Appendix C

Transportation, Economic, and Demographic Trends

Colorado
Department of Transportation

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Section 1

Introduction

There are several factors influencing statewide trends in transportation, the economy and demographics. These factors primarily relate to population and employment, which are forecast to change over time. To evaluate the future transportation needs of Colorado, it is important to understand its current and future population and economic conditions.

Objective data available through the US Census Bureau's American Community Survey, the Colorado Department of Local Affairs (DOLA) and Office of Economic Development and International Trade was helpful in capturing the holistic pattern of demographic and economic change in Colorado as it relates to mobility, safety, and asset management needs.

This memorandum provides a summary of the trends analysis.

Section 2

Demographic Profiles

2.1 Total Population

2.1.1 Existing Growth

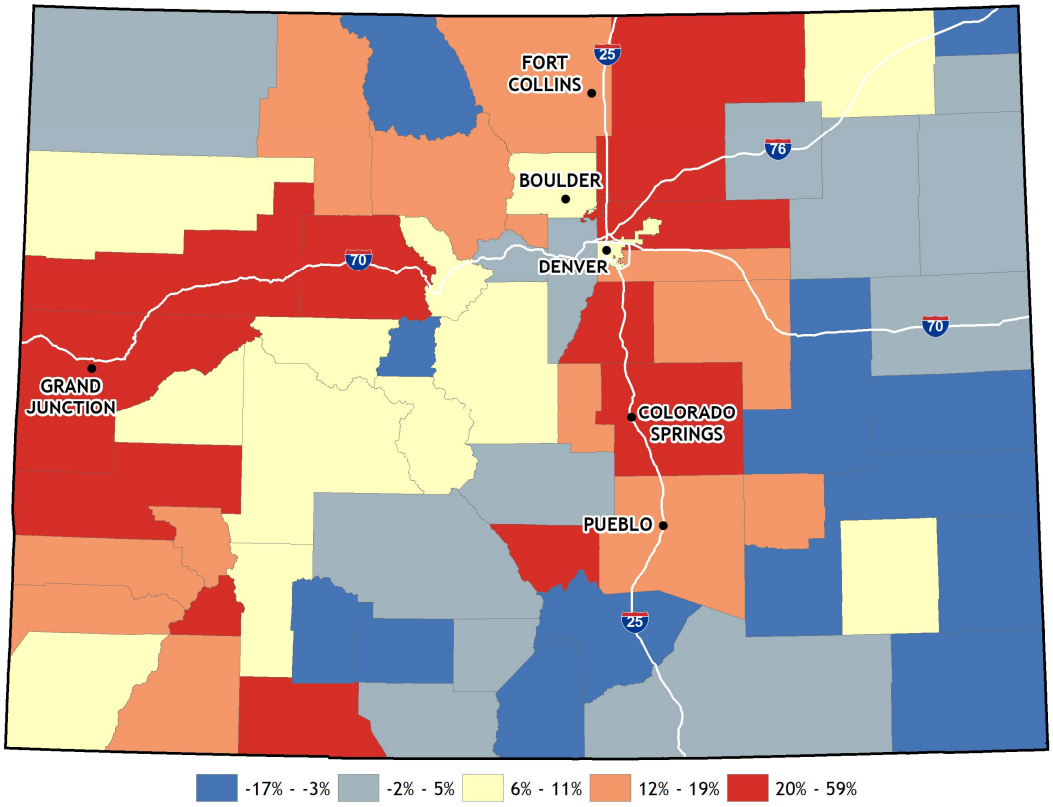
Between 2000 and 2010, Colorado's population increased by almost 710,000, or 16 percent. Figure 2-1 shows the areas of growth and decline during that period. Similarly, between 2010 and 2020, the population increased by roughly 790,000, or 16 percent. As shown Figure 2-2, the increase in population since 2010 has been concentrated along the Front Range. Colorado has experienced dramatic population growth over the last 25 years. As shown in Table 2-1, between 1995 and 2020, Colorado's population increased by approximately two million, or 53 percent.

Table 2-1 Colorado Population, 1995-2020

	1995	2000	2005	2010	2015	2020
Population	3,811,074	4,338,785	4,662,534	5,050,332	5,454,707	5,842,076
Increase	NA	527,711	323,749	387,798	404,375	387,369
Percent Change	NA	14%	7%	8%	8%	7%

