



# 2023 Annual Report on Roadway Traffic Congestion in the Denver Region

November 2024

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Along many of the region's interstates and major corridors, such as Interstate 25 (pictured here in Denver), traffic congestion returned to pre-pandemic levels for the first time in 2023. Photo by RaskyBH/Shutterstock.com.



## Introduction

The Denver region is vibrant and growing. Given the continued increase in residents, tourism and economic activity, travel trends in the region are constantly changing. On average, drivers make about 10 million vehicle trips per day in the region, often carrying passengers, as well as goods and services required to satisfy regional demand. In total, vehicles travel around 85 million miles on the region's roadway network every day. This translates to about **4 million gallons of gasoline and diesel fuel burned each day**, exacerbating ozone pollution and greenhouse gas emissions. Traffic congestion remains prevalent in the region and is expected to persist into the future.

The Annual Report on Roadway Traffic Congestion in the Denver Region has consistently examined the performance of the region's roadways since 2006. Prepared by the Denver Regional Council of Governments (known as DRCOG), this report provides a snapshot of regional travel in 2023 and continues to explore the evolving dynamics caused by the COVID-19 pandemic.

The report concludes with annual travel projections for 2050 associated with the 2050 Metro Vision Regional Transportation Plan as adopted in May 2024. The plan and broader local, regional and

state planning efforts (including the statewide greenhouse gas rulemaking from Senate Bill 21-260) will continue to shape how DRCOG staff measure and monitor traffic congestion into the future.

## Congestion management process

The federal government requires all large metropolitan planning organizations like DRCOG to conduct a congestion management process. The U.S. Department of Transportation also requires DRCOG to address several planning factors, including "improving the resiliency and reliability of the transportation system." This planning factor is closely tied to the congestion management process. DRCOG's Annual Report on Roadway Traffic Congestion in the Denver Region is just one component of its congestion management process.

The process includes an extensive database of roadway attributes, traffic counts, vehicle crash incidents, other multimodal data metrics and performance measures. The effort also identifies severely congested segments on the designated Regional Roadway System. DRCOG, partner agencies and member government staff use these resources to help define effective congestion reduction and mobility choice projects.

DRCOG's [2050 Metro Vision Regional Transportation Plan](#) identifies overarching desired outcomes and specific initiatives related to the congestion management process.

### Outcomes

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

### Initiatives

- Implement “new technology and other operational investments to improve reliability and mitigate increasing congestion and delays.”

The congestion management process addresses specific objectives to help reach the outcomes identified in the regional transportation plan. The following objectives are applicable to all travel modes, as well as the movement of goods and freight:

1. Improve the multimodal reliability of the regional roadway system so **people and businesses experience fewer unexpected delays.**
2. Reduce the number and duration of crash events so **the transportation system operates more safely**, first responders work in a safer environment, and extensive travel delays and dangerous backups are reduced.
3. Reduce excessive travel delays faced by occupants of all types of motor vehicles so **people and businesses experience lower costs associated with severe traffic congestion.**

4. Implement transportation demand management and improve active transportation modes (such as walking and biking) and transit service so **people can choose different travel modes and adapt to traffic congestion.**
5. Improve traveler information and alert systems so **people and businesses can be alerted to critical incidents** and make informed decisions about travel mode and route choices.
6. Improve day-to-day and major maintenance efforts to enhance **the safety and reliability of the entire multimodal transportation system.**
7. Expand the toolkit of congestion reduction strategies so DRCOG's member governments and partner agencies have a **full suite of project types to consider, fund and implement.**
8. Ensure that congestion management process projects and actions are implemented in an equitable manner across the region so **low-income and disadvantaged communities reap significant benefits** and are not burdened by negative impacts.

The congestion management process is also closely aligned with other key DRCOG planning efforts:

- [Regional Transportation Operations and Technology Strategic Plan.](#)
- [Active Transportation Plan.](#)
- [Coordinated Transit Plan.](#)
- [Taking Action on Regional Vision Zero.](#)
- [Transportation Demand Management Strategic Plan.](#)



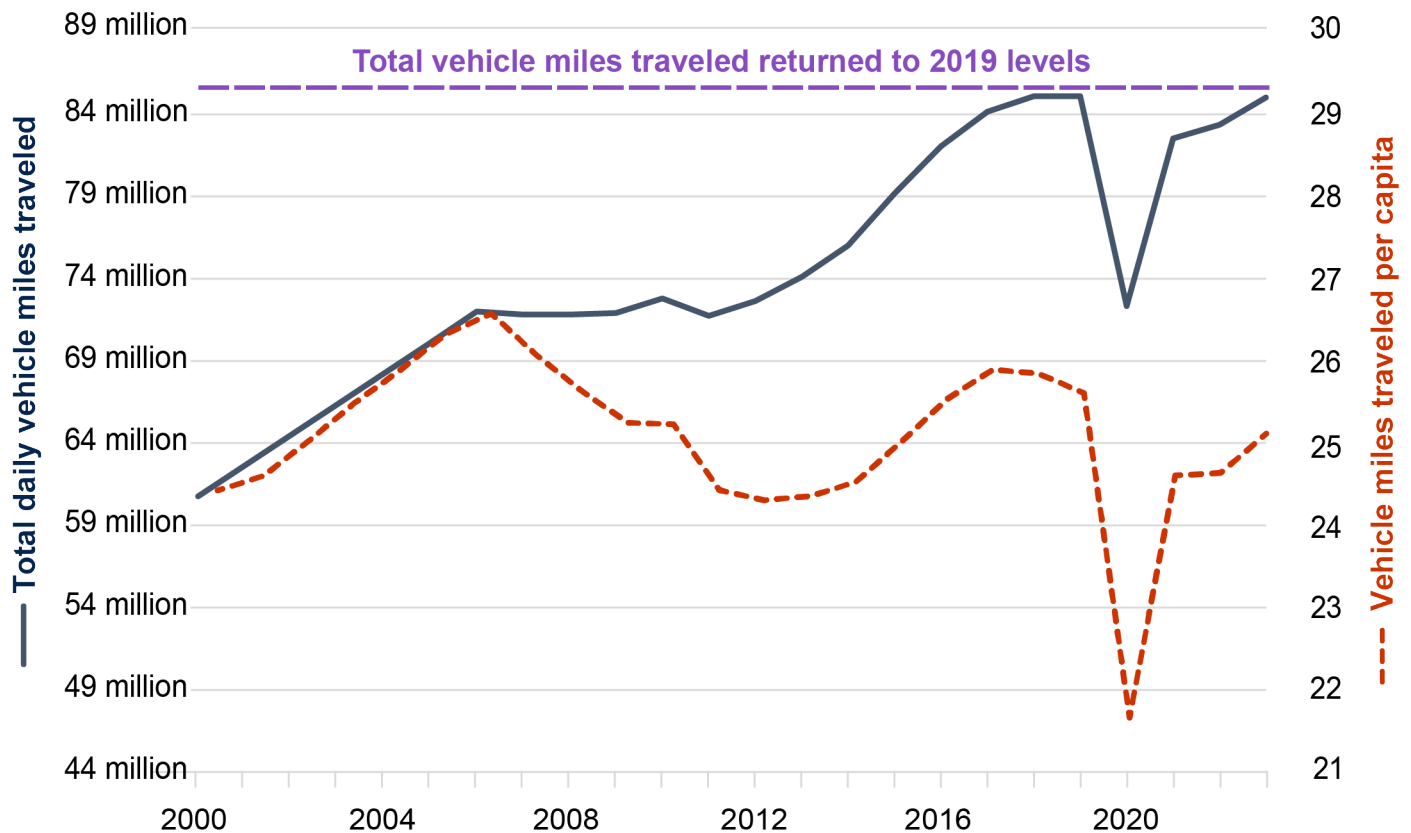
Interstate 25 (pictured here near Orchard Boulevard in south Denver) is a busy corridor even outside typical rush hour times.  
Photo courtesy of Colorado Department of Transportation.

