



Roadway users spent 350,000 extra hours in traffic on an average weekday in 2019. **Photo by 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:

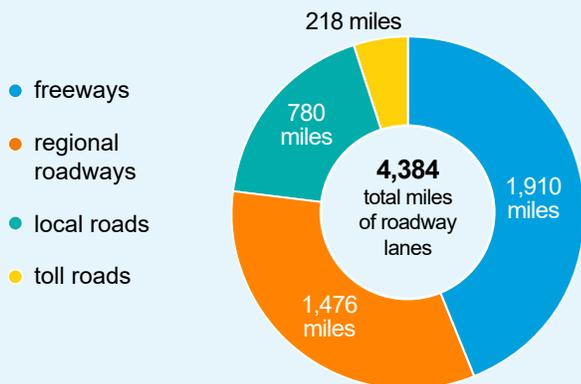
- Traffic-related deaths and serious injuries are a public health epidemic and social equity issue in the Denver region, which may be improved by implementing Vision Zero and developing local safety plans across the Denver region to eliminate fatal and serious-injury crashes.
- Throughout the region, 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

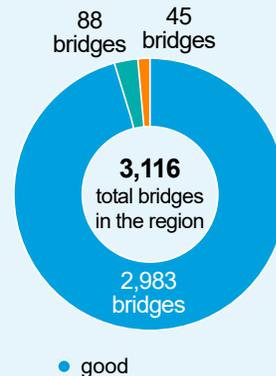


How well is the system being maintained?

Roadway conditions



Bridge conditions

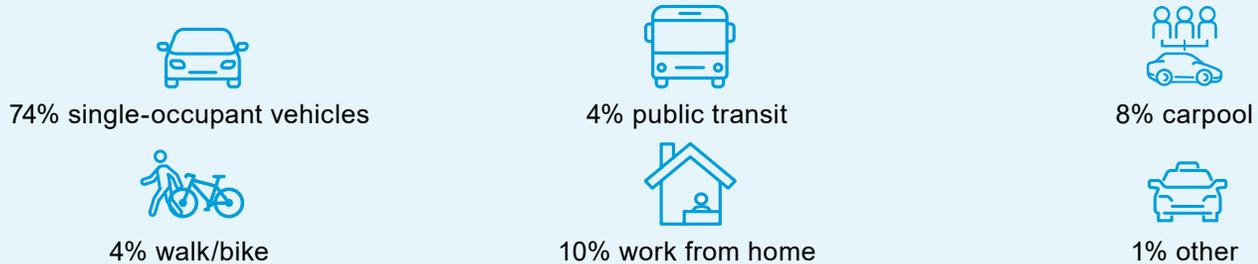


- Innovation in transportation technology is expected to touch all aspects of the system, from the introduction of ride-hailing and shared micromobility to automated shuttles and electric vehicles to implementation of intelligent transportation systems and the widespread adoption of connected vehicles 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.

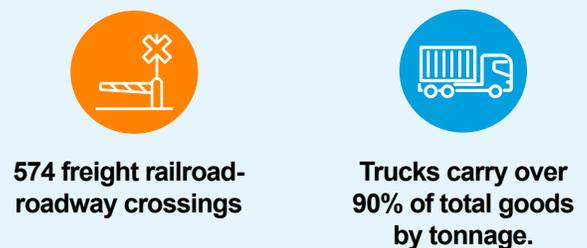
Which modes do people use to get to work?



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

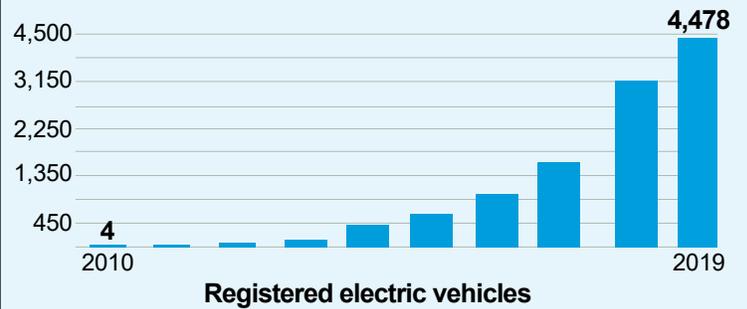


● bus ● light rail ● commuter rail

How safe are the region's streets?



How's the region using electric vehicles?



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.

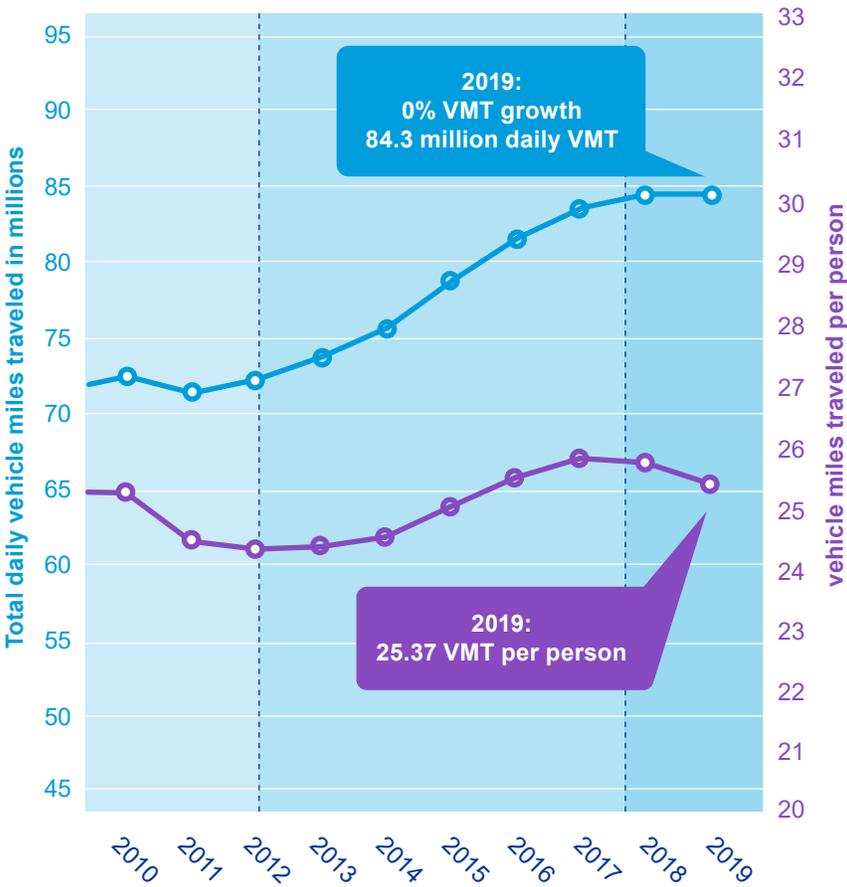


Regional Roadway System

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 are the most dynamic, often serving 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 per person (2010-2019)



