COLORADO PERA®

COLORADO PERA'S ECONOMIC AND FISCAL IMPACTS

2024

PREPARED BY PACEY NEHLS ECONOMIC CONSULTING

CONTENTS

INTRODUCTION

This study provides a brief overview of the background of the Colorado Public Employees' Retirement Association (PERA), for both the active members and benefit recipients of PERA (by division), discusses the magnitude of their impact on output, income, and employment to the state as well as to regional and local economies. This June 2024 study is a follow-up to the earlier reports performed in August 2009 and subsequent studies in 2011, 2015, 2016, 2018, 2020 and 2022. We also include a perspective on the changes in the impacts over the prior decade. Furthermore, this June 2024 study reflects the aftermath of the COVID-19 pandemic and how this worldwide health emergency has changed the future outlook for all economies. This PERA investment continues to grow, providing continuity and predictability for the citizens of the state and our civil servants, who help us to continue to prosper and enjoy Colorado.

EXECUTIVE SUMMARY

Colorado PERA is the retirement plan for over 400 public entities and government agencies within the State of Colorado. Since 2010, when the Denver Public Schools (DPS) joined the PERA rolls, there has been a nominal change in the number of organizations served by PERA. With the addition of DPS, PERA is comprised of five divisions as identified below. School and State continue to dominate PERA recipients and the proportion of recipients within each division has remained relatively consistent over the last 14 years.

- School Division
- State Division
- Local Government Division
- Judicial Division
- DPS Division

PERA continues to be an important driver of economic activity for the state as a whole as well as our regional and local (county) economies.

- The Association provides retirement distributions of $4.56[1] billion annually to Colorado residents (based on monthly retirement distributions as of December 2023 annualized). This annual amount is up 86% from $2.45 billion in 2009, and is due, in large part, to the ongoing retirement of baby-boomers from various divisions.
- These PERA retirement distributions include only monthly pension retirement distributions and not health care benefits provided to retirees or refunds to members, which understates the full advantages the community receives from its PERA recipients.
- For perspective, retirement distributions can be examined on a per capita basis as well as compared to total payroll. Per capita, as opposed to per recipient, retirement distributions in 2023 average some $780 per person at the state level; however, the per capita figures in rural regions range from the $800's to the highest in the Pueblo-Southern Mountains Region at $1,555 per person, highlighting the importance of PERA retirement payments in these areas.
- When measured against total payroll, retirement distributions amount to 2.7% at the state level vis-à-vis 2.7% in 2009. Again, as in past studies, the rural areas, such as the Pueblo-Southern Mountains and San Luis Valley Regions, amount to 12.0% and 10.3% of local area payroll in 2023, respectively, further highlighting the importance of these PERA retirement benefits for rural communities.
- As will be demonstrated in this study, PERA distributions provide reliable, predictable income allowing for an "automatic stabilizing effect" on state, regional and local economies, especially in economic downturns.

Commonly recognized economic impact measures include output, value-added, labor income, and employment. The $4.56 billion annual PERA distributions to Colorado residents results in the following:

- **$7.13 billion** in output (all goods and services transactions)
- **$3.39 billion** in value-added (state gross domestic product)
- **$1.80 billion** in labor income (which measures worker impact in wages)
- **28,525** jobs
- **$381.8 million** in state and local tax revenues

The Colorado economy experienced increases in all economic impact measures since the 2022 study with the exception of jobs and a very slight decline in tax impacts. The lower jobs impact measure is thought to be due to the tight labor market and associated unfilled job opportunities.

When the impact results are analyzed on an industry sector basis, there are six sectors (Real Estate and Rental and Leasing; Health and Social Services; Finance and Insurance; Retail Trade; Professional, Scientific, and Tech; and Government) which continue to account for two-thirds of the value-added to our state economy from PERA retirement distributions.

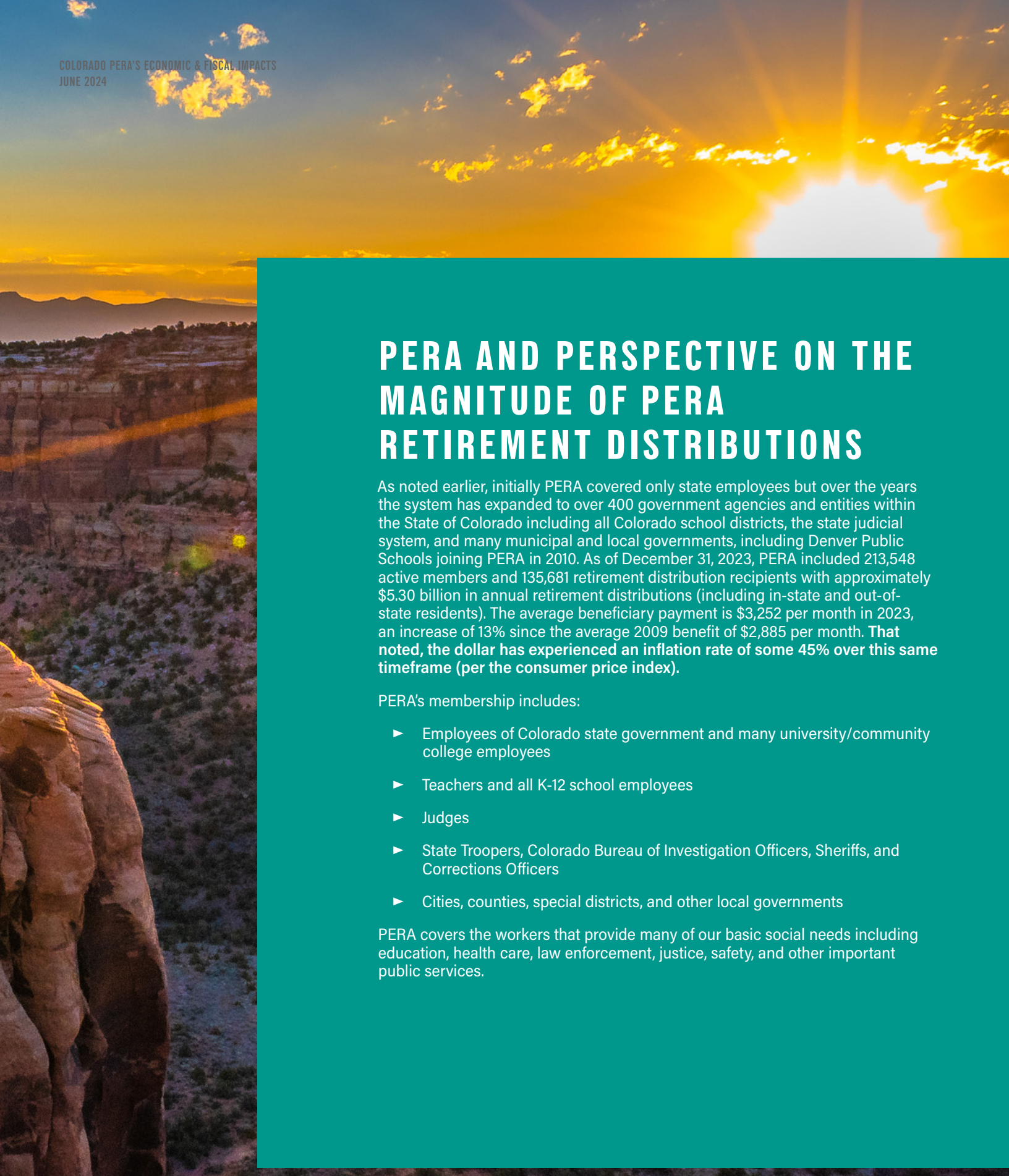
There are variations in the impacts on a county level with the largest variation in the value-added and labor income impacts, where rural counties continue to benefit more from PERA retirement distributions as measured on a per capita basis. This is likely due to differences in the distribution of PERA benefit recipients relative to their county population and recognition of the lower cost of living expenses as well as lower housing prices in rural counties.