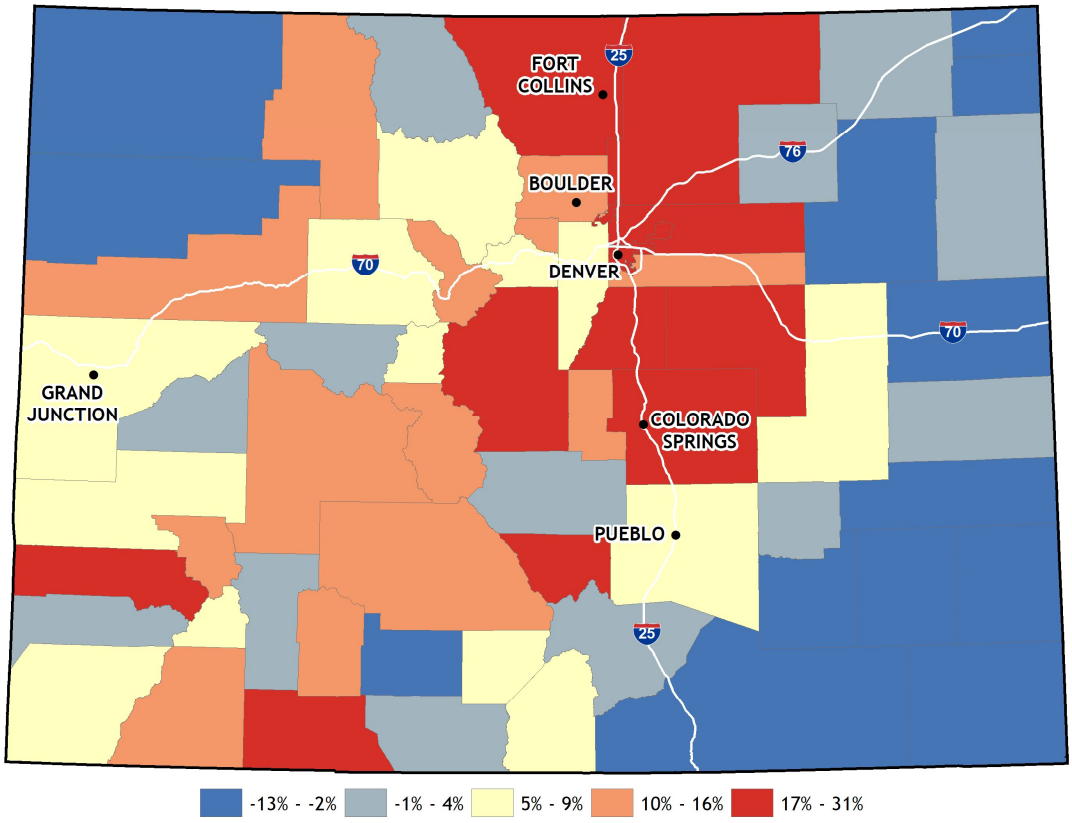
Source: Colorado Department of Local Affairs 2020.

Figure 2-1 Total Population Percent Change, 2000-2010



Source: DOLA, 2020.

Figure 2-2 Total Population Percent Change, 2010-2020



Source: DOLA, 2020.

2.1.2 Future Growth

Colorado is expected to see a sustained population growth over the next 25 years. The population in Colorado is projected to increase by almost two million, or 33 percent, between 2020 and 2045, to a total population of 7,776,756.

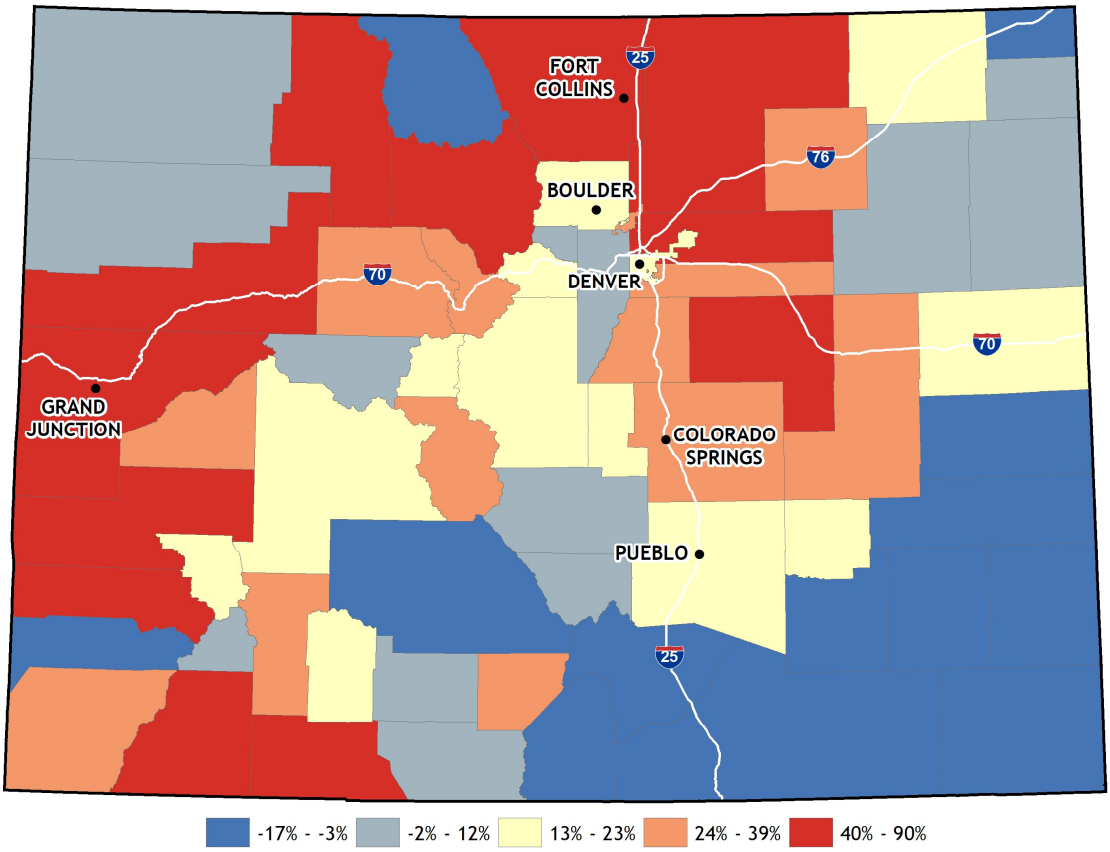
As shown in Figure 2-3, the biggest total population changes are expected to happen in the Front Range and Rocky Mountain area. As shown in Table 2-2, Colorado's population is forecast to continue to grow but at a slowing rate from 2020 to 2045. Although Colorado's growth is forecast to slow, it is projected to grow twice as fast as the nation.

Table 2-2 Colorado Population, 2020-2045

	2020	2025	2030	2035	2040	2045
Population	5,842,076	6,252,913	6,686,512	7,092,627	7,460,600	7,774,711
Increase	387,369	410,837	433,599	406,115	367,973	314,110
Percent Change	7%	7%	7%	6%	5%	4%

Source: Colorado Department of Local Affairs 2020.