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

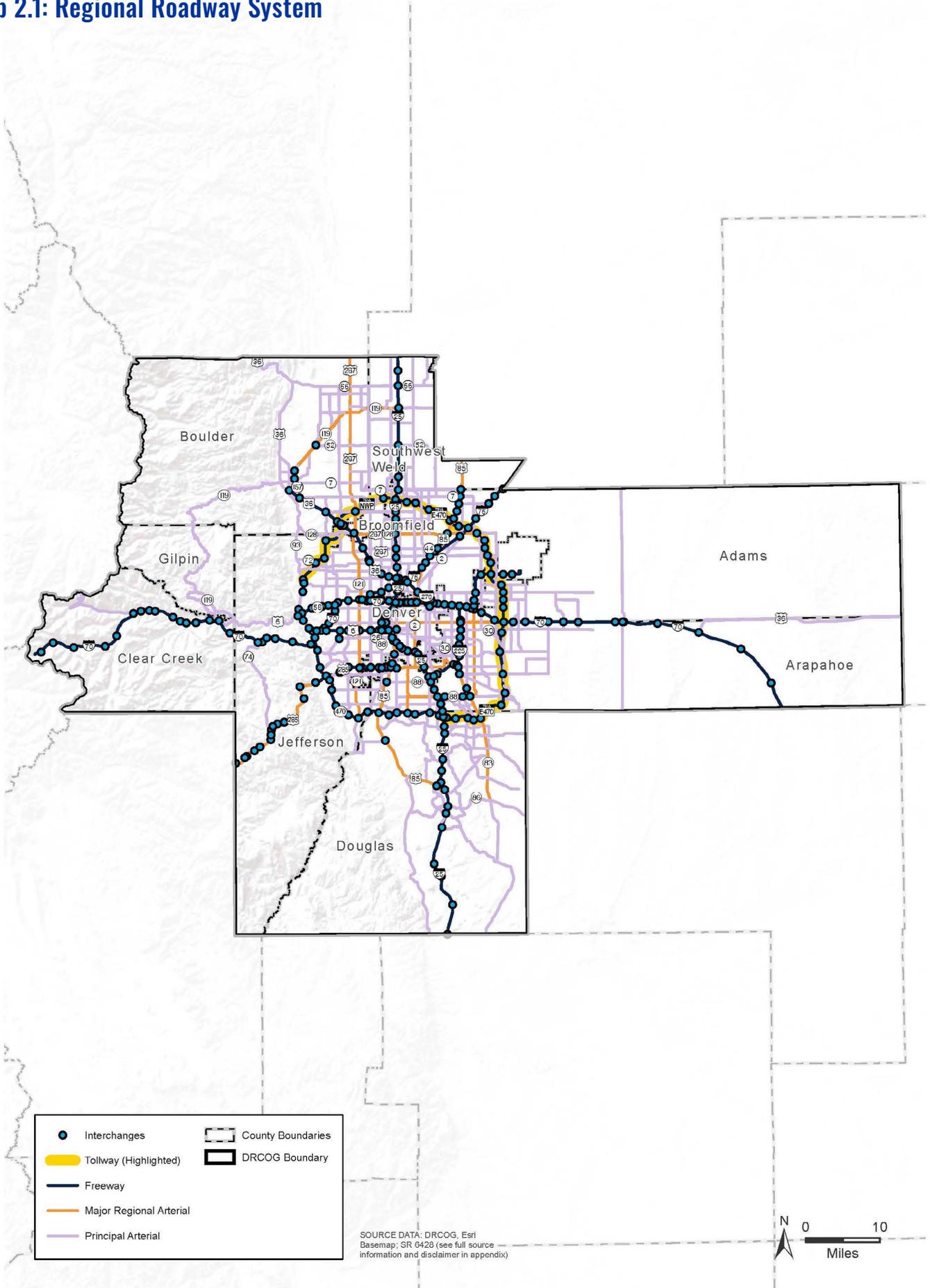


The roadway system Denver residents and visitors know today has evolved over centuries. At the turn of the 20th century, 17th Street in Denver was used by pedestrians, bicyclists and the Denver Tramway. **Photo credit: Courtesy of the Library of Congress, Copyright 1906 by E. W. Kelley, LC-DIG-stereo-1s11060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

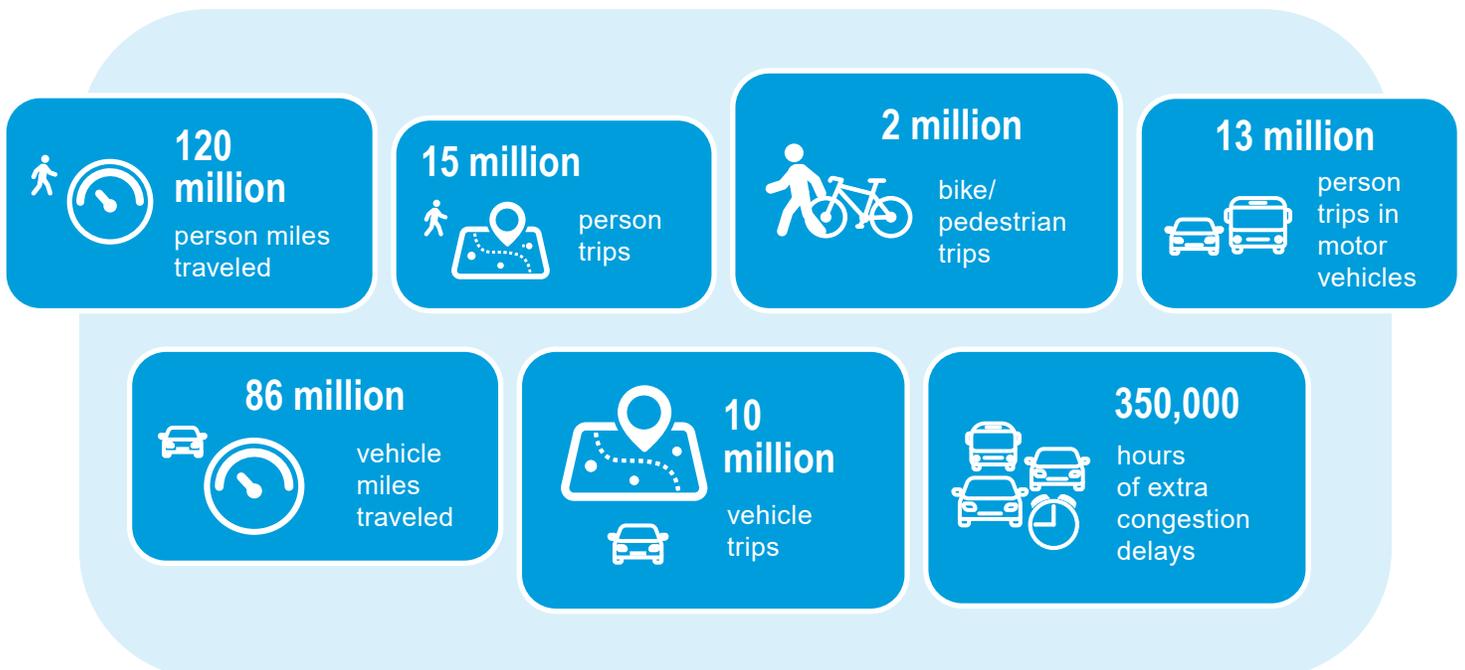
The number of people and vehicles on the road network has increased with population and employment growth. Congestion occurs when the number of vehicles exceed the carrying capacity on limited roadway space, often concentrated during the peak travel periods of the day. While traffic congestion may be 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.

How is the region's 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 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 rapid transit on several corridors. Bus rapid transit enables 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 envisions a future expansion of the bus rapid transit system to provide better service to more people.

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 among 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

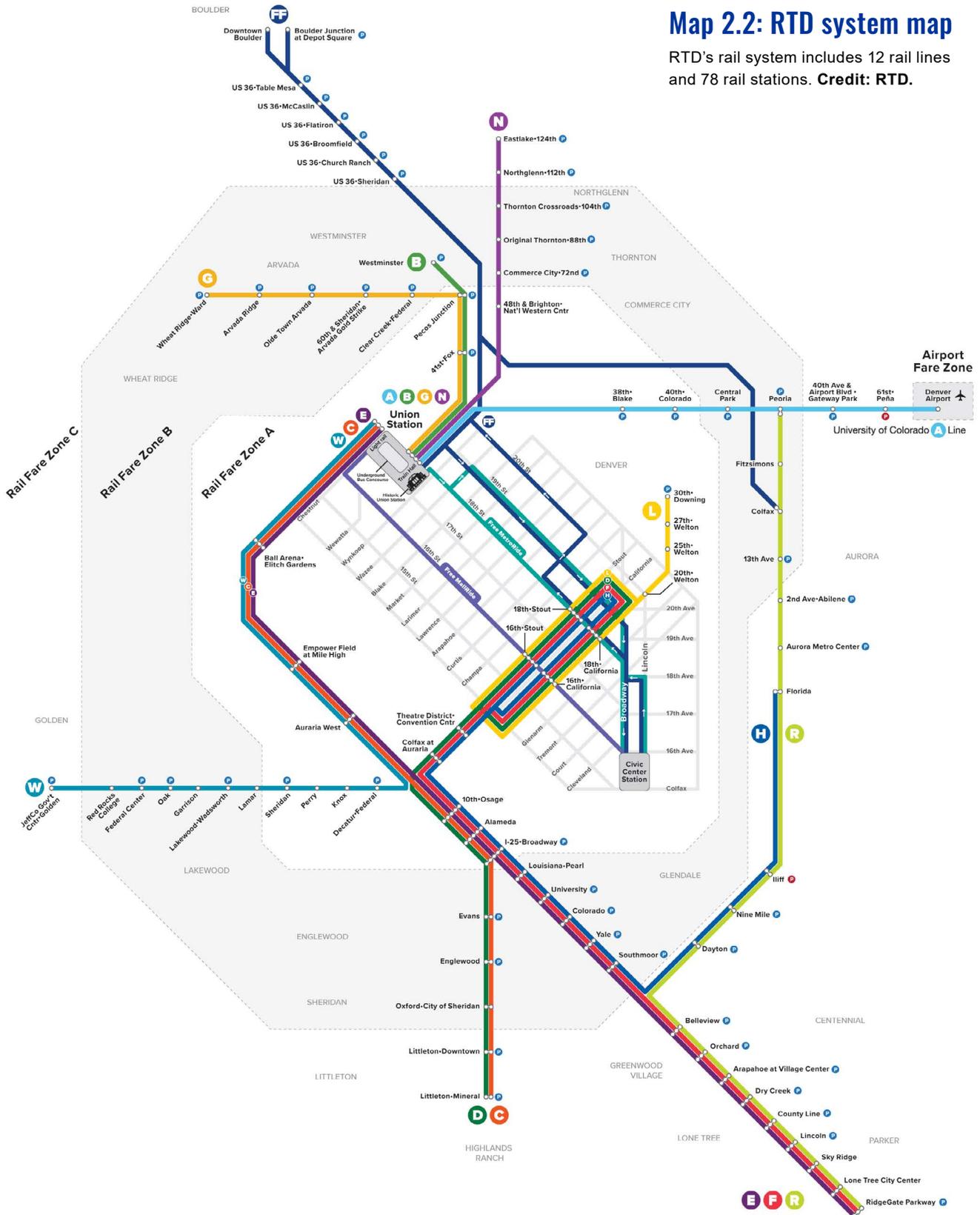
Human service transportation includes specialized services for older adults and individuals with disabilities. It can also include services for people with lower incomes, offered in areas where there are limited or no fixed-route services. Major providers of human service transportation in the Denver 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 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. 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.



