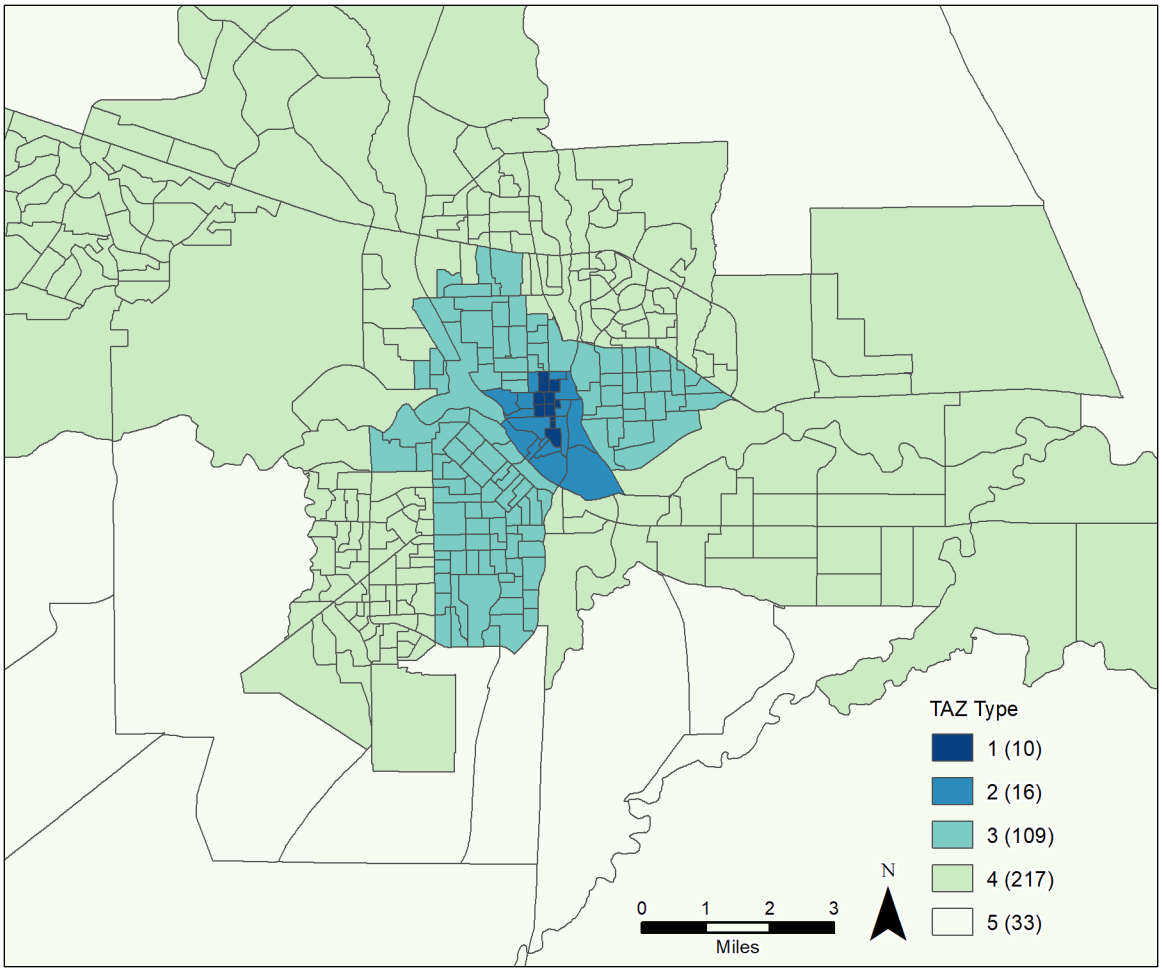

Figure 5: Area Type (Inset)

3 Highway Network Update

3.1 Background

The 2020 PACOG network model was updated using the TransCAD software Version 9.0, a product of Caliper Corporation. There are three highway network building blocks:

- **Nodes** are elements that describe the position of intersections or shape points on roadway networks.
- **Links** are network model segments that connect the nodes, represent roadways, and have attributes including direction, speed, capacity, and functional classification.
- **Centroid Connectors** are links that connect the zones to the network. They represent the distance to be covered between a zone's center of gravity (the center of trip generating and attracting activity) and the model links serving that zone.

3.2 Base Year Network Development

The 2020 highway network from the travel model update and long-range plan work of 2020 was identified and updated for the current model. This development required review and editing of the previous network to capture the changes in the region over the past four years. Network verification was conducted using aerial imagery and street layer geospatial data. The most extensive revisions were needed to implement the expanded traffic analysis zones and the addition of a transit network. Legacy centroid connectors were removed, and new connectors were put in place to serve the updated traffic analysis zones and to capture bus stop locations. Link locations and attributes were also verified, new roadways and widening projects completed in recent years were added. Traffic counts representing 2020 were added. Finally, network connectivity was tested.

3.3 Development of Link Speeds and Lane Capacities

PACOG travel models network use Level of Service (LOS) C capacities for roadway facilities. This conforms to an approach that constrains traffic volumes to desired design level of service volumes. National Academy of Sciences Transportation Research Board (TRB) guidance recommends that travel demand model capacity settings be set at "ultimate capacity," the point at which congestion-induced delays would result in diversion of traffic to alternate routes, and that applicable capacity assumptions should be developed in accordance with procedures detailed by the current Highway Capacity Manual (HCM) or from the Highway Capacity Software (HCS) or similar analysis tool.

A speed capacity look-up table was used to transfer the Level of Service associated capacities and link speeds to the PACOG highway network. The look-up table maps the appropriate capacity assumption to each functional classification in the model network. The capacity of centroid connectors is typically assumed to be very large, since these links represent the numerous ways that travelers within a zone can reach the larger highway network. **Table 11** shows the seven functional classes of highway links used in the PACOG travel model.

Table 11: PACOG Link Functional Class

Facility Type (Fac_Type)	Description
1	Interstate
2	Expressway
3	Principal Arterial
4	Minor Arterial
5	Collector
6	Ramp
7	Centroid Connectors

Speed-capacity assumptions for the newly updated PACOG travel model were developed through review and iterative testing of speed and capacities used in the four most recent legacy model versions, as well as a LOS C, HCM-based assumption set. The final capacity assumptions, shown in the rightmost column of **Table 12,** are somewhat lower than standard HCS values, adjusted to better reflect local conditions. These values and the associated travel speeds are also consistent with assumptions used for earlier PACOG travel model versions that were calibrated to local conditions. These values are also supported by literature research including the Highway Capacity Manual 2010 and comparison to peer model settings. Reduced congested speeds, used in the first iteration to "seed" the travel time skims, were implemented by the 1994 legacy model, and later abandoned. This option is retained, though not implemented in the current model update.

Table 12: PACOG Free-Flow Speeds and Ultimate Capacity/Lane

Link Type	Area Type Description	Area Type	Facility Type	Congested Speed	Free Flow Speed	Capacity
11	CBD	1	1	55	55	1600
12		1	2	22	22	650
13		1	3	17	17	500
14		1	4	17	17	450
15		1	5	15	15	450
16		1	6	10	10	350
17		1	7	15	15	1200
21	CBD Outlying	2	1	48	48	1700
22		2	2	25	25	700
23		2	3	28	28	600
24		2	4	28	28	500
25		2	5	25	25	500
26		2	6	10	10	350
27		2	7	15	15	1200
31	Urban	3	1	50	50	1900
32		3	2	35	35	900
33		3	3	30	30	750
34		3	4	30	30	650
35		3	5	25	25	650
36		3	6	20	20	400
37		3	7	15	15	1500
41	Suburban	4	1	55	55	1900
42		4	2	40	40	900
43		4	3	38	38	750
44		4	4	35	35	600
45		4	5	30	30	600
46		4	6	15	15	400
47		4	7	15	15	1500
51	Rural	5	1	60	60	1900
52		5	2	50	50	800
53		5	3	46	46	650
54		5	4	45	45	600
55		5	5	35	35	600
56		5	6	20	20	450
57		5	7	15	15	1500

3.4 Node Attributes

The node layer supports the links and serves as the source of the centroid and zone ID. **Table 13** shows the node attributes. Note that any nodes at which turns are to be saved during assignment can be selected prior to the network assignment using “Turn_Flag=1”.

Table 13: Node Fields - PACOG Travel Model

Name	Type	Description
ID	Integer	TransCAD Internal Node ID
Longitude	Integer	Node Latitude
Latitude	Integer	Node Longitude
Elevation	Real	Node Elevation (not active)
Centroids	Integer	1 if the Node is a Centroid
Turn_flag	Integer	1 if the Node Turn movement is to be saved during assignment

3.5 Link Attributes

The following revisions were done to the network during review and re-dimensioning:

- I-25/Dillon Drive area was reviewed, and connector links added to capture traffic prior to Dillon Drive entering the intersection.
- Nodes were added where bus stops are present (transit network functionality).
- A review of the functional class and number of lanes was performed.
- Traffic counts for AADT, SUT and MUT were added to represent 2020.

Key input link attributes are shown in **Table 14.** Note that inputs for the three time periods, am, pm and off-peak link segment inputs are held in this single network. The input network is found in the PACOG model input folder with a name keyed to the study year; an example is “2020_BaseNetwork.DBD”

Table 14: Input Link Fields - PACOG Travel Model

	Name	Type	Description
Input	ID	Integer	TransCAD Internal Node ID
	Dir	Integer	Direction with 0=two-way and 1 or -1 = one-way
	Length	Real	Link Length in Miles
	TYPE	Integer	Link Type (Area/Functional Class)
	Distance	Real	Link Length in Miles
	Mode	Integer	1=Non-Centroid Connector link; 2= Centroid Connector Link
	Area_Type	Integer	Area Type
	Fac_Type	Integer	Facility Type
	AB_Num_LANES	Integer	Number of Lanes (by direction)
	BA_Num_LANES	Integer	Number of Lanes (by direction)
	AB_FFSpeed	Integer	Free Flow Speed (by direction)
	BA_FFSpeed	Integer	Free Flow Speed (by direction)
	AB_FFTime	Integer	Free Flow Travel Time (by direction)
	BA_FFTime	Integer	Free Flow Travel Time (by direction)
	AB_CongSpeed	Integer	Congested Speed (by direction)
	BA_CongSpeed	Integer	Congested Speed (by direction)
	AB_CongTime	Integer	Congested Travel Time (by direction)
	BA_CongTime	Integer	Congested Travel Time (by direction)
	AB_AM_CAP	Integer	AM Link Capacity (By Direction)
	BA_AM_CAP	Integer	AM Link Capacity (By Direction)
	AB_PM_CAP	Integer	PM Link Capacity (By Direction)
	BA_PM_CAP	Integer	PM Link Capacity (By Direction)
	AB_OP_CAP	Integer	Off Peak Link Capacity (By Direction)
	BA_OP_CAP	Integer	Off Peak Link Capacity (By Direction)
	AB_NAME	Integer	Street Name
	BA_NAME	Integer	Street Name
	AB_DIR	Integer	AB Direction
	BA_DIR	Integer	BA Direction
	AB_DES	Integer	Street Description
	BA_DES	Integer	Street Description
	Count_Year	Character	Street Name
	AB_Daily_Count	Real	AB Direction ADT Count
	BA_Daily_Count	Real	BA Direction ADT Count
	TwoWay_Count	Real	Two-Way ADT Count
	Source	Character	Source of County Data
	Year	Integer	Year of Count Collection
	AB_SUT_2022	Integer	Single Unit Truck Count (by direction)
	BA_SUT_2022	Integer	Single Unit Truck Count (by direction)
	AB_MUT_2022	Integer	Multi-Unit Truck Count (by direction)
	BA_MUT_2022	Integer	Multi-Unit Truck Count (by direction)
	WalkMode	Integer	All set to value 3
	WalkT	Real	Walk Time: Length/(3/60) assuming walk at 3 mph
	IVTT	Real	In Vehicle Time for Bus: Length/(14/60) assuming bus speed at 14 mph

Once the network is used in a model scenario, it emerges as a "loaded network," a GIS ready network with daily assigned traffic as attributes. An example is "LoadedDailyNetwork_2020.DBD. Its attributes are shown in **Table 15**.

Table 15: Output Link Fields - PACOG Travel Model

	Name	Type	Description
Output	AB_AM_Flow	Real	1 hour AM period Total Traffic (by direction)
	BA_AM_Flow	Real	1 hour AM period Total Traffic (by direction)
	AB_OP_Flow	Real	22-hour off-peak period Total Traffic (by direction)
	BA_OP_Flow	Real	22-hour off-peak period Total Traffic (by direction)
	AB_PM_Flow	Real	1 hour PM period Total Traffic (by direction)
	BA_PM_Flow	Real	1 hour PM period Total Traffic (by direction)
	AB_Daily_Flow	Real	Daily Traffic (by direction)
	BA_Daily_Flow	Real	Daily Traffic (by direction)
	TwoWay_Daily	Real	Total Daily Traffic
	VMT_Daily	Real	Daily Vehicle Miles Traveled
	Vol_Range	Integer	Volume Range
	AB_AM_VC	Real	Volume to Capacity Value for AM period (by direction)
	BA_AM_VC	Real	Volume to Capacity Value for AM period (by direction)
	AB_OP_VC	Real	Volume to Capacity Value for off-peak period (by direction)
	BA_OP_VC	Real	Volume to Capacity Value for off-peak period (by direction)
	AB_PM_VC	Real	Volume to Capacity Value for PM period (by direction)
	BA_PM_VC	Real	Volume to Capacity Value for PM period (by direction)
	AB_DAILY_VC	Real	Volume to Capacity Value for Daily (by direction)
	BA_DAILY_VC	Real	Volume to Capacity Value for Daily (by direction)

Table 16 shows the link facility type (Fac_Type) used in the mapping. **Figure 6** shows the 2020 PACOG Highway Network with **Figure 7** showing a close-up of the urban area. The link attribute "Facility Type" is used to differentiate the links.

Table 16: Facility Type for Highway Links

Facility Type (Fac_Type)	Description
1	Interstate
2	Expressway
3	Principal Arterial
4	Minor Arterial
5	Collector
6	Ramp
7	Centroid Connectors

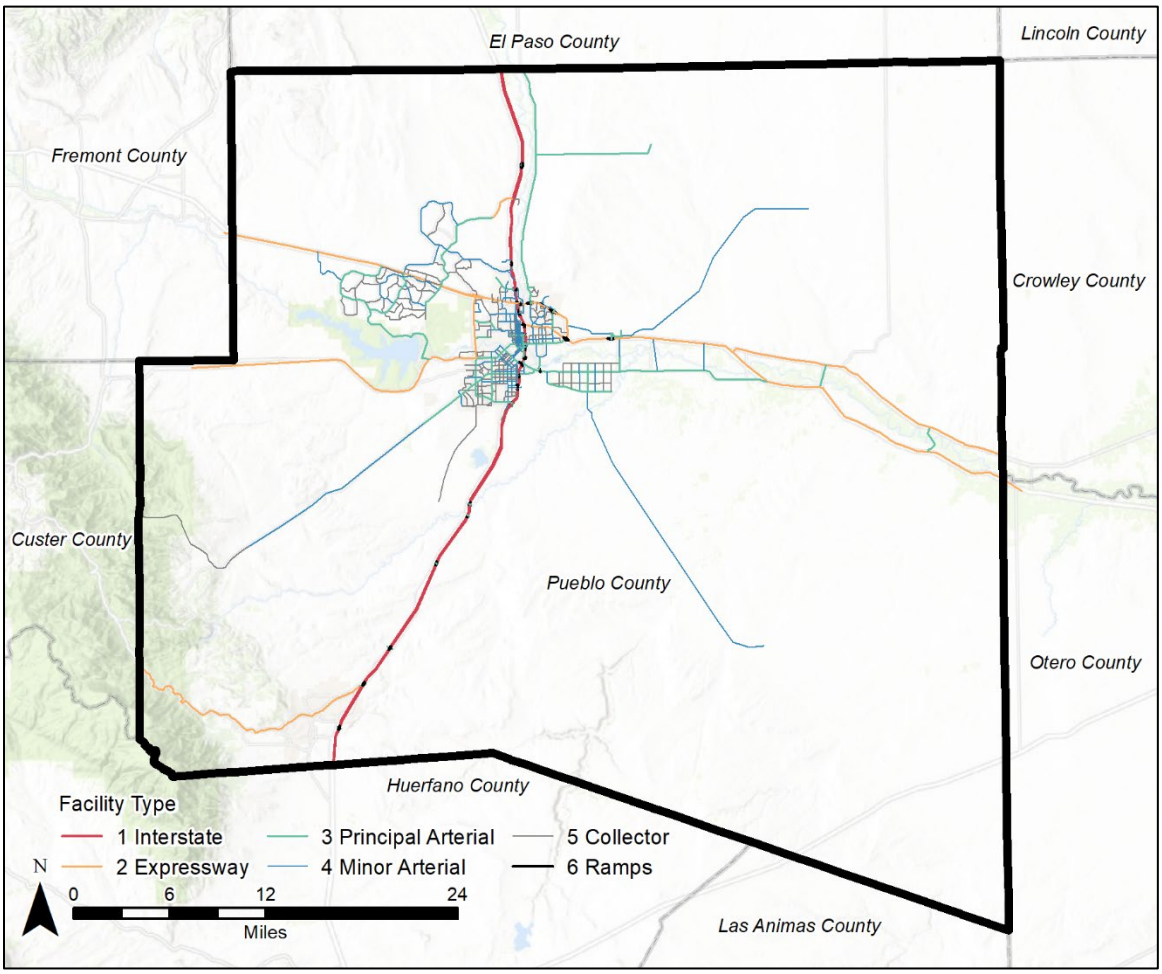

Figure 6: 2020 Link Facility Type

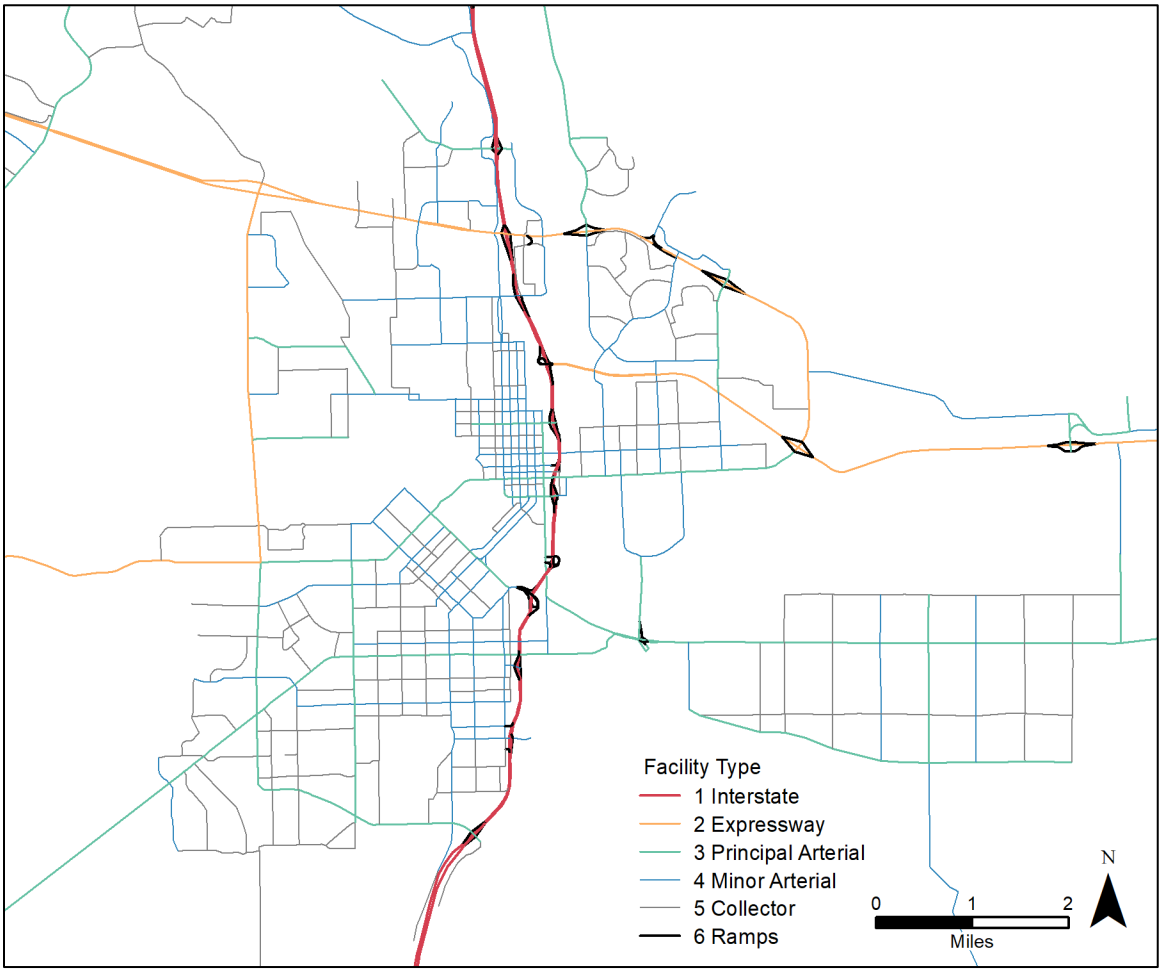

Figure 7: 2020 Link Facility Type Inset

3.6 Time of Day Capacity Assumptions

The PACOG Travel Demand Model contains three time periods. These are the am peak (7:30-8:30 am), the pm peak (4:30-5:30 pm) and the off-peak which is composed of the sum of all other times of the day. The link segment capacity multiplier for each of the two peak periods is set as "1" since they each represent one hour. During network building the "1" is multiplied by the lane capacity and the number of lanes to calculate the carrying capacity of the link segment during that one hour. The off-peak period is composed of all remaining hours spread throughout the day including late morning, midday, afternoon, evening and overnight. It will naturally have a larger capacity multiplier than do each of the peak hours. Since the off-peak period traffic is not evenly spread over the 22 off-peak hours, the network factor is not 22. Rather a factor of 11 has been determined to represent the traffic flow that takes place within the off-peak period. The factor of 11 was estimated based on an analysis of the time-of-day of travel data summarized from the 2010 Front Range Household Survey. **Table 17** shows the am, pm, and off-peak capacity factors used for the traffic assignments. The sum of traffic from the three time-period assignments adds up to daily traffic.

Table 17: Capacity Factors for Traffic Assignment

Period Name	Length (Hours)	Capacity Factor
AM Peak	1	1
PM Peak	1	1
Off Peak	22	11

3.7 Turn Movements and Prohibitions/Penalties

The PACOG Travel Model application of TransCAD software has the capability to conduct analysis reporting on turning movements.

Turn Movements – Turn movements are activated by placing a "1" in the "Turn_Flag" attribute of the network node file. All nodes with this setting will be selected during each of the three time of day model runs. During assignment all turn movements from the selected nodes will be exported to a "Turn Movement" assignment output file.

Turn Prohibitions & Penalties – Turn prohibitions and penalties (in minutes) are available for the PACOG travel model. A file called "turnpen.dbf" in the parameter folder can be activated. In model application the turn prohibitors are listed in a file that TransCAD reads during the assignment process. Activating turn movements can be of value in conducting corridor traffic studies or similar small-scale efforts where turn delay data is available. At the regional level there is risk in activating some turns but not all as this approach can perturb regional patterns of traffic. Global settings are activated in the current model to disallow U-turns throughout the region.

4 Truck Model

The PACOG travel model features a three-step truck model that expands upon the previous one truck class model by generating, distributing, and assigning two classes of truck.

4.1 Truck Model Approach

The truck model is framed using CDOT's vehicle classification definition[9] which is drawn from the FHWA vehicle classification scheme. The FHWA approach is shown in **Table 18** and in **Figure 8**. There are two truck classes in the PACOG model:

- Single Unit Trucks - Vehicles larger than pickup trucks built on a single chassis and consistent with FHWA Classes 4-7.
- Combination or Multi Unit Trucks – trucks with 3 or more axles-single trailer or multiple trailers and consistent with FHWA Classes 8-13.

The TMIP Quick Response[10] modeling approach was utilized as a starting point. Adjustment to Pueblo conditions was required, with both truck trip generation and distribution rates adjusted using feedback from the assignment process. SUTs were set to 1.5 and MUT to 2.5 Passenger Car Equivalents (PCE) during assignment. The Colorado DOT provided sufficient observed truck data to validate the PACOG MPO model by SUT and MUT classes. The observed truck data consists of 132 locations delivering 322 directional truck counts in the PACOG region.

Table 18: FHWA Truck Vehicle Classification

PACOG Vehicle Classification	FHWA ID	Description
Passenger Vehicles	Class 1	Motorcycles, Autos and Trucks
	Class 2	
	Class 3	
Single-Units	Class 4	Buses
	Class 5	Two Axle, Six Tire, Single Unit Trucks
	Class 6	Three Axle Single Unit Trucks
	Class 7	Four or More Axle Single Unit Trucks
Multi-Units	Class 8	Four or Fewer Axle Single Trailer Trucks
	Class 9	Five Axle Single Trailer Trucks
	Class 10	Six or More Axle Single Trailer Trucks
	Class 11	Five or fewer Axle Multi Trailer Trucks
	Class 12	Six Axle Multi Trailer Trucks
	Class 13	Seven or More Axle Multi Trailer Trucks

[9] CDOT Catalog Search / Glossary, https://dtdapps.coloradodot.info/otis/catalog, accessed November 2023.

[10] *Source: NCFRP Report 31: Incorporating Truck Analysis into the Highway Capacity Manual (2014), accessed November 2023.*

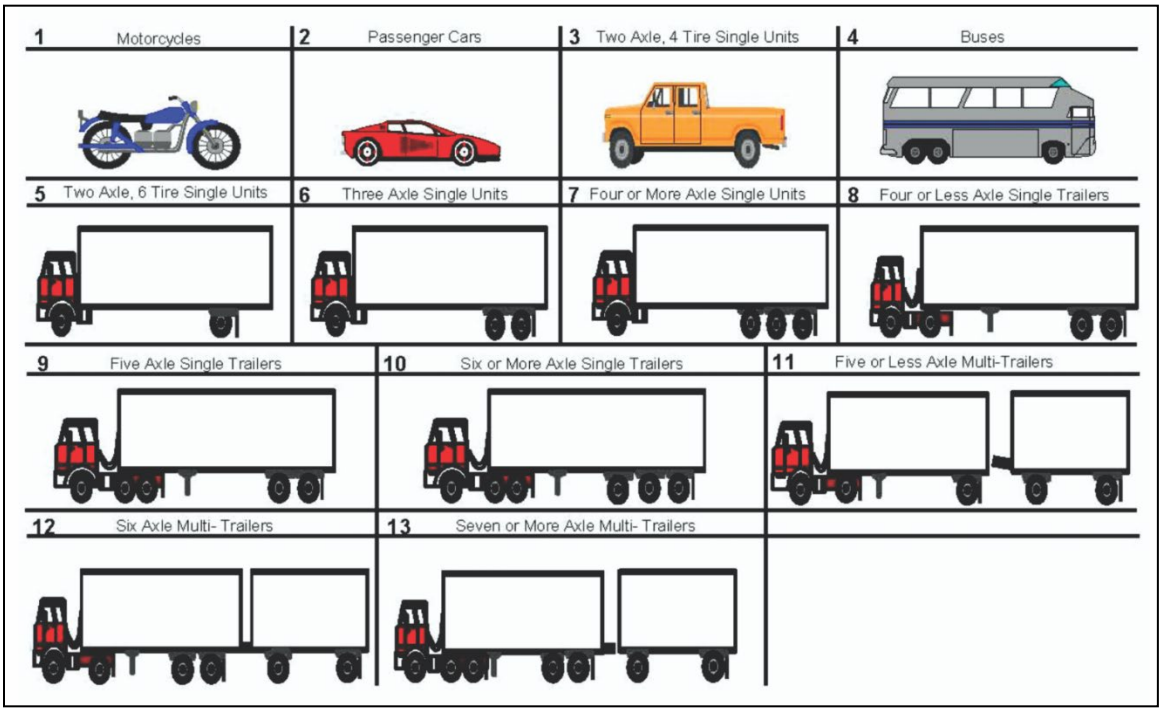

Figure 8: FHWA Truck Vehicle Classification

4.2 Truck Trip Generation and Distribution

Two sizes of trucks are generated using attraction rates only. These rates are written to the production side of the distribution model. Through truck trips are to be developed in a separate step. The general concepts used in the TMIP approach were utilized for this 2020 update with input adjustments for local conditions. Truck trip generation rates and distribution values are shown in **Table 19** and **Table 20**.

Table 19: Truck Trip Generation Rates

Purpose	HH	Retail	Basic	Service	Government	Elem_Enroll	Sec_Enroll	Colleg_Enroll
SUT	0.042	0.100	0.024	0.190	0.090	0.030	0.030	0.030
MUT	0.022	0.080	0.015	0.013	0.009	0.010	0.010	0.010

Table 20: Truck Trip Distribution Rates

Purpose	Alpha	Beta	Gamma
SUT	--	--	0.227
MUT	--	--	0.048

4.3 Truck Model Validation

The two classes of trucks, SUT and MUT, were subjected to validation tests.

Single Unit Trucks had 322 directional counts available for validation. At the daily level, the count and model flow volume for these trucks differed by 1.6%. The Root Mean Square Error (RMSE) was 53. The scatterplot shows an R-squared of 75% with a good fit between modeled and observed SUTs as shown by the adherence to the diagonal.

Table 21: SUT Validation Statistics

Truck Class	Type ID	# of Obs.	RMSE	RelRMSE	Sum of Counts	Sum of Flows	% Difference
Single Unit	SUT	322	114.66	52.97	69,706	70,852	1.6%

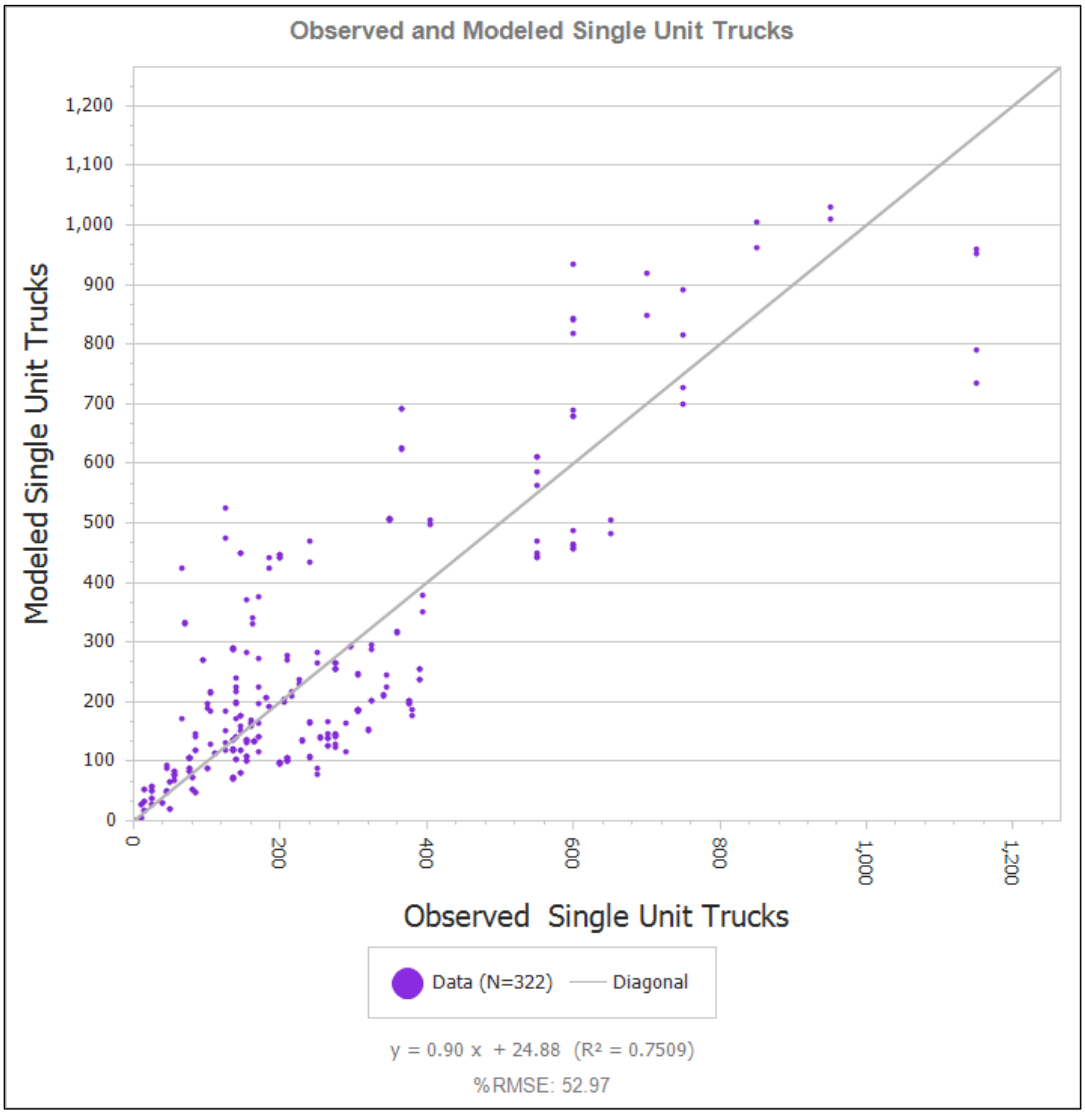

Figure 9: SUT Validation Scatterplot

Multi-Unit Trucks had 322 directional counts available for validation. At the daily level, the count and model flow volume for these trucks differed by 2.8%. The Root Mean Square Error (RMSE) was 40. The scatterplot shows an R-squared of 92% with a good fit of modeled to observed MUTs as shown by the adherence to the diagonal.

Table 22: MUT Validation Statistics

Truck Class	Type ID	# of Obs.	RMSE	RelRMSE	Sum of Counts	Sum of Flows	% Difference
Multi-Unit	MUT	322	90.84	39.61	73,849	75,921	2.8%

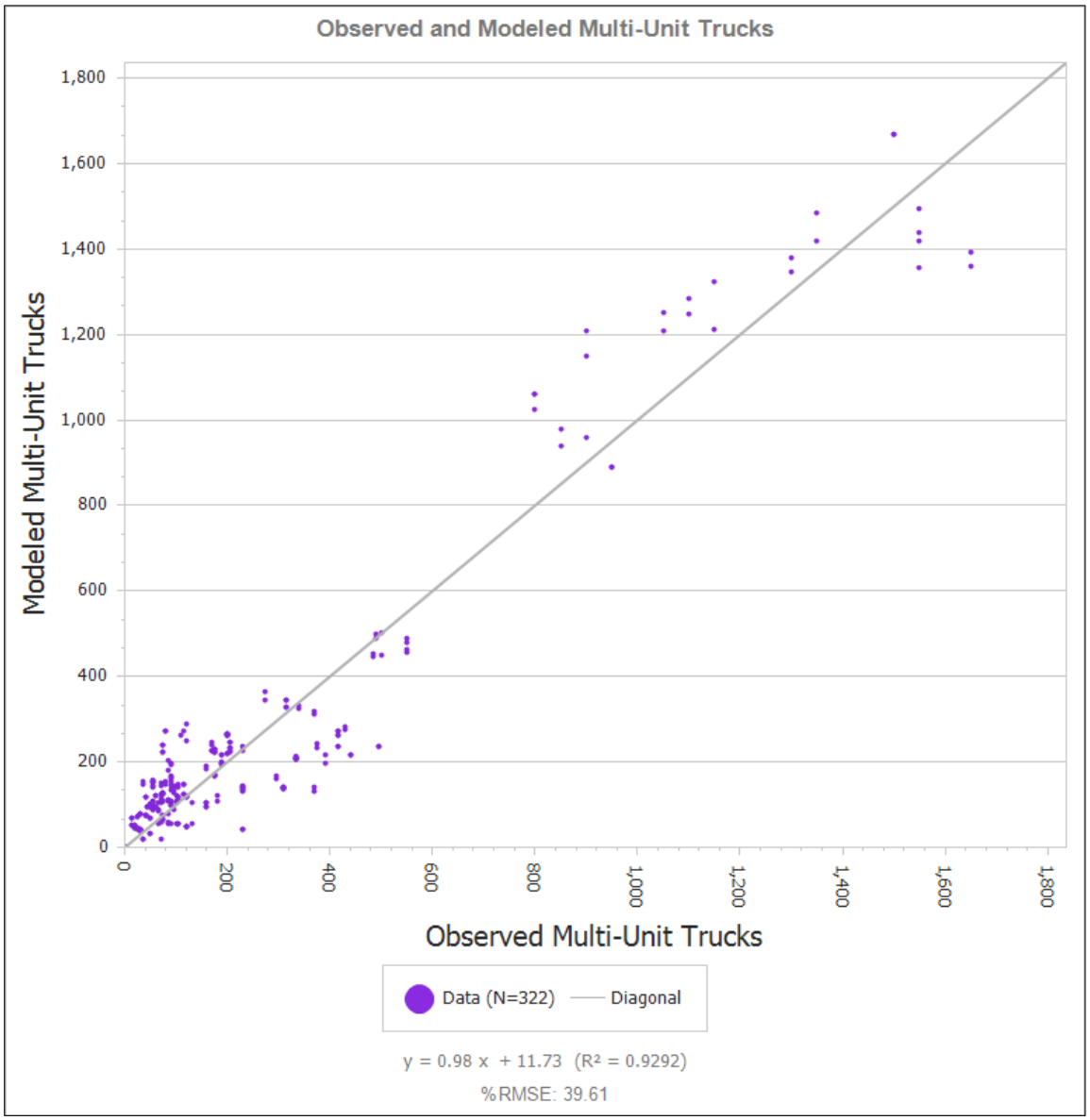

Figure 10: MUT Validation Scatterplot

5 Trip Generation

The first step in the four-step travel demand model development process is accomplished by the trip generation models. Trip generation is composed of two fundamental components: 1) household trip rate

development and application, and 2) special generator approach. Household trip generation steps include socioeconomic disaggregation, trip production and attraction models, and external trip models, all of which are developed using a household travel survey. Special generator models are built for facilities whose traffic is not driven by household-based trip generation. In the Pueblo region, special generator approaches have been developed for recreational and tourist destinations. These facilities use data and information, such as annual visitors, to estimate trip-making behavior.

5.1 Overview of Components

5.1.1 Household Trip Generation

Household trip generation includes procedures to estimate the travel demand associated with specific socioeconomic characteristics and land use activities. The goal of the trip generation model is to estimate trip productions and trip attractions for use in the model steps that follow. There are four key components of trip generation:

- **Socioeconomic Disaggregation** – These models begin with aggregate data such as the total number of households and the mean household size per TAZ. The data is then disaggregated to obtain the finer level detail needed to generate trips by cross-classification. This step is conducted within the TransCAD trip generation cross-classification module by four income and five household size categories.
- **Trip Production Models** – These models estimate trip productions on a TAZ level. Productions are typically a function of population or number of households along with a measure of wealth such as income or auto ownership. In the Pueblo travel demand model, household size and income level were used to produce trip rates for eight purposes.
- **Trip Attraction Models** – These models estimate trip attractions on a TAZ level. Attractions are typically a function of socioeconomic activity, households, employment by type, or school enrollment but they may also be land-use based such as retail square feet, open space or parks, gross floor area of manufacturing, or other.
- **External Trip Models** – These models estimate the number of trips that enter/exit the study area at the external stations of the travel model. Both external-internal/internal-external and external-external trips are estimated for Pueblo.

5.1.2 Truck Trip Generation

Trucks are generated in the Pueblo model using a modified Quick Response Manual (QRM) approach. Both Single Unit Trucks (SUTs) and Multi Unit Trucks (MUTs) are generated and distributed.

5.1.3 Special Trip Generators

In travel demand modeling, separate trip attraction models are recommended for special generators within a region, such as airports and other facilities that produce significant traffic that is not predicted by the household and employment information. Trip rates for these facilities can be developed by adapting national or ITE[11] rates, but are best based upon specific local surveys, data and counts if this data is available. For the Pueblo travel model a combination of both methodologies was used. In the Pueblo area, special generators include:

- Colleges and Universities
- Recreational Generators
- Tourist Destinations
- The Pueblo Airport (PUB)

[11] Institute of Transportation Engineers, Trip Generation, 9th Edition, ITE, 2012.

5.2 Household Socioeconomic Disaggregation

The PACOG travel model uses the number of households stratified by household size and income group as the primary independent variables for estimating trip productions. The stratification is applied at the TAZ level.

5.2.1 Household Income Categories

The four income categories used in trip generation were established to stratify the model's households. Income affects the rate of trip making and the stratification captures this differential. The income categories were stratified using the 2021 American Community Survey data. **Table 23** lists the income categories with the number of households in each category as well as the percentage each category is of the total.

Table 23: Household Income Ranges

Income Level	Number of Households	% of Total	Income Category
less than $41,999	15,817	24%	1
$41,999 to $49,999	16,901	25%	2
$50,000 to $65,999	15,989	24%	3
over $65,999	17,735	27%	4
Total	**66,442**	**100%**	

5.2.2 Household Trip Production Model

The production model selected for Pueblo is a two-way cross classification model which estimates motorized person trip rates by household stratified by two independent variables: household size and household income.

5.2.3 Trip Purposes

Fundamental to the trip generation model is an understanding of trip purpose. People travel for a multitude of reasons—work, shopping, recreation, school, doctor, post office, and dropping or picking up passengers. Because each distinct reason for trip making cannot be included in the trip generation model, a set of major trip purposes were established and used in the PACOG travel model to serve the year 2020. These purposes were adapted from the previous PACOG model which used the 2010 Colorado Front Range Household Survey. An updated Household Survey is expected to be completed in 2025 at which time these rates will be available for a model update. Eight final trip purposes are defined:

- Home-based work
- Home-based elementary or middle school
- Home-based high school
- Home-based college/university
- Home-based shopping
- Home-based other
- Non-home-based from work
- Non-home-based from other (note work)

5.2.4 Cross-Classification Approach

The procedure used for the PACOG trip production model is a cross-classification technique. Cross-classification offers the advantage that trip rates can be applied as a series of non-linear relationships. It has been shown that the number of trips generated by a household does not behave in a purely linear manner. For example, a three-person household does not make three times as many shopping trips as a one-person household. The second advantage that cross-classification provides is that it reduces the error associated with using zonal averages for household income and size. Cross-classification analysis is based on this fundamental assumption that trip generation rates are neither continuous nor linear in nature, and that the defined categories of independent variables are stable across the sample and through time.

For the PACOG study area, trip rates are estimated at the most disaggregate level available – the household – and continue to use the Pueblo Front Range 2010 Household Travel Survey[12]. The survey effort began in August 2009 and concluded in the fall of 2010. The survey looked at urban household travel behavior along Colorado's Front Range – from Fort Collins to Pueblo. Before this effort, surveys were done separately in each individual geographic area. A total of 989 households in Pueblo County participated in the survey effort. **Figure 11** shows the location of the sample households in the PACOG region.

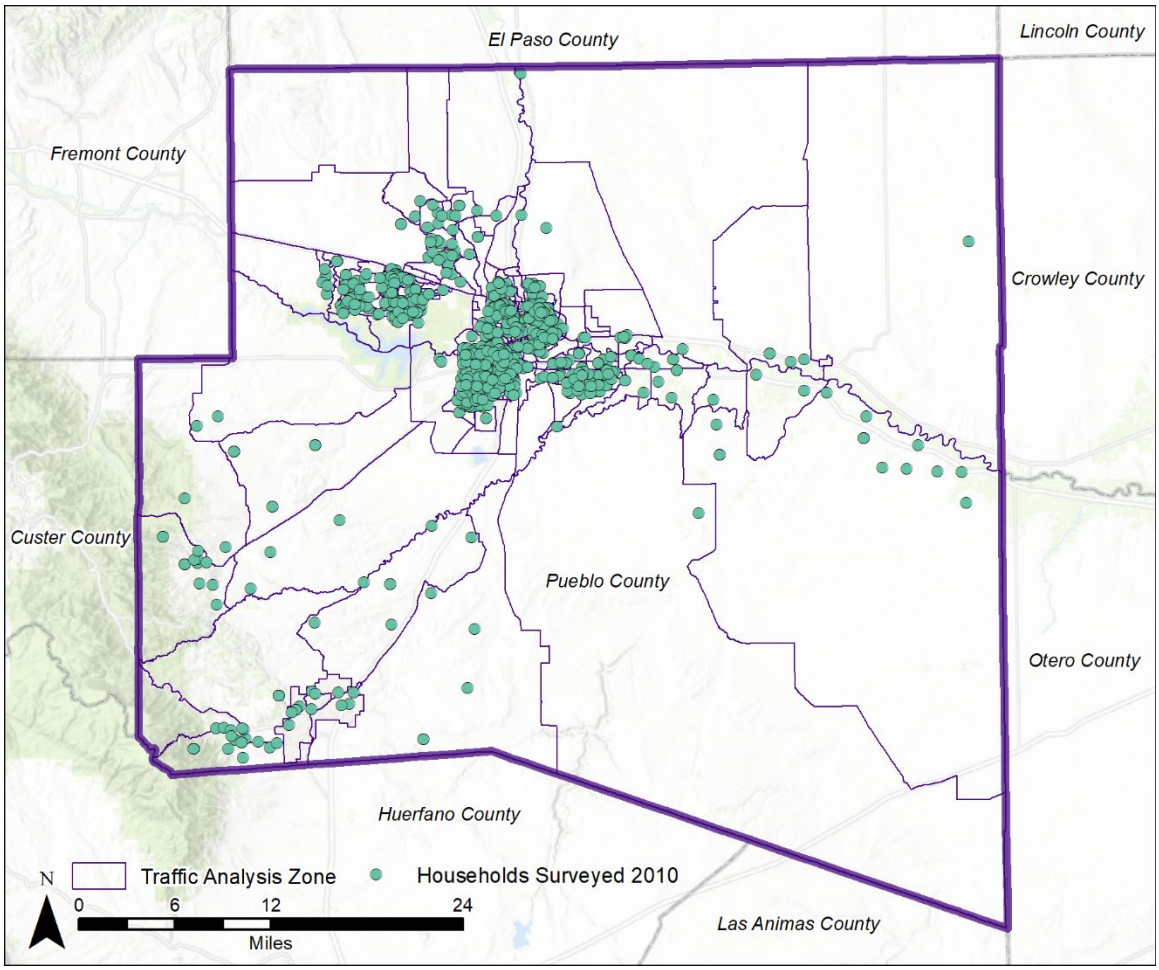

Figure 11: Front Range 2010 Surveyed Households

[12] Front Range Travel Counts: PACOG Household Travel Survey Final Report, NuStats, July 2012.

The survey database was used in the development of household trip rates by purpose for the trip generation step. It was also used to revise the trip distribution, mode choice, trip length, auto occupancy and time of day information. The survey responses contain records representing households, persons, and trips in Pueblo County[13]

Each trip record of the home interview was tagged with the appropriate income and household size indicator. The number of regional trips was then summed for each trip purpose, by both income and size category. The mean household trip production rate was calculated by dividing the number of trips by the number of households for each income and household size category. The results are the trip rates shown below in **Table 24** through **Table 31**. The trip production rates were then applied to the households by income and household size category for each TAZ. The result was trip productions for each TAZ for each trip purpose.

Table 24: Home-Based Work Trip Production Rates

Income	Household Size				
	1	2	3	4	5+
less than $41,999	0.38	1.02	1.09	1.16	1.16
$41,999 to $49,999	0.73	1.27	1.44	1.82	1.82
$50,000 to $65,999	0.70	1.70	1.56	2.61	2.61
over $65,999	0.70	1.79	2.37	2.35	2.35

Table 25: Home-Based Other Trip Production Rates

Income	Household Size				
	1	2	3	4	5+
less than $41,999	0.56	1.15	2.46	2.73	3.58
$41,999 to $49,999	0.54	1.47	2.46	4.43	6.52
$50,000 to $65,999	0.68	1.30	2.41	3.26	4.38
over $65,999	0.60	1.38	1.79	4.06	5.25

Table 26: Home-Based Shop Trip Production Rates

Income	Household Size				
	1	2	3	4	5+
less than $41,999	0.64	1.00	1.69	1.36	1.81
$41,999 to $49,999	1.00	1.73	1.74	2.17	2.79
$50,000 to $65,999	1.04	1.71	2.41	2.10	2.10
over $65,999	1.20	2.12	1.65	1.56	1.60

Table 27: Non-Home-Based Work-Related Trip Rates

Income	Household Size				
	1	2	3	4	5+
less than $41,999	0.20	0.60	0.71	0.82	0.82
$41,999 to $49,999	0.72	0.54	1.18	1.74	1.74
$50,000 to $65,999	0.70	0.84	0.98	1.23	1.23
over $65,999	0.85	1.57	1.87	1.84	1.84

[13] Regional Travel Survey Summary Report, Pueblo, CO, NuStats, 2011.

Table 28: Non-Home Based Other Related Trip Rates

Income	Household Size				
	1	2	3	4	5+
less than $41,999	0.84	1.29	1.46	3.55	3.55
$41,999 to $49,999	0.79	1.63	2.05	3.70	4.92
$50,000 to $65,999	1.08	1.57	2.34	3.00	4.00
over $65,999	1.05	1.47	2.19	3.68	3.72

Table 29: Home-Based Elementary/Middle School Trip Production Rates

Income	Household Size			
	2	3	4	5+
less than $41,999	0.13	0.23	0.36	0.70
$41,999 to $49,999	0.02	0.28	0.70	0.98
$50,000 to $65,999	0.01	0.12	0.97	0.89
over $65,999	0.01	0.31	1.44	1.30

Table 30: Home-Based High School Trip Production Rates

Income	Household Size			
	2	3	4	5+
less than $41,999	0.04	0.08	0.11	0.14
$41,999 to $49,999	0.04	0.18	0.17	0.17
$50,000 to $65,999	0.01	0.10	0.39	0.50
over $65,999		0.29	0.30	0.39

Table 31: Home-Based College/University Trip Production Rates

Income	Household Size			
	2	3	4	5+
less than $41,999	0.07	0.08	0.09	0.10
$41,999 to $49,999	0.02	0.15	0.22	0.22
$50,000 to $65,999	0.01	0.32	0.29	0.29
over $65,999	0.01	0.15	0.13	0.11

5.3 Trip Attraction Models

Trip attraction models are the complement of trip productions. They are calibrated from household travel survey data using a process referred to as “aggregate cross-classification.” This process can be used because the “type of ending place” that a person traveled to is generally known from the household survey efforts. The type of ending place can be used to determine the land use at the attraction end: residential, basic, retail, or service. The resulting number of trips attracted to each land use can be divided by the appropriate independent variable to estimate the trip attraction rates. These are presented in **Table 32.** The socioeconomic (independent) variables used by the PACOG travel model are households, school enrollment at three levels, basic employment, retail employment, government employment, and service employment. These variables were summarized for the study area. Employment data and school enrollment were also collected and verified.

Regional totals for trip productions and attractions calculated using survey-based, cross-classified trip rates, may be similar, but not exactly equal. In the distribution step of the model, zonal attractions are used to distribute trip productions (origin of non-home-based trips or non-home end of or non-home end of (trips to and from work) to employment location zones. Households are the most verifiable zonal attribute. Thus, after the attraction equations are applied, the home-based trip attractions are balanced to match total home-based trip productions.

5.3.1 Home-Based Work (HBW)

The home-based work (HBW) attraction models are stratified by household income group. This approach ensured consistency with the trip production approach by linking productions by income group with trip attractions by income group. A recent report including a survey of sixteen MPOs[14] provided guidance is checking the attraction rate values.

5.3.2 Home-Based School (School)

The home-based school trip attractions are provided for each school level - elementary/middle, high school, and college. These trips are best predicted using school enrollment alone and are balanced to the productions. Because the 2010 Pueblo Front Range Survey did not explicitly break out school trips by the age of the traveler, a step to link the trip with the person traveling was added to the survey processing.

5.3.3 Home-Based Shop (HBShop)

The home-based shop trip attraction rate is generally tied to retail employment. Given the growth in service jobs, and the blending of retail and service activity, for example, in a copy shop, tax accountancy or health club, service employment was added to this trip purpose attraction equation.

[14] National Cooperative Highway Research Program (NCHRP), Travel Demand Forecasting Parameters and Techniques. Report 716, National Academy Press, 2012.

Table 32: Trip Attraction Rates

Trip Attraction Purpose	Households	Retail Employees	Service Employees	Basic Employees	Government	Elementary School Enrollment	High School Enrollment	College Enrollment
Home-Based Work								
Income 1	0.006	0.367	0.500	0.230	0.270			
Income 2	0.006	0.719	0.631	0.320	0.631			
Income 3	0.006	0.509	0.361	0.460	0.631			
Income 4	0.020	0.284	0.239	0.360	0.590			
Home-Based School								
HB Elementary School						1.100		
HB High School							0.800	
HB College								1.300
HB Shop	0.0000	5.500	2.300	0.284	0.100			
HB Other	0.9000	2.100	2.100	0.208	0.184	0.100	0.100	0.100
Non-Home-Based Work	0.1240	1.877	0.100	0.793	0.200	0.100	0.100	0.100
Non-Home-Based Other	0.3270	3.735	0.198	1.533	0.200	0.100	0.100	0.100

5.3.4 Home-Based Other (HBO)

The home-based other category includes trips made for eating a meal, personal business, recreational, serving a passenger, and other unstated reasons. Because of the variety of destinations that drive this trip purpose, it is reasonable to assume that all land uses explain, in part, home-based other trip-making.

5.3.5 Non-Home-Based Work (NHBW)

Non-home-based work attractions are explained by all socioeconomic variables. The highest coefficient is associated with the retail employment variable, which suggests that a high number of trips made from work to a place other than the home are made to a retail destination.

5.3.6 Non-Home Based Other (NHBO)

The non-home-based non-work attractions are explained by all socioeconomic variables. The highest coefficient is associated with retail employment.

5.4 External Trip Model

The external trip totals guiding both internal-external and external-external trips were obtained from AADT information provided by CDOT, the City of Pueblo and Pueblo County. All internal-external attractions are assumed to occur at internal zones. Internal-external attractions were developed by assuming that attractions are equal to exogenously developed productions.

5.5 Work from Home (WFH) Adjustment to Work Trip Rates

5.5.1 Rationale for Work Trip Rate Adjustment

The Colorado Department of Public Health & Environment (CDPHE) is currently working actively to reduce air pollution from mobile sources through a variety of innovative programs. One of the strategies is to establish goals for mobile source emissions by having MPOs measure auto and truck GHG emissions in future years, test reductions strategies, and ultimately reach pre-established goals. PACOG must model GHG emissions (using the PACOG travel model and MOVES) with and without projects from planning documents (2050 RTP, TIPs) for 2030, 2040 and 2050. PACOG must achieve GHG reductions of 0.03 million Metric Tons (MMT) in 2030; 0.02 MMT in 2040; and 0.01 MMT in 2050.

PACOG requested that the 2024 update of the PACOG Travel Demand Model include a tool to measure the impact of selected GHG reduction strategies, including work from home initiatives, which would reduce some of the work trips in the region. The question that rose immediately was “How do we account for WFH trip reduction that was already in place prior to 2020?” Travel demand in the PACOG region to date has not addressed this issue, which would require the removal of a small percentage of work trips from the model. To design an accurate tool for measuring reduction strategies, a baseline needs to be established.

5.5.2 Work from Home Development and Application

Work from home (WFH) existing conditions were then accessed from ACS[15] (Census) Journey to Work data for years 2019 and 2022 and reviewed. These facts emerged:

- In 2019, Pueblo County work from home WFH average was 2.8%. Across the 54 Census tracts the average value ranged from 0% to 9.7%.
- In 2022 the Pueblo County WFH average was 5.8%. Across the 57 Census tracts the average value ranged from 0% to 14.4%.
- Colorado counties vary in the average WFH percentage with 2019 averages: Denver and Douglas Counties 14%; El Paso County 8%; and Pueblo County 3%. WFH averages for 2022, collected when Covid-19 workplace changes had solidified, were Denver County 27%, Douglas County 31%; El Paso County 18%; and Pueblo County 9%. Local understanding of Pueblo with its focus on manufacturing and high-tech industrial jobs, explains why the Pueblo County WFH average tends to be lower than that of counties with a high percentage of Information Technology, sales, and related work.
- County level work from home percentages for 2020 are sufficient for the PACOG Model GHG tool; these must be stratified for the four income levels in the PACOG model.
- National research has shown that WFH share increases as the household level increases[16].

Given this trend data, and the fact that WFH is continuing to evolve with employees being required in some cases to return to the office, it was asserted that the WFH percentages by income level be set at a mid-point between the 2019 and 2022 Pueblo County percentages. **Table 33** shows the final rates used to adjust work trips in the 2020 PACOG model. **Figure 12** shows the midpoint designation in plot format. The WFH values established for the 2020 base: 1%, 3%, 6% and 11% respectively, were used to reduce work trip productions permanently in the PACOG Travel Model.

Table 33: Work From Home (WFH) Percentages by Income Class Pueblo County

Year 2020 Quartiles	# of Workers	% Worked from Home	WFH Estimate for 2020 Model
INC01	18,031	0.01	180
INC02	16,133	0.03	484
INC03	10,735	0.06	644
INC04	12,953	0.11	1,425
Total	**57,851**		**2,733**

[15] *American Community Survey (ACS) Table C08301, years 2019 and 2022, accessed March 2024.*

[16] "*Home-Based Workers and the COVID-19 Pandemic, American Community Survey Reports, ACS-52, April 2023, accessed March 2024.*

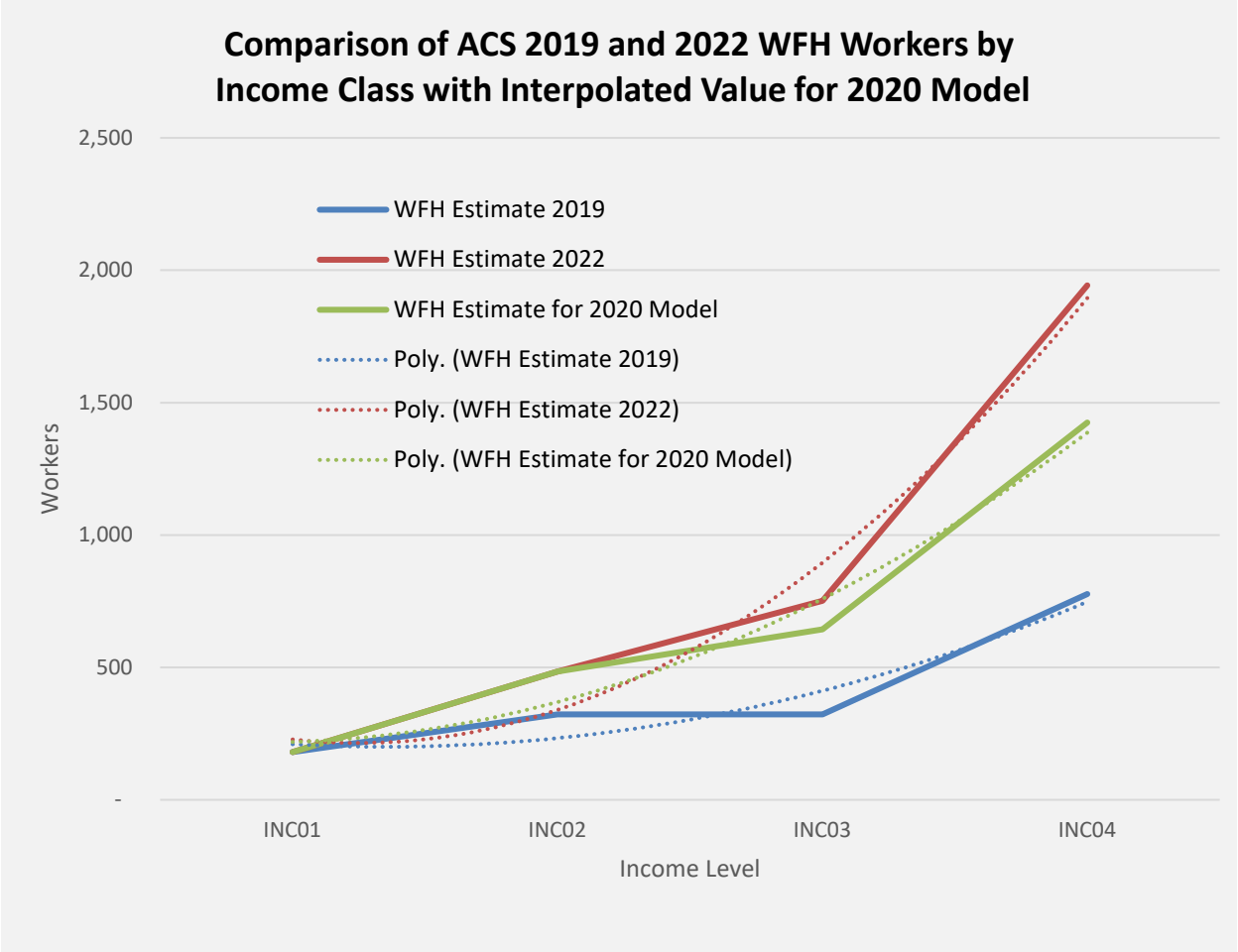

Figure 12: Midpoint Designation for Pueblo County WFH Percentages

5.6 Validation of Attraction-Production Models

5.6.1 Introduction to Trip Production

Trip production rates were developed from the most recent observed data, the 2010 Pueblo Front Range Household Travel Survey. Surveys do not provide direct estimates of zonal trip ends. Thus, there is not an observed number of trip ends to compare with model-estimated trip ends. Summary statistics such as vehicle trips per household, person trips per household, and the percentage of person trips by each trip purpose for a similar study area can be used. Guidance is available on the acceptable range of average trips per households and average trips per person.[17] A very recent source of validation targets is the Transportation Research Board (TRB) online Travel Forecasting Resource[18] website. This electronic site was launched in 2009 to serve as "a national travel forecasting handbook to be developed and kept current providing salient information to those practicing travel demand forecasting". The Travel Forecasting Resource was a valuable resource to the PACOG model validation. Finally, the 2024 report on Household Travel characteristics from the 2009 National Household Travel Survey was used[19].

Some key issues are related to the review of average trip generation production rates:

- Activity-based travel models are becoming "standard practice" in many larger urban areas. The need for well-built four-step models, however, is still strong. Continuing research and tabulation are available and needed for four-step model work.
- City or MPO size is not automatically thought to be a direct factor in the average number of trips per household. Smaller cities or towns have been shown to have trip-making rates as high as, or higher than, those in large cities. There is also anecdotal information regarding a decrease in motorized trip rates in U.S. cities between 2000 and 2024. More study of this possible trend is needed in Pueblo, and indeed across the U.S.
- Household travel survey fidelity to actual household trip patterns may be a better indicator of trip rate than is city size. The continued realization that surveyed trip rates do not capture the full extent of household travel, and that non-work trips are the most likely to be under-reported continues to affect travel model trip production rate study.
- With the increase in total trips made by U.S. households comes a decrease in the percentage of work trips of total trips. Some of this shift is due to better reporting on household travel surveys.
- Some recent work during survey data collection in the U.S. used a joint diary and GPS (Global Positioning Satellite) tabulation to capture the movement of a household's vehicles. This strategy records all motorized trips, not just those reported in the diary part of the survey. For example, in a 2013 survey effort in Albuquerque, New Mexico, an overall rate of underreporting of approximately 18% of trips occurred. These trips were detected by GPS but not reported by participants. To further leverage the data collected by the GPS subsample in this survey effort, a statistical model was tested using the trips database and key socio-demographic variables to generate Trip Rate Correction Factors. The results indicated that household vehicle ownership, trip duration, and household size were significantly associated with trip under-reporting. The analysis suggested that likely mis-reporters were respondents between 40-49 years of age, respondents who were either not employed or were students, and households with 0-1 vehicles. Trip duration was also a significant variable in reporting accuracy. In this study, trips greater than 7 minutes in length were more likely to be reported than trips less than 7 minutes in duration.
- There is some evidence that trip rates have a ceiling—households reach a saturation point at which additional trips are neither necessary nor pleasant. In the current decade, U.S. cities may be at this point. Generational differences may also be at play.

[17] Transit Cooperative Research Program "Characteristics of Urban Demand Report 73", National Academy Press, 2002.

[18] Transportation Research Board (TRB) online Travel Forecasting Resource http://tfresource.org/, accessed 2014; requires registration.

[19] "Summary of Travel Trends: 2009 National Household Travel Survey" , Washington, D.C. USA, US DOT, FHA, A Santos, N. McGuckin, H.Y. Nakamoto, D. Gray & S. Liss, June 2011.

5.6.2 Trip Production Validation

Validation for trip generation was prepared using the sources cited above. The first step was to review the average household and person trip making rates.

Average Household Trips - The National Household Travel Survey (NHTS)[20] is a good source of both the trend and the current average of trips per household and trips per person. The average weekday household trip rate is calculated by dividing the total number of trips produced in trip generation by the total number of households in 2020. Trips per household are shown from 1983 to 2022 in **Table 34.** Trips per household increased between 1983 and 2001 then declined between 2001 and 2022. The person trips per household of 9.65 weekday trips for all purposes estimated for Pueblo is generally consistent with these national rates.

Table 34: Trends in Average Daily Household Trips (NHTS)

Year	1983	1990	1995	2001	2009	2017	2022
Daily Household Trip Rate	7.92	9.45	10.76	10.90	9.30	8.18	5.18

Average Person Trips - The average weekday person trip rate is calculated by dividing the total number of trips produced in trip generation by the total number of persons living in households in 2020. This trend is shown in **Table 35** a summary of travel characteristics from the NHTS. As in the household trip rate, travel increased up to year 2001 then declined between 2001 and 2022. The person rate of 3.78 weekday trips per person for all purposes estimated for Pueblo is generally consistent with these national rates.

Table 35: Trends in Average Daily Household Trips (NHTS)

Year	1990	1995	2001	2009	2017	2022
Daily Person Trip Rate	3.76	4.30	4.09	3.79	3.37	2.28

A review of daily per capita trip rates from Albuquerque, NM; Tucson, AZ; Fort Collins, CO; Madison, WI; and Sacramento, CA was conducted. These cities have similarities to Pueblo both in size, region (Western states), and/or local characteristics, and as such, can provide reference points with respect to the daily trip rates estimated from their household travel surveys. A summary is provided below.

Daily Per Capita Trip Rate

U.S. cities surveyed daily person trip rate range is 2.40–5.55. Cities similar to Pueblo include:

Albuquerque, NM: Rate 3.97
Madison, WI: Rate 3.83
Tucson, AZ: Rate 3.54

Pueblo rate of 3.78 is within these limits.

Daily Household Trip Rate

For the U.S. cities surveyed the daily household rate range is 7.02–12.99. Cities similar to Pueblo include:

Albuquerque, NM: Rate 10.08
Fort Collins, CO: Rate 10.66
Sacramento, CA: Rate 9.72

Based on this data, the Pueblo rate of 9.65 is within these limits.

[20] *2022 National Household Travel Survey, Summary of National Trends, Report no. FHWA-HPL-24-009, published 2024.*

Percentage of Home-Based Work Trips of Total

U.S. cities surveyed have a range of 13 percent to 28 percent home-based work trips as a percentage of total daily trips. Cities similar to Pueblo include:

Albuquerque, NM:	HBW 17.7 percent
Fort Collins, CO:	HBW 13.0 percent
Tucson, AZ:	HBW 17.6 percent

Percentage of Trips by Purpose – There is value in looking at the percentage of trips produced by each of the three major trip types: home-based work (HBW), home-based other (HBO), and non-home-based (NHB). Evidence points to a trend of HBW trips taking up a diminishing percentage of total daily trips in recent years. Surveys from the 1970s and early 1980s show HBW at 19 percent to 28 percent trending in the mid 25 percent area. More recent surveys set the HBW percentage of total range at 13 percent to 28 percent trending in the low 20 percent. Based on this data, the Pueblo home-based work trip percentage of 13 percent of total daily trips is within normal limits.

5.6.3 Trip Production Ratio Validation

On the production side, it is recommended that selected trip production totals be compared to observed "on-the-ground" socioeconomic totals. Two measures are suggested: (1) Home-based work production ratio to total employment; (2) and Home-based shop productions to retail employment. In the Pueblo area, the home-based work person trip production ratio to total employment is 1.14. The retail productions per retail worker are 13.38.

5.6.4 Total Productions versus Total Attractions

Table 36 shows the unbalanced productions and attractions for each of the eight trip purposes. The total number of attractions (about 616,695) is about 3 percent lower than the total number of productions. The home to/from work difference is likely due to a more accurate capture of employment locations for the updated 2020 base year.

Table 36: 2020 Total Productions and Attractions by Trip Purpose

Trip Purpose	Productions	Attractions	Difference	% Difference
Home Based Work	85,227	85,260	33	0%
Home Based Elementary School	23,304	21,439	-1,864	-8%
Home Based High School	10,605	9,913	-693	-7%
Home Based College	10,597	9,750	-848	-8%
Home Based Shop	119,405	109,852	-9,552	-8%
Home Based Other	159,628	148,490	-11,138	-7%
Non-Home-Based Work	78,202	82,682	4,480	6%
Non-Home-Based Other	149,196	149,309	113	0%
All Trip Purposes	**636,164**	**616,695**	**-19,469**	**-3%**

Overall, the trip generation model performs within the limits indicated by national practice while reflecting in a reasonable manner the local Pueblo observed information on households, schools, and employment.

5.7 Summary

There were no major changes to the trip generation model in the updated 2020 model. The most recent household survey data continued to serve as the observed data for trip rates. Socioeconomic updates, however, captured the most recent input data to the models. The PACOG model:

- Continued to use the trip rates and trip distribution targets developed from the 989 households in the 2010 Pueblo Front Range household travel survey.
- Reviewed and verified the trip attraction rates established in the previous PACOG model.
- Reviewed the results of trip generation to ensure results consistent with recent national averages.
- Referenced Covid-19 impacts of trip rates and selected a “middle ground” that reflects HBW activity on the ground in the PACOG region.

6 Special Generators

6.1 Introduction

The special generator approach is important to capture activity at sites that are not accounted for by the household trip generation process. Trip generation rates for most sites were obtained from NCHRP 365 (update of NCHRP 187)[21]. The sites and vehicle trip generation rates included are shown in **Table 37.**

The areas of the special generators were estimated from computerized zone and geographic maps. Vehicle trips were converted to person trips (where appropriate) assuming an auto mode share of 1.0 and average auto occupancy of 1.3 persons per vehicle (which is the average for Pueblo for the trip types included. The table shows the special generator name and the vehicle trips per acre that are used for 2020. The special generator attractions are added to the standard trip generation attractions during the model run. For example, if the trip generation module produced 500 trip attractions for a zone and the special generator produced 300 attractions, the file would simply be modified to show 800 trip attractions for that zone. Note that the special generator trips will not change over time unless one of the sites is expanded or reduced in size.

Table 37: Special Generators & Rates

TAZ	Name	Trip Rate
23	Mineral Palace Park	60 vehicles / acre
54	City Park	60 vehicles / acre
59	Pueblo Country Club	7 vehicles / acre
83	Elmwood Golf Course	7 vehicles / acre
92	YMCA (Future)	1.64 vehicles / 1000 SF GFA
106	Walking Stick Golf Course	7 vehicles / acre
121	Lake Minnequa	3.6 vehicles / acre
146	Desert Hawk Golf Course	7 vehicles / acre
196	Hollydot Golf Course	7 vehicles / acre
155	Juniper Breaks Rock Canyon	Pueblo Lake State Park entrance: trip generation per state visitor counts and forecasts
167	Northern Plains North Shore	Pueblo Lake State Park entrance: trip generation per state visitor counts and forecasts
203	Arkansas Point South Shore	Pueblo Lake State Park entrance: trip generation per state visitor counts and forecasts

6.2 Pueblo Airport (PUB)

Air passenger trips constitute a distinct travel segment in a regional travel demand model. For the PACOG region, there is one commercial airport that requires review, the Pueblo Memorial Airport (PUB) located at 31201 Bryan Circle, Pueblo, CO 81001. The TAZ ID of the airport zone is 28 as shown in **Figure 13**.

Pueblo falls under the Essential Air Service program in which the U. S. Government subsidizes an airline to provide air service to a city. This federal program guarantees smaller communities access to the national transportation grid by subsidizing carriers that fly from the smaller communities to hub airports. This subsidy comes up for bid every two years; therefore, Pueblo has seen its air service provider frequently change. There have also been times where there has been no commercial air service to Pueblo, such as in the spring of 2014 and the summer and fall of 2015.

[21] National Cooperative Highway Research Program, Travel Estimation Techniques for Urban Planning, Report 365," National Academy Press, 1998.

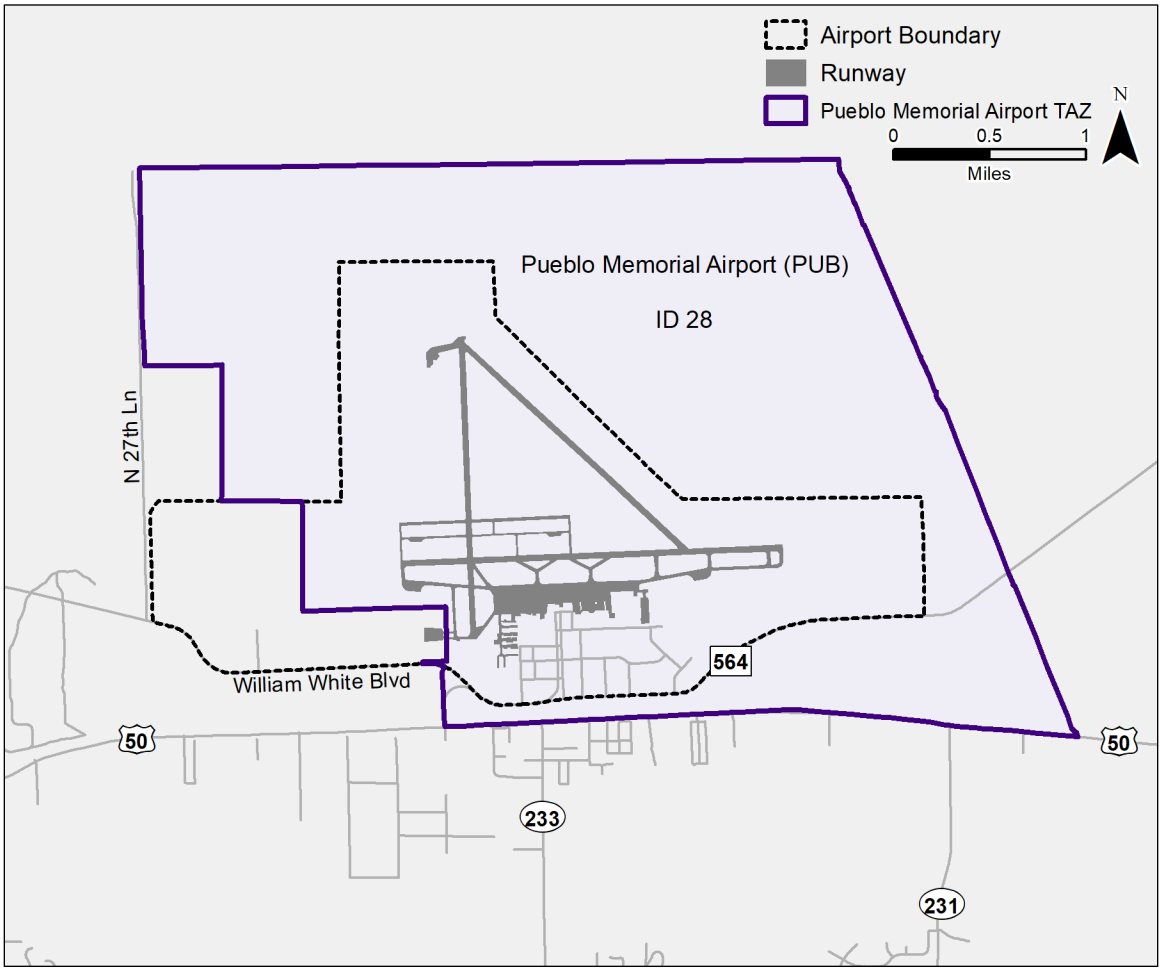

Figure 13: Pueblo Airport Area

Up until the mid-1990s, Pueblo was served by multiple airlines and for much of the year 1991, four airlines were operating at Pueblo simultaneously: America West, TWA, Continental Express, and United Express. Pueblo has also seen mainline jet service (727s, 737s, and MD-80s) by four airlines. Since 1995, however, service has only been provided by one airline with commuter or regional jet flights to Denver apart from the Allegiant Air service in 2010–2012.

Starting January 2023, Southern Airways Express LLC has been offering daily scheduled air service between Pueblo and Denver, providing an air commute link between Pueblo and Denver International Airport. Under the contract, Southern Airways will provide Pueblo with a total of 24 weekly nonstop round trips to Denver using a 9-seat Beechcraft King Air 200 plane. In exchange for the airline's willingness to serve the market, the federal government will pay an annual subsidy of $2.9 million in 2023 and $3.06 million in 2024, according to the department's order[22].

The travel model currently does not reflect these boardings and alighting air passengers generated by the Southern Airways Express service. The airport TAZ, however, contains significant employment, related to general aviation workers as well as to other employment types, which is included in the PACOG model.

[22] *The Pueblo Chieftain, "We Have Liftoff: Southern Airways begins flights from Pueblo to Denver, https://www.chieftain.com/story/business/2023/01/18/southern-airways-offering-24-weekly-flights-between-pueblo-and-denver/69816584007/, January 18, 2023.*

7 Distribution Model

7.1 PACOG Distribution Model Formulation

Within the PACOG travel model, trips are distributed geographically, for all but the external-external trip purpose, using a gravity model-based procedure. This approach was also used in the previous PACOG travel models. The basic theory underlying the gravity model is that the number of trips between two zones is directly proportional to the number of trips produced at the production zone and the number of trips attracted to the attraction zone and inversely proportional to the impedance between the two zones.

$$T_{i,,j} = P_i \times \left(\frac{A_j F_{i,j}}{\sum_{k=1}^{n} A_k F_{i,k}} \right)$$

where: $T_{i,j}$ = trips from zone i to zone j

P_i = trip productions in zone i

Aj = trip attractions in zone j

Fi,j = the "attractiveness" between zone i and zone j

The "attractiveness" factor in the equation (Fi,j), often referred to as the "friction factor," represents the spatial separation such that as separation between zones increases, the attractiveness to travel between these zones decreases. The gravity models used in the PACOG travel model distribution procedures were calibrated by trip purpose to observed data (the 2010 Front Range Pueblo household travel survey data). As in previous PACOG travel models, the formulation (gamma or exponential) used for the PACOG gravity model "friction factor" varied by trip purpose. The gamma function was used for all person trips and the exponential function for all truck trips. The formulations of these functions are as follows:

1) the gamma function:

$$F_{i,j} = a \times t_{i,j}^{b} \times e^{c \times t_{i,j}}$$

2) the exponential function:

$$F_{i,j} = a \times e^{c \times t_{i,j}}$$

where: $t_{i,j}$ = the travel impedance between zone I and zone j
a, b, and c are calibrated coefficients.
e = the base of the natural logarithm (2.71828)

Each of the "friction factor" (Fij) formulations (gamma or exponential) used by the PACOG travel model for gravity model-based trip distribution include a travel impedance term, $t_{i,j}$. Although composite impedances including costs for travel (fuel, depreciation, tolls, fares, etc.) are often used for representing $ti_{,j}$, the PACOG gravity model formulations use travel times alone for the interzonal travel impedance ($t_{i,j}$) friction factor terms. The PACOG model incorporates a feedback loop from assignment to distribution to utilize the most recent congested times in distribution.

Testing was considered to determine the value of adding "terminal times" at the origin and destination of each time skim. Standard practice no longer supports this step which is seen as a constant on the zone-to-zone times with little explanatory value and therefore this step was not implemented with this current update.

Recognizing that intrazonal travel times may be needed for model application, these times were also calculated and added to the initial congested auto travel time skims. The intrazonal travel times were

calculated using a standard process whereby the zone-to-zone travel time was assumed to be one half of the average of travel time between that zone and all adjacent zones. The calculation assumes that roughly one half of the intrazonal travel time relates to the origin zone, with the other half of the travel time to the destination zone. Averaging this function for all adjacent zones has the effect of dampening the effect on the calculation of anomalies that may be created by irregular zone shapes or uneven major network coverage. TransCAD standard procedures were available to process the required calculations.

7.2 Distribution Model Development

7.2.2 Gravity Model Calibration

The gravity model was first calibrated in 1993 using the 1990 Household Survey data for Pueblo County. The 1993 trip distribution coefficients served as the starting point for the 2010 model update. The distribution was calibrated using the survey, testing the fit of the resulting gamma function gravity model formulations, revising coefficients, and optimizing the model's performance. Trip length frequency distributions (TLFDs) were prepared for each purpose using utility programs in TransCAD GISDK. Iterative testing was done with the model coefficients until a fit with observed distributions was achieved. For the current 2020 update, observed data remains the 2010 Front Range Household Survey.

Figure 14 through **Figure 19** show the fit of modeled travel time distribution vs. observed travel time distribution for each trip purpose. Final coefficients are presented in **Table 38** together with a comparison of "observed" and modeled average trip lengths.

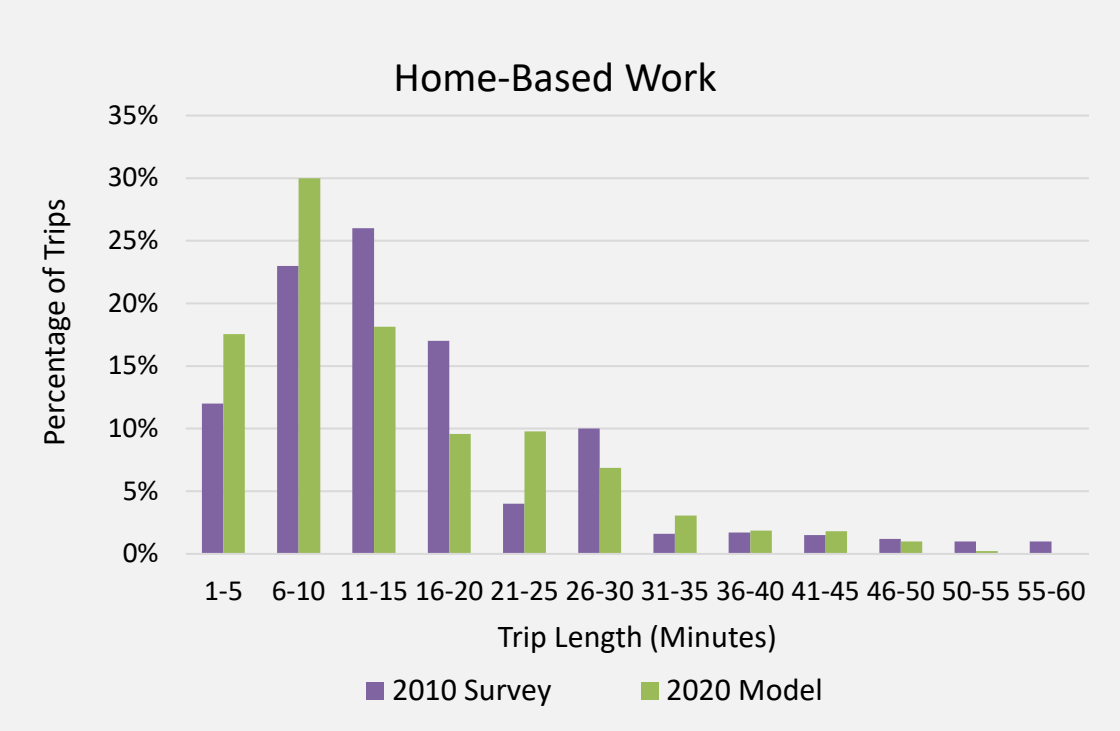

Figure 14: Home-Based Work Trip Length Frequency Comparison

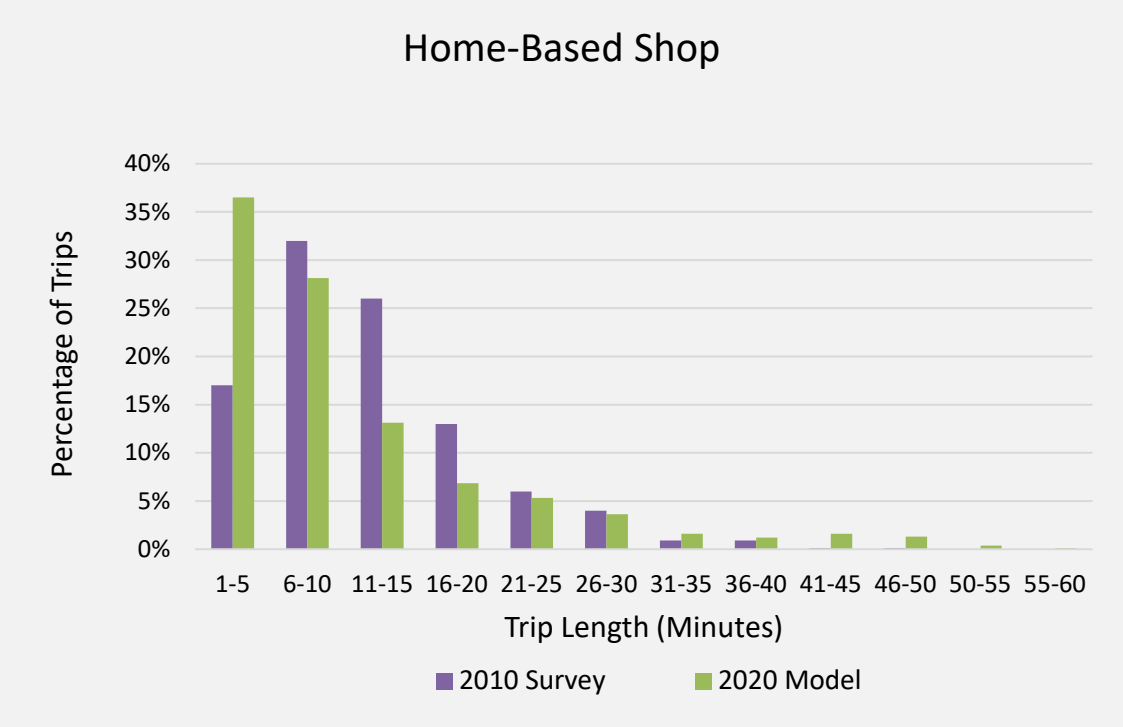

Figure 15: Home-Based Shopping Trip Length Frequency Comparison

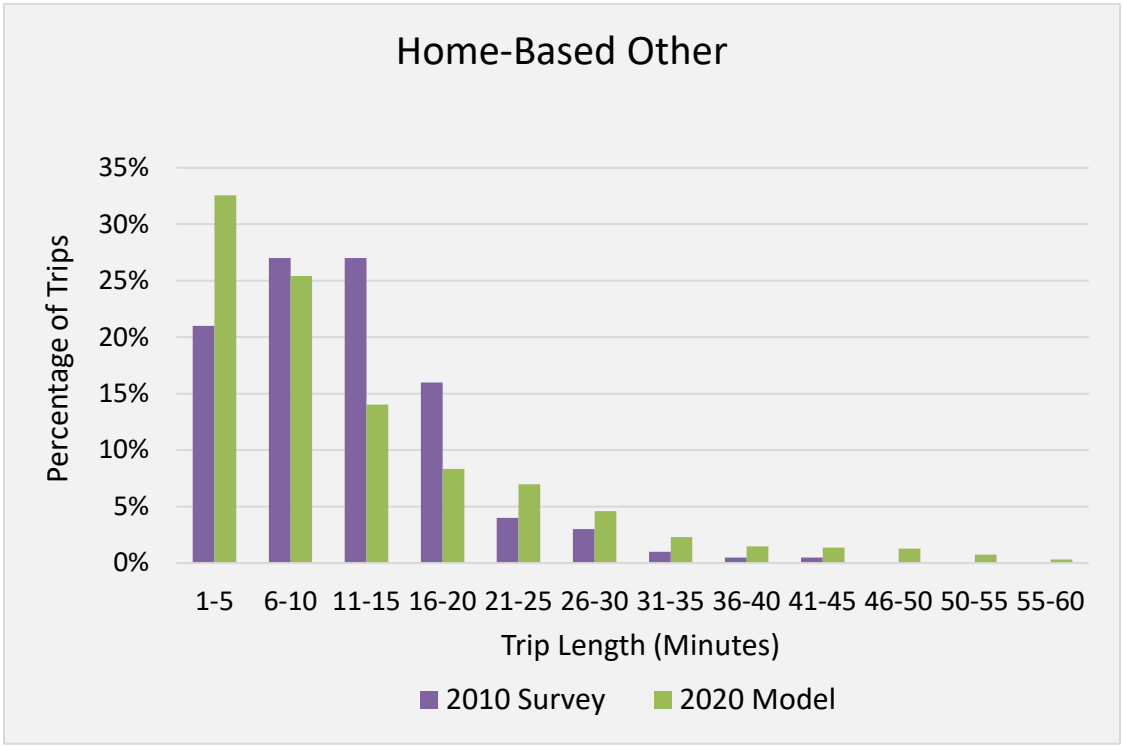

Figure 16: Home-Based Other Trip Length Frequency Comparison

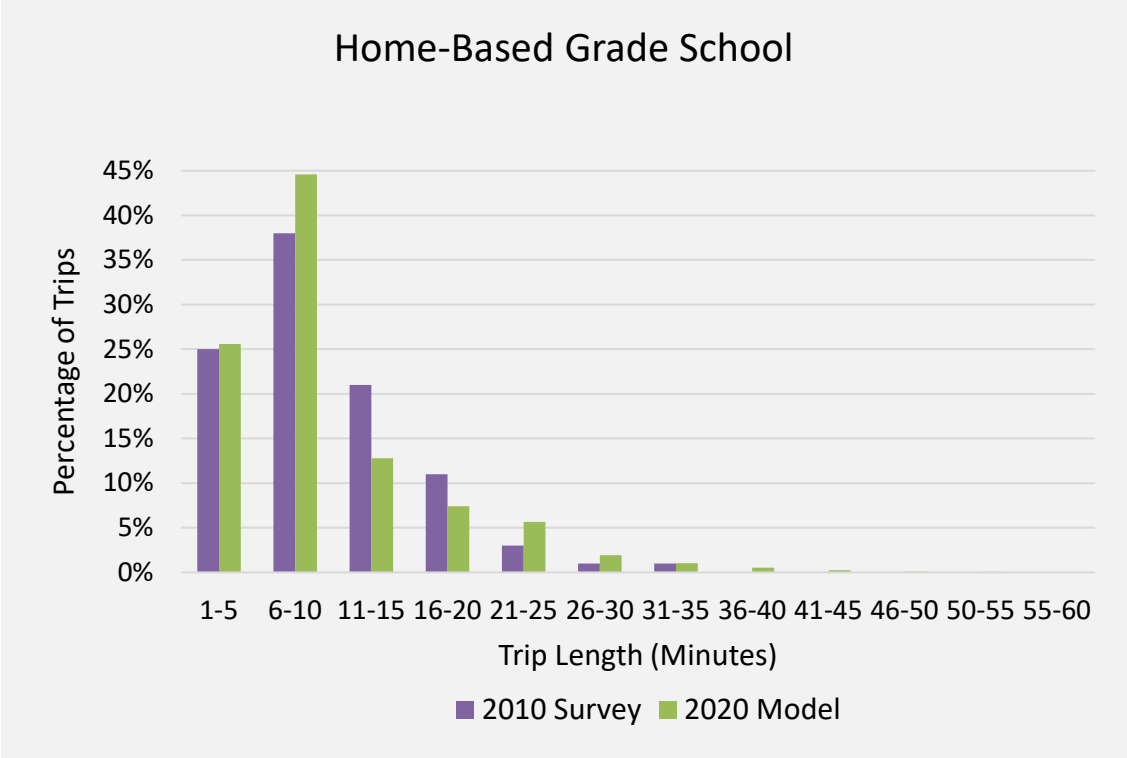

Figure 17: Home-Based Elementary & Middle School Trip Length Frequency Comparison

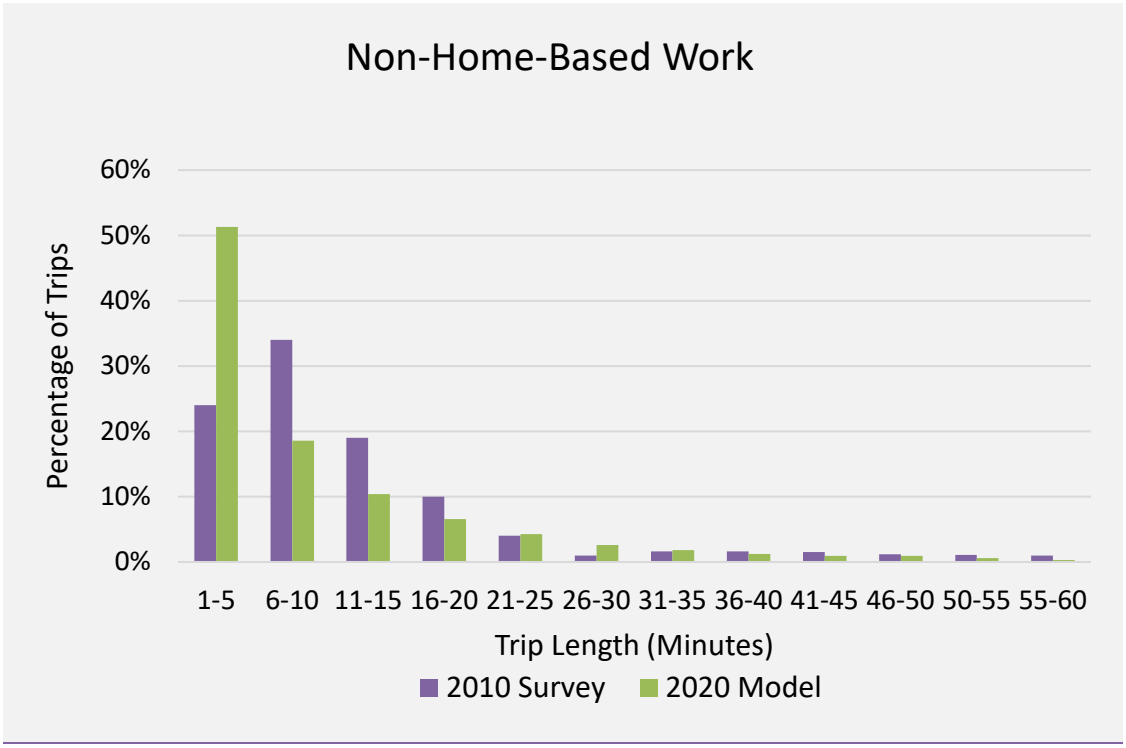

Figure 18: Non-Home-Based Work Trip Length Frequency Comparison

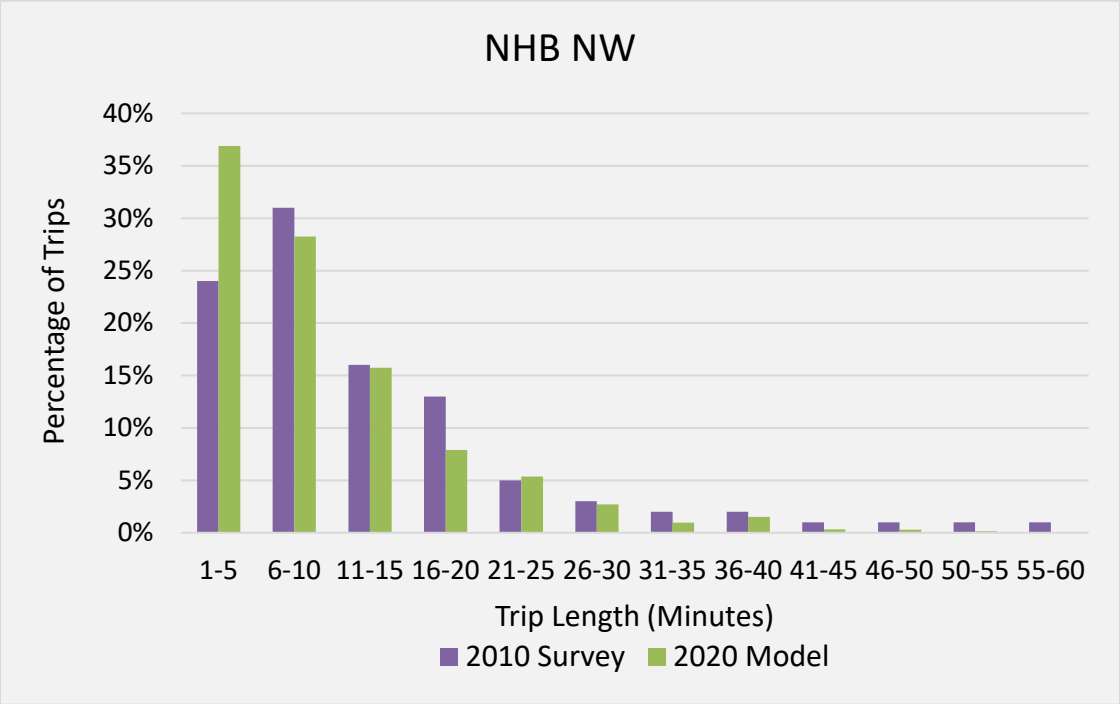

Figure 19: Non-Home-Based Other Trip Length Frequency Comparison

Table 38: Trip Distribution Parameters by Purpose

Trip Purpose	Friction Factor Function Coefficients				Average Trip Length	
	a	b	c	Function	2010 Front Range Pueblo Survey	2020 Modeled
Home-Based Work						
Low-Income	28507	0.3260	0	gamma	15.8	10.3
Lower Middle Income	28507	0.3568	0	gamma	15.8	10.7
Middle Income	28507	0.0200	0.123	gamma	16.7	13.1
Upper Income	28507	0.0200	0.2	gamma	17.5	20.0
Home-Based School						
Home-Based Elementary	139173	0.1000	0.2000	gamma	10.8	10.5
Home-Based High School	43057	1.0000	0.0500	gamma	12.1	12.1
Home-Based College	28507	0.0200	0.1230	gamma	20.5	12.6
Home-Based Shop	139173	1.2534	0.0345	gamma	13.5	11.8
Home-Based Other	139173	1.2850	-0.0200	gamma	13.0	13.3
Non-Home-Based Work	219113	1.3320	0.0100	gamma	12.4	13.9
Non-Home-Based Other	219113	1.0561	0.0591	gamma	10.9	10.8

7.2.3 External-External Trip Distribution

External-external (E-E) trip distribution was performed using the Fratar process. This approach is used since the true origins and destinations of the trips are not known. For example, a trip traveling through Pueblo County on I-25 could have started in Denver and be destined for Albuquerque or to many other points south.

Typically, external-external trip tables are estimated using a base year trip table obtained from an external station survey. Since no such survey was available for Pueblo in 2024, a different technique had to be used. This approach is adapted from the National Cooperative Highway Research Program (NCHRP) guidance on travel model development.[23]

Specifically, the starting point was the AADT at each of the eight external portals. A set of factors was established to calculate both the percent through traffic at each external station and the distribution of the through traffic to the other external stations. As an example, some of the traffic observed at the I-25 portal on the north continues through the county to exit at I-25 south. The scores were based on the functional classification of the external station as well as the volume and type of traffic at each candidate destination external portal. Certain movements were disallowed – if, for example, the trip is a U-turn or another illogical movement. The starting external movements are shown in **Table 39**. The estimated through traffic can then be calculated to match external-external origins and destinations at each external station using derived growth factors and Fratar Model methods. The rows and columns are balanced to achieve symmetry about the diagonal. Through trips were estimated for autos and two classes of trucks separately.

Table 39: External Station 2020 Traffic Worksheet

Location	TAZ ID	2-Way AADT	2 Way SUTs	2 Way MUTs	IX Productions	XX AADT Trips	XX Origins	XX Destinations
I-25 (North)	401	29,000	941	2,570	19,500	9,500	4,750	4,750
SH 96 E	402	1,000	42	40	700	300	150	150
US 50 E	403	3,700	141	370	2,800	900	450	450
I-25 South	404	8,100	357	1,160	600	7,500	3,750	3,750
SH 165 W	405	800	28	30	600	200	100	100
SH 78 W	406	1,000	37	30	800	200	100	100
SH 96 W	407	1,000	28	60	800	200	100	100
US 50 W	408	8,100	157	370	6,300	1,800	900	900
Total		**52,700**	**1,731**	**4,630**	**32,100**	**20,600**	**10,300**	**10,300**

The future year external movements for truck and auto were estimated using the growth factors provided by CDOT, and the Fratar Expansion calculation process.

[23] National Cooperative Highway Research Program (NCHRP) Travel Estimation Techniques for Urban Planning (Report 365), TRB National Academy Press, 1998.

8 PACOG Transit Modeling

With this PACOG Travel Demand Model update, transit routes, stops, and service characteristics are included in the PACOG model for the first time. Additional transit network information is used to support transit skimming which is an input to mode choice modeling and later in transit assignments. Roadway network detail and data attributes were expanded to support transit modeling as well.

8.1 Pueblo Transit System

The Pueblo Transit System consists of eleven bus lines in 2023 offering peak and off-peak service with differing frequencies. All buses begin and end at the Pueblo Transit Center in downtown Pueblo. There were approximately 1,600 weekday boardings in 2022, down from about 3,000 in 2016. This bus system served as the input for the transit model. **Table 40** and **Figure 20** show the system profile.

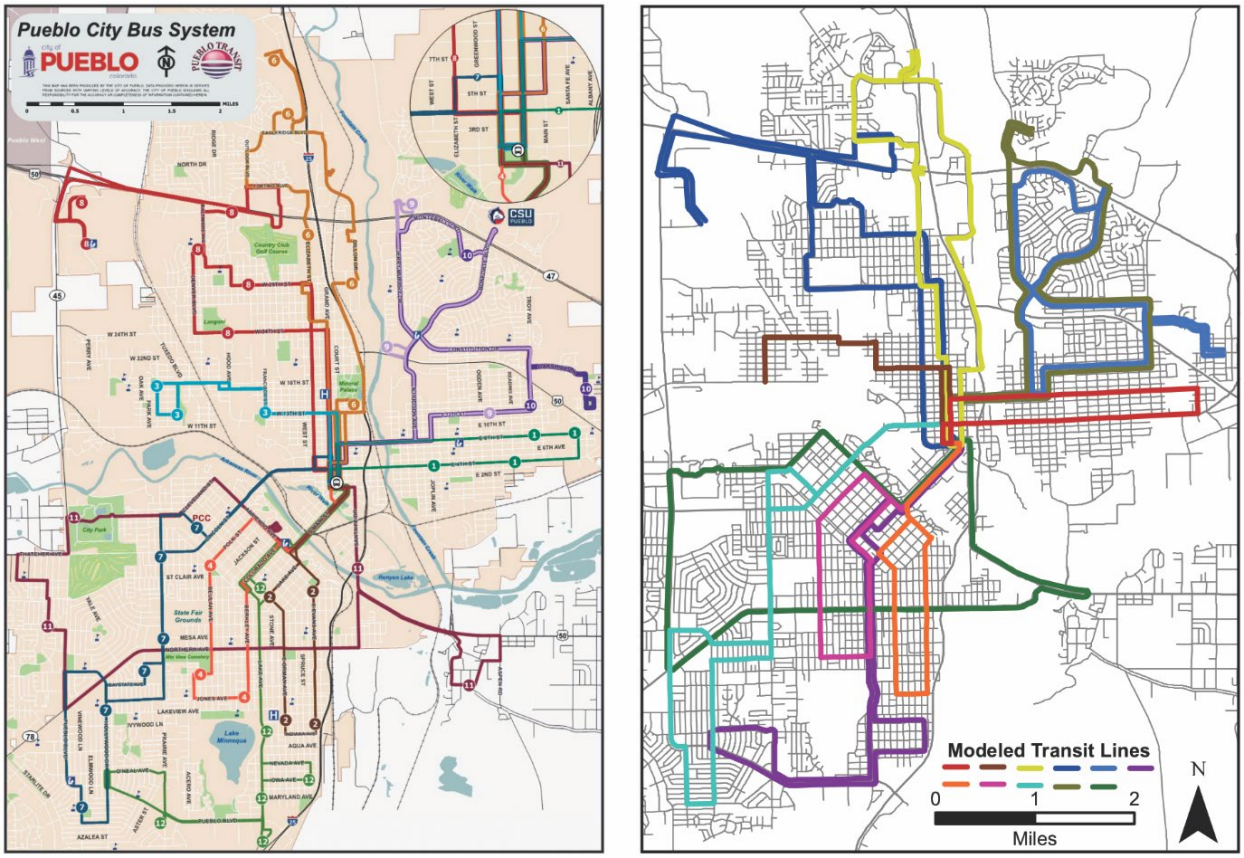

Figure 20: Pueblo Transit System, Observed and Modeled

Table 40: Pueblo Transit System

Bus Line	Headways		Line Haul Time in Minutes
	Peak	Off Peak	
1-Eastside	30	60	25
2-Bessemer	30	60	25
3-Irving Place	30	60	25
4-Berkley/Beulah	30	60	25
6-Pueblo Mall	60	30	50
7-Highland Park	30	30	55
8-Hwy 50-West	60	60	50
9-University	60	60	55
10-Belmont	60	60	50
11-Red Creek Ride	60	60	55
12-Lake Avenue	30	60	55

8.2 Pueblo Transit Model Processing for Mode Split

During a model run, the model script calls a macro that conducts transit skimming. The process begins by generating a transit network that is sensitive to:

- **Peak Headway** – "PK_Headway," is an attribute of the Transit Route System that represents the time between buses along a given route during peak service periods.

