

2050 METRO VISION REGIONAL TRANSPORTATION PLAN



Adopted Sept. 21, 2022

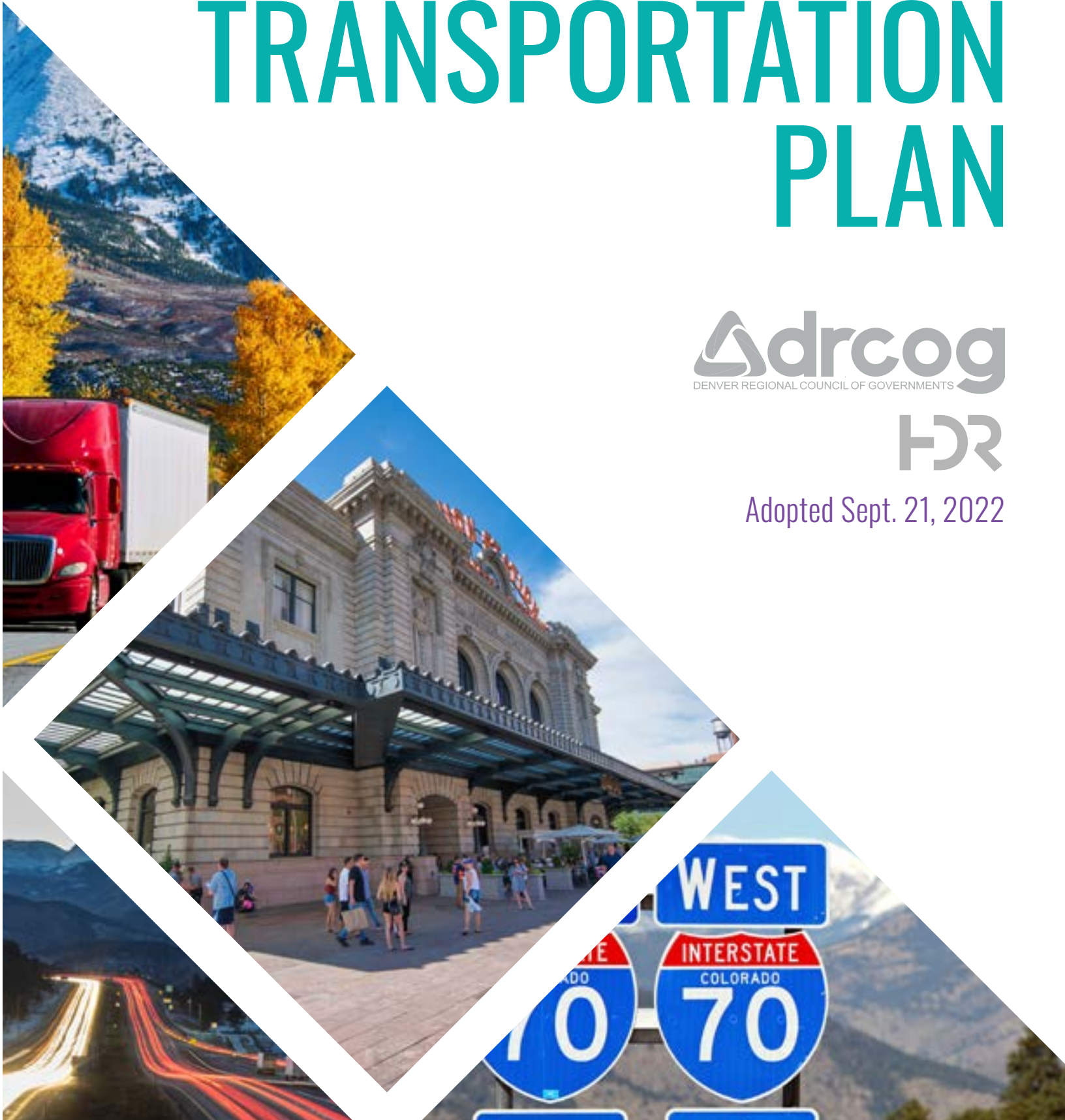


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Welcome!

Thank you for your interest in the 2050 Metro Vision Regional Transportation Plan! The 2050 RTP sets the vision for the Denver region's multimodal transportation system and guides investment in the projects and programs to achieve that vision. Through the 2050 RTP's major project and program investment priorities, the region will:

- Increase safety for all users of the transportation system.
- Improve air quality and reduce greenhouse gas emissions.
- Expand the region's rapid transit network.
- Provide more ways to travel by car, bus, bicycle, other mobility devices and foot.
- Expand travel options for vulnerable and underserved transportation users.
- Prepare for and adapt to future changes in transportation.

As the federally designated transportation planning agency for the Denver region, the Denver Regional Council of Governments prepared the 2050 RTP in partnership with the Colorado Department of Transportation, the Regional Transportation District, local governments and other transportation stakeholders. Significant public engagement also shaped the plan. In partnership with the public and stakeholders, DRCOG will implement the 2050 RTP's project and program investment priorities that continue to make the Denver region one of the country's most desirable places to live, work and play.

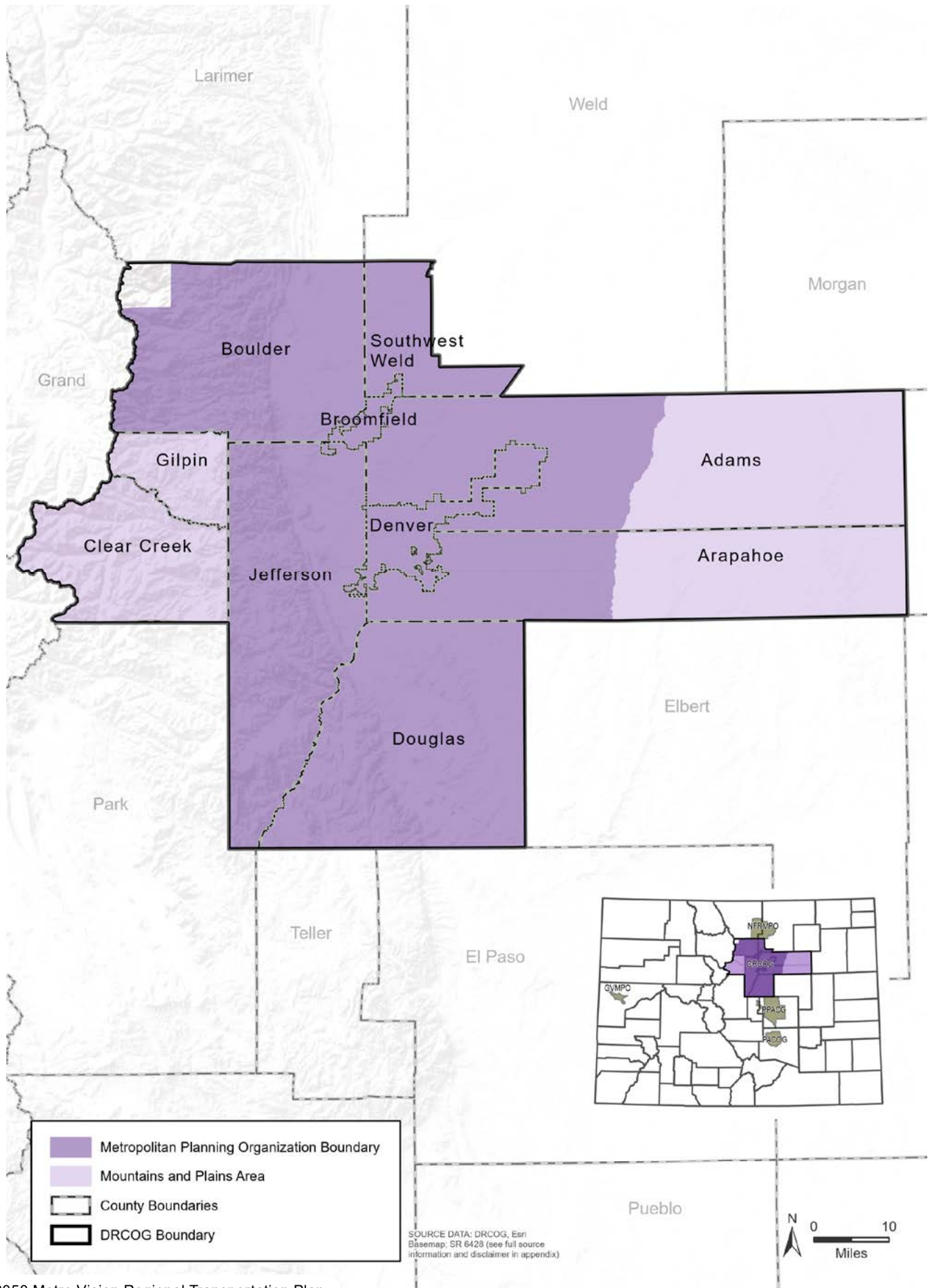
I invite you to explore the 2050 RTP!



A handwritten signature in black ink, appearing to read 'DWR', written in a cursive style.

Douglas W. Rex, Executive Director
Denver Regional Council of Governments

Map 1.1: The DRCOG region





What is DRCOG?

DRCOG is a planning organization where local governments collaborate to establish guidelines, set policy and allocate funding in the areas of transportation and personal mobility, growth and development, and aging and disability resources.

Vision: Our region is a diverse network of vibrant, connected, lifelong communities with a broad spectrum of housing, transportation and employment, complemented by world-class natural and built environments.

The Denver region

The Denver region is a dynamic region of 3.4 million people and 58 communities anchoring Colorado's Front Range. Consistently rated one of the best places to live in the country, the region will add a million more people and half a million more jobs by 2050. The 2050 Metro Vision Regional Transportation Plan balances investments to address this new growth while repairing and maintaining the existing transportation system.

The Flatirons near Boulder are a popular destination for outdoor recreation.



Learn what the plan's about

Plan framework

Regional transportation planning priorities

Denver Regional Council of Governments staff and partners developed the 2050 Metro Vision Regional Transportation Plan to improve mobility for all users of the Denver region's multimodal transportation system. The 2050 RTP identifies specific project and program investments to address the region's transportation planning priorities identified in the DRCOG Metro Vision plan and through the 2050 RTP planning process:

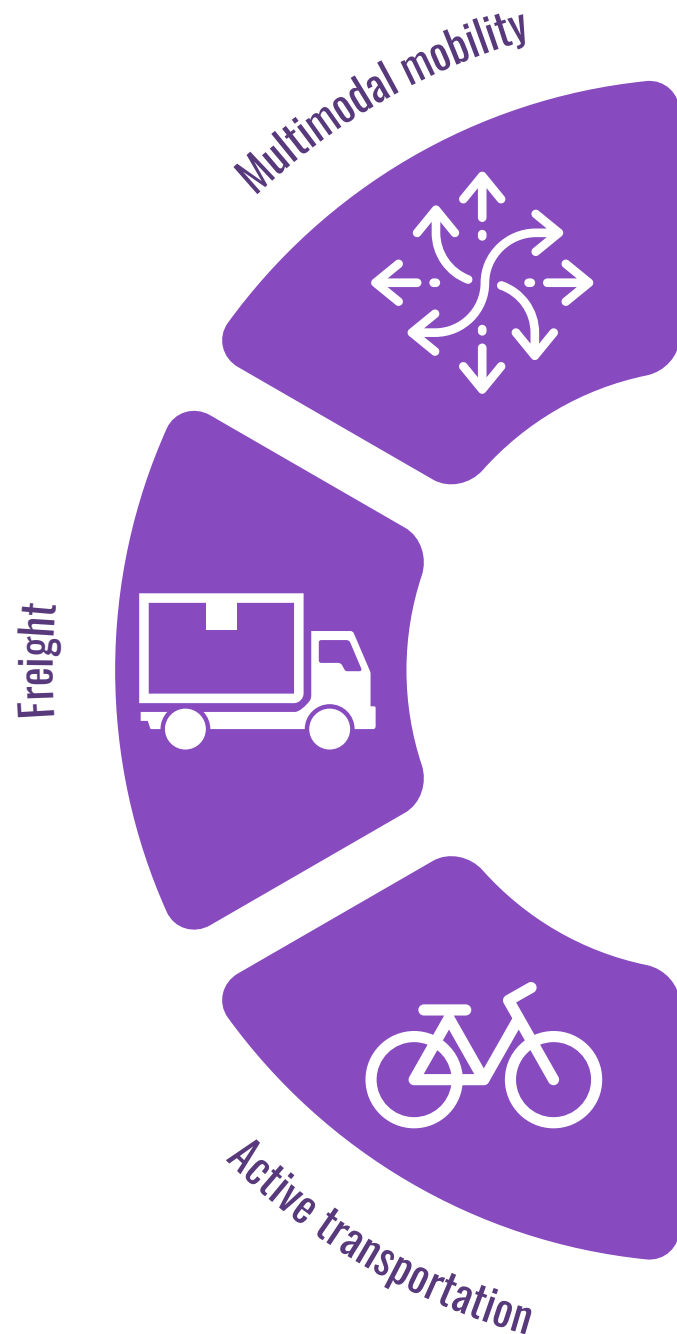
- Creating a safety program to increase the region's investments in projects to eliminate transportation fatalities and serious injuries. The program would continue implementation of the Denver Regional Council of Governments [Taking Action on Regional Vision Zero](#) and CDOT's [Strategic Transportation Safety Plan](#).
- Continuing to invest in programs for community mobility planning and implementation, regional transportation operations and technology, regional air quality, commute options, and human service transportation through DRCOG's Transportation Improvement Program.
- Investing in a regional bus rapid transit system of corridors that can leverage federal funding opportunities, attract high volumes of ridership, are ready for implementation and reflect regional geographic equity considerations.
- Investing significant planning and financial resources to further define and implement distinct transit visions in several corridors throughout the region.
- Implementing mobility hubs at strategic locations across the region to connect various travel modes.
- Continuing to implement the DRCOG [Active Transportation Plan](#) through a program to further develop the region's high-comfort active transportation corridors, eliminate gaps and invest in the 2050 RTP's pedestrian focus areas and short-trip opportunity zones.
- Creating a program focused on freight-related investments to implement multimodal freight plans recently adopted by both [DRCOG](#) and [CDOT](#).

The planning process also emphasized specific considerations for projects contained in the 2050 RTP:

- Projects that are multimodal, recognizing the unique context of each project and its location, and that provide multiple benefits consistent with the investment priorities.
- Projects with potential regional benefit (instead of primarily local benefit or driven primarily by local growth or development).
- County transportation forum candidate project rankings (described in Chapter 3).
- Regional agency priorities (described in Chapter 3).
- Geographic balance of projects across the region.

Together, these project and program investment priorities will address the region's shared multimodal transportation planning priorities.

2050 RTP priorities



Safety



Air quality



Regional transit

State and federal context

DRCOG updates the RTP every four years and amends it frequently to ensure that its content remains relevant and reflects current trends, needs and priorities. The 2050 RTP performs several functions as the region's multimodal transportation plan, including:

- Setting the region's **long-range vision** for transportation over the next 20-plus years.
- Reflecting a broad set of **public and stakeholder input**.
- Demonstrating enough **available revenue** to fund the projects and programs identified in the 2050 RTP.
- Identifying **how funds will be spent** on projects and programs across all modes of transportation.
- Conforming to all applicable **air quality** regulations.
- Ensuring that transportation decisions don't negatively affect **low-income and minority communities** more than others areas and provide at least as much benefit compared with the entire region.
- Incorporating the 10 federal **planning factors** into the planning process: economic vitality; safety; security; accessibility and mobility; environment; multimodal connectivity; system management and operations; system preservation; resilience and reliability; and travel and tourism.
- Linking investment priorities to achieving **performance measure** targets.

DRCOG carries out a comprehensive, continuing and cooperative transportation planning process.

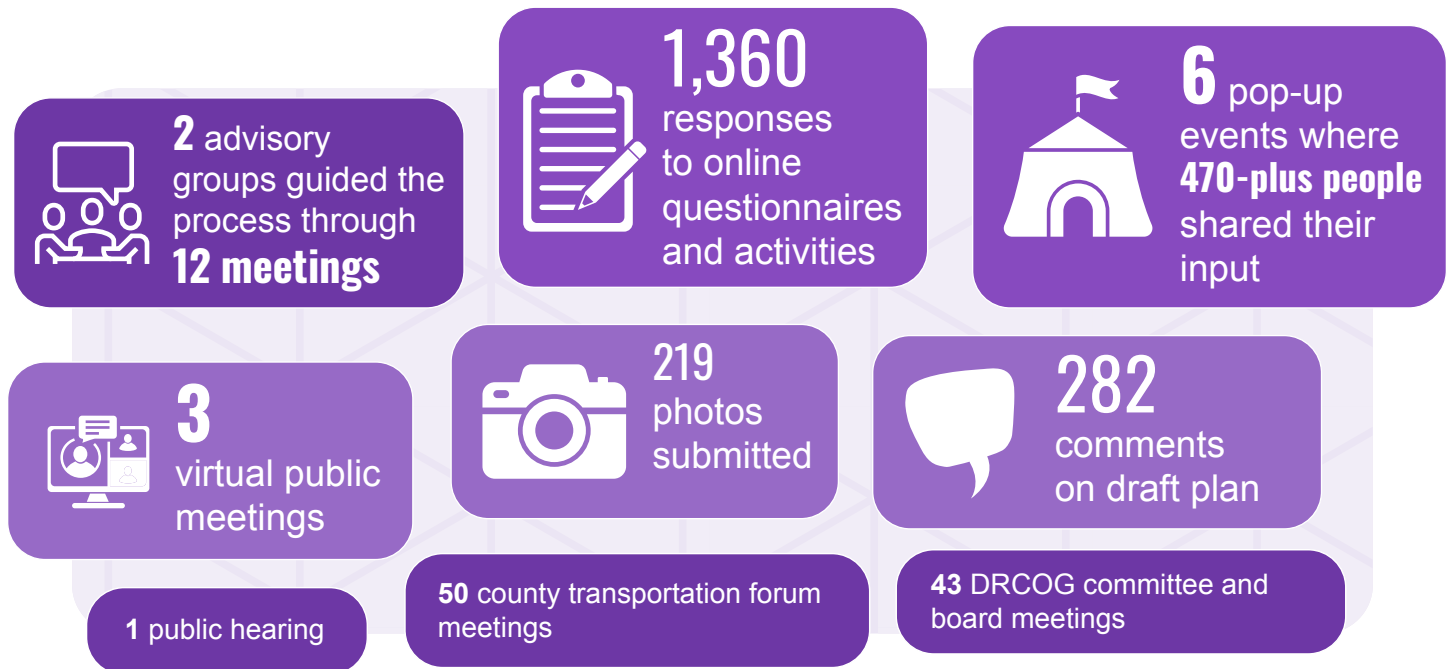
Planning process and public engagement

Developing a multibillion-dollar transportation plan for the region is a complex, multiyear process. DRCOG leadership and staff believe that meaningful public engagement is critical to an open process in which all residents have the opportunity to provide input and share their vision for the future of transportation in the Denver region. All outreach efforts are guided by its Board-adopted public engagement plan, [People-centered planning, projects and services](#).

In addition to the general public, creating the 2050 RTP involved three regional agencies, 10 counties, 48 cities and towns, elected officials, transit operators, local government staff, community-based organizations, business groups and nonprofits.

The two-year planning process began in the summer of 2019 and culminated with the DRCOG Board of Directors adopting the 2050 RTP in April 2021. The resulting 2050 RTP represents the collective vision of the public, stakeholders and DRCOG's partners.

Input highlights



Promotion and outreach highlights



Phases of public engagement

DRCOG considers early and ongoing engagement vital to the success of the 2050 RTP. Outreach efforts for the 2050 RTP were planned using a public engagement strategy (available in [Appendix C](#)) that divided the 2050 RTP process into four phases with opportunities for input. Each engagement phase served distinct purposes

and built upon previous phases. Phases included visioning and educating, prioritizing investments, analyzing scenario options, developing the plan, and inviting public review of the draft plan. Highlights of the input that was received and the methods used to solicit feedback are shown on the opposite page and above.

Engagement for the 2050 RTP kicked off in summer 2019, when DRCOG staff attended fairs and festivals around the region to ask people about their vision for transportation in 2050. **Photo credit: DRCOG.**



2050 RTP public engagement strategies and milestones

The graphic below highlights several of the strategies used by DRCOG to reach the public in each phase of engagement and key decision-making milestones in the

planning process. Many of the engagement strategies in 2020 and 2021 were adapted to virtual methods due to the COVID-19 pandemic. Full details about all

Public engagement

1

June 2019
visioning
and education



2

November 2019
investment priorities
and scenario options



plan
kickoff

scenario
planning
analysis

small
area
forecast

project
solicitation
and evaluation

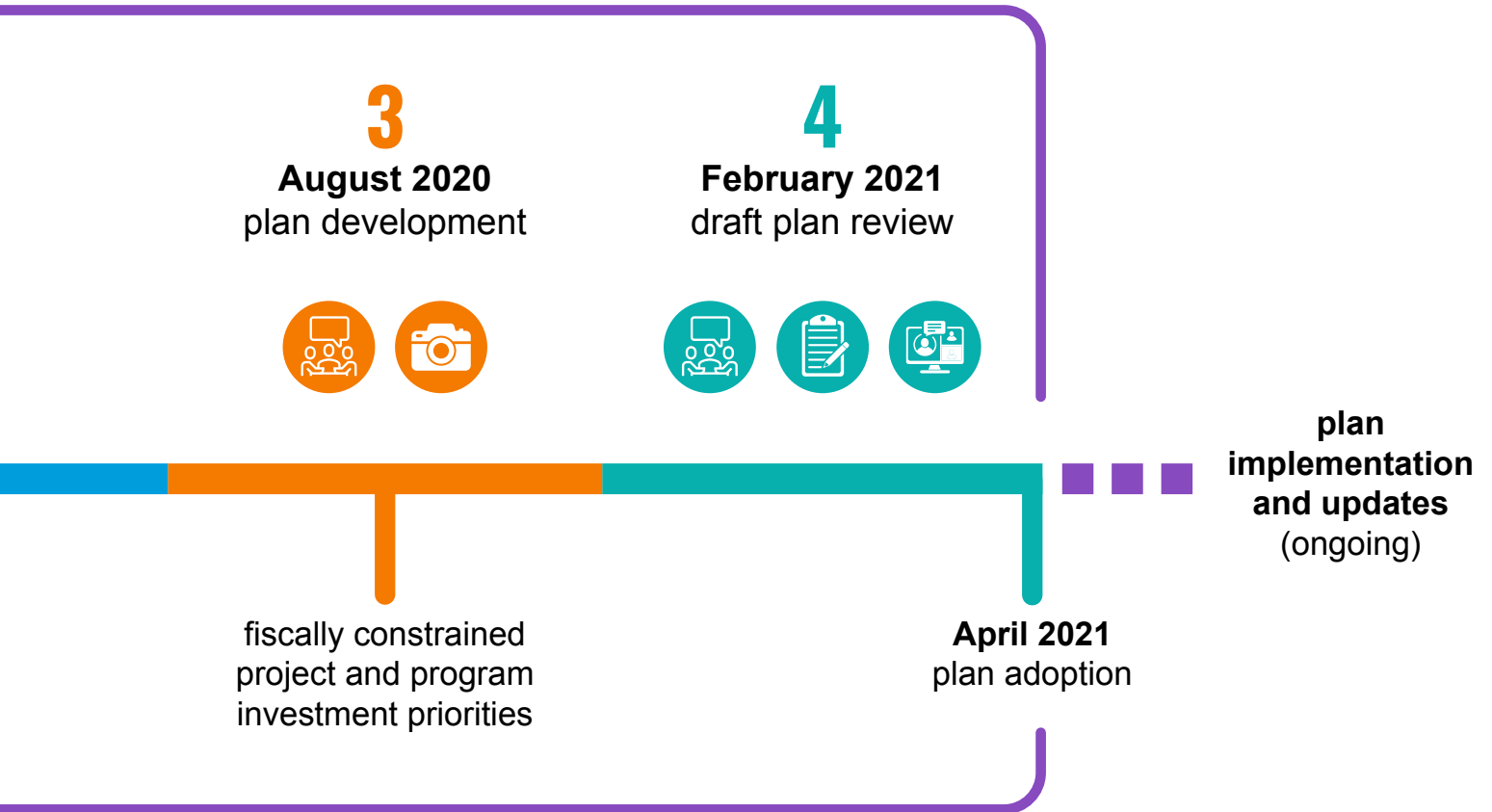
Key plan milestones

Key regional stakeholders

Organizations involved in developing the 2050 RTP included: the DRCOG Board of Directors, the Transportation Advisory Committee, the Regional Transportation Committee, CDOT, RTD, county transportation forums and local government staff.

engagement strategies and results of the input can be found in [Appendix C](#). Throughout the planning process, especially in Phase 1, DRCOG, CDOT and RTD

collaborated on public engagement to identify shared priorities.



Examples of engagement strategies used



survey



pop-up events



scenario budget activity



advisory groups



photo contest



virtual open houses

Key milestones and stakeholder collaboration

DRCOG developed the plan with key stakeholders. Regular coordination and information-sharing among DRCOG, CDOT and RTD helped ensure the 2050 RTP represents the priorities of all three agencies.

DRCOG obtained crucial local government feedback through county transportation forums formed during the 2020-2023 TIP process. Each county’s forum included participating local governments, CDOT, RTD and other stakeholders. The forums served as stakeholder sounding boards throughout the 2050 RTP process and provided technical analysis and local government input. Separately from the county transportation forums, local government staff also provided insight and input into the small-area forecast development.

DRCOG’s Transportation Advisory Committee, Regional Transportation Committee and Board of Directors also provided regular input and guidance throughout the 2050 RTP development process and made decisions at key milestones of the effort.

Engaging underrepresented populations

One of the guiding principles of DRCOG’s public engagement plan is the invitation and consideration of perspectives from those traditionally underrepresented in transportation planning processes. Some examples include individuals who speak languages other than English, people representing diverse cultural backgrounds, low-income individuals, people with disabilities and young adults. The development of this 2050 RTP emphasized reaching out to underrepresented communities early and often.

Find more details about the engagement strategies staff used to develop this plan with the public in [Appendix C](#).

Staff convened two advisory groups, the Youth Advisory Panel and the Civic Advisory Group (below) to provide input and guidance throughout the development of the 2050 RTP. **Photo credit: DRCOG.**



Implementing Metro Vision

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



The most recent version of Metro Vision was adopted in 2017 and amended in 2019.

What is Metro Vision?

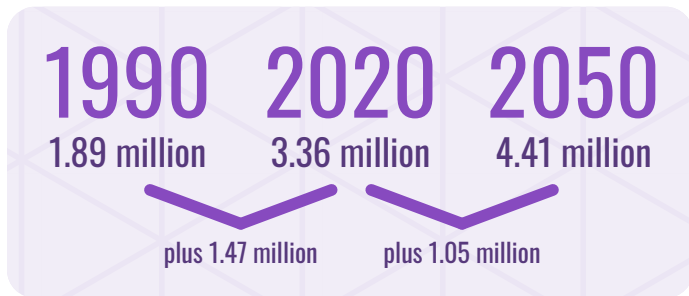
Metro Vision fulfills DRCOG's duty to make and adopt a regional plan for the physical development of the region.

The DRCOG Board recognizes that the success of the visionary plan requires the coordinated efforts of local, state and federal governments; the business community; and other planning partners, including philanthropic and not-for-profit organizations. The Metro Vision plan does not replace the vision of any individual community; rather, it is a tool to promote regional cooperation on issues that extend beyond jurisdictional boundaries. The plan anticipates that individual communities will contribute to Metro Vision outcomes through different pathways and at different speeds for collective impact.

To learn more about Metro Vision and read the full plan document, visit metrovision.drcog.org.

Metro Vision outlines outcomes, objectives and initiatives established by the DRCOG Board of Directors to ensure the coordinated efforts of DRCOG's many partners meet the evolving needs of the region's existing and future residents. The region grew from 1.89 million people in 1990 to 3.36 million in 2020. With that 30-year, 78% increase, the needs of many residents remain unmet. Looking forward, the Colorado State Demography Office forecasts the region will be home to an additional 1.05 million people by 2050, a 31% increase over 2020. Population growth will continue to place significant demands on the region's transportation system. [Appendix E](#) compares several aspects of mobility and travel between 2020 and 2050. The 2050 RTP strikes a balance in planning for an additional million residents in the region while also maintaining the current transportation system and expanding travel options.

Denver region population, 1990-2050



Source: "Population by Single Year of Age," State Demography Office, Colorado Department of Local Affairs. Weld County portioning applied by DRCOG.

Metro Vision guides the work of DRCOG and its partners' shared actions to move the region toward a shared future expressed in the five overarching themes on pages 16-17. The themes organize 14 interrelated, aspirational future outcomes that DRCOG, local governments and partners will work toward together.

The 2050 RTP helps DRCOG and its many partners implement the shared aspirational vision of Metro Vision by identifying specific improvements to the transportation system and its operations. Metro Vision's transportation improvements are also identified as project and program investments throughout the 2050 RTP.

The region's transportation system includes roads and transit, but also sidewalks and paths used by people of all abilities who walk or roll. **Photo credit: Tiffany O'Connell (photo contest finalist).**



As the Denver region experiences continued growth, improving transportation infrastructure is essential.



Metro Vision themes

Healthy, inclusive and livable communities

Outcomes

- The built and natural environment supports healthy and active choices.
- The region's residents have expanded connections to health services.
- Diverse housing options meet the needs of residents of all ages, incomes and abilities.

How the 2050 RTP contributes to realizing this theme:

- Investments in active transportation and multimodal options that improve the safety and convenience of healthy and active travel choices.
- Transit planning and investments to support viable travel choices, including strategies and funding to address ever-evolving needs of the region's most vulnerable users.
- Actions to reduce regional disparities through a focus on environmental justice and equitable outcomes among diverse households and communities.

A safe and resilient natural and built environment

Outcomes

- The region has clean water and air, and lower greenhouse gas emissions.
- The region values, protects and connects people to its diverse natural resource areas, open space, parks and trails.
- The region's working agricultural lands and activities contribute to a strong regional food system.
- The risks and effects of natural and human-created hazards are reduced.

How the 2050 RTP contributes to realizing this theme:

- Projects and programs to help manage travel demand and provide safe, convenient alternatives to single-occupant vehicle travel to help reduce emissions and congestion.
- Investments in trails, paths and other connections for recreation, active transportation and a more well-connected trail network.
- Investments in freight and goods movement, a vital part of the regional food system.
- Transportation safety, security and maintenance activities to mitigate the effects of hazards and improve local and regional resiliency.



An efficient and predictable development pattern

Outcomes:

- The region is comprised of diverse, livable communities.
- Through a coordinated effort between DRCOG and local communities, new urban development occurs in an orderly and compact pattern within regionally designated growth areas.
- Connected urban centers and multimodal corridors throughout the region accommodate a growing share of the region's housing and employment.

How the 2050 RTP contributes to realizing this theme:

- Transportation investments in a range of communities throughout the region, intended to improve mobility and provide viable transportation choices for diverse users.
- The 2050 RTP prioritizes project locations that help encourage investment and reinvestment in existing communities.
- A focus on multimodal corridors that connect the region's urban centers, including investments in bus rapid transit, commuter rail and other corridor projects and programs to improve mobility, safety and operations

A connected and multimodal region

Outcomes

- The regional transportation system is well-connected and serves all modes of travel.
- The transportation system is safe, reliable and well-maintained.

How the 2050 RTP contributes to realizing this theme:

- A wide range of transportation investments, from new roadway and interchange capacity to new rapid transit service and multimodal corridor improvements to pedestrian and bicycle connections.
- A renewed focus on approaches that enhance and ensure safety for all users, incorporating the safety action plan, Taking Action on Regional Vision Zero.
- New technology and other operational investments to improve reliability and mitigate increasing congestion and delays.
- Continued regional and local investments in transportation system optimization, preservation and maintenance.

A vibrant regional economy

Outcomes

- All residents have access to a range of transportation, employment, commerce, housing, educational, cultural and recreational opportunities.
- Investments in infrastructure and amenities allow people and businesses to thrive and prosper.

How the 2050 RTP contributes to realizing this theme:

- Investments that improve multimodal access within and to a variety of opportunity-rich destinations.
- A focus on equitable outcomes and opportunities through catalytic investments.
- Investments that connect our region to producers and consumers in Colorado, the United States and across the globe.



Implementing the 2050 Metro Vision Regional Transportation Plan

The 2050 Metro Vision Regional Transportation Plan sets the long-range vision and investment framework for the region's multimodal transportation system. Multiple agencies throughout the region contribute to implementing the 2050 RTP. State and local governments take action to implement the strategies and projects identified in the 2050 RTP and program activities funded through the regional work program.

Partnership and collaboration

Implementing transportation projects crosses the boundaries of, and often requires collaboration among, individual agencies and levels of government. DRCOG, which represents more than 50 local governments, leads the region's transportation planning process in collaboration with CDOT and RTD.

Each partner brings a distinct perspective to the planning process. CDOT manages, constructs and maintains state highways. It also conducts statewide multimodal transportation planning efforts. RTD handles the development, maintenance and operation of a public transportation system. Staff and elected officials from DRCOG member jurisdictions bring knowledge of their local areas and represent their communities.

Project and program investment priorities

The 2050 RTP's project and program investment priorities provide a framework to guide investment in the region's multimodal transportation system. The multimodal project investments define specific priorities for the region to implement as funding becomes available and is allocated by DRCOG, CDOT, RTD and local project sponsors.

The program investment priorities provide direction to future Transportation Improvement Program cycles to program funds to specific programs and project types. While each TIP development cycle includes distinct selection criteria, the specificity of the 2050 RTP's program investment priorities framework ensures its implementation through the TIP by allocating revenues to specific programs in the 2050 RTP financial plan.

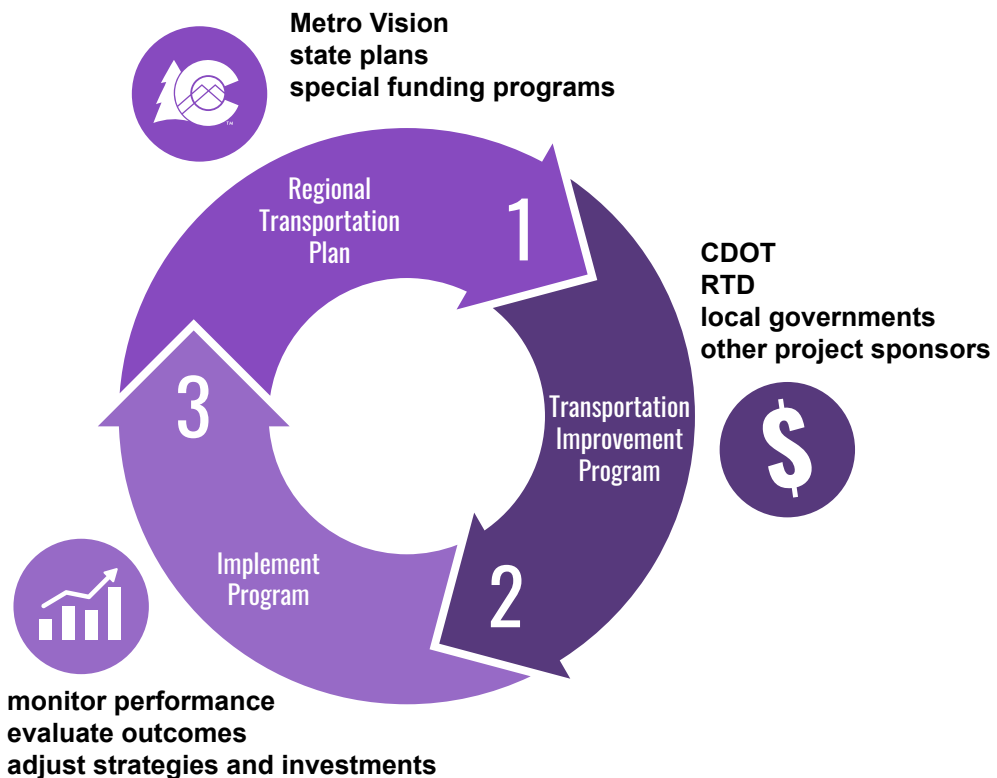
Besides the TIP, the 2050 RTP project and program investment priorities are also implemented through various studies, plans and project development processes by various stakeholders involved in the transportation planning process. The 2050 RTP's projects and programs help the region prioritize as funding becomes available.

Transportation Improvement Program

The TIP assigns funding to transportation projects and implements the multimodal vision of the 2050 RTP. DRCOG develops a new program every two years and releases calls for projects every four years. Projects selected for inclusion in the TIP are limited by funds expected to be available. Projects selected to receive federal and state surface transportation funds, and all regionally significant projects regardless of funding type, must be identified in the TIP.

DRCOG selects projects through a cooperative process and by using criteria consistent with Metro Vision's strategic planning framework and the guidance of this plan. Project sponsors will complete the federally funded transportation improvements and management actions programmed in the TIP over a four-year period. Project sponsors include CDOT, RTD, local governments, and others. The process is represented visually below.

Transportation Improvement Program process



What's in the 2050 Metro Vision Transportation Plan?

Chapter 2 provides an overview of the planning framework and DRCOG's regional partnerships. It reviews the current transportation network in the Denver metropolitan area, including descriptions of the Denver region's current roadway, public transportation, bicycle and pedestrian, aviation and freight systems. It also covers strategies for transportation demand management, emerging technologies, safety and security. Chapter 2 provides the foundation of the 2050 Metro Vision Regional Transportation Plan by describing the strengths of today's transportation system and needs of its users.

Chapter 3 proposes tactical investments in the transportation system through 2050. It provides a list of project and program investment priorities. In addition, it outlines available funding, the prioritization process and project implementation.

Chapter 4 considers the anticipated outcomes of implementing the 2050 RTP, including effects on the region's performance measures, equity and the environment. DRCOG based anticipated outcomes on analyses of the projects identified in Chapter 3. Chapter 4 provides an opportunity to see how the transportation system of 2050 may affect the lives of the Denver region's residents and visitors.

Navigation icons

Throughout the document you'll find icons representing the six big ideas and priorities of the 2050 RTP:



Multimodal mobility



Safety



Air quality



Regional transit



Active transportation



Freight

The icons will call attention to each subject to make it easy to find what you're looking for.





Roadway users spent 350,000 extra hours in traffic on an average weekday in 2019. **Photo credit: Rey H. Sosa (photo contest finalist).**



**Discover the
transportation system**

The future of the Denver region's transportation system will be shaped by how the region responds to existing challenges and future opportunities. This chapter summarizes the state of the system across the Denver Regional Council of Governments planning area.

As DRCOG and partners developed the 2050 Metro Vision Regional Transportation Plan, they reviewed existing conditions and identified needs and visions established in previous regional transportation — and other — plans. During this process, several key takeaways emerged, including the following:

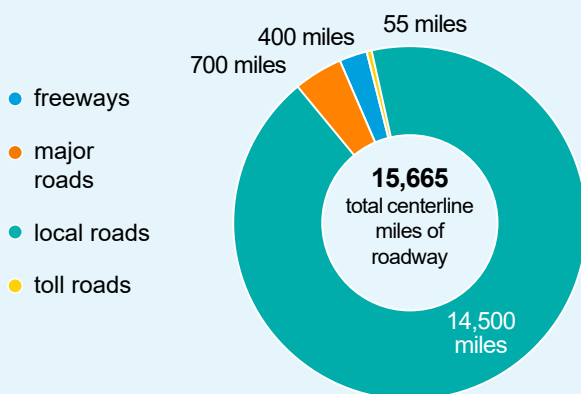
- Traffic-related deaths and serious injuries are a public health epidemic and social equity issue in the Denver region, which may be improved by implementing Vision Zero and developing local safety plans across the Denver region to eliminate fatal and serious-injury crashes.
- Throughout the region, partners and local governments have been constructing, expanding and connecting a high-comfort network of bicycle and pedestrian facilities. Planning and developing such facilities for the most vulnerable users make them functional for people of all ages and abilities.

At a glance: the Denver region's transportation system

The system is a mature and integrated regional network of multimodal transportation facilities and services. The purpose of the network is to provide access and mobility for people, goods and services. Both public and private entities provide and maintain the system which consists of multiple components including facilities and vehicles;

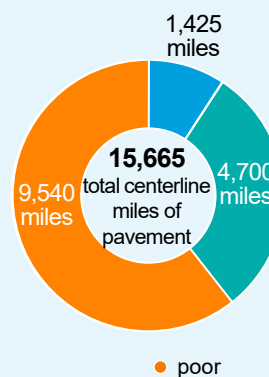
transportation programs and services; and technologies such as phone applications and roadway sensors. The future of this system will be shaped by how the region responds to existing and future challenges and opportunities. This chapter summarizes the state of the system today.

How extensive are the region's roadways? Types of roadway lanes by centerline miles

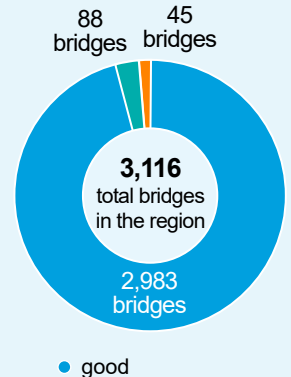


How well is the system being maintained?

Roadway conditions



Bridge conditions

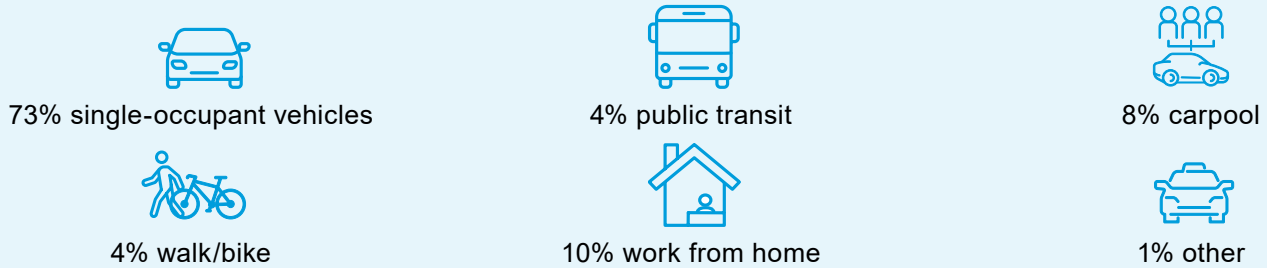


- Innovation in transportation technology touches all aspects of the system, from the introduction of ride-hailing and shared micromobility to automated shuttles and electric vehicles to implementation of intelligent transportation systems and the anticipated widespread adoption of connected vehicles and infrastructure.
- Total vehicle miles traveled has increased over time with population and employment growth, but vehicle miles traveled per person has not changed much at the regional level, though major infrastructure investments have made a positive impact along

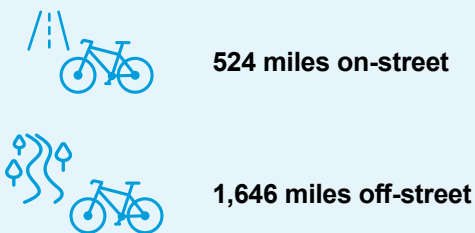
certain corridors and within certain areas (such as the Denver Central Business District).

- There is an ongoing need for more comprehensive regional freight planning to address anticipated growth pressures and meet current and future demand for moving goods.
- Agencies in the region have adopted a performance-based asset management philosophy to preserve and maintain the region’s transportation system. 52% of the region’s future investments will go toward maintaining and operating the system.

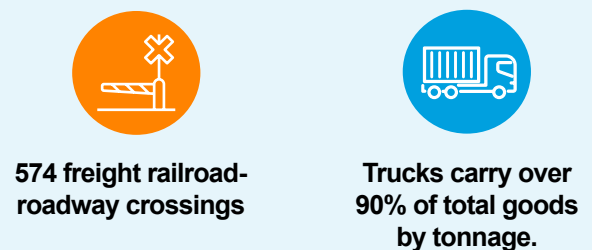
Which modes do people usually use to get to work?



How extensive is the bike network?



How does freight move through the region?



5 
Interstates

6 
U.S. Highways

36 
State highways

2 
Toll highways

2 Class 1 railroads (BNSF and Union Pacific)

- The state of the Denver region's transportation system is the result of decades of decisions by local, regional, state and federal agencies working to meet the needs of the community. The system is a mature and integrated regional network of multimodal transportation facilities and services. The network provides access and mobility for people, goods and services. Both public and private entities provide and maintain facilities and vehicles, transportation programs and services, applications and roadway sensors.

How does the transit system serve the region's residents?

142 routes



1,293 vehicles



55.4 million annual service miles

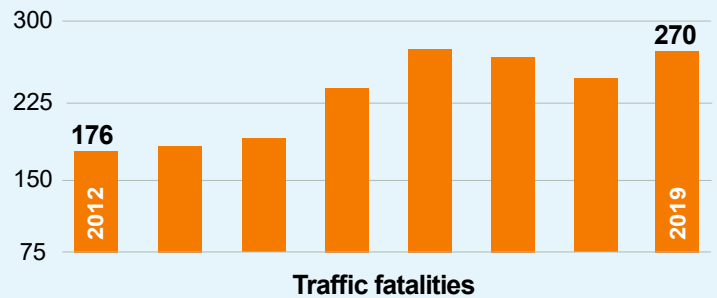


94.8 million annual boardings



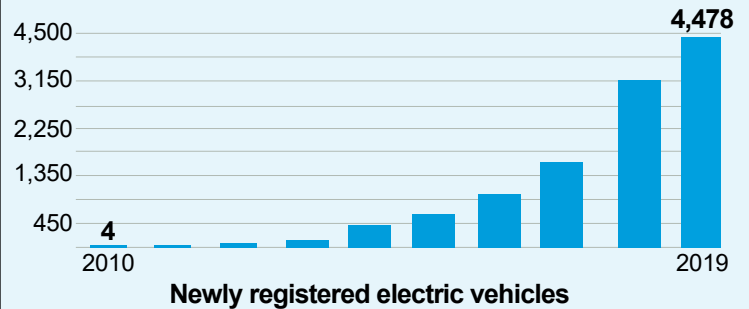
● bus ● light rail ● commuter rail

How many traffic fatalities are there in the region?