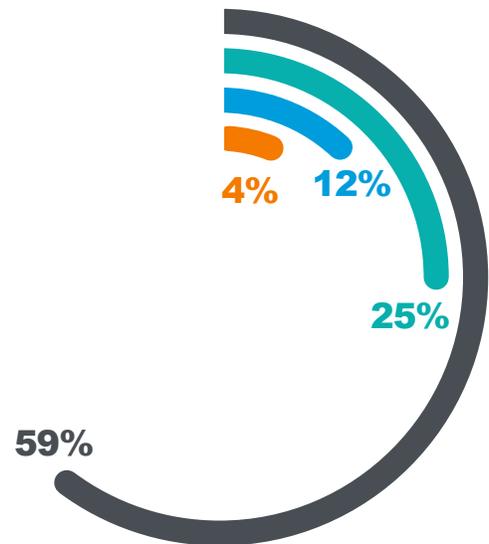
Among the bicycle facilities in the region are on- and off-street lanes and paths. **Photo credit: DRCOG.**

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: DRCOG.**

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. It's difficult for large numbers of people or people who use wheelchairs 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. Pedestrian facilities include infrastructure like crosswalks, pedestrian islands, intersection improvements 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 high-comfort facilities

One of the most essential elements in attracting more people to walking and bicycling is a high-comfort or low-stress 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.

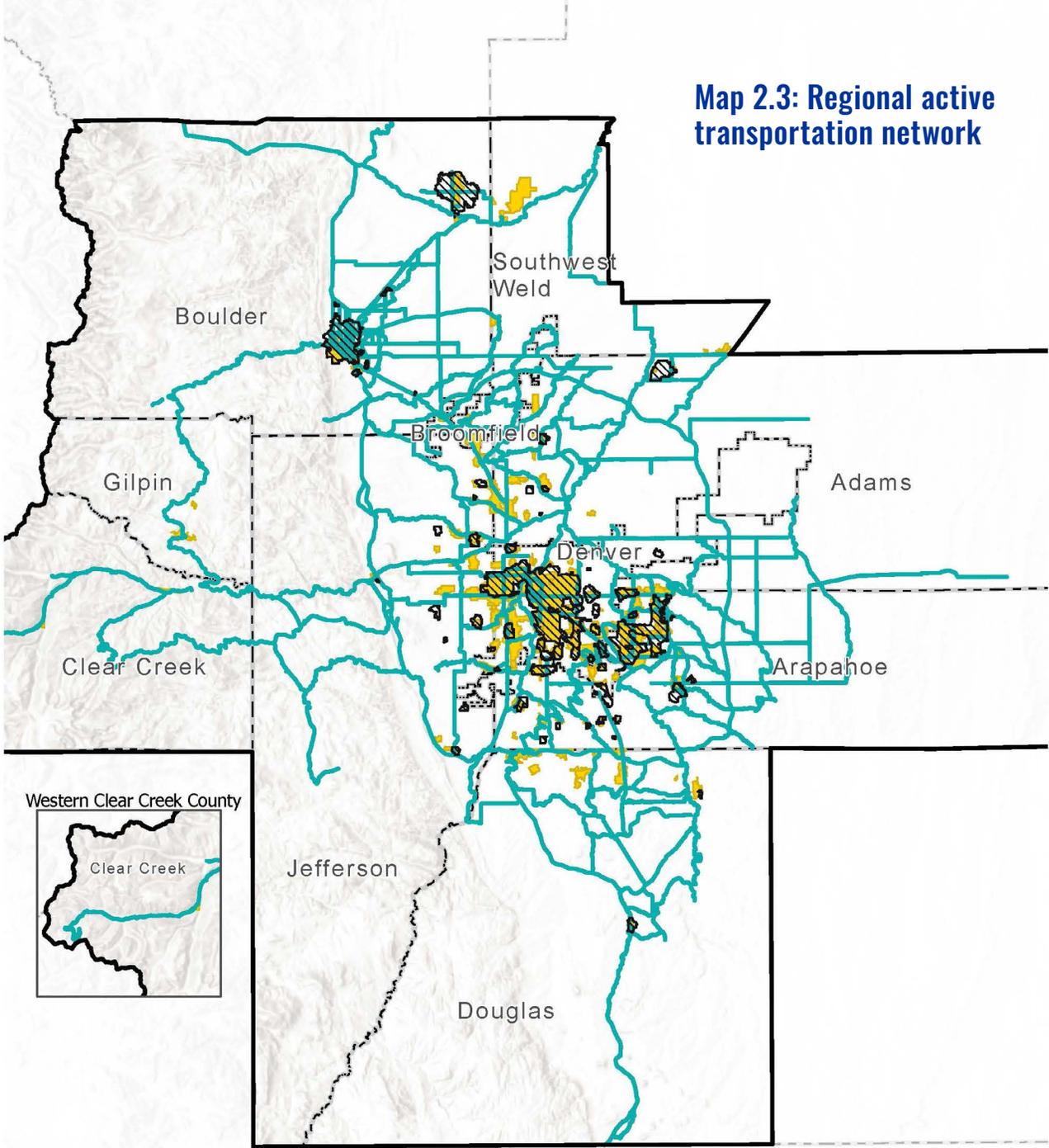
Connecting the active transportation network

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 low-stress 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



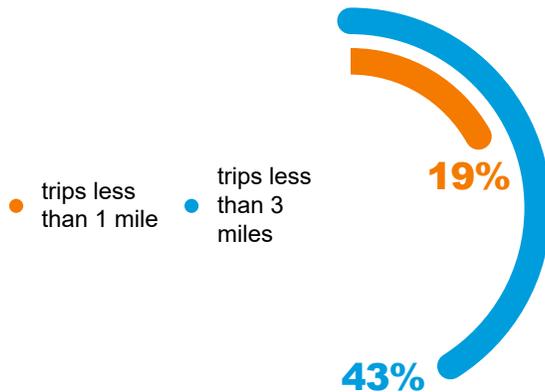
 Active Transportation Corridors	 County Boundaries
 Short Trip Opportunity Zones	 DRCOG Boundary
 Pedestrian Focus Areas	

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 routine 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.

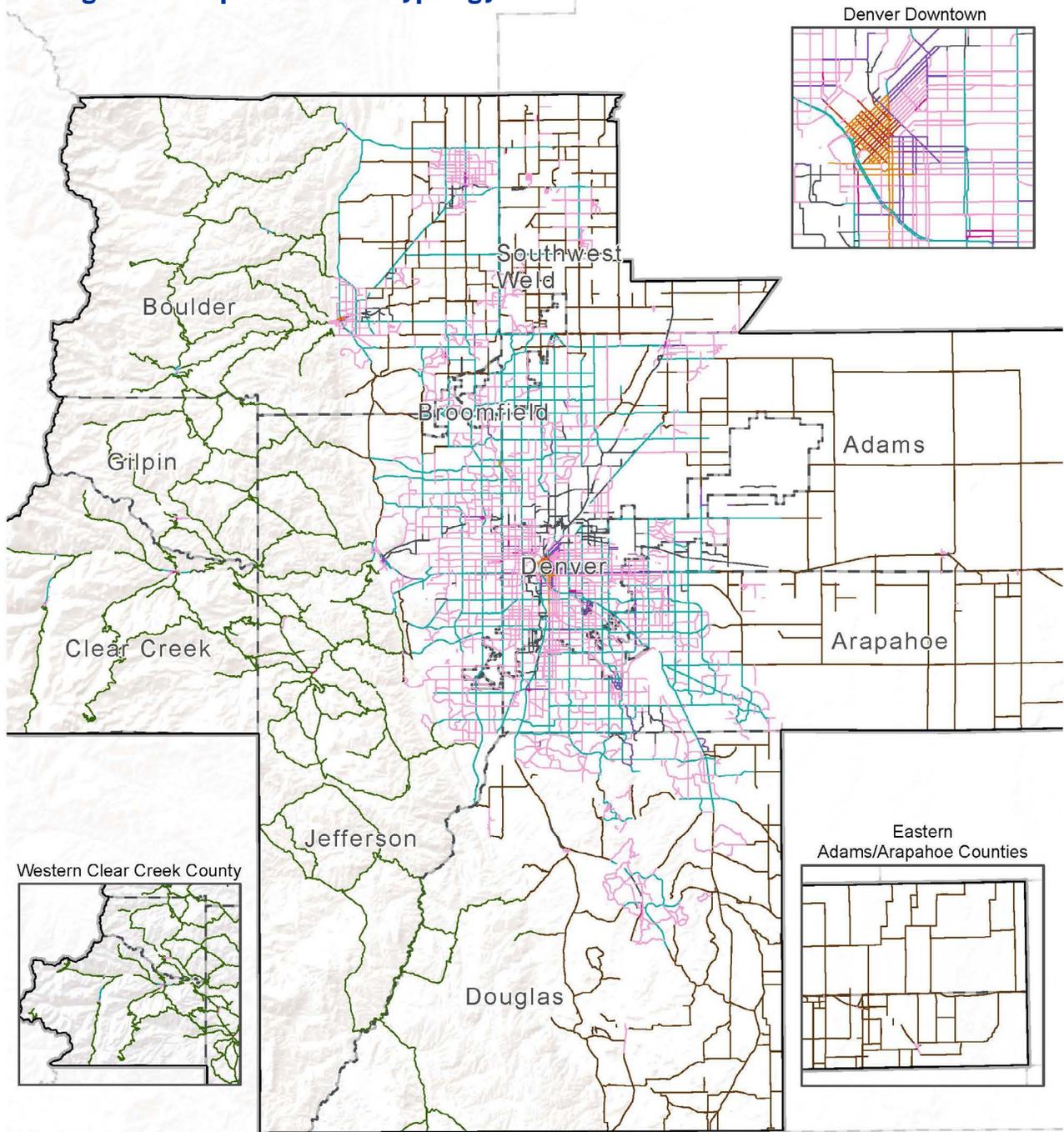
Included in the regional Complete Streets Toolkit are street typologies. The typologies were created based on existing and future streets in the Denver region, available data and stakeholder feedback. The typologies were applied across the area's roadways and highlighted opportunities for regional connections 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 is infrastructure and amenities that support active transportation. Examples of active transportation supportive infrastructure include separated and protected bicycle facilities; pedestrian shelters at transit stops; 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 car 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



