

ATTACHMENT A

To: Chair and Members of the Transportation Advisory Committee

From: Jacob Riger, Manager, Long Range Transportation Planning

Meeting Date	Agenda Category	Agenda Item #
June 27, 2022	Informational Briefing	3

SUBJECT

2050 Regional Transportation Plan (2050 RTP) greenhouse gas (GHG) analysis update.

PROPOSED ACTION/RECOMMENDATIONS

N/A

ACTION BY OTHERS

N/A

SUMMARY

As discussed at previous TAC meetings, DRCOG staff has been testing several strategies and concepts to meet the state GHG Rule's required emission reduction targets, including:

- a) Representing programmatic (non-project specific) 2050 RTP investments in the Focus model
- b) Strategic changes to the 2050 RTP's project investment mix and additional fiscally constrained programmatic investments (especially by 2030)
- c) Near-term land use forecast adjustments based on observed residential density increases between 2019-2025
- d) Telework rate adjustments in the Focus travel model
- e) Several potential mitigation measures relating to re-zoning, parking management, development/redevelopment, and complete streets standards/implementation

Based on the technical analysis conducted for a) through d), staff estimates the following progress towards meeting the reduction targets as compared to the baseline for the 2030, 2040, and 2050 analysis years (before mitigation measures are included):

Table 1: Draft Progress Towards Achieving GHG Rule Reduction Targets

Description	2030 Status		2040 Status		2050 Status	
	GHG Base	GHG Compliance	GHG Base	GHG Compliance	GHG Base	GHG Compliance
Network	Conformity	GHG 2030 Network Edits	Conformity	GHG 2040 Network Edits	Conformity	GHG 2050 Network Edits
Telework Rate	12%	25%	12%	25%	12%	25%
Represent of Programmatic Funding	No	Yes	No	Yes	No	Yes
Land Use	RTP-2020 GHG Base	Updated Land Use	RTP-2020 GHG Base	Updated Land Use	RTP-2020 GHG Base	Updated Land Use
VMT	99,138,667	93,033,400	111,432,381	103,039,672	122,036,695	112,282,772
VMT Compared to Base	-	-6.2%	-	-7.5%	-	-8.0%
GHG (MMT)	9.22	8.55	6.22	5.67	3.70	3.36
GHG compared to Base	-	-7.2%	-	-8.8%	-	-9.4%
GHG Reduction Required (MMT)	0.82		0.63		0.37	
GHG Target (MMT)	8.400725803		5.59		3.33	
Gap to Target (Metric Tons)	153,274		80,056		23,007	
% of total reduction remaining	19%		13%		6%	

Additionally, staff has prepared documentation (Attachment 1) on the Focus travel model assumptions and GHG technical analysis.

2050 RTP Project Investment Mix and Fiscal Constraint Changes

In addition to the technical analysis summarized above and in Attachment 1, staff has briefed TAC on the concept of proposed strategic changes to the 2050 RTP's project investment mix and fiscal constraint. The proposed changes also incorporate the project sponsor-requested changes to specific projects in the fiscally constrained 2050 RTP requested during the 2050 RTP "cycle amendments" process earlier this year.

DRCOG staff has been discussing with CDOT and other project stakeholders the following proposed modifications to select 2050 RTP projects (CDOT-directed funds and DRCOG-directed funds) from the lens of the GHG rule :

- Freeway managed lane projects: modify C-470 and Central I-25 projects to refocus on safety, operational, transit, and other multimodal project elements with associated GHG benefits; redirect CDOT funds to advance BRT corridors (see below) and fund additional regional multimodal programmatic investments (see below); process CDOT-requested project amendments (advance I-70 Floyd Hill and I-270 projects).
- DRCOG-directed funded roadway projects: modify scope of several projects to remove "6 laning" components to re-focus these projects on multimodal, safety, and complete streets investments.
- Bus Rapid Transit (BRT) network: advance several BRT corridors and complete four BRT corridors by 2030: East Colfax, SH-119, Federal, and Colorado; advance Broadway/Lincoln BRT corridor from 2040-2050 to 2030-2039; potentially advance East Colfax Extension BRT corridor.
- Additional Multimodal programmatic investments: Through the project-specific changes described above, re-allocate and finance \$900 million in additional multimodal programmatic investments (\$500 million by 2030, \$200 million more by 2040, \$200 million more by 2050).

Attachment 2 shows the proposed project-specific changes to the regionally funded projects in the 2050 RTP.

Mitigation Measures

At the June 13th TAC work session, staff described the mitigation measures concepts currently being analyzed for feasibility. As a reminder, the GHG rule provides for using mitigation measures to further reduce GHG emissions that are separate from emission reduction strategies reflected in DRCOG's Focus model. Mitigation measures must be specific, measurable, and effective in reducing GHG emissions, and able to be tracked over time. The process of using mitigation measures within the GHG rule, which CDOT codified within [Policy Directive 1610](#) (PD1610), would require the DRCOG Board to adopt a Mitigation Action Plan as part of the revised 2050 RTP committing the region to implement and annually report on the status of the specific mitigation measures chosen at the regional level (not by individual jurisdiction).

Attachment 3 shows the specific mitigation measures staff is proposing to include in a Mitigation Action Plan, and the estimated GHG emission reduction associated with each measure. Because most of the proposed mitigation measures are associated with specific geographies (such as transit stations, urban centers, etc.), staff has prepared an [interactive webmap](#) to illustrate the locations of these specific geographies throughout DRCOG's MPO area.

Federal Funds Restrictions

As staff has previously indicated, if the 2050 RTP cannot meet the GHG rule's emission reduction targets, certain federal funds (STBG and CMAQ) administered by DRCOG and CDOT would be restricted within the DRCOG MPO area to only projects allowed by the GHG rule that reduce GHG emissions. This restriction of federal funds would affect project eligibility for DRCOG's 2024-2027 TIP calls #3 and #4 in late 2022 and early 2023. Attachment 4 highlights the regionally funded projects in the 2050 RTP that would likely or potentially be restricted in this scenario. Because many 2050 RTP projects include multiple components, some components of otherwise-restricted projects could potentially advance, while other components may be restricted.

Conclusion

This memo summarizes the proposed framework and specific elements DRCOG staff is developing, analyzing, and preparing to meet the GHG rule's required emission reduction targets for the MPO area. This work includes close coordination with many stakeholders and partner agencies, particularly CDOT. Part of this important coordination is CDOT's updates to its 10-Year Plan in concert with DRCOG's updates to the 2050 RTP. Attachment 5 summarizes CDOT's work to revise its 10-Year Plan as described at CDOT's recent "4P" county meetings, and is being provided as background information.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

N/A

ATTACHMENTS

1. Focus travel model GHG analysis
2. 2050 RTP proposed project changes
3. Draft mitigation measures and GHG emission reductions
4. GHG rule potentially restricted projects
5. CDOT 10-Year Plan update
6. DRCOG staff presentation

ADDITIONAL INFORMATION

If you need additional information, please contact Jacob Riger, Manager, Long Range Transportation Planning, at 303-480-6751 or jriger@drcog.org.

Attachment 1: DRCOG Focus Travel Model: Reflecting Programmatic Funding for 2050 Regional Transportation Plan GHG Analysis

Draft: June 23, 2022

Summary

In a typical RTP update, there are network changes to regionally significant projects. These are reflected in the DRCOG Focus Model for each staging year. This year staff is also proposing to make further updates to model inputs and factors to better reflect observed real-world changes and future categories of “programmatic investments” included in the Draft 2022 Update to the 2050 RTP.

As adopted in April 2021, DRCOG’s fiscally constrained 2050 MVRTP contains over \$15 billion in programmatic funding. These programmatic investments are shown as a lump sum and individual projects are not yet identified in these programs. Specific projects within these programmatic investments will be determined through the Transportation Improvement Program process as regional and local priorities evolve over the 30-year life of the plan.

Programmatic funding categories include transit investments, active transportation, safety/Vision Zero, transportation demand management, and ITS investments, all of which are key strategic investments in improving the region’s multimodal transportation system while also reducing emissions. Despite representing a significant portion of the total investments in the fiscally constrained RTP, DRCOG has not historically reflected how the programmatic funding may influence future travel behavior in the Focus travel model.

In the context of the state of Colorado’s greenhouse gas rulemaking to regulate transportation planning processes, DRCOG is now evaluating methodologies to represent these programmatic funds in the travel model in coordination with the North Front Range MPO and CDOT. Through this coordinated effort, we hope to achieve a transparent and consistent methodology to reflect the effects these types of investments could make in future travel within the DRCOG region. DRCOG believes that reflecting these programmatic funds in the modeling will result in a more complete and accurate depiction of the total investments included in the RTP.

The details of model outputs, such as bicycle and pedestrian trips at localized and regional levels, better reflect future increased investments supporting those travel modes in relation to recent observed land use changes. This document details the methodology used to estimate available funding, the specific adjustments made to the model, and the reasoning behind those adjustments.

Methodology

DRCOG staff evaluated the categorical and programmatic RTP funding and estimated the approximate percentage of total funds in each pool associated with *additional* projects and investments not yet reflected in the travel model. The results are shown in Table 1, which has been reviewed by DRCOG’s TAC, RTC, and Board Workshop committees.