Does not include traffic fatalities in Clear Creek or Gilpin counties, which are tracked by CDOT.

How many electric vehicles are there in the region?



How does Denver International Airport serve the region?



672 million pounds of cargo in 2019



69 million passengers in 2019

22 million passengers' origin or final destination was within the Denver region.

3 Mountain passes

4,000 Signalized intersections

9,800 Bus stops

17,700 Sidewalk miles

8 Airports

The majority of transportation in the region occurs on the roadway system, on which people travel more than 115 million miles every day in cars, buses, vans, trucks and motorcycles.



The Regional Roadway System carries people and goods to, from and through the region. **Photo credit: CDOT.**

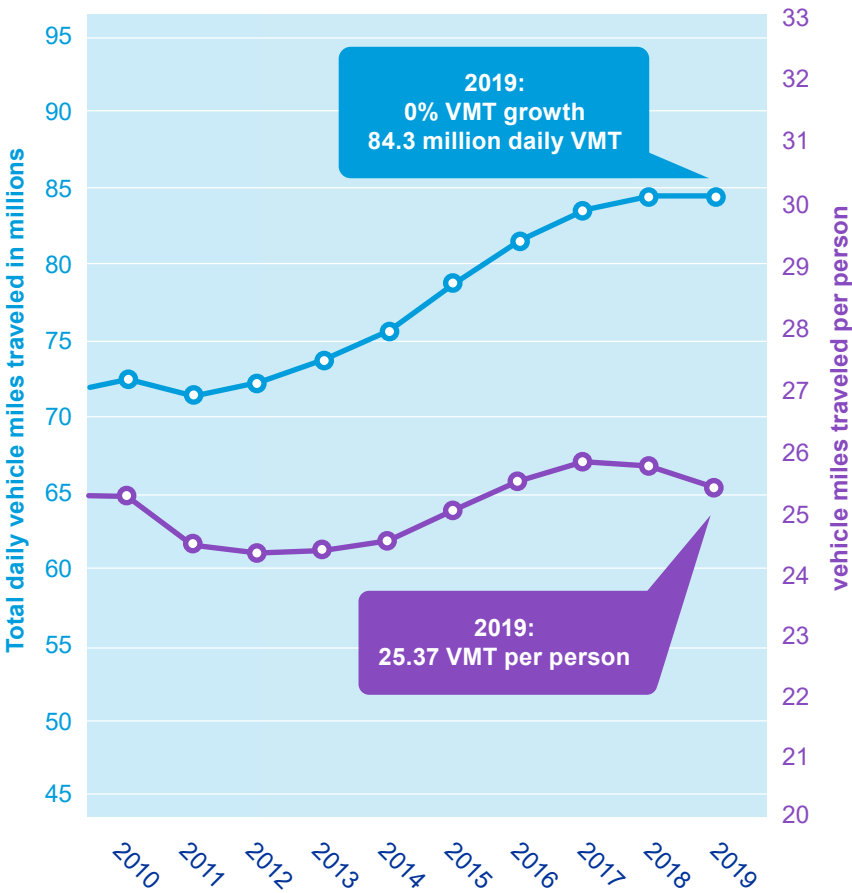


Regional Roadway System

The extensive roadway system that connects people throughout the region serves multiple functions. Roadways consist of vehicular travel lanes; bridges and overpasses; parking and loading zones; sidewalks and crosswalks; bikeways; bus lanes and bus stops; landscaping; traffic signals and message signs; bollards and guardrails. Roadway types range from busy freeways that move 400,000 people a day to rural highways serving agricultural and mountain

communities to arterial streets with businesses and local residential streets with children playing. Arterial streets in denser urban and suburban settings often serve as social activity places, corridors of commerce and locations for essential services, all while facilitating the movement of cars, buses, delivery vans, trucks, ambulances, firetrucks, pedestrians and bicyclists.

Average daily vehicle miles traveled (2010-2019)



Vehicle miles traveled per person has remained stable over the years as total travel has increased with population growth.

Source: DRCOG travel model output

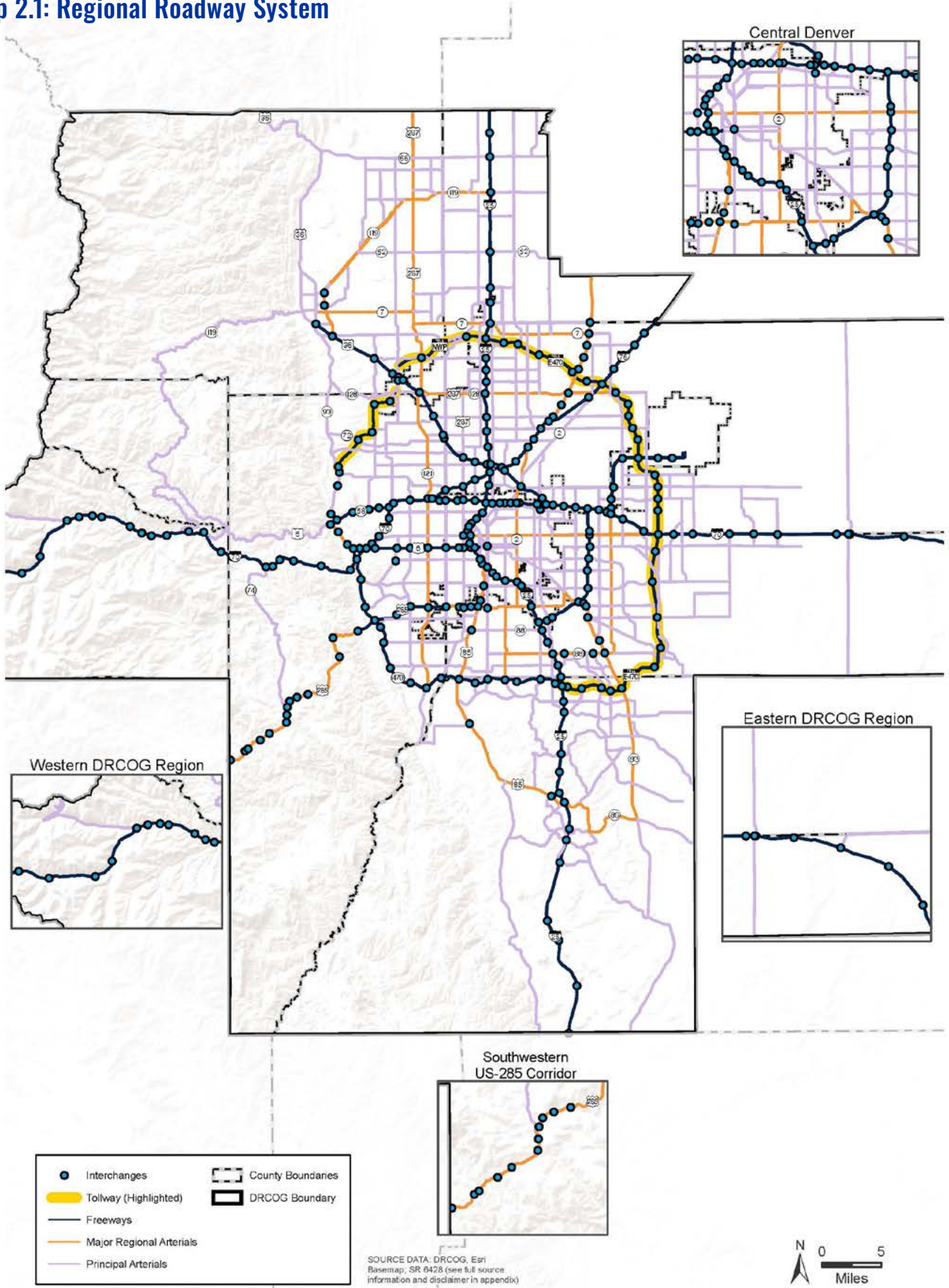


The roadway system Denver residents and visitors know today has evolved over centuries. At the turn of the 20th century, 17th Street in Denver was used by pedestrians, bicyclists and the Denver Tramway. **Photo credit: Courtesy of the Library of Congress, Copyright 1906 by E. W. Kelley, LC-DIG-stereo-1s11060 DLC.**

The roadways that are designated as part of the Regional Roadway System carry the most people and goods to and from locations across the region and are

identified in this plan. Transportation on the Regional Roadway System accounts for about three quarters of the region's vehicle miles traveled.

Map 2.1: Regional Roadway System



Congestion

The number of people and vehicles on the road network has increased with population and employment growth. Congestion occurs when the number of vehicles exceed the carrying capacity on limited roadway space, often concentrated during the peak travel periods of the day. While traffic congestion may be a byproduct of a thriving economy, there are a wide variety of negative impacts from congestion including unpredictable travel times, increased freight costs, wasted fuel, air pollution and reduced quality of life.

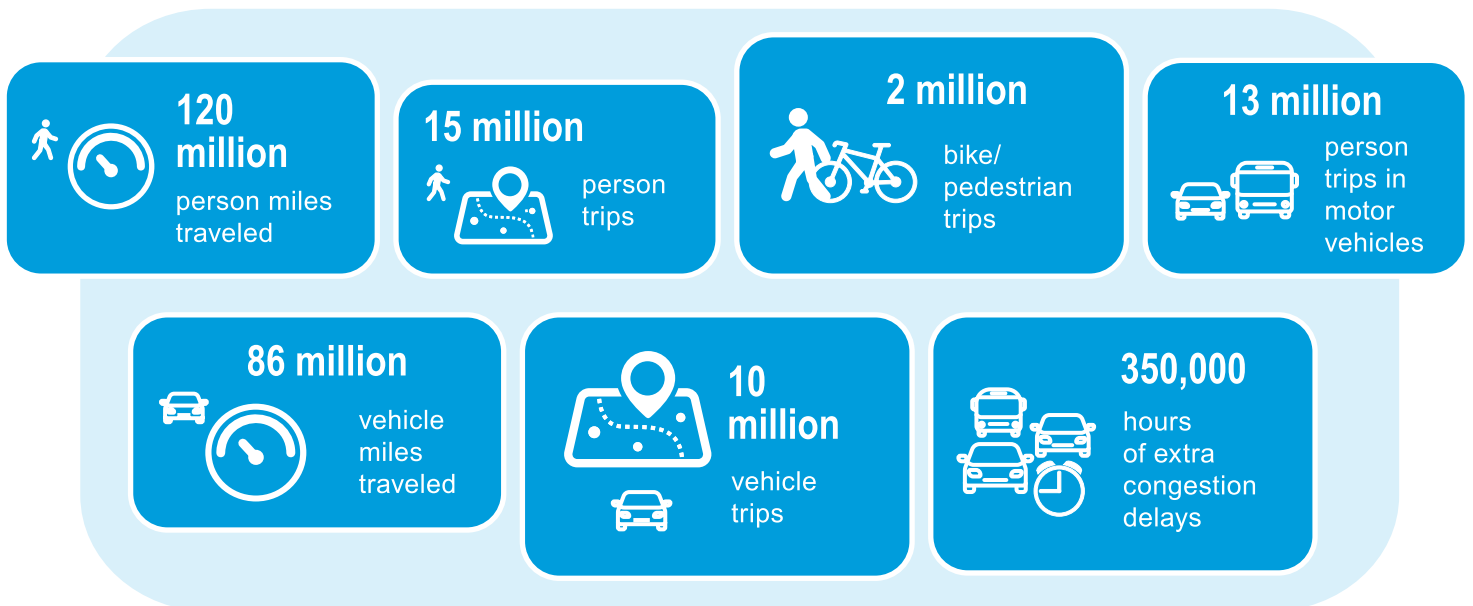
DRCOG reports annually on roadway traffic congestion and keeps up with management strategies to mitigate the impacts and extent of congestion in the region. The figure below highlights key statistics on the use of the roadway system, including how many people move throughout the region every day, and the trips they make. DRCOG's [Congestion Management Program](#)

includes the 2019 Annual Congestion report that discusses the data shown in the figure below. Through its Congestion Management Program and by using the Congestion Mitigation Toolkit, DRCOG monitors annual change and summarizes ongoing, effective mitigation strategies. DRCOG and CDOT also use the annual congestion report to identify congestion hot spots and develop roadway projects and multimodal strategies to address them, per federal guidance.

As discussed in Chapter 3, congestion was one of many factors used in evaluating candidate projects for inclusion in the 2050 RTP. Additionally, the 2050 RTP includes several strategies from the Congestion Mitigation Toolkit, including active roadway management, transportation demand management, transit investments and roadway capacity; strategies which are covered further in this chapter and in Chapter 3.

How is the region's transportation system used?

On an average weekday in 2019





Public transportation

The region's public transportation, or transit, network includes general public transportation, paratransit, and human service transportation. The largest operator of general public transportation in the Denver region is the Regional Transportation District. In addition to operating general public transportation, RTD also operates paratransit. Several nonprofit, for-profit and volunteer organizations provide human service transportation. CDOT also operates intercity bus service, branded as Bustang and Bustang Outrider.

Coordinated Transit Plan

The Coordinated Transit Plan [Appendix J](#) inventories existing transit services and identifies fiscally constrained and envisioned transit service and system needs for the Denver region. It integrates transit modes for both general public transit and human service transportation. The Federal Transit Administration requires that projects selected under the FTA 5310 Enhanced Mobility for Seniors and Individuals with Disabilities grant program be included in a coordinated transit plan.

RTD provides more than 98% of the trips on transit in the region, which equated to more than 105 million boardings in 2019 (about 300,000 a day).

General public transportation

Regular, continuing shared-ride surface transportation services that are open to the general public.

Fixed route

A system of providing designated public transportation in which a vehicle is operated along a defined route according to a fixed schedule.

Paratransit

Complementary transportation service required by the Americans with Disabilities Act for individuals with disabilities who are unable to use fixed route transportation systems.

Human service transportation

Shared-ride surface transportation services (often demand-responsive services) that are open to segments of the general public defined by age, disability or income.

Boardings

The number of times passengers board public transportation vehicles.



Part of the Union Station Transit Center, RTD's 22-gate underground bus facility provides convenient connections across the system. **Photo credit: RTD.**



FlexRide delivers first- and last-mile connections to other RTD Park-n-Rides and stations, medical centers and business parks.
Photo credit: RTD.

Bus service

Buses are the backbone of transit service for RTD — nearly 75% of all trips made by RTD users are on a bus. RTD operates 130 local, airport and regional fixed bus routes serving 9,800 bus stops and 89 Park-n-Rides with 30,000 parking spaces. RTD’s bus system had almost 70 million boardings in 2019.

RTD operates bus service on several corridors that have exclusive or semiexclusive rights of way, which enable faster, more reliable and more comfortable bus service. Examples include the 16th Street MallRide in exclusive right of way; bus routes in bus-only lanes on

Broadway and Lincoln in downtown Denver; and Flatiron Flyer service between Boulder and Denver in the Express Lanes along U.S. Route 36 and I-25.

RTD’s FlexRide offers demand-responsive service available to the general public within a defined service area. This service generally operates in more suburban settings. Customers call to reserve a trip within each FlexRide service boundary. There were 500,000 FlexRide boardings in 2019.

Rail

RTD's rail network consists of 113 miles of rail along 12 rail lines served by 78 rail stations. In 2019, RTD's rail system had 34 million boardings. The total number of boardings has increased as new lines and extensions opened in the past few years. The most recent addition to the network is the N Line from Denver Union Station to Thornton, which opened in September 2020.

Paratransit

Under the Americans with Disabilities Act, the region's transit providers must also provide complementary paratransit service within three-quarters of a mile of a bus route or rail station, at the same hours and days, and for not greater than twice the regular fixed-route

fare. RTD's Access-a-Ride paratransit service provided almost 900,000 boardings in 2019.

Human service transportation

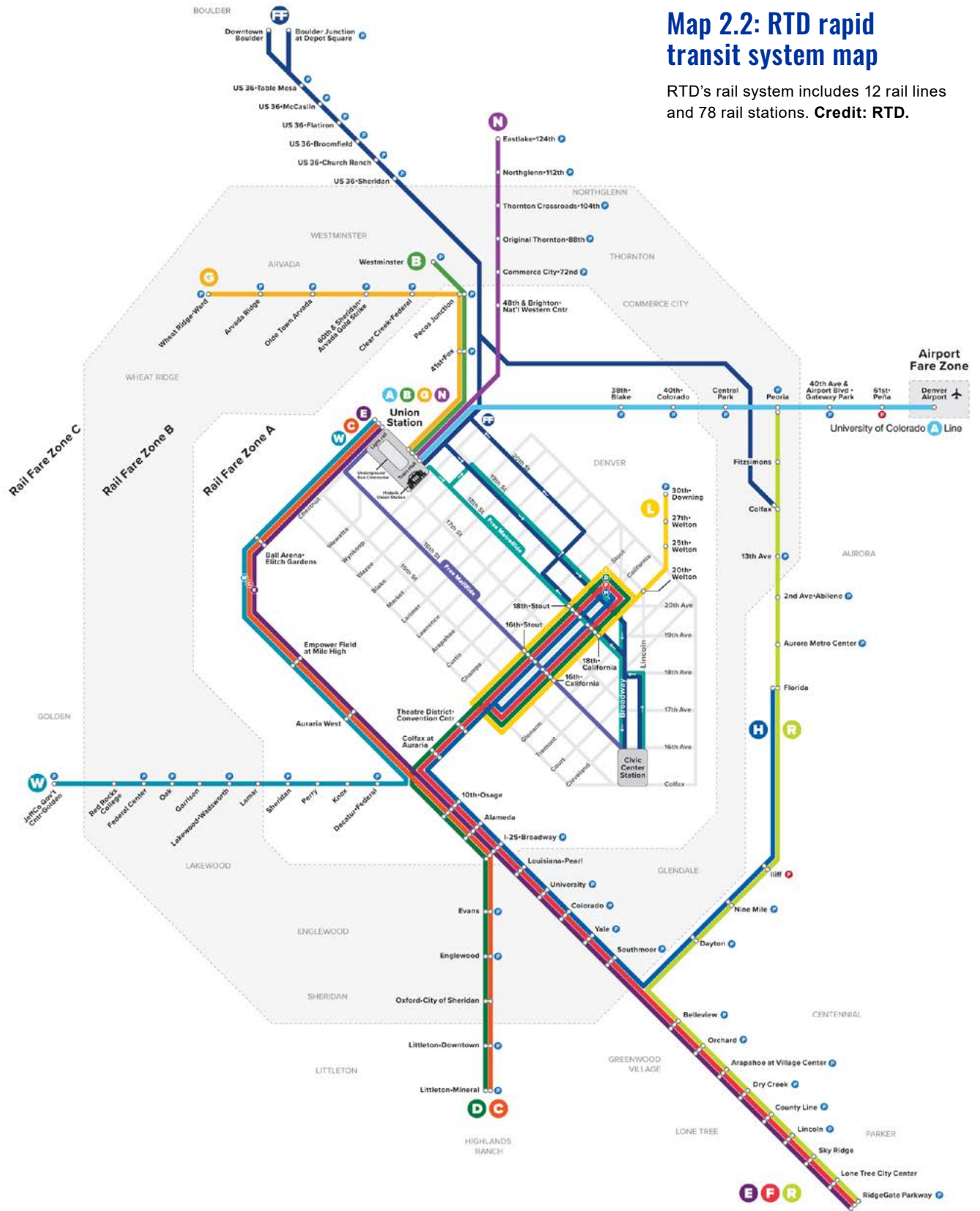
Human service transportation includes specialized services for older adults and individuals with disabilities. It can also include services for people with lower incomes, offered in areas where there are limited or no fixed-route services. Major providers of human service transportation in the Denver region include Via Mobility Services and Douglas County, which contracts with multiple providers. Many offer services that go beyond the requirements of the Americans with Disabilities Act; door-through-door services and in areas not covered by paratransit.

The N Line is RTD's newest rail line and adds 13 miles and six stations between Denver Union Station and Thornton. **Photo credit: RTD.**



Map 2.2: RTD rapid transit system map

RTD's rail system includes 12 rail lines and 78 rail stations. Credit: RTD.





Active transportation

What is active transportation?

Active transportation is a way of getting around powered primarily by human energy, via pedestrian and bicycling travel modes. Pedestrian travel includes people walking or using wheelchairs, longboards and other mobility devices, such as walkers or crutches. Bicycling includes any type of wheeled and pedaled cycle, with or without a motor.

The Denver region's arid climate and abundant sunshine makes it an ideal place for walking and bicycling.

Also referred to as active transportation, walking and bicycling are flexible, accessible, healthful and clean modes of transportation and can be used exclusively or in conjunction with other modes.

Benefits of active transportation

- **Health:** Being physically active is one of the most important ways people of all ages can improve their health; bicycling and walking for transportation and recreation can help adults and children meet recommended levels of physical activity established by the Centers for Disease Control and Prevention.
- **Accessibility and mobility:** Active transportation contributes to a more equitable transportation system by reducing accessibility barriers for people who ride a bicycle, walk or use transit.

- **Safety:** Planning for people who walk or bike benefits all users of the transportation system, especially those with the greatest risk of suffering an injury or fatality when involved in a crash. Providing and maintaining facilities to increase the safety of people who bicycle and walk also improves safety for drivers.
- **Economic vitality:** A 2016 Colorado study estimated that bicycling and walking account for combined health and economic benefits of approximately \$4.8 billion annually — \$3.2 billion for walking and \$1.6 billion for bicycling.

Active Transportation Plan

In January 2019, DRCOG adopted the first regional Active Transportation Plan [Appendix L](#). DRCOG developed the plan alongside the Active Transportation Stakeholder Committee and other regional partners during 2017 and 2018. The Active Transportation Plan highlights the region's vision for a safe, comfortable and connected active transportation network and highlights opportunities and implementation strategies. It promotes regional cooperation on active transportation topics and encourages staff of municipalities to share ideas and learn from each other to advance a more connected and cohesive active transportation network.

Active Transportation Plan framework

What does it mean for the region?



Regional active transportation corridors connect significant regional destinations and may serve longer distance bicycle trips, as well as local walking and biking trips.

The regional active transportation corridors are intended to allow safe and comfortable access to existing and future regional destinations for people of all ages, incomes and abilities. Development of the corridors supports Metro Vision outcomes related to creating a connected multimodal region and a vibrant regional economy. The regional network can facilitate cross-jurisdictional collaboration toward a common vision for a regional active transportation network. Local facilities that connect to the regional network are essential to improving mobility across the region.



Pedestrian focus areas have a high concentration of existing or potential pedestrian activity.

Efforts to improve pedestrian safety and convenience in pedestrian focus areas will help the region achieve Metro Vision outcomes related to livable communities, safety, health and transit integration.



Short-trip opportunity zones are areas with a high concentration of short trips (2 miles or less).

The average bicycle trip distance in the Denver region is 1.8 miles. Areas with a large number of trips 2 miles or less hold potential for converting car trips to bicycle trips, which will help fulfill a key Metro Vision target of reducing single-occupant vehicle mode share.



Local active transportation networks are routes that connect residents to local destinations and to the regional network.

Local active transportation networks are the primary means by which people get around by foot or bike. These networks carry the bulk of active transportation trips and should connect to regional active transportation corridors where possible. Additionally, local facilities are the primary implementation mechanism within pedestrian focus areas and short-trip opportunity zones. Local bicycling and walking networks are defined by local agencies and are not addressed in detail in the Active Transportation Plan.

Currently, the region's pedestrians and bicyclists make more than 2 million trips each day.

The number of people who bike to work in the Denver region is more than twice the national average and is increasing at a greater rate than any other transportation mode.



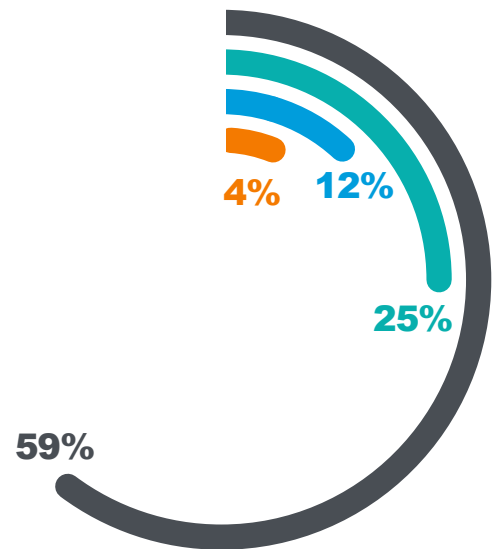
Among the bicycle facilities in the region are on- and off-street lanes and paths. **Photo credit: DRCOG.**

Bicycling

Residents of the Denver region, as well as statewide, embrace a bicycling culture. The number of people who bike to work in the Denver region is more than twice the national average and is increasing at a greater rate than any other transportation mode. Among the region’s residents, there are various perspectives on bicycling, including 59% of people who define themselves as “interested but concerned” — folks who would like to bike but are concerned about safety.

Types of bicyclists in the Denver region

- somewhat confident
- highly confident
- non-bicyclist
- interested but concerned



DRCOG inventories on-street and off-street bicycle facilities in the Denver region, and makes the information available through the bicycle facility inventory data set [available online](#) in the DRCOG Regional Data Catalog and through the Denver Regional Bicycle [web map](#).



The region's communities have constructed, expanded and connected a network of high-comfort facilities to help users feel confident and safe.
Photo credit: Jack Todd (photo contest entry).

Walking

The characteristics and quality of pedestrian facilities vary throughout the region. Many new residential and commercial developments incorporate wide sidewalks or shared-use paths. Conversely, many older neighborhoods have narrow or poorly maintained sidewalks, crossings or curb ramps. It's difficult for large numbers of people or people who use wheelchairs, strollers or other mobility devices to use narrow or poorly maintained sidewalks. In many places, pedestrian facilities are nonexistent, and people are forced to walk along the road or on an unpaved social path. In addition to sidewalks, pedestrian facilities include infrastructure like Americans with Disabilities Act-compliant curb ramps, crosswalks with high-visibility markings, pedestrian islands, intersection improvements, pedestrian-scale lighting, benches, shade trees and wayfinding.

DRCOG has completed a regionwide planimetric data project to map infrastructure features and assets, including sidewalks. Within 1,308 square miles of the region's urban core are 17,700 miles of sidewalk. In the future, it might be possible for DRCOG to capture the entire region's sidewalk system, including total mileage. Regional planimetric data collected to date can be accessed at the DRCOG Regional Data Catalog.

Supporting active transportation in the Denver region

Constructing and maintaining high-comfort facilities

One of the most essential elements in attracting more people to walking and bicycling is a high-comfort network of active transportation facilities. People are more likely to bike or walk if they feel comfortable and safe. Over the past few years, the region's communities have constructed, expanded and connected a network of high-comfort facilities to appeal to people from a wide range of ages and abilities.

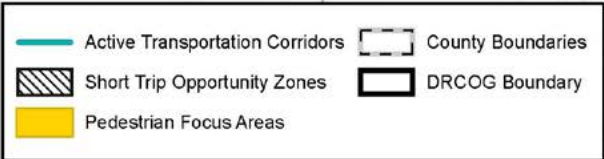
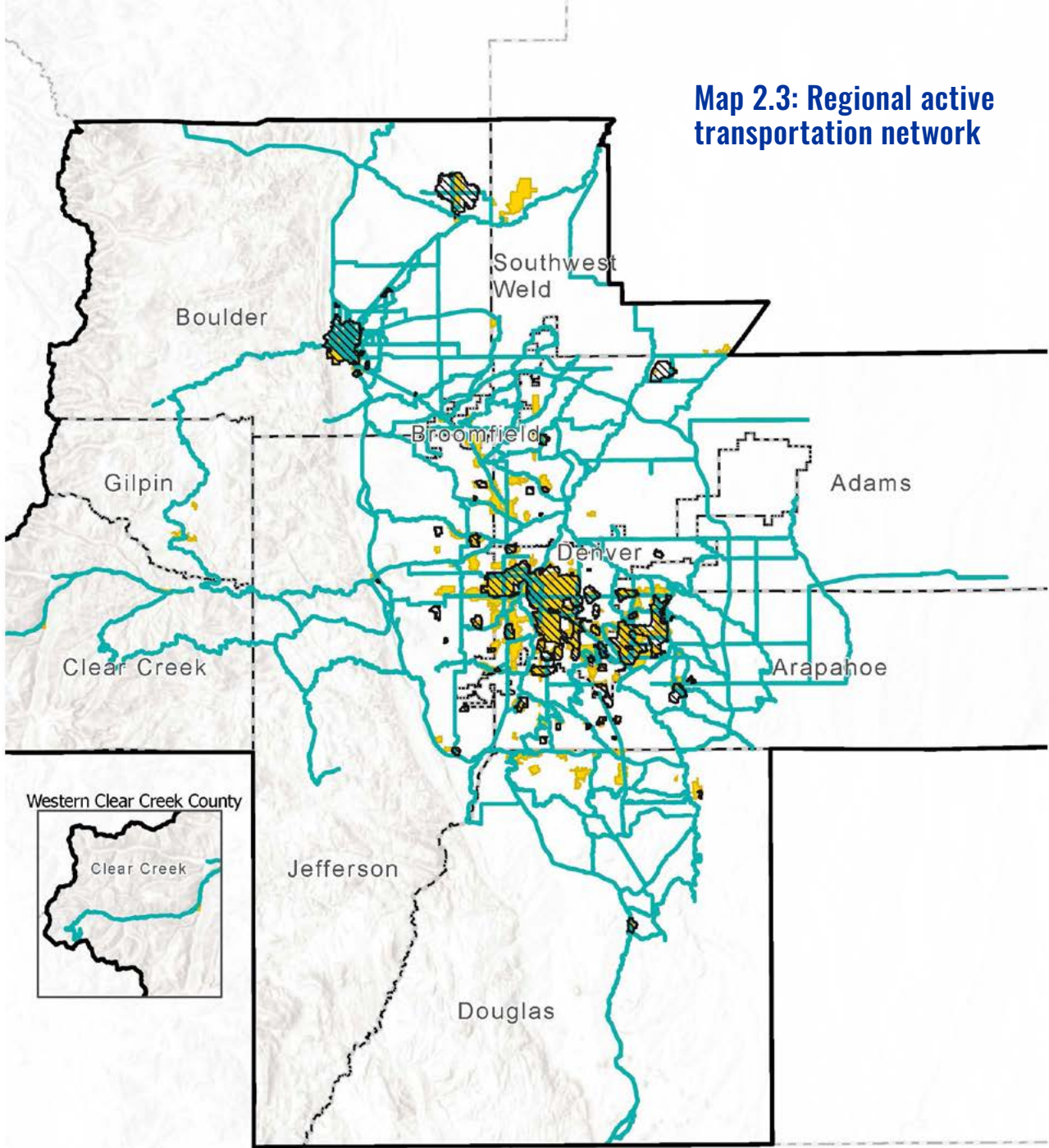
Connecting the active transportation network

Essential to attracting more people to walking and bicycling is continuity and consistency in the active transportation system. Local communities and transportation providers can achieve this by connecting the high-comfort network. In addition to filling in gaps and connecting facilities, identifying and connecting to desirable destinations and to other modes of transportation will encourage people to walk and bike.

Pedestrian infrastructure in the region varies across communities and development. **Photo credit: DRCOG.**



Map 2.3: Regional active transportation network

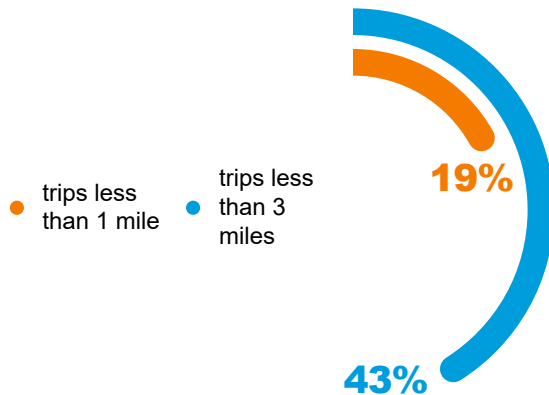


SOURCE DATA: DRCOG, Esri
 Basemap: SR 6428 (see full source information and disclaimer in appendix)



A regional active transportation network is a key element of the Active Transportation Plan. Regional active transportation corridors, pedestrian focus areas, short-trip opportunity zones and local active transportation networks work together to create the conditions necessary to make bicycling and walking viable for everyday trips. The active transportation network identifies facilities and services that connect and enhance local active transportation networks but are not otherwise included as part of regional corridors, pedestrian focus areas or short-trip opportunity zones.

Travel trends: short trips



Designing for Complete Streets

Complete Streets enable safe access and travel for all users. Local communities, planners, and transportation providers can design and operate Complete Streets where pedestrians, bicyclists, motorists, transit users and travelers of all ages and abilities are able to move along the street network safely. Walking and bicycling options can be considered during the design and construction of new roadways and reconstruction projects by local communities. DRCOG is working with stakeholders to adopt a regional [Complete Streets Toolkit](#) to provide further guidance for local governments in the Denver region to plan, design and implement Complete Streets.

Included in the regional Complete Streets Toolkit are street typologies. The typologies were created based on existing and future streets in the Denver region, available data and stakeholder feedback. The typologies were applied across the area's roadways and highlighted opportunities for regional connections for nonvehicle travel modes. Putting modal priority at the forefront elevated active transportation for consideration within the street's right-of-way. Under the concept of providing walkers and people who use wheelchairs or assistive devices ample right of way to feel safe and comfortable on every roadway, pedestrians were included as a priority within every street type.

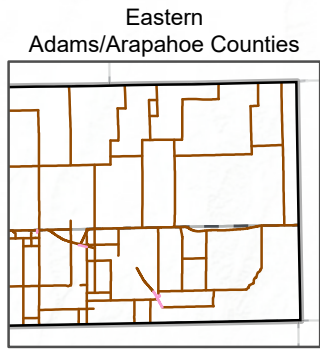
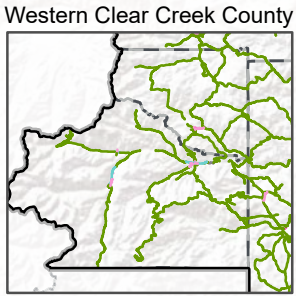
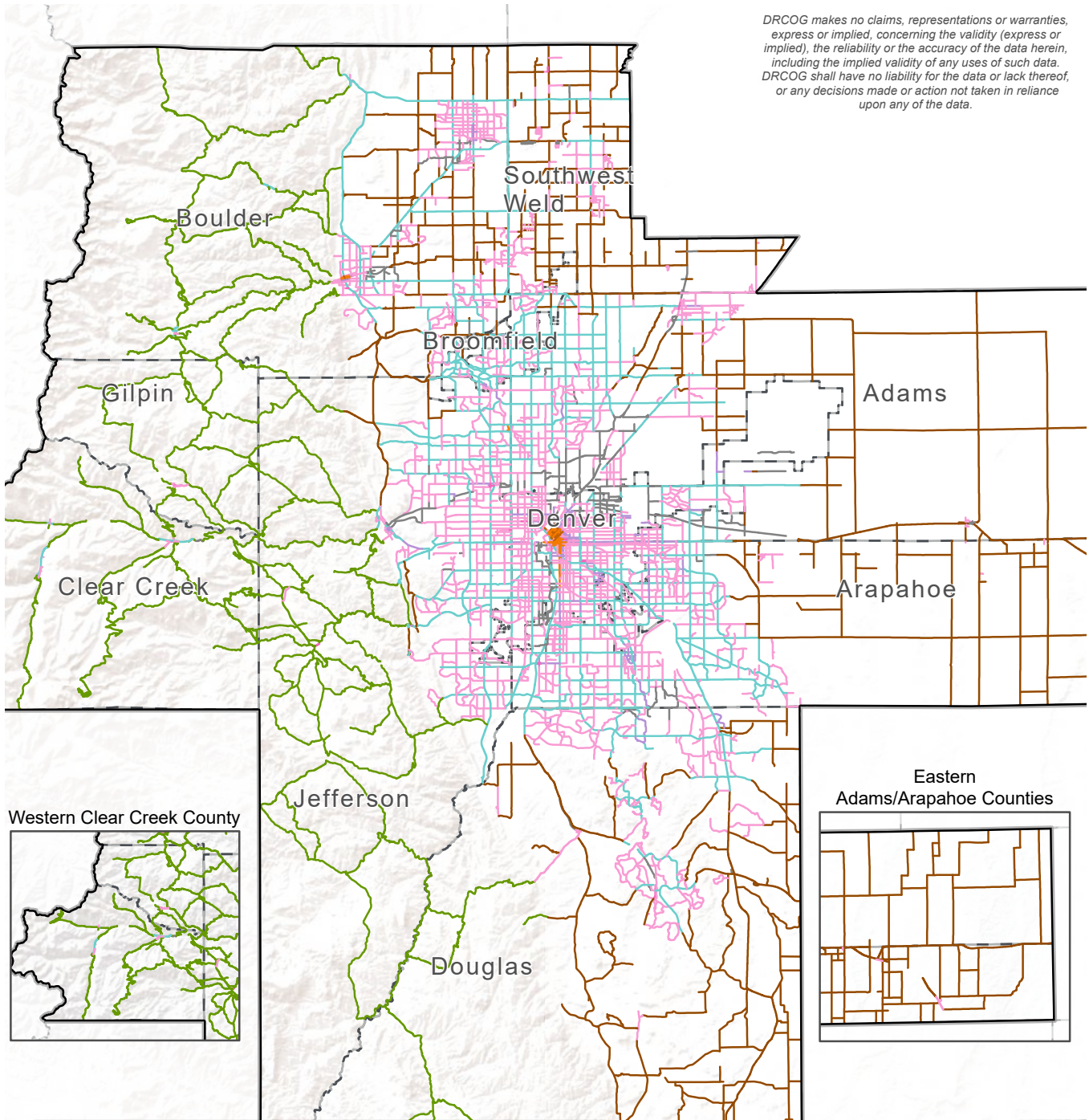
Increasing supportive infrastructure and technology

People are more likely to walk and bike when there are infrastructure and amenities that support active transportation. Examples of active transportation supportive infrastructure include separated and protected bicycle facilities; protected mid-block crossings; pedestrian shelters at transit stops; pedestrian bulbouts; pedestrian-scale lighting; shade trees and landscaping along sidewalks; bicycle racks and secure bicycle parking; and wayfinding.

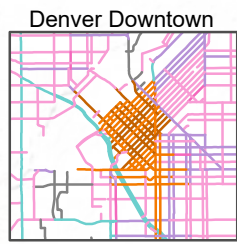
Real-time transportation applications and trip-planning capabilities support and enable walking and bicycling as standalone modes or in conjunction with another travel mode. For example, technology can enable people using transit to reserve a shared scooter or bike at the beginning or end of their trip. Supportive infrastructure, amenities, and technology that is convenient, easily accessible and intuitive will encourage people to walk and bike more.

Map 2.4: Regional Complete Streets typology

DRCOG makes no claims, representations or warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the data herein, including the implied validity of any uses of such data. DRCOG shall have no liability for the data or lack thereof, or any decisions made or action not taken in reliance upon any of the data.



- | | |
|-------------------------------|---------------------------|
| Downtown commercial street | Neighborhood main street |
| Downtown mixed use street | Regional connector street |
| Industrial street | Rural road |
| Mixed use street | County Boundaries |
| Mountain road | DRCOG Boundary |
| Neighborhood connector street | |



SOURCE DATA: DRCOG, Basemap: Esri Basemap, SR 6428
 Creator: pjordan, 6/29/2022

\\Cogshare\Transportation\Complete Streets Project



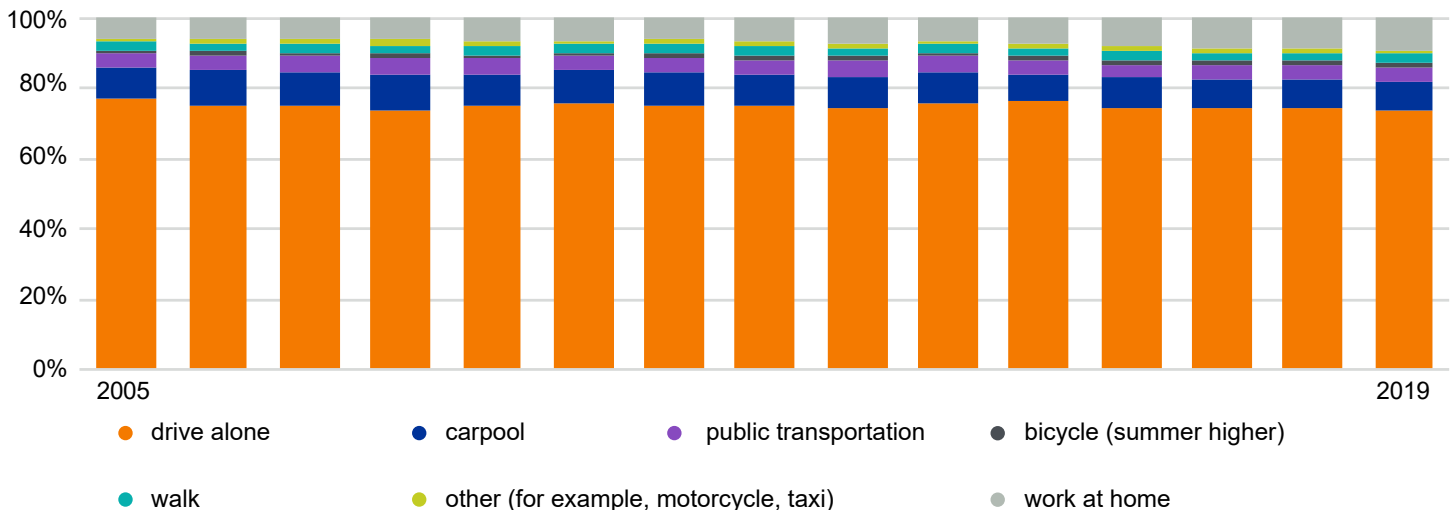
Transportation demand management

Strategies to promote and facilitate travel options to reduce the demand for motor vehicle travel, particularly single-occupant vehicle travel during peak periods, are sometimes referred to as transportation demand management. Such travel choices include carpooling, vanpooling, transit, bicycling and walking, as well as teleworking and varying travel times through alternative work schedules. Strategies can be grouped into four categories:

- **Travel options:** Providing and promoting mobility options to reduce single-occupant vehicle usage.
- **Work travel patterns:** Especially prevalent because of the COVID-19 pandemic, providers and partners also promote and facilitate flexible employee work schedules.
- **Incentives and policies:** These strategies can encourage certain travel choice options and offer opportunities to save money and time.
- **Supportive land use:** One of the most influential elements in encouraging people to walk, bicycle, or ride transit is development patterns and the proximity of, and connections to, transportation options.

Transportation demand management is a set of strategies to help people use the transportation system more efficiently while reducing traffic congestion, vehicle emissions and fuel consumption.

How people get to work in the Denver region



Bike to Work Day

DRCOG's Way to Go team coordinates and hosts the Denver region's Bike to Work Day, which is the second-largest of its kind in the U.S. More than 30,000 people participated in the Denver region's 2019 Bike to Work Day. Evaluation of Bike to Work Day in the Denver region has shown the annual event draws participants from across a wide spectrum of bicycling behavior. Bike to Work Day targets first-time bike commuters, creating a fun and supportive environment to encourage them to continue biking for all purposes in the future.



Go-Tober

Go-Tober is an annual, employer-based commuting challenge hosted by Way to Go. Participating employers are grouped according to size and transit access and compete by encouraging their employees to track their non-single-occupant vehicle trips taken during October. Companies compete to win prizes, and individual participants are eligible to earn rewards. The challenge encourages employees to try various methods of getting to and from work such as carpooling, vanpooling, taking transit, biking, walking or telecommuting.

Providers and partners

Regional agencies

CDOT's Mobility Services team in the Office of Innovative Mobility works on related efforts. CDOT developed a statewide plan in 2019 which outlines core strategies, support strategies, emerging technologies, options for specific markets, costs and participation.

RTD, by way of providing transit throughout the Denver region, provides and promotes commute options for the region's residents. In its First and Last Mile Strategic Plan, RTD highlighted the benefits of linking transit with tools like parking cash-out, transit passes and dynamic carpooling.

The Regional Air Quality Council partners with DRCOG and other agencies in the region to support commute choice. Its projects and programs, such as [Simple Steps Better Air](#), support commute choice and air quality improvement.