## Vehicle miles traveled in 2023

Each year, DRCOG staff estimate the number of vehicle miles traveled on the region's roadways during an average weekday. Seasonal variations and other disruptions commonly affect average daily vehicle miles traveled throughout the year. Staff estimate that in 2023, vehicle miles traveled increased by 2% compared with 2022. With this growth, the **average daily vehicle miles traveled reached 2019 levels for the first time since the COVID-19 pandemic began**. However, despite the addition of roughly 85,000 people to the region's population, the average vehicle miles traveled per capita was 25 miles on an average day, still significantly less than 2019 levels.

Figure 1 illustrates that from 2000 to 2018, vehicle miles traveled in the region increased by approximately 40%. In 2018 and 2019, there was very little growth in total vehicle miles traveled. During 2020, average daily vehicle miles traveled declined by about 15%, reaching levels comparable to 2005 and 2011. With recovery from the pandemic in 2021 and 2022, total vehicle miles traveled grew by about 13%. Despite population growth, vehicle miles traveled only rebounded to pre-pandemic levels in 2023.

**Figure 1: Average daily vehicle miles traveled in the Denver region (2000-2023)**



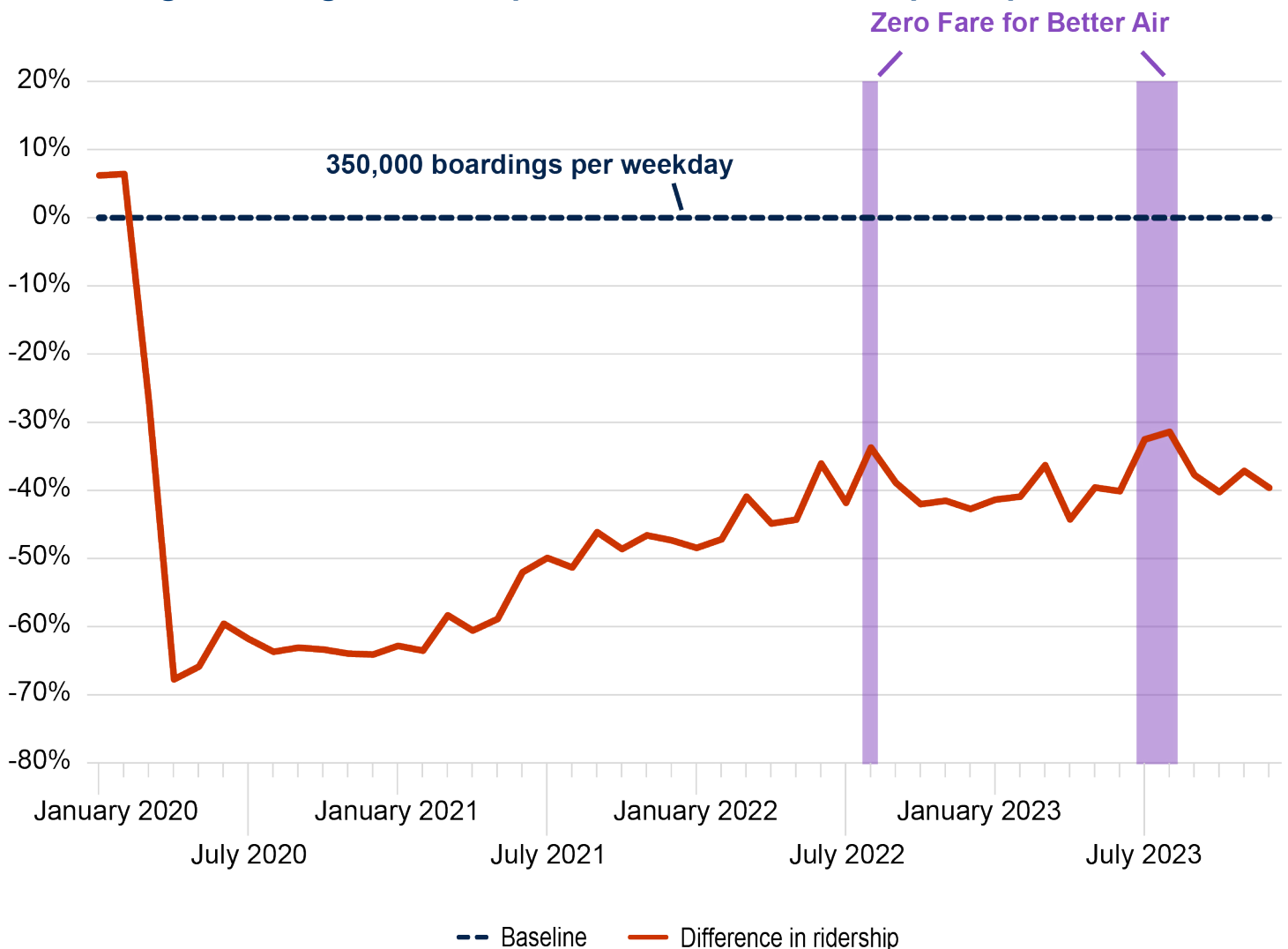
## 2023 regional transit

While traffic volumes have rebounded across the region, transit ridership has yet to return to pre-pandemic levels. Figure 2 illustrates the slow climb of transit ridership from the onset of the pandemic to the end of 2023. Fewer workers in office buildings, increased telework, reduced transit service levels, and ongoing health and safety concerns have all contributed to the sustained reduction in transit ridership. **However, ridership reached its highest post-pandemic levels in August 2022 and July and August 2023 during Colorado's Zero Fare for Better Air**

**Air program.** Zero Fare for Better Air was a statewide initiative to provide optional funding to local and metropolitan transit agencies to allow them to reduce or eliminate fares during the highest ozone months. This initiative was not renewed for the Regional Transportation District, or RTD, in 2024.

RTD has [introduced a plan to boost transit services](#) in 2025. While operator staffing and financial strain have served as barriers, RTD intends to continue implementing its [system optimization plan](#), which aims to restore service to 85% of 2019 levels.