The percentage of the total funds, by category, was estimated by evaluating historic and intended uses of funding for infrastructure and services with the potential to reduce GHG emissions. The intention was to determine funding and/or enhancements in the use of funds for new infrastructure investments, services, or components of projects that were not reflected in the previous RTP model, such as bike/ped infrastructure supporting a BRT corridor.

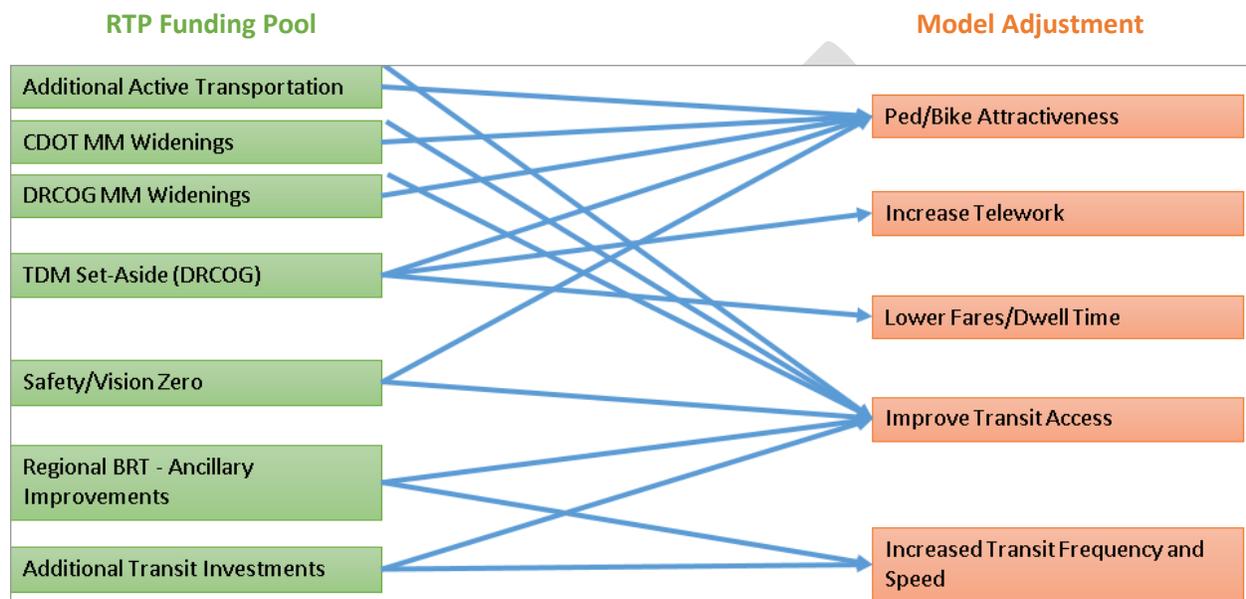
The resulting funding estimates will be used along with an estimated cost per unit to approximate the quantity of infrastructure (i.e., new multi-use paths) or service levels (i.e., increased transit service) to be reflected or mimicked in the travel model.

Table 1- 2050 RTP Funding Associated with Additional GHG Reduction

2050 RTP Investment Categories - GHG Reduction	2021-2030	2031-2040	2041-2050	RTP Total Funds	Investment (2020 Dollars)			Estimated % of total funds	GHG Associated Total Funds
					2021-2030	2031-2040	2041-2050		
Additional Transit Investments	\$58,720,014	\$59,095,014	\$59,470,014	\$702,358,000	\$52,848,013	\$53,185,513	\$53,523,013	90%	\$632,122,000
	\$3,500,000	\$320,000,000	\$201,573,077		\$3,150,000	\$288,000,000	\$181,415,769		
Regional BRT - Ancillary Improvements	\$629,000,000	\$256,000,000	\$298,000,000	\$1,183,000,000	\$31,450,000	\$12,800,000	\$14,900,000	5%	\$59,150,000
Additional Active Transportation	\$10,178,872	\$10,566,307	\$10,853,343	\$179,799,000	\$10,178,872	\$10,566,307	\$10,853,343	100%	\$179,799,000
	\$42,000,000	\$25,000,000	\$81,200,000		\$42,000,000	\$25,000,000	\$81,200,000		
Safety/Vision Zero	\$48,858,583	\$50,718,274	\$52,096,044	\$465,348,000	\$19,543,433	\$20,287,310	\$20,838,418	40%	\$186,139,000
	\$228,712,500	\$65,200,000	\$19,762,500		\$91,485,000	\$26,080,000	\$7,905,000		
Multimodal components of DRCOG Funded Widening Projects	\$221,200,000	\$748,000,000	\$630,000,000	\$1,599,200,000	\$22,120,000	\$74,800,000	\$63,000,000	10%	\$159,920,000
Multimodal components of CDOT Funded Widening Projects	\$3,144,400,000	\$1,360,000,000	\$1,550,000,000	\$6,054,400,000	\$157,220,000	\$68,000,000	\$77,500,000	5%	\$302,720,000
TDM Set-Aside (DRCOG)	\$34,000,000	\$34,000,000	\$34,000,000	\$102,000,000	\$3,400,000	\$3,400,000	\$3,400,000	10%	\$10,200,000
RTO&T Set-Aside (DRCOG)	\$50,000,000	\$50,000,000	\$50,000,000	\$150,000,000	\$5,000,000	\$5,000,000	\$5,000,000	10%	\$15,000,000
Operational and Safety Improvements (CDOT)	\$564,769,706	\$665,097,708	\$778,967,356	\$2,008,835,000	\$28,238,485	\$33,254,885	\$38,948,368	5%	\$100,442,000
Signal and Equipment Upgrades (CDOT)	\$872,784,945	\$877,942,269	\$881,779,868	\$2,632,507,000	\$43,639,247	\$43,897,113	\$44,088,993	5%	\$131,625,000
TOTAL:	\$5,908,124,621	\$4,521,619,573	\$4,647,702,203	\$15,077,447,000	\$510,273,050	\$664,271,129	\$602,572,904		\$1,777,117,000

Next, DRCOG staff evaluated how to represent these pools of funds, either in the Focus travel model, or through an off-model evaluation. DRCOG staff leaned heavily on the methodologies used during a scenario planning exercise from early 2020, as well as methodologies used by CDOT in defining the GHG targets. DRCOG staff linked each type of RTP categorical funding with the types of model factors that could be adjusted based on the intended use of the funds. Figure 1 shows how several of the RTP funding pools are associated with various adjustments in the model.

Figure 1- Model Adjustments Associated with Programmatic Funding Pools



For funding pools that are associated with multiple types of model adjustments, total funds were divided evenly between model adjustment categories.

Two categories of RTP funding pools are not able to be adequately represented in the Focus travel model: Increasing operational efficiency and Complete Street investments.

- Increasing operational efficiency above and beyond what is represented in the base model represents enhancements to incident management, signal timing, and other innovative methods of efficient operation of the existing roadway network.
- Complete streets balance the use of the public right of way for all modes of travel, thus encouraging additional travel by transit, bicycle, and pedestrian modes. They may involve speed reductions and/or street calming methods to improve safety.

DRCOG is proposing to represent both above funding pools by using PD1610's formulas off-model. The specific process and methodology will be documented in the final transportation GHG report.

The total funding available, by model adjustment category, by staging year, is shown in Table 2.

Table 2- Total Programmatic Funding Available by Model or Off-Model Category

Model Adjustment	2021-2030 Funds	2031-2040 Funds	2041-2050 Funds	Total Funds
Ped/Bike Attractiveness	\$ 153,521,000	\$ 105,606,000	\$ 126,884,000	\$ 386,011,000
Increase Telework	\$ 1,122,000	\$ 1,122,000	\$ 1,122,000	\$ 3,366,000
Lower Fares/ Reduced Dwell Time	\$ 1,156,000	\$ 1,156,000	\$ 1,156,000	\$ 3,468,000
Improve Transit Access	\$ 197,233,000	\$ 281,941,000	\$ 250,969,000	\$ 730,143,000
Increased Transit Frequency and Speed	\$ 43,724,000	\$ 176,993,000	\$ 124,919,000	\$ 345,636,000
Increase Operational Efficiency	\$ 76,878,000	\$ 82,152,000	\$ 88,037,000	\$ 247,067,000
Complete Streets Implementation	\$ 36,639,000	\$ 15,301,000	\$ 9,485,000	\$ 61,426,000
Grand Total	\$ 510,273,000	\$ 664,271,000	\$ 602,573,000	\$ 1,777,117,000

In-model representation
Off-model representation

DRCOG staff then estimated the level of adjustment to each model component, based on the funding available, scaled in proportion to estimates used in DRCOG’s Scenario costing work as well as the methodologies used in CDOT’s cost benefit document developed in relation to the state’s GHG rulemaking.

Proposed Adjustments

The proposed adjustments, reasoning, and funding summaries that support the adjustments are documented below. DRCOG staff will continue to perform research and monitor travel trends to ensure the model adjustments reflect real world conditions into the future.