- | | |
|-------------------------------|-------------------|
| Downtown Commercial Street | Industrial Street |
| Downtown Mixed Use Street | Rural Road |
| Neighborhood Main Street | Mountain Road |
| Mixed Use Street | County Boundaries |
| Regional Connector Street | DRCOG Boundary |
| Neighborhood Connector Street | |

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





Transportation demand management

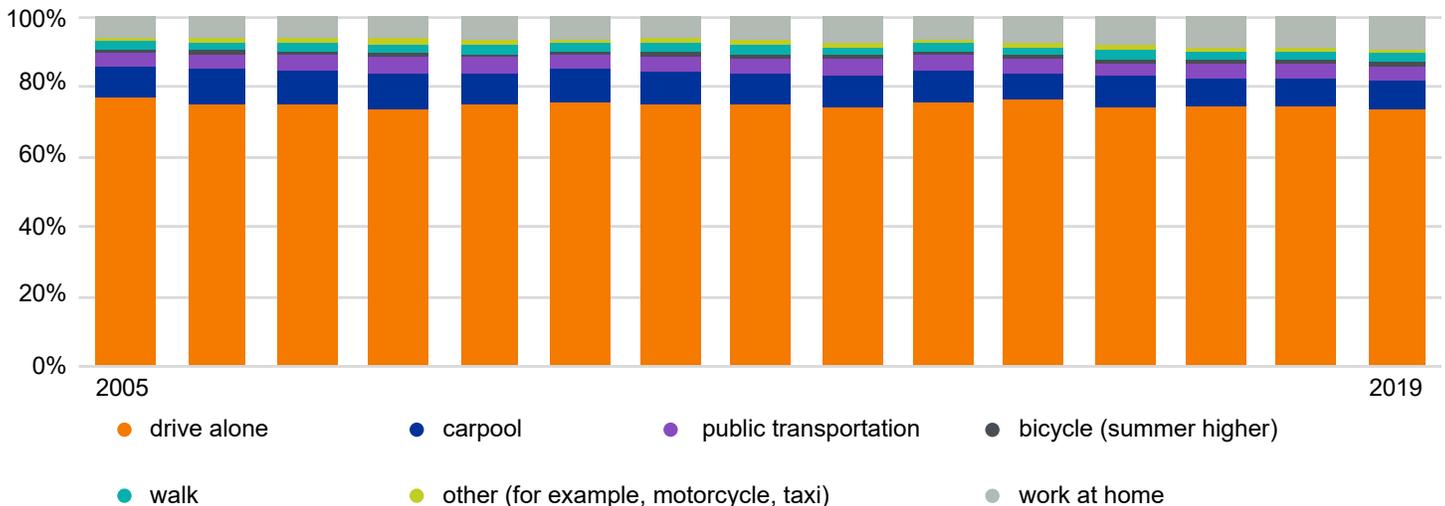
Strategies to promote and facilitate travel options to reduce the demand for motor vehicle travel, particularly single-occupant vehicle travel during peak periods, are sometimes referred to as transportation demand management. Such travel choices include carpooling, vanpooling, transit, bicycling and 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:

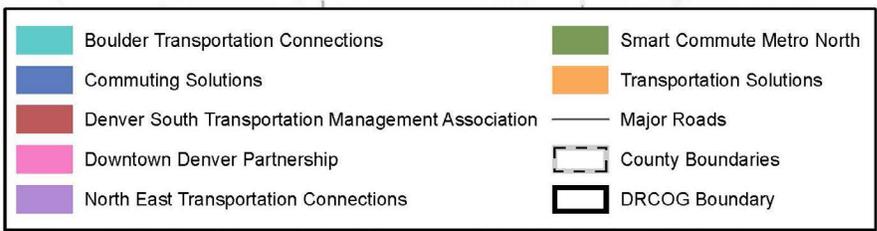
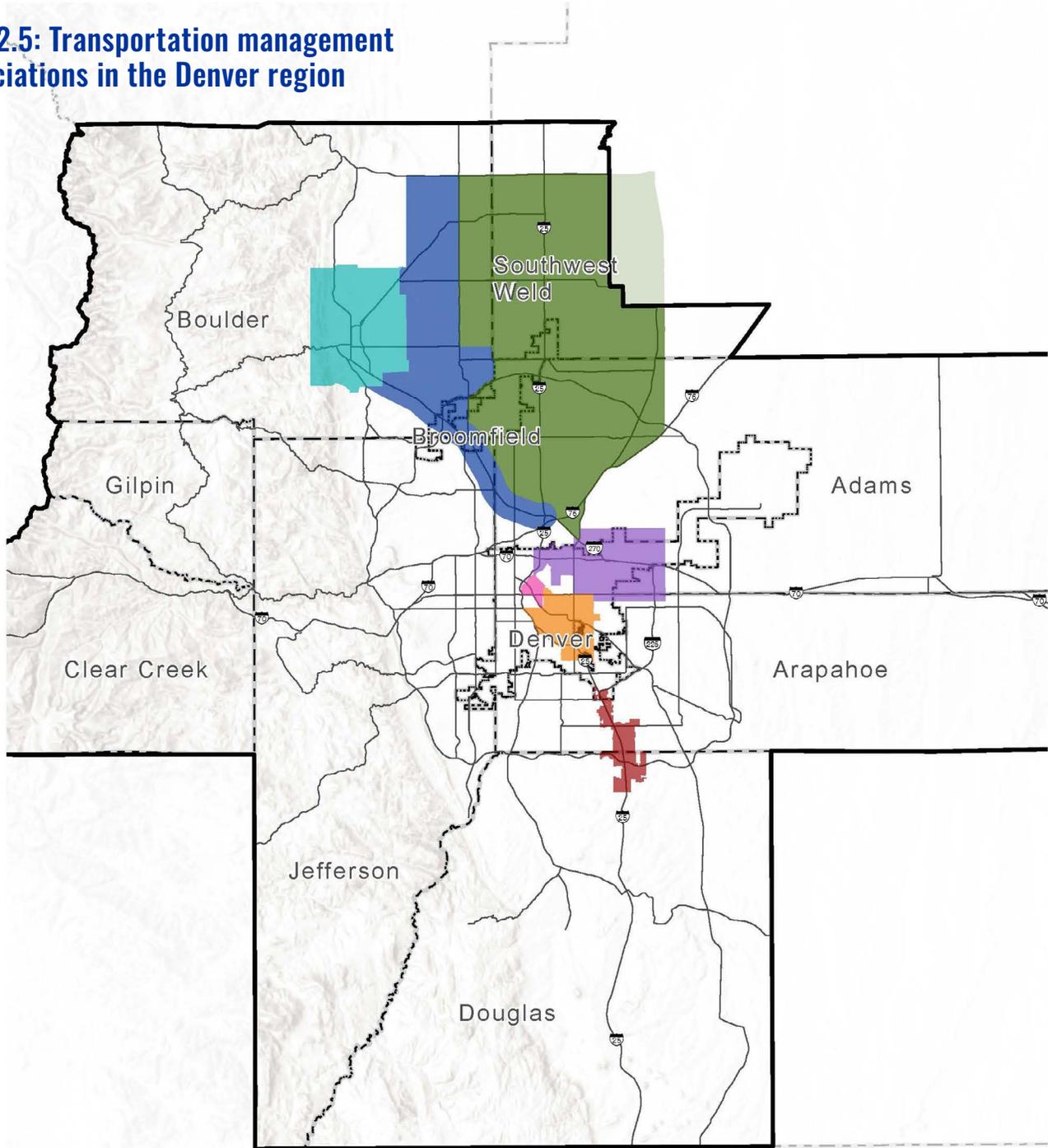
- Employer and community outreach.
- Regional marketing campaigns as well as local promotion of commute options in each corridor or respective area.
- Facilitating commute options and connections through the MyWayToGo trip-planning platform.
- Offering Guaranteed Ride Home services.