**Figure 2: Regional Transportation District ridership comparison**



Source: National Transit Database

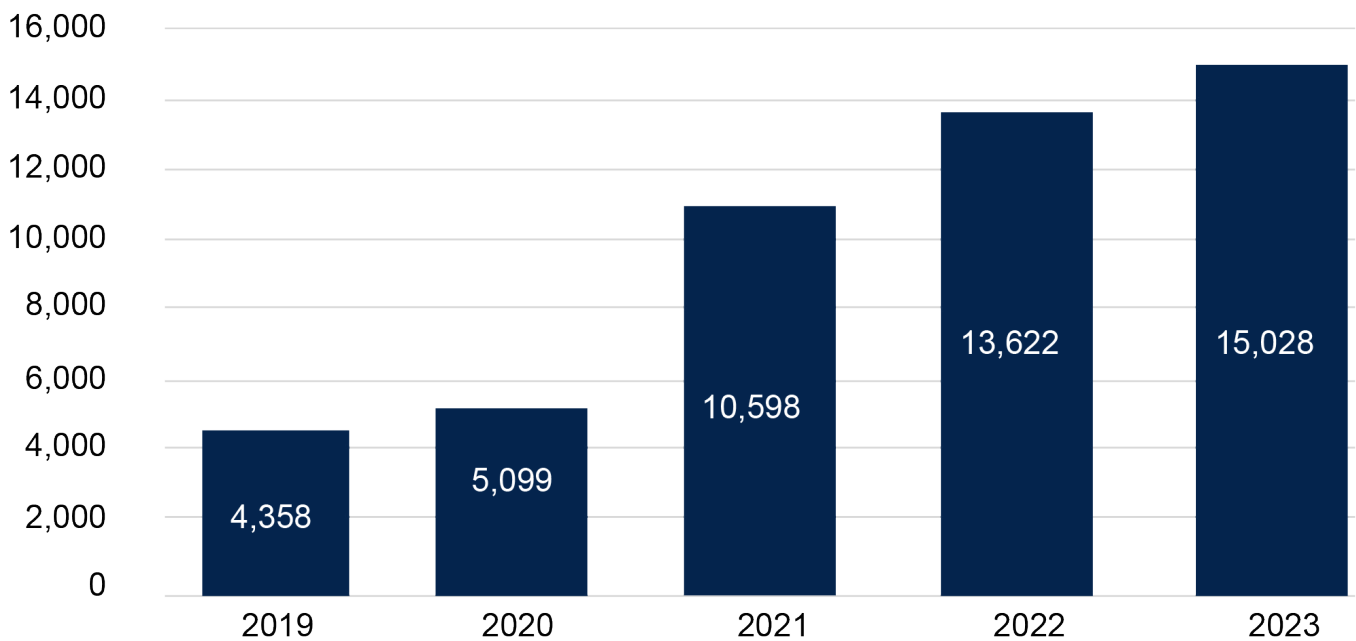


## 2023 shared micromobility

While transit ridership has yet to return to pre-pandemic levels, **shared micromobility usage has more than tripled since 2019**. Shared micromobility refers to shared, small, human- and electric-powered modes of transportation, including station-based bike-sharing programs, dockless bikes and e-bikes, and e-scooters. Such vehicles are typically available for short-term rentals and can be used in designated service areas.

Figure 3 illustrates the annual average number of shared micromobility trips per day in the Denver region between 2019 and 2023. The number of trips on any given day varies greatly depending on multiple factors, including seasonality, weather and if school is in session. The total number of vehicles available and service area expansions have contributed to the growth in use. In the Denver region, users of shared micromobility vehicles took nearly 5.5 million trips in 2023.

**Figure 3: Average number of micromobility trips per day**



Source: Ride Report



Public transit, like commuter rail (pictured here along Park Avenue West near downtown Denver), serves as a critical option for people to adapt to traffic congestion. Photo courtesy of RTD.

## Projected congestion in 2050

The Denver region is expected to grow and change over the next 30 years, and so will travel patterns and congestion. Using forecasts from the State Demography Office within the Colorado Department of Local Affairs, DRCOG staff anticipate the region will grow by about 1 million people and add 700,000 jobs by 2050. The transportation system will change, with new facilities added across modes, and transit service will continue to evolve. Technological advancement will also impact available travel modes, mobility services and safety systems, changing how people get around and when they choose to travel.

Per federal legislation, the U.S. Department of Transportation has established goals to reduce congestion, improve system reliability and improve freight and goods movement. To track the region's progress at addressing congestion, DRCOG's [System Performance Report](#) (Appendix G of the Regional Transportation Plan) highlights the federally established goals and progress toward performance measures such as travel time reliability and annual hours of peak-hour excessive delay per capita.

As for future progress as the region's population grows, the 2050 Metro Vision Regional Transportation Plan outlines how the region will continue to meet federal performance targets and improve transportation infrastructure and services. Between now and 2050, DRCOG's travel model forecasts a 40% increase in vehicle miles traveled in the region. With limited intervention, such a significant increase would result in a near tripling of both vehicle hours of delay and lane miles congested for longer than three hours a day. **In the projected scenario,**

**congestion at 2 p.m. in 2050 will be worse than it was at 5 p.m. in 2023.** Tables 1 through 4 include a comparison of several congestion measures between 2023 and 2050.

Map 1 illustrates the most congested segments from 2023 and reflects additional roads that will experience high levels of congestion by 2050 based on four key metrics:

- Severity: How bad is roadway congestion during rush hour?
- Duration: How many hours per day is the roadway congested?
- Magnitude: How many people (traffic volume) are affected by roadway congestion?
- Reliability: How often do crashes or incidents occur on the roadway?

**Table 1: Vehicle-focused congestion measures on Denver freeways and major roads**

**Note:** The measures in this table only relate to the designated Regional Roadway System.

Congestion measure	2023 average weekday	2050 average weekday	Change between 2023 and 2050
Vehicle miles traveled	65,326,000	92,481,000	42%
Vehicle hours traveled	1,389,000	2,214,000	59%
Vehicle hours of delay	182,000	499,000	174%

**Table 2: Person-focused congestion measures on Denver freeways and major roads**

**Note:** The measures in this table only relate to the designated Regional Roadway System.

Congestion measure	2023 average weekday	2050 average weekday	Change between 2023 and 2050
Person miles traveled	87,821,000	128,368,000	46%
Person hours traveled	1,898,000	3,063,000	61%
Person hours of delay	250,000	686,000	174%
Travel delay per resident	4 minutes	10 minutes	135%

**Table 3: Other congestion measures on Denver freeways and major roads**

**Note:** The measures in this table only relate to the designated Regional Roadway System.

Congestion measure	2023 average weekday	2050 average weekday	Change between 2023 and 2050
Percent of travel time in delayed conditions	13%	22%	70%
Additional travel time at 5 p.m. compared with free flow conditions	18%	37%	103%
Additional travel time at 2 p.m. compared with free flow conditions	13%	20%	51%
Percent of total lane miles congested for three hours or more	18%	35%	94%
Percent of total lane miles congested for three or more hours	18%	34%	89%