- **Walk Time** – "WalkT" is an attribute of the roadway file and is used to estimate the travel time due to the walk components of a transit trip (walk to bus stop from trip origin, walk to transfer, walk to destination).

- ***In Vehicle Travel Time*** – IVTT is an attribute of the roadway file and is used to estimate the travel time due to the in-vehicle portion of a transit trip (riding on the bus, waiting for other riders to get on/off the bus). The IVTT value is computed inside the SPCAP portion of the script, and the default value uses 2 x Auto Travel Time to account for the frequent stops and slower overall travel speeds of buses in mixed traffic.

The resulting transit "network" is encoded in a TransCAD network file but is not ready to be used until Transit Settings are designated. The Transit Settings process establishes a set of weights and upper/lower limits to key variables that allow TransCAD to find the best transit path between every pair of TAZs. Some key transit path building assumptions are listed below:

- **Access/Egress Walk Time**: capped at 15 minutes, if the walk trip to/from the nearest bus stop exceeds this threshold, then transit is not feasible.
- **Initial Waiting Time**: ½ of the headway, and a maximum of 60 minutes.
- **Transfers**: maximum of 1 transfer, 40% fare on the second bus, 3-minute time penalty.

The resulting transit network and settings are then ready for skimming. The transit skimming process results in a matrix file with each of the following variables representing the characteristics of a transit trip between the zone pairs. Several key elements from the transit skim are copied into a mode choice input matrix for the mode choice step.

Transit related elements in the mode choice skims are as follows:

- **Bus Availability**: “BUS_AVAIL”: computed by the skim, set to 1 if bus is feasible between zones, 0 if not feasible.
- **Bus In Vehicle Time**: “BUS_INVTT’: sum of the transit journey travel time spent inside the bus between a zone pair, includes dwelling time.
- **Bus Initial Waiting Time**: “BUS_INWAIT”: sum of the transit journey’s time spent waiting at the initial bus stop.
- **Bus Walk Time**: “BUS_WLKTIM”: sum of the transit journey’s travel time spent walking to the bus stop.
- **Bus Transfer Wait**: BUS_TRWAIT: sum of the transit journey’s travel time spent waiting for a transfer bus if a transfer is needed to reach the destination.

As a first effort to integrate the transit mode into the PACOG model, the above transit network and skimming approach successfully prepared a set of inputs to bring transit to the mode choice model.

9 Mode Choice

9.1 Introduction

During the mode choice step, trips from zone to zone by trip purpose are further divided into trips by various transportation modes and then converted to vehicle trips and passenger trips for the purpose of predicting vehicle flows on the roadway network and demand for alternative modes. Mode Choice models are mathematical expressions used to estimate the share of travel on each available mode given the time and cost characteristics of each mode and the demographic and socio-economic characteristics of trip makers.

The mathematical formulation of the nested multinomial logit model structure is as follows.

The generalized mode choice model structure is represented by a logit formulation. This mathematical relationship estimates the probability of choosing a specific mode using the following equation:

$$P_i = \frac{e^{U_i}}{\sum_k e^{U_i}}$$

where:

P_i	is the probability of a traveler choosing mode i;
U_i	is a linear function of the attributes of mode i that describe its attractiveness;
$\sum_k e^{U_i}$	is the summation of the linear functions of the attributes of all the alternatives (k) for which a choice is feasible.

The utility expression for each available mode (i) is specified as a linear function which incorporates a range of variable types, including time and cost incurred by a traveler using a given mode. For example:

$$U_i = b_1 * INVTT_i + b_2 * IWAIT + b_3 * WALKT + b_4 * TRFRT + b_0$$

where:

U_i	is the utility for mode i;
b_0	is a constant specific to mode i that captures the overall effect of any significant variables that are missing or unexplained in the expression (i.e., comfort, convenience, safety);
b_1	is a coefficient applied to a variable describing the level-of-service (in-vehicle travel time) provided by mode i;
b_2	is a coefficient applied to a variable describing the wait time for the bus mode for the specific origin-destination pair;
b_3	is a coefficient applied to a variable describing the walk time to the boarding bus stop for the bus mode for the specific origin-destination pair;
b_4	is a coefficient applied to a variable describing the wait time if a transfer is required for the bus mode for the specific origin-destination pair.

9.2 Formulation and Nesting Structure

The travel time variables are disaggregated into in-vehicle and out-of-vehicle time for the bus mode; the out-of-vehicle time is broken out by initial wait time, access walk time, and transfer walk time. And finally, a mode specific constant reflects non-included variables such as comfort or reliability of service. The individual coefficients associated with each variable reflect the relative importance of each attribute.

In the nested logit model structure shown in **Figure 21**, the formulation employs two levels of multinomial logit models; one for the primary choice of mode among auto and transit, then a second level choice among auto driver or auto shared ride. A composite of the utilities of the auto sub-mode modes then represents each nest mode respectively in the upper tier of the model structure. This composite measure is the natural logarithm of the denominator of the logit model, often termed the *"LogSum".* The LogSum term is effectively the combined utility provided by the sub-modes of a particular primary mode.

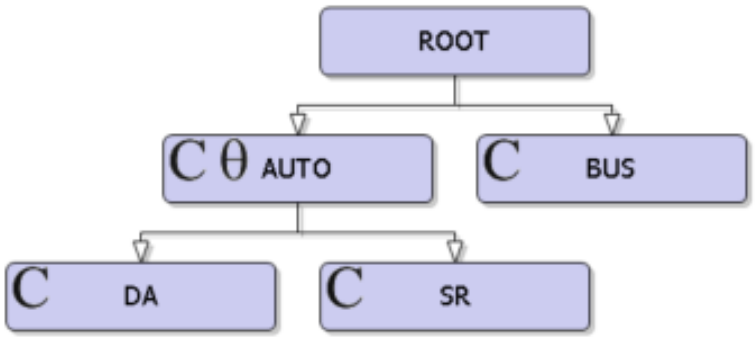

Figure 21: Mode Choice Nesting Structure

There are alternative options for developing the mode choice model coefficient estimates for each of the modal utility expressions, and in the past, it was common to estimate unique coefficients for each model via analysis of combined household travel/on-board transit survey datasets. However, FTA research has shown that spurious models often result. For the PACOG mode choice model, the models by trip purpose used coefficients within the ranges recommended under current best practice guidance by NCHRP 716[24] for work trip purposes (see **Table 41** below). For non-work trip purposes, coefficients were borrowed from the North Front Range Model's non-work trip mode choice model settings for in-vehicle, walk time, and wait times.

Table 41: Pueblo Transit System

Model	In-Vehicle Time	Out-of-Vehicle Time	Walk Time	First Walk Time	Transfer Walk Time
A	-0.021	--	-0.054	-0.098	-0.098

Source: NCHRP Report 716, Table 4.8 Coefficients from survey of MPO mode choice models.

Mode specific constants are then used to calibrate the PACOG mode choice model to fit local conditions. During the calibration process, unique mode specific constants were initially borrowed from a recently completed model for the Flagstaff Arizona MPO, by trip purpose. Then the initial constant settings were adjusted using a heuristic process whereby the full set of constants was factored until the PACOG model produced the correct total transit system boardings. In the future, if observed mode shares by purpose becomes available via a new household travel survey, then these constants can be re-estimated to match observed mode shares by trip purpose. Mode Choice model parameters used in the PACOG model are listed below in **Table 42**.

[24] National Cooperative Highway Research Program (NCHRP) Report 716: Travel Demand Forecasting: Parameters and Techniques, January 2014, accessed November 2023.

Table 42: PACOG Mode Choice Model Parameters

HBW1 – Home-Based Work, Income Quartile 1

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0210	-0.0210	-0.0210
Coef. IWAIT			-0.0980
Coef. WALKT			-0.0540
Coef. TFRT			-0.0980
Constant	0.0000	-2.6000	-0.5000

HBSE – Home-Based Elementary School

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	-99.0000	0.0000	-2.6000

HBO – Home-Based Other

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	0.0000	-0.1500	-2.8000

HBW2 – Home-Based Work, Income Quartile 2

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0210	-0.0210	-0.0210
Coef. IWAIT			-0.0980
Coef. WALKT			-0.0540
Coef. TFRT			-0.0980
Constant	0.0000	-2.6000	-0.6000

HBSS – Home-Based Secondary School

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	0.0000	0.0000	-1.9000

NHBW – Non-Home-Based, Work Related

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	0.0000	-3.0000	-4.2000

HBW3 – Home-Based Work, Income Quartile 3

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0210	-0.0210	-0.0210
Coef. IWAIT			-0.0980
Coef. WALKT			-0.0540
Coef. TFRT			-0.0980
Constant	0.0000	-2.9000	-0.7000

HBSH – Home-Based Shop

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	0.0000	-2.5000	-1.7000

NHBO – Non-Home-Based, Other

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	0.0000	-3.0000	-4.2000

HBW4 – Home-Based Work, Income Quartile 4

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0210	-0.0210	-0.0210
Coef. IWAIT			-0.0980
Coef. WALKT			-0.0540
Coef. TFRT			-0.0980
Constant	0.0000	-3.2000	-1.0000

HBSU – Home-Based University

NEST	AUTO		
MODE	DA	SR	BUS
Coeff. INVIT	-0.0250	-0.0250	-0.0250
Coef. IWAIT			-0.0375
Coef. WALKT			-0.0540
Coef. TFRT			-0.0375
Constant	0.0000	-0.5000	-1.5000

9.3 Mode Choice Model Implementation

The PACOG model applies the eleven individual mode choice models (one for each household trip purpose) via a model specification file. A visual of the mode choice structure showing the connectivity to the skim matrices and matrix cores is shown in **Figure 22.**

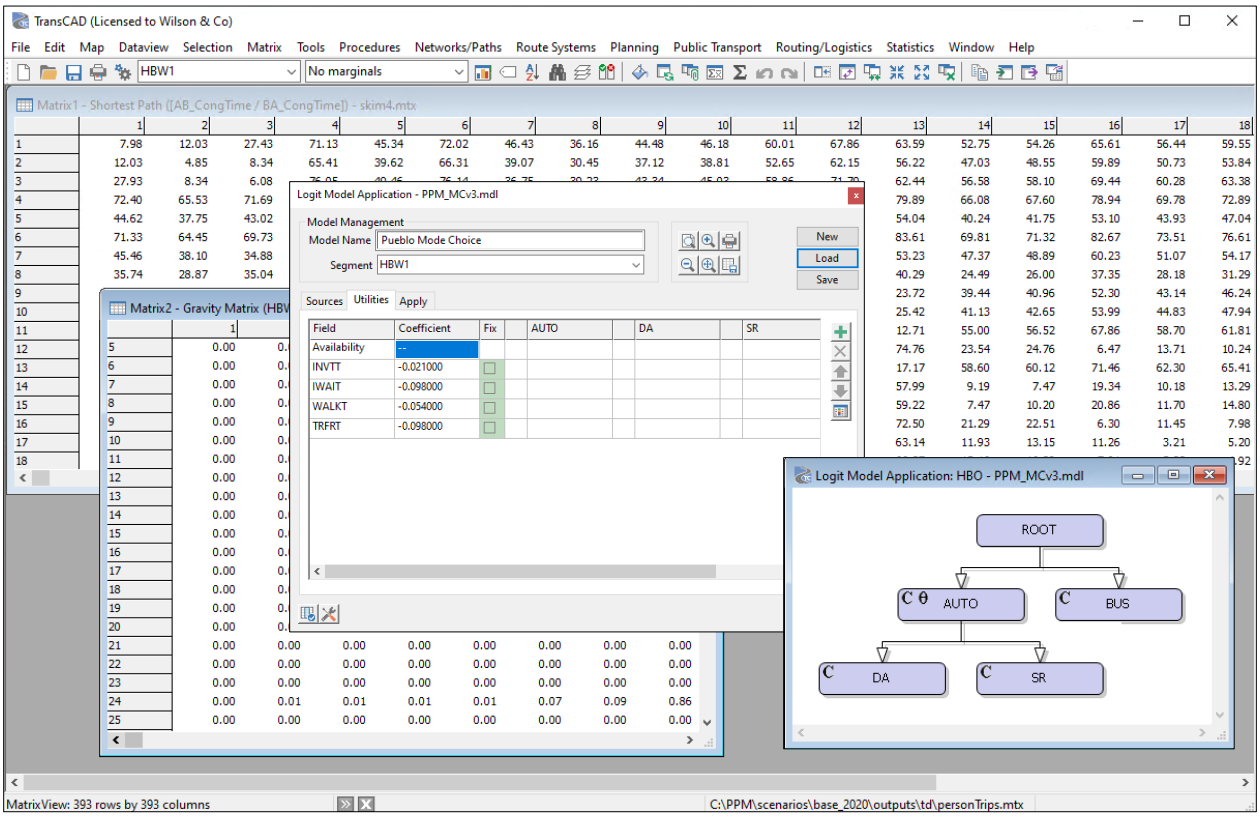

Figure 22: Viewing the Mode Choice Model Structure

9.4 Observed Mode Shares and Model Sensitivity

In addition to general base year mode choice calibration, the mode choice model's sensitivity to different scenarios was also evaluated to ensure that the model is appropriate for forecasting applications. For this, a full model run was conducted for an additional scenario:

- Year 2020 Base travel demand with base roadway network, and improved transit service with headways reduced to half of the current values (shorter wait time for bus). The results show a large increase in bus overall bus mode share, with a disproportionate share of the new riders shifting from drive alone work trips. However, the overall transit share is still under 1%. This is seen as a reasonable response.

The sensitivity results are summarized in **Table 43**.

Table 43: PACOG Mode Choice Sensitivity Test Report

Work Trip Purpose			
MODE -- >	AUTO		BUS
SCENARIO	DA	SR	
Base 2020	93,873	5,217	687
Transit Improvement 2020	92.749	5,142	1,888
Base 2020	94.1%	5.2%	0.7%
Transit Improvement 2020	93.0%	5.2%	1.9%
Non-Work Trip Purpose			
MODE -- >	AUTO		BUS
SCENARIO	DA	SR	
Base 2020	385,011	163,916	1,647
Transit Improvement 2020	384,364	163,438	2,773
Base 2020	66.9%	29.8%	0.3%
Transit Improvement 2020	69.8%	29.7%	0.5%
Total Trips			
MODE -- >	AUTO		BUS
SCENARIO	DA	SR	
Base 2020	478,884	169,133	2,334
Transit Improvement 2020	477,113	168,580	4,661
Base 2020	73.6%	26.0%	0.4%
Transit Improvement 2020	73.4%	25.9%	0.7%

9.5 Post Mode Choice Trip Processing

Auto mode outputs from the mode choice process, by trip purpose, are aggregated into a daily auto trip table. During this step, person trips designated as “auto-drive alone” or “auto-shared ride” are converted to vehicle trips. Drive alone trips are treated as one person per vehicle. Assumptions about persons per vehicle for Shared Ride trips varies by trip purpose as shown in **Table 44.**

Table 44: Shared Ride Persons per Vehicle

Purpose	HBW1	HBW2	HBW3	HBW4	HBSE	HBSS	HBSU	HBSH	HBO	NHBW	NHBO
Average Auto Occupancy	2.23	2.23	2.23	2.23	2.84	2.41	3.88	3.2	3.2	3.2	3.2

9.6 Time of Day Modeling and Directional Split Factors

The resulting vehicle trip matrix remains in production-attraction (PA) format. Next, the vehicle trips are converted from PA format to OD format using the time-of-day percentages. For each of the time periods (AM, PM, OP) the daily auto vehicle table is converted from PA to OD using the following time of day factors by trip purpose; see **Table 45**.

Table 45: Time of Day Factors by Trip Purpose

PURPOSE	AMO	AMI	PMO	PMI	OPO	OPI
HBW1	14.2%	0.5%	1.3%	11.8%	38.0%	34.1%
HBW2	14.2%	0.5%	1.3%	11.8%	38.0%	34.1%
HBW3	14.2%	0.5%	1.3%	11.8%	38.0%	34.1%
HBW4	14.2%	0.5%	1.3%	11.8%	38.0%	34.1%
HBSE	35.6%	0.0%	0.0%	4.0%	19.5%	40.9%
HBSS	41,6%	0.0%	1.0%	3.0%	17.8%	36.6%
HBSU	10.3%	1.7%	3.4%	3.4%	34.5%	46.6%
HBSH	1.9%	0.5%	3.9%	6.3%	39.1%	48.2%
HBO	9.5%	2.1%	3.5%	4.2%	37.7%	43.0%
NHBW	1.1%	5.4%	8.9%	1.3%	37.5%	45.8%
NHBO	6.8%		7.1%		86.1%	
SUT	10.0%		10.0%		80.0%	
MUT	10.0%		10.0%		80.0%	
EXT_AUTOS	10.0%		10.0%		80.0%	
EXT_SUT	6.1%		4.6%		89.4%	
EXT_MUT	6.1%		4.6%		89.4%	

During the am peak hour, 14.2 percent of the HBW trips occurred from home to work, and 0.5 percent occurred from work to home. In the pm peak hour, 1.3 percent of the trips were from home to work, and 11.8 percent of the trips were from work to home. During the off-peak 22 hours, the HBW directional split factors were 38.0 percent and 34.1 percent from home to work and work to home, respectively. The directional split factors for all trip purposes exhibit patterns and relationships that are supported by intuition and logic. Several examples of the temporal spread of trips are given in **Figure 23** through **Figure 27**.

The distribution of home-based work trips by time of day shown in **Figure 23** is characterized by a sharp high peak in the AM, another sharp, somewhat lower peak in the PM and a small but distinguishable peak during the midday.

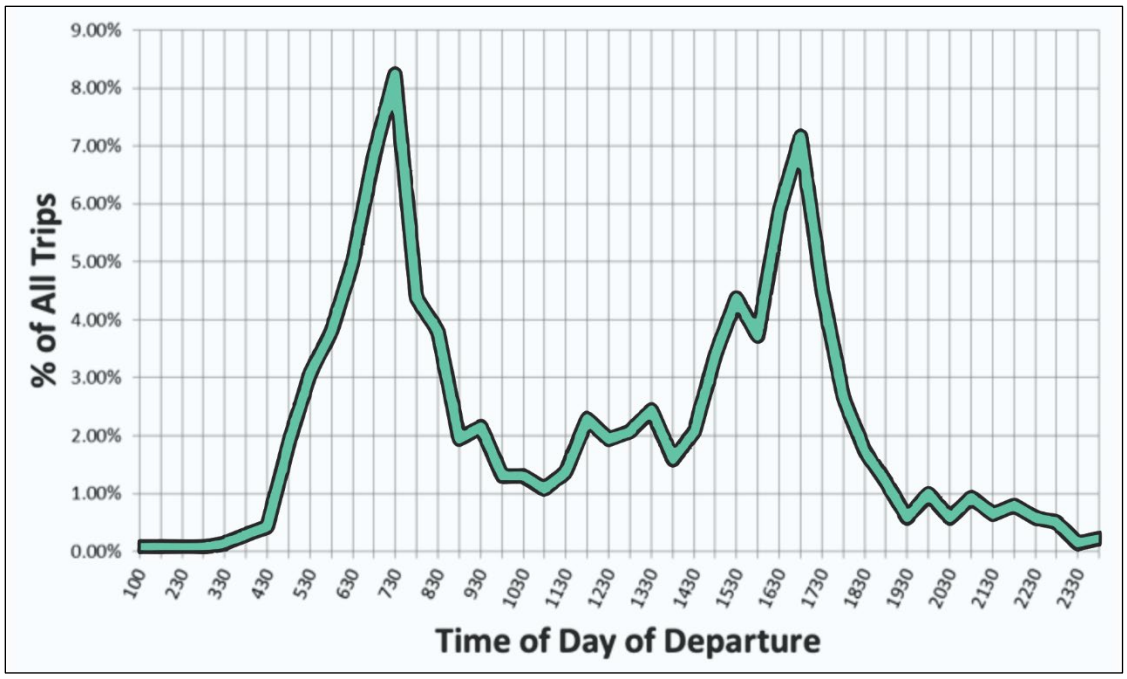

Figure 23: Home-Based Work Time of Day of Travel

The distribution of home-based shop trips by time of day, shown in **Figure 24** is a jagged line with an increasing trend that reaches a maximum in the PM before dropping off.

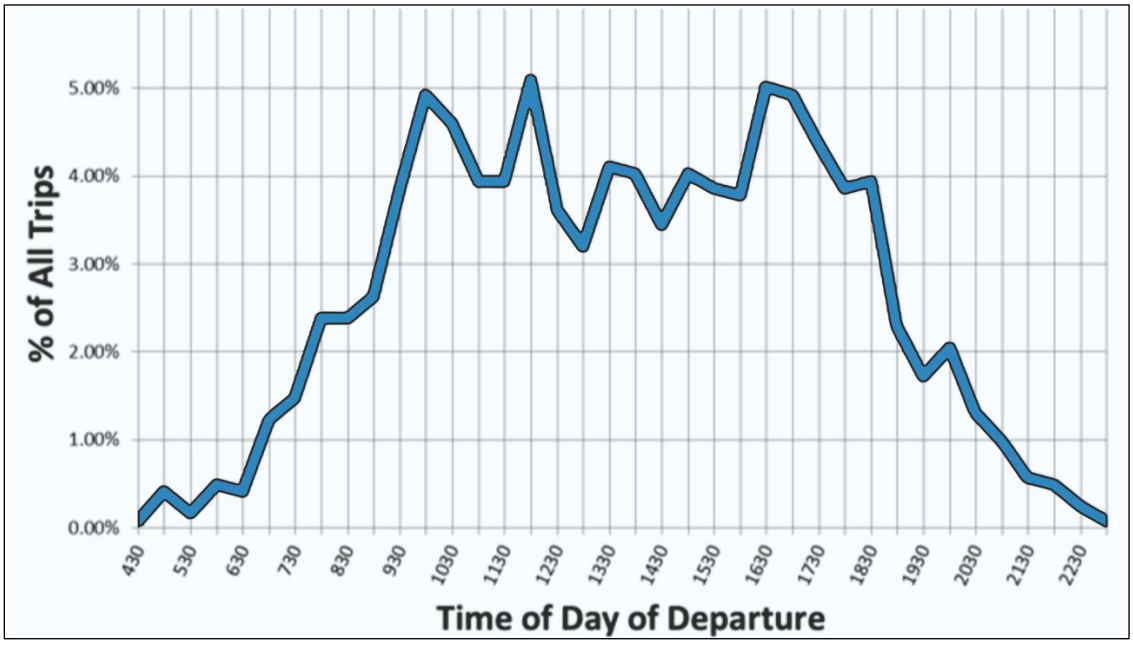

Figure 24: Home-Based Shop Time of Day of Travel

The Home-based other trips, plotted in **Figure 25** show that this purpose peaks sharply, reaching a maximum at approximately 7:30 AM. The distribution peaks again at approximately 3:00 PM.

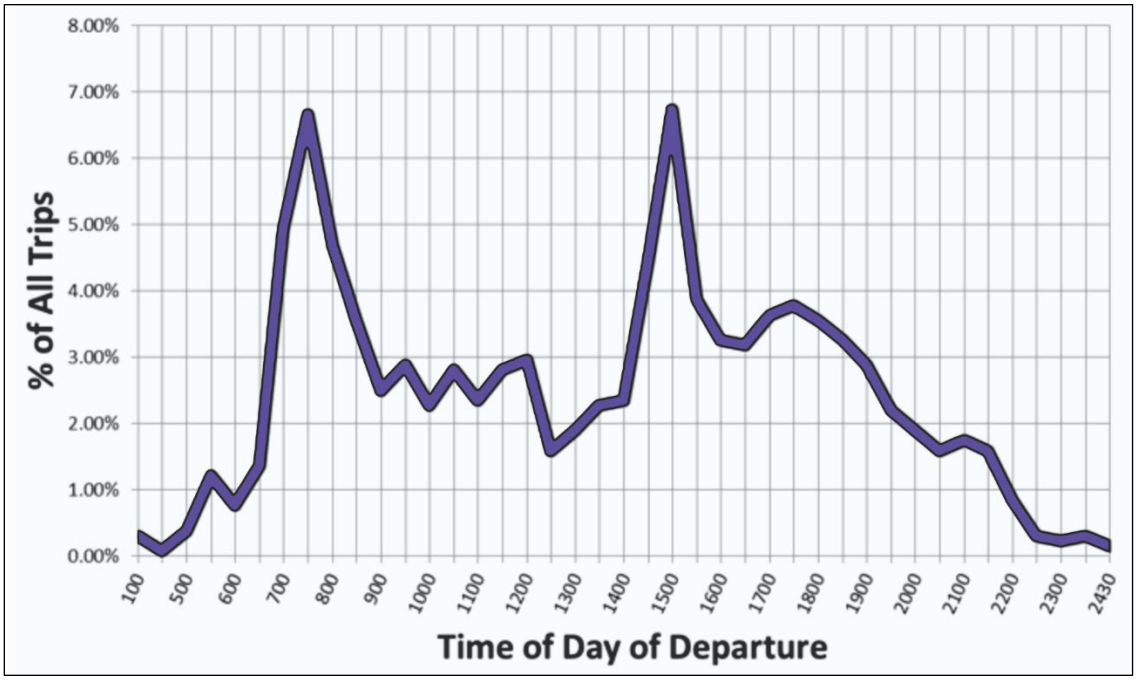

Figure 25: Home-Based Other Time of Day of Travel

The Non-Home-Based trips, shown in **Figure 26** have an early peak at about 7:30 am then maintain a continued presence throughout the day.

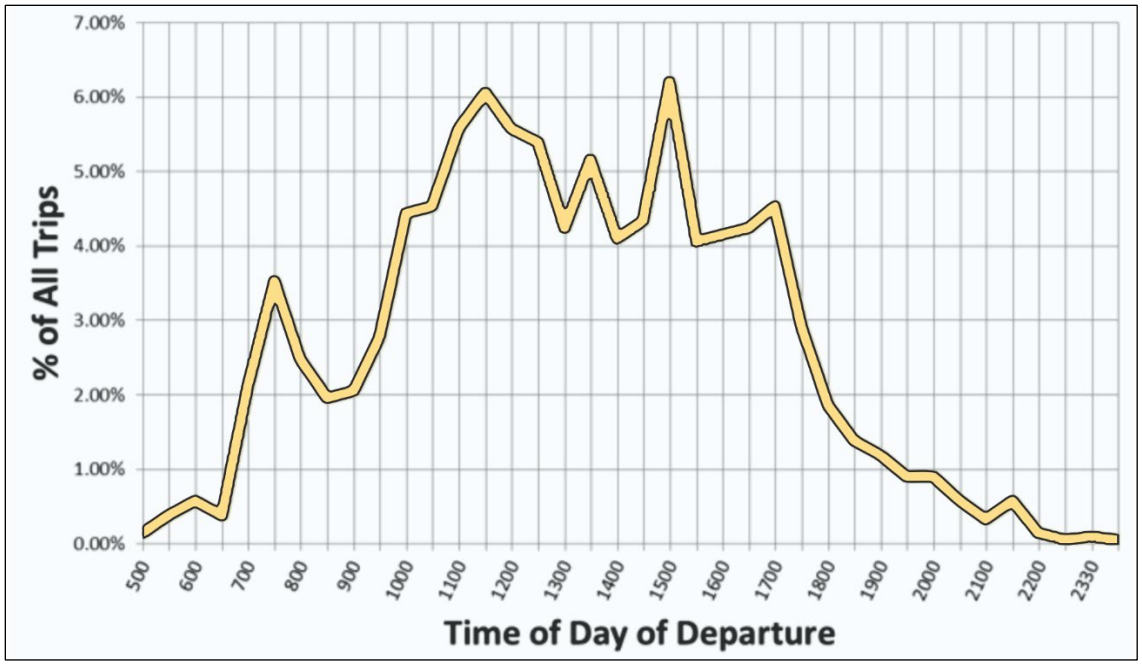

Figure 26: Non-Home-Based Time of Day of Travel

The distribution of all trips by time-of-day as a percentage of the sum of all trips for the 24-hour period is depicted in **Figure 27**.

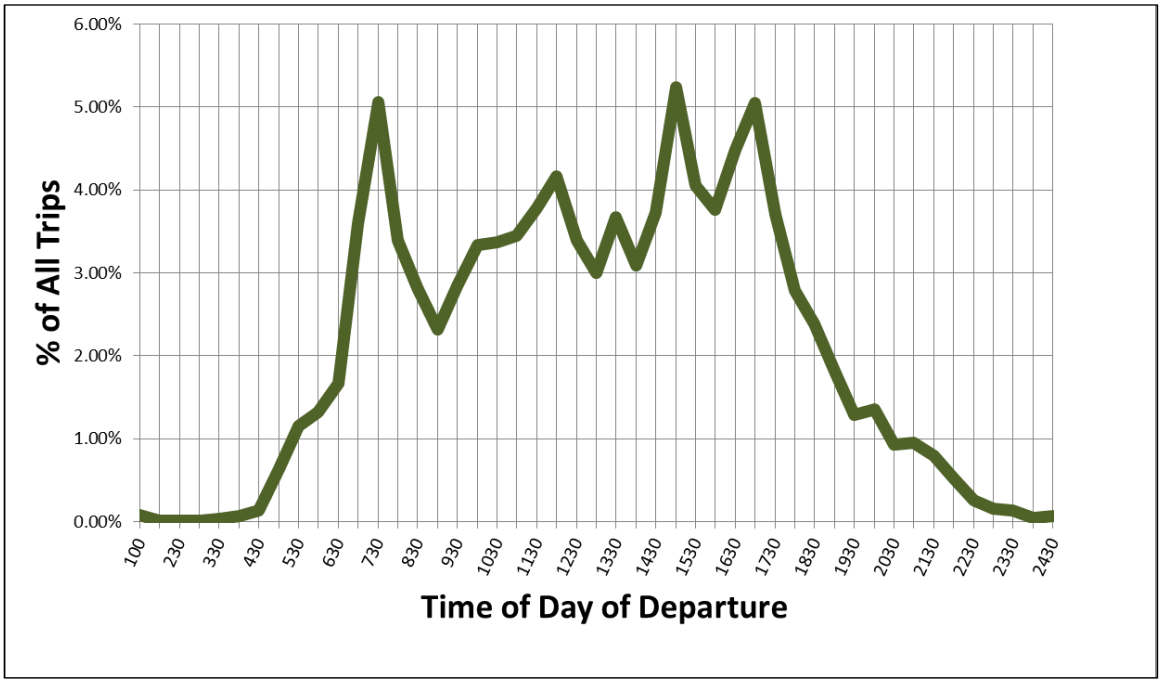

Figure 27: All Trips Time of Day of Travel

The trip tables produced at this point in the modeling process will be assigned to the highway and transit networks since they are now in origin-destination format. The trips have also been segmented by time of day. The results of the time-of-day factoring in vehicle trips for the 2020 validation run are shown in **Table 46.**

Table 46: Auto Vehicle Trips by Time of Day

Time of Day	Vehicle Trips
AM Peak Period Trips	48,365
PM Peak Period Trips	46,672
Off-Peak Period Trips	421,608

10 Highway and Transit Assignment Approach

10.1 Highway Assignment

The traffic assignment process runs for three time periods; am peak hour, pm peak hour, and off-peak hours. The capacity constrained assignment process uses TransCAD's multi-modal multi-class assignment with three vehicle classes, Auto and two truck classes (SUT and MUT). The assignment process is a user-equilibrium with time-period specific capacities and initial travel times pulled from the roadway attributes. Default alpha and beta parameters (0.15 and 4.0 respectively) are used in the volume-delay function. In addition, the volume-delay function uses a passenger car equivalent (PCE) of 1.5 for single unit trucks (SUT) and 2.5 for multi-unit trucks (MUT). The PCE adjustment is only used to determine the link travel time, and the actual SUT/MUT vehicle flow is reported later in the results. The assignment process runs through each of hundreds of iterations, and the volume-delay function computes a congested travel time that affects the shortest time paths used in the next iteration. As roads become congested, traffic diverts to other roadway paths until an equilibrium is achieved.

10.2 Transit Assignment

A daily transit route assignment is included with each model run. Transit assignment uses the daily bus trips from Mode Choice which have been afterward converted from PA to OD format. Transit network files and settings are identical to those set up during Transit Skimming. The daily transit assignment process results in the following outputs:

- Transit Ons and Offs – joins to the transit stops and shows boarding by stop. This file is used to aggregate boardings by route when the Transit Ridership report is requested from the user interface.
- Transit-Related Walk Flows – joins to the road network and shows walk flows resulting from the transit riders accessing/egressing transit.
- Transit Use on Road Network – joins to the road network and shows an aggregation of all person trips using transit on the road layer.
- Transit Flow by Route – joins to the transit route system and shows the number of people on each bus route between each pair of stops.

After a model run is completed for a given scenario, a transit ridership report can be generated from the Maps and Reports tab of the user interface. This report summarizes the total daily bus boardings in the system. Additional bus boarding results by line are provided in the 2020 base model scenario for validation purposes.

11 User Interface, GHG Analysis and Reporting

The PACOG model's original reporting capabilities were updated to work with the new components/updates. Several new reporting outputs were added under the Other Outputs section of the Graphical User Interface, namely:

- Mode Shares – summarizes modeled person trips by each mode and trip purpose into a single output table.
- Transit Ridership – summarizes transit assignment results into boarding by individual bus route and compares with observed boarding counts for the 2020 base and system totals for the future years.
- GHG Link Data – generates a comma delimited database that combines all highway assignment time period outputs for each link. This raw information can be converted for use in a MOVES (EPA air quality model) County Data Inventory run for greenhouse gas emissions.
- Trip Lengths – generates a trip length distribution chart and computes average trip length for each modeled trip purpose and truck type.

Guidance on the application of these reporting tools within the PACOG GUI are available in the "PACOG Travel Demand Model User Guide" prepared in 2024. Of note is the GHG sensitivity module designed to allow PACOG to test GHG reduction scenarios using Work from Home percentages, transit frequency and transit speed.

11.1 Greenhouse Gas Reduction Scenarios

As part of the greenhouse gas analysis capabilities, the PACOG Travel Demand Model user interface allows users to apply some general assumption changes impacting travel demand/mode choice which can be applied in special model scenario runs.

- Adjust Work from Home assumptions by each income quartile – If the model user changes from default values, then the net change is applied at the HBW trip generation step. This could be used to estimate the effects of employers requiring workers returning to in-person office jobs post-COVID. Increases in work from home can be modeled as well.
- Increase Transit Frequency – Allows model users to test the effectiveness of increased transit service via shorter wait times between buses. This is applied as a factor across all bus routes. For example, if the value is changed to 2, then buses would be twice as frequent. If a more complex scenario is desired, then the model user will need to create a separate Transit Route System with the characteristics to be tested (new route, itinerary, frequency and other).
- Improve Transit Speed – Allows model users to test the effectiveness of reducing transit travel times via various improvements (signal pre-emption, separated right of ways, improved boarding). In the model, this is accomplished by changing the In-Vehicle Travel Time (IVTT) encoded on each roadway link. The default setting is transit travel speed is 50% of the auto speed on a given road segment. If the user desires to increase the speed of transit service, then the value would be set to a value greater than 50%.

12 Daily Model Validation

12.1 Observed Traffic Data

Observed traffic in the form of Average Annual Daily Traffic (AADT) for years 2020 through 2023 was collected. The span of time during which the Covid-21 pandemic was active spanned the years 2020 through 2021+ rendering those years of limited use due to the observed suppressed traffic flow. Hence the decision was made to utilize 2022 and 2023 observed traffic to capture a realistic base year representing 2020. The AADT data was collected and stored in a GIS point file then transferred to the TransCAD model highway network for use in validation. Three parent files were used:

- Colorado DOT's Online Transportation Information System (OTIS)[25]
- Pueblo city traffic counts
- Pueblo County traffic counts

Truck traffic was obtained from OTIS site for both Single Unit (medium-sized) and Multi Unit (heavy or combination) trucks. Over 500 count locations from the three sources were processed for the project. The AADT values from 2020 through 2023 were reviewed for consistency with the established post Covid-21 base asserted to represent 2020. The final traffic data set was joined to prepare a count database that provided coverage throughout the PACOG region. **Figure 28** shows the locations of the traffic counts collected for the project.

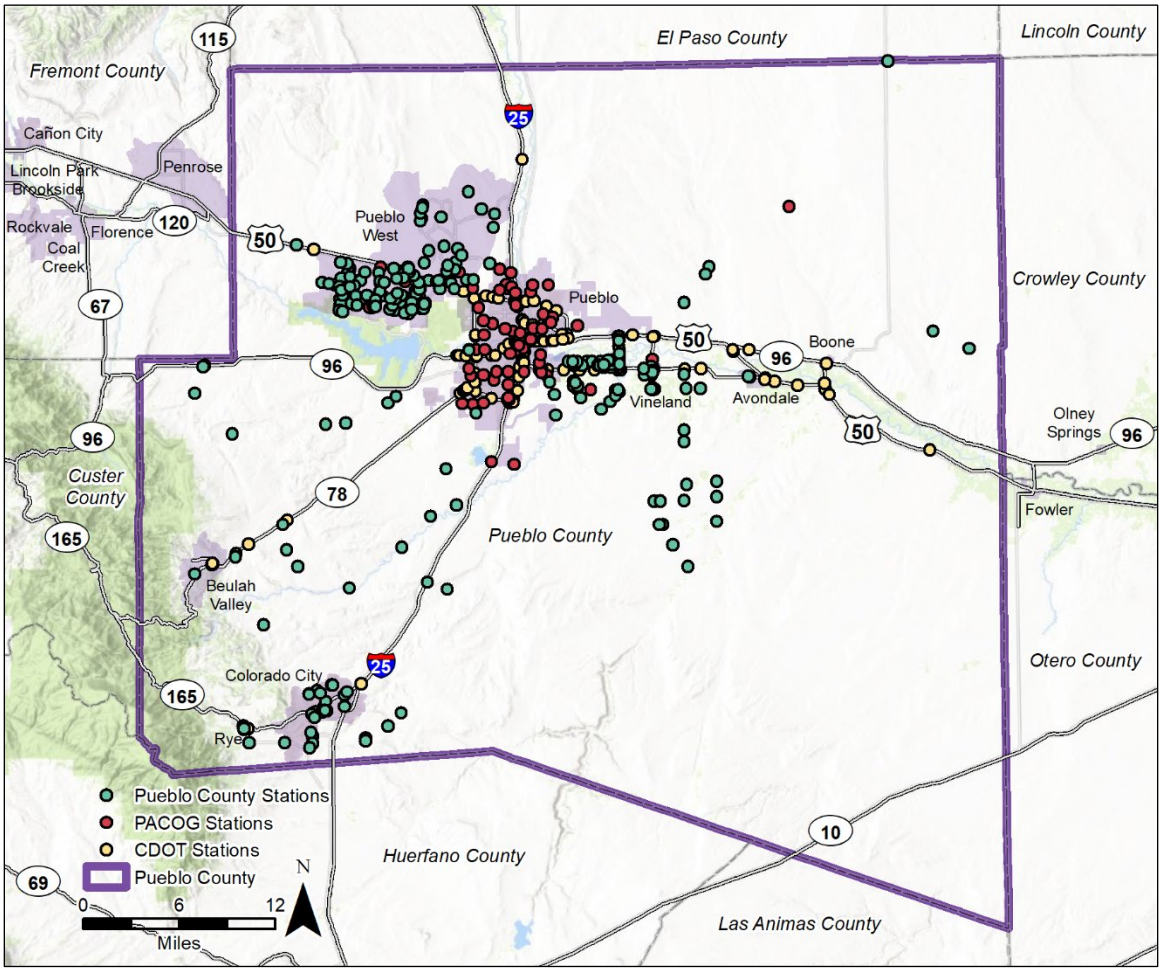

Figure 28: AADT Count Locations

[25] *Online Transportation Information System (OTIS): https://dtdapps.coloradodot.info/otis, accessed December 2023.*

A comprehensive review of count values and locations provided a clean dataset for comparison with counts spread evenly throughout the county and across all functional classes of roadways. Care was taken to obtain multiple location counts on all major facilities such as I-25 and U.S. Highway 50. The count records were reviewed for consistency and to remove redundant records and entered as an attribute on the 2020 PACOG highway network file.

12.2 Validation Approach

12.2.1 Traffic Validation Link Categories

All validation was conducted using comparison of modeled to daily traffic. At the completion of the three time period traffic assignments: one-hour am peak, one-hour pm peak and 22 hours off-peak, the PACOG Travel Model time of day flows are summed into daily modeled traffic. This daily attribute includes both commercial vehicles (trucks) by two size classes, and autos from all time periods. The model daily traffic can then be compared to the observed base year AADT in different ways, measuring the goodness of fit across several summary categories. Three summary categories were selected for comparison:

Highway Functional Classification – Four highway functional classifications were identified: interstate, expressway, principal arterial, and minor arterial. Collectors, ramps, and centroid connectors are not included in this summary table.

Volume Range – Traffic counts can also be put into categories based on the volume ranges. This comparison allows the observed traffic itself to define a set of categories. For the PACOG model, volume ranges were established for every 10,000 AADT, except for the first two volume range bins which are 0-5,000, and 5,000 to 10,000 AADT. Ramps and centroid connectors are not included in this summary table.

Screenlines – Six screenlines were developed for the PACOG validation. Screenlines measure the regional traffic flows crossing selected roadways or natural features and provide a cross-check on regional traffic flows. As an example, the U.S. Highway 50 (West) screenline sums all the counts at locations crossing US Highway 50 from north to south and from south to north in the area west of Interstate-25.

12.2.2 Daily Highway Model Validation Tests

The following validation tests were performed on the PACOG Travel Demand Model traffic to validate the daily traffic assignment:

Observed and Modeled Traffic Flows Comparison – This test, which totals the observed and the modeled traffic using observed and counted link flows, is presented by functional classification, volume range, and screenline.

Percent Root Mean Square Error (% RMSE) – This test, which measures the absolute value of the difference between model volumes and observed traffic counts, is where the variability of the traffic counts is most evident. It is presented by functional classification, volume range, and screenline. If the model fit were perfect, the percent root mean square error would be zero; the lower the % RMSE value, the better the model fit.

Volume Range Scatter Plot – Volume range scatter plots are used as a test to provide a visual comparison of the difference between the observed and modeled traffic. Each point represents a traffic count and the model volume from assignment. When the data points conform to the diagonal where the y-axis (model) equals the x-axis (counts), the fit is exact.

12.3 Highway Model Validation Results

12.3.1 Validation by Facility Type

The first test of highway validation was conducted using the category of facility type. Four facility types were analyzed: Interstates, Expressways, Principal Arterials, and Minor Arterials. **Table 47** shows the validation results for these categories. Overall, the daily model flows were about 1% higher than the observed value. Interstates and expressways have a highly accurate percent difference (less than 1%), demonstrating a close fit to observed values on roads where traffic is heaviest. RMSE of 30 shows good fire of modeled to observed traffic.

Table 47: Traffic Validation by Facility Type

Facility Type	Facility Type ID	Number of Observations	Flow Comparison			% Root Mean Square Error
			Sum of Counts	Sum of Flows	% Difference	
Interstate	1	22	537,000	533,142	-0.7	11
Expressway	2	39	732,205	731,330	-0.1	26
Principal Arterial	3	66	927,746	949,910	2.4	35
Minor Arterial	4	20	148,828	158,842	6.7	69
Total		**147**	**2,345,779**	**2,373,223**	**1.2**	**30**

12.3.2 Validation by Volume Range

The second test of highway validation is that of volume range as shown in **Table 48**. Volume range operates by establishing intervals of observed values, usually by steps of 10,000 AADT and then using them as categories to compare modeled flows to observed. There are six volume range categories used in the PACOG model. The lowest two categories are subcategories: 0-5,000 and 5,000-10,000 AADT which were established to capture the volume range validation more readily on low traffic facilities.

Overall, the daily assigned volume was 1.2 percent higher than the observed value with a % RMSE of 30. The higher volume classes, 20,000 AADT and above, have the most accurate % RMSE, demonstrating a closer fit to observed values on the facilities where traffic is heaviest. The % Root Mean Square Error (RMSE) values of 30 or higher on segments of less than 10,000 AADT communicates that a large part of the model traffic variation is confined to the lower volume highway segments, which typically are more of a challenge to load evenly in assignment. Of note is the I-25 call-out with a -1% difference model to observed, and a % RMSE of 11 indicating a very close fit on this facility.

Table 48: Traffic Validation by Volume Range

Volume Range	Volume Range ID	Number of Observations	Flow Comparison			% Root Mean Square Error
			Sum of Counts	Sum of Flows	% Difference	
Less than 5,000	1	10	45,229	75,855	67.7	97
5,000-10,000	2	38	272,219	331,645	21.8	54
10,000-20,000	3	61	914,563	931,477	1.8	30
20,000-30,000	4	26	645,768	609,870	-5.6	21
30,000-40,000	5	7	245,000	227,861	-7.0	16
40,000-50,000	6	5	223,000	196,515	-11.9	20
Total		**147**	**2,345,779**	**2,373,223**	**1.2**	**30**
I-25	*special*	*22*	*537,000*	*533,142*	*-1*	*11*

12.3.3 Validation by Screenline

The six screenlines developed for the PACOG validation are shown in **Figure 29**. **Table 49** shows the traffic validation using the screen lines. The total of the six screenlines yielded crossing volumes about 1% below the observed total traffic summed from all locations. No screenlines were higher than plus or minus 14% of observed totals from the traffic assignment.

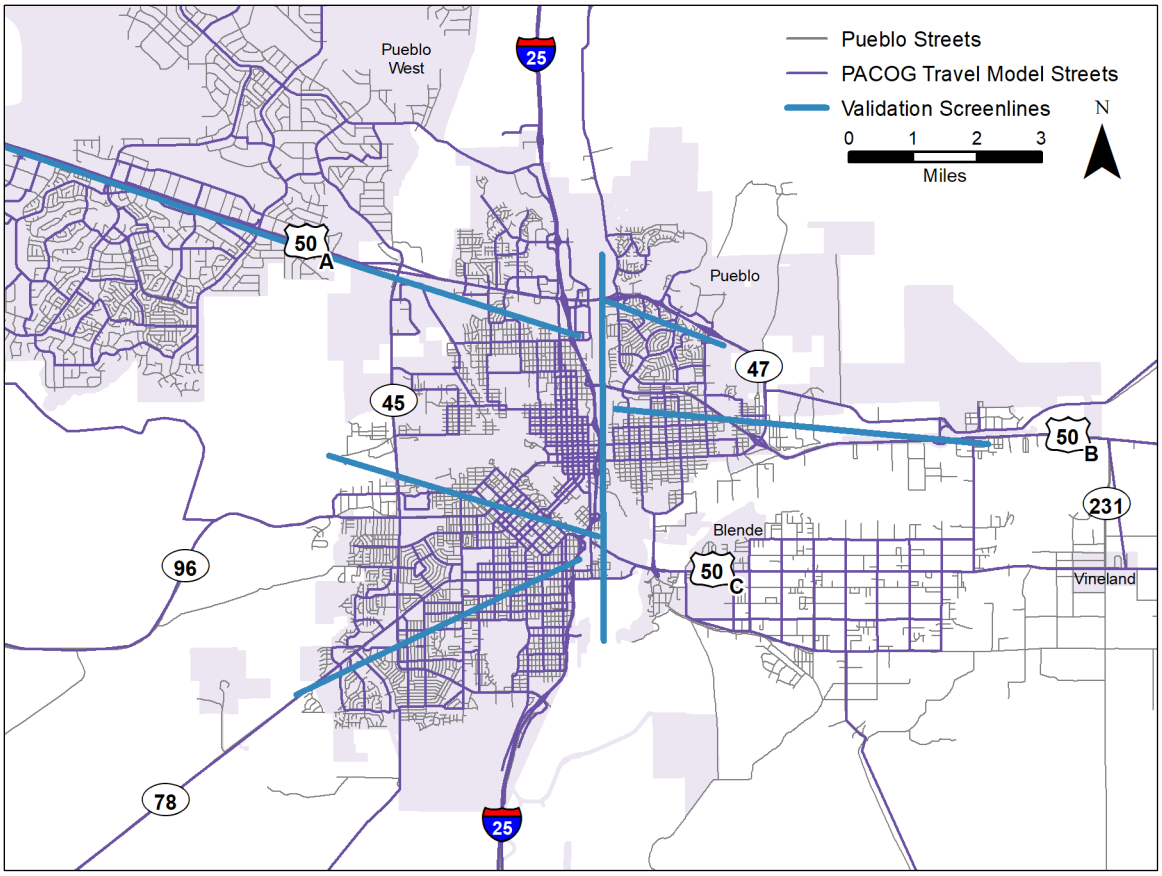

Figure 29: Location of PACOG Travel Model Screenlines

Table 49: Traffic Validation by Screenline

Screenline Name	ID	Number of Observations	Flow Comparison			% Root Mean Square Error
			Sum of Counts	Sum of Flows	% Difference	
N-S Fountain Creek	1	4	64,000	62,450	-2	26
E-W Arkansas River (west of town)	3	6	126,428	129,847	3	8
E-W parallel to CO 47, east of I-25	4	2	10,682	11,147	4	45
E-W, parallel to US 50, west of I-25	5	3	83,465	72,568	-13	14
E-W, parallel to US 50, east of I-25	6	5	36,542	41,674	14	56
E-W parallel to SH 78, southwest part of town	7	2	43,000	44,022	2	3
All Screenlines		**22**	**364,117**	**361,707**	**-1**	**20**

12.3.4 Validation by Scatterplot

Figure 30 illustrates the comparison between observed and modeled traffic flow in scatterplot format for all PACOG Travel Model traffic counts (AADT) used for validation. This test shows a good fit of modeled to observed traffic with the data points generally following the diagonal line of x-axis equals y-axis.

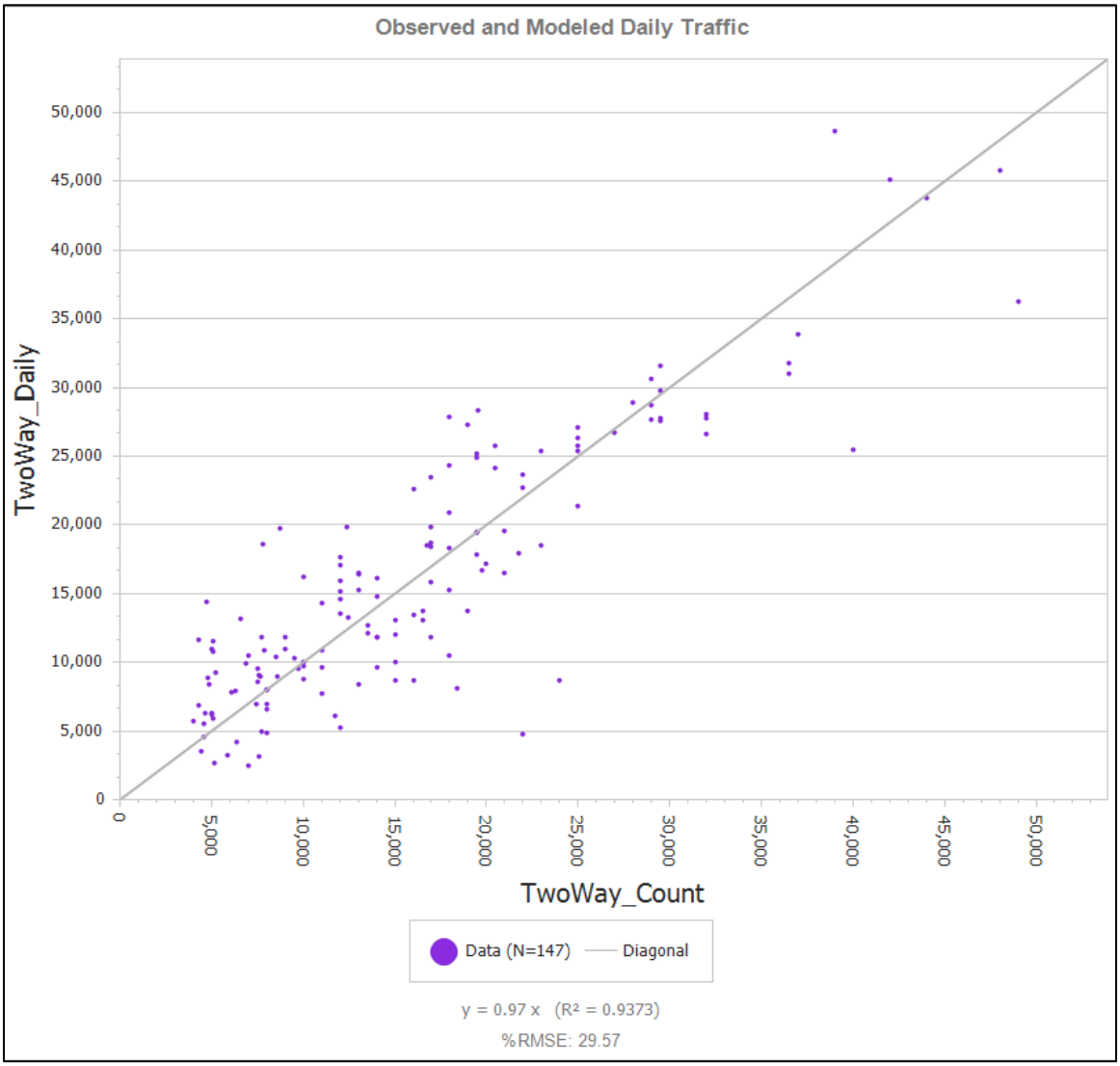

Figure 30: Scatterplot of all Counted Link Segments

12.3.5 Summary of Highway Validation

Three tests were run and on each, the 2020 PACOG Travel model performed well. With respect to relative difference over all counted link segments, an acceptable range within 10 percent (+/-) was set as a target for validation, consistent with standard practices and was exceeded with a 1.2% deviation delivered by the 2020 PACOG model. A Percent RMSE in the low thirties with descending values as the volume class increases is also a target which was met (see **Table 48**). Interstate-25, a key facility in the PACOG region with 22 segments analyzed, performed within 1% of modeled to observed traffic. The highway network 2020 count and model validation, including the review of the full set of model inputs, has yielded a validated 2020 base and a predictive future year travel demand model that is ready for application in the MPO environment.

PACOG

Pueblo Area Council of Governments

Methodology Report

Appendix B. GHG Strategy Scenario Sensitivity Modeling

GHG CONFORMITY REPORT

PACOG MOVES THE REGION

2024 MODEL UPDATE

PACOG “Proof of Concept”
Greenhouse Gas Conformity Report

“Proof of Concept” Demonstration of Conformity with the GHG Transportation Planning Standard

Prepared by: Wilson & Company
For: Pueblo Area Council of Governments

May 2025

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List of Abbreviations

Abbreviation	Term/Phrase/Name
APCD	Air Pollution Control Division
BY	Base Year
CCR	Code of Colorado Regulations
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
IACT	State Interagency Consultation Team South.
LRTP	Long Range Transportation Plan
MMT	Million Metric Tons
MOVES	MOtor Vehicle Emission Simulator Model
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization
PACOG	Pueblo Area Council of Governments.
PMT	Person Miles Traveled
PPM	Pueblo Planning Model
RTDM	Regional Travel Demand Model
RTP	Regional Transportation Plan
SIP	State Implementation Plan
SDO	State Demography Office
STIP	State Transportation Improvement Program
TAZ	Traffic Analysis Zone
TC	Transportation Commission
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TMA	Transportation Management Area
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
WFH	Work From Home

1 Purpose

This report documents the process to be used by the Pueblo Area Council of Governments (PACOG) to demonstrate conformity with Colorado's greenhouse gas (GHG) Transportation Planning Standard ("GHG Planning Standard"). For this "proof of concept" GHG Conformity Report, modeling of GHG emissions used the 2024 Pueblo Planning Model (PPM) Update for scenario years 2030, 2040 and 2050 as the "Baseline Plan." Calculation of GHG emissions for each of the modeled scenarios was completed by the Colorado Department of Health and Environment (CDPHE) Air Pollution Control Division (APCD) the using the Environmental Protection Agency's Motor Vehicle Emission Simulator (MOVES3) air quality model. The PACOG 2024 Travel Model Update was completed in 2024. The focus of the model update was the extension and enhancement of PACOG's PPM to better support the GHG conformity demonstration that is to be completed by PACOG in early 2026 as specified in Colorado Revised Statutes §43-4-1103 and the Code of Colorado Regulations (2 CCR 601-22, Section 8.02.5.1).

For this "proof of concept" GHG Conformity Report, the "Updated Plan," a surrogate for the 2050 LRTP that PACOG will adopt in 2026, was developed through an iterative process much like the process that PACOG will use to develop the actual 2050 LRTP. Because PACOG does not plan to rely on GHG Mitigation Measures to demonstrate compliance with the GHG Planning Standard, this "proof of concept" GHG Conformity Report does not include a Mitigation Action Plan (MAP).

The analysis and modeling results documented herein are based on analysis of all trips. Travel modeling was conducted by PACOG. GHG emissions calculations for each modeled scenario using a MS Access Database tool that was developed and validated by APCD. The PACOG MS Access Database tool was developed by APCD for PACOG and was supported by emissions rates developed using the Environmental Protection Agency's (EPA's) Motor Vehicle Emission Simulator (MOVES3) air quality model.

APCD used MOVES3 modeling as input to MS Access Databases that were developed for each of the five Colorado MPOs and CDOT. APCD also post-processed of travel model GHG link data and traffic ground counts provided by CDOT and the MPOs, and then assessed and validated the MS Access Database GHG emissions calculator tool, using "Baseline Plan" scenarios and first-pass "Updated Plan" (Action) scenarios provided by the MPOs or CDOT.

This report is not the official 2050 LRTP planning cycle GHG Transportation Report. Rather, this report is intended to serve as a template for the PACOG 2050 LRTP GHG Transportation Report to be approved by the Colorado Transportation Commission in February of 2026.

2 Background

In 2021, SB21-260: Sustainability of the Transportation System was enacted. The bill, which substantially increases funding for transportation, also required the Colorado Transportation Commission (TC) to adopt the implementing guidelines and procedures for addressing GHG emissions in transportation planning. In December 2021, the TC adopted revisions to the statewide transportation planning rules to incorporate a new GHG Planning Standard to address the GHG requirements in SB21-260.

The GHG Planning Standard requires the Colorado Department of Transportation (CDOT) and the Metropolitan Planning Organizations (MPOs) in Colorado to determine the amount of GHG emissions from transportation projects included in transportation plans and to take steps to reduce GHG emissions relative to estimated emissions resulting from Baseline Plans. Baseline Plans are defined as the plans in place at the time the GHG Planning Standard became effective on January 30, 2022. Because PACOG is not required to demonstrate conformity with the GHG Planning Standard until 2026, their applicable Baseline Plan is the adopted 2025 Long Range Transportation Plan (LRTP) and their Plan Update and supporting interim year implementation programs (e.g., TIP, !0-Year CIP) will be the 2050 Long Range Transportation and its supporting implementation programs. The adopted 2045 LRTP and supporting TIP and 10-Year Plan can be accessed at: https://www.pacog.net/mpodocs.

The PACOG is the MPO for the Pueblo Area Council of Governments Planning Area which includes Pueblo County. The PACOG Planning Area and smaller Pueblo Urban Area Boundary are as shown in **Figure 1** on the following page. The Pueblo Planning Model coverage/extents include all of Pueblo County.

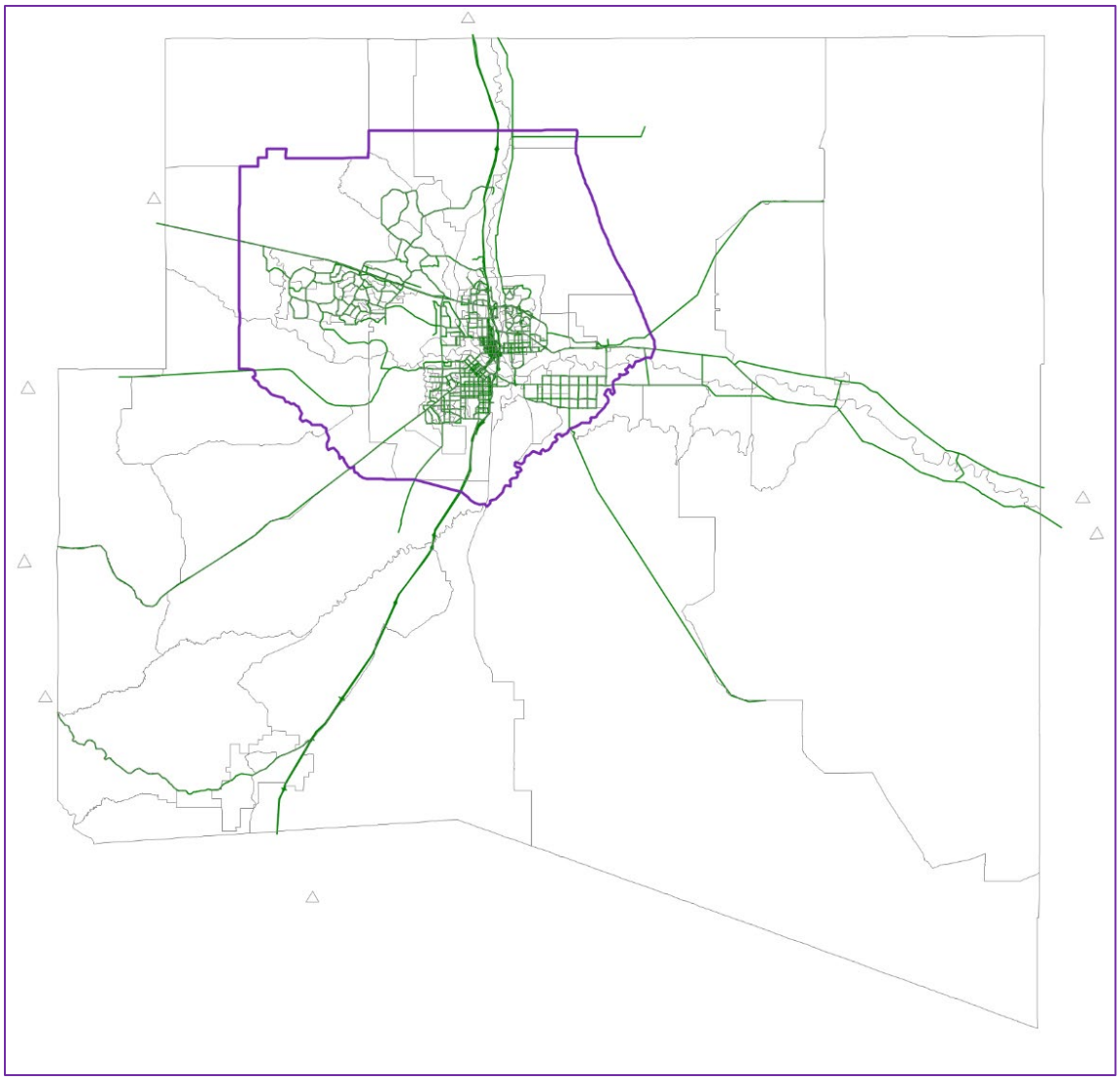

Figure 1: PACOG Model Extents and Urban Area Boundary

The Baseline Plan that was used for 2030, 2040 and 2050 reference scenarios for this GHG modeling and analysis exercise are based on the adopted PACOG 2045 LRTP. The PACOG 2045 LRTP was adopted by the PACOG Board in April of 2021.

For purposes of this “proof of concept” GHG Transportation Report, the adopted 2045 LRTP is referred to as the Baseline Plan. The 2024 Travel Model Update version of the PPM that was validated for a 2022 base year scenario was used to develop both Baseline Plan and Updated Plan scenarios for GHG analysis. The Baseline Plan scenarios represent the adopted 2045 LRTP and supporting Transportation Improvement Program (TIP) and 10-Year Plan. The Updated Plan scenarios were developed for 2030, 2040 and 2050 analysis years using the 2024 Travel Model Update version of the PPM and its on-board GHG Scenario Builder to iteratively evaluate GHG/VMT reduction strategies to achieve GHG emissions reduction target for the 2030, 2040 and 2050 planning horizons.

An Intergovernmental Agreement (IGA) will be developed by CDOT, the Pueblo MPO (PACOG),and the Air Pollution Control Division (APCD) of the Colorado Department of Public Health and Environment (CDPHE) and once completed it will be included in Appendix A of the official GHG Report for the PACOG 2050 LRTP. The IGA will identify the roles and responsibilities of each agency for model execution and address modeling assumptions for compliance demonstrations for the GHG Planning Standard.

The PPM modeling extents include all of Pueblo County. This “proof of concept” GHG conformity demonstration is for the area within the Pueblo Urban Area boundary the comprises the MPO planning area. The PACOG travel model update and validation report, *2024 Model Update/Validation Pueblo Planning Model Methodology Report* (June 2024). A separate technical memorandum, *Modeling Methodology for Non-Motorized GHG Strategy* (April 2025), describes updates to the GHG Scenario Builder to generate Esri shapefile GHG link data output from model runs and to model increases in non-motorized mode share. Both documents were reviewed by CDOT to confirm the suitability of the 2024 Model Update version of the PPM for GHG modeling.

3 Greenhouse Gas (GHG) Emissions Analysis

The “proof of concept” GHG emissions analysis documented by this GHG Transportation Report utilized 2030, 2040 and 2050 scenarios based on the adopted PACOG fiscally constrained 2045 LRTP as the Baseline Plan and a prototype 2050 RTP as the Updated Plan. Only highway/streets and transit improvements included in the 2030, 2040 and 2050 Baseline Plan network scenarios.

As a starting point for developing Updated Plan scenarios for 2030, 2040 and 2050 highway and transit systems improvement projects that had advanced to “funded” status since adoption of the 2045 LRTP, either supported by state/federal funding, grants, or private investment, were added to Baseline Plan network scenarios for 2030, 2040 and 2050. With these networks as the foundational (Action1 Scenario) for Updated Plan 2030, 2040 and 2050 scenarios, policy and operational GHG reduction strategies were iteratively applied at varying levels and in various combinations to achieve “proof of concept” GHG emissions reductions.

The final Updated Plan (Action8 Scenario) scenarios include roadway and transit improvement projects that were "funded" since adoption of the 2045 LRTP plus multi-strategy packages of policies and operational improvements that support mode shift from travel by automobile to travel by active transportation and/or transit modes. The analysis results demonstrated "proof of concept" the "GHG Reduction Levels" established for the PACOG in the GHG Planning Standard for all three compliance years.

GHG emissions for the 2045 LRTP Baseline Plan (Base) and final Updated Plan (Action8) scenarios are shown in **Table 1** for each of the three compliance years: 2030, 2040, and 2050.

Table 2: GHG Emissions Results, Million Metric Tons (MMT) per Year

	2030	2040	2050
Baseline Plan	0.48	0.30	0.17
Updated Plan	0.44	0.27	0.16
GHG Emissions Reduction (Baseline Plan- Update Plan)	0.04	0.03	0.01
Required GHG Reduction Level	0.03	0.02	0.01
Pass/Fail	**PASS**	**PASS**	**PASS**

4 Baseline and Updated Plan Descriptions

4.1 Baseline Plan Description

The GHG analysis of the Baseline Plan includes the roadway, transit, and active transportation (non-motorized modes) facility improvements identified in the adopted 2045 Long Range Transportation Plan (LRTP). The 2045 RTP identified major capacity projects, including regionally significant roadway and transit capacity expansion, which are fiscally constrained and planned for the region through 2045. Each of these major capacity projects are identified in maps and tables included in Chapter 9, Sections 9.2, 9.3, and 9.4 of the 2045 LRTP.

As part of the 2024 Update of the Pueblo Planning Model (PPM), a new scenario was built for 2030. For purposes on this "proof of concept' GHG conformity demonstration, it assumed that for the Baseline Plan no projects would be added between 2045 and 2050.

Working from the supporting 2021-2023 TIP and 10-Year CIP associated with the PACOG 2045 LRTP, and considering anticipated year of completion, Baseline Plan projects were assigned to one of three staging periods, including 2021-2030, 2031-2040, and 2041-2050.

Baseline Plan Highway/Streets and Non-Motorized Projects - 2021-2030 Staging Period
Twenty-two funded highway/streets and nonmotorized facilities projects from the 2021-2023 TIP were assigned to the earliest staging period. The locations of these projects are shown below, in **Figure 2**. **Table 2**, on the following page, lists the 2021-2023 TIP projects along with associated funding sources and levels.

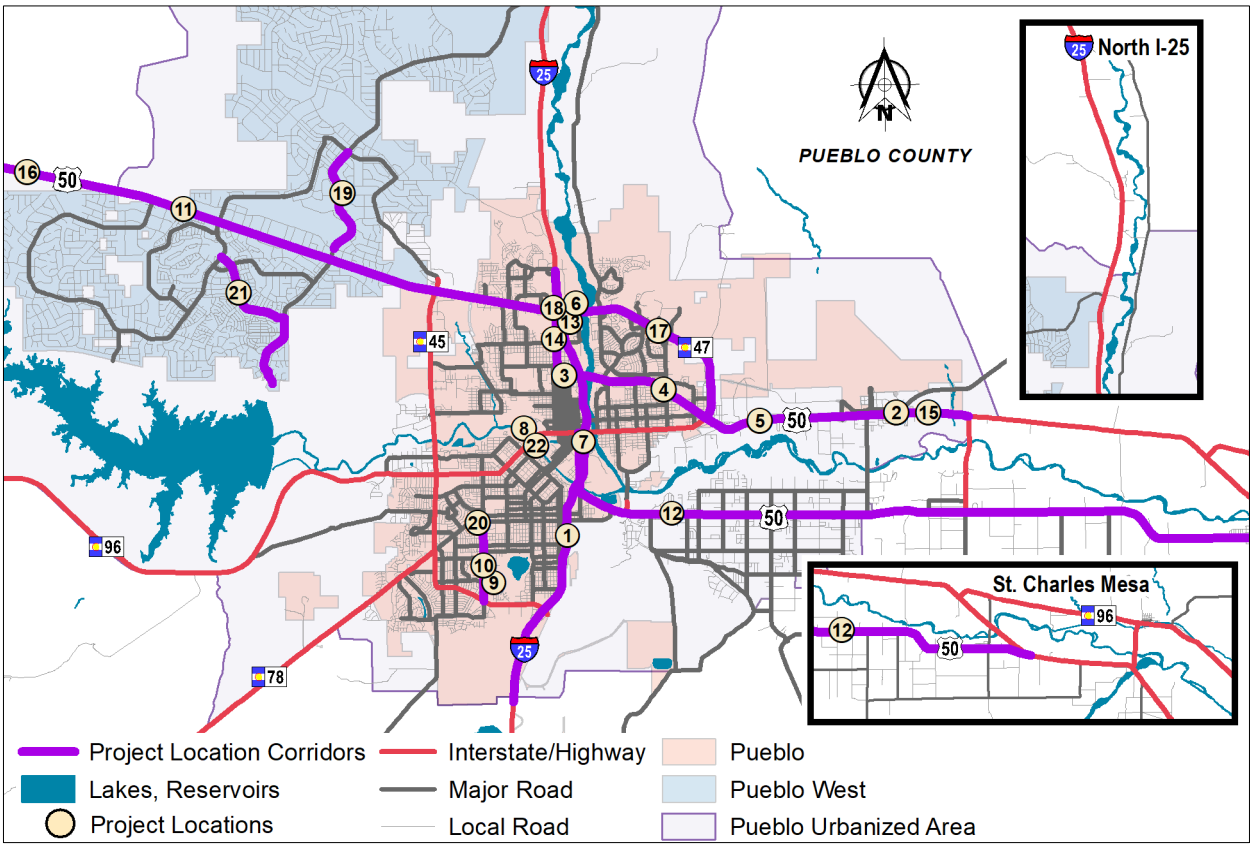

Figure 2: Transportation Improvement Program (2021- 2024) Project Locations

Table 2: 2021 - 2024 Transportation Improvement Program Projects by Funding Year

ID#	Funding Program	Project	2021	Rolled	2022	2023	2024	4 Year Total
1	Regional Priority Program (RPP); Senate Bill 1 Sales & Use Tax (SB1)	I-25 through Pueblo	$2,750,000	$978,633				$3,728,633
2	Construction Wall Program (CWP)	U.S. 50B Mill and Overlay I25 to 36th Lane	$847,674		$436,987	$93,339		$,378.000
3	Curb Ramp Upgrades to ADA Compliance (ADA)	ADA Improvements in the Pueblo TPR Area	$939,273		$410,889			$1,350,162
4	Construction Bridge Program (CBP)	U.S. 50 Scour Critical Counter Measures K-18-BY, BZ	$541,160					$541,160
5	Construction Bridge Program (CBP)	U.S. 50B - I 25 to 26th Lane	$422,608			$1,655,285		$2,077,893
6	Bridge Off Systems (BRO)	S Pueblo-PURHAR-0.1 FRNT	$523,377					$523,377
7	Multi-Modal Options (MMO); TAP - Region (TAP)	Santa Fe Ave Streetscape Ph 1B - 1st Street and I-25		$261,349				$261,349
8	Multi-Modal Options (MMO); TAP - Region (TAP)	Arkansas River Trail Phase 4		$970,618				$970,618
9	TAP - Region (TAP); Multi-Modal Options (MMO)	Minnequa Lake Trail Connection	$194,000	$194,000				$388,000
10	Multi-Modal Options (MMO)	City of Pueblo Prairie Avenue MM upgrades		$1,300,000				$1,300,000
11	Regional Priority Program (RPP)	U.S. 50 West	$1,469,963					$1,469,963
12	Regional Priority Program (RPP); Surface Treatment (SUR)	U.S. 50C Drainage Improvements	$1,710,922					$1,710,922
13	Regional Priority Program (RPP)	I-25 Dillon Frontage Road			$1,200,000	$3,000,000		$4,200,000
14	Surface Treatment (SUR)	Elizabeth-U.S. 50 to Ridge Drive	$1,440,000		$160,000			$1,600,000
15	Surface Treatment (SUR)	U.S. 50B mill and overlay I25 to 36th lane			$12,013,733	$4,839,200	$2,177,068	$19,030,001
16	Surface Treatment (SUR)	U.S. 50A Pueblo County Line to West of Purcell Blvd					$13,340,700	$13,340,700
17	Surface Treatment (SUR)	SH 47A Preventative Maintenance					$1,372,500	$1,372,500
18	Surface Treatment (SUR)	I-25 and US 50 B Interchange					$161,732	$161,732
19	TAP - Region (TAP)	Pueblo West-SDS Trail N Park		$513,176				$513,176
20	TAP - Region (TAP)	City of Pueblo Northern Avenue Phase 3		$625,000				$625,000
21	TAP - Region (TAP)	Joe Martinez Trail in Pueblo West		$671,294	$410,447			$1,081,741
22	TAP - Region (TAP)	Arkansas Levee Construction		$634,328				$634,328
Total Cost			**$10,839,047**	**$6,148,398**	**$14,632,056**	**$9,587,824**	**$17,052,000**	**$58,259,325**

Seven projects highway/street projects included in the 2045 Fiscally Constrained LRTP 10-Year were also assigned to the earliest staging period. These projects are in **Table 3**, along with 2020 total cost estimates. The table includes a note that project funding earmarked for the projects is nearly twice the estimated total cost in 2020 dollars.

Table 3: 2045 Fiscally Constrained LRTP 10-Year CIP Projects (2025-2030)

ID/#	Project	From	To	2020 Total Cost
23	SH 96A West of Pueblo - Shoulder Widening, Bridge Rail Replacement, Bike Lane, and Other Safety Improvements	West of Pueblo		$11,500,000
24	I-25 Improvements	North of 13th St	North of U.S. Highway 50B	$28,000,000*
25	SH 47 four (4) Lane Extension to US50B (Approximately .5 Mile) Interchange Improvements	13th St	U.S. Highway 50B	$8,000,000
26	I-25 Exit 108 Replace Single Box Covert	MP 107.5 South of Exit 108	MP 108.5 North of Exit 108	$11,000,000
27	U.S. Highway 50C Drainage Improvements	1 Block East of 36th Lane	1 Block West of 36th Lane	$5,500,000
28	SH 45 North Extension Study	U.S. Highway 50A	Interstate-25 at Exit 108	$1,000,000
29	Dillon Drive E. of I-25 Frontage Road Construct a New 2-Lane Facility; In Addition, Construct a Roundabout at Exit 104 West of I-25	MP 104.5 South of Platteville Blvd	MP 104.5 N. of Platteville Blvd	$3,000,000
			Total Cost	**$68,000,000.00**

*Project funding includes $60 M SB267, $3.4 M Surface Treatment, $6.6 M Faster Safety, $30 M Bridge for a Total of S128,000,000 M

Baseline Plan Transit Projects - 2021-2030 Staging Period

Committed transit funding is identified in the 2020-2023 Transportation Improvement Program. Funding in the FTA-5307 Small Urban Transit category is earmarked to support Pueblo Transit fixed route services. Funding in the FTA-5310 category is earmarked to support specialized transportation services for seniors and individuals with disabilities. Funding in the FTA-5311 Rural Area Formula Grants category is earmarked for transit services to areas outside of the Urbanized Area. FASTER funds provided additional transit enhancement projects.

The adopted 2020-2023 Transportation Improvement Program (TIP) included no transit service expansion projects. Capital expenditure was limited to vehicle replacement. Remaining funding was dedicated to supporting maintenance and operations. Transit investments included in the first three years of the Baseline Plan 2021-2030 Staging Period for the are listed by Program Category, Funding Program and Funding Source below in **Table 4**.

For the remainder of the Baseline Plan 2021-2030 Staging Period (2024-2030), it was assumed that operating and maintenance levels would be maintained at levels needed to support the existing urban and rural transit service.

Table 4: Transit Operating Funding (2020-2023)

Program Category	Funding Program	Fund Source	SFY 2020	SFY 2021	SFY 2022	SFY 2023	4- Year Funding Total
Small Urban Transit	FTA - 5307	FTA	$2,092,862	$2,092,862	$2,092,862	$2,092,862	$8,371,448
		City of Pueblo	$1,418,933	$1,418,933	$1,418,933	$1,418,933	$5,675,732
Small Urban Transit Totals			$3,511,795	$3,511,795	$3,511,795	$3,511,795	$14,047,180
Enhanced Mobility of Seniors and Individuals with Disabilities	FTA - 5310 Admin & Operating	FTA	$84,269	$84,269	$84,269	$84,269	$337,076
		Local	$84,269	$84,269	$84,269	$84,269	$337,076
Enhanced Mobility Administration & Operating Totals			$168,538	$168,538	$168,538	$168,538	$674,152
Enhanced Mobility of Seniors and Individuals with Disabilities	FTA - 5310 Capital Projects-SRDA	FTA	$64,488	$56,623	$56,623	$56,623	$234,357
		Local	$16,372	$18,874	$18,874	$18,874	$72,994
Enhanced Mobility Capital Projects Totals			$80,860	$75,497	$75,497	$75,497	$307,351
Rural Area Formula Grants	FTA - 5311	FTA	$100,751	$100,751	$100,751	$100,751	$403,004
		Local	$28,843	$28,843	$28,843	$28,843	$115,372
Rural Area Formula Grants Totals			$129,594	$129,594	$129,594	$129,594	$518,376
Small Urbanized Capital Projects Vehicle Replacement of 35' Hybrid Vehicle	FTA - 5399	FTA	$544,800	TBD	TBD	TBD	$544,800
		Local	$136,200	TBD	TBD	TBD	$136,200
Small Urbanized Capital Projects Totals			$681,000	TBD	TBD	TBD	$681,000
ITS Project with FASTER Funds IT Equipment (Farebox & Mobile Ticketing)	FASTER	State	$233,600	TBD	TBD	TBD	$233,600
		Local	$58,400	TBD	TBD	TBD	$58,400
ITS Project with FASTER Funds Totals			$292,000	TBD	TBD	TBD	$292,000
Small Urbanized Capital Projects Replacement of three 30' vehicles	FTA - 5339	FTA	$158,436	TBD	TBD	TBD	$158,436
		Local	$39,609	TBD	TBD	TBD	$39,609
Small Urbanized Capital Projects Totals			**$198,045**	**TBD**	**TBD**	**TBD**	**$198,045**
Total Funding (2020-2023)			**$5,061,832**	**$3,885,424**	**$3,885,424**	**$3,885,424**	**$16,718,104**

Baseline Plan Highway/Streets and Non-Motorized Projects - 2031-2045 Staging Period
The adopted Fiscally Constrained 2045 LRTP grouped all projects that were anticipated to come online between 2031 and 2045 into a single staging period. The Baseline Plan scenarios for 2040 and 2050 include all of these projects that could be modeled directly or indirectly through their effects on mode shares. Examples of projects that could not be modeled are resurfacing and drainage improvement projects.

In addition to directly and indirectly modeled highway/streets and transit projects, existing and projected "no action" levels of Work from Home (WFH) participation (based on continuation of current policy and trends represented by ACS Journey to Work Survey data) and non-motorized travel mode shares were represented by the Baseline Plan for all GHG compliance year scenarios.

Table 5: 2045 Planning Horizon Funded Projects (Beyond 2030)

ID#	2015 Total Cost	From	To	2020 Total Coat
30	U.S. 50B (MP 332.1 and 333.9) (Continuous Left Lane where U.S. 50C and U.S. Highway 50B Meet)	Intersection of U.S. Highway 50C and U.S. Highway 50B		$2,000,000
31	US 50B Drainage Improvements	Pueblo	Granada	$30,000,000
32	Pueblo Boulevard - US 50 to Platteville Road	U.S. Highway 50 West	Railroad Crossing	$11,100,000
		Railroad Crossing	Eagleridge Blvd	$7,500,000
		Eagleridge Blvd	Drew Dix Blvd	$5,200,000
33	Pueblo Blvd Platteville Road to I-25 Exit 108	PHASE 2 OF CONSTRUCTION		
		Drew Dix Blvd	Railroad Crossing	$24,900,000
		Railroad Crossing	Purcell Blvd	$7,500,000
		Purcell Blvd/I-25 Interchange Improvements		$12,000,000
		Railroad Crossing		$7,300,000
34	U.S. 50B East at Troy to Pueblo Airport – Guardrail	Troy Ave	Pueblo Memorial Airport	$3,000,000
35	SH 78 at MP 20 & MP 28 Bridge Widening and Shoulder Widening	MP 20	MP 28	$4,000,000
36	U.S. Highway 50C Drainage Improvements	1 Block East of 36th Lane	1 Block West of 36th Lane	$5,500,000
37	Interstate-25	City Center (1st St)	13th St	$200,000,000
		U.S. 50B	North of 29th St	$62,000,000
38	US Highway 50A - Add 3rd Thru Lane on US 50A Eastbound & Westbound between Purcell Blvd & McCulloch Blvd. Construct a Grade-Separate Interchange at U.S. 50A/McCulloch. Improve the Median Safety and Intersections on U.S. 50A between McCulloch & Swallows Rd	Purcell Blvd	Swallows Road	$50,000,000
39	SH 78 - Raised Median between Bandera Parkway and Surfwood Lane with Intersection Improvements and Raised Median	Bandera Parkway	Surfwood Lane	$3,400,000
			Total Cost	**$435,400,000**

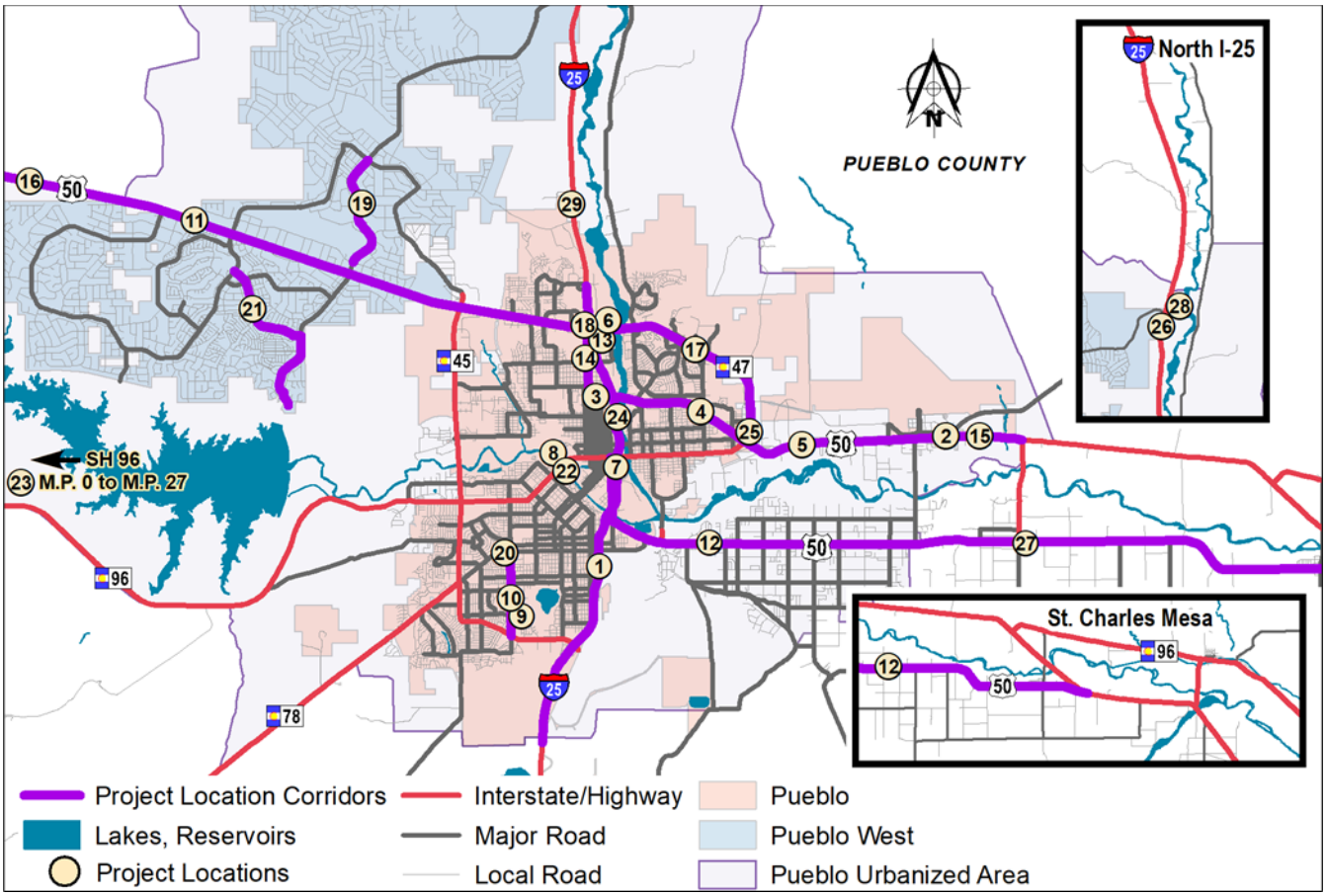

Figure 3: 2045 Planning Horizon Funded Projects (Beyond 2030)

4.2 Updated Plan Description

A "proof of concept" Updated Plan was identified through iterative scenario-based evaluation of GHG emissions for eight "Action"/Updated Plan scenarios. The base for all of the Updated Plan scenarios for 2030, 2040 and 2050 includes a set of transit and highway/streets projects that have advanced through varying levels of implementation since adoption of the PACOG 2045 LRTP, or that were identified by the 2045 LRTP Vision Plan. Thes projects represent connections or extension roadway and transit segments that had potential to reduce out of direction travel/VMT. These system extension/connection projects are listed in **Table 6**, along with the compliance year scenarios to which they were added.

Updated Plan Transit and Highway/Street Connection and Extension Projects

The extensions and connections listed in **Table 6** represent known development activity at the time that the PACOG 2045 LRTP. Since that time, Pueblo has adopted a new Comprehensive Plan and development activity has become more vigorous. In this context, new "projects" whether highway/streets connections and extensions or additional transit service/routes, which are not included in the fiscally constrained 2045 LRTP and the 2045 LRTP Vision Plan may be added. Additionally, "projects" included in this "proof of concept" Updated Plan may be replaced by alternative routing and/or may be renamed in the modeling for this "proof of concept" Updated Plan and GHG Transportation Report.

Table 6: Updated Plan Modeled Highway/Street and Transit Projects by Scenario Year

Category	Improvement	Scenario Year(s)
Fixed Route Transit	Shopping Shuttle Bus Route(s)	2030, 2040, 2050
Highway/Streets	Medal of Honor Blvd (Purcell Blvd-Pueblo Blvd)	2030, 2040, 2050
Highway/Streets	Drew/Dix Split Diamond Interchange	2030, 2040, 2050
Highway/Streets	Pueblo Blvd FR (Medal of Honor Blvd-Spaulding Ave)	2030, 2040, 2050
Highway/Streets	Spaulding Ave (31st St-24h St; Pueblo Blvd-Pueblo Blvd FR)	2030, 2040, 2050
Highway/Streets	Spaulding Ave (24th St-)	2040, 2050
Highway/Streets	24th St (Tuxedo Blvd-Atlanta Ave)	2040, 2050
Highway/Streets	Mc Carthy Blvd (CO96/ Thatcher Ave-CO78/ Northern Ave)	2040, 2050
Highway/Streets	Bandera Pkwy (CO96/Thatcher Ave-Siena Dr)	2040, 2050
Highway/Streets	Red Creek Springs Rd (Mc Carthy Blvd-Bandera Pkwy)	2040, 2050
Highway/Streets	Lehigh Ave ((Mc Carthy Blvd-Bandera Pkwy)	2040, 2050
Highway/Streets	Baltimore Ave (Kachina Dr-29th St)	2040, 2050
Highway/Streets	Spaulding Ave (31st St-11th St)	2040, 2050
Highway/Streets	18th St (Spaulding Ave-Perry Ave)	2040, 2050
Highway/Streets	Baker Stesmer Rd (Lowell Ave-24th St)	2050
Highway/Streets	Hollywood Dr Extension (Farabaugh Ln-Unnamed1 and Unnamed2)	2050
Highway/Streets	Little Burnt Mill Dr Connection (Rambo Trail-Salt Creek Crossing)	2050
Highway/Streets	Unnamed Loop1 Connection (Lake Ave-CO 78/Northern Ave)	2050
Highway/Streets	Bandera Pkwy (Bridal Trail-Unnamed Loop1)	2050
Highway/Streets	Bridal Trail Extension (Bandera Pkwy-Unnamed Loop1)	2050
Highway/Streets	Unnamed Loop2 (Unnamed Loop1-Little Burnt Mill Dr)	2050

Updated Plan TDM, Active Transportation and Transit Operations Strategies

The "proof of concept" Updated Plan GHG also includes commitments to expand non-motorized facilities, to implement transit operational improvements, and adopt policy-based TDM strategies to shift the mode share of trips made within the Pueblo Urban Area away from automobile trips. The specific strategies included in the "proof of concept" Updated Plan are summarized in **Table 7**.

Table 7: Updated Plan TDM, Active Transportation and Transit Operations Strategies

Category	TDM, Active Transportation and Transit Operational Strategy	Scenario Year(s)
Transit	Transit average speed increased to 65% of average auto speed	2030, 2040, 2050
Transit	Transit headways decreased by 23% (e.g., 60-minute headways decreased to 46-minute headways)	2030, 2040, 2050
TDM	WFH participation by income quartile increased to (10%,15%,30%, 30%)	2030, 2040, 2050
Active Transportation	Active transportation mode share for trips 5 miles or less in length increased 3.5% (trips shifted from automobile to non-motorized modes)	2030, 2040, 2050

4.3 Modeling Summary

Model Description and Process

The PACOG's travel demand model (TDM), the Pueblo Planning Model (PPM), was updated in 2024 to add key components to the model to support GHG analysis and demonstration of conformity with the GHG Planning Rule by PACOG. Key updates and new components of the 2024 Travel Model Update, fully documented in the *2024 Model Update/Validation Pueblo Planning Model Methodology Report*, included:

- **Extended Model Forecast Horizon** – The new modeling system extends the planning horizon to 2050, extending the model horizon an additional five years from the previous 2045 planning horizon. The model update also added interim year scenarios for 2030 and 2040 to the 2020 base year and 2050 planning horizon scenarios, with the 2050 planning horizon scenario replacing the 2025 Travel Model Update's 2045 planning horizon scenario in preparation for the 2050 LRTP planning cycle.
- **Updated Observed Traffic Data** – The model integrates 2020 traffic count data by auto, Single Unit (SUT) and Multi Unit (MUT) truck vehicle classifications.
- **Zone System Revisions** – Zonal coverage was changed to match CDOT's Traffic Analysis Zone (TAZ) structure to provide better geographic resolution, and consistency between the DOT and PACOG regarding base and forecast land use assumptions.
- **Zonal Data Update** – Socioeconomic data was updated for population, households, median income, and group quarters (2020 Census). Employment data updated using the 2020 Quarterly Census of Employment & Wages (QCEW), data obtained from the Colorado Dept. of Labor & Employment, including employment point data (2021). Trip generation disaggregation values, and trip distribution targets utilize the 2010 Pueblo Front Range Household Survey data. An updated statewide travel survey is in progress.
- **More Detailed Truck Vehicle Classes** – Previous versions of the model used Single Unit (SUT) and Multi Unit (MUT) trucks in trip generation and internal trip distribution but then collapsed this category into a generic truck category in later model steps. This version carries SUT and MUT classes through all model steps and outputs.
- **Transit Network/Model** –Transit routes, stops, and service characteristics are included in the PACOG model for the first time. The additional transit network information is used to support transit skimming used in Mode Choice modeling and later in transit assignments. Roadway network details and data attributes were expanded to support transit modeling as well.

- **Addition of Mode Choice Modeling** – This is a new model component that was added to improve the model's sensitivity to anticipated future scenarios. This component explicitly models individual choices related to traveling by auto and transit depending on trip purpose and characteristics of the journey to the destination location. Addition of the mode choice step significantly changed outputs and subsequent model steps related to Production-Attraction to Origin-Destination (PA-OD) conversion.
- **Expanded Traffic Assignment** – The PACOG model provides traffic flow outputs for AM and PM peak hours, the remaining 22 Off Peak hours, and daily totals. Outputs for vehicle classes are now split into Autos, SUT, and MUT. The process adds a Passenger Car Equivalent (PCE) methodology that accounts for the fact that trucks use more road capacity than autos. A daily transit route assignment is added as well, with transit outputs and reporting.
- **Updated User Interface, Analysis, and Reporting** – The PACOG model's original reporting capabilities were updated to work with the new components/updates. Several new reporting outputs were added to summarize mode choice and transit assignment results. Reporting capability now includes customized Greenhouse Gas (GHG) reporting/output. In accordance with guidance from CDOT and APCD at the time GHG output was formatted in comma separated variable (csv) format that could be readily imported to an Excel worksheet. The intent was to support input to MOVES GHG emissions calculations.
- **Addition of a GHG Scenario Builder** - A set of steps and processes were formalized in a GHG Scenario Builder. The GHG Scenario Builder allows PACOG technical staff to rapidly evaluate policy and operational GHG reduction strategies using their updated travel model for Greenhouse Gas (GHG) testing and subsequent processing using the PACOG MS Access Database GHG emissions calculator created by APCD. The 2024 Model Update GHG Scenario builder included three policy/operational tools to facilitate evaluation of Work from Home (WFH) participation by income quartile, increased transit service frequency (reduced headways), and increased transit operating speeds.

Following significant changes to the Colorado GHG modeling process that were put in place by the Statewide Modeling Coordination Groups (SMCG), the 2024 Travel Model Update version of the PPM was modified to generate Esri shapefile formatted GHG link data as the output of GHG analysis. This was done to facilitate APCD review, acceptance, and use as input (as table export in MS Excel format) to MS Access Database for model results processing to calculate total GHG emissions for the Baseline Plan and Updated Plan scenarios.

APCD, CDOT and PACOG were all involved in the development of PACOG-specific parameters implemented for the PACOG MS Access Database. APCD developed the supporting data and methodology that is/was used to disaggregate total vehicle assignments to HPMS vehicle types (based on classification count data). Methodology to disaggregate the PPM model assignment results (speeds and volumes) for the Off-Peak assignment period (22 hours) into 22 one-hour periods was developed jointly by PACOG and CDOT and accepted by APCD. The emission factors used by the MS Access database tool were developed by APCD using MOVES3.

Model Baseline Plan and Updated Plan Assumptions and Results

Key inputs and outputs from travel model runs for the Baseline Plan and the Updated Plan for each of the three compliance years for the respectively are provided in **Table 8** and **Table 9**. The data provided for each scenario and compliance year includes demographic data and travel forecasts for the full extents of the PACOG 2024 Update Travel Model, including all of Pueblo County. PACOG Urban Area, for which GHG emissions were calculated, is a subset of the larger PPM 2024 Model Update modeling extents. The demographic data is consistent with the State Demographer's Office (SDO) updated forecasts. The same demographic data was used for both the Baseline Plan and the Updated Plan for this "proof of concept" GHG analysis.

Table 8: PACOG Modeling Summary, Baseline Plan

	2030	2040	2050
Socioeconomic Data			
Population	182,758	193,288	198,327
Housing	72,315	76,153	79,350
Employment	80,382	84,768	86,914
Lane Miles by Roadway Type			
Interstate	194	194	194
Expressway	326	326	326
Principal Arterial	301	373	380
Minor Arterial	393	470	481
Collector	306	1,006	1,095
Ramp	19	23	23
Centroid Connector	659	684	684
Total Lane Miles	2,197	3,074	3,182
Person Trip Mode Share			
Drive Alone	71.9%	71.1%	71.4%
Shared Ride	26.6%	27.5%	27.3%
Transit	0.5%	0.3%	0.3%
Non-Motorized	1.0%	1.0%	1.0%
Vehicle and Transit Data			
Vehicle Miles Traveled (VMT)	5,615,909	6,193,646	6,223,802
VMT per Capita	30.7	32.0	31.4
Transit Boardings	4,265	2,606	2,673

Table 9: PACOG Modeling Summary, Updated Plan

	2030	2040	2050
Socioeconomic Data			
Population	182,758	193,288	198,327
Housing	72,315	76,153	79,350
Employment	80,382	84,768	86,914
Lane Miles by Roadway Type			
Interstate	194	194	194
Expressway	326	326	326
Principal Arterial	314	387	404
Minor Arterial	396	481	492
Collector	310	1,016	1,128
Ramp	19	23	23
Centroid Connector	664	684	689
Total Lane Miles	2,222	3,111	3,255
Person Trip Mode Share			
Drive Alone	73.2%	68.0%	68.2%
Shared Ride	21.7%	26.3%	26.2%
Transit	0.6%	1.2%	1.1%
Non-Motorized	4.5%	4.5%	4.5%
Vehicle and Transit Data			
Vehicle Miles Traveled (VMT)	5,232,778	5,751,863	5,951,124
VMT per Capita	28.6	29.8	30.0
Transit Boardings	10,777	12,429	11,583

5 Impact

Based on the proposed investments, the Pueblo Metropolitan Planning Organization (MPO) region expects to see a decrease in overall trips taken and miles driven, increase in active transportation and transit usage, and a decrease in VMT. In order to determine which investments would best achieve these targets, PACOG evaluated eight multi-strategy scenarios to identify the investments that would produce the greatest reduction in GHG emissions.

Table 10 shows the overall impacts comparing the *Baseline Plan* to each of the *Updated Plan* scenarios that were evaluated. Reductions that meet the GHG reduction targets that were set for PACOG are shown in **bold colored text**. An overall explanation for reduction in VMT and non-SOV trips is a multifaceted approach that combines strategies for increasing WFH shares, improving transit operations, and increasing mode share of non-motorized modes for trips of five miles or less in length.

Table 10: Scenarios Evaluated and GHG Emissions Results

Scenarios Modeled		GHG Emissions Million Metric Tons (MMT)			GHG Emissions Reduction Million Metric Tons (MMT)		
Scenario	**Description**	**2030**	**2040**	**2050**	**2030**	**2040**	**2050**
Baseline	2045 LRTP Network/Bus Routes	0.4836	0.3017	0.1705			
Action1	Funded Projects, Existing % WFH	0.4791	0.2994	0.1696	0.0045	0.0024	0.0009
Action 2	Funded Projects, Increased % WFH (2-8-18-25)	0.4683	0.2930	0.1659	0.0153	0.0087	0.0045
Action 3	Funded Projects, Increased % WFH (9-13-23-30), Increased Transit Frequency (45-Minute Headways)	0.4612	0.2889	0.1579	0.0224	0.0129	**0.0126**
Action 4	Funded Projects, Increased % WFH Participation (10-15-30-40), Increased Transit Frequency (45-Minute Headways)	0.4542	0.2855	0.1617	**0.0294**	**0.0162**	**0.0088**
Action 5	Funded Projects, Increased % WFH Participation (9-13-23-30), Increased (+1%) Non-Motorized Mode Share	0.4599	0.2875	0.1628	**0.0237**	**0.0143**	**0.0077**
Action 7	Funded Projects, Increased % WFH Participation (10-15-30-40), Increased (+3%) Non-Motorized Mode Share, Improved transit speed (+25%)	0.4446	0.2779	0.1575	**0.0390**	**0.0239**	**0.0130**
Action 8	Funded Projects, Increased % WFH Participation (12-20-33-42), Increased (+3%) Non-Motorized Mode Share, Improved transit speed (+25%)	0.4393	0.2750	0.1558	**0.0443**	**0.0267**	**0.0146**
Action 9	Funded Projects, Increased % WFH Participation (12-20-33-42), Increased (+3%) Non-Motorized Mode Share, Improved transit speed (+25%)	0.4402	0.2737	0.1582	**0.0434**	**0.0280**	**0.0123**
				Required GHG Reduction	**0.03**	**0.02**	**0.01**

Appendix C. PACOG GHG Analysis and Modeling Technical Documentation Memorandum

Memorandum

WILSON & COMPANY
HIGHER RELATIONSHIPS

To: Eva Cosyleon, PACOG MPO Manager

From: Maureen Paz de Araujo (W), Mary Lupa (W), Dean Munn (CP)

Date: 5/23/2025

Re: PACOG Greenhouse Gas (GHG) Analysis and Modeling Technical Documentation

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SUMMARY OF CONTENTS

In this memo, the following sections are provided to users of the 2024 PACOG GHG Travel Model:

- A review of the updated PACOG Model, conducted in 2024, including an overview of the Scenario Builder and the GHG strategies available for testing.
- Methodologies underlying the Work from Home, Transit Sensitivity, and Non-Motorized Trip Adjustment Features.
- Attachments containing detailed steps in the PACOG GHG process:
  - Attachment A: Using the PACOG GHG Scenario Builder
  - Attachment B: GHG Emissions Calculations Guidance
  - Attachment C: Work from Home Analysis and Modeling Methodology
  - Attachment D: Non-motorized Trip Adjustment Modeling Methodology

PROOF OF CONCEPT

To summarize, the PACOG GHG Model / Scenario Builder was successfully applied to a battery of "proof of concept" Updated Plan/Action Scenario tests and the results are summarized in the PACOG GHG Conformity Report. The analysis and modeling used the PACOG adopted 2045 Long Range Transportation Plan as the Baseline Plan/Reference Scenario. Eight Updated Plan/Action scenarios were evaluated producing varying levels of GHG emission reduction conformity/compliance with the targets set for PACOG. The Baseline Plan and an Updated Plan scenarios that achieved compliance with the PACOG GHG emission reduction targets are presented in Table 10 of the "proof of concept" PACOG GHG Conformity Report. This report provides descriptions of the Updated Plan scenarios that were evaluated and their results, demonstrating that the PACOG model is an incisive tool for building successful GHG strategies.

PACOG 2024 TRAVEL MODEL UPDATE OVERVIEW

In early 2024 PACOG completed an update to the MPO's Travel Demand Model, the Pueblo Planning Model (PPM). The Model Update added key components to the model that were needed to support GHG analysis and demonstration of conformity with the Colorado GHG Planning Rule. Key updated and new components of the 2024 Model Travel Update, fully documented in the separate *2024 Model Update/Validation Pueblo Planning Model Methodology Report*, included:

- **Extended Model Forecast Horizon** – The new modeling system accommodates forecasts out to 2050, extending the model horizon an additional five years from the previous 2045 LRTP planning horizon. The model update also added interim year scenarios for 2030 and 2040 to the 2020 base year and 2050 planning horizon scenarios, with the 2050 planning horizon scenario replacing the 2025 Travel Model Update's 2045 planning horizon scenario in preparation for the 2050 LRTP planning cycle.