Share of Work at Home

Table 3

Increase Telework	2030	2040	2050
Work at home rate for workers	25%	25%	25%
Millions of Dollars Invested per staging period	\$1.1	\$1.1	\$1.1

- Multiple factors influence work location choice and work trips. Previously, DRCOG targeted 20% of workers working at home on a given day. Current conditions lead DRCOG staff to believe 20% is now an underestimate. An increase to 25% is warranted because of the new way of work we are seeing in the world changed by the pandemic along with increased efforts in travel demand management programs and interest in policies to encourage more working from home at the state and local level.
- It is important to know what “work at home” encompasses. It does not just include telework, or office workers working remotely. Work from home also includes part time workers, self-employed small businesses, home offices, flexible/hybrid working schedules, and people who work alternative schedules such as three 12 hour shifts a week, could be doing on a sample day.
- It is also important to note that people that work from home may still take trips, whether it’s for personal business or work-related.

- Post-pandemic there has been an increase in businesses, schools, agencies, or other communities turning towards a four day a week compressed work week model.
- Before the pandemic, observed data demonstrated a significant increase in people working from home in the Denver region. Post-pandemic we continue to observe elevated levels of remote working or working at home some days of the week.

Bicycle and Pedestrian Attractiveness

The regional travel model does not have a bicycle and pedestrian network and, thus, specific identified projects cannot be coded. To reflect the programmatic investments in the model, bicycle and pedestrian attractiveness factors are used to represent the additional investments.

Table 4

Bike and Pedestrian Attractiveness	2030	2040	2050
Increase sidewalk density by the following factor	8%	16%	25%
Increase walk and bicycle operating speeds	4mph/ 11mph	5mph/ 12mph	5mph/ 12mph
Modify person-specific penalties	Remove penalties for gender and age 11-75	Remove penalties for gender and age 11-75	Remove penalties for gender and age 11-75
Millions of Dollars Invested per staging period	\$173	\$113	\$132

Increase sidewalk density

- One of many factors correlated with the attractiveness of active transportation modes is “sidewalk density”. As a preprocess to running the travel model, each transportation analysis zone is assigned a sidewalk density value based on the quantity of sidewalks and shared use paths within that zone, divided by the area. Sidewalk density is one factor which represents the ease and comfort of active transportation modes in specific geographic areas.
- To reflect the funds dedicated to active transportation infrastructure in each staging period, DRCOG is proposing to incrementally increase the sidewalk density values for urban and suburban area types over the life of the plan.
- The increased values do not represent an absolute increase in sidewalks, but rather represents select, strategic projects effectively increasing the density by focusing on key gaps and missing links. Through planimetric data and local government data collection and sharing efforts, we can optimize the addition of new sidewalk mileage to create more complete, connected networks.
- The value increases over the staging period because these infrastructure investments are additive over the years.

Increase walk speed and bicycle operating speed

- When the walk or bike modes are assigned in the model, they are given an operational travel speed which reflects the average speed for the trip, including, for example, wait time at intersections. Walk speeds were 3mph and bike speeds 8mph.

- DRCOG is proposing to increase walk and bicycle speeds incrementally in future staging years, as described in the table above.
- The increase in speed for walk and bicycle modes represent:
 1. The electrification of active modes through the adoption of e-bikesⁱ and e-scootersⁱⁱ. Not only does electrification increase the speed of these modes, but it may make the mode more attractive.
 2. The speed increase also represents additional priority being provided to active modes through legislation and infrastructure such as: cyclists given their own right of way and priority signal treatments; legal permissions for traversing intersections; improved sidewalk conditions; new key connections completed; and the perception of faster travel time that occurs when a walking journey is comfortable and on a well-connected network.

Modify person-specific negative attractiveness factors for bike (and ped) mode choice

- In both real life and in the model, an individual’s propensity to walk or bike is influenced by their age and their gender. Based on travel survey data from 2010, the model was calibrated to make walking and bicycling less attractive for women and older adults to reflect the observed data.
- To reflect the buildout of and enhancements to our active transportation system, observed cultural changes, and electrification providing additional mobility to older adults, we removed the negative factors applied to individuals in the model based on gender and adjusted the age where negative factors as described in the table above.
- This is motivated by the belief that the enhanced multimodal facilities will reduce some barriers for cycling for older people and women.
- Examples of enhancements that might affect the attractiveness of biking and walking include lighting on paths, safe crossings with appropriate time to cross, all new paths having appropriate widths – and added space at potential conflict points. We also know our local governments are working to build bike facilities based on comfort for all ages and abilities and targeting key connections to make high comfort complete routes.
- There is research¹ to show the perception of increased safety in numbers. For example, knowing other cyclists and walkers will be on a path can help it feel safer for some users or knowing drivers are used to seeing cyclists aids in comfort and sense of safety.

Transit

Table 5

Transit	2030	2040	2050
Reduce Fares	20%	20%	20%
Reduce Dwell Time	20%	20%	20%
Reduce Headways	5%	5%	5%

¹<https://www.sciencedirect.com/journal/safety-science/vol/92/suppl/C> ; <https://www.normalizecycling.com/safety-in-numbers/#:~:text=There%20is%20strong%20evidence%20of%20an%20association%20between,causes%20%28confounding%20factors%29%20that%20are%20not%20being%20measured>

Cap on Waiting Time	max 15 minutes	max 15 minutes	max 15 minutes
Reduce transit walk-access time	Remove penalties	Remove penalties	Remove penalties
Increase speed on transit walk links	100%	100%	100%
Transit Access Improvements: Funding (in millions)	\$197	\$282	\$251
Improve Transit Frequency and Speed: Funding (in millions)	\$44	\$177	\$125
Total Additional Transit Funding (in millions)	\$259	\$466	\$380

Reduce transit fares

- In the travel model, the cost of a trip influences people’s mode choice, as it does in real life. In the model, the cost of transit fare is a single value that represents what, in reality, is a complex pricing system including people with EcoPasses, discounted fares, monthly passes, fare zones, and more.
- DRCOG is proposing to reduce this value by 20% for all staging years. This is not suggesting there will be a blanket reduction of 20% in fares, hitting RTD revenues in the fare box, but rather it is intended to reflect the experience of users having a perception of lower fare through programmatic investments and strategic partnership, including:
 - Through TDM efforts, more people in the region will be able to use transit at a free or reduced cost, through commuter benefits like EcoPass or other programs.
 - Ongoing efforts to increase eligibility for discounted fares, and this is intended to reflect that.
 - RTD’s fare-revenue study is reviewing how to simplify the fare structure, which could reduce fares for some trips or psychologically reduce the cost for people by reducing confusion. ²
 - SB22-180³ will pilot free transit for one month a year, which could influence future transit fare decisions.

Reduce transit dwell time

- In the travel model, transit buses have a dwell time based on the type of route. To reflect some of the ancillary benefits of enhanced transit investments, the dwell time was reduced by 20%.
- In general, this change is to reflect transit investments that enhance the travel time competitiveness of transit. The primary reason for this change is streamlined payment and faster boardings.

² <https://www.rtd-denver.com/faresstudy>

³ <https://leg.colorado.gov/bills/sb22-180>

- It also reflects investment in transit signal prioritization equipment, that allows for a bus to travel through an intersection before or after a stop or more quickly re-enter the flow of traffic, which users can experience as additional dwell time.

Reduce headways

- The frequency of each transit route is included in the model. The time between buses or trains at a particular stop is considered the headway.
- The proposed 5% decrease in headway for all staging years is to reflect an increase in vehicle revenue miles across the region. Because these model adjustments represent programmatic investments, we cannot model specific route changes because this is adaptable based on future needs of the region.

Cap waiting time for longer headway routes

- In the travel model, travelers are assigned a “wait time” equal to half of the transit route’s headway for that time period. For all routes, the total wait time was capped at 15 minutes.
- Previously, the model assumed some people would arrive 30 minutes before their bus arrived. This significantly increased the travel time for some transit trips and did not reflect how most people use transit for long headway routes. This adjustment accounts for how smart phones and the investment in real time transit service information have changed how people will plan for their transit trip. Bus tracking specifically also allows people to plan to reduce wait time.

Reduce transit walk-access time

- The model includes information on how people get to transit. For trips where people access transit through active transportation modes the access time penalties were removed.
- This reflects the significant investment being made in active transportation access across the region and DRCOG’s prioritization of pedestrian projects near transit. More direct walk routes and pedestrian infrastructure improvements increase the ease of accessing transit.

Increase speed on transit walk links

- The specific pedestrian links that have a distinct connection to transit have a defined user travel speed. Because of the investments in active transportation and the pedestrian environment near transit, this speed needed to be readjusted. The speed was doubled for these short links to reflect the enhancements in infrastructure, including things like sidewalks, lighting, and more.
- The idea is that more comfortable and direct infrastructure, such as pedestrian bridges over high volume roadways, allows people to travel faster and also has a psychological impact on how people experience the length of a journey.