Figure 2-3 Projected Population Percent Change, 2020-2045



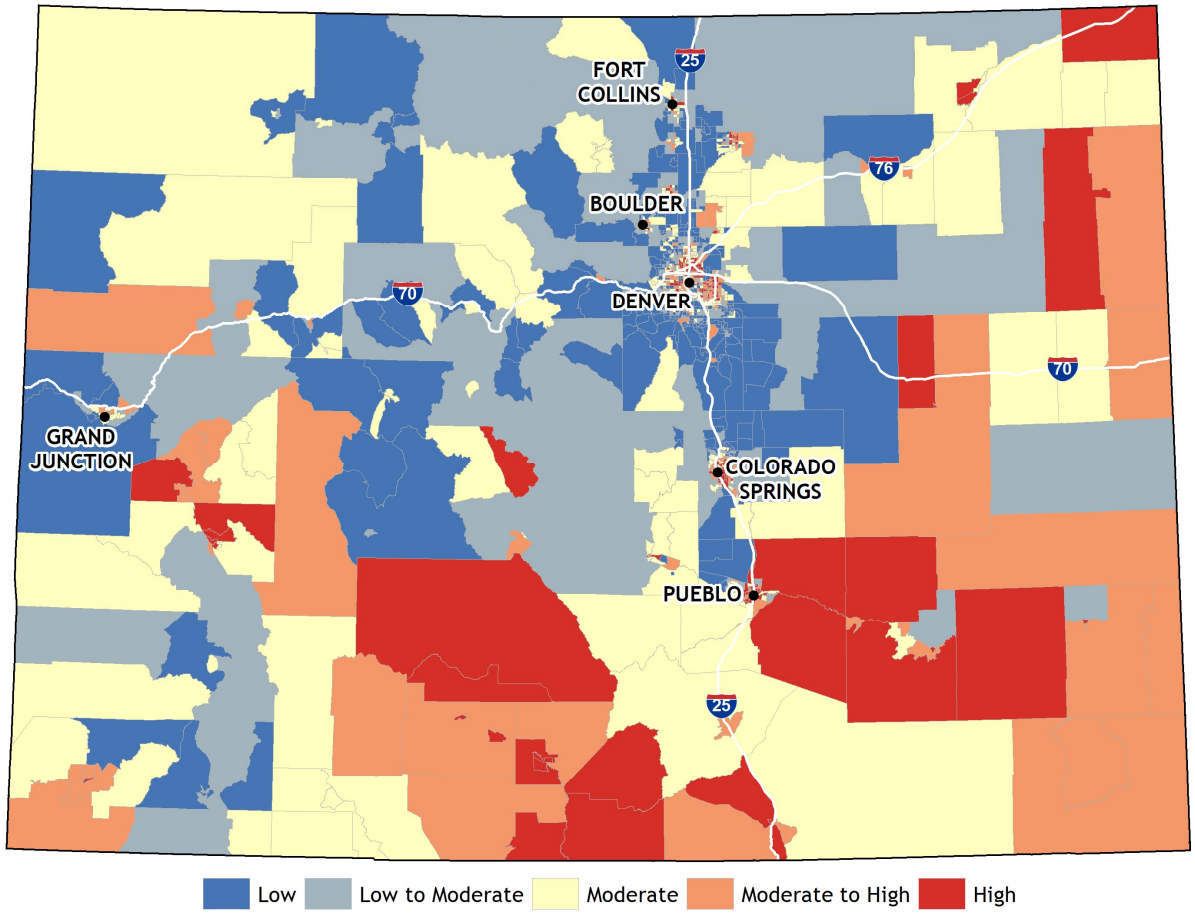
Source: DOLA, 2020.

2.2 Historically Underserved Population

Data from the US Census Bureau's American Community Survey was used to help identify where in Colorado are historically underserved communities located. An indexing effort aggregated data at the census tract level about older adults, people with disabilities, minorities, low-income populations, those with limited English proficiency, and zero vehicle households. Figure 2-4 shows the areas in the state with the highest aggregated propensity of underrepresented populations residing in Colorado, which are often the people with a high need for alternative mobility options. Note that an environmental justice analysis was completed to determine the location of CDOT investments in census tracts with the greatest number of historically underserved communities. For further information, please refer to Appendix H, Environmental Justice.

In general, Colorado tends to have a smaller minority and low-income population but more disabled persons than the rest of the nation. Table 2-3 shows the comparison of minority populations in the nation and state. In terms of the disabled population, there were 773,699 disabled persons in Colorado in 2017, or 14 percent of the total state population, compared to 40,678,654 in the nation, or 12.7 percent of the total national population. In addition, approximately 10.3 percent of families and people in 2017 had income below the poverty level compared to the national trend of 13.4 percent.

Figure 2-4 Historically Underserved Population Index, 2013-2017 Averages



Source: American Community Survey 2017.

Table 2-3 Minority Population, 2017

	United States	% of total	Colorado	% of total
White alone	235,507,457	72.3%	4,720,495	84.2%
Black or African American alone	41,393,491	12.7%	229,436	4.1%
American Indian and Alaska Native alone	2,726,278	0.8%	56,792	1.0%
Asian alone	18,215,328	5.6%	179,251	3.2%
Native Hawaiian and Other Pacific Islander alone	608,219	0.2%	8,400	0.1%
Some other race alone	16,552,940	5.1%	219,189	3.9%
Two or more races:	10,715,465	3.3%	193,591	3.5%
Two races including Some other race	1,610,234	0.5%	31,859	0.6%
Two races excluding Some other race, and three or more races	9,105,231	2.8%	161,732	2.9%

Source: American Community Survey 2017.