- **Updated Observed Traffic Data** – The model integrates 2020 traffic count data by auto, Single Unit (SUT) and Multi Unit (MUT) truck.
- **Zone System Revisions** – Zonal coverage was changed to match CDOT's Traffic Analysis Zone (TAZ) structure to provide better geographic resolution, and total consistency between the DOT and PACOG regarding base and forecast land use assumptions.
- **Zonal Data Update** – Socioeconomic data was updated for population, households, median income, and group quarters (2020 Census). Employment data updated using the 2020 Quarterly Census of Employment & Wages (QCEW), data obtained from the Colorado Dept. of Labor & Employment, including employment point data (2021). Trip generation disaggregation values, and trip distribution targets utilize the 2010 Pueblo Front Range Household Survey data. An updated statewide travel survey is in progress.
- **More Detailed Truck Vehicle Classes** – Previous versions of the model used Single Unit (SUT) and Multi Unit (MUT) trucks in trip generation and internal trip distribution but then collapsed this category into a generic truck category in later model steps. This version carries SUT and MUT classes through all model steps and outputs.
- **Transit Network/Model** –Transit routes, stops, and service characteristics are included in the PACOG model for the first time. This additional transit network information is used to support transit skimming used in Mode Choice modeling and later in transit assignments. Roadway network details and data attributes were expanded to support transit modeling as well.
- **Addition of Mode Choice Modeling** – This is a new model component that was added to improve the model's sensitivity to anticipated future scenarios. This component explicitly models individual choices related to traveling by auto and transit depending on trip purpose and characteristics of the journey to the destination location. Addition of the mode choice step significantly changed outputs and subsequent model steps related to Production-Attraction to Origin-Destination (PA-OD) conversion.
- **Expanded Traffic Assignment** – The PACOG model provides traffic flow outputs for AM and PM peak hours, the remaining 22 Off Peak hours, and daily totals. Outputs for vehicle classes are now split into Autos, SUT, and MUT. The process adds a Passenger Car Equivalent (PCE) methodology that accounts for the fact that trucks use more road capacity than autos. A daily transit route assignment is added as well, with transit outputs and reporting.
- **Updated User Interface, Analysis, and Reporting** – The PACOG model's original reporting capabilities were updated to work with the new components/updates. Several new reporting outputs were added to summarize mode choice and transit assignment results. Reporting capability now includes customized Greenhouse Gas (GHG) reporting/output. In accordance with guidance from CDOT and APCD at the time GHG output was formatted in comma separated variable format that could be readily imported to an Excel worksheet. The intent was to support input to MOVES GHG emissions calculations.
- **Addition of a GHG Scenario Builder** - A set of steps and processes were formalized in a GHG Scenario Builder. The GHG Scenario Builder allows PACOG technical staff to rapidly evaluate policy and operational GHG reduction strategies using their updated travel model for Greenhouse Gas (GHG) testing and subsequent processing using MOVES. The 2024 Model Update GHG Scenario builder included three policy/operational tools that allow the user to evaluate scenarios that include shifts in Work from Home (WFH) participation by income quartile, increased transit service frequency (reduced bus transit headways), and increased transit operating speeds.

- **Addition of GHG Link Data Report** – It was important to streamline the output of model assignment results to conform with input requirements to MOVES during the 2024 Travel Model Update. A preset report was added to create a comma separated variable report of assignment results for the AM and PM peak hour and 22-hour off-peak period for input to and processing by MOVES to calculate GHG emissions.

2024 TRAVEL MODEL GHG ANALYSIS SCENARIO BUILDER OVERVIEW

The 2024 PACOG Travel Model Update added a GHG Scenario Builder tool. To streamline the integration and testing of GHG reduction strategy packages the GHG Scenario Builder add-in uses check boxes and spinners to facilitate rapid configuration of multiple strategy GHG Reduction Plan Update scenarios for processing through the EPA Motor Vehicle Emission Simulator (MOVES) model to estimate the mobile source emissions associated with each scenario modeled using the 2024 PACOG Travel Model.

2024 PACOG Travel Model Update GHG Scenario Builder

The GHG Scenario Builder supports scenario-based analysis of multiple non-supply (highway network/transit system) GHG reduction/mitigation strategies to support GHG Conformity demonstration. Initially, three basic demand side strategies that were deemed to be applicable and feasible in the Pueblo MPO context were incorporated into the 2024 PACOG Travel Model Update GHG Scenario Builder. These three strategies step beyond highway network and transit system "projects" to produce GHG emissions reductions. The GHG Scenario Builder facilitates rapid analysis and sensitivity evaluating the effectiveness of these GHG reduction strategies, either individually or as multi-strategy inputs that affect travel demand. Multi-strategy approaches include greater Work from Home participation, and strategies that influence mode choice and result in shifting travel to transit and/or non-motorized travel modes. The initial three GHG Scenario Builder tools are as follows:

1. **Increased Work from Home Participation** – Prior to the Covid-19 pandemic, and certainly during and after this pandemic, workers who were able to conduct their work off-site were either allowed or required to do so. The trend toward allowing WFH has continued. Future GHG scenarios evaluate potential increased WFH percentages using four income classifications. These strategies would be implemented at a policy level working with employers.
2. **Increased Transit Service Frequency** – Increased transit service frequency can make transit more attractive as a travel mode, resulting in a shift from personal automobile to transit as a preferred mode of travel. With more attractive bus service, additional travelers for all trip purposes will shift to bus transit. The 2024 PACOG Travel Model includes a comprehensive bus system/transit model that can be used to evaluate new routes/services as GHG reduction projects. Systemwide modifications to transit service frequency can also be evaluated using the GHG Scenario Builder. The user can apply service frequency multipliers e.g., to implement 40-minute headways in the place of existing 60-minute headways.
3. **Increased Transit Travel Speeds** – Transit buses generally travel at average speeds that are less than automobiles. This is due to the impact of dwell times at stops and delays at signals and when entering and exiting through travel lanes from bus stops. Increased transit operating speeds can make transit more attractive as a travel mode, resulting in a shift from personal automobile to transit as a preferred mode of travel. With more attractive bus service, additional travelers for all trip purposes will shift to bus transit. The validated 2024 PACOG Travel Model set the transit bus speeds at 50% of automobile running speeds. The GHG Scenario Builder can be used to modify the relationship between auto speeds and transit auto speeds. From an operating perspective, increased transit operating speeds can be achieved by implementing improvement projects such as transit signal priority (TSP) signal phases combined with nearside bus stops.

Updated 2024 PACOG Travel Model GHG Analysis Scenario Builder

Through a collaborative process, the Colorado Statewide Modeling Coordination Group (SMCG) reset the GHG Planning Rule conformity determination modeling requirements and approval processes as well as the roles of CDOT, APCD, and the five MPO's in the process. The outcome of the SMCG collaboration significantly changed the modeling and approval process from the process that was in place for the 2022 GHG conformity demonstrations by CDOT, DRCOG and the NFRMPO. The MPOs would no longer be required or even allowed to run MOVES for their GHG Conformity demonstrations. Output of GHG link data from the PACOG models would be required to be in a georeferenced format, at this time an Esri shapefile to be clipped to include only the officially adopted Urban Area in place in 2022. As a result of these changes, and to make the GHG Scenario Builder more robust, PACOG updated the 2024 Travel Model and GHG Scenario Builder to include the following:

- **Output of GHG Link Data as an Esri Shapefile** – The Maps and Reports GHG Link Data option was modified to produce Esri shapefile output when the Maps and Reports GHG Link Data box was checked. The shapefile is retrieved from the scenario folder Outputs > Reports > Link Maps.
- **Non-motorized (Bicycle and Walk) Enhancement** – An active transportation strategy option was added to the GHG Scenario builder. Investment in walking and bicycle paths and trails, including on-street bicycle lanes, increases the tendency of travelers to use non-motorized modes of travel for shorter distance trips. A new GHG Scenario Builder tool was added to facilitate evaluation of the effect of shifts from auto to bicycle or walk modes for trips up to five miles in length.
- **Addition of 2030 and 2040 Networks and Routes Files in Reference Scenario** – Highway network and transit routes data bases for the 2030 and 2040 interim years required for GHG analysis were added to the PACOG Travel Model Reference Scenario to facilitate building new Plan Update scenarios with additional GHG reduction "projects."

A guide on using the PACOG GHG Scenario Builder is addressed in greater detail in **Attachment A: Using the PACOG GHG Scenario Builder.**

A companion guide to taking the travel model outputs step by step through the GHG emissions calculation process is included as **Attachment B: GHG Emissions Calculations Guidance.**

GHG SCENARIO BUILDER STRATEGY DEVELOPMENT METHODOLOGY

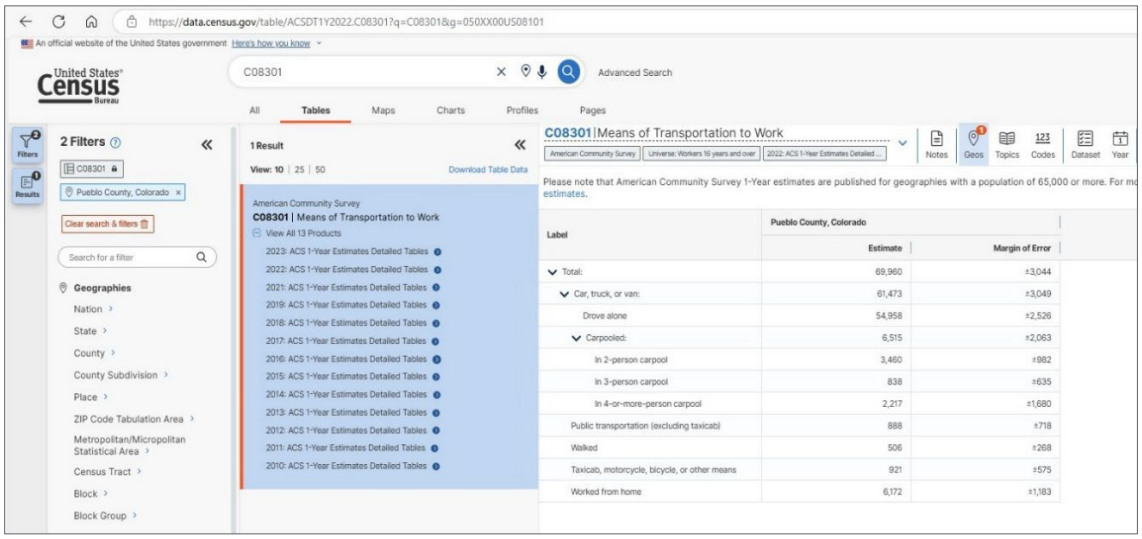
Work From Home Approach and Methodology

The WFH approaches for both the 2024 PACOG Travel Model Update and GHG Scenario Builder were developed using the following steps:

1. **Research the Existing Model Base Year WFH Percentage** – Prior to the advent of WFH becoming widely permitted by selected employers, and prior to the Covid-19 pandemic, some workers did work from home. The U.S. Census American Community Survey (ACS) Table C0301, "Means of Transportation to Work" captures this fact in the question on how workers travel to work, as shown in Figure 1.

Most of the workers in the United States use a private vehicle to travel to work. However, some workers historically have responded that they "Worked from Home." To focus on the need for 2022 model input assumptions, pre-Covid and post-Covid WFH percentages were collected. In Pueblo County, CO, the WFH average increased from an average of 2.8 to 5.8 percent of workers over the period from 2019 to 2022, likely a reflection of the Covid-19 lockdowns.

Figure 1. Capture of ACS Data on Means of Travel to Work, Table C08301



Source: American Community Survey (ACS) Table C08301,
C08301: Means of Transportation - Census Bureau Table, accessed November 2024.

What this work trip information meant was that, for the base year (2022) travel model, it was necessary to remove 5.8 percent of the Home-Work trip productions from the trip generation model step. If a chunk of Home-Work productions is removed from the model to capture base year WFH percentages, the travel model will no longer validate to base year observed traffic.

This raised a few issues which were addressed in the 2024 PACOG Travel Model Update as follows:

- From most households, work trips tend to be longer than shop or recreational trips. The removal of some work trips perturbed the model and resonated through all model steps. This issue was addressed in the PACOG model by conducting the base year WFH correction during the model update/validation work.
- A decision on what the WFH percentage will be in the future must be made – for example, to model years as distant as the 2050 horizon year used in Pueblo. A relatively safe assumption is that the base year value, in this case 5.8 percent, will persist in the coming decades. These assertions must be tempered with the knowledge that Covid-19 created WFH habits which some workers are reluctant to give up, that some employers are requiring a return to office, and that understanding the overall increasing digital nature of daily work is a fact of life, allowing people to do almost anything online from anywhere.
- Some employment types, such as manufacturing, retail, or agriculture, require employees to be present at the work site. WFH percentages are available by employment type, but this area - linking household WFH factors with employment by category - is still under research and development. Externals such as a shift in gasoline prices, employee retention, and others are not captured in travel models but could affect the impact of WFH.

2. Apply WFH Reduction Factor to Home-Work Trip Production Cross Classification Table – Work from Home for a base year model, once researched, was used to reduce the values used in the trip generation production step in the travel model. In a cross-classification trip generation model, typically household size and a wealth attribute are used to create an input table, as in Table 1 below. In the PACOG model there are five household size bins (1, 2, 3, 4, or 5+ persons) and four household income bins, established by quartile from the most recent ACS information. Work productions increase as the household size increases, reflecting the likelihood of more than one worker within the home. The factors in the trip production table are fractional. To reduce the work trips by 5.8%, the Home-Work production factor is simply multiplied by (1 minus 0.058 or 0.942. Ideally, this reduction is done by revising the entire home-work production table during a model update/validation process.

Table 1. Sample Home-Based Work Trip Production Rate Cross-Classification

Income	Household Size				
	1	2	3	4	5+
less than $41,999	0.38	1.02	1.09	1.16	1.16
$41,999 to $49,999	0.73	1.27	1.44	1.82	1.82
$50,000 to $65,999	0.70	1.70	1.56	2.61	2.61
over $65,999	0.70	1.79	2.37	2.35	2.35

A very rough first pass would multiply each of these 20 values in the PACOG model by .942 and run the model. However, national research has shown that WFH share increases as the household income level increases. Thus, it would make sense to establish a reduction factor for each of the four income categories.

3. Develop a Reduction Factor for each of the Four Income Categories – A resource useful in developing income sensitive WFH factors is the U.S. Census Bureau's publication called "Home-Based Workers and the COVID-19 Pandemic." This report discusses average national percentages of WFH by income quartiles estimated before and during Covid-19. These numbers facilitated the estimation of a base year WFH factor by income categories for the PACOG model using national factors by decile. Values sensitive to the four PACOG model income levels were then prepared for the PACOG model. Review and comparison of the PACOG WFH reduction rates to those of other MPO models is underway. Table 2 shows that the rough effect is to remove about 2,700 workers from the travel model.

Table 2: WFH Percentages, PACOG Travel Model 2024

Year 2020 Quartiles	# of Workers	% Worked from Home	WFH Estimate for 2020 Model
INC01	18,031	0.01	180
INC02	16,133	0.03	484
INC03	10,735	0.06	644
INC04	12,953	0.11	1,425
Total	**57,851**		**2,733**

4. Move Beyond the Base Year WFH Adjustment – With a base year fitted to the existing WFH factors using the revised Home-Work trip production table, GHG scenarios can be generated and run to reflect the base year percentage of WFH trips. Any increase or decrease in WFH levels can be modeled by:

    - Manually altering the trip production factors in a particular scenario and running the model.
    - Editing the TransCAD GISDK code to allow scenario specific factors to be called up, stored and run in that scenario.

    The 2024 PACOG Travel Model's GHG Scenario Builder integrates the approach summarized by the second bullet to allow sensitivity testing of a range of WFH percentages by income quartile.

The analysis of and implementation of WFH strategies within the PACOG GHG Scenario Builder is addressed in greater detail in **Attachment C:** ***Work from Home Analysis and Modeling Methodology.***

Transit Operational Improvements Approach and Methodologies

Transit service enhancements also provide a means of shifting trip makers away from the automobile mode. Selected for the PACOG travel model were two potential transit changes: increasing the frequency of buses and increasing the speed at which buses travel during their route. In general, time is a critical feature of transit travel with out-of-vehicle time, such as waiting for a bus, is weighted more heavily by the rider than in-vehicle time, such as riding on a bus. Hence the two choices for enhancing the bus mode may be applied individually or as a set, with each choice affecting potential riders in a distinct manner. Given transit system funding, both choices are feasible enhancements to a transit system.

Non-Motorized Travel Mode Approach and Methodology

Since non-motorized modes are not included in the PACOG mode choice model, a travel time adjustment cannot be implemented as was done by other Colorado MPO's. Instead, an elasticity concept was developed, where an increase in non-motorized trips impacts the auto trips. The impact on auto trips is greatest for short distance trips and is almost negligible for trips over five miles. This approach was derived from the Flagstaff AZ travel model, where household survey data and Streetlight data on non-motorized trips were available. The non-motorized adjustment occurs inside the model, just after mode choice, and reduces auto trips using the elasticity equation which is summarized in Table 3 on the following page.

Table 3: Auto Mode Share Factor for Increases in Non-Motorized Share by Trip Distance

Dist	Pct Non-Motorized Mode Share Change									
	0%	1%	2%	3%	4%	5%	10%	20%	30%	100%
0.25	1	0.990	0.980	0.970	0.960	0.950	0.900	0.801	0.701	0.004
0.50	1	0.997	0.994	0.990	0.987	0.984	0.968	0.936	0.905	0.682
0.75	1	0.998	0.996	0.995	0.993	0.991	0.982	0.965	0.947	0.824
1.00	1	0.999	0.998	0.997	0.995	0.994	0.988	0.977	0.965	0.885
1.25	1	0.999	0.998	0.998	0.997	0.996	0.992	0.984	0.976	0.918
1.50	1	0.999	0.999	0.998	0.998	0.997	0.994	0.988	0.982	0.939
1.75	1	1.000	0.999	0.999	0.998	0.998	0.995	0.991	0.986	0.954
2.00	1	1.000	0.999	0.999	0.999	0.998	0.996	0.993	0.989	0.964
2.25	1	1.000	0.999	0.999	0.999	0.999	0.997	0.994	0.991	0.971
2.50	1	1.000	1.000	0.999	0.999	0.999	0.998	0.995	0.993	0.977
2.75	1	1.000	1.000	0.999	0.999	0.999	0.998	0.996	0.994	0.981
3.00	1	1.000	1.000	1.000	0.999	0.999	0.998	0.997	0.995	0.985
3.25	1	1.000	1.000	1.000	0.999	0.999	0.999	0.997	0.996	0.987
3.50	1	1.000	1.000	1.000	1.000	0.999	0.999	0.998	0.997	0.990
3.75	1	1.000	1.000	1.000	1.000	1.000	0.999	0.998	0.997	0.991
4.00	1	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.998	0.993
4.25	1	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.998	0.994
4.50	1	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.998	0.995
4.75	1	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.996
5.00	1	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.996

Factors are applied to auto trips immediately after mode choice

The auto adjustment affects traffic assignment outputs from each model scenario with Vehicle Miles Traveled (VMT) reductions appearing in the modeled output when the non-motorized mode share is increased. Using the GHG Scenario Builder, non-motorized mode share for trips up to five miles in length may be increased by shifting auto trips to non-motorized modes.

This GHG Scenario Builder component strategy may be adaptable to evaluation of land-use based GHG reduction strategies because should also be sensitive to land use scenarios where there is more density/in-fill, and the resulting new trips would be expected to be shorter. The methodology is described in greater detail in **Attachment D:** ***Non-Motorized Trip Adjustment Modeling Methodology***.

Appendix D. PACOG Coordinated Agency Review Memorandum

COLORADO
Department of Transportation
Division of Transportation Development

PACOG Coordinated Agency Review Memorandum

To: Transportation Commission.
From: Sabrina Williams, Scott Ramming; CDOT
Date: January 13, 2026.

Subject: Overview of Coordinated Modeling Approaches for Compliance with GHG Rule (2 CCR 601-22)

Background

PACOG has completed its efforts to model Greenhouse Gas (GHG) emissions within the PACOG MPOIO boundary in order to comply with 2 CCR 601-22, referred to herein as the Standard. Throughout this process, CDOT coordinated closely with Colorado Air Pollution Control Division (APCD) as well as members of the Statewide Model Coordination Group (SMCG) on the most appropriate ways to proceed. After reaching agreement on the process for representing emissions in the PACOG area, CDOT was given opportunity to review and comment on this representation of travel and emissions as presented in PACOG's Long Range Transportation Plan and GHG emissions analysis through an interagency review. This memorandum documents CDOT's interagency review period and comments received on the boundary file that spatially represents the PACOG area as well as the appropriateness of any links that were required to be split at this boundary file for the purposes of performing GHG emissions calculations associated with the Updated Plan.

Boundary File Representing the PACOG Compliance Area

Reviewing Agency: CDOT

PACOG provided CDOT the boundary file developed by PACOG and consultant staff for spatially representing the PACOG GHG compliance area, which comprised a representation of the MPO boundary on a statewide scale. PACOG requested CDOT to review and either propose revisions/modifications of the representation of their MPO boundary or provide concurrence. CDOT identified no errors in the representation of PACOG's MPO boundary as legally defined for this Long Range Transportation Plan. Therefore, CDOT approved the use of the boundary file initially developed by PACOG and consultant staff for representing the roadways within the MPO boundary for this plan without modifications.

Splitting Links at the PACOG MPO Boundary

Reviewing Agency: CDOT

Following CDOT review and approval of the representation of the PACOG MPO area for the purposes of calculating GHG emissions, PACOG split the roadway links from the travel model at locations where portions of roadways extended outside of the MPO area into another GHG compliance area's boundary. PACOG provided CDOT with the statewide roadway network with the split links at the approved PACOG boundary file and requested CDOT to review that all links crossing outside of the MPO boundary had been correctly split at their MPO boundary. CDOT confirmed in the review that the correct boundary file had been used to split the roadway network links and that links crossing outside the PACOG MPO boundary as represented in the PACOG travel model had been correctly split with links or sections of links crossing outside the MPO boundary.

Appendix E. MOVES Methodology Memorandum

COLORADO
Department of Transportation
Division of Transportation Development

2025 MOVES4 Modeling and Greenhouse Gas Emissions Calculation Methodology Memorandum

To: Transportation Commission.
From: Sabrina Williams - CDOT and Dale Wells - CDPHE.
Date: December 22, 2025.

Subject: CDOT Greenhouse Gas Transportation Planning Standard — 2025 MOVES4 Modeling and Greenhouse Gas Emissions Calculations Methodology Documentation.

Introduction

This document summarizes the methodology used to calculate greenhouse gas (GHG) emissions for demonstrating compliance with the CDOT Greenhouse Gas (GHG) Transportation Planning Standard (Standard). Previous GHG emissions calculations to support CDOT were conducted by the Air Pollution Control Division (APCD). This methodology represents a coordinated approach between CDOT and APCD's modeling teams to represent likely future on-road GHG emissions as accurately as possible. The approach was also agreed upon by the Statewide Model Coordination Group (SMCG). Several refinements and improvements were made compared to the previous methodology for calculating GHG emissions due to the availability of new models, data and assumptions. All data and files utilized in the GHG emissions analysis methodology were reviewed by an individual other than the person who developed the data and/or performed the modeling as documented throughout.

The process for calculating GHG emissions begins with generating emission rates using the EPA's Motor Vehicle Emissions Simulator Model (MOVES). The GHG emissions rates developed in MOVES are the same statewide and applied consistently between all agencies to calculate mass total GHG emissions for a compliance area. The emission rates are multiplied by the vehicle miles traveled (VMT) from the Travel Demand Model (travel model) at the link level for individual hours of the days based on the observed vehicle mix from CDOT's statewide Automated Traffic Recorder (ATR) station network within a Microsoft (MS) Access relational database. The result of querying the database is the predicted total mass emissions of GHGs for the roadways represented in the travel model for an average weekday. This requires a series of data analysis and post-processing steps to correctly compile these three main parameters (emissions rates, travel behavior, vehicle mix) into compatible formats within the database.

In 2025 the three significant new considerations for how GHG emissions are calculated for the purposes of an agency demonstrating compliance with the Standard were adopted by consensus through the Statewide Model Coordination Group (SMCG). These considerations involve updates to (1) vehicle emissions rates, (2) vehicle mix assumptions, and (3) the number of vehicle classes considered.

Each step in the emissions calculation process results in standalone datasets (emissions rates, vehicle mix, travel modeling) that are created independently, but compiled in a manner that allows this data to interface with each other through relational database software (MS Access) that calculate total GHG mass emissions for a compliance agency. All data used in the emissions analysis developed by an individual (or agency) was then independently reviewed by another individual (or agency) for data validity and accuracy prior to incorporation into the final GHG emissions calculations methodology. In addition to the analysts and reviewers noted throughout, all SMCG member agencies were extended the opportunity to perform additional data review at each step in development of the emissions calculations, including contributing to the underlying framework that established the methodology and resultant procedures.

Vehicle Emissions Rates

Performed by: Sabrina Williams-CDOT

Reviewed by: Dale Wells-CDOT

New GHG Rates were required to incorporate the State Interagency Coordination Team (IACT) determination, as defined under 2 CCR 601-22 Section 1.44, May 5, 2025 that the CDOT Department of Accounting and Finance (DAF) projections on future EV adoption be used in the GHG emissions rates development. The previous GHG emissions rates were developed using asserted adoption curves of early, mid and late term EV adopters annually with individual forecasts for passenger vehicles and SUVs/light-duty trucks through 2050. CDOT DAF, as part of CDOT's 10-Year Plan development, created a forecast of expected revenue through the year 2050. As part of their revenue forecasting effort, DAF also generated a forecast of light-duty EV fleet growth in Colorado (since revenue from EVs is different from revenue from fossil-fueled vehicles). DAF's forecast estimated 950,000 light-duty EVs in Colorado in 2031, with an estimate of 95% of light-duty vehicles being EVs in 2050.

Separate EV adoption rates were initially developed for passenger cars and SUVs/light-duty trucks as at that time very few EV SUVs/light-duty trucks were available for purchase and it was unknown when additional electrified SUVs/light-duty trucks would be commercially available. Since the time the initial EV planning assumptions were used to develop the original GHG rates, numerous electrified SUV make and models are now commercially available and auto manufacturers continue to release additional EV SUVs for sale. Furthermore, manufacturers have indicated that electrified light-duty trucks will become more broadly available in future years. The Colorado Energy Office (CEO) has completed numerous studies on likely future EV adoption for planning purposes such as EV charging infrastructure needs. These studies also project greater levels of electrification of these larger passenger vehicles within the next five years. Given that a significant percentage of passenger vehicles registered in the state are classified as SUVs

and light-duty trucks, the earlier SUV/light-duty truck EV adoption rates was adjusted to reflect the quicker levels of EV adoption now expected. Therefore, in future years the rate of EV adoption is assumed to be the same between passenger cars and SUVs/light-duty trucks in developing the new GHG rates whereas previously they differed.

Vehicle Mix Assumptions

Performed by: Juan Robles-CDOT

Reviewed by: Sabrina Williams-CDOT, Dale Wells-CDPHE

Overview

The vehicle mix represents the type (i.e., motorcycles, passenger cars, SUVs, vans, trucks, etc.) of vehicles operating on a roadway. The GHG emissions rates are highly variable by vehicle class and generally increase with the size of the vehicle. For example, passenger cars emit significantly less GHGs per vehicle mile traveled (VMT) than heavy-duty trucks. While travel demand models forecast total on-road travel behavior, including trips from commercial vehicles, no travel demand model in the state is calibrated for commercial travel accurately enough to properly assign the on-road vehicle mix. Therefore, the real-world observed vehicle mix used to calculate GHG emissions for the Standard is developed from traffic observations (counts) collected by CDOT's vehicle count stations.

Vehicle mix is assigned from ATR data using both continuous and short-duration counts stratified by hour of the day, the 13 Federal Highway Administration (FHWA) vehicle classifications as well as roadway and urban or rural area type updated for more recently observed years. Each ATR station's counts were used in conjunction with VMT weighting for the roadway to develop a ratio of vehicle types by hour for all of the major roadway types in Colorado. The VMT-weighting of the counts is a refinement of the previous vehicle mix assignment that used unweighted (straight) counts in the previous emissions calculations. The VMT-weighting method was developed by CDOT and APCD in order to better reflect the vehicle mix outside the Front Range where the majority of ATR stations are located. Furthermore, for the 2025 vehicle mix used to calculate GHG emissions rates, post-pandemic (2023) vehicle classification counts were used. In the previous GHG emissions calculations methodology, pre-pandemic (2017-2019) vehicle classification counts were used. SMCG determined that an update to post-pandemic vehicle classification counts should be made statewide to the emissions calculation methodology in order to more accurately reflect the vehicle mix that is currently present on roadways in the state as transportation behavior has altered since COVID due to factors including increased remote employment and land use changes.

ATR Count Data Methodology

To assign the vehicle mix percentages by roadway functional category, a total of 316 statewide count stations that collect hourly classification data were used. Of these count locations, 75 of them are permanent traffic recorders (ATRs), and 241 were short-term counts for the years 2022 and 2023. The 13-bin FHWA hourly counts were then grouped into the five Highway Performance Monitoring System (HPMS) class groups used in MOVES to calculate emission rates (passenger vehicles [including SUVs and light-duty

trucks], motorcycles, buses, single unit heavy-duty trucks and combination heavy-duty trucks)

To calculate the vehicle mix fractions or percentages for each functional class by individual hours, the VMT-weighted sum of all hourly volumes from each class was divided by the total number of counts for each class. This means that ATR stations have a larger weight than short-term count locations because there are many more hourly counts available from ATRs, and that count stations with higher volumes or VMT have a higher weight than stations with low volumes or VMT.

A simplified example would be if the number of total individual hourly volumes at an ATR station were 20,000 vehicles and 17,000 vehicles were observed to be passenger vehicles and 1,000 vehicles were single unit (SU) trucks. In this case, the percentage of passenger vehicles for that station in that individual hour is assigned to be 85% and the fraction of SU trucks would be 15%.

Figure 1 shows percentages for the Urban Freeways and Expressways functional category with reliance on 11 ATRs. The average percentages for this class are shown in green and the percentages for each of the ATRs are below the green bar. Only the aggregated values for the entire area type and roadway functional classification are used to calculate emissions for the state, the individual data shown for each ATR station is used in the calculation of average vehicle mix percentages.

Figure 1. Example illustrating calculation of vehicle mix percentages as a weighted average of count data from multiple locations

Sta_ID	Rural_Urban	Func_Class	Average VMT	M-cycles	Pass_veh	Buses	SU	Combo
	Urban	**(2) Freeway & Ex**	109,926	**0.17%**	**97.37%**	**0.13%**	**1.25%**	**1.09%**
000003	Urban	(2) Freeway & Expr	134,451	**0.19%**	**97.38%**	**0.06%**	**1.12%**	**1.25%**
000004	Urban	(2) Freeway & Expr	168,873	**0.07%**	**98.27%**	**0.29%**	**0.76%**	**0.61%**
000503	Urban	(2) Freeway & Expr	57,247	**0.10%**	**98.96%**	**0.07%**	**0.50%**	**0.37%**
000504	Urban	(2) Freeway & Expr	246,762	**0.18%**	**97.05%**	**0.23%**	**1.53%**	**1.02%**
000506	Urban	(2) Freeway & Expr	91,498	**0.13%**	**97.97%**	**0.10%**	**1.24%**	**0.56%**
100331	Urban	(2) Freeway & Expr	131,878	**0.20%**	**98.27%**	**0.20%**	**0.85%**	**0.48%**
103608	Urban	(2) Freeway & Expr	104,847	**0.11%**	**98.44%**	**0.09%**	**0.72%**	**0.64%**
103684	Urban	(2) Freeway & Expr	81,433	**0.12%**	**89.91%**	**0.25%**	**3.38%**	**6.34%**
103712	Urban	(2) Freeway & Expr	11,012	**0.10%**	**89.71%**	**0.11%**	**3.29%**	**6.78%**
105548	Urban	(2) Freeway & Expr	164,048	**0.19%**	**97.45%**	**0.07%**	**1.22%**	**1.08%**
107556	Urban	(2) Freeway & Expr	121,040	**0.13%**	**96.99%**	**0.10%**	**1.77%**	**1.02%**

Of the seven roadway functional categories:

(1) Interstate

(2) Freeway & Expressway

(3) Other Principal Arterial

(4) Minor Arterial

(5) Major Collector

(6) Minor Collector

(7) Local

CDOT does not collect classification data on Minor Collectors, Ramps or Local roads that would permit the calculation of accurate mix percentages for these roadways. Thus, there is no vehicle classification count data available at a statewide level for these roads. However, travel models must account for vehicle travel for all road types in the state to accurately predict passenger trips and associated VMT whose emissions need to be accounted for. CDOT and APCD determined the most suitable approach for assigning the vehicle mix on these access roads for the purposes of calculating GHG emissions was to assign the same vehicle mix as the most similar roadway functional classification for which vehicle classification was available. In this case, functional classes six and seven would use the rates from Major Collectors.

The result is a compiled table of the observed individual hourly vehicle mix by HPMS category for the seven roadway functional classifications that are represented in the travel modeling for a GHG compliance area.

The vehicle mix is applied to the travel model run data in the MS Access database that calculates the mass total emissions and is not considered directly within the MOVES modeling to develop the GHG emissions rates as discussed later in the documentation of the GHG emissions analysis methodology.

Vehicle Classes Considered

Performed by: Mobility Analysis Section-CDOT

Reviewed by: Sabrina Williams-CDOT, Juan Robles-CDOT

The original GHG rates developed in MOVES for use in prior analyses to demonstrate compliance with the standard had unique rates for six HPMS vehicle categories: motorcycle, passenger cars, passenger trucks, buses, single unit heavy trucks, and combination heavy trucks. These GHG emissions rates by HPMS category are applied to the travel model data in the MS Access database in conjunction with the observed vehicle mix fractions (observed vehicle classification counts) to calculate total mass GHG emissions for a compliance area. However, Division of Transportation Development Mobility Analysis Section staff realized that because vehicle classification counts are recorded by the number of axles and length of a given vehicle, the CDOT count network often records SUVs and light-duty trucks as passenger cars. Furthermore, in MOVES the type of vehicles are not grouped by the body style of a vehicle, rather by similar characteristics of the engines and associated emissions profiles. This results in many vehicles that are commonly thought of as passenger vehicles, such as wagons and crossovers, being considered to be passenger trucks in the MOVES model.

To more accurately account for the number of larger passenger vehicles and to minimize the discrepancy between the CDOT count network's data collection mechanism and the MOVES model vehicle source types, a refinement was made to the number of vehicle classes considered in the GHG emissions calculations to combine passenger cars and SUVs/light-duty trucks to reflect total passenger vehicles. This was performed by aggregating the observed vehicle classification counts to a new HPMS25 vehicle category

representing all passenger vehicles instead of differentiating between passenger cars and SUVs/light-duty trucks. This resulted in reducing the number of HPMS classes considered in the MOVES model to develop the updated GHG emissions rates from six to five categories of vehicles: motorcycles, passenger vehicles, buses, single-unit heavy trucks, and combination heavy trucks.

The refinements to the number of vehicle classes considered results in an increased representation of SUVs/light-duty trucks and their associated GHG emissions in the state that more accurately depicts present real-world observed conditions. Furthermore, the approach of representing all passenger vehicles as a single HPMS category is now consistent with the manner in which CDOT reports HPMS data for the state.

MOVES4 GHG Emissions Rates

Performed by: Sabrina Williams, CDOT

Reviewed by: Dale Wells, APCD-CDPHE

Overview

Incorporating the DAF future EV planning assumptions required new emissions rates to be developed in MOVES. Emissions rates were generated using the MOVES version 4.1.2 (MOVES4). Previously MOVES version 3.0.1 (MOVES3) was used to generate the original GHG emissions rates. The change in GHG emissions rates specific to changing to model versions is minimal due to the previous and continued high levels of EV/ZEV adoption assumed in future years, which is discussed in later sections. For more information about GHG modeling using MOVES, see the Using MOVES for Estimating State and Local Inventories of On-road Greenhouse Gas Emissions and Energy Consumption guidance document. The MOVES4 Run Specifications used to generate the GHG emissions rates may also be found in later sections.

MOVES4 Run Specifications

The run specification (RunSpec) parameters outlined below were used to calculate GHG emission rates with MOVES. CDOT performed the MOVES4 modeling to develop the new GHG emissions rates and model results and inputs were reviewed and verified by APCD for accuracy. The MOVES modeling methodology is largely consistent with APCD's previous process to calculate GHG emissions except where noted.

The three modeled years: 2030, 2040, and 2050, used the same run specifications except for where specified (e.g., the year being modeled). Each of the three modeled years has five related run specifications to separate the emission rates by vehicle type, as described in the On-road Vehicles section, i.e., five MOVES runs per compliance year. This denotes a change from the previous GHG emissions rates that were generated using six model runs to represent vehicle types by aggregating passenger cars with SUVs and light-duty trucks into a single MOVES run. When used for modeling compliance with the Standard the GHG emissions rates are applied identically between an agency(s) baseline plan and compliance plan demonstrations, e.g., there is no emissions benefit given to a compliance demonstration for future EV/ZEV adoption. If an MPO or CDOT were to develop a project in a long-range transportation plan specific to switching vehicle types

or vehicle fuel types in a future year, this will be revisited by SMCG for consideration on how to best represent these types of planning actions.

Scale

The “Scale” parameters define the model type (on-road or non-road), domain/scale, and calculation type.

Model Type

On-road was the model type selected. This estimates emissions from motorcycles, cars, buses, and trucks that operate on roads.

Non-road/off-network emissions were not included. These emissions are from equipment used in applications such as recreation, construction, lawn and garden, agriculture, mining, etc. and are outside of the scope of this analysis.

Domain/Scale

MOVES allows users to analyze mobile emissions at various scales: National, County, and Project. While the County scale is necessary to meet statutory and regulatory requirements for State Implementation Plans (SIPs) and transportation conformity, either the County or National scale can be used for GHG inventories at the federal level. EPA recommends using the County scale for GHG analysis.

The County scale allows the user to enter locally-specific data through the County Data Manager whereas under the National Scale only MOVES default values are used. Providing local data significantly improves the precision of the modeling results and allows the MOVES users to better evaluate future planning scenarios. Therefore, the County Scale was used.

County Scale in MOVES can be used to model a single county, or a larger representative group of counties such as a nonattainment area or entire state that share common emissions characteristics such as fuel types and blends, emissions testing programs, vehicle age and other considerations. For this modeling, Adams County was used as the representative county on MOVES to develop the statewide GHG emissions rates. All non-default inputs in MOVES4 used in the County Data Manager are representative of the most currently available statewide vehicle data compiled by APCD for EPA’s National Emissions Inventory (NEI) Reporting, with the exception of future EV/ZEV adoptions rates at the direction of IACT.

Calculation Type

MOVES has two calculation types - Inventory (total emissions in units of mass) or Emissions Rates (emissions per unit of distance for running emissions or per vehicle for starts and hotelling emissions) in a look-up table format that must be post-processed to produce an inventory. Either may be used to develop emissions estimates for GHGs.

The Emission Rates calculation type was used. Emissions Rates calculation type requires more post-processing; however, this also allows for a consolidated set of GHG emissions rates that can be used statewide by any GHG compliance agency with minimal emissions

modeling required from an MPO. Furthermore, this method provides for not needing to rerun MOVES if there is a change to an agency's travel model.

Time Span

The "Time Span" parameters define the years, months, days, and hours that emissions are calculated.

When Emission Rates is specified in the RunSpec, users may choose to approach the selection of options in the Time Spans Panel differently than when running MOVES in Inventory mode. For example, when modeling running emission rates, instead of entering a diurnal temperature profile for 24 hours, users can enter a range of 24 temperatures in increments that represent the temperatures over a period of time. By selecting more than one month and using a different set of incremental temperatures for each month, users could create a table of running emission rates by all the possible temperatures over an entire season or year.

When using Emission Rates instead of Inventory, the time aggregation level is automatically set to Hour and no other selections are available. Pre-aggregating time does not make sense when using Emission Rates and would produce emission rates that are not meaningful. However, the year, month, and day must still be specified and will affect the emission rates calculated.

The time span parameters specified in the following subsections were also used because the travel model outputs represent an average weekday. These daily emissions are then translated into annual emissions in the final step of the emissions calculation process.

Years

The County scale in MOVES allows only a single calendar year in a RunSpec. Users who want to model multiple calendar years using the County scale will need to create multiple RunSpecs, with local data specific to each calendar year, and run MOVES multiple times.

The years used were 2030, 2040, and 2050. Emission rates for each of these years were calculated separately. This accounts for information such as a changing age distribution of vehicles, fleet turnover and their corresponding fuel types and fuel efficiencies.

Months

MOVES allows users to calculate emissions for any or all months of the year. If the user has selected the Emission Rates option, the Month can be used to input groups of temperatures as a shortcut for generating rate tables for use in creating inventories for large geographic areas.

The months used were January and July to match the previous modeling by APCD. These represent winter and summer months and generally the extremes in annual weather conditions. This accounts for changes in fuel efficiency between warm and cold temperatures throughout the year. The arithmetic averages of emission rates from January and July were used for the final emissions inventory to represent an annual average GHG emissions rate.

Days

Weekdays and weekend days can be modeled separately in MOVES. MOVES provides the option of supplying different speed and VMT information for weekdays and weekend days to allow the calculation of separate emissions estimates by type of day.

The days used were weekdays to match the TDM output data. These represented the emission rates for an average weekday. The results are annualized in one of the final steps for calculating the GHG emissions to approximate a full year.

Hours

The hours used were all 24 hours of the day (i.e., clock hours ending at 1:00 AM, 2:00 AM, 3:00 AM, etc.). These represent the emission rates for individual hours of a day. This accounts for changes in fuel efficiency between warm and cold temperatures throughout the day.

Geographic Bounds

The “Geographic Bounds” parameter defines the county(s) used. For a county-scale run, only one county can be selected per RunSpec. The county used was Adams County, Colorado; however, any county in Colorado could have been selected as the MOVES modeling defined input parameters such as the vehicle age used to estimate emission rates using statewide data.

On-Road Vehicles

MOVES describes vehicles by a combination of vehicle characteristics (e.g., passenger car, passenger truck, light commercial truck, etc.) and the fuel that the vehicle is capable of using (gasoline, diesel, etc.). This is required to specify the vehicle types included in the MOVES run.

The “On-road Vehicles” parameter defines the source types (i.e., vehicle types) and their fuels (gasoline, diesel, electricity, etc.). All combinations of vehicle types and fuels available in MOVES4 were used to calculate the emission rates; except that no EV/ZEVs are assumed for buses or commercial vehicles. The process for assigning what vehicle types are represented in the model run has been refined from the previous method that used separate MOVES runs to represent passenger cars vs. SUVs and light-duty trucks. The MOVES model runs used in the GHG rates update now match the MOVES HPMS types defined in the model that aggregates all passenger vehicles into a single category (HPMS=25).

Table 1 illustrates the HPMS categories.

Table 1. Composition of vehicle types used for MOVES emissions modeling

MOVES Vehicle Source Type	HPMS Name	HPMS (Current)	HPMS (Previous)
Motorcycle	Motorcycles	10	10
Passenger Car	Light-Duty Vehicles	25	20
Passenger Truck	Light-Duty Vehicles	25	30
Light-Commercial Truck	Light-Duty Vehicles	25	30
Other Buses	Buses	40	40
Transit Bus	Buses	40	40
School Bus	Buses	40	40
Refuse Truck	Single Unit Trucks	50	50
Single Unit Short-Haul Truck	Single Unit Trucks	50	50
Single Unit Long-Haul Truck	Single Unit Trucks	50	50
Motor Home	Single Unit Trucks	50	50
Combination Short-Haul Truck	Combination Trucks	60	60
Combination Long-Haul Truck	Combination Trucks	60	60

Road Type

The Road Type in MOVES is used to define the types of roads that are included in the run. There are four categories of road types in MOVES used to represent onroad emissions and they are separated between urban vs. rural and ramp-controlled (Interstates) vs. non ramp-controlled (local roads). Assignment of the correct road type when calculating emissions is important because in MOVES the vehicle drive cycles assumed in the model are variable by road type, e.g., MOVES assumed more stop and go traffic on local roads associated with intersection controls than interstates, as well as area type, e.g., MOVES assumes a greater level of congestion on local roads in urban areas than rural areas. MOVES also has an option for Off-Network road types which would be associated with vehicle emissions not occurring in traffic, e.g., idling vehicles at a large transit station. All road types were selected in MOVES. The Off-Network road

type must be selected for MOVES to execute in Emissions Rate mode, but was not used in the emissions calculations as they are not on-road emissions.

Pollutants and Processes

The Pollutants and Processes Panel allows users to select from various pollutants, types of energy consumption, and associated processes of interest. In MOVES, a pollutant refers to particular types of pollutants or precursors of a pollutant but also includes energy consumption choices. Processes refer to the vehicle mechanism by which emissions are released, such as running exhaust or start exhaust. Users should select all relevant processes associated with a particular pollutant to account for all emissions of that pollutant. Generally, for this project, that includes running emissions, e.g., emissions processes associated with vehicle start-ups, extended idling and refueling occur on Off-Network road types in MOVES.

The CO2 Equivalent pollutant is the sum of the global warming potential of Carbon Dioxide (CO2) and all other greenhouse gases expressed as a unit CO2 Equivalents. (CO2e) is the pollutant of interest in MOVES as it accounts for all greenhouse gas emissions considered in MOVES. MOVES requires several other prerequisite pollutants for CO2e, e.g., methane; whose individual global warming potentials are calculated within the model and appropriately summed with CO2 and reported as CO2e.

General Output

The General Output parameters define the output database, units, and activity.

Output Database

Results from the five related HPMS RunSpecs for a given analysis year (2030, 2040, 2050) can be stored together in a single output database for convenience, or separate databases can be created for each run. The RunSpecs must have the same units and aggregation or MOVES will not execute. A different output database is required for each year and varying MOVES RunSpec. A consistent and informative naming convention for the output database assists in file housekeeping. Five output databases were used for each year modeled representing a single HPMS category for that year. Each output database contained results for the modeled year and vehicle HPMS category.

Units

Users can select from any of the mass unit selection options but should generally choose a unit whose magnitude is appropriate for the parameters being analyzed.

The units selected in the MOVES RunSpecs are grams for mass, joules for energy, and miles for distance.

Activity

MOVES allows the user to select multiple activity output options. As Emissions Rates were selected MOVES automatically reports emissions in mass units per distance traveled (grams/VMT) for each month and hour selected in the MOVES Time Spans panel for each Road Type selected in MOVES.

Output Emissions Detail

This panel allows the users to make selections that will additionally disaggregate the data beyond what is automatically reported by MOVES. Certain selections are automatically made by MOVES based on the RunSpec definition and cannot be unselected.

No optional details were selected in this panel as the outputs automatically reported by MOVES for these RunSpecs contain sufficient detail for calculating GHG emissions in this manner.

Input Database (Formerly the County Data Manager)

The previous panels in MOVES defined the RunSpec and the format of the output data. The next step is to create the input database where files with local data are imported.

The RunSpec parameters selected in the other panels in MOVES define the file structure and required data for the input database and constrain all files imported into MOVES to this structure or errors are generated and the model will not execute. Therefore, it is recommended that the MOVES user make this Input Database the last panel used in the MOVES graphical user interface (GUI) as any alterations to the RunSpec can result in needing to recreate its settings.

One input database was created for each model year for each vehicle HPMS category; a total of 15 MOVES model runs. Data is imported into the input database for each MOVES run, as specified below.

Age Distribution

The Age Distribution in MOVES represents the distribution of the age of each vehicle type in MOVES from 0-30 years old (vehicles whose model years are 31 years and older). The age distribution is a critical input in MOVES as this directly assigns the specific vehicle model years and vehicle characteristics, e.g., fuel types and associated emissions rates. MOVES allows the user to import locally specific data as was performed in this analysis. APCD develops locally specific age distributions from all vehicles registered in the state every three years for the EPA's National Emissions Inventory (NEI) reporting at the county and statewide level, as well as for the Denver Metro/North Front Range 8-hr Ozone Nonattainment Area. For this analysis, the statewide age distribution for the 2024 NEI reporting was imported into MOVES4 except for long-haul commercial vehicles. National default values were used for long-haul commercial vehicles as a significant portion of these vehicles in the state are registered elsewhere in the country.

Average Speed Distribution

Vehicle tailpipe emissions rates are highly affected by the speed the vehicle is traveling. At lower speeds associated with congestion emissions rates are higher and rates decrease until vehicles are traveling at speeds of approximately 55 miles per hour (mph) where at that point emissions rates begin to increase again. MOVES requires an Average Speed Distribution be imported to perform a model run. This distribution is an important input in Inventory Mode as it represents the detailed information concerning the on-road speeds of vehicles and related emissions rates by road type, hour of the day, day of the

week, and month of the year. In Emissions Rates mode, however, the average speed distribution is not used and for this analysis national default values were used.

Fuel

The fuels data in MOVES assigns the specific fuel formulations, including chemical properties, for all petroleum vehicles as well as the fuel types for each vehicle type by model year including representation of EV/ZEVs in the model through the Alternative Vehicles Fuels and Technologies (AVFT) file. For the GHG analysis, default fuel values were used with the exception of the AVFT data.

The AVFT file specifies the fraction of each fuel used by a vehicle type, e.g., gas, diesel, ethanol and electricity, for vehicle model years 1960-2060. It is important to specify these fractions by model year as this provides a more accurate estimate of the fuel economy standards and emissions improvements associated with fleet turnover as older higher emitting vehicles are retired and replaced with lower emitting vehicles than assuming an average fuel mix for an entire vehicle type in MOVES.

In a MOVES run, vehicle data is only considered for the same vehicle model year as the analysis year selected in the RunSpec and the previous 30 vehicle model years, i.e., the fuel mix considered in a specific run is assigned from the Age Distribution in MOVES.

Although EV/ZEVs have zero GHG emissions, these vehicles do have emissions of other pollutants, such as particulate matter, and should be represented within MOVES. Therefore, future EV/ZEV planning assumptions are directly considered within MOVES and there is no “zeroing” out of EV/ZEV VMT, because that VMT corresponds to a GHG tailpipe emissions rate of zero. For this analysis, the AVFT file used the same motor vehicle registration data for the 2024 NEI as the Age Distribution through vehicle model year 2024 after which the DAF EV planning assumptions for light-duty vehicles were incorporated to represent future EV adoption levels. MOVES4 contains default values for future EV adoption for commercial vehicles; however, this data was not used in the model and no EV/ZEVs were considered for commercial vehicles.

Meteorology

Vehicle emissions rates can vary by temperature and humidity, particularly for criteria pollutants and mobile source air toxics. However, GHG emissions from vehicles relate to atmospheric conditions solely based on a driver’s comfort and their likely usage of air conditioning in a vehicle and resultant impacts to fuel economy. The default values for Meteorology in MOVES represent actual climate data for all individual counties in the nation as collected from the National Climate Data Center. MOVES default data for Adams County, Colorado was used for the months of January and July in the analysis, which is consistent with the RunSpec.

Road Type Distribution

MOVES does not have default data for the Road Type Distribution and it must be created and imported by the user. In Emissions Rates the Road Type Distribution data in a MOVES run does not impact the results and is not an important file in the analysis, but must be

present and correctly compiled for the model to run. A Road Type Distribution file was provided by APCD imported in MOVES for the analysis.

Source Type Population

MOVES requires the Source Type Population file to be present in MOVES and there is no national default data available in MOVES. However, this file does not change the results in Emissions Rates as this data is used for calculating vehicle emissions associated with off-network activity, e.g., extended periods of idling at a truckstop or a large number of vehicles congregating at a transit station. As these vehicle emissions are not truly occurring "on-road" they are not accounted for in the analysis or present in the Emissions Rates output files. The Source Type Population was provided by APCD from the 2024 NEI and used in the analysis.

Vehicle Type VMT

The Vehicle Type VMT is required to run MOVES and is very important if Inventory is selected in the RunSpec. However, in Emissions Rates mode this data does not change the results; moreover, a single vehicle classification is considered in this analysis so the VMT considered in MOVES does not vary by vehicle category. Default Vehicle Type VMT data was imported in MOVES for all runs with the exception of the annual HPMS file that was provided by APCD from the 2024 NEI in order for MOVES to run.

Inspection and Maintenance Program

The Denver Metro/North Front Range Ozone Nonattainment Area has a vehicle inspection and maintenance (I/M); i.e., emissions testing program as an emissions reduction strategy in the state implementation plan (SIP) for all or a portion of these nine counties in the state. However, in MOVES there is no GHG tailpipe emissions benefit associated with I/M programs as emissions control devices such as catalytic converters and diesel particulate filters do not reduce emissions of GHGs. In MOVES there is a slight methane credit given to I/M programs associated with evaporative emissions; however, these emissions reductions are insignificant compared to net GHG emissions that are dominated by tailpipe exhaust. The check box for "No I/M Program" was selected since there is not a statewide I/M program and accounting for the minimal GHG emissions credit within the ozone nonattainment area would result in no meaningful change to the results.

MOVES Output Data and Post-processing

Output Database (HeidiSQL)

After MOVES has successfully completed a model run the results are stored in the output database that was created in the RunSpec. The MOVES install package includes HeidiSQL which is an open source database software and results are automatically stored here as well as the data that was imported into the input database for that RunSpec.

The main output file of interest in MOVES for this analysis is the "Rate Per Distance" table. The file associated with each MOVES run contains the emissions rates for the HPMS category being analyzed for the months, road types and pollutants specified in the

RunSpec for every individual hour of the day by speed bin. This table was queried in HeidiSQL to select only emissions of CO2eq as that is the pollutant of interest in the analysis and those results were exported from the HeidiSQL as a .csv file for each MOVES run.

Post-Processing Emissions Rates by Speed and Month

Emissions Rates mode in MOVES does not produce emissions rates associated with speed changes at the level of rates at individual integer speeds in miles per hour values. Rather MOVES aggregates emissions by speed into groups of 16 speed bins with each bin corresponding to a five mile per hour maximum and minimum range of vehicle speeds, e.g., 42.5 mph to 47.5 mph. This results in faster model run times and smaller output files, and could be appropriate in instances where only a qualitative analysis is needed. However, for the purposes of this quantitative analysis a greater level of granularity concerning emissions rates by speeds is needed for GHG emissions results precise enough for accurate comparison to the absolute standards associated with each compliance year.

Previously the emissions rates were post-processed to produce emissions rates in grams per mile at individual integer speeds through interpolation in an additional MS Access database that was separate from the database utilized to calculate total mass GHG emissions for a compliance area. In revising the analysis, the interpolation methodology to develop GHG emissions rates in individual integer mph values remains unchanged, but APCD has consolidated this step into the same MS Access database used by an agency to calculate the total GHG emissions for a compliance area. Average annual emissions rates were similarly generated from a straight average of the emissions rates from the representative months of January and July in MOVES output data in the MS Access database.

Calculation of Mass GHG Emissions

Performed by: Dale Wells-ACPD

Reviewed by: Sabrina Williams-CDOT

Total mass GHG emissions for a compliance area are calculated in MS Access databases for 2030, 2040 and 2050 that are developed by APCD and are unique for each MPO/non-MPO area based on the design and structure of each compliance agency's travel modeling platform as well as the format the travel model runs data is provided.

Each database contains lookup tables for the GHG emissions rates and vehicle mix ratios that are consistent statewide, and the travel model run files specific to each individual agency. There are additional tables in each database that appropriately assign each link a road type from MOVES based on the area type and roadway functional classification based on an agency's travel modeling metadata.

Travel Model Data Considerations

Prior to calculating GHG emissions an agency must remove all links extending outside of their GHG compliance area that are represented in the travel model run. This is performed by a compliance agency splitting any sections of links that may go outside a compliance area in comparison to their boundary in appropriate spatial software, e.g., ESRI geographic information system (GIS) or TransCAD, so that only the portions of the link within a compliance area boundary are considered in the GHG emissions calculations for the agency. Following the splitting of links, the length of those split links must be recalculated. Whether this calculation is done automatically or manually depends on the particular software platform in use. Once the lengths of any split links are calculated, the VMT for the split links can be calculated by multiplying the recently-calculated link length by the predicted travel volumes.

GHG emissions rates are highly variable by vehicle speeds, and to a much lesser extent individual hours of the day based on temperature and use of cooling in the cab of the vehicle. Ideally, some form of dynamic traffic assignment would be used (such as the Simulation-Based Assignment of PTV VISUM) to estimate such within-day variation in travel speed. Static assignment of 24 individual hours would produce similar output data for GHG emissions calculations. Conversely, if an agency's travel model has less than 24 time periods, coordination is required between CDOT, APCD and individual MPOs on an agreed upon process for disaggregating travel model data with predicted vehicle volumes and speeds from time periods representing multiple hours to discrete individual hours. This is particularly important for agencies with a traffic assignment process that contains a single off-peak period representing 22 hours travel behavior in a day. In this instance simply dividing the predicted volumes on a link by the number of hours in the period is likely to greatly underestimate travel volumes during the AM and PM peak shoulders and midday hours, while overestimating travel volumes in nighttime hours. Furthermore, the use of the predicted speed for a link from a four-step model during an off-peak hours is likely to overestimate speeds during the AM and PM peak shoulders and midday hours which results in underestimating emissions during this time of day.

Querying the Database

The MS Access databases developed by APCD each contain numerous queries that run in sequence. These queries assign the correct GHG emissions rates and vehicle mix ratios at the link level through a series of joins. The length of each link is multiplied by the predicted hourly volume to calculate the VMT for that hour that then is multiplied by the vehicle mix ratio and appropriate GHG emissions rate for that vehicle class to calculate the emissions. Emissions for the links are then summed together to calculate the final database output which is daily GHG emissions in short-tonnes for each travel model scenario.

Calculation of Annual Emissions and Modeled Reductions

The emissions in GHG short-tons/day from the MS Access database are extracted into spreadsheet workbooks, e.g., MS Excel, and annualized through multiplying the weekday emissions by 338 to get annual emissions. Standard unit conversions (one US short ton = 0.907185 metric tons) are applied to calculate the GHG emissions in million metric tons (MMT) per year for each agency's baseline and compliance travel model scenarios for 2030, 2040, and 2050. The modeled emissions reduction for each year is simply calculated by subtracting the compliance emissions from the baseline emissions. The modeled emissions reduction is then compared to the agency's reduction target for that compliance year to determine if compliance with the Standard has been demonstrated through modeling or if mitigation is required.

Appendix F. Hourly VMT Distribution Methodology Memorandum

COLORADO
Department of Transportation

PACOG GHG Emissions Modeling Memorandum

To: Transportation Commission of Colorado
From: Sabrina Williams, Scott Ramming
Date: December 1, 2025

Subject: Methodology for Assigning Individual Hourly Volumes and Speeds from PACOG's Travel Model in the GHG Emissions Database.

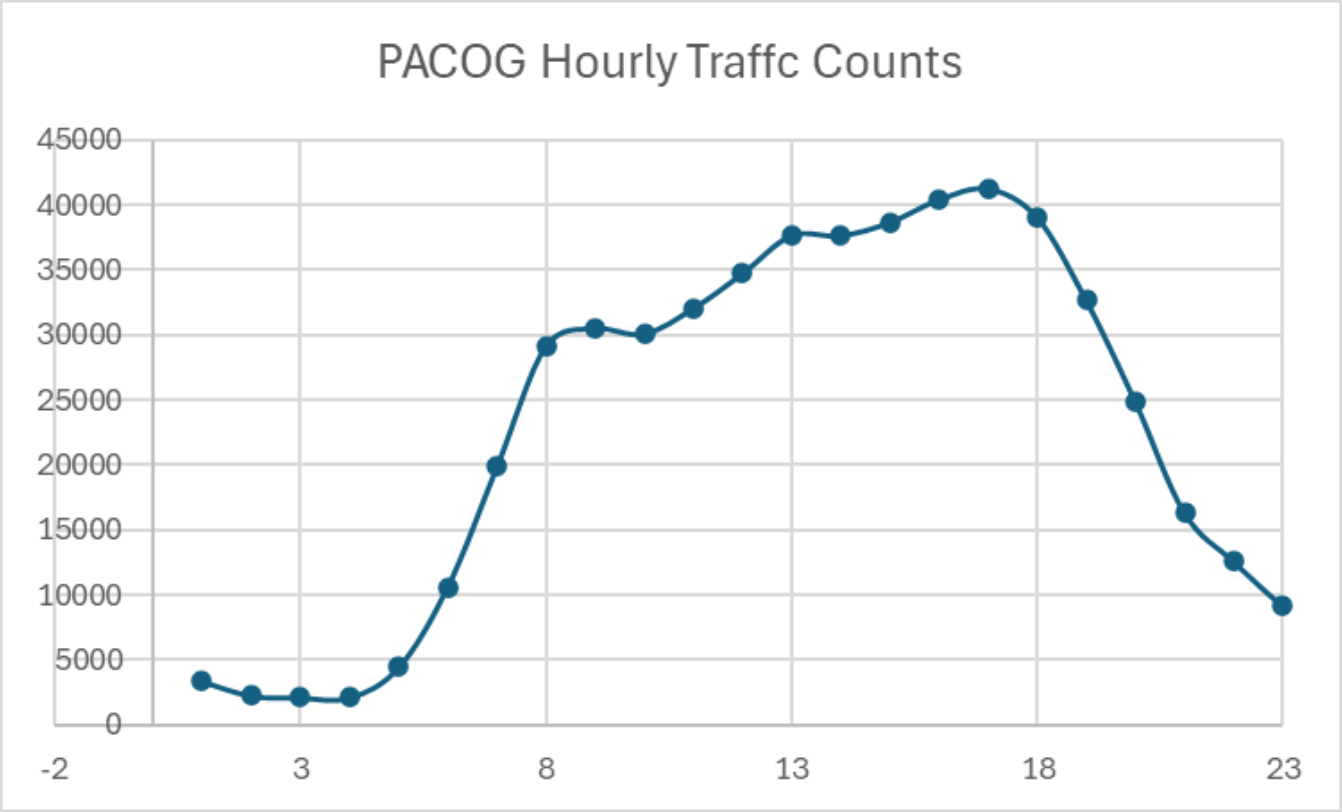
Background

The MOVES modeling conducted by APCD generated greenhouse gas (GHG) emissions rates in grams of CO2eq/VMT for each individual hour of the day (24hrs) that is further disaggregated by speed, vehicle type, and road type. APCD uses the MOVES emissions rates in conjunction with a GHG compliance area's predicted total daily on-road travel activity for each compliance year within a database platform to calculate predicted total annual GHG emissions (million metric tonnes, MMT/yr) to verify whether an area can demonstrate compliance with GHG Rule for Transportation Planning. To accurately calculate total daily and annual GHG emissions it is necessary for the GHG database to assign individual hourly volumes and speeds (24hrs/day) at the link level from the travel model's daily output. Most travel models for GHG compliance areas in Colorado do not use 24 time periods that facilitate this individual hourly assignment. Therefore, GHG compliance areas with fewer than 24 time periods, in consultation with CDOT and APCD, need to develop a mutually agreed upon process for the assignment of individual hourly volumes and speeds within the GHG database that interacts with the travel model output to calculate GHG emissions.

PACOG has a 4-step travel model that includes a 1-hour AM peak period from 8:30 AM to 9:30 AM, a 1-hour PM peak period from 4:30 PM to 5:30 PM, and a 22-hour off-peak period from 9:30 AM to 4:30 PM and 5:30 PM to 8:30 AM. Thus, it is necessary to disaggregate the 22-hour off-peak period into individual hourly speeds and volumes at the link level for the purposes of GHG emissions calculations. Similarly the half-hour-offset PM peak period is split between the individual clock hours (that is, 4:00 to 4:59 PM and 5:00 to 5:59 PM) in which the MOVES emissions rates are created and output.

Methodology

The Pueblo Area Council of Governments (PACOG) actively engaged with CDOT's Travel Modeling Unit and APCD to coordinate on a process for assignment of individual hourly volumes and speeds from their travel model's off-peak period. All agencies agreed that the use of hourly traffic counts used in the PACOG's travel model validation was the most appropriate dataset for this purpose. The hourly travel counts are plotted below:



The visual representation of PACOG count data indicates a high variability in individual hourly volumes during the 22-hour off-peak period, with noticeably increased travel activity during the daytime off-peak hours from 7:00 AM to 8:30 AM, 9:30 AM to 4:30 PM and 5:30 PM to 7:00 PM (10 hours) as compared to the remaining nighttime hours. Based on the count data it was determined that use of a simple hourly average of the travel model's predicted off-peak volumes would not be most representative of realistically expected travel behavior. The large variability in count data during the off-peak period was also determined to indicate that individual hourly speeds would likely not agree between the daytime and nighttime off-peak hours at the link level. Additionally, the predicted average speeds at the link level from the travel model output for the full 22-hour off-peak period would not be accurate for the purposes of emissions calculations as speeds during the daytime off-peak hours are likely lower than during the nighttime off-peak hour speeds (when lower volumes means operating speeds approach free-flow). This is particularly important as GHG emissions rates are highly sensitive to vehicle speeds, with lower speeds resulting in higher associated GHG emissions rates until vehicles reach speeds of approximately 50-60 mph at which point emissions rates begin to increase. Thus, use of a 22-hour average speed would likely result in an underestimation of GHG emissions during the daytime off-peak hours, as well as a likely overestimation of GHG emissions from the nighttime off-peak hours. Further, because of the non-linear nature of congested traffic speeds (relative to volumes) and emissions rates (relative to operating speeds), it would not be reasonable to assume that the overestimation during daytime hours simply offsets the overestimation during nighttime hours.

To facilitate an accurate assignment of individual hourly volumes and speeds, the hourly count data was further numerically analyzed as follows:

HOUR	Counts	%	Peak	OP SUM	OP%
12:00 AM	3361	0.6%		0.6%	0.7%
1:00 AM	2268	0.4%		0.4%	0.5%
2:00 AM	2121	0.4%		0.4%	0.5%
3:00 AM	2122	0.4%		0.4%	0.5%
4:00 AM	4452	0.8%		0.8%	1.0%
5:00 AM	10636	2.0%		2.0%	2.3%
6:00 AM	19857	3.7%		3.7%	4.3%
7:00 AM	29151	5.4%		5.4%	6.2%
8:00 AM	30510	5.7%	50.0%	2.8%	3.3%
9:00 AM	30090	5.6%	50.0%	2.8%	3.2%
10:00 AM	32048	6.0%		6.0%	6.9%
11:00 AM	34724	6.5%		6.5%	7.4%
12:00 PM	37654	7.0%		7.0%	8.1%
1:00 PM	37638	7.0%		7.0%	8.1%
2:00 PM	38648	7.2%		7.2%	8.3%
3:00 PM	40404	7.5%		7.5%	8.7%
4:00 PM	41236	7.7%	50.0%	3.8%	4.4%
5:00 PM	39051	7.3%	50.0%	3.6%	4.2%
6:00 PM	32681	6.1%		6.1%	7.0%
7:00 PM	24882	4.6%		4.6%	5.3%
8:00 PM	16348	3.0%		3.0%	3.5%
9:00 PM	12609	2.3%		2.3%	2.7%
10:00 PM	9141	1.7%		1.7%	2.0%
11:00 PM	5844	1.1%		1.1%	1.3%

In this table, the column labeled **%** indicates what fraction each hours count represents of the total 24-hour count. The **Peak** column represents what percentage of the AM or PM peak hour occurs during each clock hour. Since PACOG's PM peak hour is 4:30 to 5:30 pm, it is split evenly between the 4 PM and 5 PM clock hours. The **OP sum** column represents the percentage of the daily count that occurs during each clock hour. Since half of the 4 PM hour's 7.7% of the daily count occurs during the PM peak hour, the remaining half (3.8% of the daily count after rounding) occurs during the 22-hour off-peak period. The total of the OP sum column, 86.5%, indicates that the remaining 13.5% of travel occurs during the two peak hours. In the **OP%** column, the OP sum column is normalized to sum to 100% (by

dividing each hourly percentage by 86.5%) to create factors to convert the 22-hour off-peak period volumes to hourly volumes.

The analysis of the count data was supportive of the assumption that during the daytime off-peak hours, the individual hourly volumes and speeds would be in better agreement with the AM and PM peak period predicted travel activity that had a similar level of counts than the nighttime off-peak period hours that had noticeably fewer counted vehicles during these hours. Based on the count data, PACOG, CDOT and APCD agreed to assign individual hourly volumes and speeds within the GHG database during the off-peak period at the link level as shown below (note that the travel model provides outputs for links in both the AB and BA direction for each period, with the reverse/"wrong way" direction volumes equal to zero for one-way links.

PACOG Individual Hourly Volume and Speed Assignments at the Link Level Within the GHG Database

Hour	AB Direction		BA Direction	
	Volume	Speed	Volume	Speed
12:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
1:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
2:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
3:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
4:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
5:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
6:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
7:00 AM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
8:00 AM	(0.5*AB_AM_VOL) + 0.5*(AB_OP_VOL*OP%)	AM_AB_SPD	(0.5*BA_AM_VO) + (0.5^AB_OP_VOL*OP%)	AM_BA_SPD
9:00 AM	(0.5*AB_AM_VOL) + (0.5*AB_OP_VOL*OP%)	AB_AM_SPD	(0.5*BA_AM_VO) + (0.5^AB_OP_VOL*OP%)	AM_BA_SPD
10:00 AM	AB_OP_VOL*OP%	AB_AM_SPD	BA_OP_VOL*OP%	BA_AM_SPD
11:00 AM	AB_OP_VOL*OP%	(0.5*AB_AM_SPD)+(0.5_AB_PM_SPD)	BA_OP_VOL*OP%	(0.5*BA_AM_SPD)+(0.5_BA_PM_SPD)
12:00 PM	AB_OP_VOL*OP%	(0.5*AB_AM_SPD)+(0.5_AB_PM_SPD)	BA_OP_VOL*OP%	(0.5*BA_AM_SPD)+(0.5_BA_PM_SPD)
1:00 PM	AB_OP_VOL*OP%	(0.5*AB_AM_SPD)+(0.5_AB_PM_SPD)	BA_OP_VOL*OP%	(0.5*BA_AM_SPD)+(0.5_BA_PM_SPD)
2:00 PM	AB_OP_VOL*OP%	(0.5*AB_AM_SPD)+(0.5_AB_PM_SPD)	BA_OP_VOL*OP%	(0.5*BA_AM_SPD)+(0.5_BA_PM_SPD)

Hour	AB Direction		BA Direction	
	Volume	Speed	Volume	Speed
3:00 PM	AB_OP_VOL*OP%	AB_PM_SPD	BA_OP_VOL*OP%	BA_PM_SPD
4:00 PM	(0.5*AB+PM+VOL)+(0.5*AB_OP_VOL*OP%)	AB_PM_SPD	(0.5*AB+PM+VOL)+(0.5*AB_OP_VOL*OP%)	BA_PM_SPD
5:00 PM	(0.5*AB_PM_VOL)+(0.5*AB_OP_VOL*OP%)	AB_PM_SPD	(0.5*BA_PM_VOL)+(0.5*BA_OP_VOL*OP%)	BA_PM_SPD
6:00 PM	AB_OP_VOL*OP%	AB_PM_SPD	BA_OP_VOL*OP%	BA_PM_SPD
7:00 PM	AB_OP_VOL*OP%	(0.25*AB_PM_SPD)+(0.75*FreeFlow)	BA_OP_VOL*OP%	(0.25*BA_PM_SPD)+(0.75*FreeFlow)
8:00 PM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
9:00 PM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
10:00 PM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow
11:00 PM	AB_OP_VOL*OP%	FreeFlow	BA_OP_VOL*OP%	FreeFlow

Note: The 4 PM speed calculation reflects half of the volume (from 4:00 to 4:29/30 PM) traveling at the daytime speed, which is the average of the AM and PM peak hour speeds, averaged with the other half of the volume traveling at the PM peak speed.

Individual Hourly Volume Assignment

For the AM peak period occurring from 8:30 AM to 9:30 AM and for the PM peak period occurring from 4:30 PM to 5:30 PM that each span two individual hours of the day, a 50% weighting coefficient was applied to the both the peak and off-peak hourly assigned volumes at the link level that were then summed together for the individual hours representing 4:00 PM to 6:00 PM. As shown in the equations, rather than performing a simple average of the 22-hour total predicted volumes, the percentage of observed off-peak hourly counts for PACOG was applied to the total predicted 22-hour off-peak travel volumes to assign individual hourly off-peak volumes at the link level.

Individual Hourly Speed Assignment

For the AM peak period occurring from 8:30 AM to 9:30 AM and for the PM peak period that occurs from 4:30 PM and 5:30 PM that each span two individual hours of the day, the individual hourly speeds at the link level occurring from these peak hours were assigned a 100% weighting of the AM and PM peak period predicted average speed. The individual hourly speeds at the link level occurring from 11:00 AM PM to 2:00 PM PM were assigned a 50% weighting of the predicted hourly PM peak period average speed and a 50% weighting of the nighttime offpeak speed assignment of average hourly speed = free flow to represent an equal weighting between the partial PM peak hour of 5:00 to 5:30 PM and the partial nighttime peak hour of 5:30 PM to 6:00 PM. Further detail on the assignment of individual hourly speeds during the 22-hour offpeak period is provided below.

Professional judgement was used to assume that during the daytime offpeak individual hours occurring from 9:00 AM to 4:30 PM, speeds at the link level were likely to largely agree with the predicted speeds during the AM and PM peak periods as the count data indicated volumes would also be similar. To represent individual hourly volumes and speeds at the link level during the daytime offpeak hours an average of the AM peak period predicted speed and the PM peak period predicted average speed were assigned at the link level. Similarly, professional judgement was used to analyze the observed count data during the nighttime offpeak hours from 5:30 PM to 8:00 AM and a determination was made that given the low overall percentage of counts observed during these nighttime hours in relation to the total observed offpeak hourly travel counts speeds were unlikely to be reduced by congestion and were assigned the free flow speeds as defined in their travel model to represent the individual hourly speeds during the nighttime offpeak hours.

Conclusion

PACOG coordinated with CDOT and APCD to develop an agreed upon process for assigning individual hourly volumes and speeds at the link level that is appropriate for the purposes of calculating GHG emissions for the GHG compliance area. All agencies involved had familiarity with PACOG's travel model platform, reviewed the travel counts used in the analysis for the individual hourly assignments and reached consensus that the methodology described in this memo should result in an accurate depiction of individual hourly daily travel activity in the area required for use in the GHG database. The result of this process is a table housed within the GHG database containing the equations provided in this memo, that interacts with the travel model output table, as well as the MOVES GHG emissions rates that result in prediction of annual GHG emissions for the PACOG GHG compliance area to determine whether the GHG reduction targets established in CDOT's GHG rule have been met.

Appendix G. APCD Verification Memorandum

COLORADO
Department of Public Health & Environment

January 27, 2026

Eva Coslyeon
MPO Manager
Pueblo Area Council of Governments (PACOG)
211 East D Street, Pueblo, CO 81003

Subject: Greenhouse Gas Transportation Report as required by the Colorado Greenhouse Gas Pollution Reduction Planning Rule

Dear Eva,

Thank you for providing the Pueblo Area Council of Governments (PACOG) Transportation Greenhouse Gas Report for the PACOG boundary area for Colorado Department of Public Health and Environment, Air Pollution Control Division (Division) review.

Per 2 CCR 601-22, Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions, the Division is respectfully submitting our verification of the PACOG 2050 Long Range Transportation Plan Amendment.

Based on the analysis of the report, supporting datasets, and information provided, we can verify that the report and data inputs address the requirements of the Colorado Greenhouse Gas Pollution Reduction Planning Rule. The submitted package describes the baseline and compliance travel demand modeling runs and how they meet the Rule requirements. The submitted package describes how the travel demand model was deployed and how emissions were calculated. The Division finds the outputs to be mathematically correct.

The Division would like to thank the PACOG for providing the necessary data files and Report. The Division would also like to thank Dale Wells, Megan Carroll, and Cody Johnston from the Division who performed the verification analysis and Sabrina Williams and Scott Ramming of the Colorado Department of Transportation for their efforts in validating the results.

Sincerely,

Michael Ogletree
Director, Air Pollution Control Division
Colorado Department of Public Health and Environment

CC:

Christopher Laplante, CDOT
Elizabeth Rollins, CDOT
Darius Pakbaz, CDOT
Erik Sabina, CDOT
Scott Ramming, CDOT
Sabrina Williams, CDOT
Dale Wells, APCD
Kevin Briggs, APCD
Erick Mattson, APCD
Rick Coffin, APCD

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission
From: Keith Stefanik, P.E., Chief Engineer
Date: February 27, 2026

Subject: Report Pursuant to Colorado Revised Statutes, §43-1-208 Regarding Project Number FBR 1602-193 US 160 Elmore's to Dry Creek, Seeking Approval to Initiate and Conduct Condemnation Proceedings

Purpose
CDOT Region 5 seeks condemnation authorization for 1 ownership consisting of 2 fee parcels, 1 Wildlife Habitat parcel and 2 temporary easements necessary for Project Number FBR 1602-193.

Action
A resolution, in accordance with Colorado Revised Statute §43-1-208, granting approval to CDOT to initiate and conduct condemnation proceedings.

Background
This written report to the Transportation Commission is pursuant to Colorado Revised Statutes ("C.R.S."), Section 43-1-208(1). On 9/15/2025, the Right of Way Plans for US 160 Elmore's to Dry Creek were authorized, which allowed CDOT to acquire land necessary for the project by purchase, exchange, or negotiations with the landowner listed below.

Projects (FBR 1602-193/26704) and NHPP 1602-157/20980) are federally funded projects where CDOT must adhere to the requirements set forth by the US Fish and Wildlife Service regarding endangered species. As a result of construction activities, CDOT is required to mitigate for an endangered species, The New Mexico Meadow Jumping Mouse. In project 26704, specifically, the project is replacing the current bridge on 160 that crosses the Florida River. The new bridge will be longer, higher, and wider, creating impacts to existing wetlands and habitat for this endangered species.

Before the plans were authorized, Carli Harriman, Region 5 Real Estate Specialist III, met with the Robisons on their property with CDOT's review appraiser, David Eckelberry, and CDOT's contracted licensed appraiser, Bonnie Roerig. They walked the property and discussed all of the project's needs. Due to the Wildlife Habitat parcel's location, the discussion turned to the possibility of the Robisons selling their whole parcel. While Mr. Robison entertained the idea, Mrs. Robison did not have much interest in selling, as she liked the portion by the river. She also said that she did not want the mouse mitigation on her property as the Wildlife Habitat parcel was located within the most valuable piece of the property. They believe their property is worth a lot due to the highway access, being on the river and the potential growth between Bayfield and Durango.

They have been through condemnation on this property before (Project # NH 1601-053 code 14913) and prefer not to go through that again. Mr. Robison hoped we could make a deal, but they expressed that they believe their value is substantial in price.

Following Right of Way Plan Authorization, an offer package was e-mailed (as previously requested by the Robisons) to Gary and Judy Robison along with their attorney, Scott Albertson on 12-19-2025. The Robison's were traveling and couldn't receive their packet by UPS. Scott confirmed that the offers were received and they would let us know.

CDOT'S offer was calculated on the parcels needed for highway expansion and associated highway improvements which included the property needed for wildlife mitigation pursuant to USFW requirements for the endangered New Mexico Meadow Jumping Mouse.

Resolution No. Approving Negotiation: N/A
Landowner's Name: Gary and Judy Robison
Proposed Size of Acquisition of RW-31: .0614 acre or 2,675 square feet
Proposed Size of Acquisition of RW-31A: 1.238 acres or 53,947 square feet
Proposed Size of Acquisition of *31-WH: 13.600 acres or 592,416 square feet
Proposed Size of Easement of TE-31: 1.269 acres or 55.289 square feet
Proposed Size of Easement of *TE-31A: .293 acres or 12,904 square feet
*Parcels 31-WH and TE-31A are for the wildlife habitat.

FMV valuation, $177,890
FMV Valuation was completed by David Eckelberry, Certified General Appraiser.
Date of Initial Offer: December 17, 2025

continued

CDOT made an additional offer for the remainder parcel as previously discussed with the Robison's

Landowner's Name: Gary and Judy Robison
Proposed size of Acquisition 31-RM: 46.375 acres.

FMV valuation, $528,675
FMV Valuation was completed by a Certified General CDOT review appraiser, David Eckelberry's review of Bonnie Roerig's appraisal.
Date of Initial Offer: December 17, 2025

Summary of Counteroffers:
On January 6, 2026, Robison's/Scott Albertson sent a counteroffer via email. Their counteroffer consisted of RW-31, RW-31A for 1.299 acres and TE-31 for 1.269 acres at $35,000/acre. They said they are not interested in selling and conveying 31-WH and TE-31A or the Remainder, 31-RM, to CDOT.

On January 28, 2026, CDOT sent an email to Robisons/Albertson recapping the offers and asked if they would be willing to sell the remainder parcel, which is 31-RM REV, for 46.375 acres. Combining all parcels the total acreage would be 61.274.

On February 4, 2026, Robisons/Albertson sent an email stating they are amenable to selling the entirety of their 61.274-acre ownership for $4,000,000.00, which breaks down to $65,281 per acre.

The Robisons stated they talked with an appraiser; however, an appraisal was not completed.

CDOT has rejected the Robison's $4,000,000.00, counteroffer.

The property owner will be informed of the Transportation Commission meeting on 3/18/2026 through an email and letter to be sent before 3/2/2026.

Next Steps

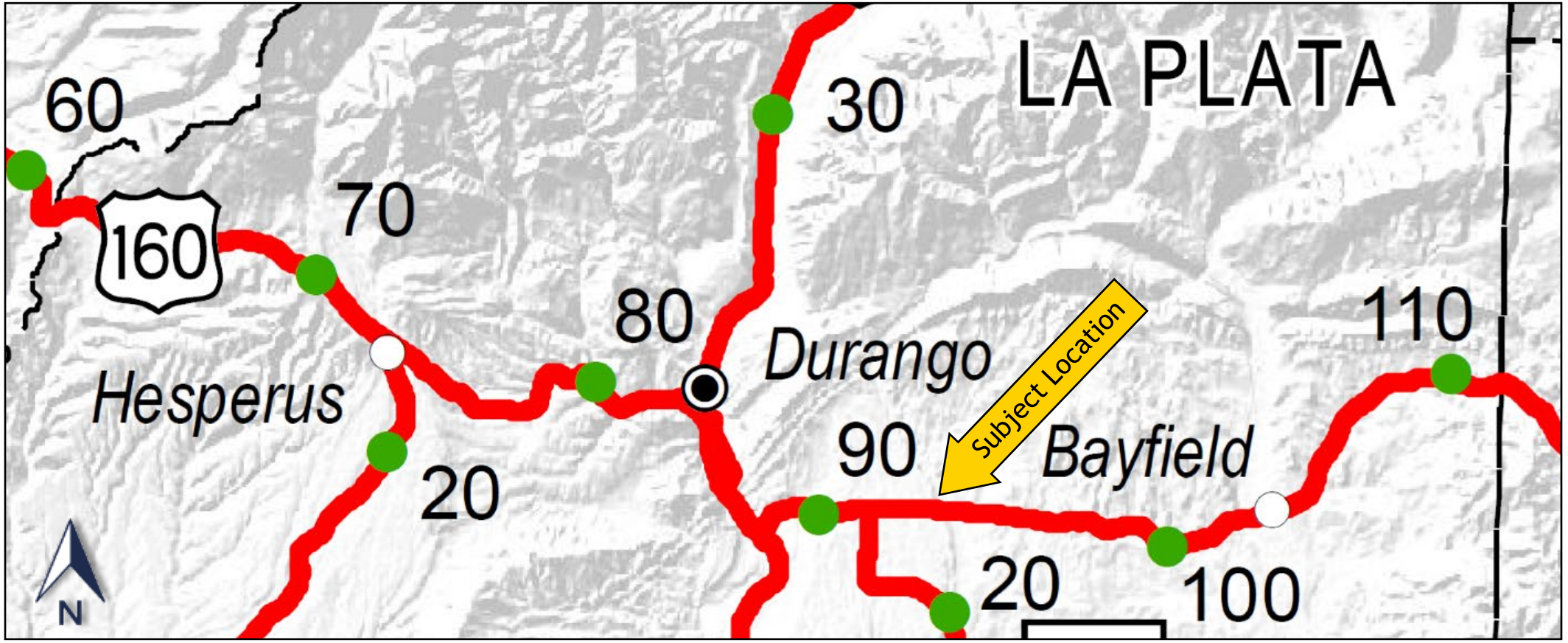
Upon condemnation authorization, this matter will be referred to the Attorney General's Office to gain possession through a court order. No further TC action.

Attachments

Proposed Resolution
Right-of-Way Plans
Legal Descriptions
Contact Summary

Condemnation Authorization
US 160 Elmore's to Dry Creek

District: 8 Region: 5 Project: FBR 1602-193
NHPP 1602-157 Project Code: 26704
20980



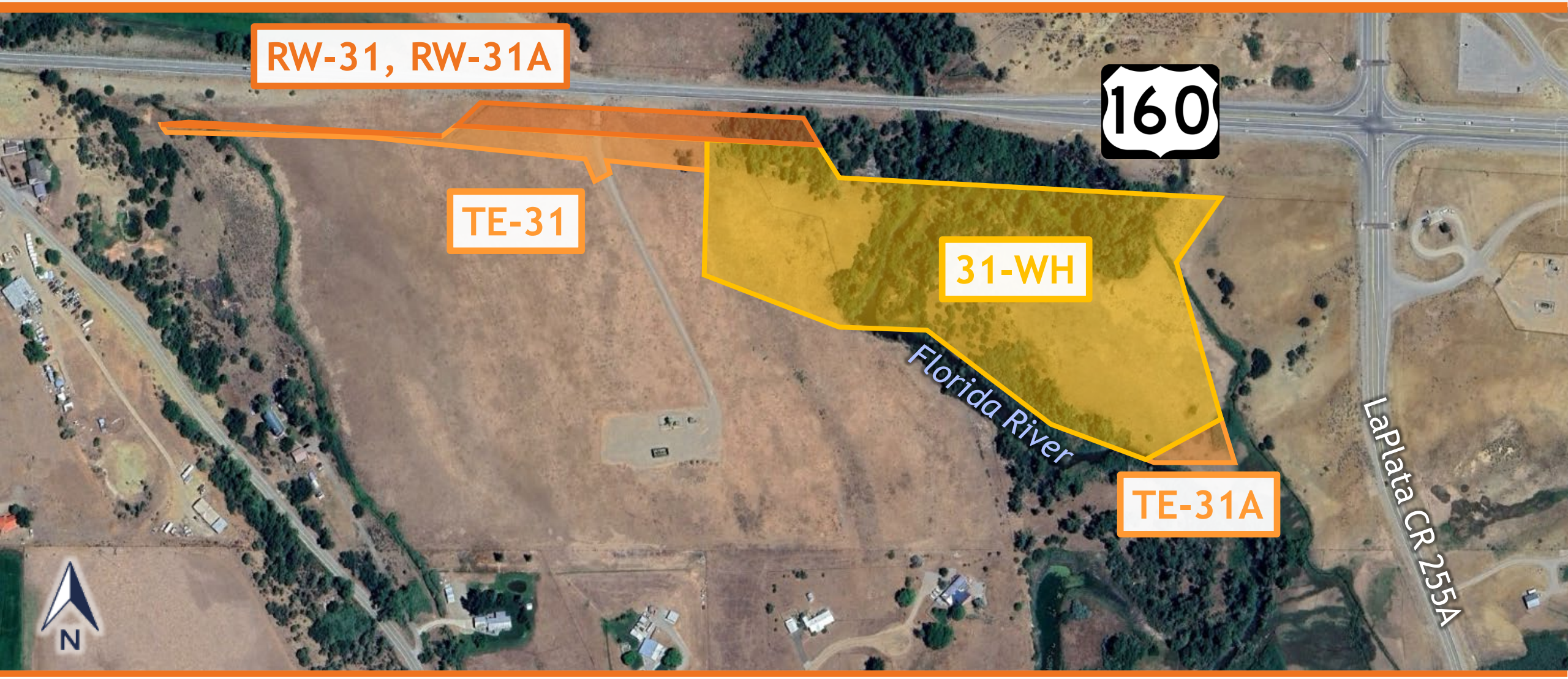
Owners: Gary & Judy Robison

Project Purpose: Improve traffic flow and safety for the traveling public

Condemnation Authorization
US 160 Elmore's to Dry Creek

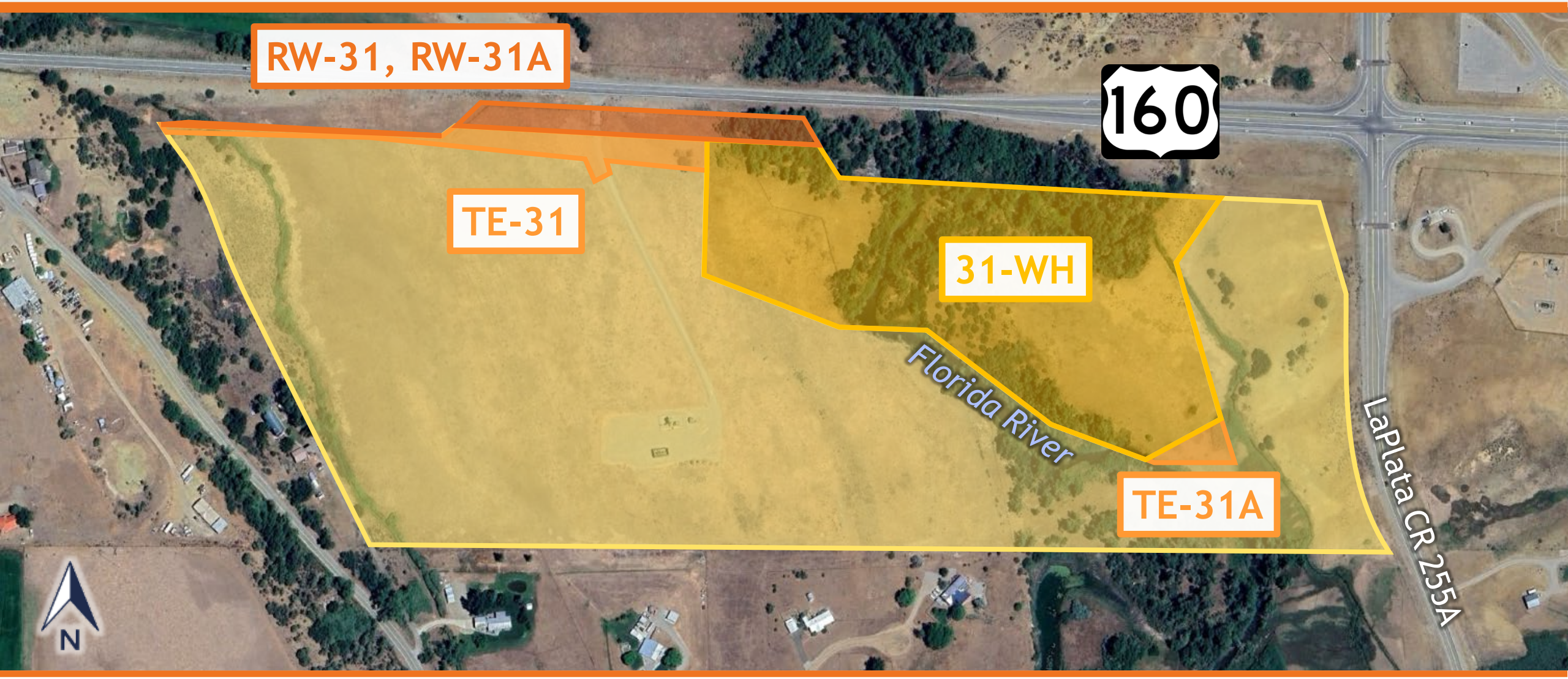
Location of RW/WH/TE Parcels, RM Parcel

Condemnation Authorization
US 160 Elmore's to Dry Creek



Detail of Subject Parcels

Condemnation Authorization
US 160 Elmore's to Dry Creek



Detail of Subject Parcels

Condemnation Authorization
US 160 Elmore's to Dry Creek

ecos.fws.gov/ecp/species/7965

U.S. Fish & Wildlife Service

Search ECOS

ECOS Environmental Conservation Online System

Conserving the Nature of America

ECOS /

New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)

Range Information | Candidate Info | Federal Register | Recovery | Critical Habitat | SSA | Conservation Plans | Petitions | Biological Opinions | Life History

Taxonomy: View taxonomy in ITIS

Listing Status: **Endangered**

Where Listed: **WHEREVER FOUND**

General Information

The New Mexico meadow jumping mouse (jumping mouse) is endemic to New Mexico, Arizona, and a small area of southern Colorado (Hafner et al. 1981, pp. 501-502; Jones 1999, p. 1). The jumping mouse is grayish-brown on the back, yellowish-brown on the sides, and white underneath (Van Pelt 1993, p 1). The species is about 7. 4 to 10 inches (187 to 255 mm) in total length, with elongated feet (1.2 inches (30.6 mm)) and an extremely long, bicolored tail (5.1 inches (130.6 mm)) (Van Pelt 1993, p. 1; Hafner et al. 1981, p. 509). The jumping mouse is a habitat specialist (Frey 2006d, p.

Condemnation Authorization
US 160 Elmore's to Dry Creek

Wildlife Habitat:

- Project 26704 is federally-funded, replacing the current bridge on US 160 over the Florida River. The new bridge will be longer, higher, and wider, creating impacts to existing wetlands and habitat for the New Mexico meadow jumping mouse. CDOT must adhere US Fish and Wildlife requirements regarding this endangered species. USFW believe Parcel 31 is the best location for the necessary wildlife mitigation.

Summary of Negotiation Timeline:

- Negotiations began with RW-31, RW-31A, 31-WH, TE-31 and TE-31A

- Owners and attorney counteroffered for RW-31, RW-31A and TE-31 for $35,000/acre. Owners were not interested in selling 31-WH and TE-31A for the wildlife habitat.

- CDOT rejected the counteroffer, as it did not include the required area for the Wildlife Habitat.

- Owners and attorney counteroffered the entirety of their 61.274-acre ownership for $4,000,000.00. CDOT has rejected the $4,000,000.00, counteroffer.

Condemnation Authorization
US 160 Elmore's to Dry Creek

OFFERS	DATE	AMOUNT
Notice of Interest to Acquire	July 16, 2025	N/A
Valuation*	November 24, 2025	$177,890
CDOT Initial Offer*	December 17, 2025	$177,890 ($10,800/acre for 16.46 ac)
Owner Counteroffer (NOT including WH parcels)	January 6, 2026	$100,149 ($35,000/acre for 2.86 ac)
Owner Counteroffer (for all 61.274 acres west of CR 255A)	February 4, 2026	$4,000,000
CDOT Final Written Offer*	February 27, 2026	$400,000

*Offer for RW-31, RW-31A, TE-31, TE-31A and 31-WH (16.4614 acres).

Note: TE-31A and 31-WH are required for Wildlife Habitat

Colorado Department of Transportation Condemnation Authorization Contact Summary	Project Code: 26704 Parcel: **RW-31,RW-31A,31-WH,TE-31,TE-31A** Owner: W. Gary & Judy Robison

The following is a summary of communications which have taken place between CDOT and/or its representatives and the above referenced owner related to the acquisition of the above described parcels. This summary is prepared to assist the Transportation Commission in considering CDOT's request for authorization to initiate and conduct condemnation proceedings.