ⁱ <https://denverite.com/2022/05/06/denvers-e-bike-rebates-are-already-gaining-traction-with-residents/>

ⁱⁱ <https://www.9news.com/article/news/local/next/scooter-bike-share-denver-released-public/73-1d0e03e1-43fa-4ea7-bc3c-f024ec8db6b4>

Attachment 2
DRCOG 2050 Regional Transportation Plan
Proposed Project Modifications: Cycle Amendments & GHG Analysis

Last Revised: June 23, 2022

Project Name/Corridor	Location/Limits	Current 2050 RTP Project Description	Proposed Project Change/Description
I-70 Floyd Hill Eastbound	Floyd Hill to Veterans Memorial Tunnel	Eastbound interchange improvements with frontage road extension from Hidden Valley interchange to US 6 interchange	Process requested amendment. Move from 2030-2039 stage to 2020-2029 stage
I-70 Floyd Hill Westbound	Floyd Hill to Veterans Memorial Tunnel	Addition of a new express travel lane from the top of Floyd Hill to Veterans Memorial Tunnels, and eastbound auxillary lane from the bottom to top of Floyd Hill	Process requested amendment. Move from 2030-2039 stage to 2020-2029 stage
I-270	I-25/US 36 to I-70	New managed lanes	Process requested amendment. Move from 2030-2039 stage to 2020-2029 stage
C-470	Wadsworth to I-70	New managed lanes	Remove managed lanes component; complete interchange complex reconstruction and then reassess need for new managed lanes
	U.S. Route 285/Morrison/Quincy	Interchange complex reconstruction	
I-25 Central Buildout	Colfax Ave. to 20th St.	Ultimate buildout of corridor improvements	Re-scope corridor to focus on transit network improvements in Burnham Yard & future Front Range Rail, safety, operations, multimodal mobility; community re-connections; advance I-25/Speer/23rd Ave. safety/operational improvements; advance safety & operations improvements, Santa Fe to Colfax
I-25 Valley Highway/Burnham Yard	Santa Fe Blvd. to Colfax Ave.	Managed lanes, includes right-of-way, Burnham Yard, Central Main Line relocation	
Broncos Pkwy./Easter/Dry Creek Corridor	Parker Rd. to Havana	Widening to 6 lanes, bridge widening and intersection improvements	Widen to 4 lanes; bridge, multimodal corridor and intersection improvements
Gun Club Rd.	State Hwy. 30 to 6th Ave.	Widen from 2 to 4/6 lanes, includes stream crossing upgrade at Coal Creek	Widen from 2 to 4 lanes, includes stream crossing upgrade at Coal Creek, multimodal corridor improvements; advance stage period
Gun Club Rd.	Quincy to Aurora Pkwy.	Widen from 2 to 6 lanes	Widen from 2 to 4 lanes, multimodal corridor improvements
Smoky Hill Rd.	Buckley Rd. to Picadilly St.	Widen from 4 to 6 lanes	Multimodal corridor improvements [Note: corridor remains at 4 lanes]; potentially advance stage period
State Hwy. 30	Airport Blvd. to Quincy Ave.	Widen from 2 to 6 lanes	Widen from 2 to 4 lanes, multimodal corridor improvements; potentially advance stage period
Lincoln Ave.	Oswego to Keystone	Widen 4 to 6 lanes	Multimodal corridor improvements [Note: corridor remains at 4 lanes]; potentially advance stage period
SH-66	Lyons to Longmont	Widen from 2 to 4 lanes (Hover St. to Main St.) and operational/safety improvements from Lyons to Longmont in alignment with PEL	Process requested amendment. Split project between the 2020-2029 (Hover to Main) and 2030-2039 (Lyons to Hover) stage periods
South Platte River Trail		Complete missing links and upgrade trail section	Process requested amendment. Split project cost between the 2020-2029 and 2030-2039 stage periods
Broadway/Lincoln BRT	Colfax to Highlands Ranch Pkwy.	Bus rapid transit service and supporting safety/multimodal improvements	Advance BRT implementation from 2040-2050 stage period to 2030-2039 stage period
Federal Blvd. BRT	120th to Santa Fe/Dartmouth	Bus rapid transit service and supporting safety/multimodal improvements	Process requested amendment. Advance BRT implementation from 2030-2039 stage period to 2020-2029 stage period
State Hwy. 119 BRT	Downtown Boulder to downtown Longmont	Bus rapid transit service and supporting safety/multimodal improvements	Process requested amendment. Advance BRT implementation from 2030-2039 stage period to 2020-2029 stage period
Colfax Ave. Ext. BRT	I-225 to E-470	Bus rapid transit service and supporting safety/multimodal improvements	Potentially advance stage period (currently 2040-2050 stage period)

Attachment 3

GHG Emission Reduction Summary - All Mitigation Measures

Measure	Description	2025	GHG Reduction - Metric Tons		
			2030	2040	2050
Retime/optimize arterial signals	50 additional signals per year on arterial corridors above base program	59,625	50,625	34,875	24,750
Increase Residential Density from <10 units / acre to at least 15 to 25 units / acre	1,759 acres in Urban Centers/Pedestrian Focus Areas (43%) and rail/BRT Station Areas (57%)	2,375	13,548	16,011	10,557
Increase Job Density from <0.5 FAR to at least 1.0 FAR	367 acres in UC/Pedestrian Focus Areas (43%) and rail/BRT Station Areas (57%)	403	2,309	2,822	1,833
Mixed-Use TOD-higher intensity: Area rezoned for mixed-use TOD at least 25 units / acre and 150 jobs / acre	501 acres in UC/Pedestrian Focus Areas (25%) and rail/BRT Station Areas (75%)	1,502	8,588	9,814	6,510
Mixed-Use TOD-moderate intensity: Area rezoned for mixed-use TOD at least 15 units / acre and 100 jobs / acre	1,314 acres in UC/Pedestrian Focus Areas (24%) and rail/BRT Station Areas (76%)	3,219	18,397	21,157	14,455
Reduce or eliminate minimum requirements and set low maximum levels (residential)	Maximums: no more than 0.75 per 1 bed/studio/efficiency; 1.0 per 2 bed; and 1.25 per 3+ bed 1,718 acres in UC/Pedestrian Focus Areas (15%) and rail/BRT station areas (85%)	6,544	37,750	43,795	29,573
Reduce or eliminate minimum requirements and set moderate maximum levels (residential)	Maximums: no more than 1.0 space per 1 bed/studio/efficiency; 1.5 per 2 bed; and 1.75 per 3+ bed 2,481 acres in UC/Pedestrian Focus Areas (56%) and rail/BRT Station Areas (44%)	3,178	18,332	21,281	14,347
Reduce or eliminate minimum requirements and set maximum levels (commercial office)	Maximums: 2.0 to 2.5 per 1,000 sf non-CBD; 1.0 to 1.5 per 1,000 sf CBD 217 acres in UC/Pedestrian Focus Areas (20%) and rail/BRT Station Areas (80%)	946	4,557	4,045	3,564
Adopt local complete streets standards and apply to "locally funded" RTP projects	Additional benefits above and beyond regional investments in Complete Streets	101	287	243	44
Grand Total		77,894	154,392	154,043	105,631

Vacant and Redevelopable Parcels by Geography

Improvement to Land Value Ratio	Category	w/in 1/2 mile of rail station	w/in 1/4 mile of bus rapid transit (non-rail station area)	Total Station/BRT Areas	w/in existing urban center (non-station area)	w/in pedestrian focus areas (non-station, nor urban center)	Total UC/Ped Focus Areas	Total All Areas
0	vacant	3,463	1,135	4,598	697	2,056	2,753	7,351
0-1	redevelopable	3,483	2,388	5,871	1,019	1,337	2,356	8,227
1-2		2,132	1,232	3,364	755	1,205	1,960	5,324
Subtotal vacant/redevelopable		9,078	4,755	13,833	2,471	4,598	7,069	20,902
2-3	developed	1,446	921	2,367	569	1,174	1,743	4,110
3+		12,863	7,614	20,477	7,683	19,411	27,094	47,571

Note: Includes parcels in areas below 10 households per acre in 2020; excludes parcels in areas 15 households per acre or more in 2050

