

# Inflation in Colorado: *A Closer Look*

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Throughout the country, inflation and its many impacts have been a hot topic. National stories spotlight the challenges of rising costs for families. But what do these impacts look like in Colorado? This question and the differential impact inflation is having on low, middle, and upper-income Coloradans is explored in greater depth below.

*How Does Colorado’s Recent Inflation Compare to the Rest of the Country?*

Prices in Colorado rose over the past year at a rate unseen in decades. A survey conducted in April 2022 asked residents whether they think the rising cost of living is an extremely serious problem, a very serious problem, somewhat serious problem, or not too serious a problem in Colorado. A vast majority of respondents, 88%, consider the rising cost of living to be either an extremely serious or very serious problem.

Higher-income households appear somewhat less concerned with the increasing cost of living than other income groups. The middle-income respondents (based on two-thirds to double the state’s median household income of \$75,231 in 2020, but unadjusted for household size)<sup>1</sup> illustrate that households on the lower middle-income threshold more closely resemble the lower-income households’ perceptions of rising costs. Importantly, over 85% of the more securely middle-income households, with incomes ranging from \$75,000 to \$150,000, consider the rising cost of living to be an extremely or very serious problem (see table 1 for details).

**Table 1: Perceived Problem Severity of the Rising Cost of Living in Colorado by Household Income**

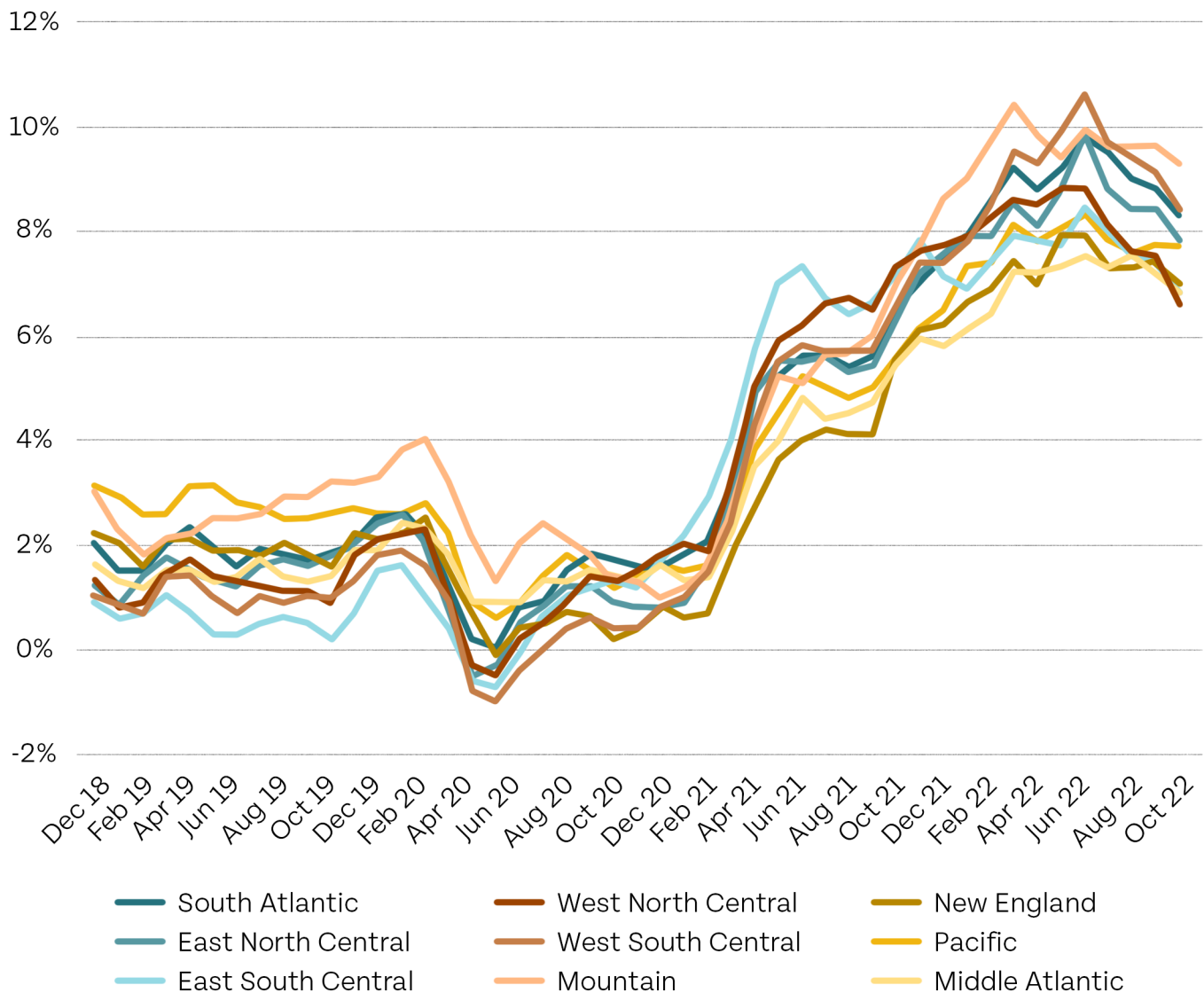
	Household Income (2021)					
	< \$30,000	\$30,000-\$50,000	\$50,000-\$75,000	\$75,000-\$100,000	\$100,000-\$150,000	\$150,000+
<b>Extremely Serious Problem</b>	73%	69%	73%	57%	61%	42%
<b>Very Serious Problem</b>	22%	24%	20%	29%	26%	38%
<b>Somewhat Serious Problem</b>	1%	8%	7%	11%	12%	19%
<b>Not Too Serious Problem</b>	3%	2%	0%	2%	1%	1%

Source: Fairbank, Maslin, Maullin, Metz & Associates. Colorado Health Foundation 2022 Pulse Survey - 320-1003 (April 5-26, 2022), Table 11: Q14b.

Survey results reflect widespread concerns over the rising cost of living in Colorado. Looking more broadly, the Mountain census division (which includes Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming) experienced relatively high inflation rates since the end of 2018 compared to the other census divisions (see figure 1, for details) especially from December 2018 to September 2020, and from November 2021 to October 2022.