**Table 4: Economic congestion measures on Denver freeways and major roads**

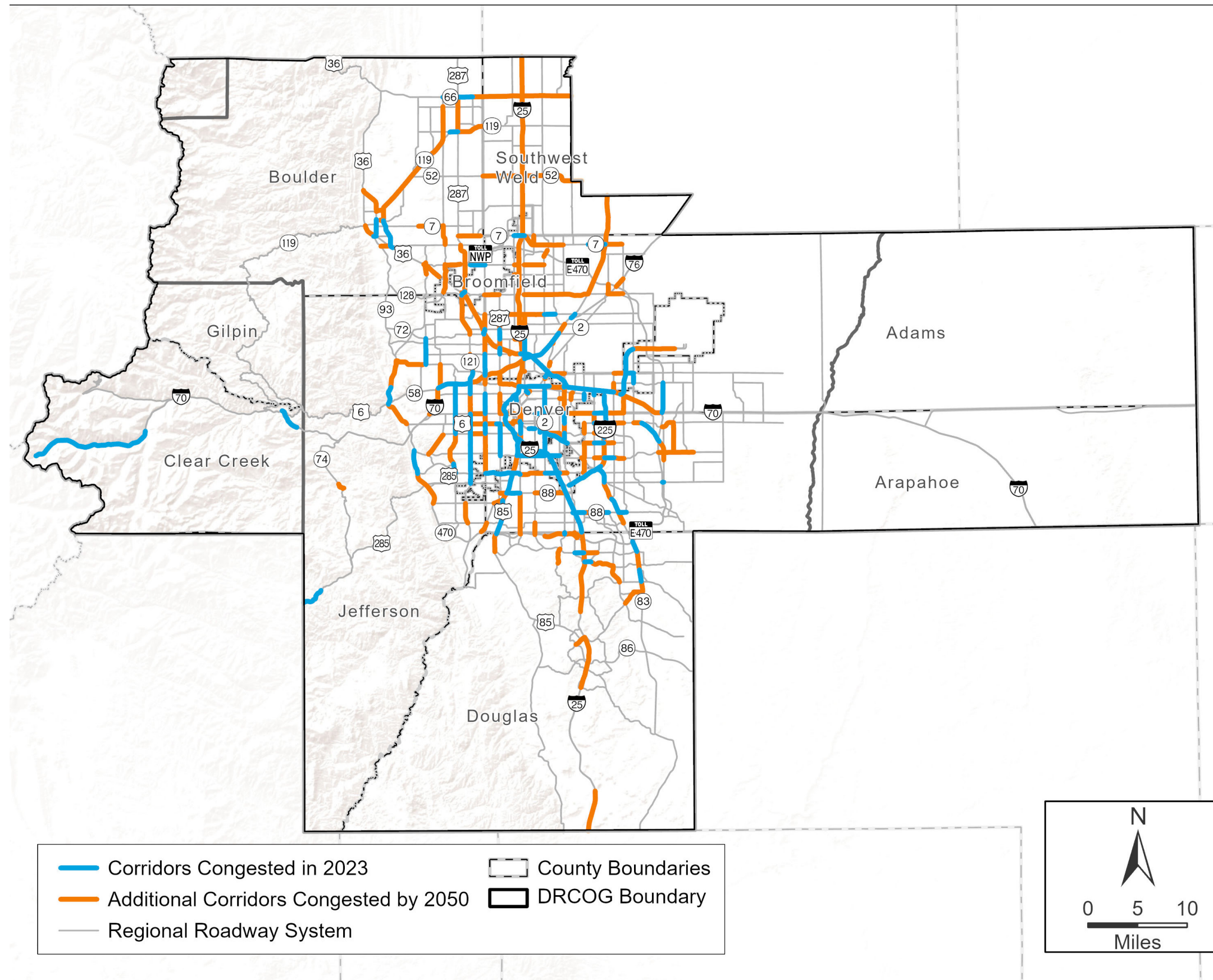
**Note:** The measures in this table only relate to the designated Regional Roadway System.

Congestion measure	2023 average weekday	2050 average weekday	Change between 2023 and 2050
Estimated costs to commercial vehicles (factoring \$48.30 per hour per light-duty operator and \$71 per hour per heavy-duty operator)	\$1,008,000	\$2,913,000	189%
Estimated costs to passenger vehicles (factoring \$12 per hour per adult in the vehicle)	\$2,719,000	\$5,396,000	98%
Total estimated costs of congestion	\$3,727,000	\$8,309,000	123%



Express lanes add roadway capacity at a fee, even into the mountains on Interstate 70 (pictured here), serving as an option for drivers to avoid traffic congestion. Photo courtesy of CDOT.

**Map 1: Key congested locations in 2023 and 2050**



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Source Data: DRCOG, CDOT, Inrix  
 Esri Basemap; SR 6428  
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 Location: \\TPO\CMPP\AnnualReport\2023\0 - CMPP 2023 ArcPro Maps\



## Regional shifts in travel behavior

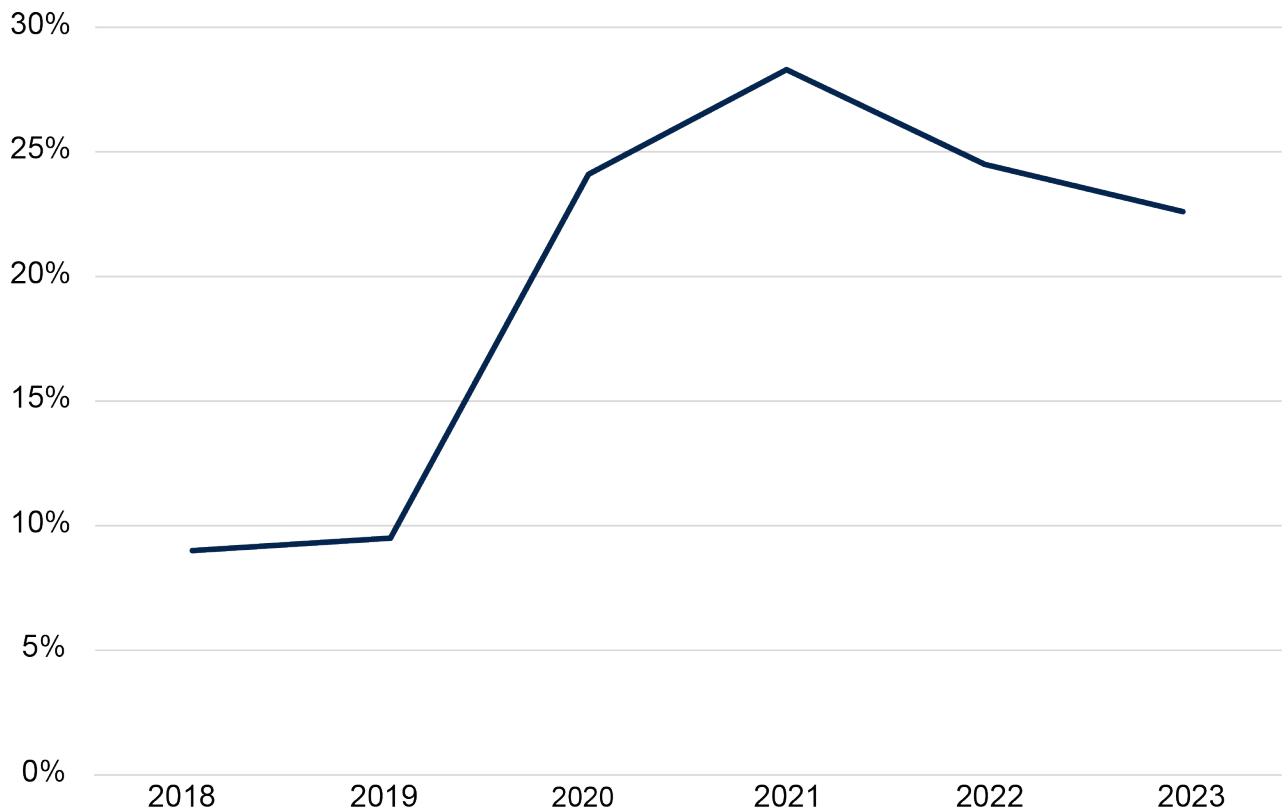
As telework became a public health necessity during the COVID-19 pandemic, it rapidly changed the patterns and frequency with which people move throughout the region, especially those who previously commuted to an office job. As local agencies lifted restrictions and concerns about health risks waned through 2021 and 2022, traffic congestion returned nationwide, including in the Denver region. However, the times of day and severity of congestion may have changed throughout the region due to widespread shifts in how people work and acquire goods and services.

For the 2022 Annual Report on Roadway Traffic Congestion in the Denver Region, DRCOG staff

examined three major freeway corridors in the region using Inrix vehicle travel time data to compare how congestion had shifted between 2019 (prior to the pandemic) and 2022. Given that trends continue to evolve following the pandemic, DRCOG staff chose to continue this analysis for this report, considering how 2023 compares to 2019. Each corridor is unique and does not reflect regionwide dynamics. The three corridors are reflected in Map 2 on page 18.