Contributions from both employees and employers are utilized by PERA to provide a healthy return on investment. PERA, as a defined benefit plan with the characteristic of a large pool of investors with varying ages and retirement dates, has experienced an average 7.8% return on investment over the last decade which continues to exceed the expected rate of return of 7.25%.

[1] *Of note, this figure is slightly higher than the $4.55 billion figure shown in other PERA publications. The variance is attributable to different data processes. For Colorado PERA benefit recipient data records missing county information, Pacey Nehls Economic Consulting utilized the recipient's ZIP code or other means to determine Colorado county of residence, whereas PERA's totals excluded those data records.*

COLORADO PERA BACKGROUND

- The Colorado Public Employees' Retirement Association (PERA), established by state law in 1931, operates by authority of the Colorado General Assembly and is administered under Title 24, Article 51 of the Colorado Revised Statutes.
- Initially, PERA covered only state employees, but over the years has expanded to over 400 government agencies and public entities within the State of Colorado including all Colorado school districts, the state judicial system, and many municipal and local governments.
- Retirement distributions are pre-funded: while a member is working both the member and the employer contribute a fixed percentage of the member's salary to the retirement trust funds. The employee contribution rate for most members is currently 11%. The employer contribution rate in the early 2000's was approximately 10% but legislation enacted in 2004, 2006, 2010, and 2018 required employers to remit additional contributions to PERA. In addition, the 2018 legislation requires an annual assessment comparing the current employer contribution rates to actuarially determined contribution rates in order to gauge whether or not additional rate increases are necessary to stay on track to achieve the 30-year full funding target by 2048. This mechanism is known as the Automatic Adjustment Provision, or AAP. Most division employers contributed 21.4% of salary in 2023, which includes 1.02% for the associated health care trust fund.
- PERA provides distributions to members at retirement, upon determination of disability, or to a survivor upon a member's death. Most PERA members do not participate in Social Security for the minimum 10 years and thus are not eligible to receive Social Security retirement income. Although some members have or will participate in Social Security for the required 10 years, they will receive a much-reduced Social Security benefit due to the Social Security windfall elimination provision. Therefore, the PERA retirement distribution is designed and funded to provide total retirement monies consistent with the private sector where retirement is based on a combination of a private plan and Social Security.
- As of December 31, 2023, PERA's membership included:
  - 213,548 active members
  - 343,736 inactive members
  - 135,681 retirement distribution recipients
  - 2,581 survivor benefit recipients.
- The total PERA retirement distributions to recipients in 2023 amounted to just under $5.30 billion with an average per recipient monthly distribution of $3,252. This monthly distribution allows eligible PERA recipients with more than 30 years of service to receive at least 75% of their pre-retirement income from retirement distributions, a "replacement ratio" recommended by financial experts.
- The trust funds are invested by PERA under the direction of a Board of Trustees. PERA's investment strategy uses actuarially established investment objectives with long-term goals and policies. For the year ended December 31, 2023, the time-weighted net-of-fees annualized rate of return for the pooled investment assets over the last 10 years was 7.8% which is 55 basis points greater than the target rate of return of 7.25%. Not surprisingly, this 7.8% return includes four years with lower than target returns and six years with returns higher than target returns, with four of those six years more than double the target return, consistent with typical market variations and further highlighting the benefits of long-term risk pooling.



PERA AND PERSPECTIVE ON THE MAGNITUDE OF PERA RETIREMENT DISTRIBUTIONS

As noted earlier, initially PERA covered only state employees but over the years the system has expanded to over 400 government agencies and entities within the State of Colorado including all Colorado school districts, the state judicial system, and many municipal and local governments, including Denver Public Schools joining PERA in 2010. As of December 31, 2023, PERA included 213,548 active members and 135,681 retirement distribution recipients with approximately $5.30 billion in annual retirement distributions (including in-state and out-of-state residents). The average beneficiary payment is $3,252 per month in 2023, an increase of 13% since the average 2009 benefit of $2,885 per month. **That noted, the dollar has experienced an inflation rate of some 45% over this same timeframe (per the consumer price index).**

PERA's membership includes:

- Employees of Colorado state government and many university/community college employees
- Teachers and all K-12 school employees
- Judges
- State Troopers, Colorado Bureau of Investigation Officers, Sheriffs, and Corrections Officers
- Cities, counties, special districts, and other local governments

PERA covers the workers that provide many of our basic social needs including education, health care, law enforcement, justice, safety, and other important public services.

As noted earlier, the largest division of members and retirement distribution recipients is the School Division followed by the State Division, the Local Government Division, and then the DPS Division. The Judicial Division is the smallest. A breakdown of active members and retirement distribution recipients by division is identified in Table A.

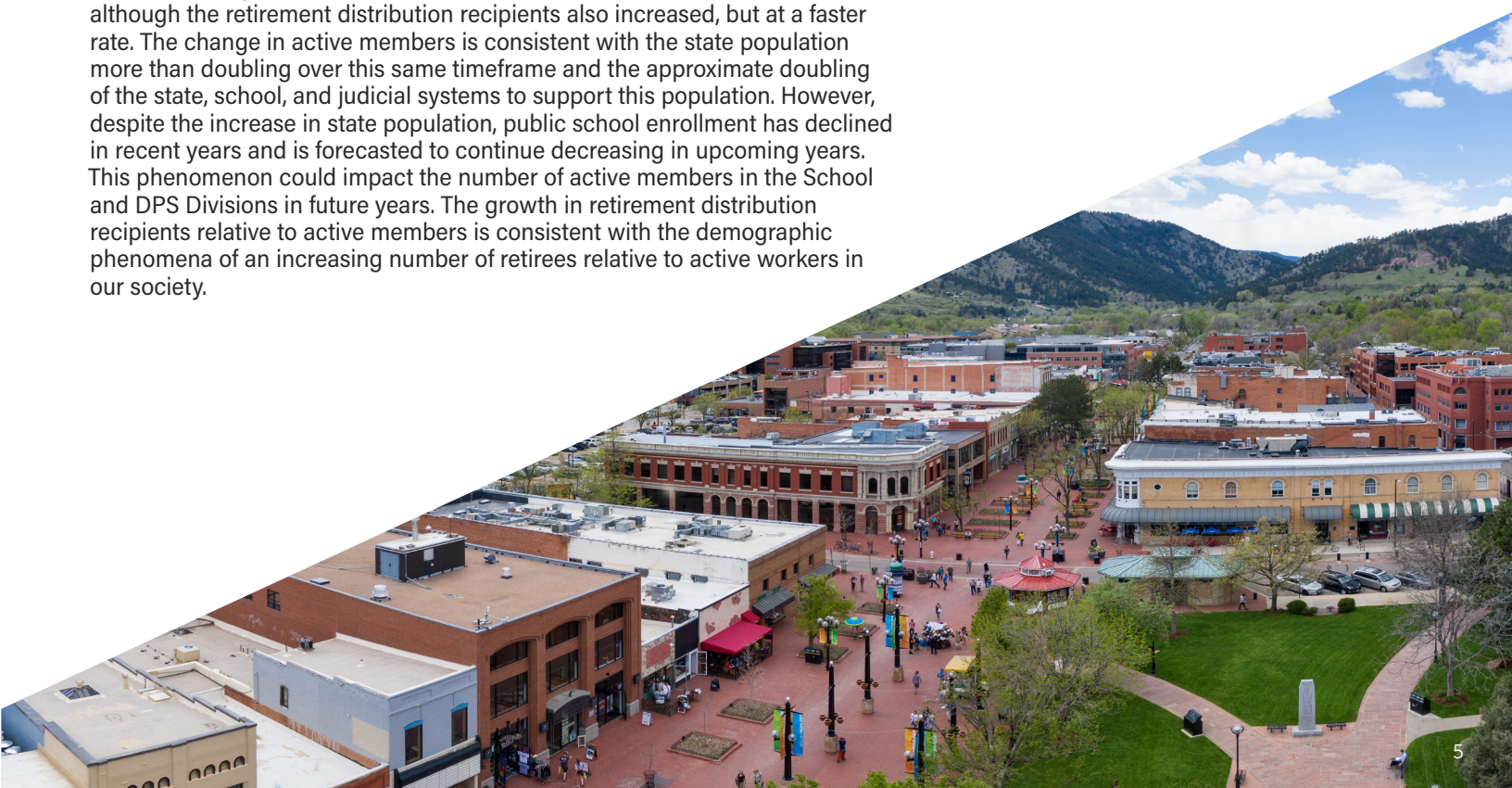
Table A

PERA Active and Inactive Members and Retirement Distribution Recipients by Division

Source: Colorado PERA Annual Comprehensive Financial Report for the Year Ended December 31, 2023.