The United State Census defines persons with Hispanic or Latino origins as an ethnicity instead of a race. However, as Hispanic or Latino community members make up a large portion of the Colorado population, Table 2-4 provides a break down of these community members in the state.

Table 2-4 Hispanic Population, 2017

	United States	% of total	Colorado	% of total
Hispanic or Latino (of any race)	56,510,571	17.60%	1,157,200	21.29%
Not Hispanic Latino	264,493,836	82.40%	4,279,319	78.71%
Total Population	321,004,407	-	5,436,519	-

Source: American Community Survey 2017.

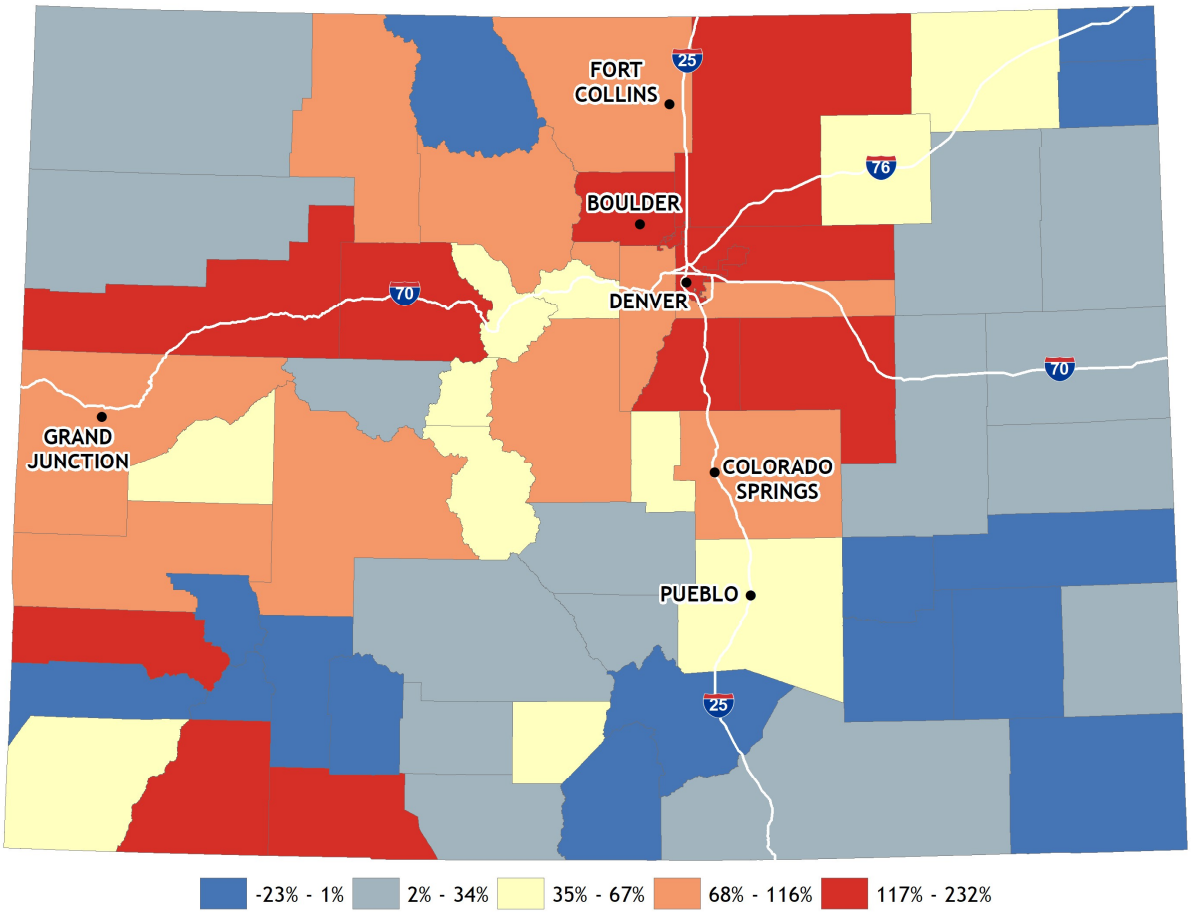
It is also vital that CDOT monitor impacts that their plans, programs and projects may have on the senior population (65 years and older), as this population can have special needs and accommodations that the general population may not have. Table 2-5 displays the older adult population in Colorado and the percentage change through 2045. The older adult population is expected to grow over the next 25 years to 19.3 percent of the total population of the state, or 1,503,432 people. This population is going to need more specialized transportation services like paratransit and dial-a-ride transportation, as they stop driving but still need access to medical and social activities.

Table 2-5 Older Adult Population, 2015-2045

	2015	2020	2030	2040	2045
65+ Population	709,416	876,332	1,201,182	1,410,502	1,503,432
Increase	NA	166,916	324,850	209,320	92,930
Percent Change	NA	24%	37%	17%	7%
Total State Population	5,456,722	5,844,096	6,688,542	7,462,640	7,776,756

Source: Colorado Department of Local Affairs 2020.

Figure 2-5 Older Adult Population Percent Change, 2015-2045



Source: DOLA 2020.

Colorado has multiple military facilities that as of 2017 had over 47,000 active duty members and over 13,000 military reserve members, serving in various branches of the military, according to Defense Department personnel data. This population of active duty military members tend to settle in Colorado at a higher rate than the rest of the nation, once they are veterans. Approximately 8.7 percent of people in Colorado had veteran's status in 2017 compared to the 7.3 percent of people in the nation.