Date	Contact Description	Amount/Description
9/12/2024	First Contact w/Property Owner	Phone Call (multiple #s)
9/18/2024	Discussion of CDOT Project	Notice of Intent
10/9/2024	CDOT Offer	$177,890.00 for RW,WH,&TE $528,675.00 for RM
2/19/2026	Owner Counter-Offer	$4,000,000.00
2/26/2026	CDOT Last Offer	$400,000.00
3/6/2026	Last Contact w/Property Owner	TC Notice

Number of Property Owner Contacts Attempted:	14
Number of Successful Property Owner Contacts:	11

Matters Discussed During Property Owner Contacts (check all that apply)

- [X] Access
- [X] Valuation
- [X] Owner Appraisal Reimbursement
- [X] Project Timeline
- [X] Design
- [X] CDOT Processes
- [ ] Other Specify here:

Post-Amerco Real Property Condemnation Authorization Requests
March 18,2026 Transportation Commission Meeting - Virtual

Region 5 - Condemnation Authorization Requests

TC District	Project Name	Project #	Project Code	Parcel #	Parcel Size	Property Owner(s)	Valuation Amount	Appraisal (A) or Waiver Valuation (WV)	Date of Valuation	Owner's Current Counter-Offer	Prior TC Condemnation or Acquisition Resolution Number (if applicable)
2	US 160 Elmore's to Dry Creek	FBR 1602-193	26704	31	RW- 1.299 acres WH- 13.6 acres TE- 1.565 acres	Gary & Judy Robison	$177,890	Appraisal	10/29/2025	$65,000.00/acre for the whole parcel 61.274 acres $35,000/acre for RW1.299 and TE 1.269 excluding WH 13.60	

Colorado Department of Transportation
3803 North Main Avenue
Suite 300
Durango, CO 81301
Phone: 970-385-1400 FAX: 970-385-1410
Region 5 TCJ

Sheet Revisions

Date	Description	Initials
9/15/25	Revised 31-RM	DLO

Sheet Revisions

Date	Description	Initials

Farnsworth GROUP
1099 Main Ave, Suite 306
DURANGO, CO 81301
(970) 403-5822

All seals for this set of drawings are applied to the cover page(s)

Right of Way Plans
Tabulation of Properties

Project Number/Project Code: NHPP 1602-157/20980
Project Number/Project Code: FBR 1602-193/26704
Project Location: US 160 ELMORES TO DRY CREEK/ MP 93.77 BRIDGE BTE

Last Mod. Date	Subset	Sheet No.
9/30/25	2.07 of 2.09	2.07

Sheet 7 - Tabulation of Properties

R.O.W. TABULATION OF PROPERTIES IN LA PLATA COUNTY U.S. NO. 160

Parcel No.	Ownership Name and Mailing Address	Site Address & County Parcel No.	Location: T 34 N (N.U.L.) R 8 W N.M.P.M.	Area In Acres (Square Feet)					Book and Page No. And/Or Reception No.	Title Commitment No.	Justification/ Remarks
				Area Of Parcel	Existing ROW	Net Area	Remainder Left	Remainder Right			
RW-29	**LISA D. MURPHY**	412 CR 223	TRACT OF LAND	0.306			7.69			08862C2022	Fee ROW required for highway expansion and associated highway improvements. Remainder Area based on La Plata County Assessor information, Being acquired under Project No. NHPP 1602-157, Project Code: 20980
	1411 SEABRIGHT AVE	DURANGO CO 81301	SE 1/4 NE 1/4	(13,310)							
	GROVER BEACH, CA. 93433	567308100036	SECTION 8								
			CORRECT QCD REC# 892362								
TE-29	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	0.089							Temporary Easement is required for fence installation and construction of associated highway improvements. Being acquired under Project No. NHPP 1602-157, Project Code: 20980
				(3882)							
RW-30	**JUDY M. SAUCK, aka**	426 CR 223	TRACT OF LAND	1.469			148.27			08863C2021	Fee ROW required for highway expansion and associated highway improvements. Remainder Area based on La Plata County Assessor information, Being acquired under Project No. FBR 1602-193, Project Code: 26704
	JUDY M. TINKER	DURANGO CO 81301	N 1/2 SW 1/4 & S 1/2 NW 1/4	(64,000)							
	180 VALLE ESCODIDO DR.	567309200131	SECTION 9								
	DURANGO CO 81303		SE 1/4 NE 1/4 SECTION 8								
			PERSONAL REP.'S DEED								
			THOSE PORTIONS OF PARCEL 2								
			PERSONAL REP.'S DEED								
			REC# 108522								
TE-30	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	0.669							Temporary Easement is required for fence installation, driveway construction and construction of associated highway improvements. Being acquired under Project No. FBR 1602-193, Project Code: 26704
				(29,142)							
RW-31	**W. GARY ROBISON AND**	UNKNOWN	WARRANTY DEED RECEPTION NO.	0.061				8.473		08818C2021	Fee ROW required for highway expansion and associated highway improvements. Remainder Area based on La Plata County Assessor information, Being acquired under Project No. FBR 1602-193, Project Code: 26704
	JUDY S. ROBISON	567309300138	1029853 (PARCEL I AND PARCEL II)	(2675)							
	P.O. BOX 1847		SECTION 9								
	DURANGO CO 81302		LESS & EXCEPT								
			REC# 1044576,1047631								
RW-31A	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	1.238				(SEE RW-31)		(SAME)	Fee ROW required for highway expansion and associated highway improvements. Remainder Area based on La Plata County Assessor information Being acquired under Project No. FBR 1602-193, Project Code: 26704
				(53,947)							
											(Remainder is combined with RW-31)
31-RM REV	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	46.375				(SEE RW-31)		(SAME)	The RM Area based on La Plata County Assessor information LESS COMBINED areas for RW-31, RW-31A, WH-31, Being acquired under Project No. FBR 1602-193, Project Code: 26704
31-WH	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	13.600				(SEE RW-31)		(SAME)	Fee acquisition for wildlife habitat mitigation, Being acquired under Project No. FBR 1602-193, Project Code: 26704
				(592,416)							
TE-31	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	1.269							Temporary Easement is required for fence installation, driveway construction and construction of associated highway improvements. Being acquired under Project No. FBR 1602-193, Project Code: 26704
				(55,289)							
TE-31A	(SAME AS ABOVE)	(SAME AS ABOVE)	(SAME AS ABOVE)	0.296							Temporary Easement is required for construction of wildlife habitat improvements, Being acquired under Project No. FBR 1602-193, Project Code: 26704
				(12,904)							

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Exhibit "A"

Colorado Department of Transportation
3803 North Main Avenue
Suite 300
Durango, CO 81301
Phone: 970-385-1400 FAX: 970-385-1410
Region 5 TCJ

Sheet Revisions		
Date	Description	Initials
9/15/25	Update Topography and Wetlands, Revised 31-RM	DLD

Scale: 1"=200' (U.S. Survey feet)

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www.f-w.com

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Right of Way Plans
Plan Sheet

Project Number/Project Code: NHPP 1602-157/20980
Project Number/Project Code: FBR 1602-193/26704
Project Location: US 160 ELMORES TO DRY CREEK/ MP 93.77 BRIDGE BTE

Last Mod. Date	Subset	Sheet No.
9/30/25	7.14 of 7.18	7.14

T 34 N (N.U.L.), R 8 W, N.M.P.M.
SECTION 8
NE¼

RW-29 Lisa D. Murphy
TE-29 A tract of land in the SE¼of the NE¼
Section 8, T 34N, R 8W, NMPM
Correction Quitclaim Deed Reception No. 892362
Title Commitment No. 08862C2021
Assessor Parcel No. 5673-081-00-036
1411 Seabright Ave
Grover Beach, CA 93433

RW-30 Judy M. Sauck, aka Judy M. Tinker
TE-30
A parcel of land being only those portions of (Parcel) No. 2 on Exhibit A of deed reception No. 1082522, Lying within the N 1/2 of the SW 1/4, and S 1/2 of the NW 1/4 of Section 9, and also the SE 1/4 of the NE 1/4 of Section 8, T 34N, R 8W, NMPM
Personal Representatives Deed Reception No. 1082522
Title Commitment No. 08863C2021
Assessor Parcel No. 5673-092-00-131

180 Valle Escondido Dr
Durango, CO 81303

T 34 N (N.U.L.), R 8 W, N.M.P.M.
SECTION 9
NW¼

LPEA EASEMENT RECEPTION NO. 986987 20 FT
LPEA EASEMENT RECEPTION NO. 985169 20 FT
CAS AND WATERLINE EASEMENT RECEPTION NO. 767009 40 FT
100 YR FLOODPLAIN
500 YR FLOODPLAIN
EXISTING R.O.W. ESTABLISHED ON PROJECT F 022-2(6) RETRACED AND MONUMENTED ON PROJECT FC-NH(CX)160-2(48)
MCCLEAN SPRING
PNT 260- P.O.B.: RW-29, RW- 30 TIE: TO WITNESS CORNER, NL/16 S9 N66°36'41"E 2894.34'
I/4 SECTION LINE S88°36'5"E PROJECTED
US HWY 160
P.O.B.: RW-31, RW-31A, 31-WH TIE: TO WITNESS CORNER, NL/16 S9 N47°33'24"E 2211.68'
THADIUS S. COUNTESS 274 COUNTY ROAD 222 ASSESSOR PARCEL NO. 5673-093-00-109
LINDSAY BARAN AND RYAN BARAN 63 COUNTY ROAD 222 ASSESSOR PARCEL NO. 5673-084-00-031
BART RABKIN AND PAULA RABKIN 68 COUNTY ROAD 222 ASSESSOR PARCEL NO. 5673-084-00-030
ROBERT J. WYATT 291 COUNTY ROAD 222 ASSESSOR PARCEL NO. 5673-084-00-028
SEE DETAIL SHEET 7.14A
SEE DETAIL SHEET 7.14B
SECTION LINE N.L.T. PROJECTED
CR 222
PROJ 2+56.6
PI 230+11.37
PI 235+36.77
230+00
235+00
240+00
GAS AND WATERLINE EASEMENT RECEPTION NO. 767009 40 FT
PROPOSED WILDLIFE HABITAT
FLORIDA RIVER
FLORIDA RIVER BRIDGE STR # P-05-B
EXISTING R.O.W. ESTABLISHED ON PROJECT F 022-2(6) RETRACED AND MONUMENTED ON PROJECT FC-NH(CX)160-2(48)

RW-31 W. Gary Robison and Judy S. Robison
RW-31A
31-RM REV Parcel I and Parcel II
31-WH Section 9, T 34N, R 8W, NMPM
TE-31 Warranty Deed Reception No. 1029853
TE-31A Title Commitment No. 08818C2021
Assessor Parcel No. 5673-093-00-138

PO Box 1847
Durango, CO 81302

31-RM REV

T 34 N (N.U.L.), R 8 W, N.M.P.M.
SECTION 8
SE¼

T 34 N (N.U.L.), R 8 W, N.M.P.M.
SECTION 9
SW¼

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Colorado Department of Transportation
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Region 5 TCJ

Sheet Revisions

Date	Description	Initials
9/15/25	Update Topography and Wetlands, Revised 31-RM	DLO

0' 50' 100' 200'
Scale: 1"=100'
(U.S. Survey feet)

Farnsworth GROUP
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DURANGO, CO 81301
(970) 403-5822
www.f-w.com

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Right of Way Plans
Plan Sheet

Project Number/Project Code: NHPP 1602-157/20980
Project Number/Project Code: FBR 1602-193/26704
Project Location: US 160 ELMORES TO DRY CREEK/ MP 93.77 BRIDGE BTE

Last Mod. Date	Subset	Sheet No.
9/30/25	7.14A of 7.18	7.14A

RW-29 TE-29

T 34 N, R 8 W, (N.U.L.) N.M.P.M.
SECTION 8
NE¼

Lisa D. Murphy

A tract of land in the SE¼of the NE¼
Section 8, T 34N, R 8W, NMPM
Correction Quitclaim Deed Reception No. 892362
Title Commitment No. 08862C2021
Assessor Parcel No. 5673-081-00-036

1411 Seabright Ave
Grover Beach, CA 93433

T 34 N, R 8 W, (N.U.L.) N.M.P.M.
SECTION 9
NW¼

RW-30
TE-30

Judy M. Sauck, aka Judy M. Tinker

A parcel of land being only those portions of (Parcel) No. 2 on Exhibit A of deed reception No. 1082522, Lying within the N½of the SW 1/4, and S½of the NW¼ of Section 9, and also the SE¼of the NE¼of Section 8, T 34N, R 8W, NMPM
Personal Representatives Deed Reception No. 1082522
Title Commitment No. 08863C2021
Assessor Parcel No. 5673-092-00-131

180 Valle Escondido Dr
Durango, CO 81303

Line Table		
Name	Length (FEET)	Direction
L18	44.12	S 80°36'17" E
L22	40.46	S 80°37'14" E

Curve Table					
Name	Radius (FEET)	Arc (FEET)	Chord (FEET)	Tangent (FEET)	Chord Bearing
C3	159.00	30.63	30.59	15.36	N 40°49'43" E
C4	159.00	11.06	11.06	5.53	N 33°18'59" E

CR 223
LPEA EASEMENT RECEPTION NO. 986987 20 FT
460 L22 361 TE-29 341.33' S89° 56'56"E
256 C3 L18 259 526 350.32' N89° 54'12"W
ROW 5007
445.12' S85° 56'3"E
RW-29
EXISTING GATE
EXISTING R.O.W. ESTABLISHED ON PROJECT F 022-2(6) RETRACED AND MONUMENTED ON PROJECT FC-NH(CX)160-2(48)
9330
MCCLEAN SPRING
P.O.B.: RW-29, RW- 30
TIE: TO WITNESS CORNER, N1/16 S9
N66°36'41"E 2894.34'
EXISTING CULVERT
PROPOSED DRAINAGE CULVERT
US 160 DESIGN ALIGNMENT
225+00
PRC 225+15.83
EXISTING R.O.W. ESTABLISHED ON PROJECT F 022-2(6) RETRACED AND MONUMENTED ON PROJECT FC-NH(CX)160-2(48)
547.84' S85° 57'24"E
LINDSAY BARAN AND RYAN BARAN
63 COUNTY ROAD 222
ASSESSOR PARCEL NO. 5673-084-00-031
CR 222
SECTION LINE N1°37'11"E PROJECTED
T 34 N, R 8 W, (N.U.L.) N.M.P.M.
SECTION 8
SE¼

(469 - 261) N32° 44'26"W 12.05'
257 362 S89° 56'56"E 85.28'
261 N89° 54'12"W 78.89'
527 S32° 44'26"E 55.77'
260 138.57' S85° 56'3"E 264
453.64' S79° 29'34"E
451.93' N79° 29'34"W
TE-30
363
528
1/4 SECTION LINE S88° 36'5"E PROJECTED
806.56' S81° 40'5"E
783.50' S82° 41'9"E
783.78' N82° 41'9"W
EXISTING CULVERT
PROPOSED IRRIGATION CULVERTS
PROPOSED MAMMAL CULVERT
230+00
D =2° 25'35"
Rc =23400.00'
La =990.94'
C =990.87'
CB =S85° 16'08"E
US HWY 160
PROPOSED DETOUR
PROPOSED DRAINAGE CULVERT
PROPOSED MAMMAL CULVERT
9355R
235+00
PT 235+06.27
S85° 56'3"E 500.00'
265
EXISTING CULVERT

(262 - 561) S87° 1'36"W 5.54'
S87° 1'36"W 68.92'
561 262 5012 ROW
RW-31
634.44' S85° 56'45"E
702.89' N86° 38'0"W
510.08' S87° 23'2"E
542.99' S83° 32'2"E
5013 ROW
449
N87° 1'36"E 401.10'
9340 ROW 5011
N36° 24'31"W 24.03'
448
PT 230+11.37
P.O.B. (PNT 5013): RW-31, RW-31A, 31-WH
TIE: TO WITNESS CORNER, N1/16 S9
N47°33'24"E 2211.68'
T 34 N, R 8 W, (N.U.L.) N.M.P.M.
SECTION 9
SW¼

RW-31
RW-31A
31-RM REV
31-WH
TE-31
TE-31A

W. Gary Robison and Judy S. Robison

Parcel I and Parcel II
Section 9, T 34N, R 8W, NMPM
Warranty Deed Reception No. 1029853
Title Commitment No. 08818C2021
Assessor Parcel No. 5673-093-00-138

PO Box 1847
Durango, CO 81302

31-RM REV

9/30/2025 dorris 11:03:57 AM J:\2021\D2115178.00 - CDOT US 160 Elmores Corner Widening\20980\RDW_Survey\Drawings\20980RDW_Plan7.14 Detail-A.dgn

Colorado Department of Transportation
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Region 5 TCJ

Sheet Revisions

Date	Description	Initials
9/15/25	Update Topography and Wetlands, Revised 31-RM	DLO

0' 50' 100' 200'
Scale: 1"=100'
(U.S. Survey feet)

N

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Right of Way Plans
Plan Sheet

Project Number/Project Code: NHPP 1602-157/20980
Project Number/Project Code: FBR 1602-193/26704
Project Location: US 160 ELMORES TO DRY CREEK/ MP 93.77 BRIDGE BTE

Last Mod. Date	Subset	Sheet No.
9/30/25	7.14B of 7.18	7.14B

Line Table		
Name	Length (FT)	Direction
L5	40.77	N 34°30'01" W
L6	56.01	N 70°37'31" W
L7	55.17	N 20°06'47" E
L8	84.32	S 68°27'04" E
L9	97.90	S 36°31'31" E
L10	19.87	S 85°56'03" E
L11	37.32	N 73°40'42" E
L14	11.60	S 4°04'52" W
L17	37.32	S 73°40'42" W
L18	102.18	N 85°56'03" W
L25	39.78	N 51°04'51" E
L29	36.41	S 19°50'40" E
L30	44.56	S 68°04'37" W
L31	60.96	N 21°31'34" W

Judy M. Sauck, aka Judy M. Tinker

A parcel of land being only those portions of (Parcel) No. 2 on Exhibit A of deed reception No. 1082522, Lying within the N½of the SW 1/4, and S½of the NW¼ of Section 9, and also the SE¼of the NE¼of Section 8, T 34N, R 8W, NMPM
Personal Representatives Deed Reception No. 1082522
Title Commitment No. 08863C2021
Assessor Parcel No. 5673-092-00-131

180 Valle Escondido Dr
Durango, CO 81303

T 34 N, R 8 W, (N.U.L.) N.M.P.M.
SECTION 9
NW¼

RW-30
TE-30
RW-31A
TE-31
RW-31
31-RM REV
31-WH
TE-31A

W. Gary Robison and Judy S. Robison

Parcel I and Parcel II
Section 9, T 34N, R 8W, NMPM
Warranty Deed Reception No. 1029853
Title Commitment No. 08818C2021
Assessor Parcel No. 5673-093-00-138

PO Box 1847
Durango, CO 81302

T 34 N, R 8 W, (N.U.L.) N.M.P.M.
SECTION 9
SW¼

P.O.B. (PNT 5013): RW-31, RW-31A, 31-WH
TIE: TO WITNESS CORNER, N1/16 S9
N47°33'24"E 2211.68'

GAS AND WATERLINE EASEMENT RECEPTION NO. 767009 40 FT

1/4 SECTION LINE S88°36'5"E PROJECTED

235+00 PT

240+00

245+00

783.50' S82° 41'9"E
783.78' N82° 41'9"W
S81° 40'5"E 806.56'
437.38' S85° 56'3"E
438.31' S85° 56'3"E
1000.00' S85° 56'3"E
800.00' S85° 56'3"E
400.00' S85° 56'3"E
224.19' N63° 37'11"E
221.03' N63° 37'11"E
172.05' N39° 36'12"E
1933.83' S86° 28'55"E
634.44' S85° 56'45"E
702.89' N86° 38'0"W
542.99' S83° 32'2"E
255.29' S83° 32'2"E
912.59' S85° 56'3"E
634.59' (562-800)
278.00' S85° 56'3"E
S31° 41'51"W 92.40'
N31° 28'19"W 77.42'
S31° 28'19"E 94.63'
S2° 4'38"W 77.39'
(800 - 801) S2° 4'38"W 339.52'
N2° 4'38"E 262.13'

D =2° 25'35"
Rc =23400.00'
Lc =990.94'
C =990.87'
CB =S85° 16'08"E

W=24'

EXISTING CULVERT
PROPOSED DRAINAGE CULVERT
PROPOSED MAMMAL CULVERT
PROPOSED DETOUR
PROPOSED BRIDGE
PROPOSED WILDLIFE HABITAT
EXISTING R.O.W. ESTABLISHED ON PROJECT F 022-2(6) RETRACED AND MONUMENTED ON PROJECT FC-NH(CX)160-2(48)
FLORIDA RIVER BRIDGE STR # P-05-B
FLORIDA RIVER
100 YR FLOODPLAIN
500 YR FLOODPLAIN
GAS AND WATERLINE EASEMENT RECEPTION NO. 767009 40 FT
ROW 5006
ROW 5013
ROW 5014
ROW 5015
ROW 5016

9/30/2025 dorris 1:33:23 PM J:\2021\021578.00 - CDOT US 160 Elmores Corner Widening\20980\ROW_Survey\Drawings\20980ROW_Plan7.14 Detail-B.dgn

Colorado Department of Transportation
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Region 5 TCJ

Sheet Revisions

Date	Description	Initials
9/15/25	Update Topography and Wetlands, Revised 31-RM	DLD

T 34 N, R 8 W, N.M.P.M.
SECTION 9

0' 100' 200' 400'

Scale: 1"=200'
(U.S. Survey feet)

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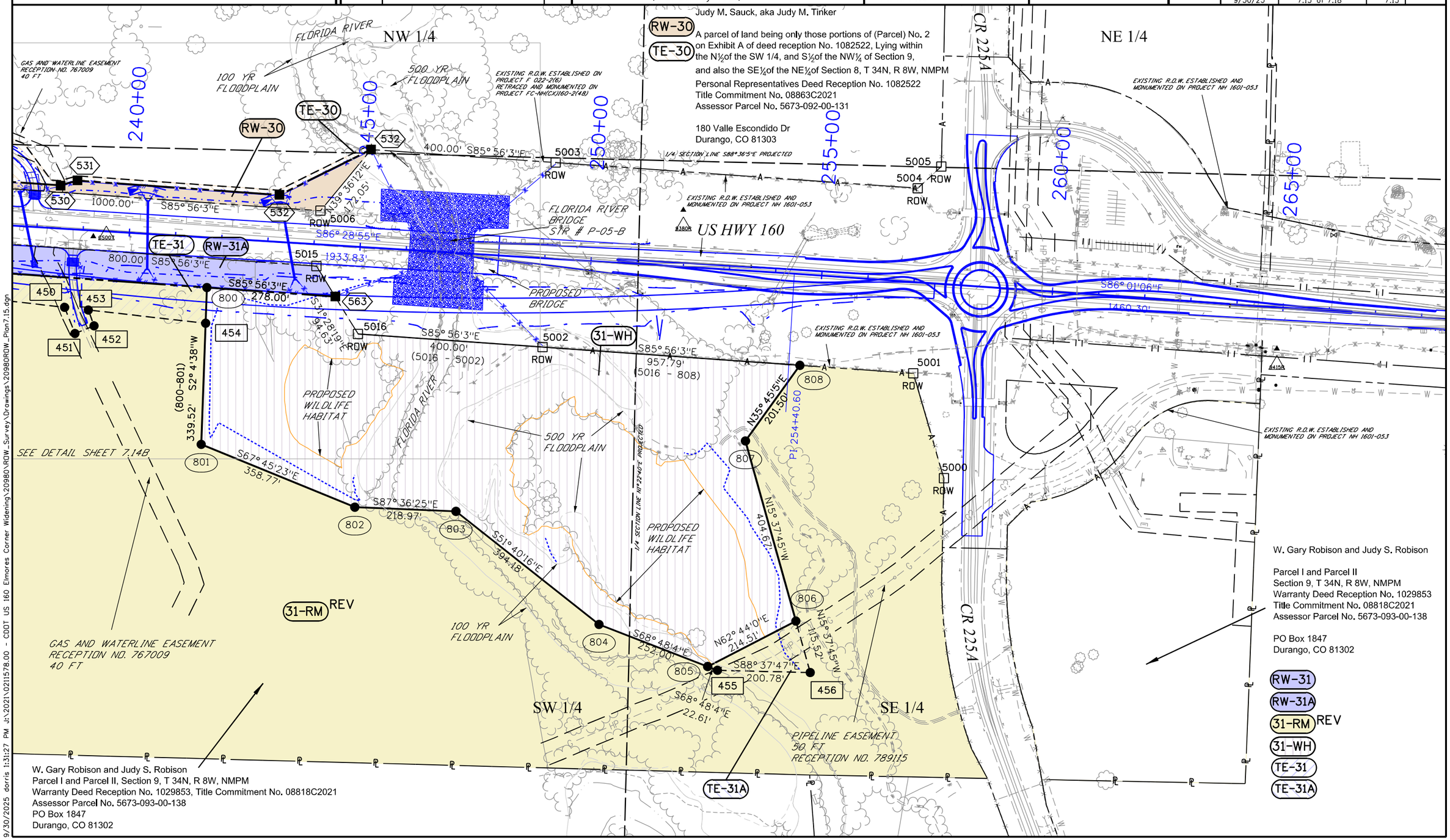
Right of Way Plans
Plan Sheet

Project Number/Project Code: NHPP 1602-157/20980
Project Number/Project Code: FBR 1602-193/26704
Project Location: US 160 ELMORES TO DRY CREEK/ MP 93.77 BRIDGE BTE

Last Mod. Date	Subset	Sheet No.
9/30/25	7.15 of 7.18	7.15



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COLORADO DEPARTMENT OF TRANSPORTATION
REAL PROPERTY

TO BE ACQUIRED

Parcel Number: RW-31
STA. 228+11.97 Rt. to STA. 235+10.78 Rt. (US 160 Alignment)

FROM

W. Gary Robison and Judy S. Robison
PO Box 1847
Durango, CO 81302

FOR

Project Code: 26704
Project Number: FBR 1602-193
Location: US 160 MP 93.77 Florida Bridge BTE

EXHIBIT "A"

PROJECT CODE: 26704
PROJECT NUMBER: FBR 1602-193
PARCEL NUMBER: RW-31
DATE: JULY 8TH, 2025

DESCRIPTION

A tract or parcel of land, No. RW-31 of the Department of Transportation, State of Colorado, Project Code 26704, Project Number FBR 1602-193, containing 0.061 acres (2,675 sq. ft.), more or less, lying in a portion of a tract of land described in Warranty Deed Reception No. 1029853, located in the N1/2 of the SW1/4 of Section 9, Township 34 North (N.U.L.), Range 8 West, New Mexico Principal Meridian, La Plata County, Colorado, said tract or parcel of land being more particularly described as follows:

Beginning at a point on the southerly existing Right-of-Way of US Highway 160 established on former Project F 022-2(6), said point being a 3.25" Brass Cap in a 6" concrete cylinder (COLO DEPT HWYS ROW MARKER), from which the Witness Corner for the N 1/16 corner of Section 9, Township 34 North (N.U.L.), Range 8 West, being a 3/4" diameter rebar with a 3.5" aluminum cap (COLO DEPT OF TRANSPORTATION WC 80.00 N1/16 S9 2012 PLS 37932), Bears: N 47°33'24" E, a distance of 2211.68 feet;

1. Thence N 86°38'00" W, a distance of 702.89 feet to a point on the southerly Right-of-Way of US Highway 160;
2. Thence N 87°01'36" E, along said Right-of-Way, a distance of 68.92 feet;
3. Thence S 85°56'45" E, along said Right-of-Way, a distance of 634.44 feet to the POINT OF BEGINNING.

The above described tract or parcel of land contains 0.061 acres (2,675 sq. ft.), more or less.

Basis of Bearings: All bearings are grid bearings of the Colorado State Plane coordinate system, High Accuracy Reference Network (CHARN), Southern Zone (0503), NAD83(92). Bearings used in the calculations of coordinates are based on two NGS Deep Rods monuments, MP 91.45 "PERINO" 1992 to MP 95.10 "WEMLINGER" 1992; Bears S 87°15'14" E.

Prepared for and on behalf of the
Colorado Department of Transportation
Daniel L. Orris, PLS #38434
Farnsworth Group, Inc.
1099 Main Ave., Suite 306 Durango, CO 81301

COLORADO DEPARTMENT OF TRANSPORTATION
REAL PROPERTY

TO BE ACQUIRED

Parcel Number: RW-31A
STA. 235+40.14 Rt. to STA. 244+52.69 Rt. (US 160 Alignment)

FROM

W. Gary Robison and Judy S. Robison
PO Box 1847
Durango, CO 81302

FOR

Project Code: 26704
Project Number: FBR 1602-193
Location: US 160 MP 93.77 Florida Bridge BTE

EXHIBIT "A"

PROJECT CODE: 26704
PROJECT NUMBER: FBR 1602-193
PARCEL NUMBER: RW-31A
DATE: JULY 8TH, 2025

DESCRIPTION

A tract or parcel of land, No. RW-31A of the Department of Transportation, State of Colorado, Project Code 26704, Project Number FBR 1602-193, containing 1.238 acres (53,947 sq. ft.), more or less, lying in a portion of a tract of land described in Warranty Deed Reception No. 1029853, located in the N1/2 of the SW1/4 of Section 9, Township 34 North (N.U.L.), Range 8 West, New Mexico Principal Meridian, La Plata County, Colorado, said tract or parcel of land being more particularly described as follows:

Beginning at a point on the southerly existing Right-of-Way of US Highway 160 established on former Project F 022-2(6), said point being a 3.25" Brass Cap in a 6" concrete cylinder (COLO DEPT HWYS ROW MARKER), from which the Witness Corner for the N 1/16 corner of Section 9, Township 34 North (N.U.L.), Range 8 West, being a 3/4" diameter rebar with a 3.5" aluminum cap (COLO DEPT OF TRANSPORTATION WC 80.00 N1/16 S9 2012 PLS 37932), Bears: N 47°33'24" E, a distance of 2211.68 feet;

1. Thence N 51°4'51" E, a distance of 39.78 feet along the southerly Right-of-Way of US Highway 160, to the TRUE POINT OF BEGINNING;
2. Thence N 51°4'51" E, continuing along said Right-of-Way, a distance of 92.40 feet;
3. Thence S 85°56'03" E, continuing along said Right-of-Way, a distance of 800.00 feet;
4. Thence S 31°28'19" E, continuing along said Right-of-Way, a distance of 77.42 feet;
5. Thence N 85°56'03" W, a distance of 912.59 feet to the TRUE POINT OF BEGINNING.

The above described tract or parcel of land contains 1.238 acres (53,947 sq. ft.), more or less.

Basis of Bearings: All bearings are grid bearings of the Colorado State Plane coordinate system, High Accuracy Reference Network (CHARN), Southern Zone (0503), NAD83(92). Bearings used in the calculations of coordinates are based on two NGS Deep Rods monuments, MP 91.45 "PERINO" 1992 to MP 95.10 "WEMLINGER" 1992; Bears S 87°15'14" E.

Prepared for and on behalf of the
Colorado Department of Transportation
Daniel L. Orris, PLS #38434
Farnsworth Group, Inc.
1099 Main Ave., Suite 306 Durango, CO 81301

COLORADO DEPARTMENT OF TRANSPORTATION
REAL PROPERTY

TO BE ACQUIRED

Parcel Number: 31-RM REV
STA. 228+12.51 Rt. to STA. 259+33.09 Rt. (US 160 Alignment)

FROM

W. Gary Robison and Judy S. Robison
PO Box 1847
Durango, CO 81302

FOR

Project Code: 26704
Project Number: FBR 1602-193
Location: US 160 MP 93.77 Florida Bridge BTE

EXHIBIT "A"

PROJECT CODE: 26704
PROJECT NUMBER: FBR 1602-193
PARCEL NUMBER: 31-RM REV
DATE: SEPTEMBER 30TH, 2025

DESCRIPTION

A tract or parcel of land, No. 31-RM REV of the Department of Transportation, State of Colorado,
Project Code 26704, Project Number FBR-1602-193, containing 46.375 acres, more or less, being a portion of a tract of land described in Warranty Deed Reception No. 1029853 (Parcels I), located in the N1/2 of the SW1/4 and the NW1/4 of the SE1/4 of Section 9, Township 34 North (N.U.L.), Range 8 West, New Mexico Principal Meridian, La Plata County, Colorado, said tract or parcel of land being more particularly described as follows:

All that part of the North 1/2 of the Southwest1/4 of Section 9, Township 34 North, Range 8 West, N.M.P.M., lying South of US Highway 160 described in reception No.'s 857605 and 857606, and the parcel described in Quitclaim Deed Reception No. 1029852, LESS and EXCEPT those portions described in the following instruments: Warranty Deed recorded December 17, 1923 at Reception No. 100883 in Book 178 at Page 547, Stipulation and Consent to Entry of Rule and Order recorded March 26, 2012 at Reception No. 1044576, and Rule and Order recorded May 31, 2012 at Reception No. 1047631, County of La Plata, State of Colorado.

Also, Less and Except, all that part of the parcel described in Warranty Deed Reception No. 1029853 lying East of CR 225A.

Also, Less and Except, Parcels RW-31, RW-31A, and WH-31 from CDOT Project Code: 26704, No. FBR 1602-193.

The above described tract or parcel of land contains 46.375 acres, more or less.

The intent of this description is to describe all of that tract or parcel of land conveyed in the recorded Warranty Deed under Reception Number 1029853, lying West of CR 225A.

Prepared for and on behalf of the
Colorado Department of Transportation
Daniel L. Orris, PLS #38434
Farnsworth Group, Inc.
1099 Main Ave., Suite 306 Durango, CO 81301

COLORADO DEPARTMENT OF TRANSPORTATION
REAL PROPERTY

TO BE ACQUIRED

Parcel Number: 31-WH
STA. 241+74.71 Rt. to STA. 254+66.46 Rt. (US 160 Alignment)

FROM

W. Gary Robison and Judy S. Robison
PO Box 1847
Durango, CO 81302

FOR

Project Code: 26704
Project Number: FBR 1602-193
Location: US 160 MP 93.77 Florida Bridge BTE

EXHIBIT "A"

PROJECT CODE: 26704
PROJECT NUMBER: FBR 1602-193
PARCEL NUMBER: 31-WH
DATE: SEPTEMBER 30TH, 2025

DESCRIPTION

A tract or parcel of land, No. 31-WH of the Department of Transportation, State of Colorado, Project Code 26704, Project Number FBR 1602-193, containing 13.600 acres (592,416 sq. ft.), more or less, lying in a portion of a tract of land described in Warranty Deed Reception No. 1029853 (Parcels I), located in the N1/2 of the SW1/4 and the NW1/4 of the SE1/4 of Section 9, Township 34 North (N.U.L.), Range 8 West, New Mexico Principal Meridian, La Plata County, Colorado, said tract or parcel of land being more particularly described as follows:

Beginning at a point on the southerly existing Right-of-Way of US Highway 160 established on former Project F 022-2(6), said point being a 3.25" Brass Cap in a 6" concrete cylinder (COLO DEPT HWYS ROW MARKER), from which the Witness Corner for the N 1/16 corner of Section 9, Township 34 North (N.U.L.), Range 8 West, being a 3/4" diameter rebar with a 3.5" aluminum cap (COLO DEPT OF TRANSPORTATION WC 80.00 N1/16 S9 2012 PLS 37932), Bears: N 47°33'24" E, a distance of 2211.68 feet;

1. Thence N 51°4'51" E, a distance of 39.78 feet along the southerly Right-of-Way of US Highway 160,
2. Thence S 85°56'03" E, a distance of 634.59 feet to the TRUE POINT OF BEGINNING.
3. Thence S 85°56'03" E, a distance of 278.00 feet to a point on the southerly Right-of-Way of US Hwy 160,
4. Thence S 31°28'19" E, along said Right-of-Way, a distance of 94.63 feet;
5. Thence S 85°56'03" E, continuing along said Right-of-Way, a distance of 957.79 feet;
6. Thence S 35°45'05" W, a distance of 201.50 feet;
7. Thence S 15°37'45" E, a distance of 404.67 feet;
8. Thence S 62°44'00" W, a distance of 214.51 feet;
9. Thence N 68°48'04" W, a distance of 252.00 feet;
10. Thence N 51°40'16" W, a distance of 394.18 feet;
11. Thence N 87°36'25" W, a distance of 218.97 feet;
12. Thence N 67°45'23" W, a distance of 358.77 feet;
13. Thence N 2°4'38" E, a distance of 339.52 feet to the TRUE POINT OF BEGINNING.

The above described tract or parcel of land contains 13.600 acres (592,416 sq. ft.), more or less.

Basis of Bearings: All bearings are grid bearings of the Colorado State Plane coordinate system, High Accuracy Reference Network (CHARN), Southern Zone (0503), NAD83(92). Bearings used in the calculations of coordinates are based on two NGS Deep Rods monuments, MP 91.45 "PERINO" 1992 to MP 95.10 "WEMLINGER" 1992; Bears S 87°15'14" E.

Prepared for and on behalf of the
Colorado Department of Transportation
Daniel L. Orris, PLS #38434
Farnsworth Group, Inc.
1099 Main Ave., Suite 306 Durango, CO 81301

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: The Transportation Commission

From: Jeff Sudmeier, Chief Financial Officer
Bethany Nicholas, Deputy Chief Financial Officer

Date: March 18, 2026

Subject: FY 2026-27 Final Annual Budget Allocation Plan

Purpose

To present the FY 2026-27 Final Annual Budget Allocation Plan for Transportation Commission (TC) adoption.

Action

The Division of Accounting and Finance (DAF) is requesting that the TC adopt the FY 2026-27 Final Annual Budget Allocation Plan.

FY 2026-27 Final Annual Budget Allocation Plan

The FY 2026-27 Final Annual Budget Allocation Plan is available on the Department's website. The FY 2026-27 Final Annual Budget totals $2,300.7 million (including the CDOT enterprises) and allocates:

- $856.9 M to capital construction programs
- $475.2 M to maintenance and operations programs
- $462.3 M to suballocated programs
- $113.5 M to multimodal and mobility programs
- $169.4 M to administration and agency operations
- $223.4 M to debt service, contingency reserve, and other programs

The FY 2026-27 Final Revenue Allocation Plan is balanced, with all flexible revenue allocated. Revenues specific to a program that are considered inflexible (i.e., FAST Act and State mandated programs such as safety education and Aeronautics) have been automatically adjusted based on the FY 2026-27 Revenue Forecast. Asset Management programs are funded according to the FY 2026-27 Asset Management Planning Totals, approved by the TC in September 2022. All other program revenues are flexible and are initially set based on the FY 2025-26 budget amounts as adopted by the TC in March 2025 (and subsequently amended), and then modified through the work plan budget and decision item processes.

COLORADO
Department of Transportation

Changes from the Draft Final Budget

Since the TC reviewed the Final Budget in February 2026, staff made minor updates to allocations for the Colorado Transportation Investment Office (CTIO) to reflect final decisions by the CTIO Board.

The Joint Budget Committee is making final decisions on statewide common policies during their figure setting process, which will impact the Administration line (Line 67). Staff will likely submit a Budget Amendment in July 2026 to incorporate final impacts.

Options and Recommendations

Pursuant to Section 43-1-113 (9)(c), C.R.S., the TC is required to adopt a Final Annual Budget Allocation Plan for the upcoming fiscal year by April 15. DAF requests TC adoption of the FY 2026-27 Final Annual Budget Allocation Plan. Options include:

1. Adopt the FY 2026-27 Final Annual Budget Allocation Plan by resolution. (Staff Recommendation)
2. Request additional changes to the FY 2026-27 Final Annual Budget Allocation Plan prior to April 15, 2026.

Next Steps

Upon Adoption, the FY 2026-27 Final Annual Budget Allocation Plan will be delivered to the Governor on or before April 15, 2026. The TC has the authority to amend the budget after this date. The budget may also be changed according to the revised common policy or other legislatively approved changes.

Attachments

Attachment A – FY 2026-27 Revenue Allocation Plan
Attachment B - Presentation

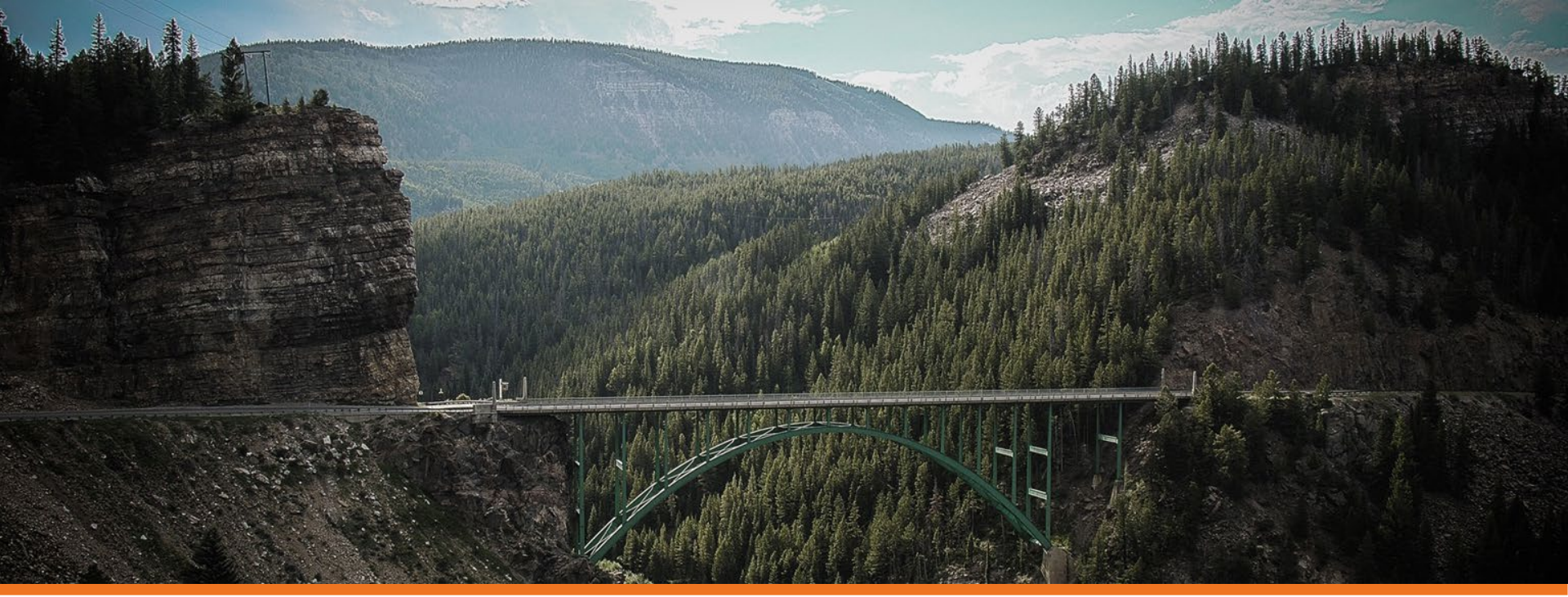
Fiscal Year (FY) 2026 -27 Revenue Allocation Plan							
Line	Budget Category / Program	A. Rollforward from FY 2025-26*	B. FY 2025-26 Final Allocation Plan	C. FY 2026-27 Final Allocation Plan	FY 2026-27 Total Final Available Budget (A+C)	Directed By	Funding Source
1	**Colorado Department of Transportation (CDOT)**						
2	**Capital Construction**	**$845.6 M**	**$612.0 M**	**$654.3 M**	**$1,499.9 M**		
3	**Asset Management**	**$191.3 M**	**$398.3 M**	**$407.6 M**	**$598.9 M**		
4	Surface Treatment	$100.0 M	$229.7 M	$233.0 M	$333.0 M	TC	FHWA / SH / SB 09-108
5	Structures	$50.0 M	$60.9 M	$63.4 M	$113.4 M	TC	FHWA / SH / SB 09-108
6	System Operations	$6.8 M	$25.9 M	$27.3 M	$34.1 M	TC	FHWA / SH
7	Geohazards Mitigation	$4.0 M	$8.1 M	$9.7 M	$13.7 M	TC	SB 09-108
8	Permanent Water Quality Mitigation	$0.5 M	$6.5 M	$6.5 M	$7.0 M	TC	FHWA / SH
9	Emergency Relief	$0.0 M	$0.0 M	$0.0 M	$0.0 M	FR	FHWA
10	10 Year Plan Projects - Capital Asset Management	$30.0 M	$67.2 M	$67.6 M	$97.6 M	TC / FR	FHWA
11	**Safety**	**$137.6 M**	**$121.8 M**	**$123.4 M**	**$261.0 M**		
12	Highway Safety Improvement Program	$55.0 M	$41.0 M	$43.2 M	$98.2 M	FR	FHWA / SH
13	Railway-Highway Crossings Program	$0.5 M	$3.5 M	$3.2 M	$3.8 M	FR	FHWA / SH
14	Hot Spots	$2.0 M	$2.7 M	$2.2 M	$4.2 M	TC	FHWA / SH
15	FASTER Safety	$70.0 M	$67.4 M	$67.7 M	$137.7 M	TC	SB 09-108
16	Americans with Disabilities Act Compliance	$10.0 M	$7.2 M	$7.2 M	$17.2 M	TC	FHWA / SH
17	**Mobility**	**$516.8 M**	**$91.9 M**	**$123.3 M**	**$640.1 M**		
18	Regional Priority Program	$55.5 M	$50.0 M	$50.0 M	$105.5 M	TC	FHWA / SH
19	10 Year Plan Projects - Capital Mobility	$432.3 M	$19.3 M	$60.7 M	$493.0 M	SL	FHWA / SB 21-260
20	Freight Programs	$28.9 M	$22.6 M	$12.6 M	$41.5 M	FR	FHWA / SH / SL
21	**Maintenance and Operations**	**$42.8 M**	**$419.9 M**	**$434.0 M**	**$475.9 M**		
22	**Asset Management**	**$35.4 M**	**$384.2 M**	**$396.7 M**	**$431.3 M**		
23	Maintenance Program Areas	$0.8 M	$312.8 M	$325.3 M	$325.3 M		
24	Roadway Surface	$0.0 M	$41.7 M	$37.2 M	$37.2 M	TC	SH
25	Roadside Facilities	$0.0 M	$24.3 M	$27.3 M	$27.3 M	TC	SH
26	Roadside Appearance	$0.0 M	$8.6 M	$14.8 M	$14.8 M	TC	SH
27	Structure Maintenance	$0.0 M	$6.3 M	$5.8 M	$5.8 M	TC	SH
28	Tunnel Activities	$0.0 M	$4.8 M	$5.1 M	$5.1 M	TC	SH
29	Snow and Ice Control	$0.0 M	$103.8 M	$111.5 M	$111.5 M	TC	SH
30	Traffic Services	$0.0 M	$81.8 M	$82.9 M	$82.9 M	TC	SH
31	Materials, Equipment, and Buildings	$0.0 M	$21.4 M	$22.0 M	$22.0 M	TC	SH
32	Planning and Scheduling	$0.0 M	$20.0 M	$18.8 M	$18.8 M	TC	SH
33	Express Lane Corridor Maintenance and Operations	$3.0 M	$13.2 M	$13.2 M	$16.1 M	TC	SH
34	Property	$0.0 M	$22.8 M	$22.7 M	$22.7 M	TC	SH
35	Capital Equipment	$31.6 M	$23.4 M	$23.6 M	$55.2 M	TC	SH
36	Maintenance Reserve Fund	$0.0 M	$12.0 M	$12.0 M	$12.0 M	TC	SH
37	**Safety**	**$2.2 M**	**$11.4 M**	**$11.4 M**	**$13.5 M**		
38	Strategic Safety Program	$2.2 M	$11.4 M	$11.4 M	$13.5 M	TC	FHWA / SH
39	**Mobility**	**$5.2 M**	**$24.4 M**	**$25.9 M**	**$31.1 M**		
40	Real-Time Traffic Operations	$0.2 M	$14.4 M	$15.9 M	$16.1 M	TC	SH
41	Intelligent Transportation System Investments	$5.0 M	$10.0 M	$10.0 M	$15.0 M	TC	FHWA / SH
42	**Multimodal and Mobility Programs**	**$87.2 M**	**$56.9 M**	**$36.7 M**	**$123.9 M**		
43	**Mobility**	**$87.2 M**	**$56.9 M**	**$36.7 M**	**$123.9 M**		
44	Innovative Mobility Programs	$18.4 M	$9.4 M	$8.0 M	$26.3 M	TC	FHWA / SH
45	National Electric Vehicle Program	$0.0 M	$14.5 M	$0.0 M	$0.0 M	FR	FHWA
46	10 Year Plan Projects - Multimodal	$20.0 M	$9.6 M	$14.3 M	$34.3 M	TC	FHWA / SB 21-260
47	Rail Program	$10.6 M	$0.0 M	$0.0 M	$10.6 M	SL	SL
48	Bustang	$38.3 M	$23.3 M	$14.4 M	$52.7 M	TC	SB 09-108 / Fare Rev. / SB 21-260
49	**Suballocated Programs**	**$447.2 M**	**$358.8 M**	**$330.4 M**	**$777.6 M**		
50	**Aeronautics**	**$34.2 M**	**$56.1 M**	**$48.8 M**	**$83.0 M**		
51	Aviation System Program	$34.2 M	$56.1 M	$48.8 M	$83.0 M	AB	SA
52	**Highway**	**$184.7 M**	**$148.6 M**	**$151.4 M**	**$336.1 M**		
53	Surface Transportation Block Grant - Urban	$100.0 M	$63.8 M	$65.2 M	$165.2 M	FR	FHWA / LOC
54	Congestion Mitigation and Air Quality	$45.0 M	$51.4 M	$52.5 M	$97.5 M	FR	FHWA / LOC
55	Metropolitan Planning	$1.0 M	$11.4 M	$11.7 M	$12.7 M	FR	FHWA / FTA / LOC
56	Off-System Bridge Program	$38.7 M	$22.0 M	$22.0 M	$60.7 M	TC / FR	FHWA / SH / LOC
57	**Transit and Multimodal**	**$228.2 M**	**$154.2 M**	**$130.2 M**	**$358.4 M**		
58	Recreational Trails	$1.2 M	$1.6 M	$1.6 M	$2.8 M	FR	FHWA
59	Safe Routes to School	$9.7 M	$3.1 M	$3.1 M	$12.8 M	TC	FHWA / LOC
60	Transportation Alternatives Program	$43.8 M	$21.8 M	$22.3 M	$66.1 M	FR	FHWA / LOC
61	Transit Grant Programs	$120.0 M	$43.0 M	$41.9 M	$161.9 M	FR / SL / TC	FTA / LOC / SB 09-108
62	Multimodal Options Program - Local	$30.0 M	$68.2 M	$51.7 M	$81.7 M	SL	SB 21-260
63	Carbon Reduction Program - Local	$15.0 M	$9.4 M	$9.6 M	$24.6 M	FR	FHWA / LOC
64	Revitalizing Main Streets Program	$8.5 M	$7.0 M	$0.0 M	$8.5 M	SL / TC	SB 21-260
65	**Administration & Agency Operations**	**$6.1 M**	**$138.8 M**	**$138.4 M**	**$144.5 M**		
66	Agency Operations	$4.7 M	$83.8 M	$88.1 M	$92.8 M	TC / AB	FHWA / SH / SA / SB 09-108
67	Administration	$0.0 M	$53.3 M	$48.4 M	$48.4 M	SL	SH
68	Project Initiatives	$1.4 M	$1.7 M	$1.9 M	$3.3 M	TC	SH
69	**Debt Service**	**$110.6 M**	**$44.5 M**	**$35.5 M**	**$146.1 M**		
70	Debt Service	$110.6 M	$44.5 M	$35.5 M	$146.1 M	DS	SH
71	**Contingency Reserve**	**$61.3 M**	**$18.9 M**	**$15.0 M**	**$76.3 M**		
72	Contingency Fund	$21.1 M	$15.0 M	$15.0 M	$36.1 M	TC	FHWA / SH
73	Commission Reserve Funds	$40.2 M	$3.9 M	$0.0 M	$40.2 M	TC	FHWA / SH
74	**Other Programs**	**$42.2 M**	**$38.9 M**	**$40.3 M**	**$82.5 M**		

75	Safety Education	$31.0 M	$19.5 M	$20.3 M	$51.3 M	TC / FR	NHTSA / SL
76	Planning and Research	$1.5 M	$18.2 M	$18.6 M	$20.1 M	FR	FHWA / SH
77	State Infrastructure Bank	$9.7 M	$1.2 M	$1.4 M	$11.1 M	TC	SIB
78	**Total - CDOT**	**$1,643.0 M**	**$1,688.7 M**	**$1,684.6 M**	**$3,326.7 M**		
79	**Colorado Bridge & Tunnel Enterprise (BTE)**						
80	**Capital Construction**	**$31.8 M**	**$110.6 M**	**$124.7 M**	**$156.5 M**		
81	**Asset Management-BTE**	**$31.8 M**	**$110.6 M**	**$124.7 M**	**$156.5 M**		
82	Capital Construction-BTE	$31.8 M	$110.6 M	$124.7 M	$156.5 M	BTE Board	SB 09-108, SB 21-260
83	**Maintenance and Operations**	**$0.8 M**	**$2.4 M**	**$1.4 M**	**$2.2 M**		
84	**Asset Management-BTE**	**$0.8 M**	**$2.4 M**	**$1.4 M**	**$2.2 M**		
85	Maintenance and Preservation	$0.8 M	$2.4 M	$1.4 M	$2.2 M	BTE Board	SB 09-108
86	**Administration & Agency Operations**	**$2.0 M**	**$2.2 M**	**$2.6 M**	**$4.6 M**		
87	Agency Operations-BTE	$2.0 M	$2.2 M	$2.6 M	$4.6 M	BTE Board	SB 09-108, SB 21-260
88	**Debt Service**	**$0.7 M**	**$66.2 M**	**$78.3 M**	**$79.0 M**		
89	Debt Service-BTE	$0.7 M	$66.2 M	$78.3 M	$79.0 M	BTE Board	FHWA / SH
90	**Total - Bridge & Tunnel Enterprise (BTE)**	**$35.2 M**	**$181.4 M**	**$207.0 M**	**$242.2 M**		
91	**Colorado Transportation Investment Office (CTIO)**						
92	**Capital Construction**	**$143.1 M**	**$83.3 M**	**$77.8 M**	**$220.9 M**		
93	**Mobility**	**$143.1 M**	**$83.3 M**	**$77.8 M**	**$220.9 M**		
94	Capital Construction-CTIO	$143.1 M	$83.3 M	$77.8 M	$220.9 M	CTIO Board	Tolls / Managed Lanes Revenue
95	**Maintenance and Operations**	**$11.9 M**	**$8.7 M**	**$39.9 M**	**$51.8 M**		
96	**Asset Management**	**$11.9 M**	**$8.7 M**	**$39.9 M**	**$51.8 M**		
97	Express Lanes Operations	$11.9 M	$8.7 M	$39.9 M	$51.8 M	CTIO Board	Tolls / Managed Lanes Revenue
98	**Multimodal and Mobility Programs**	**$63.9 M**	**$57.0 M**	**$55.6 M**	**$119.5 M**		
99	Rail Projects	$63.9 M	$57.0 M	$55.6 M	$119.5 M	CTIO Board	SB 24-230
10	**Administration & Agency Operations-CTIO**	**$18.0 M**	**$57.6 M**	**$25.2 M**	**$43.2 M**		
101	Agency Operations-CTIO	$18.0 M	$57.6 M	$25.2 M	$43.2 M	CTIO Board	Tolls / Fee for Service / SB 24-230
102	**Debt Service-CTIO**	**$3.8 M**	**$29.1 M**	**$53.1 M**	**$56.9 M**		
103	Debt Service-CTIO	$3.8 M	$29.1 M	$53.1 M	$56.9 M	CTIO Board	Tolls / Managed Lanes Revenue
104	**Total - Colorado Transportation Investment Office (CTIO)**	**$240.6 M**	**$235.7 M**	**$251.6 M**	**$492.2 M**		
105	**Clean Transit Enterprise (CTE)**						
106	**Suballocated Programs**	**$58.0 M**	**$27.7 M**	**$101.1 M**	**$159.1 M**		
107	**Transit and Multimoda**	**$58.0 M**	**$27.7 M**	**$101.1 M**	**$159.1 M**		
108	Zero Emissions Transit Grant Program	$48.2 M	$11.3 M	$12.6 M	$60.8 M	CTE Board	SB 21-260
109	Local Transit Operations Formula Program	$4.3 M	$11.0 M	$77.5 M	$81.9 M	CTE Board	SB 24-230
110	Local Transit Grant Programs	$5.4 M	$5.5 M	$11.0 M	$16.5 M	CTE Board	SB 24-230
111	**Multimodal and Mobility Programs**	**$10.3 M**	**$38.4 M**	**$21.2 M**	**$31.5 M**		
112	**Mobility**	**$10.3 M**	**$38.4 M**	**$21.2 M**	**$31.5 M**		
113	Rail Grant Program	$10.3 M	$38.4 M	$21.2 M	$31.5 M	CTE Board	SB 24-230
114	**Administration & Agency Operations**	**$0.0 M**	**$1.1 M**	**$2.4 M**	**$2.4 M**		
115	Agency Operations-CTE	$0.0 M	$1.1 M	$2.4 M	$2.4 M	CTE Board	SB 21-260/SB 24-230
116	**Contingency Reserve**	**$0.0 M**	**$1.3 M**	**$1.3 M**	**$1.3 M**		
117	Contingency Reserve-CTE	$0.0 M	$1.3 M	$1.3 M	$1.3 M	CTE Board	SB 21-260
118	**Debt Service**	**$0.0 M**	**$0.0 M**	**$0.0 M**	**$0.0 M**		
119	Debt Service-CTE	$0.0 M	$0.0 M	$0.0 M	$0.0 M	CTE Board	SB 21-260
120	**Total - Clean Transit Enterprise (CTE)**	**$68.3 M**	**$68.5 M**	**$126.0 M**	**$194.3 M**		
121	**Nonattainment Area Air Pollution Mitigation Enterprise (NAAPME)**						
122	**Suballocated Programs**	**$26.0 M**	**$13.2 M**	**$15.3 M**	**$41.3 M**		
123	**Mobility**	**$26.0 M**	**$13.2 M**	**$15.3 M**	**$41.3 M**		
124	NAAPME Projects	$26.0 M	$13.2 M	$15.3 M	$41.3 M	NAAPME Board	SB 21-260
125	**Administration & Agency Operations**	**$0.0 M**	**$0.2 M**	**$0.4 M**	**$0.4 M**		
126	Agency Operations-NAAPME	$0.0 M	$0.2 M	$0.4 M	$0.4 M	NAAPME Board	SB 21-260
127	**Contingency Reserve**	**$0.2 M**	**$0.0 M**	**$0.0 M**	**$0.2 M**		
128	Contingency Reserve-NAAPME	$0.2 M	$0.0 M	$0.0 M	$0.2 M	NAAPME Board	SB 21-260
129	**Debt Service**	**$0.0 M**	**$0.0 M**	**$0.0 M**	**$0.0 M**		
130	Debt Service-NAAPME	$0.0 M	$0.0 M	$0.0 M	$0.0 M	NAAPME Board	SB 21-260
131	**Total - Nonattainment Area Air Pollution Mitigation Enterprise (NAAPME)**	**$26.2 M**	**$13.4 M**	**$15.8 M**	**$41.8 M**		
132	**Fuels Impact Enterprise (FIE)**						
133	**Suballocated Programs**	**$3.3 M**	**$14.9 M**	**$15.5 M**	**$18.7 M**		
134	**Highway**	**$3.3 M**	**$14.9 M**	**$15.5 M**	**$18.7 M**		
135	Fuels Impact Grants	$3.3 M	$14.9 M	$15.5 M	$18.7 M	FIE Board	SB 23-280
136	**Administration & Agency Operations**	**$0.0 M**	**$0.1 M**	**$0.3 M**	**$0.3 M**		
137	Agency Operations-FIE	$0.0 M	$0.1 M	$0.3 M	$0.3 M	FIE Board	SB 23-280
138	**Contingency Reserve**	**$0.1 M**	**$0.0 M**	**$0.0 M**	**$0.1 M**		
139	Contingency Reserve-FIE	$0.1 M	$0.0 M	$0.0 M	$0.1 M	FIE Board	SB 23-280
140	**Debt Service**	**$0.0 M**	**$0.0 M**	**$0.0 M**	**$0.0 M**		
141	Debt Service-FIE	$0.0 M	$0.0 M	$0.0 M	$0.0 M	FIE Board	SB 23-280
142	**Total - Fuels Impcat Enterprise (FIE)**	**$3.4 M**	**$15.0 M**	**$15.8 M**	**$19.2 M**		
143	**Total - CDOT and Enterprises**	**$2,016.7 M**	**$2,202.6 M**	**$2,300.7 M**	**$4,316.4 M**		

* Roll forward budget is budget from a prior year that hasn't been committed to a project or expended from a cost center prior to the close of the fiscal year.

Key to Acronyms:
AB = Aeronautics Board
BEB = Bridge Enterprise Board
CTB = Clean Transit Board
DS = Debt Service
FR = Federal
HPTEB = High Performance Transportation Enterprise Board
LOC = Local

M = millions in dollar amount
NAAPMEB = Nonattainment Area Air Pollution Mitigation Enterprise Board
SA = State Aviation
SB = Senate Bill
SH = State Highway
SIB = State Infrastructure Bank
SL = State Legislature
TC = Transportation Commission



COLORADO
Department of Transportation

March 2026 Budget Workshop
FY 2026-27 Final Annual Budget

Agenda

Fiscal Year 2026-27 (FY27) Final Annual Budget Allocation Plan:

- FY27 Sources and Uses
- FY27 Final Budget Allocation Plan
  - Narrative and Appendices
  - Revenue Allocation Plan
- Timeline and Next Steps

Fire engine at Eisenhower-Johnson memorial tunnel

Sources of CDOT & Enterprise Revenue FY 2026-27

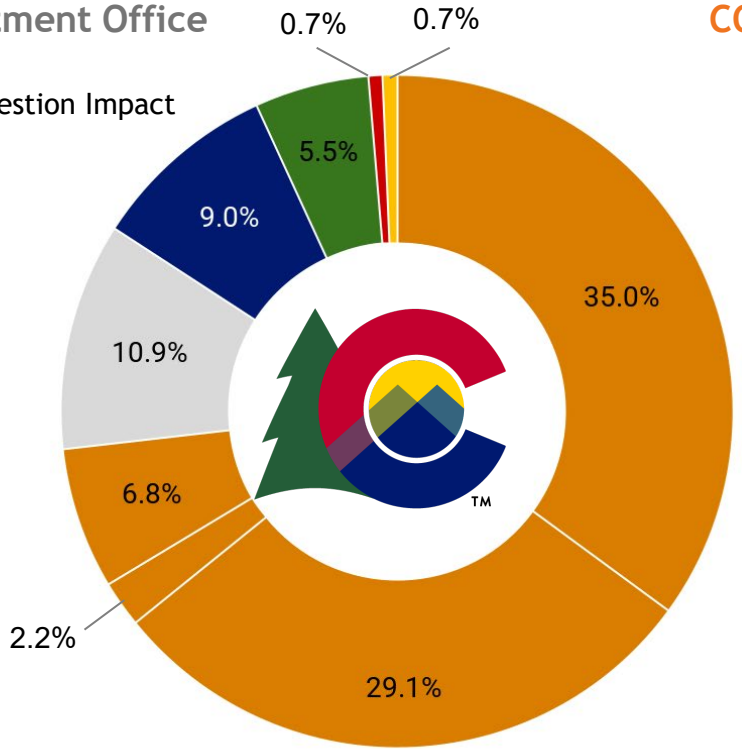
Colorado Transportation Investment Office
$251.6 million - 10.9%
Tolling and managed lane revenue, Congestion Impact fee

Bridge & Tunnel Enterprise
$207.0 million - 9.0%
Bridge Safety surcharge, Bridge and Tunnel Impact fee, Retail Delivery fee

Clean Transit Enterprise
$126.0 million - 5.5%
Retail Delivery fee, Oil and Gas Production fee

Nonattainment Enterprise
$15.8 million - 0.7%
Retail Delivery fee, Rideshare fee

Fuels Impact Enterprise
$15.8 million - 0.7%
Fuels Impact Reduction fee



$2,300.7M CDOT + Enterprises

CO Department of Transportation
$1,684.6 million - 73.2%

Federal Programs
$806.3 million - 35.0%
18.4 cents per gallon paid at the pump, Federal General Fund

Highway Users Tax Fund
$670.2 million - 29.1%
Fuel taxes and fees, vehicle registrations, FASTER fees, Retail Delivery fee

General Fund
$51.0 million - 2.2%
General Fund Transfers to the State Highway Fund, Capital Development Committee funds

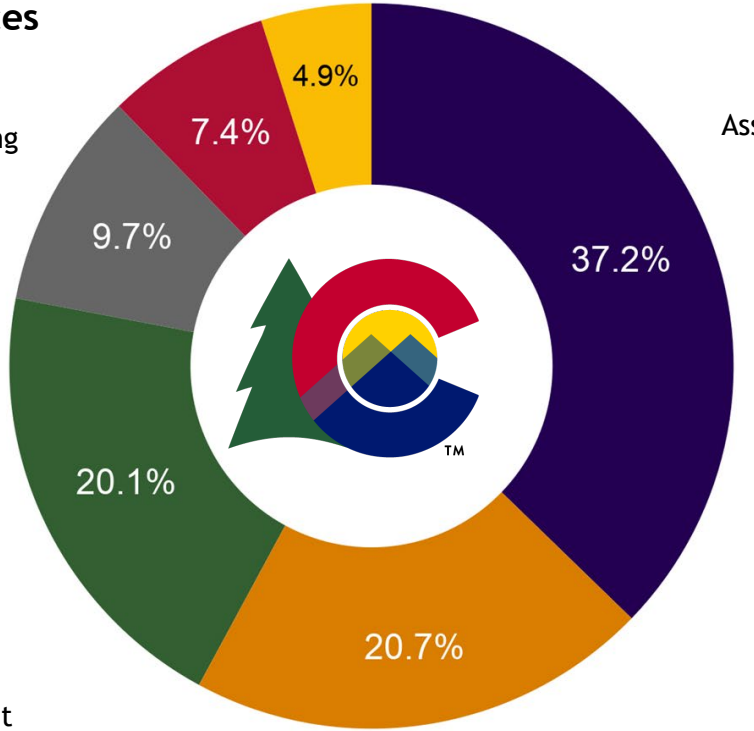
Other State Funds
$157.0 million - 6.8%
Aviation fuel taxes, appropriated special programs, miscellaneous revenue

Uses of CDOT Funding FY 2026-27

Multimodal and Mobility Services
$113.5 million - 4.9%
Innovative Mobility, NEVI, 10-Year Plan Projects (Transit), Rail Programs, Bustang

Administration and Agency Operations
$169.4 million - 7.4%
Appropriated Administration budget, agency operations and project initiatives

Other Programs, Debt Service, Contingency Funding
$223.4 million - 9.7%
State safety education, planning and research, State Infrastructure Bank, Debt Service, Contingency and Reserve funds

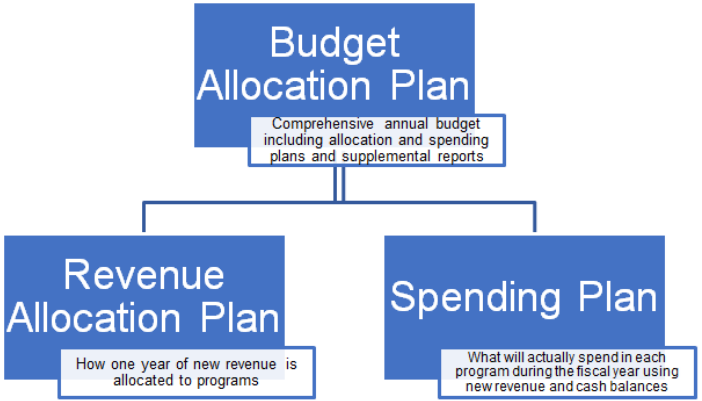


Capital Construction
$856.9 million - 37.2%
Asset Management, Safety Programs, 10-Year Plan projects, Regional Priority Program

Maintenance and Operations
$475.2 million - 20.7%
Maintenance Program Areas, Strategic Safety Program, Real-time Traffic Operations, ITS Investments

Suballocated Programs
$462.3 million - 20.1%
Aeronautics funding, sub allocated federal programs

Narrative and Other Budget Appendices



Review the Narrative and Revenue Allocation Plan on CDOT's Website:

https://www.codot.gov/business/budget/cdot-budget

- Appendix A - Revenue Allocation Plan
- Appendix B - Spending Plan
- Appendix C - Open Projects & Unexpended Project Balances
- Appendix D - Planned Projects
- Appendix E - Total Construction Budget
- Appendix F - Project Indirects & Construction Engineering
- Appendix G - CDOT Personnel Report
- Appendix H - Update on 10 Year Plan

FY 2026-27 Revenue Allocation Plan

FY 2026-27 Revenue Allocation Plan

Line	Budget Category / Program	A. Estimated Rollforward from FY 2025-26*	B. FY 2025-26 Final Allocation Plan	FY 2026-27 Proposed Allocation Plan	FY 2026-27 Total Final Available Budget (A+C)	Directed By	Funding Source
1	**COLORADO DEPARTMENT OF TRANSPORTATION**						
2	**Capital Construction**	$0.0 M	$612.0 M	$656.2 M	$656.2 M		
3	**Asset Management**	$0.0 M	$398.3 M	$407.6 M	$407.6 M		
4	Surface Treatment	$0.0 M	$229.7 M	$233.0 M	$233.0 M	TC	FHWA / SH / SB 09-108
5	Structures	$0.0 M	$60.9 M	$63.4 M	$63.4 M	TC	FHWA / SH / SB 09-108
6	System Operations	$0.0 M	$25.9 M	$27.3 M	$27.3 M	TC	FHWA / SH
7	Geohazards Mitigation	$0.0 M	$8.1 M	$9.7 M	$9.7 M	TC	SB 09-108
8	Permanent Water Quality Mitigation	$0.0 M	$6.5 M	$6.5 M	$6.5 M	TC	FHWA / SH
9	Emergency Relief	$0.0 M	$0.0 M	$0.0 M	$0.0 M	FR	FHWA
10	10 Year Plan Projects - Capital Asset Management	$0.0 M	$67.2 M	$67.6 M	$67.6 M	TC / FR	FHWA
11	**Safety**	$0.0 M	$121.8 M	$123.2 M	$123.2 M		
12	Highway Safety Improvement Program	$0.0 M	$41.0 M	$43.2 M	$43.2 M	FR	FHWA / SH
13	Railway-Highway Crossings Program	$0.0 M	$3.5 M	$3.2 M	$3.2 M	FR	FHWA / SH
14	Hot Spots	$0.0 M	$2.7 M	$2.7 M	$2.7 M	TC	FHWA / SH
15	FASTER Safety	$0.0 M	$67.4 M	$66.9 M	$66.9 M	TC	SB 09-108
16	Americans with Disabilities Act Compliance	$0.0 M	$7.2 M	$7.2 M	$7.2 M	TC	FHWA / SH
17	**Mobility**	$0.0 M	$91.9 M	$125.4 M	$125.4 M		
18	Regional Priority Program	$0.0 M	$50.0 M	$50.0 M	$50.0 M	TC	FHWA
19	10 Year Plan Projects - Capital Mobility	$0.0 M	$19.3 M	$62.8 M	$62.8 M	SL	FHWA / SB 21-260
20	Freight Programs	$0.0 M	$22.6 M	$12.6 M	$12.6 M	FR	FHWA / SH / SL
21	**Maintenance and Operations**	$0.0 M	$419.9 M	$431.2 M	$431.2 M		
22	**Asset Management**	$0.0 M	$384.2 M	$395.5 M	$395.5 M		
23	Maintenance Program Areas	$0.0 M	$312.8 M	$323.7 M	$323.7 M		
24	Roadway Surface	$0.0 M	$41.7 M	$43.1 M	$43.1 M	TC	SH
25	Roadside Facilities	$0.0 M	$24.3 M	$25.1 M	$25.1 M	TC	SH
26	Roadside Appearance	$0.0 M	$8.6 M	$8.9 M	$8.9 M	TC	SH
27	Structure Maintenance	$0.0 M	$6.3 M	$6.5 M	$6.5 M	TC	SH
28	Tunnel Activities	$0.0 M	$4.8 M	$5.0 M	$5.0 M	TC	SH
29	Snow and Ice Control	$0.0 M	$103.8 M	$107.5 M	$107.5 M	TC	SH
30	Traffic Services	$0.0 M	$81.8 M	$84.7 M	$84.7 M	TC	SH
31	Materials, Equipment, and Buildings	$0.0 M	$21.4 M	$22.1 M	$22.1 M	TC	SH
32	Planning and Scheduling	$0.0 M	$20.0 M	$20.7 M	$20.7 M	TC	SH
33	Express Lane Corridor Maintenance and Operations	$0.0 M	$13.2 M	$13.5 M	$13.5 M	TC	SH
34	Property	$0.0 M	$22.8 M	$22.8 M	$22.8 M	TC	SH
35	Capital Equipment	$0.0 M	$23.4 M	$23.4 M	$23.4 M	TC	SH
36	Maintenance Reserve Fund	$0.0 M	$12.0 M	$12.0 M	$12.0 M	TC	SH
37	**Safety**	$0.0 M	$11.4 M	$11.4 M	$11.4 M		
38	Strategic Safety Program	$0.0 M	$11.4 M	$11.4 M	$11.4 M	TC	FHWA / SH
39	**Mobility**	$0.0 M	$24.4 M	$24.4 M	$24.4 M		
40	Real-Time Traffic Operations	$0.0 M	$14.4 M	$14.4 M	$14.4 M	TC	SH
41	Intelligent Transportation System Investments	$0.0 M	$10.0 M	$10.0 M	$10.0 M	TC	FHWA / SH
42	**Multimodal and Mobility Programs**	$0.0 M	$56.9 M	$38.3 M	$38.3 M		
43	**Mobility**	$0.0 M	$56.9 M	$38.3 M	$38.3 M		
44	Innovative Mobility Programs	$0.0 M	$9.4 M	$9.4 M	$9.4 M	TC	FHWA / SH
45	National Electric Vehicle Program	$0.0 M	$14.5 M	$0.0 M	$0.0 M	FR	FHWA
46	10 Year Plan Projects - Multimodal	$0.0 M	$9.6 M	$14.5 M	$14.5 M	TC	FHWA / SB 21-260
47	Rail Program	$0.0 M	$0.0 M	$0.0 M	$0.0 M	SL	SL
48	Bustang	$0.0 M	$23.3 M	$14.4 M	$14.4 M	TC	SB 09-108 / Fare Rev. / SB 21-260
49	**Suballocated Programs**	$0.0 M	$358.8 M	$301.1 M	$301.1 M		
50	**Aeronautics**	$0.0 M	$56.1 M	$48.8 M	$48.8 M		
51	Aviation System Program	$0.0 M	$56.1 M	$48.8 M	$48.8 M	AB	SA
52	**Highway**	$0.0 M	$148.6 M	$151.4 M	$151.4 M		
53	Surface Transportation Block Grant - Urban	$0.0 M	$63.8 M	$65.2 M	$65.2 M	FR	FHWA / LOC
54	Congestion Mitigation and Air Quality	$0.0 M	$51.4 M	$52.5 M	$52.5 M	FR	FHWA / LOC
55	Metropolitan Planning	$0.0 M	$11.4 M	$11.7 M	$11.7 M	FR	FHWA / FTA / LOC
56	Off-System Bridge Program	$0.0 M	$22.0 M	$22.0 M	$22.0 M	TC / FR	FHWA / SH / LOC
57	**Transit and Multimodal**	$0.0 M	$154.2 M	$101.0 M	$101.0 M		
58	Recreational Trails	$0.0 M	$1.6 M	$1.6 M	$1.6 M	FR	FHWA
59	Safe Routes to School	$0.0 M	$3.1 M	$3.1 M	$3.1 M	TC	FHWA / LOC
60	Transportation Alternatives Program	$0.0 M	$21.8 M	$22.3 M	$22.3 M	FR	FHWA / LOC
61	Transit Grant Programs	$0.0 M	$43.0 M	$41.9 M	$41.9 M	FR / SL / TC	FTA / LOC / SB 09-108
62	Multimodal Options Program - Local	$0.0 M	$68.2 M	$22.4 M	$22.4 M	SL	SB 21-260
63	Carbon Reduction Program - Local	$0.0 M	$9.4 M	$9.6 M	$9.6 M	FR	FHWA / LOC
64	Revitalizing Main Streets Program	$0.0 M	$7.0 M	$0.0 M	$0.0 M	SL / TC	SB 21-260
65	**Administration & Agency Operations**	$0.0 M	$138.8 M	$143.3 M	$143.3 M		
66	Agency Operations	$0.0 M	$83.8 M	$86.7 M	$86.7 M	TC / AB	FHWA / SH / SA / SB 09-108
67	Administration	$0.0 M	$53.3 M	$54.9 M	$54.9 M	SL	SH
68	Project Initiatives	$0.0 M	$1.7 M	$1.7 M	$1.7 M	TC	SH
69	**Debt Service**	$110.6 M	$44.5 M	$35.5 M	$146.1 M		
70	Debt Service	$110.6 M	$44.5 M	$35.5 M	$146.1 M	DS	SH
71	**Contingency Reserve**	$0.0 M	$18.9 M	$15.0 M	$15.0 M		

- Balanced using December 2025 revenue forecast
- Flexible revenue allocated based on FY 2025-26 budget amounts adopted by TC in March 2025 (and subsequently amended), with some adjustments to balance
- Inflexible revenue automatically adjusted based on FY 2026-27 revenue forecast
- Asset Management and Maintenance programs funded according to the FY 2026-27 Asset Management Planning Totals, approved by the TC in September 2022.
- The FY 2026-27 Revenue Allocation Plan reflects:
  - $1,684.6 million for CDOT programs
  - $616.2 million for transportation enterprises
  - $2,300.7 million total CDOT and enterprises

Timeline and Next Steps

DAF will continue to address the following items for the FY 2026-27 Final Annual Budget:

- April 2026: The approved FY 2026-27 Final Annual Budget Allocation Plan will be submitted to the Governor's Office and legislature.
- The final impacts of legislative proposals will be incorporated into the budget via Budget Amendment in July 2026.
- The Administration Line and any other legislatively appropriated budget lines will be adjusted via Budget Amendment in July 2026 to reflect the final spending authority approved by the legislature.

Light Rail bridge over 6th Avenue with view of downtown

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission (TC)
From: Darius Pakbaz, Director, Division of Transportation Development
Date: March 18, 2026

Subject: FY 2027-2036 10-Year Plan Workshop

Purpose

Staff is continuing the process of presenting the 10-Year Plan for consideration and adoption. 10-Year Plan public engagement and results from the 2-week public comment period will be featured in this workshop, along with a discussion about how the 10-Year Plan achieves PD-14 performance targets.

Action

No action; Discussion Item.

Background

The 10-Year Plan is Colorado's roadmap for prioritizing and investing in critical transportation projects across the state over the next decade. It is an action plan that defines how and when transportation performance goals established in the recently adopted 2050 Statewide Transportation Plan will be achieved.

Key Plan Characteristics and Priorities:

- **Focus on PD-14 Targets:** The plan prioritizes strategic projects that advance the state's PD-14 performance goals, which include fixing roads, advancing transportation safety, and sustainably increasing transportation choice.
- **Funding:** Initiatives are fully or partially supported by "strategic funding", meaning flexible state and federal resources allocated to projects that directly address PD-14 performance goals.
- **Asset Management:** The plan significantly boosts funding to reduce backlogs in pavement and bridge maintenance and repair.
- **Safety:** Safety investments are centered on the Safe System Approach, with a focus on improving intersections.
- **Transportation Choice:** The plan supports options like Bustang, local transit, and active transportation.

Input Guiding Major Investments:

Major investment needs are identified through a comprehensive approach:

- Data analysis (e.g., addressing assets in poor condition like pavement)
- Community outreach
- Statewide planning and development studies
- Metropolitan and rural regional transportation plans

Public Comment Themes:

While the public shows strong agreement on the need to improve system safety and performance, different views exist on resource prioritization, including:

- Reducing congestion and improving reliability
- Maintaining and repairing existing infrastructure
- Expanding reliable travel options
- Supporting freight mobility while mitigating community impacts

Next Steps

Staff anticipates bringing a final draft of the FY 2027-2036 10-Year Plan to the Commission in April for adoption. Adoption of the plan will set the framework for project development, budget development, and finalization of the next Statewide Transportation Improvement Program (STIP) in April 2026.

After adoption, the Transportation Commission may review and amend the plan mid-cycle for the following reasons:

- The addition or removal of any project between major update cycles.
- Per PD 703, any requests for modifications to strategic funds within the plan require approval.
- Annually in May, the Transportation Commission approves the STIP which will allocate funding per federal statute and approves the CDOT annual budget, including funding allocations for the fiscal year for strategic fund line-items.

Development of the next four-year prioritized period (FY31-34) is anticipated to occur in Spring 2029.

Attachments

- Presentation - 10-Year Plan Workshop March TC
- Attachment A - 10-Year Plan Public Comments 2-Pager
- Attachment B - All 10-Year Plan Public Comments (Due to size, will be sent separately from the packet)

YOUR TRANSPORTATION PRIORITIES

POWERED BY YOU

10-Year Plan Workshop

Colorado Transportation Commission

March 2026

Workshop Agenda

- Public Engagement & Results from Public Comment Period
- How the 10-Year Plan Achieves PD-14 Targets:
  - Advancing Transportation Safety
  - Fix Our Roads
  - Sustainably Increase Transportation Choice
- 10-Year Plan Finalization & Next Steps

Public Engagement & Results from Public Comment Period

Public & Stakeholder Engagement Opportunities

Public Engagement

50K+ Telephone Town Hall Participants

3.4K+ public survey responses

Bilingual outreach for the telephone town halls and the statewide plan survey

15K+ website page views since May 2024

Stakeholder Engagement

40+ Quarterly meetings with rural regions since May 2024

70+ Monthly meetings with metropolitan regions since May 2024

Hosted meetings to gather input from key stakeholder groups such as freight carriers, environmental organizations, bicycle and pedestrian advocacy groups, and transit agencies.

Public Comment Period

Culmination of all prior outreach efforts

Two week period:
Jan. 26th - Feb. 12th 2026

Components: Comment Form on Website, Email Announcement, Social Media Posts, Project Factsheets and Webmap

Results on subsequent slides

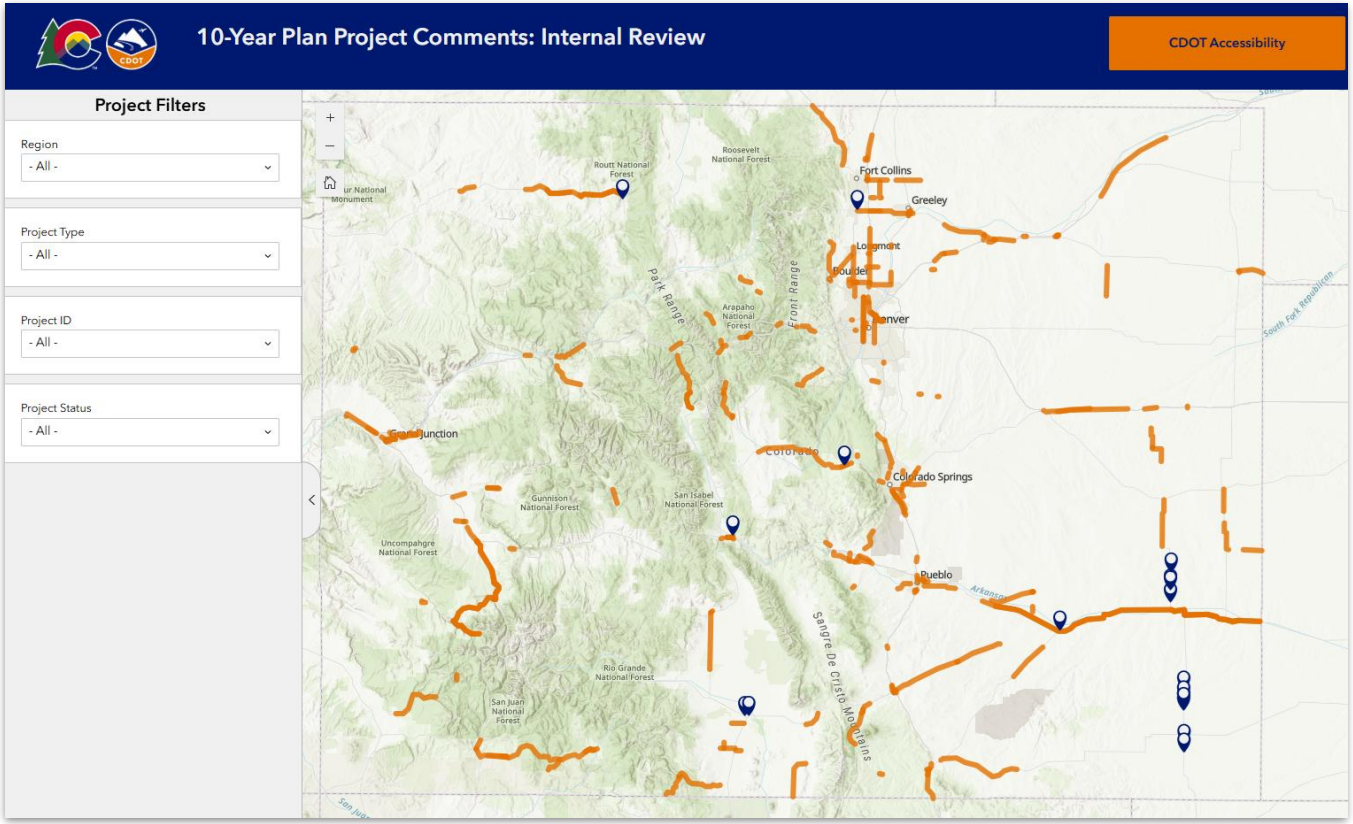
10-Year Plan Public Comment
Fact Sheets and Web Map

COLORADO
Department of Transportation

10 Year Plan Fact Sheet

Categories	Corresponding Information
Region	Region 1
10 Year Plan Project Name	Federal Boulevard BRT Phase 1
Planning Project ID	2638.1
Project Corridor or Non-Corridor Specific	US 287, CO 88
Project Type	Transit, Active Transportation, Safety, Urban Paving, Roadway Capacity, Intersections/Operational
Project Elements	Highway Capacity Improvements, Pavement Preservation or Rehabilitation (Resurfacing), Intersection Improvements, Safety Features, Transit Elements, Adding/expansion of sidewalks/bike/multi-use paths
Milepost Start	294
Milepost End	4
MPO/TPR	Denver Regional COG (R1)
Total Estimated Project Cost	$168,000,000
TC Requested Strategic Funding (FY19-26)	$59,600,000
TC Requested Strategic Funding (FY27-30)	$68,761,000
TC Requested Strategic Funding (FY31+)	$0
Other Funding (Not Strategic)	$0
Project Status	Design
Description	Construction of side-running bus rapid transit infrastructure (stations, signals, roadway elements) and supporting infrastructure (bike and pedestrian infrastructure, lighting, etc.) on an 18-mile section of Federal Blvd. (120th Ave. to Dartmouth Ave.).

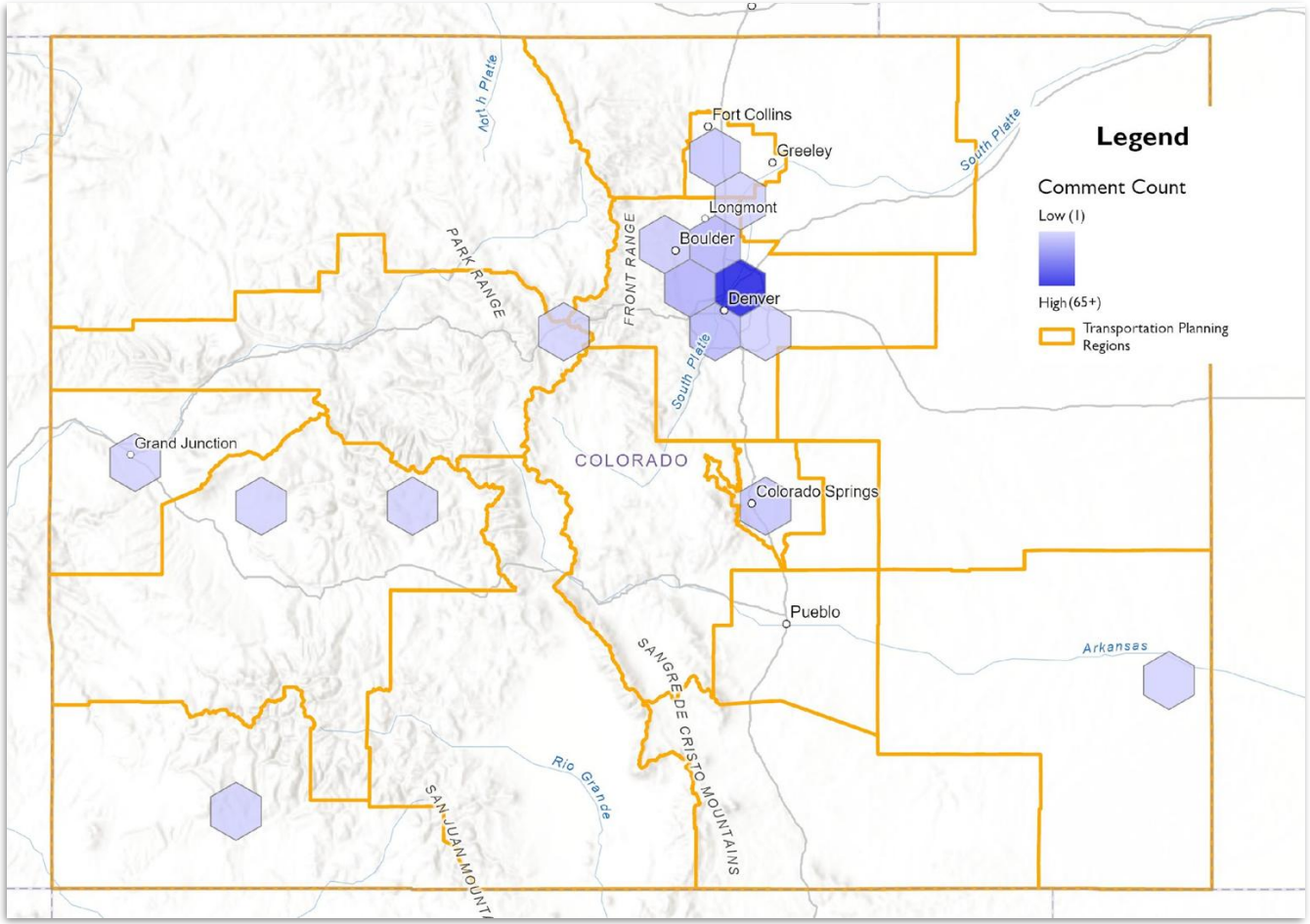
DRAFT



Statewide Responses

139 total online comments were received during a two-week period; 400+ web map views

80 comments (57%) were submitted from Denver; approximately 120 (86%) were from the Greater Denver area

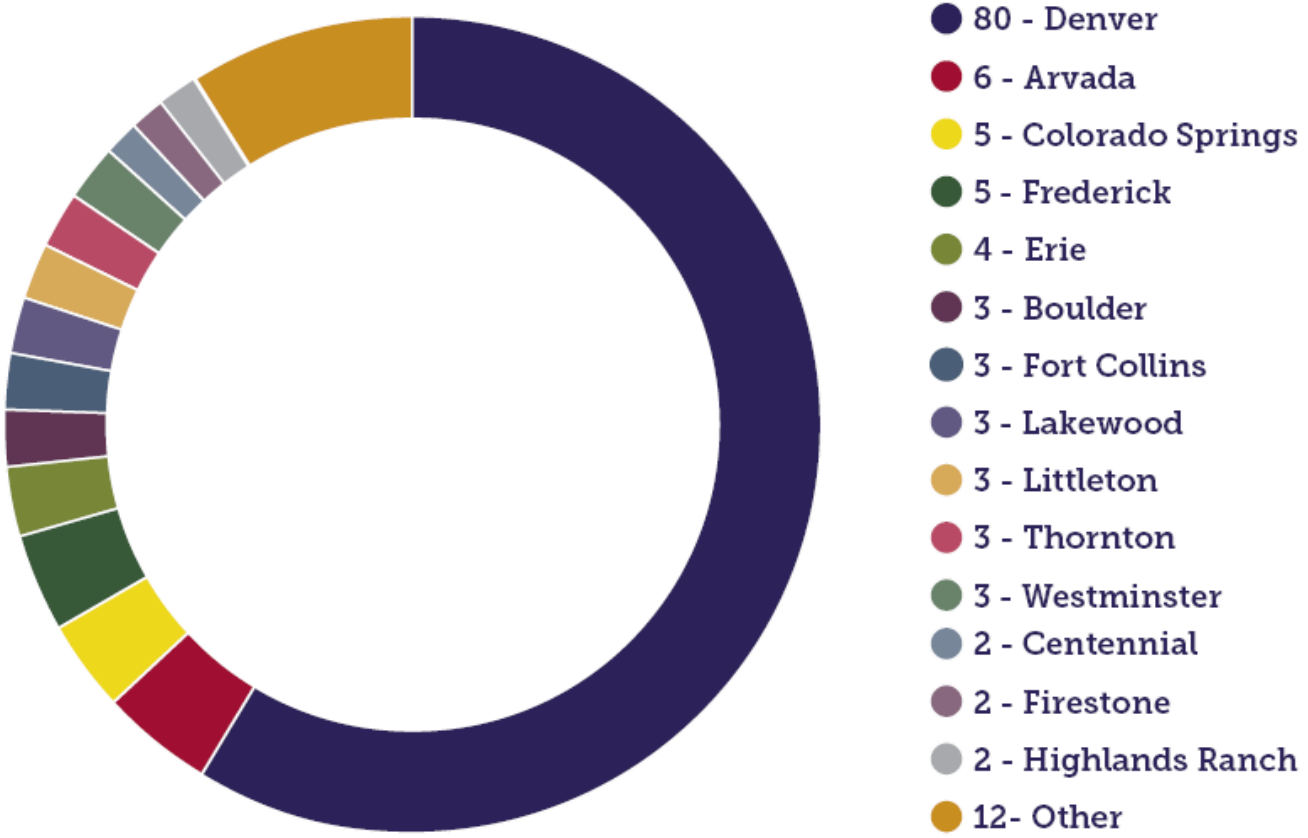


Who Responded

Comments reflect engaged residents, advocacy groups, elected officials, and corridor-specific stakeholders

58 form-filled comments were generated by call-to-action emails from advocacy groups, advocating for increased multimodal project funding

Comment Count by City/Town



What We Heard

Strong emphasis on Safety across all perspectives

Safety was one of the most consistently raised issue. Comments referenced freeway crash frequency, intersection design, emergency response delays, pedestrian and bicycle safety, and rural shoulder conditions. Safety concerns were raised by both those supporting capacity expansion and those advocating for multimodal investment.

73% (102) of comments mentioned safety-related keywords.

High expectations for Multimodal Investment

Transit, bicycle, pedestrian, and multimodal investments were the most frequently referenced themes, particularly among Greater Denver respondents. Comments emphasized clearly defined BRT projects, passenger rail advancement, expanded Bustang service, and safer crossings of high-speed corridors. Many comments emphasized network performance and reliability.

83% (115) of comments referenced transit or multi-modal key words.

Divergent Perspectives on Investment Priorities

Comments reflected differing emphases on highway expansion, state-of-good-repair investments, and sustainability goals. Many respondents questioned continued system expansion and urged greater focus on preserving existing infrastructure.

53% (73) of comments included key words around maintenance.

Corridor-Specific Engagement is High

Specific corridors and projects, including I-25, I-270, Powers Boulevard, I-70, US 36, CO 7, and US 50, were cited in over half of the public comments. Opinions on these corridors varied, with some calling for specific actions, while others advocated for no action in favor of greater emphasis on multimodal solutions. Recurring themes in corridor-specific feedback included requests for enhanced multimodal options, safety improvements, faster interchange upgrades, and better wildlife safety measures.

69% (96) of comments mentioned a specific corridor or project.

Key Takeaways

Safety is a strong shared value

- Across differing viewpoints and regions, safety remains a consistent priority.

Denver area engagement drove participation

- High participation from the Greater Denver area contributed to elevated emphasis on transit, sustainability, and mode shift themes.

Corridor stakeholders are highly engaged

- Many comments focused on sequencing, acceleration, or addition of specific projects.

Public comments reflect strong agreement on the need to improve system safety and performance, alongside differing views on how limited resources should be prioritized:

- Reducing congestion and improving reliability
- Maintaining and repairing existing infrastructure
- Expanding reliable travel options
- Supporting freight mobility while addressing community impacts

Comments by PD 14 Goal Areas

Advancing Transportation Safety

Public comments consistently emphasized safety across travel modes and regions, reinforcing the expectation that projects demonstrate measurable improvements in crash reduction, emergency response reliability, and protection of vulnerable users.

Fix Our Roads

Respondents expressed clear interest in maintaining and improving existing infrastructure, highlighting the importance of state-of-good-repair investments and freight-critical corridors as foundational to system performance and economic reliability.

Sustainably Increase Transportation Choice

Comments reflected strong expectations for expanded and reliable multimodal options, particularly transit performance and connectivity, alongside consideration of long-term emissions and mobility outcomes.

2050 Statewide Plan:

Overview of the Performance Goals for the Statewide Transportation Plan

Performance Goals for future of Colorado's Transportation System

Policy Directive 14 Goals support the development of the 2050 Statewide Plan, the long term vision for transportation in Colorado, encompassing all CDOT Programs.

Fix Our Roads

Prioritize strategic investments in Colorado's highways to improve infrastructure conditions.

Performance Measures

- Bridge Condition
- Pavement Condition

Advancing Transportation Safety

No matter where you're going or how you're getting there, Colorado is committed to providing you a safe and efficient transportation network, so you arrive at your destination safely.

Performance Measures

- Traffic-Related Fatalities and Serious Injuries
- Vulnerable Road Users

Sustainably Increase Transportation Choice

Provide alternatives to single occupancy vehicle travel that increase choices and reduce air pollution from transportation.

Performance Measures

- GHG Reduction
- VMT Per Capita
- Statewide Transit

Advancing Transportation Safety

Advancing Transportation Safety

No matter where you're going or how you're getting there, Colorado is committed to providing you a safe and efficient transportation network so you arrive at your destination safely.

Performance Measures

- Fatalities and Serious Injuries
- Vulnerable Road Users

- Reduce the number of traffic-related fatalities and serious injuries.
  - 50% reduction by 2037
- Reduce the number of traffic-related fatalities and serious injuries involving Vulnerable Road Users.
  - 50% reduction by 2037

ATS
Advancing Transportation Safety

Fix Our Roads

Prioritize strategic investments in Colorado's highways to improve infrastructure conditions.

Performance Measures

- Bridge Condition
- Pavement Condition

Pavement Condition

- Interstate Pavement in Poor Condition (FHWA Metric)
  - At or Below 1% (by 2037)
- State Highway System Pavement Drivability Life (DL)
  - At or above 80% High/Moderate DL (by 2037)

Bridge Condition

- National Highway System (NHS) Bridges in Poor Condition
  - At or below 5% Poor (Maintain through 2037)
- State Highway System (SHS) Bridges in Poor Condition
  - At or below 5% Poor (Maintain through 2037)

Sustainably Increase Transportation Choice

Sustainably Increase Transportation Choice

Provide alternatives to single occupancy vehicle travel that increase choices and reduce air pollution from transportation.

Performance Measures

- Statewide Transit
- Clean Transportation

- **Statewide Transit**
  - Collaborate with stakeholders, including local partners and rail operators, to expand statewide transit and rail services.
    - Increase revenue service miles by 66.7 million (83%) by 2037
  - Reduce Vehicle Miles Traveled (VMT) per Capita
    - Achieve a 1% annual reduction in VMT per capita.
- **Clean Transportation**
  - Reduce Greenhouse Gas (GHG) emissions from the transportation sector in-line with the Colorado GHG Pollution Reduction Roadmap.
    - 60% Reduction of Carbon Dioxide Equivalent (CO_2e) by 2037 (from 2005 baseline)

Achieving Performance Targets

How the 10-Year Plan Helps Move the Needle

Converts long-range strategy into implementable investments

- The 10-Year Plan prioritizes strategic projects that directly advance the priorities from the long-range 2050 Statewide Transportation Plan.

Aligns funding with performance outcomes

- The 10-Year Plan evaluates projects against metrics such as safety outcomes, asset condition, and multimodal transportation needs.
- Projects included in the 10-Year Plan are selected because they demonstrate measurable progress toward PD 14 targets.

Integrates all available funding sources

- Consistent with the 2050 strategy, the 10-Year Plan looks at all available revenue streams (i.e., state transportation revenues, federal formula and discretionary funds, enterprise funding, and local & regional partnerships).
- By coordinating these funding sources, CDOT can deliver projects that best advance PD14 outcomes, even when funding comes from multiple sources, including our baseline funding programs and enterprises.

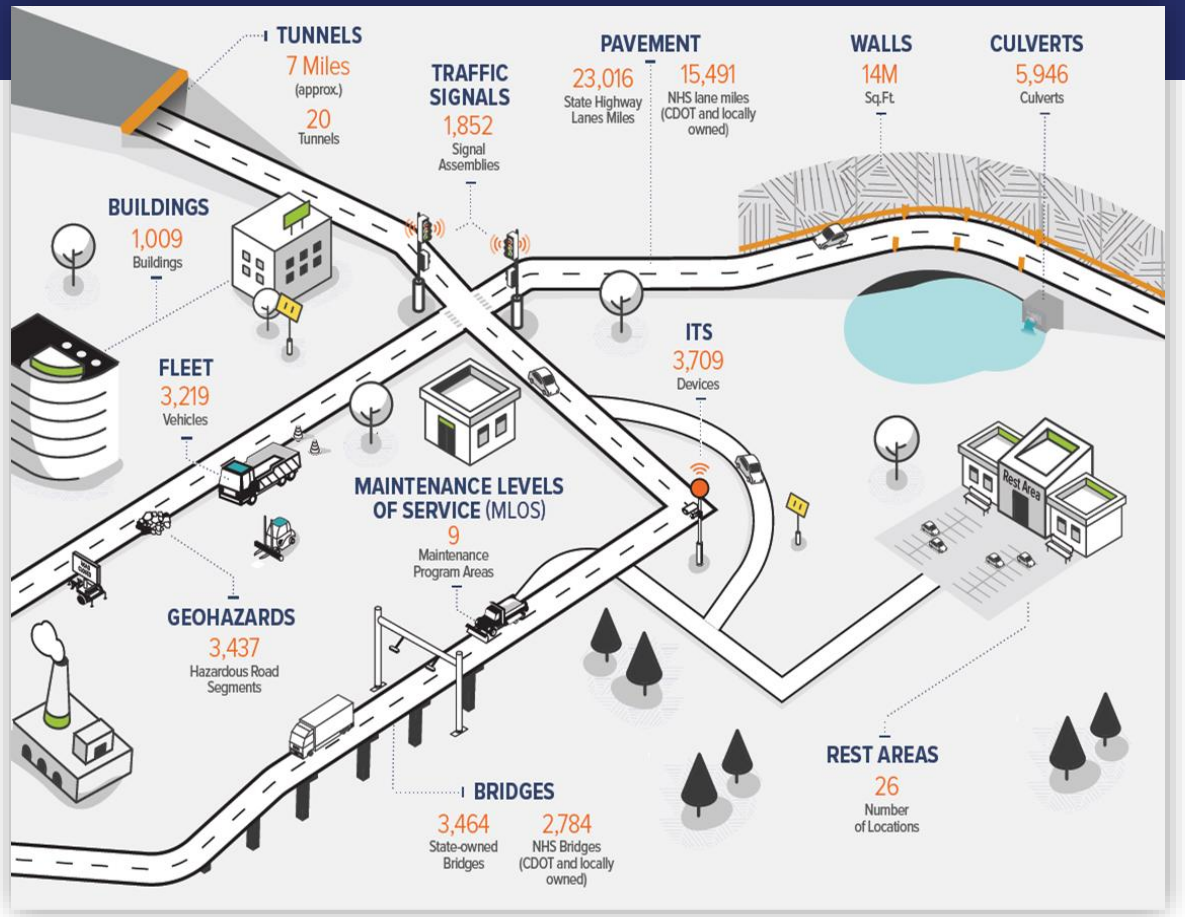
How the 10-Year Plan Helps Achieves PD-14 Targets:
Fix Our Roads

Meeting Performance Targets
Asset management selects cost-effective treatments

The Asset Management Program optimizes investments to achieve performance targets, but resources are limited.

The Transportation Asset Management (TAM) Program maximizes available funds by developing the best mix of cost-effective treatments (e.g., preservation, rehabs, etc.)

- The TC recently approved FY30 and FY31 TAM planning budgets that include:
  - Pavement funding of $247.5 million in FY30 and $253.3 million in FY31. This represents a 6.2 percent and 2.3 percent increase, respectively, compared to prior years.
  - Staff Bridge funding of $38.3 million in FY30 and FY31. This funding maintains earlier budget levels as the Bridge and Tunnel Enterprise is increasing its preventive maintenance investment.



Meeting Performance Targets
Additional asset funding in the 10-Year Plan

CDOT is increasing pavement and bridge funding through the 10-Year Plan to make progress toward PD-14 targets.

Asset management funding is insufficient to meet long-term performance goals and has resulted in a backlog of “poor” assets.

Strategic funding for the new 10-Year Plan helps address the pavement and bridge backlog.

- More than half (53%*) of projects include pavement and/or bridge asset management elements.
- Projects with asset management work are planned statewide, with an estimated* distribution of:
  - 30 projects in Region 1
  - 48 projects in Region 2
  - 25 projects in Region 3
  - 36 projects in Region 4
  - 15 projects in Region 5

**Tentative estimates, early 2026.*

Meeting Pavement Performance Targets
Additional asset funding in the 10-Year Plan

The new 10-Year Plan significantly augments annual pavement investment.

10-Year Plan strategic funding invests in pavement by addressing rural roads, pavement rated “poor” under federal metrics, and more.

- Of the proposed projects in the new 10-Year Plan, about 55% include pavement work.
- The 10-Year Plan increases CDOT’s annual pavement investment by an estimated 65%* compared to the Surface Treatment budget alone.
- Lane miles treated: Equivalent to 7 years* of the Surface Treatment Program.

**Tentative estimates, late 2025.*

Meeting Bridge Performance Targets
Additional asset funding in the 10-Year Plan

The new 10-Year Plan includes substantial investments from the Bridge and Tunnel Enterprise (BTE) to help meet bridge PD-14 targets.

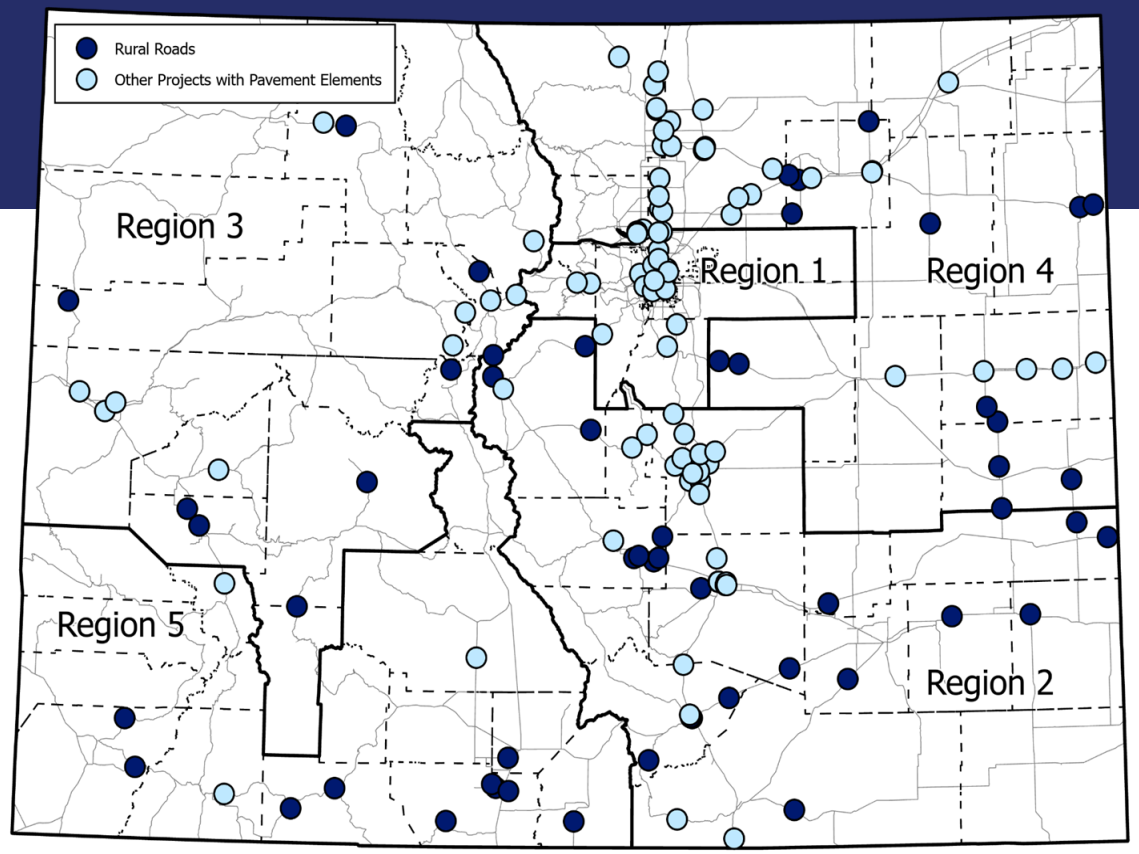
About 29% of the new 10-year Plan projects include bridge work.

New 10-Year Plan: BTE Bridge investments

- BTE plans to contribute $637.2 million to the new 10-year plan—with most of it funding bridge projects. This includes:
  - $354.5M in FY27-30 (21 bridge replacements)
  - $26.5M in FY27-30 (15 bridges treated with preventative maintenance)
  - $206M+ in FY31 and beyond (5 bridge replacements + other projects TBD)
  - $50.2M in FY27-30 (tunnel repairs at EJMT)
- BTE's contribution will remove more than 296,000 sq. feet of poor deck area.

Fix Our Roads

Maintaining the Commitment to Rural Roads Statewide



CDOT will continue to focus on these roads as part of its next 10-year Plan through the Rural Road Paving Program and supplementing asset management funding.

59 projects will be rural road paving projects, including:

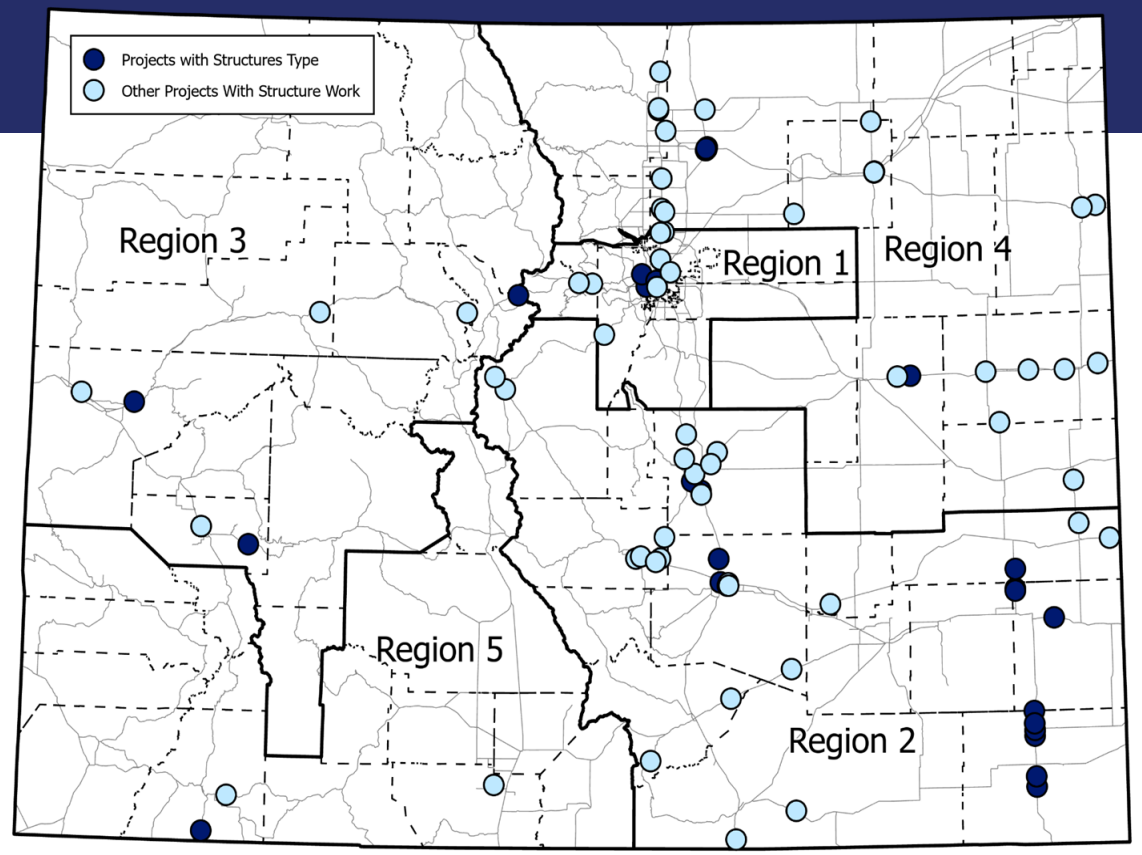
- US 50 between Penrose and the Fremont/Pueblo County Line
- CO 9C Fairplay to Hoosier Pass
- CO 9 South of Green Mountain Reservoir
- CO 9 Hoosier Pass paving
- CO 135 Almont

Another 78 projects will fix our roads as part of their scope, including:

- I-76 Keenesburg Overlay Preservation
- I-270 Corridor Improvements
- US 550 Shoulder Improvements, Wildlife Fencing and Underpass Between Uncompahgre River and Colona
- US 285 Safety and Mobility Improvements between Center and Saguache

Fix Our Roads
Addressing Bridges and Structures Statewide

Projects within these plans will keep structures on our highways in a state of good repair and achieve performance outcomes of the Fix Our Roads goals.



72 projects will either be focused primarily on, or will include as part of its project scope, fixing or replacing poor bridges, culverts and other poor structures, including:

- Safety and Operational Improvements Exit 135 South Academy to Exit 138 Circle/Lake - Phase 1 US85A bridge replacement over I-25 and B St/Venetucci/Maxwell Intersection Improvements
- US 50 Bridge Preventative Maintenance - Prowers County
- I-25 and CO 14 Interchange and Multimodal Safety Improvements
- CO 371 between CO 15 and CO 368
- I-70 Glenwood Canyon Critical Asset Repair
- US 50 Asset Management North of Montrose

How the 10-Year Plan Helps Achieves PD-14 Targets:
Advancing Transportation Safety

Advancing Transportation Safety
The Safe System Approach

Safety Culture

- **Focus:** Foster positive social norms and organizational change
- **Key Areas:** Legislation, policy, and data management

Safe Roads

- **Focus:** Implement cutting-edge infrastructure designs for all modes and users
- **Key Strategies:** Improve intersections, roadway departures, and speed interventions

Safe People

- **Focus:** Protect vulnerable users (pedestrians, bicyclists, motorcyclists, young and aging drivers, work zone crews)
- **Key Areas:** Work zones, bicycle and pedestrian safety, driver's education

Safe Driving

- **Focus:** Address impaired driving, distracted driving, speeding, and seatbelt usage
- **Key Strategies:** Public awareness campaigns and enforcement

Post-Crash Care

- **Focus:** Enhance crash survivability through better emergency response, medical care access, and traffic incident management
- **Key Areas:** Emergency Medical Services and Traffic Incident Management

Proven Safety Countermeasures: Pedestrian/Bicyclist

- **Bicycle Lanes**
  Bicycle Lane additions can reduce total crashes up to 49% on urban collectors and local roads.