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: Transportation management associations in the Denver region



SOURCE DATA: DRCOG, Esri
 Basemap: SR 5429 (see full source information and disclaimer in appendix)

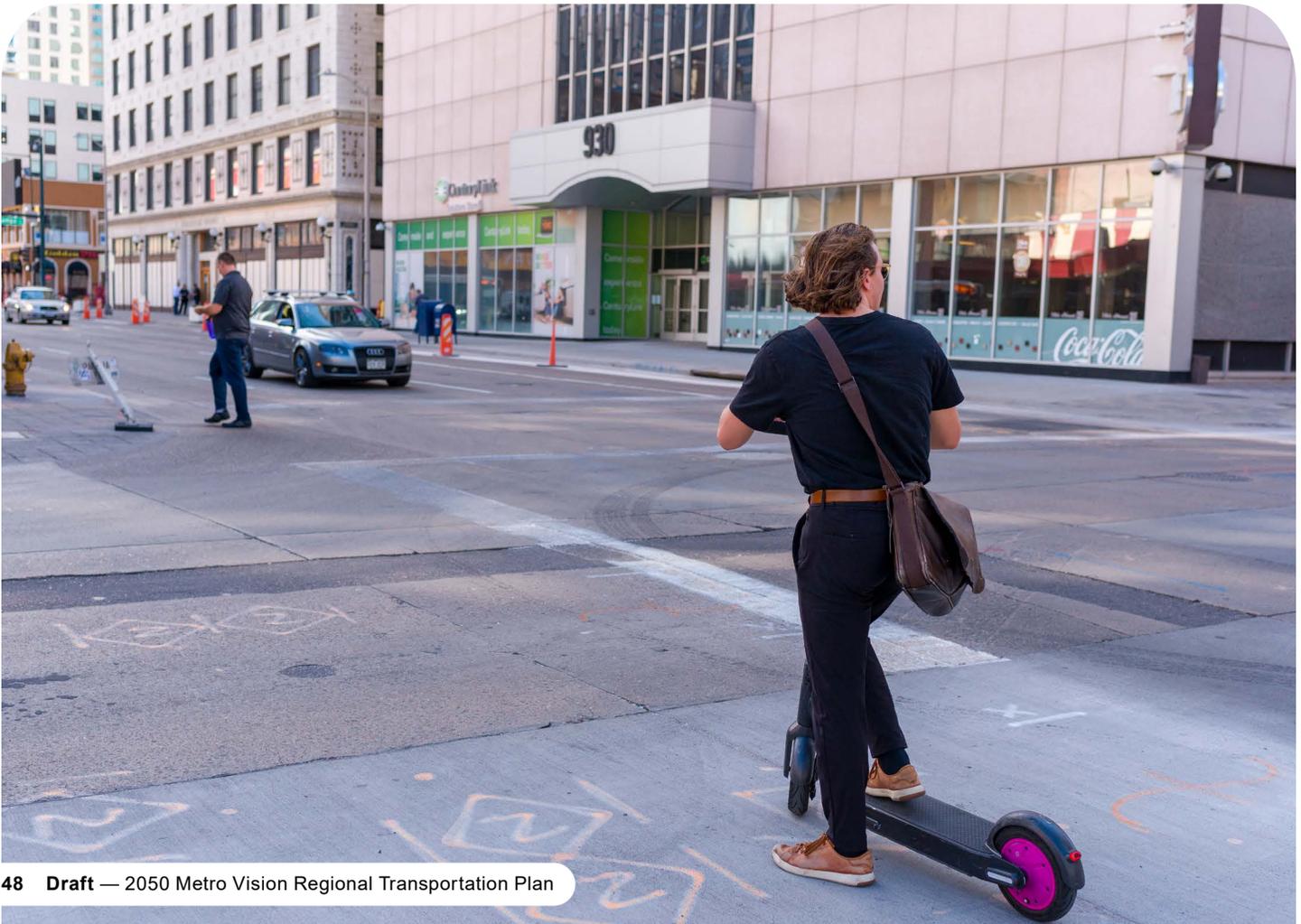
Other organizations

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

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



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.

While shared mobility is not considered to be an emerging aspect of regional transportation planning, recent innovation due to advances in technology has affected the sector. 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.

Benefits of emerging mobility include more travel choices, first- and last-mile connections to transit,

reduced congestion, air quality improvements and increased access to transportation. 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, with 2,800 scooters and bikes in the Denver region.



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. RTD and the Denver International Airport have also incorporated ride-hailing into their planning.



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 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.



Aviation

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

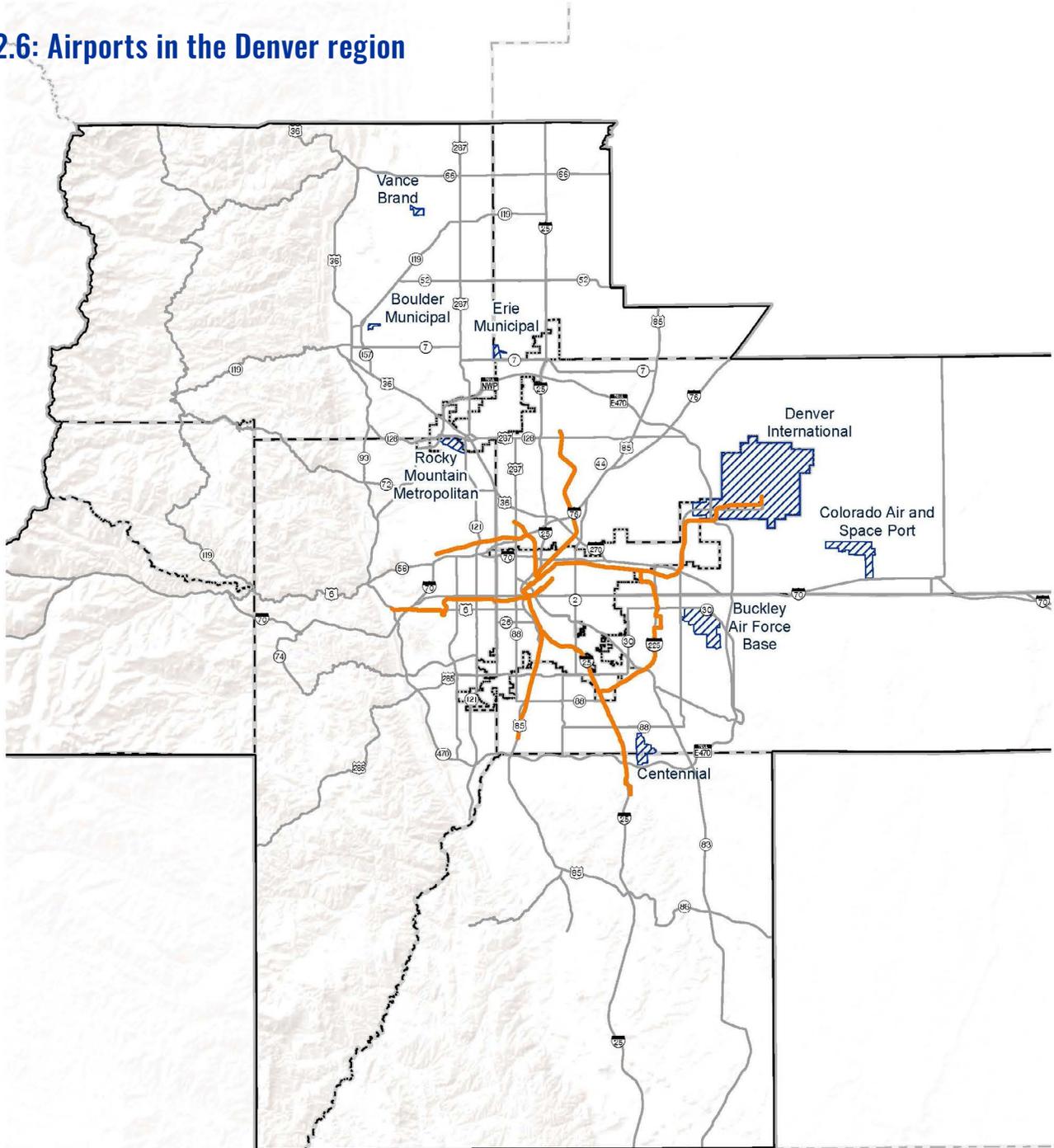
The region's residents, visitors, business professionals, emergency service providers, flight training operations and air cargo shippers depend on airports for their livelihoods, quality of life and access to the national and global transportation system.