	State Division	School Division	Local Government Division	Judicial Division	Denver Public Schools Division	Total
Active Members	53,687	131,188	12,700	347	15,626	213,548
Inactive Members	104,667	183,894	34,600	38	20,537	343,736
Recipients receiving retirement distributions	43,438	75,736	8,884	450	7,173	135,681
Average monthly benefit (retirement benefits)	$3,463	$3,106	$3,259	$6,545	$3,305	$3,252
Recipients receiving survivor benefits	977	1,271	191	8	134	2,581

From a longer-term perspective, the number of active members and retirement distribution recipients has increased over the past three decades from 132,311 active members with 34,416 retirement distribution recipients in 1991 to 213,548 active members with 135,681 retirement distribution recipients in 2023. Until the pandemic, the trend of active members had modest increases, although the retirement distribution recipients also increased, but at a faster rate. The change in active members is consistent with the state population more than doubling over this same timeframe and the approximate doubling of the state, school, and judicial systems to support this population. However, despite the increase in state population, public school enrollment has declined in recent years and is forecasted to continue decreasing in upcoming years. This phenomenon could impact the number of active members in the School and DPS Divisions in future years. The growth in retirement distribution recipients relative to active members is consistent with the demographic phenomena of an increasing number of retirees relative to active workers in our society.



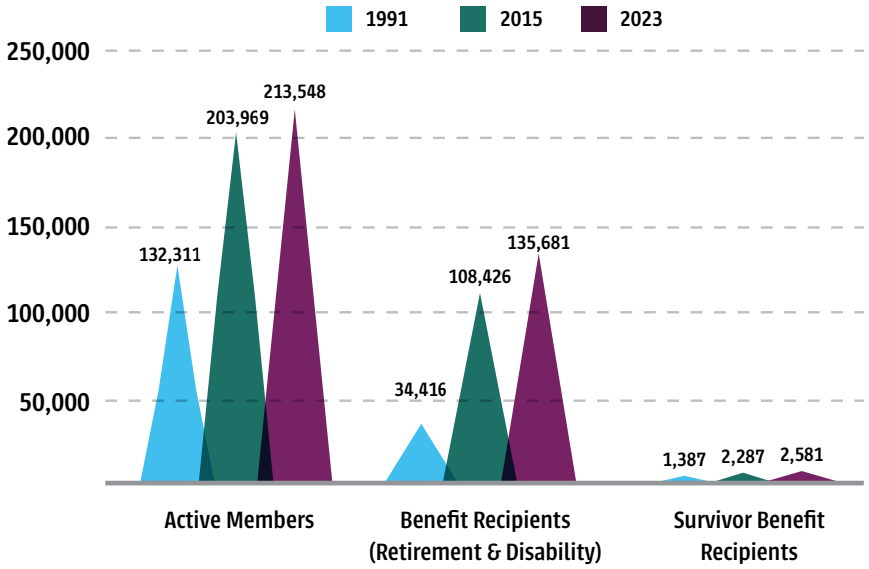


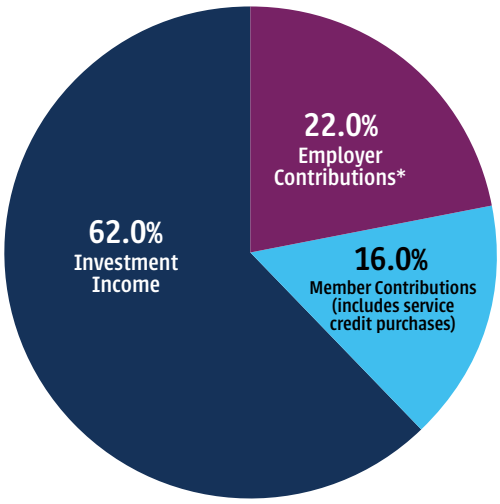
Figure 1

Number of PERA Active Members and Retirement Distribution Recipients, 1991, 2015, and 2023

Source: Colorado PERA Annual Comprehensive Financial Reports.

Figure 2

Additions to the PERA Trust Funds, 1988 to 2023

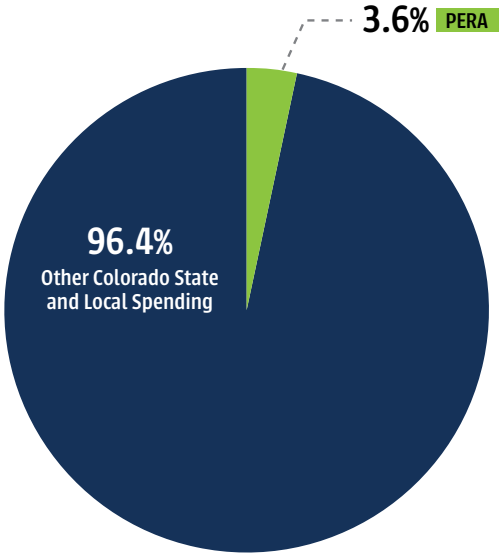


Source: Colorado PERA Annual Comprehensive Financial Reports.

**Includes $1.33B from SB 18-200.*

Figure 3

Colorado State and Local Government Spending



Source: National Association of State Retirement Administrators (NASRA) February 2024 Issue Brief.

A key element of PERA funding is the ability to generate income from the investment of employer and member contributions. A summary of the source of PERA assets is provided in Figure 2 above. Over the last 35 years, the largest portion of additions to the trust fund has been investment income amounting to 62% of additions, even when including the dramatic downturn in investment monies from the Great Recession.

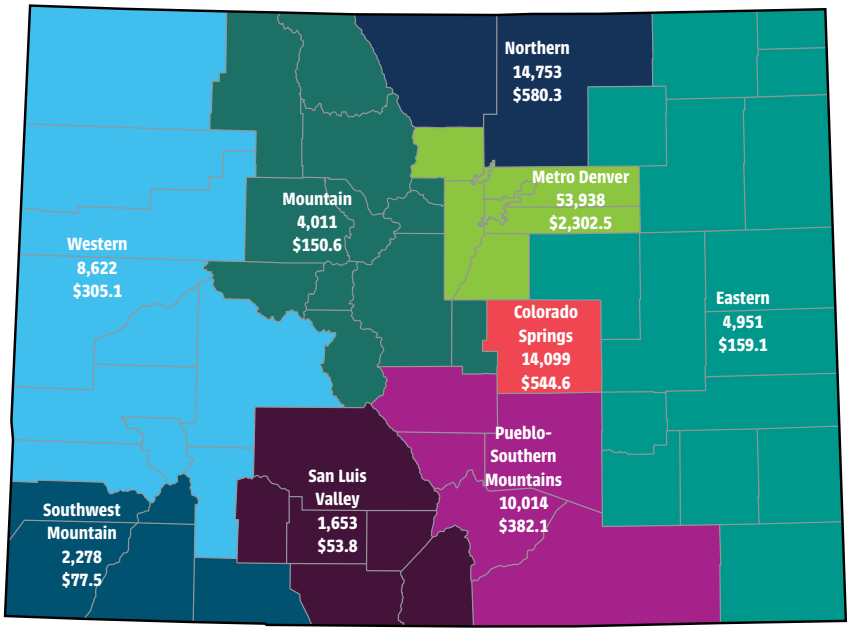
Figure 3 above provides perspective on the relative expense of PERA compared to other state and local expenditures. PERA employer contributions in 2021 accounted for only 3.57% of the overall spending of its participating employers based on a February 2024 study from National Association of State Retirement Administrators (NASRA). Such a percentage is notably less than the national average state and local spending on pensions as a share of overall spending of 5.06%.