Way to Go

DRCOG's Way to Go program includes a formal partnership with seven transportation management associations in the region. The partnership collaborates on a comprehensive and coordinated effort to address traffic congestion and improve air quality in the region by promoting and implementing a suite of commute choice services, including:

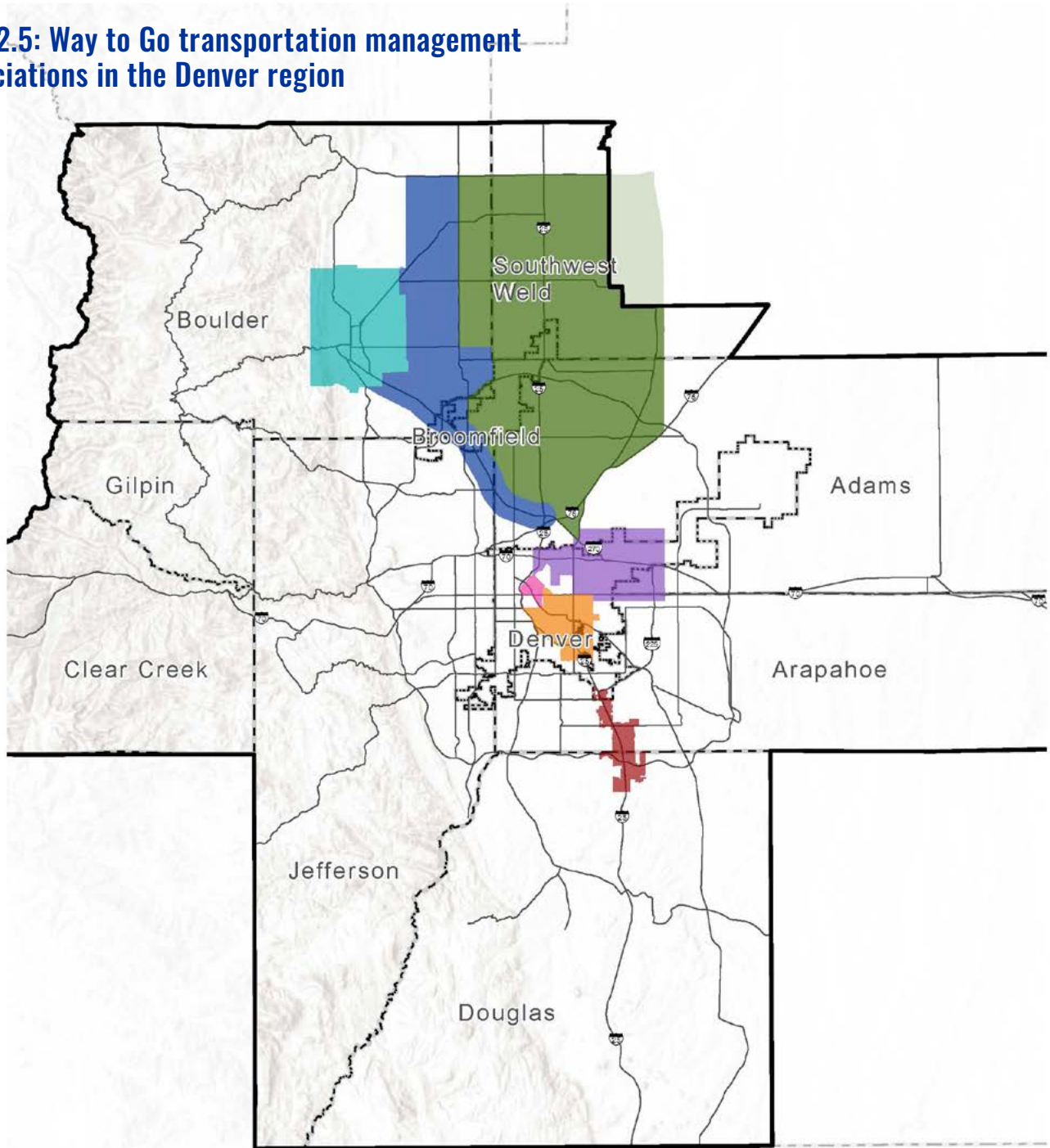
- Employer and community outreach.
- Regional marketing campaigns as well as local promotion of commute options in each corridor or respective area.
- Facilitating commute options and connections through the MyWayToGo trip-planning platform.
- Offering Guaranteed Ride Home services.

Commute options outreach partners

Seven Way to Go outreach partners help local residents, employers and commuters learn about options for getting to and from work within specific corridors, communities or areas of the region. They include:

- Boulder Transportation Connections
- Commuting Solutions
- Denver South
- Downtown Denver Partnership
- Northeast Transportation Connections
- Smart Commute Metro North
- Transportation Solutions

Map 2.5: Way to Go transportation management associations in the Denver region



SOURCE DATA: DRCOG, Esri
 Basemap: SR 8425 (see full source information and disclaimer in appendix)

DRCOG's Way to Go staff performs outreach functions in areas not served by a transportation management association.

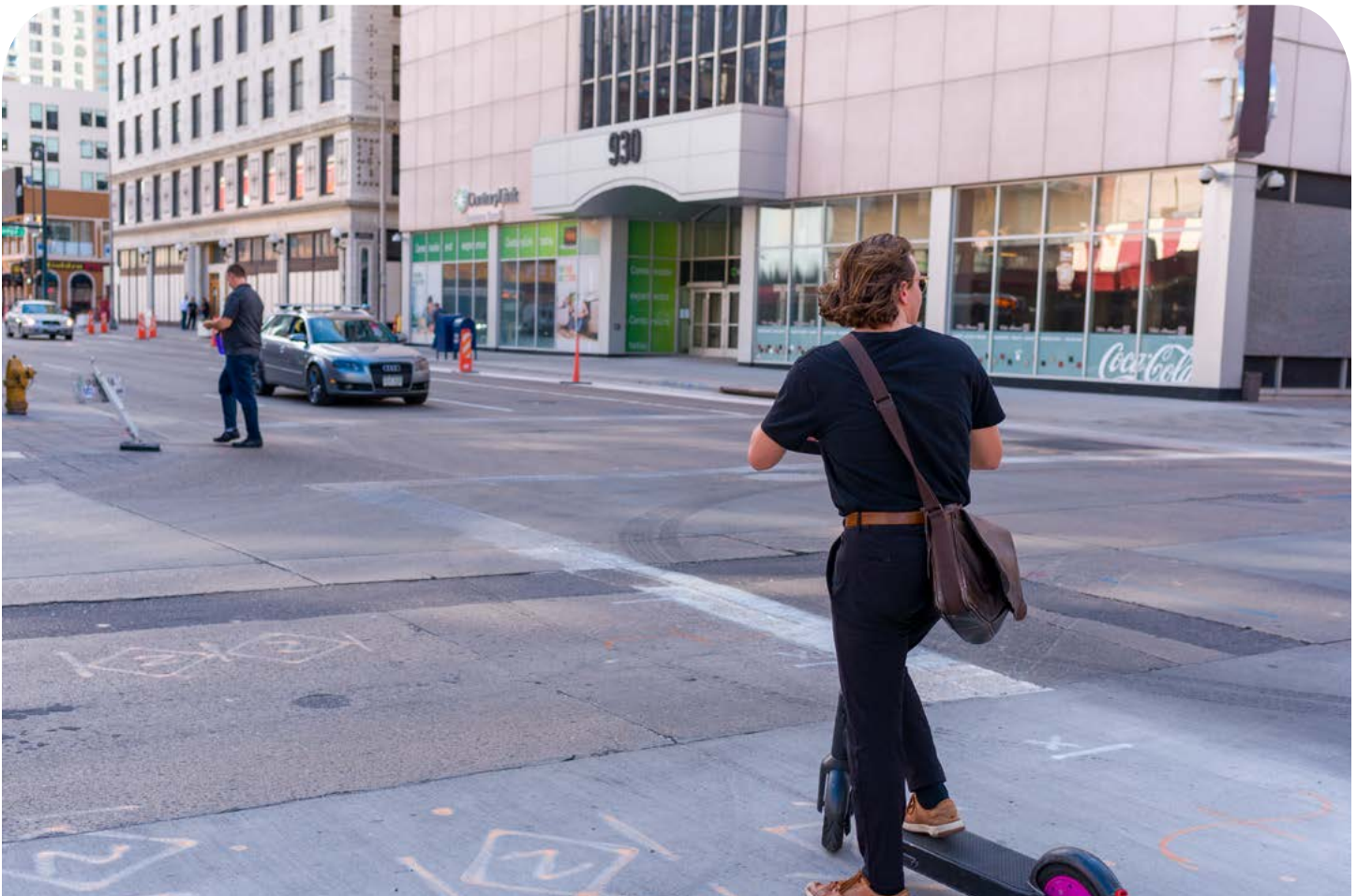
Other organizations

Various nonprofit organizations also provide products or services related to commute options, including, but not limited to:

- Bicycle Colorado (including the Denver Streets Partnership)
- Community Cycles
- Boulder B-Cycle
- Colorado CarShare



Shared micromobility fleets, including e-scooters and e-bikes, are seen here deployed in Denver. **Photo credit: DRCOG**





Emerging mobility

Emerging mobility technology and services are shifting the transportation needs, preferences and opportunities for the region's residents and communities. Over the past decade, innovation in transportation technology has included the introduction of ride-hailing, shared micromobility, automated shuttles and mobility on demand.

Mobility-related technology and services broadly affect the entire transportation system, so while elements of transportation technology are described elsewhere in this plan, this section specifically addresses emerging mobility technology and services. The [Mobility Choice Blueprint](#) contains comprehensive information about transportation technology and emerging mobility.

Benefits of emerging mobility can include things like more travel choices, first- and last-mile connections to transit, air quality improvements and increased access to transportation. While there are benefits to emerging mobility, there are also potential challenges, such as competing curbside uses, zero-occupant vehicles and accessibility. Public and private agencies must work together to proactively plan for and consider emerging mobility in the Denver region.

Shared mobility

Transit, carpool and vanpool are traditional types of shared mobility and are covered earlier in this chapter. Shared mobility in the emerging mobility context refers to the technology-enabled sharing of vehicles and services and may include various business models. Shared mobility has opened the doors for many communities to consider how emerging trends such as mobility as a service,



curbside management, mobility hubs and a digital environment can both support shared mobility and integrate emerging technology into the transportation landscape.

Advanced Mobility Partnership

DRCOG joined CDOT, RTD and the Denver Metro Chamber of Commerce to develop the [Mobility Choice Blueprint](#), which considered how new transportation technologies transform the way people in the Denver region move. The Mobility Choice Blueprint identified 34 tactical actions in several focus areas for the region to consider as partner agencies plan for emerging mobility and transportation technology in the region.

In late 2019, DRCOG, CDOT, RTD and the Denver Metro Chamber of Commerce established the Advanced Mobility Partnership. The partnership guides implementation of the Mobility Choice Blueprint and serves as a forum for collaboration and coordination on transportation technology pilots, projects and programs in the region.



In December 2019, executive leadership from CDOT, the Denver Metro Chamber of Commerce, RTD and DRCOG formed the Advanced Mobility Partnership. **Photo credit: DRCOG.**

Shared micromobility

Shared micromobility refers to low-speed, lightweight, small, human- and electric-powered transportation solutions like bikes and scooters. Devices are available for short-term rental in designated service areas. Use of these services has exploded in popularity in the Denver region, and DRCOG continues to work with local agencies to better plan for and accommodate shared micromobility as part of the transportation system..



use of a car when they need one. Car-sharing programs have evolved with technology to allow app-based trip reservation and payment. Car-sharing programs are operated in the Denver region by companies like Colorado CarShare and Zipcar, along with peer-to-peer car-sharing options.

Microtransit

Microtransit, which uses smaller transit vehicles than buses, can provide fixed-route or on-demand service. Microtransit is emerging in the Denver region. Microtransit technology matches riders who want to go in the same direction, so its route is dynamic and is based on rider needs. Microtransit services extend the reach of RTD's fixed-route transit service and represent a convenient option for riders. An example of microtransit in the DRCOG region is the Lone Tree Link. The Lone Tree Link is a free shuttle service that provides on-demand rides anywhere within Lone Tree city limits. It is funded through a public-private partnership.



Ride-hailing

Ride-hailing allows travelers to procure a ride from a driver pool through a smartphone application. Companies like Uber and Lyft have operated throughout the Denver region since 2013.



Car-sharing

Car-sharing is a service through which people share passenger vehicles. Car-sharing programs enable car-free and car-light lifestyles, so individuals can reserve short-term



Aviation

Air transportation's role in the regional and statewide economy makes it an important element of the regional transportation system.

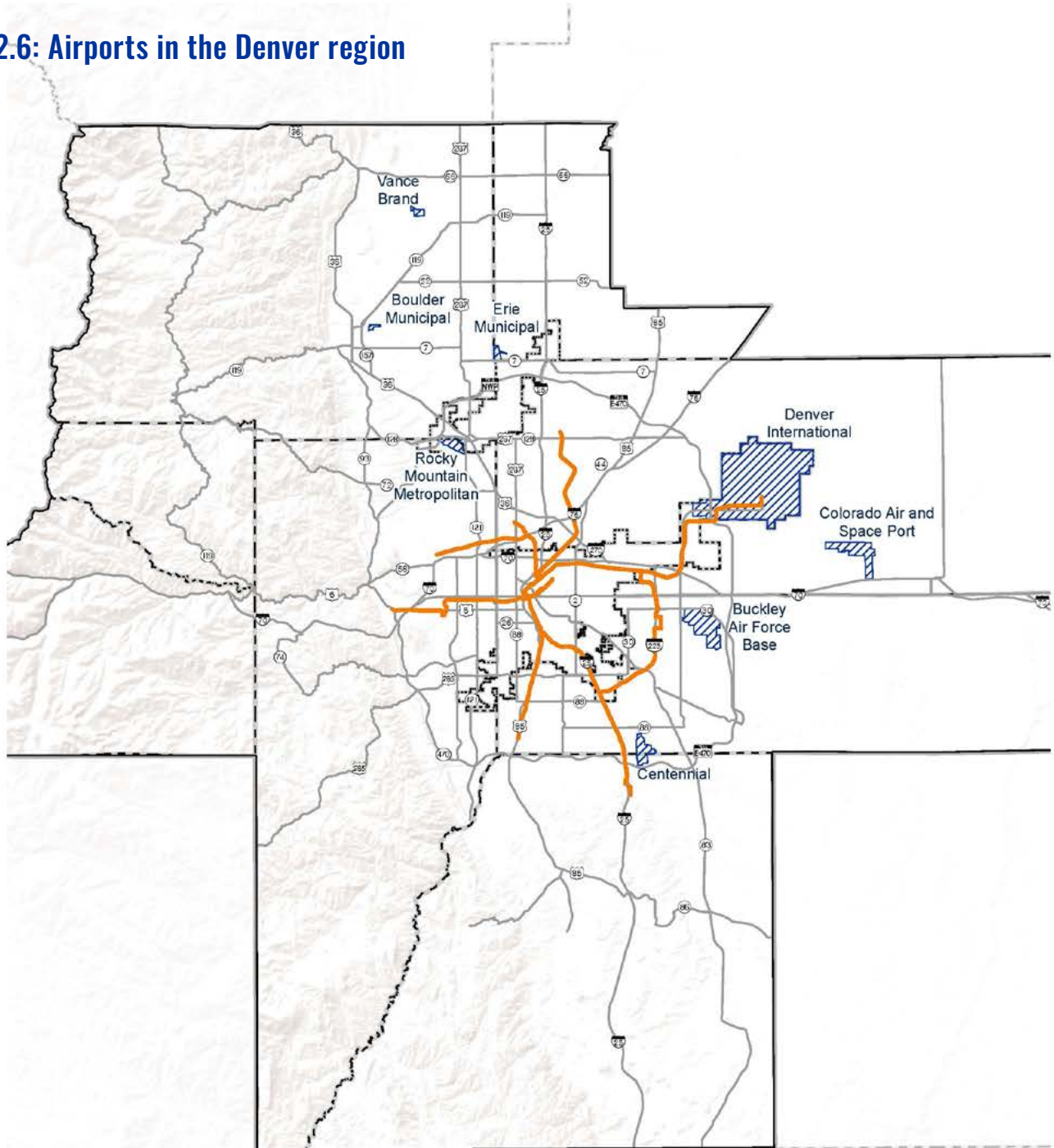
The region's residents, visitors, business professionals, emergency service providers, flight training operations and air cargo shippers depend on airports for their livelihoods, quality of life and access to the national and global transportation system.






According to the CDOT Division of Aeronautics, 2020 Aviation Economic Impact Study, the region's airports support nearly 237,000 jobs with a payroll of more than \$18.2 billion, creating over \$32.5 billion of business revenues and economic output.



The Denver region's airport system comprises one air carrier airport, Denver International Airport; four reliever airports; two general aviation airports; and one military facility.

Map 2.6: Airports in the Denver region



	Rail System		County Boundaries
	Major Roads		DRCOG Boundary
	Airport		

SOURCE DATA: DRCOG, Esri
 Basemap: SR 6428 (see full source information and disclaimer in appendix)



Denver International Airport

The Denver International Airport represents the largest aviation economic generator in Colorado and is the state's only large hub airport. DEN provides connections to national and international destinations and serves as an origin/destination and transfer point in the state for air passenger traffic. According to Airport Council International statistics for 2019, Denver International Airport ranked 16th worldwide and fifth in North America for annual passengers. It also ranked fifth worldwide and in North America for its volume of annual aircraft operations.

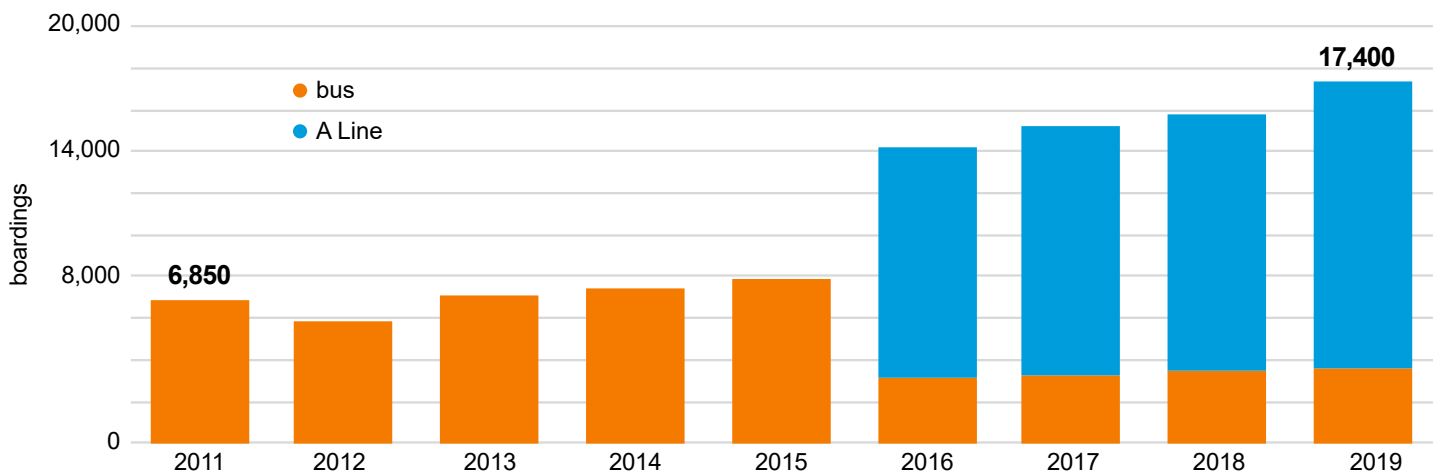
About 36,500 people worked at Denver International Airport in 2019 and on an average day, around 190,000 passengers used the airport. In 2019, just over 64% of boardings were passenger trips beginning or ending at Denver International Airport, meaning that on an average day around 122,000 passengers travel to or from Denver International Airport to begin or end their airline trip. The remainder were passengers making connections at the airport. RTD's A Line from Denver

In 2019, Denver International Airport served 69 million passengers and moved 672 million pounds of cargo via 640,000 aircraft movements (landings and take-offs).

Union Station to Denver International Airport helps move those same workers and passengers. The line also has increased transit ridership to and from the airport since it started service in 2016.

Denver International Airport's latest aviation forecast anticipates that the airport will handle around 120 million passengers and more than 950,000 aircraft movements in 2040. In anticipation of such growth, the airport's staff is planning major infrastructure improvements and to implement its real estate strategic development plan to ensure Denver International Airport's ability to serve the region and the state for decades to come. The improvements will support the airport's role as the major regional and state economic engine and job generator for passengers, employees, visitors, cargo and related businesses.

RTD daily ridership to and from Denver International Airport (2011-2019)



Data represents average weekday boardings/alightings for the August Runboard (August to December)



Denver International Airport contributed \$33.5 billion to the regional and state economy in 2019. **Photo credit: Adobe Stock**

Buckley Air Force Base

The only military airport within the region is Buckley Air Force Base. The base hosts the 460th Space Wing, which directly supports combatant commands around the world. It also hosts the 140th Wing of the Colorado Air National Guard, the Navy Operational Support Center, the Aerospace Data Facility-Colorado, the Army Aviation Support Facility and the Air Reserve

Personnel Center. The base in 2016 included 3,100 active-duty military members from every service, 4,000 National Guard personnel and reservists, four commonwealth international partners, 2,400 civilians, 2,500 contractors, 36,000 retirees and approximately 40,000 veterans and dependents.

In February 2019, DRCOG participated with Buckley Air Force Base leaders, partners, staff and community stakeholders to update the Buckley Air Force Base Area Development Plan. The master plan outlines growth and operations that support Buckley Air Force Base's vision "to create a sustainable, transit-oriented community through mixed-use districts with appropriate landscaping connected by a network of pedestrian-friendly streets." DRCOG provided regional transportation expertise, including Metro Vision planning consistency, and coordination of regional commute option efforts. DRCOG maintains relationships with Buckley Air Force Base partners.

Colorado Aviation System Plan

CDOT's 2020 Colorado Aviation System Plan focuses on four goals for Colorado's airport system. For each goal, the 2020 Colorado Aviation System Plan identifies several performance measures and facility and service objectives to provide a baseline for the infrastructure, facilities and service capabilities required to support the type and volume of aviation activity at each airport. The Colorado Aviation System Plan identifies gaps between the airport's existing condition and the needs to satisfy performance measures, facility and service objectives, and future facility needs anticipated by aviation demand forecasts. Individual airport's report cards detailing each airport's future needs are available through the Colorado Aviation System Plan. Denver International, Centennial and Rocky Mountain Metropolitan airports are investing in expansion of airfield facilities to address demand.



Safety and efficiency advances Colorado's airport system by promoting and preserving safe and efficient facilities, on and off airports.

Access and mobility provides Colorado's airports with infrastructure and sufficient capacity enabling the public adequate access and mobility utilizing the aviation system.

Economic sustainability supports sustainable economic growth and development to continue Colorado's status as a leader in technology, testing, and the aerospace industry.

System viability preserves airport system assets to promote fiscal responsibility and sustainable, cost-effective investments to ensure the system's long-term viability.

Operating the transportation system

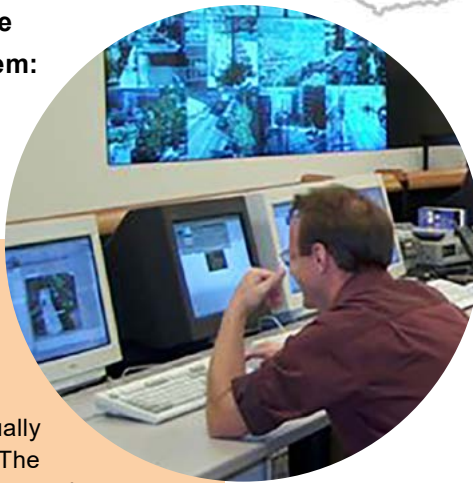
The Denver region's transportation system is complex and requires countless technologies and people working daily to maintain mobility, which the public may take for granted. Hundreds of individual and overlapping entities work within the transportation system, such as municipalities, counties, fire districts, public safety departments, CDOT, RTD, organizations that promote travel options, public utilities, railroads and private service or information providers.

Five key regional themes relate to the operation of the transportation system:

Monitor activities:

“What is going on out there?”

People work in transportation management centers, troubleshoot traveler apps and visually monitor the region's transportation system. The region's travelers can help monitor the transportation systems and report concerns. Devices in vehicles, along the roadside and in transportation management centers help people monitor and detect safety and operational incidents and needs.



Operate things:

“Keep the facilities and services operating reliably.”

People work in vehicle dispatching offices, write software code, operate traffic signals and drive buses, ride-hailing vehicles, snowplows, emergency vehicles and tow trucks. Enforcement officers ensure compliance with laws related to disruption of mobility ranging from speeding enforcement to ticketing cars or trucks parked in bike lanes. Technological devices work independently or in conjunction with people to dispatch vehicles, operate apps, control traffic devices, control trains and even enforce laws.





Respond, share and inform:

“Something happened: What should be done?”

A coordinated response to planned events, incidents and disruptions is critical to maintaining a safe and reliable transportation system. Applicable resources like tow trucks, emergency services, snow plows, repair crews must be dispatched, and agencies, media and the public need information. People on the move and at home or work receive information about disruptive incidents. Coordination among the agencies that update information devices, variable message signs, travel information apps, websites and social media ensures that people get the messages they need, when they need them, in order to make well-informed decisions.



Evaluate past conditions and events:

“What could have been done better?”

Staff associated with planning, operations, and incident response use archived or supplemental data to evaluate past conditions or incidents. Recommendations can be made for improvements to pre-event actions like revised traffic signal timing plans and post-event responses like communication and command protocols.



Improve regional coordination efforts:

“What resources and system components are needed?”

Future investments can improve interjurisdictional situational awareness, communication systems, coordination efforts, training, data management, multimodal trip integration, and traveler information accuracy.



Quick responses to crashes and accidents saves lives and keeps the region's roadways operating efficiently. **Photo credit: CDOT.**



Data management is integral to each of the operational themes. Data is obtained continuously from local, state, regional and private sources, then used and shared in real-time or stored for longer-term analyses. It is critical that such data is managed in a coordinated effort across the region, not just within localized entities.

While some operational activities may not change much by 2050, others will change significantly, primarily due to emerging technological advances, which system operators refer to as intelligent transportation systems. By implementing intelligent transportation systems elements and devices in well-planned and coordinated

fashion in the public sphere, the region will maximize their benefits. Full mobility benefits will not be achieved if done on an individual, haphazard basis. Road users are already reaping the benefits of connected vehicle safety technology in cars and trucks. As the share of vehicles traveling on the region's roadways with such capabilities increases, greater operational benefits will be achieved through communication connections between a vehicle and the roadway, other vehicles, transportation management centers, transit stations and individuals walking or bicycling with smartphones.

CDOT is responsible for plowing state highways and interstates and keeping them open and operating during inclement weather. **Photo credit: CDOT.**





Vehicle and infrastructure technology

Vehicle technology

Advances in vehicle technology have sparked public interest in the evolution of the transportation system. With the right planning, connected, automated, shared and electric vehicle technologies have the potential to support positive outcomes for the region's vision of a future transportation system. Without adequate planning, a haphazard implementation of connected, automated, shared and electric vehicle technologies may misalign with the region's vision or lead to negative outcomes. The potential to affect a preferred outcome suggests that member governments and partner agencies consider benefits and challenges during project development and implementation. As the Denver region prepares for changes in vehicle technology, regional partner agencies are working to implement tactical actions related to these technologies as outlined in the Mobility Choice Blueprint.

“Transportation is currently the second largest source of greenhouse gas emissions in the state — and as Colorado’s electricity sector decarbonizes, transportation will become the greatest contributor of harmful, climate-altering pollution.”

— Colorado Energy Office

Electric vehicles

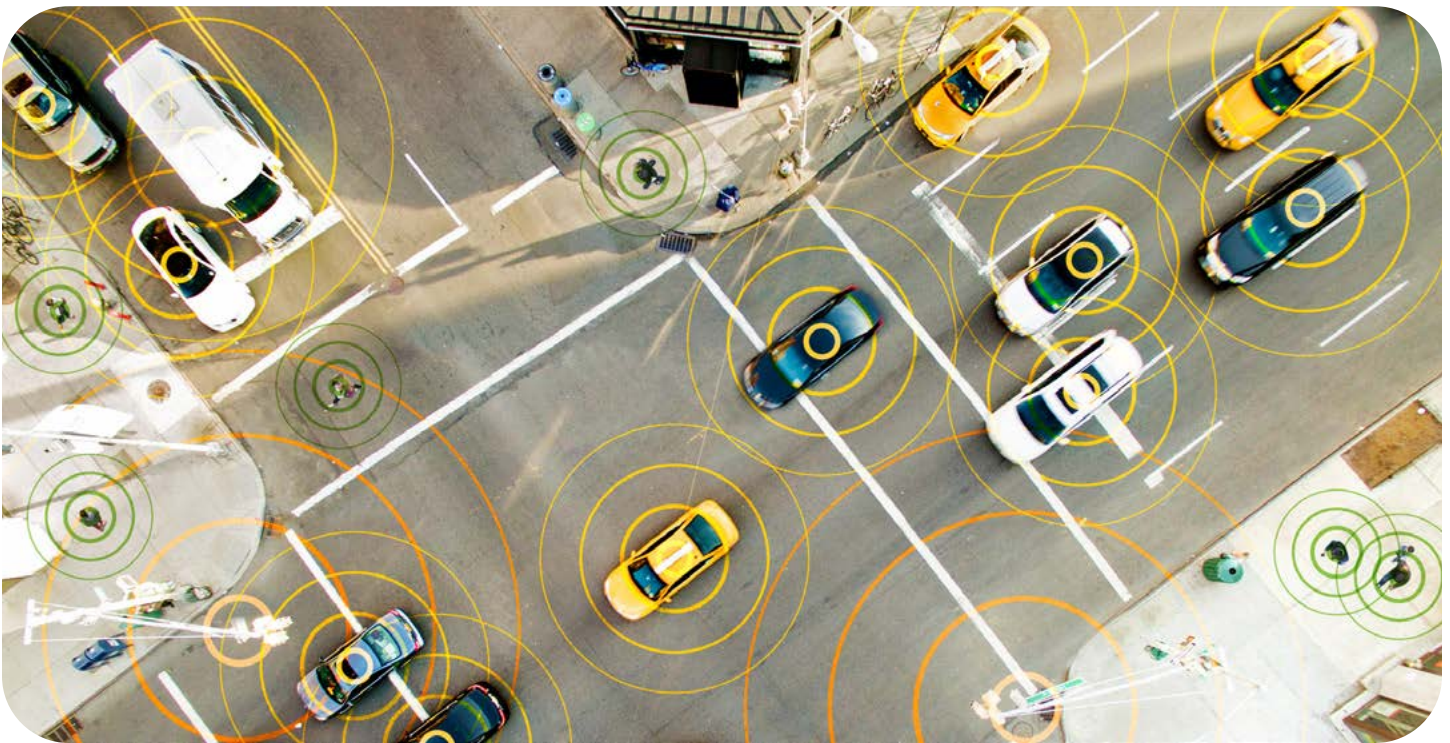
Electric vehicles derive all or part of their power from electricity supplied by the electric grid. Electric vehicle types include all-electric and plug-in hybrid vehicles. Recent technological advances in electric vehicle and battery technology have paved the way for original equipment manufacturers to deliver a greater variety of electric vehicle types. Publicly accessible electric vehicle charging stations are now a critical part of transportation infrastructure. Colorado has more than 31,000 electric vehicles on the road today, more than two-thirds of which are in the Denver region. Electric vehicles are associated with positive health, economic and environmental benefits for all people in the Denver region. Vehicle electrification and charging infrastructure are more extensively discussed in the Mobility Choice Blueprint and Colorado Electric Vehicle Plan.

DRCOG has partnered with the State of Colorado in efforts to increase the amount of geographically dispersed electric vehicle charging points. Increasing the amount of charging points will improve air quality, reduce greenhouse gas emissions and encourage continued deployment of electric vehicles in the Denver region.



The increased availability of electric vehicle charging stations in the region will help improve air quality and reduce emissions.

Photo credit: CDOT.



Today, hundreds of miles of roadways are equipped with technology so connected vehicles can communicate with other vehicles.
Photo credit: HDR.

Vehicle connectivity and automation

Connected vehicles are equipped to communicate with and receive alerts from other vehicles, roadway infrastructure, transportation management centers and personal electronic devices like smartphones. The benefits of connected vehicles include reducing crashes, fatalities and serious injuries, improving travel reliability and increasing the energy efficiency of traveling vehicles.

Automated vehicle types include those with automated driver-assistance features, like automatic emergency braking or lane departure assistance, as well as driverless vehicles, sometimes referred to as autonomous vehicles. Depending on their level of automation, such vehicles have various benefits. A highly anticipated benefit of widespread automated

vehicle use is improved safety. In the Denver region, several automated vehicle pilots including the 61AV Demonstration Project and the City of Westminster's EasyMile pilot have tested automated vehicle shuttles in various conditions.



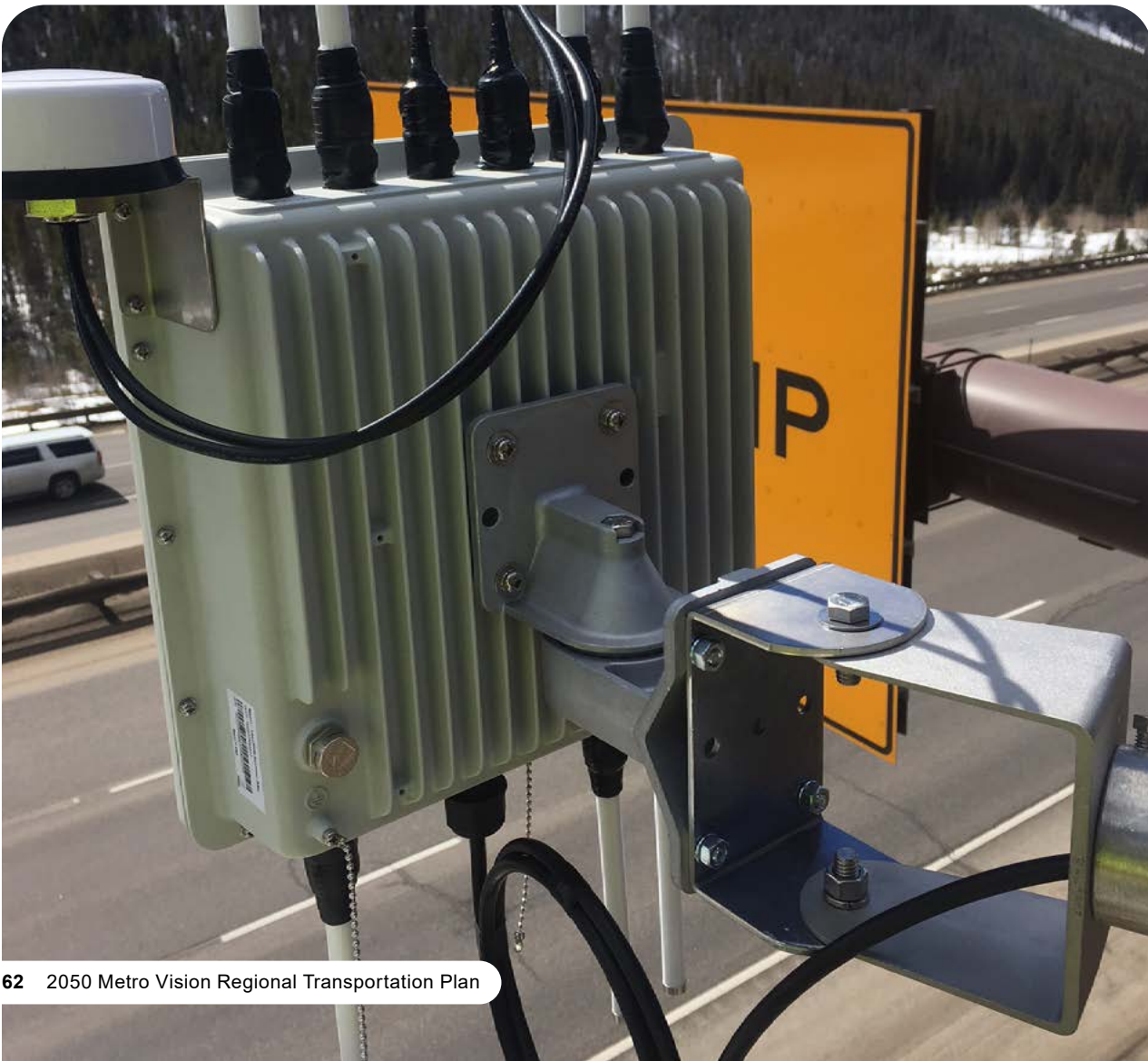
Throughout the region, automated vehicle shuttle pilots have provided partners an opportunity to learn about automated vehicles in various situations. **Photo courtesy City of Westminster.**

Infrastructure technology

To realize the benefits of connectivity and automation, both physical and digital infrastructure are required. Roadside equipment is required to communicate with vehicles and other traveler devices. Such infrastructure must be connected by a robust fiber and wireless communications system to traffic management centers throughout the region. Additionally, the physical infrastructure must be connected to and supported by a digital infrastructure that collects, consolidates, analyzes and disseminates data for use by operators, travelers and businesses.

CDOT began preparing its physical and digital infrastructure for connected vehicles and automated vehicles in 2016 with deployment of roadside units along I-70 from the Denver region in Golden west toward Vail. Today, hundreds of miles of highways are equipped with roadside equipment. Additionally, the City and County of Denver has installed roadside equipment on arterial roadways, connecting with the existing traffic signal infrastructure.

Infrastructure can communicate with and send alerts to connected vehicles. **Photo credit: CDOT**





Safety

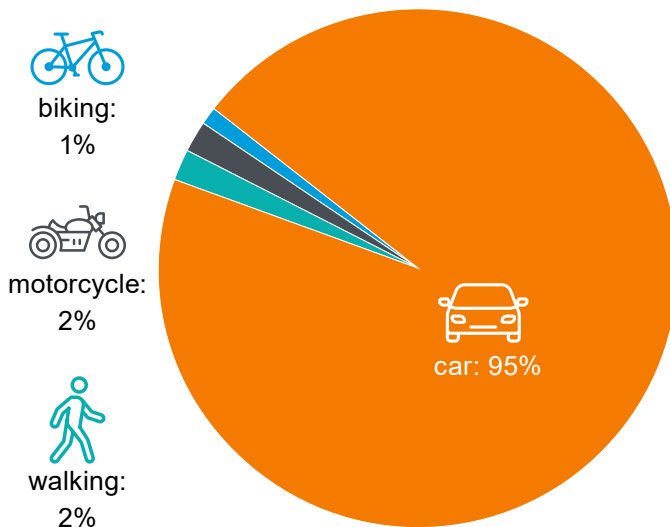
Traffic-related deaths and serious injuries are a critical and preventable public health epidemic and social equity issue in the metropolitan Denver area. DRCOG, its member governments and partner agencies are responsible for reducing crashes by providing safer transportation systems.

In 2019, 270 people were killed and 1,764 people were seriously injured on the Denver region's urban streets and highways. There were nearly 10,120 crashes between 2015 and 2019 that resulted in a fatality or

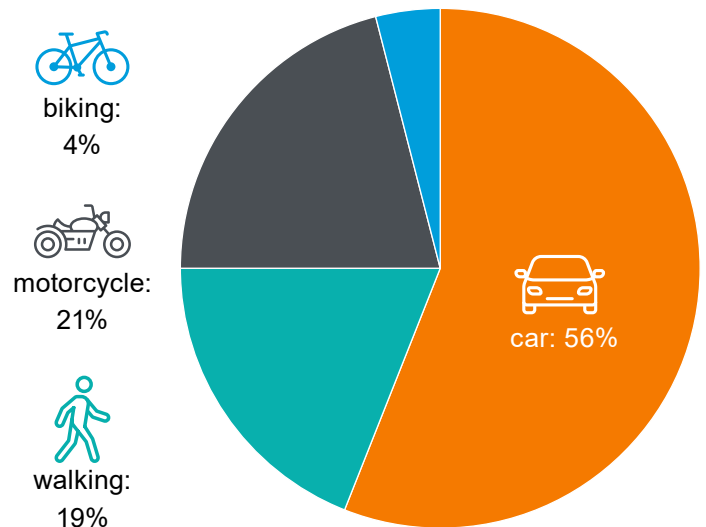
serious injury. The human toll of these crashes is significant; 1,288 people died and 8,859 people were seriously injured.

While the overall percentage of reported crashes involving people walking, biking or riding a motorcycle is small, the percentage of fatal crashes involving walking, biking or riding a motorcycle is disproportionately high compared to mode share. Of fatal crashes, 21% involve a person riding a motorcycle, 19% involve a pedestrian and 4% involve a cyclist.

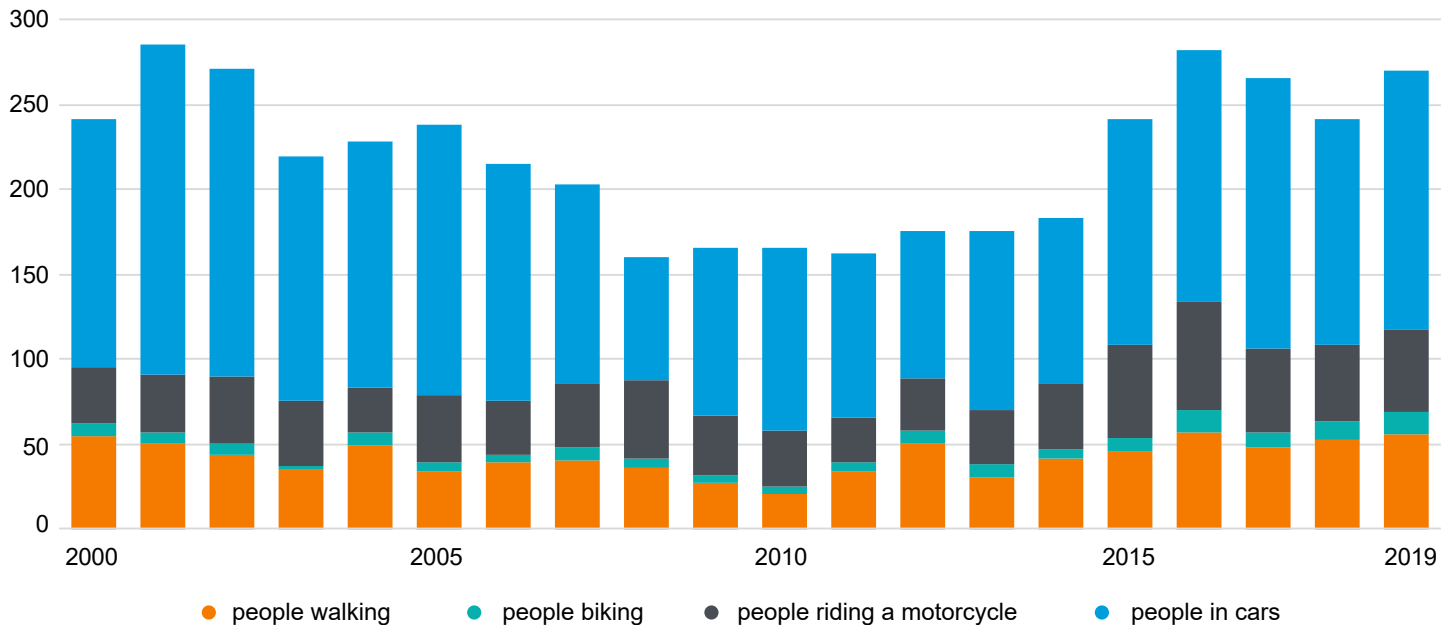
Percent of all reported crashes by travel mode (2013-2017)



Percent of all fatal crashes by travel mode (2013-2017)



Number of fatalities by travel mode (2000-2019)



Taking Action on Regional Vision Zero

On June 16, 2020, DRCOG’s Board of Directors adopted Taking Action on Regional Vision Zero [Appendix K](#), a safety action plan that established a target of zero fatalities and serious injuries on the Denver region’s transportation system. Taking Action on Regional Vision Zero includes detailed descriptions of six safety objectives for the Denver region:

- Improve collaboration between allied agencies.
- Increase awareness and adoption of Vision Zero.
- Design and retrofit roadways to prioritize safety.
- Improve data collection and reporting.
- Increase funding and resources.
- Increase legislation support that results in safety improvements.

Vision Zero is a transportation safety philosophy based on the principle that death is not an acceptable mobility outcome.

Vision Zero has become a useful framework to guide decisions to eliminate traffic deaths and serious injuries in the transportation system. Vision Zero recognizes that humans make mistakes and therefore the transportation system should be designed to minimize the consequences of human error.

The Vision Zero approach is fundamentally different from the traditional traffic safety approach in American communities in six key ways:

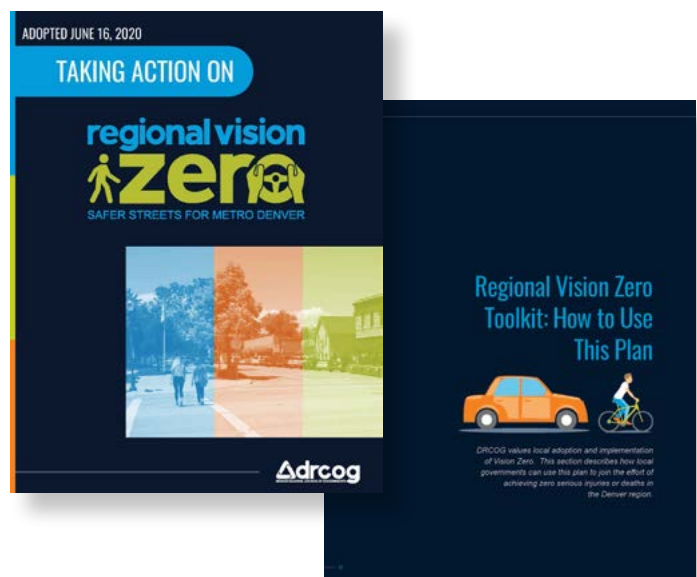
- Reframes traffic deaths as preventable.
- Integrates human error into the approach.
- Focuses on preventing fatal and serious crashes rather than eliminating all crashes.
- Aims to establish safe systems prioritizing human life when designing a road network.
- Applies data-driven decision making.
- Establishes road safety as a social equity issue.