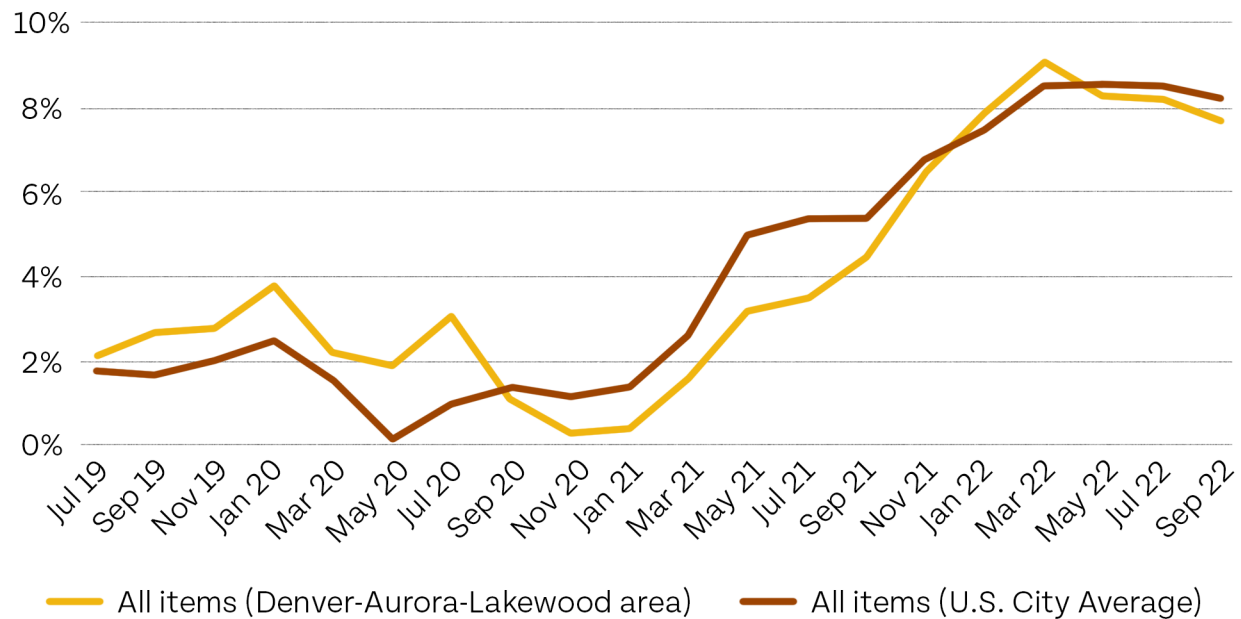
**Figure 1: 12-Month Percentage Change, Consumer Price Index, by Census Division, All Items December 2018 to October 2022**



Source: U.S. Bureau of Labor Statistics. "12-month percentage change, Consumer Price Index, by region and division, all items." Accessed at: <https://www.bls.gov/charts/consumer-price-index/consumer-price-index-by-region.htm#>

Moving beyond the Mountain region to focus more closely on Colorado requires the use of CPI (Consumer Price Index) data for the Denver-Aurora-Lakewood core based statistical area (CBSA). The Denver-Aurora-Lakewood CBSA includes Colorado's Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park counties. These counties represent 51% of the state's population, but only 8% of the state's land area. A comparison of the Denver-Aurora-Lakewood CBSA's headline inflation rates to those of other urban areas nationally (see figure 2) illustrates similar trends, albeit the Denver area experienced higher inflation rates from July 2019 to July 2020 and from January 2022 to March 2022 (note that CBSA CPI values are reported only every two months).

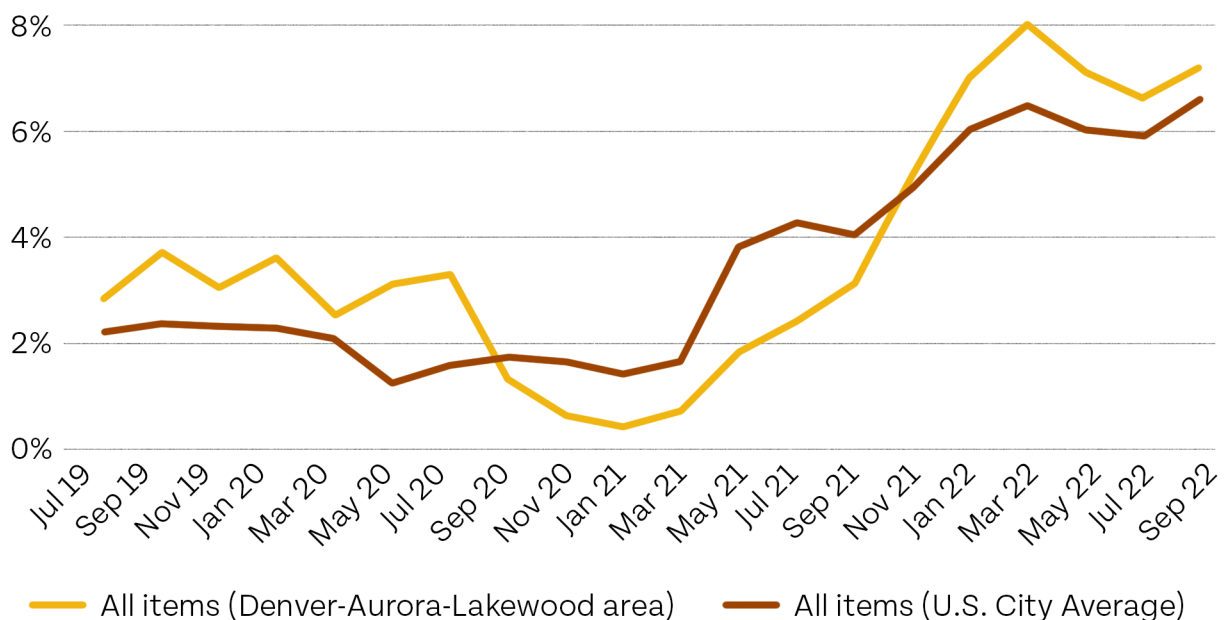
**Figure 2: Comparison of Year-over-Year Inflation Change (All items), Denver Metro Area and United States, July 2019 to September 2022**



Source: U.S. Bureau of Labor Statistics (BLS). “Consumer Price Index, Denver-Aurora-Lakewood area – September 2022.” Accessed at: [https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex\\_denver.htm](https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex_denver.htm)

An examination of core inflation (see figure 3), which removes food and energy costs, results in a less favorable inflation comparison for the Denver area. The relatively high core inflation since November 2021 suggests that the Denver area experienced lower aggregate price increases for food and energy than other urban areas nationally.

**Figure 3: Comparison of Year-over-Year Inflation Change (All items less food and energy), Denver Metro Area and United States, July 2019 to September 2022**