Section 3

Economic Profiles

3.1 Employment

3.1.1 Existing Growth

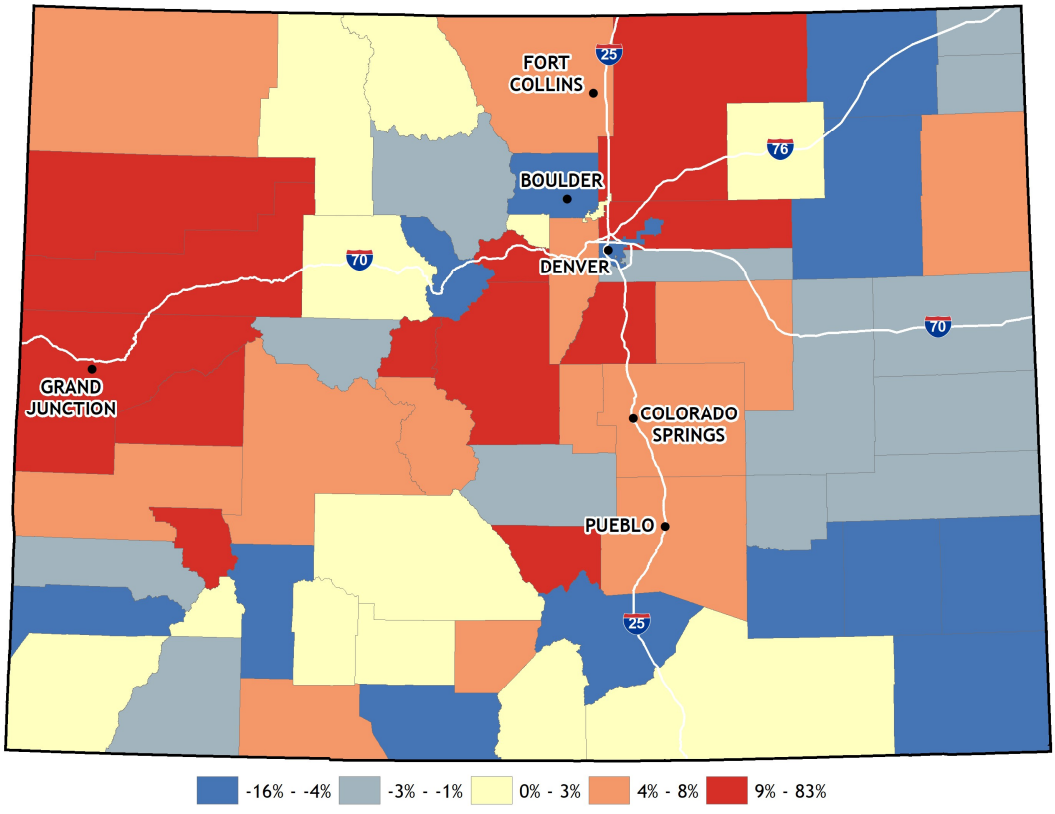
Between 2010 and 2020, Colorado's employment increased by roughly 750,000, or 27 percent. Colorado has experienced dramatic population growth over the last 25 years. As shown in Table 3-1, between 1995 and 2020, Colorado's employment increased by approximately 1.3 million, or 59 percent. Colorado ranks third in the nation in employment growth since 2010. However, as shown in Figure 3-1 and 3-2, job growth across the state has been disparate. The economic recovery from the recession has not been equally enjoyed by all counties.

Table 3-1 Colorado Employment 1995-2020

	1995	2000	2005	2010	2015	2020
Employment	2,217,669	2,684,441	2,768,384	2,784,948	3,161,545	3,534,291
Increase	NA	466,772	83,943	16,564	376,597	372,746
Percent Change	NA	21%	3%	1%	14%	12%

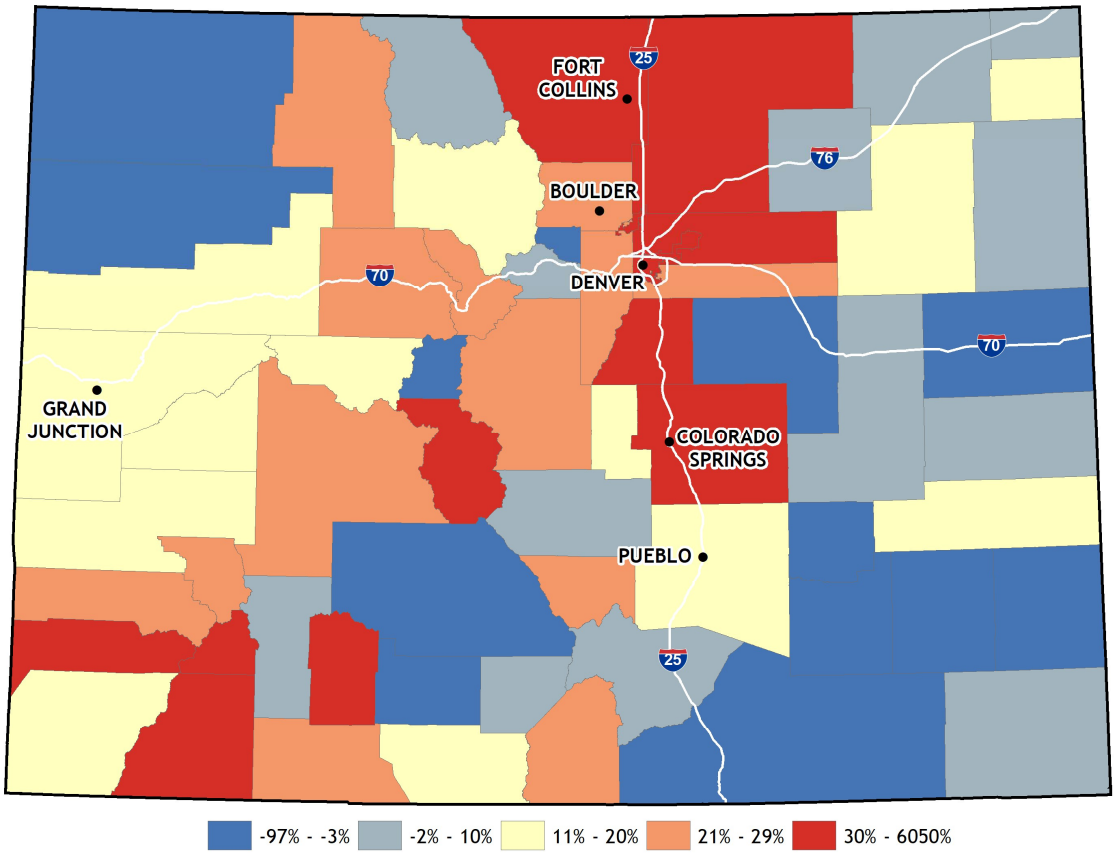
Source: Colorado Department of Local Affairs 2020.