The nine regions identified in this research continue to consist of the same counties and designations as utilized by the *Colorado Legislative Council* for its economic forecasts and allows for long term comparisons of PERA trends. The map below shows the number of PERA retirement distribution recipients and the total annual PERA payments for each region. Since 2009, the statewide annual PERA payments have increased 86%, while each region has increased more than 69%, with the exception of the Pueblo-Southern region, which has increased 58%. Notably, the annual PERA payments in the Metro Denver and Mountain regions increased by approximately 97% and 84%, respectively.

Although smaller numbers of PERA participants reside outside the Metro Denver region, the monetary impact of PERA distributions on maintaining the health of the regions in more rural areas is more substantial as noted in earlier studies and will be further discussed in this study.

Figure 4

Number of PERA Recipients and Annual PERA Retirement Distributions by Region (PERA payments shown in millions)

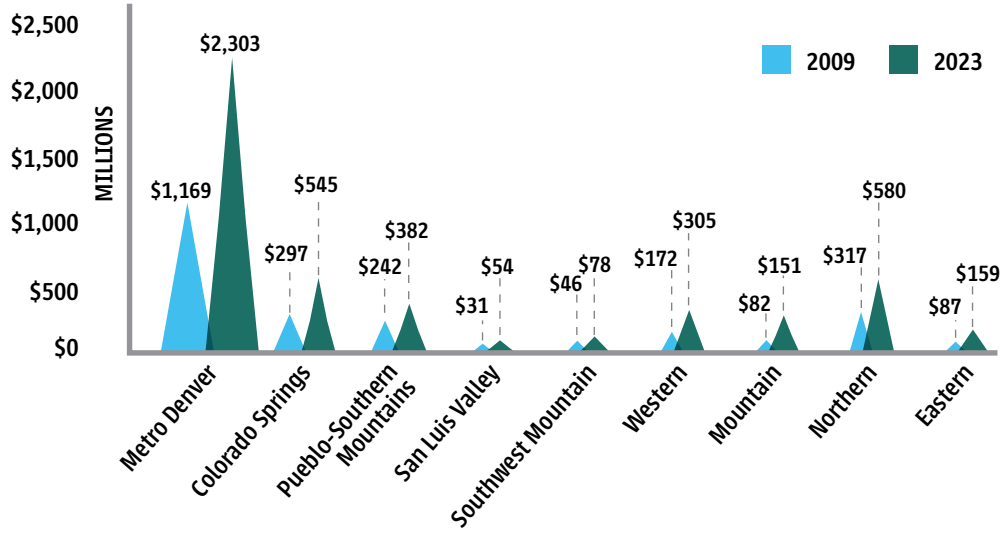


Source: Data from Colorado PERA as of December 2023. Retirement distributions have been annualized.

Figure 5

Annual PERA Retirement Distributions by Region (in millions)

Source: Data from Colorado PERA as of December 2023. Retirement distributions have been annualized.



As of December 2023, some $4.56 billion dollars (on an annualized basis) will be paid by PERA to recipients who continue to reside in Colorado through the end of the year. The 2023 geographic dispersal of PERA retirement distributions by regions is illustrated in Figure 5 above. Not surprisingly, due to the population growth and urbanization in Colorado over the past 14 years, Metro Denver and/or the Front Range have grown at a faster rate than the rural areas, such as the Pueblo-Southern Mountains, since 2009. Furthermore, long-term home ownership and fixed low interest rates have likely prevented PERA recipients from relocating to rural areas of Colorado in recent years. This asymmetric population growth renders PERA distributions even more important to rural population areas.

Total retirement distributions are concentrated in the Metro Denver region (see Figure 5); however, Figure 6 identifies the annual PERA retirement distributions on a per capita basis and demonstrates the relative importance of the PERA payments to each region. The per capita PERA monies are especially important in rural regions such as the Pueblo-Southern Mountains where these payments amount to over $1,500 per year per person (i.e., when measured by all persons in the region, not only PERA recipients). Since 2009, annual PERA retirement distributions on a per capita basis have increased by over 60%, statewide, and have increased by over 75% in the Mountain, Eastern, and San Luis Valley regions. The higher per capita increase in these three regions is consistent with the well-recognized phenomena in Colorado and across the country. Reduced employment opportunities in rural areas coupled with the high cost of living in our Mountain region, often results in the relocation of some of the working population.

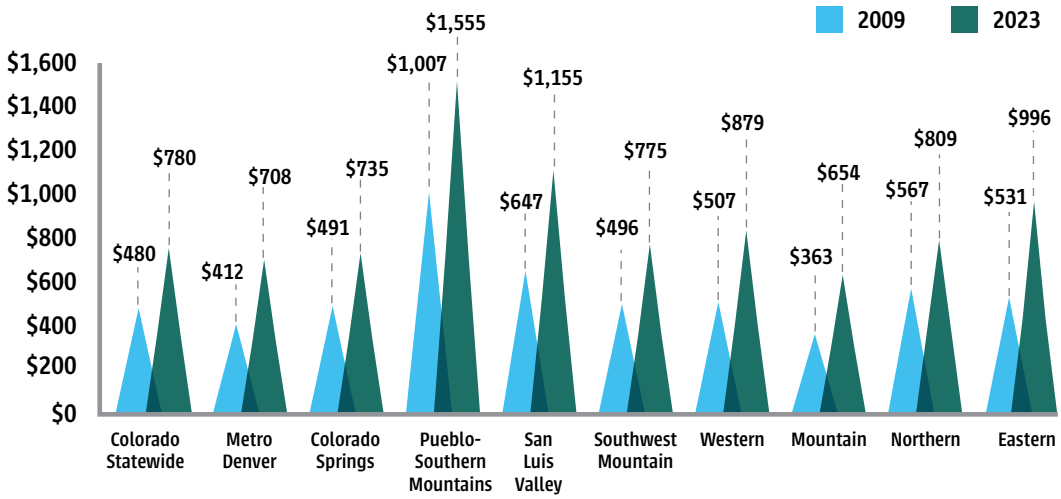


Figure 6

Regional Per Capita Annual PERA Retirement Distributions

Source: Data from Colorado PERA as of December 2023. Retirement distributions were first annualized prior to the determination of the per capita amounts shown.

Table B and Figure 7 provide a perspective on the magnitude of PERA payments to recipients relative to the state, regional, and local (county) economies. As noted earlier, annual PERA retirement distributions to Colorado residents amount to $4.56 billion and represent 2.7% of statewide payroll. However, these payments represent as much as 10.3% or 12.0% of payroll in the rural counties of San Luis Valley and Pueblo-Southern Mountains, respectively, further confirming that PERA payments are especially important in rural regions and less critical, but still important, in the Metro Denver and Mountain regions. The PERA payments as a percentage of payroll are some 5% to 10% greater in some regions compared to the state of Colorado.