- **Crosswalk Visibility Enhancements**
  Intersection lighting can reduce pedestrian crashes up to 40%.

- **Leading Pedestrian Interval**
  LPI's can reduce pedestrian-vehicle crashes up to 13% at intersections.

- **Medians and Pedestrian Refuge Islands in Urban and Suburban Areas**
  Pedestrian Refuge Islands can reduce pedestrian crashes up to 56%.

- **Pedestrian Hybrid Beacons**
  PHBs can reduce pedestrian crashes up to 55%.

- **Rectangular Rapid-Flashing Beacons (RRFB)**
  RRFBs can reduce pedestrian crashes up to 47%

- **Road Diets (Roadway Reconfiguration)**
  A 4-lane to 3-lane road diet conversion can reduce total crashes by 19%-47%

- **Walkways**
  Sidewalks can reduce crashes involving pedestrians walking along the roadway by 65%-89%

Proven Safety Countermeasures: Roadway Departure

- **Enhanced Delineation for Horizontal Curves**
  Chevron signs can reduce night-time crashes up to 25%.

- **Longitudinal Rumble Strips and Stripes on Two-Lane Roads**
  Centerline rumble strips can reduce head-on fatal and injury crashes on two-lane rural roads by 44%-64%.

- **Median Barriers**
  8% of all fatalities on divided highways are due to head-on crashes.

- **Roadside Design Improvements at Curves**
  Increasing the distance to roadside features to from 3.3 to 16.7 feet can reduce crashes by up to 22%.

- **Safety Edge**
  Safety Edge can reduce fatal and injury crashes by up to 11%.

- **Wider Edge Lines**
  6 inch edge lines can reduce fatal and injury crashes on rural, two-lane roads up to 37%.

Proven Safety Countermeasures: Intersections

- **Backplates with Retroreflective Borders**
  Retroreflective backplates can reduce total crashes up to 15%.

- **Corridor Access Management**
  Reducing driveway density on urban/suburban arterials can reduce fatal and injury crashes by 25%-31%.

- **Dedicated Left- and Right-Turn Lanes at Intersections**
  Left turn lanes can reduce total crashes by 28%-48%.

- **Reduced Left-Turn Conflict Intersections**
  Converting an unsignalized intersection to an unsignalized RCUT can reduce fatal and serious injury crashes up to 63%.

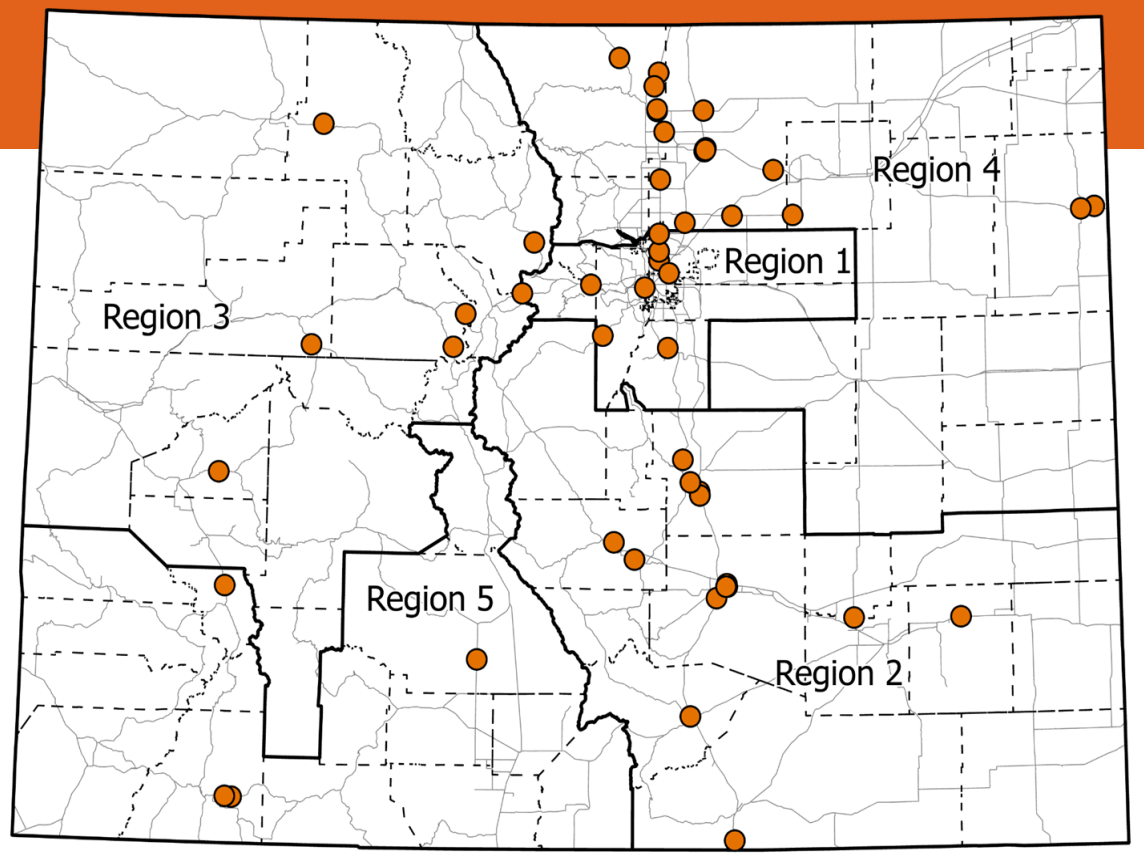
- **Roundabouts**
  Converting a signalized intersection to a roundabout can reduce fatal and serious injury crashes up to 78%.

- **Systemic Application of Low-Cost Countermeasures at Stop-Controlled Intersections**
  Enhanced signing and pavement marking at rural intersections can reduce fatal and injury crashes up to 27%

- **Yellow Change Intervals**
  Appropriately timed yellow change intervals can reduce red-light running by 36%-50%.

Advancing Transportation Safety
Investments towards Safer Travel Statewide

The Advancing Transportation Safety goal focuses on making travel safer for all modes. Overall, these projects will include elements to improve the safety of the traveling public.



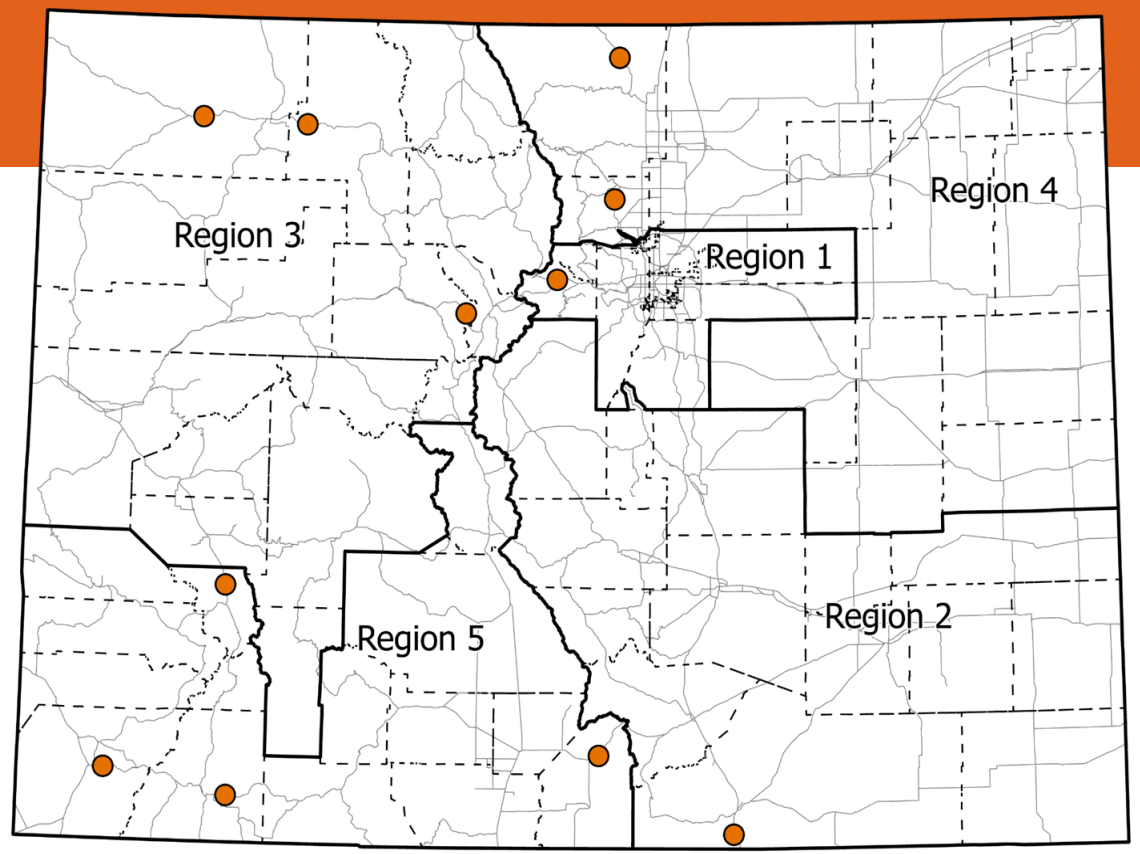
49 projects are primarily designed for to make travel safer on our highways with shoulders and passing lanes improvements, including:

- I-270 Corridor Improvements Phase 2
- I-25 North between 84th Avenue and 104th Avenue (Segment 2a)
- I-70 West: Vail Pass Safety Improvements – Phase 1
- US 160: Dry Creek Passing and Mobility Improvements
- US 40 Passing Lanes between Craig and Steamboat Springs
- US 550 Shoulder Improvements, Wildlife Fencing and Underpass Between Uncompahgre River and Colon

20-40% predicted intersection related crash reduction on corridors with these projects.

Advancing Transportation Safety
Reducing Wildlife Collisions

Projects focusing on wildlife mitigation help improve the safety of the traveling public, save the traveling public money through avoiding these crashes, and improve quality of life for residents and wildlife alike.



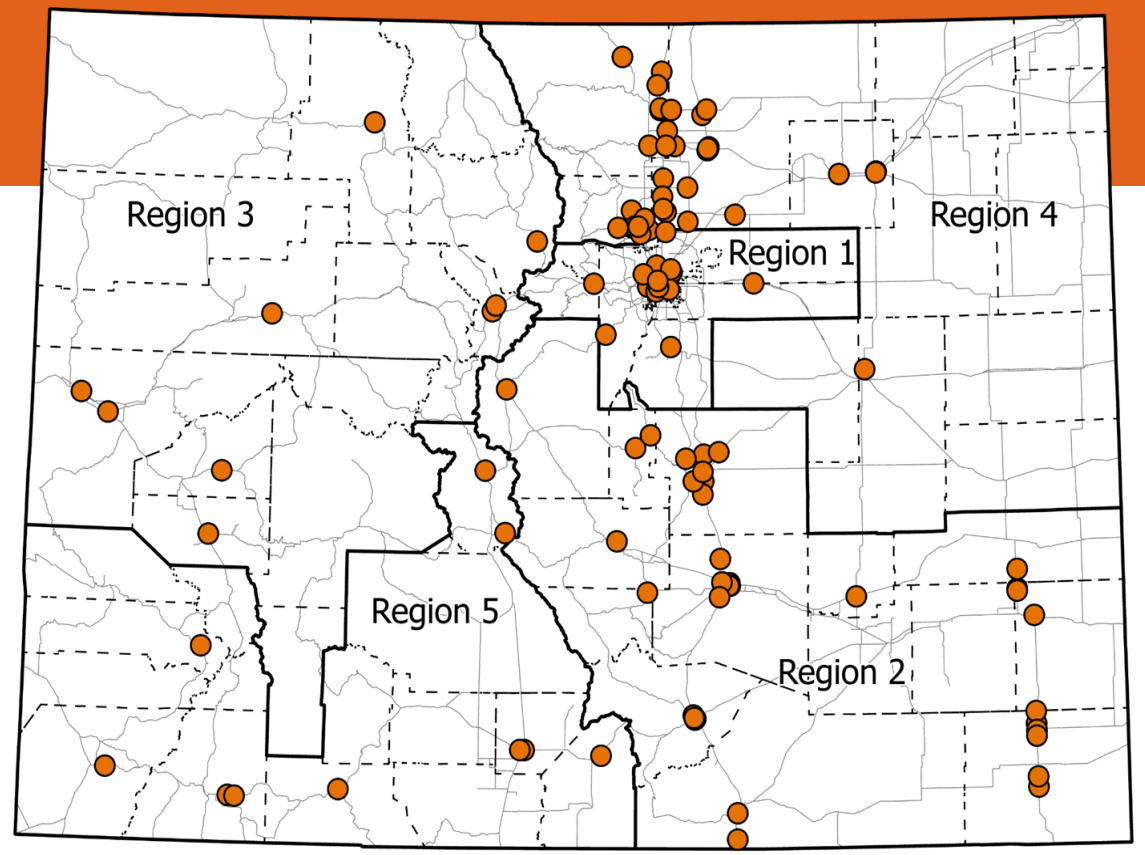
11 projects will help reduce wildlife crashes as part of its improvements, including:

- I-70 West: Empire Wildlife Crossing
- I-25 Raton Pass Wildlife Safety Improvements
- US 160 East of Fort Garland Safety and Wildlife Mitigation; Advancing Transportation Safety (to be completed in early 2026)
- Wildlife Mitigation on US 160 between Cortez and Mancos
- I-70 West: Vail Pass Safety Improvements – Phase 1
- US 160 Elmore's Corner East

20-40% predicted intersection related crash reduction on corridors with these projects.

Advancing Transportation Safety
Safer Intersections Statewide

The Advancing Transportation Safety goal focuses on investments to improve safety on our transportation system, for all modes. This includes improving intersections throughout both regions to make them safer for all users of the transportation system.



86 projects are focused on making intersections safer including:

- I-25 Interchange Reconstruction at Speer Boulevard and 23rd Avenue
- Colfax Stadium Safety Access Improvements
- Federal Boulevard BRT Phase 1
- US 40 and Downhill Drive Intersection Improvements
- Intersection Improvements at US 160 and Pike Avenue
- Intersection Improvements at US 160 and CR 30.1 (Phil's World)
- Intersection and Pedestrian Improvements at CO 291 and US 50
- US 50/US 550 Intersection Improvements

20-40% predicted intersection related crash reduction on corridors with these projects.

How the 10-Year Plan Helps Achieves PD-14 Targets:

Sustainably Increase Transportation Choice

Sustainably Increase Transportation Choice
Supporting Statewide Transit Services

Supporting Bustang and local transit services throughout the state will also provide transportation choice for travel within communities and includes continued investment in the 10-Year Plan.

$60 million investment in the Bustang fleet, supporting routes such as:

- Bustang North Line (Denver to Ft. Collins)
- Bustang South Line (Denver to Colorado Springs)
- Outrider Routes throughout the state

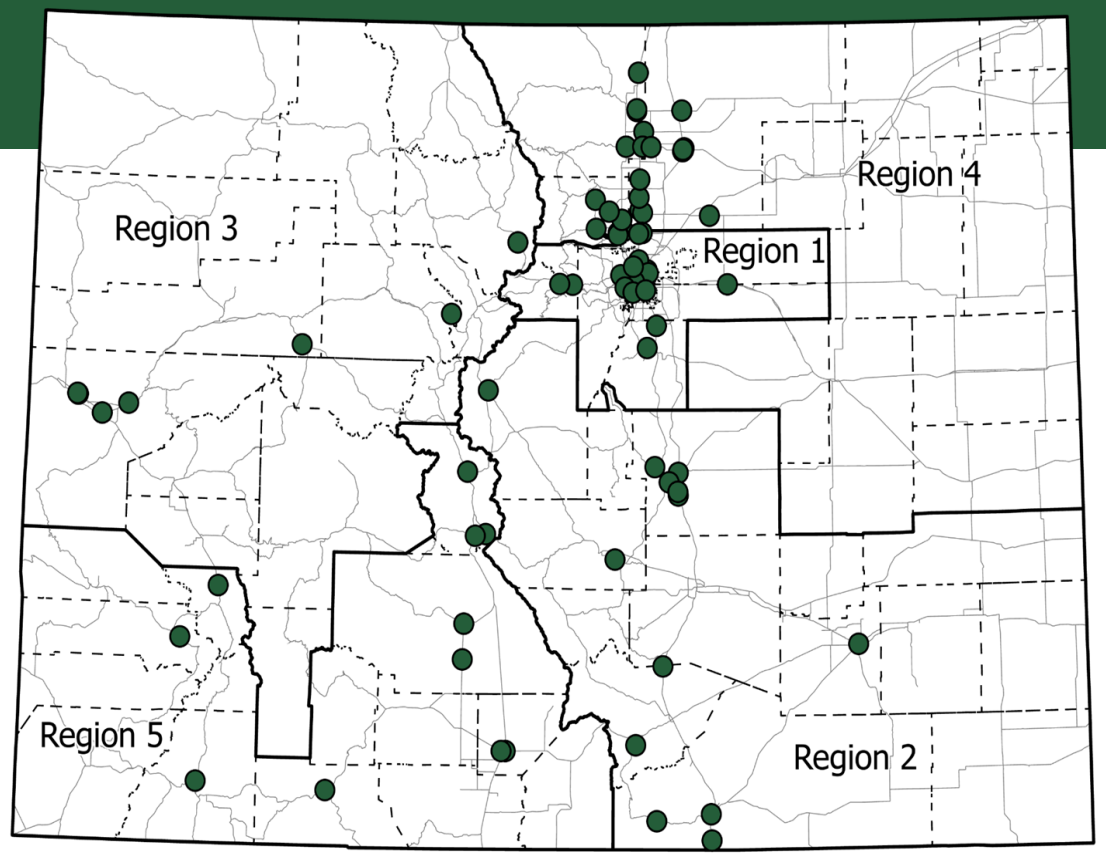
15 Projects will support stops and mobility hubs for Bustang Services

50 Projects will support local transit service through local agency partners. Examples include:

- Federal Boulevard BRT
- Pikes Peak State College North & South Mobility Hubs
- I-25 Exit 108 (Purcell Boulevard) Replace Single Box Culvert Crossing Under I-25 & North Pueblo Mobility Hub
- Poncha Springs Crossroads Welcome Center
- Durango Transit Capital Improvement

Sustainably Increase Transportation Choice
Supporting Active Transportation

Projects in the 10-Year Plan will continue to support Active Transportation efforts, either delivering major improvements or as part of the overall project scope, supporting walking and biking throughout Colorado.



74 projects will also include active transportation elements including:

- I-70 Business (Pitkin Avenue) Corridor Improvements between First Street and 15th Street
- US 6 Fruita to Palisade Safety Improvements (Fruita)
- US 285 Multimodal Improvements in Saguache
- US 24 Intersection Improvements at Steele in Buena Vista
- CO 7 Priority Intersection Improvements
- I-25 Interchange Reconstruction at Speer Boulevard and 23rd Avenue
- US 6 and Wadsworth Boulevard Interchange

Sustainably Increase Transportation Choice
VMT Reduction Performance

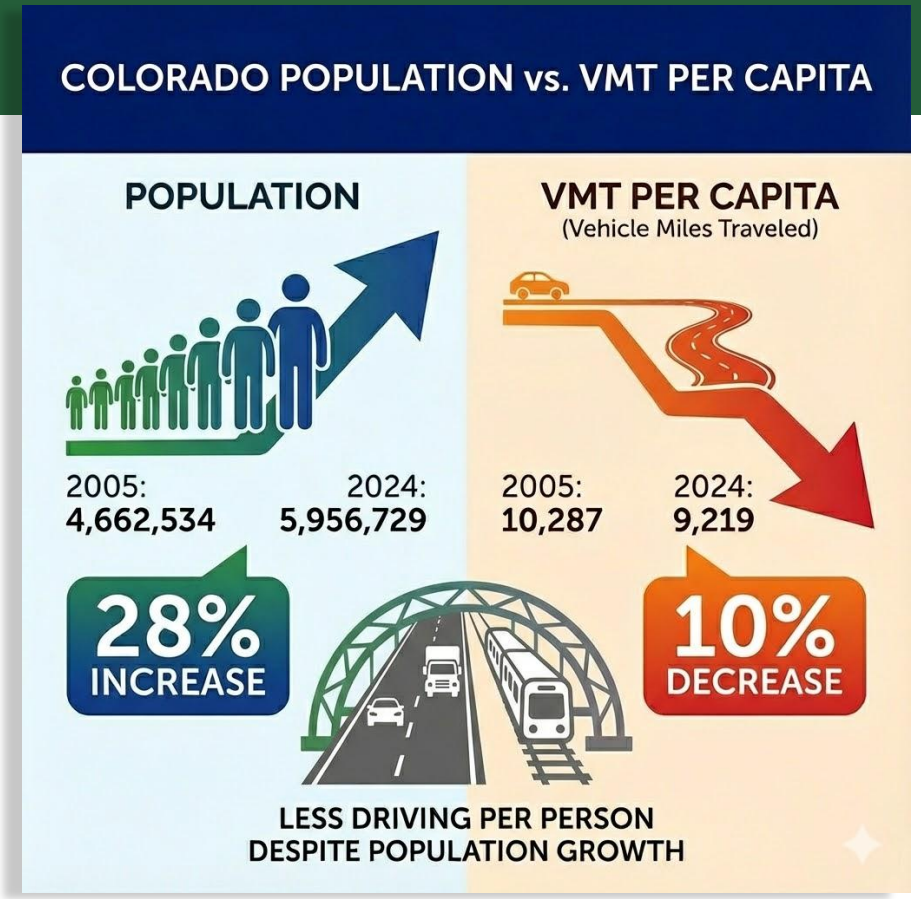
People throughout the state state are driving less and utilizing multimodal options, resulting in a reduction in VMT per Capita, expecting to continue in the future.

Overall VMT Per Capita has declined in the past two years:

- Since 2005, Colorado's population has increased by 28% while VMT per capita has decreased by 10% in the same period.

Continued decline in VMT per Capita projected into the future:

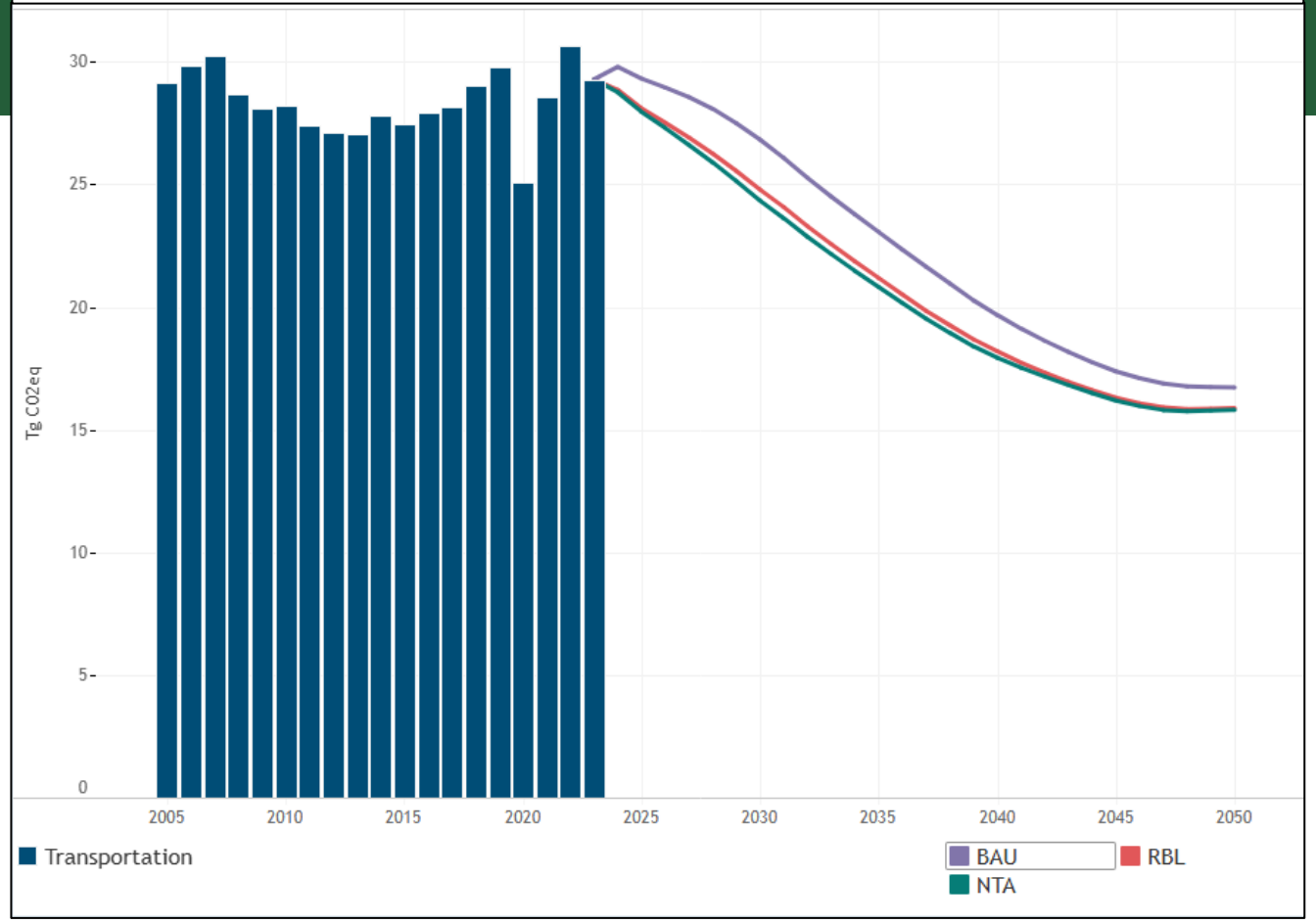
- Based on current trends, it is projected that VMT per capita will continue to decline by approximately 7 percent over the next ten years.
- This is a reduction of 19% from 2005 levels.
- While Population is projected to continue to increase by another 11 percent over the next ten years or a total of 42% since 2005.



Sustainably Increase Transportation Choice
GHG Emissions

GHG from the Transportation section continues to decline due to the Department's programs and the administration's near-term actions from the GHG Pollution Reduction Roadmap.

GHG Emission Inventory and Projections - Transportation Sector



GHG Emissions from the Transportation Sector is expected to continue to decline in the future.

- 2005 GHG from transportation sector GHG Inventory - 29.14 MMT
- 2037 projected GHG from transportation sector - 19.5 MMT
- 33% reduction in emissions from transportation sector from 2005 levels.
- Includes Aviation GHG emissions (15% of total) as part of the transportation sector.

- Emissions from Previous Years
- BAU - "Business as usual"
- RBL - "Roadmap Baseline"
- NTA - "Near Term Action"

Sustainably Increase Transportation Choice
Vehicle Revenue Miles Goals

CDOT and its Enterprises are leading the way to help provide more multimodal options and working with local transit partners on increasing transit throughout the state. Some examples include:

Major Passenger Transit and Rail Projects providing more travel options for regional travel in the state:

- Front Range Passenger Rail/Joint Service Rail projects
- Mountain Rail Project
- Federal Blvd. and Colorado Blvd. Bus Rapid Transit Projects

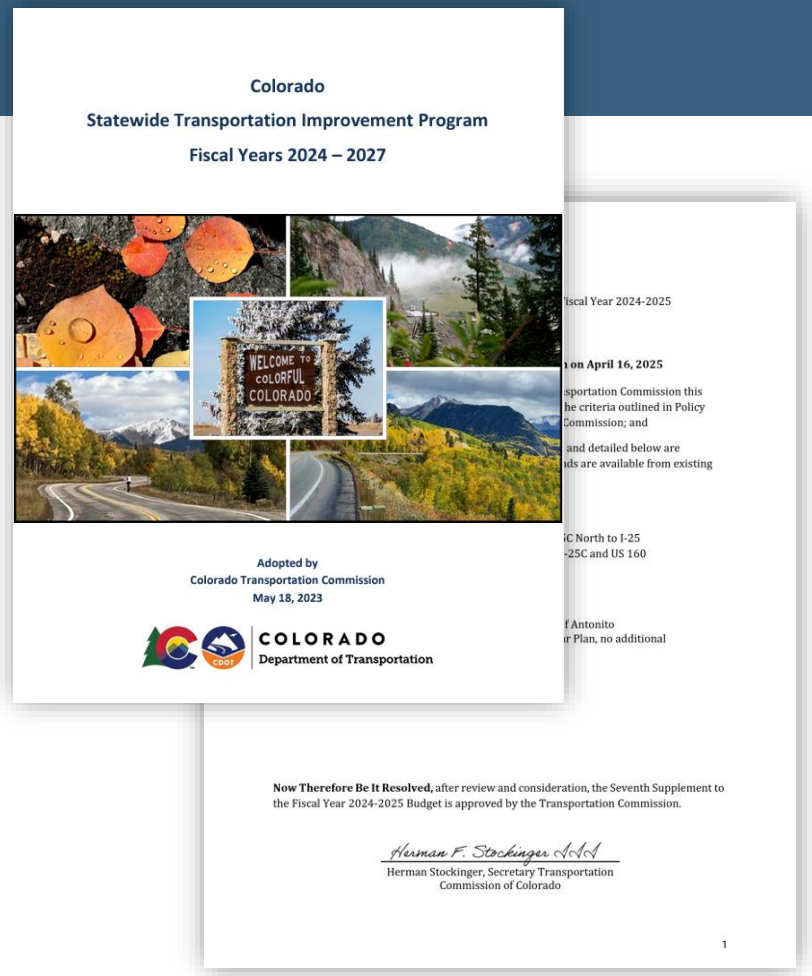
Clean Transportation Enterprise Formula Funding Grants:

- Through the Clean Transportation Enterprise's formula funding grant program, an estimated additional $350 million for local transit agencies operating and capital costs.
- These transit agencies estimate an additional 29.9 million vehicle revenue miles throughout the state by 2030, with potentially an increase in unlinked passenger trips by 46 million.

Finalization Schedule & Next Steps

Accountability & Transparency
Amending the Plan & Future Development

After Adoption, the plan can be amended mid-cycle and will be amended in future planning cycles.



The Transportation Commission can review and amend the plan mid-cycle.

- The addition or removal of any project between major update cycles.
- Per PD 703, approve any requests for modifications to strategic funds within the plan.
- Annually in May, approve the STIP which will allocate funding per federal statute and approve the CDOT annual budget, including funding allocations for the fiscal year for strategic fund line-items.

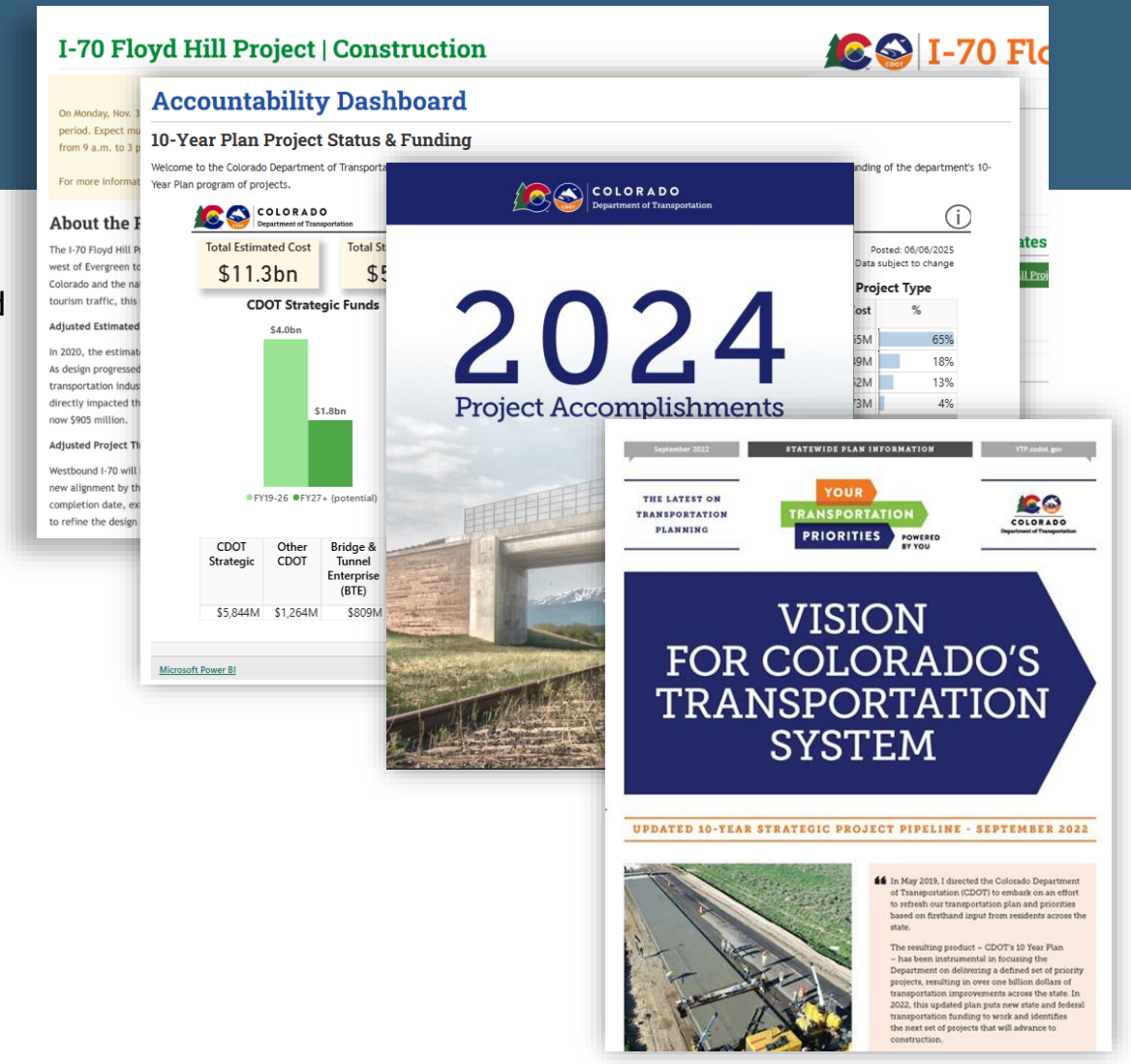
Development of the next four-year prioritized period (FY31-FY34) starting in Fiscal Year 2029.

- This update will be adopted by the Commission, anticipated in Spring 2029.

CDOT Staff will be managing the plan through a robust change control process.

Accountability & Transparency
Reporting on 10-Year Plan Progress

On-going transparency with the Public, Stakeholders, and Statewide Partners



10-Year Plan Dashboards

- Available publicly on codot.gov, with detailed funding and status, and estimated construction start/end dates

Quarterly 10-Year Plan Report

- Every project listed with approved strategic funding and current status in pipeline.

Annual 10-Year Plan Report, included in the Department's Budget Submission

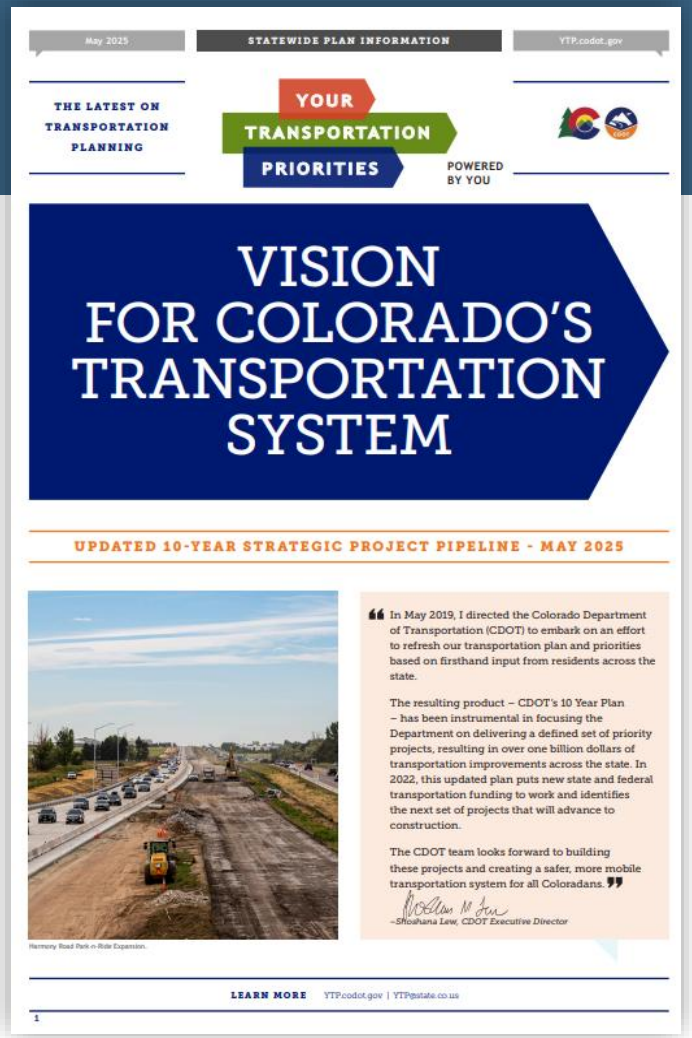
- Published in November, similar to quarterly reports.

CDOT's Annual Project Accomplishments Report

- Projects completed in the prior calendar year from all CDOT programs.

Webpages for major projects on codot.gov

Next Steps
Future Workshops and Completion of the Plan



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THE LATEST ON TRANSPORTATION PLANNING

YOUR TRANSPORTATION PRIORITIES POWERED BY YOU

VISION FOR COLORADO'S TRANSPORTATION SYSTEM

UPDATED 10-YEAR STRATEGIC PROJECT PIPELINE - MAY 2025

In May 2019, I directed the Colorado Department of Transportation (CDOT) to embark on an effort to refresh our transportation plan and priorities based on firsthand input from residents across the state.

The resulting product – CDOT's 10 Year Plan – has been instrumental in focusing the Department on delivering a defined set of priority projects, resulting in over one billion dollars of transportation improvements across the state. In 2022, this updated plan puts new state and federal transportation funding to work and identifies the next set of projects that will advance to construction.

The CDOT team looks forward to building these projects and creating a safer, more mobile transportation system for all Coloradans.

–Shoshana Lew, CDOT Executive Director

Harmony Road Park-n-Ride Expansion.

LEARN MORE YTP.codot.gov | YTP@state.co.us

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Roadmap for Plan Adoption

10-Year Plan Adoption

Adoption of the plan will set the framework for project development, budget development, and finalization of the next STIP in April 2026.

10-Year Plan Comment Summary

Overview

During the two-week public comment period, CDOT received nearly 140 online comments on the 10-Year Plan. Of the total comments, 80 were from Denver and approximately 120 were from the Greater Denver area, with additional input from suburban growth corridors, the Western Slope, and rural communities. Several submissions included similar language, suggesting organized outreach, and results reflect recurring themes rather than proportional statewide sentiment. Taken together, the feedback highlights ongoing conversations about growth and climate goals, highway expansion and mode shift, urban and suburban mobility needs, freight reliability, and maintenance versus expansion tradeoffs.

Key Takeaways

Themes below are derived from review of the full comment set, Percentages are based on thematic coding of 139 comment entries. Individual comments frequently referenced multiple themes.

Geographic concentration was significant

80 of 139 comments (57%) were submitted from Denver, and approximately 120 (86%) were from the Greater Denver area. Additional comments came from suburban corridors, the Western Slope, and rural communities. Of the 62 comments expressing strong disagreement, 44 (71%) originated from Denver.

Support for transit and multimodal investments

Transit and multimodal investment was referenced in 115 of 139 comments (83%) Comments frequently mentioned Bus Rapid Transit (BRT), passenger rail, Bustang service, bicycle and pedestrian infrastructure, and multimodal corridors, with emphasis on reliability, connectivity, and dedicated facilities.

Safety was a critical concern

Safety was referenced in 102 of 139 comments (73%).Commenters cited freeway crash frequency, intersection design, emergency response delays, pedestrian and bicycle safety, rural shoulder conditions, and high injury network locations.

Interest in sustainability and climate-related issues

Sustainability and climate-related issues were referenced in 80 of 139 comments (58%). Comments included greenhouse gas reduction goals, emissions, climate commitments, induced demand research, and long-term congestion impacts of highway widening.

Key Takeaways (continued)

Repair and maintenance priorities

Maintenance and asset condition were referenced in 73 of 139 comments (53%). Commenters raised pavement condition, bridge maintenance, drainage issues, shoulder standards, and prioritizing repair before expansion. In addition, many emphasized sustaining existing infrastructure before expansion.

Specific corridor concerns

Corridor focused comments were raised in 96 of 139 comments (69%). Frequently referenced corridors included I-25, I-270, Powers Boulevard, I-70, US 50, US 36, and CO 7, with emphasis on completing full corridor segments rather than isolated improvements.

Alignment with PD-14 Goals

Fix Our Roads

Respondents raised issues related to pavement condition, bridge maintenance, shoulder standards, and system reliability. Many comments questioned whether additional expansion should proceed without sustained investment in maintaining and improving the current system. In freight-dependent corridors, the importance of preserving reliable highway operations and interchange performance to support goods movement and economic activity was emphasized. **What this tells us: Maintaining and improving existing infrastructure remains a core priority alongside future capacity or multimodal investments.**

Advancing Transportation Safety

Freeway crash frequency, emergency response delays, pedestrian and bicycle fatalities, rural shoulder conditions, and intersection design were noted as concerns. Some supported capacity improvements to address congestion-related crash risk, while others emphasized traffic calming, roundabouts, protected bike lanes, and safer crossings. Safety was framed as both a system performance issue and a design priority. **What this tells us: Safety remains a broadly shared value across differing viewpoints and geographic areas.**

Sustainably Increase Transportation Choice

Clearly defined BRT projects, expanded Bustang service, passenger rail advancement, and safer high-speed corridor crossings were frequently mentioned, with an emphasis on reliability, connectivity, and performance. Sustainability and climate considerations were often linked to these requests, particularly in discussions about highway expansion and long-term congestion impacts. **What this tells us: There is strong interest in expanding transportation options, and expectations for performance and connectivity are high.**

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission

From: Bob Fifer, Deputy Director of Operations, DMO
Jim Fox, Deputy Director of Maintenance, DMO

Date: March 18, 2026

Subject: Roadside Vegetation Management and Fire Mitigation

Purpose

This memo provides an overview of the actions taken and further discussions needed to address roadside vegetation management related to wildland fire mitigation.

Action

Requesting concurrence from the Commission to proceed with development of the final plan.

Background

The dry and warmer weather conditions for the 2025-26 Winter Season have brought forth the conversation on the effects of vegetation, including trees and grasses with an emphasis on wildland fires. To address these conditions, conversations have led to augmenting the current CDOT roadside vegetation management activities with a focus upon reducing the wildfire fuel loads for areas adjacent to the State highways. As part of the CDOT Integrated Roadside Vegetation Management plan, one of the goals of that program is to reduce the fuel for wildfires on the roadside. This is accomplished through mechanical control such as mowing along with trimming trees for traffic safety. Several key objectives have been identified in these proposed and enhanced mitigation strategies for this season:

- Reduce Roadside Fire Starts
- Protect Evacuation Routes
- Maintain Mobility (open roads)
- Fuel break/ Control line (large fires)
- Safety of road users & sight distance
- Visually Appealing Roadside
- Noxious weeds

While current Maintenance practices assist with wildland fire mitigation strategies, for the upcoming summer season staff recognizes a heightened approach is warranted. By identifying these key objectives, CDOT staff developed techniques that will aid in these enhanced

mitigation strategies. These techniques can then be moved into action through leveraging existing Maintenance staff activities with augmentation by contractors. For the work locations, CDOT is actively working with the Colorado Department of Public Safety's Division of Fire Prevention and Control (DFPC) to both identify those locations as well as prioritize those routes. Staff will then collaborate with local Counties and Municipalities to create the final work plan.

To maximize the efficiency of our restricted budget and personnel, we are utilizing DFPC data to prioritize specific state routes based on wildfire risk and fuel load. Our initial evaluation will target the Front Range (Pueblo–Larimer) and the I-70 corridor (Jefferson–Mesa). This approach allows us to maintain a broad project footprint by confining operations to highway-adjacent areas, ensuring that our limited implementation window is spent on the most critical corridors.

The approach for this effort is to combine efforts from the CDOT Maintenance forces and contractors to perform the work. Staff recommend a heightened approach to vegetation mitigation prior to the summer season, with a focus on reducing fuel loads along selected and prioritized State highways.

The actions identified with this approach include:

- Remove diseased trees or trees that are greater than 50% dead
- Chip slash/wood on-site and spread, remove larger blocks
- Increase separation of larger vegetation based on zone designation
- Cut stumps flush as identified in CDOT Specifications
- Remove ladder fuels, lower branches and combustibles

To perform this work, it is recommended the mechanical vegetation control be completed by internal CDOT Maintenance forces. For the removal of trees and lower branches of live trees, staff recommend soliciting contractors to complete the work as well as working with other government entities to assist with the removal of such fuels.

Next Steps

Upon concurrence from the Commission to continue developing the plan, staff will finalize the plan and opportunities to solicit proposals from contractors to perform the work as indicated once funding has been identified.

Attachments

None

COLORADO
Department of Transportation

Roadside Vegetation Management & Fire Mitigation Update

March 18th, 2026

What is the Objective?

- Reduce Roadside Fire Starts
- Protect Evacuation Routes
- Maintain Mobility (open roads)
- Fuel break/ Control line (large fires)
- Safety of road users & sight distance
- Visually Appealing Roadside
- Noxious weeds

Mitigation Techniques

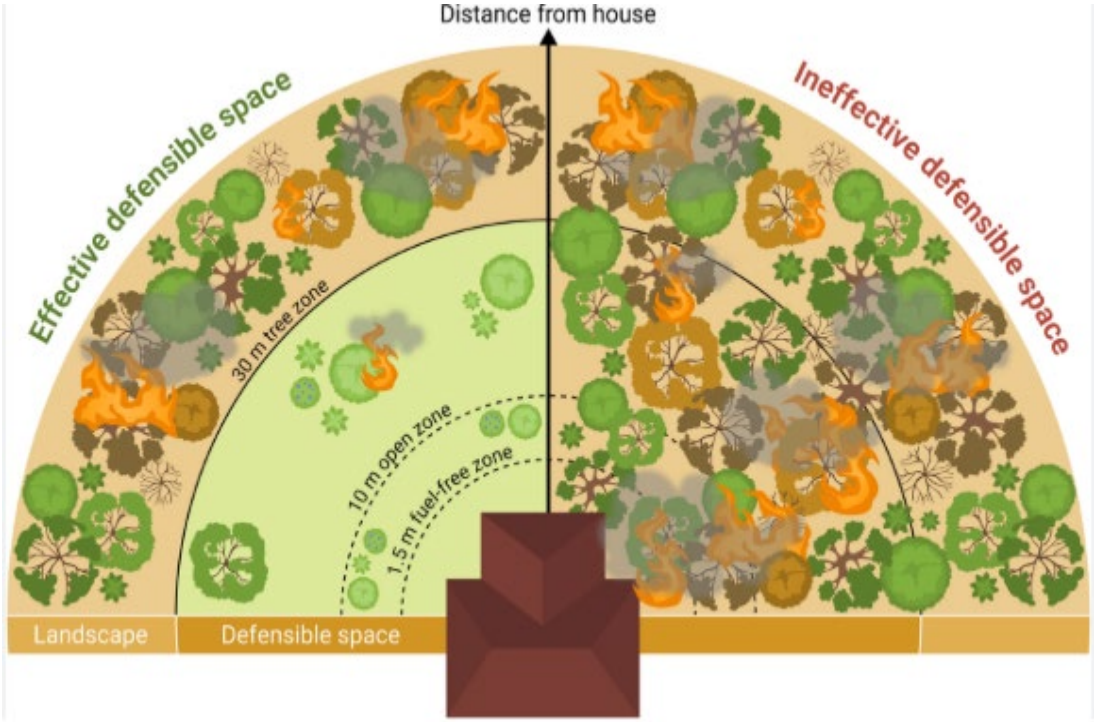
- Mowing
- Fuel Reduction (Trimming, remove ladder fuels, vegetation spacing)
- Dead vegetation removal
- Controlled Burning (CDOT not allowed)
- Bare grounding (chemically)
- Fire line/ Fuel break at ROW fence

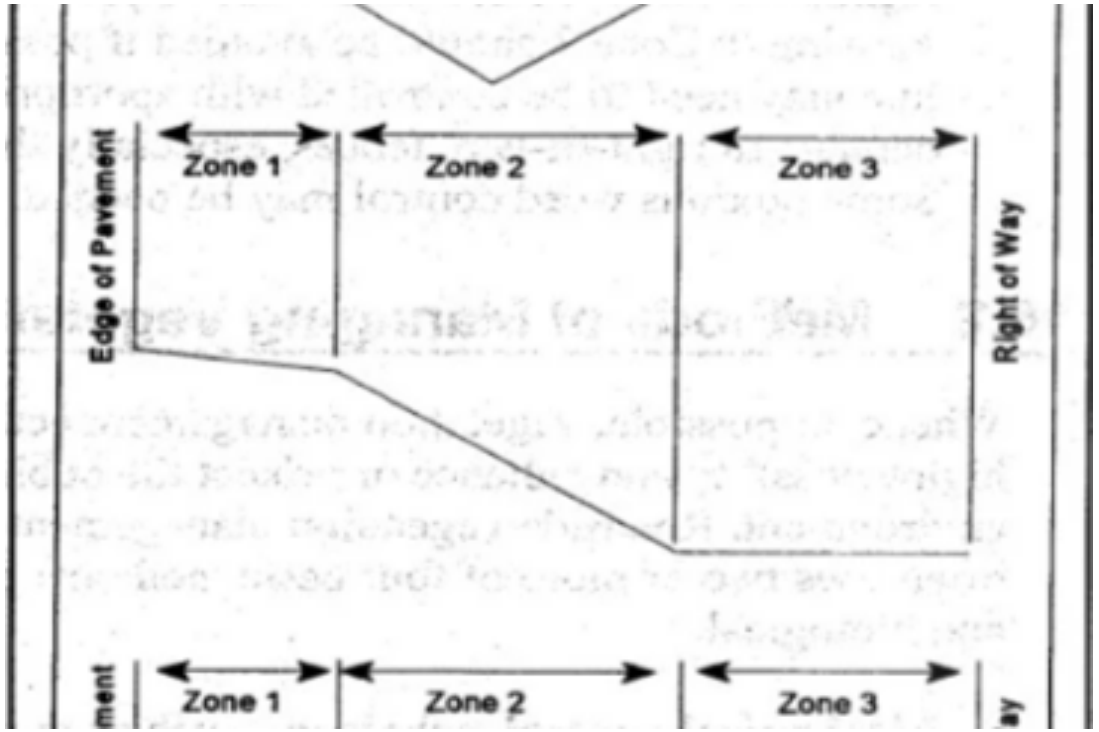
Vegetation Mitigation Comparison

Combination of multiple mitigation techniques accomplishes several objectives.

- Mowing
- Ladder fuels removed, slow fire spread
- Spacing of vegetation promotes stronger & healthier forest
- Clear zone, motorist safety & Errant vehicle recovery
- Minimize snow drifting
- Aesthetically pleasing

Zone Comparison with Home Defensible Space





Drafted Scope of Work

Identify priority work areas based on:

- Division of Fire Prevention and Control (DFPC) identifying extremely and highest potential need for roadside treatment.
- DFPC identify minimal public safety and evacuation routes.
- DFPC to identify historic data for fire activity including Roadside Fire Starts statistics.
- CDOT will overlay Road Category & ADT.
- Within CDOT Right-of-Way boundaries.
- Impact to critical infrastructures and environmental sensitivities.
- Collaboration with local county/ municipality for identified locations.

After Prioritization, and based on any funding, Teams will:

- Remove diseased trees or trees that are 50% dead or more.
- Chip slash / wood on-sight and spread, remove larger blocks.
- Increase separation of larger vegetation based on zone designation.
- Cut stumps flush as identified in CDOT Specifications.
- Remove ladder fuels, lower branches and combustibles.

Work Approach

The work will be performed using a dual-method approach:

- Internal Maintenance forces
- Contracted services

Performance of Work

Internal Maintenance Forces

- Standardized mowing operations will be conducted by CDOT Maintenance Sections to manage vegetation in adjacent roadside areas

Contracted Services

- Leverage established CDOT procurement methods to contract with external contractors for the removal of dead or diseased timber alongside the roadway

COLORADO
Department of Transportation

Thank You

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Jim Fox
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Colorado Transportation Commission
Audit Review Committee Agenda
Wednesday, March 18, 2026

Rick Ridder, Chair	Diane Barrett	Shelly Cook	Todd Masters
District 6	District 1	District 2	District 11

All commissioners are invited to attend this Committee meeting

1. **Call to Order** — **Verbal**
2. **Motion to Approve December 17, 2025, Minutes** — **Verbal**
3. **Motion to Approve FY 2027 Internal Audit Plan** — **Verbal**

The agenda may be altered at the chair's discretion

Transportation Commission Meetings
February 18-19, 2026

Transportation Commission Workshop (TC) Notes

Wednesday, February 18, 2025 - 12:30 PM - 4:15 PM Workshops

12:30 - 4:15 PM Attendance:
Eleven Transportation Commissioners were present: Chair: Shelley Cook, Vice Chair: Barbara Bowman, Cecil Gutierrez, Elise Jones, Barbara McLachlan, Juan Marcano, Rick Ridder, Terry Hart, Diane Barrett, Hannah Parsons, and Todd Masters

Joint TC/CTIO Workshop on I-70 Floyd Hill Project - Kurt Kionka, Jessica Myklebust, and Piper Darlington

Purpose and Action: To update the TC on the progress of the I-70 Floyd Hill project and a planned project financing through the Colorado Transportation Investment Office (CTIO). No action is to occur this month. A second workshop is anticipated in March, with approval actions anticipated for April. Approval actions include approval of a financing parameters resolution by the CTIO Board, and approval of a credit support interagency agreement (IAA) between CTIO and CDOT (if applicable).

For more details regarding this workshop please see the February 2026 TC Packet (Pages 4-16).

Discussion

- Commissioner Ridder asked about outstanding bond issuances related to the project and whether the current proposal was the initial element.
- Piper Darlington confirmed that this would be the first CTIO-led bond issuance for Floyd Hill, noting an existing $25 million loan for the Mountain Express lane (MEXL) eastbound and that the Bridge and Tunnel Enterprise (BTE) also has some bonds on the project.
- Commissioner Cook also inquired if the I-70 Floyd Hill project video was available on the website, which was confirmed to be on CDOT's YouTube channel.
- Commissioner Cook sought clarification on whether the refinancing would provide $105 million in new capital, or only $80 million, to which it was confirmed that it would be $80 million.

Joint TC/CTIO Workshop on Bustang Funding - Jeff Sudmeier, Kay Kelly, Paul DesRocher, and Emily Haddaway

Purpose and Action: To provide an overview of the Bustang Family of Services and give greater detail into Bustang's current and future financial projections. This is an Informational item only.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 17-34)

Discussion:

- Commissioner Marcano expressed issues with the way the funding table was presented, stating that no transportation system in the world actually covers its full costs, as transportation services like Bustang are a public service and serve the public good. He emphasized the importance of understanding the true costs of the service, and questioned the real benefit of Bustang beyond just costs, asking what the savings per rider are (e.g., no car usage, more discretionary income - due to not owning a car, no fuel/maintenance costs, time savings, safer environment). He also asked if CDOT tracks the public benefits of the service.
    - Response: Paul DesRocher, CDOT Division of Transit and Rail Director, responded by saying it is hard to achieve a quantitative number, but added the benefits that Commissioner Marcano stated are true amongst other factors like GHG emissions reduction.
- Commissioner Parsons asked what percentage of CTIO's budget would be absorbed by Bustang operational costs and when that full expenditure would occur, and acknowledged that the charts show deficits.
    - Response: Piper Darlington, CTIO Director, stated that they do not have the answers to the budget expenditure question, as that analysis has not been analyzed yet, but confirmed that it would be part of future discussions.
- Commissioner Gutierrez had concerns about the shift in funding and found it unrealistic to use an enterprise's funding stream, set up for a specific purpose (surface infrastructure linked to fees by law), for something else 16 years later. He believed this would be difficult to explain to the public, and agreed on the problem with one-time funding: once a service is started it is very difficult for riders to have it terminated, and that the service should be maintained.. Gutierrez also stated that people don't understand how CTIO's budgeting works, but it appears the majority of the budget is already committed. In addition, the SB 24-184 congestion impact fee revenue is still undefined, and its allocation for rail projects such as Joint Service or Front Range Passenger Rail (FRPR) versus Bustang is unknown, and expressed concern that we need to take the proper amount of time to make the right decision related to these two services, and work more collaboratively in making decisions.

- Commissioner Hart thanked participants for the initiation of this conversation, stating it accomplished its goal of identifying specifics, needs, and options for addressing funding gaps by looking at potential revenue sources. Hart acknowledged the very real challenges we face, but saw it as a huge opportunity for the state, and stressed the importance of finding a sustainable pathway for Bustang, which he believes is critical for Colorado's growth and mobility. A suggestion to focus on the long-term vision for the system, rather than getting caught in short-term challenges was raised. Support for a joint funding strategy was noted, and he believes a broader conversation on funding is necessary, as there are limited funds in the traditional CDOT world. He emphasized the success of Bustang as a pilot program and believes its popularity demonstrates a public desire for the service. The CTIO and TC should work together to propose a holistic solution. This problem may need legislative action as part of the solution.
- Commissioner Jones appreciated the presentation and the robust conversation on this, agreeing with much that was stated previously by others. Jones acknowledged that money is tight, but felt there's a positive side in terms of opportunity, and stated that transit operations have long been underfunded in Colorado. She also noted that Bustang's popularity is a consistent theme raised public meetings. Overall, Commissioner Jones expressed her support and recognition of the 10 years of success with Bustang, and encouraged the conversation at CTIO, seeing the use of toll revenues for overall performance of the corridor as something to consider. She believes that increasing Bustang services on I-25, for example, would make the transportation system overall work better.
    - Response: CDOT Executive Director Lew stated it's not the end, nor the beginning, of the conversation, as conversations regarding this have been occurring for years. Transit was always a mission of CTIO: the original enabling statute for CTIO authorized use of transit revenue for transit operations as a source of revenue. Lew acknowledged that the enabling statute was not precise, causing questions about the scope. She also noted that other DOT's have been building infrastructure on the transit side with toll revenue for years, and believes the conversation should evolve to focus on multimodal operation of the corridor, not just infrastructure and emphasized balancing the needs of road users and transit users in the same corridor. In terms of funding rail, this conversation could create some clarity.
- Commissioner McLachlan observed regarding the pilot program's piece of Bustang noting as a test Bustang has shown it is working. Bustang also fits into the climate (GHG) discussion well, and McLachlan supports Bustang due to the ridership strides it has made over the years.
- Chair Cook asked if we are affected by the loss of the $10.5 Million dollar general fund transfer?
    - Response: Jeff Sudmeier, CDOT Chief Financial Officer, confirmed that if it's a cut in the funding and that it would eliminate the MMOF funding stream for Bustang. Sudmeier stated that the JBC (Joint Budget

Committee) was considering changing the MMOF distribution to hold the Bustang revenue in place. Currently, about $3.5 million annually goes to Bustang from the MMOF.

- Commissioner Parsons reiterated appreciation for Bustang and desire for its success, expressed concern about overall impacts, particularly to local transit, if Bustang receives MMOF funds while local transit doesn't. Parsons advocated for a holistic conversation about how funding decisions (e.g., for Bustang vs. local transit) play out across the entire system, and noted that success is not defined just by ridership, but by sustainability.
- Chair Cook asked how long does it take to forward a bill to fund Bustang.
    - Response: Emily Haddaway explained that prior internal discussions around legislation for Bustang/transit didn't progress due to uncertainty about political support for another transit bill.
    - The current Boards (CTIO & Clean Transit Enterprise [CTE]) discussions, there's a need for more stakeholder discussions to get initial opponents on board and to ensure stakeholder interest.
    - It was clarified that any potential legislation would be based around the concept of giving both Boards flexibility to make decisions administratively, rather than as a mandate.
    - Indicated that this flexibility would allow for future discussions and decisions without needing to return to the legislature for every detail.
    - Paul DesRocher responded to Commissioner Parsons' concern about MMOF cuts by saying that local agencies now get more CTE grants, which outways the MMOF cuts.
- Chair Cook wanted to reiterate support for Commissioner Marcano's notion of coming up with quantitative data on how Bustang is helpful to Colorado.
- Commissioner Bowman wanted to give her thanks for this presentation.

Condemnation Authorization Request - RW-181, US6 & Wadsworth Interchange, Project 24948, US6 & Wadsworth Interchange, Region 1 - Keith Stefanik and Jessica Myklebust

Purpose and Action: Seeking TC approval to initiate and conduct condemnation proceedings. The project NHPP 0062-037, US6 & Wadsworth Interchange is necessary to reconstruct the existing cloverleaf interchange configuration to a tight diamond with a single loop, improving traffic flow and safety. This will include replacing the existing US-6 bridge, replacement of culverts, a water quality pond, multi-use paths, widened sections of Wadsworth, and installation of noise walls.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 35-52)

Discussion:

- Commissioner Barrett asked if there was a minimum amount (of land) that would not need to be taken to Commission for approval.
- Response: No,it seems like all have to go to the Commission. CDOT may have tried to change the statute before, but it was easier just to go to the Commission each time.
- Chair Cook asked if the owner had been paying taxes on the property - it seems unlikely, but it is possible.

Budget Workshop

Draft FY 2026-27 Final Budget Allocation Plan - Jeff Sudmeier and Bethany Nicholas

Purpose and Action: To review the draft FY 2026-27 Final Annual Budget Allocation Plan, that is set for adoption in March 2026. The Division of Accounting and Finance (DAF) is requesting that the TC review the draft FY 2026-27 Final Annual Budget Allocation Plan, and provide feedback to the Department in preparation for the March 2026 meeting, when the FY 2026-27 Final Annual Budget will be presented to the TC for adoption.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 53-80)

Discussion:

- Commissioner Jones asked if the rollover funds were safe from being reallocated elsewhere as a result of legislative decisions.
    - Response: Most rollforward dollars are already allocated to specific funding sources, so it is difficult to reallocate them. If the dollars are in a vulnerable source they are more susceptible to being eliminated if there is not enough funds.
- Commissioner Gutierrez asked if the Transit grants in line 61 of the budget could be used for Bustang
    - Response Jeff Sudmeier: No line 61 is reserved for local transit agencies; very little of that funding could be used for Bustang.
    - Follow up question: Can any safety funding be used for Bustang?
    - Response: No, the specific safety funding pointed out is federal dollars so that can't be reallocated.
- Line 99 should be SB25-184 instead of SB-230.
- Commissioner Marcano asked if in light of the low snow season, does the Division of Operations and Maintenance (DMO) have any extra funds available.

- Response: DMO is spending the extra funds on repairing potholes and preparing for what could be a bad fire season (summer).

HQ Building Certificates of Participation (COP) Refunding - Jeff Sudmeier and Bethany Nicholas

Purpose and Action: Inform the TC on the prospective Refunding Certificates of Participation, Series 2026 COPs issuance ahead of an approval request at the February TC meeting. In February 2026, the TC was asked to approve the Parameters Resolution associated with the issuance of the Series 2026 COPs to refinance the Department's outstanding Series 2016 and Series 2017 COPs.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 81-93)

Discussion

- No discussion occurred.

Bridge and Tunnel Enterprise (BTE) Workshop - Patrick Holinda and Katie Carslon

Draft BTE FY 2026-27 Final Budget Allocation Plan

Purpose and Action: This month, the Bridge and Tunnel Enterprise Board of Directors (Board) and the TC is being presented with a Statewide Bridge and Tunnel Enterprise fiscal year (FY) 2026-27 Final Annual Budget Allocation Plan for Special Revenue Fund (C.R.S 43-4-805(3)(a) 538) (Fund 538) for review and comment. The Board is asked to review and comment on the FY 2026-27 Final Annual Budget Allocation Plan, and BTE staff will return next month seeking the Board's approval and adoption of this budget.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 94-96)

Discussion

- No substantial discussion occurred and questions were adequately answered at the end of the presentation.

BTE 8th Budget Supplement to FY 2025-26

Purpose and Action: This month, the BTE Board of Directors (Board) and the TC is being asked to approve a budget supplement request for one project. Region 1 requests a budget supplement to fund the final design for the I-270 Critical Bridges

(E-17-ID, E-17-IE, E-17-IF, E-17-IG, E-17-IH, E-17-IJ) project. Staff requests Board approval of Proposed Resolution #BTE2, the eighth supplement to the Fiscal Year 2025-26 BTE budget.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 97-100)

Discussion

- No substantial discussion occurred and questions were adequately answered at the end of the presentation.

USDOT Better Utilizing Investments to Leverage Development (BUILD) Program Grant Match Funding

Purpose and Action: The Statewide BTE Board and the TC is being asked to approve the attached resolution to commit BTE state match funding for the 23rd Avenue Bridge Improvements Project being submitted for the Capital Projects category of the Federal Fiscal Year 2026 U.S. Department of Transportation (USDOT) Better Utilizing Investments to Leverage Development (BUILD) discretionary grant opportunity. Staff request Board approval of Proposed Resolution #BTE3 to commit BTE state match funds for the Federal Fiscal Year 2026 USDOT BUILD discretionary grant opportunity.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 101-116)

Discussion

- Chair Cook: asked if the investments to leverage the build grant match funding is a part of the budget supplement as well?
    - Response- Patrick Holinda: It is not a budget allocation, it is referred to as a commitment in principle, if the grant is awarded then the BTE would come back to the TC for approval.

Fuels Impact Enterprise (FIE) Workshop - Darius Pakbaz

Purpose and Action: This workshop provided the TC a summary of the Final budget for Fiscal Year 2026-2027 for adoption by the Fuels Impact Enterprise Board of Directors (Board). The TC is being requested to adopt the Fiscal Year 2027 draft Budget, that was reviewed in November with adjustments requested by the Board of Directors.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 117-133)

Discussion

- No Discussion

Hinsdale County Off Highway Vehicle (OHV) Permit - Jason Smith and Zane Znamenacek

Purpose and Action: Adopt a resolution in place of the previously approved TC 2018-07-17, TC 2021-03-10 and TC 2024-02-08 that will reflect a time extension of the resolution with generally the same terms as previously agreed upon with CSP, Hinsdale County and the Town of Lake City. TC 2018-07-17, TC 2021-03-10 and TC 2024-02-08 allowed CDOT to enter into an agreement with Lake City and Hinsdale County to allow OHV travel on a segment of Hwy 149. General terms of the agreement included:

- The route starts at MP 73.11 (Ocean Wave Dr) in Lake City and travels south to MP 69.85 (CR 30) with no deviations
- Total length of the project was about 3.26 miles
- The program lasted for the summer seasons (May through Sept) of 2019, 2020, 2021, 2022, 2023, 2024 and 2025
- A final report on the program was required of the applicants, Lake City and Hinsdale County

Hinsdale County and the Town of Lake City are requesting a time extension in this program for another ten years of implementation. Other terms in the resolution would remain the same as the past program, except for three items. The first is a shift in the timeframe for the program to slightly later in the year. Previously, the start and end dates have varied around the Memorial Day and Labor Day holidays, but this proposal would be from June 1 through Sept 30 of each year. This shift in dates better aligns with the demand period for OHV use. The second change would be to eliminate the requirement that Hinsdale County hire two seasonal law enforcement officers to enforce the Town and County ordinances related to OHV use. This term is no longer needed because the Hinsdale County sheriff's office has expanded to a sheriff, three additional full-time deputies, and two seasonal deputies during the summer. The Sheriff’s Office will also be responsible for providing information on the rules and regulations of the program while on patrol Lastly, CDOT Region 3 will require a newSpecial Use Permit for each of the ten years approved by TC. This will allow CDOT to keep control of the program.

For more details regarding this workshop please see the February 2026 TC Packet (Pages 134-151)

Discussion

- Director Lew supported the program with a less hands on approach in contrast with previous iterations of the program.
- Commissioner McLachlan wanted to congratulate Hinsdale County on the upward progression of this program throughout the years.
- Commissioner Ridder said he expects that other municipalities will follow suit in obtaining this exception, and it may be difficult to do that, since it is such a unique situation.
  - Response: Jason Smith, CDOT Region 3 RTD, agreed with Commissioner Ridder's examination.
- Commissioner Marcano wanted to clarify that an OHV is a vehicle that is not typically street legal.
  - Response: Jason Smith clarified that this is correct, but most (if not all) vehicles have to follow the same parameters as a traditional vehicle.
- Chair Cook stated it was a great collaboration between Lake City and Hinsdale County, and Commissioner Bowman echoed those comments.

Adjournment

The TC Board Meeting was adjourned at approximately 4:19pm.

The next Transportation Commission Workshops and Board Meeting are scheduled for Wednesday - Thursday, March 18-19, 2026.

Transportation Commission (TC) Board Meeting

Thursday, February 19, 2026 - 9:00 AM

Call to Order, Roll Call

Eleven Transportation Commissioners were present: Chair: Shelley Cook, Vice Chair: Barbara Bowman, Cecil Gutierrez, Elise Jones, Barbara McLachlan, Juan Marcano, Rick Ridder, Terry Hart, Diane Barrett, Hannah Parsons, and Todd Masters

Public Comments

Public Commenters YouTube Video www.youtube.com/live/-Q5kXeeFbdI Timestamp 0:43 to 14:56.

Riley Warton, an employee of Arapahoe Community College, requested and stressed that CDOT needs to invest in better transit. He states he prefers taking transit and feels other (smaller) counties have better transportation and we now, due to people moving here from other states, have the opportunity to build great transit. Increase Transit Funding.

Ann Imse, an Investigative Journalist, spoke on the following topics:
Wildfire Mitigation

Funding for Highway 285 Expansion

- CDOT planned a four-lane US 285 from Conifer to Bailey 25 years ago, but it remains unfunded.
- The next small segment of this expansion is not slated to receive funding until 2031 or later within the 10-year plan.

Gerry Blasi, Rotary Wildfire Safety and Evergreen Fire Department urged support for wildlife mitigation along federal highways, particularly evacuation routes. Some of the federal highways are designated as non-surviving during a catastrophic event. Our forests are dense and overgrowing which could lead to quicker and more deadly wildfire. Blasi recommends fuel reduction and a thinning of the forests. This is, as he states, a public safety, economic, and transportation investment.

For more details on public commenters who signed up and any written comments that may have been submitted to the TC, please reach out to the TC Secretary, Herman Stockinger at herman.stockinger@state.co.us.

Comments of the Chair and Commissioners

- Commissioner Jones: Expressed gratitude for public comments. Highlighted the tragic accident on I-25 and emphasized the importance of safety. Stressed the need to address the impact of climate change on transportation infrastructure. Expressed support for the Bustang transit system, noting its popularity in reducing congestion, and providing another transportation choice. She is confident that solutions will be found to continue its service, despite funding challenges.
- Commissioner McLachlan: Regarding the Alamosa intersection issue miscommunication, they met with city officials and the Region 5 RTD, Julie Constan, and had a productive meeting that identified a solution. Excited for an underpass at 12th street in Durango. Noted a general concern for the dry climate.

- Commissioner Barrett: Thanked the CDOT staff for the hard work for preparing and presenting in Wednesday's TC workshop.
- Commissioner Parsons: Is excited about the Fountain-Fort Carson transit circulator service to be provided on the military base. It will start service in May. This program, supported by a CDOT grant, could serve over 100,000 people across Fountain, Southeast Colorado Springs, Security, and Widefield, in an area prone to congestion. Commended Todd Evans (Deputy City Manager for Fountain) for leading the effort and recognized other partners including PPACG, Mountain Metro Transit, Pikes Peak State College, CDOT Region 2 Regional Transportation Director, Shane Ferguson, and Scott Skinner.
- Commissioner Ridder: Would like more passing lane notification signs (alerting people to passing lanes). Also wanted to give thanks to the CDOT Division of Maintenance and Operations (DMO) for their hard work (with various other projects) in a historic low snow year.
- Commissioner Bowman: Thanked Region 3 for the Proposed Resolution #6: Hinsdale County Off Highway Vehicle (OHV) Permit for travel on CO 149. Expressed appreciation for Bustang, CDOT Staff, and for both the rendering and progress on the I-70 Floyd Hill project.
- Commissioner Masters: Drew attention to the tragic number of fatalities on Colorado highways in 2025 and 2026, with nearly two people dying per day in 2025. Urged drivers to be more cautious, slow down, be aware of other drivers, and maintain distance in Colorado's precarious and unpredictable weather conditions (hail, heavy rain, etc.).
- Commissioner Hart: Echoed colleagues' comments on safety issues, climate change impacts, and wildfire mitigation. Emphasized the importance of considering the social benefits of transportation, beyond just technical or engineering aspects. Expressed interest in hearing about the CDOT budget for the upcoming fiscal year. Stressed the need for interagency cooperation in addressing climate change. Expressed gratitude for efforts to find money for Bustang and transit funding.
- Commissioner Gutierrez: Recognized the Pikes Peak Area Council of Governments (PPACG) for the initiation of the transit circulator at Fort Carson. The Poudre River Trail will be completed this spring. The Weld County side of the trail was completed with grants or private money exclusively.

- Commissioner Marcano: Noted the need for more wildfire mitigation, and more transit use. His wife is a wheelchair user and frequently uses transit, and feels that RTD has frequent enough headways during the day, but after 7pm it is more difficult due to the less frequent service. Also noted that if Bustang service is reduced, it will lead to more expense for roadway maintenance with more drivers on the road.
- Commissioner Cook: Echoed comments from other Commissioners, especially Commissioner Hart, regarding safety, crashes, and wildfire mitigation, and would also like to learn more about the impacts of the Marshall Fire. Furthermore, Cook attended the SMART Act hearing and acknowledged all the hard work that went into preparing for the hearing.

Executive Director's Report - Shoshana Lew

- Director Lew acknowledged that the current month had been particularly challenging due to the warm, dry, winter.
- The Smart Act hearing was highlighted as an important annual event, commending her team for their meticulous planning and successful execution of the event, and noted the recent winter conferences held across the state, which provided opportunities for teams to gather.
- There are ongoing legislative discussions, including the progress of the CDOT cleanup bill. Lew shared that Darius Pakbaz (DTD Director) was invited to present to another state legislature in Oregon, indicating that other states are looking to Colorado for leadership.
- The positive outcome of the warm winter is that more construction work can be completed, such as the resurfacing project in Empire.
- The siting of a maintenance facility in Routt County and related discussions are occurring to assure the TC and the public that CDOT is working closely with the County for an amicable resolution, to ensure snowplows have the necessary space.

Chief Engineer's Report - Keith Stefanik

- Stefanik found the Smart Act hearing to be a good setting for disseminating information and gathering feedback, which helps shape future initiatives.
- Yearly engineering conferences were highlighted as a valuable opportunity to meet with regional staff, gather feedback on how headquarters can support the Regions, and discuss accomplishments, future plans, and lessons learned.
- It was announced that CDOT projects received three specific awards from the Colorado Asphalt Paving Association (CAPA) this year, with two in Region 5 and one in Region 3. Additionally, Region 1 won the *Best in Colorado* for an urban award (I-25 Central corridor paving project), and Region 5 won for a rural project (US 160 Treasure Falls). He congratulated the Regions for these accomplishments.
- Keith participated in the Winter Bike to Work Day, held on Friday, February 13, 2026, and congratulated the DTD team for organizing a great event with strong participation.

- The next deployment of automated speed enforcement will begin on I-25 North in Segment 5, covering a four-mile corridor. The warning period starts March 1st, and violations will begin April 1st. This is CDOT's second such deployment.

CTIO Director's Report - Piper Darlington

- Darlington announced that the annual CTIO legislative report was published online on February 15th and provided to the transportation legislative review committee (TLRC). It is a valuable resource for information on CTIO's programs, public-private partnerships, express lanes, and support for transit programs such as Bustang.
- Colorado (CTIO) received an A rating from the P3 bulletin, a trade group that tracks public-private partnership activity. This recognition highlights the state's broad enabling legislation for P3s and the successful transportation infrastructure projects delivered by CTIO and CDOT, such as US36 and Central 70.
- An update was provided on the expansion of the Denver Connector - the Globeville/Elyria-Swansea (GES) program to support the GES Connector, an on-demand ride service similar to Uber or Lyft. This service, a CTIO partnership with the City and County of Denver, addresses a gap in night and weekend coverage, especially for community members needing access to grocery stores and other services. The service has seen positive early results, with 100 passengers a day and two drivers in its first month.
- The advantages of CTIO's involvement in micromobility options was shared, as it allows for the collection of valuable data that can be shared with other agencies.

FHWA Report - John Cater

- Cater stated that safety is a top priority for Federal Highway's, CDOT, and CDOT's Chief Engineer, Stefanik. It was acknowledged that while the fatality rate per vehicle mile traveled has improved significantly over the last two decades, the number of fatal crashes is increasing. He outlined a comprehensive approach to safety, focusing on: Safer roads through better design and project completion. FHWA has affirmed its commitment to work with CDOT to improve innovation for both project delivery and safety, aiming to ensure everyone has a safe ride home.

STAC Report - STAC Chair, Gary Beedy

- A presentation on the 2027-2036 10-Year Plan was provided from Regions 1, 2, and 4.
- A significant topic was the briefing on Policy Directive 1601, which pertains to the interchange approval process. Concerns were raised that conflicts within this process are not being addressed quickly enough, leading to too many delays.

- A Transportation Alternatives Program (TAP) update was presented, which provides federal funding to states for transit, bike, and sidewalk improvements.
- Senate Bill 25-030 was discussed; this bill aims to increase transportation choice transparency by creating an inventory of Active Transportation projects to create a database of project to therefore identify infrastructure and funding gaps in bicycle and pedestrian infrastructure.
- Beedy specifically commented on an accident on I-25 south of Pueblo caused by blowing dust. It was noted that visibility can instantly drop to zero in such conditions, and using highway signage during high wind events to warn drivers to slow down before entering areas with blowing dust was suggested.

Legislative Report - Emily Haddaway

- Smart Act Hearing: Haddaway noted that the Smart Act Hearing, held last month, generated many questions on transportation funding, rural roads, and CTIO activities. The information presented was well-received.
- Joint Budget Committee (JBC) Update: The JBC figure setting meeting on February 6th resulted in MMOF not receiving the general fund transfer of $10.5 million. The JBC also approved a staff recommendation to extend the roll-forward authority from three to six years.

CDOT Supported Bills:

- HB26- 1076 (Statutory Cleanup Bill): This bill has passed the House and is quickly moving to the Senate.
- HB26-1237 (Traffic Safety Modifications): Introduced recently, this bipartisan bill includes: Clarifying changes to traction law for two-wheel-drive vehicles, and an update to the statute regarding abandoned vehicles in the right-of-way. The most significant change is amending 13 different titles to replace the term *accident* with the more neutral term *crash* throughout the statute.
- HB26-1127 (Reporting After Fatal Car Crash): This bill emerged from a recommendation by the Impaired Driving Task Force and requires County Coroners to report toxicology data from fatal crashes to CDOT on a quarterly basis. This aims to standardize and ensure timely reporting of data currently provided annually.

Other Legislative Items (CDOT Monitor):

- SB 26-035 (Increase of Traffic Violation Penalties): Is a bill related to passing lane issues in Commissioner Ridder's district
- Two bills were postponed indefinitely: the *Adjust Subdivision Access to State Highway System*, and the *Register and Drive Surplus Military Vehicles*, both of which CDOT did not fully support.
- Ongoing conversations about Bustang funding.
- Forthcoming legislation on wildlife crossings.

- Chair Cook had a question about the Graduated Income Tax: Haddaway clarified that a proposed restructuring of Colorado's income tax to a graduated system is a ballot measure, not currently in the legislature, though it has passed the Title Board.

Discuss and Act on Consent Agenda - Herman Stockinger

- Proposed Resolution #1: Approve the Regular Meeting Minutes of January 15, 2026
- Proposed Resolution #2: IGA Approval >$750,000
- Proposed Resolution #3: Disposal Parcel 10REV-EX, US 285 EB On Ramp between Lincoln and Sherman, Englewood
- Proposed Resolution #4: Disposal Parcel 5-EX, Mancos Car Wash
- Proposed Resolution #5: Disposal Parcel E8, Park Avenue and I-25, Denver
- Proposed Resolution #6: Hinsdale County Off Highway Vehicle (OHV) Permit
- Proposed Resolution #7: MMOF Match Reduction Request, City of Fort Collins

A motion by Commissioner Bowman was raised to approve, and seconded by Commissioner Marcano and passed unanimously.

Discuss and Act on Proposed Resolution #8: Condemnation Authorization Request - RW-181, US 6 and Wadsworth Interchange, Project 24948, Region 1 - Jessica Myklebust

A motion by Commissioner Barrett was raised to approve, and seconded by Commissioner Jones, and passed unanimously.

Discuss and Act on Proposed Resolution #9: HQ Building COP Refunding - Jeff Sudmeier

A motion by Commissioner Jones was raised to approve, and seconded by Commissioner Barrett, and passed unanimously.

Adjournment

The TC Board Meeting was adjourned at approximately 10:30 am.

The next Transportation Commission Workshops and Board Meeting are scheduled for Wednesday - Thursday, March 18-19, 2026.

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission
From: Lauren Cabot
Date: March 4, 2026

Subject: Intergovernmental Agreements over $750,000.00

Purpose

Compliance with CRS §43-1-110(4) which requires intergovernmental agreements involving more than $750,000 must have approval of the Commission to become effective. In order stay in compliance with Colorado laws, approval is being sought for all intergovernmental agencies agreements over $750,000 going forward.

Action

CDOT seeks Commission approval for all IGAs contracts identified in the attached IGA Approved Projects List each of which are greater than $750,000. CDOT seeks to have this approval extend to all contributing agencies, all contracts, amendments, and option letters that stem from the original project except where there are substantial changes to the project and/or funding of the project.

Background

CRS §43-1-110(4) was enacted in 1991 giving the Chief Engineer the authority to negotiate with local governmental entities for intergovernmental agreements conditional on agreements over $750,000 are only effective with the approval of the commission.

Most contracts entered into with intergovernmental agencies involve pass through funds from the federal government often with matching local funds and infrequently state money. Currently, CDOT seeks to comply with the Colorado Revised Statutes and develop a process to streamline the process.

Next Steps

Commission approval of the projects identified on the IGA Project List including all documents necessary to further these projects except where there are substantial changes to the project and/or funding which will need re-approval. Additionally, CDOT will present to the Commission on the Consent Agenda every month listing all the known projects identifying the region, owner of the project, project number, total cost of the project, including a breakdown of the funding source and a brief description of the project for their approval. CDOT will also present any IGA Contracts which have already been executed if there has been any substantial changes to the project and/or funding.

Attachments

IGA Approved Project List

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: The Transportation Commission
From: Keith Stefanik, P.E. Chief Engineer
Date: March 19, 20206

Subject: Parcel 140R-Rev1, 1605 Lincoln Ave, Steamboat Springs

Purpose
The purpose of this memorandum is to provide the Transportation Commission with the necessary supporting documents including legal descriptions and maps to declare Parcel 140R-Rev1 as excess property.

Action
In accordance with Colorado Revised Statute 43-1-210(5), the Department of Transportation is authorized, subject to approving resolution of the Transportation Commission, to dispose of any property or interest which, in the opinion of the Chief Engineer, is no longer needed for transportation purposes. CDOT is requesting the Transportation Commission adopt a resolution to declare a 140R-Rev1 containing 1.8 Acres (+/-) as excess property.

Background
Parcel 140R-Rev1 is located south of US Highway 40 at 1605 Lincoln Avenue in the City of Steamboat Springs, County of Routt, and contains 1.8 Acres (+/-) of land that is located outside of the right of way necessary for US Highway 40. Parcel 140R-Rev1 is comprised of all of Parcel 140R and a portion of Parcel 140 which were acquired by CDOT as part of Project No. FR040-2(26) in 1989 and a portion of Parcel H-1 as part of Project No. QRF 040-2(10) acquired in 1976 for the construction of US Highway 40.

The City of Steamboat Springs and CDOT have jointly determined that Parcel 140R-Rev1 is a good fit for the City to utilize as part of a sustainable, attainable workforce housing project.

C.R.S. 43-1-210(5) and 23 CFR 710 403(e) require CDOT to obtain fair market value for the sale of property. C.R.S. 43-210(5) also defines a right of first refusal process for the sale of CDOT property. When a CDOT excess property has value to more than one adjacent owner, any political subdivision of the state with taxing authority over the property has a first right of refusal to acquire the property for fair market value. The City of Steamboat and CDOT have negotiated a contract for the City to acquire the property for fair market value based on appraisals that are currently in process.

State Senator Dylan Roberts has issued a letter of support for this transaction in recognition of the following facts to assist CDOT in siting a maintenance facility in the Yampa Valley:

- CDOT and The City of Steamboat Springs have acknowledged the CDOT's Rabbit Ears

Maintenance site is past its useful life and needs to be replaced.

- The City of Steamboat Springs, Routt County and Colorado's travelling public would all benefit by relocating the Rabbit Ears site to the Yampa Valley floor; ideally close to the foot of Rabbit Ears Pass.
- CDOT has unsuccessfully searched for a suitable site for the relocation of the Rabbit Ears site for several years.
- CDOT is selling Parcel 140R-Rev1 (some of its limited property ownership in the Yampa Valley) to the City of Steamboat Springs, which will be used for the development of much needed affordable housing, in advance of finding a suitable site for the relocation of the Rabbit Ears site.
- The City of Steamboat Springs has agreed to collaborate with CDOT to find a suitable relocation site that will allow CDOT to improve future maintenance operations.
- It is CDOT and the City of Steamboats desire for CDOT to use the funds from the sale of this parcel to invest in the City of Steamboat Springs future sustainable, attainable workforce housing project, to obtain housing units for CDOT's workforce located in the Yampa Valley.

Details

CDOT Region 3 has determined the disposal of Parcel 140R-Rev1 will not affect the operation, use, maintenance or safety of the highway facility.

The Chief Engineer and the Department of Transportation are authorized pursuant to C.R.S. 43-1-106(8)(n); 43-1-110; 43-1-114(3) and 43-1-210(5) to make determinations regarding land to be declared excess. CDOT Region 3 has declared through Keith Stefanik as Chief Engineer that Parcel 140R-Rev1 containing 1.8 Acres (+/-) is not needed for transportation purposes.

Next Steps

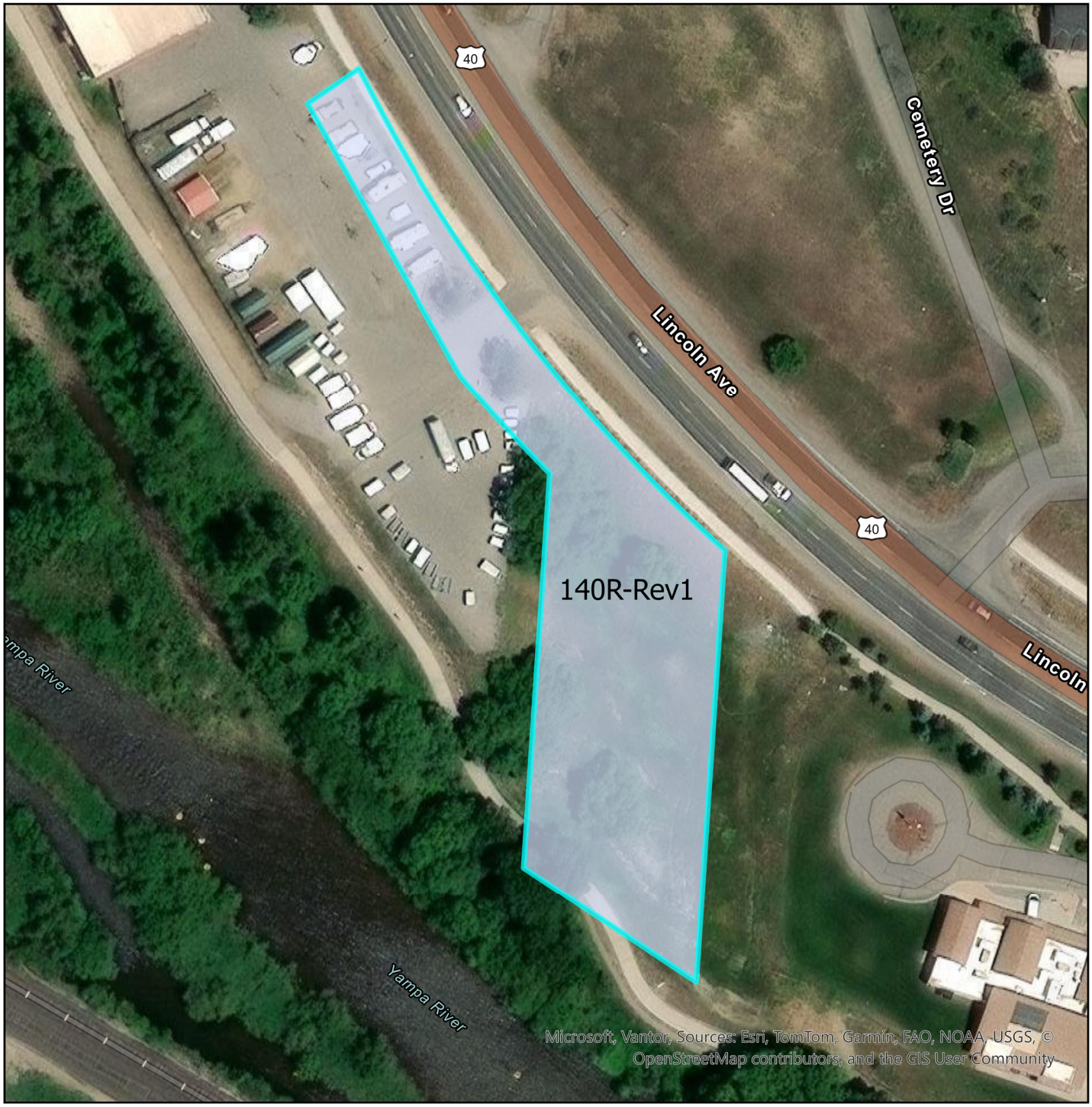
Upon approval of the Transportation Commission, CDOT will transfer Parcel 140R-Rev1 containing 1.8 Acres (+/-) of land in exchange for fair market value pursuant to the provisions of the C.R.S. 43-1-210(5) and 23 CFR 710.403(e).

Attachments

Legal Description with Exhibit

Letter of Support from State Senator Dylan Roberts.

CDOT Parcel 140R-Rev1 - Steamboat Springs, CO



N

0 75 150 300 Feet

Legend

Parcels

Prepared by: Cameron Petitt
CDOT Property Management -DMO

General Assembly
State of Colorado
Denver

March 10, 2026

Dear Members of the Transportation Commission,

The mobility, commerce, and access to critical safety services in the Yampa Valley rely heavily on the functionality of US40 and other state highways. As the State Senator and State Representative representing Routt County, we are keenly aware that CDOT's ability to operate these vital public facilities relies on the ability of its team of professional highway maintainers having the assets they need to house equipment — in close proximity to state highways and communities that depend upon those highways functioning twelve months a year.

We appreciate that the current Rabbit Ears Pass Maintenance Facility, which is situated on a U.S Forest Service easement, is not operable over the long term, as it would require significant and costly septic system replacement as well as additional space to suit current equipment. We also recognize that the current developable CDOT right-of-way in the Yampa Valley area is quite limited, and that discussions for several years have not yielded a clear path forward with respect to siting CDOT operations.

In addition, we are immensely grateful for CDOT's work to help the region with the immense challenge that is the availability of affordable and attainable housing for working families. In making a portion of its existing developable right-of-way available for affordable housing known as the Campbell Project, CDOT is displaying a good faith partnership with the City of Steamboat Springs and working people of Routt County and we ask the Transportation Commission to please support a measure this month to move forward with a disposition to the City of Steamboat Springs for this purpose.

At the same time, we commit to facilitating and accelerating discussions with all relevant stakeholders to identify a parcel suitable for CDOT operations on vital stretches of US40, including Rabbit Ears Pass and the City of Steamboat Springs. We value the projects that CDOT is advancing to improve the condition of US40, and have advocated for greater investment in the safety of this key corridor. Highway maintenance is similarly vital to operating this highway.

As a next step in this process, we commit to convening a working group with relevant state and local officials to identify suitable sites, with the goal of providing siting options for CDOT and the Transportation Commission's consideration by Summer 2026. We will be in touch soon with a proposal for in-person and virtual meetings to make sure progress is made on finding a solution that works for CDOT, the City of Steamboat Springs, and the people of this region.

Sincerely,

Senator Dylan Roberts

Representative Meghan Lukens

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission
From: Emily Haddaway, CDOT Legislative Liaison
Date: March 6th, 2026

Subject: Designation of Sergeant John "Jack" Thurman Memorial Highway

Purpose

Memorial designations of state highways or bridges passed by the General Assembly require review and approval from the Transportation Commission. The CDOT Office of Policy and Government Relations (OPGR) typically brings all memorial designations from the past legislative session to the Transportation Commission at once, after the legislative session concludes. However, Sergeant Thurman was a prominent veteran who served in WWII, including the battle of Iwo Jima, and stakeholders have requested that the resolution be considered for early adoption to ensure signage can be installed in his honor before Memorial Day. Larimer County Commissioner John Kefalas has also been supporting this highway designation, and is retiring this year. Stakeholders have communicated that they would like to celebrate the designation this upcoming Memorial Day, while Commissioner Kefalas is still in office.

Action

The Transportation Commission is requested to adopt the resolution passed by the Colorado House and Senate on the consent agenda.

Background

TC Policy Directive 1503.0 establishes a consistent statewide process regarding the designation or memorialization of highways, bridges, or other highway components. As part of this process, the TC has the authority to accept and approve such legislative requests. All legislative memorial designations enable CDOT to receive gifts, grants, and donations for the installation of memorial signage. As such, no state funds will be used to produce, erect, or install these signs.

Next Steps

The Transportation Commission has the choice to adopt a resolution to confirm the following memorial highway:

COLORADO
Department of Transportation

1. Senate Joint Resolution SJR 26-011 passed, designating the portion of State Highway 34 from Wilson Ave. and North County Rd. 23H as “Designate Sergeant John "Jack" Thurman Memorial Highway.”

Attachments

Transportation Commission Resolution to Adopt the Sergeant John "Jack" Thurman Memorial Highway

Copy of SJR 26-011

SENATE JOINT RESOLUTION 26-011

BY SENATOR(S) Marchman and Kirkmeyer, Amabile, Baisley, Ball, Bridges, Bright, Carson, Catlin, Cutter, Danielson, Exum, Frizell, Gonzales J., Hinrichsen, Jodeh, Kipp, Kolker, Lindstedt, Liston, Michaelson Jenet, Mullica, Pelton B., Pelton R., Rich, Roberts, Rodriguez, Simpson, Snyder, Sullivan, Wallace, Weissman, Zamora Wilson, Coleman;
also REPRESENTATIVE(S) Boesenecker, Bacon, Barron, Bottoms, Bradley, Brooks, Brown, Caldwell, Camacho, Carter, Clifford, DeGraaf, Duran, Espenoza, Flanell, Froelich, Garcia, Garcia Sander, Gilchrist, Goldstein, Gonzalez R., Hamrick, Hartsook, Jackson, Johnson, Joseph, Keltie, Lieder, Lindsay, Luck, Lukens, Mabrey, Marshall, Mauro, McCormick, Nguyen, Paschal, Phillips, Rutinel, Rydin, Slaugh, Smith, Soper, Stewart K., Stewart R., Story, Suckla, Taggart, Titone, Willford, Winter T., Woodrow, Woog, McCluskie.

CONCERNING DESIGNATION OF A PORTION OF U.S. HIGHWAY 34 BETWEEN WILSON AVE. AND NORTH COUNTY RD. 23H IN MEMORY OF SGT. JOHN "JACK" THURMAN.

WHEREAS, Sergeant John "Jack" Ryland Thurman, United States Marine Corps, was born on September 27, 1925, in South Dakota, and passed February 1, 2025, at 99 years old, in Loveland; and

WHEREAS, Jack married the love of his life, Carol Jean Meier, on October 22, 1951, and together, the couple raised four children; and

WHEREAS, After many decades together, Carol Jean passed June 22, 2009; and

WHEREAS, Sgt. Thurman was a veteran of World War II, a survivor of Iwo Jima, and one of just a few select soldiers pictured in the iconic "Gung Ho" photo of U.S. Marines atop Japan's Mt. Suribachi mid-battle; and

WHEREAS, Jack enlisted on his 18th birthday with the United States Marine Corps at Minnesota's Ft. Snelling; was selected for special forces training at Marine Corps Base Camp Pendleton, CA, a group that became known as the original "Carlson's Raiders", and was attached to the 5th Marine Division 27th Regiment, 2nd Battalion, Foxtrot Company, and Headquarters; and

WHEREAS, Sgt. Thurman deployed to the Japanese island of Iwo Jima from February 19, 1945, to the end of March 1945, where he was in the first waves of steel "amtracs" (amphibious assault vehicles) that landed on Red Beach 1; and

WHEREAS, An advanced infantry sniper, Sgt. Thurman provided coverage for the six original Iwo Jima flag raisers, saved numerous Marines by securing pillboxes and Japanese tunnels, located a strategic map identifying Japanese heavy artillery locations-which impacted the outcome of the war, provided supplies to the front lines, and rescued sailors and Marines from a downed B-29 bomber on Motoyama Airfield No. 1 while under direct fire; and

WHEREAS, Sgt. Thurman took mortar wounds to his hip and face during the battle, and his arms numbed from the impact of his M1 Carbine rifle itself taking a hit, but he was determined to keep moving forward; and

WHEREAS, For his heroism, Sgt. Thurman received a Bronze Star Medal, Good Conduct Medal, American Campaign Medal, Asiatic-Pacific Campaign Medal, and the World War II Victory Medal, in addition to an Honorable Discharge; and

WHEREAS, Sgt. Thurman's military memorabilia has been preserved at museums such as the National Museum of the Marine Corps near Quantico, VA; the World War II Memorial in Washington, D.C.; the Center for American Values in Pueblo; and the Broomfield Veterans Museum; and

WHEREAS, After World War II, Sgt. Thurman had a successful career as an architect and designer in Colorado, best known for his involvement with the University of Colorado Engineering Center, the

U.S. Marine Corps Memorial in Golden, the Admiral Arleigh Burke Memorial in Boulder, the Black Forest restaurant in Nederland, and several commercial buildings throughout the United States and in Germany; and

WHEREAS, Sgt. Thurman remained dedicated to community service as a member or volunteer with organizations including the Boulder and Loveland VFW and American Legion-for which he was appointed Commander and Colorado District Commander, Arvada-based Marine Corps club "Cooper's Troopers", the Marine Corps League, 40/8, Lions Club, Knights of Columbus, Veterans Honor Guard, youth sports, Boy Scouts and Girl Scouts, police and fire departments, and as a guest speaker providing numerous presentations educating children and adults alike; and

WHEREAS, Sgt. Thurman served as Grand Marshal of the Larimer County Fair Parade on July 27, 2019, a day subsequently proclaimed as "Sgt. John 'Jack' Thurman Day" by the Larimer County Board of Commissioners; was Veterans Day Grand Marshal for Denver, Loveland, Boulder, and Longmont; and was selected as "Veteran of the Month" twice by FOX31; and

WHEREAS, Sgt. Thurman was also honored by President Donald Trump in 2020 during a Colorado Springs rally, recognizing him for his service as an Iwo Jima survivor; and

WHEREAS, In addition to his military and civic accomplishments, Sgt. Thurman also was a champion chess player at the University of Colorado and an established author, completed the Bolder Boulder in 2016 in a wheelchair pushed by his daughter Karen, and tossed the coin for both a Colorado Buffaloes and a Denver Broncos game; and

WHEREAS, Sgt. Thurman also served as a lifelong inspiration for his daughter, Commander Karen Thurman, U.S. Navy (Ret.), who herself served 21 years on active duty, with deployments to Bosnia; Naval Station Guantanamo Bay, Cuba; Okinawa; and Iraq; and

WHEREAS, Sgt. Thurman, a member of the Greatest Generation, will be remembered for his heroism, courage, dedication, strong faith, humble compassion, and his significant impact on our American history; now,

therefore,

Be It Resolved by the Senate of the Seventy-fifth General Assembly of the State of Colorado, the House of Representatives concurring herein:

(1) That the portion of U.S. Highway 34 between Wilson Ave. and North County Rd. 23H be designated as the "Sgt. John 'Jack' Thurman Memorial Highway";

(2) That the Colorado Department of Transportation may accept and expend gifts, grants, and donations for the purpose of the initial placement of signs to mark the portion of U.S. Highway 34 between Wilson Ave. and North County Rd. 23H as the "Sgt. John 'Jack' Thurman Memorial Highway"; and

(3) That the Colorado Department of Transportation may explore a cooperative agreement with the City of Loveland, Larimer County, or both, for the maintenance of the signs marking the "Sgt. John 'Jack' Thurman Memorial Highway".

Be It Further Resolved, That copies of this Joint Resolution be sent to Commander Karen Thurman, Larimer County Commissioner John Kefalas, and Colorado Department of Transportation Executive Director Shoshana Lew.

James Rashad Coleman Sr.
PRESIDENT OF
THE SENATE

Julie McCluskie,
SPEAKER OF THE HOUSE
OF REPRESENTATIVES

Esther van Mourik
SECRETARY OF
THE SENATE

Vanessa Reilly
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES

COLORADO
Department of Transportation

Region 4

MEMORANDUM

DATE: February 27th, 2026
TO: Transportation Commission of Colorado
FROM: Tim Bilobran, Region 4 Permits Program Manager
Daniel Roussin, Program Administrator, Access Management Unit

SUBJECT: Access Appeal of Permit #425127, 8 ½ Enterprises, LLC C/O Ken Evans on State Highway 85C

Purpose

The purpose of this memorandum is to summarize and inform the Transportation Commission of the Access Permit Appeal in Region 4 on State Highway 85C, and the access appeal process outlined in the State Highway Access Code (2 CCR 601-1, 2.9).

Action Requested

Region 4 recently received an appeal of the denial of an access application on CDOT Highway 85C from Mr. Ken Evans, representing 8 ½ Enterprises, LLC, which was submitted through Civil Resources, LLC on his behalf. In accordance with the Colorado State Highway Access Code, the landowner has requested an administrative hearing before the Transportation Commission (TC). Pursuant to C.R.S. § 43-2-147(6)(c), the Transportation Commission will make the determination if the appeal will be heard by the Transportation Commission, or referred to the Department of Administration, Division of Administrative Appeals where it would be heard by an Administrative Law Judge.

Background

CDOT controls highway access through the State Highway Access Code, 2 CCR 601-1 (2002). 8 ½ Enterprises LLC applied for an access permit for Parcel No. 147118000060 in Weld County on US Highway 85C (the "Property") to change an existing agricultural field access into an access facilitating mining operations. On October 22nd, 2025, Region 4 provided Traffic Study comments to both the permittee and Weld County notifying the permittee that the permittee's proposal could not be approved for two different reasons:

1. Per conversations with Weld County and an eventual December 2nd, 2025 email from Weld County, this property has reasonable local access from Weld County Road 8.5 on the back side of the parcel. US Highway 85 is an Expressway category at this location. Section 3.7(3) of the State Highway Access Code states for an Expressway category, no access to private property may be permitted unless reasonable access cannot be obtained from the general street system.

2. The US-85 Access Control Plan (ACP), effective since 2000, requires this closure as a condition of the change in use. The US 85 ACP went through a public process during adoption with 9 different open houses throughout 1998 and 1999. CDOT and 11 local jurisdictions including Weld County signed an IGA mandating adoption of the ACP.

Region 4 denied the application on December 10, 2025. CDOT received an appeal from the Permittee on February 10, 2026.

Next Steps

Staff recommends to the Transportation Commission that it delegate the appeal to the Department of Administration, Division of Administrative Appeals. As set forth in C.R.S. § 43-1-147(6)(c), if the hearing is held before the Transportation Commission, the Transportation Commission is required to conduct the proceedings and the hearing in accordance with the same rules, regulations and procedures set forth in Article 4 of Title 24 of C.R.S., that apply to administrative court proceedings. Because of the time sensitivity of the current situation, the legal issues involved, and the nature of the dispute regarding the permit denial, staff believe that referral to the Department of Administration, Division of Administrative Appeals will provide the most efficient and effective decision.

Attachments

- Appendix A: Access Application Denial Letter, with copy of accepted Access Permit Application
- Appendix B: 8.5 Enterprises, LLC Appeal Request

COLORADO
Department of
Transportation

Via Certified Mailing #7018 1830 0001 9765 2967

December 10th, 2025

ATTN: Ken Evans
8 1/2 Enterprises, LLC
PO Box 9382
Denver, Colorado 80209-0382

RE: Denial of Highway Access Permit Request No. 425127, U.S. Highway 85C, approximate milepost 85.85 East

Dear 8 ½ Enterprises, LLC:

CDOT received your online Access Permit Application on November 14, 2025. The application proposes the use of an existing direct US 85 historical field approach for private aggregate mining operation. The proposed access location is approximately 0.80 miles north of Weld County Road 8, on the east side of Highway 85. The undeveloped property is identified by Weld County parcel number 147118000060 and currently has no assigned street address. The undeveloped property has a historical field approach / Rural Access (RA) direct US-85 highway access point Unfortunately, CDOT must deny your request for redeveloped mining access to this parcel for the following reasons:

1. The US-85 Access Control Plan (ACP), effective since 2000, requires this closure.
    - The US-85 ACP shows the closure of this field approach access on US-85. The ACP plan was for this property to have access onto WCR 8.5.
    - This US-85 ACP did have a public process as outlined in the Access Code. The landowner at that time had the ability to comment on the ACP.