Figure 3-1 Total Employment Percent Change, 2000-2010



Source: DOLA, 2020.

Figure 3-2 Total Employment Percent Change, 2010-2020



Source: DOLA, 2020.

3.1.2 Future Growth

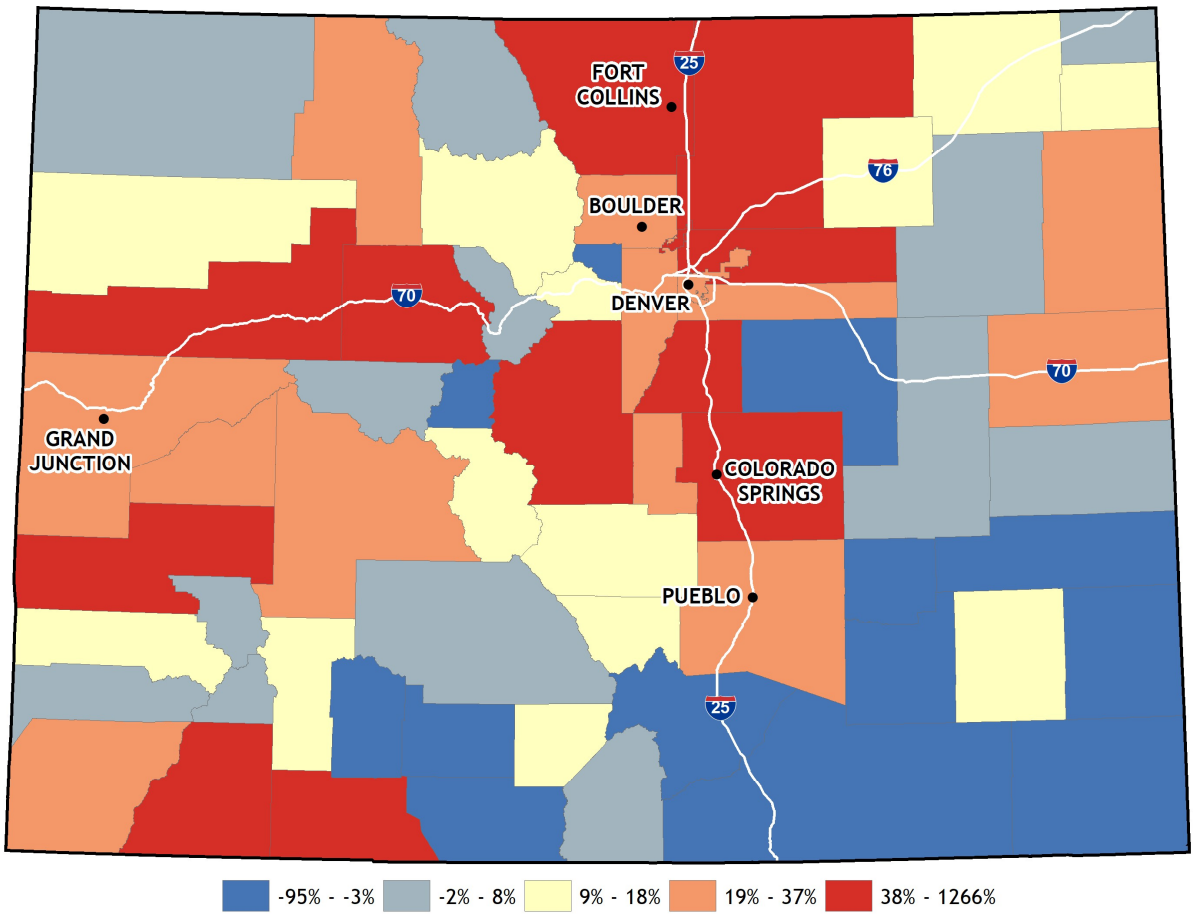
As shown in Table 3-2, Colorado is expected to grow by nearly 31 percent between 2020 and 2045, adding over 1.1 million jobs over that 25-year period. As shown in Figure 3-3, the largest employment growth would happen along the Front Range.

Table 3-2 Employment Forecast 2020-2045

	2020	2025	2030	2035	2040	2045
Employment	3,534,291	3,803,408	4,043,334	4,254,054	4,446,391	4,647,424
Increase	372,746	269,117	239,926	210,720	192,337	201,033
Percent Change	12%	8%	6%	5%	5%	5%

Source: Colorado Department of Local Affairs 2020.

Figure 3-3 Projected Employment Percent Change, 2020-2045



Source: DOLA, 2020.

