

DRCOG 2023 Greenhouse Gas Mitigation Action Plan Report

March 30, 2023

Introduction

DRCOG has prepared this 2023 Greenhouse Gas Mitigation Action Plan Report to comply with the requirements of the [Greenhouse Gas \(GHG\) Transportation Planning Standard](#) (known as the GHG rule) adopted by the Colorado Transportation Commission in December 2021. Because DRCOG prepared a Mitigation Action Plan in 2022 as part of its strategy framework to comply with the GHG rule, the rule requires annual reports addressing the implementation status of the Mitigation Action Plan. The Colorado Department of Transportation’s (CDOT) [Policy Directive 1610](#) specifies the following information to include in the annual GHG Mitigation Action Plan Report for each mitigation measure:

- The implementation timelines;
- The current status;
- For measures that are in progress or completed, quantification of the annual benefit of such measures;
- For measures that are delayed, canceled, or substituted, an explanation of why that decision was made and, how these measures or the equivalent will be achieved, and
- For measures located in a Disproportionately Impacted Community that are delayed, canceled, or substituted, an explanation of why that decision was made and, how these measures or the equivalent will still be achieved in Disproportionately Impacted Communities

Summary of DRCOG Mitigation Action Plan Measures

The GHG rule provides for preparing a Mitigation Action Plan (MAP) as a final step to close the remaining gap in meeting the rule’s required reduction levels. Through its [Greenhouse Gas Transportation Report](#), DRCOG determined a MAP is needed for the 2030, 2040, and 2050 analysis compliance years (but not for 2025), as shown in Table 1:

TABLE 1. GREENHOUSE GAS EMISSION REDUCTION RESULTS, MILLION METRIC TONS PER YEAR

	2025	2030	2040	2050
2050 RTP update modeling (Network updates, programmatic funding and observed data)	0.68	0.68	0.57	0.35
Additional programmatic transportation investments (Active transportation, complete street retrofits, signal timing and CDOT Bustang)	N/A	0.07	0.05	0.03
Mitigation Action Plan (Commitment to further action in Appendix A)	N/A	0.10	0.12	0.08
Total greenhouse gas reductions	0.68	0.85	0.74	0.46
Reduction level requirement from Table 1 of the greenhouse gas rule (2 CCR 601-22, Section 8.02.6)	0.27	0.82	0.63	0.37
Reduction level achieved	Yes	Yes	Yes	Yes

The MAP details the region’s approach to using mitigation measures to help achieve the GHG reduction levels required for the DRCOG MPO area for 2030, 2040, and 2050. DRCOG’s mitigation measures are regional, policy-based, and represent the sum of potential local actions related to:

- increasing residential and employment densities
- mixed-use transit-oriented development
- reducing or eliminating minimum parking requirements while also setting maximum levels
- adopting local complete streets standards

Table 2 shows the GHG emission reductions associated with the MAP mitigation measures for each measure and each analysis year:

TABLE 2. GREENHOUSE GAS EMISSIONS REDUCTIONS FROM MITIGATION ACTION PLAN STRATEGIES

Mitigation Measure		Greenhouse gas reduction (metric tons)		
		2030	2040	2050
Land use strategies	Increase residential density from <10 units/acre to at least 15 to 25 units/acre	13,548	16,011	10,557
	Increase job density from <0.5 floor area ratio to at least 1.0 floor area ratio	2,309	2,822	1,833
	Mixed-use transit-oriented development higher intensity: Area rezoned for mixed-use transit-oriented development at least 25 units/acre and 150 jobs/acre	8,588	9,814	6,510
	Mixed-use transit-oriented development moderate intensity: Area rezoned for mixed-use transit-oriented development at least 15 units/acre and 100 jobs/acre	18,397	21,157	14,455
Parking strategies	Reduce or eliminate minimum parking requirements and set low maximum levels (residential)	37,750	43,795	29,573
	Reduce or eliminate minimum parking requirements and set moderate maximum levels (residential)	18,332	21,281	14,347
	Reduce or eliminate minimum parking requirements and set maximum levels (commercial)	4,373	3,940	3,511
Adopt local Complete Streets standards		369	243	44
Grand total		103,666	119,063	80,829

At the local government level, mitigation measures are voluntary, and the MAP does not require local jurisdictions to implement any mitigation measure in any specific location or within any specific timeframe. However, the mitigation measures were specifically chosen to build on the Denver region’s foundation of integrated transportation-land use planning, particularly around the region’s existing and planned rapid transit system and urban centers.