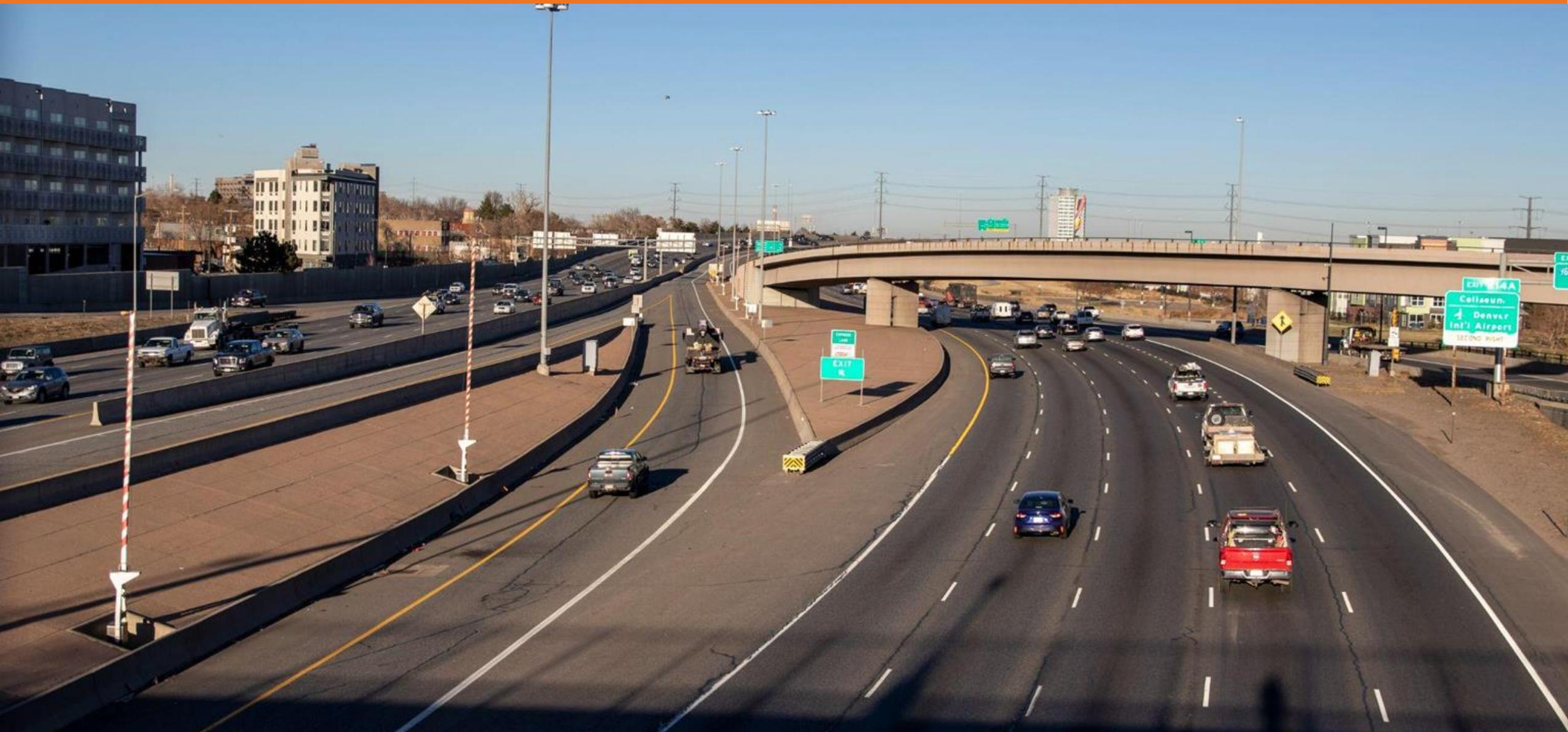
Attachment 4: 2050 Regional Transportation Plan Investments - Potentially Restricted Projects under the GHG Rule

Project name/Corridor	Location/Limits	Project description	Project cost (2020)	Staging period	Restricted?	Circulation	Bike/ped	Safety	Transit	Freight
2050 Metro Vision Regional Transportation Plan: regionally funded projects and programs										
Colorado Department of Transportation administered multimodal capital projects and programs										
C-470	Wadsworth to I-70	New managed lanes	\$410,000,000	2030-2039	Y	x		x	x	x
C-470	U.S. Route 285/Morrison/Quincy	Interchange complex reconstruction	\$150,000,000	2030-2039	Y	x		x		x
Federal Blvd.	6th Ave. to Howard Pl.	Widen from 5 to 6 lanes	\$23,400,000*	2020-2029	N/A	x	x	x	x	x
I-25 North (Segment 5)	State Hwy. 66 to Weld County Rd. 38 (DRCOG boundary)	Add 1 toll/managed lane each direction	\$175,000,000	2020-2029	Y	x		x	x	x
I-25 North (Segment 4)	State Hwy. 7 to State Hwy. 66	Managed lanes, State Hwy. 119 mobility hub, intelligent transportation systems, bicycle and pedestrian trail connections	\$150,000,000	2030-2039	P	x	x	x	x	x
I-25 North	E-470 to State Hwy. 7	Managed lanes, State Hwy. 7 interchange reconstruction and State Hwy. 7 mobility hub	\$200,000,000	2030-2039	P	x	x	x	x	x
I-25 North	84th Ave. to 104th Ave.	Operational improvements, center-loading transit station at 88th Ave. and general purpose lane	\$230,000,000	2040-2050	P	x	x	x	x	x
I-25 Central Buildout	Coffax Ave. to 20th St.	Ultimate buildout of corridor improvements	\$420,000,000	2040-2050	Y	x	x	x		x
I-25 Valley Highway/Burnham Yard	Santa Fe Blvd. to Coffax Ave. Santa Fe Dr. (U.S. Route 85) to Alameda Ave.	Managed lanes, includes right-of-way, Burnham Yard, Central Main Line relocation	\$900,000,000	2040-2050	Y	x	x	x	x	x
I-25	Bellevue	Interchange capacity	\$30,000,000	2020-2029	Y	x	x	x		x
I-25	Bellevue	Interchange reconstruction and pedestrian connections	\$112,000,000	2030-2039	Y	x	x	x		x
I-25	El Paso County Line to north of Crystal Valley Pkwy.	Add 1 toll/managed-lane each direction	\$300,000,000*	2020-2029	N/A	x	x	x	x	x
I-270	I-25/U.S. Route 36 to I-70	New managed lanes	\$500,000,000	2030-2039	Y	x		x	x	x
I-270	I-25/U.S. Route 36 and I-70	New freeway "direct connects" at each end of I-270	\$300,000,000	2030-2039	Y	x		x	x	x
I-70 Floyd Hill eastbound improvements	Floyd Hill to Veterans Memorial Tunnel	TBD	\$250,000,000	2030-2039	Y	x		x	x	x
I-70 Floyd Hill westbound improvements	Floyd Hill to Veterans Memorial Tunnel	TBD	\$450,000,000	2030-2039	Y	x		x	x	x
I-70	Eisenhower-Johnson Memorial Tunnels	Major rehabilitation of the Eisenhower-Johnson Memorial Tunnels	\$142,000,000	2020-2050	N	x		x	x	x
I-70	Twin Tunnels to Empire Junction (U.S. Route 40)	Add 1 westbound peak period managed lane	\$50,000,000*	2020-2029	N/A	x		x		x
I-70	Kipling	Interchange reconstruction and pedestrian connections	\$80,000,000	2040-2050	P	x	x	x		x
I-70	I-25 to Chambers Rd.	Add 2 new managed lanes	\$1,175,700,000*	2020-2029	N/A	x	x	x	x	x
State Hwy. 66	Lyons to Main St. (U.S. Route 287)	Widen from 2 to 4 lanes (Hover St. to Main St.) and operational/safety improvements from Lyons to Longmont	\$10,000,000	2030-2039	Y	x	x	x		x
State Hwy. 83 (Parker Rd.)	State Hwy. 86 to E. Mississippi Ave.	Corridor planning/investment for multimodal mobility, operations and safety	\$150,000,000	2030-2039	P	x	x	x	x	x
U.S. Route 6	Wadsworth Blvd.	Interchange capacity	\$80,000,000	2020-2029	Y	x	x	x		x
U.S. Route 85	120th Ave.	New interchange	\$100,000,000	2020-2029	Y	x		x		x
U.S. Route 85	104th Ave.	New interchange	\$100,000,000	2020-2029	Y	x		x		x
U.S. Route 85	Louviers to milepost 191.75	Widen from 2 to 4 lanes	\$59,000,000*	2020-2029	N/A	x		x		x
U.S. Route 85	Sedalia to Daniels Park	Widen from 2 to 4 lanes	\$35,000,000	2020-2029	Y	x	x	x		x
U.S. Route 85	Daniels Park to Meadows	Widen from 2 to 4 lanes	\$32,000,000	2020-2029	Y	x	x	x		x
U.S. Route 285	Pine Valley Rd. (County Rd. 126)/Mt. Evans Blvd.	New interchange	\$40,000,000	2030-2039	Y	x		x		x
U.S. Route 285	Parker Ave.	New interchange	\$25,000,000	2030-2039	Y	x		x		x
U.S. Route 285	Shaffers Crossing to Kings Valley Dr.	Widen from 3 to 4 lanes (add 1 southbound lane)	\$60,000,000	2020-2029	Y	x		x		x
U.S. Route 285	Kings Valley Dr.	New interchange	\$15,000,000	2020-2029	Y	x		x		x
U.S. Route 285	Kings Valley Dr. to Richmond Hill Rd.	Widen from 3 to 4 lanes (add 1 southbound lane)	\$25,000,000	2020-2029	Y	x		x		x
Vasquez Blvd.	60th Ave.	Intersection improvements	\$80,000,000	2040-2050	Y	x		x		x
				\$5,251,000,000						
Regional system preservation, enhancement, and operations	Varies	Road resurfacing; traffic signals, optimization, communication, variable message signs; bridge replacement, rehabilitation, preservation; and other systematic repairs and preventative maintenance	\$11,408,841,041	2020-2050	P					
				\$11,408,841,041						
Denver Regional Council of Governments administered multimodal capital projects and programs										
88th Ave.	I-76 northbound ramps to State Hwy. 2	Widen from 2 to 4 lanes	\$21,500,000	2020-2029	Y	x	x	x		x
104th Ave.	Colorado Blvd. to McKay Rd.	Widen from 2 to 4 lanes	\$8,100,000	2020-2029	Y	x	x	x		x
120th Ave.	U.S. Route 85 to E-470	Widen to 4 lanes	\$24,000,000	2020-2029	Y	x	x	x		x
Broncos Pkwy./Easter/Dry Creek corridor improvements	Parker Rd. to Havana	Widening to 6 lanes, bridge widening and intersection improvements	\$35,000,000	2040-2050	Y	x	x			x
County Line Rd.	Phillips St. to University Blvd.	Widen from 2 to 4 lanes	\$9,500,000	2020-2029	Y	x	x	x		x
Gun Club Rd.	State Hwy. 30 to 6th Ave.	Widen from 2 to 4/6 lanes, includes Stream crossing upgrade at Coal Creek	\$32,000,000	2030-2039	Y	x	x			x
Gun Club Rd.	Quincy to Aurora Pkwy.	Widen from 2 to 6 lanes	\$15,000,000	2020-2029	Y	x	x			x
I-25 North	104th Ave. to 120th Ave.	Shoulders; general purpose lanes; bridge	\$70,000,000	2040-2050	Y	x		x	x	x
I-25	Broadway	Interchange capacity	\$50,000,000	2020-2029	Y	x	x	x		x
I-25	Lincoln Ave.	Interchange capacity	\$49,400,000	2020-2029	Y	x	x	x		x
I-25	Happy Canyon Rd.	Interchange reconstruction	\$30,000,000	2020-2029	P	x	x	x		x
I-25	Meadows/Founders	Interchange reconstruction	\$50,000,000	2040-2050	P	x	x	x		x
I-25	Crystal Valley Pkwy.	New interchange and south frontage road	\$80,000,000	2020-2029	Y	x	x	x		x
I-225/Yosemite	DTC Blvd. to I-25 on-ramp	Interchange and ramp reconstruction	\$60,000,000	2020-2029	Y	x		x		x
Indiana (State Hwy. 72)	W. 80th Ave. to W. 86th Pkwy.	Widen to 4 lanes	\$39,000,000	2030-2039	Y	x	x	x		x
Kipling St.	Kentucky Ave. to I-70	Multimodal corridor improvements	\$250,000,000	2040-2050	P	x	x		x	x
Lincoln Ave.	Oswego to Keystone	Widen 4 to 6 lanes	\$24,000,000	2030-2039	Y	x	x			x
Martin Luther King Jr. Blvd.	Havana St./Iola St. to Peoria St.	Widen 2 to 4 lanes; new 4-lane road	\$15,000,000*	2020-2029	N/A	x	x			x
Peña Blvd.	I-70 to 64th Ave.	Add 1 managed lane in each direction	\$139,000,000	2030-2039	Y	x		x	x	x
Peña Blvd.	64th Ave. to E-470	Add 1 managed lane in each direction	\$124,000,000	2030-2039	Y	x		x	x	x
RidgeGate Pkwy.	Havana St. to Lone Tree eastern city limit	Widen from 2 to 4 lanes	\$8,000,000*	2020-2029	N/A	x	x			x
Smoky Hill Rd.	Buckley Rd. to Picadilly St.	Widen from 4 to 6 lanes	\$10,000,000	2040-2050	Y	x	x		x	x
State Hwy. 7	164th Ave. to Dahlia St.	Widen from 2 to 4 lanes	\$24,000,000	2020-2029	Y	x	x			x
State Hwy. 30	Airport Blvd. to Quincy Ave.	Widen from 2 to 6 lanes	\$175,000,000	2030-2039	Y	x	x			x
State Hwy. 52	Weld County Rd. 1 to Weld County Rd. 13	Planning and Environment Linkages study outcomes — safety, operational and multimodal improvements	\$20,000,000	2040-2050	P	x	x	x	x	x
State Hwy. 66	U.S. Route 287/Main Street to E. County Line Rd. (Weld County Rd. 1)	Capacity, operations and bicycle/pedestrian	\$15,000,000	2030-2039	P	x	x	x	x	x
State Hwy. 66	E. County Line Rd. (Weld County Rd. 1) to Weld County Rd. 19	Widen 2 to 4 lanes, pedestrian improvements	\$35,000,000	2040-2050	Y	x	x			x
State Hwy. 93	State Hwy. 58 to State Hwy. 170	Widen to 4 lanes and safety/transit improvements	\$200,000,000	2030-2039	P	x	x	x	x	x
U.S. Route 6	Heritage Rd.	New interchange	\$30,000,000	2020-2029	Y	x		x		x
U.S. Route 85 (Santa Fe)	C-470 to Bowles	Corridor planning/investment for multimodal mobility, operations and safety	\$150,000,000	2040-2050	P	x	x	x	x	x
U.S. Route 287/120th Ave.	Midway Blvd. to Lowell Blvd.	Improve circulation, safety, active transportation access, business access, congestion and transit operations	\$15,000,000	2020-2029	P	x	x	x	x	x
U.S. Route 85	Highlands Ranch Pkwy. to north of County Line Rd.	Widen from 4 to 6 lanes	\$50,100,000*	2020-2029	N/A	x	x			x
Wadsworth Blvd.	35th Ave. to 48th Ave.	Widen from 4 to 6 lanes	\$31,000,000	2020-2029	Y	x	x		x	x
Wadsworth Blvd.	17th Ave. to 35th Ave.	Multimodal corridor improvements	\$60,000,000	2040-2050	P	x	x	x	x	x
				\$1,875,500,000						