State/Region	2023 Retirement Distributions	State Annual Payroll[2] (adjusted to 2023 $)	2023 PERA Payments as Percentage of Payroll	2009 PERA Payments as Percentage of Payroll
State of Colorado	$4,555.7	$167,216.6	2.7%	2.7%
Metro Denver	2,302.5	117,272.0	2.0%	1.9%
Colorado Springs	544.6	15,901.5	3.4%	3.5%
Pueblo-Southern Mountains	382.1	3,178.6	12.0%	13.5%
San Luis Valley	53.8	521.9	10.3%	11.6%
Southwest Mountain	77.5	1,843.1	4.2%	4.7%
Western	305.1	6,087.3	5.0%	4.7%
Mountain	150.6	6,056.4	2.5%	2.1%
Northern	580.3	14,660.9	4.0%	4.9%
Eastern	159.1	1,694.9	9.4%	8.8%

[2] *Statewide payroll is collected from the County Business Pattern, where data items are extracted from the Business Register (BR), a database of all known single and multi-establishment employer companies maintained and updated by the U.S. Census Bureau. This series includes the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll.*

Table B

Annual PERA Retirement Distributions as Percentage of Payroll (Dollars in millions)

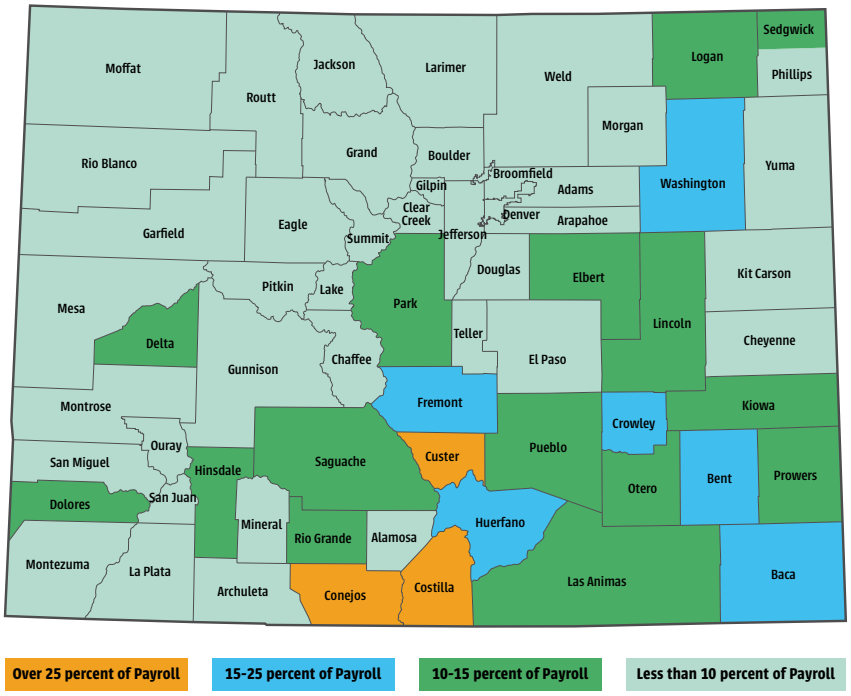
Source: Retirement distribution data is from December 2021 Colorado PERA. Payroll data is from the 2020 County Business Patterns, U.S. Census Bureau (publicly released April 2022). PPP data is from the Payroll Protection Program Freedom of Information Act, Small Business Administration. For purposes of comparison, the payroll and PPP data are adjusted to 2021 dollars.

Figure 7 illustrates the annual PERA retirement distributions as a percent of county payroll and shows PERA continues to be a significant contributor to local economies.

- PERA retirement distributions represent a larger share of the local economy in the less populated regions of the San Luis Valley, Pueblo-Southern Mountains, and Eastern regions.
- In more affluent or urban areas, this percentage is less than 5 percent; however, for a substantial number of rural counties, PERA retirement distributions are in the range of 5% to 20% with some notable exceptions including the counties of Custer (31.8%), Costilla (26.0%), Conejos (26.6%), and Fremont (22.4%).
- PERA retirement distributions are an important source of financial stability in the state economy, especially during times of recession.
- Appendix A provides county-by-county detailed tables demonstrating PERA distributions as a percent of annual payroll.

Figure 7

Annual PERA Retirement Distributions Relative to Payroll by County



MEASURING ECONOMIC AND FISCAL IMPACTS

When a household receives PERA retirement distributions, it represents an infusion of income into the local economy that creates a chain of economic activities whose total impact is greater than the initial retirement distribution payment. That is, these payments have substantial "ripple" or "multiplier" effects where one recipient's spending becomes someone else's income. With $4.56 billion paid to recipients who reside in Colorado, PERA has a large economic footprint on the state, regional, and local economies.

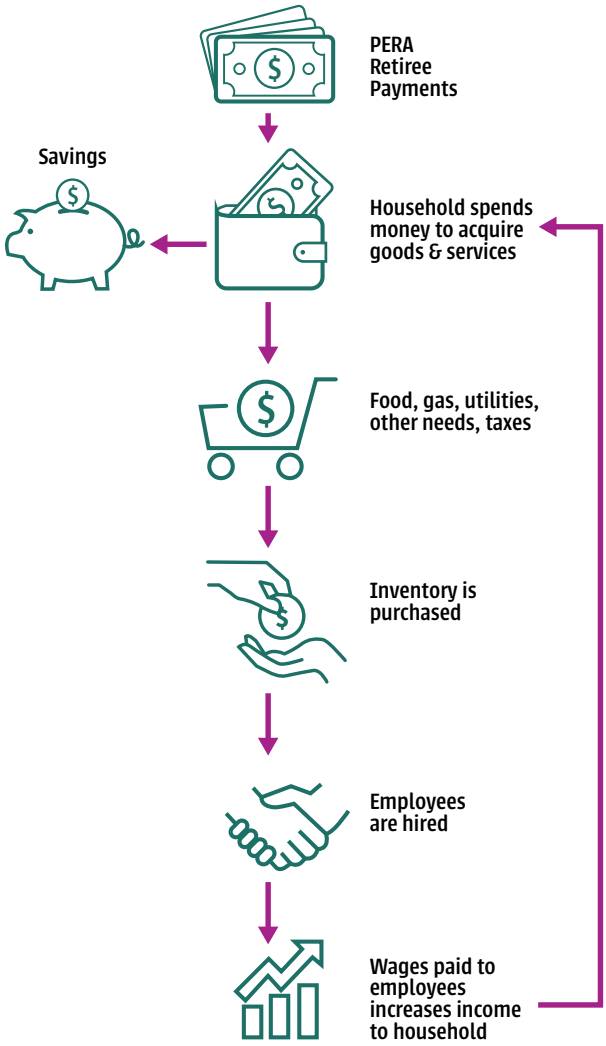
The impact of the PERA retirement distributions reaches well beyond those who receive the initial retirement distributions (retirees or survivors) as the recipient can fulfill obligations such as purchasing groceries, apparel, gasoline, etc. with these monthly PERA payments. This creates the "multiplier" effect as described and illustrated below.

The Multiplier Effect

- PERA makes lifetime monthly distributions to recipients (retirees and survivors).
- PERA recipients spend the monthly monies on household needs (such as food, gasoline, and utilities) and pay taxes and fees.
  - PERA recipients may also "save" some of the monthly monies and this "savings" leaks out of the multiplier effect, but since most recipients are in the decumulation phase of life, most of the distributions are spent.
- Businesses and/or governments providing those needs use their existing inventory or purchase new inventory and may also be required to hire labor to sell or produce their products or provide their services.
- Then business owners as well as their employees obtain income from these purchases (initially by the PERA recipient) and they too then go out and buy goods and services.
- Which, in turn, means added business income and wages/salaries.
- And the cycle repeats, adding value in the communities in which PERA benefit recipients live.