Tracking Mitigation Measures Implementation

DRCOG is integrating the tracking of mitigation measure implementation into existing workflows as much as possible. The anticipated tracking plan is outlined below, with details related to the land use strategies, parking strategies, and complete streets policies shown separately where needed.

Local government outreach

DRCOG staff develop and maintain relationships with local government planners to understand, anticipate and coordinate local and regional growth priorities. The need for these relationships and this understanding is connected to several official roles DRCOG fulfills:

- as part of the regional transportation planning process required of all **metropolitan planning organizations** to promote consistency between transportation investments and local planned growth, housing, and economic development patterns,
- to update and help local governments implement Metro Vision, the region's plan for its physical development DRCOG prepares as a **regional planning commission**, and
- because local governments are voluntary members of DRCOG as an **association of local governments**.

With many changes to local government operations and staff turnover throughout the COVID-19 pandemic, DRCOG staff have initiated an effort in 2023 to regularly visit local government planning offices. While the new framework being piloted for these visits allows the local governments to tailor this collaboration, it also provides the opportunity for DRCOG staff to identify when local governments are updating local plans, zoning codes (i.e. local zoning text amendments), parking standards, or Complete Streets standards to assess potential applicability to the MAP.

Land use strategies tracking

As a part of the regional transportation planning process, DRCOG maintains a portfolio of regionally comprehensive datasets for use in allocating county-level household and job growth forecasts across over 2,800 transportation analysis zones. DRCOG refers to this as its small-area forecast. DRCOG relies on a predictive model, the UrbanSim block model, to simulate household and employment location choices within the natural and regulatory constraints of each block. This work connects to the land use strategies in the MAP because of the work DRCOG does to represent regulatory constraints within this modeling framework. DRCOG staff estimate local zoning district capacity of approximately 2,000 unique districts. Relevant portions of this process are described below, and are further detailed in [Appendix F](#) of the [2050 Metro Vision Regional Transportation Plan](#).

Early every calendar year, DRCOG staff collect geospatial data from local governments, harvesting it from public geographic information systems (GIS) data portals and through direct requests. These include addresses, parcels, open space, bicycle facilities/trails, municipal boundaries, special district boundaries, bicycle counts and, most important to the work above, zoning. Attributes in zoning data do not include allowable densities. Consistently, this zoning data only includes district name and a shorthand notation.

While DRCOG has year-over-year data on local zoning maps, staff only have the resources to estimate capacity if the agency is anticipating the need for a new small-area forecast – updated every four years at minimum during the cycle for developing a new regional transportation plan. DRCOG staff first eliminates significant overlap in the local zoning file, then adds in several datasets: natural constraints (e.g. floodplain, waterbodies), protected ownership (e.g. schools, rights-of-way, protected open space). DRCOG then uses observable, point-level housing and employment data it licenses, collects and compiles from a variety of sources to understand the range of densities currently observed in different blocks throughout these different zoning districts.

This observation-based approach to estimating zoning capacity has limited ability to capture new or novel zoning that represents greater future densities than can be observed today. DRCOG staff currently rely on local government planning staff feedback on a draft small-area forecast to identify where capacity overrides may be necessary in the modeling process. Staff are exploring different partnerships or other opportunities that could provide additional resources to translate different dimensional standards, allowed uses, and allowed building forms into the housing unit and employment per acre metrics of the mitigation measures – potentially following the scope and schema of the National Zoning Atlas (www.zoningatlas.org).

DRCOG staff are also considering the development of methods to track year-over-year change even without re-estimation of capacity to track the role of local zoning map amendments (i.e. rezonings, annexation). This may involve the use of a hexagonal geospatial indexing system, which would allow DRCOG to evaluate regulatory capacity alongside current development levels of housing units and employment, as well as projected levels in the small-area forecast. Importantly, this could also allow for DRCOG to:

1. evaluate changes from the baseline small-area forecast used in the development of DRCOG's GHG baseline forecast in terms of both increased capacity and observed development,
2. evaluate success by looking at these areas in terms of vehicle miles traveled (VMT) per household or job as estimated by DRCOG's activity-based travel demand model, Focus, to understand how both capacity and development are changing in areas that may be more location-efficient, and
3. target future outreach and implementation assistance efforts in areas that offer greater opportunities for success in terms of emissions reductions and MAP compliance.