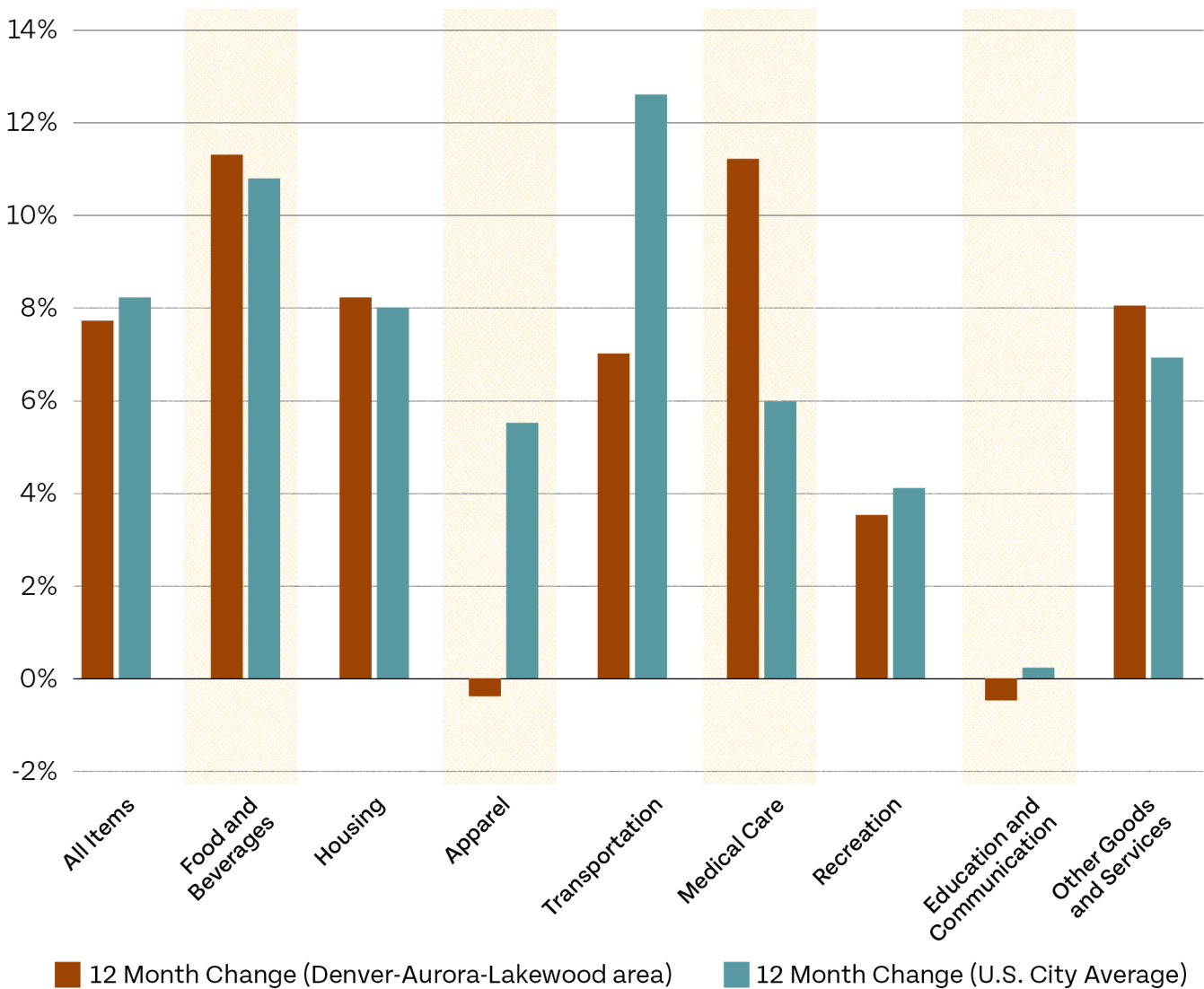


Source: U.S. Bureau of Labor Statistics (BLS). “Consumer Price Index, Denver-Aurora-Lakewood area – September 2022.” Accessed at: [https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex\\_denver.htm](https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex_denver.htm)



Drilling down to price changes for specific components of the CPI measure, in figure 4, provides a more nuanced comparison of the relative inflation in the Denver area over the past year. Overall, the inflation rate for the Denver area slightly lagged the nation as a whole. Notable differences include the Denver area experiencing lower relative price gains in Apparel and Transportation and higher relative gains in Medical Care and Other Goods and Services.<sup>2</sup> While the change in Denver’s Housing costs parallel national changes over this period, the Housing category is an especially large component of Colorado’s CPI and deserves special attention (see box 1).

**Figure 4: Comparison of Year-over-Year Inflation Component Change, Denver Metro Area and United States (September 2022)**



Notes: These categories represent the eight major expenditure groups used by the BLS. The percent change for the Denver CBSA’s medical care component reflects the July 2021 to July 2022 change, since the September figure was unavailable.

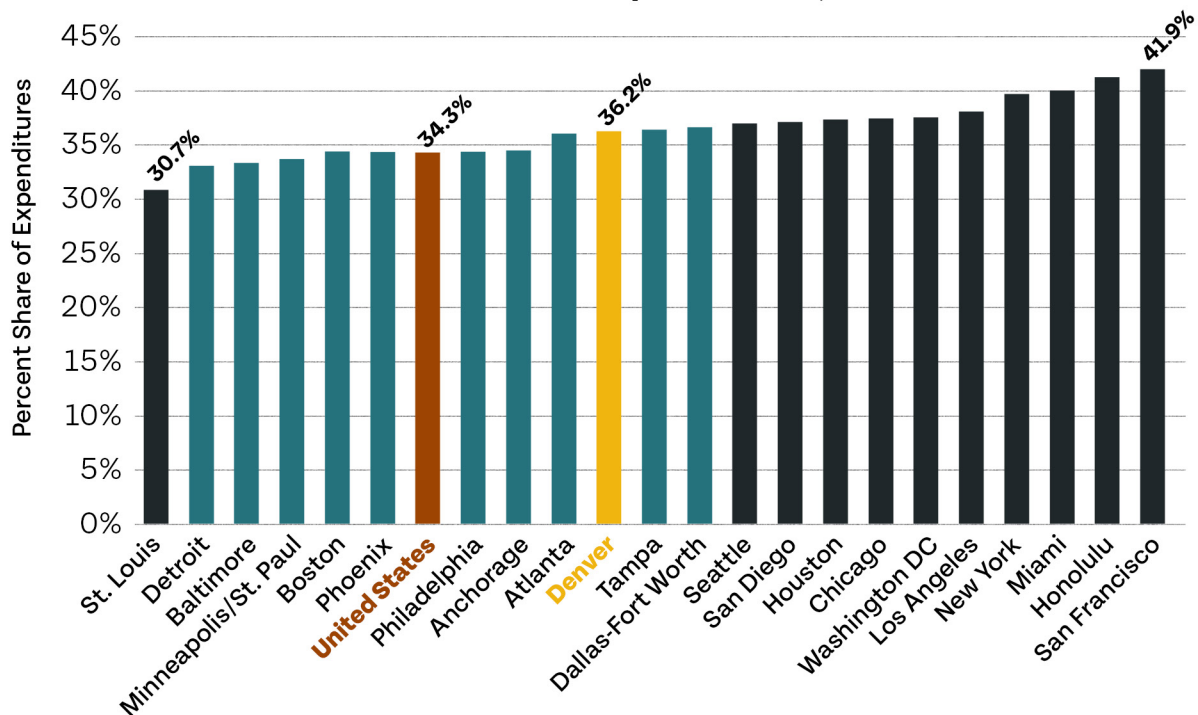
Source: U.S. Bureau of Labor Statistics (BLS). Accessed at: [https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex\\_denver.htm](https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex_denver.htm) and [https://www.bls.gov/news.release/archives/cpi\\_10132022.htm](https://www.bls.gov/news.release/archives/cpi_10132022.htm)

# Box 1

## Housing and Inflation in Colorado

Colorado's housing market rightfully receives attention for mounting affordability challenges, but the difference between the share of average annual expenditures for housing in the Denver metropolitan area and the national average is not statistically different from zero. As seen in figure 5, the Denver area exceeds the average for the nation's urban areas but falls in the middle for the metropolitan areas reported on by the CPI.