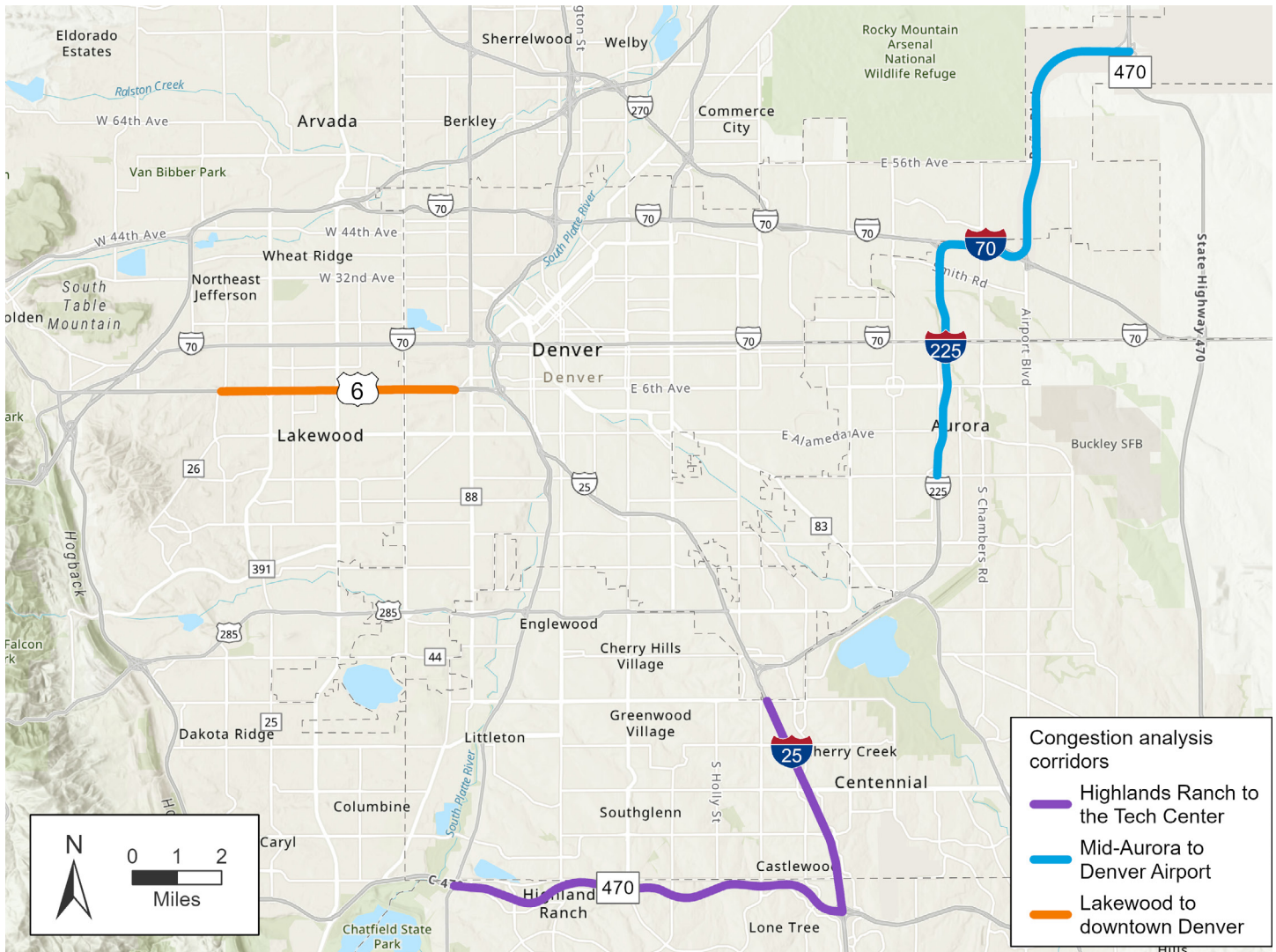
It's first important to examine how telework itself has persisted as a trend. Figure 4 represents the percentage of people working from home in the Denver region from 2018 to 2023. The percentage of teleworkers peaked in 2021 and has gradually waned in recent years.

**Figure 4: Percentage of people who typically work from home in the Denver region from 2018 to 2023**



Source: U.S. Census Bureau, American Community Survey 2018-2023 one-year estimates

## Map 2: Commute corridors analyzed for changes in travel behavior



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Source Data: DRCOG  
Esri Basemap; SR 6428  
CC, 10/07/2024  
Location: RPDshare\  
GIS\Requests\  
AnnualReportTrafficCongestion



The morning rush hour along U.S. Route 6 still hasn't returned to pre-pandemic levels of congestion. Photo courtesy of CDOT.

## Lakewood to Denver morning commute

The U.S. Route 6 eastbound corridor from Union Boulevard to Knox Street is a 5-mile stretch of freeway that brings people and goods from Interstate 70 and the Lakewood area into and through central Denver. In 2022, about 146,000 vehicles moved through U.S. 6 at Federal Boulevard on an average day, only 2% less than in 2019, before the pandemic. However, the time of day this travel occurred shifted dramatically in 2022. During the morning commute, significantly fewer vehicles moved through the corridor, especially in the earliest parts of rush hours, resulting in faster travel times.

However, these trends changed in 2023. On the average weekday, the corridor saw more vehicles than in 2019. The morning rush hour continues to see fewer vehicles compared with 2019, but that gap has narrowed from 17% to 6.6%.

This change in the morning rush hour is almost certainly caused by the large increase in work-from-home rates (refer to Figure 4 on page 17). Many of the jobs in central Denver are office jobs that allow for teleworking. Commuters who travel into the downtown area likely have more flexibility in their work hours or no longer feel the need to leave as early as 6 a.m. to beat traffic, as travel times in the later parts of the morning peak decreased significantly as well.

Contrarily, the evening peak has seen a 2.4% increase in vehicles compared with 2019. These trends suggest that people have more flexibility with where and when they start work but choose to return home at traditional times of the day.



**2.1% higher volumes**



**1% higher speeds**



**2.6% lower travel times**



The Lakewood Gulch Trail runs parallel to U.S. 6, connecting Lakewood to Denver by bike.  
Photo courtesy of CDOT.



The R Line's Florida Station along I-225 in Aurora.  
Photo courtesy of RTD.

## Mid-Aurora to Denver International Airport

Travel from the Aurora area to Denver International Airport via Interstate 225 and Peña Boulevard returned to pre-pandemic traffic conditions early in 2022. Traffic on Peña Boulevard is unique because the corridor does not have peak rush hours. Given that a large percentage of the travel along Peña Boulevard is associated with the Denver International Airport, it becomes congested at off-peak times, and these trends remained consistent in 2023.

Alongside airport traffic, the corridor has had significant population and housing growth in the area between Peña Boulevard and E-470. DRCOG staff estimate that between 2019 and 2022, the area experienced a 20% increase in jobs (4,750 new jobs) and a 6% increase in housing (1,050 new units), funneling additional traffic into bottleneck points along the corridor. Figure 5 highlights average travel times from 2019 to 2023 for the I-225 to Denver International Airport corridor.