2. US Highway 85 is an Expressway category, Major Bypass at this location.
    - From the Colorado Access Code Section 3.8(3): No access to private property may be permitted unless reasonable access cannot be obtained from the general street system. This property has other reasonable access from the local street system on Weld County Road 8.5 per a December 2nd, 2025 email from Dawn Anderson, Weld County Development Review Manager.

For these reasons, CDOT must deny your request for redeveloped mining access to this parcel. If this parcel's use or traffic counts change from the current field approach / Rural Access, the access in question must close under a free Access Permit from this office.

Should you object to the denial of a permit application by the Department or object to any of the terms or conditions of a permit placed there by the Department, you have a right to appeal the decision to the Transportation Commission of Colorado pursuant to Section 2.9 of the State Highway Access Code. To appeal the decision, submit a written request for administrative hearing to the Transportation Commission of Colorado within 60 days of transmittal of notice of denial. Submit the request to the Transportation Commission of Colorado, 2829 West Howard Place, Denver, CO 80204. The request shall include reasons for the appeal and may include changes, revisions, or conditions that would be acceptable to the permittee or applicant.

If you have questions regarding the Department's decision, please contact me at (970) 350-2163

Sincerely,

Tim Bilobran

Tim Bilobran, Permits Manager

Cc:
Region 4 Executive Director Heather Paddock
Region 4 Traffic Engineer, Katrina Kloberdanz,
Region 4 Access Manager, Rose Valdes
Daniel Roussin, Statewide Access Program Manager
Weld County Planning, Dawn Anderson

COLORADO
Department of
Transportation

COLORADO DEPARTMENT OF TRANSPORTATION **STATE HIGHWAY ACCESS PERMIT APPLICATION**	Issuing authority application acceptance date:

Instructions:

Please print or type

**Indicates required field*

- Contact the Colorado Department of Transportation (CDOT) or your local government to determine your issuing authority.
- Contact the issuing authority to determine what plans and other documents are required to be submitted with your application.
- Complete this form (some questions may not apply to you) and attach all necessary documents and ssubmit it to the issuing authority.
- Submit a separate application for each access affected.
- If you have any questions, contact the issuing authority.
- For additional information, see CDOT's Access Management website at http://www.codot.gov/business/permits/accesspermits .

1) Property Owner (Permittee)*		**2) Applicant for Permittee (if different from property owner)**	
8 1/2 Enterprises, LLC		8 1/2 Enterprises, LLC	
Mailing Address*		**Mailing Address**	
PO Box 9382		PO Box 9382	
City, State & Zip*	**Phone #***	**City, State & Zip**	**Phone #**
Denver, Colorado 80209-0382	3039336349 **Ext:**	Denver, Colorado 80209-0382	3039336349 **Ext:**
E-mail Address*		**E-mail Address (if available)**	
ken@pei-corp.com		ken@pei-corp.com	

3) Address of property to be served by permit :

TBD

4) Legal description of property:

County *	City or Municipality	Parcel # or Tax Schedule #	Latitude	Longitude
Weld County	Fort Lupton	147118000060		

5) What State Highway are you requesting access from? *		**6) What side of the highway? ***
Highway: 085C	Milepoint/Milepost: 240.000	East

7) How many feet is the proposed access from the nearest milepost (or cross street if mile post unknown)? *

675

8) What is the approximate date you intend to begin construction?

Jun 1, 2026

9) Check here if you are requesting a: *

New Access: ☐ Temporary Access (duration anticipated): ☐ Improvement to Existing Access: ☑

Change in Access Use: ☑ Removal of Access: ☐ Access Via a local public road: ☐

Relocation of an Existing Access: ☐

COLORADO
Department of
Transportation

10) Provide existing property use:

Vacant: ☐ Single Family Residence: ☐ Multi-Family: ☐

Mixed Use: ☐ City Street/County Road: ☐ Commercial: ☐

Industrial: ☐ Other: ☐ Agricultural/Grassing: ☑

11) Do you have knowledge of any State Highway access permits serving this property, or adjacent properties in which you have a property interest? *

No

12) Does the property owner own or have any interests in any adjacent property? *

No

13) Are there other existing or dedicated public streets, roads, highways or access easements bordering or within the property? *

Yes WCR 8.5

14) If you are requesting agriculture field access – how many acres will the access serve?

15) If you are requesting commercial or industrial access, please indicate the types and number of businesses and provide the floor area square footage of each.

Gravel mining operation

16) If you are requesting residential development access, what is the type (single family, apartment, townhouse) and number of units?

17) Provide the following vehicle count estimates for vehicles that will use the access. *

Total peak hour volumes for all vehicles *	# of passenger cars and light trucks in peak hour	# of multi-unit trucks in peak hour
18	9	9
# of single unit vehicles in excess of 30 ft.	# of farm vehicles (field equipment)	
0	0	

18) Check with the issuing authority to determine which of the following documents are required to complete the review of your application.

a) Property map indicating other access, bordering roads and streets.
b) Highway and driveway plan profile.
c) Drainage plan showing impact to the highway right-of-way.
d) Map and letters detailing utility locations before and after development in and along the right-of-way.
e) Subdivision, zoning, or development plan.
f) Proposed access design.
g) Parcel and ownership maps including easements.
h) Traffic studies.
i) Proof of ownership.

1- It is the permittee 's responsibility to contact appropriate agencies and obtain all environmental clearances that apply to their activities. Such clearances may include Corps of Engineers 404 Permits or Colorado Discharge Permit System permits, or ecological, archeological, historical or cultural resource clearances. The COOT Environmental Clearances Information Summary presents contact information for agencies administering certain clearances, information about prohibited discharges, and may be obtained from Regional COOT Utility/Special Use Permit offices or accessed via the COOT Planning/Construction-Environmental-Guidance webpage: https://www.codot.gov/programs/environmental/resources/guidance-standards/environmental-clearances-info-summary-august-2017/view .

2- All workers within the State Highway right of way shall comply with their employer's safety and health policies/ procedures, and all applicable U.S. Occupational Safety and Health Administration (OSHA) regulations -including, but not limited to the applicable sections of 29 CFR Part 1910 -Occupational Safety and Health Standards and 29 CFR Part 1926

- Safety and Health Regulations for Construction.

Personal protective equipment (e.g. head protection, footwear, high visibility apparel, safety glasses, hearing protection, respirators, gloves, etc.) shall be worn as appropriate for the work being performed, and as specified in regulation. At a minimum, all workers in the State Highway right of way, except when in their vehicles, shall wear the following personal protective equipment: High visibility apparel as specified in the Traffic Control provisions of the documentation accompanying the Notice to Proceed related to this permit (at a minimum, ANSI/ISEA 107-1999, class 2); head protection that complies with the ANSI 289.1-1997 standard; and at all construction sites or whenever there is danger of injury to feet, workers shall comply with OSHA's PPE requirements for foot protection per 29 CFR 1910.136, 1926.95, and 1926.96. If required, such footwear shall meet the requirements of ANSI 241-1999.

Where any of the above-referenced ANSI standards have been revised, the most recent version of the standard shall apply.

3- The Permittee is responsible for complying with the Revised Guidelines that have been adopted by the Access Board under the American Disabilities Act (ADA). These guidelines define traversable slope requirements and prescribe the use of a defined pattern of truncated domes as detectable warnings at street crossings. The new Standards Plans and can be found on the Design and Construction Project Support web page at: https://www.codot.gov/business/civilrights/ada/resources-engineers .

If an access permit is issued to you, it will state the terms and conditions for its use. Any changes in the use of the permitted access not consistent with the terms and conditions listed on the permit may be considered a violation of the permit.

The permittee declares under penalty of perjury in the second degree, and any other applicable state or federal laws, that all information provided on this form and submitted attachments are to the best of their knowledge true and complete.

I understand receipt of an access permit does not constitute permission to start access construction work.

By signing this application I am confirming that I am the Permittee (landowner) OR an authorized representative. This signature shall constitute agreement with this application by all owners -of-interest unless stated in writing. If a permit is issued, the property owner, in most cases, will be listed as the Permittee and will be required to sign the permit.

Permittee or Authorized by the Owner **Digital Signature**	Print Name	Date
Kyle Regan	Kyle Regan	11/14/2025, 11:25:25 AM

January 30, 2026

CDOT
Transportation Commission of Colorado
2829 West Howard Place
Denver, Colorado 80204

RE: Appeal and request for administrative hearing in front of the Transportation Commission of Colorado related to the denial of Highway Access Permit Request No. 425127, US Highway 85C, approximate milepost 85.85 East

To Whom It May Concern:

The following information is provided in support of an appeal and request for Administrative Hearing in front of the Transportation Commission of Colorado on behalf of the permittee, Mr. Ken Evans. The appeal and request is in response to the recent denial of Highway Access Permit Request No. 425127, US Highway 85C, approximate milepost 85.85 East.

Background

The proposed WCR 8.5 Gravel Mine (see attached location map), is located in the West half of the Northwest quarter of Section 18, Township 1 North, Rage 66 West of the 6th P.M, Weld County Colorado. Generally the site is located one and one-half miles south of the City of Fort Lupton, bounded by United States (US) Highway 85 (US-85) on the west and private property on the north, south, and east.

The applicant requested an access permit through CDOT to allow for gravel mining truck ingress and egress via an existing Rural Access (RA). A traffic study was performed by Kimley-Horn and Associates to analyze 200 total truck trips using the RA (100 inbound and 100 outbound). The traffic study concluded that a right-in-right-out (RIRO) access would operate and function acceptably. Northbound deceleration and acceleration lanes were required improvements along US 85. The mine is proposed to be active for approximately 10-years depending on market conditions.

Denial

CDOT denied the applicants request for an access permit via US85 on December 10th, 2025. The following reasons were presented to the applicant.

1. *The US-85 Access Control Plan (ACP), effective since 2000, requires this closure.*
    - *The US-85 ACP shows the closure of this field approach access on US-85. The ACP plan was for the property to have access onto WCR 8.5.*
    - *This US-ACP did have a public process as outlined in the Access Code. The landowner at that time had the ability to comment on the ACP.*
2. *US-Highway 85 is an Expressway category, Major Bypass at this location.*
    - *From the Colorado Access Code Section 3.8(3) (sic): No access to private property may be permitted unless reasonable access cannot be obtained from the general street system. This property has other reasonable access from the local*

street system on Weld County Road 8.5 per a December 2nd, 2025 email from Dawn Anderson, Weld County development Review.

Response to Denial

1. The US-85 Access…
    - The ACP recommends closure of most RA field approaches. It was conveyed to the applicant the ACP is a "living document" with the understanding that plans can change as discussed under the *Implementation Section of the ACP*. While closure of RAs is the general recommendation, the US-85 corridor has changed significantly in the past 26-years. There is valuable gravel resource along the eastern flank of the US-85 corridor and it's a requirement to extract this resource per *Colorado Revised Statue 34-1-301*. The recommendation to close access points in 2000 did not take into account future market conditions and demand along the US-85 corridor. While the plan's intent is to make US-85 safer, the proposed RA improvement with a right-in/right-out access and northbound deceleration and acceleration lanes does not make US-85 less safe. Assuming the ACP historically recommended access along Weld County Road (WCR) 8.5 is presumptuous as WCR 8.5 is a single lane unpaved rural road with access terminating on a two-lane road without turn lanes. The subject property is also located in a potential industrial area along US-85, which could generate heavy truck traffic.

      The ACP recommends improvements to various intersections, in general these improvements might happen (for example WCR 8 and US-85), but final improvements may not be per the ACP recommendations as demands and uses have changed along the corridor. Improvements to intersections at WCR 8 and US-85 and WCR 8 and Denver Ave have not occurred yet per the ACP's recommendations. This is relevant because plans can change based on current conditions, engineering studies, public process and engineering judgment and budgetary constraints. This is also relevant as it puts potential offsite improvement obligations onto one user, along with further public interference during construction (see Figure 3).

    - The ACP states that there was a public process, this assumes the information conveyed to the property owners in 2000 would have discussed the potential for gravel mining demands per *Colorado Revised Statue 34-1-301* and access closure implications. It should be noted that all zoned agricultural properties allow for gravel mining in Weld County and Fort lupton. The ACP does not state future development was discussed with mineable resource owners or gravel mine stake holders. To put ACP's burden on the current property owner does not allow for the most efficient access more than 20 years later.

2. The US-85 is…
    - The Colorado Access Code Section (SHAC) 3.7(3) states. *No access to private property may be permitted unless reasonable access cannot be obtained from the general street system.* As shown on Figure 2 detailing the WCR 8.5 and Denver Ave access, to state the WCR 8.5 access is "reasonable" assumes the following:

- It assumes the applicant's future required movements at WCR 8.5 and Denver Ave are attainable per the Traffic Impact Study (TIS), local government codes and geometric constraints. Per the City of Fort Lupton, commercial northbound traffic is not allowed at WCR 8.5. Exiting traffic desiring to travel north will be forced to travel south via Denver Ave, then east along WCR 8 and finally north along US-85 past the subject site. This significantly increases travel distance and time (vehicle miles traveled) rather than having a direct right-out access along US-85 (see Figure 3)
- As shown in the attached Figures, it assumes the five existing commercial access points to the south along WCR 8.5 are not conflicting based on engineering design standards and local government road improvement standards (see discussion below). To further complicate the access along Denver Ave, there is a historic irrigation ditch (Fulton Ditch) that runs along Denver Ave, requiring significant offsite improvements. There are redirect implications along Denver Ave due to left turning (northbound to westbound) movements from Denver Ave. To reduce this volume, having direct northbound right-in entrance access along US85 would provide great benefit. Weld County's statement that the property has "reasonable" access along WCR 8.5 assumes Weld County Planning read through the applicant's response to CDOT. The response from Weld County Planning was never shared with the applicant.

- Reasonable or available is not defined in the SHAC or ACP.

The following information discusses further concerns with using the WCR 8.5 and Denver Ave access and talks generally about the ACP and SHAC.

US-85 Access Control Plan and SHAC

The Highway 85 Access Control Plan (ACP) designates the existing Site access (MP 239.86 east) as an existing Rural Access (RA) with a median opening. The ACP calls for RAs to be closed if the land use changes or if there is a change that increases the daily trip generation by 20 percent or more provided that other access is available. Per the ACP, if access to the local road system is not possible, a right in/right out (RIRO) with deceleration and acceleration lanes is permitted. Per the ACP, RAs rely on intersection improvements. The WCR 8 and US-85 intersection improvement has not been constructed to date.

Highway 85 is designated as an Expressway (E-X) roadway. The State Highway Access Code (SHAC) does not allow for access to private property unless "reasonable" access cannot be obtained from the local/municipal transportation system. Both the ACP and the SHAC allow for direct private access to Highway 85 provided that there is no "reasonable" or "available" alternative to the roadway system.

Similar Sites

Review of similar gravel mining operations in the area, it was determined that BURNCO's Ewing Gravel Mine (Ewing Site) had applied for and received an access permit at MP243.72 (west). This

access location is also designated as a RA access by the ACP and was slated for closure after changing land use. The Ewing Site is located on the west side of Highway 85 and is bounded by private property to the north and south and the South Platte River to the west. There is an existing RA approximately 1,000 feet to the south of the Ewing Site, MP 243.22 (west), which is slated to remain open as a ¾ access until an intersection is built at CR 14.5. While the access here was granted, it could be argued that a bridge improvement was more "reasonable" than allowing an RA to remain open.

Summary

Similar to the Ewing Site, the WCR 8.5 Gravel Mine Site is bounded on the north, east, and south by private property, with Site frontage onto Highway 85 on the west. The only other available access is Weld County Road 8.5 (WCR 8.5) which dead ends into the property from the east. It's the applicant's opinion the alternative access is unavailable or reasonable based on the following.

- The shortest path to the highway from WCR 8.5 route would be to travel from WCR 8.5 east to Denver Ave, head south on Denver Ave 0.5 miles to WCR 8, head west on WCR 8 for 0.5 miles to Highway 85. The intersection of WCR 8 and Highway 85 has recently been changed to a RIRO stop controlled intersection where trucks generated by the Site would then travel north past the proposed WCR 8.5 Gravel Mine Site access onto Highway 85. This significantly increases the volume of traffic on adjacent roadways and intersections by causing a much longer travel route and increased vehicle miles traveled as shown in Figure 3.

- WCR 8.5 runs southeast from the property past two (2) private farmhouses where it intersects with Denver Ave. WCR 8.5 is currently used for local passenger vehicle access to the properties south and west of the Site and is an unpaved single lane road. The WCR 8.5 Gravel Mine Site is proposed to generate 200 semi-truck trips per day which will require construction of an additional lane and shoulder. These trucks would travel in very close proximity to existing homes on either side of the roadway as shown in the attached Figures.

- Denver Ave is designated as an Arterial roadway by the City of Fort Lupton (Ft. Lupton). According to Ft. Lupton's Design Standards for Public Improvements (2024), access to arterials is only permitted when the property has no other "reasonable" access to the general street system. Per Ft. Lupton, trucks are required to go southbound at WCR 8.5 and Denver Ave. Additionally, Fort Lupton's Design Standards require that access to arterials be limited to one-half mile intervals. There are currently five (5) existing southern access locations within one-half mile south of the intersection of WCR 8.5 and Denver Ave, the closest one being 350 feet to the south. It is our experience auxiliary lanes will be required on Denver Ave as a result of the increased truck traffic generated by the Site and these lanes would conflict with the five (5) adjacent southern access locations as shown on the attached Figures.

It is our opinion that the Site's RA and the required improvements represent the only reasonable, available, and the least intrusive construction option accessible to the public, for the following reasons.

- As shown on Figure 3, the nearest access on Highway 85 from the proposed Site access is a RA approximately 2,250 feet to the north which allows for the construction of the required auxiliary lane improvements without encroaching on neighboring access locations. Access directly to Highway 85 would route Site truck traffic away from existing homes on CR 8.5 and Denver Ave. This would provide reasonable access to the roadway system rather than access to Fort Lupton's arterial roadway. A preliminary geometric RIRO access design has been performed by Civil Resources (CR) and the required acceleration and deceleration lanes will fit into the existing ROW and will not encumber adjacent access points. Movements into and out of this proposed US-85 right-in/right-out access are anticipated to operate very well and safely with the auxiliary lanes constructed.

- The ACP has a provision under the RA access designation that "if access to the local road system is not possible, a RIRO will be allowed with deceleration and acceleration lanes per ACP Appendix A-3. The SHAC states that for category E-X roadways, *"No access to private property may be permitted unless reasonable access cannot be obtained from the general road system."* (SHAC page 35). Since both the ACP and the SHAC allow for direct access after a land use change if there is no "reasonable" alternative, it is our opinion that the proposed RIRO site access is the best design option for the future use of the WCR 8.5 Gravel Mine Site access onto US-85.

Conclusion

Due to information presented and the attached Figures, it is our opinion that the WCR 8.5 to Denver Ave route is not a "reasonable" or "available" access for gravel trucks to enter the roadway system and the Site RA and required improvements is best suited for access to the roadway system.

Please schedule the US-85 Access Denial for an administrative hearing to discuss this issue with the Transportation Commission of Colorado. Let me know if you have any questions or if any additional information is needed. Thank you for your thorough review.

Sincerely,

CIVIL RESOURCES, LLC

Andy Rodriguez P.E.

Attachments: Figures

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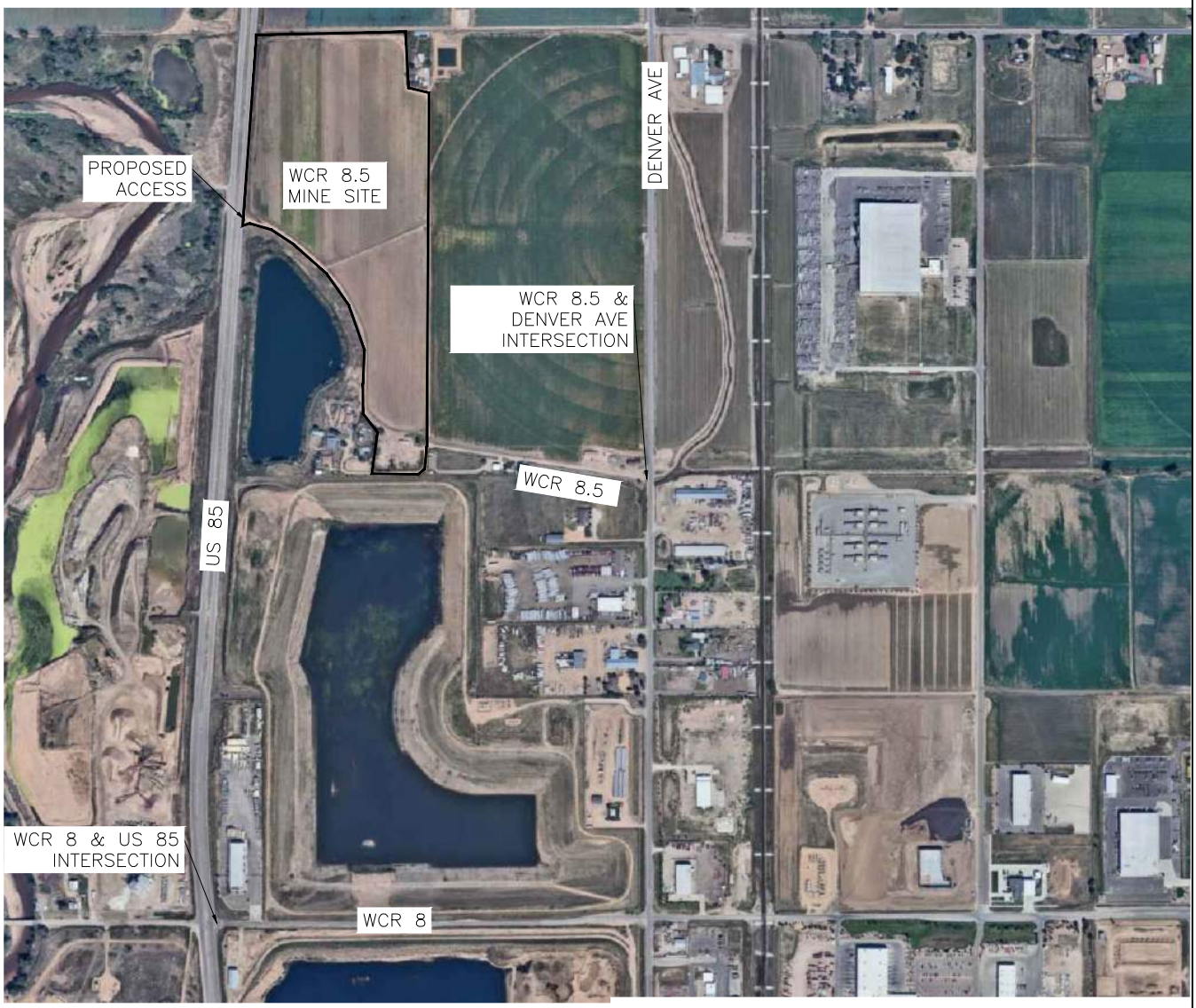

NORTH

CIVIL RESOURCES, LLC	WCR 8.5 GRAVEL MINE
DATE: 10/2025 / FIGURE: 1	GENERAL LOCATION MAP

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NORTH

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CIVIL RESOURCES, LLC		WCR 8.5 GRAVEL MINE
DATE: 1/2026	FIGURE: 2	GENERAL LOCATION MAP ACCESS

CIVIL RESOURCES, LLC	WCR 8.5 GRAVEL MINE
DATE: 1/2026 / FIGURE: 3	SITE ACCESS OPTIONS

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WCR 8.5
LOOKING WEST

DENVER AVE @
WCR 8.5
LOOKING SOUTH

DENVER AVE @
WCR 8.5
LOOKING SOUTH

DENVER AVE @
WCR 8.5
LOOKING NORTH

CIVIL RESOURCES, LLC	WCR 8.5 GRAVEL MINE
DATE: 1/2026 / FIGURE: 4	SITE PHOTOS

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US 85 LOOKING
WEST @ RA

US 85 LOOKING
SOUTHWEST @ RA

US 85 LOOKING
NORTH @ RA

US 85 LOOKING
SOUTHWEST @ RA

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CIVIL RESOURCES, LLC		WCR 8.5 GRAVEL MINE
DATE: 1/2026	FIGURE: 5	SITE PHOTOS

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: The Transportation Commission

From: Jeff Sudmeier, Chief Financial Officer
Bethany Nicholas, Deputy Chief Financial Officer

Date: March 19, 2026

Subject: March Budget Supplement

10 Year Plan Transfers and Project Budget Increase Request

Region 2

Additional funding is required to re-advertise the Ten Year Plan project CO 71 Ordway Intersection Improvements at County Road G and CO 96 due to the project's location and construction duration. Region 2 requests to use $1.2 million in project savings from the US 350A Overlay MP 46-63 Otero County project to re-advertise and fully fund construction of the intersection improvements project.This request requires Transportation Commission approval both as a Ten Year Plan funding transfer and as a project budget increase, as the proposed transfer would result in an approximate 34 percent increase to the existing project budget. Please see attached memo #1 for additional details.

Region 2 requests approval to reallocate $1.5 million in unused funding from four Ten Year Plan Projects to the La Junta Multimodal Transit Center (Plan ID #1285), a high-priority project ready to advance to construction. The reallocation ensures timely use of funds and supports critical local and regional transit and passenger rail needs in La Junta. Please see the attached memo #2 for additional details.

Region 2 requests the reallocation of unused funding from three Ten Year Plan projects to the South Central Storage and Maintenance Facility in Trinidad (Plan ID #1270). The $2.5 million reallocation will help advance construction of a transit vehicle storage and maintenance facility serving both SCCOG Transit and CDOT Bustang Outrider. Please see the attached memo #3 for additional details.

Summary of Region 2 10 Year Plan Funding Changes:

Funding Change	10 Year Plan Project	Plan ID
-$1,224,654	US350A Overlay MP 46-63, Otero CO Rural Paving	6267
-$400,000	Expanded Regional Transit Service in Kiowa County	1047
-$400,000	Baca County Bus Facility	1048
-$500,000	Regional Transit Service between Campo and Lamar	1049
-$200,000	City of La Junta Bus Barn Rehabilitation	1288

-$1,400,000	Expanded Regional Transit Service between Walsenburg – La Veta – Gardner – Cuchara	1038
-$500,000	Kim Transit Garage	1044
-$600,000	Expanded Regional Transit Service for Branson, Kim, and Baca County	1045
+$1,224,654	I-CO71 Ordway Intersection Improvements County Road G and CO96	1625
+$1,500,000	La Junta Multimodal Transit Center	1285
+$2,500,000	South Central Storage and Maintenance Facility (Trinidad)	1270

Balances of TC Funds are as follows:

Transportation Commission Contingency Reserve Fund Reconciliation

Date	Transaction Description	Amount	Balance
July-25	Balance 1S25		$35,029,753
August-25	Balance 2S25		$35,029,753
September-25	Balance 2S25		$35,188,319
October-25	Balance 3S25		$36,442,757
November-25	Balance 4S25		$31,487,915
December-25	Balance 5S25		$31,487,915
January-26	Balance 5S26		$31,487,915
	Proj Savings: R5: SH141 Bridge Repair, R5 SH17 Culvert	$3,700,205	
February-26	Balance 5S26		$35,188,120

Cost Escalation Fund Reconciliation

Date	Transaction Description	Amount	Balance
July-25	Balance 1S25		$1,811,571
August-25	Balance 2S25		$3,997,457
September-25	Balance 2S25		$3,997,457
October-25	Balance 3S25		$4,090,752
November-25	Balance 4S25		$4,090,752
December-25	Balance 5S25		$4,090,752
January-26	Balance 5S26		$3,181,767
January-26	R1 I-25 South County Line Ramp Resurfacing	-$1,828,807	
February-26	Balance 5S26		$1,352,960

Transportation Commission Program Reserve Fund Reconciliation

Date	Transaction Description	Amount	Balance
July-25	Balance 1S25		$56,915,262
August-25	Balance 2S25		$56,915,262
September-25	Balance 2S25		$147,101,951
October-25	Balance 3S25		$144,753,872
November-25	Balance 4S25		$145,753,872
December-25	Balance 5S25		$48,450,185
January-26	Balance 5S26		$48,450,185
February-26	Balance 5S26		$49,826,329
	KOA Hail Damage Loan Reimbursement	$537,192	
March-26	Pending Balance 6S26		$50,363,521

Transportation Commission Maintenance Reserve Fund Reconciliation

Date	Transaction Description	Amount	Balance
June-25	Balance 12S25		$3,719,556
	FY26 Allocation		$12,000,000
July-25	Balance 1S25		$15,719,556
August-25	Balance 2S25		$15,719,556
September-25	Balance 2S25		$12,000,000
October-25	Balance 3S25		$12,000,000
November-25	Balance 4S25		$12,000,000
December-25	Balance 5S25		$26,200,000
January-26	Balance 5S26		$24,711,218
February-26	Balance 5S26		$22,493,941
	Jan. Special Pay Distribution #3	-$2,317,375	
March-26	Pending Balance 6S26		$20,176,566

COLORADO
Department of Transportation

Memo

To: Transportation Commission
From: Shane Ferguson, Region 2 Transportation Director
Date: March 19th, 2026

Subject: Region 2 10 Year Plan Changes

Purpose

To request the Transportation Commission's (TC) approval of the March Budget Supplement for the reallocation of 10-year plan funding from bid savings from the US350A Overlay MP 46-63, Otero County (ID 2627, Project Code 24703) to the CO71 Ordway Intersection Improvements County Road G and CO96 (ID 1625, Project Code 25539). This transfer is needed to fully fund the construction phase for the intersection improvement project.

Action

Approval of the proposed March Budget Supplement to move $1,224,654 to Plan ID 1625, I-CO71 Ordway Intersection Improvements County Road G and CO96 from the following:

- $1,224,654 from Plan ID 2627, US350A Overlay MP 46-63, Otero County rural paving

The identified funding is needed to fully fund the construction phase of the project and re-advertise for construction this season.

Background

The intersection improvement project advertised in January and let February 19th. Three competitive bids were received however they were all significantly over the Engineers Estimate (EE). The Region rejected the bids and is revising the scope and requesting additional funds based on the questions from contractors and bid item costs. The location of the project and duration of the work are likely reasons the costs were higher than estimated.

The rural paving project let last November. The project was awarded under budget resulting in $1,224,654 of bid savings. Both the intersection improvement and the rural paving project are within the South East (SE) TPR boundaries. The residual 10-year funds from the US350A rural paving project will provide the Region the funds needed to re-advertise the project.

Recommendation

Staff recommend approval of the transfer between 10-Year Plan Projects as detailed above. Transferring the funds will allow the CO71 Ordway Intersection Improvements project to be fully funded for re-advertisement for construction and will allow the funding to stay in the SE TPR boundaries.

Next Steps

If approved, Region 2 will complete the 10-Year Plan funding request, update the STIP, and begin the budget action request process to fund the construction phase of the CO71 Ordway Intersection Improvements project.

COLORADO
Department of Transportation

Memorandum

To: Colorado Transportation Commission

From: Shane Ferguson, P.E., Region 2 Transportation Director

Date: March 19th, 2026

Subject: Region 2 Ten Year Plan Strategic Funding Project Savings Reallocation Request: La Junta Multimodal Transit Center (Plan ID # 1285)

Purpose

Periodically, modifications to projects in the Ten Year Plan are necessary. Since the Transportation Commission (TC) is responsible for approving the initial plan, any subsequent changes must also be submitted to the TC for approval.

Therefore, Region 2 seeks the TC's approval of the March Budget Supplement to reallocate existing Region 2 Ten Year Plan dollars to an existing Ten Year Plan project.

Background

Region 2 staff continue to work closely with the members of the Southeast Transportation Planning Region (SETPR) to ensure regional funding is allocated to the TPR's highest priority projects.

In 2018 - 2019, during the development of the original Ten Year Plan, the following projects were allocated strategic funding:

- Expanded Regional Transit Service in Kiowa County (Plan ID# 1047) with $400,000 in Fiscal Years (FY) 2023 to FY 2026 strategic funds
- Baca County Bus Facility (Plan ID# 1048) with $400,000 in FY 2023 to FY 2026 strategic funds

- New Regional Transit Service between Campo and Lamar; Expanded Baca County Demand Response Services (Plan ID# 1049) with $500,000 in Fiscal Years (FY) 2023 to FY 2026 strategic funds
- City of La Junta Bus Barn Rehabilitation (Plan ID # 1288) with $200,000 in Fiscal Years (FY) 2023 to FY 2026 strategic funds

Region 2 respectfully requests the reallocation of $1,500,000 in unused strategic funds—comprising $1,500,000 in original project funds to the La Junta Multimodal Transit Center (Plan ID # 1285), an existing project in the Ten Year Plan. These strategic funds have been unused since the Ten Year Plan's adoption by the TC in 2020. This reallocation is requested to ensure timely and appropriate use of the funds and will help advance this high-priority SETPR project to the construction phase. This request is for the following reasons:

- The La Junta Multimodal Transit Center project is listed on the SETPR 2045 and 2050 Regional Transportation Plans Priority Lists of Projects
- This project addresses local and regional transit needs and this additional funding will make this project whole
- This project is the design and construction of a new multimodal transit center and passenger rail station in La Junta at Santa Fe, San Juan, and 1st Street

Action

The Transportation Commission approves the reallocation of $1,500,000 of Ten Year Plan FY 2019 - FY 2026 Strategic Funding from the above existing projects' allocations to an existing FY 2027+ Ten Year Plan Project, the La Junta Multimodal Transit Center (Plan ID # 1285).

Recommendation

Region 2 recommends approving the reallocation of FY 2019 - FY 2026 Ten Year Plan Strategic Funding as detailed above.

Next Steps

If approved, the Region 2 Business Office will work with the Office of Financial Management and Budget (OFMB) to adjust the funding for the project.

COLORADO
Department of Transportation

Memorandum

To: Colorado Transportation Commission

From: Shane Ferguson, P.E., Region 2 Transportation Director

Date: March 19th, 2026

Subject: Region 2 Ten Year Plan Strategic Funding Project Savings Reallocation Request: South Central Storage and Maintenance Facility (Plan ID # 1270)

Purpose

Periodically, modifications to projects in the Ten Year Plan are necessary. Since the Transportation Commission (TC) is responsible for approving the initial plan, any subsequent changes must also be submitted to the TC for approval.

Therefore, Region 2 seeks the TC's approval of the March Budget Supplement to reallocate existing Region 2 Ten Year Plan dollars to an existing Ten Year Plan project.

Background

Region 2 staff continue to work closely with the members of the South Central Transportation Planning Region (SCTPR) to ensure regional funding is allocated to the TPR's highest priority projects.

In 2018 - 2019, during the development of the original Ten Year Plan, the following projects were allocated strategic funding:

- Expanded Regional Transit Service between Walsenburg - La Veta - Gardner - Cuchara (Plan ID # 1038) with $1,400,000 in Fiscal Years (FY) 2023 to FY 2026 strategic funds
- Kim Transit Garage (Plan ID # 1044) with $500,000 in FY 2023 to FY 2026 strategic funds

- Expanded Regional Transit Service for Branson, Kim, and Baca County (Plan ID # 1045) with $600,000 in FY 2023 to FY 2026 strategic funds

Since the original Ten Year Plan was adopted by the TC in 2020, these strategic funding resources remained unused through 2025. In order to ensure timely and appropriate use of these strategic funds, the funding is requested to be reallocated to the South Central Storage and Maintenance Facility Ten Year Plan project. This addition of strategic funds will help advance this project to construction.

Region 2 respectfully requests to reallocate the above project funds ($2,500,000) in strategic funding to the existing Ten Year Plan project South Central Storage and Maintenance Facility (Plan ID # 1270), bringing the total allocation to $2,500,000 This request is for the following reasons:

- This project is on the SC TPR 2050 Regional Transportation Plan Priority List of Projects
- This project addresses local and regional transit needs and this additional funding will make this project whole
- The design and construction of a new public transit vehicle storage and maintenance facility in Trinidad will serve both SCCOG Transit and the CDOT Bustang Outrider service

Action

The Transportation Commission approves the reallocation of $2,500,000 of existing Ten Year Plan Strategic Funding (FY 2019 - FY 2026) from the above project funds to another existing Ten Year Plan Project, the South Central Storage and Maintenance Facility in Trinidad (Plan ID # 1270).

Recommendation

Region 2 recommends approving the reallocation of existing FY 2019 - FY 2026 Ten Year Plan Strategic Funding as detailed above.

Next Steps

If approved, the Region 2 Business Office will work with the Office of Financial Management and Budget (OFMB) to adjust the funding for the project.

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Transportation Commission.

From: Darius Pakbas, Director, Division of Transportation Development
Christopher Laplante, Manager, Air and Climate Section
Libba Rollins, GHG Program Manager
Taylor Bartlett, GHG Program Specialist

Date: March 19, 2026

Subject: CDOT's FY 2027-2036 10-Year Plan Compliance with GHG Transportation Planning Standard, 2 CCR 601-222.

Purpose

This memo provides an overview of the compliance strategy for CDOT to meet the GHG Transportation Planning Standard ("the Standard").

Action

Approval of CDOT's 2026 GHG Transportation Report via Resolution as outlined per 8.05.1 in the Standard, "If the Commission determines the requirements of Rule 8.02.6 have been met, the Commission shall, by resolution, accept the GHG Transportation Report.".

Background

Per 2 CCR 601-22, CDOT's updated 10-Year Plan must comply with the Standard's GHG emission reduction levels in Table 1 for the 2030, 2040, and 2050 analysis years for the non-MPO areas of the state. CDOT is no longer required to conduct an emissions analysis for the 2025 compliance year per Section 8.02.1 of the Standard since that year is now in the past.

At the January 2026 TC meeting, CDOT presented the results of the 2026 GHG Transportation Report for the forthcoming FY 2027-2036 10-Year Plan, demonstrating compliance with the GHG Transportation Planning Standard (the Standard). This determination is made by modeling the new 10-Year Plan using CDOT's travel demand model and EPA's MOVES model, and comparing those results to the "baseline" plan,

CDOT's 2020 10-year Plan. The results of this modeling show that CDOT meets the GHG reduction levels from Table 1 in the Standard in 2030 and 2050, but requires a Mitigation Action Plan (MAP) in 2040. CDOT's MAP, included as an appendix in the 2026 GHG Transportation Report, describes in detail the mitigation measures used to achieve compliance. As required by 8.04.1 of the Standard, CDOT received written verification from APCD on the technical data used to develop the GHG Transportation Report, as seen in Attachment C.

CDOT has also met the following requirements set forth by the Standard:

- 30 days prior to the adoption/amendment of any applicable planning document, CDOT must submit a GHG Transportation Report to the Transportation Commission. Staff brought the 2026 GHG Transportation Report to the Transportation Commission Workshop in January for review.
- Submitted technical details of the GHG Report to CDPHE's Air Pollution Control Division (APCD) 45 days before adoption of a new plan (December 15, 2025) for their review. Received written verification from APCD, see Attachment C.

Next Steps

TC will vote on acceptance by resolution of the GHG Transportation Report at the March meeting. CDOT will provide a written status report to the Commission for each GHG Mitigation Measure identified in the MAP on an annual basis, by April 1.

Attachments

B - CDOT 2026 GHG Transportation Report

C- APCD Letter of Verification

Proposed Resolution #10

COLORADO
Department of Transportation

Greenhouse Gas Transportation Report

Associated with the
CDOT FY2027-2036 10-Year Plan
March 2026

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Acronyms and Abbreviations

Greenhouse Gases (GHGs)

CO_2	carbon dioxide
CH_4	methane
N_2O	nitrous oxide

Other Abbreviations

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway & Transportation Officials
ABM	Activity-based model
ACTS	AASHTO Census Transportation Solutions
ADA	Americans with Disabilities Act
ADU	Accessory Dwelling Unit
APCD	Air Pollution Control Division
AT	Active Transportation
ATP	Active Transportation Plan
ATR	Automated Traffic Recorderer
AVFT	Alternative Vehicles Fuels and Technologies
BEV	Battery-Electric Vehicle
BMP	Beneficiary Mitigation Plan
BRT	Bus Rapid Transit
CAFE	Corporate Average Fuel Economy Standards
CB	Crested Butte
CCR	Code of Colorado Regulations
CDLE	Colorado Department of Labor and Employment
CDOT	Colorado Department of Transportation
CEO	Colorado Energy Office
CFI	Charging and Fueling Infrastructure
CNG	Compressed Natural Gas
CO_2e	CO_2 Equivalent
CO	Carbon monoxide
CO XX	Colorado State Highway (where XX is the highway number)
COA	Comprehensive Operational Analysis
COG	Council of Governments
COVID-19	Coronavirus Disease 2019
CR	County Road
CRS	Colorado Revised Statutes
CSU	Colorado State University
CTE	Clean Transit Enterprise

CTIO	Colorado Transportation Investment Office
CTPP	Census Transportation Planning Package
DAF	Division of Accounting and Financing
DEN	Denver International Airport
DI	Disproportionately Impacted
DOLA	Colorado Department of Local Affairs
DRCOG	Denver Regional Council of Governments
DRO	Durango-La Plata County Airport
DTR	Division of Transit and Rail
DUS	Denver Union Station
E85	Gasoline mixture with 85 percent ethanol
EPA	Environmental Protection Agency
EV	Electric Vehicle
FASTER	Funding Advancements Surface Transportation Economic Recovery Act
FREX	Front Range Express
FHWA	Federal Highway Administration
FRPR	Front Range Passenger Rail
FSM	FASTER Safety Mitigation
FTA	Federal Transit Administration
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Geographic information system
GJT	Grand Junction Regional Airport
GUI	Graphical user interface
GVMPO	Grand Valley Metropolitan Planning Organization
HB	House Bill
HD	Heavy Duty (vehicle)
HPMS	Highway Performance Monitoring System
HSIP	Highway Safety Improvement Program
I-XX	Interstate Highway (where XX is the route number)
IACT	Interagency Consultation Team
IIJA	Infrastructure, Investment and Jobs Act
I/M	Inspection and Maintenance
MAP	Mitigation Action Plan
MD	Medium Duty (vehicle)
MMOF	Multimodal Transportation and Mitigation Options Fund
MMT	Million Metric Tons
MOD	Montrose, Olathe, Delta
MOVES	Motor Vehicle Emission Simulator (EPA)
MP	Mile Point

MPH	Miles per hour
MPO	Metropolitan Planning Organization
MS	Microsoft
MT	Metric Tons
MTJ	Montrose Regional Airport
NAAPME	Nonattainment Area Air Pollution Mitigation Enterprise
NECALG	Northeast Colorado Association of Local Governments
NEI	National Emissions Inventory
NFRMPO	North Front Range Metropolitan Planning Organization
NOx	Nitrous Oxide
OMEGA	Optimization Model for reducing Emissions of Greenhouse gases from Automobiles
OTIS	CDOT's Online Transportation Information System
PACOG	Pueblo Area Council of Governments
P&R	Park and Ride (or PnR for RTD lots)
PD	Policy Directive
PHEV	Plug-in/Hybrid Electric Vehicle
PM	Particulate Matter
PMT	Person (or Passenger) Miles Traveled
PPACG	Pikes Peak Area Council of Governments
QCEW	Quarterly Census of Employment and Wages
RFTA	Roaring Fork Transportation Authority
RIRO	Right-in-right-out (limited-movement side street access)
RMS	Revitalizing Main Streets
RRT	Road Runner Transit
RT/d	Round trips per day
RTA	Regional Transportation Authority
RTD	Regional Transportation District
RTP	Regional Transportation Plan
SACSIM	Sacramento Activity-Based Travel Simulation Model
SB	Senate Bill
SIP	State Implementation Plan
SMART	San Miguel Authority for Regional Transportation
SMCG	Statewide Model Coordination Group
SO_2	Sulfur Dioxide
SoCoCAA	Southern Colorado Community Action Agency
SST	Steamboat Springs Transit
STIP	State Transportation Improvement Program
SU	Single unit
SUV	Sport Utility Vehicle

SWP	Statewide Transportation Plan
TAP	Transportation Alternatives Program
TC	Transportation Commission
TCS	Transit Connections Study
TOD	Transit-Oriented Development
TPR	Transportation Planning Regions
US XX	United States Highway (where XX is the highway number)
VHD	Vehicle hours of delay
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound(s)
VRH	Vehicle Revenue Hours
VRM	Vehicle Revenue Miles
VRU	Vulnerable Road Users
ZEV	Zero Emissions Vehicle

Executive Summary

This GHG Transportation Report developed by the Colorado Department of Transportation (CDOT) presents the planning strategies employed by staff and agency partners to develop the updated fiscal year (FY) 2027-2036 CDOT 10-Year Plan. CDOT's updated 10-Year Plan and associated GHG Mitigation Action Plan (MAP) comply with the Colorado GHG Pollution Reduction Planning Standard (the Standard), contained in Code of Colorado Regulations (CCR), 2 CCR 601-22, Section 8[1]. The Standard requires CDOT and the state's five metropolitan planning organizations (MPOs) to determine total GHG emissions expected from planned future transportation projects and reduce GHG emissions by set amounts from their baseline plan. Specifically, the Standard applies when CDOT adopts an updated 10-Year Plan[2], and more specifically to:

- Regionally Significant[3] projects included in the plan; and
- Projects located outside the boundaries of the state's five MPO areas.

This GHG Transportation Report details CDOT's approach to comply with the GHG reduction levels established in the Standard. CDOT employed a combination of modeling proposed future infrastructure projects and GHG mitigation measures, as allowed by 2 CCR 601-22, Section 8.02.4, to demonstrate compliance with GHG reduction requirements. Table 1 below summarizes results of these strategies across each compliance year. Of particular note, CDOT is no longer required to conduct an emissions analysis for the 2025 compliance year per Section 8.02.1 of the Standard since that year is now in the past.

CDOT did not add any new regionally significant projects in non-MPO areas as part of this updated plan. Based on updated modeling CDOT is able to meet the required GHG emission reduction level in compliance years 2030 and 2050 through modeling alone. For compliance year 2040 CDOT additionally relies on a GHG MAP to achieve compliance. CDOT will employ a variety of GHG Mitigation Measures established in Policy Directive (PD) 1610 "Greenhouse Gas Mitigation Measures" including land use,

[1] 8.02.6 "Demonstrating Compliance. At least thirty (30) days prior to adoption or amendment of any Applicable Planning Document except amendments to MPO TIPs, CDOT for Non- MPO areas, and the MPOs for their areas shall provide to the Commission a GHG Transportation Report containing the following information…"

[2] The CDOT 10-Year Plan is an Applicable Planning Document as defined in the Standard in Section 1.02.

[3] Regionally Significant projects are projects that result in a fundamental change to the way people travel (for example, new highway lanes). This distinction, consistent with legislative direction, creates an important differentiation between those projects that materially alter how the infrastructure will be used or its impact on a community, versus those changes that are strictly asset management. CDOT developed a guidance memo detailing the process for evaluating projects to determine whether they are Regionally Significant.

transit, traffic operations, and Medium/Heavy duty electrification strategies further detailed in Appendix A. CDOT's GHG MAP goes above and beyond what is otherwise required by the Standard (i.e. Voluntary Mitigations) given that CDOT has already made progress on a number of these strategies and remains committed to reducing emissions. Additionally, this approach will also offer additional assurance that if progress on one measure is slow, other measures may fill the gap. Progress on the GHG MAP will be reported annually to the Transportation Commission (TC) as required by the Standard.

Table 1. GHG Reduction Results and Compliance

Compliance Year	**2030** (MMT[4])	**2040** (MMT)	**2050** (MMT)
GHG Reductions Achieved through Modeling[5]	0.391	0.254	0.188
Required GHG Reductions Achieved through Mitigations	-	0.046	-
Voluntary GHG Reductions Achieved through Mitigations	0.038	0.002	0.031
Total GHG Reductions Achieved	0.429	0.302	0.219
2 CCR 601-22 Table 1 Required GHG Reduction Amount	0.360	0.300	0.170
Compliance Achieved?	Yes	Yes	Yes

[4] MMT = Million Metric Tons

[5] These values represent the net reduction in MMT of GHG emissions between the Baseline 10-Year plan modeling (Table 4) and the updated 2027-2036 10-Year plan modeling (Table 6).

Introduction

Purpose

CDOT developed this Greenhouse Gas (GHG) Transportation Report to meet requirements of Colorado's GHG Transportation Planning Standard (2 CCR 601-22) (the Standard) as the Transportation Commission (TC) takes action to adopt an updated CDOT 10-Year Plan for fiscal years 2027 through 2036. The Standard requires CDOT and the state's five metropolitan planning organizations (MPOs) determine the total GHG emissions expected from the existing transportation network and future planned Regionally Significant transportation projects and reduce emissions by set amounts. This GHG Transportation Report details CDOT's compliance with the GHG reduction levels established in the Standard.

The planning and project selection outcomes, emissions modeling analysis, and GHG mitigation measures collectively demonstrate that CDOT will meet the required GHG reduction levels for all future compliance years through this updated plan. CDOT relies on a number of GHG Mitigation Measures established in the TC's Policy Directive (PD) 1610 "GHG Mitigation Measures" to demonstrate compliance including transit, traffic operations, Medium Duty (MD)/Heavy Duty (HD) electrification, and land use strategies.

This demonstration is based on modeling analysis conducted using CDOT's Travel Demand Model, and the Environmental Protection Agency's (EPA's) Motor Vehicle Emission Simulator (MOVES) air quality model. GHG emissions reduction strategies (i.e mitigation measures) that could not be effectively modeled were calculated off model using methodologies defined by PD 1610, documented in the Mitigation Action Plan (MAP) in Appendix A.

Background

The TC's adoption of CDOT's updated 10-Year Plan for fiscal years 2027-2036 is an action which requires CDOT to demonstrate compliance with the GHG emissions reduction requirements of the Standard (2 CCR 601-22, Section 8.02.1), as the 10-Year Plan is an applicable planning document (2 CCR 601-22, Section 1.02). The Standard requires CDOT to model the existing transportation network and, at a minimum, all planned Regionally Significant projects contained in the updated 10-Year Plan to demonstrate compliance with the CDOT/Non-MPO GHG reduction levels contained in 2 CCR 601-22, Section 8.01.2, Table 1. For CDOT, emissions reduction requirements apply outside the boundaries of the state's five MPOs. The emissions reduction levels required by the Standard are summarized in Table 2 below. The TC is adopting CDOT's

updated plan in 2026. As such, CDOT is no longer required to conduct an emissions analysis for the 2025 compliance year per Section 8.02.1 of the Standard since that year is now in the past. Notably, CDOT modeled compliance with the 2025 emission reduction level in the 2022 GHG Transportation Report accepted by the TC.

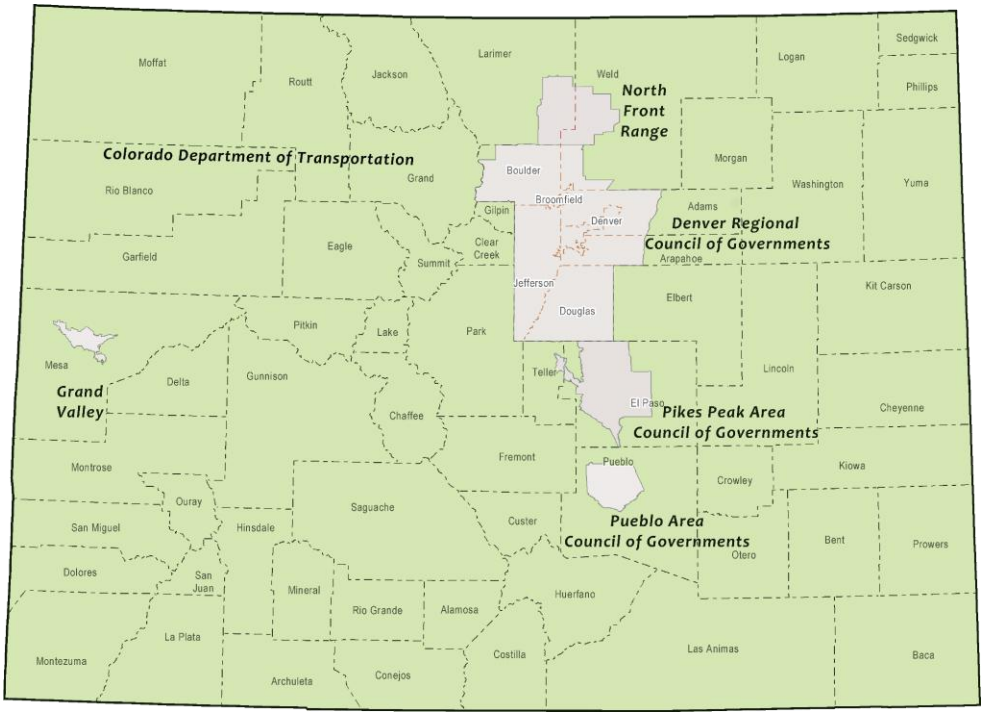
Table 2. GHG Transportation Planning Reduction Levels in MMT of CO_2e

Regional Area	2030 Reduction Level (MMT)	2040 Reduction Level (MMT)	2050 Reduction Level (MMT)
DRCOG	0.82	0.63	0.37
NFRMPO	0.12	0.11	0.07
PPACG	0.15	0.12	0.07
GVMPO	0.02	0.02	0.01
PACOG	0.03	0.02	0.01
CDOT/Non-MPO	**0.36**	**0.30**	**0.17**
Total	1.50	1.20	0.70

Planning Compliance Area

CDOT's analysis requires modeling travel behavior and GHG emissions from existing infrastructure and planned Regionally Significant projects contained in the 10-Year Plan and located outside the boundaries of the state's five MPO areas. Figure 1 below highlights CDOT's geographic compliance area in green, which does not include the MPO areas noted in gray.

Figure 1. CDOT GHG Planning Standard Compliance Area



CDOT's Plan Development

Overview of the Planning Process

CDOT follows a performance-based, multimodal transportation planning process that is continuous, comprehensive and cooperative (3C), as required by federal and state laws. This process involves updating plans every four to five years, ensuring broad public involvement in key decisions about Colorado's transportation system. It includes setting long and short-term goals, identifying strategies, and prioritizing investments. The process results in key planning documents, such as the long-range Statewide Transportation Plan (SWP) and associated Regional Transportation Plans (RTPs), 10-Year Plan, and the Statewide Transportation Improvement Program (STIP).

The SWP is a visionary plan spanning over 20 years while the 10-Year Plan contains the strategic projects that guide the infrastructure investments and transportation improvements across the state. These two plans are designed to work in tandem but serve different purposes in terms of scope, timeline and detail. Once transportation projects are funded, they are programmed into the 4-Year STIP.

The SWP, 10-Year Plan, and STIP are discussed in more detail below:

- 2050 Statewide Transportation Plan: Visionary, Long-Term Framework

    - Purpose: The 2050 Statewide Transportation Plan provides the long-term vision for transportation in Colorado, addressing how the system should evolve by 2050 in response to changing demographics, climate, technology, and economic trends.
    - Key Features:
        - A policy and planning document rather than a specific project list.
        - Identifies broad goals, performance measures, and strategies for improving the transportation system over 20+ years.
        - Considers multimodal transportation, air quality impacts, and land use.
        - Informed by data analysis and public and significant stakeholder input
        - Incorporates themes from long-range regional transportation plans
        - Adheres to federal and state planning requirements.
        - Updated every four to five years.

- CDOT's 10-Year Plan: Focused, Action-Oriented Investment Strategy
    - Purpose: The 10-Year Plan is a short-to mid-term project list designed to guide strategic funding decisions. The initial 4-year prioritized plan in this updated 10-Year Plan is for fiscal years 2027 through 2030.
    - Key Features:
        - Developed collaboratively with significant public and local input.
        - Focuses on high-priority, "strategic" transportation projects supported by flexible state and federal funding.
        - Operates in conjunction with other CDOT funding programs to maximize the budget and achieve performance goals.
        - Includes Regionally Significant highway, transit, bike/pedestrian (ped), and safety projects.
        - Updated regularly; Quarterly reporting to show real-time funding, scope and project status updates
        - Complies with the Colorado GHG Transportation Planning Standard (2 CCR 601-22, Section 8).

- 4-Year STIP: Near-term listing of all funded projects
    - Purpose: The STIP is a near-term project list that represents all CDOT funding.
    - Key Features:
        - Very detailed: Based on short-term budgets approved by the TC, which serves as the primary source for comprehensive project funding data. This detailed information encompasses the strategic projects within the 10-Year Plan as well as those funded through

CDOT's other major program areas, such as the Asset Management Program, Surface Treatment Program, and Bridge Program.
- Adheres to federal planning requirements
- Updated annually to include a full four years of projects and be fiscally constrained based on current CDOT revenue projections.
- Developed via the "4P" process (Project Priority Programming Process) involving regions, Transportation Planning Regions (TPR), MPOs, counties, local agencies, and public input.

While CDOT's 10-Year Plan represents only a portion of CDOT's overall construction budget, it is designed to operate in conjunction with other CDOT funding programs to maximize the budget outcomes and achieve performance goals. Further details are provided in the programing and funding section of this document.

In summary, the 10-Year Plan is the action plan, turning goals into funded, shovel-ready projects. The 2050 Statewide Transportation Plan is the blueprint, a long-term vision that guides investment priorities. CDOT uses the 2050 Statewide Transportation Plan to set the "why" and "what", and the 10-Year Plan to define the "how" and "when".

Considerations for Reducing GHGs

Overview

CDOT's previous 10-Year Plan was structured around two prioritized four-year funding periods (FY 2019-2022 and FY 2023-2026). Projects in the later years (FY 2027 and beyond) were included as out-year projects but were not prioritized for funding. CDOT is emphasizing GHG reductions through the strategic direction set by new concepts introduced for both the 2050 Statewide Transportation Plan and the updated 10-Year Plan (covering fiscal years 2027–2036).Those new concepts include the following:

- Sustainably Increase Transportation Choice goal area: The TC's Policy Directive (PD) 14 "Policy Guiding Statewide Transportation Plan Goals and Performance Measures" establishes the overarching policy and objectives for the development and implementation of the long-range 2050 Statewide Transportation Plan and associated 10-Year Plan. Updated in September 2024, one of the three goal areas established in PD 14 is to Sustainably Increase Transportation Choice. This means providing alternatives to single-occupancy vehicle travel that increase choices and reduce air pollution from transportation. To meet evolving travel needs, Colorado must expand safe, convenient transportation options that go beyond personal vehicles. This means building a connected network that works across regions and modes, enabling

people to access jobs, education, and services whether they live in rural areas or urban centers. Region-specific approaches are essential, as mobility solutions must reflect local conditions. The goal is to create an inclusive system that supports daily life for all Coloradans. The associated performance measures and targets adopted in CDOT's updated PD 14 include:

    - Clean Transportation:
        - Reduce surface transportation sector GHG emissions (CO_2e) by 60% on or before 2037, compared to the 2005 baseline.
    - Statewide Transit:
        - Collaborate with stakeholders, including local partners and rail operators, to expand statewide transit services by increasing statewide revenue service miles by 66.7 million by 2037, from the 2022 baseline.
        - Achieve a 1% annual reduction in Vehicle Miles Traveled (VMT) per capita from the 2023 baseline.

- "Complete-Project" concept: This concept prioritizes both people and place and thoughtfully tailors projects like traditional roadway and safety improvement to include a wider range of elements, such as transit and active transportation infrastructure. This approach helps to enhance access and connectivity among travel modes.

- Land Use and Air Quality Linkage: While local governments in Colorado are responsible for land use decisions, CDOT engages in land use discussions to promote coordination and efficiency between land use and transportation. Land use decisions directly influence the needs and costs of Colorado's transportation infrastructure. Early involvement from CDOT in the decision-making process can help ensure that infrastructure investments align with broader state goals. Additionally, Colorado has passed a number of land-use and transportation-related pieces of legislation. Most notably House Bill (HB)24-1313, the Housing in Transit Oriented Development, which establishes transit-oriented communities and requires those communities to meet housing opportunity goals.

- Mobility Hubs: CDOT is facilitating the development of 'mobility hubs' on key corridors that emphasize connections between multimodal options while providing access to modes other than single-occupant vehicle travel in coordination with local land use.

- Enterprise Funding: CDOT partners with three self-funded transportation enterprises that directly support funding for projects that may reduce air

pollution emissions, including GHGs. The Nonattainment Air Pollution Mitigation Enterprise (NAAPME) and the Clean Transit Enterprise (CTE) collectively contribute approximately $80-144 million annually through targeted initiatives. Following the 2024 legislative session, Governor Polis signed SB24-184 "Support Surface Transportation Infrastructure Development" which creates a dedicated funding source for rail and transit through the Colorado Transportation Investment Office (CTIO) by imposing a fee on rental cars, generating approximately $50 million annually. By leveraging funding from these enterprises with traditional transportation funding, CDOT can stretch our budget further and invest more in projects that improve air quality.

In addition to the considerations outlined above, CDOT has supported the development of various additional plans to help guide our efforts to expand transit, support active transportation and encourage smart land use as discussed in further detail below. Additionally, CDOT has supported the Colorado Freight and Passenger Rail Plan and the 2050 Region Transit Plans from each of the rural transportation planning regions. Combined, these plans will support CDOT's broader efforts to reduce GHGs from transportation.

Colorado Transportation Vision 2035

In November 2024, Colorado published the Colorado Transportation Vision 2035 (Vision 2035) document. Vision 2035 is a systematic framework for expanded transportation choices that outlines goals and strategies that expand transportation options to meet Colorado's climate, affordability, safety, and equity goals. By doing so, it will advance the State's ability to increase access to, and improve the quality of, transportation options over the next ten years. Specifically, Vision 2035 focuses on the emissions that state, regional, and local policies and investments can impact by the year 2035 beyond vehicle electrification alone, mostly focused on mode shift. Mode shift is defined as being "a traveler's choice to supplement or avoid driving to also use a lower cost and more convenient transportation modes such as transit, biking, walking and carpooling." The main emissions reduction goal of Vision 2035 is additional reductions of 1.2 MMT from non-auto modes of travel. This goal is supported by the following subgoals:

- Double Colorado's non-auto mode share from 9.6% to 19.2% by 2035.
- Increase current transit service from 79 million transit revenue miles to 145 million (about 83%) by 2035.
- Increase in bicycle infrastructure statewide by 81% (3,540 miles of new bicycle routes).

- Increase in sidewalks statewide by 3.4% (1,345 miles of new sidewalks on existing streets).
- A Transit-Oriented Development goal of at least 52% of new housing units in transit oriented areas and 77% within existing Census Urban Areas.

These sub-goals utilize strategies including the expansion of transit service, implementing policies to encourage compact land use and walkable communities, reducing the number and distance of vehicle trips, and increasing travel choice by investing in bicycle and pedestrian infrastructure and micro mobility services that assist with "first and last mile" connections to transit facilities to meet the main emissions reduction goal.

Transit Connections Study

In July 2025, CDOT published the Transit Connections Study (TCS). Colorado boasts a robust public transportation system, with local and regional networks linked by a statewide network that includes intercity bus lines, Amtrak passenger rail, and CDOT's Bustang interregional bus service. Building on this foundation and anticipating Colorado's evolving transportation needs, the TCS aims to strengthen this system by creating a strategic vision for a more integrated statewide transit network that enhances mobility and connectivity across Colorado. The TCS achieves this through examining stops, stations, regional and interregional service gaps, and opportunities to better connect Colorado's transit network. This involved a review of the current public transportation services, focusing on regional characteristics, opportunities, challenges, key corridors, demographics, and travel demand patterns across these regions and corridors. The primary objective is to identify and address service gaps in Colorado's regional and interregional public transportation network. The key goals of the study include:

- Enhance Accessibility and Connectivity of Colorado's Transit Network: Connect rural and urban areas to Bustang, passenger rail, and local transit networks.
- Foster Multimodal Integration: Strengthen Colorado's statewide transit network.
- Promote Sustainability: Support modeshift and GHG reduction by increasing public transit use.

This study informs CDOT's transit planning through its identification of gaps and needs in the public transportation network including Bustang service planning, statewide transit and transportation planning, and preparation for interregional passenger rail services. Ultimately, the TCS will support CDOT's continued progress to expand transit

services, contingent upon adequate funding, which will further support CDOT's ability to comply with the Standard.

Active Transportation Plan

Throughout 2024 and 2025, CDOT engaged in a robust statewide stakeholder process to develop the draft Active Transportation Plan (ATP). The ATP establishes goals, policy recommendations and methods to guide the next generation of active transportation improvements in Colorado, completed in collaboration with local agencies, community members and other stakeholder groups. The ATP establishes a framework for consistent, defensible and equitable evaluation and prioritization of active transportation projects — a recognition that the demand for investment in active transportation exceeds available resources. The ATP both builds from and informs other statewide planning initiatives to ensure active transportation is thoroughly considered and prioritized in broader discussions around mobility, equity, safety, connectivity and sustainability. The ATP will support CDOT's goal to increase the use of active modes of transportation and mode shift from single occupancy vehicle use.

Statewide Strategic Growth Report

In 2024, the Colorado General Assembly adopted several pieces of legislation around housing, land use, water, and other related issues. One of these laws, SB24-174, directs the Colorado Department of Local Affairs (DOLA) to submit a Strategic Growth Report to the state legislature by October 31, 2025. The law states that the report must include three major elements:

1) A land use scenario analysis
2) An analysis of the impact of state policies and programs on sprawl
3) Land use policy recommendations

With this analysis, the Strategic Growth Report is intended to further a statewide conversation on the intersections between facets of built and natural environments including housing, transportation, infrastructure, water supply, air quality, wildlife risk, parks and open space, resource lands, and critical areas; and why the way we grow is important to the affordability and sustainability of Colorado. In developing the Strategic Growth Report, the law directs DOLA to consider the context of communities and consult widely with a range of stakeholders. The law also states that jurisdictions must consider the Strategic Growth Report, where applicable and appropriate, when developing a comprehensive plan. Other work related to this report will include the Vital Landscapes and Resources Report and Planning Guide, the CDOT's Policy Barriers and Opportunities study, as well as guidance on Strategic Growth Elements that provide a "Local Policy Toolkit" to support jurisdictions in this effort. In October 2025,

DOLA published the Colorado Strategic Growth Report. The Strategic Growth Report recommends that CDOT consider more collaborative corridor planning initiatives to ensure key intercity and interregional highways consider land use and the future multimodal opportunities. This report will support CDOT to achieve GHG mitigation measure land use goals in non-MPO areas of the state through encouraging greater long range planning initiatives that pair land use and transportation goals.

The confluence of strategic concepts outlined above supported CDOT's decision making process for projects included in the updated 10-Year Plan for fiscal years 2027-2036. CDOT worked with the engineering regions to prioritize complete projects which are intended to thoughtfully tailor traditional roadway and safety improvement projects to include a wider range of elements, such as transit and active transportation infrastructure.

10-Year Plan Project Mix

Working with regional and local partners, CDOT identified projects to carry forward from the previous 10-Year Plan and new projects to add to the updated 10-Year Plan that support the goals of PD 14 to sustainably increase transportation choice, advance safety, and fix our roads. The updated 10-Year Plan funding allocated during this planning cycle supports many previously planned projects and a limited number of newly planned projects.

CDOT's Compliance Area

Classifying each project by type proves challenging, as many projects encompass multiple elements which serve more than one goal. Additionally, the use of strategic funds allocated in the 10-Year Plan supports projects both in MPO and CDOT compliance areas for the Standard. Figure 2 below represents the number of projects in each region in the 10-Year Plan outside the MPO areas of the state that have either a transit or active transportation element or both. These are the projects that help to sustainably increase transportation choice in CDOT's compliance area.

Figure 2. Non-MPO Area Projects with and without Transit and/or Active Transportation (AT) Elements

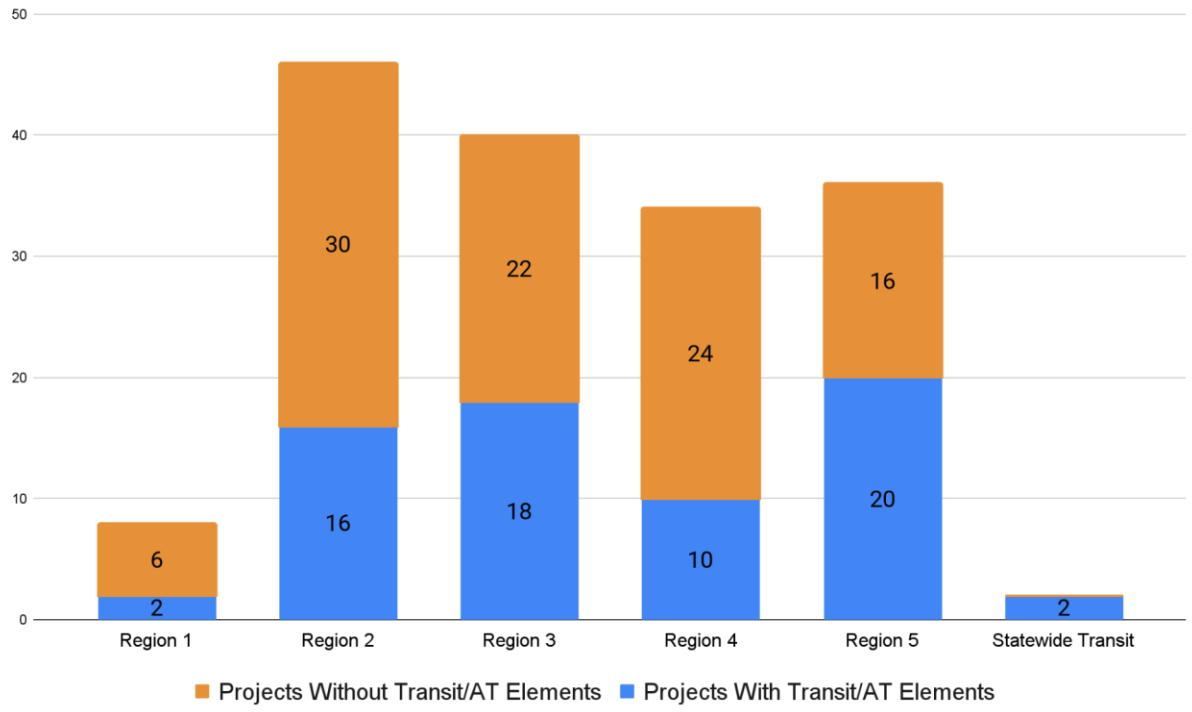
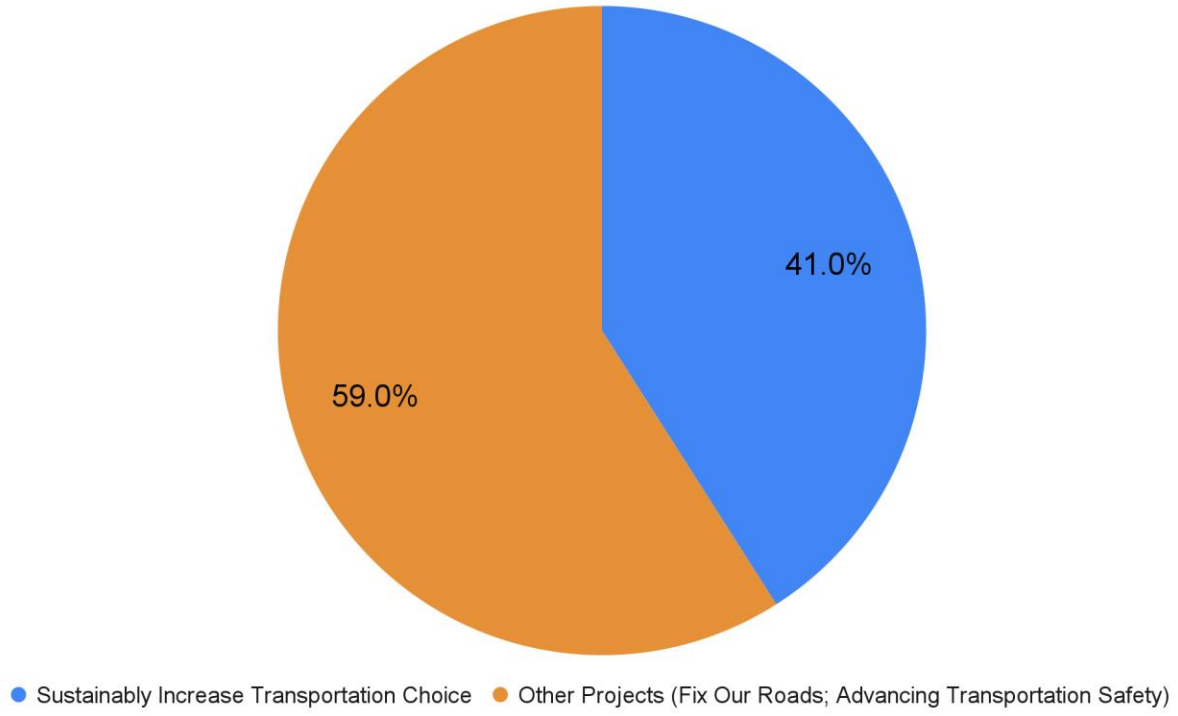


Figure 2 represents the 164 total projects in non-MPO areas (CDOT's GHG compliance area), but there are many more projects in MPO areas that strategic funding in the updated 10-Year Plan is supporting to achieve statewide GHG reduction goals. While projects located within the MPO boundaries do not count towards CDOT's compliance with Table 1 GHG reduction targets, some are highlighted in the MPO Compliance Areas section of this document that will help support meeting the state's broader MPO area GHG emission reduction targets in Table 1. Beyond the 68 projects with transit/AT elements, there are five projects within non-MPO areas that are Regionally Significant (all of which were contained in CDOT's previous 10-year plan) and 98 projects that are focused on improving safety and asset management that have neutral impact on GHGs.

The pie chart in Figure 3 below categorizes 10-Year Plan projects by Policy Directive 14 goal area. Projects within the "Sustainably Increase Transportation Choice" goal area directly contribute to improving air quality and reducing GHG emissions in Colorado. Approximately 41% of projects in non-MPO areas statewide include a bicycle, pedestrian, or transit element. This represents 68 out of 164 total projects.

Figure 3. Non-MPO Projects Supporting the Goal to Sustainably Increase Transportation Choice



The Standard requires CDOT to model, at a minimum, Regionally Significant projects in the 10-Year Plan outside of MPO areas. The updated 10-Year Plan does not add any new Regionally Significant projects outside of MPO areas that were not otherwise included in the previous version of CDOT's 10-Year Plan for FY19-FY28. These projects include the I-70 West Floyd Hill and I-70 climbing lane from Bakerville to Eisenhower Tunnel projects in Region 1, I-70 West Vail Pass Safety and Operational Improvements Region 3, and the US 160 Elmore's Corner East project in Region 5. Additionally, CDOT modeled the US 40 Fraser Safety Improvements project in Region 3 under a conservative presumption that it will be regionally significant even though the project scope is yet to be fully determined.

There are several notable projects within CDOT's GHG compliance area included in this update to the 10-Year Plan which are worth highlighting that will help reduce GHG emissions, including Mountain Rail, Bustang, local transit projects, and active transportation projects, described in further detail below.

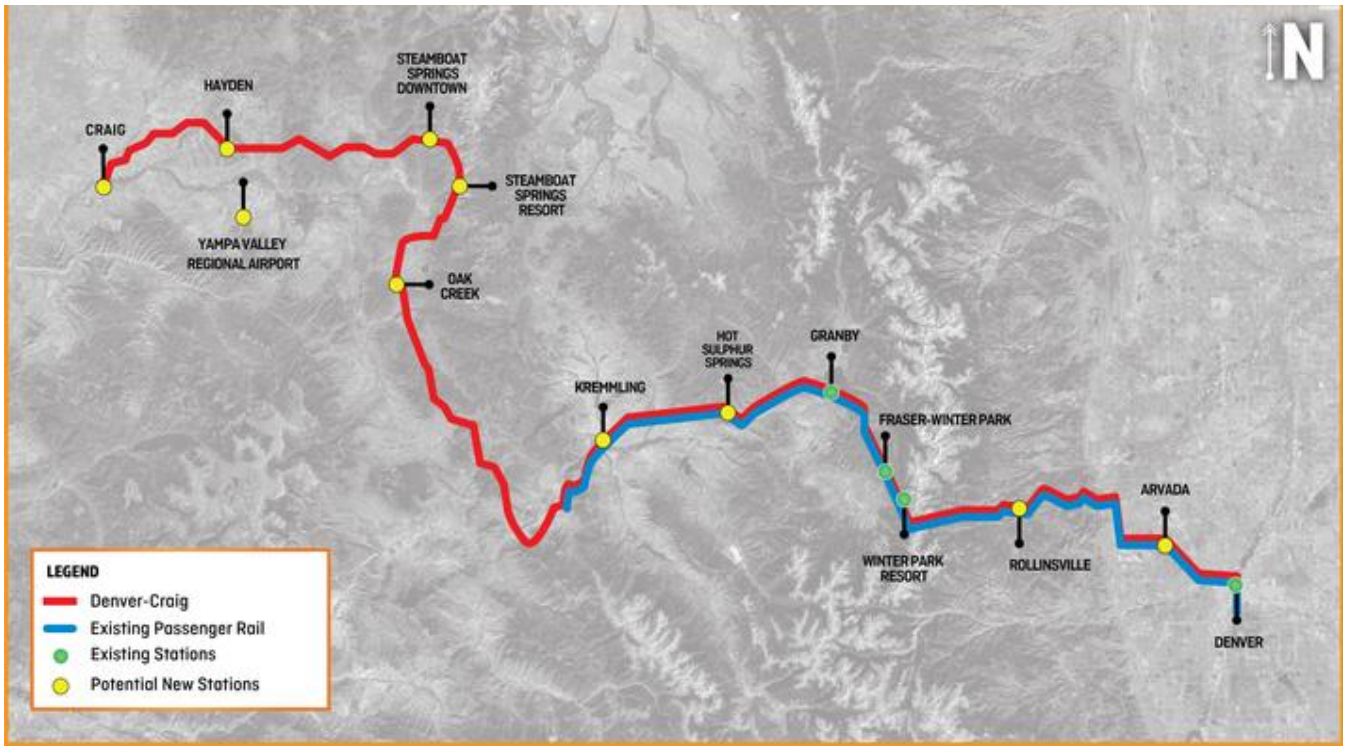
Mountain Rail

Given the popularity of travel in the mountains and challenging geographical conditions, it is critical to provide reliable transportation alternatives to create better

connectivity to mountain towns, recreational opportunities, and transitional communities. A shift in the rail industry, with declining coal traffic, has opened opportunities to repurpose rail corridors for passenger use. Included in the 10-Year Plan for the first time, the plan for Mountain Rail involves developing a network of passenger rail lines that connect the mountain towns and regions with urban centers and recreational locations from Denver to Craig (see Figure 4). At the time of the development of this report, the specific station locations along the new route are still under consideration. As a part of this ongoing study, community feedback is crucial in shaping the final decisions. This input will be integrated with engineering requirements and design constraints to ensure the selected station locations meet both practical and community needs. The Mountain Rail project will provide alternative transportation options for visitors who want to experience mountain towns but who do not want to drive. Mountain Rail is also an affordable and reliable commuting option for workers in Steamboat who live in Craig and Hayden. Additionally, it would promote economic development, as housing, hotels, and retail establishments become attracted to areas served by rail.

Mountain Rail will receive dedicated funding through the congestion impact fees established by Senate Bill 24-184. The anticipated opening date for initial Mountain Rail service is November 1, 2026.

Figure 4. Colorado Mountain Passenger Rail Project Map



Bustang Family of Services

As CDOT's interregional bus transit service, Bustang connects major populations, employment centers, and local transit entities and is a key component of providing more travel choices throughout the non-MPO areas of the state.

Bustang will be supported by a brand-new $60 million in investment in its fleet in the updated 10-Year Plan, which will help to maintain the long distance and high-frequency service of routes such as:

- Bustang Outrider Services supports communities such as Steamboat Springs, Craig, Durango, Alamosa, Crested Butte, and many other communities.
- Bustang Mainline and Pegasus from Denver to Avon and Grand Junction.
- Bustang Snowstang Service to Arapahoe Basin, Breckenridge, Copper Mountain, & Loveland Ski Area.

Investing in Bustang's transit fleet will ensure riders experience dependable service, which in turn increases trust and ridership.

The updated 10-Year Plan continues to support Bustang in the non-MPO areas through 11 projects which invest in Outrider stops, and mobility hubs, including:

- Outrider Improvements at Montrose, Delta, and Gunnison (2454)[6]
- Outrider Improvements at Fraser, Granby, Kremmling, and Hot Sulphur Springs (2494)
- Outrider Improvements at Steamboat Springs, Milner, Hayden, and Craig (2748)
- Outrider Improvements at Winter Park and Tabernash (2749)
- Grand Junction Mobility Hub (2747)[7]

Improvements to bus stops along service routes increases ridership of the transit network. Upgrades which add Americans with Disabilities Act (ADA)-compliant platforms, curb ramps, level boarding pads, and wider sidewalks makes transit more accessible for wheelchair users and others with limited mobility. Further, transit stops with shelter, lighting, signage, and seating improvements make stops more comfortable, safe, and convenient - increasing the attractiveness of public transit and boosting ridership.

[6] The numbers next to each project are their 10-Year Plan Project ID.

[7] While this project is located within the MPO boundary, it will serve as a new transit hub for Bustang, which supports travel throughout the non-MPO areas.

Supporting Local Transit Service

CDOT is committed to supporting local transit service throughout the state, providing transportation choice for travel within communities through continued investment in the 10-Year Plan.

The updated 10-Year Plan carries forward planned projects that support the continued development of seven transit centers and mobility hubs with local partners, including:

- Montrose Multimodal Transit Center (1096)
- Gunnison Transfer Station (1102)
- Redesign and Construct the Steamboat Springs Transportation Center – Phase 1 (1246)
- Buena Vista Park & Ride and Intermodal Facility (1297)
- Poncha Springs Crossroads Welcome Center (1319)
- La Junta Multimodal Transit Center (1285)
- Mountain Express Transit Center (2766)

Building transit centers and mobility hubs improves connectivity between multiple routes, allowing riders to transfer easily by increasing reliability and predictability. Further, transit centers and mobility hubs allow routes to become coordinated - improving travel time speeds across the transit network. These facilities can become focal points for supporting additional first and last mile access, including car-share and scooter-share, microtransit pick-up zones, secure bike parking, or ride-hail drop-off areas. Together, these benefits work together to increase ridership across the transit network.

The updated 10-Year Plan also carries forward planned projects that seek to continue to support new or expanded local agency service, including:

- One project continuing onto the updated 10-Year Plan will support new service; between Gunnison and Montrose (2767). This would support a brand-new route from Crested Butte to Montrose, via Gunnison.
- Regional Transit Service between Montrose and Telluride (1028), which will provide additional service for the existing fixed-route transit service between Montrose and Telluride on US 550, CO 62, and CO 145. It is anticipated to run seven days/week with four trips/day which would require two full size buses. Potential stops include Montrose, Colona, Ridgway, Placerville, and Telluride.

- Bus Service between Pagosa Springs and Durango (2523), providing new service with one roundtrip per day.
- Teller Senior Coalition Outreach (1004A) and the Fremont County Transit Outreach (1004B) are new projects that will expand on demand access and assistance to meet the growing demand for programs and provide vital service to the public in the area.

Active Transportation

To support public transportation projects and multimodal infrastructure, the updated 10-Year Plan incorporates 28 projects with active transportation elements in non-MPO areas. Active transportation projects help facilitate safe and accessible multimodal communities and, in many cases, improve the usability of public transportation.

The following highlights some of the active transportation projects contained in the updated 10-Year Plan and reflects previously planned and newly added projects focused on safety by adding, repaving, and improving sidewalks and intersections and meeting ADA requirements. They include the following:

- CO 14 Intersection and Preservation Improvements (New)[8]
- CO 82 Safety and Active Transportation Improvements (3318)
- CO 52/WCR 59 Roundabout and Safety Improvements (2772)
- US 24 Intersection Improvements at Steele in Buena Vista (2039)
- CO 12 ADA Ramps and Sidewalk Improvements in La Veta and Trinidata (1493)
- US 285 Safety and Mobility Improvements between Center and Saguache (1051)

The updated 10-Year Plan also incorporates previously planned and newly added active transportation projects focused on multimodal improvements such as the following:

- I-25 Wellington Preliminary Interchange Design and Pedestrian Crossing (New)
- Pagosa Springs' Main Street Reconstruction and Multimodal Improvements (1339)
- US 160 Multimodal Improvements in Alamosa (2038)
- US 285 Multimodal Improvements on CO 145 (1482)

[8] The numbers next to each project are the previous 10-Year Plan Project ID. Newly added projects are listed as "New".

- Intersection and Pedestrian Improvements at CO 291 and US 50 (2070)
- US 50 Corridor Improvements in Poncha Springs (2456)

MPO Compliance Areas

Under the Standard, CDOT is responsible for reducing transportation GHG emissions outside the MPO areas. As such, the GHG modeling conducted for this report and the projects highlighted focus only on 10-Year Plan projects in the rural areas of the state. However, the majority of projects in CDOT's updated 10-Year Plan are located within MPO boundaries, many of which support meeting the state's broader statewide GHG emission reduction goals and support an MPO's ability to meet the reduction levels in Table 1. Some noteworthy projects within MPO boundaries that are newly added to the updated 10-Year Plan include bus rapid transit (BRT) and Front Range Passenger Rail (FRPR).

There are several projects which support BRT within the MPOs in the updated 10-Year Plan. Worth highlighting are the two new projects in the Denver Regional Council of Governments (DRCOG) region which, in partnership with the Regional Transportation District (RTD), will construct side-running BRT infrastructure for an an 18-mile section of Federal Blvd, from 120th Ave to Dartmouth Ave as well as a 7.5 mile section of Colorado Blvd, from 40th Ave to Amherst Ave. These projects will construct stations, signals, and roadway elements, and supporting bicycle and pedestrian infrastructure along these corridors.

FRPR is a newly included intercity passenger train project in the updated 10-Year Plan, with service from Fort Collins through Denver and south to Pueblo. FRPR will provide a safe, efficient and reliable transportation option, connecting major population and employment centers and key destinations. The passenger rail service will be competitive with car travel, expand travel options and foster regional economic vitality. From 2020 to 2050, millions more people are expected to live in Colorado and approximately 85% will travel along the Front Range. The existing highway system cannot accommodate growth without significant changes. On a typical weekday through Denver, I-25 averages eight or more hours of congestion. Every three to four days, the highway is partially or fully closed. Intercity passenger rail offers a safer and more reliable way to transport people and accommodate growth without adding to highway congestion or increasing GHG emissions.

Programming and Funding

To make the most of every dollar, CDOT combines traditional funding with enterprise funding. Enterprise funding is described in more detail in the next section of this

document. By leveraging these resources together, CDOT can stretch the budget further and invest more in the projects that improve safety, mobility, and quality of life across the state. CDOT's 10-Year Plan was designed to do exactly that by combining state, federal, and enterprise funding to maximize every investment. By strategically aligning these resources, CDOT can take on more projects, accelerate timelines, and focus on the improvements that move the needle on meeting CDOT's performance goals, including reducing GHG emissions.

It is important to note that CDOT's 10-Year Plan represents only a portion of CDOT's overall budget. Furthermore, the 10-Year Plan strategically invests in the state's transportation infrastructure, utilizing approximately $225 million annually from CDOT's total $1.7 billion budget (excluding enterprise funding). This plan, supported by flexible state and federal funding, operates in conjunction with other CDOT funding programs to maximize the budget and achieve performance goals. Some of the additional funding directly supports GHG mitigation measures CDOT has committed to in the GHG MAP in Appendix A.

Enterprises

A significant funding advancement for the state and CDOT is the creation and development of the Clean Transit Enterprise (CTE), as required by SB21-260 "Sustainability of the Transportation System". CTE plays an important role supporting CDOT's ability to comply with the Standard's requirements in non-MPO areas of the state by supporting CDOT's implementation of transit-aligned GHG mitigation measures. The CTE is an entity created within CDOT that is currently charged with implementing two pieces of legislation. The Enterprise was initially created by SB21-260, which allows the enterprise to impose a Clean Transit Retail Delivery Fee to fund support for 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 (CFI). The second piece of legislation, SB24-230 "Oil & Gas Production Fees", provides funding for transit expansion including local transit capital and operational projects as well as passenger rail. Annual funding to support these programs is estimated to be approximately $67 million in FY26 and then increase to approximately $110-130 million per year in FY27 and beyond. Examples of projects that have been funded that support CDOT's GHG mitigation measures include EV transit bus purchases and local transit service expansions. Based on initial estimates, SB24-230 funding is expected to support an annual increase of 8.3 million vehicle revenue miles across the state by 2030.

The CTIO develops innovative funding solutions for priority projects, including new dedicated funding from SB 24-184 for rail and transit projects, presenting an

unprecedented opportunity for CDOT to advance multimodal projects and fortify the state's transportation system to address the mobility needs of the present and future. The rental car fee imposed by SB 24-184 will create a dedicated funding stream of approximately $50 million per year for rail and transit, an anticipated $500 million over the next 10 years and $1.15 billion by 2050. The law also encourages regional coordination between the Regional Transportation District (RTD), FRPR District, and CDOT to explore opportunities in establishing train service from Denver to Fort Collins. In addition, it directs CTIO to develop a multimodal strategic capital plan that aligns with CDOT's 10-Year Plan and statewide GHG pollution reduction goals.

The NAAPME supports mitigation of the environmental and health impacts of increased air pollution from motor vehicle emissions in nonattainment areas that results from the rapid and continuing growth in retail deliveries made by motor vehicles and in prearranged rides provided by transportation network companies. NAAPME funding is for eligible projects that reduce traffic, including demand management projects that encourage alternatives to driving alone or that directly reduce air pollution, such as retrofitting of construction equipment, construction of roadside vegetation barriers, and planting trees along medians. NAAPME currently offers approximately $15 million annually to fund projects including those in both MPO and CDOT's GHG compliance areas. Annual funding is expected to increase to approximately $37 million in FY 2036. Examples of projects that have been funded that support CDOT's GHG mitigation measures include roundabout construction and active transportation infrastructure.

Programs

Further, CDOT implements a number of funding programs that are managed externally from the strategic funding allocated in the 10-Year Plan. Many of these funds support projects that enhance active transportation opportunities and mode shift through grants or formula funding to non-MPO areas of the state.

The Highway Safety Improvement Program (HSIP) and FASTER Safety Mitigation (FSM) Program provide funding opportunities for safety projects, including projects that improve protection of Vulnerable Road Users (VRU), such as bicyclists and pedestrians. Some examples include separated bicycle lanes, road diets and new or enhanced sidewalks and walkways. These two programs offer approximately $110 million dollars annually to projects statewide with approximately 15% of the funding for projects in non-MPO areas.

The Transportation Alternatives Program (TAP) awards grants to transportation projects that expand travel choice beyond the single occupancy vehicle, strengthen the local economy, improve quality of life, and protect the environment such as pedestrian and bicycle facilities. During the 2023 call for projects TAP awarded over

$42 million to 37 projects statewide with approximately 43% of funding to projects in non-MPO areas. Future calls are expected every two to three years awarding approximately a similar amount of funding, depending on federal statute.

The Multimodal Transportation and Mitigation Options Fund (MMOF) funds multimodal transportation projects throughout the state including, for example, fixed route transit service and bicycle and pedestrian projects. In FY26 through FY32 the MMOF fund is expected to provide approximately $6.3-9.3 million annually for projects in non-MPO areas of the state, with $3-4.5 million of that being directed towards CDOT's Bustang services, improving statewide and rural transit.

The Safe Routes to School Program makes walking and bicycling to school safer and more appealing and facilitates the planning, development and implementation of projects that improve safety, and reduce traffic and congestion, fuel consumption, and air pollution in the vicinity of schools. In the two most recent project selections for FY23-26, $11 million was awarded to local agency projects with 40% of funds awarded to projects in non-MPO areas.

Greenhouse Gas Emissions Modeling Analysis and Results

GHG Modeling Overview

The Standard requires newly adopted applicable planning documents, such as CDOT's updated 10-Year Plan for fiscal years 2027-2036, to demonstrate reductions in GHG emissions in each of the future compliance years relative to baseline GHG emissions levels. For CDOT, the baseline GHG emissions are those determined to result from the 10-Year Plan adopted as of January 30, 2022 (2 CCR 601-22, Section 1.04). Therefore, CDOT's baseline 10-Year Plan is the version adopted by the TC on April 16, 2020, also referred to as the CDOT's 2019 10-Year Plan in the previous GHG Transportation Report. CDOT initially demonstrated compliance with the Standard by updating the baseline 2019 10-Year Plan which the TC adopted in September 2022.

CDOT uses its statewide travel demand model, StateFocus, and EPA MOVES to model GHG emissions which will result from the projects included in the updated 10-Year Plan.

StateFocus is an activity-based model based directly on the DRCOG Focus model, which in turn was based on the Sacramento Activity-Based Travel Simulation Model (SACSIM) model developed for the Sacramento Area Council of Governments, coming into operations around 2007. Activity-based models (ABM) represent an improvement

beyond earlier trip-based models because ABMs consider travel decisions at an individual rather than aggregate level. For example, the trip generation step of a trip-based model is replaced by multiple components including Day Activity Pattern Choice (a decision on what reasons to leave home), Exact Number of Tours Choice (how many of which purpose tours to make), Work-Based Subtour Generation (whether to travel during the workday and why, such as for lunch or an off-site meeting) and Intermediate Stop Generation. Each of these ABM components can be sensitive to congestion levels by including accessibility terms as explanatory variables. One limitation of earlier trip-based models was that trip generation rates were typically assumed to be constant irrespective of congestion levels. When the ABM completes, it outputs a forecasted daily itinerary or schedule for each person in the model's synthetic population. More detail about the StateFocus model is available in Appendix B.

EPA MOVES is a software model developed by the U.S. Environmental Protection Agency to estimate emissions from motor vehicles for various project types. MOVES is based on real-world testing of over one million vehicles by EPA in their mobile source research center. MOVES allows for calculation of emissions for pollutants like criteria air pollutants, GHGs, and air toxics from various sources, including but not limited to, tailpipe and fuel evaporation. EPA MOVES is able to account for various factors that influence emissions such as the age and type (i.e. car, SUV, Heavy duty truck) of the vehicle, fuel type and activity of the vehicle. MOVES modelers can also utilize case-specific inputs to the model such as future electric vehicle (EV)/zero emissions vehicle (ZEV) and other vehicle fuel type adoption rates as was done for this analysis. For this analysis, the CDOT EV/ZEV adoption rates that were directed for use by the state Interagency Consultation Team (IACT) in 2025 were simulated for future vehicle fuel mix. More information about the MOVES modeling methodology is available in Appendix C.

CDOT used their statewide activity-based Travel Demand Model and EPA MOVES model version 4 to complete the GHG emissions analysis of CDOT's baseline 10-Year Plan and the updated 10-Year Plan for fiscal years 2027-2036. 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. Notably, the model:

- Depicts each person individually, including characteristics important to that individual's travel choices.
- 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 or infrastructure) or by larger changes in society (for example, COVID effects).

- Estimates the trips (number, type, etc.) that people make based on the activities they need to accomplish and the effect of travel conditions on one person's choice of how to accomplish those tasks. This modeling approach permits the model to estimate changes in people's demand for travel as travel conditions change.
- Depicts the location of households and jobs at the address level rather than at the coarse "zone" level that is common in older aggregate, trip-based models — also called four-step models. This is particularly important for modeling active transportation modes like walking and biking where trip lengths might often be smaller than many zones' dimensions.

The primary output of the Travel Demand Model is the estimated VMT for a given year at the level of a "link", which represents a roadway segment from intersection to intersection. Forecasted emissions rates developed from the EPA MOVES model are necessary to translate these link VMTs into GHG emissions. The forecasted emissions rates are stratified by vehicle type, roadway type, operating speed (in "bins" of up to five miles per hour [mph] - for example, 27.5 to 32.5 mph), rural or urban area roadway type, and hour of day. The emissions rates in individual vehicle mph are calculated from the operating speed bins that are output from MOVES through interpolation.

In 2025 three new considerations for how GHG emissions are calculated for the purposes of an agency demonstrating compliance with the Standard were adopted by consensus through the Statewide Model Coordination Group (SMCG). These considerations involve updates to (1) vehicle emissions rates, (2) vehicle mix assumptions, and (3) the number of vehicle classes considered. These three adjustments were applied to the remodeling of the baseline and the updated 2027-2036 10-Year Plan.

Vehicle GHG Emissions Rates

The first change made was that new MOVES GHG emissions rates were developed using MOVES4.1.2. Previous GHG emissions rates were generated using MOVES3 which was replaced by EPA with MOVES4 in September 2023. The main difference between versions of MOVES is that MOVES4 integrates the latest light and heavy-duty vehicle fuel economy (Corporate Average Fuel Economy [CAFE]) standards. Notably, the majority of fuel economy and related emissions improvements demonstrated in MOVES4 are achieved through vehicle electrification present in the default data,

particularly for commercial vehicles. In the previous MOVES3 modeling the inputs in the model for current light-duty EV/ZEVs as well as significant growth in future years were already assumed at higher adoption levels than the default EV/ZEV rates present in MOVES4.

When new federal fuel economy standards are promulgated, an auto manufacturer demonstrates compliance by adjusting their product offerings such that the average fuel economy of the entire fleet of vehicles for a class (for example, light-duty vehicles or heavy-duty vehicles) available for sale by that auto manufacturer for the current model year meets the new standard. A manufacturer may adjust their product line by introducing new (more fuel economical) models, discontinuing existing models, or modifying an existing model (for example, using a different engine type or offering more alternative fuel options such as PHEV, BEV, E85 or CNG). These industry responses often result in the actual fuel economy changes having a high level of variation among individual makes and models - and also within model lines across model years. The different possible dimensions of industry responses result in the EPA needing to make assumptions about MOVES inputs regarding how the fuel economy standards will be achieved in future years, including switching vehicle fuel types vs. engine efficiency improvements.

When new fuel economy standards are issued at the federal level, the EPA forecasts future vehicle sales by fuel type and engine technology through their Optimization Model for reducing Emissions of Greenhouse gases from Automobiles (OMEGA) model. OMEGAconsiders factors such as vehicle costs, consumer purchasing preferences and the availability of market incentives. The results of the EPAanalysis are coded as default values present in MOVES. A user can run MOVES using the national default values or revise them to reflect state or local data and assumptions, as was done in the development of the new GHG emissions rates for the Standard implementation (and was performed previously to develop the original GHG rates in MOVES3 that were used for previous analyses). Comparing the differences in default values present between versions of MOVES allows experienced users of the emissions rates model to evaluate changes in assumptions surrounding tailpipe emissions improvements and future vehicle sales at the national scale.

In a straight comparison of model versions, MOVES3 vs. MOVES4, the majority of fuel economy improvements associated with the new standards are achieved through sales of EV/ZEVs in future years and there is significantly less change in the GHG emissions rates for petroleum vehicles. Therefore, the previous high levels of EV/ZEV adoption that were already assumed in developing the original GHG emissions rates in MOVES3 (for the 2022 10-Year Plan) result in very little change from switching model versions of MOVES alone. New GHG emissions rates were needed to integrate the new EV/ZEV

adoption forecasts that were developed by the CDOT Division of Accounting and Finance (DAF) and adopted by IACT in 2025 for use in GHG modeling for the Standard. The new EV/ZEV adoption forecasts are used statewide and increase the amount of light-duty EV/ZEVs in future years, particularly for light-duty pickups and sport utility vehicles (SUVs) in vehicle Model Years 2030-2040 compared to the previous GHG emissions rates developed in 2021. No bus or commercial EV/ZEV adoption is reflected in the MOVES GHG emissions rates for current or future years, i.e., the default EV/ZEV adoption assumptions present in MOVES4 for these vehicle types were zeroed-out from the model runs.

Vehicle Mix

The vehicle mix represents the type (i.e. motorcycles, passenger cars, SUVs, vans, trucks, etc.) of vehicles operating on a roadway. The GHG emissions rates are highly variable by vehicle type and generally increase with the size of the vehicle, for example, passenger cars emit significantly less GHGs per vehicle mile than heavy-duty trucks. While travel demand models forecast total on-road travel behavior, including trips from commercial vehicles, no travel demand model in the state is calibrated for commercial travel accurately enough to properly assign the on-road vehicle mix. Therefore, the vehicle mix used to calculate GHG emissions for the Standard are developed from traffic observations (counts) collected by CDOT's Automated Traffic Recording (ATR) stations as was performed previously using both continuous and short-duration hourly vehicle counts stratified by the 13 Federal Highway Administration (FHWA) vehicle classifications as well as roadway and urban or rural area type updated for more recently observed years. Each ATR station's counts were used in conjunction with VMT weighting for the roadway to develop a ratio of vehicle types by hour for all of the major roadway types in Colorado. The VMT-weighting of the counts is a refinement of the previous vehicle mix assignment that used unweighted (straight) counts that was used in the previous emissions calculations. The VMT-weighting method was developed by CDOT and APCD in order to better reflect the vehicle mix outside the Front Range where the majority of ATR stations are located. Furthermore, for the 2025 vehicle mix used to calculate GHG emissions rates, post-pandemic (2023) vehicle classification counts were used. In the previous GHG emissions calculations methodology, pre-pandemic (2017-2019) vehicle classification counts were used. It was determined that an update to post-pandemic vehicle classification counts should be made statewide to the emissions calculation methodology in order to more accurately reflect the vehicle mix that is currently present on roadways in the state as transportation behavior has altered since COVID due to factors including increased remote employment and land use changes.

Vehicle Classes

The switch to the use of the post-pandemic vehicle mix resulted in the need for the final significant change to how GHG emissions are calculated, which is the aggregation of passenger cars with SUVs/light-duty trucks into a single vehicle emissions rate category in MOVES. Previously emissions rates for passenger cars had been separate from the larger passenger vehicles (SUVs and light-duty trucks). However, CDOT and APCD determined that the ATR network often records SUVs and light-duty trucks as passenger cars due to the axle-based nature of the classification count data collection system. Therefore, SUVs and light-duty trucks had previously been inadvertently underrepresented in the vehicle mix assignment. The aggregation into a single passenger vehicle emissions rate category is a refinement to more accurately represent the vehicle mix on the road in current conditions. It should also be noted that the rates of future EV/ZEV adoption are now assumed to be the same between these two vehicle categories in MOVES; thus, the emissions benefits of future EV/ZEVs through fleet turnover in SUVs/light-duty trucks are now also occurring at a higher levels than was previously assumed. The emissions benefits of increased levels of EV planning assumptions for SUVs and light-duty vehicles are particularly noticeable in the 2040 compliance year as significantly lower levels of EV adoption for SUVs and light-duty trucks were previously assumed for model years 2025-2040.

In order to calculate the GHG emissions, a database is developed by the APCD that integrates the MOVES emissions rates, the observed vehicle mix, and the travel demand modeling predicted transportation behavior. A lookup table approach is used to select the appropriate vehicle mix and emissions rates for each link modeled. Each emissions rate is multiplied by the hourly VMT for the appropriate vehicle class to calculate forecasted emissions.

The adjustments discussed above represent improvements in underlying data inputs for calculation of GHG emissions in this compliance demonstration compared to CDOT's prior demonstration in 2022. It is best practice to make adjustments and improvements in the emissions calculations methods over time as new data, planning assumptions and/or appropriate refinements are identified compared to previous work that provides for more accurate characterization of GHG emissions from transportation. Overall, while significantly more EV/ZEV adoption is assumed for SUVs and light-duty trucks results in more zero tailpipe emissions vehicles, the revision to more accurately account for the total number of SUVs and light-duty trucks that were previously underrepresented resulted in higher statewide MOVES GHG emissions rates for passenger vehicles for 2030, 2040 and 2050. This is due to the effect of more of these larger passenger vehicles overall, which are now more accurately represented, not being fully offset by the updated higher levels of EV/ZEV adoption now also being

assumed for these vehicles, which better accounts for the present statewide vehicle mix.

The refinements and adjustments to the GHG emissions calculation methodology were developed by the SMCG through a nearly two-year deliberative and collaborative process with participation from transportation and emissions modelers, as well as planners and other staff from CDOT, APCD, DOLA, Colorado Energy Office (CEO) and all MPOs in the state. The consensus outcomes of the SMCG process were adjustments and refinements to the method for calculating GHG emissions. The net effect of these adjustments was an increase in the predicted total average carbon intensity (i.e. grams GHG/VMT) of each vehicle mile traveled in the state in future years than the GHG emissions methodology used in 2022.

GHG reduction levels required by the Standard must be achieved relative to a modeled baseline amount of GHG emissions. The Standard requires each agency to determine the baseline emissions in addition to the GHG emissions that will result from the updated applicable planning document. CDOT's modeling analysis process is further described below.