**Figure 5: Percent share of average annual expenditures for housing, United States and 22 metropolitan areas, 2020-21**



Notes: A black bar represents a statistically significant difference from the U.S. average at the 95-percent confidence level. The Denver bar is shaded gold and U.S. average is shaded red.

Source: U.S. Bureau of Labor Statistics (BLS). "Consumer Expenditures for the Denver Metropolitan Area – 2020-21," October 31, 2022. Accessed at: [https://www.bls.gov/regions/mountain-plains/news-release/consumerexpenditures\\_denver.htm](https://www.bls.gov/regions/mountain-plains/news-release/consumerexpenditures_denver.htm)

Housing, or shelter, represents approximately a third of the basket of goods and services reflected in the CPI. Despite the prominence of housing in the index, the CPI's approach to capturing the cost of housing likely understates the magnitude of increasing housing prices in Colorado. The CPI's methodology shifted in 1983 in an effort to focus squarely on the value received by owners from living in their home, rather than capturing the overall asset value of



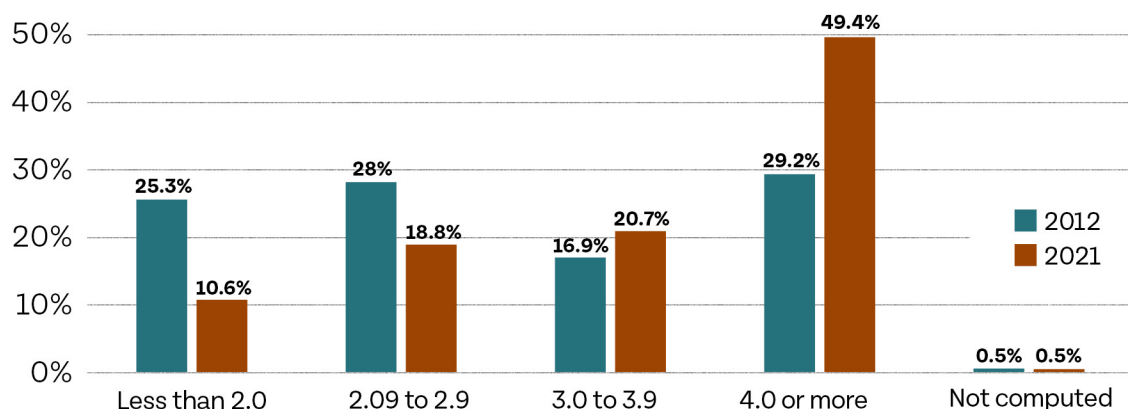
owner-occupied homes.<sup>3</sup> The Shelter component of the CPI now includes “Rent of primary residence” and “Owners’ equivalent rent of residences,” with the latter recently being weighted about three times the former (7.4% to 24%).<sup>4</sup>

While “Rent of primary residence” is fairly straightforward as rent paid for shelter, the “Owners’ equivalent rent” attempts to represent the amount the owner would have to pay to rent a similar home. Information collected on a large number of rented and owned residences provides the basis for calculating rent and owners’ equivalent rent, but a number of meaningful challenges exist to accurately estimating owners’ equivalent rent.<sup>5</sup> For example, the estimates of owners’ equivalent rent consider the rental amount homeowners believe could be charged for their home – a difficult number to correctly assess.

Increases in home prices ultimately result in rising costs, especially for renters and new homeowners. As a major component of America’s middle class, homeownership depends on the ability to have income or wealth sufficient to purchase a home. Once purchased, homeownership provides a path to building wealth, as owners repay long-term mortgage financing on a monthly basis and gain home equity.

Although based on self-reported home values and incomes, the ratio of owner-occupied home values to household income in Colorado shifted dramatically higher over the past decade (as seen in figure 6). The ratio provides insight into home affordability based on income (although not wealth). In 2012 a little more than half of respondents (53.3%) reported home value to household income ratios of 2.9 or less, meaning that the household’s gross income was less than 3 times their house value. A decade later in 2021, nearly half (49.4%) of homeowners lived in homes valued at more than 4 times household income. While some of the change may be attributed to an aging population with lower incomes in retirement, the data suggest increasing challenges to attaining homeownership across income groups.

**Figure 6: Ratio of Value to Household Income in the Past 12 Months, 2012 and 2021 (owner-occupied housing units with a mortgage in Colorado)**



Source: American Community Survey (ACS), S2506 Financial Characteristics for Housing Units with a Mortgage, 2012 & 2021.



The Denver metropolitan area, like many parts of the country, experienced especially rapid growth in home values following the onset of the COVID-19 pandemic. According to the S&P/Case-Shiller CO-Denver Home Price Index, home prices in Denver climbed 44.2% from March 2020 to the peak in May 2022 before subsequently experiencing a modest decline.<sup>6</sup> Given the treatment of owner-occupied housing in the CPI, considering who is most impacted by the rapid growth in home values is worthwhile. Despite the growth in home values, an estimated 66.2% of housing units in Colorado were owner-occupied housing from 2016-2020.<sup>7</sup> And among owner-occupied housing units, nearly a third (30.3%) lack a mortgage according to the 2021 American Community Survey.<sup>8</sup>

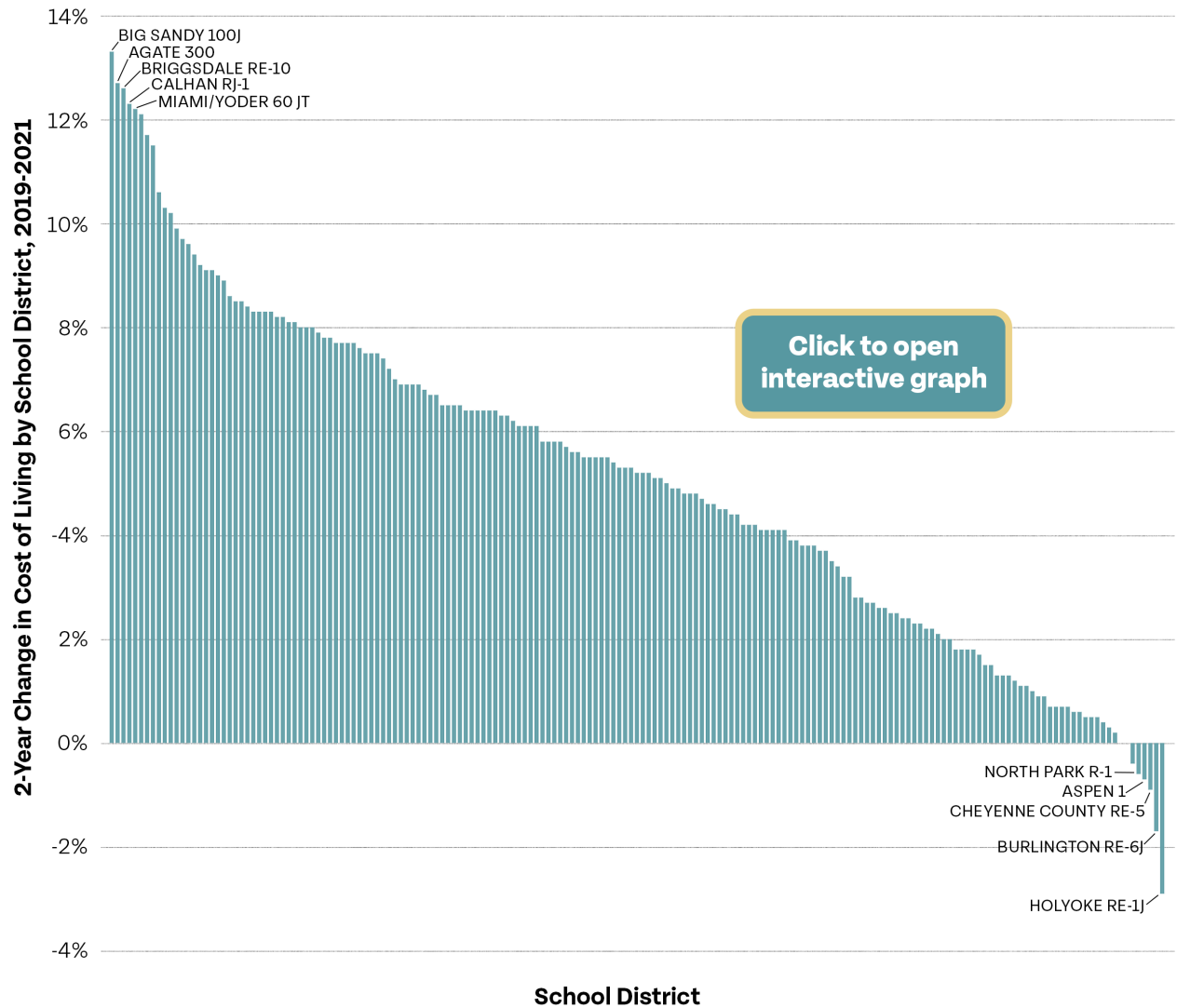
Existing homeowners, a hallmark of the middle class, generally remain insulated from the negative effects of rising home prices while benefiting from increasing