3.2 Occupation by Industry Type

Colorado's transportation network is important to the economic vitality of the state. An example of this is delivering raw materials from the eastern plains of the state to the manufacturing centers in the urban areas around the state. Table 3-3 shows the national and state non-military employment breakdown by industry. Management, business, and financial occupations make up the largest share of jobs in the state. Health care services are dominant in areas with larger population centers, and professional and technical services thrive in metropolitan areas and areas with full broadband infrastructure. Analyzing the growth by industry allows for researchers and policy makers to evaluate the type of job growth Colorado has been experiencing and the types of housing and other services that may be needed in the future.

Table 3-3 Occupation by Industry Type, 2017

Industry Type	United States	%	Colorado	%
Civilian employed population 16 years and over	155,058,331		2,899,926	
Management, business, science, and arts occupations:	59,160,458	38.2%	1,216,391	41.9%
Management, business, and financial occupations:	24,009,493	15.5%	524,703	18.1%
Management occupations	16,332,467	10.5%	363,815	12.5%

Business and financial operations occupations	7,677,026	5.0%	160,888	5.5%
Computer, engineering, and science occupations:	8,925,990	5.8%	228,062	7.9%
Computer and mathematical occupations	4,710,650	3.0%	121,079	4.2%
Architecture and engineering occupations	2,857,463	1.8%	71,296	2.5%
Life, physical, and social science occupations	1,357,877	0.9%	35,687	1.2%
Education, legal, community service, arts, and media occupations:	16,852,852	10.9%	303,957	10.5%
Community and social services occupations	2,709,029	1.7%	47,514	1.6%
Legal occupations	1,702,542	1.1%	31,952	1.1%
Education, training, and library occupations	9,289,193	6.0%	157,900	5.4%
Arts, design, entertainment, sports, and media occupations	3,152,088	2.0%	66,591	2.3%
Healthcare practitioner and technical occupations:	9,372,123	6.0%	159,669	5.5%
Health diagnosing and treating practitioners and other technical occupations	6,346,928	4.1%	114,547	3.9%
Health technologists and technicians	3,025,195	2.0%	45,122	1.6%
Service occupations:	27,736,071	17.9%	492,327	17.0%
Healthcare support occupations	3,592,883	2.3%	55,039	1.9%
Protective service occupations:	3,247,935	2.1%	59,313	2.0%
Firefighting and prevention, and other protective service workers including supervisors	1,785,686	1.2%	33,615	1.2%
Law enforcement workers including supervisors	1,462,249	0.9%	25,698	0.9%
Food preparation and serving related occupations	9,025,239	5.8%	179,876	6.2%
Building and grounds cleaning and maintenance occupations	6,011,119	3.9%	98,740	3.4%
Personal care and service occupations	5,858,895	3.8%	99,359	3.4%
Sales and office occupations:	35,540,722	22.9%	649,479	22.4%
Sales and related occupations	15,870,822	10.2%	295,677	10.2%
Office and administrative support occupations	19,669,900	12.7%	353,802	12.2%
Natural resources, construction, and maintenance occupations:	13,743,035	8.9%	273,143	9.4%
Farming, fishing, and forestry occupations	1,049,466	0.7%	19,630	0.7%
Construction and extraction occupations	7,987,832	5.2%	176,837	6.1%
Installation, maintenance, and repair occupations	4,705,737	3.0%	76,676	2.6%
Production, transportation, and material moving occupations:	18,878,045	12.2%	268,586	9.3%
Production occupations	8,876,641	5.7%	110,500	3.8%
Transportation occupations	5,846,372	3.8%	102,834	3.5%
Material moving occupations	4,155,032	2.7%	55,252	1.9%

Source: American Community Survey 2017.

Section 4

Transportation

The Colorado Department of Transportation (CDOT) is responsible for developing, operating and maintaining state roadways. This includes maintaining more than 23,000 lane miles of roads, 1480 rock fall hazard sites, over 3,400 bridges, 21 tunnels, 6,000 culverts, 2,350 intelligent transportation system devices, and 35 year-round mountain passes, in addition to supporting numerous transit systems throughout the state. CDOT also oversees 28 billion miles of vehicle travel annually.

4.1 Commuter Travel Mode Split and Average Travel Times

As shown in Table 4-1, Colorado has a higher percentage of employees whom worked at home compared to the rest of the nation (8.5 percent compared to 5.2 percent, respectively). Colorado also has more than double the rate of employees commuting by bicycle compared to the rest of the nation (1.1 percent compared to 0.5 percent, respectively). These two mode shares help Colorado have a smaller percentage of employees commuting by car, truck or van than the national average (83.4 percent versus 85.3 percent, respectively). Although the average employee is more likely to commute by car, truck or van in Colorado, he or she is almost twice as likely to have access to a vehicle than the rest of the county. The mean travel time to work is a minute less in Colorado compared to the national average, at 25.9 minutes.