**5.5% higher  
volumes**

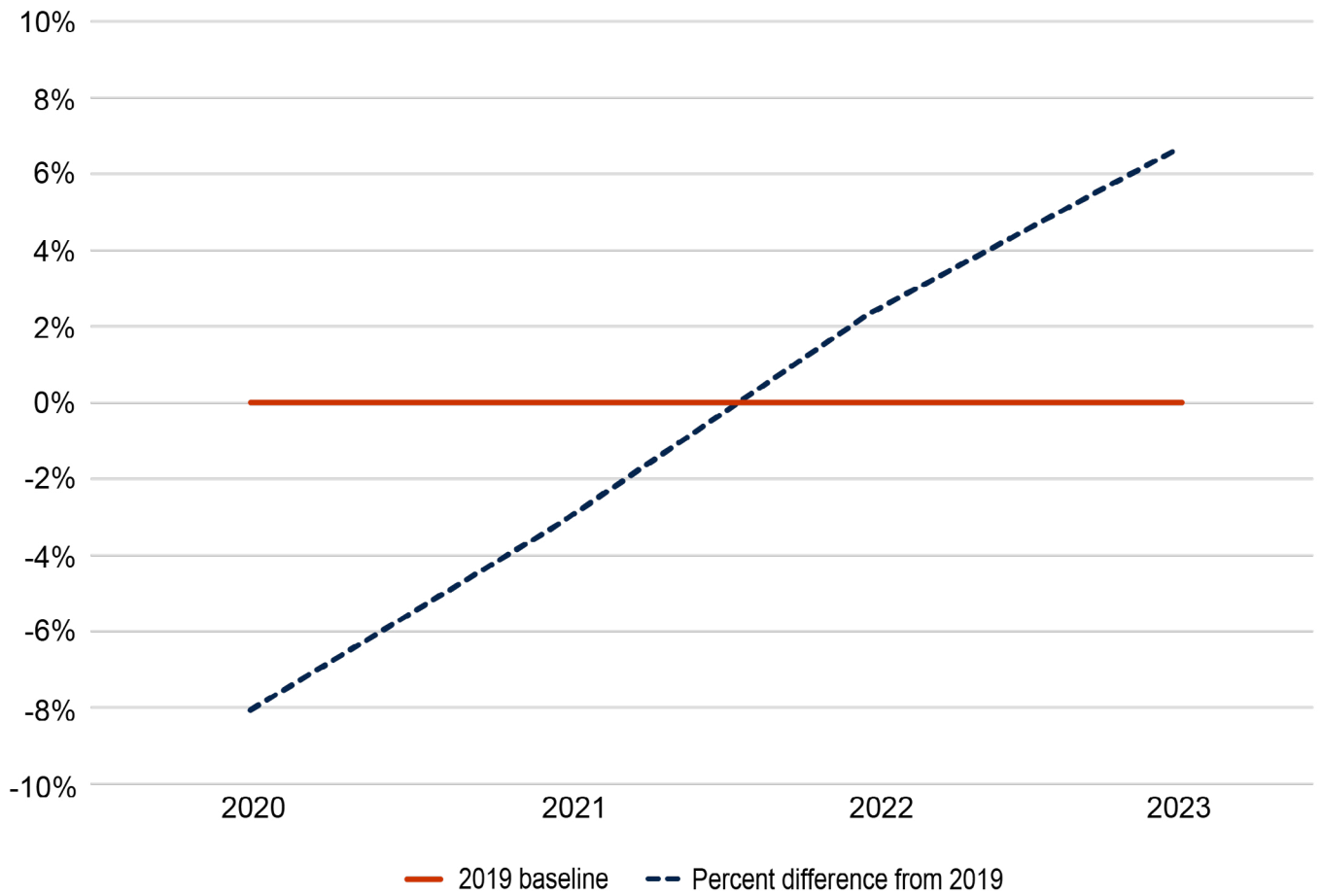


**4.2% lower  
speeds**



**7.7% higher  
travel times**

**Figure 5: Difference in travel time between Aurora and Denver International Airport from 2019 levels**



Source: Inrix

Mississippi Avenue overlooking Interstate 225 toward the north.  
Photo by Max Monk/Denver Regional Council of Governments.





From an overpass on I-25, looking northward in the Denver Tech Center.  
Photo by JR Goodwin/Denver Regional Council of Governments.

## Highlands Ranch to the Denver Tech Center

The Denver Tech Center has long been an employment hub for the region, drawing commuter traffic. To examine traffic patterns between a suburban location and this hub, DRCOG staff chose the corridor along C-470 and Interstate 25 to Highlands Ranch.

Commuting from Highlands Ranch to the Denver Tech Center takes 12% less time in 2023 than it did 2019, although travel time is now slightly closer to 2019 levels than it was in 2022. Additionally, the corridor saw 25% more

trips compared with 2019, a marked difference from 2022. Reduced travel times are due in part to an increase in telecommuting, as well as the completion of the C-470 managed lane project, which opened in 2020. These changes facilitated smoother, more reliable travel conditions while allowing for more vehicles than prior to the pandemic along most of the corridor.

Additionally, the construction of C-470 managed lanes in 2019 prompted travelers to take alternate routes, reducing traffic volumes. Figure 6 illustrates that travel times continue to remain below 2019 levels for commutes from Highlands Ranch to the Denver Tech Center.