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.

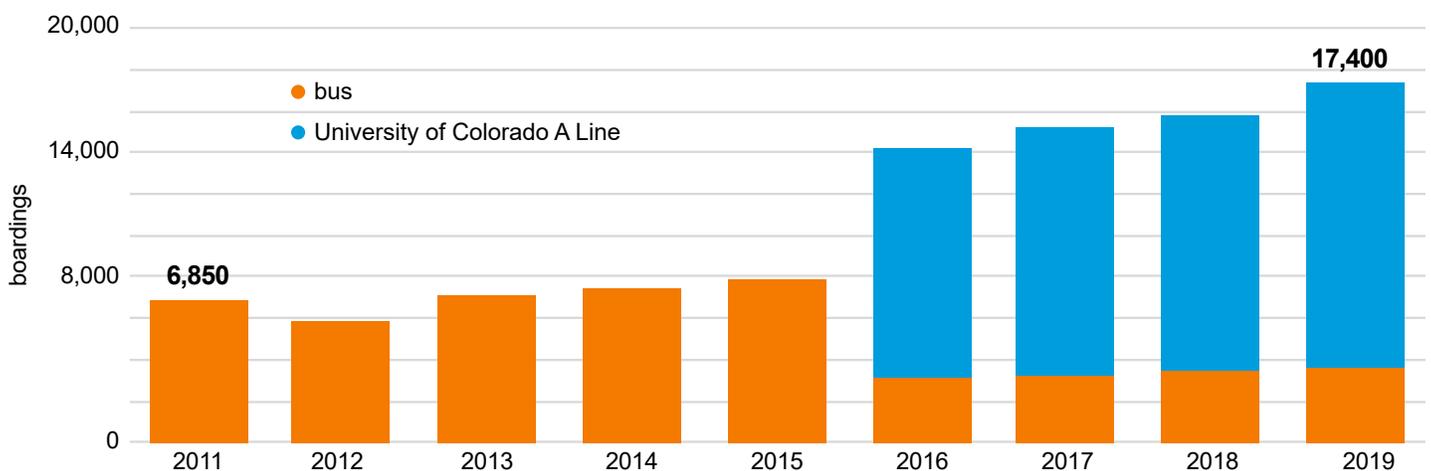
About 36,500 people worked at Denver International Airport in 2019 and on an average day, around 190,000 passengers used the airport. In 2019, just over 64% of boardings were passenger trips beginning or ending at Denver International Airport, meaning that on an average day around 122,000 passengers 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 University of

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).

Colorado A Line from Denver 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 opened 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.

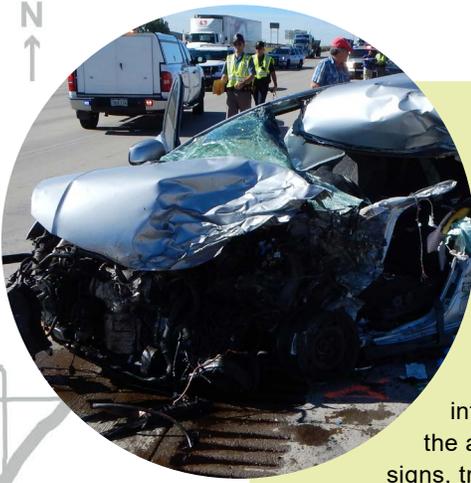
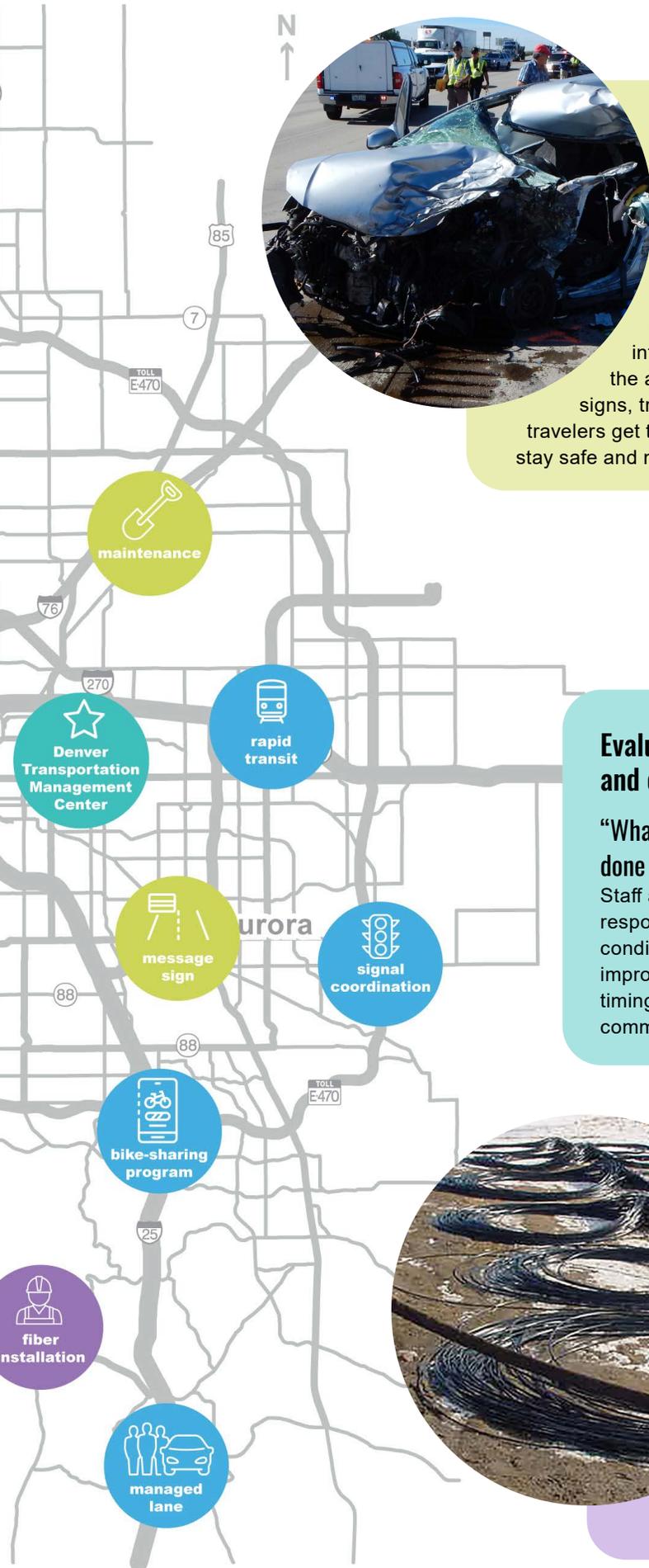


Operate things:

“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 and unplanned 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 travelers get the messages they need, when they need them, in order to stay safe and 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. Private vehicle operators 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 potential positive outcomes including health, economic and environmental benefits. 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.