Total Projects with Funds Restricted without Waiver	\$5,604,561,451	9.9%
Total Projects with Funds potentially or partially Restricted without Waiver	\$13,008,841,041	23.1%
Total Projects with Funds not expected to be Restricted	\$37,729,316,392	67.0%



CDOT 10 Year Plan Updates





Updating the 10-Year Plan

Why are we updating the 10-Year Plan?

- **History:** CDOT, in partnership with DRCOG and RTD, met with DRCOG counties in summer 2019 and developed the original 10 Year Plan based on feedback received.
- **New revenue:** SB260 was passed to help deliver the 10-Year Plan. Additionally, the federal infrastructure bill brings new transportation dollars to the state.
- **Greenhouse Gas Rulemaking:** In December 2021, the Transportation Commission adopted the new GHG Pollution Reduction Planning Rule. The 10-Year Plan must comply with the new standard for reduced greenhouse gas emissions.
- **Progress delivering the first four years of the 10-Year Plan:** Looking across the entire time period of the current plan, we are transitioning from completing the last year of the original 4-year list to determining the next 4 year priority list that covers fiscal years 2023-2026.



Updating the 10-Year Plan

In updating the 10-Year Plan, our top priorities are to:

1. Fully deliver on the original 4-year priority list (FY 19-22) and to “close out” regional equity across this period.
 - \$380 M for FY 22, including 10% minimum to transit
2. Build the next 4-year priority list (FY 23-26)
 - \$325 M/year on average, including 10% minimum to transit (\$1.3 Billion total in strategic funding over next four-year prioritized list of projects)

Strategic funding assumptions include:

- SB 267 COPs
- SB 260 HUTF
- STBG (IIJA)
- Carbon Reduction (IIJA)
- Flexible funding and specific funding for bridges and risk/resiliency (IIJA)

➤ Region 1 can reasonably anticipate 34.23% of the total statewide funding (regional equity target)



Region 1 Anticipated Strategic Funding By Fiscal Year

Highway					
FY22	FY23	FY24	FY25	FY26	TOTAL
\$120,373,108	\$100,122,750	\$100,122,750	\$100,122,750	\$100,122,750	\$520,864,108

10% Minimum to Transit					
FY22	FY23	FY24	FY25	FY26	TOTAL
\$16,845,400	\$11,124,750	\$11,124,750	\$11,124,750	\$11,124,750	\$61,344,400

- Total anticipated strategic funding for FY 22-26 (highway + transit minimum) for Region 1 = **\$582,208,508**
- Anticipated funding represents yearly averages. Funding actuals may be higher or lower in certain years.