Regional Vision Zero Toolkit

Taking Action on Regional Vision Zero includes a toolkit resource for local governments to use to prioritize safety and encourage Vision Zero adoption and local safety plan development across the Denver region. Ideally, local governments will use the toolkit to work strategically to eliminate serious injury and fatal crashes. The toolkit includes:

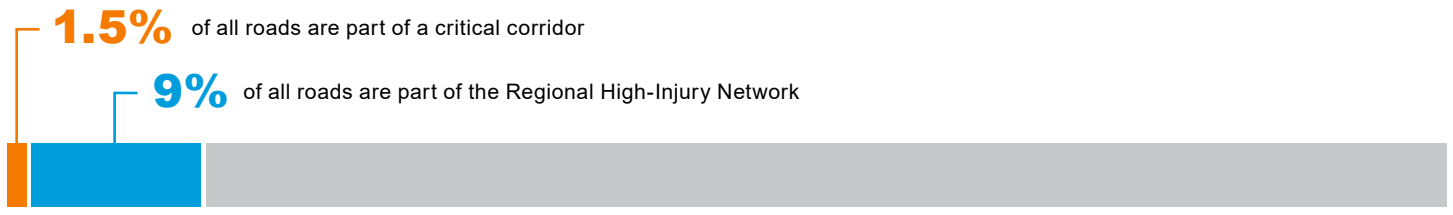
- Regional High Injury Network: Using an [interactive map with safety layers](#), the Regional High-Injury Network identifies the roadways in the Denver region with the highest numbers of crashes that result in death or serious injury.

- Critical corridors: Critical corridors identify segments along the Regional High Injury Network that have the highest density of crashes involving death or serious injury. DRCOG analyzed each of the region's 10 counties separately to ensure the critical corridors were geographically dispersed.
- Crash profiles and crash behaviors: Crash profiles describe the circumstances associated with a crash. Behavior profiles describe the human behavior that contributed to a crash.
- Safety countermeasures: Countermeasures are strategies documented to reduce crashes or otherwise recognized as a best practice for addressing certain crash types.



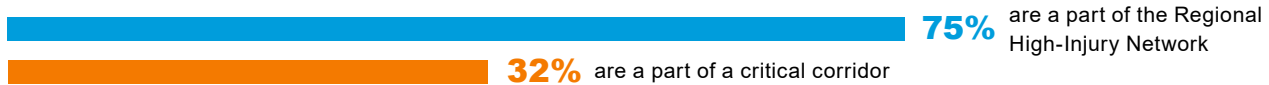
Click here to [view the entire report.](#)

Regional High-Injury Network

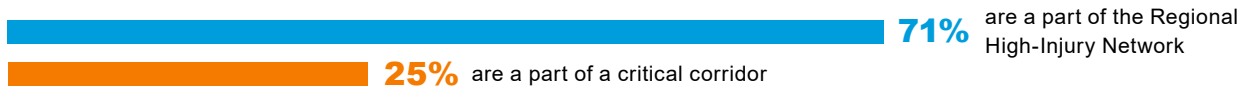


Despite only 1.5% of the region's roads being part of a Critical Corridor and 9% of the region's roads being a part of the Regional High-Injury Network, the majority of the Denver Region's safety problems are concentrated on such roadways.

Fatal and serious injury crashes:



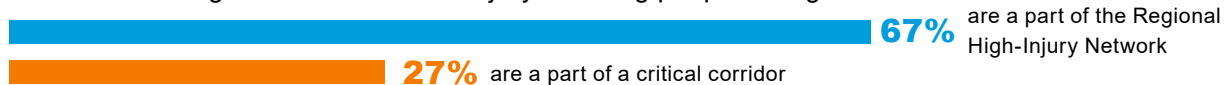
All fatal crashes:



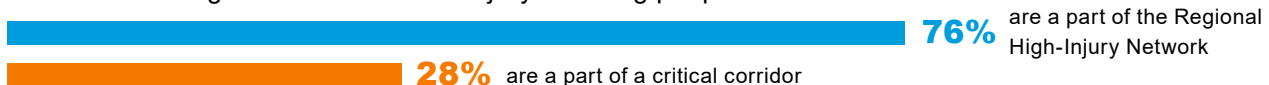
Crashes resulting in death or serious injury involving people walking:



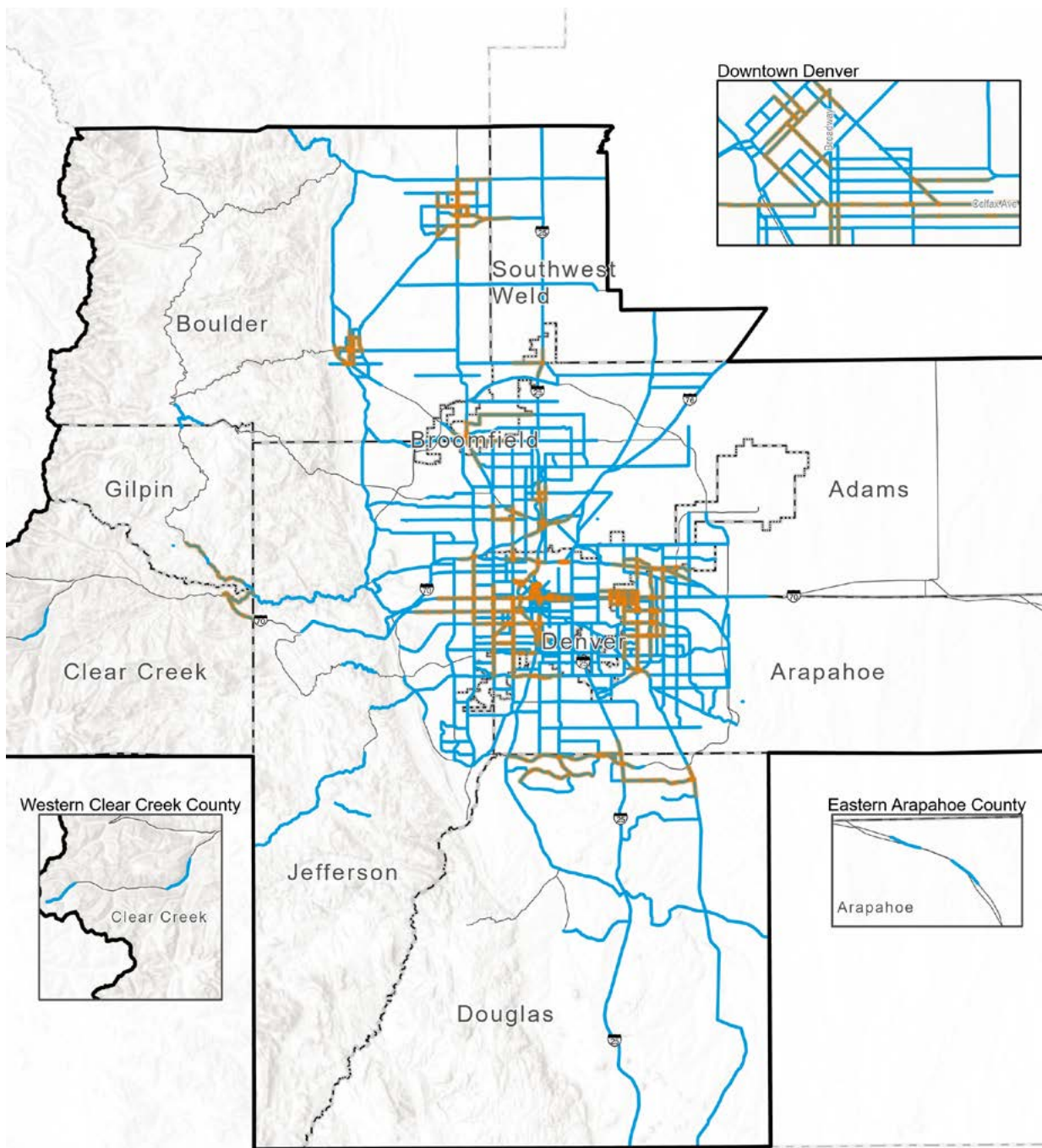
Crashes resulting in death or serious injury involving people biking:



Crashes resulting in death or serious injury involving people under 18 or over 65:



Map 2.7: Regional High-Injury Network and critical corridors



- Critical Corridors
- High Injury Network
- Major Roads
- County Boundaries
- DRCOG Boundary

SOURCE DATA: DRCOG, Esri Basemap, SR 6428 (see full source information and disclaimer in appendix)



Security and resilience

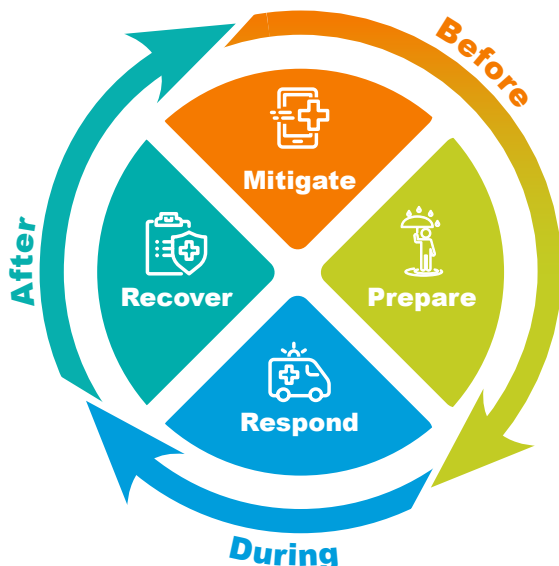
The security and resilience of the transportation system refers to the system's ability to provide safe and reliable service in the event of an emergency, threat or shock. Whether natural or human-caused, such events can affect both physical and digital infrastructure and communications systems and devices. Users of all types of facilities including airplanes, transit vehicles, roadways, tunnels, sidewalks, and shared-use paths expect them to be safe and reliable. Transportation system users also expect communication, fuel and power-generation systems to be secure. Emergency management planners consider it critical to plan for emergencies, threats and shocks to ensure the transportation system's resilience. Emergency management planners recognize the transportation system as a critical resource to support emergency response and recovery. The transportation community has an equally significant role in assisting in all aspects of security mitigation, preparation, response and recovery.

As required by the U.S. Department of Homeland Security, the State of Colorado established all-hazard emergency management regions across the state to improve interjurisdictional communication and coordination for emergency preparedness and response. Dozens of federal, state, regional, local and private entities representing multiple disciplines participate in security planning. The North Central All-Hazards Emergency Management Region, which largely encompasses the Denver region, has primary responsibility for coordinating security planning, training and exercises. DRCOG participates on applicable committees to help provide information and facilitate coordination among emergency management planning and related transportation planning efforts.

Emergency management is a continuous process with varying stakeholder roles and responsibilities before, during and after emergency events, as depicted in the figure below.

Emergency management activity flow

Source: Community Emergency Response Guide of Fairfax County Virginia



Mitigate. Prevent future emergencies or minimize their effects.

Prepare. Take actions ahead of time to be ready for an emergency.

Respond. Protect life and property in an emergency.

Recover. Rebuild from an emergency.



In 2015, 211.8 million tons of goods, valued at \$218.7 billion, flowed into, out of and within the metro area. Photo courtesy of David E. Hattan.

Freight

With over 3.2 million residents, 1.7 million workers, 119,000 businesses and 18 million visitors, the Denver region relies on the multimodal freight system to move millions of individual products. Many of the state's significant rail terminals, intermodal yards, highways, warehouses, distribution centers and manufacturing centers are located in the region, making the DRCOG region the trade hub for Colorado.

For example, newly manufactured vehicles are shipped into Denver's rail intermodal facilities for sale across the region and the Mountain West. Oil and petroleum products are moved by pipeline, truck and train within the region and to the Western Slope. Producers of milk, cheese, chocolate, pet food, beef and a range of natural and locally made food products are distributed across the region and shipped out to the rest of the country and world.

Key considerations related to the movement of freight and goods are delivery logistics, railroad crossing safety, truck parking and freight trends.

Multimodal freight plan

In the summer of 2020, DRCOG adopted the Regional Multimodal Freight Plan ([Appendix M](#)). The plan was coordinated by DRCOG and guided by an advisory committee of local government staff and industry stakeholders. The regional plan provides a strategic

view of significant freight issues, challenges and opportunities that communities within the region can address. The plan is a precursor to more comprehensive regional freight planning and is intended to provide a framework for the region to engage on freight issues through coordination, partnership, integration and investment.

Delivery logistics

The growth of online commerce enables consumers to access an ever-expanding variety of goods from around the globe. Key issues expressed by stakeholders include:

- Addressing user conflicts between delivery trucks and cyclists or pedestrians in busy urban and suburban areas.
- Resolving the lack of delivery zones and parking availability in urban centers.
- Balancing transit needs and delivery parking and curb management policies.
- The need for alternative delivery options such as off-hours, lockers or store pickup to manage residential delivery demands.



Delivering goods in urban areas often results in conflicts between delivery trucks and cyclists and pedestrians. **Photo credit: DRCOG.**



Railroad crossing safety

Ten people died at railroad crossings between 2015 and 2019. Rail crossing incidents generally occur at public at-grade crossings when vehicles attempt to circumvent safety devices, when vehicles stall on tracks or when pedestrians or vehicle drivers do not respond to warning signals.

There are approximately 312 at-grade crossings along public roadways in the Denver region. Key indicators on existing conditions and safety infrastructure of at-grade public rail crossings across the region are shown in the following table.

Inventory of Denver region public at-grade freight railroad-highway crossing characteristics

Crossing characteristics		Percent of crossings	
250	on Federal-Aid Highway Program system	80%	
174	one or more trains per day	56%	
188	commercial or industrial land use	60%	
54	residential or institutional land use	17%	
252	crossbuck sign present	81%	
213	advance warning signals present	68%	
186	crossing illuminated	60%	
134	stop signs present	43%	
103	bells present	33%	
61	pavement marking present	20%	
312	total crossings	100%	

Of public at-grade railroad-highway crossings, 68% of have advance warning signals. **Photo credit: CDOT.**



Truck parking

Truck parking and a lack of real-time information about available parking is a growing national concern for truck drivers, freight planners, and freight operators, and is an acute issue in Colorado. Growing congestion in urban areas and stricter monitoring of service-hour laws make it hard to supply enough safe truck parking. As a result, more truck drivers are parking in problematic places. The lack of safe, lighted parking spaces or the absence of amenities such as restrooms can deter truckers from using available spaces. Insufficient parking can also create inefficiencies and delays in supply chains. Truck drivers may stop well before their allotted driving time runs out to ensure access to a parking spot, resulting in lost road time and shipment delays. An analysis of truck parking use by the Colorado Department of Transportation found that of available parking facilities

in the Denver region, most were nearing peak capacity. Expanding rest areas and public-private partnerships are two strategies recommended in the Multimodal Freight Plan to increase parking supply.

Freight trends

As the Denver region's population grows, demand for moving packages and products will grow, too, necessitating that more products be moved by rail, truck, plane and pipeline. Due to population and economic growth, as well as continued growth in e-commerce, goods movement is forecast to increase by 80% between 2015 and 2045. By 2045, over 323 million tons, valued at \$400 billion, will be imported to and exported from the Denver region.

Table 2.1: Value of goods by primary mode (2015-2045)









		2015	2045
	Truck	\$189,741,226,750	\$341,222,927,843
	Air	\$26,544,921,144	\$54,434,069,036
	Pipeline	\$1,789,910,875	\$2,872,651,428
	Rail	\$391,925,539	\$852,084,833

Table 2.2: Tonnage of goods by primary mode (2015-2045)

		2015	2045
	Truck	204,678,619	311,465,673
	Air	267,171	484,099
	Pipeline	6,346,102	10,186,592
	Rail	503,047	1,037,757

Future congestion on regional roadways will affect the ability of businesses to deliver to the region's households, offices and businesses. Shifts from road to rail or alternative delivery options like unmanned aerial

vehicles and automated vehicles that manage demand during peak delivery times can help address congestion and meet the demand for moving the 323 million tons of goods expected in 2045.

Local governments are responsible for a wide variety of maintenance activities such as traffic signal maintenance, striping, repaving, pothole patching, street sweeping, snow removal and light repairs. **Photo courtesy of Douglas County.**





Nearly half of CDOT's annual budget goes to maintaining the existing system. **Photo credit: CDOT**

Asset management and system preservation

In recognition of the region's considerable investment in the multimodal transportation system, managing and preserving facilities and vehicles is increasingly important. The transportation system, including roadways, transit systems, sidewalks, communication infrastructure and other components, naturally deteriorates due to use, time and climate. Roadway and bridge deterioration is strongly related to use, especially by heavy trucks. Roadway striping, pavement markings,

and signage also deteriorate over time. As fully autonomous vehicles come to market and the number of older drivers increase, maintenance components become more important. The condition of transit buses declines quickly because of the hundreds of thousands of miles they travel in stop-and-go conditions. Sidewalks and shared-use paths deteriorate through seasonal cycles, tree root growth and other factors.

The region's transportation partners and stakeholders have embraced a performance-based asset management philosophy. The agencies regularly collect asset condition information and analyze it to optimize and prioritize maintenance and replacement. CDOT, for example, collects annual data on pavement and bridge condition, while RTD is responsible for the "state of good repair" of its vehicles and preservation activities for its system and facilities. Local governments maintain their streets and accompanying sidewalks as well as off-street shared-use paths.

Roadway system and bridge preservation

Maintenance of the region's roadways and bridges is the responsibility of numerous agencies including CDOT, public highway authorities and local government agencies. CDOT collects data on pavement and bridge condition in the Denver region. As of 2019, 8% of the bridge deck area in the region was in poor condition. Additionally, 5% of the national highway system mileage and 1% of the interstate system mileage in the region is in poor condition.



Of the 3,116 bridges in the Denver region, 45 are considered to be in poor condition. Maintenance and reconstruction activities improve the quality of bridges throughout the region, including along RidgeGate Parkway in Lone Tree. **Photo courtesy of the City of Lone Tree.**



As a relatively young agency, RTD has not experienced the decaying infrastructure that many older and larger transit systems have.
Photo credit: RTD.

Transit system preservation

Maintenance of transit stations, stops and vehicles is critical to passenger comfort and transit service safety and reliability. Stations or vehicles in poor condition affect transit patrons' comfort and ability to access service. Uneven or missing pavement at on-street boarding locations not only causes them to fall into disrepair, but also affects safety and accessibility. Vehicle breakdowns may cause hardships to transit patrons, affecting future ridership.

Maintenance of park-and-ride lots, rail lines, bus-only travelways and ramps is critical to their long-term serviceability. Poorly maintained tracks, electrical and

signal systems or pavement may damage vehicles or slow down operations. Because park-and-ride lots accommodate private vehicles, deteriorating conditions affect whether drivers choose to use them, and therefore affect transit ridership.

RTD's asset management strategy is not driven by a growing set of decaying assets, but by the expansion of the asset base in recent years. The funding for the most recent expansion projects did not make provision for the long-term maintenance and capital renewal of the new assets. A growing backlog increases risk to safety, service, and future sustainability.

Pedestrian and bicycle facility preservation

Communities in the Denver region have invested heavily in sidewalks, on-street bicycle treatments and an extensive off-street, shared-use path system. They invest in facility maintenance for the comfort, safety, retention and growth of users. Tree roots, utility construction and normal weathering can greatly affect the condition and life of sidewalks and bike facilities. Roadway curb and gutter areas adjacent to where

bicyclists tend to travel often deteriorate more quickly than primary travel lanes, creating dangerous situations that force bicyclists to quickly maneuver around physical and environmental hazards. Many pedestrian and bicycle facilities are maintained by adjacent property owners. Without city enforcement this can result in widespread deterioration and inconsistent accessibility across the network.



When streets and roadways are widened and reconstructed, sidewalks and curb ramps must be brought into compliance with Americans with Disabilities Act standards. **Photo credit: Commerce City**



The Denver region is facing the prospect of continued growth over the coming decades. Strategic investments in the transportation system will make it safer, manage congestion, provide travel options and ensure the region remains a great place to call home.

Explore funding and projects

Introduction

This chapter describes and illustrates the major project, program and financial elements of the fiscally constrained 2050 Metro Vision Regional Transportation Plan and the transportation vision it represents. It specifically focuses on the portion of the multimodal transportation vision that can be implemented by 2050 based on reasonably anticipated revenues. The chapter

reviews how Denver Regional Council of Governments staff estimated anticipated revenues, coordinated with agencies throughout the region to select individual projects for inclusion in the fiscally constrained project list and how the 2050 RTP may be amended in the future due to changing circumstances.

The 2050 RTP proposes investments in a diverse array of travel options to keep the region's residents connected and on the move.



Financial plan

The financial plan identifies sources and amounts of federal, state, local and private revenues estimated to be available from 2021 through 2050 and then outlines how the prioritized projects can be implemented with anticipated resources. The financial plan ensures that project costs do not exceed projected revenues. Because there are more potential project costs than available revenues, only those projects that can be implemented within the projected revenues are considered part of the fiscally constrained 2050 RTP. The major steps for developing the financial plan included:

- 1) Estimating the amount of revenue available out to 2050 for all aspects of the transportation system in coordination with regional, state and federal partners.
- 2) Determining the amount of funding available for multimodal capital projects versus funding allocated to programmatic expenses.
- 3) Evaluating and prioritizing multimodal capital projects to determine the best use of limited regional funding.

Multimodal capital projects are listed individually in the plan. They include roadway and transit capacity projects, as well as priority Regional Vision Zero, active transportation and freight projects.

Programmatic investments are shown as a lump sum. Individual projects are not identified in these programs. Programmatic investments include continuing efforts to manage, operate and preserve the system.

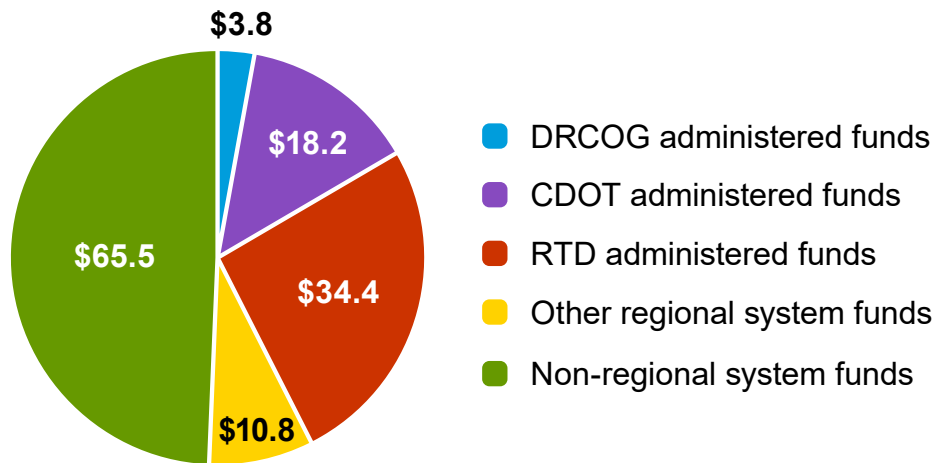
The complete assumptions and methodologies that DRCOG used to develop the financial plan, including the changes made for the 2022 update, are included in [Appendix H](#).

Revenue projections

DRCOG, in coordination with the Colorado Department of Transportation, Regional Transportation District, local governments, special districts and authorities and various special funding agencies, estimated total revenues available for transportation purposes. Estimated revenues were inflated to year of expenditure to depict the value of the available funds at the time they will be available.

Approximately \$132.7 billion is expected to be available from 2021 through 2050 to manage, operate, preserve, maintain and expand the Denver region's multimodal transportation system. While this represents a significant amount of revenue, the majority is dedicated to preserving, maintaining and operating the existing system.

Revenues available for use (billions)



The information on the following pages reflects the conditions at the time of plan adoption. To see the latest financial plan assumptions and methodologies used in the 2022 update, please review Appendix H.

DRCOG

DRCOG relies on CDOT's Program Distribution to develop revenue projections for funds DRCOG administers. DRCOG is anticipated to have an estimated \$3.8 billion in available revenue through 2050. To fund the largest number of priority projects, \$3.0 billion of the total is dedicated to multimodal capital projects. These priorities include the implementation of a regional bus rapid transit network and capital projects for arterial safety and Regional Vision Zero, active transportation and freight. The remaining \$800 million is allocated to programmatic investments for set-asides, active transportation, Regional Vision Zero and freight improvements. Specific projects within these

programmatic investments will be determined through the Transportation Improvement Program process.

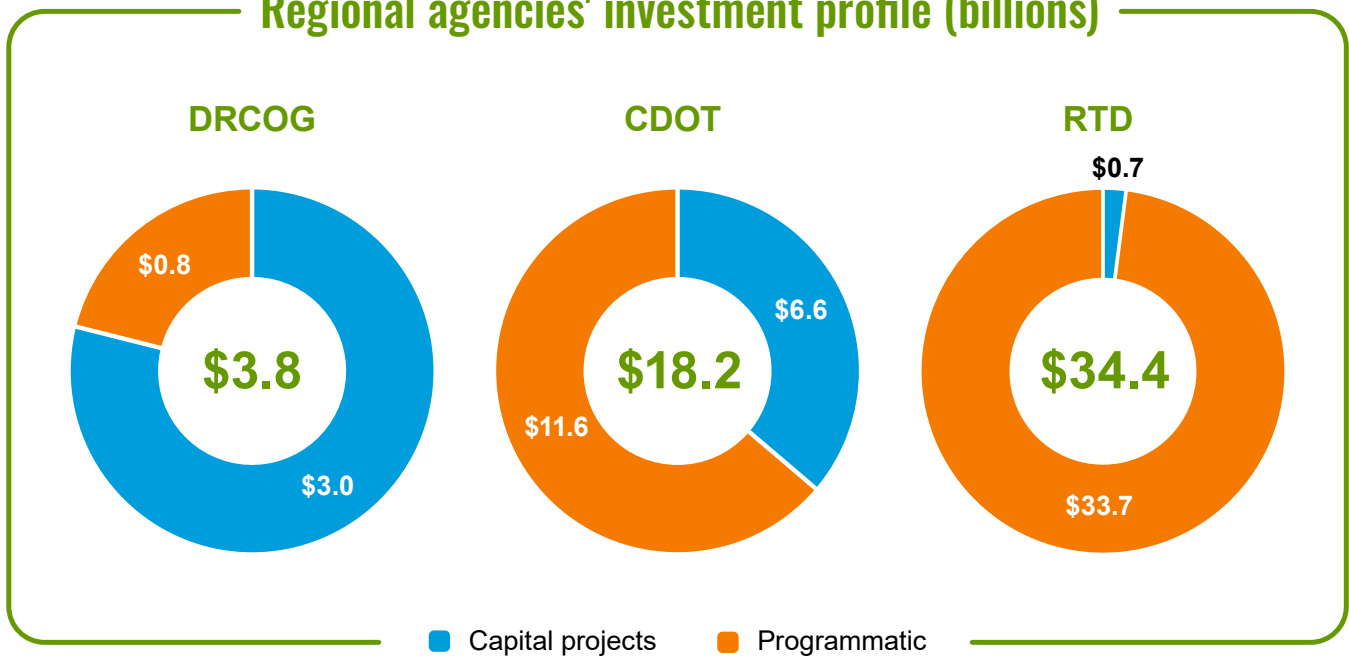
CDOT

CDOT, in coordination with DRCOG, developed a Program Distribution that forecast the amount of funding available for use on the transportation system. Within the Denver region, CDOT is anticipated to have an estimated \$18.2 billion in available revenue through 2050. Approximately \$11.6 billion is dedicated to programmatic investments to operate and maintain the system. The remaining \$6.6 billion is available for multimodal capital projects, with priorities based on CDOT's [10-Year Strategic Project Pipeline](#) and additional long-term needs.

RTD

DRCOG relies on forecasts developed by RTD to determine the amount of funding available for use on RTD's transit network. RTD is anticipated to have an estimated \$34.4 billion available in revenues

Regional agencies' investment profile (billions)



through 2050. Through the interagency process, RTD is allocating \$730 million toward implementing the Northwest Rail peak period service plan, a component of FasTracks, and a contribution to the State Highway 119 bus rapid transit project. The remainder is dedicated to maintaining and operating the existing system. RTD is prioritizing service and maintenance while working through the financial repercussions of the COVID-19 pandemic.

Other regional system funding

Regional system funding assumes the availability of revenue from federal discretionary awards, toll authorities and local funding for improvements on the Regional Roadway System. DRCOG worked with CDOT, RTD and federal partners to develop reasonable forecasts using historic data. Approximately \$10.8 billion is estimated to be available, of which 53% is dedicated to preservation and operational improvements.

Non-Regional system funding

Non-Regional system funding assumes the availability of revenue from local governments and private sources. DRCOG used historic data to calculate future revenues available. Approximately \$65.5 billion is anticipated to be spent on improvements to facilities that are not part of the Regional Roadway System and do not have regionally significant air quality impacts. Because these roads are not eligible for regional funding, improvements are fully funded by local governments or private sources.

Estimated project costs

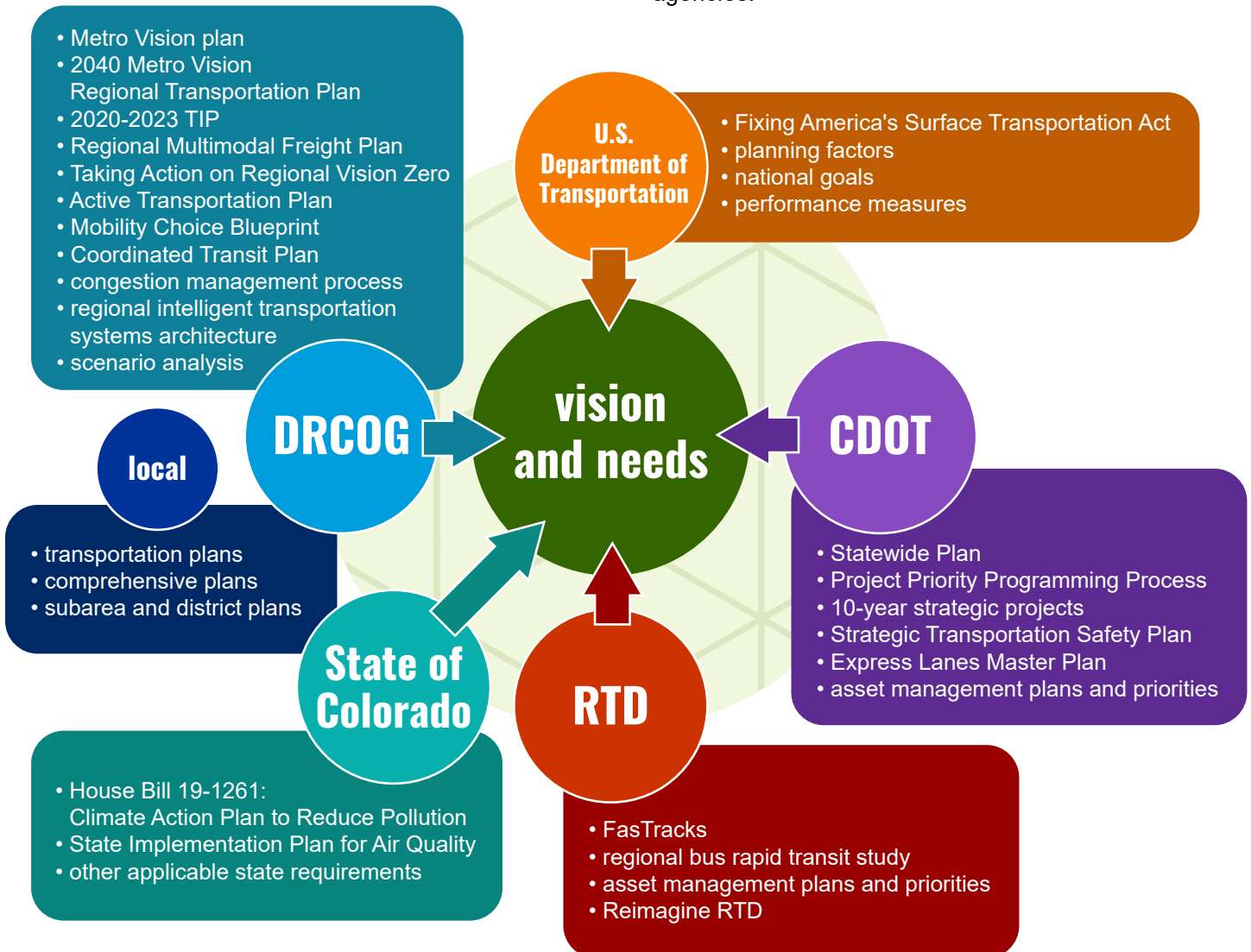
DRCOG relies on planning-level cost estimates from agencies that design and construct projects. Estimates include, as appropriate: preliminary engineering, right-of-way and construction. Current year (2020) project costs were forecast to the appropriate future year of expenditure to reflect the trend of rising project costs over time and to provide an accurate picture of the anticipated cost at the time of implementation.

Project solicitation and evaluation

DRCOG coordinated with CDOT, RTD and local governments to develop a performance-based approach to request and evaluate a set of candidate projects representing a diversity of project types and sponsoring agencies for inclusion in the fiscally constrained 2050 RTP. The process incorporated the themes

outlined in Metro Vision and reflects the needs and priorities identified at both the regional level and by the county-level subregional forums. It also included the transportation performance measures contained in the Fixing America’s Surface Transportation Act. The performance measures include safety, congestion, air quality and pavement/bridge condition. Concurrently, DRCOG identified regionally significant projects which are anticipated to be funded entirely by local sponsoring agencies.

Policy framework and desired outcomes

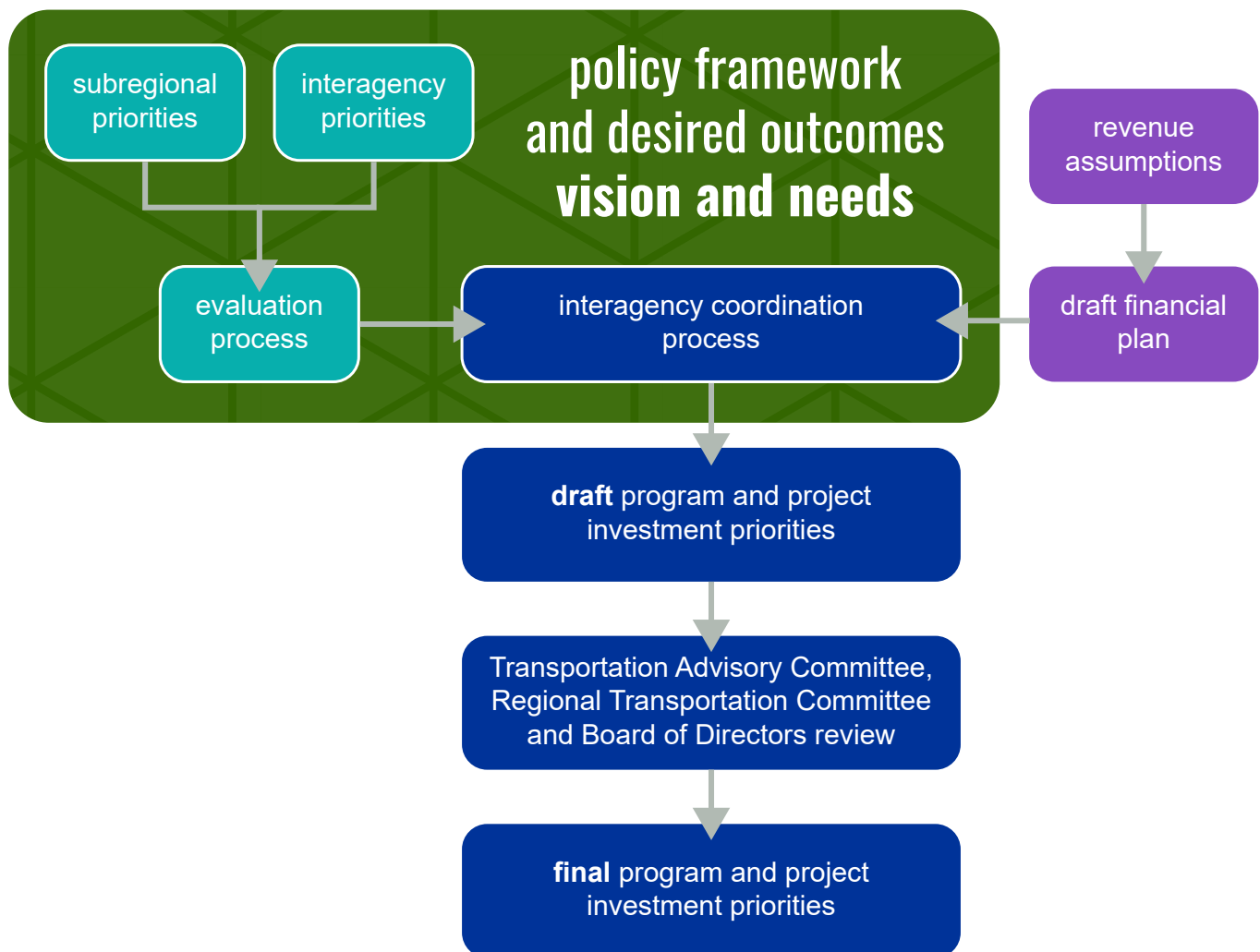


Scenario Planning Analysis

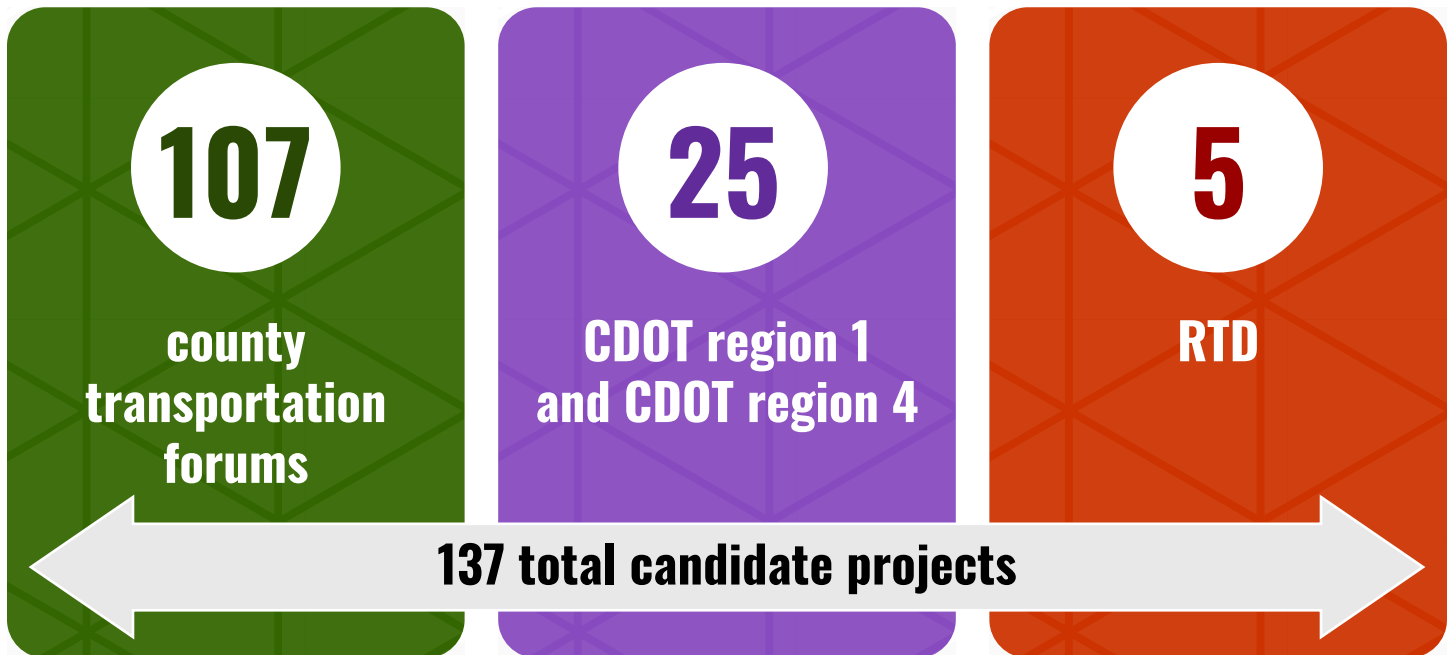
DRCOG conducted a significant scenario planning analysis to explore future regional travel and mobility outcomes through testing several transportation and land use scenarios. This process helped inform the

policy framework and desired outcomes illustrated on the previous page. DRCOG also worked with the region's local governments to prepare small area forecasts as part of the official planning inputs for the 2050 RTP. Both of these efforts are described in [Appendix F](#).

Investment priorities framework process



137 candidate projects



Partner agencies and local governments submitted 137 candidate projects, including managed lane projects, road widenings, active transportation and safety projects. DRCOG used the following key considerations to evaluate projects and select those that best use limited regional funding to advance the region's goals:

- The 2050 candidate project solicitation and evaluation process adopted by the DRCOG Board of Directors that reflected the distinct roles of the regional agencies and the local governments.
- The priorities expressed by the public and stakeholders including the results from multiple rounds of meetings with the Civic Advisory Group and the Youth Advisory Panel.
- The 2050 candidate project qualitative scoring results by which each project was evaluated against the Metro Vision themes and federal

performance measures. The scores were provided to DRCOG's Transportation Advisory Committee, Regional Transportation Committee and Board of Directors to help guide discussions.

- The input from the 2050 RTP Regional Evaluation Panel, comprising local government representatives who reviewed the scores of candidate projects and provided guidance on project selection considerations.
- DRCOG travel demand estimates conducted to determine future average daily traffic.
- The draft 2050 RTP financial plan and investment strategy that outlined regional priorities, such as safety and Vision Zero, air quality, regional transit, active transportation, freight and multimodal mobility.

Qualitative project scoring and associated Metro Vision objectives

up to 3
points

Place

An efficient and predictable development pattern

- Increase housing and employment in urban centers.

up to 24
points

Mobility

A connected multimodal region

- Improve and expand the region's multimodal transportation system, services and connections.
- Operate, manage and maintain a safe and reliable transportation system.

up to 12
points

Environment

A safe and resilient natural and built environment

- Improve air quality and reduce greenhouse gas emissions.
- Connect people to natural resource and recreation areas.
- Reduce the risks of hazards and their effects.

up to 6
points

Livability

Healthy, inclusive and livable communities

- Increase access to amenities that support healthy, active choices.
- Improve transportation connections to health care facilities and service providers.

up to 6
points

Vitality

A vibrant regional economy

- Improve access to opportunity.
- Improve the region's competitive position.

A bicyclist rides past the Denver Rock Drill near the 39th Avenue Greenway in Denver's Cole neighborhood. Photo credit: Alana Miller (photo contest finalist).



Project and program investment priorities

The fiscally constrained 2050 RTP includes the multimodal projects selected through the candidate project solicitation and evaluation process described on page 87. The projects include both the [regionally significant capacity projects for air quality conformity](#), as well as a diverse set of multimodal projects prioritized during the 2050 RTP planning process. The plan also includes several carryover projects from the 2040 RTP.

The regionally significant projects are major roadway, interchange and rapid transit projects that considerably change the capacity of the transportation network. Regionally significant projects are listed individually in the 2050 RTP by air quality staging completion period (2020-2029, 2030-2039 and 2040-2050). The transportation networks containing these projects are modeled to demonstrate compliance with federal air quality conformity requirements.

Map 3.1 and tables 3.1 and 3.2 detail the fiscally constrained projects. Map 3.2 illustrates the roadway network that can be completed by 2050 with current revenues. Map 3.3 shows the managed lanes network that can be completed by 2050. Finally, Map 3.4 shows the fiscally constrained rapid transit network anticipated by 2050.

Table 3.1 lists the regionally funded fiscally constrained project and program investment priorities identified in the interagency process and adopted by the DRCOG Board. These include:

- Multimodal capital projects.
- TIP set-aside programs.

- Regional bus rapid transit network.
- Transit planning corridor investments.
- Arterial safety and Regional Vision Zero program.
- Active transportation program.
- Freight program.

For a full list of program expenditures, see the Financial Plan ([Appendix H](#)). Table 3.2 lists the locally funded fiscally constrained projects also adopted by the DRCOG Board. Locally funded fiscally constrained projects are identified and funded by local governments and toll authorities.

The sum of the programs outlined above sets a specific priority investment framework through the 30-year timeframe of the 2050 RTP. While the 2050 RTP identifies several projects and lists them in Table 3.1, the priority investment framework will guide the selection of additional projects implementing the programs, which will be included in future TIPs.

Project and program investment priorities are also drawn from the significant planning efforts undertaken by DRCOG, CDOT and RTD in recent years. Examples include DRCOG's Taking Action on Regional Vision Zero, CDOT's Statewide Transportation Plan, and RTD's Regional Bus Rapid Transit Feasibility Study.

The key fiscally constrained regionally significant projects are described by type in the section that follows.



New bike lanes, opened September 2020, on Pine Street in Louisville. Photo credit: Gloria Handyside.



Photo credit: RTD.

Multimodal capital projects

Table 3.1 lists multimodal capital projects by the lead funding agency (CDOT, DRCOG or RTD). They are a diverse set of roadway projects that include multiple travel modes as part of their design and implementation. While each project and project location within the Denver region is unique, the projects will be implemented in the most locally appropriate multimodal way.

TIP set-asides

TIP set-asides reflect continued investment in programs for community mobility planning and implementation, regional transportation operations and technology, regional air quality, commute options and human service transportation through DRCOG's TIP.



Photo credit: RTD.



Photo credit: DRCOG.