Table 4-1 Commute Characteristics, 2017

	United States	Colorado
Workers 16 years and over	152,802,672	2,886,978
MEANS OF TRANSPORTATION TO WORK		
Car, truck, or van	85.30%	83.40%
Drove alone	76.40%	74.90%
Carpooled	8.90%	8.60%
In 2-person carpool	6.70%	6.50%
In 3-person carpool	1.30%	1.20%
In 4-or-more person carpool	0.90%	0.80%
Workers per car, truck, or van	1.06	1.06
Public transportation (excluding taxicab)	5.00%	3.20%
Walked	2.70%	2.70%
Bicycle	0.50%	1.10%
Taxicab, motorcycle, or other means	1.30%	1.10%
Worked at home	5.20%	8.50%
TRAVEL TIME TO WORK		
Less than 10 minutes	12.20%	11.90%
10 to 14 minutes	13.30%	13.60%
15 to 19 minutes	15.10%	15.30%
20 to 24 minutes	14.40%	15.10%
25 to 29 minutes	6.50%	6.70%
30 to 34 minutes	13.80%	14.50%
35 to 44 minutes	7.00%	7.20%
45 to 59 minutes	8.30%	8.20%

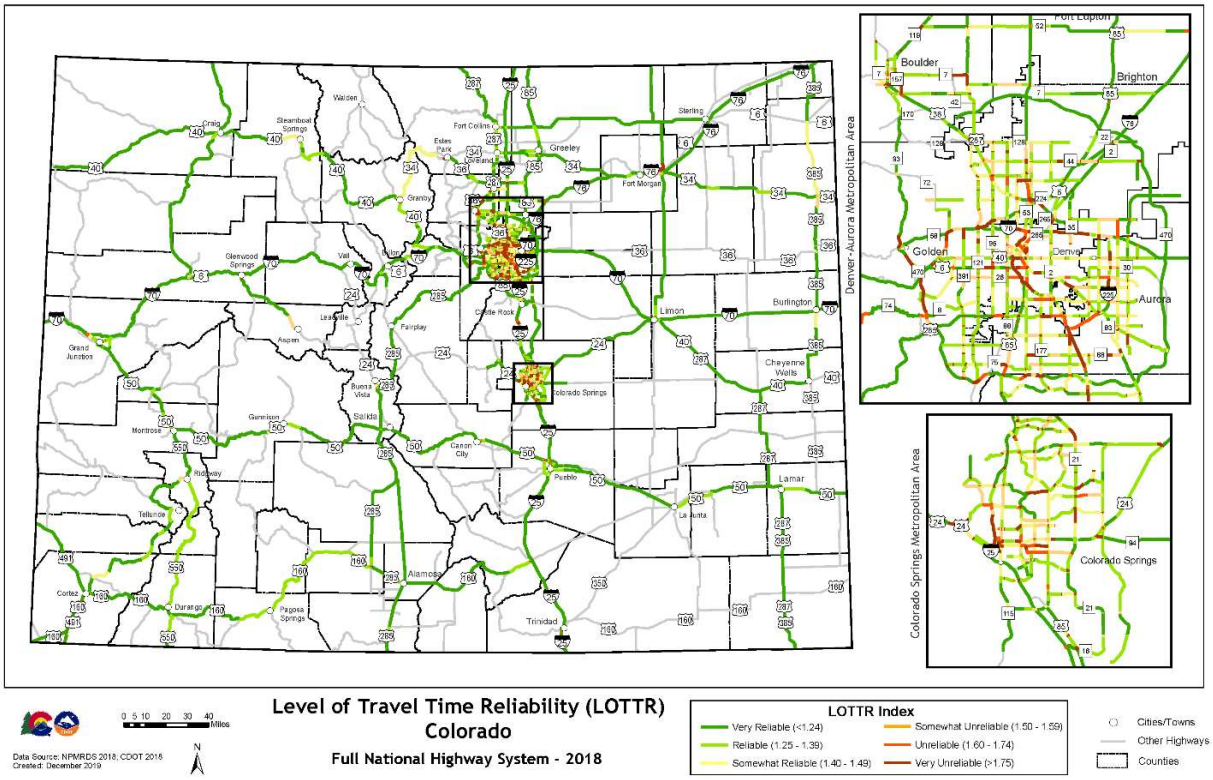
60 or more minutes	9.30%	7.50%
Mean travel time to work (minutes)	26.9	25.9
VEHICLES AVAILABLE		
No vehicle available	4.20%	2.30%

Source: American Community Survey 2017.

4.2 Travel Time Reliability

Level of Travel Time Reliability (LOTTR) is defined as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile), using data from FHWA's National Performance Management Research Data Set (NPMRDS) or equivalent. Data are collected in 15-minute segments during all time periods between 6 a.m. and 8 p.m. local time. The measures are the percent of person-miles traveled on the relevant portion of the National Highway System (NHS) that are reliable. Person-miles take into account the users of the NHS. Data to reflect the users can include bus, auto, and truck occupancy levels. Figure 4-1 shows the LOTTR for both Interstate and Non-Interstate facilities on the NHS in Colorado (2018).

Figure 4-1 Level of Travel Time Reliability (LOTTR) in Colorado (2018)



4.3 Transportation Safety

Details on trends for transportation safety are discussed in the Strategic Transportation Safety Plan, which is Appendix K of Your Transportation Plan.

4.4 Vehicle Miles Traveled

Colorado will continue to grow for the foreseeable future, and this growth will place significant strain on transportation infrastructure. The amount of travel per person (as expressed in miles travelled per capita) is expected to remain flat over that time. However, because of an increase in population total travel and associated transportation demand will increase. In 2015, total annual vehicles miles traveled (AVMT) on Colorado state highways and local roads reached 50.4 billion with 74.7 billion expected by 2045.[1] This growth in AVMT given Colorado's existing roadways will cause severe increases in traffic congestion. Traffic growth in Colorado is forecast to result in a 48.1 percent increase in traffic between 2015 and 2045, creating 447 million additional hours of delays annually.

CDOT has a goal of reducing traffic volume by implementing a number of transportation demand strategies, including transit incentives; carpooling and vanpooling; and biking and walking. Encouraging the use of public transit alternatives for single-occupancy vehicles is one strategy that can help reduce VMT.

[1] The AVMT data for 2015 was obtained using the HPMS (all roads) estimates, and VMT forecasts for 2045 assume constant per capita VMT.

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