Region 1 Original Year 1-4 Projects

Original Year 1-4 Project	Strategic Funding Commitment Fulfilled		Original Year 1-4 Project	Strategic Funding Commitment Partially Fulfilled
I-25 South Gap	✓		I-70 West: Floyd Hill	
I-70 EB Escape Ramp Improvements	✓		I-270 Improvements and Congestion	
I-70 Corridor-West Metro Bridges	✓		I-70 Bustang Pegasus Park-N-Ride	
EJMT Repairs and Maintenance	✓		Bustang Fleet Purchases	
Noise Wall Maintenance	✓		Castle Rock Mobility Hub	
Safer Main Streets Program	✓		Bustang Heavy Maintenance Fac	
Lone Tree Mobility Hub	✓		I-70 / Harlan Bridge Replacement	
Idaho Springs Mobility Hub	✓			
I-25 Valley Highway - Burnham Yard Acquisition	✓			
I-25 and CO 7 Mobility Hub	✓			



Region 1 10-Year Plan Projects FY22-26

10-year Project	Est. Total Project Cost	Received to Date (Through FY21)	FY22 Strategic Funding	FY23-26 Strategic Funding	Strategic Funding FY22-26 = \$520M	Addition FY27+ Strategic Funding
I-70 West: Floyd Hill	\$700,000,000	\$135,000,000	\$56,800,000	\$183,200,000	\$240,000,000	
I-270 Improvements and Congestion Relief*	\$600,000,000	\$30,000,000		\$154,500,000	\$154,500,000	\$15,500,000
EJMT Repairs and Maintenance	\$150,000,000	\$50,000,000				
I-25 Interchange Reconstruction at Speer & 23rd	\$75,000,000		\$3,500,000	\$11,500,000	\$15,000,000	
I-25 North between 84th & 104th*	TBD		\$4,000,000	\$16,000,000	\$20,000,000	
US 6th and Wadsworth Blvd Interchange	\$125,000,000		\$40,000,000	\$20,000,000	\$60,000,000	
Vision Zero Priority Improvements	\$15,000,000			\$15,000,000	\$15,000,000	
I-70 & Harlan Bridge Replacement	\$25,600,000	\$21,300,000	\$600,000		\$600,000	
I-70 East Bound Truck Escape Ramp	\$25,000,000		\$13,000,000		\$13,000,000	
I-70 & Kipling (Early ROW)	\$80,000,000		\$2,500,000		\$2,500,000	



Region 1

10-Year Plan Transit Projects FY22-26

10-year Project	Total Project Cost	Received to Date (Through FY21)	FY22 Strategic Funding	FY23-26 Strategic Funding	Strategic Funding FY22-26 = \$60M
Castle Rock Mobility Hub	\$13,470,000	\$300,000	\$10,195,400	\$2,974,600	\$13,170,000
Bustang Heavy Maintenance Facility	\$4,500,000	\$500,000	\$450,000	\$3,550,000	\$4,000,000
Bustang Fleet Purchases (\$5.65M already spent)	\$1,200,000	\$0	\$1,200,000		\$1,200,000
I-70 West: Floyd Hill (I-70 Bustang Pegasus Park-n-Rides)	\$5,000,000	\$2,000,000	\$2,000,000	\$1,000,000	\$3,000,000
Regionwide Arterial BRT & Transit Improvements	\$70,000,000	\$0	\$3,000,000	\$37,000,000	\$40,000,000 + \$30,000,000 Enterprise Eligible Funds - TBD



Other Existing Outyear Projects FY27+

10-Year Project
I-25 Valley Highway - Phases 3 and 4
Regionwide Bridge Rehabilitation and Maintenance
I-25 at Belleview Ave Interchange - Phase 1
I-70 and Kipling Interchange *
I-70 Climbing Lane from Bakerville to the Eisenhower Tunnel
US 85 Corridor Improvements Sedalia to Meadows Parkway in Castle Rock
US 285 Corridor Improvements near Pine Junction
I-270 Improvements and Congestion Relief *
Regionwide Arterial BRT & Transit Improvements *

10-Year Project
CO 7 Priority Intersection Improvements
CO 30 Improvements between Quincy Road and Airport Road
C-470: US 85 to Morrison Road Interchange Reconstruction and Widening
Regionwide Trail Grade Separations and Crossing Improvements
Regionwide Bottlenecks Reductions
Regionwide Signal Cabinets Upgrades
Regionwide Signal Upgrades
I-25 North between 84th & 104th *

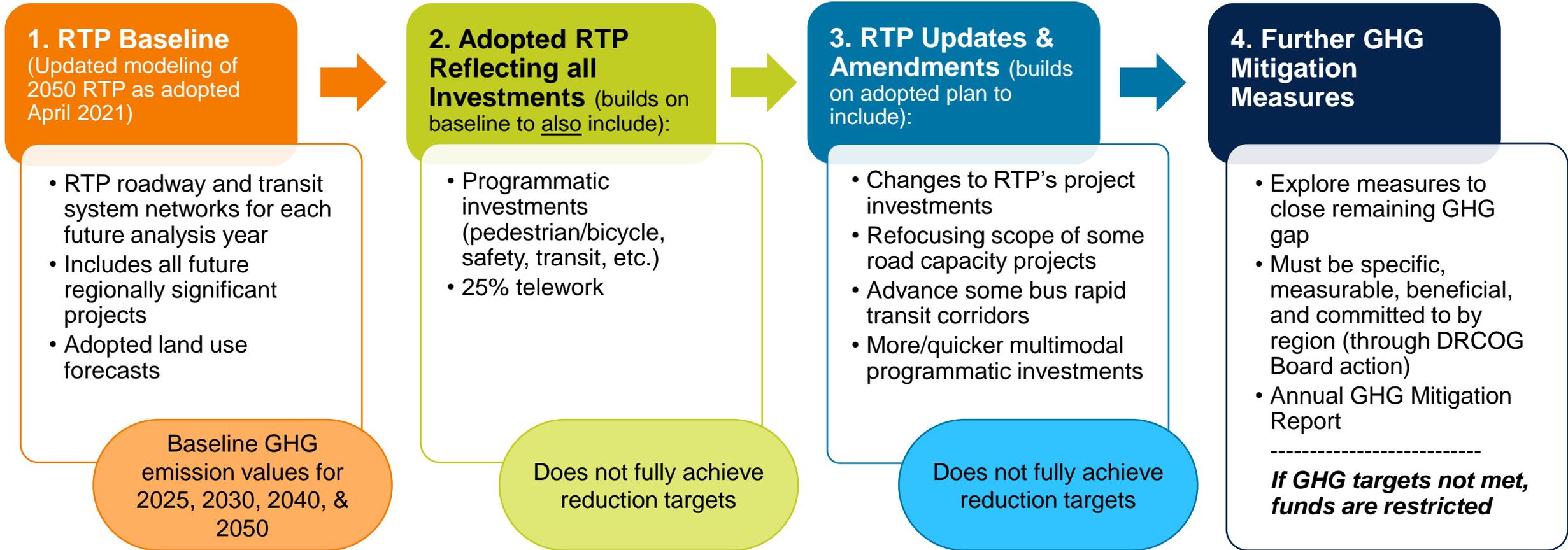
***Reflects existing remaining need to complete projects after 2026**

2050 MVRTP GHG Analysis – Proposed Project Modifications And Mitigation Measures

Transportation Advisory Committee
June 27, 2022

Jacob Riger, AICP
Manager, Long Range Transportation Planning

Process to meet GHG reduction levels



- **Representing programmatic (non-project specific) 2050 RTP investments** in the Focus model
- **Strategic changes to the 2050 RTP's project investment mix** and additional fiscally constrained programmatic investments (especially by 2030)
- **Near-term land use forecast adjustments** based on observed residential density increases between 2019-2025
- **Telework rate adjustments** in the Focus travel model
- **Several potential mitigation measures** relating to signal re-timing, re-zoning, parking management, development/redevelopment, and complete streets standards/implementation



Table 1: Draft progress towards achieving GHG rule reduction targets

Description	2030 Status		2040 Status		2050 Status	
	GHG Base	GHG Compliance	GHG Base	GHG Compliance	GHG Base	GHG Compliance
Network	Conformity	GHG 2030 Network Edits	Conformity	GHG 2040 Network Edits	Conformity	GHG 2050 Network Edits
Telework Rate	12%	25%	12%	25%	12%	25%
Represent of Programmatic Funding	No	Yes	No	Yes	No	Yes
Land Use	RTP-2020 GHG Base	Updated Land Use	RTP-2020 GHG Base	Updated Land Use	RTP-2020 GHG Base	Updated Land Use
VMT	99,138,667	93,033,400	111,432,381	103,039,672	122,036,695	112,282,772
VMT Compared to Base	-	-6.2%	-	-7.5%	-	-8.0%
GHG (MMT)	9.22	8.55	6.22	5.67	3.70	3.36
GHG compared to Base	-	-7.2%	-	-8.8%	-	-9.4%
GHG Reduction Required (MMT)	0.82		0.63		0.37	
GHG Target (MMT)	8.400725803		5.59		3.33	
Gap to Target (Metric Tons)		153,274		80,056		23,007
% of total reduction remaining		19%		13%		6%

- **Overall strategy** – Strategic modifications for GHG benefits and additional programmatic investments
 - **Modify freeway managed lane projects** to focus on safety, operational, transit, and other multimodal aspects and associated GHG benefits. Process CDOT-requested project amendments
 - Modify scope of several DRCOG-administered roadway projects to **remove “6 laning” components** to re-focus these projects on multimodal, safety, and complete streets investments
 - **Complete four BRT corridors by 2030**: East Colfax, SH-119, Federal, and Colorado; **advance Broadway/Lincoln BRT corridor** from 2040-2050 to 2030-2039; **potentially advance East Colfax Extension BRT corridor**
 - Additional multimodal programmatic investments by **re-allocating and financing \$900 million** (\$500 million by 2030, \$200 million more by 2040, \$200 million more by 2050)