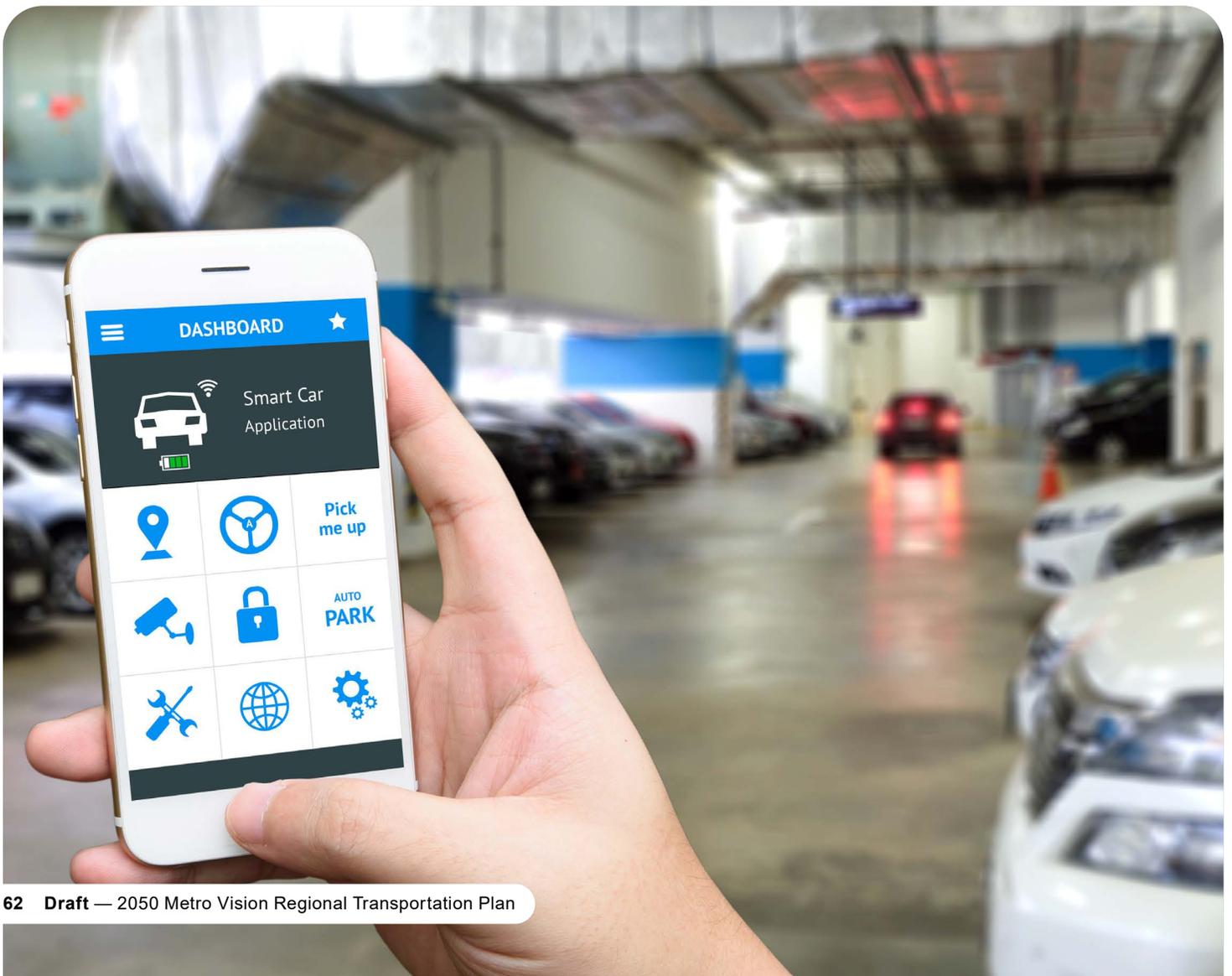
Throughout the region, automated vehicle shuttle pilots have provided partners an opportunity to learn about automated vehicles in various situations. **Photo courtesy City of Westminster.**

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 and analyzes data for use by operators, travelers and businesses.

Colorado 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.

Digital infrastructure like smart phone applications can communicate with and send alerts to connected vehicles. **Photo credit: HDR**





Safety

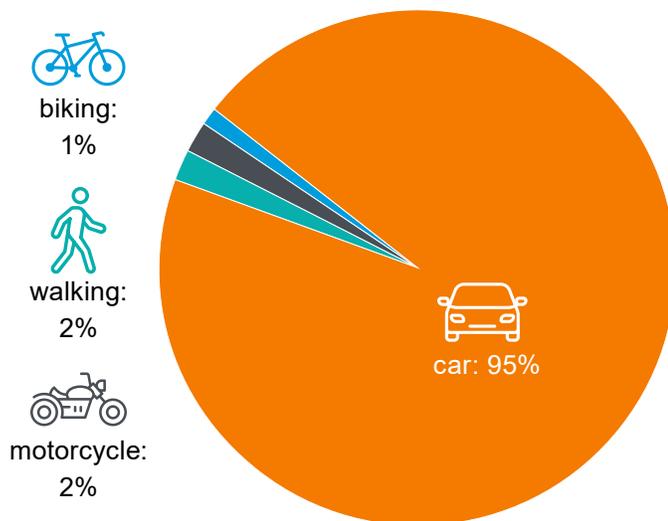
Traffic-related deaths and serious injuries are a critical and preventable public health epidemic and social equity issue in the metropolitan Denver area. DRCOG, its member governments and partner agencies are responsible for reducing crashes by providing safer transportation systems.

In 2019, 270 people were killed and 1,764 people were seriously injured on the Denver region's streets and highways. There were nearly 10,120 crashes between

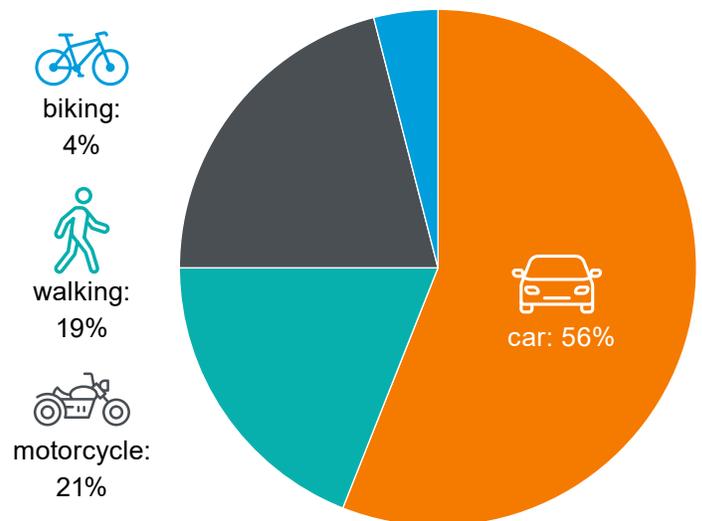
2015 and 2019 that resulted in a fatality or serious injury. The human toll of these crashes is significant; 1,288 people died and 8,859 people were seriously injured.

While the overall percentage of 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: 21% of fatal crashes involve a person riding a motorcycle, 19% involve a pedestrian and 4% involve a cyclist.

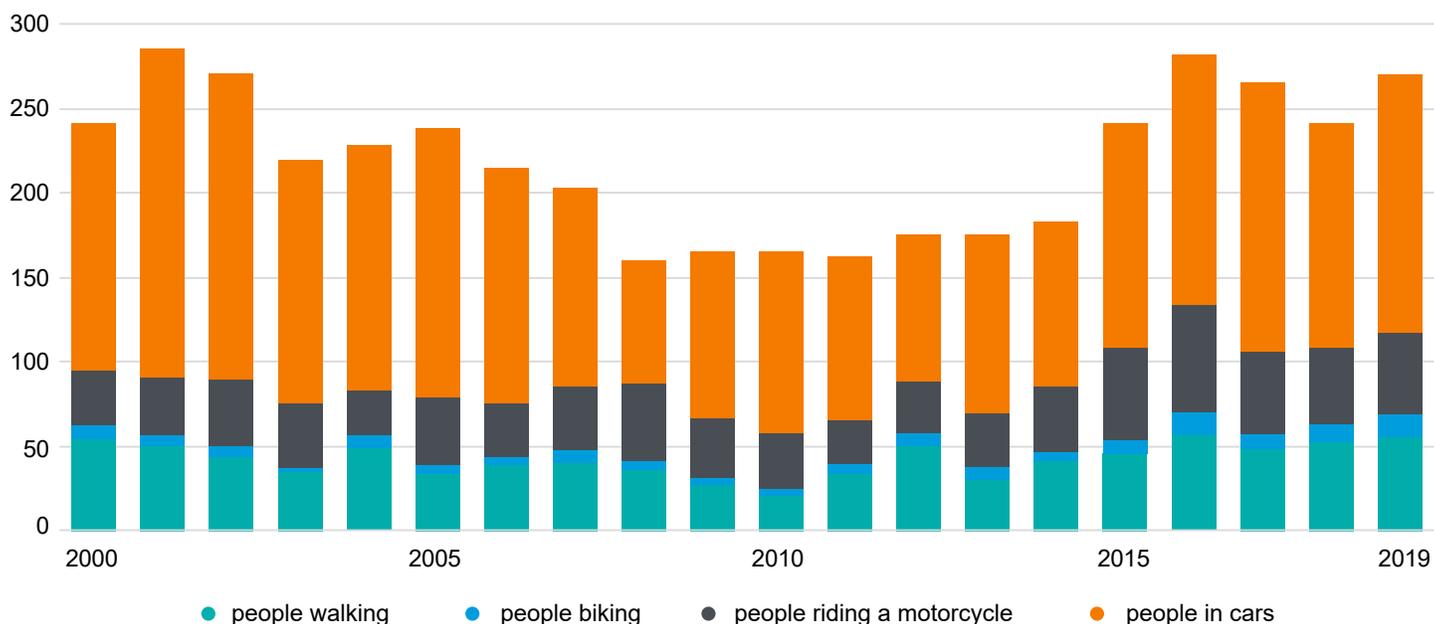
Percent of all crashes by travel mode (2013-2017)



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, 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 income.

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.