Figure 8

The Multiplier Effect of Household Expenditures



To measure the multiplier effect, sophisticated mathematical procedures (generally referred to as input-output models) are created to track the flow of dollars through an economy. These input-output models recognize the relationships between industries and institutions (households, business, and government sectors) in the economy of a certain geographic area (state, region, or county). The models incorporate the prevalence of different industry sectors in different geographic regions and recognize certain industries retain more of the dollars within the region than other industries.

For example, money spent on professional services or accommodations/food are more likely to stay within the area and benefit the local community while mining or manufacturing sectors may improve employment and wages, but if much of the product is sent out of the area or the input needs are purchased elsewhere, the economic impact will be more limited. Also, another integral piece of the model is the weighting of different consumer expenditure patterns by income levels.

There are a number of well-recognized input-output models including RIMS II, IMPLAN, REMI, etc. This research utilizes the **IMPLAN** (formerly an acronym for **IM**pact Analysis for **PLAN**ning) input-output model to estimate the economic and fiscal impact of PERA retirement distributions to the state and regional economies. (Appendix E provides more detailed information regarding the methodology used for this research.)

Key and commonly recognized economic impact measures include output, value-added, labor income, and employment. Definitions and examples for each of these measures are provided and illustrated on the following pages.

Definitions

OUTPUT

This broad measure includes the total sales or revenues generated by firms, government, and households, from initial stimulus (i.e., the PERA benefit payment) and subsequent expenditures.

VALUE-ADDED

A key economic performance measure that includes only "additions" in the economy, i.e., newly created goods and services resulting from the PERA distribution; not the sum of sales at each transaction, but rather, the component of sales that represents the additional production of goods and services; commonly referred to as Gross Domestic Product (GDP).

A classic example is presented to assist in understanding the output and value.

Farmer sells wheat to the Mill for $0.50, using supplies costing $0.25

Mill makes flour & sells it to the Bakery for $1.00

Bakery makes bread and sells it to the Customer for $1.75

OUTPUT	VALUE-ADDED	
$0.50	($0.50 - $0.25)	= $0.25
+$1.00	+ ($1.00 - $0.50)	= $0.50
+$1.75	+ ($1.75 - $1.00)	= $0.75
$3.25	**$1.50**	**$1.50**

Output and value-added are measures of economic impact that include all types of economic activity. That is, when PERA retirement distribution recipients spend money in grocery stores, retail shops, restaurants, etc., those businesses respond by buying more supplies, utilities, building space, etc. Businesses also respond by hiring more workers. The employment component of the economic impact on workers from a stimulus to the economy, such as PERA retirement distributions, is of particular interest and measured by labor income (which measures worker impact in wages) and employment (which measures worker impact in number of jobs).

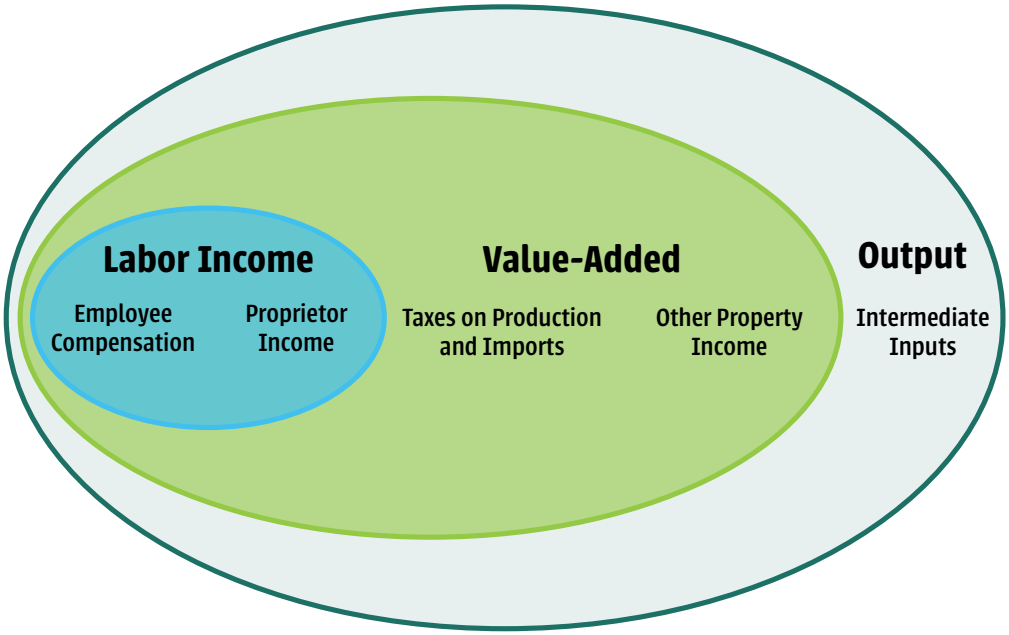
LABOR INCOME

A component of value-added, labor income, measures the portion of newly created value that is employee compensation and self-employment income required to produce or sell the additional goods and services.

EMPLOYMENT

Employment is the level of full-time and part-time jobs generated by the PERA payments, i.e., ongoing PERA payments support this level of jobs.

The chart below demonstrates the relationship between the various economic impact measures. IMPLAN identifies five components of economic impact: intermediate inputs, employee compensation, proprietor income, taxes on production and imports, and other property income. Of these five measures, labor income is comprised of employee compensation and proprietor income. Value-added includes the two components of labor income PLUS taxes on production and imports and other property income. Output is the broadest measure and includes all four components of value-added PLUS intermediate inputs.



PERA ECONOMIC AND FISCAL IMPACTS

PERA retirement distributions are a critical source of reliable, predictable income and provide an "automatic stabilizing effect" on state, regional, and local economies, especially in economic downturns as these monies provide important stimulus to local and state market activity. As noted in the previous section, these steady monthly retirement distributions are especially vital to small communities due to the lack of diverse local industries when other steady sources of income are not readily available. Households with stable incomes can be counted on to spend on basic needs and other purchases as well as pay taxes and fees generating revenue for state and local governments. In addition, monthly distribution recipients are less subject to extreme economic and life events that would result in the need for government assistance. The following sections estimate the effect of spending from PERA retirement distributions, including the overall economic impact and by industry sectors, as well as a narrower analysis of the fiscal impact on state and local government revenues. (For a more detailed description of the methodology used in this analysis, see Appendix E. The methodology is well accepted and widely used by federal, state, and local governments, research organizations, academic institutions, and businesses to assess the economic and fiscal impacts of a variety of developments, including numerous analyses of the retirement distributions of publicly funded pension plans. Notable IMPLAN clients include but are not limited to the Bureau of Economic Analysis (BEA), the Federal Reserve, Colorado Department of Labor and Employment, both University of Colorado and Colorado State University, as well as private sector organizations.)

Figure 9 illustrates the economic impacts of PERA on the State of Colorado as calculated using the well-recognized and well-accepted IMPLAN model. The $4.56 billion in annual PERA retirement distributions to Colorado residents results in $7.13 billion in output, up 92% from 2009, while both value-added and labor income has more than doubled over the past 14 years to $3.39 billion and $1.80 billion, respectively, with an increase from 20,635 jobs in 2009 to 28,525 jobs (down slightly from 2022 study). Such an economic output amounts to 1.4% of 2023 Colorado gross domestic product. Of note, the impact on employment is measured in "annual average jobs" and reflects jobs supported for one year. The ongoing PERA retirement distributions would continue to support these jobs and additional increases in retirement distributions to PERA recipients (such as an increase in the number of recipients or increases in retirement distributions) over subsequent years will, on the margin, add new jobs to the economy. The economic impact to state/local governments through tax receipts amounts to $381.8 million, slightly down from the 2022 study of $382.2 million. Despite the slight downturn in jobs, labor income and tax receipts ($1.80 billion and $381.8 million, respectively) were similar to those found in the 2022 study.