equity in their homes. The majority of Colorado homeowners who still hold mortgages purchased the homes with long-term fixed-rate mortgages. Many existing homeowners are experiencing higher property taxes (reflecting increased property values), maintenance expenses, insurance premiums, and utility costs that parallel the broader inflationary trends, yet holding a fixed-rate mortgage or having no mortgage blunts the direct effects of price growth despite the rising interest rate environment. The use of adjustable-rate mortgages varies with the current interest rate environment, but represented less than 9% of mortgage applications nationally in mid-November 2022.<sup>9</sup> First-time homebuyers, those relocating to Colorado from lower-cost-of-living locations, and renters experience the downsides of housing value increases much more intensely than existing homeowners.



The availability of the CPI at the Denver metropolitan area provides insight into the average inflation experience for about half of Colorado's population. A fair question is whether the Denver-area inflation story aligns with other parts of the state like the Western Slope or Eastern Plains. While imperfect for assessing regional variation in inflation across Colorado, a cost-of-living survey is conducted every two years at the school district level in Colorado and can be used as a proxy to gauge the relative changes in local costs for a fixed basket of goods.<sup>10</sup> For the most recent two-year period, the statewide average cost of the bundle of goods used to benchmark local costs for school districts climbed 5.81% between the 2019 and 2021 reports. At the school district level, the change in costs ranged from a high of 13.3% in the Big Sandy 100J district located in rural Elbert and El Paso Counties, to a low of -2.9% for the Holyoke RE-1J district in northeast Colorado's largely agricultural Phillips County. The median increase in costs for a family in these school districts purchasing the same basket of goods over this period was 5.2%. The wide variation in cost of living changes is apparent in the following figure and tables.

**Figure 7: 2-Year Percent Change in Cost of Living by School District, 2019-2021**



**Top 10**

<b>Big Sandy 100J</b>	13.3%
<b>Agate 300</b>	12.7%
<b>Briggsdale RE-10</b>	12.6%
<b>Calhan RJ-1</b>	12.3%
<b>Miami/Yoder 60 JT</b>	12.2%
<b>Fountain 8</b>	12.1%
<b>Edison 54 JT</b>	11.7%
<b>Peyton 23 JT</b>	11.5%
<b>Ellicott 22</b>	10.6%
<b>Deer Trail 26J</b>	10.3%

**Bottom 10**

<b>Holyoke RE-1J</b>	-2.9%
<b>Burlington RE-6J</b>	-1.7%
<b>Cheyenne County RE-5</b>	-0.9%
<b>Aspen 1</b>	-0.7%
<b>North Park R-1</b>	-0.6%
<b>Springfield RE-4</b>	-0.4%
<b>Lamar RE-2</b>	0.0%
<b>Meeker RE1</b>	0.0%
<b>Wray RD-2</b>	0.2%
<b>Granada RE-1</b>	0.3%

Source: Authors' analysis of data from Corona Insights. 2021 Colorado School District Cost of Living Analysis, 2022. Accessed at: <https://leg.colorado.gov/publications/2021-cost-living-study-corona-insights-2022> and Corona Insights. 2019 Colorado School District Cost of Living Analysis, 2020. Accessed at: <https://leg.colorado.gov/publications/2019-cost-living-study-corona-insights-2020>



While the magnitude and composition of inflation differs by location, inflation is also experienced differently by each household depending on consumption patterns and income levels. The following section details how the inflation experience differs across households with different income levels in Colorado.

### *What is the Impact of Inflation Across Income Groups in Colorado?* \_\_\_\_\_

While everyone in a community faces the same price increases for similar goods and services, not everyone will experience price changes the same, owing to differences in residents' spending patterns and income. Large price increases for goods that are a relatively small fraction of a household's budget will force smaller spending trade-offs, compared to a household where the goods comprise a larger share of the budget. The budget trade-offs created by increasing prices are exacerbated when there are no cheaper substitutes. A household may spend more of their income on gasoline, for instance, because they are priced out of neighborhoods closer to train stations and do not have reliable public transportation in their current neighborhood. Gas price increases will force such households to make larger budget trade-offs than an otherwise similar household closer to reliable public transportation. Similarly, consider prescription drugs, which are critical to maintain quality of life for many. If there are no substitute drugs, price increases will affect households differently depending on their share of drug spending.