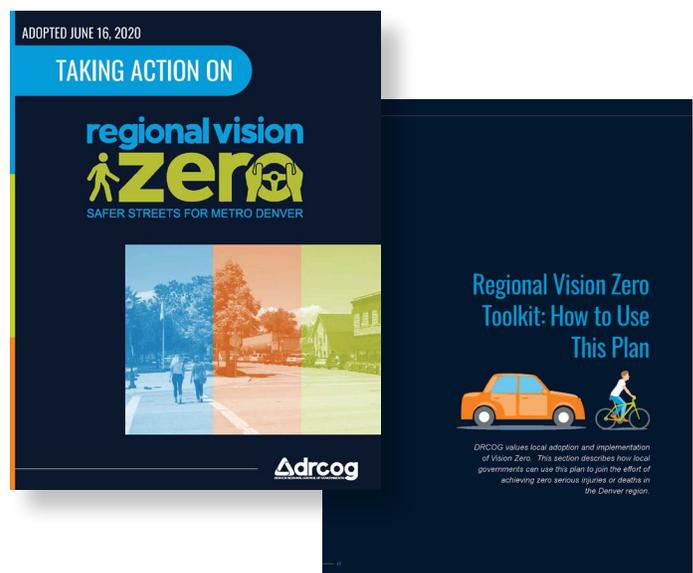
Regional Vision Zero Toolkit

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

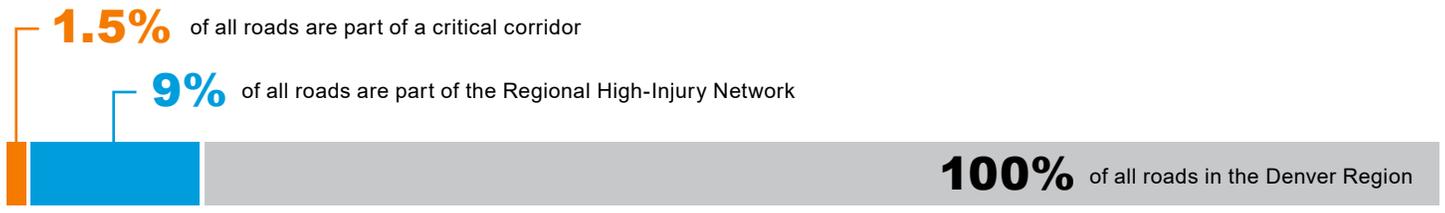
region with the highest numbers of crashes that result in death or serious injury. DRCOG conducted additional analysis for each county to identify critical corridors along the Regional High-Injury Network to hone in on some of the most dangerous areas.

- 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

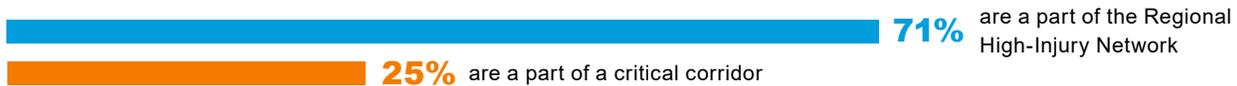


Despite only 1.5% of the region's roads being part of a Critical Corridor and 9% of the region's roads being a part of the Regional High-Injury Network, the majority of the Denver Region's safety problems are concentrated on such roadways.

Fatal and serious injury crashes:



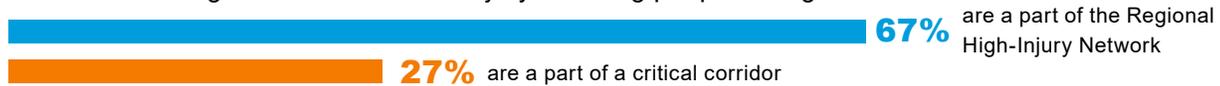
All fatal crashes:



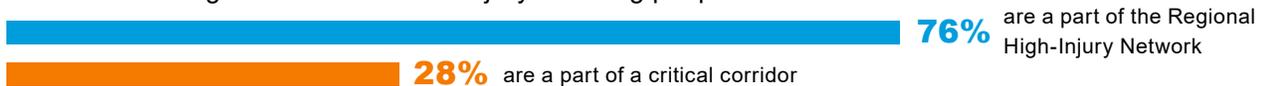
Crashes resulting in death or serious injury involving people walking:



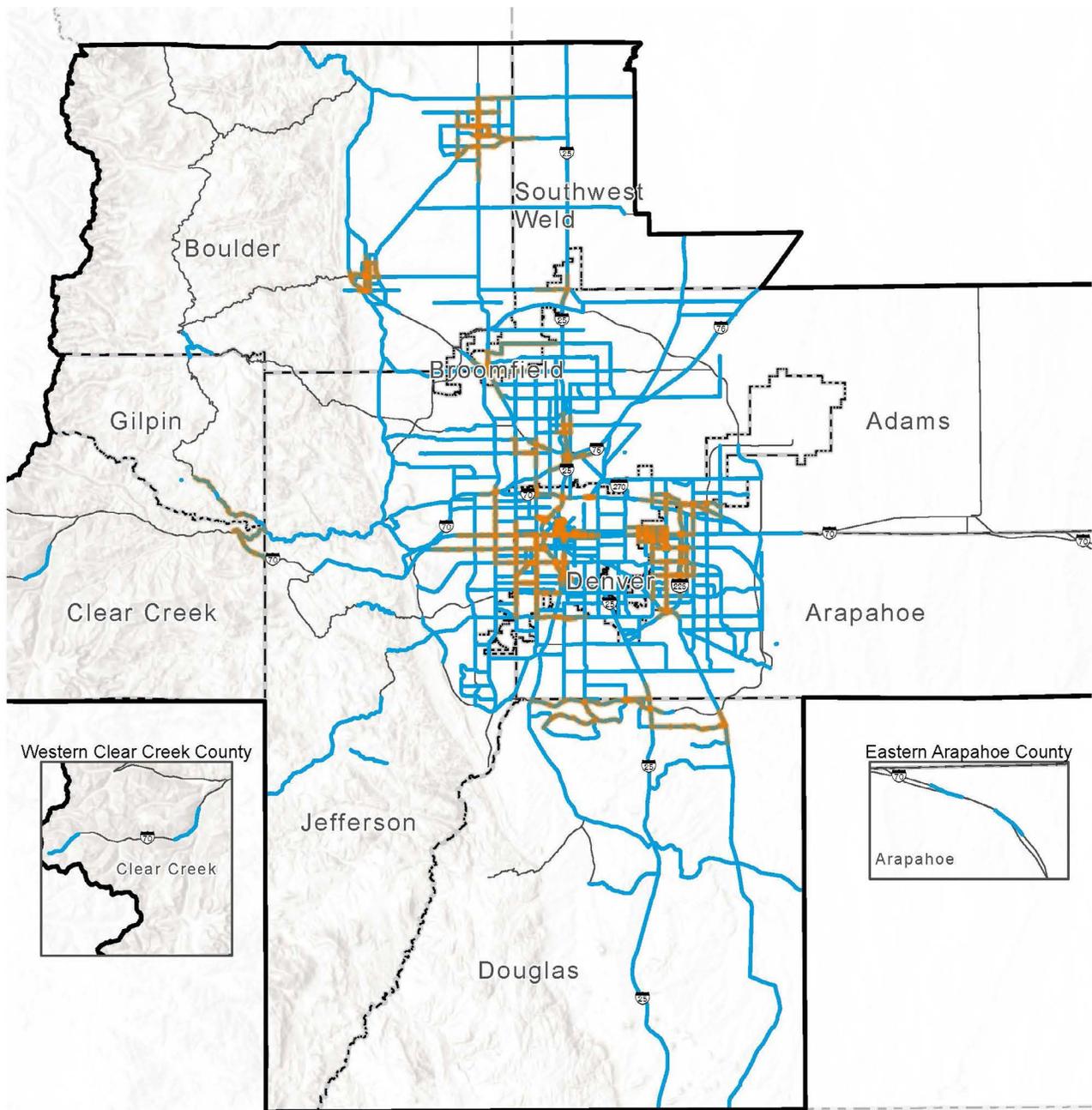
Crashes resulting in death or serious injury involving people biking:



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		County Boundaries
	High Injury Network		DRCOG Boundary
	Major Roads		

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 infrastructure and internet-based and communications systems and devices. Users of all types of facilities including airplanes, transit vehicles, roadways, tunnels, sidewalks, and multiuse trails 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. And 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.

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. 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 574 freight railroad crossings in the Denver region, of which 312 are at-grade crossings along public roadways. 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 railroad-highway crossing characteristics

Crossing characteristics		Criteria	
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 drones, blimps,

autonomous vehicles and robots 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, 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 and other components, naturally deteriorates due to use, time and climate. Roadway and bridge deterioration is

strongly related to use, especially by heavy trucks. The condition of transit buses declines quickly because of the hundreds of thousands of miles they travel in stop-and-go conditions. Sidewalks and multipurpose trails 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. Local governments maintain their streets and accompanying sidewalks as well as off-street multiuse trails.

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, only 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, roadway bicycle treatments and an extensive multipurpose trail 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 paths. 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 hazards. Most pedestrian and bicycle facilities are maintained by adjacent property owners. Without city enforcement this can result in widespread deterioration and inconsistent access 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**