Attachment 2: Proposed project modifications – cycle amendments & GHG analysis

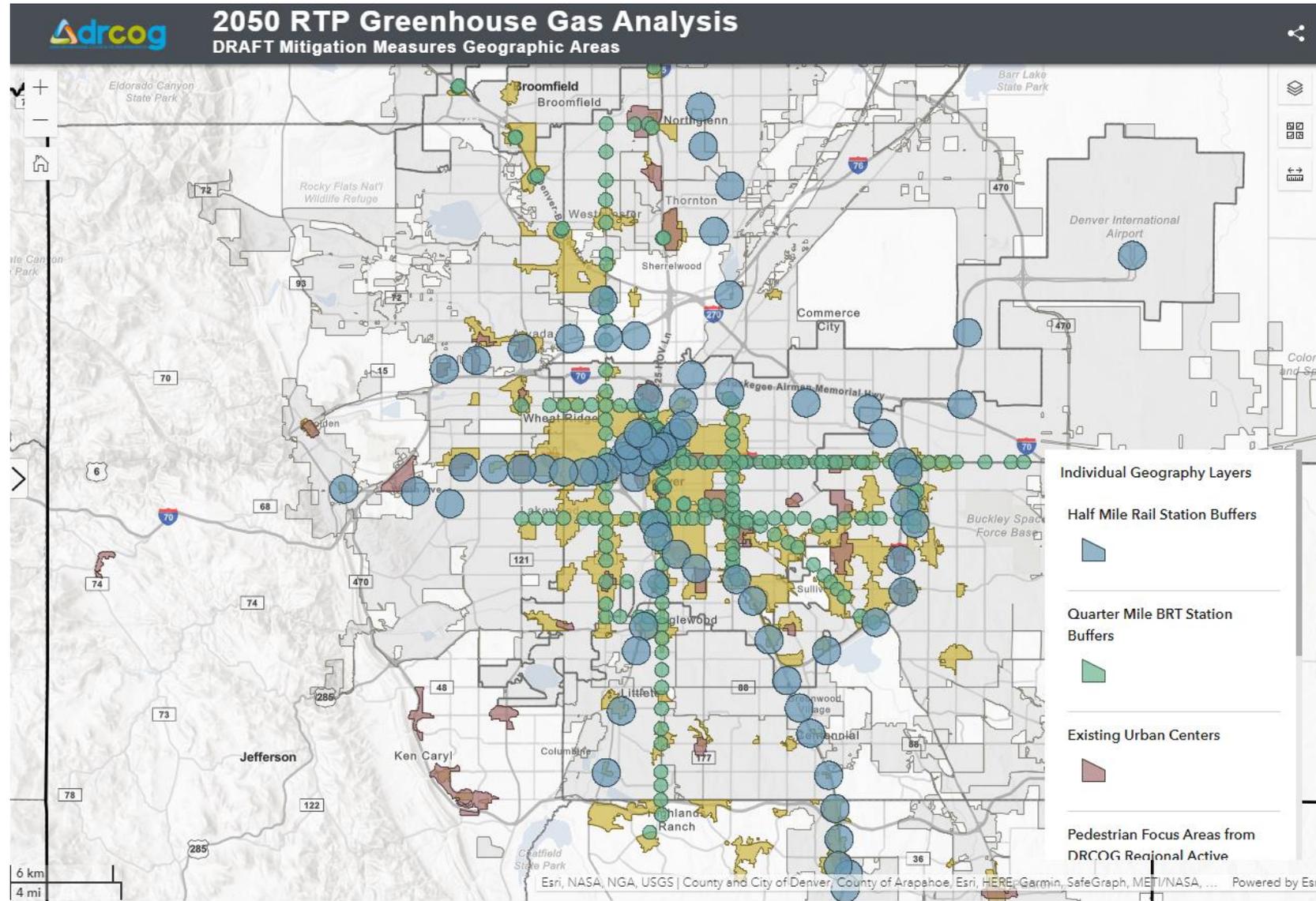
Project Name/ Corridor	Location/ Limits	Current 2050 RTP Project Description	Proposed Project Change/Description
I-70 Floyd Hill Eastbound	Floyd Hill to Veterans Memorial Tunnel	Eastbound interchange improvements with frontage road extension from Hidden Valley interchange to US 6 interchange	Process requested amendment. Move from 2030-2039 stage to 2020-2029 stage
I-70 Floyd Hill Westbound	Floyd Hill to Veterans Memorial Tunnel	Addition of a new express travel lane from the top of Floyd Hill to Veterans Memorial Tunnels, and eastbound auxiliary lane from the bottom to top of Floyd Hill	Process requested amendment. Move from 2030-2039 stage to 2020-2029 stage
I-270	I-25/US 36 to I-70	New managed lanes	Process requested amendment. Move from 2030-2039 stage to 2020-2029 stage
C-470	Wadsworth to I-70	New managed lanes	Remove managed lanes component; complete interchange complex reconstruction and then reassess need for new managed lanes
	U.S. Route 285/Morrison/Quincy	Interchange complex reconstruction	
I-25 Central Buildout	Colfax Ave. to 20th St.	Ultimate buildout of corridor improvements	Re-scope corridor to focus on transit network improvements in Burnham Yard & future Front Range Rail, safety, operations, multimodal mobility; community re-connections; advance I-25/Speer/23rd Ave. safety/operational improvements; advance safety & operations improvements, Santa Fe to Colfax
I-25 Valley Highway/Burnham Yard	Santa Fe Blvd. to Colfax Ave.	Managed lanes, includes right-of-way, Burnham Yard, Central Main Line relocation	
Broncos Pkwy./Easter/Dry Creek Corridor	Parker Rd. to Havana	Widening to 6 lanes, bridge widening and intersection improvements	Widen to 4 lanes; bridge, multimodal corridor and intersection improvements
Gun Club Rd.	State Hwy. 30 to 6th Ave.	Widen from 2 to 4/6 lanes, includes stream crossing upgrade at Coal Creek	Widen from 2 to 4 lanes, includes stream crossing upgrade at Coal Creek, multimodal corridor improvements; advance stage period
Gun Club Rd.	Quincy to Aurora Pkwy.	Widen from 2 to 6 lanes	Widen from 2 to 4 lanes, multimodal corridor improvements
Smoky Hill Rd.	Buckley Rd. to Picadilly St.	Widen from 4 to 6 lanes	Multimodal corridor improvements [Note: corridor remains at 4 lanes]; potentially advance stage period
State Hwy. 30	Airport Blvd. to Quincy Ave.	Widen from 2 to 6 lanes	Widen from 2 to 4 lanes, multimodal corridor improvements; potentially advance stage period
Lincoln Ave.	Oswego to Keystone	Widen 4 to 6 lanes	Multimodal corridor improvements [Note: corridor remains at 4 lanes]; potentially advance stage period
SH-66	Lyons to Longmont	Widen from 2 to 4 lanes (Hover St. to Main St.) and operational/safety improvements from Lyons to Longmont in alignment with PEL	Process requested amendment. Split project between the 2020-2029 (Hover to Main) and 2030-2039 (Lyons to Hover) stage periods
South Platte River Trail		Complete missing links and upgrade trail section	Process requested amendment. Split project cost between the 2020-2029 and 2030-2039 stage periods
Broadway/Lincoln BRT	Colfax to Highlands Ranch Pkwy.	Bus rapid transit service and supporting safety/multimodal improvements	Advance BRT implementation from 2040-2050 stage period to 2030-2039 stage period
Federal Blvd. BRT	120th to Santa Fe/Dartmouth	Bus rapid transit service and supporting safety/multimodal improvements	Process requested amendment. Advance BRT implementation from 2030-2039 stage period to 2020-2029 stage period
State Hwy. 119 BRT	Downtown Boulder to downtown Longmont	Bus rapid transit service and supporting safety/multimodal improvements	Process requested amendment. Advance BRT implementation from 2030-2039 stage period to 2020-2029 stage period
Colfax Ave. Ext. BRT	I-225 to E-470	Bus rapid transit service and supporting safety/multimodal improvements	Potentially advance stage period (currently 2040-2050 stage period)

Proposed mitigation measures

- **Mitigation measures will be needed** to achieve the GHG targets
- Staff has **analyzed the feasibility & applicability** of measures from PD1610 and proposes:
 - Retime/optimize arterial signals; increase residential density; increase job density; rezone for mixed-use TOD; reduce/eliminate minimum parking requirements; adopt local complete streets standards
- **Attachment 3 shows the estimated GHG emission reduction** associated with each measure
- Staff has **prepared an interactive webmap** to illustrate the locations of specific geographies associated with most of the proposed mitigation measures



Interactive webmap



- STBG and CMAQ funds administered by DRCOG and CDOT would **be restricted to only projects allowed by the GHG rule** to reduce GHG emissions
- Project eligibility for DRCOG's 2023-27 TIP **Calls for Projects #3 and #4 would be impacted**
 - Restrictions would also affect CDOT project funding eligibility within the DRCOG MPO area
 - Some eligible components of restricted projects could potentially advance
- **Attachment 4 highlights the regionally funded projects that would likely or potentially be restricted** in this scenario in the 2050 RTP



THANK YOU!
QUESTIONS?

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