**25% higher volumes**

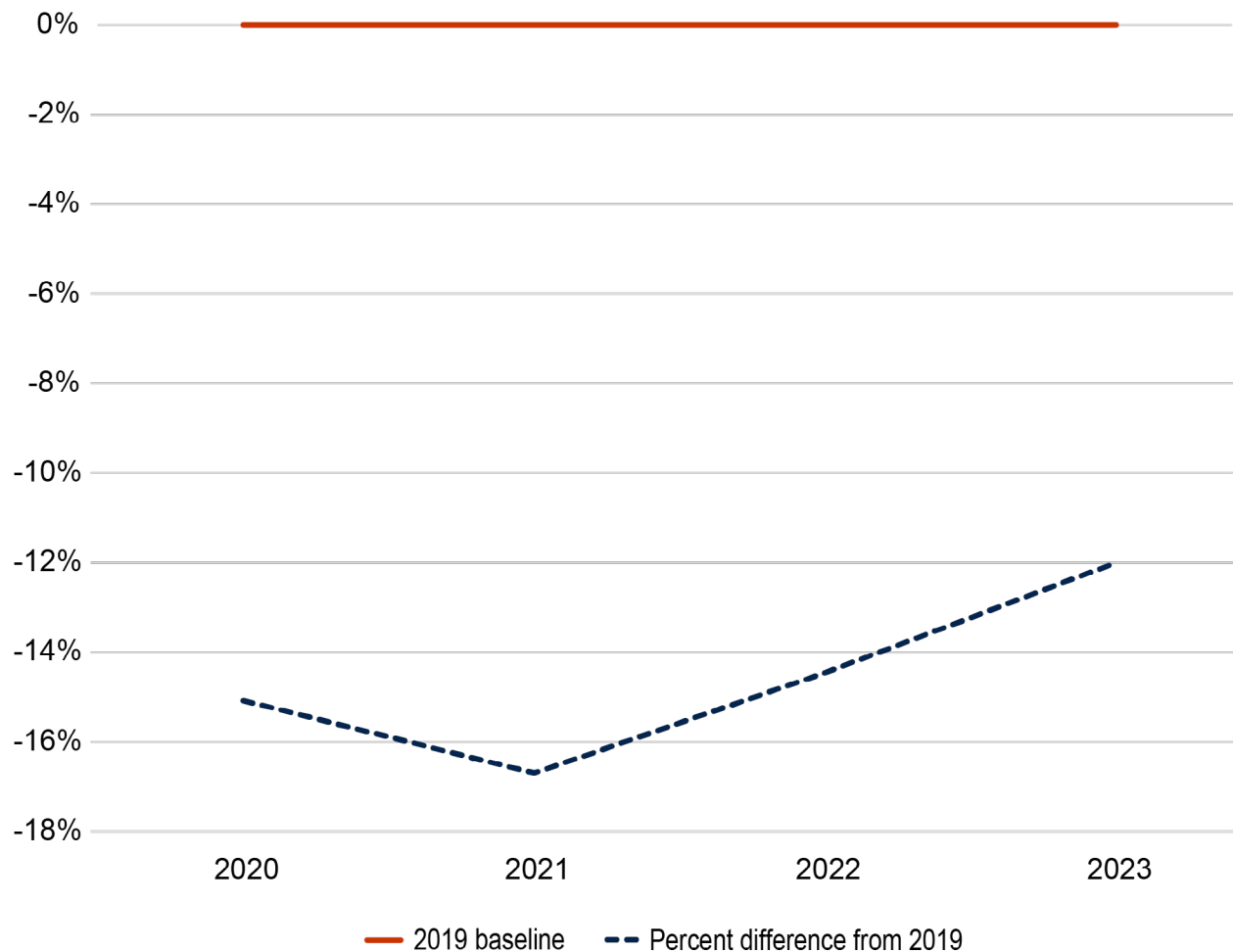


**10.6% higher speeds**



**12% lower travel times**

**Figure 6: Difference in travel time between Highlands Ranch and the Denver Tech Center from 2019 levels**



Source: Inrix

### Additional metrics influenced by telework and the pandemic

Traffic patterns aren't the only phenomena impacted by telework and the pandemic. With fewer office commute trips occurring, how have vacancy rates changed? How has the population of downtown Denver shifted? While these variables may not be directly related to congestion, they are relevant — which is why DRCOG staff elected to examine these metrics, which weren't part of the 2022 report.

### Population of downtown Denver

Downtown Denver is the economic center of the region. Prior to the pandemic, office workers had incentive to live downtown to be close to work, have access to transit services and avoid commuting and congestion. The pandemic and the increase in telework it brought led many residents to reconsider their proximity to others and the tradeoff of a commute. Figure 7 represents the population of ZIP code 80202 (which covers the majority of downtown Denver) based on data from the U.S. Census American



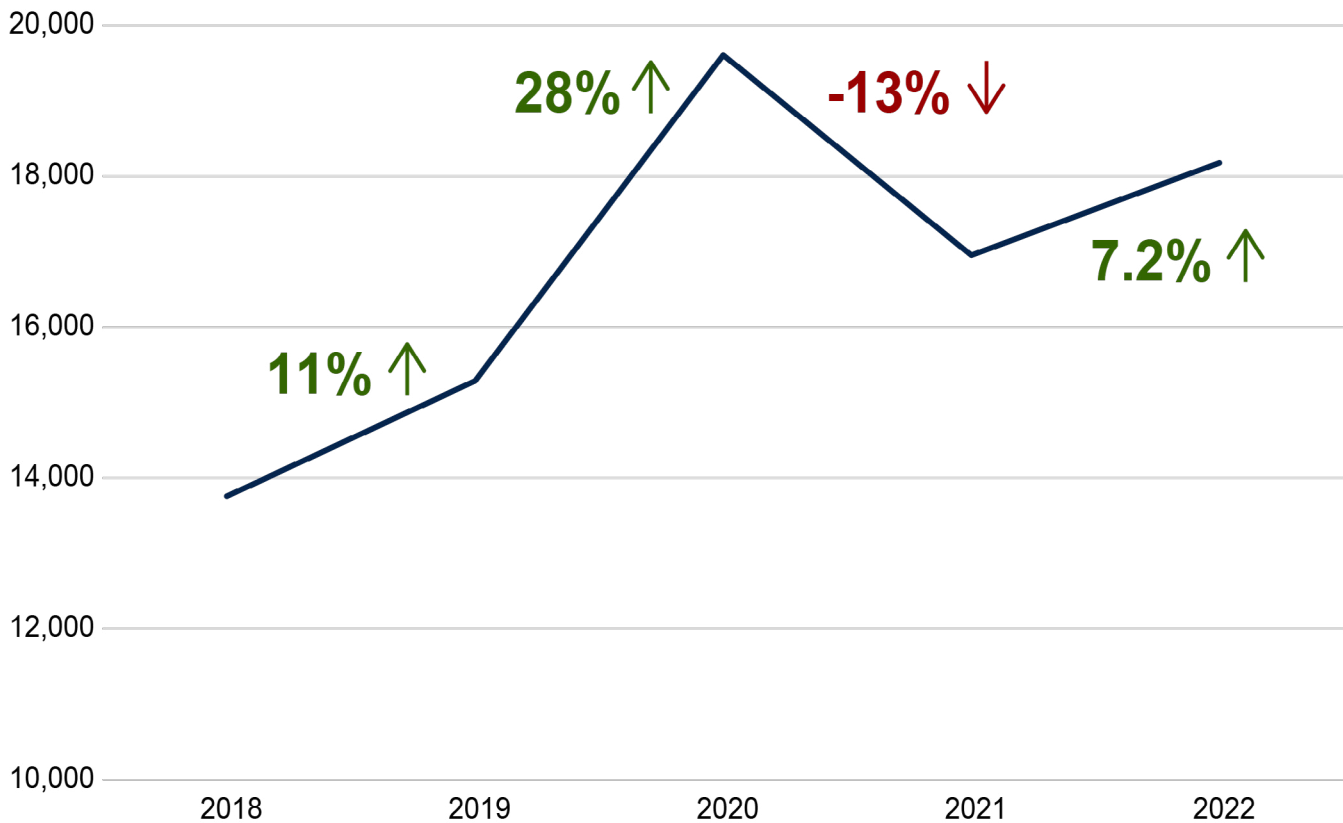
Community Survey (2022 is the most recent year for population data at this level). According to American Community Survey data, nearly 3,000 people left downtown between 2020 and 2021, suggesting that to them, an occasional commute was worth the tradeoff of residing elsewhere. As the worst period of the pandemic ended and more housing stock became available, the downtown population began to rise again.

### Office vacancy rates

With more people working from home, fewer are working in an office at a given time — intuitively,