Regional bus rapid transit projects

The regional bus rapid transit projects listed in Table 3.1, would implement a comprehensive, connected bus rapid transit network across the region over the next 30 years. The 2050 RTP includes the bus rapid transit corridors prioritized by RTD's [Regional Bus Rapid Transit Feasibility Study](#) which are anticipated to be completed by 2050. The study prioritized projects based on factors including safety, equity, projected ridership and cost.

Corridor transit planning projects and program

The corridor transit planning program draws on visioning and planning conducted by local and regional agencies along several corridors throughout the region to further define desired transit service. Corridors are listed in Table 3.1. The corridor transit planning program also includes future mobility hubs at key locations and are expected to be further refined. Mobility hubs vary by size and function, but in general provide connections for travelers between modes such as transit, car-sharing and ride-hailing services, bike- and scooter-sharing programs, and walking.



Photo credit: DRCOG.



Photo credit: DRCOG.

Arterial safety and Regional Vision Zero projects and program

The arterial safety and Regional Vision Zero program addresses travel safety, especially on major roadways, by implementing DRCOG's [Taking Action on Regional Vision Zero plan](#) and CDOT's [Strategic Transportation Safety Plan](#). The major arterial safety and Regional Vision Zero projects are listed in Table 3.1. The program element would define future safety projects for implementation through 2050. The innovative Safer Main Streets collaboration between DRCOG and CDOT is a model for the program element of the category.

Active transportation program

The active transportation program will continue implementing DRCOG's [Active Transportation Plan](#) by eliminating gaps in the region's bicycle and pedestrian networks, building out the regional active transportation corridors and investing in the plan's pedestrian focus areas and short-trip opportunity zones. Several specific projects are shown in Table 3.1.



Photo credit: CDOT.



Photo credit: Douglas County.

Freight program

The freight program will focus on investments to implement multimodal freight plans recently adopted by [DRCOG](#) and [CDOT](#). Several specific projects are shown in Table 3.1.

Locally funded projects

DRCOG worked with local governments and public highway authorities to identify locally funded, regionally significant capacity projects that will be completed by 2050. Projects in this category represent major transportation investments but are typically funded by local governments, toll highway authorities or other project sponsors through funding sources they control, such as general fund revenues, developer contributions or other revenue sources. The list of locally funded projects was updated from the 2040 RTP through two rounds of coordination with project sponsors.

Table 3.1: Regionally funded project and program investment priorities

Project name/ Corridor	Location/Limits	Project description
2050 Metro Vision Regional Transportation Plan: regionally funded projects and programs		
Colorado Department of Transportation administered funds for multimodal capital projects and programs		
C-470	U.S. Route 285/ Morrison/Quincy	Interchange complex reconstruction
Federal Blvd.	6th Ave. to Howard Pl.	Widen from 5 to 6 lanes
I-25 North (Segment 5)	State Hwy. 66 to Weld County Rd. 38 (DRCOG boundary)	Add 1 toll/managed lane each direction
I-25 North (Segment 4)	State Hwy. 7 to State Hwy. 66	Managed lanes, State Hwy. 119 mobility hub (Firestone-Longmont Mobility Hub), intelligent transportation systems, bicycle and pedestrian trail connections
I-25 North	E-470 to State Hwy. 7	Managed lanes, State Hwy. 7 interchange reconstruction and State Hwy. 7 mobility hub
I-25 North	84th Ave. to 104th Ave.	Operational improvements, center-loading transit station at 88th Ave. and general purpose lane
I-25 Central Improvements	Santa Fe Blvd. to 20th St.	Safety, operations, multimodal mobility, transit and community connections
I-25	Speer Blvd./23rd Ave.	Bridge replacements with safety and multimodal mobility improvements
I-25	Santa Fe Dr. (U.S. Route 85) to Alameda Ave.	Bridge replacement, intersection safety and multimodal mobility improvements
I-25	Belleview	Interchange reconstruction and pedestrian connections
I-25	El Paso County Line to north of Crystal Valley Pkwy.	Add 1 toll/managed-lane each direction
I-270	I-25/U.S. Route 36 to I-70	New managed lanes

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Jefferson	\$150,000,000	2030-2039		●		●
Denver	\$23,400,000*	2020-2029	●	●	●	●
Weld	\$175,000,000	2020-2029		●	●	●
Broomfield/Weld	\$150,000,000	2030-2039	●	●	●	●
Broomfield	\$200,000,000	2030-2039	●	●	●	●
Adams	\$230,000,000	2040-2050	●	●	●	●
Denver	\$645,000,000	2040-2050	●	●	●	●
Denver	\$75,000,000	2020-2029	●	●	●	●
Denver	\$35,000,000	2020-2029	●	●		●
Arapahoe	\$112,000,000	2030-2039	●	●		●
Douglas	\$300,000,000*	2020-2029	●	●	●	●
Adams	\$500,000,000	2020-2029		●	●	●

Continued on next page.

* This cost is not included in the fiscal constraint analysis because funding was allocated prior to 2020.

Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Colorado Department of Transportation administered funds for multimodal capital projects and programs		
I-270	I-25/U.S. Route 36 and I-70	New freeway “direct connects” at each end of I-270
I-70 Floyd Hill eastbound improvements	Floyd Hill to Veterans Memorial Tunnel	Eastbound interchange improvements with frontage road extension from the Hidden Valley interchange to U.S. Route 6 interchange
I-70 Floyd Hill westbound improvements	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
I-70	Eisenhower-Johnson Memorial Tunnels	Major rehabilitation of the Eisenhower-Johnson Memorial Tunnels
I-70	Twin Tunnels to Empire Junction (U.S. Route 40)	Add 1 westbound peak period managed lane
I-70	Kipling	Interchange reconstruction and pedestrian connections
I-70	I-25 to Chambers Rd.	Add 2 new managed lanes
State Hwy. 66	Lyons to Hover St.	Operational/safety improvements from Lyons to Longmont in alignment with PEL
State Hwy. 66	Hover St. to Main St. (U.S. Route 287)	Widen from 2 to 4 lanes
State Hwy. 83 (Parker Rd.)	State Hwy. 86 to E. Mississippi Ave.	Corridor planning/investment for multimodal mobility, operations and safety
U.S. Route 6	Wadsworth Blvd.	Interchange capacity
U.S. Route 85	120th Ave.	New interchange
U.S. Route 85	104th Ave.	New interchange

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Adams	\$300,000,000	2030-2039		●	●	●
Clear Creek	\$250,000,000	2020-2029		●	●	●
Clear Creek	\$450,000,000	2020-2029		●	●	●
Clear Creek	\$142,000,000	2020-2050		●	●	●
Clear Creek	\$50,000,000*	2020-2029		●		●
Jefferson	\$80,000,000	2040-2050	●	●		●
Denver/Adams	\$1,175,700,000*	2020-2029	●	●	●	●
Boulder	\$5,000,000	2030-2039	●	●		●
Boulder	\$5,000,000	2020-2029	●	●		●
Arapahoe/ Douglas	\$150,000,000	2030-2039	●	●	●	●
Jefferson	\$80,000,000	2020-2029	●	●		●
Adams	\$100,000,000	2020-2029		●		●
Adams	\$100,000,000	2020-2029		●		●

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* This cost is not included in the fiscal constraint analysis because funding was allocated prior to 2020.

Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Colorado Department of Transportation administered funds for multimodal capital projects and programs		
U.S. Route 85	Louviers to milepost 191.75	Widen from 2 to 4 lanes
U.S. Route 85	Sedalia to Daniels Park	Widen from 2 to 4 lanes
U.S. Route 85	Daniels Park to Meadows	Widen from 2 to 4 lanes
U.S. Route 285	Pine Valley Rd. (County Rd. 126)/Mt. Evans Blvd.	New interchange
U.S. Route 285	Parker Ave.	New interchange
U.S. Route 285	Shaffers Crossing to Kings Valley Dr.	Widen from 3 to 4 lanes (add 1 southbound lane)
U.S. Route 285	Kings Valley Dr.	New interchange
U.S. Route 285	Kings Valley Dr. to Richmond Hill Rd.	Widen from 3 to 4 lanes (add 1 southbound lane)
Vasquez Blvd.	60th Ave.	Intersection improvements
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

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Douglas	\$59,000,000*	2020-2029		●		●
Douglas	\$35,000,000	2020-2029	●	●		●
Douglas	\$32,000,000	2020-2029	●	●		●
Jefferson	\$40,000,000	2030-2039		●		●
Jefferson	\$25,000,000	2030-2039		●		●
Jefferson	\$60,000,000	2020-2029		●		●
Jefferson	\$15,000,000	2020-2029		●		●
Jefferson	\$25,000,000	2020-2029		●		●
Adams	\$80,000,000	2040-2050		●		●
CDOT projects total	\$4,246,000,000					
Regional	\$11,408,841,041	2020-2050	●	●	●	●
CDOT programs total	\$11,408,841,041					

Continued on next page.

* This cost is not included in the fiscal constraint analysis because funding was allocated prior to 2020.

Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Denver Regional Council of Governments administered funds for multimodal capital projects and programs		
88th Ave.	I-76 northbound ramps to State Hwy. 2	Widen from 2 to 4 lanes
104th Ave.	Colorado Blvd. to McKay Rd.	Widen from 2 to 4 lanes
120th Ave.	U.S. Route 85 to E-470	Widen to 4 lanes
Broncos Pkwy./Easter/Dry Creek corridor improvements	Parker Rd. to Havana	Widen to 4 lanes; bridge, multimodal corridor and intersection improvements
County Line Rd.	Phillips St. to University Blvd.	Widen from 2 to 4 lanes
Gun Club Rd.	State Hwy. 30 to 6th Ave.	Widen from 2 to 4 lanes, includes stream crossing upgrade at Coal Creek, multimodal corridor improvements and transit service
Gun Club Rd.	Quincy to Aurora Pkwy.	Widen from 2 to 4 lanes, multimodal corridor improvements and transit service
I-25 North	104th Ave. to 120th Ave.	Shoulders; general purpose lanes; bridge
I-25	Broadway	Interchange capacity
I-25	Lincoln Ave.	Interchange capacity
I-25	Happy Canyon Rd.	Interchange reconstruction
I-25	Meadows/Founders	Interchange reconstruction
I-25	Crystal Valley Pkwy.	New interchange and south frontage road
I-225/Yosemite	DTC Blvd. to I-25 on-ramp	Interchange and ramp reconstruction

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Adams	\$21,500,000	2020-2029	●	●		●
Adams	\$8,100,000	2020-2029	●	●		●
Adams	\$24,000,000	2020-2029	●	●		●
Arapahoe	\$35,000,000	2040-2050	●	●		●
Douglas	\$9,500,000	2020-2029	●	●		●
Arapahoe	\$60,000,000	2020-2029	●	●	●	●
Arapahoe	\$30,000,000	2020-2029	●	●	●	●
Adams	\$70,000,000	2040-2050		●	●	●
Denver	\$50,000,000	2020-2029	●	●		●
Douglas	\$49,400,000	2020-2029	●	●		●
Douglas	\$30,000,000	2020-2029	●	●		●
Douglas	\$50,000,000	2040-2050	●	●		●
Douglas	\$80,000,000	2020-2029	●	●		●
Arapahoe	\$60,000,000	2020-2029		●		●

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Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Denver Regional Council of Governments administered funds for multimodal capital projects and programs		
Indiana (State Hwy. 72)	W. 80th Ave. to W. 86th Pkwy.	Widen to 4 lanes
Kipling St.	Kentucky Ave. to I-70	Multimodal corridor improvements
Lincoln Ave.	Oswego to Keystone	Multimodal corridor improvements
Martin Luther King Jr. Blvd.	Havana St./Iola St. to Peoria St.	Widen 2 to 4 lanes; new 4-lane road
Peña Blvd.	I-70 to 64th Ave.	Add 1 managed lane in each direction
Peña Blvd.	64th Ave. to E-470	Add 1 managed lane in each direction
RidgeGate Pkwy.	Havana St. to Lone Tree eastern city limit	Widen from 2 to 4 lanes
Smoky Hill Rd.	Buckley Rd. to Picadilly St.	Safety, operational and multimodal corridor improvements and transit service
State Hwy. 7	164th Ave. to Dahlia St.	Widen from 2 to 4 lanes
State Hwy. 30	Airport Blvd. to Quincy Ave.	Widen from 2 to 4 lanes, multimodal corridor improvements and transit service
State Hwy. 52	Weld County Rd. 1 to Weld County Rd. 13	Planning and Environment Linkages study outcomes — safety, operational and multimodal improvements
State Hwy. 66	U.S. Route 287/Main Street to E. County Line Rd.(Weld County Rd. 1)	Capacity, operations and bicycle/pedestrian
State Hwy. 66	E. County Line Rd. (Weld County Rd. 1) to Weld County Rd. 19	Widen 2 to 4 lanes, pedestrian improvements

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Jefferson	\$39,000,000	2030-2039	●	●		●
Jefferson	\$250,000,000	2040-2050	●	●	●	●
Douglas	\$24,000,000	2020-2029	●	●		
Denver	\$15,000,000*	2020-2029	●			●
Denver	\$139,000,000	2030-2039		●	●	●
Denver	\$124,000,000	2030-2039		●	●	●
Douglas	\$8,000,000*	2020-2029	●			●
Arapahoe	\$10,000,000	2020-2029	●	●	●	
Adams	\$24,000,000	2020-2029	●			●
Arapahoe	\$175,000,000	2030-2039	●	●	●	●
Weld	\$20,000,000	2040-2050	●	●	●	●
Boulder	\$15,000,000	2030-2039	●	●	●	●
Weld	\$35,000,000	2040-2050	●			●

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* This cost is not included in the fiscal constraint analysis because funding was allocated prior to 2020.

Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Denver Regional Council of Governments administered funds for multimodal capital projects and programs		
State Hwy. 93	State Hwy. 58 to State Hwy. 170	Widen to 4 lanes and safety/transit improvements
U.S. Route 6	Heritage Rd.	New interchange
U.S. Route 85 (Santa Fe)	C-470 to Bowles	Corridor planning/investment for multimodal mobility, operations and safety
U.S. Route 287/120th Ave.	Midway Blvd. to Lowell Blvd.	Improve circulation, safety, active transportation access, business access, congestion and transit operations
U.S. Route 85	Highlands Ranch Pkwy. to north of County Line Rd.	Widen from 4 to 6 lanes
Wadsworth Blvd.	35th Ave. to 48th Ave.	Widen from 4 to 6 lanes
Wadsworth Blvd.	17th Ave. to 35th Ave.	Multimodal corridor improvements
TIP Set-Asides	Varies	Investment in transportation demand management, community mobility, air quality, operations and technology and human services transportation

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Jefferson	\$200,000,000	2030-2039	●	●	●	●
Jefferson	\$30,000,000	2020-2029		●		●
Arapahoe	\$150,000,000	2040-2050	●	●	●	●
Broomfield	\$15,000,000	2020-2029	●	●	●	●
Douglas	\$50,100,000*	2020-2029	●			●
Jefferson	\$31,000,000	2020-2029	●		●	●
Jefferson	\$60,000,000	2040-2050	●	●	●	●
DRCOG projects total	\$1,918,500,000					
Regional	\$375,112,551	2020-2050	●	●	●	●
DRCOG programs total	\$375,112,551					

Continued on next page.

* This cost is not included in the fiscal constraint analysis because funding was allocated prior to 2020.

Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Regional Transportation District administered funds for multimodal capital projects and programs		
Northwest Rail	Westminster Station to downtown Longmont	Implement peak period service plan
Base System and FasTracks Operations and Maintenance	Varies	On-going and preventative maintenance for transit vehicles and facilities to operate RTD's FasTracks and base system.
Base System and FasTracks Debt Service	Varies	Repayment of debt service for the construction of RTD's FasTracks and base system
Regional bus rapid transit projects		
New bus maintenance facility	TBD (RTD northern area)	Construction of a new bus maintenance facility in RTD's northern service area
38th/Park BRT	Wadsworth to Colfax	Bus rapid transit service and supporting safety/multimodal improvements
Alameda BRT	Wadsworth to R-Line	Bus rapid transit service and supporting safety/multimodal improvements
Broadway/ Lincoln BRT	Colfax to Highlands Ranch Pkwy.	Bus rapid transit service and supporting safety/multimodal improvements
Colfax Ave. BRT	Union Station to I-225	Bus rapid transit service (dedicated lanes) and supporting safety/multimodal improvements
Colfax Ave. Extension BRT	I-225 to E-470	Bus rapid transit service and supporting safety/multimodal improvements

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Adams/Boulder/Broomfield/Jefferson	\$700,000,000	2040-2050	●	●	●	
RTD projects total	\$700,000,000					
Regional	\$27,287,056,566	2020-2050			●	
Regional	\$6,423,902,502	2020-2050				
RTD programs total	\$33,710,959,069					

TBD	\$50,000,000	2020-2029			●	
Denver/Jefferson	\$40,000,000	2040-2050	●	●	●	
Arapahoe/Denver/Jefferson	\$61,000,000	2030-2039	●	●	●	
Arapahoe/Denver/Douglas	\$61,000,000	2030-2039	●	●	●	
Adams/Arapahoe/Denver	\$250,000,000	2020-2029	●	●	●	
Adams/Arapahoe	\$100,000,000	2020-2029	●	●	●	

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Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Regional bus rapid transit projects		
Colorado Blvd. BRT	A Line to I-25	Bus rapid transit service and supporting safety/ multimodal improvements
Federal Blvd. BRT	120th to Santa Fe/ Dartmouth	Bus rapid transit service and supporting safety/ multimodal improvements
North I-25 BRT	Union Station to State Hwy. 119	Bus rapid transit service and supporting safety/ multimodal improvements
Speer/ Leetsdale/ Parker BRT	Colfax to I-225	Bus rapid transit service and supporting safety/ multimodal improvements
State Hwy. 119 BRT	Downtown Boulder to downtown Longmont	Bus rapid transit service and supporting safety/ multimodal corridor improvements, including a separated bikeway
State Hwy. 119 BRT Extension	Downtown Longmont to I-25/State Hwy. 119 mobility hub	Bus rapid transit service and supporting safety/ multimodal improvements, including the Firestone- Longmont Mobility Hub
Corridor transit planning projects and program		
Regional mobility hubs	Varies	Construction of multimodal mobility hubs
Regional strategic transit	Varies	Investment in regional transit services including Bustang, human services transportation, and rural transportation
Castle Pines transit mobility corridor	Castle Pines to RidgeGate RTD Station	Transit corridor

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Denver	\$35,000,000	2020-2029	●	●	●	
Adams/Denver	\$94,000,000	2020-2029	●	●	●	
Adams/ Broomfield/ Denver/Weld	\$97,000,000	2040-2050		●	●	
Arapahoe/Denver	\$95,000,000	2030-2039	●	●	●	
Boulder	\$200,000,000	2020-2029	●	●	●	
Boulder/Weld	\$100,000,000	2030-2039	●	●	●	
Regional bus rapid transit total	\$1,183,000,000					

Regional	\$200,137,636	2020-2050	●		●	
Regional	\$200,137,636	2020-2050	●		●	
Douglas	\$20,000,000	2030-2039	●	●	●	

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Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Corridor transit planning projects and program		
W. Colfax	Sheridan to Broadway/Lincoln	Transit corridor and supporting safety/multimodal improvements
Golden/Mines autonomous circulator	Downtown Golden, School of Mines, RTD W Line	Autonomous circulator
RidgeGate Pkwy. transit mobility corridor	Mainstreet in Parker to Lone Tree City Center RTD Station	Transit corridor
S. Boulder Rd.	Lafayette to Boulder	Multimodal corridor improvements
State Hwy. 7	Boulder to Brighton	Multimodal corridor improvements
U.S. Route 36/28th St and State Hwy. 93/ Broadway	U.S. Route 36/28th St. and State Hwy. 93/Broadway	Transit corridor and supporting safety/multimodal improvements
U.S. Route 287	U.S. Route 36 to Larimer County Line	Safety, operational and multimodal improvements
Arterial safety/Regional Vision Zero/Complete Streets retrofits projects and program		
Arterial safety/ Regional Vision Zero/Complete Streets retrofits set-aside	High-Injury Network and critical corridors identified in the Taking Action on Regional Vision Zero plan	Vision Zero, safety and Complete Streets improvements

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Denver	\$26,573,077	2040-2050	●	●	●	
Jefferson	\$3,500,000	2020-2029		●	●	
Douglas	\$100,000,000	2040-2050	●	●	●	
Boulder	\$75,000,000	2040-2050	●	●	●	
Adams/Boulder/Broomfield	\$100,000,000	2030-2039	●	●	●	
Boulder	\$15,200,000	2030-2039	●	●		
Boulder/Broomfield	\$200,000,000	2030-2039	●	●	●	●
Transit corridor planning total	\$940,548,349					

Regional	\$249,217,902	2020-2050	●	●		
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Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Arterial safety/Regional Vision Zero/Complete Streets retrofits projects and program		
Brighton Blvd.	Race to York	Reconstruction, Vision Zero, safety and freight improvements
Chambers Rd.	E. 56th Ave. to E. 40th Ave.	Vision Zero corridor improvements
Colfax safety improvements	Wadsworth to Sheridan	Multimodal arterial safety
Federal Blvd. multimodal improvements	52nd Ave. to 120th Ave.	Bicycle/pedestrian/transit improvements; Turn lanes; bus/business access lanes
W. Mississippi Ave.	South Federal Blvd. to S. Broadway	Vision Zero and pedestrian improvements
Sheridan safety improvements	52nd to Hampden	Vision Zero corridor improvements
State Hwy. 42	Louisville and Lafayette	Safety and operational improvements
U.S. Route 36	Boulder to Lyons	Corridor safety improvements
U.S. Route 85 operational and safety improvements	Weld County Rd. 2 to Weld County Rd. 10	Safety and operational improvements
U.S. Route 285 congestion mitigation improvements	Knox Ct./Lowell Blvd. (west) to Havana (east)	Speed and reliability corridor and Vision Zero improvements

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Denver	\$19,762,500	2040-2050	●	●	●	●
Denver	\$16,712,500	2020-2029	●	●	●	
Jefferson	\$12,000,000	2020-2029	●	●	●	●
Adams	\$50,000,000	2020-2029	●	●	●	●
Denver	\$18,600,000	2020-2029	●	●	●	
Denver/Jefferson	\$17,100,000	2020-2029	●	●	●	
Boulder	\$50,000,000	2030-2039	●	●		
Boulder	\$20,000,000	2020-2029	●	●		
Weld	\$6,100,000	2020-2029		●		
Arapahoe/Denver	\$88,200,000	2020-2029		●	●	●
Arterial safety/ Regional Vision Zero/Complete Streets retrofits total	\$547,692,902					

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Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Active transportation projects and program		
Active transportation set-aside	Short-trip opportunity zones, pedestrian focus areas, and active transportation corridors identified in the DRCOG Active Transportation Plan	Bicycle and pedestrian improvements
Bear Creek Trail	(not specified)	Upgrade trail for safe crossings and consistent cross section. Integrate intelligent transportation systems/ artificial intelligence equipment.
Clear Creek Greenway	Jefferson County Line to Loveland Ski Area	Clear Creek Greenway portion of Peaks to Plains trail system
McCaslin Regional trail	Rock Creeky Pkwy. to State Hwy. 128	Regional trail
Boulder to Erie Regional Trail	Boulder to Erie	Regional trail
S. Platte River Trail	Northern Denver city limits (near 53rd Ave.) to southern Denver city limits (near Harvard Ave.)	Complete missing links and upgrade trail section
S. Platte River Trail	Northern Denver city limits (near 53rd Ave.) to southern Denver city limits (near Harvard Ave.)	Complete missing links and upgrade trail section
Smith Rd. bicycle/ pedestrian facilities	Peoria Street to Powhaton Rd.	New shared-use path

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Regional	\$822,477,521	2020-2050	●	●		
Denver	\$31,200,000	2040-2050	●	●		
Clear Creek	\$50,000,000	2040-2050	●	●		
Boulder	\$3,000,000	2020-2029	●	●		
Boulder	\$6,000,000	2020-2029	●	●		
Denver	\$25,000,000	2020-2029	●	●		
Denver	\$25,000,000	2030-2039	●	●		
Adams	\$4,000,000	2020-2029	●	●		

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Table 3.1: Regionally funded project and program investment priorities (continued)

Project name/ Corridor	Location/Limits	Project description
Active transportation projects and program		
St. Vrain Greenway	Longmont to Lyons	Regional trail
Freight projects and program		
Freight set- aside	Varies	Freight improvements including but not limited to bridge reconstructions, overpasses/underpasses, new bridges
47th Ave./48th Ave.	I-25 to Pecos	Bridge reconstruction, new multimodal underpass and new bicycle/pedestrian bridge
Alameda Pkwy. Bridge over I-225	Between Potomac St. and Abilene St.	Bridge reconstruction
Peoria St. Bridge	Sand Creek	Bridge reconstruction
Ward Rd./ BNSF	I-70 frontage road north and Ridge Rd.	Multimodal grade separation

County	Project cost (2020)	Staging period	Multimodal Project Elements			
			Bicycle/pedestrian	Safety	Transit	Freight
Boulder	\$4,000,000	2020-2029	●	●		
Active transportation total	\$970,677,521					

Regional	\$75,836,451	2020-2050		●		●
Denver	\$45,225,000	2040-2050	●	●	●	●
Arapahoe	\$20,000,000	2020-2029	●	●	●	●
Adams	\$19,000,000	2020-2029	●	●		●
Jefferson	\$60,000,000	2020-2029	●	●	●	●
Freight total	\$220,061,451					

Table 3.2: Locally funded projects and programs

Project name/ Corridor	Location/Limits	Project description
2050 Metro Vision Regional Transportation Plan: locally funded projects		
Local government funded projects and programs		
6th Ave.	Airport Blvd. to Tower Rd.	Widen from 2 to 6 lanes
6th Ave.	Tower Rd. to 6th Pkwy.	Widen from 2 to 6 lanes
6th Ave.	6th Pkwy. to Harvest Rd.	Widen from 2 to 6 lanes
6th Ave.	Harvest Mile Rd. to Watkins Rd.	New 6-lane road
6th Ave.	Watkins Rd. to Manila Rd.	New 4-lane road
6th Ave.	Manila Rd. to Schumaker Rd.	New 2-lane road
17th Ave.	Alpine St. to Ute Creek Dr.	Widen from 2 to 4 lanes
48th Ave.	Picadilly Rd. to Powhatan Rd.	New 6-lane road
48th Ave.	Powhatan Rd. to Monaghan Rd.	New 2-lane road
48th Ave.	Powhatan Rd. to Monaghan Rd.	Widen from 2 to 4 lanes
48th Ave.	Imboden Rd. to Manila Rd.	Widen from 2 to 4 lanes
56th Ave.	Havana St. to Peña Blvd.	Widen from 4 to 6 lanes
56th Ave.	Peoria St. to Peña Blvd.	Widen from 2 to 4 lanes
56th Ave.	Peña Blvd. to Tower Rd.	Widen from 4 to 6 lanes
56th Ave.	Genoa St. to Picadilly Rd.	Widen from 5 to 6 lanes
56th Ave.	Picadilly Rd. to E-470	Widen from 2 to 6 lanes
56th Ave.	E-470 to Powhatan Rd.	Widen from 2 to 6 lanes
56th Ave.	Powhatan Rd. to Imboden Rd.	Widen from 2 to 4 lanes
56th Ave.	Imboden Rd. to Schumaker Rd.	New 2-lane road
58th Ave.	Washington St. to York St.	Widen from 2 to 4 lanes
64th Ave.	Tower Rd. to Denver/Aurora City Limits	Widen from 2 to 4 lanes

County	Project cost (2020)	Staging period
Arapahoe	\$10,160,000	2020-2029
Arapahoe	\$14,097,000	2020-2029
Arapahoe	\$13,194,030	2020-2029
Adams	\$19,200,000	2040-2050
Arapahoe	\$19,200,000	2040-2050
Adams	\$9,600,000	2040-2050
Boulder	\$2,302,510	2020-2029
Adams	\$40,706,040	2020-2029
Adams	\$7,500,000	2020-2029
Adams	\$7,500,000	2030-2039
Adams	\$4,800,000	2030-2039
Denver	\$15,000,000	2030-2039
Denver	\$40,000,000	2020-2029
Denver	\$17,300,000	2020-2029
Denver	\$5,800,000	2020-2029
Adams	\$9,696,450	2020-2029
Adams	\$19,400,000	2020-2029
Adams	\$24,000,000	2030-2039
Adams	\$19,000,000	2040-2050
Adams	\$10,346,093	2020-2029
Denver	\$700,000	2020-2029

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Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
64th Ave.	Denver/Aurora city limit to Himalaya St.	Widen from 2 to 6 lanes
64th Ave.	Himalaya Rd. to Harvest Mile Rd.	Widen from 2 to 4 lanes
64th Ave.	Himalaya Rd. to Harvest Mile Rd.	Widen from 4 to 6 lanes
64th Ave.	Harvest Mile Rd. to Powhatan Rd.	New 2-lane road
64th Ave.	Harvest Mile Rd. to Powhatan Rd.	Widen from 2 to 4 lanes
64th Ave.	Powhatan Rd. to Monaghan Rd.	New 4-lane road
72nd Ave.	Simms St. to Kipling St.	Widen from 2 to 4 lanes
96th Ave.	State Hwy. 2 to Tower Rd.	Widen from 2 to 4 lanes
96th Ave.	Tower Rd. to Picadilly Rd.	Widen from 2 to 6 lanes
Interlocken Loop	96th St. to State Hwy. 128	Add 2 toll lanes
104th Ave.	Marion St. to Colorado Blvd.	Widen from 4 to 6 lanes
104th Ave.	McKay Rd. to U.S. Route 85	Widen from 2 to 4 lanes
120th Ave.	Sable Blvd. to E-470	Widen from 2 to 6 lanes
120th Ave.	E-470 to Picadilly Rd.	Widen from 2 to 6 lanes
144th Ave.	U.S. Route 287 to Zuni St.	Widen from 2 to 4 lanes
144th Ave.	Washington St. to York St.	Widen from 2 to 4 lanes
144th Ave.	York St. to Colorado Blvd.	Widen from 2 to 4 lanes
152nd Ave.	Washington St. to York St.	Widen from 2 to 4 lanes
Arapahoe Rd.	Waco St. to Himalaya St.	Widen from 2 to 6 lanes
Arapahoe Rd.	Himalaya Way to Liverpool St.	Widen from 4 to 6 lanes
E. Bromley Ln.	U.S. Route 85 to Sable Blvd.	Widen from 4 to 6 lanes
E. Bromley Ln.	Tower Rd. to I-76	Widen from 4 to 6 lanes

County	Project cost (2020)	Staging period
Adams	\$6,452,362	2020-2029
Adams	\$39,000,000	2030-2039
Adams	\$39,000,000	2030-2039
Adams	\$6,452,362	2020-2029
Adams	\$10,934,700	2020-2029
Adams	\$6,709,410	2020-2029
Jefferson	\$20,000,000	2030-2039
Adams	\$46,672,500	2030-2039
Adams	\$14,668,500	2030-2039
Broomfield	\$39,370,000	2020-2029
Adams	\$6,276,340	2020-2029
Adams	\$40,600,000	2020-2029
Adams	\$29,718,000	2030-2039
Adams	\$15,500,000	2030-2039
Broomfield	\$21,200,000	2020-2029
Adams	\$12,795,250	2020-2029
Adams	\$10,433,050	2020-2029
Adams	\$13,074,650	2030-2039
Arapahoe	\$20,400,000	2020-2029
Arapahoe	\$6,176,772	2020-2029
Adams	\$1,333,500	2020-2029
Adams	\$1,853,032	2020-2029

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Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
Broncos Pkwy.	Havana St. to Peoria St.	Widen from 4 to 6 lanes
Broncos Pkwy.	Jordan Rd. to Parker Rd.	Widen from 4 to 6 lanes
Buckley Rd.	136th Ave. to Bromley Rd.	Widen from 2 to 4 lanes
Buckley Rd.	118th Ave. to Cameron Dr.	Widen from 2 to 6 lanes
C-470 eastbound: S. Kipling Pkwy. to I-25	S. Kipling Pkwy. to Wadsworth Blvd.	Add 1 high-occupancy toll lane
C-470 westbound: S. Kipling Pkwy. to I-25	Wadsworth Blvd. to S. Kipling Pkwy.	Add 1 high-occupancy toll lane
C-470 westbound: S. Kipling Pkwy. to I-25	Colorado Blvd. to Lucent Blvd.	Add 1 high-occupancy toll lane
C-470 eastbound: S. Kipling Pkwy. to I-25	Broadway to I-25	Add 1 high-occupancy toll lane
Canyonside Blvd.	Crowfoot Valley Rd. to Hess Rd.	New 4-lane road
Chambers Rd.	E-470 to Arapahoe/Douglas County Line	Widen from 4 to 6 lanes
Chambers Rd.	Mainstreet to Lincoln Ave.	Widen from 4 to 6 lanes
Chambers Rd.	Hess Rd. to Mainstreet	Widen from 4 to 6 lanes
Chambers Rd.	Crowfoot Valley Rd. to Hess Rd.	New 2-lane road
Chambers Rd.	Crowfoot Valley Rd. to Hess Rd.	Widen from 2 to 4 lanes
Chambers Rd.	Crowfoot Valley Rd. to Hess Rd.	Widen from 4 to 6 lanes

County	Project cost (2020)	Staging period
Arapahoe	\$8,134,350	2020-2029
Arapahoe	\$6,934,200	2020-2029
Adams	\$7,747,000	2020-2029
Adams	\$13,897,737	2020-2029
Douglas/Jefferson	\$45,000,000	2020-2029
Douglas/Jefferson	\$45,000,000	2020-2029
Douglas	\$80,000,000	2030-2039
Douglas	\$80,000,000	2030-2039
Douglas	\$16,000,000	2030-2039
Douglas	\$12,500,000	2040-2050
Douglas	\$16,000,000	2040-2050
Douglas	\$10,000,000	2040-2050
Douglas	\$19,500,000	2020-2029
Douglas	\$17,500,000	2030-2039
Douglas	\$12,000,000	2040-2050

Continued on next page.

Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
Chambers Rd./ Bayou Gulch Rd.	Parker Rd. to Vistancia Dr.	Widen from 2 to 4 lanes
Chambers Rd./ Bayou Gulch Rd.	Vistancia Dr. to southern boundary	New 2-lane road
Chambers Rd./ Bayou Gulch Rd.	Vistancia Dr. to southern boundary	Widen from 2 to 4 lanes
Chambers Rd./ Bayou Gulch Rd.	Crowfoot Valley Rd. to Parker south town limit, new road	New 2-lane road
Chambers Rd./ Bayou Gulch Rd.	Crowfoot Valley Rd. to Parker south town limit, widening	Widen from 2 to 4 lanes
Colorado Blvd.	south of 168th Ave. to 168th Ave.	New 4-lane road
Colorado Blvd.	156th Ave. to south of 168th Ave.	New 4-lane road
Colorado Blvd.	144th Ave. to 156th Ave.	Widen from 2 to 4 lanes
E. County Line Rd.	9th Ave. to State Hwy. 66	Widen from 2 to 4 lanes
Crowfoot Valley Rd.	Chambers Rd. to Stroh Rd.	Widen from 2 to 4 lanes
Crowfoot Valley Rd.	Macanta Rd./Canyonside Blvd. to Chambers Rd.	Widen from 2 to 4 lanes
Crowfoot Valley Rd.	Founders Pkwy. to Macanta Rd./ Canyonside Blvd.	Widen from 2 to 4 lanes
Green Valley Ranch Blvd.	Chambers Rd. to Peña Blvd.	Widen from 4 to 6 lanes
Green Valley Ranch Blvd.	Peña Blvd. to Tower Rd.	Widen from 4 to 6 lanes

County	Project cost (2020)	Staging period
Douglas	\$18,000,000	2040-2050
Douglas	\$6,000,000	2020-2029
Douglas	\$6,000,000	2040-2050
Douglas	\$5,000,000	2020-2029
Douglas	\$4,500,000	2030-2039
Adams	\$23,500,000	2030-2039
Adams	\$23,500,000	2030-2039
Adams	\$23,500,000	2030-2039
Boulder	\$9,779,000	2030-2039
Douglas	\$11,500,000	2030-2039
Douglas	\$38,000,000	2030-2039
Douglas	\$10,000,000	2030-2039
Denver	\$9,900,000	2020-2029
Denver	\$1,700,000	2020-2029

Continued on next page.

Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
Gun Club Rd.	Yale Ave. to Mississippi Ave.	Widen from 2 to 4 lanes
Gun Club Rd.	Yale Ave. to Mississippi Ave.	Widen from 4 to 6 lanes
Gun Club Rd.	Quincy Ave. to 1.5 miles south of Quincy Ave.	Widen from 2 to 6 lanes
Hampden Ave.	Picadilly Rd. to Gun Club Rd.	Widen from 2 to 4 lanes
Harvest Mile Rd.	56th Ave. to 64th Ave.	New 3-lane road
Harvest Mile Rd.	56th Ave. to 64th Ave.	Widen from 3 to 6 lanes
Harvest Mile Rd.	48th Ave. to 56th Ave.	New 6-lane road
Harvest Mile Rd./Powhatan Rd.	I-70 to 26th Ave.	New 4-lane road
Harvest Mile Rd./Powhatan Rd.	I-70 to 26th Ave.	Widen from 4 to 6 lanes
Harvest Rd.	6th Ave. to I-70	New 6-lane road
Harvest Rd.	Alameda Ave. to 1st Ave.	Widen from 4 to 6 lanes
Harvest Rd.	Mississippi Ave. to Alameda Ave.	Add new 6-lane road
Harvest Mile Rd.	Jewell Ave. to Mississippi Ave.	Widen from 2 to 6 lanes
Hess Rd.	Canyonside Blvd. to Chamber Rd.	Widen from 2 to 4 lanes
Hilltop Rd.	Canterberry Pkwy. to Singing Hills Rd.	Widen from 2 to 4 lanes
Huron St.	160th Ave. to State Hwy. 7	Widen from 2 to 4 lanes
Huron St.	150th Ave. to 160th Ave.	Widen from 2 to 4 lanes

County	Project cost (2020)	Staging period
Arapahoe	\$10,899,140	2030-2039
Arapahoe	\$10,899,140	2030-2039
Arapahoe	\$26,670,000	2020-2029
Arapahoe	\$12,353,544	2020-2029
Adams	\$6,452,235	2020-2029
Adams	\$7,760,970	2030-2039
Adams	\$15,900,000	2020-2039
Adams	\$12,000,000	2020-2029
Adams	\$8,000,000	2030-2039
Adams	\$13,313,410	2020-2029
Arapahoe	\$6,657,340	2020-2029
Arapahoe	\$13,313,410	2020-2029
Arapahoe	\$13,313,410	2030-2039
Douglas	\$17,000,000	2030-2039
Douglas	\$20,000,000	2020-2029
Broomfield	\$5,080,000	2020-2029
Broomfield	\$8,572,500	2020-2029

Continued on next page.

Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
I-70	Picadilly Rd.	Add new interchange
I-70	Harvest Mile Rd.	Add new interchange
I-76	Bridge St.	Add new interchange
Imboden Rd.	48th Ave. to 56th Ave.	Widen from 2 to 4 lanes
Jefferson Pkwy.	State Hwy. 128/96th St. to State Hwy. 93 north of 64th Ave.	New 4-lane road
Jefferson Pkwy.	Indiana St./State Hwy. 128	Add new interchange
Jefferson Pkwy.	Candelas Pkwy.	Add new interchange
Jefferson Pkwy.	State Hwy. 72	Add new interchange
Jewell Ave.	Himalaya St. to E-470	Widen from 3 to 6 lanes
Jewell Ave.	E-470 to Gun Club Rd.	Widen from 2 to 6 lanes
Jewell Ave.	Gun Club Rd. to Harvest Mile Rd.	Widen from 2 to 6 lanes
Jewell Ave.	Harvest Rd. to Monaghan Rd.	Widen from 2 to 6 lanes
Jewell Ave.	Monaghan Rd. to Watkins Rd.	Widen from 2 to 4 lanes
Lincoln Ave.	Peoria St. to 1st Ave.	Widen from 4 to 6 lanes
Lincoln Ave.	1st St. to Keystone Blvd.	Widen from 4 to 6 lanes
Lincoln Ave.	Keystone Blvd. to Parker Rd.	Widen from 4 to 6 lanes
Mainstreet	Canterberry Pkwy. to Delbert Rd.	Widen from 2 to 4 lanes
Manila Rd.	Alameda Ave. to I-70	New 4-lane road
Manila Rd.	I-70 to 48th Ave.	Widen from 2 to 4 lanes
McIntyre St.	52nd Ave. to 60th Ave.	Widen from 2 to 4 lanes
Monaghan Rd.	56th Ave. to 64th Ave.	New 4-lane road
Monaghan Rd.	26th Ave. to 56th Ave.	Widen from 2 to 4 lanes
Monaghan Rd.	I-70 to 26th Ave.	New 4-lane road

County	Project cost (2020)	Staging period
Adams	\$27,490,547	2020-2029
Adams/Arapahoe	\$39,566,215	2020-2029
Adams	\$25,400,000	2020-2029
Adams	\$24,000,000	2030-2039
Jefferson	\$259,080,000	2020-2029
Jefferson		2020-2029
Jefferson		2020-2029
Jefferson		2020-2029
Arapahoe	\$13,194,030	2020-2029
Arapahoe	\$4,848,860	2020-2029
Arapahoe	\$9,950,450	2020-2029
Adams	\$9,700,000	2030-2039
Adams	\$14,400,000	2030-2039
Douglas	\$4,000,000	2030-2039
Douglas	\$18,000,000	2030-2039
Douglas	\$20,250,000	2020-2029
Douglas	\$28,000,000	2040-2050
Adams	\$5,000,000	2030-2039
Adams	\$15,000,000	2030-2039
Jefferson	\$6,500,000	2020-2029
Arapahoe	\$25,000,000	2030-2039
Arapahoe	\$26,000,000	2030-2039
Arapahoe	\$25,000,000	2030-2039

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Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
Monaghan Rd.	Quincy Ave. to Yale Ave.	New 6-lane road
Nelson Rd.	75th St. to Affolter Dr.	Widen from 2 to 4 lanes
Pace St.	5th Ave. to 17th Ave.	Widen from 2 to 4 lanes
Pecos St.	52nd Ave. to 0.72 miles north of 52nd Ave.	Widen from 2 to 4 lanes
Peña Blvd.	E-470 to Jackson Gap St.	Widen from 6 to 8 lanes
Peña Blvd.	Gun Club Rd.	Interchange capacity
Peña Blvd.	Jackson Gap St. west ramps to DEN terminal	Widen from 6 to 8 lanes
Peoria St.	E-470 to 0.75 mile south of Lincoln Ave.	Widen from 2 to 4 lanes
Peoria St.	0.75 miles south of Lincoln Ave. to Mainstreet/RidgeGate Pkwy.	Widen from 2 to 4 lanes
Picadilly Rd.	96th Ave. to 120th Ave.	New 6-lane road
Picadilly Rd.	82nd Ave. to 96th Ave.	New 6-lane road
Picadilly Rd.	70th Ave. to 82nd Ave.	New 6-lane road
Picadilly Rd.	56th Ave. to 70th Ave./Aurora city limits	New 6-lane road
Picadilly Rd.	48th Ave. to 56th Ave.	Widen from 2 to 6 lanes
Picadilly Rd.	Smith Rd. to 48th Ave.	Widen from 2 to 6 lanes
Picadilly Rd.	I-70 to Smith Rd.	Widen from 2 to 6 lanes
Picadilly Rd.	Colfax Ave. to I-70	New 6-lane road
Picadilly Rd.	6th Pkwy. to Colfax Ave.	Widen from 2 to 6 lanes
Picadilly Rd.	State Hwy. 30 to 6th Pkwy.	New 4-lane road
Plum Creek Pkwy.	Wolfensberger Rd. to I-25	Widen from 2 to 4 lanes

County	Project cost (2020)	Staging period
Arapahoe	\$22,860,000	2030-2039
Boulder	\$5,198,110	2020-2029
Boulder	\$3,827,780	2020-2029
Adams	\$8,647,748	2020-2029
Denver	\$33,000,000	2020-2029
Denver	\$15,000,000	2020-2029
Denver	\$10,200,000	2020-2029
Douglas	\$7,000,000	2030-2039
Douglas	\$5,000,000	2030-2039
Adams	\$49,022,000	2030-2039
Adams	\$21,590,000	2030-2039
Denver	\$11,400,000	2020-2029
Adams	\$20,353,020	2020-2029
Adams	\$13,568,680	2020-2029
Adams	\$22,496,780	2020-2029
Adams	\$5,332,730	2020-2029
Adams	\$12,904,724	2020-2029
Arapahoe	\$5,000,000	2020-2029
Arapahoe	\$7,000,000	2020-2029
Douglas	\$5,080,000	2020-2029

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Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
Plum Creek Pkwy.	Gilbert St. to Ridge Rd.	Widen from 2 to 4 lanes
Powhaton Rd.	26th Ave. to 48th Ave.	New 6-lane road
Powhaton Rd.	Jewell Ave. to 26th Ave.	Widen from 2 to 4 lanes
Powhaton Rd.	Smoky Hill Rd. to County Line Rd.	Widen from 2 to 6 lanes
Quail Run Rd./ Imboden Rd.	I-70 to 48th Ave.	New 4-lane road
Quail Run Rd.	6th Ave. to I-70	New 4-lane road
Quebec St.	132nd Ave. to 160th Ave.	Widen from 2 to 4 lanes
Quebec St.	120th Ave. to 128th Ave.	Widen from 2 to 4 lanes
Quincy Ave.	Simms St. to Kipling Pkwy.	Widen from 2 to 4 lanes
Quincy Ave.	Irving St. to Federal Blvd.	New 2-lane road
Quincy Ave.	Plains Pkwy. to Gun Club Rd.	Widen from 2 to 6 lanes
Quincy Ave.	Monaghan Rd. to Hayesmount Rd.	Widen from 2 to 6 lanes
Quincy Ave.	Hayesmount Rd. to Watkins Rd.	Widen from 2 to 6 lanes
Rampart Range Rd.	Waterton Rd. to Titan Rd.	Widen from 2 to 4 lanes
Ridge Rd.	Plum Creek Pkwy. To State Hwy. 86	Widen from 2 to 4 lanes
Sheridan Pkwy.	Northwest Pkwy. to Preble Creek	Widen from 2 to 4 lanes
Sheridan Pkwy.	Lowell Blvd. to Northwest Pkwy.	Widen from 2 to 4 lanes
Smoky Hill Rd.	Pheasant Run Pkwy. to Versailles Pkwy.	Widen from 4 to 6 lanes
State Hwy. 7	Boulder County Line to Sheridan Pkwy.	Widen from 2 to 4 lanes

County	Project cost (2020)	Staging period
Douglas	\$5,080,000	2020-2029
Adams	\$40,000,000	2020-2029
Adams/Arapahoe	\$24,500,000	2040-2050
Arapahoe	\$3,491,230	2030-2039
Adams	\$24,000,000	2030-2039
Arapahoe	\$5,000,000	2040-2050
Adams	\$21,010,880	2020-2029
Adams	\$8,432,800	2020-2029
Jefferson	\$12,001,500	2020-2029
Arapahoe	\$3,810,000	2020-2029
Arapahoe	\$13,335,000	2020-2029
Arapahoe	\$18,935,700	2030-2039
Arapahoe	\$16,002,000	2030-2039
Douglas	\$10,000,000	2030-2039
Douglas	\$3,810,000	2020-2029
Broomfield	\$5,715,000	2020-2029
Broomfield	\$7,620,000	2020-2029
Arapahoe	\$33,909,000	2030-2039
Broomfield	\$6,604,000	2020-2029

Continued on next page.

Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
State Hwy. 7	Sheridan Pkwy. to I-25	Widen from 2 to 6 lanes
State Hwy. 7	Riverdale Rd. to U.S. Route 85	Widen from 2 to 4 lanes
State Hwy. 30	Stephen D. Hogan Pkwy. (6th Pkwy.) to Mississippi Ave.	Widen from 2 to 4 lanes
State Hwy. 58	Cabela St.	Add new interchange
Stephen D. Hogan Pkwy. (6th Pkwy.)	State Hwy. 30 to E-470	Widen from 2 to 6 lanes
Stephen D. Hogan Pkwy. (6th Pkwy.)	E-470 to Gun Club Rd.	Widen from 2 to 6 lanes
Stroh Rd.	Chambers Rd. to Crowfoot Valley Rd.	New 4-lane road
Stroh Rd.	Crowfoot Valley Rd. to J. Morgan Blvd.	Widen from 2 to 4 lanes
Titan Rd.	Rampart Range Rd. to Santa Fe Dr.	Widen from 2 to 4 lanes
Tower Rd./ Buckley Rd.	105th Ave. to 118th Ave.	New 4-lane road
Tower Rd.	Peña Blvd. to 105th Ave.	Widen from 4 to 6 lanes
Tower Rd.	56th Ave. to Peña Blvd.	Widen from 4 to 6 lanes
Tower Rd.	48th Ave. to 56th Ave.	Widen from 4 to 6 lanes
Tower Rd.	45th Ave. to Green Valley Ranch Blvd.	Widen from 4 to 6 lanes
Tower Rd.	Colfax Ave. to Smith Rd.	Widen from 2 to 6 lanes
Tower Rd.	6th Ave. to Colfax Ave.	New 2-lane road
Tower Rd.	6th Ave. to Colfax Ave.	Widen from 2 to 6 lanes

County	Project cost (2020)	Staging period
Broomfield	\$10,172,700	2020-2029
Adams	\$16,319,500	2030-2039
Arapahoe	\$18,000,000	2020-2029
Jefferson	\$19,558,000	2020-2029
Arapahoe	\$34,904,680	2030-2039
Arapahoe	\$4,848,860	2020-2029
Douglas	\$14,000,000	2020-2029
Douglas	\$9,250,000	2020-2029
Douglas	\$25,000,000	2030-2039
Adams	\$8,801,100	2020-2029
Adams	\$20,000,000	2020-2029
Denver	\$16,000,000	2020-2029
Denver	\$5,300,000	2020-2029
Denver	\$2,500,000	2020-2029
Adams	\$8,727,440	2020-2029
Arapahoe	\$25,820,370	2020-2029
Arapahoe	\$25,820,370	2030-2039

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Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
Local government funded projects and programs		
U.S. Route 85	Titan Rd. to Highlands Ranch Pkwy.	Widen from 4 to 6 lanes
Washington St.	152nd Ave. to 160th Ave.	Widen from 2 to 6 lanes
Waterton Rd.	State Hwy. 121 to Campfire St.	Widen from 2 to 4 lanes
Watkins Rd.	Quincy Ave. to I-70	Widen from 2 to 6 lanes
Wolfensberger Rd.	Coachline Rd. to Prairie Hawk Dr.	Widen from 2 to 4 lanes
Yale Ave.	Monaghan Rd. to Hayesmount Rd.	Widen from 2 to 6 lanes
York St.	160th Ave. (State Hwy. 7) to 168th Ave.	Widen from 2 to 4 lanes
York St.	E-470 to State Hwy. 7	Widen from 2 to 4 lanes
York St.	152nd Ave. to E-470	Widen from 2 to 4 lanes
York St.	88th Ave. to 78th Ave.	Widen from 2 to 4 lanes
York St.	78th Ave. to State Hwy. 224	Widen from 2 to 4 lanes
York St.	State Hwy. 224 to 58th Ave.	Widen from 2 to 4 lanes
System preservation, enhancement, and operations	Varies	Road resurfacing; traffic signals, optimization, communication, variable message signs; and other systematic repairs and preventative maintenance
Bridges & culverts	Varies	Bridge replacement, rehabilitation, preservation, and systematic repairs
New non-regional roadway system	Varies	Construction of new arterials, collectors, and local roads
Toll authority debt service	Varies	Repayment of debt service for the construction of toll facilities

County	Project cost (2020)	Staging period
Douglas	\$5,000,000	2030-2039
Adams	\$37,300,000	2020-2029
Douglas	\$16,000,000	2030-2039
Arapahoe	\$54,673,500	2030-2039
Douglas	\$7,500,000	2030-2039
Arapahoe	\$17,335,500	2030-2039
Adams	\$7,493,000	2020-2029
Adams	\$10,668,000	2020-2029
Adams	\$13,074,650	2030-2039
Adams	\$13,500,000	2020-2029
Adams	\$12,800,000	2020-2029
Adams	\$20,000,000	2020-2029
Local government projects total	\$3,315,886,301	
Regional	\$17,025,350,550	2020-2050
Regional	\$3,367,673,315	2020-2050
Regional	\$48,275,895,000	2020-2050
Regional	\$1,850,678,088	2020-2050
Local government programs total	\$70,519,596,954	

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Table 3.2: Locally funded projects and programs (continued)

Project name/ Corridor	Location/Limits	Project description
E-470 Public Highway Authority projects and programs		
E-470	U.S. Route 85 to I-25 North	Widen 4 to 6 lanes
E-470	I-76 to U.S. Route 85	Widen 4 to 6 lanes
E-470	Peoria	Widen to 6 through-lanes plus turn lanes
E-470	Sable	New interchange
E-470	104th to I-76	Widen 4 to 6 lanes
E-470	Peña to I-76	Widen 6 to 8 lanes
E-470	I-76	Add ramps for fully directional interchange
E-470	I-76	Add ramps for fully directional interchange
E-470	112th Ave.	New interchange
E-470	Peña	Add separated auxillary lanes
E-470	I-70 to 104th	Widen 4 to 6 lanes
E-470	88th Ave.	New interchange
E-470	48th Ave.	New interchange
E-470	38th Ave.	New interchange
E-470/I-70 interchange Complex	I-70	Directional I-70 interchanges
E-470	Quincy to I-70	Widen 4 to 6 lanes
E-470	Smoky Hill to I-70	Widen 6 to 8 lanes
E-470	Parker Rd. to Smoky Hill	Widen 6 to 8 lanes
E-470	I-25 South to Parker Rd.	Widen 6 to 8 lanes

County	Project cost (2020)	Staging period
Adams	\$109,000,000	2030-2039
Adams	\$41,000,000	2030-2039
Adams	\$1,750,000	2030-2039
Adams	\$21,096,000	2020-2029
Adams	\$102,000,000	2020-2029
Adams	\$23,000,000	2030-2039
Adams	\$27,700,000	2020-2029
Adams	\$83,100,000	2030-2039
Adams	\$15,822,000	2020-2029
Denver	\$19,885,000	2020-2029
Adams	\$74,000,000	2020-2029
Adams	\$15,822,000	2020-2029
Adams	\$21,096,000	2020-2029
Adams	\$30,589,000	2020-2029
Adams	\$106,500,000	2020-2029
Arapahoe	\$56,950,000	2020-2029
Arapahoe	\$28,000,000	2020-2029
Arapahoe/Douglas	\$16,000,000	2020-2029
Douglas	\$18,000,000	2020-2029
E-470 Public Highway Authority projects total	\$811,310,000	

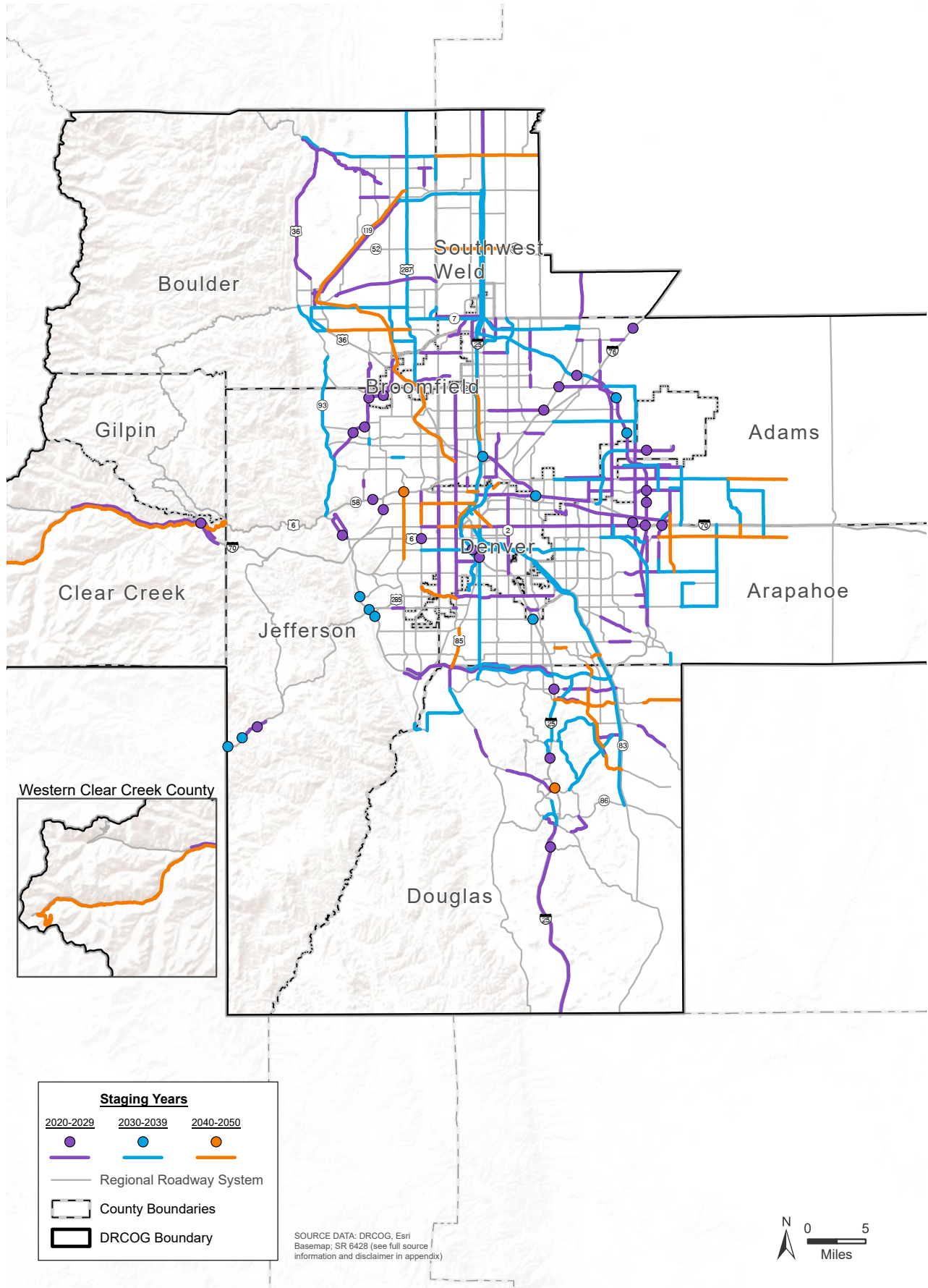
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Table 3.2: Locally funded projects and programs (continued)

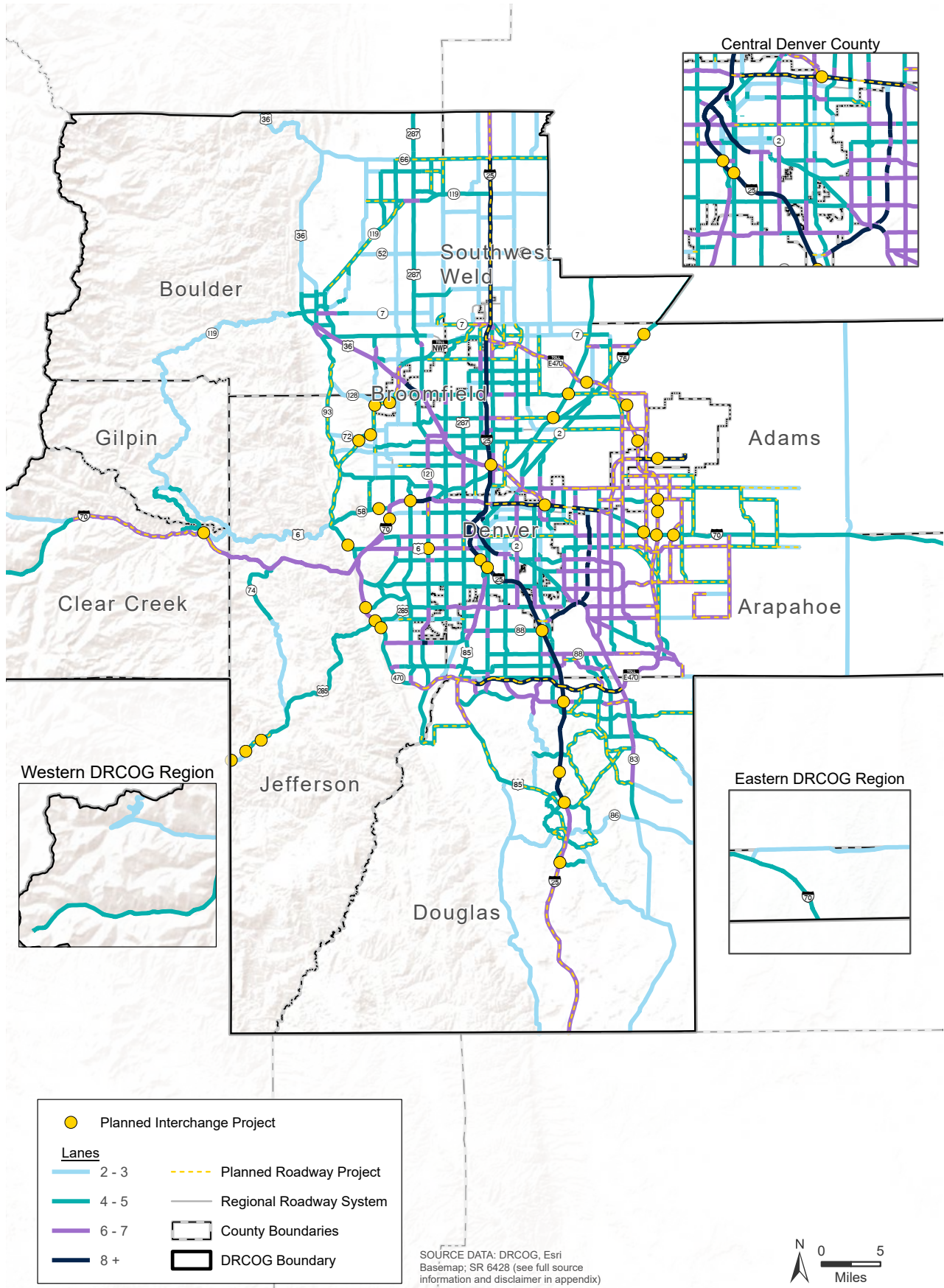
Project name/ Corridor	Location/Limits	Project description
E-470 Public Highway Authority projects and programs		
E-470 renewal and replacement program	Varies	Infrastructure renewal, replacement and maintenance items
E-470 ramp signalization and geometric improvements	Varies	Signalize ramp terminal intersections and geometric interchange improvements
E-470 pavement overlays	Varies	Pavement overlays needed before reconstruction associated with anticipated widening
E-470 multiuse trails	Varies	Trail projects anticipated to be linked with E-470 widening

County	Project cost (2020)	Staging period
Adams/Arapahoe/Douglas	\$679,022,419	2020-2050
Adams/Arapahoe/Douglas	\$62,444,000	2020-2050
Adams/Arapahoe/Douglas	\$25,618,000	2020-2050
Adams/Arapahoe/Douglas	\$28,600,000	2020-2050
E-470 Public Highway Authority programs total	\$795,684,419	
2050 RTP projects total	\$13,221,027,025	
2050 RTP programs total	\$118,358,001,179	
2050 RTP investment total	\$131,563,828,204	

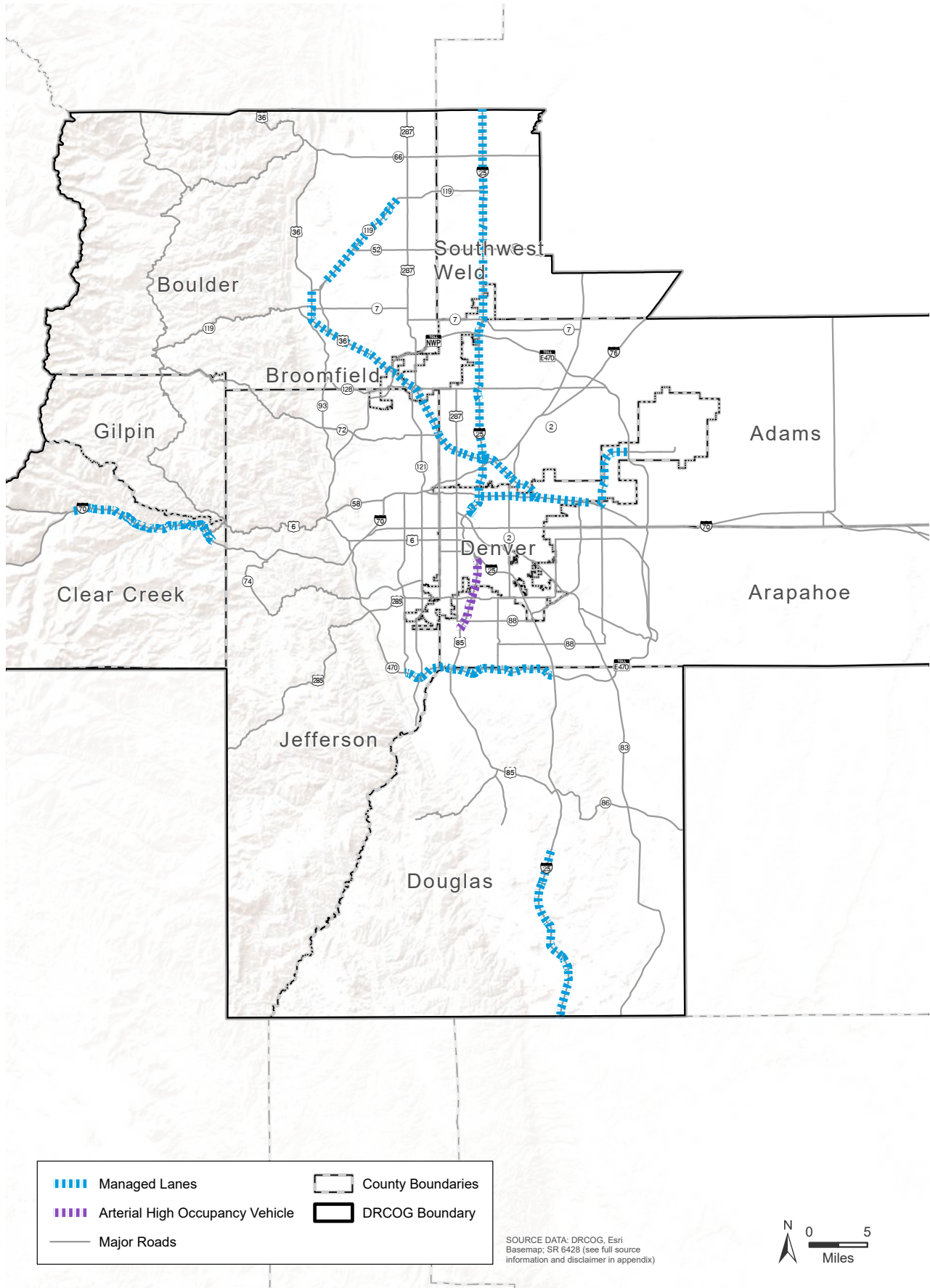
Map 3.1: Fiscally constrained projects



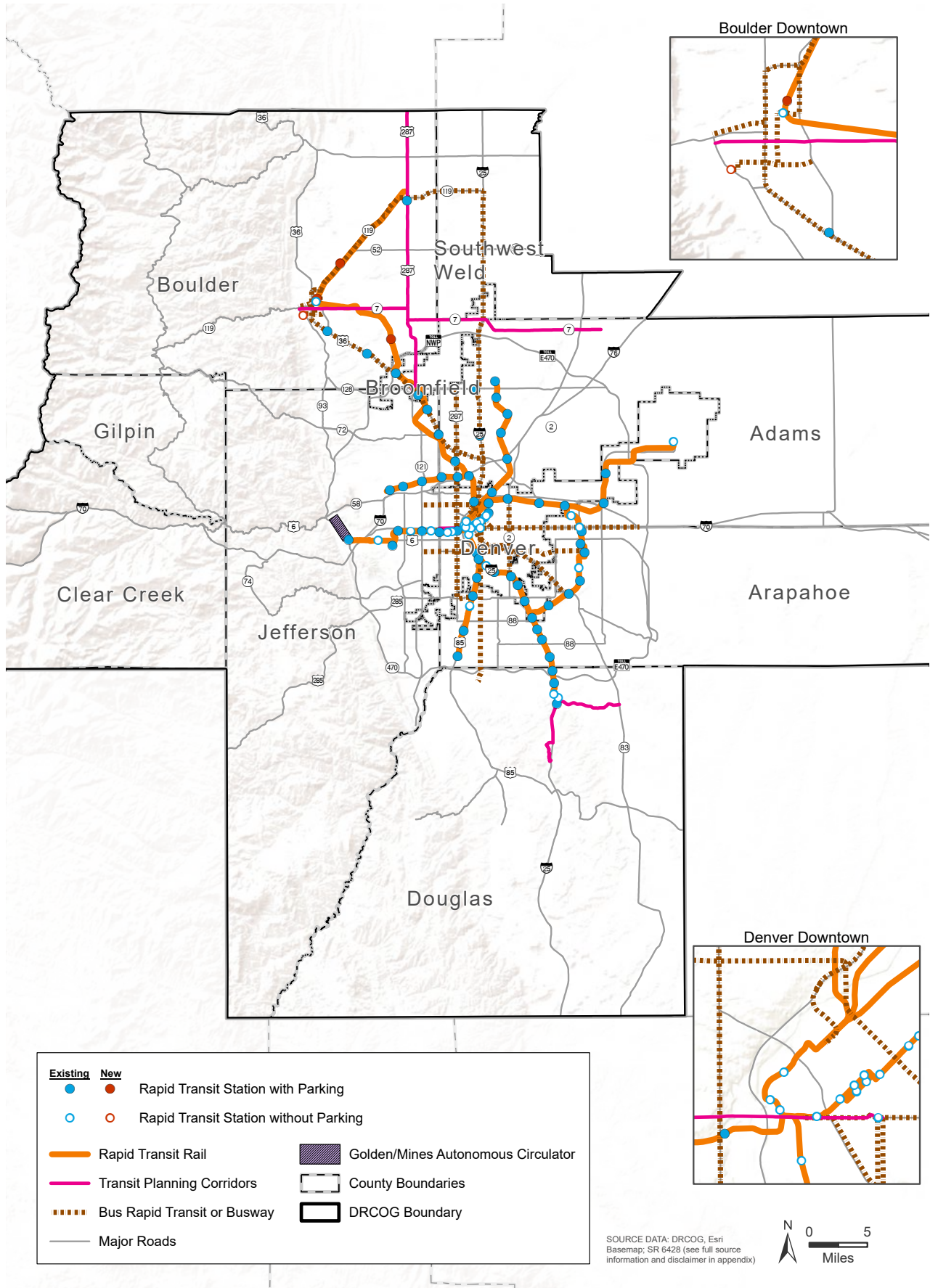
Map 3.2: Fiscally constrained roadway network



Map 3.3: Fiscally constrained managed lanes network



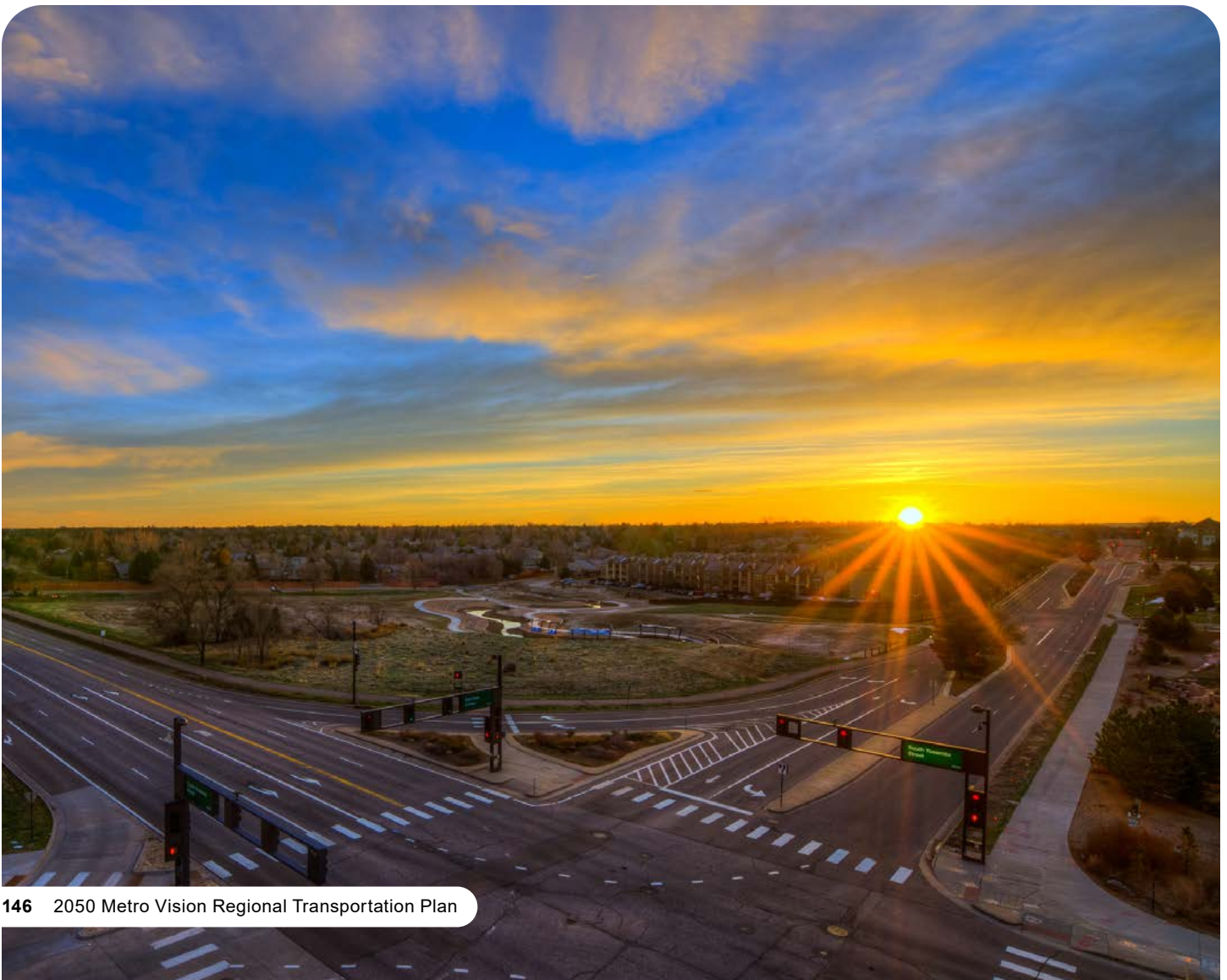
Map 3.4: Fiscally constrained rapid transit network



Other modes, services and facilities

The fiscally constrained 2050 RTP also includes projects, programs and services that address broad areas of need. Examples include local bus service, bridges, system operations, preservation and maintenance, local streets, safety and debt service. Specific projects are developed by the sponsoring agencies when they apply for DRCOG-directed funding through the TIP.

Local agencies like cities and counties develop an array of projects as part of the TIP process that may not be explicitly listed in this chapter, but which help advance the priorities, themes and programs outlined. **Photo credit: Chris Foster (photo contest winner).**



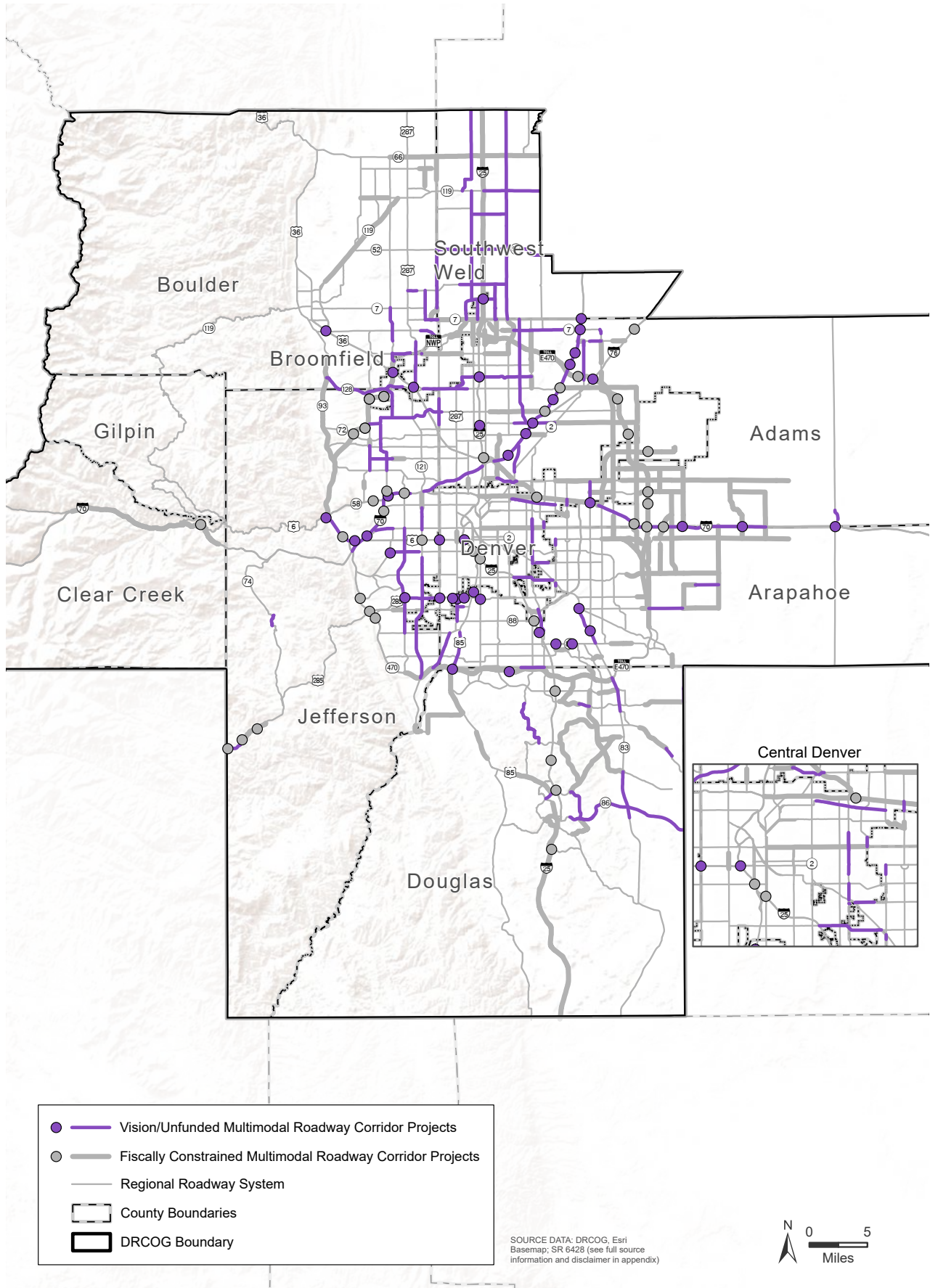
Vision (unfunded) projects

The multimodal system that represents the region's desired state by 2050 is made up of the projects in the fiscally constrained 2050 RTP (outlined above) and vision projects. Vision projects are projects which are needed and desired by CDOT, RTD, and local agencies within the region, but are unfunded at this time.

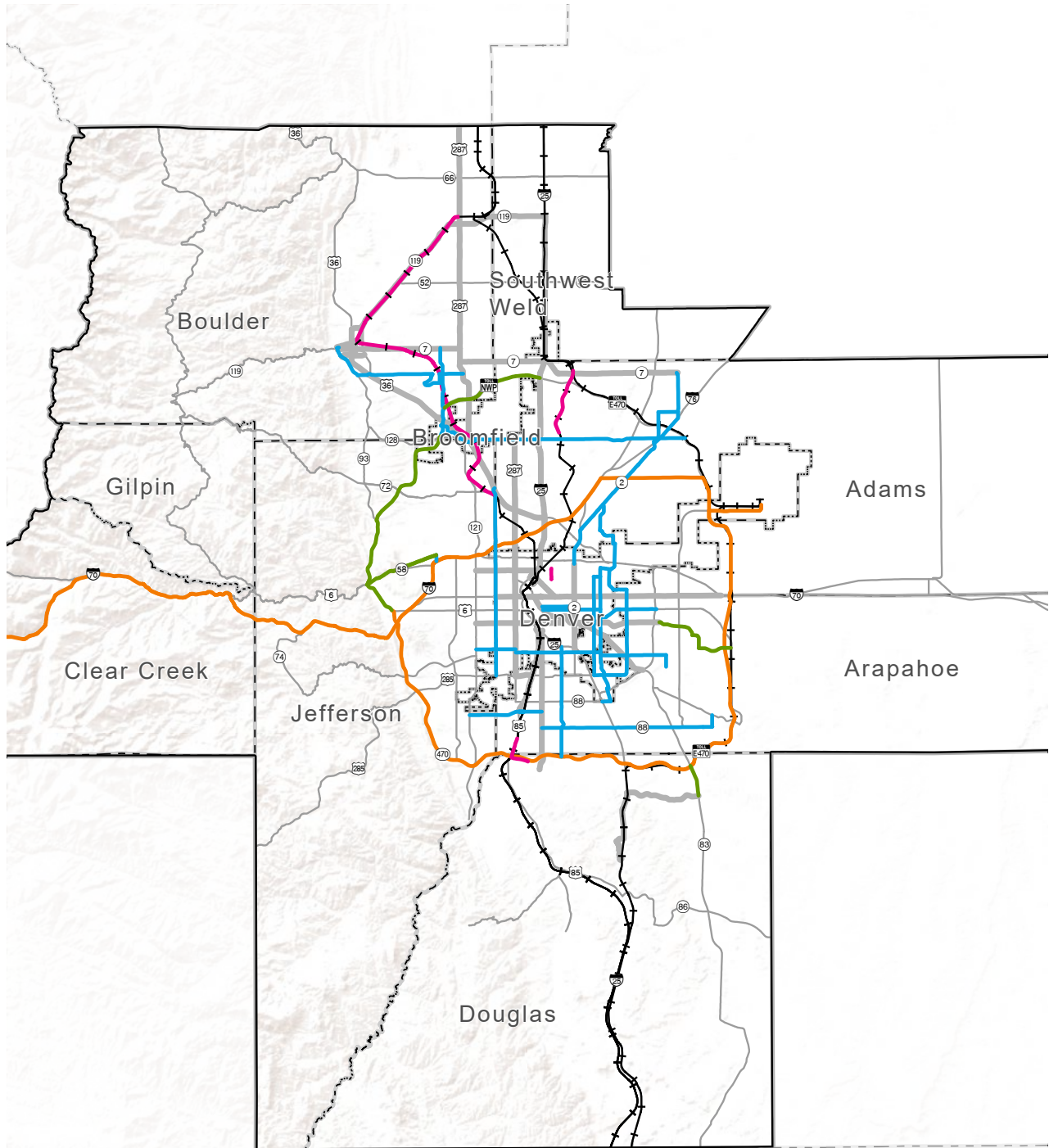
The vision projects include the following:

- The “Policy framework and desired outcomes” (see page 84) that defined the vision and needs for the 2050 planning process.
- The unfunded candidate projects (primarily roadway projects) that were not selected for the fiscally constrained 2050 RTP.
- The unfunded components of RTD's FasTracks system not included in the fiscally constrained 2050 RTP.
- The unfunded candidate bus rapid transit corridors from RTD's Regional Bus Rapid Transit Feasibility Study not included in the fiscally constrained 2050 RTP.
- Ongoing planning and project development associated with the three potential alignments for a future Front Range passenger rail system.
- Potential intercity rail along the I-70 mountain corridor with two potential alignments within the Denver region.
- Map 3.5 (roadways) and Map 3.6 (rapid transit projects) depict both vision and fiscally constrained projects.

Map 3.5: Vision and fiscally constrained roadway network



Map 3.6: Vision and fiscally constrained rapid transit network



Front Range Rail Alternative Alignments	Fiscally Constrained Rapid Transit System
Potential Additional Bus Rapid Transit and Busway	Major Roads
Conceptual Preservation Corridors	County Boundaries
Remaining FasTracks Components	DRCOG Boundary
I-70 Mountain Corridor High Speed Transit Alternative Alignments	

SOURCE DATA: DRCOG, Esri
 Basemap: SR 6428 (see full source information and disclaimer in appendix)



Amending the 2050 RTP

Changing needs and conditions within the region sometimes make it necessary for DRCOG to amend the 2050 RTP. DRCOG follows an established process with minimum thresholds for amending the 2050 RTP outside of the four-year update cycle.

Amendment procedures

The amendment procedures ensure that prioritized projects continue toward implementation. Depending on the level of air quality impacts and scope of changes needed, the following thresholds apply for making an amendment:

- **Level 1 – Administrative Modification:** A minor change to a project with regionally significant air quality impacts that does not require public review or comment, redetermination of fiscal constraint or redetermination of transportation air quality conformity.
- **Level 2 – Minor Amendment:** A major change to the total estimated project cost of a project with regionally significant air quality impacts that requires an abbreviated public review and comment period and redetermination of fiscal constraint. Redetermination of transportation air quality conformity is not required.
- **Level 3 – Major Amendment:** A major change to a project with regionally significant air quality impacts that requires a full public review and comment period, redetermination of fiscal constraint and redetermination of transportation air quality conformity.

For more information on the revision procedures, see [Appendix I](#).

2022 amendments

The 2050 RTP was amended in 2022 to address the requirements of CDOT's Greenhouse Gas Transportation Planning Standard (known as the greenhouse gas rule). Appendix T, the Greenhouse Gas Transportation Report, documents the changes made to the 2050 RTP, as well as other documentation required by the greenhouse gas rule.



Local bicyclists organized Denver Solidarity Rides throughout summer 2020 to raise awareness of historic injustices faced by Black people, Indigenous people and people of color. Nearly 100 bicyclists rode past Union Station on July 31, 2020. **Photo credit: Jack Todd (photo contest finalist).**



Envision the outcomes

The 2050 Metro Vision Regional Transportation Plan will guide investment to improve safety, mobility, equity, environment and quality of life for the residents of the Denver region. Through the implementation of the fiscally constrained project and program investment priorities described in Chapter 3, the 2050 RTP will influence many regional outcomes. DRCOG measures and evaluates these outcomes in several ways:

- 2050 RTP transportation performance measures.
- DRCOG regional transportation and mobility measures.
- Federal performance-based planning framework.
- Environmental justice and equity priorities.
- Environmental mitigation measures.

Bicyclists ride on a bridge over the South Platte River near Ball Arena in Denver. Area residents take pride in its extensive network of regional shared-use paths.

This chapter describes the various metrics and how the anticipated outcomes of the 2050 RTP are measured against them. It then illustrates how the outcomes support DRCOG's efforts to address the region's six shared multimodal transportation planning priorities, recognizing some of the challenges the region will face in realizing them.



2050 RTP performance measures

Metro Vision performance measures

The 2050 RTP helps DRCOG and its partners implement the Metro Vision plan by identifying specific improvements to the transportation system and its operations. The Metro Vision plan establishes a series of performance measures to help track progress of these and other efforts based on:

- Relevance to Metro Vision outcomes and objectives.
- Availability of regularly updated and reliable data sources.
- Use of measurable, quantitative information, rather than anecdotal insights.

While the investments in the 2050 RTP will likely affect all 16 Metro Vision performance measures, they will most directly and significantly affect the performance measures under the theme “A Connected Multimodal Region,” which include:

- Non-single-occupant vehicle mode share to work.
- Daily vehicle miles traveled per capita.
- Average travel time variation (peak vs. off-peak).
- Daily person delay per capita.
- Number of traffic fatalities.

Other Metro Vision performance measures likely to be affected by the investments identified in the 2050 RTP include:

- Surface transportation-related greenhouse gas emissions per capita.
- Share of the region’s housing and employment in high-risk areas.
- Share of the region’s housing and employment near rapid transit stations or high-frequency transit stops.

For each performance measure, Metro Vision includes:

- 1) A baseline that indicates the region’s current status for that measure.
- 2) A 2040 target that establishes the desired future outcome for that measure. The 2050 RTP includes forecasts of travel and mobility in 2050 that can help assess how the plan’s investments help address the Metro Vision targets. Although the plan’s forecasts can’t assess progress on all Metro Vision targets, this chapter includes an analysis based on available forecast data. The assessment indicates the 2050 RTP makes progress toward addressing Metro Vision’s targets, and also highlights the need to amend the Metro Vision plan.

Metro Vision measure amendments

The Metro Vision approach to performance management is dynamic and flexible. Plan amendments incorporate new targets or methods for measuring success as new information becomes available or circumstances change. Such amendments require additional public and stakeholder input, as well as a majority affirmative vote by the DRCOG Board.

With the completion of the 2050 RTP, DRCOG will initiate a Metro Vision amendment process including:

- The identification and consideration of new targets for 2050 or other years as needed.
- The consideration of new or alternative measures that more closely reflect regional priorities included in the 2050 RTP.

DRCOG will initiate target or measure amendments addressing safety and Regional Vision Zero, congestion and mobility, active transportation, transit quality, regional bicycle network completion and quality, and greenhouse gas emissions. Details of each proposed Metro Vision amendment are discussed beginning on page 144 in this chapter.

Regional transportation and mobility measures

Changes in regionwide travel measures between 2020 and 2050 are estimated using outputs from the Denver Regional Council of Governments Focus transportation model. The Focus model uses forecast population and employment from DRCOG's UrbanSim model, the Colorado State Demography Office and other input variables to forecast transportation trends and

performance. The region's population and employment growth, the distribution of that growth and the provision of transportation facilities and services will affect future travel patterns. The results from the Focus transportation model are included in [Appendix E](#).

Every community in the Denver region is distinct. Through DRCOG, local governments work together to enhance each place's uniqueness, such as downtown Parker (below), for the benefit of the entire region.



Federal transportation performance management measures

The Federal Highway Administration and the Federal Transit Administration established guidance for implementation of federal performance-based planning and programming requirements. Each requirement pertains to a particular area of transportation, and lays out the goals, measures and data the Colorado Department of Transportation, DRCOG and the Regional Transportation District use in setting targets. CDOT, RTD, and DRCOG are required to demonstrate how investments contribute to achieving targets.

Safety Performance Targets:

The safety performance targets support the Highway Safety Improvement Program to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands.

Infrastructure Condition Targets:

The National Highway Performance Program provides support for the condition and performance of the National Highway System, for the construction of new facilities, and to ensure that investments of federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a state's asset management plan for the national highway system.

System Performance Targets:

The system performance targets assess the performance of the interstate and non-interstate National Highway System for the purpose of carrying out the National Highway Performance Program; assess freight movement on the Interstate System; and assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement Program.

(continued ...)