To supplement this further, DRCOG may test the feasibility of creating a workflow that relies on local interagency referral processes to track zoning map amendments, and possibly even zoning text amendments and changes to parking standards. This process feasibility assessment is anticipated to be included in DRCOG's FY 2024 and FY 2025 Unified Planning Work Program. The main limiting factor will continue to be staffing and financial constraints to routinely be able to conduct this breadth and depth of work.

Parking strategies tracking

DRCOG staff are currently identifying baselining activities related to parking standards for potential inclusion in the FY 2024 and FY 2025 Unified Planning Work Program. The primary purpose of this work will be to help with outreach and implementation assistance efforts, and may also help develop a community of practice around parking standards, which will help staff track the adoption of new parking standards that implement these strategies from the MAP. This work and community of practice will be integrated with current parking-related efforts being developed in DRCOG's [Transportation Demand Management Strategic Plan](#) to the maximum extent possible.

Complete Streets standards tracking

DRCOG adopted a [Regional Complete Streets Toolkit](#) in 2021. Development of the toolkit required collaboration with a wide range of stakeholders, including local governments, giving DRCOG a strong baseline understanding of the state of Complete Streets standards in the region, as well as the relationships needed to track implementation into the future. DRCOG staff is exploring a process to periodically survey local governments (as part of the local government described above, or separately)

to understand and update the status of jurisdictions developing and adopting local Complete Streets standards. The other important aspect is how Complete Streets standards are used to inform the design and implementation of transportation investments, particularly roadway projects. As provided for in the Bipartisan Infrastructure Law, DRCOG has developed a Complete Streets prioritization toolkit that synthesizes data layers from multiple DRCOG plans and datasets to graphically illustrate locations and street segments in the region that score highest for multimodal project investments. The Toolkit is intended to assist local governments and other project sponsors in developing multimodal projects for funding through DRCOG’s Transportation Improvement Program as well as locally funded projects. Accordingly, DRCOG staff will also be working with local governments over time to track not just the status of adopting Complete Streets standards, but their application to multimodal project design and implementation, which is one of the mitigation measures in the MAP.

MAP Measures Implementation Timeline

Since this first annual MAP Report is required only six months after DRCOG Board adoption of the MAP (as part of the updated 2050 Metro Vision Regional Transportation Plan) in September 2022, there is not yet meaningful implementation progress to report. Instead, this 2023 report focuses on exploring a potential framework for tracking MAP measures over time.

Tables 3 through 6 illustrate an anticipated implementation timeline that makes increasing progress towards the first required horizon year (2030) for the land use strategies, as outreach and implementation assistance activities are resourced and developed over time.

TABLE 3. LAND USE STRATEGIES ANTICIPATED CUMULATIVE IMPLEMENTATION, ACRES REZONED

	2022	2024	2026	2028	2030
Increase residential density	-	31	154	339	616
Increase job density	-	6	32	70	128
Mixed-use transit-oriented development: moderate intensity	-	23	115	253	460
Mixed-use transit-oriented development: higher intensity	-	9	44	96	175

TABLE 4. RESIDENTIAL PARKING STRATEGIES ANTICIPATED CUMULATIVE IMPLEMENTATION, DWELLING UNITS ALLOWED

		2022	2024	2026	2028	2030
Eliminate minimum and set low maximum parking levels	urban core	-	676	3,382	7,439	13,526
	urban	-	609	3,043	6,695	12,173
	suburban	-	150	752	1,653	3,006
Eliminate minimum and set moderate maximum parking levels	urban core	-	847	4,233	9,313	16,933
	urban	-	391	1,954	4,298	7,815
	suburban	-	163	814	1,791	3,256

TABLE 5. COMMERCIAL PARKING STRATEGIES ANTICIPATED CUMULATIVE IMPLEMENTATION, 10,000 SQUARE FEET OF FLOOR AREA

		2022	2024	2026	2028	2030
Reduce or eliminate minimum and set maximum parking level	maximum two-and-a-half spaces per 1,000 square feet	-	31	153	337	613
	maximum two spaces per 1,000 square feet	-	4	18	39	70
	maximum one-and-a-half spaces per 1,000 square feet	-	9	43	94	170
	maximum one space per 1,000 square feet	-	9	43	94	170

TABLE 6. LOCAL COMPLETE STREETS ANTICIPATED CUMULATIVE IMPLEMENTATION, MILES

	2022	2024	2026	2028	2030
Adopt local complete streets standards: urban	-	1	3	7	14
Adopt local complete streets standards: suburban	-	2	8	17	32

These timelines are dependent on resources for outreach and implementation assistance that have yet to be integrated into the forthcoming FY 2024 and FY 2025 Unified Planning Work Program. They also rely on the interest, capacity, priorities, and actions of local governments to ultimately implement.