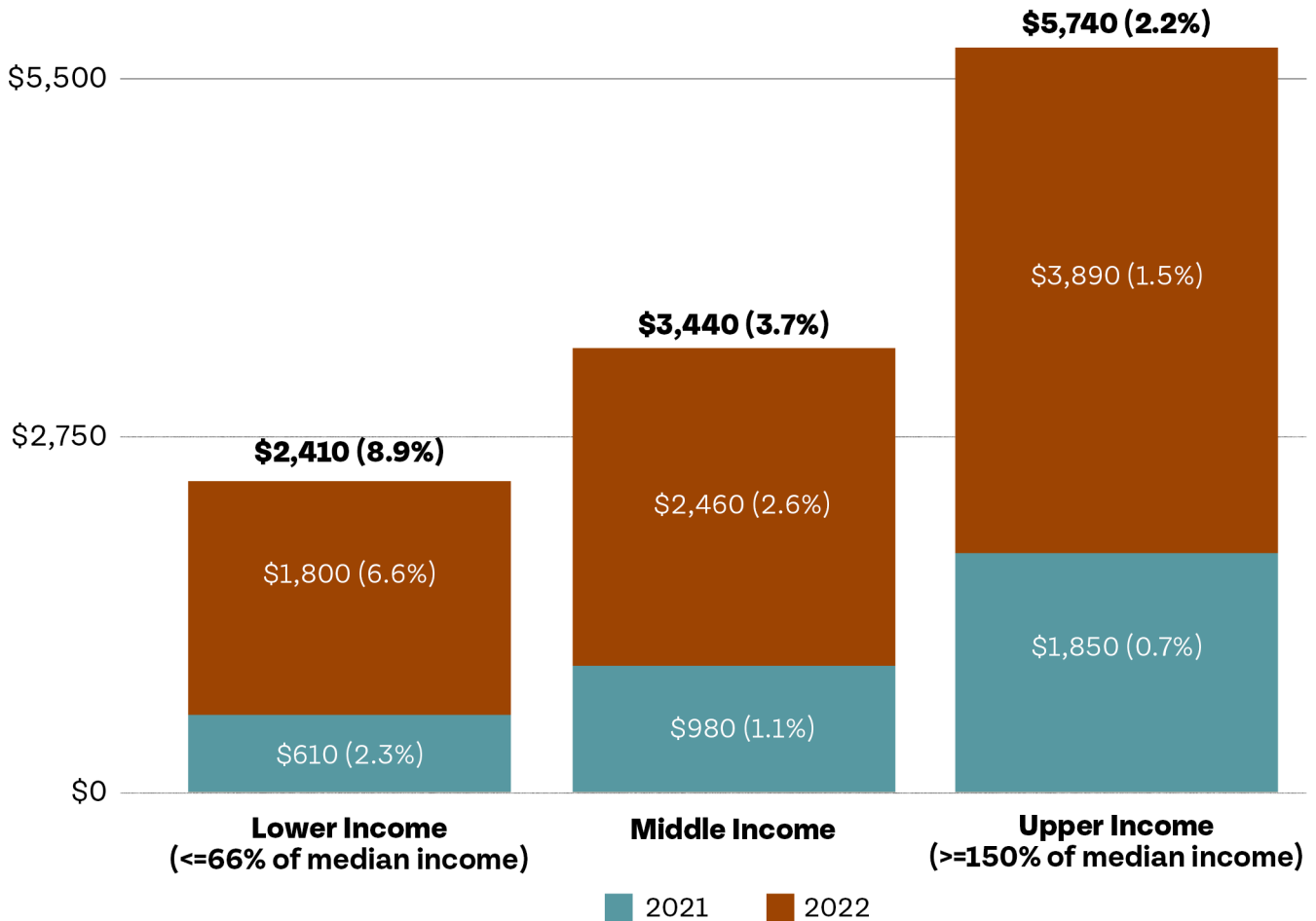
In order to get a sense of how different Colorado households are impacted differently by inflation, we estimated how much more households are spending on goods and services over the last two years. We used data from the Consumer Expenditure Survey (CES) to determine how the median lower-income, middle-income, and upper-income households have fared.<sup>11</sup> We define income according to household size using the same approach as in our 2018 report, *Colorado's Middle-Class Families: Characteristics and Cost Pressures*.<sup>12</sup> Moreover, we focus on major spending categories for which the Bureau of Labor Statistics published CPI data for the Denver metro area. There are 11 categories:

- |  |  |
|--|--|
| <b>1. Apparel</b>                          | <b>7. Household utilities</b>  |
| <b>2. Education</b>                        | <b>8. Medical care</b>   |
| <b>3. Entertainment</b>                    | <b>9. Personal services</b>  |
| <b>4. Food away from home</b>              | <b>10. Shelter (rent and owner-occupied housing costs)</b>             |
| <b>5. Groceries</b>                        | <b>11. Transportation excluding the price of new and used vehicles</b> |
| <b>6. Household equipment and services</b> |  |

These categories comprise 89 percent of all household spending captured by the CPI and 62 percent of all spending. Noteworthy expenditures we exclude are spending on personal insurance, savings, cash transfers such as donations or alimony, purchases for illegal goods, fines, and new and used vehicles. With the exception of new and used vehicles, the CPI does not measure changes in the price of these other types of expenditures. New and used vehicles are also infrequent expenditures, comprising a significant share of a household's budget in the year purchased. Though the price of used cars in particular have increased considerably due to a combination of inflation, the pandemic, and parts shortages, we feel the infrequency of car purchases make it a less important inflation story than more frequently consumed goods and services.



**Figure 8: Cumulative Increase in Spending for the Median Colorado Household**



Source: Authors' analysis of Consumer Expenditure Survey and Consumer Price Index data.

Figure 8 shows the incremental and cumulative increase in spending for the median Colorado household by income group for 2021 and 2022. The teal area is the total increase in spending due to inflation from September 2021 to September 2020, while the maroon area is the additional increase in spending due to inflation from September 2021 to September 2022. The dollar figure atop each stacked bar is the cumulative increase in spending due to inflation on a 12-month basis since September 2020.