(... continued)

Transit Asset Management:

Transit asset management develops a framework for transit agencies to monitor and manage public transportation assets, improve safety and increase reliability and performance to keep their systems operating smoothly and efficiently.

Public Transportation Agency Safety Plan:

The latest federal performance measures to come into effect and require DRCOG action are the targets set for transit safety. Certain operators of public transportation systems that receive federal Section 5307 funds under the Federal Transit Administration's Urbanized Area Formula Grants are required to develop safety plans. It brings management and labor together to better control risk, detect and correct safety problems earlier, share and analyze safety data more effectively, and measure safety performance more precisely.

The System Performance Report for the 2050 RTP is included in [Appendix G](#). It includes an evaluation of the transportation system and a description of progress toward achieving the federal targets.

DRCOG will continue to adopt, update and evaluate performance targets. As DRCOG member governments and partners implement the projects and programs within the 2050 RTP, they will continue to prioritize investments that facilitate progress toward achieving performance measure targets. DRCOG's planning process will also continue to integrate CDOT's and RTD's performance measure goals, objectives and plans.

DRCOG has been coordinating its performance-based planning efforts with regional, state and federal partners for many years. DRCOG has developed, adopted and reported on the targets as they became effective. Targets are intended to be realistic and achievable, but are near-term and rely on current system performance. As such, DRCOG has used the long-range vision established in Metro Vision and specific modal plans to set the federal targets, ensuring the integration of the federal targets into DRCOG's long-range vision.

The targets have been incorporated into the 2050 RTP and the Transportation Improvement Program. Go to [Appendix G](#) for full details about federal performance areas, measures and targets.

2050 RTP and the six focus areas

The following pages illustrate how the outcomes of the 2050 RTP support the region's six shared multimodal transportation planning priorities.

The 2050 RTP includes specific project and program investments to address the federal targets and DRCOG's Metro Vision targets. Examples include:

- \$1.2 billion toward implementing a regional bus rapid transit system that will increase non-single-occupant vehicle travel and improve state of good repair.
- \$465 million toward arterial safety and Regional Vision Zero projects and programs to reduce traffic fatalities.

Denver Union Station is the region's primary transit hub, connecting multiple travel options. **Photo credit: RTD**

- \$220 million toward freight projects and programs to increase freight reliability in the region and move goods more efficiently.

The following section uses 2050 travel and mobility forecasts from the 2050 RTP, Metro Vision targets, federal targets and plan investment benefits to present an integrated summary of the plan's outcomes, organized by its six focus areas: safety, air quality, regional transit, multimodal mobility, active transportation and freight.



Safety

The 2050 RTP's investments to change the current safety conditions based on the measures listed above are highlighted here.

Safety in the Denver region is measured through:

- Metro Vision plan performance measures.
- Federal Transportation Performance Management measures.

DRCOG member governments and stakeholders have demonstrated their commitment to safety as a priority by adopting Taking Action on Regional Vision Zero. The plan sets out action initiatives, an implementation timeline and measures that will help DRCOG track regional progress toward safety improvements.

Proposed Metro Vision plan amendment



When DRCOG adopted Taking Action on Regional Vision Zero in 2020, it committed to a target of zero fatalities and serious injuries. Based on technical analysis and guidance

from the Board of Directors in 2020, DRCOG will consider amending the Metro Vision plan to include a 2040 target for zero fatalities and a 2045 target for zero serious injuries.



12
safety projects in the
2050 RTP



\$465
million
in 2050 RTP projects
dedicated to safety
improvements



\$152
million
set aside for
other safety
improvements

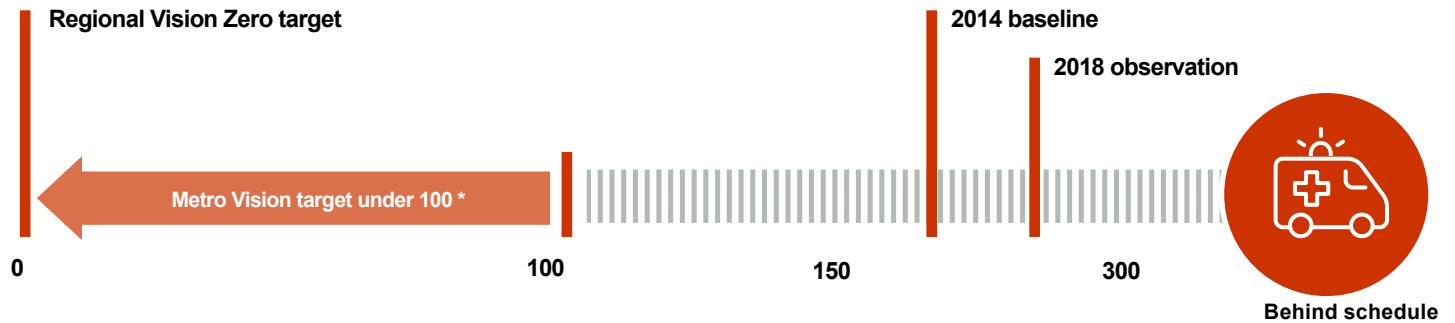


0
goal for Vision Zero
traffic fatalities

Source: 2050 RTP, Taking Action on Regional Vision Zero (2020, DRCOG) and DRCOG calculations

Metro Vision 2050 RTP performance measures

Number of traffic fatalities



Source: Metro Vision Performance Measures Status Report, DRCOG, metrovision.drcog.org.
 *Metro Vision safety target anticipated to be amended to zero after adoption of the 2050 RTP.

Federal Transportation Performance Management measures

The System Performance Report in [Appendix G](#) contains more information including progress in achieving the federal targets. The following targets are draft pending DRCOG Board of Directors action Feb. 17, 2021.

Five-year rolling average

	Baseline 2015-2019	Targets 2017-2021	Actuals 2017-2021
Number of fatalities	258	255	To be determined
Rate of fatalities per 100 million vehicle miles traveled	0.93	0.89	To be determined
Number of serious injuries	1772	1,733	To be determined
Rate of serious injuries per 100 million vehicle miles traveled	6.37	6.02	To be determined
Number of nonmotorized fatalities and serious injuries	376	372	To be determined

Target preventable accident rate per 100,000 miles



Bus



Light rail

2021 public transit agency safety plan targets (compared to 2020 baseline)

0 Fatalities in RTD operating systems; bus, light rail and commuter rail

Reduction in bus preventable accidents	10%	Reduction of slip-and-fall injuries	25%
Reduction in light rail preventable accidents	10%	Reduction of injuries from strains	25%
Reduction in commuter rail accidents	10%	To current levels of performance for system reliability without decline in reliability or increases in costs as described in the current Transit Asset Management Plan.	Measure and hold
Reduction of lost time employee injuries	25%		
Reduction of on-the-job injuries	15%		

Air quality

The 2050 RTP's investments to change the current air quality conditions are based on these highlighted measures.

Air quality in the Denver region is measured through:

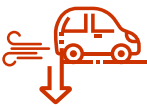
- Metro Vision plan performance measures.
- Federal Transportation Performance Management measures.
- DRCOG regional travel model mobility measures.
- Federal Clean Air Act and air quality conformity requirements (see Appendix S for more information)
- State Greenhouse Gas Emission Reduction rule (see Appendix T for more information).

Federal Transportation Performance Management measures

The System Performance Report in [Appendix G](#) contains more information including progress in achieving the Board-adopted federal targets.



\$3 billion in transit, active transportation and freight projects to reduce emissions



34% reduced per capita greenhouse gas emissions with the 2050 RTP by 2050 compared to 2020 levels

Sources: DRCOG calculation and 2050 RTP



Total amount of emissions reduced through projects

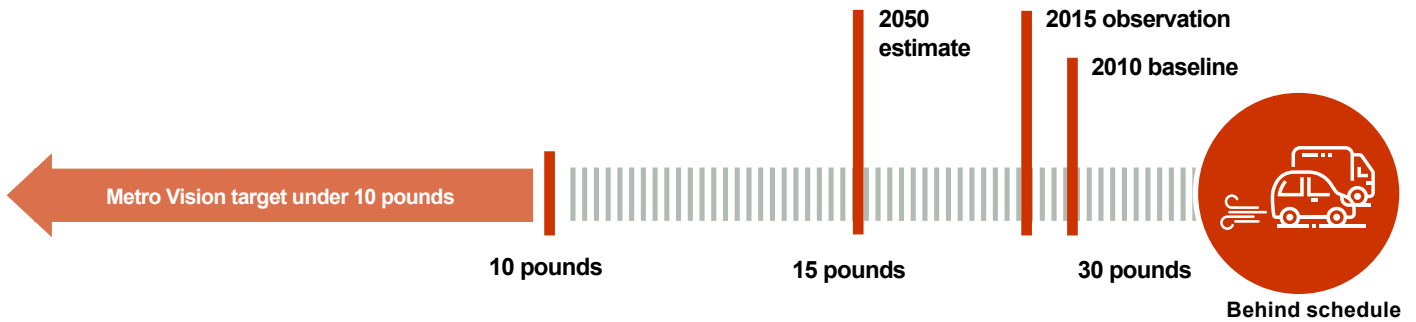
	Baseline	Two-year targets	Four-year targets
Total emissions reductions of volatile organic compounds, kilogram/day	89	86	105
Total emissions reductions of particulate matter with a diameter of 10 microns or less, kilogram/day	41	31	152
Total emissions reductions of carbon monoxide, kilogram/day	1,683	1,152	1,426
Total emissions reductions of nitrogen oxides, kilogram/day	391	86	105

Better air quality improves the lives of residents and visitors, keeping them healthy and active in the region's communities. Healthy air makes it more possible and enjoyable for residents and visitors to explore the region's natural amenities, such as Barr Lake State Park near Brighton in Adams County.



Metro Vision 2050 RTP performance measures

Surface transportation-related greenhouse gas emissions per capita



Source: Metro Vision Performance Measures Status Report, DRCOG, metrovision.drcog.org

Proposed Metro Vision plan amendment

In 2019, the Colorado General Assembly passed House Bill 19-1261: Climate Action Plan to Reduce Pollution. HB19-1261 sets a target of reducing greenhouse gas emissions by 90% from 2005 levels by 2050. Since original adoption of the 2050 RTP in April 2021, the Colorado Transportation Commission adopted the

Greenhouse Gas Planning Standard (known as the greenhouse gas rule). DRCOG amended the 2050 RTP in 2022 to address the greenhouse gas rule. Similarly, DRCOG will also amend Metro Vision's greenhouse gas emissions reduction target based on HB19-1261, SB21-260 and the Greenhouse Gas Planning Standard.





Regional transit


The 2050 RTP's investments to change the current regional transit conditions are based on these highlighted measures.


Regional transit in the Denver region is measured through:


- Metro Vision plan performance measures.
- Federal Transportation Performance Management measures.
- DRCOG regional travel model mobility measures.


Federal Transportation Performance Management measures

The System Performance Report in [Appendix G](#) contains more information including progress in achieving the Board-adopted federal targets. The targets below reflect the useful life and condition of vehicles, track and facilities.

 Rolling stock (useful life benchmark)	Baseline number	Baseline percent	Target number	Target percent
Articulated bus	116	0.0%	116	0.0%
Over-the-road bus	174	0.0%	174	0.0%
Bus	771	24.0%	768	25.1%
Cutaway bus	372	0.0%	410	0.0%
Light rail vehicle	201	0.0%	201	0.0%

 Equipment (useful life benchmark)	Baseline number	Baseline percent	Target number	Target percent
Automobile	48	43.8%	48	79.2%
Truck and other rubber tire	387	13.2%	387	18.1%
Steel wheel vehicles	4	0.0%	4	0.0%

 Infrastructure (with performance restrictions)	Baseline total track	Baseline percent	Target total track	Target percent
Light rail	119.5	2.0%	119.5	2.0%
Commuter rail: N Line	13.2	0.0%	13.2	2.0%

 Facilities (less than 3.0 on the TERM Scale)	Baseline number	Baseline percent	Target number	Target percent
Stations and parking	110	10.9%	106	11.3%
Maintenance and administration	13	0.0%	13	0.0%



10

new bus rapid transit corridors identified in the 2050 RTP result in:



146 miles

of new bus rapid transit projects



\$2.7 billion

invested in 20 transit projects



\$700 million

to implement rail service to Longmont



10%

higher transit ridership compared to future trend without the 2050 RTP



374,000

transit trips are forecast in 2050, a 63% increase from 229,000 in 2020



60%

of people in 2050 are forecast to have good access to jobs via public transit



78%

of people in low-income and minority areas in 2050 are forecast to have good access to jobs via public transit

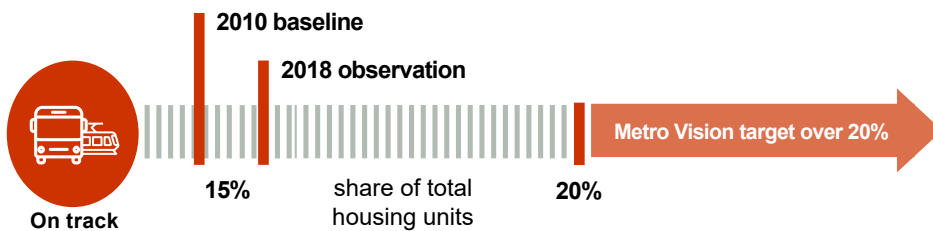
Sources: DRCOG existing plus committed modeling results, 2050 RTP and DRCOG GIS calculation

DRCOG member governments and stakeholders have demonstrated their commitment to regional transit as a priority through the 2050 Coordinated Transit Plan. The 2050 RTP Coordinated Transit Plan addresses federal requirements, identifies strategies to address

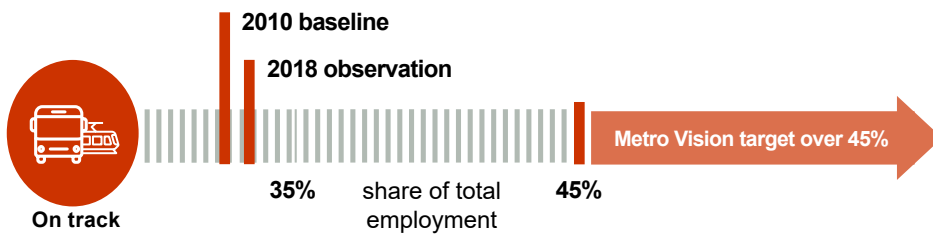
the transportation needs of the region's older adults and individuals with disabilities, and emphasizes the region's integrated approach to coordinating an array of fixed route and human service transit services.

Metro Vision 2050 RTP performance measures

Share of region's housing near rapid transit stations or high-frequency transit stops



Share of region's employment near rapid transit stations or high-frequency transit stops



Source: Metro Vision Performance Measures Status Report," DRCOG, metrovision.drcog.org

Proposed Metro Vision plan amendment

Identify a new Metro Vision measure to address the quality of transit service, particularly for vulnerable populations. For the region's residents and visitors, frequent transit is only valuable when it takes them where they need, or want, to go. As of early 2021, RTD is engaged in Reimagine RTD, a comprehensive planning effort to identify strategies to better connect people to the places they want and need to go. The outcomes of the Reimagine RTD process will inform DRCOG's work on a transit quality measure for Metro Vision.

DRCOG regional travel model mobility measures

	<i>Total transit trips</i>	<i>Share of total population with good transit-job accessibility (100,000+ jobs within a 45-minute transit trip)</i>	<i>Share of total population in low-income or minority areas with good transit-job accessibility (100,000+ jobs within a 45-minute transit trip)</i>
Does DRCOG want this measure to increase or decrease?	Increase	Increase	Increase
What are the expected outcomes with the 2050 RTP?	Increase by 63%	Increase by 8%	Increase by 5%



68

multimodal projects and programs



\$6.6 billion

invested in the 68 multimodal projects and programs



25%

reduction in congested vehicle travel compared to the future trend without the 2050 RTP



12,700

fewer driver trips per day with the 2050 RTP compared to the future trend without the 2050 RTP

Sources: DRCOG existing plus committed modeling results and 2050 RTP

Multimodal mobility

The 2050 RTP's investments to change the current multimodal mobility conditions are based on these highlighted measures.

Multimodal mobility in the Denver region is measured through:

- Metro Vision plan performance measures.
- Federal Transportation Performance Management measures.
- DRCOG regional travel model mobility measures.

Federal Transportation Performance Management measures

The System Performance Report in [Appendix G](#) contains more information including progress in achieving the Board-adopted federal targets.



Pavement condition

	Two-year targets	Four-year targets
Interstate pavement in good condition	45%	40%
Interstate pavement in bad condition	0%	5%
Non-interstate National Highway System pavement in good condition	49%	40%
Non-interstate National Highway System pavement in bad condition	1%	5%



Bridge condition

	Two-year targets	Four-year targets
National Highway System bridges in good condition	49%	44%
National Highway System bridges in bad condition	4%	4%



Traffic congestion reduction

	Baseline	Two-year targets	Four-year targets
Percent of non-single-occupancy vehicle travel	24%	24%	25%
Annual hours of peak-hour excessive delay per capita	48	52	54

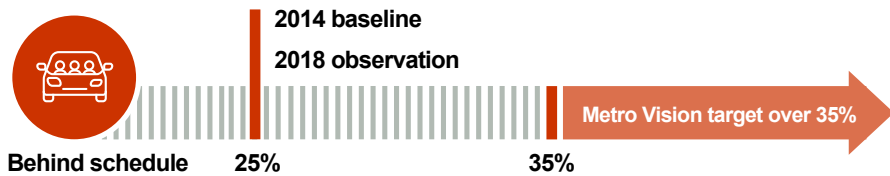


Travel time reliability

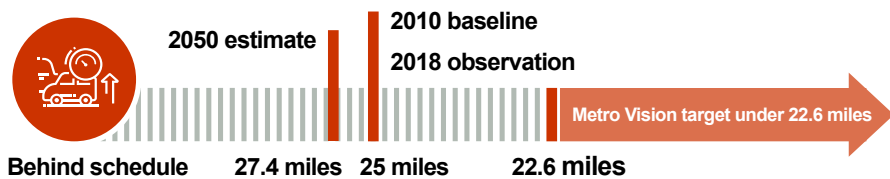
	Baseline	Four-year targets
Reliable person-miles traveled on interstates	82%	81%
Reliable person-miles traveled on the non-interstate National Highway System	64%	64%

Metro Vision 2050 RTP performance measures

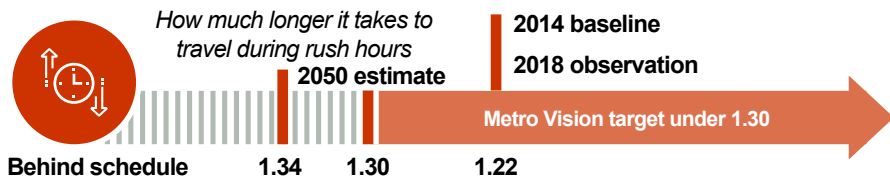
Percent of commuters who don't drive alone to work



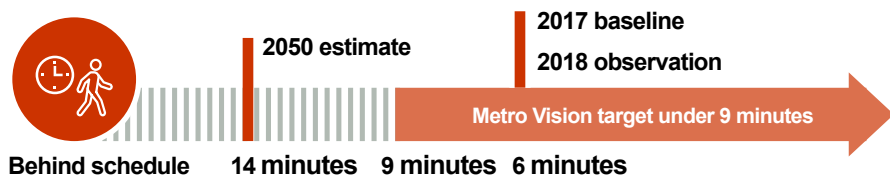
Vehicle miles traveled per person per day



Average travel time variation (peak vs. off-peak)



Daily person delay



Source: Metro Vision Performance Measures Status Report, DRCOG, metrovision.drcog.org

Proposed Metro Vision plan amendment

The travel time variation congestion metric demonstrates the difference in the amount of time it takes to travel during rush hours and non-rush hours. DRCOG intends to expand the travel time variation congestion metric to better measure the duration, extent and severity of congestion. The target for travel time variation will not change, rather, it will be expressed as a percentage of how much longer it takes to travel during peak periods. DRCOG will also consider adding a new measure to track the share of the region's roadway network on which severe congestion extends well beyond peak periods.



Active transportation

The 2050 RTP's investments to change the current active transportation conditions are based on these highlighted measures.

Active transportation in the Denver region is measured through:

- DRCOG regional travel model mobility measures.



154 miles of new regional shared-use paths with the 2050 RTP



\$180 million in 2050 RTP projects specifically dedicated to active transportation



\$32 million set aside for other bicycle and pedestrian improvements



Regional complete streets toolkit to help build out active transportation network

Sources: DRCOG 2050 RTP and DRCOG GIS data

Proposed Metro Vision plan amendment

New Metro Vision measures to address the quality and quantity of multiuse facilities in the region. The new measures will align with DRCOG's Active Transportation Plan related to active transportation corridors and high-comfort facilities.

DRCOG regional travel model mobility measures

	<i>Total bicycle trips</i>	<i>Total pedestrian trips</i>
Does DRCOG want this measure to increase or decrease?	Increase	Increase
What are the expected outcomes with the 2050 RTP?	Increase by 32%	Increase by 44%

Source: DRCOG regional travel model

Freight

The 2050 RTP's investments to change the current freight conditions are based on these highlighted measures.

Freight in the Denver region is measured through:

- Federal Transportation Performance Management measures

DRCOG member governments and stakeholders have demonstrated their commitment to regional freight as a priority through the Regional Multimodal Freight Plan. The freight plan provides a strategic view of significant freight issues, challenges and opportunities that can be addressed by communities within the region.



Federal Transportation Performance Management measures

The System Performance Report in [Appendix G](#) contains more information including progress in achieving the Board-adopted federal targets.



Pavement condition

	Baseline	Four-year targets
Interstate pavement in good condition	45%	40%
Interstate pavement in bad condition	0%	5%
Non-interstate National Highway System pavement in good condition	49%	40%
Non-interstate National Highway System pavement in bad condition	1%	5%



Bridge condition

	Two-year targets	Four-year targets
National Highway System bridges in good condition	49%	44%
National Highway System bridges in bad condition	4%	4%



Freight reliability

	Baseline	Four-year targets
Truck travel time reliability index	1.45	1.50



4 freight projects and programs in the 2050 RTP plan, plus:



\$220 million in 2050 RTP projects specifically dedicated to freight



\$76 million set aside for other freight improvements



20% fewer vehicle hours of delay forecast with the 2050 RTP compared to future trend without the 2050 RTP

Sources: DRCOG 2050 RTP and DRCOG calculation

Environmental justice and equity priorities

DRCOG recognizes the organization's role in building and maintaining an equitable region where all residents and communities can thrive. DRCOG affirms its commitment to ensure the Denver region remains a diverse network of vibrant, connected, lifelong communities. DRCOG launched the Civic Advisory Group and Youth Advisory Panel as part of the 2050 RTP to be more inclusive in outreach and engagement during the planning process. DRCOG is also committed to the 2050 RTP respecting the issues of equity in its project and program investment priorities. Transportation helps address social equity issues, and transportation equity is one of the foundational themes of the 2050 planning process and the 2050 RTP. The 2050 RTP's vision for transportation connects people of all ages, incomes and abilities to housing, jobs, health care, recreation, and other aspects of daily life. The 2050 RTP prioritizes investments to make travel safer, to provide more travel modes and options, and to connect major corridors and destinations across the region.

Accordingly, DRCOG considered the 2050 RTP's potential benefits to, and impacts on, minority and low-income populations within the Denver region, especially compared to the broader population. Guidance for evaluating these benefits and impacts is derived from Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The executive order and accompanying

memorandum reinforced the requirements of Title VI of the Civil Rights Act of 1964 which address federal attention to environmental and human health conditions in minority and low-income communities.

The U.S. Department of Transportation order on environmental justice, issued to comply with Executive Order 12898, defines a member of a minority population as a person who is:

- Black (having origins in any of the black racial groups of Africa).
- Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).
- Asian American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent or the Pacific Islands).
- American Indian and Alaskan Native (having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

Identifying minority and low-income populations

The first step in the environmental justice evaluation process for the 2050 RTP was to identify geographic concentrations of minority and low-income populations within the region. Table 4.1 is a comparison between the percentages of the minority and low-income populations in the Denver region area and Colorado. The geographic unit for this analysis is known as a transportation analysis zone, which comes from DRCOG's travel model tool.

Environmental justice refers to the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin or educational level with respect to the development, implementation and enforcement of environmental laws, regulations and policies. For the purpose of this strategy, fair treatment means that no population, due to policy or economic disempowerment, is forced to bear a disproportionate burden of the negative human health and environmental impacts, including social and economic effects, resulting from transportation decisions, programs and policies made, implemented and enforced at the federal, state, local or tribal level. Source: U.S. Department of Transportation

Table 4.1: 2020 environmental justice populations in the Denver region and state

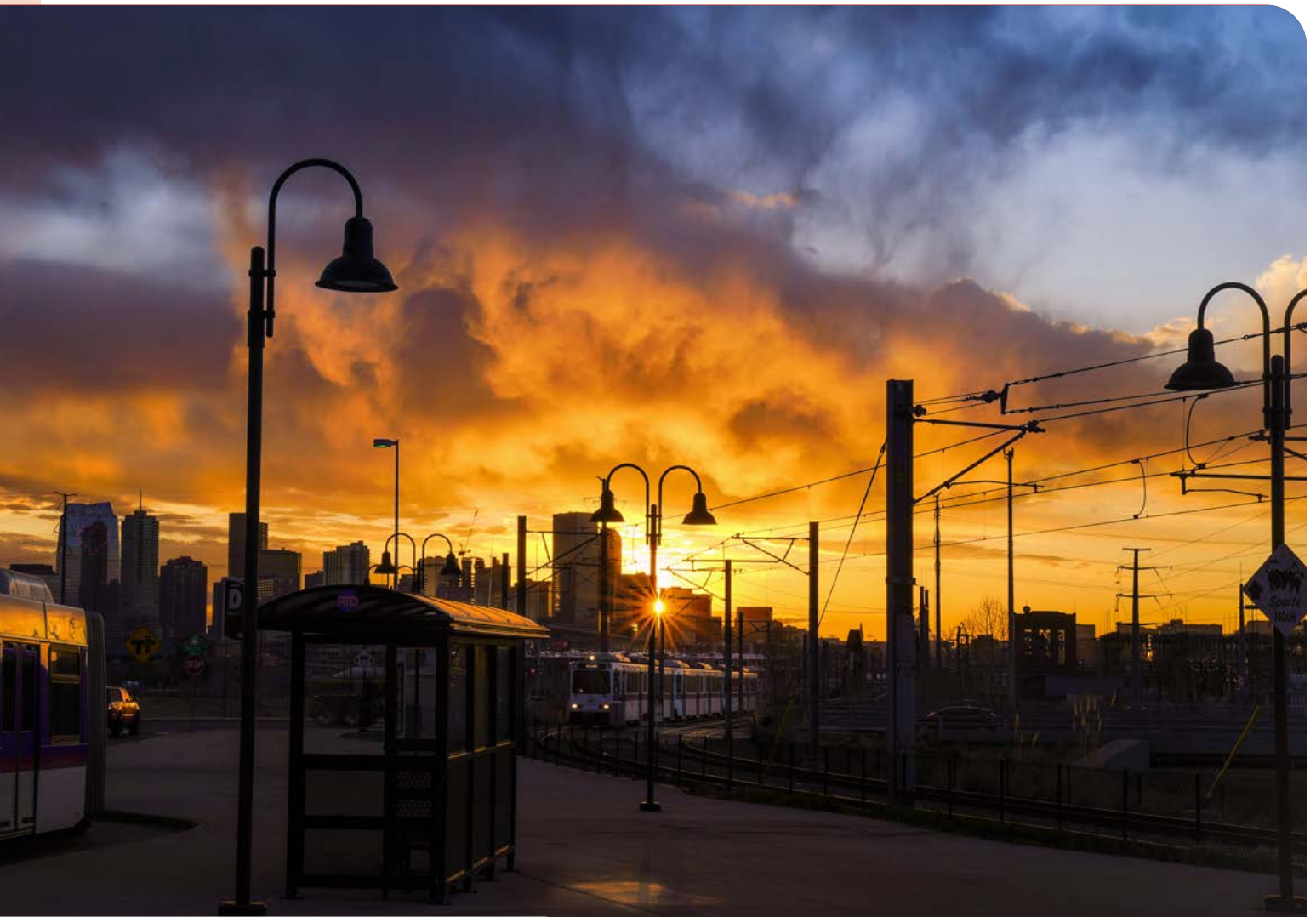
Vulnerable population	Denver region	Colorado
Minority population	36%	33%
Low-income population	13%	6%

2020 data derived from Esri ArcGIS GeoEnrichment Service

The transportation analysis zones identified with high concentrations of minority individuals or low-income households compared to the regional average make up the environmental justice areas of the region. Map 4.1 on page 183 shows the traffic analysis zones where, based on 2020 Esri ArcGIS GeoEnrichment Service Data shown in [Appendix D](#), the percent of minority populations is at or above the regional minority

percentage of 35.9%. It also shows the traffic analysis zones for which the percentage of households with incomes at or below the U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation 2020 poverty guidelines for a family of four (\$26,200) is at or above the regional average of 12.5%.

Ensuring that people of all races, ethnicities, incomes and abilities can participate in the region's vibrant, connected, lifelong communities and get to the places they need to go is a cornerstone of the 2050 RTP's commitment to equity.



Potential effects on travel time to destinations for vulnerable populations

DRCOG used population and travel demand forecasting tools to determine whether vulnerable populations experience more hardship than the general population related to time spent traveling to jobs, essential services and entertainment and education opportunities. The methodology staff used is described in [Appendix D](#). The most current DRCOG travel model provides travel time estimates for 2020 and a horizon year of 2050 based on the transportation network of fiscally constrained projects in the 2050 RTP. Staff evaluated how 2050 network travel times may change for low-income and minority populations in relationship to specific destinations based on the network of fiscally constrained projects in the 2050 RTP.

To create the population-based measures, DRCOG needed to estimate low-income and minority populations within each traffic analysis zone. However, the DRCOG small-area forecast for 2050 only provides total households by zone. DRCOG estimated future target household counts using current proportions. The percent of minority and low-income households in each zone was estimated for 2020 and 2050 by linking the 2050 forecast household counts to the estimated 2020 proportions.

It is not possible to identify one destination type specific to environmental justice populations. DRCOG examined the following destinations and their associated travel times in 2020 and 2050:

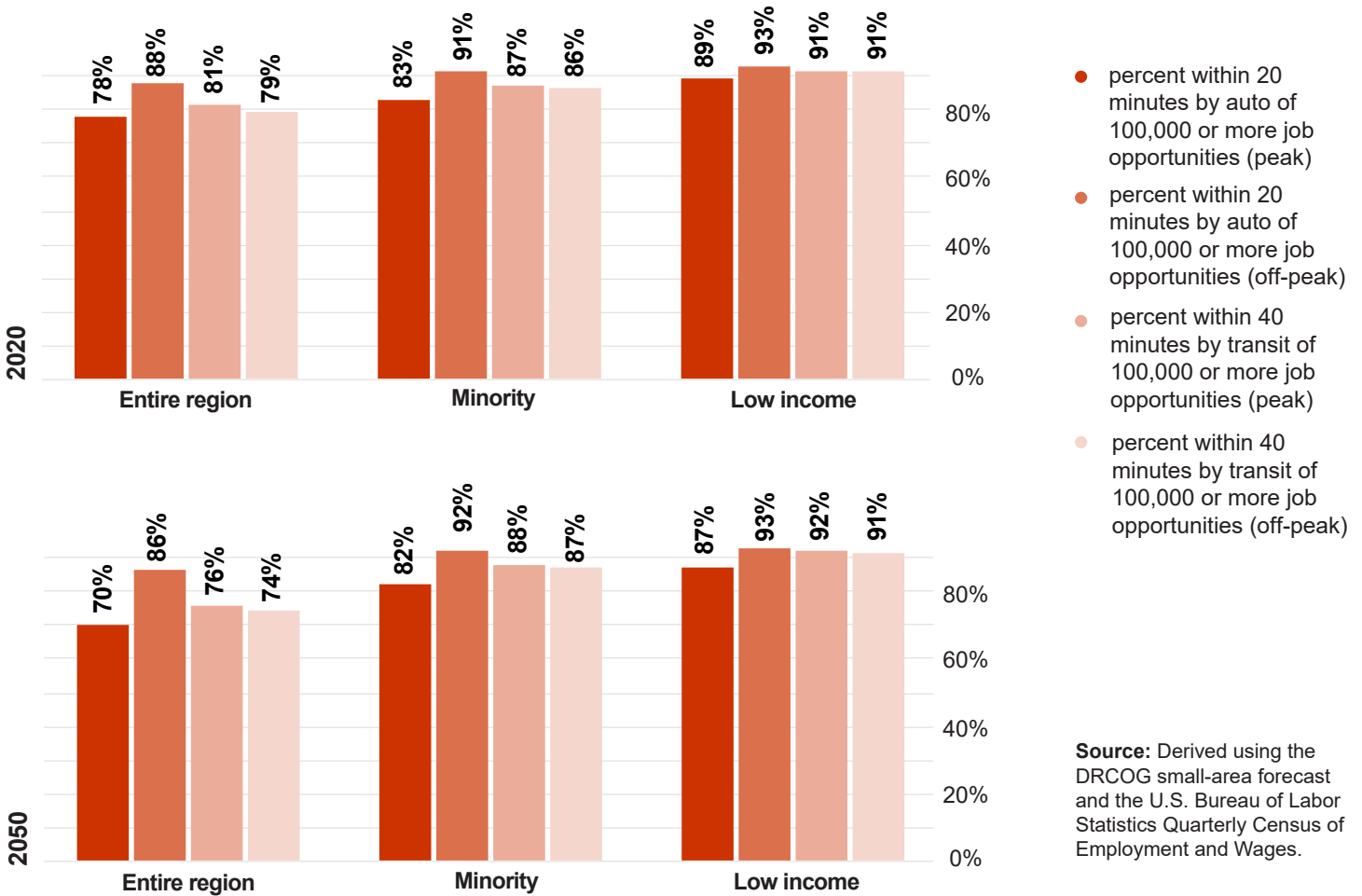
- Percent of households close to 100,000 or more job opportunities (20-minute automobile trip, 40-minute transit trip).
- Percent of households close to a hospital (20-minute automobile trip, 40-minute transit trip).
- Percent of households close to a college or trade school (20-minute automobile trip, 40-minute transit trip).
- Percent of households close to a grocery store (10-minute automobile trip, 20-minute transit trip).
- Percent of households close to the central business district (20-minute automobile trip, 40-minute transit trip).

The figures on the following pages show the results of this analysis:



As part of its analysis of how well the 2050 RTP serves people from minority communities and with low incomes, DRCOG estimated how long it would take commuters to get to a high concentration of job opportunities, such as within the Central Business District.

Percent of households close to job opportunities



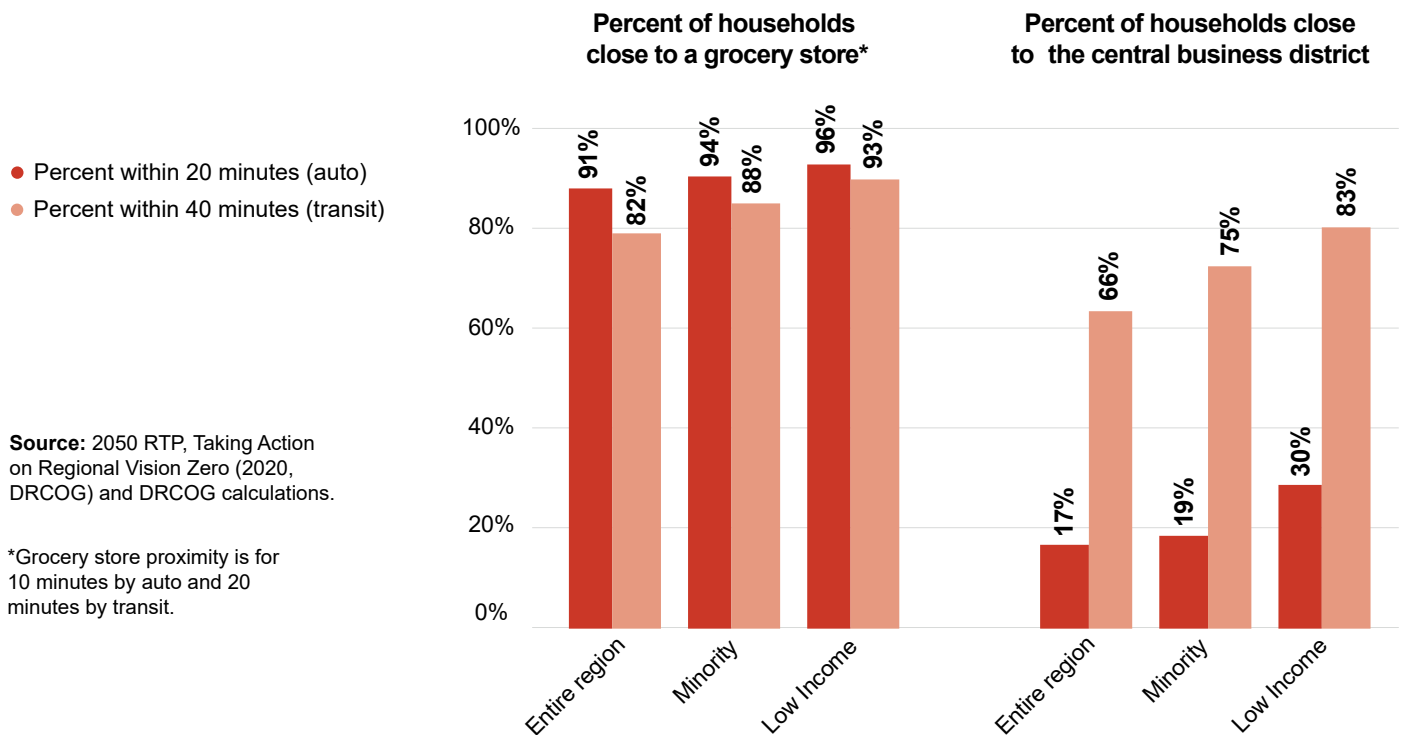
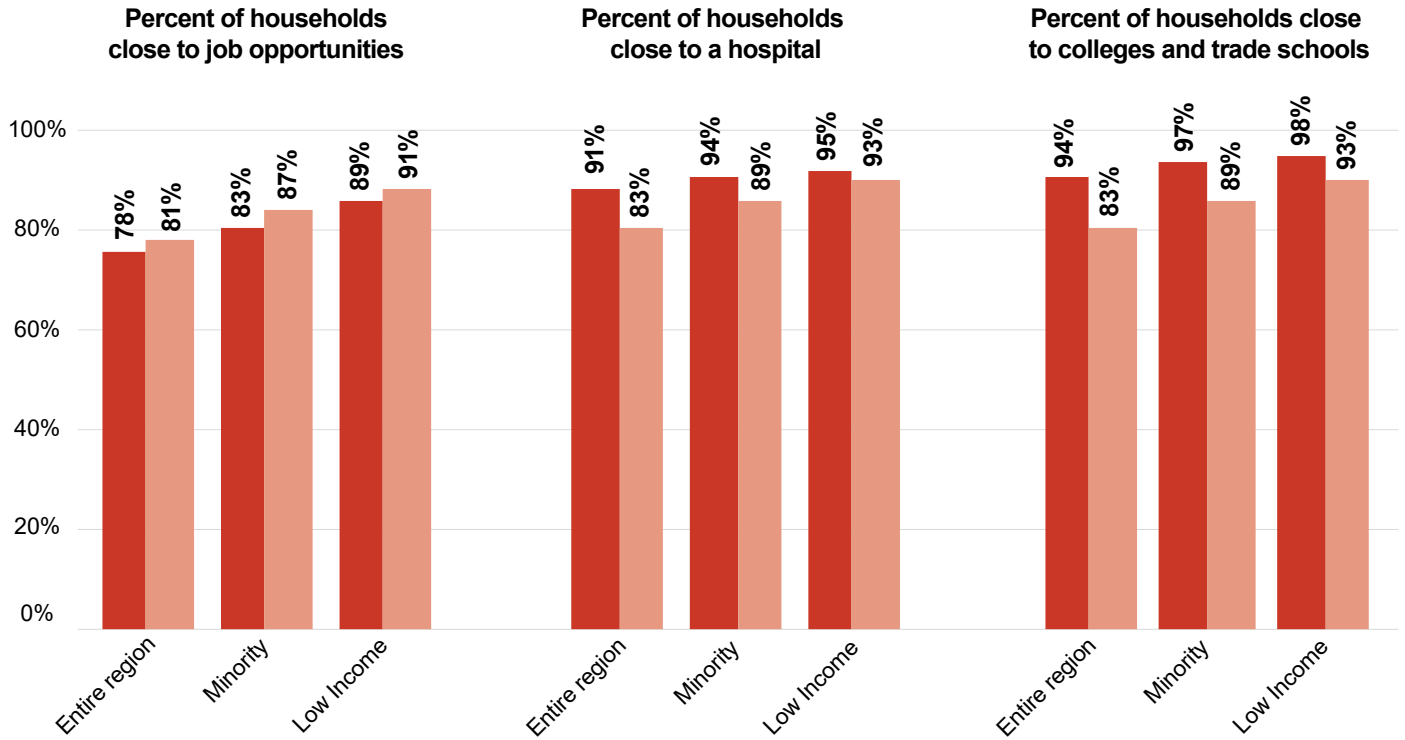
DRCOG conducted an evaluation that revealed several findings:

- Drive times generally increased between 2020 and 2050, but by a smaller amount for vulnerable population groups.
- A large share of the overall region has convenient access to colleges, hospitals and grocery stores.
- Minority and low-income populations generally live closer to the central business district.

- Minority populations generally have longer travel times than low-income groups.

Overall, the travel times presented indicate the decisions reflected in the 2050 RTP don't negatively affect low-income and minority communities more than others. The model demonstrates that a similar percentage of all population groups have access to the various destinations measured.