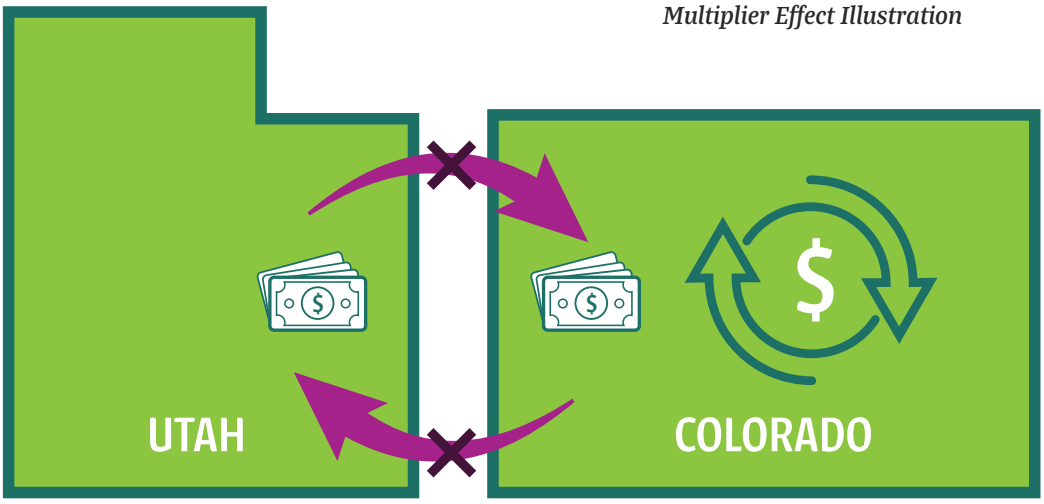
The total output multiplier can be derived by dividing the total economic output ($7.13 billion) by the initial retirement distributions ($4.56 billion) amounting to a multiplier of 1.56. This means that for every dollar spent by a PERA recipient an additional 56 cents are generated in the economy through additional rounds of spending. The slight downturn from earlier studies may well be due to the pandemic where local purchase opportunities were limited (e.g., an increase in out-of-state online sales).

As discussed previously, the economic impact of PERA retirement distributions is larger than just the initial retirement distribution because of the "multiplier" effect. The multiplier effect occurs when a PERA retiree spends some of his/her retirement distribution on food, for example, which creates income for grocery store employees who, in turn, spend it on clothing, and so on and so on. Hence, the PERA dollars ripple throughout the economy, and the size of the ripple is known as the multiplier.

The multiplier effect arises when individuals spend their dollars in specific stores. Consequently, the size of the multiplier is influenced by the particular geographic region being studied, which will include some stores and exclude others. This idea is illustrated in Figure 9 which shows the flow of PERA dollars within Colorado and between Colorado and Utah. When measuring the multiplier using the state of Colorado as the geographic region, only income and purchases within the state are included. If a retiree lives in Colorado but buys in Utah, or lives in Utah and buys in Colorado, those dollars are not included in the multiplier for the state of Colorado. The

Figure 9

Multiplier Effect Illustration



dollars spent across state lines still generate economic activity, they are just not included in the computation of the state multiplier. Similarly, the multiplier for the Northern region does not included purchases made in the Metro Denver region, and the multiplier for Jefferson County does not include purchases made in Denver County. Consequently, the full multiplier effect to the state, and its regions and localities is even greater than identified in this report.

The multiplier for PERA retirement distributions for the state of Colorado in this study is 1.56. Of note, the *Pensionomics* 2023 study, authored by National Institute on Retirement Security (NIRS) utilizes the same IMPLAN software as this analysis (as do numerous other academic and government institutions) and finds a slightly smaller multiplier of 1.44 for the State of Colorado.

A larger geographic region gives a larger multiplier because a larger region will include more stores. Similarly, smaller geographic regions give smaller multipliers. The simple average (not weighted average) multiplier for the 9 legislative regions is 1.27, and the simple average multiplier for the 64 counties is 1.15. However, the multipliers in the larger regions and counties are significantly higher than the average. It should be emphasized that the smaller county multiplier doesn't imply that PERA dollars spent in, say, Conejos County somehow have less of an impact. Rather, it is simply a reflection that, by necessity of purchase opportunities, some of the Conejos dollars are spent in Alamosa County, and those dollars are included in the multiplier for Colorado, but not in the multiplier for Conejos, nor in the multiplier for Alamosa. As a result, the county-by-county impacts presented in Appendix B should not be added to derive state or regional totals; state and regional impact measures are identified elsewhere in this report.

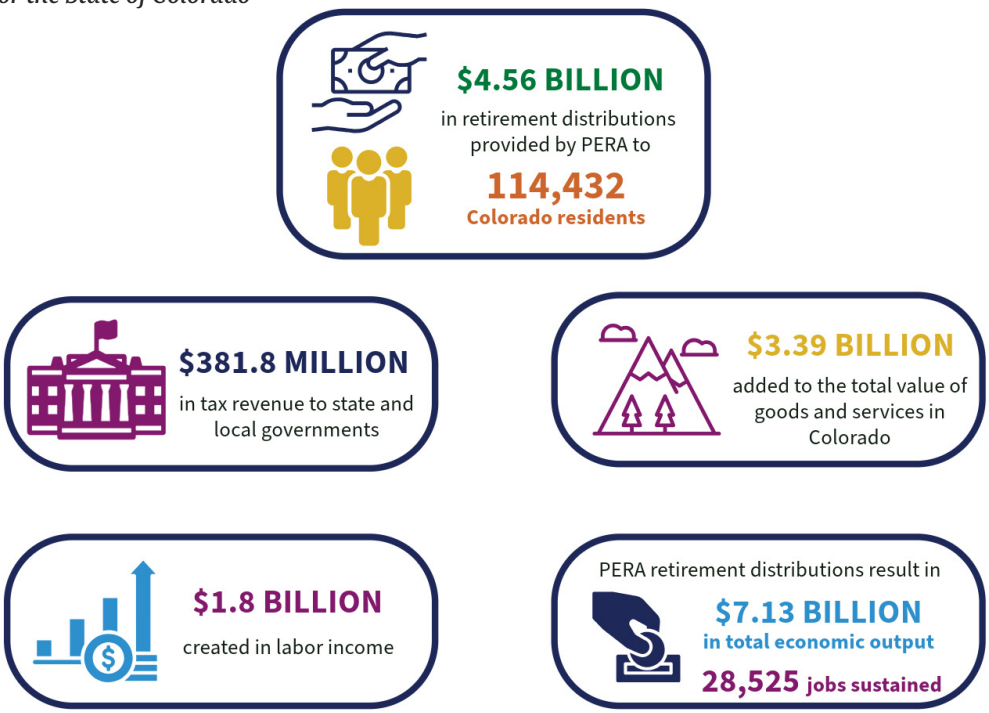
Of note, this analysis is limited to the disbursement of retirement payments to the households, the largest benefit provided by PERA. The economic activity related to other benefits provided by PERA (such as the PERACare subsidy, 401(k) and other voluntary benefit programs) has not been incorporated into this analysis but would obviously increase the overall economic and fiscal impacts provided by PERA.

The salient information for the year after year economic impact by region is best demonstrated by the value-added and labor income measures, beyond the substantial direct payments of $4.56 billion to recipients.

Total impact at the state and regional levels is largely driven by population and the respective wage levels of that population and, therefore, the impact figures are further refined by adjusting for population. The following figures demonstrate the impact on a per person basis in the region. (That is, per capita impacts are obtained by dividing total impact by the relevant population base for the state, regions, and counties.) The magnitude of the results varies across regions as each region has different industries and economic infrastructure and, as such, the multiplier effect for each region will differ.