Modeling the Baseline 10-Year Plan

The baseline model run uses the CDOT 2019 10-Year Plan as adopted by the Commission in April 2020. This modeling analysis assumes full build-out of all Regionally Significant projects in the baseline 10-Year Plan. For this updated compliance analysis CDOT did not model the Standard's Table 1 2025 compliance year as the year has already passed. CDOT demonstrated compliance with the 2025 GHG reduction level through modeling of the previous updated 10-Year Plan for fiscal years 2019-2028 adopted by the TC in September 2022. As part of evaluating the updated 10-Year Plan for 2027-2036 CDOT remodeled the baseline 2019 10-Year Plan with MOVES modifications as discussed above in addition to the DOLA modifications below.

The land use (population, job totals, and locations) begins with existing development as built, with existing households and jobs located based on sources such as data from the Colorado Department of Labor and Employment (CDLE), the US Census, and county assessors' parcel/address data. Since the current StateFocus version only produces modeled outputs future years of 2030 and 2045, development growth for the years 2030 and 2045 is taken from county-level forecasts provided by the State Demographer's Office in the Colorado DOLA. (The model's existing horizon year of 2045 dictates which set of socioeconomic inputs are used. Interpolation and extrapolation are used to create forecasts for 2040 and 2050, as required by the regulation. Interpolated or extrapolated socioeconomic inputs to the model may not precisely match the DOLA forecasts for those specific years.) The DOLA 2024

socioeconomic forecasts used to develop this plan reflect post-pandemic expectations, while the 2022 plan was based on socioeconomic forecasts made by DOLA in 2018. Both sets of socioeconomic forecasts are compared in Table 3 below. Outside MPO areas, additional households and jobs (due to projected growth beyond today's levels) are placed in buildable areas in each county (for example, avoiding national forests, water, road rights of way, steep slopes, etc.) but are otherwise distributed randomly within each county.[9] Inside MPO areas, job and household locations are taken from the MPOs models.

Compared to the 2018 DOLA forecast used in CDOT's 2022 GHG Report, the new 2024 DOLA Forecast used in CDOT's 2025 travel demand modeling and associated GHG Report reflect significantly less future population and households, as well as slightly less employment for the travel demand modeling years of 2030 and 2045. A downward shift in population and households resulted in fewer predicted vehicle miles traveled and associated GHG emissions in both CDOT's Baseline and Updated 10-Year Plan. A total emissions reduction of GHGs from reductions in predicted future populations that is overall beneficial towards reducing contributions to climate change would seemingly be supportive towards Colorado's climate action goals; however, the reduction targets in Table 1 of the Standard are absolute total mass reductions, rather than a GHG per-capita reduction or GHG intensity reduction target. Therefore, when the predicted baseline emissions for a compliance year are reduced from fewer vehicle miles traveled due to a lesser population in a compliance year, it makes the reduction target for that year an overall greater percentage reduction of the baseline. This can result in making it more challenging for an agency to demonstrate compliance with the Standard.

The VMT resulting from these baseline Travel Demand Modeling runs are then analyzed within the non-MPO GHG databases that apply the correct EPA MOVES GHG emissions rates for each roadway segment in order to obtain the baseline plan GHG emission values for 2030, 2040, and 2050.

Table 3. Comparison of DOLA Statewide Socioeconomic Forecasts over Time

Modeled Year Statistic	DOLA Forecast from 2018 (2022 Report)	DOLA Forecast from 2024 (2025 Report)	Percentage Change
2030 Statewide Population	6,974,465	6,467,694	-7.3%
2030 Statewide Households	2,950,775	2,702,130	-8.4%

[9] CDOT does not have local zoning and comprehensive plans necessary to place future development in a manner more consistent with local government intentions.

Modeled Year Statistic	DOLA Forecast from 2018 (2022 Report)	DOLA Forecast from 2024 (2025 Report)	Percentage Change
2030 Statewide Employment	3,995,831	3,963,747	-0.8%
2045 Statewide Population	8,233,674	7,387,301	-10.3%
2045 Statewide Households	3,467,931	3,102,187	-10.5%
2045 Statewide Employment	4,463,682	4,341,638	-2.7%

Source: CDOT StateFocus model input files reflecting DOLA 2018 and DOLA 2024 forecasts

CDOT predicts travel behavior for non-MPOs areas by modeling the entire state and then removing results for the MPO areas. Thus, the baseline runs for the various horizon years called for in the Standard include specific highway and transit projects listed in CDOT and MPO plans that were adopted on or before the date of the Standard adoption (January 20, 2022). Categories/quantities of funds that are included in such plans, but have not been assigned to projects, are not included in baseline scenarios. Instead they are included in compliance scenarios. In general, the statewide model is well able to depict Regionally Significant highway projects, and fixed-route transit services in urbanized areas. CDOT's statewide model does not explicitly depict bicycle and pedestrian facilities (except for where MPO models explicitly include these facilities, such as with the North Front Range Metropolitan Planning Organization [NFRMPO] model area). The effects of funds allocated to these active modes are approximated by adjusting parameters in the statewide model that depict people's response to overall service levels afforded by the bicycle/pedestrian networks (for example, general perceptions of safety, convenience, speed, etc. and differences in these perceptions among people of different ages or genders). Plan elements by mode in the 10-Year Plan baseline model run are depicted as follows:

- Highway: Includes all Regionally Significant projects in the April 2020 10-Year Plan, including in some cases project clarification/detail provided by CDOT region staff. In the MPO areas, the networks include all Regionally Significant projects included in the MPO travel models. Outside MPO areas there are five Regionally Significant projects in CDOT's baseline 10-Year Plan: I-70 West Vail Pass (0442/1161), US 40 Fraser Safety Improvements (1259), US 160 Elmore's Corner East (1334), I-70 West Floyd Hill (0004), and I-70 climbing lane from Bakerville to Eisenhower Tunnel (2582).

- Transit: includes all existing services in the MPO areas, all existing services of rural transit providers, and all existing Bustang services that existed prior to April 2020. Short-distance circulator shuttles that are too fine to represent

under the statewide model's current zone structure are omitted from both Baseline and Compliance scenarios. These omitted routes would represent a small fraction of the total rural vehicle revenue miles of service provided.

- Bicycle/pedestrian: bicycle and pedestrian service levels afforded by the current system are assumed to remain the same in all future baseline scenarios. This is reflected in the statewide travel model by leaving at their current value all model parameters that depict the extent to which various demographic groups choose to walk or bicycle. For example, the model includes parameters, developed from the 2010 Front Range Travel Counts survey data, that show women choosing to bicycle less readily than do men: the same is true of younger and older people of all genders.

Baseline VMT and emission results are listed in Table 4 below. While VMT increases over time, total emissions decrease in the more distant future because of EV adoption and emissions improvements to internal combustion engines and hybrid vehicles.

Table 4. CDOT GHG Emissions from Baseline 10-Year Plan by Horizon Year in MMT

GHG Horizon Year	2030	2040	2050
Statewide weekday VMT	170,733,534	186,428,854	202,124,174
Non-MPO area weekday VMT	40,385,157	43,775,591	47,166,025
Baseline 10-Year Plan Emissions (MMT)	4.886	3.315	2.558

Sources: CDOT, APCD

Note: The statewide VMT presented in Table 4 is estimated by the StateFocus model. Only the non-MPO portion of this VMT should be relied upon, since MPOs provide their own model estimates of VMT within their respective regions.

Modeling the Updated 10-Year Plan

Process of Development of the Updated 10-Year Plan

As described earlier, the updated 10-Year Plan is developed through a comprehensive process that begins with long-range Statewide and Regional Transportation Plan (RTP) development. This involves numerous meetings with rural Transportation Planning Regions (TPRs), MPOs, and other stakeholders. Priority projects are identified in RTPs through data analysis and public and stakeholder engagement. In addition to the regional plans, CDOT also uses modal, topical, and functional area plans like the Asset Management Plan, Strategic Highway Safety Plan, Freight Plan, Transit Plan, and

Active Transportation Plan to inform the development of the 10-Year Plan. This comprehensive process identifies projects that align with the TC's PD 14 goal areas.

The CDOT DAF is responsible for generating revenue projections for 10-Year Plan strategic funds. CDOT utilizes these projections to prioritize projects within the 10-Year Plan, working in four-year increments. In compliance with SB24-184 "Support for the Development of Surface Transportation Infrastructure", the CTIO enterprise is mandated to revise its strategic plan to align with the 10-Year Plan. Similarly, other partnering CDOT enterprises have adopted a model to ensure enterprise funding aligns with the 10-Year Plan.

Upon completion of the GHG emissions modeling to demonstrate compliance with the Standard, CDOT releases the draft 10-Year Plan for a 30-day public and stakeholder review and comment period. Once all comments are received and addressed, the draft 10-Year Plan is submitted to the TC for approval.

As required by the Standard, all Regionally Significant Projects within the updated 10-Year Plan were coded into the travel demand model, a process referred to here as the "compliance run." Notably, there are no new Regionally Significant Projects for the non-MPO areas in the updated 10-Year Plan. The five Regionally Significant Projects in the non-MPO areas of the state that were included in CDOT's baseline plan are still in the updated 10-Year Plan:

1. I-70 West Vail Pass (0442/1161),
2. US 40 Fraser Safety Improvements (1259),
3. US 160 Elmore's Corner East (1334),
4. I-70 West Floyd Hill (0004), and
5. I-70 climbing lane from Bakerville to Eisenhower Tunnel (2582).

These projects are reflected in both the baseline and compliance Travel Demand Model runs.

CDOT also adjusted several assumptions within the model to reflect changed travel patterns resulting from the COVID-19 pandemic and increased investments in multimodal funding. The final assumptions used in the modeling that supports this report are summarized in Table 5 below. These model adjustments for the updated 10-year plan remain identical to the assumptions made in CDOT's 2022 compliance demonstration.

- The percentage of Coloradans working from home increased. Prior to the COVID pandemic, US Census Bureau data used by CDOT in its modeling work estimated that 6.3% of Colorado workers worked from home on a typical day. During the COVID pandemic, the Census Bureau conducted a series of weekly "pulse"

surveys, in which as many as 45% of Colorado households said that some adults in their household had shifted some or all work trips to work-from-home due to COVID, over and above pre-existing work-from-home habits. While these data do not of course provide certainty of future work-from-home behaviors, there are no indications that work-from-home behaviors will return fully to their pre-COVID levels. CDOT therefore has adjusted the statewide model to produce approximately 20% work-from-home. This level of working from home corresponds well to the 19.9% of Colorado workers reporting working from home in the 1-year 2024 American Community Survey data. This represents a somewhat more conservative assumption than is being used by DRCOG and the NFRMPO. Teleworking opportunities are generally more plentiful in denser urban areas, where broadband infrastructure has long been in place, and many jobs are in the information sector. In contrast, rural jobs in the agriculture, extraction or recreation sectors by their nature require in-person presence.

- Rural residents will use an increased amount of tele-health and tele-university due to broadband expansion. On December 2, 2025 the Colorado Broadband Office was approved to receive $420.6 million in federal funding from the Infrastructure, Investment and Jobs Act (IIJA) for the state's broadband infrastructure. The funds are anticipated to be strategically deployed to connect Colorado's most remote communities, providing high-speed internet to more than 96,000 Coloradans.

- Changes to average bicycling and walking speed and adjustments in model factors reflect increased adoption of e-bikes and a greater perception of bicycle/pedestrian safety, comfort and convenience among some demographic groups that currently are less likely to use active modes. All these changes contribute to more trips using these modes and are expected to occur due to expanded investments in bicycle and pedestrian infrastructure.

Table 5. Model Assumption Changes between Baseline and Compliance Scenarios

Parameter	Baseline (all horizon years)	2030 compliance	2040 compliance	2050 compliance
Tele-work	6%	20%	20%	20%

Parameter	Baseline (all horizon years)	2030 compliance	2040 compliance	2050 compliance
Telehealth and teleuniversity	Low in pre-COVID period	Telehealth: replaces 2% of personal business trips by non-MPO residents Teleuniversity: replaces 2% of personal business trips by non-MPO residents (3 of 5 days on campus)	Telehealth: replaces 2% of personal business trips by non-MPO residents Teleuniversity: replaces 40% of trips by non-MPO students (3 of 5 days on campus)	Telehealth: replaces 2% of personal business trips by non-MPO residents Teleuniversity: replaces 40% of trips by non-MPO students (3 of 5 days on campus)
(Perceived)[10] Walk speed	3 mph	5 mph	5 mph	5 mph
Bike speed	12 mph	13 mph	13.7 mph	14.3 mph
E-bike adoption[11]	negligible	25%	42%	58%

Plan elements by mode in the 10-Year Plan compliance model run are depicted as follows:

- Highway: In the non-MPO areas, the plan contains a number of highway projects, none of them added substantial lane miles, interchanges, etc., so in the non-MPO areas, the network is essentially the same as the baseline scenario.
- Transit: the travel model network includes all existing urban and small town fixed-route services, and existing Bustang services. New rural transit and Bustang/Outrider expansion (post 2020) was evaluated in the context of the Mitigation Action Plan, separate from the travel model. The compliance scenarios include the FRPR and Mountain Rail services anticipated during each horizon year. In 2030 the anticipated services are Joint Rail between Denver

[10] Pedestrians are not assumed to walk faster in the future. Rather, improvements to the pedestrian infrastructure and environment will make a one-mile walk “feel like” it only takes 12 minutes in the future, compared to the (actual) 20 minutes it takes today.

[11] Future bike speeds are a result of e-bike adoption. Assumes 12 mph for "classic" bikes and 16 mph for e-bikes.

Union Station (DUS) and Fort Collins' South Transit Center, and Mountain Rail between DUS and Granby. Service for 2040 and beyond assumes full build-out of Pueblo to Fort Collins for FRPR and Craig to DUS for Mountain Rail.

- Bicycle/pedestrian: as discussed above, bicycle/pedestrian parameters simulating lower use of these modes by some demographic groups were reduced by 50%, simulating improved acceptance of these modes in these demographic groups.

Compliance run emissions results are summarized in Table 6 below.

Table 6. CDOT GHG Emissions from Updated 10-Year Plan by Horizon Year in MMT

GHG Horizon Year	2030	2040	2050
Statewide weekday VMT	155,788,468	169,634,853	183,481,237
Non-MPO area weekday VMT	37,156,273	40,541,169	43,926,065
2027-2036 10-Year Plan GHG Emissions (MMT)	4.495	3.061	2.371

Sources: CDOT, APCD

Note: The statewide VMT presented in the table is estimated by the StateFocus model. Only the non-MPO portion of this VMT should be relied upon, since MPOs provide their own model estimates of VMT within their respective regions.

GHG Modeling Result Summary

The effects on total estimated annual GHG emissions of the 2024 DOLA revised development forecast and of the updated GHG emissions calculation methodology (both described above) have effects in opposite directions. The revised DOLA forecast reduces the total amount of predicted VMT and associated GHG emissions in the state; whereas the updates to the emissions calculations methodology increase the amounts of GHGs emitted per VMT.

The net effect of these changes is more heavily influenced by the increases in the GHGs emitted per VMT than the decrease in overall VMT. This increases total predicted annual onroad GHG emissions in future years and modeled emissions reductions as reductions in vehicle miles traveled are associated with a higher emissions benefit.

Table 7. GHG Modeling Result Summary

GHG Horizon Year	2030	2040	2050
Baseline 10-Year Plan GHG Emissions (MMT)[12]	4.886	3.315	2.558
Updated 2027-2036 10-Year Plan GHG Emissions (MMT)	4.495	3.061	2.371
Total Modeled GHG Reductions (MMT)	0.391	0.254	0.188
2 CCR 601-22 Table 1 Required GHG Reduction Amount (MMT)	0.360	0.300	0.170
Additional Reductions Needed from a GHG Mitigation Action Plan (MMT)	**None**	**0.046**	**None**

GHG Mitigation Measures

As shown in Table 7, CDOT needs to implement GHG mitigation measures for compliance year 2040 through a GHG MAP to meet the reduction levels required for compliance with the Standard. CDOT also recorded voluntary mitigation measures for 2030 and 2050 for projects and programming which have already occurred or have dedicated future funding, but were not included as part of the modeling work. CDOT is committed to implementing GHG mitigation measures that in some cases go above and beyond what is required to maintain compliance with the Standard based on the most recent 2025 modeling, to provide assurance necessary reductions are achieved. CDOT intends to use a combination of GHG mitigation measures including land use, transit, medium/heavy duty electrification and traffic operation strategies. These measures are described in detail in the GHG MAP in Appendix A of this document. Table 8 below summarizes the mandatory and voluntary GHG mitigations to be implemented by CDOT to meet the reduction levels and achieve compliance. Progress on achieving these GHG mitigation measures will be reported to the TC annually as required by the Standard under Section 8.02.7. Based on modeling the baseline and updated 2027-2036 10-Year Plan CDOT is only required to achieve an additional 46,000 metric tons of GHG mitigation reductions in 2040. The remainder of the GHG mitigation reductions referenced below are voluntary and go above and beyond what is required by the Standard for this compliance demonstration.

[12] These emissions values represent the updated GHG emissions calculations for the baseline plan based on the 2025 modeling.

Table 8 - GHG Mitigation Measures Summary Table

Mitigation Measure	Greenhouse Gas Reductions		
	2030 (MT/year)	2040 (MT/year)	2050 (MT/Year)
Land Use Strategies			
Increase residential density	0	3,900	1,800
Mixed-use Transit-Oriented Development (TOD) - moderate intensity	0	14,950	7,150
Land Use Strategy Subtotal	**0**	**18,850**	**8,950**
Transit Strategies			
Rural Transit Service Recovery	4,457	3,175	4,038
Bustang and Outrider	9,355	4,678	4,678
CTE SB24-230 Formula Grant Program	8,664	4,435	4,503
Transit Strategy Subtotal	**22,476**	**12,288**	**13,219**
Medium-Duty and Heavy-Duty Electrification Strategies			
Electric Transit Vehicle for Rural Transit Agencies	**5,950**	**8,360**	**6,438**
Traffic Operations Strategies			
Roundabout Construction	5,636	6,850	2,833
Traffic Signal Retiming	4,165	1,584	0
Traffic Operations Strategy Subtotal	**9,800**	**8,434**	**4,623**
Grand Total	**38,227**	**47,932**	**31,440**

Conclusion

CDOT's priorities for updating the 10-Year Plan, as described in PD 14, are to sustainably increase transportation choice, advance safety, and fix our roads. Through the development of the updated 10-Year Plan CDOT also focused on aligning the

project mix to achieve compliance with the GHG Planning Standard and reduce GHG emissions in non-MPO areas of the state for each future compliance year. In 2030 and 2050 CDOT will achieve the required GHG reductions through modeling the project mix alone. In 2040 CDOT will achieve the required GHG reductions through both modeling and implementation of GHG mitigation measures. A summary of CDOT's compliance is provided in Table 9 below.

Table 9. GHG Reduction Results and Compliance

Compliance Year	**2030**	**2040**	**2050**
GHG Reductions Achieved through Modeling (MMT)	0.391	0.254	0.188
Required GHG Reductions Achieved through Mitigations (MMT)	-	0.046	-
Additional Voluntary GHG Reductions Achieved through Mitigations (MMT)	0.038	0.002	0.031
Total GHG Reductions Achieved (MMT)	0.429	0.302	0.219
2 CCR 601-22 Table 1 Required GHG Reduction Amount (MMT)	0.360	0.300	0.170
Compliance Achieved?	**Yes**	**Yes**	**Yes**

Appendix A - GHG Mitigation Action Plan

Appendix A.1 - Greenhouse Gas Emissions Reductions

Based on the results of CDOT's modeling of GHG emissions impacts from the baseline 10-Year Plan and updated future action scenario 10-Year Plan CDOT will need to implement a GHG MAP as allowed by 2 CCR 601-22 Section 8.02.6.3. Mitigation measures are needed to help meet the GHG reduction targets in 2040 but not 2030 and 2050. Voluntary mitigations not needed for compliance are also reported for 2030 and 2050 to reflect projects and programs which have already occurred or have dedicated funding streams. For the purposes of this report mitigations are counted and accredited out through 2050. A summary of the necessary GHG reductions necessary to achieve through mitigation measures to comply with the requirements of Table 1 in the Standard is provided in Table A-1.

Table A-1. GHG Mitigations Summary

Compliance Years	2030	2040	2050
GHG Reductions achieved through modeling the 10-Year Plan's mix of projects (MT)	391,000	254,000	188,000
Required GHG Reductions achieved through Mitigation Measures (MT)	-	46,000	-
Voluntary GHG Reductions achieved through Mitigation Measures (MT)	38,245	1,931	32,869
Total GHG Reductions Achieved (MT)	429,245	301,931	220,869
Table 1 GHG Reduction Target (MT[13])	360,000	300,000	170,000
Compliance Achieved?	Yes	Yes	Yes

The mitigation measures outlined below represent an update to the original GHG MAP CDOT developed in 2022. Some previous strategies have been removed, such as transportation demand management, while others have been added, such as signal retiming as a transportation operations strategy. Furthermore, some existing strategies have been modified to increase target metrics based on CDOT's increased focus in those areas.

[13] Metric Tons (MT)

Appendix A.2 - GHG Mitigation Measures Analysis

Land Use Strategies

CDOT Multimodal Investments and Internal Policies to Encourage High-Density, Mixed-Use Development

The benefits of dense, mixed-use land use patterns for transit, multimodal travel, and VMT reduction are widely accepted. PD 1610 acknowledges these foundational dynamics by including land use as an option for mitigation credit. The land use mitigation measures described below as part of CDOT's compliance framework focus on increasing residential density and mixed-use transit-oriented development in the non-MPO areas of Colorado.

Non-MPO areas of Colorado are a unique mix of communities and regions. Many of Colorado's rural communities with agricultural based economies may not be the best suited for increased mixed use transit-oriented designs. However, mountain towns and rural resort communities that have been experiencing faster population growth and development pressures from their tourism-based economy may be primed to invest in mixed-use, transit-oriented nodes. Due to the winter weather, mountain topography, and resulting limitations for buildable land or expanding highways, many of these non-MPO areas with strong tourism-based communities are already linking land use and transportation solutions. Further investments may increase potential VMT reductions by increasing infill development and expanding regional transit and multimodal networks.

CDOT's GHG MAP (2022) identified that with strategic investments and support from CDOT, the potential to increase the amount of high-density zoned areas in non-MPO Colorado as a whole exists. Increasing opportunities to walk, bike, and take transit are critical for high-density development to be an attractive option for communities to apply in appropriate areas. CDOT's role in providing multimodal investments, in partnership with local governments, was identified as critical to making the reductions in GHG emissions via land use a viable option.

Since 2022, several main activities have supported this strategy to become a reality and two elements have created challenges for state-level GHG emission reduction goals:

- Supportive: The State Legislature has taken action to increase housing opportunity across Colorado's communities by passing several bills, which began

implementation largely by the DOLA in 2024 and 2025 (discussed more in External Policies section).
- Supportive: The same laws have varying levels of partnership and collaboration with CDOT's Land Use Program.
- Supportive: Governor Polis has required state department funding opportunities to prioritize scoring for communities who are "Strategic Growth Law Compliant" through two Executive Orders (D 2025 005 in May and D 2025 011 in August, 2025).
- Supportive: PD 1610 acknowledges the interrelationship between mixed use land uses, active transportation opportunity, and the ultimate reduction of GHG.
- Supportive: A "built environment" component was added to the scoring within the last Transportation Alternatives Program (TAP) funding call to align transportation decision making with land use.
- Challenge: Shifting federal priorities has created funding and other challenges for state-level GHG emission reduction strategies.
- Challenge: State budgeting constraints have reduced funding for dedicated multimodal and innovative transportation funding opportunities.

External Policies to Encourage High-Density, Mixed-Use Development and CDOT Collaboration

The 2024 and 2025 legislative sessions saw the passage of seven State Land Use and Housing bills largely being implemented by the DOLA. These bills (HB24-1007, HB24-1152, HB24-1313, SB24-174, HB24-1304, HB25-1273, SB25-002) span many topics in land use and housing including:

- Removing residential occupancy limits that are based solely on family relationships;
- Allowing and streamlining review and approval processes for certain types of homes such as Accessory Dwelling Units (ADUs);
- Removing parking minimums in specific areas of certain jurisdictions for small and moderate sized residential development;
- Requiring building code amendments;
- Identifying transit oriented communities and ensuring more zoning capacity for multifamily housing near transit;
- Requiring new components of comprehensive plans; and more.

These laws rely on best practices to densify communities over time through increased zoning capacity in infill areas and near transit and streamlined approval processes; encouraging opportunities for mixed-use redevelopment so communities can offer more types of homes and businesses in a smaller land footprint; and identifying

specific areas suitable for greater access to transit and active transportation as a result of increases in residential capacity.

These laws all influence the way Colorado continues to grow, which has an effect on how Coloradans travel and move in their communities, regionally, and across the state. Due to the growth patterns in the state, the majority of these laws apply to urbanized communities along the Front Range that are within MPOs; for several of the laws, communities outside of these subject jurisdictions may opt-in voluntarily. While generally, all of these laws have a tertiary impact on the State Highway system and assets; two laws in particular, HB24-1313 and SB24-174, are responsible for creating the Neighborhood Centers program. The Neighborhood Centers program and these two laws require CDOT's involvement and consideration, and also have potential to reduce transportation related GHG emissions in the non-MPO areas of the state.

Identified in SB24-174 and HB24-1313, the Neighborhood Centers program is an interagency incentive program that builds on the tradition of state and local support for "mixed-use pedestrian-oriented neighborhoods". Neighborhood Centers are voluntarily designated by local governments in areas that meet the criteria established by DOLA. Generally, Neighborhood Centers are dynamic focal points in neighborhoods where housing, commerce, community, and mobility converge, like the main streets of Colorado's historic mountain towns, small towns, or walkable neighborhoods in cities. Neighborhood Centers may be designated in areas that currently exist as mixed-use pedestrian-oriented neighborhoods, or in areas that anticipate becoming a mixed-use pedestrian-oriented neighborhood over time through plans and policies.

SB24-174 (Sustainable Affordable Housing Assistance) creates the opportunity for communities across Colorado to voluntarily designate as "neighborhood centers." By December 31, 2026, State departments (Departments of Local Affairs, Transportation, Natural Resources, Public Health and Environment, Personnel and Administration, as well as the CEO and Office of Economic Development) who provide grants for the primary purpose of supporting housing and land use planning must determine how to prioritize areas that are designated as a neighborhood center. As a Department that does not typically provide grants for the designated purposes, by December 31, 2026, CDOT must determine appropriate grant opportunities to prioritize funding to communities who designate as a neighborhood center.

The strategic streamlining and prioritization of funding is presented in this law in relationship to the Neighborhood Centers concepts. Currently, the Neighborhood Centers concept is in a pilot designation phase to finalize the criteria that will be used in 2026. SB24-174 has additional components with important implications for increasing residential density in the non-MPO areas of the state. Three components

most relevant to CDOT are the strategic growth element, Housing Needs Assessment, and Housing Action Plan. The strategic growth element is required for all comprehensive/master plans across Colorado's communities, unless a county or region meets particular criteria to be excluded from this requirement outlined within the bill. The Housing Needs Assessment and subsequent Housing Action plan have varying applicabilities for subject jurisdictions, but the criteria is based on population and affects communities in both non-MPO and MPO boundaries.

HB24-1313 (Transit Oriented Communities) applies to the MPO areas of the state and seeks to improve opportunities to construct housing near transit, create more accessible and affordable housing options, and improve access to transit and multimodal services. Notably, many of the identified transit corridors are on state highways and will require a level of coordination and collaboration with CDOT. Additionally, this bill requires that CDOT create a "Policy Flexibility & Context Study" that examines the Access Code, Roadway Design Guide, and pedestrian and bicyclist crossings. The study must examine the impacts that these policies have on neighborhood and transit centers, housing production, the implementation of context sensitive design, complete streets, and pedestrian and bicyclist safety. This study is anticipated to be completed in 2026.

Together, these laws and Executive Orders create a shared state agency investment strategy that will reduce costs of the extension of utilities and services, promote infill and redevelopment of underutilized parcels, promote development near transit and job centers, and preserve natural and agricultural lands (see Measure Origin and History). Given this focus, it is rational to conclude that existing trends, state agency strategic investments, and support from CDOT, could lead to an increase in the amount of high-density zoned areas in non-MPO Colorado as a whole. Increased options to walk, bike, and take transit are critical for high-density development to be an attractive option for communities, and CDOT's role in providing multimodal investments in partnership with local governments is critical to making the reductions in GHG emissions via land use discussed here a viable option.

Land Use Strategies GHG Reduction Benefits and Timing

Table A-2. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - Land Use Strategy

Mitigation Project Type	Unit	Project Lifetime (Years)	MT GHG/ Unit 2030	MT GHG/ Unit 2040	MT GHG/ Unit 2050
Increase residential density	Per acre rezoned from <10 units/acre to at least 15-25 units/acre meeting "smart growth" criteria	30	22	13	6
Mixed-use TOD - moderate intensity	Per acres of area rezoned for mixed-use TOD accommodating at least 15 residential units/acre and 100 jobs/acre, within ½ miles of high-frequency bus transit or fixed guideway station	30	40	23	11

Table A-2 forms the basis of the GHG reduction estimates in Table A3. For example, 300 acres of increased residential density by 2040 results in 3,900 MT of GHG reduction in 2030 (300 acres * 13 MT), as shown in Table A-3. Land use measures in PD 1610 have a 30-year lifetime, so any measure that occurs by 2040 will also be garnering GHG reduction in 2050, which is reflected in the GHG emission reduction calculations.

For the purposes of this MAP, acres of TODs act as a temporary proxy for acres that may decide to become designated as Neighborhood Centers. The Neighborhood Centers concept most closely mirrors TOD, with a focus on mixed-use qualities, dense housing, and proximity to transit - but it is not a perfect match. Given the relative newness of the Neighborhood Centers program, CDOT plans to add a Neighborhood Centers specific mitigation measure to PD 1610 once the criteria have been further defined following the current pilot round.

Table A-3. Land Use GHG Mitigations for CDOT's Compliance, 2030-2050

Project Type	2040 Units (Acres)	MT GHG Reduction 2040	MT GHG Reduction 2050
Increase residential density	300	3,900	1,800
Mixed-use TOD - moderate intensity	650	14,950	7,150

Co-benefits

Land use changes also generate co-benefits in the form of VMT reduction and the reduction of harmful air pollutants. These benefits are quantified in Table A-4 below.

Table A-4. Annual Estimated Pollutants Avoided (kg) and VMT avoided from the Combined Land Use Mitigation Measures, 2040-2050

Co-benefit	2040	2050
CO	138,534	47,789
NOx	1,415	503
PM 2.5	785	657
SO_2	149	65
VOCs	3,789	1,767
VMT reduction	94,364,850	94,364,850

VMT avoided is based on the calculations associated with built environment changes in PD 1610, which assumes 77,800 VMT is reduced annually for every acre of increased residential density, 174,706 VMT is reduced for every acre of mixed-used TOD (higher intensity), and 109,268 VMT is reduced for every acre of mixed-used TOD (moderate intensity.

Measure origin and history

The 2022 MAP recognized four land use strategies as an effective way for CDOT to strategically invest in communities' active transportation, transit, and complete street

programs to spur local rezonings, development, and interest in more compact and dense communities. CDOT has decided to remove the "increase jobs density" component of the previous mitigation strategy after determining the threshold established in PD 1610 is not achievable for the non-MPO areas of the state. Originally, 43 communities across Colorado were identified as non-MPO communities to track local rezonings and TOD changes to contribute to the previous MAP. To further CDOT's intent to support these goals, a built environment scoring component was added to the 2023 Transportation Alternatives Program (TAP) call. The 2026 TAP call for new grantees will integrate Strategic Growth and Neighborhood Centers into the scoring rubric to decide awarded projects.

Due to the collaborative efforts between CDOT and other state agencies on the strategic growth laws passed in 2024 and 2025, there are a few new, expanded elements to understand land use as a strategy to reduce GHG emissions and meet the standard. These expanded elements are occurring because of an increased and coordinated state-level approach to "strategic growth." Defined in the Strategic Growth Report, strategic growth is "a fiscally and environmentally sustainable approach to land use planning, housing, community well being, and infrastructure that promotes the development or redevelopment of vacant and underutilized influx parcels and mitigates the need for extensions of infrastructure and public services into natural and agricultural lands." This coordinated approach is aligning funds, programs, and data availability.

The Strategic Growth Report (required from SB24-174) completed a "Transect Analysis", supported by work from the CDOT travel modeling unit and explains typologies of place as it relates to metrics like density, housing costs, household expenses, water use, VMT, and GHG emissions.

Using the "Transect Analysis" from the Strategic Growth Report, it is more likely the "downtown" and "urban core" place types will have the potential to yield the greatest GHG Emissions and VMT reductions from the State's Strategic Growth Laws (see Transect of Place Types in Colorado in Figure A-1). The "downtown" and "urban core" are within more heavily populated and economically dense MPO jurisdictions. It is unrealistic to assume Colorado's non-MPO jurisdictions would evolve or develop to experience the same, or even a similar, scale of residential, commercial, and economic densities as Census Urban Areas[14] that are required to be part of a MPO jurisdiction. As a result, the "Traditional Neighborhoods" category are the most likely place types that may see the greatest GHG reductions from coordinated CDOT

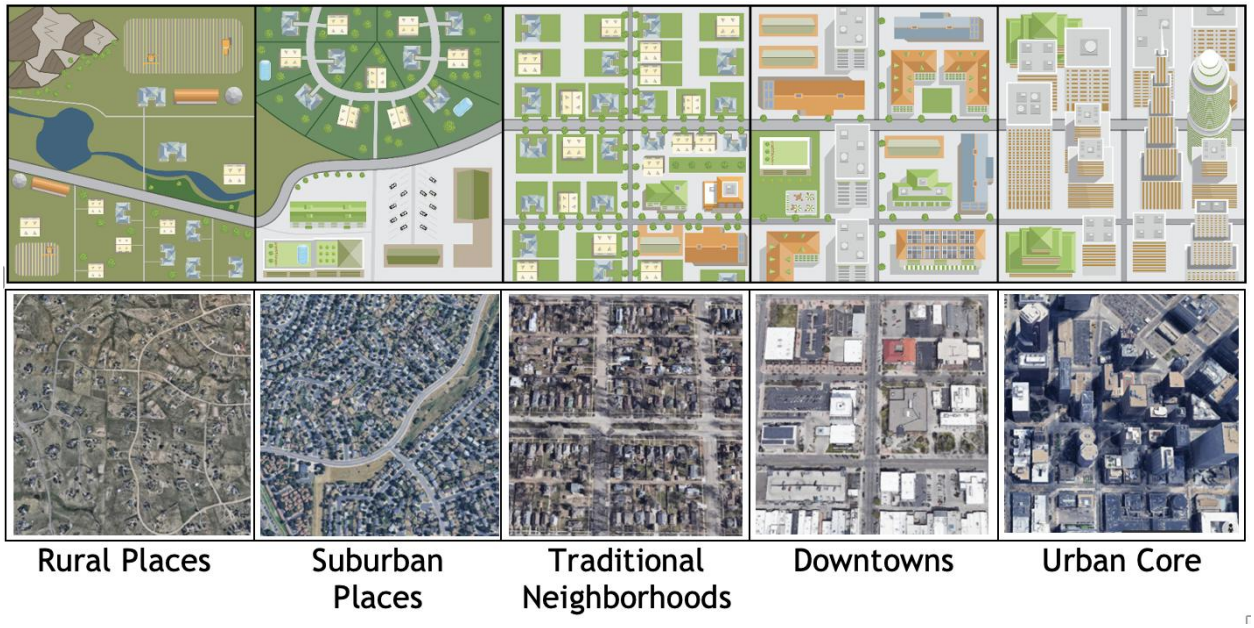
[14] Federal law requires Census Urban Areas with a population of 50,000 or more to form an MPO.

investments in non-MPO areas and will be the focus area for the GHG land use category moving forward.

Traditional Neighborhoods (see Figure A-1) are characterized by walkable areas with mixed housing options, more affordable homes, and moderate densities; this most closely aligns with Area Type 3 (AT 3)[15] in CDOT's travel demand model. For example, the two largest "urban areas" in the non-MPO areas are Cañon City and Montrose, which each have populations of just under 25,000 and their downtowns are represented as Area Type 3 in the CDOT model. Approximately 70 potential locations totaling over 10,000 acres have been identified through CDOT's Model that meet these characteristics and type specification and highlights the potential to achieve the land use changes proposed by this mitigation measure.

[15] Within the model's description, AT 3 has a population density between 5,200 and 10,000 persons per square mile in a half-mile radius around the zone centroid or 2,300 to 8,000 jobs/square mile.

Figure A-1. Transect of Place Types in Colorado



Funding/Resources/Partnerships

For strategic growth funding priorities to be successful, collaborative and coordinated approaches between land use and transportation are essential. Currently, state agencies are developing coordinated and collaborative approaches to implement the state's land use and housing laws which will affect how the Land Use GHG mitigation measures develop in the near and long term. There are a few notable items affecting the implementation of these laws.

First, Governor Polis signed two related Executive Orders, D 2025 005 in May and D 2025 011 in August 2025. D 2025 005 directs DOLA to summarize a framework, criteria, and benchmarks established in HB24-1007, HB24-1152, HB24-1304, HB24-1313, SB24-174, HB25-1273, and SB25-002. This process identifies and certifies Strategic Growth Compliant Local Governments to establish priority for state funding opportunities on at least a quarterly basis. The second Executive Order, D 2025 011, lists specific state funding opportunities that must prioritize scoring for local governments who are certified as Strategic Growth Compliant. Eight CDOT funding opportunities are required to integrate prioritized scoring: MMOF, TAP (statewide), Safe Routes to School, E-mobility Education and Awareness Grants, Transportation Demand Management Innovation Grants, Roadside and On-board Unit In-Kind Grant, Transportation Management Organization Seed Funding, and RMS.

Additionally, funds like the NAAPME and CTE are being implemented through CDOT and have sizable distributions. NAAPME's 10-Year Plan (2024) and Community Clean

Transportation Assistance support active transportation and transit projects, mostly within MPO areas, but still have important implications for the greater transportation network. CTE invests in a variety of transit and electrification efforts and the SB230 Formula Program requires a "local zoning" component as part of the apportionment formula for transit agencies around the state.

Last, SB24-174 "Sustainable Affordable Housing Assistance" requires prioritized scoring for community locations that are designated as "Neighborhood Centers." Per SB24-174, by December 1, 2026, CDOT is required to identify applicable and appropriate grant fund opportunities that will prioritize scoring for locations designated as "neighborhood centers." To date, the TAP funding has been identified as a logical funding opportunity to prioritize scoring for locations that are certified as Neighborhood Centers. As the Neighborhood Centers program grows, it is possible CDOT may want to consider more funding opportunities that prioritize Neighborhood Center locations to create a greater return on our investments to meet our GHG Goals through the land use measure.

Historically, state transportation policy and funding have interacted with land use development patterns in a way that moves both systems further from strategic growth principles, often leading to increased sprawl and increased long-term system costs. Highways and roads have traditionally been more reliably funded than transit, bicycle, and pedestrian infrastructure, encouraging development in areas best served by highways, i.e. areas further from city centers, as roads make commuting feasible from more distant locations. More miles of road and longer service utility lines (including water, electricity, and sewer) increase system maintenance and capital costs. However, the last decade has seen the state increase in dedicated funding for transit and active transportation, despite the reductions seen over the last few years due to state budget constraints.

While these land use changes will not be directly funded by CDOT, CDOT will seek to understand how SB21-260, SB22-180, SB24-230, and 10-Year Plan Strategic funds can be used to fund the transportation programs, projects and grants that seek to encourage and support such built environment changes.

Other info as needed

While large MPOs have many advantages in measuring GHG emissions reductions via improved land use patterns due to land use models that supplement travel demand models and more robust data from local governments, CDOT is in the beginning stages of understanding and considering how to track, measure, report and support sustainable land use with appropriate transportation infrastructure in the non-MPO

areas of the state. This effort will be supported by the tracking and reporting components built into the Sustainable Affordable Housing and Transit Oriented Communities laws.

Further, DOLA has begun a Neighborhood Center Pilot Round to finalize the criteria established by DOLA which was published on June 30, 2025. The Program Guideline outlines the criteria for Neighborhood Centers based on location, efficient approval processes, density, and pedestrian oriented and mixed use characteristics. The Neighborhood Center criteria will be finalized in 2026.

Transit Strategies

Bustang and Outrider

Bustang, CDOT's interregional express bus service, began operation in 2015 to connect urbanized areas across the State. This service has three main lines: the North Line (Denver to Fort Collins), West line (Denver to Grand Junction), and the South Line (Denver to Colorado Springs). In 2022, SB22-180 was passed, providing $30M in direct funding to the expansion of Bustang service through a three-year pilot program. This pilot program planned to expand service along the I-25 corridor by 200% on weekdays, 200% on weekends, and service along I-70 west increased by approximately 250%. The full expansion of the North and South lines was achieved in November 2024 and the final phase of expansion of the West Line was completed in December 2024. This mitigation measure assumes the continuation of this expanded service from present day out to 2050.

Outrider was launched in 2018, and builds and expands transit service to connect rural areas to primary corridors and larger cities and towns. This transit service offers eight routes and focuses on providing reliable and affordable transportation options, often partnering with local transit agencies to ensure comprehensive and accessible service. In 2022, there was a service expansion that included an increased frequency of the Sterling to Denver Route, increasing from one daily round trip on Tuesday and Thursday to running daily Monday through Friday. Outrider had another update in 2024 by adding a stop at Denver International Airport (DEN) and eliminating other stops that saw low ridership, resulting in a decrease in the trip time from Sterling to Denver by an hour.

GHG Reductions Benefit and Timing

As seen in Table A-5 below, Bustang and Outrider are both considered to be new or increased fixed route transit service between cities. Each project is measured per 1,000 vehicle revenue miles and the lifetime of each project is one year. Therefore,

the VRM goals established below are expected to be achieved within each respective compliance year.

Table A-5. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - Transit: Regional Service Expansion

Mitigation Project Type	Unit	Project Lifetime	MT GHG/Unit 2030	MT GHG/Unit 2040	MT GHG/Unit 2050
New or increased fixed-route transit service - intercity fleet average bus	Per 1,000 vehicle revenue miles	1 year	2	1	1

CDOT plans to continue to invest in these transit services moving forward. To calculate the GHG reduction benefit of these services, annual VRM must be known or estimated. The VRM in Table A6 for Bustang are based on the final phase of expansion achieved as a result of SB22-180, continued in each compliance year. The VRM estimates for Outrider in Table A-6 are based on the service expansions that have occurred since 2021. The GHG reduction benefits for each compliance year presume the established VRM goal will be achieved within each respective compliance year. CDOT bases the VRM goal only upon the VRM that is achieved within non-MPO areas, as some of the VRM occurs within the boundaries of the state's five MPOs.

Table A-6. Transit Mitigations for CDOT's Compliance, 2030-2050

Transit Service	Unit (new VRM)	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
Bustang	3,913,568	7,827	3,914	3,914
Outrider	763,897	1,528	764	764
Total	4,677,465	9,355	4,678	4,678

Co-benefits

While bus services can help reduce single occupancy VMT which reduces GHG emissions overall, Bustang and Outrider also provide other benefits. They reduce cars on the roadways, resulting in less traffic congestion and time savings for commuters. They

also reduce the need for personal vehicle use, allowing for cost savings through vehicle fuel and maintenance costs. By reducing the need to drive a personal vehicle, bus services can also reduce costs associated with vehicle crashes. Reducing vehicle crashes can lead to reduced medical, insurance, vehicle property, and lost workplace productivity costs.

Table A-7. Annual Estimated Pollutants Avoided (kg) and VMT avoided from the combined effects of Bustang and Outrider

Co-benefit	2030	2040	2050
CO	89,561	39,817	15,023
NOx	-	-	158
PM 2.5	110	197	206
SO_2	62	40	21
VOCs	1,628	994	555
VMT avoided	43,033,000	43,033,000	43,033,000

VMT avoided is based on the calculation associated with intercity transit service in PD 1610, which assumes 9,200 VMT is reduced for every 1,000 new VRM.

Measure Origin and History

CDOT launched Bustang in 2015, aiming to provide much needed transit to and from the communities along the I-25 and I-70 corridors. Then, in 2018 CDOT launched the Outrider service, aiming to bring rural connections to the Bustang I-70 and I-25 services.

Funding/Resources/Partnerships

A handful of different funding sources will be used to sustain Bustang service. One funding source is MMOF, which funds multimodal transportation projects and can be used to improve statewide and rural transit. MMOF is expected to provide $3-4 million to Bustang service from FY 26 through FY32. Another funding source is SB 09-108, or the Funding Advancements Surface Transportation Economic Recovery Act of 2009 (FASTER). Along with supporting the improvement of roadway safety and repairing deteriorating bridges, it also aims to support and expand transit. FASTER does not sunset or expire, ensuring that there is a reliable source of funding for Bustang for years to come, and therefore continuing to allow for reliable transit service through

Bustang. Other funding sources include the fare revenue from Bustang users and SB21-260, the Sustainability of the Transportation System bill, which will be used for Bustang mobility hubs and other similar projects.

Rural Transit Service Recovery

Following the COVID-19 pandemic, traffic in many parts of the state returned to pre-pandemic levels, while transit ridership and service remained low. Through state and federal funds, CDOT aims to support the return of intercity, local, and demand response service levels of the state's rural transit agencies to pre-COVID levels by 2030 or earlier.

GHG Reductions Benefits and Timing

This measure uses three mitigation project types from PD 1610 to calculate the project GHG benefits of local, intercity, and demand response transit service recovery throughout the non-MPO areas of the state. The GHG reduction benefits are measured by tracking increases in either vehicle revenue service miles (VRM) or vehicle revenue-hours (VRH) and the lifetime of each project is one year. Therefore the VRM and VRH goals established below will need to be achieved within each respective compliance year.

Table A-8. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - Transit: Rural Service Recovery

Mitigation Project Type	Unit	Project Lifetime	MT GHG/Unit 2030	MT GHG/Unit 2040	MT GHG/Unit 2050
New/increased fixed-route transit service - intercity fleet average	Per 1,000 vehicle revenue-miles	1 year	2	1	1
New/increased fixed-route transit service - electric/diesel fleet average	Per 1,000 new vehicle revenue hours	1 year	4	5	7
New/increased demand-response bus service	Per 1,000 new vehicle revenue hours	1 year	-	1	2

To determine the GHG reduction benefit for rural transit service recovery, VRM for intercity transit and VRH for local transit and demand response must be known or

estimated. To develop the VRM and VRH estimates in Table A-9, CDOT compared National Transit Database service data for rural agencies in 2019 (pre-pandemic) and 2020 (during pandemic) to determine how much service was lost and set a recovery target based on the difference.

Table A-9. Rural Transit Service Recovery GHG Calculation of GHG Benefits, 2030-2050

Transit Service	Unit	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
Recovered intercity service	2,060,742 VRM	4,121	2,060	2,060
Recovered local service	84,004 VRH	336	420	588
Recovered demand response service	695,128 VRH	0	695	1,390
Total	-	4,457	3,175	4,038

Co-benefits

Table A-10. Annual Estimated Pollutants Avoided (kg) and VMT avoided from the combined effects of Rural Transit Service Recovery, 2030-2050

Co-benefit	2030	2040	2050
CO	76,692	38,297	16,226
NOx	-	-	171
PM 2.5	-	150	223
SO_2	47	37	22
VOCs	866	824	600
VMT avoided	46,502,800	46,502,800	46,502,800

VMT avoided is based on the calculation associated with intercity transit service, fixed-route (local) transit service, and demand response service measures in PD 1610. PD 1610 assumes intercity service avoids 9,200 VMT for every 1,000 new VRM, local

service avoids 89,700 VMT for every 1,000 VRH, and demand response service avoids 28,800 VMT for every 1,000 VRH.

Measure Origin and History

The following rural transit agencies saw decreases in transit service operations due to the COVID-19 pandemic. These agencies also receive state and federal funding: Bent County Transit, The Lift (City of Winter Park), ECO Transit (Eagle County), Gunnison Valley RTA, Mountain Express, Northeast Colorado Association of Local Governments (NECALG), RFTA, San Miguel Authority for Regional Transportation (SMART), Senior Resource Development Agency, Southern Colorado Community Action Agency (SoCoCAA, based in Ignacio), Steamboat Springs Transit (SST), Summit Stage, Black Hawk & Central City Tramway, Cripple Creek Transit, Durango Transit, Ride Glenwood Springs, La Junta, Envida, East Central Council of Local Governments, All Points Transit (Montrose), Prowers County, Summit Stage, Teller County, Canon City, Avon Transit, Mountain Village, Snowmass Village, Galloping Goose, Via Mobility Services, Wet Mountain Valley Rotary, Dolores County, South Central COG, and Montezuma County. The majority of these transit agencies' services are not captured in CDOT's travel demand model and thus are suited for off model calculation.

This strategy was identified in CDOT's 2022 MAP. As part of the annual mitigation updates to the Commission, CDOT has tracked rural transit service recovery through the National Transit Database and seen a steady increase in VRM and VRH, as well as increases in ridership, throughout rural transit agencies.

Funding/Resources/Partnerships

Rural transit agencies operations are funded primarily through Federal Transit Administration (FTA) formula funds for rural areas (FTA 5311 and FTA 5310), and local funding sources. Rural capital projects are funded through FASTER, SB17-267, FTA 5304, 5310, 5311, and 5339 funds.

CTE SB24-230 Formula Grant Program

The SB24-230 Formula Grant Program focuses primarily on expanding transit operations throughout the state by investing in public transit, including vehicles, infrastructure, equipment, materials, supplies, maintenance, and operations and staffing, to achieve the level of frequent, convenient and reliable transit that is known to increase readership by replacing car trips with bus and rail trips and forms of transit known to support denser land use patterns that future reduce pollution due to shorter trip lengths and greater walking and cycling mode share. The program is run by CDOT's CTE and funded by the Oil and Gas Production Fee, discussed further below.

GHG Reductions Benefits and Timing

Similar to Rural Transit Service Recovery, each project within the CTE SB24-230 Formula Grant Program is measured per 1,000 vehicle revenue miles or vehicle revenue-hours and the lifetime of each project is one year. In each compliance year the VRM and VRH goals established below will need to be achieved within each respective compliance year. Based on initial applications for the grant program received in the fall of 2025, these CTE funds will be used for both local and intercity service expansions in non-MPO areas of the state. Local service is represented by the "new/increased fixed-route transit service - electric/diesel fleet average" mitigation measure, which is associated with slower transit vehicle speeds and more frequent stops - resulting in reduced emissions benefits from a decrease in transit vehicle operating efficiency.

Table A-11. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - Transit: CTE Formula Grant Program

Mitigation Project Type	Unit	Project Lifetime	MT GHG/Unit 2030	MT GHG/Unit 2040	MT GHG/Unit 2050
New/increased fixed-route transit service - intercity fleet average	Per 1,000 vehicle revenue-miles	1 year	2	1	1
New/increased fixed-route transit service - electric/diesel fleet average	Per 1,000 vehicle revenue-hours	1 year	4	5	7

To estimate the VRM and VRH increases associated with this grant program, which are necessary to calculate the GHG reduction benefit, CDOT reviewed the comprehensive operational analysis (COA) documents received by applicants in the first round of CTE applications. These COAs describe how rural transit agencies intend to use the SB24-230 funds to expand their transit operations over the next five years, including money requested and expected increases in VRM, VRH, and unlinked passenger trips. However, not all of the COAs have been received for agencies that intend to use SB24-230 funds, as some agencies needed more time. CDOT estimated future revenue for the grant program, and used existing COA data on service and costs to estimate how the additional funds may translate to increases in VRH or VRM for rural transit agencies interested in the program. As additional COAs come in and CTE continues to track progress on this program, CDOT will be able to update this mitigation measure appropriately.

Table A-12. CTE Formula Grant Program GHG Mitigation Benefit in the non-MPO areas

Transit Service	Unit	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
New/increased fixed-route transit service - intercity fleet average	4,438 VRM	8,527	4,263	4,263
New/increased fixed-route transit service - electric/diesel fleet average	34 VRH	137	171	240
Total	-	8,664	4,435	4,503

Co-benefits

Table A-13. Annual Estimated Pollutants Avoided (kg) and VMT avoided from the combined effects of the CTE Formula Grant Program in the non-MPO areas, 2030-2050

Co-Benefit	2030	2040	2050
CO	196,755	86,799	36,676
NOx	-	-	386
PM 2.5	-	211	504
SO_2	126	87	50
VOCs	1,457	1,775	1,356
VMT avoided	105,057,440	105,057,440	105,057,440

VMT avoided is based on the calculation associated with intercity transit service and fixed-route (local) transit service in PD 1610. PD 1610 assumes intercity service avoids 9,200 VMT for every 1,000 new VRM and that local service avoids 89,700 VMT for every 1,000 VRH.

Measure Origin and History

Senate Bill 24-230 was passed in the Spring of 2024, expanding the business purpose of the CTE by setting up the Local Transit Operations Formula Program (known as the

SB230 Formula Grant Program). The program establishes a new funding source for mitigation measures and is thus being added to CDOT's MAP. Apportionments of the grant are based on a formula that incorporates the following six factors: population, population density, local zoning, transit ridership, vehicle revenue miles, and the share of disproportionately impacted community population or Transportation Disadvantaged Communities. The CTE has been working since January 2025 to implement the SB230 Formula Grant Program and allocate resources to agencies, is in the process of making the first grant awards, and anticipates the distribution of funds to eligible transit entities will begin in the second half of FY26.

Funding/Resources/Partnerships

The Oil and Gas Production Fee, enacted as part of SB24-230, requires CTE to implement a production fee, based on quarterly average spot prices, that is paid quarterly by every producer of oil and gas in the state and applies to all oil and gas produced in the state on and after July 1, 2025. Proceeds from the fees are allocated to three programs: The SB230 Formula Program (70% of revenues), a discretionary transit grant program (10% of revenues), and a passenger rail program (20% of revenues). The SB230 formula Program will enable CTE to fund more transit-oriented projects across the state to expand transit service, increase ridership, and contribute to reductions in GHG emissions because of the additional business purpose and revenue stream from the Oil and Gas Production Fee. and For FY26, limitations on CTE funding levels resulting from Proposition 117 will result in SB230 Formula Program funding of about $37 million. For FY27 and beyond, CTE projects annual funding levels will average $70 to 80 million. However, because program funding levels are tied to oil and gas prices, they are likely to fluctuate over time.

Medium-Duty and Heavy-Duty Electrification Strategies

Electric Transit Vehicles for Rural Transit Agencies

This strategy measures the outcomes of CDOT's support for the replacement of diesel transit buses with electric transit buses in non-MPO areas. In CDOT's previous GHG MAP (2022) we established a goal of replacing 25 diesel transit buses with electric buses between 2020 and 2030. From 2020 to 2025, 13 electric transit buses have been placed into service in the state's rural areas through a combination of grant money from the CTE, the Volkswagen Diesel Emission Settlement Program, and federal grants. In the years to come, the CTE will play an important role in facilitating the transition of Colorado's transit fleet to zero emission vehicles (ZEVs). The CTE is an entity created within CDOT by SB21-260 which collects revenues through a Clean Transit Retail Delivery Fee to fund support for public transit electrification planning efforts, facility

upgrades, fleet motor vehicle replacements, as well as construction and development of electric motor vehicle charging and fueling infrastructure. The CTE public transit electrification program has now been operating for over three years and has awarded a total of approximately $15.5 million in grants to entities around the state to support a transition to zero-emission transit services. This includes eight Zero-Emission Transition Planning grant awards (totalling just over $500,000) and 11 Zero Emission Transit Capital Grant awards – one facility project, one infrastructure project, and nine vehicle projects which will result in 28 zero emission transit vehicle purchases (totalling $15 million). The CTE opened a new round of grants on September 29, 2025 which will close on December 5, 2025.

GHG Reductions Benefits and Timing

Table A-14. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - MD/HD: Electric Transit Vehicles

Mitigation Project Type	Unit	Project Lifetime	MT GHG/Unit 2030	MT GHG/Unit 2040	MT GHG/Unit 2050
Replace diesel transit buses with battery-electric buses	Per new vehicle	12 years	85	76	74

Table A-15. Currently Awarded EV Bus Grants

Time Period	Number of EV buses placed into service	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
2020 -2025	13	1,105	0	0
2026-2027 (estimated)	19	1,615	0	0
2028-2030 (estimated)	17	1,445	1,292	0
Total	49	4,165	1,292	0

Table A-15 estimates the GHG reduction benefit achieved by grants for transit ZEVs in the non-MPO areas of the state. Table A-14 re-displays the GHG reduction rates for transit bus electrification from PD 1610.0, which were used to calculate the benefits in Table A-15. From 2020 to 2025, 49 buses have been awarded to the non-MPO areas through CTE and other grants, 13 of which have been placed into service. The remaining 36 are expected to be placed into service over the next 5 years. Notably, the lifetime of an EV bus is 12 years, so any vehicle placed into service from 2020 to

2027 will not result in GHG emission reductions in 2040 or 2050. Additionally, any vehicle placed into service from 2020 to 2030 will not result in GHG emissions reductions in 2050.

In Table A-16, CDOT estimates the GHG reduction benefit associated with how many new transit ZEVs the CTE might be likely to fund from grants that have yet to be awarded, between the most recent call for applications (beginning September 2025) through 2050. To develop the estimates on the number of transit ZEVs placed into service in the non-MPO areas of the state due to this program, CDOT forecast estimated Retail Delivery Fee revenues from the CTE 10-Year Plan, considered the relative percentage of grants that have been awarded to rural transit agencies, estimated the cost of transit ZEVs, the grant amount per vehicle, and the number of rural transit ZEVs funded per year. CDOT will revisit these future projections as more data becomes available.

Table A-16. Future CTE Grant Projections for EV Bus Grants

Timeframe	Number of ZEV Buses Placed into Service (estimated)	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
2028-2030	21	1,785	1,596	-
2031-2037	57	-	3,876	-
2038-2040	21	-	1,596	1,554
Total	165	1,785	7,068	1,554

Co-benefits

Table A-17 - Annual Estimated Pollutants Avoided (kg) from the combined EV bus replacement strategy in the non-MPO areas, 2030-2050

Co-Benefit	2030	2040	2050
CO	10,438	14,769	10,388
NOx	12,916	14,932	10,455
PM 2.5	418	280	196
SO_2	15	21	15
VOCs	781	845	583

Measure Origin and History

The CDOT Division of Transit & Rail (DTR) has helped to support the regular replacement of transit vehicles reaching the end of their service life with new transit vehicles (including hybrid and zero-emission models) for many years. In 2018, Colorado adopted its state Beneficiary Mitigation Plan (BMP) for the approximate $68.7 million allocation of the national Volkswagen Diesel Emission Settlement, which dedicated $30.6 million in the state's funding for the Settlement Program transit bus replacement grants. Settlement Program grants can fund up to 110% of the incremental cost of replacing an existing diesel vehicle with a zero-emission alternative, and since 2019 more than $21 million of the original amount has been awarded. The grant programs created by the CTE in 2022 will continue this work into the future, with funding secured by the Clean Transit Retail Delivery Fee. With the increases in funding established by CTE CDOT decided to update this measure compared to the original commitments made in GHG MAP (2022).

Funding/Resources/Partnerships

The CTE Board includes six members appointed by the governor, and executive directors or their designees from CDOT, Colorado Department of Public Health and Environment and the CEO. Appointed board members will serve terms of three or four years. SB 21-260 established several new fees on the delivery of items that are subject to the state sales tax, including the retail delivery fee, a portion of which funds the activities of the CTE, the Clean Transit Retail Delivery Fee, allowing it to issue grants, loans, and rebates to support electrification of public transit. Colorado Revised Statute (CRS) 43-4-1203 (7)(b) initially set the rate at $0.03 per delivery, which is the maximum amount established by SB21-260, although the fee may be adjusted for inflation in future years. Since then, the CTE Board has made periodical adjustments of the fee to account for inflation.

Traffic Operations Strategies

Roundabout Construction

Roundabouts have long been recognized for their safety and mobility benefits. In addition, the increased efficiency they provide at intersections benefits air quality by reducing GHG emissions. In developing CDOT's updated Mitigation Action Plan we assessed more fully both local agency and CDOT funded projects since the adoption of CDOT's 2020 baseline 10-Year Plan. PD 1610 states, "A locally-driven project, not otherwise prompted or developed as a result of CDOT or MPO action (e.g. funded or directly incentivized) may be included in the MAP if it is a GHG Mitigation Measure

contained in Appendix A of this Policy." The statewide travel model does not distinguish between a roundabout and traditional signalized intersection. Therefore, CDOT has included roundabout construction in the MAP to capture the additional air quality benefits the newly added roundabout projects provide. The scale of this measure is statewide for projects located outside of MPO areas.

GHG Reductions Benefits and Timing

Replacing an existing signalized intersection with a roundabout or installing a completely new roundabout in lieu of an intersection are both treated as creditable under this measure since the air quality benefits are similar. The lifetime GHG reduction benefit of constructing a roundabout is considered to be 30 years. Therefore, any roundabouts constructed in 2020 and beyond will have a GHG reduction benefit through the last 2050 compliance year of the Standard. The PD 1610 emissions factors for this strategy are summarized below in Table A-18.

Table A-18. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - Traffic Operation Strategies: Roundabouts

Mitigation Project Type	Unit	Project Lifetime	MT GHG/Unit 2030	MT GHG/Unit 2040	MT GHG/Unit 2050
Replace Signalized Intersection with Roundabout	Per 10,000 AADT per roundabout	30 years	221	133	55

To determine the GHG reduction benefit the Annual Average Daily Traffic (AADT) must be known or estimated for the intersections. Data to develop these estimates was obtained from CDOT traffic counters. CDOT determined that between 2021 and 2025 twelve local agency and CDOT funded roundabouts were constructed in non-MPO areas with a total estimated combined AADT of 142,000. In addition, between 2026 through 2030 CDOT anticipates an additional 13 roundabouts will be constructed with an estimated combined AADT of 113,000. Beyond 2030 CDOT is setting some initial aspirational goals to build an additional 26 roundabouts with a minimum combined AADT of 260,000 between 2031 through 2040. Replacing a signalized intersection with a roundabout has a 30 year lifetime benefit. Any measure that occurs by 2030 will also be garnering GHG reductions in 2050, which is reflected in the GHG emissions reduction calculations. The projected rolling combined GHG reduction benefit for each horizon year is contained in Table A-19 below.

Table A-19. Projected Rolling Combined GHG Reduction Benefits for Roundabouts, 2030-2050

Time Period	Number of Roundabouts Constructed within Time Period	Combined Total AADT of New Roundabouts	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
2021 through 2030	25	255,000	5,636	3,392	1,403
2031 through 2040	26	260,000	-	3,458	1,430
Total	51	515,000	5,636	6,850	2833

Co-benefits

Roundabouts improve air quality compared to traditional intersections by reducing vehicle idling and fuel consumption which reduces emissions. The primary reason for this is the continuous, free-flowing movement of traffic, which eliminates the need for vehicles to stop and accelerate frequently. Roundabouts are not a VMT reduction strategy. A detailed evaluation of pollutant co-benefits would require individual project level traffic simulation modeling and therefore was not possible. However, one study[16] indicates rebuilding of a signalised intersection into a roundabout resulted in an average decrease in CO emissions by 29% and NOx emissions by 21%.

Measure Origin and History

While the safety and mobility benefits of roundabouts have been widely accepted in the transportation sector, in developing the Standard in 2021 CDOT also began to explore how roundabouts have the potential to lower GHG emissions. Through extensive analysis, CDOT has established that in addition to the extensive set of safety and mobility benefits, roundabouts also go a long way towards reducing emissions. The benefits of roundabout construction are considered additional because the GHG reduction benefits of roundabouts cannot be distinguished from a more conventional at-grade intersection by the travel demand model.

Funding/Resources/Partnerships

[16] https://www.sciencedirect.com/science/article/abs/pii/S1361920901000116

Funding of roundabout projects may include support from local governments as well as state and federal funding. The combination thereof will not be determined until project programming occurs either by the local agency or CDOT through the 4-year prioritized plan as part of the 10-Year Plan process or the Statewide Transportation Improvement Program (STIP) through other CDOT Programs.

Traffic Signal Retiming

Retiming traffic signals improves air quality and reduces emissions by smoothing traffic flow, which leads to less stop-and-go driving and less idling time. This results in less fuel consumption and fewer air pollutants such as GHGs. Additionally, these efforts provide cost savings to travelers by improving travel time reliability and reducing fuel costs. Minimizing stop and go traffic also increases safety by reducing the potential for crashes. In developing CDOT's updated Mitigation Action Plan we assessed more fully CDOT regional efforts to complete signal retiming in non-MPO areas.

GHG Reductions Benefits and Timing

The lifetime GHG reduction benefit of retiming/optimizing a signal is considered to be 5 years. Therefore, any signals retimed between 2025 and the end of 2030 will have a GHG reduction benefit in the 2030 compliance year of the Standard. To receive GHG reduction credit in the 2040 compliance year signals would need to be retimed between 2035 and the end of 2040. The PD 1610 emissions factors for this strategy are summarized in Table A-20.

Table A-20. PD 1610 GHG Mitigation Benefit Emissions Factor Summary - Traffic Operation Strategies: Signal Retiming

Mitigation Project Type	Unit	Project Lifetime	MT GHG/Unit 2030	MT GHG/Unit 2040	MT GHG/Unit 2050
Retime/Optimize Arterial Signals	Per 10,000 AADT per signal optimized within 5 years prior to evaluation year	5 years	50	33	23

The 2030 GHG reduction benefits represented below are based on 43 traffic signals retimed during 2025 and an additional 20 traffic signals expected to be retimed by CDOT between 2026-2029 within non-MPO areas. Total combined AADT for these signals was estimated using CDOT traffic count data. CDOT has set aspirational goals

for the 2040 compliance year to retime 40 signals within 5 years of the 2040 compliance year. Benefits were calculated based on the presumption that across all 40 signals the average AADT would be 12,000.

Table A-21. Projected Rolling Combined GHG Reduction Benefits for Signal Retiming, 2030-2050

Time Period	Number of Signals Retimed	Combined Total AADT of Signals Retimed	MT GHG Reduction 2030	MT GHG Reduction 2040	MT GHG Reduction 2050
2025 through 2030	63	832,957	4,165	-	-
2035 through 2040	40	480,000	-	1,584	-
Total	103	1,312,957	4,166	1,584	0

Co-benefits

Retiming signals improve air quality by reducing vehicle idling and stop-and-go traffic which increases efficiency and reduces fuel consumption and emissions. Signal retiming is not a VMT reduction strategy. A detailed evaluation of pollutant co-benefits would require individual project modeling and therefore was not possible.

Measure Origin and History

Emission reduction benefits of signal retiming have been widely accepted in the transportation sector. CDOT developed an emissions factor included in PD 1610 to estimate the GHG reduction benefits from retiming signals. As part of the emissions factor development CDOT considered the disbenefit of induced VMT from vehicles that may choose to travel on a more efficient roadway. The benefits of signal retiming are considered additional because the GHG reduction benefits of signal retiming cannot be accounted for by CDOT's travel demand model.

Funding/Resources/Partnerships

Signal retiming is primarily managed at the regional level. Signal retiming is a function of local MPOs or initiated at the local government level as most signalized corridors pass through multiple jurisdictions, requiring a coordinated approach. CDOT regional staff support signal retiming on CDOT maintained roadways located within non-MPO jurisdictions. Regions typically initiate signal retiming projects on corridors that have experienced significant changes in land use, roadway geometry, or traffic patterns. Projects may also be prompted by public complaints, safety concerns, or prolonged

congestion. Commonly MPOs have programs that dedicate funding to signal retiming efforts, while CDOT uses a variety of state or federal funds to support these efforts.

Appendix A.3 - Benefits to Disproportionately Impacted Communities

In 2021, Governor Polis enacted HB21-1266 which focuses on prioritizing a reduction in environmental health disparities to disproportionately impacted (DI) communities. A DI community as defined in CRS 24-4-109 (2)(b)(II), is a community in a census block group that meets one of the following criteria:

- the proportion of households that are at or below 200% of the federal poverty line is greater than forty percent,
- the proportion of households that identify as a minority is greater than forty percent,
- the prioritization of households that are housing cost-burdened is greater than forty percent,
- the proportion of people that are linguistically isolated is greater than twenty percent,
- Communities with cumulative environmental and socioeconomic impacts, which can be identified by having a Colorado EnviroScreen score above the 80th percentile,
- The Southern Ute and Ute Mountain Ute reservations,
- Mobile home communities,
- And historically marginalized communities.

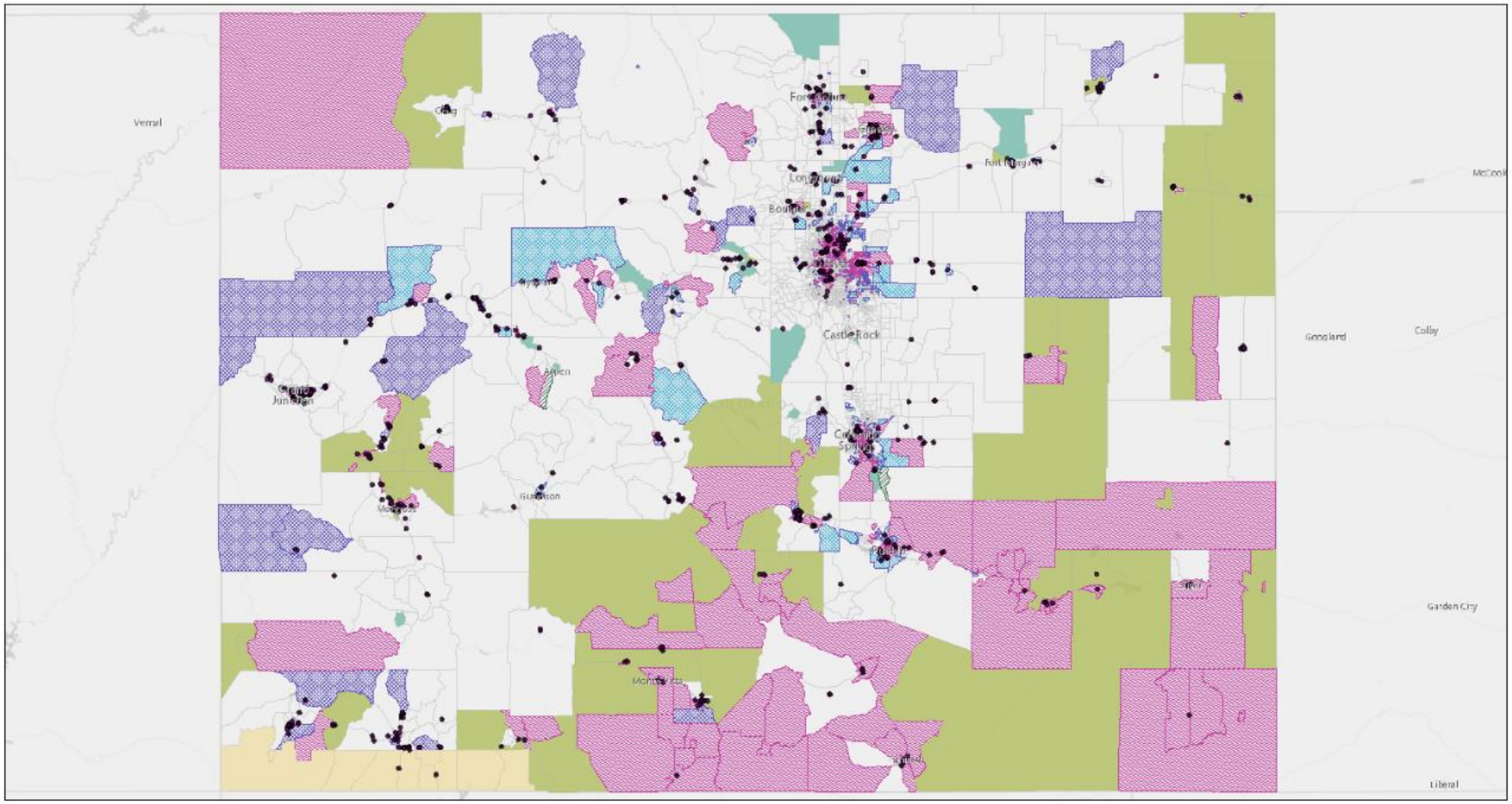
DI communities across Colorado are identified in Figure A-2 below.

At this time, CDOT does not have a final GHG mitigation measure equity benefits standards document available for measuring DI community benefits of GHG mitigation measures, per PD 1610. A tool for this purpose is in the draft stages of development. Additionally, GHG mitigations established in this plan are in the early stages of project selection and development or programmatic in nature. Therefore, CDOT does not have enough details to determine and measure potential benefits to DI communities. However, their potential benefits for DI Communities is described below.

Land use changes like increased residential densities can lead to increased total housing availability and reduced transportation costs, especially when these residential areas are transit efficient and associated with affordable housing. Because the main goal of land use strategies is to help provide multimodal infrastructure resulting in shorter and fewer trips by single occupancy vehicles, land use changes lead to

decreased need for single occupancy vehicles altogether and, in turn, lead to savings for families in DI communities. Also, if a community is designated as a Neighborhood Center, that community will receive funding for more multimodal options and other GHG reduction efforts. This funding can significantly improve DI communities.

Figure A-2 - Disproportionately Impacted Communities in Colorado



Increasing public transit options in both urban and rural areas leads to transit-efficient communities that can create better access to education, community services, health care, and affordable housing for community members. Both Bustang and Outrider intersect with DI communities within Colorado. These public transit services help create better access to jobs, hospitals, grocery stores, among other destinations, positively benefiting these communities and decreasing the cost of transportation.

Electrifying MD/HD buses that intersect with DI communities not only has the potential to create the positive impacts listed above, but also will reduce emissions from the buses that are providing improved access. Eliminating tailpipe emissions from transit buses that are typically diesel fueled substantially decreases localized pollution in communities including at bus stops. Emissions reductions lead to improved air quality in DI communities resulting in improved public health and wellness.

Roundabouts and signal retiming are operational mitigation measures that are recognized for their safety improvements and mobility benefits. These operational strategies reduce vehicle crashes leading to reduced costs for individuals. They also create increased efficiency at intersections by reducing vehicle idling and therefore fuel use which benefits air quality in DI communities where they are located.

CDOT intends to work to quantify GHG mitigation benefits to DI communities through annual MAP updates to the TC as project specifics become more clear.

Appendix B - Travel Demand Model Calibration/Methodology

This appendix presents detailed information about the modeling processes used to forecast travel demand in the non-MPO and the emissions associated with the forecasted automotive travel demand. This appendix is divided into sections as follows:

- Section B.1 provides an overview of CDOT's StateFocus travel demand model.
- Section B.2 gives a more detailed description of the individual components within the StateFocus ABM.
- Section B.3 explains how the StateFocus model addresses five of the six dimensions of choice behavior associated with what some stakeholders may call "induced demand."
- Section B.4 documents the many assumptions that underlie the StateFocus travel demand estimates for each of the horizon years and compliance scenarios considered.
- Section B.5 provides a summary of the 2015 calibration run of the current version of StateFocus.
- Section B.6 discusses the non-MPO portion of state-wide travel demand forecasts summarized in Section B.4

Appendix B.1 - Model Technical Details and Methodology

CDOT's statewide ABM meets all minimum modeling standards as described in the memo "Modeling Requirements to Meet Greenhouse Gas Standards", prepared by the Statewide Model Coordination Group (SMCG). CDOT's model:

- Has been extensively calibrated and validated against large databases of traffic counts (from CDOT's count program), transit boarding counts (from numerous transit operators around the state), and traffic speed data (from the software-as-a-service and data vendor firm INRIX);
- Uses all the credible and official data sources as inputs, including the 2010 Front Range Travel Counts survey for model estimation; the state demographer's office estimates and forecasts of population/households/jobs; the Colorado Department of Labor and Employment (CDLE) Quarterly Census of Employment and Wages (QCEW) employment data; Census Transportation Planning Package (CTPP)/AASHTO Census Transportation Solutions (ACTS); origin-destination data from the firm Streetlight Data; and other sources;

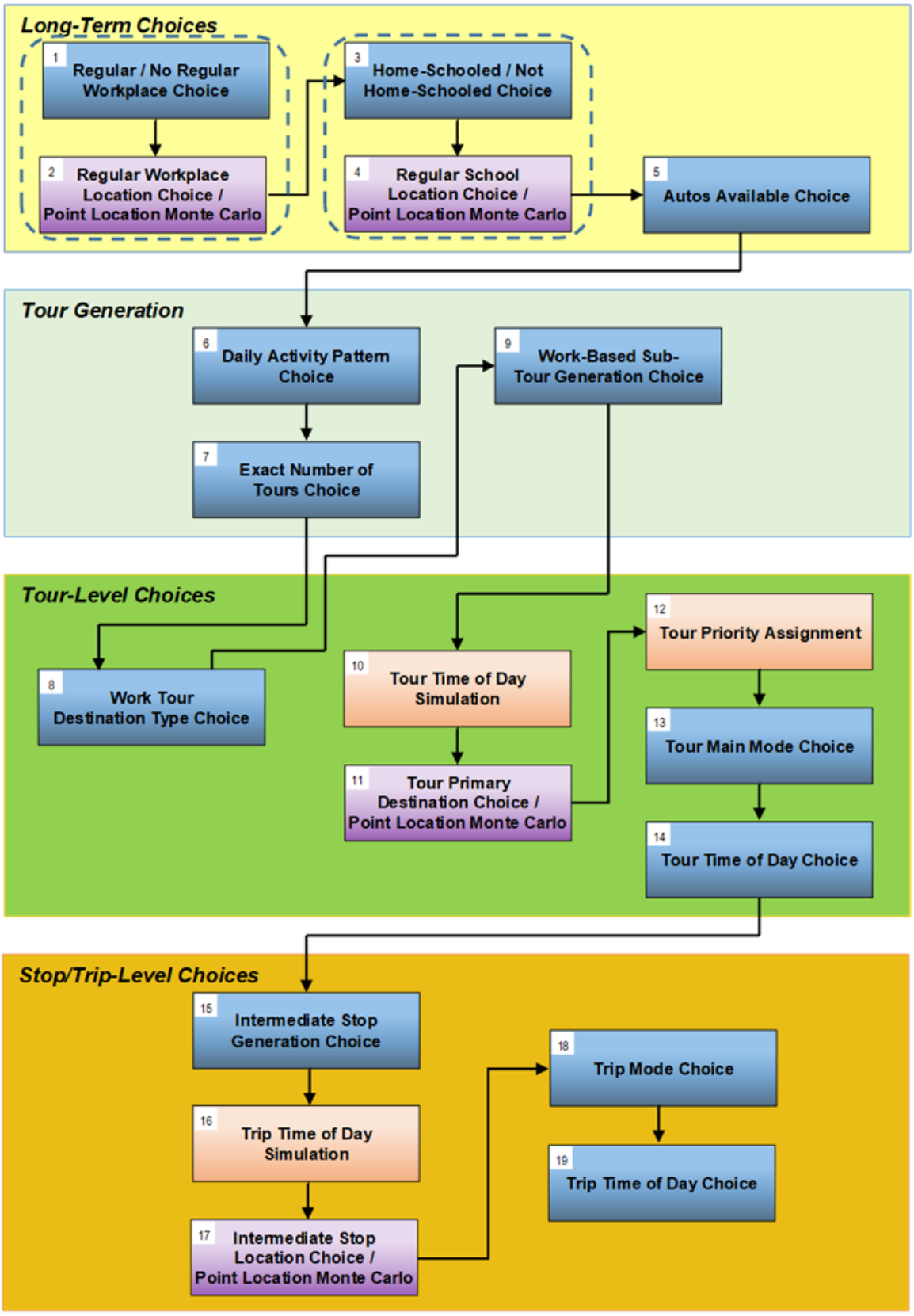
- Is supported by a detailed set of operational documentation, and a highly detailed set of model design and estimation documentation that exceeds 400 pages in length;
- Uses a household/person input dataset generated by the population synthesizer PopGen, a widely-used product of the Arizona State University's faculty;
- Includes in its mode choice models the complete basic set of active transportation modes, including separate bicycle and pedestrian modes;
- And depicts the location of jobs and households individually, at specific address locations.

As an ABM, CDOT's model possesses a number of important capabilities not well-supported by earlier model forms:

- It models work location choice, including an "at-home" choice;
- It derives travel from each person's choice of daily activities, providing a realistic depiction of changes in people's travel behavior as travel conditions change;
- It includes "accessibility variables" in all the model components that need them, providing sensitivity of various travel choices to travel conditions (for example, travel time, delay and cost);
- It depicts trips in "tours" (round trips), including depiction of multiple stops on tours, again a realistic depiction of travel that leads to more accurate model outcomes.
- These and other features permit CDOT's statewide model to support sensitivity to "induced demand", again much better than older model forms.

Figure B-1 provides a diagram of CDOT's statewide model components. The first five components are classified as Long-Term Choices: (1) Regular/No Regular Workplace Choice, (2) Regular Workplace Location Choice, (3) Home-Schooled/Not Home-Schooled Choice, (4) Regular School Location Choice, (5) Autos Available Choice. Components (6) Daily Activity Pattern Choice and (7) Exact Number of Tours Choice are classified as Tour Generation. The following component, (8) Work Tour Destination Type Choice, is the first Tour-Level Choice component. Component (9) Work-Based Subtour Generation, is the final Tour Generation component. Five more Tour-Level Choice components follow: (10) Tour Time of Day Simulation, (11) Tour Primary Destination Choice, (12) Tour Priority Assignment, (13) Tour Main Mode Choice and (14) Tour Time of Day Choice. The final five components are Stop/Trip-Level Choices: (15) Intermediate Stop Generation Choice, (16) Trip Time of Day Simulation, (17) Intermediate Stop Location Choice, (18) Trip Mode Choice and (19) Trip Time of Day Choice.

Figure B-1: CDOT's Statewide Activity-Based Model



Appendix B.2 - Model Component Descriptions

The activity-based modeling element of StateFocus produces a simulated set of itineraries for a typical weekday (spring or fall, when schools are in session, but before seasonal roadways such as Independence Pass or Trail Ridge Road have closed for the winter) using a sequential process of around 20 distinct types of travel or activity decisions. The choice components presented in Figure B-1 are described below:

- Regular or no regular workplace choice. For employed people, does the person have a regular location of employment (like an office worker) or not (like a plumber.)
- Regular workplace location choice. For workers who have a regular workplace location, where is it (home, or one of many possible locations in the state.)
- Home schooled or not. For people who are students, as the name implies. (Note that students who virtually attend schools located out-of-state are also considered to be home schooled, since StateFocus only has an inventory of educational institutions within Colorado.)
- Regular school location choice. For students who are not home-schooled, where is their regular school.
- Auto availability choice. For each household, how many automobiles do they own or have available.
- Daily activity pattern choice. Out of a set of seven activity categories, which activities will each person choose to do in the day. The seven activity categories - which also define travel purposes - are as follows:
    - Work and work-related activities, including volunteering, attending business meetings and training, and interviewing for jobs.
    - Schooling, at all levels from pre-school to professional, vocational or graduate studies.
    - Escorting other family members to their activities.
    - Personal business activities such as banking, getting legal advice, receiving medical care, and hair or beauty styling.
    - Shopping, whether for frequently purchased items such as groceries, or for less-frequently purchased items such as furniture or electronics.
    - Meals away from home, typically purchased from a restaurant or similar establishment.
    - Social and recreational activities, which includes visiting family members and friends, attending religious services, participating in civic activities, exercising, viewing professional sports, going to a concert, and seeing a play or movie in a theater.

- Exact number of tours choice. For each activity category in the person's day, how many tours (round trips) will the person make for that activity.
- Work tour destination type choice. For workers who have a regular workplace location, are they going there to work, or to some other place.
- Work-based subtour choice. For workers who work out of the home, how many tours (round trips) will the person make from and returning to the workplace, and for what purpose(es)?
- Tour primary destination choice. For all tours whose destination isn't already known, select the location.
- Tour main mode choice. The primary mode for the tour (round trip). The StateFocus model considers the following modes:
    - Single-occupant driver
    - Two-person carpool, regardless of whether the person is driving or a passenger
    - Three- or more-person carpool or vanpool
    - Taking transit by driving or getting dropped off at a park-and-ride lot or perhaps an informal location.
    - Taking transit while only walking or rolling (in a wheelchair, scooter or bike) to and from the origin and destination, and between transit vehicles.
    - Walking, including people who use a wheelchair or other mobility device.
    - Biking. Faster micromobility modes such as electric scooters would also be included in this mode.
    - Using a school bus, which is only available for school tours.
- Tour time of day choice. The time that the tour starts, paired with the time the tour ends.
- Intermediate stop generation choice. How many (and for what purpose) other stops are on the tour (besides the main stop at the tour destination and its purpose.)
- Intermediate stop location choice. The destination location for each intermediate stop.
- Trip mode choice. Will the trip use the primary mode for the tour, or which other mode will it use.
- Trip time of day choice. The time of day at which the person arrives at each stop on the tour.

Appendix B.3 - Modeling Induced Demand

Induced demand typically is viewed as having six components. CDOT's ABM handles five of these "endogenously", meaning internally to the model. Endogenous

components interact with one another naturally in the model, as a person considers all of the corresponding choice dimensions as he or she reacts to changes in the transportation environment. The six components or choice dimensions are described below, together with how a common change in a road network (adding freeway lanes) might affect them:

- Change of route: added lanes to a congested freeway can cause traffic to divert from parallel roads, increasing volume on the freeway.
- Change of destination: improved travel times can cause drivers to select more distant destinations, increasing overall system miles driven.
- Change of daily activity pattern. Reduced congestion due to freeway expansion can cause people to make trips they would not have made under more congested conditions.
- Change of mode. Reduced congestion can cause people to divert from transit to automobile trips.
- Change of time of day. Drivers avoiding peak periods due to congestion may shift back into peak periods if congestion is reduced.
- Change of development pattern. Over the medium-to-long term, adding capacity to a freeway corridor can attract additional development to the corridor, reducing or eliminating any initial reduction in congestion in the corridor due to the capacity expansion.

Note that CDOT's ABM does not model changes in development pattern endogenously. However, the model can be used to examine the effects of land use scenarios (with the planners and modelers developing different possible development pattern futures, and inputting them to the model to test their effects.)

Appendix B.4 - Modeling Inputs and Outputs

Each time CDOT updates a plan such as the current 2027-2036 10-Year Plan, the Planning Standard requires CDOT to use its travel demand model, StateFocus, to compare the proposed updated plan to the baseline plan in effect when the legislation was adopted, the CDOT 2019 10-Year Plan. Each plan contains a program of improvements over time, and the Planning Standard requires CDOT to evaluate both plans at each compliance horizon year that remains in the future. For this evaluation, those future years are 2030, 2040 and 2050.

Travel model inputs can be generally classified into three categories: (1) socioeconomic forecasts, (2) descriptions of the transportation network and (3) parameters representing various elements of travel behavior. While model forecasts have already been created for the baseline CDOT 2019 10-Year Plan, the adoption of the current 2027-2036 10-Year Plan may likely trigger a need to make new forecasts

of the Baseline CDOT 2019 10-Year Plan should any of the following circumstances apply:

- New socioeconomic forecasts are available that are substantially different from the ones previously used. DOLA updates their socioeconomic forecasts every year, and through the Statewide Model Coordination Group (SMCG), Colorado transportation planning agencies committed to using DOLA forecasts from no older than four years ago.
- More detailed or revised information about a transportation improvement in either plan may become available as that project proceeds through the environmental clearance, design and construction phases. For example, in a distant horizon year, a new roadway may be modeled with a generic or "most likely" alignment. Over time, more details may become available for any number of reasons - to avoid an environmental or cultural resource, to respond to stakeholder desires, or to take advantage of opportunities to optimize the project cost, for example. Similarly, station planning or scheduling efforts for a proposed transit service may allow anticipated service characteristics to be known with greater clarity. The new information may allow the project to be better represented in the model.
- Additional or more recent data may allow CDOT modeling staff to select parameters that more faithfully represent the current understanding of travel behavior. For example, when the CDOT 2019 10-Year Plan was adopted, news of the COVID-19 pandemic was beginning to emerge. The stay-at-home orders issued in 2020 resulted in a departure from past commuting and shopping behavior. Transportation practitioners wondered whether behaviors developed during the pandemic would continue after better medical treatments became available, or whether - and to what extent - people might return to pre-pandemic behaviors.

For GHG analysis, the primary travel model outputs of interest are the forecasted volume, VMT and travel speed at the link level. (Link VMT is calculated as the link volume multiplied by its distance. Travel speed is calculated by a volume-delay function used in the traffic assignment step.) Other model outputs include a trip roster (a list of all trips with information such as mode, origin, destination, purpose, departure time, arrival time), modal origin-destination matrices, transit ridership by stop and route, and potentially station-to-station matrices on specific routes (often for proposed services).

Description of Baseline Networks

The baseline model network reflects the full build-out of all Regionally Significant projects in the CDOT 2019 10-Year Plan as adopted by the Commission in April 2020.

2030 Baseline Network

In the non-MPO area, there are four Regionally Significant projects included in the horizon year 2030 baseline network representing the CDOT 2019 10-Year Plan:

1. I-70 auxiliary lanes on the west side of Vail Pass,
2. US 40 Fraser Safety Improvements,
3. I-70 westbound auxiliary lane from Bakerville to the Eisenhower-Johnson Memorial Tunnel,
4. I-70 reconstruction around Floyd Hill, and
5. US 160 at Elmore's Corner east of Durango.

Changes in 2030 Baseline Network from the 2022 plan

While the Baseline networks always represent the CDOT 2019 10-Year Plan, the following refinements were made to the 2030 baseline network coded previously from the 10-Year Plan GHG Transportation report adopted in September 2022 (called "the 2022 Plan" going forward) to more faithfully model the 2030 baseline network for this current 2027-2036 10-Year Plan GHG Transportation Report:

- Realigning CO 82/Grand Ave in Glenwood Springs to match new bridge configuration and updated distance. (This edit also shortened the length of RFTA's Ride Glenwood route.)
- Reflecting the opening of the Lawson Hill Park & Ride just outside Mountain Village, the diversion on the Durango-Grand Junction Outrider route to serve downtown Telluride was dropped. The SMART Lawson Hill route was coded to provide comparable access to downtown Telluride.
- Adjustmenting centroid connectors and stops on the Maroon Bells shuttle that RFTA operates in cooperation with the Forest Service to better reflect existing connectivity.
- Correcting a routing error on the southwest-bound Alamosa-Pueblo Outrider in Cañon City.
- Adding over 50 nodes as park & ride lots, primarily informal lots and locations used for drop-off and pick-up ("Kiss & Ride") to better reflect transit use patterns in the non-MPO areas. About 14 park & ride lots were re-coded to different nodes to better represent their location. Table B-1 describes the affected park & ride lots in the non-MPO area.

- Adding Amtrak long-distance services (*California Zephyr* and *Southwest Chief*).

Table B-1. Non-MPO locations where park & ride coding was added to allow drop-off & pick up

Park & Ride name or location	Locality	Routes Served
Glenwood Springs Amtrak Station	Glenwood Springs	*California Zephyr*
Granby Amtrak Station	Granby	*California Zephyr*
Fort Morgan Amtrak Station	Fort Morgan	*California Zephyr*
Trinidad Amtrak Station	Trinidad	*Southwest Chief*
Adams State University	Alamosa	Alamosa-Pueblo Outrider
Mountaineer Square	Mount Crested Butte (CB)	(CB-DUS Outrider, incorrectly), Gunnison Valley RTA
Four-Way Stop	Crested Butte	Crested Butte-Denver Outrider, Gunnison Valley RTA
CO 135 & Brush Creek Rd	South Crested Butte	(CB Outrider), Gunnison Valley RTA
Almont	Almont	(CB Outrider), Gunnison Valley RTA
Tall Texan	Gunnison	(CB Outrider), Gunnison Valley RTA
US 50 & Colorado St (hotel)	Gunnison	Crested Butte-Denver Outrider
Main St & Railroad St	Buena Vista	Crested Butte-Denver Outrider
Stockbridge Transit Center	Steamboat Springs	Craig-Denver Outrider
US 40	Parshall	Craig-Denver Outrider
US 40	Empire	Craig-Denver Outrider
US 160 & Sligo St	Cortez	Durango-Grand Junction Outrider
CO 145 & 4th St	Dolores	Durango-Grand Junction Outrider

Park & Ride name or location	Locality	Routes Served
Lawson Hill	Mountain Village	Durango-Grand Junction Outrider
CO 52 & I-76	Hudson	Sterling-Denver Outrider
Market St & I-76	Keenesburg	Sterling-Denver Outrider
Weld County Road (CR) 73 & I-76	Roggen	Sterling-Denver Outrider
CDOT Rest Area, US 6 & I-76	Wiggins	Sterling-Denver Outrider, Sterling-Greeley Outrider
Morgan Community College	Fort Morgan	Sterling-Denver Outrider, Sterling-Greeley Outrider
US 36 & Turner St	Brush	Sterling-Denver Outrider, Sterling-Greeley Outrider
US 6	Merino	Sterling-Denver Outrider, Sterling-Greeley Outrider
Logan County Courthouse	Sterling	Sterling-Denver Outrider, Sterling-Greeley Outrider
US 34 & Weld CR 53	Kersey	Sterling-Greeley Outrider
Elm St & Ash St (railroad museum)	Trinidad	Trinidad-Pueblo Outrider
Main St & San Antonio Ave	Aguilar	Trinidad-Pueblo Outrider
Main St & 5th St	Walsenburg	Trinidad-Pueblo Outrider
CO 165	Colorado City	Trinidad-Pueblo Outrider
Eagle County Maintenance	Gypsum	Core Valley
US 6 & CO 131	Wolcott	Core Valley
Freedom Park	Edwards	Core Hwy 6, Valley
US 24 Forest Service	Minturn, Dowd Junction	Core Hwy 6, Leadville & Minturn
US 24 & Spruce St	Leadville	Core Leadville

Park & Ride name or location	Locality	Routes Served
US 160 & CO 149	South Fork	Mountain Valley Transit
US 160 & CO 112	Del Norte	Mountain Valley Transit
US 160 & Jefferson St (Chamber of Commerce)	Monte Vista	Mountain Valley Transit
CO 112 & Broadway	Center	Mountain Valley Transit
Visitor Center	Estes Park	The Peak (multiple)
US 34 Workshire Lodge	Estes Park	The Peak Red
Old Hwy 66 & Elk Meadow Lodge	Estes Park	The Peak Brown
US 6 & 7th St (Firehouse)	Silt	RFTA Hogback
US 6 & Castle Valley Blvd	New Castle	RFTA Hogback
SoCoCAA Office	Ignacio	Road Runner Transit
CO 172 & DRO Airport	Durango	Road Runner Transit
US 160 & CO 172 Elmore's Corner	Durango	Road Runner Transit
Mercury Dr	Durango	Road Runner Transit
Copper Mountain	Copper Mountain	Summit Stage Copper Mountain
CO 9/Main & 2nd	Alma	Summit Stage Park County Commuter
CO 9 & McCullough Gulch	Blue River	Summit Stage Blue River & Park County Commuter
Breckenridge Station	Breckenridge	Summit Stage (multiple)
River Run	Keystone	Summit Stage Keystone-Dillon-Silverthorne
US 6 & Lake Dillon Dr/Evergreen Rd	Dillon	Summit Stage Keystone-Dillon-Silverthorne
Silverthorne Station	Silverthorne	Summit Stage (multiple)

Park & Ride name or location	Locality	Routes Served
CO 9 & 13th St	Silverthorne	Summit Stage Silverthorne Loop
CO 144 & I-76	Log Lane Village	Proposed NECALG Morgan County route
US 6	Hillrose	Proposed NECALG Morgan County route

Source: CDOT compilation of multiple operator schedules

2045 Baseline Network

The 2045 Baseline network considered some additional stops in the non-MPO area as informal P&R locations - where a transit passenger could get dropped off or picked up by a friend or family member - to allow more precise modeling of the CDOT 2019 10-Year Plan with the current version of CDOT StateFocus, 1.84. No highway construction projects were anticipated between the 2030 and 2045 horizon years of the earlier plan. Similarly, no new or expanded transit services were modeled. As with the 2030 Baseline Network, some additional transit stops were coded to allow drive-access. These additional stops (beyond those already coded in the 2030 Baseline Network) and the transit operator serving them are as follows:

- CO 17 & Hooper - Mountain Valley Transit
- CO 17 & Mosca - Mountain Valley Transit
- US 160 & US 550 Grandview Interchange - Pagosa Outrider & SoCoCAA RRT
- CO 172 east of Oxford - SoCoCAA Road Runner Transit
- CO 172 & Southern Ute Health Center - SoCoCAA Road Runner Transit
- CO 172 & CR 509 - SoCoCAA Road Runner Transit
- US 285 & Villa Grove - Mountain Valley Transit
- US 285 east of Saguache - Mountain Valley Transit
- Crested Butte South - Gunnison Valley RTA
- US 6 & Elk Lot Beaver Creek - Core Transit
- CO 9 & Blue River Road - Summit Stage
- CO 9 & Breckenridge Peak 9 Lot - Summit Stage
- CO 9 & Swan Mountain Road - Summit Stage
- US 24 near Red Cliff - Core Transit

Additionally, some stops were moved: Dolores, Durango-La Plata County airport (DRO) airport, US 550 & South Montrose Target, CO 82 & Cattle Creek (from CO 133), CO 82 & Old Snowmass, US 50 & Gunnison Travel Lodge, US 40 & Stockbridge Transportation

Center, I-25 Business in Walsenburg, Brush, Estes Park visitor center, Telluride (to the Lawson Hill P&R) and Delta (to Confluence Park). Finally, the Outrider bus stop at Montrose Regional Airport (MTJ) was removed to reflect current operations.

Changes in 2045 Baseline Network from 2022 plan

The refinements made to the 2030 baseline network were also applied to the 2045 baseline network. The other changes (from the 2030 Baseline Network) listed above generally followed the 2045 baseline network from the 2022 plan.

Description of Action or Compliance Networks

Action or compliance networks reflect new capital projects or transportation services added to the compliance plan since the 2022 adoption of the Standard. Throughout this appendix, the term "compliance" is used as a shortcut for the CDOT 2027-2036 10-Year Plan which is proposed for adoption by the Transportation Commission of Colorado in spring of 2026.

2030 Compliance Network

The 2030 Compliance network does not include any regionally-significant highway capacity projects in the Non-MPO area beyond those already in the baseline network. However, the 2030 Compliance network has more transit routes than the 2030 baseline. Some notable transit routes in the 2030 Compliance network, which are not in the 2030 Baseline network, are as follows:

- Colorado Blvd BRT = Colorado Stn (Evans/I-25/Buchtel) to 40th & Colorado Stn
- Federal Blvd BRT = two patterns:
    - Englewood Stn to Westminster Stn (71st, B Line)
    - Federal & Evans Transfer Center to Wagon Rd PnR
- Modifications to existing RTD local routes to support the new BRT services
- Joint Rail between DUS and Fort Collins South Transit Center, with three round trips/day, eight stations
- Mountain Rail Short = an enhanced version of Amtrak's current *Winter Park Express* - two round trips/day (seven day/week) DUS-Granby, six stations
- New North Pueblo mobility hub at I-25 Exit 108 Purcell Blvd

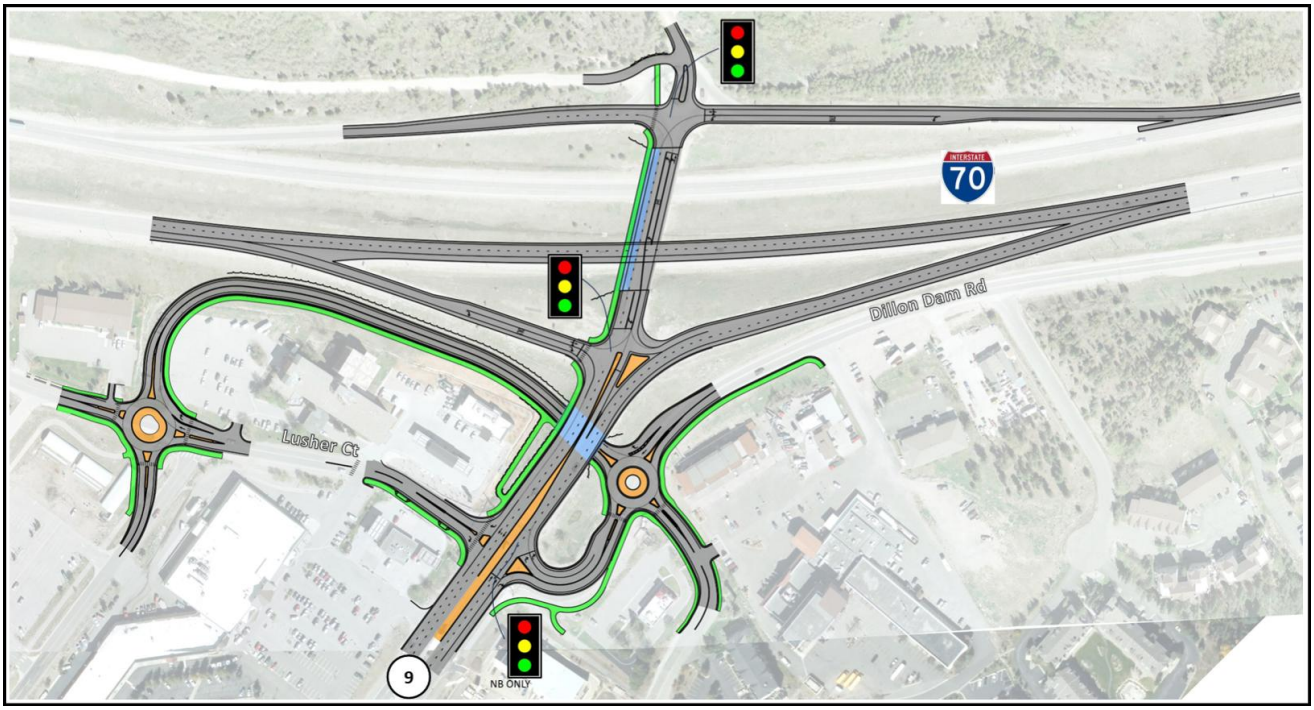
The 2030 compliance network also added existing services such as

- All Points Transit Montrose, Olathe, Delta Express & OurWay routes,
- Core Transit's Minturn-Vail route,
- The SMART system (except for the Rico & Lawson Hill-Mountain Village routes)
- SST Main Line,

- Summit Stage X-Flyer to Arapahoe Basin

Finally, several Summit Stage routes serving Frisco Station were modified to reflect the CO 9 signal at Lusher Ct/Dillon Dam Rd being converted to right-in-right-out (RIRO) access only, as shown by the schematic in Figure B-2. This model coding modification included adding link detail for Meadow Dr, Ten Mile Dr, Ten Mile Rd and a proposed frontage road underpass.

Figure B-2: Proposed underpass and frontage road at I-70 Exit 203 with CO 9 in Frisco



Source: CDOT

Changes in 2030 Compliance Network from 2022 plan

Compared to the 2030 Compliance network from the 2022 plan, the current 2030 Compliance network makes the following changes:

- Adds Joint Rail between DUS and Fort Collins South Transit Center
- Adds Mountain Rail (expanded Winter Park Express) between DUS and Granby
- Updates Bustang West Line and Durango-Grand Junction Outrider routing between downtown transit center and Grand Junction Regional (GJT) Airport.
- Bustang South Line reflects more detail for Monument P&R, closes the Tejon P&R for security concerns, and adds the Pikes Peak State College - Centennial Campus stop as a new transfer center.
- Bustang North Line is re-coded to serve a median Berthoud mobility hub.
- Adds a Bustang/Outrider stop in North Pueblo at I-25 & Purcell Blvd

- Updates the Sterling-Denver Outrider route according to published changes in stops and routing: the route uses DEN Airport instead of RTD's Peoria Station. It no longer stops at Lochbuie, Hudson, Roggen, Log Lane Village or Hillrose.
- Updates the Sterling-Greeley Outrider route according to published changes in stops and routing: The route no longer stops at Log Lane Village or Hillrose.
- Provides more detailed coding around Frisco Station (Bustang, Pegasus, Summit Stage) to reflect the proposed underpass near I-70 Exit 203, described earlier.
- Enforces the Summit Stage policy of not allowing travel within Lake County or within Park County along the respective commuter routes.
- A Swan Mountain Road closure means the X-Flyer Breckenridge-Silverthorne and Frisco-Arapahoe Basin routes have to detour.
- Provides a more detailed routing of Core Transit's Valley Route in Gypsum.
- Adds the Core Transit Minturn-Vail route as a short-turn variant of the Leadville-Vail route pattern.
- Updates the Core Transit fare policy of free travel within most of Eagle County, except $3 for trips starting or ending in Gypsum, which voted not to become part of the RTA. Trips to Leadville and Lake County remain at $7.
- Changed RTD Colfax Lynx BRT guideway from peak period only to 24-hours within Denver.
- More detailed modeling of RTD Federal Blvd BRT and Colorado Blvd BRT.