Percent of households close to key destinations (2020 peak)

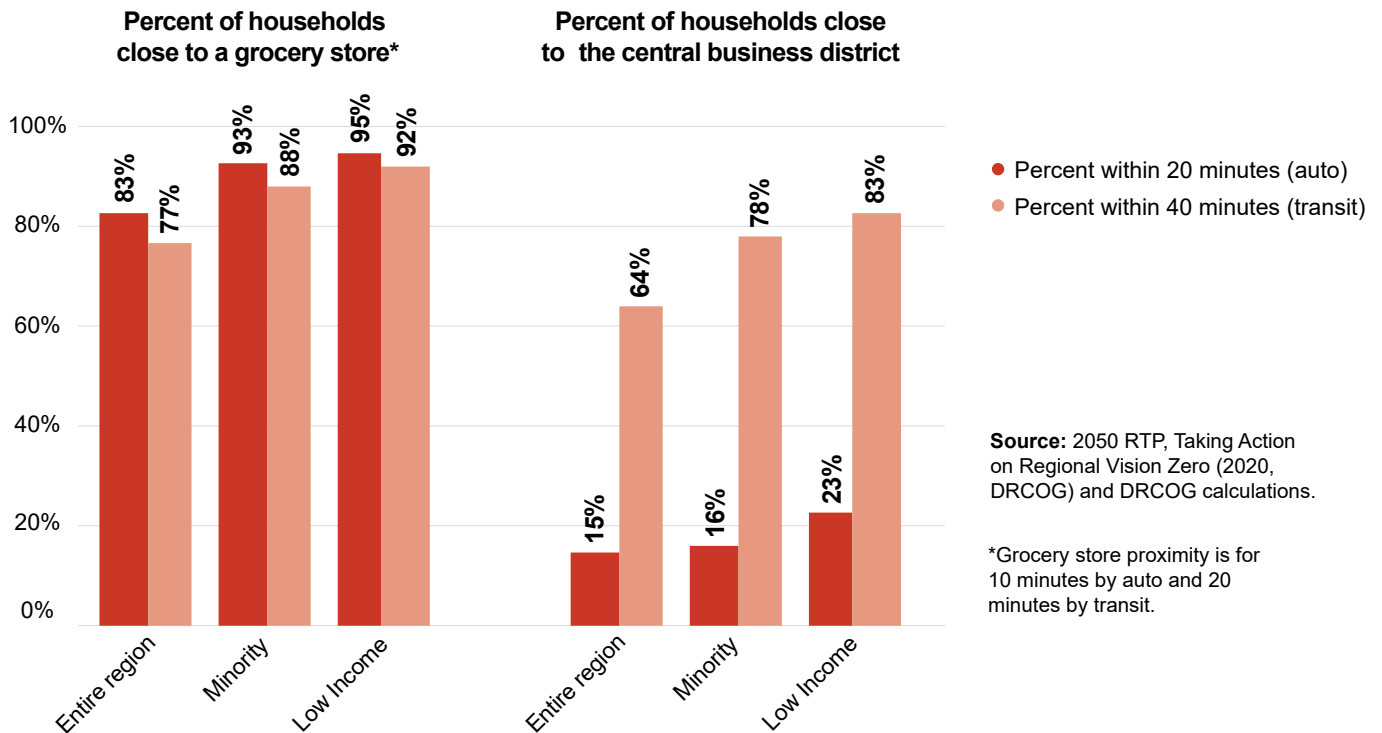
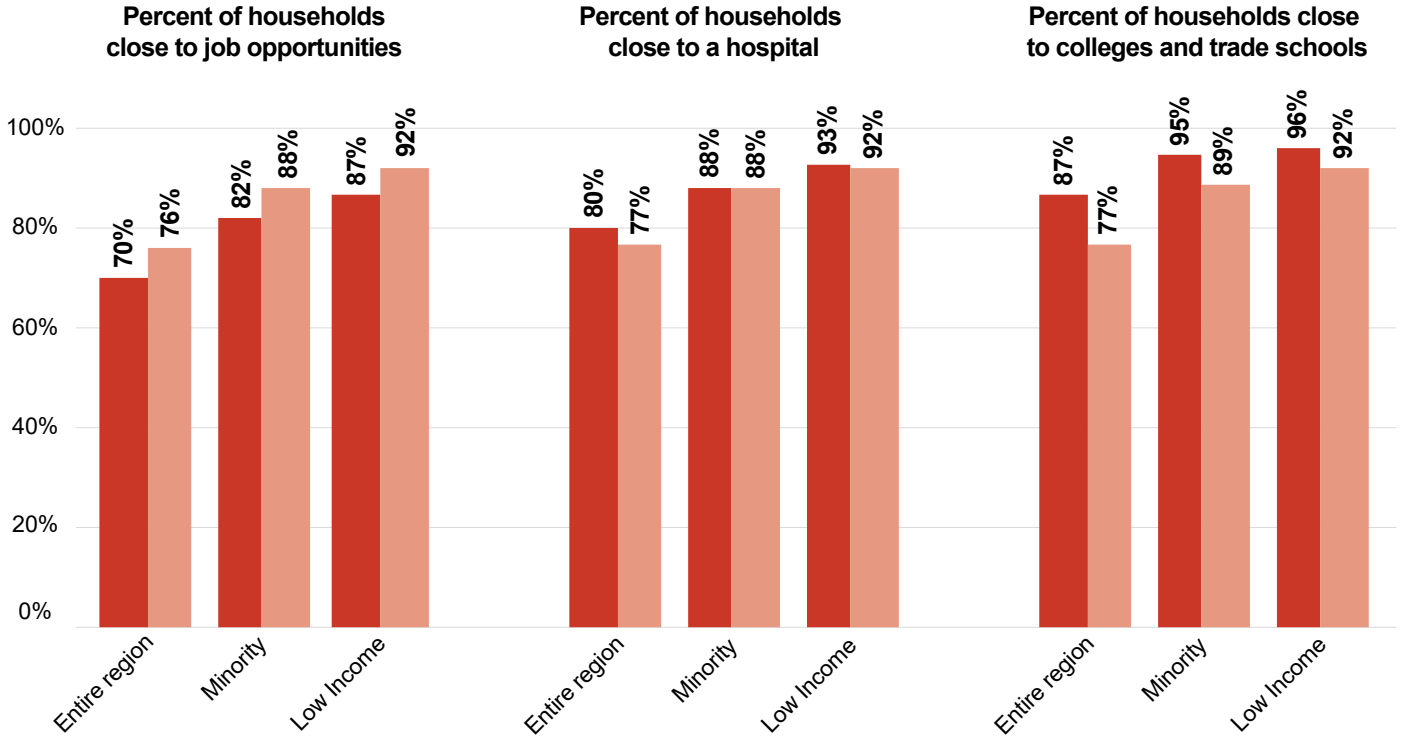


- Percent within 20 minutes (auto)
- Percent within 40 minutes (transit)

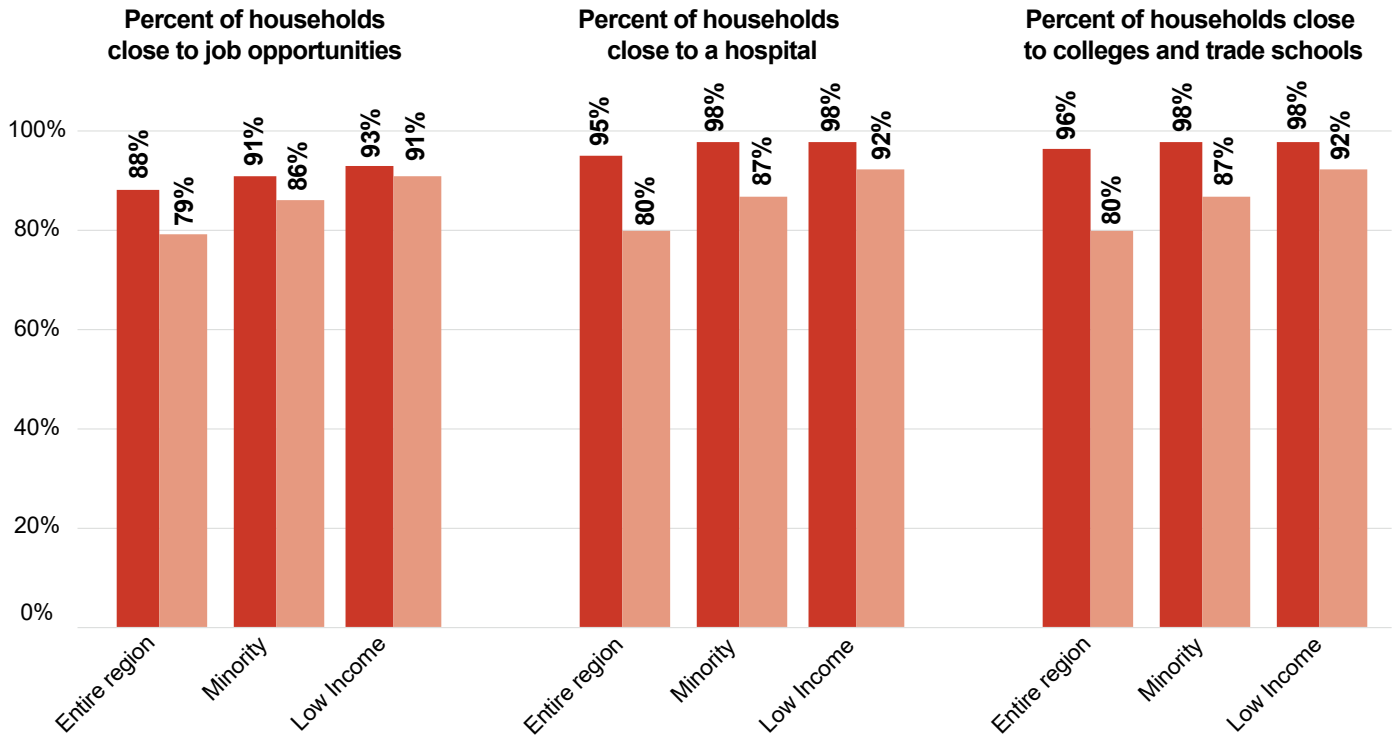
Source: 2050 RTP, Taking Action on Regional Vision Zero (2020, DRCOG) and DRCOG calculations.

*Grocery store proximity is for 10 minutes by auto and 20 minutes by transit.

Percent of households close to key destinations (2050 peak)



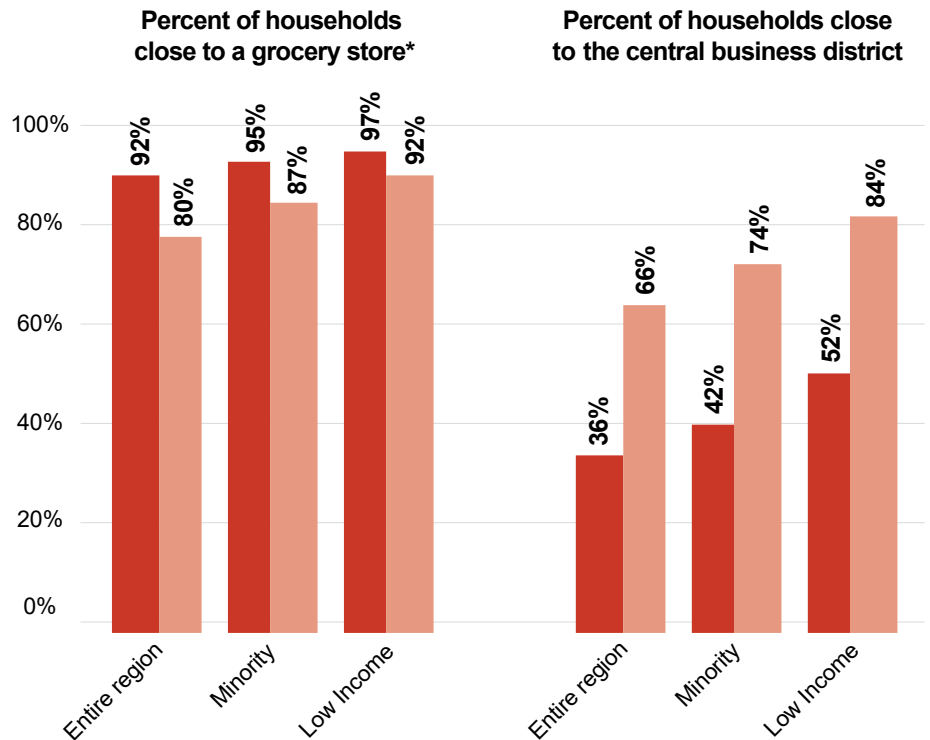
Percent of households close to key destinations (2020 off-peak)



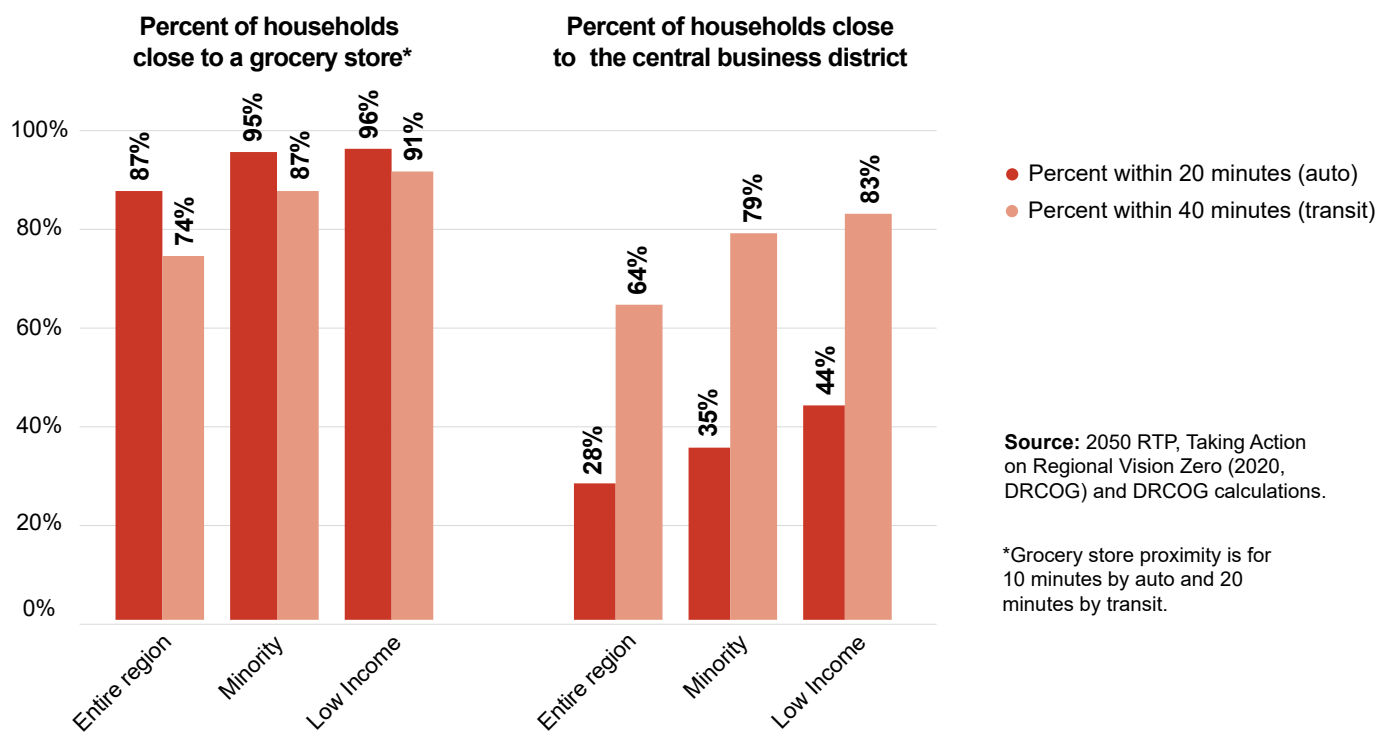
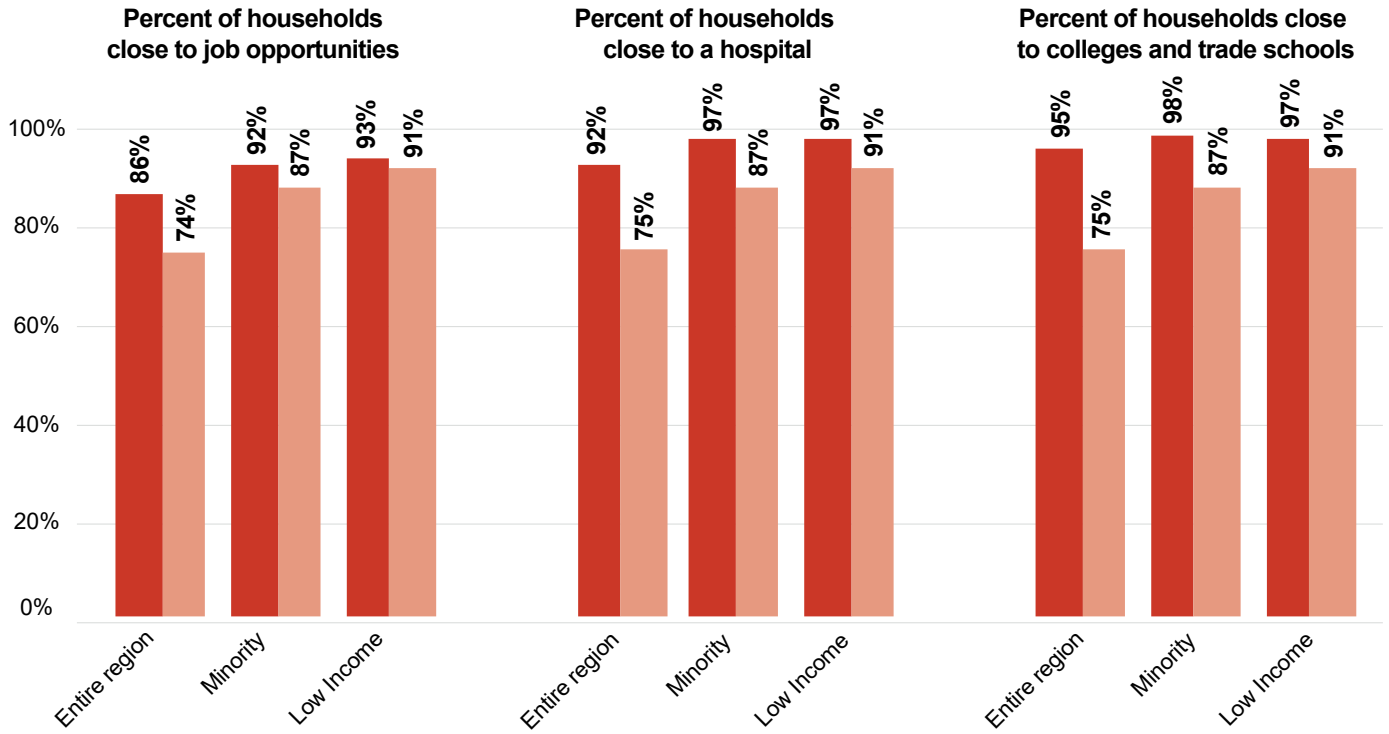
- Percent within 20 minutes (auto)
- Percent within 40 minutes (transit)

Source: 2050 RTP, Taking Action on Regional Vision Zero (2020, DRCOG) and DRCOG calculations.

*Grocery store proximity is for 10 minutes by auto and 20 minutes by transit.



Percent of households close to key destinations (2050 off-peak)



● Percent within 20 minutes (auto)
 ● Percent within 40 minutes (transit)

Source: 2050 RTP, Taking Action on Regional Vision Zero (2020, DRCOG) and DRCOG calculations.

*Grocery store proximity is for 10 minutes by auto and 20 minutes by transit.



Older adults, people with disabilities and people with low income often struggle to find affordable and accessible transportation options.

Travel characteristics of minority and low-income populations

DRCOG conducted an evaluation of the work travel characteristics of the Denver region’s minority and low-income populations based on census data, as shown in the figures that follow.

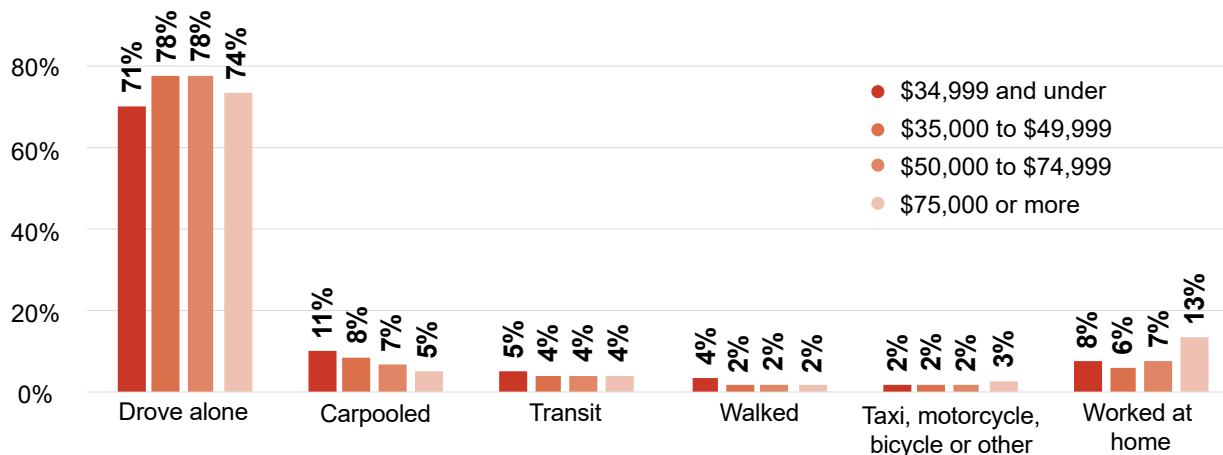
DRCOG conducted an evaluation that revealed several findings:

- Driving alone is the most prevalent travel mode for commuting to work by all races, ethnicities and income levels. More than 70% of the region’s population, of all races, ethnicities and income levels, drive alone to work.
- A greater share of minority and low-income populations take transit to work – about 5% compared to other population and income groups.

- Minority populations are twice as likely to take transit or carpool to work.
- Driving alone to work increases as income levels increase, but decreases at the highest income levels due to a correlation with teleworking rates.

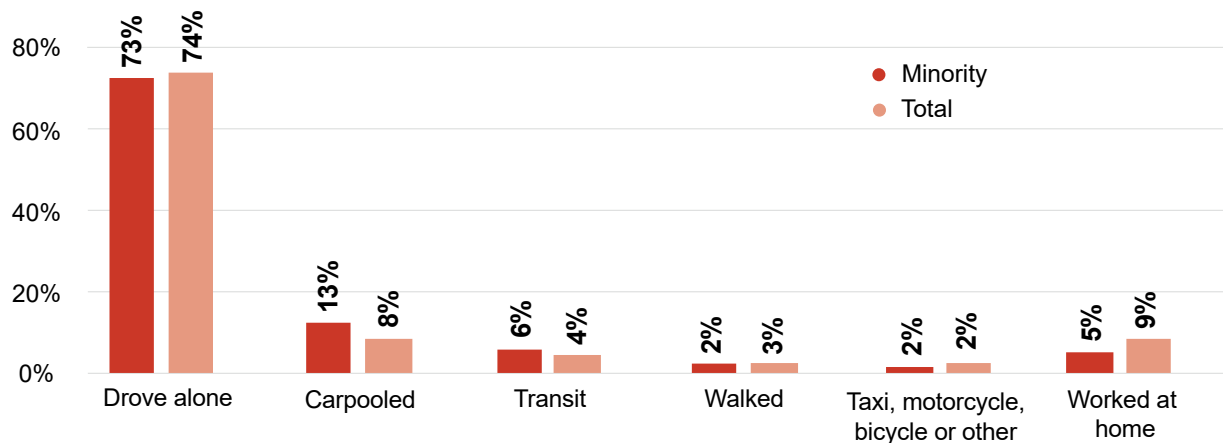
According to the U.S. Census Bureau’s 2015-2019 American Community Survey Five-Year Data, almost 70,000 households throughout the Denver region did not have an automobile available, whether by choice or circumstance. Travel options such as public transit, sidewalks and bicycle paths ensure that residents of households without automobiles can travel to work, school or medical care. Accordingly, the fiscally constrained 2050 RTP’s project and program investment strategies emphasize non-automobile modes.

Means of transportation to work by worker earnings



Source: Derived from American Community Survey 2015-2019 Five-Year Data, excluding the Weld County portion of the Denver region.

Means of transportation to work



Source: Derived from American Community Survey 2015-2019 Five-Year Data, excluding the Weld County portion of the Denver region.

Benefits of the 2050 RTP in environmental justice communities

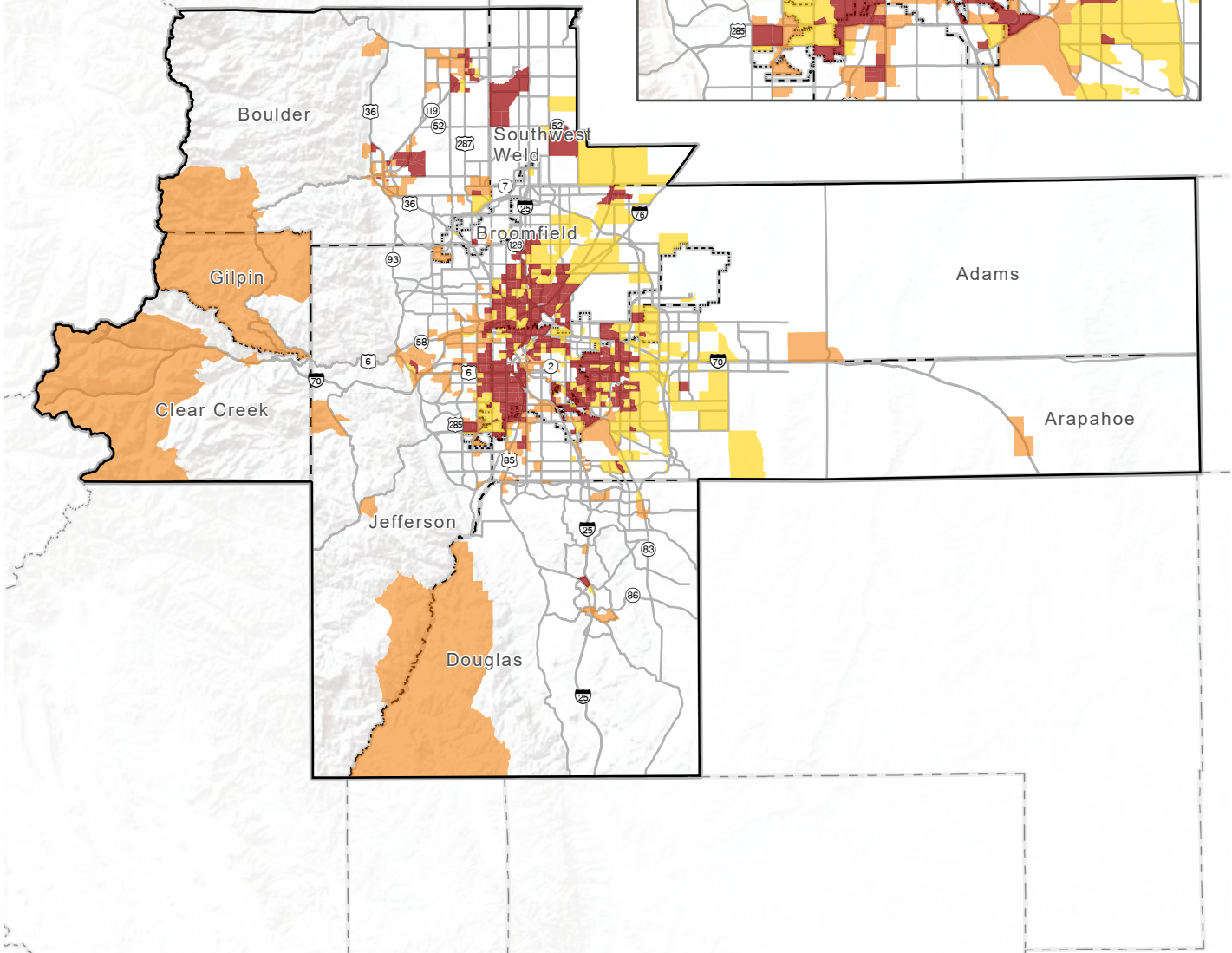
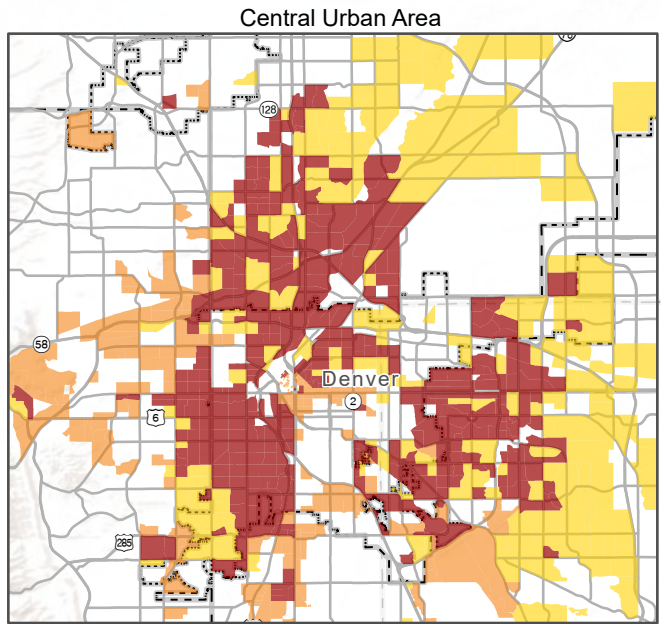
The 2050 RTP includes projects, services and other investments that will improve transportation for people living in environmental justice communities and especially for those unable to use an automobile to travel. The projects, services and other investments will also provide a system that offers people convenient commutes to a greater number of job opportunities.

Map 4.1 shows the region's environmental justice areas, while Map 4.2 shows the regionally funded 2050 RTP projects in geographic relation to the environmental justice areas. Any project, regardless of project type or mode, can have potential construction and implementation impacts. Similarly, any project can potentially provide travel and mobility benefits. Accordingly, the issue is not whether a particular project type is inherently "good" or "bad," but instead whether the potential benefits and impacts of the 2050 RTP

projects are reasonably distributed equitably across the region so that particular areas do not receive disproportionate impacts or benefits.

As shown in Map 4.2, several regionally funded 2050 RTP projects will benefit residents in environmental justice areas. Bus rapid transit, active transportation, safety, and other 2050 RTP projects will increase travel options and mobility for environmental justice communities. Other smaller-scale projects and services will be provided through future TIPs. Future roadway projects will include multimodal elements that will benefit nondrivers by providing walking and bicycling facilities and transit facilities and service. Further, as discussed in Chapter 3, more than half of the 2050 RTP's fiscally constrained regional system expenditures will be for public transit and other non-roadway projects and services.

Map 4.1: Environmental justice areas

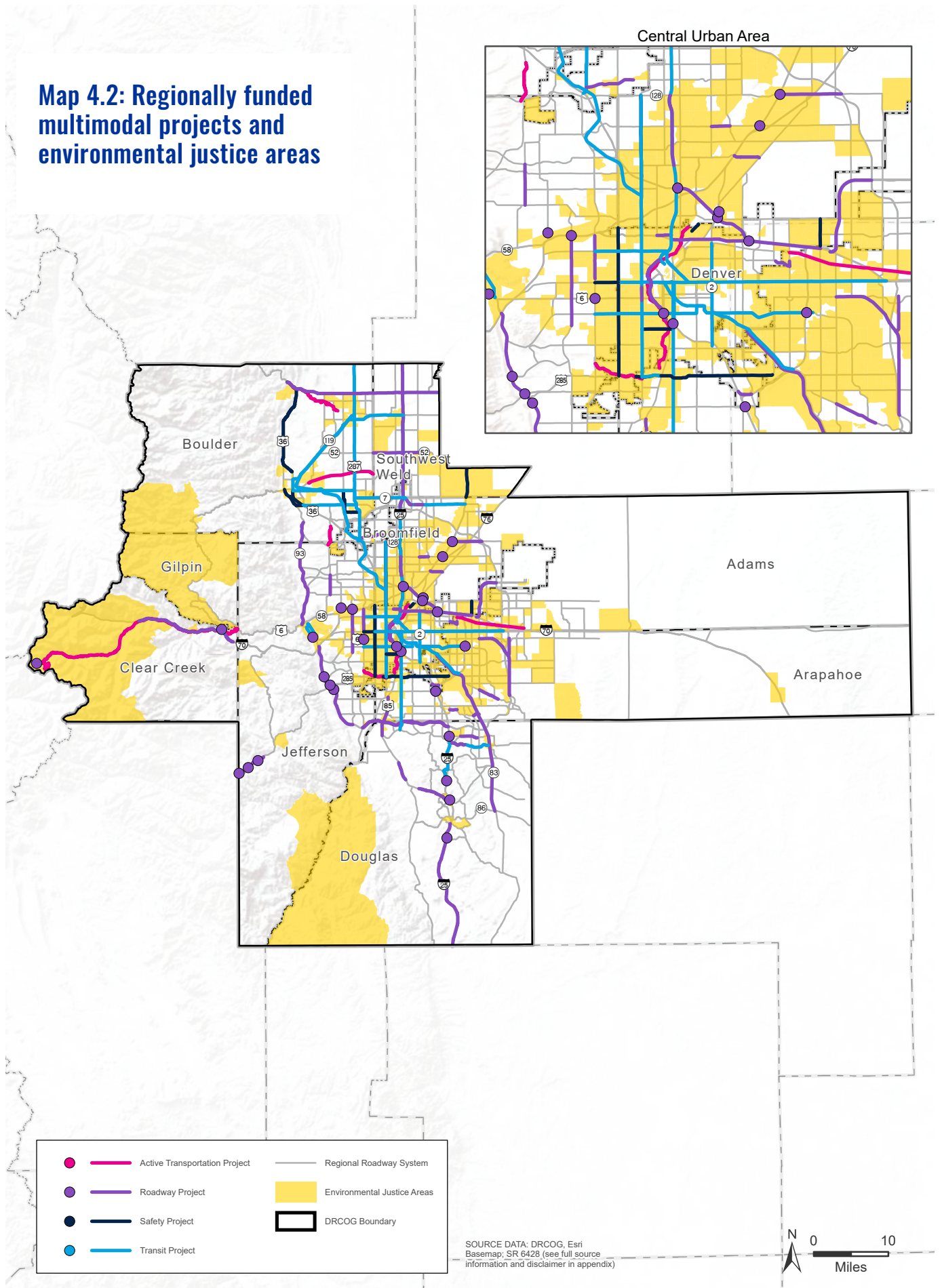


Regional Roadway System	County Boundaries
Minority EJ Areas	DRCOG Boundary
Low Income EJ Areas	
Minority & Low Income EJ Areas	

SOURCE DATA: DRCOG, Esri
 Basemap: SR 6428. (see full source information and disclaimer in appendix)

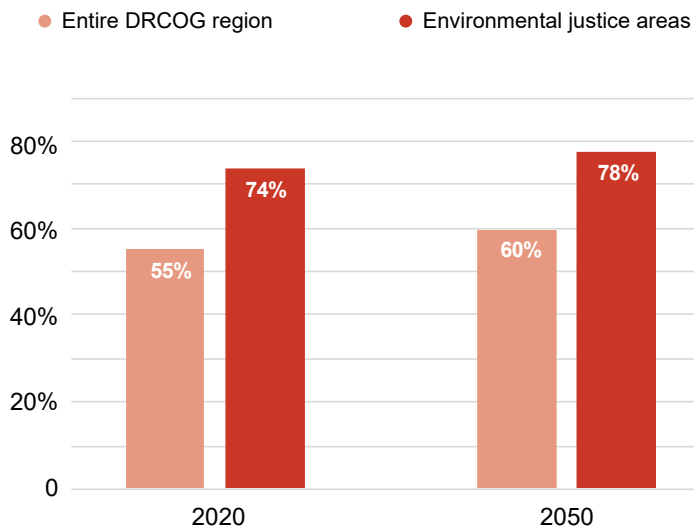


Map 4.2: Regionally funded multimodal projects and environmental justice areas



SOURCE DATA: DRCOG, Esri
 Basemap: SR 6428 (see full source
 information and disclaimer in appendix)

Share of households meeting transit-job accessibility criterion



Source: 2050 RTP, Taking Action on Regional Vision Zero (2020, DRCOG) and DRCOG calculations.

One significant equity measure is how the 2050 RTP's investments will help the region, and people in environmental justice areas, access jobs using transit. As shown, the 2050 RTP's investments will help increase accessibility to jobs using transit for the entire region as well as for people in environmental justice areas. The 2050 RTP also includes extensive additions to the bicycle and pedestrian system, expansion of transit service for vulnerable populations, and increased outreach by DRCOG's Way to Go program (a regional partnership providing commute options including carpool- and vanpool-matching). In addition to expanding commute options, the 2050 RTP's bicycle, pedestrian and transit investments will provide more transportation options for individuals with mobility challenges. Additionally, roadway capacity projects that reduce congestion will benefit all people who travel by car to work, including minority populations.

In addition to expanding the rapid transit system, the 2050 RTP provides more funding sources to serve the needs of individuals in low-income and minority populations. For example, projects within the 2050 RTP will be able to leverage Federal Transit Administration grant programs to provide potential benefits to environmental justice communities (although they do not specifically address minority populations). The grant programs allow, but do not require, expenditures toward developing transportation options for low-income individuals to access employment and job training. The grants also provide funding to increase transportation options for older adults and individuals with disabilities.

Potential effects of the fiscally constrained 2050 RTP in environmental justice communities

Based on the analyses described above, the investments in the fiscally constrained 2050 RTP do not negatively affect low-income and minority populations more than others. Negative potential project effects inherent in today's transportation system such as air pollution, excessive noise and crashes may occur throughout the region. Additionally, impacts to accessibility and mobility as measured by travel times are projected to be felt less by minority and low-income populations than the entire region in 2050.

Other environmental justice considerations

Identifying and analyzing low-income and minority areas captures only a portion of vulnerable populations within the Denver region. Based on a nationwide review of environmental justice best practices, DRCOG also conducted a population-based analysis for groups other than minority and low-income people, including:

- Adults older than 65.
- Children age 5-17.
- Households with no vehicle.
- Households that speak limited or no English.
- Households with at least one person with a disability.

Please refer to [Appendix D](#) for information about the population-based analysis.

Environmental mitigation measures

The Denver region includes a variety of environmental and ecological resources. Residents and visitors use an extensive array of municipal, county, state and federal parks and lands. A comprehensive shared-use path network serves bicyclists and pedestrians across the region. Extensive wildlife habitat for species of special concern (as designated by Colorado Parks and Wildlife) and federally protected threatened and endangered species are spread across the region, along with archaeological and historic resources. Protecting the environment is a core value of all stakeholders involved in the transportation planning process, from the federal government to local jurisdictions. A primary objective for DRCOG and its partners in developing the region's multimodal transportation system is to mitigate effects on the environment from implementing transportation projects.

[Appendix O](#) contains a series of maps illustrating numerous aspects of the Denver region's natural, environmental and ecological resources and features. Identifying environmental resources and features at a regional scale provides perspective and context for the scope of the 2050 RTP, but is not intended to address National Environmental Policy Act requirements that apply to the project development process.

In addition to identifying environmental resources potentially affected by the 2050 RTP, project and program sponsors will develop mitigation activities for natural and historic resources in consultation with federal, state and tribal wildlife, land management and regulatory agencies. It is longstanding practice in the Denver region to streamline the transportation planning and National Environmental Policy Act processes, reduce the duplication of work and expedite the delivery of transportation projects, while still following stringent guidance to protect the region's environment.

The following mitigation strategy applies to all resources in all corridors:

- 1) Avoidance: Alter the project to avoid negatively affecting environmental resources.
- 2) Minimization: Modify the project to reduce the severity of the effect.
- 3) Mitigation: Alleviate or offset a negative effect or replace an appropriated resource.

Specific mitigation strategies are developed as part of the National Environmental Policy Act environmental review process during project development activities. Many regionally significant projects identified in the 2050 RTP are conceptual in nature, with exact alignment, design and other project scope elements yet to be determined in the project development process. For many projects, the development process may not occur for years, or even decades. Project development studies define mitigation, minimization or abatement strategies that address the following example environmental topics:

- Noise levels.
- Right-of-way and property takings.
- Water quality.
- Parks.
- Site-specific air quality.
- Fish and wildlife.
- Social, community and economic impacts.
- Wetlands.
- Hazardous materials.

In addition to those that are conceptual in nature, many corridors in the region are the sites of proposed improvements that have either recently completed or for which the National Environmental Policy Act process is underway. Implementing agencies such as the CDOT and RTD lead development of National Environmental Policy Act studies and facilitate extensive coordination and consultation with resource and regulatory agencies. Documents developed during the study process contain detailed mitigation strategies.

DRCOG serves on technical committees and review draft project-level National Environmental Policy Act documents associated with the development process for specific projects and corridors. While it is the project sponsor's role to ensure compliance with all federal requirements, DRCOG reviews National Environmental Policy Act documents to ensure consistency — or a lack of conflicts with — the 2050 RTP and other DRCOG plans and programs. DRCOG also participates in CDOT's Transportation Environmental Resource Council, a consortium through which federal, state and local agencies plan for environmental stewardship in the transportation planning process.

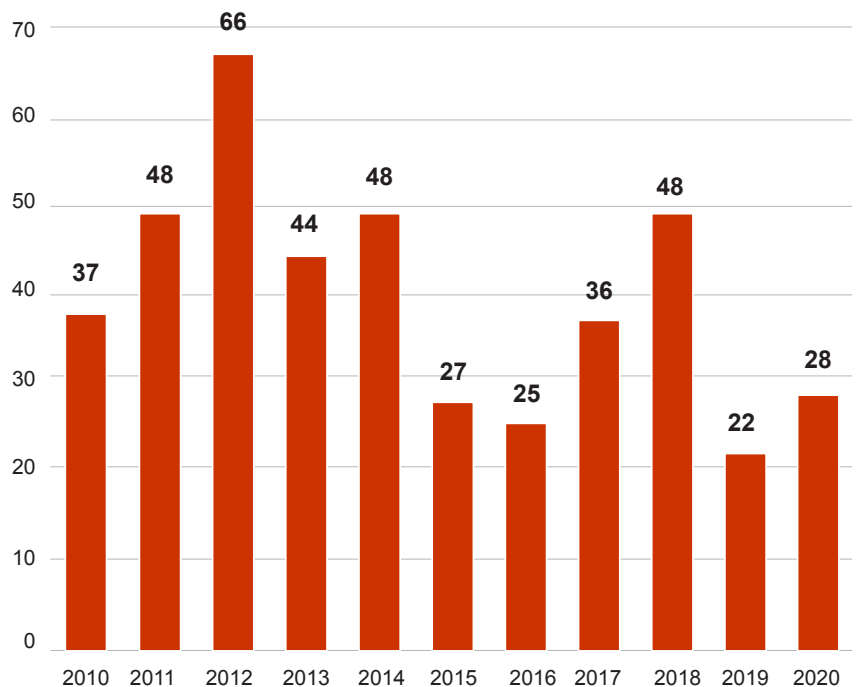
Environmental challenges

Emissions from automobiles and trucks are a major contributor to regional air pollution and area-specific toxic emissions. Ground-level ozone is the most harmful pollutant in the Denver region. Breathing ozone can trigger health problems including reduced lung function and damaged lung tissue and can worsen bronchitis, emphysema and asthma. Ozone is formed primarily in the summertime when volatile organic compounds and nitrogen oxides, emitted from sources such as automobiles, power plants, lawn care equipment, and oil and gas extraction, mix and react in the presence of sunlight.

Despite an increase in population and vehicle miles traveled in the Denver region, the use of cleaner vehicles and fuels is reducing emissions from mobile sources (any pollution source that is not stationary, like automobiles or lawn mowers). Even with cleaner vehicles, increases in population and vehicle miles traveled will continue to affect air quality. Consequently, the region will continue its ongoing efforts to promote alternate modes of travel and pursue technological improvements and cleaner fuels. Electric vehicles powered by renewable energy sources will play a key role in reducing emissions in the future. In 2019, the Denver Metro/ North Front Range was designated as a serious nonattainment area for the 2008 federal ozone standard by the Environmental Protection

Agency. To meet the federal ozone standard, the Regional Air Quality Council, in partnership with the Colorado Department of Public Health and Environment, developed a State Implementation Plan to reduce ozone precursor emissions. The ozone plan identifies control measures and motor vehicle emissions budgets that the region must not exceed for air quality conformity. The total estimated emissions from mobile sources in all staging years must not exceed budgets. The results demonstrate that the fiscally constrained 2050 RTP will not result in pollution levels that exceed federal thresholds. Through the transportation conformity process, DRCOG ensures the region's trajectory is toward clean air and minimizing bad air quality days. Documentation supporting transportation conformity is in [Appendix S](#).

Number of days per year exceeding the federal ozone standard

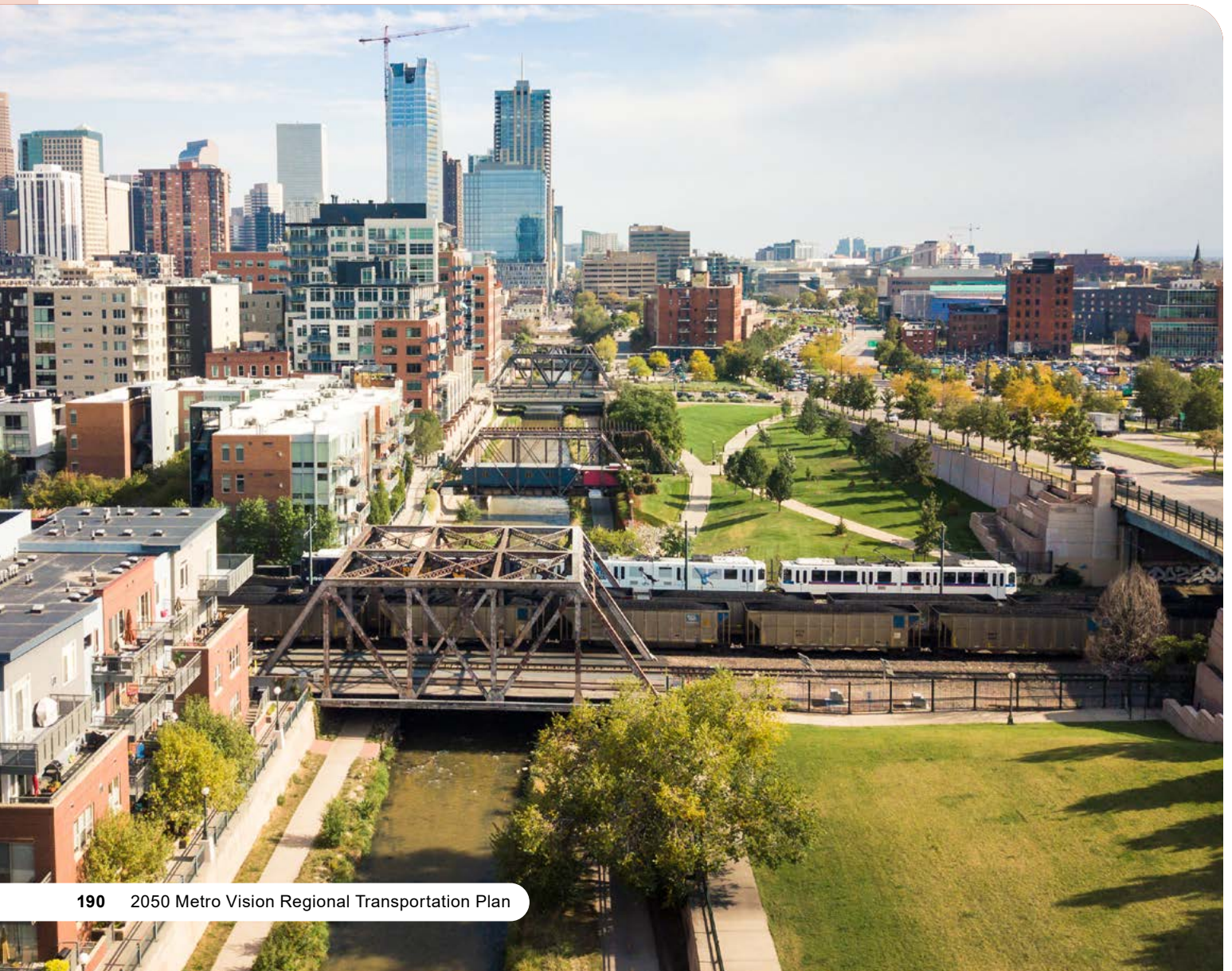


Conclusion

The 2050 RTP sets the vision for the Denver region's multimodal transportation system and guides investment in the projects and programs to achieve that vision. The 2050 RTP also reflects a collaborative and innovative approach to address the region's priorities. DRCOG's local governments and the region's transportation

planning partners will continue to work together until 2050 – and beyond – to strengthen the region's multimodal transportation system to improve safety and mobility, protect the environment and contribute to the region's desirable quality of life.

As the Denver region continues to grow, the 2050 RTP's investment strategies will help enhance quality of life for residents and visitors into the second half of the 21st century.



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