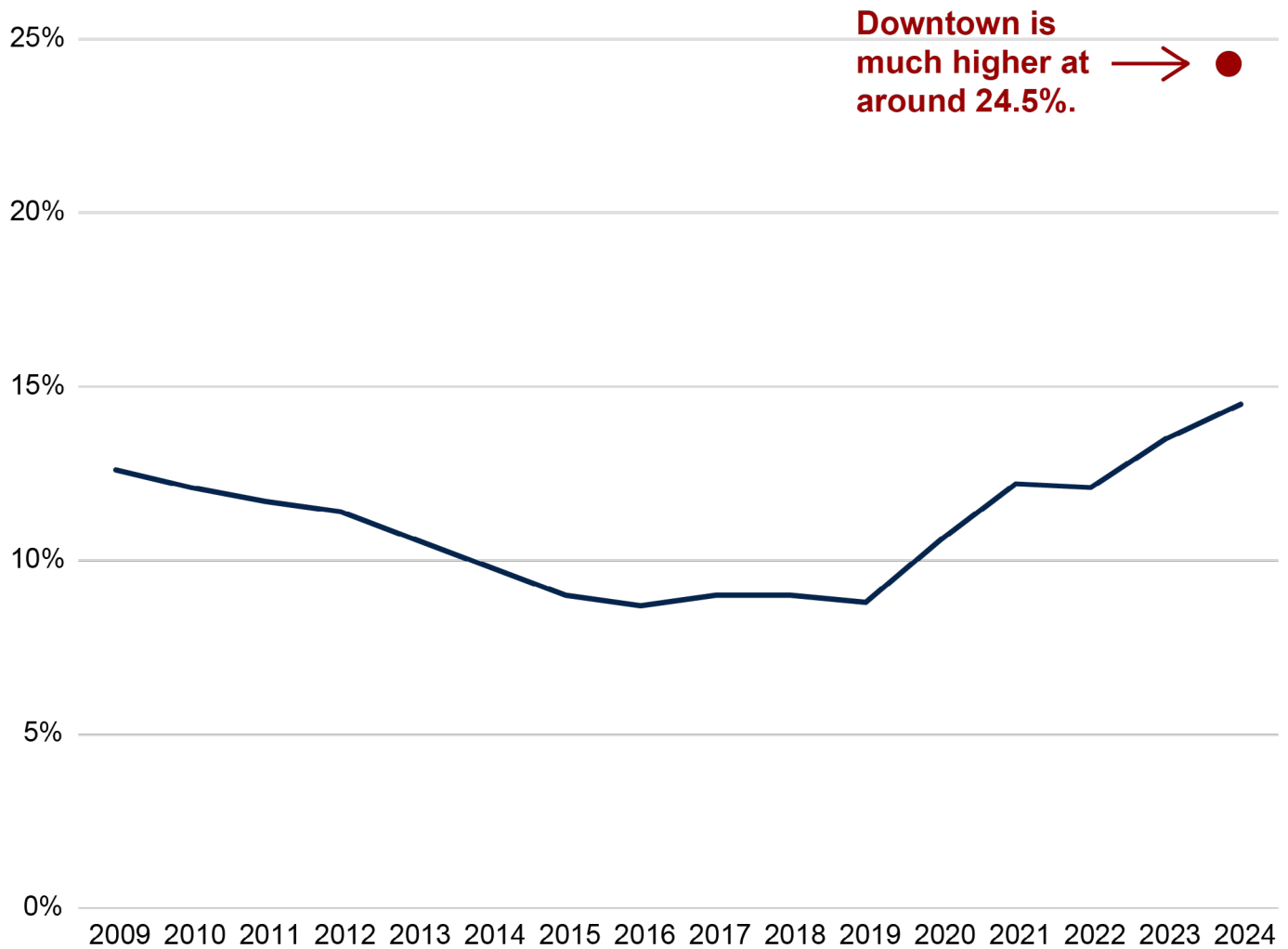
this means the demand for office capacity should be lower. DRCOG staff examined office vacancy rates from Costar, a commercial real estate company. Figure 8 depicts the percentage of vacant offices in the Denver region between 2009 and 2024. At the regional level, office vacancy rates are only slightly higher than they were during the 2009 recession period. However, downtown Denver has a much higher vacancy rate than the broader region, indicating the impacts of telework on office real estate. The elevated office vacancy rate and persistently high levels of telework have prompted [discussion about adaptive reuse of downtown office space](#).

**Figure 7: Population of downtown Denver, 2018-2022**



Source: U.S. Census Bureau, American Community Survey 2018-2022 one-year estimates

**Figure 8: Percentage of vacant offices across the Denver region from 2009 to 2024**



Source: Costar

### Conclusion

It's clear that the region is still settling into a new normal following the COVID-19 pandemic. The pandemic wholly changed travel behavior in many sectors, resulting in fewer people commuting on a given day, stymieing recreational activity in urban spaces and modifying patterns of commercial vehicle deliveries and movements.

However, many travel corridors have returned to near-2019 levels for travel time and average speed — even more in 2023 than in 2022. Coupled with population growth, this trend may continue to make regional congestion worse in the coming years.

## Current projects to address congestion

DRCOG supports local governments, the Colorado Department of Transportation and RTD in completing projects to mitigate the effects of congestion. Tables 5 through 7 list transportation projects addressing congestion and mobility that are completed or underway in 2022 and 2023. The list is not comprehensive; rather, it illustrates several categories of relevant projects. Interchange and roadway projects address key bottlenecks in the region. Transit, bicycle

and pedestrian projects provide or enhance such travel options, enabling people to avoid congestion.

In addition to location-specific projects, there are programmatic investments throughout the region to reduce and help people avoid or adapt to congestion. Eight transportation management associations provide community-specific solutions in partnership with DRCOG’s [Way to Go program](#) to address the region’s commuting challenges.

**Table 5: Selected interchange and roadway projects addressing congestion and mobility completed or underway in 2022 and 2023**

Interchange and roadway projects	Status
I-25 and Dry Creek Road Operational Improvements	Complete
120th Avenue Operational Improvements	Complete
Wadsworth Operational Improvements: Vassar to Woodard	Underway
State Highway 86, 5th Street, Founders Parkway and Ridge Road Intersection Operational Improvements	Complete
Parker Road Operational Improvements: Lincoln to Pine	Complete

**Table 6: Selected transit projects addressing congestion and mobility completed or underway in 2022 and 2023**

Transit projects	Status
Havana Street Transit Improvements: Montview to Dartmouth	Complete
28th Street Business Access Transit Lanes: Iris to Valmont	Underway
Broomfield FlexRide	Underway

**Table 7: Selected active transportation projects addressing congestion and mobility completed or underway in 2022 and 2023**

Bicycle and pedestrian projects	Status
C-470 Multi-Use Trail, Grade-Separated Crossing at Acres Green Drive	Complete
Nine Mile Station: Bicycle and Pedestrian Bridge over Parker Road	Underway
Inverness Drive West Bicycle and Pedestrian Facilities: Fulton to Inverness Drive East	Underway
30th Street Corridor Improvements: Boulder Creek to Arapahoe	Underway
100th Avenue Multimodal Improvements: Alkire to Simms	Underway

## Conclusion

Traffic volumes and roadway congestion continue to evolve in the aftermath of COVID-19. The growth in population and jobs in the Denver region requires thoughtful management of transportation system resources. As demand for roadway use increases, transportation demand management partners, transit agencies and new mobility technology innovations will be essential to mitigating the negative impact of congestion on air quality, mobility, the economy and quality of life. DRCOG staff take seriously the responsibility of creating and continuing partnerships to mitigate the most severe effects of congestion.

Traffic congestion in the region is expected to worsen. In a growing region, this can be expected unless large-scale societal and economic changes occur. However, to mitigate major increases in congestion (while simultaneously supporting economic growth and the reduction of greenhouse gas emissions), effective planning, partnerships and innovation are paramount. DRCOG staff are committed to partnering with state, regional and local agencies to keep people, goods and services moving efficiently across all travel modes now and into the future.

Light rail and bike paths offer the region's residents alternatives to driving.





U.S. Route 36 is a busy highway that connects Denver and Boulder.  
Photo by Ground Floor Media, courtesy of CDOT.

## Visit DRCOG's partner agency websites for more information:

Colorado Department of Transportation: [codot.gov](https://www.codot.gov)

Regional Transportation District: [RTD-Denver.com](https://www.RTD-Denver.com)

Colorado Department of Transportation Traveler Information: [COTrip.org](https://www.COTrip.org)

For ways to avoid or adapt to congestion, visit Way to Go: [WayToGo.org](https://www.WayToGo.org)

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This report and others are available at [DRCOG's congestion mitigation webpage](#).

Contact Max Monk, assistant planner, at [mmonk@drcog.org](mailto:mmonk@drcog.org) for additional information regarding DRCOG's congestion mitigation program.



Photo courtesy of CDOT.