2045 Compliance Network

Relative to the 2045 baseline network, the 2045 compliance network represents:

- All 2030 Compliance network elements above
- Expansion of Joint Rail to FRPR with 10 round trips per day. Two patterns use Pueblo or Colorado Springs as the southern terminus.
    - Modification of Mountain Metro Zeb Free Downtown Shuttle to better serve America the Beautiful Station
- Expansion to Mountain Rail:
    - Add one round trip per day between DUS and Craig
    - Add three round trips per day on a Yampa Valley Local route (Craig to Oak Creek)
- Relocation of Outrider and Mountain Valley Transit stops to use the proposed Poncha Springs Crossroads Transit Center
- More detailed coding of Bustang North Line to reflect the time-of-day patterns in use on the I-25 Central (reversible) Express Lanes

Changes in 2045 Compliance Network from 2022 plan

Elements of the current 2045 compliance network that weren't included in the 2022 GHG Transportation Report modeling include:

- RTD BRT-related changes (including feeder routes) described above for 2030
- Amtrak, FRPR (12 stations from Pueblo to Fort Collins, inclusive) and Mountain Rail (13 stations from Craig to DUS, inclusive)
- Core Transit's Minturn-Vail route
- All Points Transit's regional routes (Montrose, Olathe, Delta [MOD] Express and OurWay [serving Montrose, Ridgway and Ouray])
- Mountain Metro Zeb Free Downtown Shuttle modified to serve America the Beautiful Station
- SMART routes (excluding Rico and Lawson Hill-Mountain Village)
- Steamboat Springs Transit's Main Line
- Summit Stage's X-Flyer to Arapahoe Basin
- Mountain Express Transit in Pagosa Springs identified an Aspen Springs Park & Ride lot for the 2045 horizon, but CDOT was not able to verify the location or anticipated service changes within the constraints of the travel modeling schedule.

Modeling Assumptions

DOLA socioeconomic forecasts (county control totals)

Changes in socioeconomic forecasts from the 2022 plan to the current 10-Year Plan are shown in Tables B-2 and B-3. The current socioeconomic forecasts typically reflect a more modest growth projection because of the COVID-19 pandemic limiting growth during its duration.

Table B-2. Summary of model socioeconomic inputs and outputs for 2030 and 2040 GHG compliance runs

Socioeconomic data	2030 forecast in 2022 report	Current 2030 forecast	2040 forecast in 2022 report	Current 2040 forecast
Population	6,974,465	6,467,694	7,813,938	7,080,765
Households	2,950,775	2,702,130	3,295,546	2,968,835
Employment	3,995,831	3,963,747	4,307,732	4,215,674

Socioeconomic data	2030 forecast in 2022 report	Current 2030 forecast	2040 forecast in 2022 report	Current 2040 forecast
Number of workers who work at home - baseline	259,652	187,101	288,056	203,996
Number of workers who work at home - action	915,712	671,172	1,014,893	729,010

Source: CDOT, DOLA

Table B-3. Summary of model socioeconomic inputs and outputs for 2050 GHG compliance runs

Socioeconomic data	2050 forecast in 2022 report	Current 2050 forecast
Population	8,653,410	7,693,837
Households	3,640,316	3,235,539
Employment	4,619,632	4,467,602
Number of workers who work at home - baseline	316,460	220,890
Number of workers who work at home - action	1,114,073	786,848

Source: CDOT, DOLA

Travel behavior assumptions: work from home, bike speed, perceived walking speed

Changes in behavioral assumptions for travel modeling for the future baseline and compliance scenarios are summarized in Table B-4. Specific assumptions related to e-bike adoption and average bike speed for compliance forecasts, interpolated for five year increments, are summarized in Table B-5.

Table B-4. Summary of travel behavior parameter changes by forecast scenario

Parameter type	2030 & 2045 baseline assumptions	2030 compliance assumptions	2045 compliance assumptions
Gender-specific active mode biases	Same as pre-pandemic base year	Half the value of the pre-pandemic base year	No bias
Lowest age for senior active mode biases for home-based work & other tour mode choice	50, same as pre-pandemic base year	62.5	75
Senior-specific active mode biases for home-based other tour mode choice	Same as pre-pandemic base year	Same as pre-pandemic base year for walk, half for bike	Same as pre-pandemic base year
Lowest age for older adult walk bias in trip mode choice	35, same as pre-pandemic base year	55	75
Older adult walk bias in trip mode choice	Same as pre-pandemic base year	Same as pre-pandemic base year	Same as pre-pandemic base year
Highest age for youth & young adult active mode biases for home-based other tour mode choice	20, same as pre-pandemic base year	20, same as pre-pandemic base year	20, same as pre-pandemic base year
Youth & young adult specific active mode biases for home-based other tour mode choice	Same as pre-pandemic base year	Half the value of the pre-pandemic base year	No bias

Parameter type	2030 & 2045 baseline assumptions	2030 compliance assumptions	2045 compliance assumptions
Rural area type bike bias for school trips	Same as pre-pandemic base year	Eleven-twelfths the value of the pre-pandemic base year	Five-sixths the value of the pre-pandemic base year
Actual bike speed (mph - average of traditional and electric bikes)	12	13	14
Perceived walking speed (mph)	3	5	5

Source: CDOT StateFocus model

Table B-5. Relationship between e-bike adoption and average bicycle speed by year

Forecast Year	Percent of bicycles that are e-bikes	Average bicycle speed (mph)
2015 (calibration)	0%	12
2030	25%	13
2040 (interpolated)	41.67%	13.67
2045	50%	14
2050 (extrapolated)	58.33%	14.33

Source: CDOT

Post-processing of distance-based weights on transit trips

While making refinements to StateFocus as part of the FRPR Service Development Plan, the CDOT modeling unit and consultant staff noticed that StateFocus appears to under-predict long-distance transit trips. One limitation of the current StateFocus version is that it was estimated from 2009-2010 Front Range Travel Counts survey data. At that time, the only intercity transit service in Colorado with sizable ridership was the Front Range Express or FREX, which traveled between the Colorado Springs and Denver metro areas (about 70 miles).

The study team determined that a post-processing step after the activity-based components and before transit assignment (of the last speed feedback iteration) would be the most effective means of adjusting the transit trip length distribution. Transit trips of over 100 miles between origin and destination would be weighted up, while shorter trips were weighted down so that the statewide total number of transit trips would remain roughly constant. The final weights are shown in Table B-6. Note that transit trips to DEN Airport - which are not forecasted by activity-based components - remain unweighted.

Table B-6. Transit trip weights by trip distance

Transit trip distance (miles)	Weight for transit trips to DEN Airport	Weight for all other transit trips
0.000 to 69.999	1.0	0.833
70.000 to 99.999	1.0	0.950
100.000 to 149.999	1.0	2.000
150.000 to 249.999	1.0	1.500
250.000 or more	1.0	1.200

Source: CDOT

Statewide Forecast Outputs

Tables B-7 and B-8 show key model inputs and outputs for the model scenarios run in support of GHG analysis under the Standard, for the statewide model area, which includes the Non-MPO Areas, the latter being the area for which CDOT is responsible under the Standard. (For statistics specific to only the Non-MPO Area, please see appendix section B.6 and Tables B-11 and B-12)

Table B-7. Summary of model inputs and outputs for 2030 and 2040 GHG compliance runs

Baseline and GHG Action Modeling Inputs & Outputs	2030 Baseline	2030 Action	2040 Baseline	2040 Action
Lane miles by roadway type				
Interstate	5,264	5,265	5,349	5,344

Baseline and GHG Action Modeling Inputs & Outputs	2030 Baseline	2030 Action	2040 Baseline	2040 Action
Expressway	1,878	1,877	1,931	1,926
Principal arterial	11,963	11,973	12,186	12,181
Minor arterial	12,318	12,319	12,599	12,598
Collector & others	52,535	52,556	53,858	53,867
Total lane miles	**83,958**	**84,000**	**85,922**	**85,915**
Vehicle & transit data for a typical weekday				
Vehicle miles traveled (VMT)	170,733,534	155,788,468	186,428,854	169,634,853
VMT per capita	26.40	24.09	26.33	23.96
Person miles traveled (PMT) in autos	209,221,943	192,221,541	228,884,343	209,619,296
Average vehicle speed (mph)	35.47	36.82	34.63	36.15
Vehicle hours traveled (VHT)	4,813,152	4,231,193	5,383,356	4,692,920
Vehicle hours of delay (VHD)	580,473	381,349	736,432	482,414
Transit boardings	498,193	457,400	543,186	494,621
Weekday VMT by roadway type				
Interstate	52,333,920	48,353,911	56,153,576	51,926,038
Expressway	13,941,579	12,778,158	15,978,212	14,571,005
Principal arterial	51,047,145	46,565,544	55,472,839	50,366,698
Minor arterial	20,845,502	18,800,958	23,172,007	20,842,802
Collector & others	32,565,387	29,289,898	35,652,218	31,928,310

Baseline and GHG Action Modeling Inputs & Outputs	2030 Baseline	2030 Action	2040 Baseline	2040 Action
Weekday Trip mode share				
Single occupant vehicle	13,906,618	12,805,996	15,254,906	13,977,514
Shared ride trip	9,565,072	8,967,301	10,623,100	9,839,466
School bus	605,008	559,762	630,460	581,984
Bicycle	433,116	477,521	470,812	663,931
Walk	1,449,853	2,422,692	1,631,143	2,794,984
Transit	368,992	335,119	397,435	357,374
Total weekday person trips	**26,328,658**	**25,568,392**	**29,007,856**	**28,215,253**

Source: CDOT

Note: Calculations were made with more decimal places shown in the table. Totals may not add because of rounding. Values for 2040 were interpolated between 2030 and 2045 model forecasts.

Table B-8. Summary of model inputs and outputs for 2050 GHG compliance runs

Baseline and GHG Action Modeling Inputs & Outputs	2050 Baseline	2050 Action
Lane miles by roadway type		
Interstate	5,433	5,424
Expressway	1,983	1,964
Principal arterial	12,408	12,389
Minor arterial	12,879	12,876
Collector & others	55,182	55,177
Total lane miles	**87,886**	**87,831**
Vehicle & transit data for a typical weekday		

Baseline and GHG Action Modeling Inputs & Outputs	2050 Baseline	2050 Action
Vehicle miles traveled (VMT)	202,124,174	183,481,237
VMT per capita	26.27	23.85
PMT in autos	248,546,742	227,017,051
Average vehicle speed (mph)	33.95	35.60
Vehicle hours traveled (VHT)	5,953,560	5,154,646
Vehicle hours of delay (VHD)	892,391	583,480
Transit boardings	588,180	531,841
Weekday VMT by roadway type		
Interstate	59,973,232	55,498,166
Expressway	18,014,846	16,363,851
Principal arterial	59,898,533	54,167,852
Minor arterial	25,498,513	22,884,646
Collector & others	38,739,048	34,566,722
Weekday Trip mode share		
Single occupant vehicle	16,603,194	15,149,031
Shared ride trip	11,681,129	10,711,631
School bus	655,912	604,206
Bicycle	508,508	850,341
Walk	1,812,433	3,167,277
Transit	425,878	379,629
Total weekday person trips	31,687,054	30,862,115

Source: CDOT

Note: Calculations were made with more decimal places shown in the table. Totals may not add because of rounding. Values for 2050 were extrapolated from 2030 and 2045 model forecasts.

Appendix B.5 - Travel Model Calibration and Validation Process

When travel models are built, they go through a process of "estimation" (an economic modeling term), in which survey or other data are used to "estimate" the numerous relationships in the model between, for example, the likelihood of a particular travel mode being chosen given the characteristics of the person doing the choosing (for example, age, gender, employment status, etc.) and of the various modes available to that person (for example, cost, travel time, etc.) The model estimated in this way produces a variety of results, such as numbers of transit boardings, volumes on roads, and travel patterns between parts of the state (for example, total trips between the North Front Range Region and the Denver region), among many others.

After the model is initially built, it is subjected to a process of calibration and validation. In this process, rather than just assuming the model's results are accurate, we check them against other sources of information by using the model to make a "forecast" of a base year for which we have additional information. These additional information are sometimes called "calibration targets." These targets include:

- Automobile traffic counts. CDOT maintains an extensive program of acquiring such data, which are used for this purpose (and many other purposes).
- Transit boardings. CDOT obtains such data from numerous transit providers around the state.
- Travel pattern data. These data are available from a number of sources, including the US Census and private data vendors.
- Highway speed data. These data are primarily available today from private data vendors.

Models are estimated typically using survey data, which of course is taken in a particular year (in the CDOT model case, 2010.) A version of the complete model is built to depict that year (for example, the road and transit systems as they existed then, the number and geographic distribution of people and jobs in that year, etc.) The model is then run, producing the results discussed above. Those results are compared to counts taken in the year 2010. If the model's results do not compare closely enough to the counts, adjustments are made to appropriate elements of the model in order to bring the results sufficiently close to the counts. This process is referred to as "calibration".

Well-developed models also are subjected to a process known as "validation". This process is much the same as calibration, but is carried out for a different calendar year. In CDOT's case, a version of the model was built depicting the year 2015 (again, road and transit systems for that year, people and jobs, etc.) The model is then run for this year, and again the results are compared to counts such as those described above. The point of doing model validation is to test whether the model, having been developed to do a good job of depicting reality in the calibration year (in this case the year 2010) can also do a good job with a different year (2015), when the region has changed (different development, different transportation networks, etc.) In this way, we test the model's ability to correctly respond to those differences/changes through time.

CDOT's travel modeling team has conducted extensive calibration/validation on the statewide model, most recently in the context of the FRPR project. Table B-9 below shows a summary of the highway portion of the 2015 calibration run. This table is just one of numerous tables that the StateFocus model can produce to evaluate many elements of the model's results. The table shows how closely the model matches the counts, aggregated into each of the facility types in the model. The table also shows how much data was used in making these comparisons.

The table shows that industry-established calibration targets were not meant for the Interstate, minor arterial, and collector & others types. CDOT modeling staff were willing to accept these limitations in the highway calibration to give more focus to the transit calibration.

The Model Calibration and Validation Documentation Report is available through the GHG Program Website.

Table B-9. Difference between modeled auto volumes and counts by facility type

Roadway type	Number of counts	Percent difference between model & counts	Target
Interstate	675	-13%	+/-7%
Expressway	202	-2%	+/-7%
Principal arterial	2,355	-4%	+/-10%
Minor arterial	2,056	-18%	+/-10%
Collector & others	2,136	-35%	+/-15%
Ramps	95	9%	N/A

Roadway type	Number of counts	Percent difference between model & counts	Target
Total (statewide)	7,546	-11%	+/-5%

Source: CDOT

Note: N/A = Not applicable, because no target for the percentage difference between modeled ramp volumes and counts has been established.

Table B-10 shows the transit calibration results. The overall forecasted statewide boardings are close to the observed level - the model is three percent over. The forecasted RTD boardings are also three percent over, likely reflecting the fact that in 2015, RTD boardings represented roughly five-sixths of statewide boardings.

All versions of StateFocus to date have struggled to adequately predict ridership for the Roaring Fork Transportation Authority (RFTA), the top rural transit operator by ridership in the U.S., and the Colorado transit agency - rural or urban - with the most ridership after RTD. The StateFocus model also under-predicts autos on CO 82 between Glenwood Springs and Aspen. Both these results suggest that StateFocus under-predicts travel by all modes in the Roaring Fork Valley because it doesn't adequately capture travel by visitors and part-year residents. Neither of these groups are included in the synthetic population used by the activity-based components of StateFocus.

StateFocus also under-predicts ridership on the rural systems operated by Gunnison Valley RTA and Road Runner Transit (the latter overseen by the Southern Colorado Community Action Agency or SoCoCAA), likely for similar reasons it under-predicts for RFTA. The Gunnison Valley RTA serves a roughly 27-mile corridor between the City of Gunnison and Crested Butte, while RFTA's corridor is about 43 miles between Glenwood Springs and Aspen.

StateFocus comes within two percent of predicting overall Transfort ridership. While Transfort and Mountain Metro Transit (MMT) have similar levels of ridership, the StateFocus model over-predicts MMT ridership by 62 percent. While there are many dimensions to explore, one factor leading to the estimate might be that residents of the Mountain Metro service area are less inclined to use transit relative to the average Coloradan reflected by the model's parameters.

The Bustang core routes (South Line, North Line and West Line) were a particular focus of the calibration effort, which included adding a CSU student variable to mode choice calculations and reviewing the distribution of work trips by residents of

Larimer and Weld Counties. Overall, StateFocus comes reasonably close in forecasting the Bustang core system ridership, with an 8 percent under-estimate.

Note that transit systems where StateFocus has the greatest percent difference between forecasted volume and observed ridership tend to be those systems with lesser overall ridership. Such smaller systems would typically be a challenge to model, and even a high percentage difference for a lower-ridership system would mean a low absolute difference. That is, the absolute difference between modeled and observed ridership for Bustang (61 riders per weekday); Gunnison Valley RTA (117); Mountain Metro (6,788); RFTA Valley Local, Valley Express and Grand Hogback (1,718); Road Runner Transit (112) and Transfort (220) are each less than the absolute difference for RTD (9,893). CDOT has confidence in the transit ridership forecasts because of how closely the total ridership calibrates, and because for each system, the difference in ridership is a small absolute number, a small percentage or both.

CDOT is also working to improve its modeling capability to model non-MPO transit ridership in several ways. CDOT is in the process of developing a higher-resolution statewide zone scheme with greater detail in non-MPO communities such as Aspen, Durango, Glenwood Springs, Gunnison, Montrose, Steamboat Springs and Vail. CDOT also sponsored a statewide household travel survey, Colorado Travel Counts, that collected responses between February 2024 and February 2025. That survey data is currently being processed and will allow CDOT to better model travel outside the Front Range MPO areas, on weekends, and during the winter and summer recreational peaks.

Table B-10. Difference between modeled transit volumes and counts

Transit system	2015 observed average weekday ridership	Percent difference between model & counts
Bustang (excludes Outrider)	813 (2018)	-8%
Gunnison Valley RTA	285 (2010)	-41%
Mountain Metro Transit	11,002	+62%
Roaring Fork Transportation Authority (Valley Local, Valley Express & Grand Hogback)	2,700	-64%
Regional Transportation District	364,135	+3%
Road Runner Transit	160	-70%

Transit system	2015 observed average weekday ridership	Percent difference between model & counts
Transfort	13,998	-2%
Overall (where observed ridership is available)	**393,093**	**+3%**

Source: CDOT, including compilation of observed ridership from individual transit systems

Notes: Bustang core routes are the North Line, South Line and West Line. Bustang service modeled is comparable to 2018 service levels, so its ridership is compared against observed 2018 ridership counts.

Appendix B.6 - Extracting the non-MPO portion of statewide forecasts.

The emissions modeling process reflects emissions being allocated to agencies based on the location of the GHG emissions, which might be called "where the tires meet the pavement." That is, emissions are not allocated based on the residence of the travelers in the vehicle, nor to the address where the vehicle is registered. Therefore, the VMT and emissions considered for the non-MPO area may include travel by residents of any of the five Colorado MPOs or even by out-of-state visitors. Similarly, travel by rural and small urban Colorado residents within the MPO areas is considered by the respective MPOs. The nature of travelers crossing through individual GHG compliance areas, such as between individual MPOs or between an MPO(s) and the non-MPO area make it necessary for CDOT to model statewide transportation behavior in order to accurately characterize this cross agency jurisdiction travel in Colorado.

To estimate CDOT's portion of statewide travel and emissions, those quantities occurring within the five MPO areas needed to be excluded. TransCAD, the travel demand modeling software utilized by CDOT, possesses the functionality to split roadway links where they cross MPO boundaries, enabling these VMT and associated emissions calculations on these smaller sections of roadway links solely in the non-MPO area. MPOs use their own models to calculate VMT and emissions within their respective planning areas. This link-splitting process also allowed CDOT to exclude model links ("external stations") that extended into neighboring states. The lengths of the split links are recalculated using an appropriate spatial software, such as TransCAD or ArcGIS Pro, in order to account for the adjusted VMT from the split links where roads cross a GHG compliance area boundary.

As part of this 2027-2036 10-Year Plan assessment, CDOT updated its GHG compliance

area boundaries based on minor refinements communicated by both the Pikes Peak Area Council of Governments (PPACG) and the Grand Valley Metropolitan Planning Organization (GVMPO). These changes to the MPO area boundaries were a result of (1) needing greater resolution than shown on letter size maps included with their board adoption packet, (2) reflecting existing agreements about the agency responsible for capital improvements and maintenance, and (3) preferring continuous roadway sections that conformed to Census geography.

The GVMPO boundary refinements included:

1. Including the portion of I-70 roughly between MP 16.76 and 17.33 within the GVMPO area, consistent with adjacent sections.
2. Including roughly 0.025 miles of L ½ Rd east of 16 ½ Rd within the GVMPO area, reflecting considerations of that intersection.
3. Including the portion of 17 ½ Rd north of the (Main Line) Grand Valley Canal to just north of Waters Ln in the GVMPO area.
4. Including the portion of 23 Rd north of the (Main Line) Grand Valley Canal to just north of I ½ Rd within the GVMPO area.
5. Including the portion of 24 Rd on either side of the Grand Valley Canal within the GVMPO area, so that a roadway structure (the bridge over the canal) is not split between agencies.
6. Including all of the I-70 alignment from 33 Rd (roughly Mile Post (MP) 37.04) to the Colorado River and US 6 half-diamond interchange (roughly MP 43.68) within the GVMPO area, since local traffic on that segment would be generated by developments within the MPO area.
7. Smoothing a concave area of the GVMPO boundary so that US 50 roughly between MP 42.23 and 43.44 are included in the MPO area, as are adjacent sections of the highway.
8. Converting a “stair-step” portion of the GVMPO boundary to a diagonal (Northwest-Southeast) line so that Desert Rd will remain in the MPO area once it enters from the south.

The refinements that PPACG made to their boundary include:

1. Excluding the portion of (El Paso & Pueblo) County Line Rd east of I-25 and the railroad from the PPACG area.
2. Excluding the portion of Rancho Colorado Blvd west of the I-25 SB ramps at Exit 119 from the PPACG area.
3. Including the portions of Midway Ranch Blvd immediately west of I-25 (functioning as a frontage road) within the PPACG boundary.
4. Including the portion of Old Stage Rd west of Transmitter Ln, and the segment of Gold Camp Rd descending from Old Stage Rd (including historic Tunnels 4 through 7) in the PPACG boundary.

5. Including the intersection of Gold Camp Rd and Bear Creek Rd within the PPACG boundary.
6. Including all of US 24 Business in Manitou Springs near Rainbow Falls, and its half-diamond interchange with mainline US 24, within the PPACG boundary.
7. Including the eastbound lanes of mainline US 24 roughly between MP 293.86 (Fountain Creek near Cascade) and MP 297.08 (US 24 Business interchange north of Manitou Springs) within the PPACG boundary, as the WB lanes are.
8. Including two lower sections of the Pikes Peak Toll Highway within El Paso County - one from Cascade to near Crystal Creek Reservoir and a second that crosses the reservoir's dam - within the PPACG boundary. (Portions of the toll highway that reenter El Paso County near the Pikes Peak summit remain in the non-MPO area.)
9. Including Teller CR 28/Edlowe Rd between CR 281 and US 24 within the PPACG boundary.
10. Excluding portions of University Dr west of Trout Creek from the PPACG area.
11. Likewise, excluding the portions of Teller CR 25/Trout Creek Rd that are west of Trout Creek from the PPACG area.
12. Including the section of Rampart Range Rd (Forest Rd 300) north of Loy Creek Rd to its branch just south of Carroll Lakes Rd and the Rampart Sled Hill within the PPACG boundary, while excluding the portion of Rampart Range Rd north of there.
13. Excluding Mt Herman Rd between its intersections with Sunburst Dr and Shiloh Pines Dr from the PPACG area.
14. Including County Line Rd/Palmer Divide Rd from the Town of Palmer Lake to Furrow Rd within the PPACG boundary and excluding all portions east of Furrow Rd, per maintenance agreements between Douglas and El Paso counties. (The section between Furrow Rd and the Douglas & Elbert county line is within the DRCOG area, while the section east of the county line is in the non-MPO area.)
15. Including Elbert Rd from Judge Orr Rd north to the El Paso & Elbert county line within the PPACG area.
16. Including Judge Orr Rd from Elbert Rd to Ellicott Highway within the PPACG boundary.
17. Including the portion of Ellicott Highway from Squirrel Creek Rd to Judge Orr Rd within the PPACG area.
18. Including the portion of Squirrel Creek Rd west of Ellicott Highway within the PPACG boundary.

Working collaboratively, CDOT, DRCOG and NFRMPO identified areas for potential future refinements to their mutual boundaries. However, the plan adoption and regulatory compliance schedule did not allow the agencies to reach agreement - or

barely to begin such discussions - on boundary refinements, and so the calculations presented here are based on the pre-existing boundary delineations.

The travel model forecasts for the resulting non-MPO area are shown in Tables B-11 and B-12.

Table B-11. Non-MPO portion of model inputs and outputs for 2030 and 2040 GHG compliance runs

Baseline and GHG Action Modeling Inputs & Outputs	2030 Baseline	2030 Action	2040 Baseline	2040 Action
Lane miles by agency				
DRCOG	18,598	18,604	20,295	20,268
GVMPO	2,668	2,668	2,692	2,692
NFRMPO	4,111	4,111	4,263	4,213
PACOG	1,521	1,522	1,536	1,538
PPACG	5,143	5,143	5,283	5,278
Non-MPO (CDOT)	51,848	51,855	51,877	51,884
Total lane miles	**83,958**	**84,000**	**85,922**	**85,915**
Non-MPO lane miles by roadway type				
Interstate	2,613	2,621	2,618	2,618
Expressway	446	446	457	453
Principal arterial	5,518	5,518	5,373	5,390
Minor arterial	7,067	7,067	7,202	7,200
Collector & others	36,202	36,202	36,226	36,223
Weekday Non-MPO VMT by roadway type				
Interstate	11,316,059	10,659,138	12,451,632	11,801,239
Expressway	1,443,392	1,344,383	1,762,750	1,613,085
Principal arterial	10,914,663	10,020,520	11,489,036	10,674,077

Baseline and GHG Action Modeling Inputs & Outputs	2030 Baseline	2030 Action	2040 Baseline	2040 Action
Minor arterial	4,863,880	4,425,839	5,426,272	4,962,695
Collector & others	11,847,164	10,706,394	12,645,901	11,490,073
Total Weekday non-MPO VMT	**40,385,157**	**37,156,273**	**43,775,591**	**40,541,169**
Non-MPO GHG emissions				
GHG emissions (MMT/year)	4.886	4.495	3.315	3.061

Source: CDOT

Note: Totals may not add because of rounding and because of the inclusion of out-of-state lane-mileage and VMT in the model area total.

Table B-12. Non-MPO portion of model inputs and outputs for 2050 GHG compliance runs

Baseline and GHG Action Modeling Inputs & Outputs	2050 Baseline	2050 Action
Lane miles by agency		
DRCOG	21,991	21,931
GVMPO	2,716	2,716
NFRMPO	4,314	4,314
PACOG	1,552	1,552
PPACG	5,423	5,413
Non-MPO (CDOT)	51,906	51,914
Total lane miles	**87,886**	**87,831**
Non-MPO lane miles by roadway type		
Interstate	2,624	2,614
Expressway	468	460

Baseline and GHG Action Modeling Inputs & Outputs	2050 Baseline	2050 Action
Principal arterial	5,228	5,262
Minor arterial	7,336	7,333
Collector & others	36,250	36,244
Weekday Non-MPO VMT by roadway type		
Interstate	13,587,206	12,943,340
Expressway	2,082,108	1,881,788
Principal arterial	12,063,409	11,327,634
Minor arterial	5,988,664	5,499,551
Collector & others	13,444,637	12,273,751
Total Weekday non-MPO VMT	**47,166,025**	**43,926,065**
Non-MPO GHG emissions		
GHG emissions (MMT/year)	2.558	2.371

Source: CDOT

Note: Totals may not add because of rounding and because of the inclusion of out-of-state lane-mileage and VMT in the model area total.

COLORADO
Department of Transportation
Division of Transportation Development

Appendix C - 2025 MOVES4 Modeling and Greenhouse Gas Emissions Calculation Methodology

To: Transportation Commission
From: Sabrina Williams - CDOT and Dale Wells - CDPHE
Date: December 22, 2025

Subject: CDOT Greenhouse Gas Transportation Planning Standard — 2025 MOVES4 Modeling and Greenhouse Gas Emissions Calculations Methodology Documentation.

Appendix C.1 - Introduction:

This document summarizes the methodology used to calculate greenhouse gas (GHG) emissions for demonstrating compliance with the CDOT Greenhouse Gas (GHG) Transportation Planning Standard (Standard). Previous GHG emissions calculations to support CDOT were conducted by the Air Pollution Control Division (APCD). This methodology represents a coordinated approach between CDOT and APCD's modeling teams to represent likely future on-road GHG emissions as accurately as possible. The approach was also agreed upon by the Statewide Model Coordination Group (SMCG). Several refinements and improvements were made compared to the previous methodology for calculating GHG emissions due to the availability of new models, data and assumptions. All data and files utilized in the GHG emissions analysis methodology were reviewed by an individual other than the person who developed the data and/or performed the modeling as documented throughout.

The process for calculating GHG emissions begins with generating emission rates using the EPA's Motor Vehicle Emissions Simulator Model (MOVES). The GHG emissions rates developed in MOVES are the same statewide and applied consistently between all agencies to calculate mass total GHG emissions for a compliance area. The emission rates are multiplied by the vehicle miles traveled (VMT) from the Travel Demand Model (travel model) at the link level for individual hours of the days based on the observed vehicle mix from CDOT's statewide Automated Traffic Recorder (ATR) station network within a Microsoft (MS) Access relational database. The result of querying the database is the predicted total mass emissions of GHGs for the roadways represented in the travel model for an average weekday. This requires a series of data analysis and post-processing steps

to correctly compile these three main parameters (emissions rates, travel behavior, vehicle mix) into compatible formats within the database.

In 2025 the three significant new considerations for how GHG emissions are calculated for the purposes of an agency demonstrating compliance with the Standard were adopted by consensus through the Statewide Model Coordination Group (SMCG). These considerations involve updates to (1) vehicle emissions rates, (2) vehicle mix assumptions, and (3) the number of vehicle classes considered.

Each step in the emissions calculation process results in standalone datasets (emissions rates, vehicle mix, travel modeling) that are created independently, but compiled in a manner that allows this data to interface with each other through relational database software (MS Access) that calculate total GHG mass emissions for a compliance agency. All data used in the emissions analysis developed by an individual (or agency) was then independently reviewed by another individual (or agency) for data validity and accuracy prior to incorporation into the final GHG emissions calculations methodology. In addition to the analysts and reviewers noted throughout, all SMCG member agencies were extended the opportunity to perform additional data review at each step in development of the emissions calculations, including contributing to the underlying framework that established the methodology and resultant procedures.

Appendix C.2 - Vehicle Emissions Rates

Performed by: Sabrina Williams-CDOT

Reviewed by: Dale Wells-CDOT

New GHG Rates were required to incorporate the State Interagency Coordination Team (IACT) determination, as defined under 2 CCR 601-22 Section 1.44, May 5, 2025 that the CDOT Department of Accounting and Finance (DAF) projections on future EV adoption be used in the GHG emissions rates development. The previous GHG emissions rates were developed using asserted adoption curves of early, mid and late term EV adopters annually with individual forecasts for passenger vehicles and SUVs/light-duty trucks through 2050. CDOT DAF, as part of CDOT's 10-Year Plan development, created a forecast of expected revenue through the year 2050. As part of their revenue forecasting effort, DAF also generated a forecast of light-duty EV fleet growth in Colorado (since revenue from EVs is different from revenue from fossil-fueled vehicles). DAF's forecast estimated 950,000 light-duty EVs in Colorado in 2031, with an estimate of 95% of light-duty vehicles being EVs in 2050.

Separate EV adoption rates were initially developed for passenger cars and SUVs/light-duty trucks as at that time very few EV SUVs/light-duty trucks were available for purchase and it was unknown when additional electrified SUVs/light-duty trucks would be commercially available. Since the time the initial EV planning assumptions were used to develop the original GHG rates, numerous electrified SUV make and models are now

commercially available and auto manufacturers continue to release additional EV SUVs for sale. Furthermore, manufacturers have indicated that electrified light-duty trucks will become more broadly available in future years. The Colorado Energy Office (CEO) has completed numerous studies on likely future EV adoption for planning purposes such as EV charging infrastructure needs. These studies also project greater levels of electrification of these larger passenger vehicles within the next five years. Given that a significant percentage of passenger vehicles registered in the state are classified as SUVs and light-duty trucks, the earlier SUV/light-duty truck EV adoption rates was adjusted to reflect the quicker levels of EV adoption now expected. Therefore, in future years the rate of EV adoption is assumed to be the same between passenger cars and SUVs/light-duty trucks in developing the new GHG rates whereas previously they differed.

Appendix C.3 - Vehicle Mix Assumptions

Performed by: Juan Robles-CDOT

Reviewed by: Sabrina Williams-CDOT, Dale Wells-CDPHE

Overview

The vehicle mix represents the type (i.e. motorcycles, passenger cars, SUVs, vans, trucks, etc.) of vehicles operating on a roadway. The GHG emissions rates are highly variable by vehicle class and generally increase with the size of the vehicle. For example, passenger cars emit significantly less GHGs per vehicle mile traveled (VMT) than heavy-duty trucks. While travel demand models forecast total on-road travel behavior, including trips from commercial vehicles, no travel demand model in the state is calibrated for commercial travel accurately enough to properly assign the on-road vehicle mix. Therefore, the real-world observed vehicle mix used to calculate GHG emissions for the Standard is developed from traffic observations (counts) collected by CDOT's vehicle count stations.

Vehicle mix is assigned from ATR data using both continuous and short-duration counts stratified by hour of the day, the 13 Federal Highway Administration (FHWA) vehicle classifications as well as roadway and urban or rural area type updated for more recently observed years. Each ATR station's counts were used in conjunction with VMT weighting for the roadway to develop a ratio of vehicle types by hour for all of the major roadway types in Colorado. The VMT-weighting of the counts is a refinement of the previous vehicle mix assignment that used unweighted (straight) counts in the previous emissions calculations. The VMT-weighting method was developed by CDOT and APCD in order to better reflect the vehicle mix outside the Front Range where the majority of ATR stations are located. Furthermore, for the 2025 vehicle mix used to calculate GHG emissions rates, post-pandemic (2023) vehicle classification counts were used. In the previous GHG emissions calculations methodology, pre-pandemic (2017-2019) vehicle classification counts were used. SMCG determined that an update to post-pandemic vehicle

classification counts should be made statewide to the emissions calculation methodology in order to more accurately reflect the vehicle mix that is currently present on roadways in the state as transportation behavior has altered since COVID due to factors including increased remote employment and land use changes.

ATR Count Data Methodology

To assign the vehicle mix percentages by roadway functional category, a total of 316 statewide count stations that collect hourly classification data were used. Of these count locations, 75 of them are permanent traffic recorders (ATRs), and 241 were short-term counts for the years 2022 and 2023. The 13-bin FHWA hourly counts were then grouped into the five Highway Performance Monitoring System (HPMS) class groups used in MOVES to calculate emission rates (passenger vehicles [including SUVs and light-duty trucks], motorcycles, buses, single unit heavy-duty trucks and combination heavy-duty trucks)

To calculate the vehicle mix fractions or percentages for each functional class by individual hours, the VMT-weighted sum of all hourly volumes from each class was divided by the total number of counts for each class. This means that ATR stations have a larger weight than short-term count locations because there are many more hourly counts available from ATRs, and that count stations with higher volumes or VMT have a higher weight than stations with low volumes or VMT.

A simplified example would be if the number of total individual hourly volumes at an ATR station were 20,000 vehicles and 17,000 vehicles were observed to be passenger vehicles and 1,000 vehicles were single unit (SU) trucks. In this case, the percentage of passenger vehicles for that station in that individual hour is assigned to be 85% and the fraction of SU trucks would be 15%.

Figure C-1 below shows percentages for the Urban Freeways and Expressways functional category with reliance on 11 ATRs. The average percentages for this class are shown in green and the percentages for each of the ATRs are below the green bar. Only the aggregated values for the entire area type and roadway functional classification are used to calculate emissions for the state, the individual data shown for each ATR station is used in the calculation of average vehicle mix percentages.

Figure C-1. Example illustrating calculation of vehicle mix percentages as a weighted average of count data from multiple locations

Sta_ID	Rural_Urban	Func_Class	Average VMT	M-cycles	Pass_veh	Buses	SU	Combo
	Urban	**(2) Freeway & Ex**	109,926	**0.17%**	**97.37%**	**0.13%**	**1.25%**	**1.09%**
000003	Urban	(2) Freeway & Expr	134,451	**0.19%**	**97.38%**	**0.06%**	**1.12%**	**1.25%**
000004	Urban	(2) Freeway & Expr	168,873	**0.07%**	**98.27%**	**0.29%**	**0.76%**	**0.61%**
000503	Urban	(2) Freeway & Expr	57,247	**0.10%**	**98.96%**	**0.07%**	**0.50%**	**0.37%**
000504	Urban	(2) Freeway & Expr	246,762	**0.18%**	**97.05%**	**0.23%**	**1.53%**	**1.02%**
000506	Urban	(2) Freeway & Expr	91,498	**0.13%**	**97.97%**	**0.10%**	**1.24%**	**0.56%**
100331	Urban	(2) Freeway & Expr	131,878	**0.20%**	**98.27%**	**0.20%**	**0.85%**	**0.48%**
103608	Urban	(2) Freeway & Expr	104,847	**0.11%**	**98.44%**	**0.09%**	**0.72%**	**0.64%**
103684	Urban	(2) Freeway & Expr	81,433	**0.12%**	**89.91%**	**0.25%**	**3.38%**	**6.34%**
103712	Urban	(2) Freeway & Expr	11,012	**0.10%**	**89.71%**	**0.11%**	**3.29%**	**6.78%**
105548	Urban	(2) Freeway & Expr	164,048	**0.19%**	**97.45%**	**0.07%**	**1.22%**	**1.08%**
107556	Urban	(2) Freeway & Expr	121,040	**0.13%**	**96.99%**	**0.10%**	**1.77%**	**1.02%**

Of the seven roadway functional categories:

(1) Interstate

(2) Freeway & Expressway

(3) Other Principal Arterial

(4) Minor Arterial

(5) Major Collector

(6) Minor Collector

(7) Local

CDOT does not collect classification data on Minor Collectors, Ramps or Local roads that would permit the calculation of accurate mix percentages for these roadways. Thus, there is no vehicle classification count data available at a statewide level for these roads. However, travel models must account for vehicle travel for all road types in the state to accurately predict passenger trips and associated VMT whose emissions need to be accounted for. CDOT and APCD determined the most suitable approach for assigning the vehicle mix on these access roads for the purposes of calculating GHG emissions was to assign the same vehicle mix as the most similar roadway functional classification for which vehicle classification was available. In this case, functional classes six and seven would use the rates from Major Collectors.

The result is a compiled table of the observed individual hourly vehicle mix by HPMS category for the seven roadway functional classifications that are represented in the travel modeling for a GHG compliance area.

The vehicle mix is applied to the travel model run data in the MS Access database that calculates the mass total emissions and is not considered directly within the MOVES modeling to develop the GHG emissions rates as discussed later in the documentation of the GHG emissions analysis methodology.

Appendix C.4 - Vehicle Classes Considered

Performed by: Mobility Analysis Section-CDOT

Reviewed by: Sabrina Williams-CDOT, Juan Robles-CDOT

The original GHG rates developed in MOVES for use in prior analyses to demonstrate compliance with the standard had unique rates for six HPMS vehicle categories: motorcycle, passenger cars, passenger trucks, buses, single unit heavy trucks, and combination heavy trucks. These GHG emissions rates by HPMS category are applied to the travel model data in the MS Access database in conjunction with the observed vehicle mix fractions (observed vehicle classification counts) to calculate total mass GHG emissions for a compliance area. However, Division of Transportation Development Mobility Analysis Section staff realized that because vehicle classification counts are recorded by the number of axles and length of a given vehicle, the CDOT count network often records SUVs and light-duty trucks as passenger cars. Furthermore, in MOVES the type of vehicles are not grouped by the body style of a vehicle, rather by similar characteristics of the engines and associated emissions profiles. This results in many vehicles that are commonly thought of as passenger vehicles, such as wagons and crossovers, being considered to be passenger trucks in the MOVES model.

To more accurately account for the number of larger passenger vehicles and to minimize the discrepancy between the CDOT count network's data collection mechanism and the MOVES model vehicle source types, a refinement was made to the number of vehicle classes considered in the GHG emissions calculations to combine passenger cars and SUVs/light-duty trucks to reflect total passenger vehicles. This was performed by aggregating the observed vehicle classification counts to a new HPMS25 vehicle category representing all passenger vehicles instead of differentiating between passenger cars and SUVs/light-duty trucks. This resulted in reducing the number of HPMS classes considered in the MOVES model to develop the updated GHG emissions rates from six to five categories of vehicles: motorcycles, passenger vehicles, buses, single-unit heavy trucks, and combination heavy trucks.

The refinements to the number of vehicle classes considered results in an increased representation of SUVs/light-duty trucks and their associated GHG emissions in the state that more accurately depicts present real-world observed conditions. Furthermore, the

approach of representing all passenger vehicles as a single HPMS category is now consistent with the manner in which CDOT reports HPMS data for the state.

Appendix C.5 - MOVES4 GHG Emissions Rates

Performed by: Sabrina Williams, CDOT

Reviewed by: Dale Wells, APCD-CDPHE

Overview

Incorporating the DAF future EV planning assumptions required new emissions rates to be developed in MOVES. Emissions rates were generated using the MOVES version 4.1.2 (MOVES4). Previously MOVES version 3.0.1 (MOVES3) was used to generate the original GHG emissions rates. The change in GHG emissions rates specific to changing to model versions is minimal due to the previous and continued high levels of EV/ZEV adoption assumed in future years, which is discussed in later sections. For more information about GHG modeling using MOVES, see the Using MOVES for Estimating State and Local Inventories of On-road Greenhouse Gas Emissions and Energy Consumption guidance document. The MOVES4 Run Specifications used to generate the GHG emissions rates may also be found in later sections.

MOVES4 Run Specifications

The run specification (RunSpec) parameters outlined below were used to calculate GHG emission rates with MOVES. CDOT performed the MOVES4 modeling to develop the new GHG emissions rates and model results and inputs were reviewed and verified by APCD for accuracy. The MOVES modeling methodology is largely consistent with APCD's previous process to calculate GHG emissions except where noted.

The three modeled years: 2030, 2040, and 2050, used the same run specifications except for where specified (e.g., the year being modeled). Each of the three modeled years has five related run specifications to separate the emission rates by vehicle type, as described in the On-road Vehicles section, i.e., five MOVES runs per compliance year. This denotes a change from the previous GHG emissions rates that were generated using six model runs to represent vehicle types by aggregating passenger cars with SUVs and light-duty trucks into a single MOVES run. When used for modeling compliance with the Standard the GHG emissions rates are applied identically between an agency(s) baseline plan and compliance plan demonstrations, e.g., there is no emissions benefit given to a compliance demonstration for future EV/ZEV adoption. If an MPO or CDOT were to develop a project in a long-range transportation plan specific to switching vehicle types or vehicle fuel types in a future year, this will be revisited by SMCG for consideration on how to best represent these types of planning actions.

Scale

The "Scale" parameters define the model type (on-road or non-road), domain/scale, and calculation type.

Model Type

On-road was the model type selected. This estimates emissions from motorcycles, cars, buses, and trucks that operate on roads.

Non-road/off-network emissions were not included. These emissions are from equipment used in applications such as recreation, construction, lawn and garden, agriculture, mining, etc. and are outside of the scope of this analysis.

Domain/Scale

MOVES allows users to analyze mobile emissions at various scales: National, County, and Project. While the County scale is necessary to meet statutory and regulatory requirements for State Implementation Plans (SIPs) and transportation conformity, either the County or National scale can be used for GHG inventories at the federal level. EPA recommends using the County scale for GHG analysis.

The County scale allows the user to enter locally-specific data through the County Data Manager whereas under the National Scale only MOVES default values are used. Providing local data significantly improves the precision of the modeling results and allows the MOVES users to better evaluate future planning scenarios. Therefore, the County Scale was used.

County Scale in MOVES can be used to model a single county, or a larger representative group of counties such as a nonattainment area or entire state that share common emissions characteristics such as fuel types and blends, emissions testing programs, vehicle age and other considerations. For this modeling, Adams County was used as the representative county on MOVES to develop the statewide GHG emissions rates. All non-default inputs in MOVES4 used in the County Data Manager are representative of the most currently available statewide vehicle data compiled by APCD for EPA's National Emissions Inventory (NEI) Reporting, with the exception of future EV/ZEV adoptions rates at the direction of IACT.

Calculation Type

MOVES has two calculation types - Inventory (total emissions in units of mass) or Emissions Rates (emissions per unit of distance for running emissions or per vehicle for starts and hotelling emissions) in a look-up table format that must be post-processed to produce an inventory. Either may be used to develop emissions estimates for GHGs.

The Emission Rates calculation type was used. Emissions Rates calculation type requires more post-processing; however, this also allows for a consolidated set of GHG emissions rates that can be used statewide by any GHG compliance agency with minimal emissions modeling required from an MPO. Furthermore, this method provides for not needing to rerun MOVES if there is a change to an agency's travel model.

Time Span

The “Time Span” parameters define the years, months, days, and hours that emissions are calculated.

When Emission Rates is specified in the RunSpec, users may choose to approach the selection of options in the Time Spans Panel differently than when running MOVES in Inventory mode. For example, when modeling running emission rates, instead of entering a diurnal temperature profile for 24 hours, users can enter a range of 24 temperatures in increments that represent the temperatures over a period of time. By selecting more than one month and using a different set of incremental temperatures for each month, users could create a table of running emission rates by all the possible temperatures over an entire season or year.

When using Emission Rates instead of Inventory, the time aggregation level is automatically set to Hour and no other selections are available. Pre-aggregating time does not make sense when using Emission Rates and would produce emission rates that are not meaningful. However, the year, month, and day must still be specified and will affect the emission rates calculated.

The time span parameters specified in the following subsections were also used because the travel model outputs represent an average weekday. These daily emissions are then translated into annual emissions in the final step of the emissions calculation process.

Years

The County scale in MOVES allows only a single calendar year in a RunSpec. Users who want to model multiple calendar years using the County scale will need to create multiple RunSpecs, with local data specific to each calendar year, and run MOVES multiple times.

The years used were 2030, 2040, and 2050. Emission rates for each of these years were calculated separately. This accounts for information such as a changing age distribution of vehicles, fleet turnover and their corresponding fuel types and fuel efficiencies.

Months

MOVES allows users to calculate emissions for any or all months of the year. If the user has selected the Emission Rates option, the Month can be used to input groups of temperatures as a shortcut for generating rate tables for use in creating inventories for large geographic areas.

The months used were January and July to match the previous modeling by APCD. These represent winter and summer months and generally the extremes in annual weather conditions. This accounts for changes in fuel efficiency between warm and cold temperatures throughout the year. The arithmetic averages of emission rates from January and July were used for the final emissions inventory to represent an annual average GHG emissions rate.

Days

Weekdays and weekend days can be modeled separately in MOVES. MOVES provides the option of supplying different speed and VMT information for weekdays and weekend days to allow the calculation of separate emissions estimates by type of day.

The days used were weekdays to match the TDM output data. These represented the emission rates for an average weekday. The results are annualized in one of the final steps for calculating the GHG emissions to approximate a full year.

Hours

The hours used were all 24 hours of the day (i.e., clock hours ending at 1:00 AM, 2:00 AM, 3:00 AM, etc.). These represent the emission rates for individual hours of a day. This accounts for changes in fuel efficiency between warm and cold temperatures throughout the day.

Geographic Bounds

The "Geographic Bounds" parameter defines the county(s) used. For a county-scale run, only one county can be selected per RunSpec. The county used was Adams County, Colorado; however, any county in Colorado could have been selected as the MOVES modeling defined input parameters such as the vehicle age used to estimate emission rates using statewide data.

On-Road Vehicles

MOVES describes vehicles by a combination of vehicle characteristics (e.g., passenger car, passenger truck, light commercial truck, etc.) and the fuel that the vehicle is capable of using (gasoline, diesel, etc.). This is required to specify the vehicle types included in the MOVES run.

The "On-road Vehicles" parameter defines the source types (i.e., vehicle types) and their fuels (gasoline, diesel, electricity, etc.). All combinations of vehicle types and fuels available in MOVES4 were used to calculate the emission rates; except that no EV/ZEVs are assumed for buses or commercial vehicles. The process for assigning what vehicle types are represented in the model run has been refined from the previous method that used separate MOVES runs to represent passenger cars vs. SUVs and light-duty trucks. The MOVES model runs used in the GHG rates update now match the MOVES HPMS types defined in the model that aggregates all passenger vehicles into a single category (HPMS=25).

Table C-1 illustrates the HPMS categories.

Table C-1. Composition of vehicle types used for MOVES emissions modeling

MOVES Vehicle Source Type	HPMS Name	HPMS (Current)	HPMS (Previous)
Motorcycle	Motorcycles	10	10
Passenger Car	Light-Duty Vehicles	25	20
Passenger Truck	Light-Duty Vehicles	25	30
Light-Commercial Truck	Light-Duty Vehicles	25	30
Other Buses	Buses	40	40
Transit Bus	Buses	40	40
School Bus	Buses	40	40
Refuse Truck	Single Unit Trucks	50	50
Single Unit Short-Haul Truck	Single Unit Trucks	50	50
Single Unit Long-Haul Truck	Single Unit Trucks	50	50
Motor Home	Single Unit Trucks	50	50
Combination Short-Haul Truck	Combination Trucks	60	60
Combination Long-Haul Truck	Combination Trucks	60	60

Road Type

The Road Type in MOVES is used to define the types of roads that are included in the run. There are four categories of road types in MOVES used to represent onroad emissions and they are separated between urban vs. rural and ramp-controlled (Interstates) vs. non ramp-controlled (local roads). Assignment of the correct road type when calculating emissions is important because in MOVES the vehicle drive cycles assumed in the model are variable by road type, e.g., MOVES assumed more stop and go traffic on local roads associated with intersection controls than interstates, as well as area type, e.g., MOVES assumes a greater level of congestion on local roads in urban areas than rural areas. MOVES also has an option for Off-Network road types which would be associated with vehicle emissions not occurring in traffic, e.g., idling vehicles at a large transit station. All road types were selected in MOVES. The Off-Network road type must be selected for MOVES to execute in Emissions Rate mode, but was not used in the emissions calculations as they are not on-road emissions.

Pollutants and Processes

The Pollutants and Processes Panel allows users to select from various pollutants, types of energy consumption, and associated processes of interest. In MOVES, a pollutant refers to particular types of pollutants or precursors of a pollutant but also includes energy consumption choices. Processes refer to the vehicle mechanism by which emissions are released, such as running exhaust or start exhaust. Users should select all relevant processes associated with a particular pollutant to account for all emissions of that pollutant. Generally, for this project, that includes running emissions, e.g. emissions processes associated with vehicle start-ups, extended idling and refueling occur on Off-Network road types in MOVES.

The CO_2 Equivalent pollutant is the sum of the global warming potential of Carbon Dioxide (CO_2) and all other greenhouse gases expressed as a unit CO_2 Equivalents. (CO_2e) is the pollutant of interest in MOVES as it accounts for all greenhouse gas emissions considered in MOVES. MOVES requires several other prerequisite pollutants for CO_2e, e.g., methane; whose individual global warming potentials are calculated within the model and appropriately summed with CO_2 and reported as CO_2e.

General Output

The General Output parameters define the output database, units, and activity.

Output Database

Results from the five related HPMS RunSpecs for a given analysis year (2030, 2040, 2050) can be stored together in a single output database for convenience, or separate databases can be created for each run. The RunSpecs must have the same units and aggregation or MOVES will not execute. A different output database is required for each year and varying MOVES RunSpec. A consistent and informative naming convention for the output database assists in file housekeeping. Five output databases were used for each year modeled representing a single HPMS category for that year. Each output database contained results for the modeled year and vehicle HPMS category.

Units

Users can select from any of the mass unit selection options but should generally choose a unit whose magnitude is appropriate for the parameters being analyzed.

The units selected in the MOVES RunSpecs are grams for mass, joules for energy, and miles for distance.

Activity

MOVES allows the user to select multiple activity output options. As Emissions Rates were selected MOVES automatically reports emissions in mass units per distance traveled (grams/VMT) for each month and hour selected in the MOVES Time Spans panel for each Road Type selected in MOVES.

Output Emissions Detail

This panel allows the users to make selections that will additionally disaggregate the data beyond what is automatically reported by MOVES. Certain selections are automatically made by MOVES based on the RunSpec definition and cannot be unselected.

No optional details were selected in this panel as the outputs automatically reported by MOVES for these RunSpecs contain sufficient detail for calculating GHG emissions in this manner.

Input Database (Formerly the County Data Manager)

The previous panels in MOVES defined the RunSpec and the format of the output data. The next step is to create the input database where files with local data are imported.

The RunSpec parameters selected in the other panels in MOVES define the file structure and required data for the input database and constrain all files imported into MOVES to this structure or errors are generated and the model will not execute. Therefore, it is recommended that the MOVES user make this Input Database the last panel used in the MOVES graphical user interface (GUI) as any alterations to the RunSpec can result in needing to recreate its settings.

One input database was created for each model year for each vehicle HPMS category; a total of 15 MOVES model runs. Data is imported into the input database for each MOVES run, as specified below.

Age Distribution

The Age Distribution in MOVES represents the distribution of the age of each vehicle type in MOVES from 0-30 years old (vehicles whose model years are 31 years and older). The age distribution is a critical input in MOVES as this directly assigns the specific vehicle model years and vehicle characteristics, e.g., fuel types and associated emissions rates. MOVES allows the user to import locally specific data as was performed in this analysis. APCD develops locally specific age distributions from all vehicles registered in the state every three years for the EPA's National Emissions Inventory (NEI) reporting at the county and statewide level, as well as for the Denver Metro/North Front Range 8-hr Ozone Nonattainment Area. For this analysis, the statewide age distribution for the 2024 NEI reporting was imported into MOVES4 except for long-haul commercial vehicles. National default values were used for long-haul commercial vehicles as a significant portion of these vehicles in the state are registered elsewhere in the country.

Average Speed Distribution

Vehicle tailpipe emissions rates are highly affected by the speed the vehicle is traveling. At lower speeds associated with congestion emissions rates are higher and rates decrease until vehicles are traveling at speeds of approximately 55 miles per hour (mph) where at that point emissions rates begin to increase again. MOVES requires an Average Speed

Distribution be imported to perform a model run. This distribution is an important input in Inventory Mode as it represents the detailed information concerning the on-road speeds of vehicles and related emissions rates by road type, hour of the day, day of the week, and month of the year. In Emissions Rates mode, however, the average speed distribution is not used and for this analysis national default values were used.

Fuel

The fuels data in MOVES assigns the specific fuel formulations, including chemical properties, for all petroleum vehicles as well as the fuel types for each vehicle type by model year including representation of EV/ZEVs in the model through the Alternative Vehicles Fuels and Technologies (AVFT) file. For the GHG analysis, default fuel values were used with the exception of the AVFT data.

The AVFT file specifies the fraction of each fuel used by a vehicle type, e.g., gas, diesel, ethanol and electricity, for vehicle model years 1960-2060. It is important to specify these fractions by model year as this provides a more accurate estimate of the fuel economy standards and emissions improvements associated with fleet turnover as older higher emitting vehicles are retired and replaced with lower emitting vehicles than assuming an average fuel mix for an entire vehicle type in MOVES.

In a MOVES run, vehicle data is only considered for the same vehicle model year as the analysis year selected in the RunSpec and and the previous 30 vehicle model years, i.e., the fuel mix considered in a specific run is assigned from the Age Distribution in MOVES.

Although EV/ZEVs have zero GHG emissions, these vehicles do have emissions of other pollutants, such as particulate matter, and should be represented within MOVES. Therefore, future EV/ZEV planning assumptions are directly considered within MOVES and there is no “zeroing” out of EV/ZEV VMT, because that VMT corresponds to a GHG tailpipe emissions rate of zero. For this analysis the AVFT file used the same motor vehicle registration data for the 2024 NEI as the Age Distribution through vehicle model year 2024 after which the DAF EV planning assumptions for light-duty vehicles were incorporated to represent future EV adoption levels. MOVES4 contains default values for future EV adoption for commercial vehicles; however, this data was not used in the model and no EV/ZEVs were considered for commercial vehicles.

Meteorology

Vehicle emissions rates can vary by temperature and humidity, particularly for criteria pollutants and mobile source air toxics. However, GHG emissions from vehicles relate to atmospheric conditions solely based on a driver’s comfort and their likely usage of air conditioning in a vehicle and resultant impacts to fuel economy. The default values for Meteorology in MOVES represent actual climate data for all individual counties in the nation as collected from the National Climate Data Center. MOVES default data for Adams County, Colorado was used for the months of January and July in the analysis, which is consistent with the RunSpec.

Road Type Distribution

MOVES does not have default data for the Road Type Distribution and it must be created and imported by the user. In Emissions Rates the Road Type Distribution data in a MOVES run does not impact the results and is not an important file in the analysis, but must be present and correctly compiled for the model to run. A Road Type Distribution file was provided by APCD imported in MOVES for the analysis.

Source Type Population

MOVES requires the Source Type Population file to be present in MOVES and there is no national default data available in MOVES. However, this file does not change the results in Emissions Rates as this data is used for calculating vehicle emissions associated with off-network activity, e.g., extended periods of idling at a truckstop or a large number of vehicles congregating at a transit station. As these vehicle emissions are not truly occurring "on-road" they are not accounted for in the analysis or present in the Emissions Rates output files. The Source Type Population was provided by APCD from the 2024 NEI and used in the analysis.

Vehicle Type VMT

The Vehicle Type VMT is required to run MOVES and is very important if Inventory is selected in the RunSpec. However, in Emissions Rates mode this data does not change the results; moreover, a single vehicle classification is considered in this analysis so the VMT considered in MOVES does not vary by vehicle category. Default Vehicle Type VMT data was imported in MOVES for all runs with the exception of the annual HPMS file that was provided by APCD from the 2024 NEI in order for MOVES to run.

Inspection and Maintenance Program

The Denver Metro/North Front Range Ozone Nonattainment Area has a vehicle inspection and maintenance (I/M); i.e., emissions testing program as an emissions reduction strategy in the state implementation plan (SIP) for all or a portion of these nine counties in the state. However, in MOVES there is no GHG tailpipe emissions benefit associated with I/M programs as emissions control devices such as catalytic converters and diesel particulate filters do not reduce emissions of GHGs. In MOVES there is a slight methane credit given to I/M programs associated with evaporative emissions; however, these emissions reductions are insignificant compared to net GHG emissions that are dominated by tailpipe exhaust. The check box for "No I/M Program" was selected since there is not a statewide I/M program and accounting for the minimal GHG emissions credit within the ozone nonattainment area would result in no meaningful change to the results.

MOVES Output Data and Post-processing

Output Database (HeidiSQL)

After MOVES has successfully completed a model run the results are stored in the output database that was created in the RunSpec. The MOVES install package includes HeidiSQL

which is an open source database software and results are automatically stored here as well as the data that was imported into the input database for that RunSpec.

The main output file of interest in MOVES for this analysis is the "Rate Per Distance" table. The file associated with each MOVES run contains the emissions rates for the HPMS category being analyzed for the months, road types and pollutants specified in the RunSpec for every individual hour of the day by speed bin. This table was queried in HeidiSQL to select only emissions of CO_2eq as that is the pollutant of interest in the analysis and those results were exported from the HeidiSQL as a .csv file for each MOVES run.

Post-Processing Emissions Rates by Speed and Month

Emissions Rates mode in MOVES does not produce emissions rates associated with speed changes at the level of rates at individual integer speeds in miles per hour values. Rather MOVES aggregates emissions by speed into groups of 16 speed bins with each bin corresponding to a five mile per hour maximum and minimum range of vehicle speeds, e.g., 42.5 mph to 47.5 mph. This results in faster model run times and smaller output files, and could be appropriate in instances where only a qualitative analysis is needed. However, for the purposes of this quantitative analysis a greater level of granularity concerning emissions rates by speeds is needed for GHG emissions results precise enough for accurate comparison to the absolute standards associated with each compliance year.

Previously the emissions rates were post-processed to produce emissions rates in grams per mile at individual integer speeds through interpolation in an additional MS Access database that was separate from the database utilized to calculate total mass GHG emissions for a compliance area. In revising the analysis, the interpolation methodology to develop GHG emissions rates in individual integer mph values remains unchanged, but APCD has consolidated this step into the same MS Access database used by an agency to calculate the total GHG emissions for a compliance area. Average annual emissions rates were similarly generated from a straight average of the emissions rates from the representative months of January and July in MOVES output data in the MS Access database.

Appendix C.6 - Calculation of Mass GHG Emissions

Performed by: Dale Wells-ACPD

Reviewed by: Sabrina Williams-CDOT

Total mass GHG emissions for a compliance area are calculated in MS Access databases for 2030, 2040 and 2050 that are developed by APCD and are unique for each MPO/non-MPO area based on the design and structure of each compliance agency's travel modeling platform as well as the format the travel model runs data is provided.

Each database contains lookup tables for the GHG emissions rates and vehicle mix ratios that are consistent statewide, and the travel model run files specific to each individual

agency. There are additional tables in each database that appropriately assign each link a road type from MOVES based on the area type and roadway functional classification based on an agency's travel modeling metadata.

Travel Model Data Considerations

Prior to calculating GHG emissions an agency must remove all links extending outside of their GHG compliance area that are represented in the travel model run. This is performed by a compliance agency splitting any sections of links that may go outside a compliance area in comparison to their boundary in appropriate spatial software, e.g., ESRI geographic information system (GIS) or TransCAD, so that only the portions of the link within a compliance area boundary are considered in the GHG emissions calculations for the agency. Following the splitting of links, the length of those split links must be recalculated. Whether this calculation is done automatically or manually depends on the particular software platform in use. Once the lengths of any split links are calculated, the VMT for the split links can be calculated by multiplying the recently-calculated link length by the predicted travel volumes.

GHG emissions rates are highly variable by vehicle speeds, and to a much lesser extent individual hours of the day based on temperature and use of cooling in the cab of the vehicle. Ideally, some form of dynamic traffic assignment would be used (such as the Simulation-Based Assignment of PTV VISUM) to estimate such within-day variation in travel speed. Static assignment of 24 individual hours would produce similar output data for GHG emissions calculations. Conversely, if an agency's travel model has less than 24 time periods, coordination is required between CDOT, APCD and individual MPOs on an agreed upon process for disaggregating travel model data with predicted vehicle volumes and speeds from time periods representing multiple hours to discrete individual hours. This is particularly important for agencies with a traffic assignment process that contains a single off-peak period representing 22 hours travel behavior in a day. In this instance simply dividing the predicted volumes on a link by the number of hours in the period is likely to greatly underestimate travel volumes during the AM and PM peak shoulders and midday hours, while overestimating travel volumes in nighttime hours. Furthermore, the use of the predicted speed for a link from a four-step model during an off-peak hours is likely to overestimate speeds during the AM and PM peak shoulders and midday hours which results in underestimating emissions during this time of day.

Querying the Database

The MS Access databases developed by APCD each contain numerous queries that run in sequence. These queries assign the correct GHG emissions rates and vehicle mix ratios at the link level through a series of joins. The length of each link is multiplied by the predicted hourly volume to calculate the VMT for that hour that then is multiplied by the vehicle mix ratio and appropriate GHG emissions rate for that vehicle class to calculate the emissions. Emissions for the links are then summed together to calculate the final

database output which is daily GHG emissions in short-tonnes for each travel model scenario.

Calculation of Annual Emissions and Modeled Reductions

The emissions in GHG short-tons/day from the MS Access database are extracted into spreadsheet workbooks, e.g., MS Excel, and annualized through multiplying the weekday emissions by 338 to get annual emissions. Standard unit conversions (one US short ton = 0.907185 metric tons) are applied to calculate the GHG emissions in million metric tons (MMT) per year for each agency's baseline and compliance travel model scenarios for 2030, 2040, and 2050. The modeled emissions reduction for each year is simply calculated by subtracting the compliance emissions from the baseline emissions. The modeled emissions reduction is then compared to the agency's reduction target for that compliance year to determine if compliance with the Standard has been demonstrated through modeling or if mitigation is required.

COLORADO
Department of Transportation
Division of Transportation Development

Appendix D - CDOT/Non-MPO GHG Emissions Modeling Memorandum

To: Transportation Commission
From: Sabrina Williams, GHG Program Modeler
Date: December 29, 2025

Subject: Methodology for Assigning Individual Hourly Volumes and Speeds from CDOT's Travel Model in the GHG Emissions Database for the non-MPO area.

Background:

The MOVES modeling conducted for the Standard generated greenhouse gas (GHG) emissions rates in grams of CO_2eq/VMT for each individual hour of the day (24hrs) that is further disaggregated by speed, vehicle type, and road type. APCD uses the MOVES emissions rates in conjunction with a GHG compliance area's predicted total daily on-road travel activity for each compliance year within a database platform to calculate predicted total annual GHG emissions (million metric tonnes, MMT/yr) to verify whether an area can demonstrate compliance with GHG Rule for Transportation Planning.

To accurately calculate total daily and annual GHG emissions it is necessary for the GHG database to assign individual hourly volumes and speeds (24hrs/day) at the link level from the travel model's daily output. Most travel models for GHG compliance areas in Colorado do not use 24 time periods that facilitate this individual hourly assignment. Therefore, GHG compliance areas with fewer than 24 time periods need to develop a mutually agreed upon process for the assignment of individual hourly volumes and speeds within the GHG database that interacts with the travel model output to calculate GHG emissions. Each GHG compliance agency documents the agreed upon process for assigning individual hourly volumes and speeds from their travel model in the agency's GHG report.

Methodology

Generally hourly count data used to validate the travel model can be also utilized to develop logical mathematical formulas that assign individual hourly volumes at the link level. Professional judgement is used to determine the appropriate speeds for these periods, also at the link level; often by comparing the hourly counts for the off-peak period to peak period counts to determine if peak period predicted speeds should be assigned at an individual link level during these hours. However, not all travel models in the state are validated with hourly counts, e.g., the CDOT model is validated with daily counts. Travel models validated with daily counts may have any number of time of day periods. The CDOT travel model has ten time of day periods, which range in duration from a half-hour a.m. early shoulder to a seven-and-a-half-hour overnight period. With more periods of shorter duration, simply dividing the predicted period volume by the number of hours in that period to calculate an hourly volume, and assigning the same predicted speed from the travel model at the individual link level can be a reasonable approximation. The process that CDOT uses to convert period volumes to hourly volumes is shown in Table D-1. CDOT uses the period link speed for all relevant hours in that period.

Table D-1. Conversion of CDOT travel modeling periods for GHG emissions calculation

Hour ending at	Model period & description	Calculate hourly volume by dividing period volume by …
1:00 a.m.	OP1 (11:00 p.m. to 6:30 a.m.)	7.0
2:00 a.m.	OP1 (11:00 p.m. to 6:30 a.m.)	7.0
3:00 a.m.	OP1 (11:00 p.m. to 6:30 a.m.)	7.0
4:00 a.m.	OP1 (11:00 p.m. to 6:30 a.m.)	7.0
5:00 a.m.	OP1 (11:00 p.m. to 6:30 a.m.)	7.0
6:00 a.m.	OP1 (11:00 p.m. to 6:30 a.m.)	7.0
7:00 a.m.	AM1 (6:30 to 7:00 a.m.)	1.0
8:00 a.m.	AM2 (7:00 to 8:00 a.m.)	1.0
9:00 a.m.	AM3 (8:00 to 9:00 a.m.)	1.0
10:00 a.m.	OP2 (9:00 to 11:30 a.m)	2.5
11:00 a.m.	OP2 (9:00 to 11:30 a.m.)	2.5

Hour ending at	Model period & description	Calculate hourly volume by dividing period volume by …
12:00 noon	OP2 (9:00 to 11:30 a.m.) & OP3 (11:30 a.m. to 3:00 p.m.)	OP2 / 5 + OP3 / 7
1:00 p.m.	OP3 (11:30 a.m. to 3:00 p.m.)	3.5
2:00 p.m.	OP3 (11:30 a.m. to 3:00 p.m.)	3.5
3:00 p.m.	OP3 (11:30 a.m. to 3:00 p.m.)	3.5
4:00 p.m.	PM1 (3:00 to 5:00 p.m.)	2.0
5:00 p.m.	PM1 (3:00 to 5:00 p.m.)	2.0
6:00 p.m.	PM2 (5:00 to 6:00 p.m.)	1.0
7:00 p.m.	PM3 (6:00 to 7:00 p.m.)	1.0
8:00 p.m.	OP4 (7:00 to 11:00 p.m.)	4.0
9:00 p.m.	OP4 (7:00 to 11:00 p.m.)	4.0
10:00 p.m.	OP4 (7:00 to 11:00 p.m.)	4.0
11:00 p.m.	OP4 (7:00 to 11:00 p.m.)	4.0
12:00 midnight	OP1 (11:00 p.m. to 6:30 a.m.)	7.0

Source: CDOT, CDPHE

COLORADO
Department of Transportation
Division of Transportation Development

Appendix E - CDOT/Non-MPO Boundary Memorandum

To: Transportation Commission
From: Sabrina Williams, GHG Program Modeler
Date: December, 29 2025

Subject: Overview of Coordinated Modeling Approaches for Compliance with GHG Rule (2 CCR 601-22)

Background

CDOT has completed its efforts to model Greenhouse Gas (GHG) emissions within the non-MPO boundary in order to comply with 2 CCR 601-22, referred to herein as the Standard. Throughout this process, CDOT coordinated closely with Colorado Air Pollution Control Division (APCD) as well as members of the Statewide Model Coordination Group (SMCG) on the most appropriate ways to proceed. After reaching agreement on the process for representing emissions in the non-MPO area, all MPOs were given opportunity to review and comment on this representation of travel and emissions as presented in CDOT's Updated Plan and GHG emissions analysis through an interagency review. This memorandum documents CDOT's interagency review period and comments received on the boundary file that spatially represents the non-MPO area as well as the appropriateness of any links that were required to be split at this boundary file for the purposes of performing GHG emissions calculations associated with the Updated Plan.

Boundary File Representing the non-MPO Compliance Area

Review Period: October 8, 2025 to November 7, 2025

Reviewing Agencies: DRCOG, NFRMPO, PPACG, GVMPO, PACOG

CDOT provided all MPOs the boundary file developed by CDOT for spatially representing the non-MPO GHG compliance area, which comprised a representation of the MPO boundaries of each individual agency on a statewide scale. CDOT requested the MPOs to review and either propose revisions/modifications of the representation of their MPO boundary or provide concurrence. Although several agencies noted that the legal definition of their MPO boundary had changed, these

will not go into effect for the purposes of demonstrating compliance with the Standard for CDOT's Updated Plan. No agencies identified errors in representing their MPO boundary as legally defined for this Updated Plan. Therefore, CDOT used the boundary file initially developed for this Updated Plan without modifications as agreed upon between SMCG member GHG compliance agencies.

Splitting Links at the non-MPO Boundary

Review Period: December 5, 2025 to December 15, 2025

Reviewing Agencies: DRCOG, NFRMPO, PPACG, GVMPO, PACOG

Following interagency review and approval of the representation of the non-MPO area for the purposes of calculating GHG emissions, CDOT split the roadway links from the travel model at locations where portions of roadways extended outside of the non-MPO area into an MPO boundary. CDOT provided the MPOs with the statewide roadway network with the split links at the approved non-MPO boundary file and requested agencies to review that all links crossing outside of the non-MPO boundary had been correctly split at their boundary. No agencies provided comments that a link crossing into their MPO boundary from the non-MPO area as represented in the CDOT travel model had been incorrectly split.

COLORADO
Department of Public Health & Environment

January 5, 2026

Darius Pakbaz
Division of Transportation Development -CDOT
2829 W Howard Place, Denver, CO 80204

Subject: Greenhouse Gas (GHG) Transportation Report For the Colorado Department of Transportation (CDOT) as required by the Colorado Greenhouse Gas Pollution Reduction Planning Rule

Per 2 CCR 601-22, Rules Governing Statewide Transportation Planning Process and Transportation Planning Regions, the Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division (Division), is respectfully submitting our verification of the Transportation Greenhouse Gas Report associated with the 2050 Regional Transportation Plan 2024 Amendment.

Darius, thank you for the opportunity for CDPHE to review and verify the CDOT Transportation Greenhouse Gas Report.

Based on the analysis of the report, supporting datasets, and information provided, we can verify that the report and data inputs address the requirements of the Colorado Greenhouse Gas Pollution Reduction Planning Rule. The submitted package describes the baseline and compliance transportation demand modeling (TDM) runs and how with additional mitigation projects they meet the Rule requirements. The submitted package describes how the TDM model was deployed and how emissions were calculated. The Division finds the outputs to be mathematically correct.

The Division would like to thank the CDOT for providing the necessary data files and Report. The Division would also like to thank Dale Wells, Megan Carroll and Cody Johnston from the Division who performed the verification analysis.

Sincerely,

Michael Ogletree

Director, Air Pollution Control Division Colorado Department of Public Health and Environment

CC:

Christopher Laplante, CDOT
Elizabeth Rollins, CDOT
Erik Sabina, CDOT
Scott Ramming, CDOT
Sabrina Williams, CDOT
Dale Wells, APCD
Kevin Briggs, APCD
Erick Mattson, APCD

Bridge and Tunnel Enterprise Board
Meeting Minutes
February 18-19 2026

Present: Diane Barrett, District 1
Shelley Cook, Chair, District 2
Juan Marcano, District 3
Elise Jones, District 4
Cecil Gutierrez, District 5
Rick Ridder, District 6
Barbara Bowman, District 7
Barbara McLachlan, District 8
Hannah Parsons, District 9
Terry Hart, District 10
Todd Masters, District 11

And: Staff members, organization representatives, and broadcast publicly

An electronic recording of the meeting was made and filed with supporting documents in the Transportation Commission office.

In February, the Bridge and Tunnel Enterprise Board of Directors met and workshopped the following items:

- Draft BTE FY 2026-27 Final Budget Allocation Plan
- BTE 8th Budget Supplement to FY 2026-26
- USDOT BUILD Program Match Funding

Additionally, the Board of Directors approved the following Resolutions:

- BTE1: Regular Meeting Minutes of January 15, 2026
- BTE2: 8th Budget Supplement of FY 2025-26
- BTE3: BTE Grant Funding Match Request for USDOT BUILD Program

COLORADO
Department of Transportation

Bridge and Tunnel Enterprise Board of Directors Memorandum

To: The Bridge and Tunnel Enterprise Board of Directors

From: Patrick Holinda, Bridge and Tunnel Enterprise Managing Director
Katie Carlson, Bridge and Tunnel Enterprise Financial Manager

Date: March 19, 2026

Subject: Bridge and Tunnel Enterprise Fiscal Year 2026-27 Final Annual Budget Allocation Plan

Purpose

This month the Bridge and Tunnel Enterprise (BTE) Board of Directors (Board) is being presented with a Statewide Bridge and Tunnel Enterprise fiscal year (FY) 2026-27 Final Annual Budget Allocation Plan for Special Revenue Fund (C.R.S 43-4-805(3)(a) 538) (Fund 538) for approval.

Action

BTE staff is requesting the Board adopt the FY 2026-27 Final Annual Budget Allocation Plan.

Background

In November 2025, the Board approved resolution #BTE 2025-11-03, adopting a Final Proposed Annual Budget Allocation Plan for FY 2026-27. In coordination with the Office of Financial Management and Budget (OFMB), BTE staff reviewed updated revenue forecasts and made changes to the previously proposed program allocations in order to balance the BTE FY 2026-27 Final Annual Budget Allocation Plan. Additional details regarding the sources and uses for the $207.0 million of forecasted FY 2026-27 BTE revenues can be found in the attached BTE FY 2026-27 Final Annual Budget Allocation Plan and the FY 2026-27 Final Annual Budget Workshop, which was presented to the Board for review and comment in February 2026. The Board did not request any changes in the February workshop and indicated their support of the final budget.

Options and Recommendations

1. Approve Proposed Resolution #BTE2: Bridge and Tunnel Enterprise FY 2026-27 Final Annual Budget Allocation Plan- **Staff Recommendation.**
2. Request additional information or changes to specific budget line items.
3. Do not approve

Next Steps

1. BTE staff will coordinate with OFMB to ensure the adopted budget amounts are available on July 1st, 2026, per this approved allocation plan.
2. Enterprise staff will provide the Board with a year-end BTE reconciliation report for FY 2026-27 in the fall of 2026, following the close of the fiscal year. This report will provide unaudited revenue reconciliation information and remaining program balances that are eligible to be rolled into the next fiscal year.
3. Any requests for FY 2026-27 funding for individual BTE projects will be brought to the Board via the monthly budget supplement process.

Attachments

Attachment A: Bridge and Tunnel Enterprise Fiscal Year 2026-27 Final Annual Budget Allocation Plan

Bridge and Tunnel Enterprise
Statewide Bridge and Tunnel Enterprise Special Revenue Fund 538 C.R.S. §43-4-805 (3)(a)
Fiscal Year 2026-27 Final Allocation Plan & Annual Budget 3/19/26

Fiscal Year 2026-27 Estimated Revenues & Roll Forwards

Line	Source	FY2025-26 Estimated Roll Forward	FY2026-27 Estimated Revenue	FY2026-27 Estimated Available Revenue
1	FASTER Bridge Safety Surcharge Fee		$ 120,938,628	
2	Bridge & Tunnel Impact Fee		$ 47,873,360	
3	Bridge & Tunnel Retail Delivery Fee		$ 12,864,204	
4	Federal Funds for 2019A and 2024B Bond Debt Service		$ 15,000,000	
5	Interest Earnings and Miscellaneous Revenue		$ 10,337,666	
6	FY2025-26 Estimated Roll Forwards	$ 35,209,888	$ -	
7	**Total Estimated Revenues**	**$ 35,209,888**	**$ 207,013,858**	**$ 242,223,746**

Fiscal Year 2026-27 Allocations & Budget

Line	Budget Item	FY2025-26 Estimated Roll Forward	FY2026-27 Final Allocation Plan	FY2026-27 Available Budget
8	**Administrative & Operating Activities (Cost Centers)**	**$ 1,969,639**	**$ 2,603,113**	**$ 4,572,752**
9	Bridge & Tunnel Enterprise Staff Compensation & Employee Appreciaiton		$ 1,039,155	$ 1,039,155
10	Bridge & Tunnel Enterprise Program Support & Other Consulting		$ 1,075,000	$ 1,075,000
11	Attorney General Legal Services		$ 50,000	$ 50,000
12	Annual Audit		$ 35,000	$ 35,000
13	In-state Travel Expenses		$ 6,700	$ 6,700
14	Out of State Travel Expenses		$ 7,200	$ 7,200
15	Operating Expenses		$ 4,000	$ 4,000
16	Trustee Fee		$ 10,000	$ 10,000
17	Central Services		$ 376,058	$ 376,058
18	Previously approved funding held as reserve	$ 1,969,639	$ -	$ 1,969,639
19	**Administrative & Operating Activities Balance**	$ -	$ -	$ -
20	**Maintenance & Preservation (Cost Centers)**	**$ 752,608**	**$ 1,403,188**	**$ 2,155,796**
21	Bridge and Tunnel Preservation		$ -	$ -
22	Routine Maintenance on Bridge and Tunnel Enterprise Structures		$ 1,403,188	$ 1,403,188
23	Previously approved funding held as reserve	$ 752,608		$ 752,608
24	**Maintenance & Preservation Balance**	$ -	$ -	$ -
25	**Debt Service and Availability Payments (Cost Centers and Pools)**	**$ 730,146**	**$ 78,267,402**	**$ 78,997,548**
26	Series 2019A Redfunding Bonds Debt Service		$ 13,699,700	$ 13,699,700
27	Series 2024B Refunding Bonds Debt Service		$ 11,804,500	$ 11,804,500
28	Central 70 Availability Payment		$ 33,398,714	$ 33,398,714
29	Series 2024A Infrastructure Revenue Bond Debt Service		$ 7,960,975	$ 7,960,975
30	Series 2025A Infrastructure Revenue Bond Debt Service		$ 11,403,513	$ 11,403,513
31	Previously approved funding held as reserve	$ 730,146		$ 730,146
32	**Debt Service Balance**	$ -	$ -	$ -
33	**Construction Program (Cost Centers & Pools)**	**$ 31,757,495**	**$ 124,740,155**	**$ 156,497,650**
34	Capital Construction	$ 31,757,495	$ 124,740,155	$ 156,497,650
35	**Construction Program Balance**	$ -	$ -	$ -
	Total Fund 538 Available Budget			**$ 242,223,746**
	Total Fund 538 Itemized Allocations			**$ 242,223,746**
	Total Fund 538 Balance			**$ -**

Line	Budget Category / Program	A. FY2025-26 Estimated Rollforward	B. FY2025-26 Final Allocation Plan	C. FY2026-27 Proposed Allocation Plan	D. FY2026-27 Final Allocation Plan	FY2026-27 Available Budget (A+D)
1	Bridge & Tunnel Enterprise					
2	Capital Construction	$31.8 M	$110.6 M	$117.3 M	$124.7 M	$156.5 M
3	Asset Management	$31.8 M	$110.6 M	$117.3 M	$124.7 M	$156.5 M
4	Capital Construction	$31.8 M	$110.6 M	$117.3 M	$124.7 M	$156.5 M
5	Maintenance and Operations	$0.8 M	$2.4 M	$1.4 M	$1.4 M	$2.2 M
6	Asset Management	$0.8 M	$2.4 M	$1.4 M	$1.4 M	$2.2 M
7	Maintenance and Preservation	$0.8 M	$2.4 M	$1.4 M	$1.4 M	$2.2 M
8	Administration & Agency Operations	$2.0 M	$2.2 M	$2.2 M	$2.6 M	$4.6 M
9	Agency Operations	$2.0 M	$2.2 M	$2.2 M	$2.6 M	$4.6 M
10	Debt Service	$0.7 M	$66.2 M	$78.3 M	$78.3 M	$79.0 M
11	Debt Service	$0.7 M	$66.2 M	$78.3 M	$78.3 M	$79.0 M
12	TOTAL - Bridge & Tunnel Enterprise	$35.2 M	$181.4 M	$199.2 M	$207.0 M	$242.2 M

COLORADO
Department of Transportation

Transportation Commission Memorandum

To: The Transportation Commission
From: Jeff Sudmeier, Chief Financial Officer
Date: March 18, 2026

Subject: Monthly Cash Balance Update

Purpose

To provide an update on cash management, including forecasts of monthly revenues, expenditures, and cash balances for the State Highway Fund, SB 17-267 Trustee Account, and American Rescue Plan Act funds.

Action

No action is requested at this time.

Summary

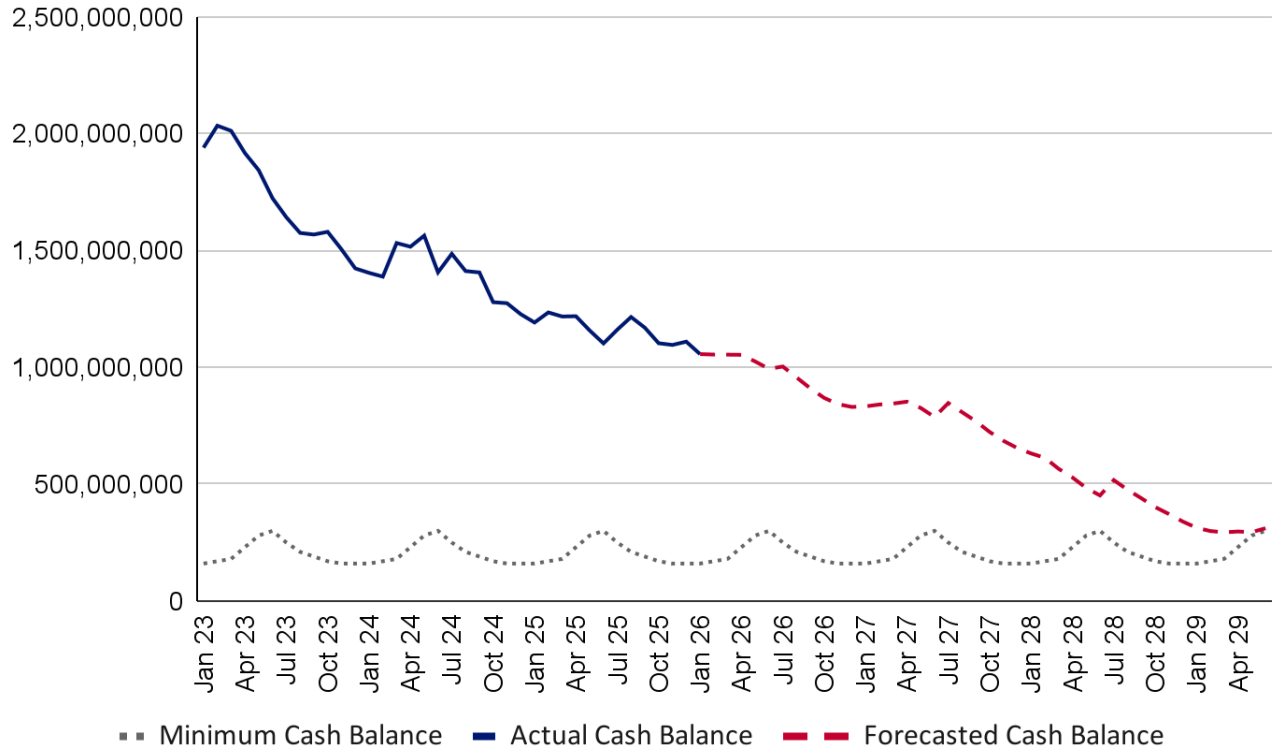
The actual cash balance for January 2026 was $1.06 billion; $896.18 million above that month's minimum cash balance target of $160.00 million. January's cash balance includes $580.11 million in the State Highway Fund, $33.07 million in ARPA Refinance funding, and $443.00 million in the Senate Bill 267 trustee account.

Figure 1 below outlines the Department's 36-month cash forecast. The primary drivers in this forecast include revenue from the state Highway Users Tax Fund (HUTF), federal reimbursements, payments to contractors, and General Fund transfers made pursuant to SB 21-260.

The Fund 400 Cash Balance is expected to gradually decrease over the forecast period as projects funded with SB 17-267 and other legislative sources progress through construction. The sections below provide additional information on the revenues and expenditures forecasted for this memo.

COLORADO
Department of Transportation

Figure 1 - Fund 400 Cash Forecast



Cash Balance Overview

The Transportation Commission's directive (Policy Directive 703.0) outlines targeted minimum cash balances to limit the risk of a cash overdraft at the end of a month to, at most, a probability of 1/1,000 (1 month of 1,000 months ending with a cash overdraft). The forecasted cash balance is expected to remain above the targeted minimum cash balance through the forecast period.

The cash balance forecast is limited to the State Highway Fund (Fund 400 and affiliated funds and trustee accounts). This forecast does not include other statutory Funds, including the Multimodal Mitigation and Transportation Options Fund and funds associated with CDOT enterprises.

Revenue Sources Forecasted

The State Highway Fund revenues forecasted in this cash balance include:

- Highway Users Tax Fund - This primarily includes Motor Fuel Taxes, Vehicle Registration Fees, Road Usage Fees, and Retail Delivery fees.
- Miscellaneous State Highway Fund Revenue - This revenue includes proceeds from the sale of state property, interest earned on balances in the cash fund,

the issuance of oversize/overweight permits, and revenue from various smaller sources.

- SB 17-267 - This bill directed the State Treasurer to execute lease-purchase agreements on existing state facilities to generate revenue for priority transportation projects.
- General Fund Transfers- Pursuant to SB 21-260, annual General Fund transfers will be made to the State Highway Fund between FY 2024-25 to FY 2031-32. This cash forecast assumes these transfers will be made in July of each year.

Expenditure Sources Forecasted

The State Highway Fund expenditures forecasted in this cash balance include:

- Payments to construction contractors (described in more detail in the section below)
- Staffing expenses and program-related professional services
- Right of Way Acquisition
- Debt Service
- Transfers between CDOT and other state entities
- Maintenance and facilities expenditures
- Grant expenditures
- Other expenditures related to services and equipment.

Cash Payments to Construction Contractors

The current forecast of payments to construction contractors under state contracts (grants paid out under inter-government agreements for construction are accounted for elsewhere in the expenditure forecast) from Fund 400 is shown in Figure 2 below.

Figure 2 - Cash Payments to Construction Contractors (millions)

CY 2019 (actual)	CY 2020 (actual)	CY 2021 (actual)	CY 2022 (actual)	CY 2023 (actual)	CY 2024 (actual)	CY 2025 (actual)	CY 2026 (forecast)
$669	$774	$615	$841	$860	$882	$962	$960 *

*This is a preliminary baseline that will be updated as additional project schedule detail becomes available.

Figure 3 details the final CY25 actual expenditures for the State Highway Fund (see Figure 2 above) as well as Bridge and Tunnel Enterprise. CDOT sets the CY baseline in January each year, using the best estimates, forecast, and schedule information available at the time.

Including Bridge Enterprise, January 2026 month end expenditures were corresponding to an Expenditure Performance Index (XPI) of 0.62 (actual expenditures vs. baseline). There were

$36.1M actual expenditures YTD vs. the baseline of $58.7M. The CY 25 baseline included expenditures from 219 projects, while the new CY 26 baseline includes expenditures from 205 projects. Figure 4 details the CY26 baseline and forecasted expenditures.

Figure 3 - Dashboard View, CY 25 Year End

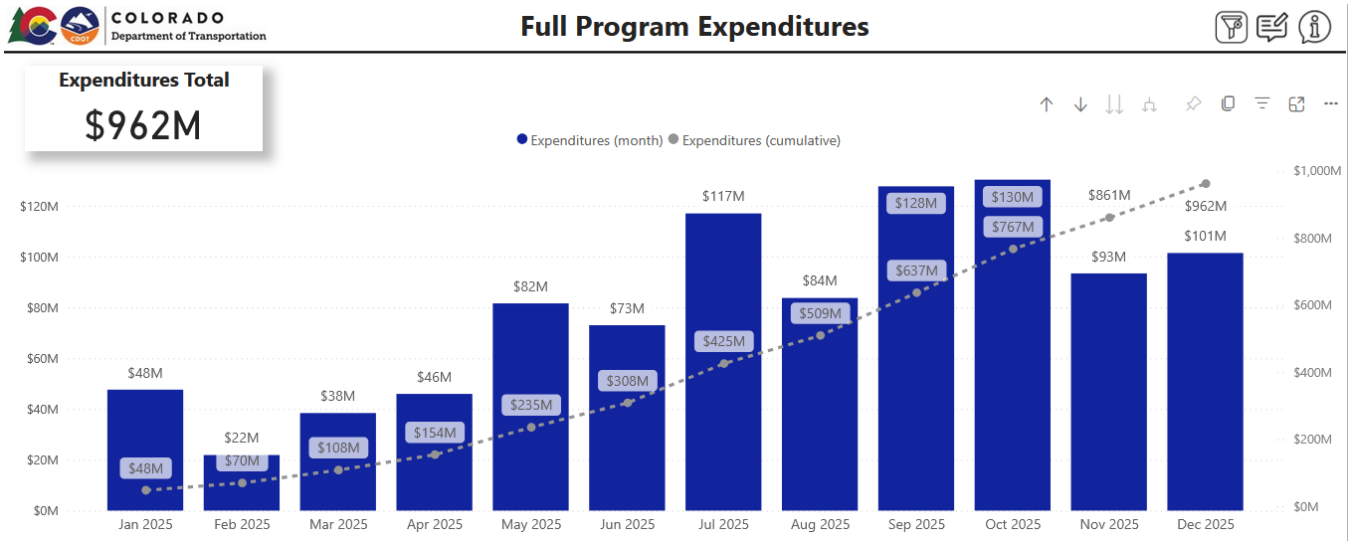
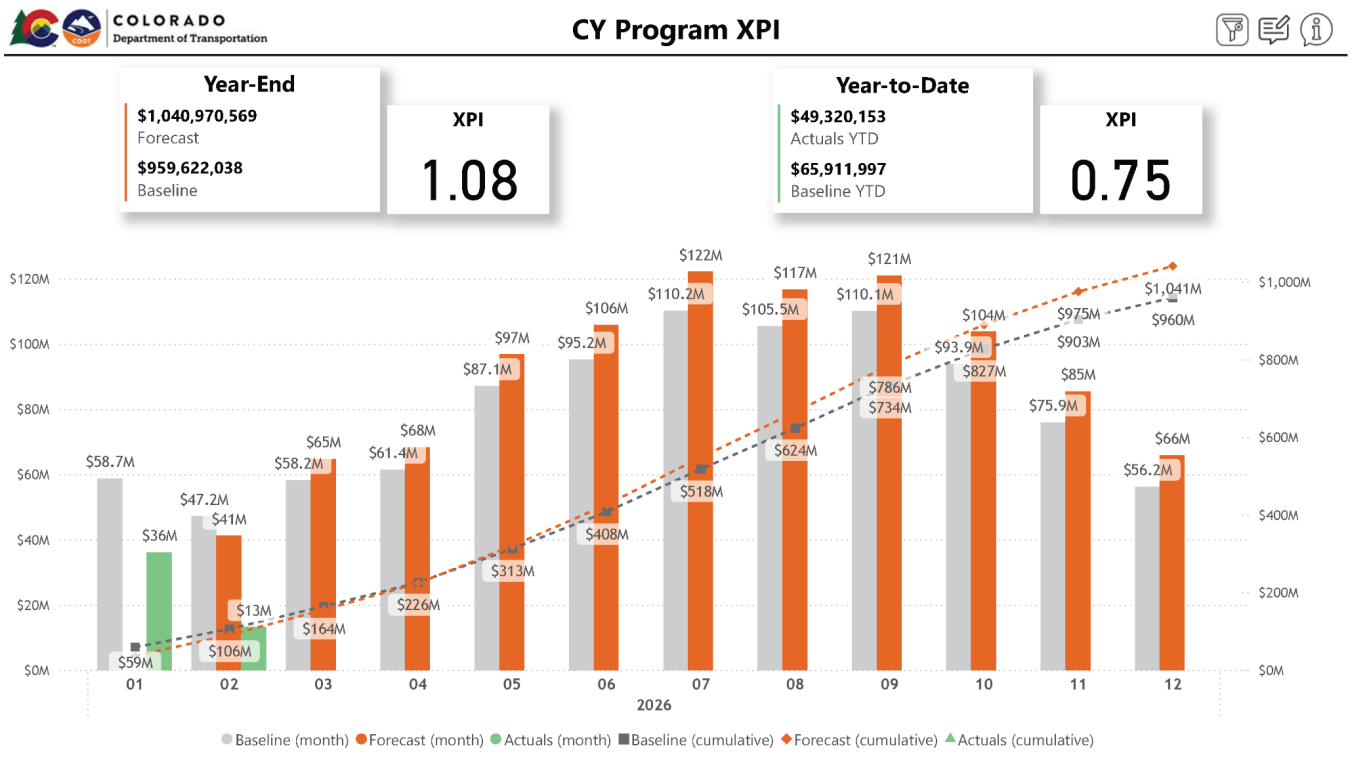


Figure 4 - Dashboard View, CY 26



COLORADO
Department of Transportation

Transportation Commission Memorandum

To: Colorado Transportation Commission

From: Leslie Welch and Anna Dunn, Grants Coordinators

Date: March 3rd, 2026

Subject: Update to the Transportation Commission on CDOT's submitted, in progress, and forthcoming grant applications

Purpose

To share progress on submitted applications, as well as current and future coordination of proposals to anticipated federal discretionary programs, primarily under the Infrastructure Investment Jobs Act (IIJA).

Action

Per PD 703.0, when the department intends to apply for grants with a match consisting of previously approved funding, no action is necessary by the Commission, but we provide the Commission with the projects we intend to pursue. If the match requires an additional commitment of funds not already approved by the Commission, or Bridge & Tunnel Enterprise (BTE), staff brings the projects to the Commission as an action item, with the additional funding being made contingent on a successful application and grant award.

As always, Commissioners and CDOT staff are encouraged to contact CDOT's in-house grant team with questions, comments, and suggestions.

Background

For information on closed 2022, 2023, 2024, and 2025 grant programs and awarded proposals, please refer to archived TC Grants Memos from December 2025 or prior.

The following discretionary grant programs have closed, but applications are still being reviewed:

1. BRIDGE INVESTMENT PROGRAM (BIP) - LARGE BRIDGE
    - I-270 Corridor Improvements Bridge Bundle, R1
2. BRIDGE INVESTMENT PROGRAM (BIP) - OTHER than LARGE BRIDGE (>$100M)
    - US50 Blue Mesa Bridges Emergency Repairs, R3
3. BRIDGE INVESTMENT PROGRAM (BIP) - PLANNING
    - I-70 West Applewood to Lakewood Critical Bridges Planning, R1
4. National Scenic Byways Program
    - Mount Blue Sky Scenic Byway: Interpretation Corridor Management Plan, R1
    - Roadside Markers Improvements on Colorado Byways, Statewide
5. BRIDGE INVESTMENT PROGRAM (BIP) - LARGE BRIDGE
    - I-270 Critical Bridges, R1

6. Rural and Tribal Assistance Pilot Program
    - Grants Team has submitted the Small Slope Alternative Avalanche Mitigation Feasibility Analysis, which will affect locations across Region 3 and 5. Notice has been delayed due to the federal shutdown.
7. RESTORE Colorado - National Fish and Wildlife Foundation - Response expected by late March 2026
    - Grants Team has submitted a $485,000 grant for the R2 I25 Raton Pass wildlife crossing project.
8. National Railroad Partnership Program (formerly known as Federal State Partnership Program) - Response expected August 2026
    - Denver Union Station Improvements- Track and equipment improvements to reduce passenger rail delays ats Union Station, Region 1
    - SAFER Travel- Rockfall mitigation, grade crossing improvements, hazmat caching along key passenger rail routes (e.g., California Zephyr), Region 3.
9. Better Utilizing Investments to Leverage Development (BUILD) (formerly known as RAISE) - Response expected August 2026
    - 23rd Avenue Bridge Improvements Project - Replacement of the 23rd Avenue bridge and corresponding multimodal improvements, Region 1
    - US Highway 50 Safety Improvements West of Cañon City (aka the '8 Mile Grant' - Installation of median and other safety improvements along US 50 west of Cañon City, Region 2
    - I-70 Tourism/Recreation Access and Interstate Longevity (TRAIL) - Replacement of the Mt. Garfield Trailhead access culvert, Region 3
    - Morgan County Building Opportunities for Optimized Safety and Transportation (BOOST) - Reconstruction of I-76 near Fort Morgan and elimination of dangerous interchange, Region 4

IN PROGRESS

CDOT is actively pursuing the following discretionary grant program(s):

1. PROTECT
    - CDOT is pursuing grants for State-Wide Avalanche Mitigation (SWAP) in Regions 3 and 5 and a Culvert package in Region 3
2. CRISI
    - CDOT intends to pursue a grant for a sidings project in R1 to improve freight movement and railyard congestion
3. Wildlife Crossings Pilot Program
    - CDOT intends to pursue resubmissions for the R2 I-25 Raton Pass project, R1 US 40 Empire Overpass, as well as a new submission for US 160 East of Cortez.
4. Bridge Investment Program: Planning
    - CDOT is preparing to submit:
        - I-70 West Applewood to Lakewood Critical Bridges Replacement Planning Project, Region 1
        - Colorado Eastern Plains Timber Bridge Replacement Planning Project, Region 1
5. Bridge Investment Program: Medium Bridge
    - CDOT is preparing grants to submit:
        - US 85 Fountain Creek Critical Bridge Replacement for Community Connectivity and Safety, Region 2
        - US 550 Animas Bridge Replacement, Region 5

CDOT DISCRETIONARY GRANT SUCCESS BY THE NUMBERS
Since the IIJA was signed into law in November 2021…

- CDOT has been awarded $612M*, including both direct and indirect via local agency partnerships
- 19 priority projects featured in our 10 Year Plan have won a federal discretionary grant
- The Floyd Hill to Veterans Memorial Tunnels Improvements Project received CDOT's largest award to date at $100M

Next Steps

Grants Team is expecting updated NOFOs to drop soon for the following programs:

- BIP Medium and Other Bridge: Deadline has been delayed by FHWA. No updated NOFO out at this time
- Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program: No updated NOFO, but expected to follow NRPP.
- Wildlife Crossings Pilot Program. Expected Spring 2026

*Amount includes now rescinded EVCRAA and CRISI grants

Transportation Commission Statewide Plan and GHG Coordination Subcommittee

Date: 3 March 2026
Time: 2:00 PM
Location: Virtual

Attendees:
TC Members: Commissioner Cook and Commissioner Jones
CDOT HQ: Herman Stockinger, Deputy Executive Director & TC Secretary; Darius Pakbaz, Division of Transportation Development (DTD) Director; Erik Sabina, DTD Deputy Director; Chris LaPlante, Air and Climate Section Manger, and Libba Rollins, Greenhouse Gas Program Manager; Aaron Willis, Statewide and Regional Planning Manager, and Kathleen Collins, Senior Transportation Planner

Meeting Purpose:
To obtain preliminary review and comment on PACOG materials pertaining to their GHG Report to be submitted to the TC in March 2026 for TC acceptance.
The DTD Director noted that this TC Subcommittee meeting was noticed on the CDOT website/TC webpage and that the meeting is open to the public.

Agenda Item 1: Review Draft Materials for the Pueblo Area Council of Governments (PACOG) Greenhouse Gas (GHG) Report

- Darius Pakbaz provided an overview of the content of PACOG's draft presentation to the
- TC for the workshop dated 2/18/2026. It was noted that PACOG may still be refining the final presentation related technical details.
- PACOG is the last MPO to demonstrate compliance with the GHG Rule and they are a smaller MPO with only ~2% of the required GHG reductions applying to their region.
- CDOT discussed the likelihood of offering either financial or in-house staff assistance to PACOG moving forward to continue to help them improve their GHG modeling and streamline their GHG reporting process in the future.

Questions/Recommendations

- No substantial questions or comments were raised by the TC members present.
- As an aside, Commissioner Cook did ask if PACOG is pairing active transportation and transit with new dense land use developments.
    - Transit and Active Transportation are covered in the 2050 LRTP, but specifics on the linking of these within the transportation system is best answered by PACOG.
    - PACOG is currently working on a Bicycle and Pedestrian Plan.

Next Steps

- Eva Cosyleon, the PACOG Manager is anticipated to remotely attend the March TC workshops to provide the GHG report presentation.
- Commissioners were encouraged to reach out to Herman and Darius with any follow up questions or concerns they may have between now and the March meetings.

COLORADO
Department of Transportation
Division of Accounting and Finance

Memorandum

To: The Transportation Commission
From: Jeff Sudmeier, Chief Financial Officer
Amanda Silk, Director of Accounting
Date: February 19,2026
Subject: FY 2024-25 Annual Financial Audit

Purpose

To present annual audit results for the Colorado Department of Transportation.

Action

No formal action is being requested. Informational only.

Background

On an annual basis, the Office of the State Auditor (OSA) engages an outside audit firm to conduct a financial and compliance audit for CDOT. For Fiscal Year 2024-25 (FY 2025), OSA contracted with CLA (Clifton Larson Allen LLP) to complete the annual audit. The purposes and the scope of the Fiscal Year 2024-25 audit were to:

- Evaluate internal controls and compliance regarding financial accounting and reporting processes for SFY 2025.
- Assess internal controls and compliance for subrecipient monitoring across the Highway Safety Cluster, Formula Grants for Rural Areas and Tribal Transportation Program, and Nationally Significant Freight and Highway Projects.

The financial and compliance audits include a Financial Audit of CDOT, and a Single Audit of selected program areas. For FY 2025 this included the following:

- Highway Safety Cluster (NHTSA funding administered by the Office of Transportation Safety for safety programs and grants)
- Formula Grants for Rural Areas and Tribal Transportation Program (FTA funding administered by the Division of Transit and Rail as local transit grants)
- Nationally Significant Freight and Highway Projects (the INFRA discretionary grant program)

Financial audits are also conducted for the Bridge and Tunnel Enterprise and Colorado Transportation Investment Office.

Details

The FY 2025 Financial Audit included two IT findings classified as material weaknesses concerning internal controls for IT onboarding and privileged user access in SAP (CDOT's Enterprise Resource Planning (ERP) system). The findings and recommendations related to a lack of formalized procedures for access management and periodic reviews within onboarding procedures.

The FY 2025 Single Audit included two findings classified as a material weakness and a significant deficiency concerning the Highway Safety Cluster. The first finding and recommendations related to internal controls over reporting requirements associated with the Federal Funding Accountability and Transparency Act (FFATA), specifically ensuring timely and accurate reporting of subawards on the federal SAM.gov website. The second finding related to complying with period of performance requirements, specifically ensuring that grant expenditures comply with the applicable award period of performance.
weaknesses. The recommendations on these items include updating procedures and staff training.

The FY 2025 Financial Audits of the Bridge and Tunnel Enterprise and Colorado Transportation Investment Office included no findings.

Other Information:

The FY 2025 audits and financial statements for the Bridge and Tunnel Enterprise and Colorado Transportation Investment Office were released by the Legislative Audit Committee (LAC) on January 21, 2026 and are available here.

The FY 2025 audits and financial statements for CDOT were released by the LAC at their meeting on February 11,2026. The Statewide Single Audit is available here.