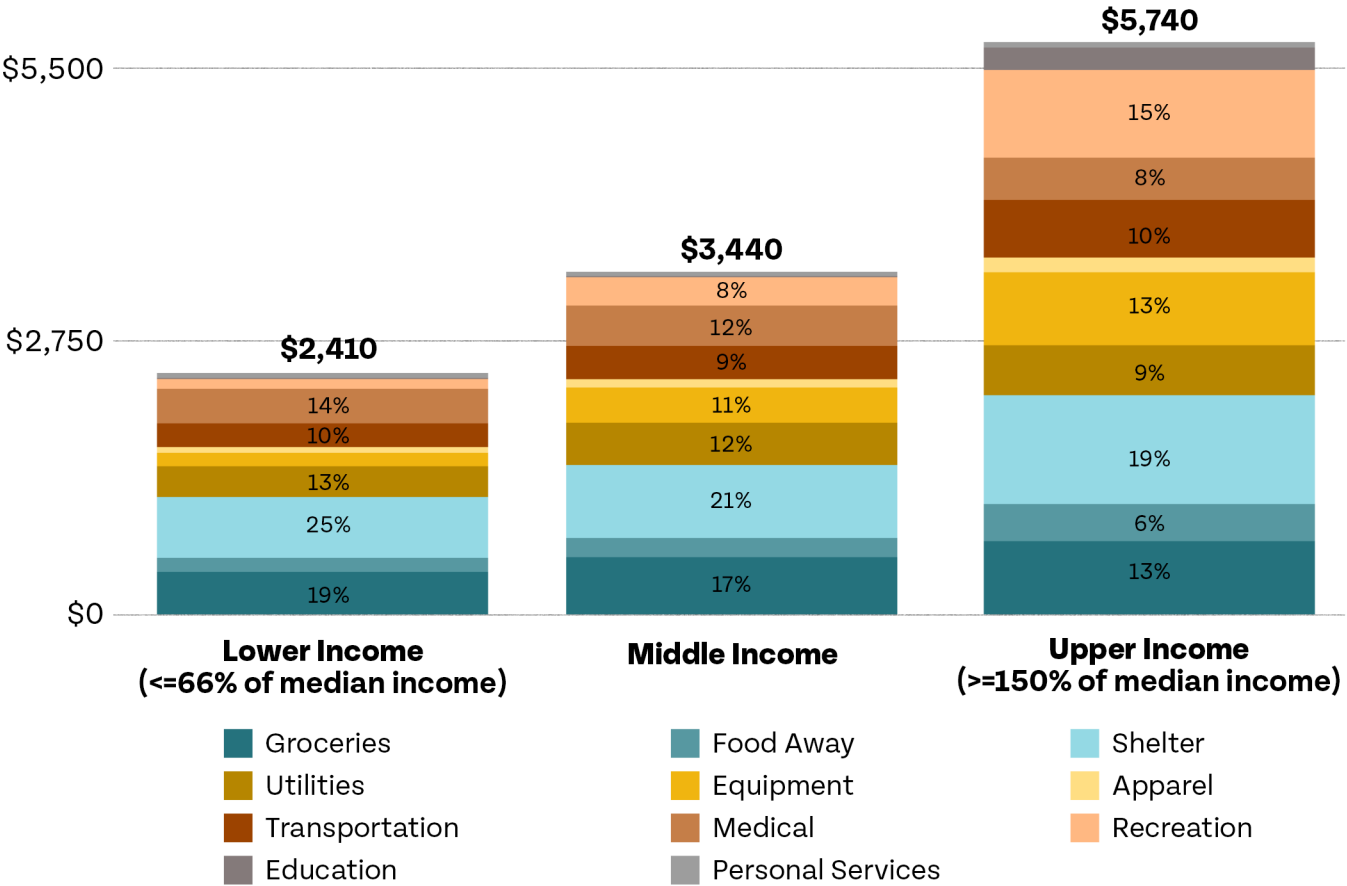
Inflation has cost the median lower-income household an additional \$2,410 over the last two years, or about \$1,200 a year on average. The median middle- and upper-income households have seen inflation push spending on their everyday items up by \$1,720 and \$2,870 a year on average, respectively.

Since households with more income have more to spend, and face less intense budget trade-offs as a result, it is instructive to consider the effect of inflation on spending relative to each group's total expenditures and income. These figures are presented in Figure 8 in parentheses. For the median lower-income household, relative to their 2020 income, inflation has increased spending by 8.9%. For the median middle- and upper-income households, the shares are 3.7% and 2.2%, respectively. Moreover, since Colorado aggregate real personal income grew by 3.7% between 2020 and 2021, it is worth considering the cost of inflation relative to 2021 incomes. Using last year's median income for each group, the shares are similar: 8.6%, 3.6%, and 2.2%,

respectively. In other words, though middle-income and upper-income households have seen their costs increase 40% to 140% more in real dollar terms, the increase in costs to lower-income households is more painful relative to their budget constraint. The implication is more difficult budget trade-offs for them compared to higher-income households.

Figure 8 masks variation across types of expenditures that could allow for more nuanced discussion about inflation’s impact on different households. In Figure 9, we disaggregate each median household’s inflation cost by the 11 categories noted previously. The data are presented as stacked bars, with the total bar height representing the combined 12-month inflation cost since September 2020 for the median lower-, middle-, and upper-income household—the same total cost displayed in Figure 8. Inflation costs are based on category-specific CPIs. Percentages show the total inflation cost broken down by spending category for each income group. For space considerations, not all shares are displayed, but since the bar stacks are measured in dollars, their relative sizes are comparable within and across income groups. The data show that inflation has pushed the cost of transportation up similarly for all groups. In contrast, inflation has been more painful for the median lower-income household in terms of groceries and shelter, but more painful for the median upper-income household in terms of food away from home, household equipment, and recreation.

Figure 9: Cumulative Increase in Spending for the Median Colorado Household by Category



Source: Authors’ analysis of Consumer Expenditure Survey and Consumer Price Index data.

Notes: The graph shows the total cost of inflation by spending category since September 2020 for the median lower-, middle-, and upper-income Colorado household. The height of each column is the total spent in dollars by each median household. Percentages indicate the relative cost share for particular spending categories relative to the total for each income group. Equipment means household equipment and services. Transportation excludes the purchase and financing cost of new and used vehicles. Utilities are household utilities including natural gas, electricity, and water.

Expressing the cost of inflation relative to income further highlights variation in the burden of inflation on different income groups in Colorado. Table 2 shows these percentages, revealing that the median lower-income household consistently faces larger budget trade-offs when the price of these goods increases.<sup>13</sup>

**Table 2: Inflation cost as a percentage of 2020 median household income**

Spending Category	Lower	Middle	Upper
Groceries	1.68%	0.63%	0.30%
Food away from home	0.45%	0.19%	0.14%
Shelter	2.25%	0.78%	0.43%
Household utilities	1.15%	0.45%	0.20%
Household equipment and services	0.54%	0.39%	0.29%
Apparel	0.17%	0.10%	0.05%
Transportation	0.92%	0.35%	0.23%
Medical	1.24%	0.45%	0.18%
Recreation and entertainment	0.40%	0.29%	0.34%
Education	0.08%	0.02%	0.10%
Personal Services	0.03%	0.02%	0.01%

*Are there Benefits of Inflation for Colorado’s Middle Class?*—————

The previous section highlights the disparate impacts of inflation on Colorado’s households based on income. While inflation generally carries a negative connotation, asking whether inflation is good or bad is a surprisingly nuanced question. In general, inflation pressures unmatched by compensation gains negatively affect households and consumers. At the same time, modest inflation is strongly preferred to deflation for the health of the economy. Where the answer gets surprising is how inflation affects a household’s outstanding debt, with the same holding true for government debt. Referred to as the “inflation tax,” higher-than-anticipated inflation benefits borrowers using fixed-rate debt products, while penalizing lenders. The reason is that the borrower gets to pay back loans with dollars that are now worth less than when borrowed.

What does this mean for middle class households? Households borrow for all sorts of reasons, including for many hallmarks of the middle class like homes, cars, and higher education. In the United States, much of this borrowing takes place using loans with fixed interest rates. Unlike most of the world, homebuyers in the United States benefit from the prominence of the 30-year fixed-rate mortgage due to federal government support. Since middle class borrowers depend more, proportionally, on fixed-rate debt, they also benefit more from the inflation tax in a relative sense than low-income households (who depend more on variable rate forms of credit) and high-income households who simply borrow less in proportion to their wealth. According to economist Edward Wolff, household debt represented 36.5% of household assets for the middle class in 2019 compared to only 2.3% for the “very rich.”<sup>14</sup>



While not a reason to embrace high inflation, if middle class households' assets keep pace with inflation over time then these households' net worth grows simply due to the erosion of outstanding debt in real terms. Table 3 illustrates the inflation tax at work based on the median Colorado household's assets (including home equity), debt, and net worth over the past decade. In real terms (meaning inflation is considered), the Colorado median household debt amount of \$112,000 is reduced to approximately \$81,000 over the period resulting in a growing net worth.