Mitigation Action Plan fulfillment

As noted previously, DRCOG is currently developing its FY 2024 and FY 2025 Unified Planning Work Program. In addition to the potential identification of tasks and resources to facilitate tracking mitigation measure implementation, this work program can also identify tasks and resources to allow for outreach and implementation assistance, as all mitigation measures identified in DRCOG’s MAP are dependent on direct action by local governments to implement.

Initial draft ideas DRCOG staff are exploring include:

- a parking utilization study of different cases throughout the region to allow decision makers to calibrate parking standards, as stakeholder engagement and education alone may not be sufficient to change local policy,
- a parking-related cohort or workshop series to help create a community of practice for local governments seeking to eliminate parking minima and establish maxima in the region,
- an inventory of local parking minimum and maximum standards, as well as other parking policies so that decision makers can see how their standards compare to other local governments while also developing a baseline understanding of local parking policies,
- local government outreach and engagement specifically on local growth priorities and a potential role for new or expanded urban centers to be designated through Metro Vision,
- developing greater analysis and technical assistance capabilities to assist local governments with small-area planning,
- developing a housing-transportation coordination plan, and
- a zoning-related cohort or workshop series to help local governments identify opportunities for greater density or intensity or development.

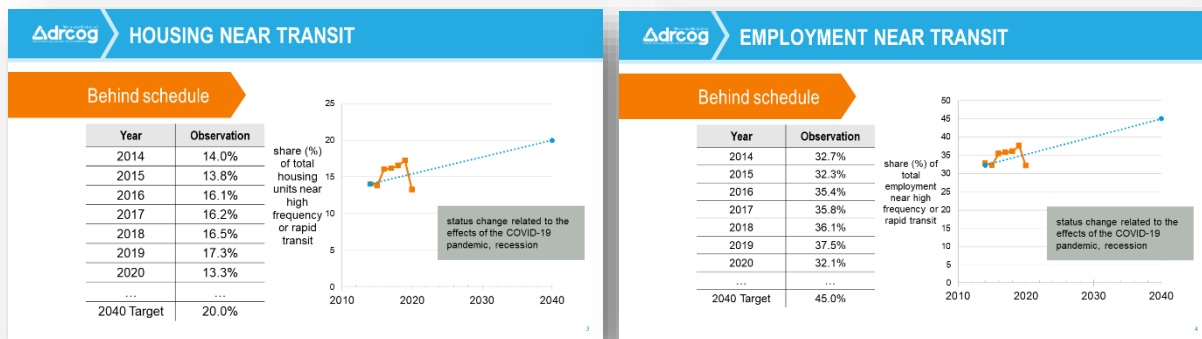
DRCOG staff are also identifying opportunities for outreach and implementation assistance within its existing Unified Planning Work Program and Transportation Improvement Program policy, such as:

- a Metro Vision Idea Exchange panel on setting parking maxima on March 30, 2023, featuring speakers from other local governments in the region;
- ad hoc opportunities under the stakeholder engagement activity to have DRCOG staff meet directly with local government staff to discuss potential parking and zoning changes;
- a pilot program focusing on the land use-transportation connection that is connecting three local governments to technical assistance support near different station areas;
- a pilot program focusing on corridor planning assistance, that will likely include important land use considerations, and
- the development of new set-asides to sustain both the corridor and land-use transportation connection (livable centers) pilots noted above.

Mitigation Action Plan success

All mitigation measures contained in DRCOG’s MAP are dependent on direct action by local governments to implement. Because the mitigation measures are qualitative, policy-based, and local government-driven – not project- or service-based – tracking their implementation is more difficult, as is measuring success over time. However, DRCOG maintains a wide array of data as part of the regional transportation planning process that can be leveraged in the future.