**Table 3: Implications of Inflation for Median Household's Net Worth in Colorado, 2013-2022**

	<b>Inflation Rate</b> (based on Denver-Aurora-Lakewood CPI-U from 2013 to 2022, 2022 estimated)	<b>Real Value of Assets</b> (assumed to keep pace with inflation over time)	<b>Real Value of Debts</b>	<b>Real Net Worth</b> (assets minus debts)	<b>Accumulated Percentage Change</b>
<b>Year 1</b>	2.80%	\$298,700	\$112,000	\$186,700	-
<b>Year 2</b>	2.80%	\$298,700	\$108,864	\$189,836	1.68%
<b>Year 3</b>	1.20%	\$298,700	\$105,816	\$192,884	3.31%
<b>Year 4</b>	2.80%	\$298,700	\$104,546	\$194,154	3.99%
<b>Year 5</b>	3.40%	\$298,700	\$101,619	\$197,081	5.56%
<b>Year 6</b>	2.70%	\$298,700	\$98,164	\$200,536	7.41%
<b>Year 7</b>	1.90%	\$298,700	\$95,513	\$203,187	8.83%
<b>Year 8</b>	2.00%	\$298,700	\$93,699	\$205,001	9.80%
<b>Year 9</b>	3.50%	\$298,700	\$91,825	\$206,875	10.81%
<b>Year 10</b>	8.20%	\$298,700	\$88,611	\$210,089	12.53%
<b>Year 11</b>	-	\$298,700	\$81,345	\$217,355	16.42%

Notes: The table is adapted from: Edward N. Wolff. "The upside of inflation: Middle-class families have benefited more from inflation than the superrich have," February 24, 2022. Accessed at: <https://www.project-syndicate.org/commentary/us-inflation-mitigates-wealth-inequality-by-edward-n-wolff-2022-02>. Median net worth and debt for Colorado households come from: U.S. Census Bureau, Survey of Income and Program Participation, Survey Year 2020, Public Use Data Internet Release Date: 10/27/2021.

The overall repercussions of inflation for middle class households depend heavily on factors beyond simply having a middle-class income. But the impact of inflation on outstanding household debt is especially important in Colorado, since the median Colorado household's total debt and home debt rank 6th and 5th, respectively, among the states as of 2020.<sup>15</sup> Fixed-rate financing previously incurred for homes, cars, and student loans provides the ability to repay debt with less valuable dollars due to inflation.

This analysis dives deep into the impacts of inflation in Colorado. Perhaps unsurprisingly, we find that the effects are not equally felt by all residents. Instead, those with the lowest incomes are disproportionately affected. This finding brings new light to the issue and offers an opportunity to further shape our understanding of inflation and its influence on our state.

## Endnotes

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- 1** For Colorado's median household income, see: <https://www.census.gov/quickfacts/fact/table/CO/BZA210220>.
- 2** While the Denver area's Medical Care prices climbed in the most recent year relative to prices nationally, consumers in the Denver metro area actually spend on average a significantly lower share of expenditures for healthcare compared to the national average (for details see, [https://www.bls.gov/regions/mountain-plains/news-release/consumerexpenditures\\_denver.htm](https://www.bls.gov/regions/mountain-plains/news-release/consumerexpenditures_denver.htm)).
- 3** Jared Bernstein, Ernie Tedeschi, and Sarah Robinson. "Housing Prices and Inflation." Council of Economic Advisors, September 9, 2021. Accessed at: <https://www.whitehouse.gov/cea/written-materials/2021/09/09/housing-prices-and-inflation/>
- 4** U.S. BLS. Consumer Price Index for All Urban Consumers (CPI-U): U. S. city average, by expenditure category. Accessed at: <https://www.bls.gov/news.release/cpi.t01.htm>
- 5** David Wessel and Sophia Campbell. "How does the Consumer Price Index account for the cost of housing?" Brookings, May 18, 2022. Accessed at: <https://www.brookings.edu/blog/up-front/2022/05/18/how-does-the-consumer-price-index-account-for-the-cost-of-housing/>
- 6** S&P Dow Jones Indices LLC, S&P/Case-Shiller CO-Denver Home Price Index [DNXRSA], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/DNXRSA>, November 25, 2022.
- 7** For details, see: <https://www.census.gov/quickfacts/fact/table/CO,US/RH1825221>
- 8** American Community Survey, S2506 Financial Characteristics for Housing Units with a Mortgage, 2021: ACS 1-Year Estimates; S2507 Financial Characteristics for Housing Units without a Mortgage (<https://data.census.gov/cedsci/table?q=colorado%20housing%20mortgages&tid=ACSST1Y2021.S2507>).
- 9** Mortgage Bankers Association's (MBA). "Mortgage Applications Increase in Latest MBA Weekly Survey," November 23, 2022. Accessed at: <https://www.mba.org/news-and-research/newsroom/news/2022/11/23/mortgage-applications-increase-in-latest-mba-weekly-survey>
- 10** For Colorado's most recent school district cost of living analysis, see: Corona Insights. 2021 Colorado School District Cost of Living Analysis, 2022. Accessed at: <https://leg.colorado.gov/publications/2021-cost-living-study-corona-insights-2022>
- 11** While the CES data allow us to gain some insight into the Colorado-specific inflation experience, the data used in this analysis may not be representative due to the limited number of Colorado observations.
- 12** Middle-income households are those whose before-tax income is between two-thirds and double the median income. Lower-income households have incomes below the two-thirds threshold, and upper-income households have incomes above the double threshold. Because household median incomes, and therefore income group classification, correlate with the number of wage earners and household costs with the presence of young children, we allow different household compositions to have unique medians. The household types are: one adult and no young kids (< 18 years old); two adults and no young kids; one adult and at least one young kid; and two adults and at least one young kid. In other words, a household with one adult and no children and a household with two adults and one child may have different incomes and costs but both may be considered lower income if their annual incomes are less than two-thirds of the median for their respective family composition type. For background and details on Colorado's middle class, see: Ely, T. & Propheter, G. Colorado's Middle Class Families: Characteristics and Cost Pressures. Center for Local Government Research and Training, University of Colorado Denver: July 2018 (<https://www.bellpolicy.org/wp-content/uploads/2018/07/Colorados-Middle-Class-Families.pdf>) and Ely, T., Propheter, G., Jones, R., and S. Wasserman. What Gets Measured, Gets Done: Understanding and Addressing Middle-Class Challenges. Public Administration Review, 79, no. 5 (Sept./Oct. 2019): 768-771.

**13** Recent research at the national level similarly recognizes that low-income households are more burdened by inflation due to less discretionary spending and saving activity. For details, see: Alicia H. Munnell and Diana Horvath. (September 2022). How Much Does Inflation Vary by Income? Depends on How It's Measured. Center for Retirement Research at Boston College (Number 22-16).

**14** Edward N. Wolff. "The upside of inflation: Middle-class families have benefited more from inflation than the superrich have," February 24, 2022. Accessed at: <https://www.project-syndicate.org/commentary/us-inflation-mitigates-wealth-inequality-by-edward-n-wolff-2022-02>

**15** U.S. Census Bureau, Survey of Income and Program Participation, Survey Year 2021, Public Use Data Internet Release Date: 08/31/2022.