First, historical and current point-level housing unit and employment data can identify locations of new, observable development and increased densification. Second, several license-restricted data sources DRCOG utilizes can help identify near-term future developments. Third, household vehicle miles traveled (VMT) estimates from its travel model, Focus, can help DRCOG understand the relative location-efficiency of these different places. In conjunction with robust statistical regression techniques, these estimates allow DRCOG staff to identify areas in the Denver region that are conducive to lower VMT per household while controlling for confounding, non-place-based factors. Such VMT estimates are directly related to greenhouse gas emissions. Using these data sources, DRCOG staff can seek to estimate VMT for the recent and near-term development and compare against a counterfactual consistent with development levels used to create DRCOG’s Greenhouse Gas Transportation Report and MAP as part of the 2050 Metro Vision Regional Transportation Plan.



Tracking development in this manner better fits DRCOG’s existing workflows than tracking local policy change, while also providing a metric that may be a more direct assessment of MAP success with its

estimate of vehicle travel and actual development. Examples of how DRCOG uses this type of performance measurement for its [Metro Vision Plan](#) are shown below for reference.

Adjusting Mitigation Measures

Because DRCOG does not need mitigation measures for compliance purposes until the 2030 analysis year, the MAP is meant to be dynamic. As DRCOG begins to track and assess the implementation and effectiveness of the MAP's current mitigation measures, it may adjust the MAP to incorporate more or less of certain existing measures; measures may also be removed or added as needed. If and when DRCOG makes changes to its MAP mitigation measures, it will provide an explanation in the applicable MAP annual report of why those decisions were made and whether or how achievement of the mitigation measures would be affected.

Mitigation Measures and Disproportionally Impacted Communities

CDOT's Policy Directive 1610 defines a disproportionately impacted community as "a community that is in a census block group...where the proportion of households that are low income is greater than 40%, the proportion of households that identify as minority is greater than 40%, or the proportion of households that are housing cost-burdened is greater than 40%."

Because DRCOG's MAP mitigation measures are policy-based and not project- or location-based, they are not directly subject to the Disproportionally Impacted Communities provisions of the GHG rule or PD 1610. Even so, this is a critically important topic to DRCOG in its MAP and GHG work. DRCOG's MAP included an analysis of the mitigation measures by mapping the disproportionately impacted community geographies within the DRCOG metropolitan planning organization area. Then, staff used GIS to compare the spatial overlaps between the conceptual mitigation measure analysis geographies that DRCOG staff used for analysis purposes with the disproportionately impacted community geographies to illustrate where both geographies overlap.

As this analysis showed in the MAP, there is meaningful overlap between the two geographies. Because the mitigation measure analysis geographies are anchored around rail stations, future bus rapid transit corridors, urban centers, and pedestrian focus areas, the policy changes associated with the land use and parking mitigation measures can provide disproportionately impacted community benefits not just at specific locations — such as adjacent to a rail station — but through access to the rail network across the region. For example, increased residential densities in transit-efficient locations can lead to reduced total housing and transportation costs. Similarly, increased job densities in transit-efficient locations can increase accessible job opportunities for people with less access to private vehicles. In these ways, encouraging integrated land use and transportation planning through the mitigation measures provides potential disproportionately impacted community benefits at both the specific location level and the network or system level.

Of course, some policy changes associated with land use and parking mitigation may lead to displacement of current residents and existing market-rate affordable housing units. Additionally, because the mitigation measures are voluntary and not location-constrained, there is also flexibility to implement them over time where and when they are most effective and needed, including to maximize disproportionately impacted community benefits.

Additionally, DRCOG has been undertaking a four-phase equity analysis project to improve the agency's environmental justice and equity analyses for transportation plans, projects and programs. While this

work will be completed later in 2023, DRCOG is committed to applying lessons learned, tools, data, and other outcomes from the equity project as applicable to its MAP and mitigation measures implementation activities.

Conclusion

This 2023 Greenhouse Gas Mitigation Action Plan Report is the first annual report required by the Transportation Commission's Greenhouse Gas Transportation Planning Standard. This report is required to address the implementation of DRCOG's Mitigation Action Plan prepared as part of its updated 2050 Metro Vision Regional Transportation Plan adopted by the DRCOG Board in September 2022. This initial report, due six months after plan adoption, focuses on exploring a framework for tracking, measuring, and assessing the implementation over time of the mitigation measures contained in the Mitigation Action Plan. Through the required annual reporting process, DRCOG will build on this initial framework to work in partnership with its local governments to optimize the greenhouse gas reductions through the mitigation measures in the Mitigation Action Plan.