Figure 10

Economic Impact for the State of Colorado



Figures 11 and 12 identify value-added and labor income for the per capita impacts for the state and regions while Table C provides their respective total dollars for output, value-added and labor income and also notes the employment impact and the economic multiplier. Note Table C finds the multiplier in the urban areas has increased slightly since 2009, while the rural areas have experienced a downturn in the multiplier given the decrease in population. County-level impacts are provided by displaying economic output per-capita in a map marked Figure 13. Findings from these four demonstratives are described below:

- Naturally, total impacts are greater in the more populated regions; thus, the impacts on a per-capita basis are the more interesting measure
- The value-added and labor income impacts follow the same distribution patterns across regions as retirement distributions. Further, the distribution patterns across regions have all experienced similar growth and output changes over the past 14 years.
- Output and employment impacts attributable to PERA recipient spending exhibit similar patterns at both the state and regional levels.
- The per capita impacts are fairly constant between regions with the exception of the Pueblo-Southern Mountains region where the per capita impact is substantially greater.
- Not surprisingly, the per capita impacts are smaller in the Mountain region where the prevalence of the resort communities likely contribute to a large in-flow of non-resident spending that overshadows the spending of PERA recipients.
- The per capita value-added has grown for all regions over the past two years, since the 2022 study.
- Nearly all regions experienced a decrease in per capita Labor Income when compared to the 2022 study, with the exception of the Metro Denver and Mountain regions. These changes are consistent with demographics of rural areas, particularly east of the Front Range, which are losing population and experiencing either slow or even negative economic growth.
- The per capita output is the highest in Pueblo County at approximately $1,899 per person.

Figure 11

Per Capita Value-Added for State and Regions

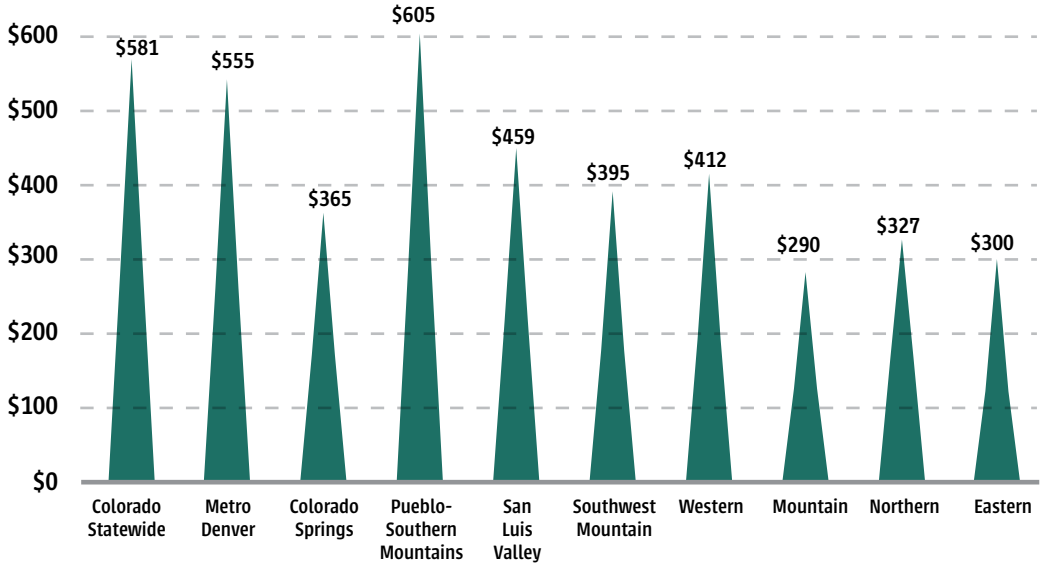


Figure 12

Per Capita Labor Income for State and Regions

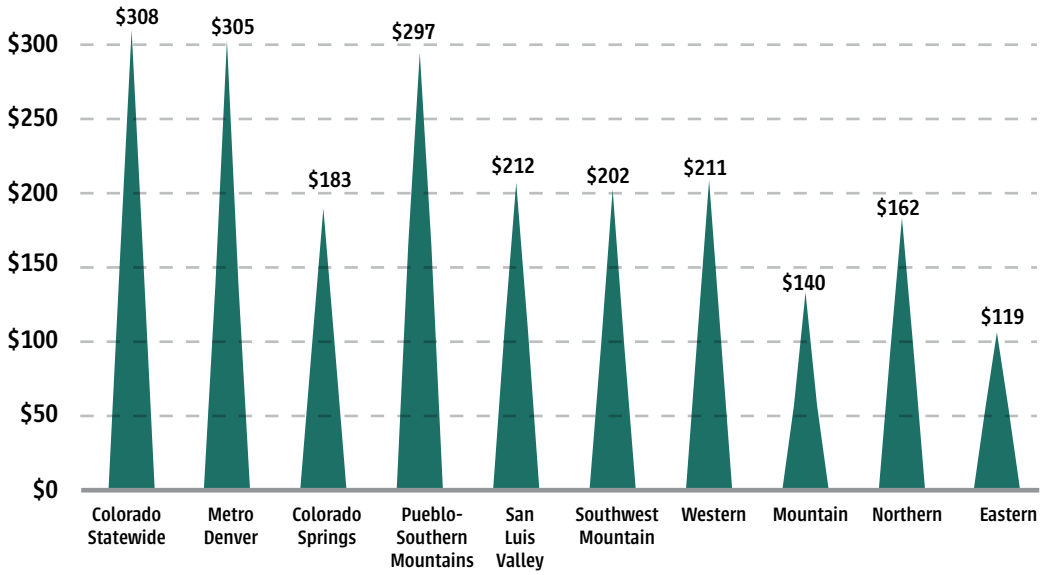


Table C[3]

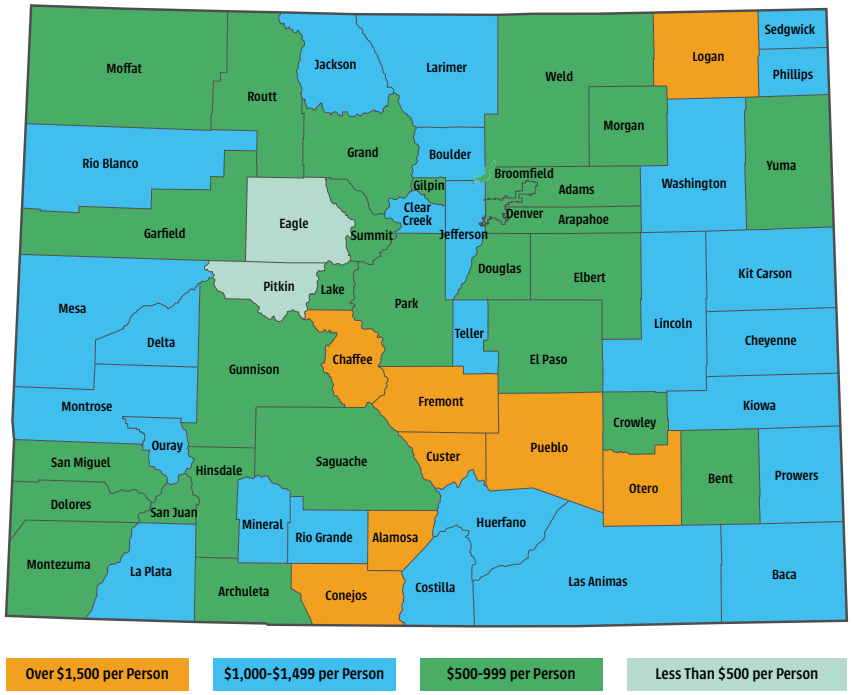
Total Economic Benefit to the State and Regions of Annual PERA Retirement Distributions (Dollars in millions, except employment and multiplier)

State/Region	2023 Retirement Distributions	Output	Value-Added	Labor Income	Employment	Multiplier	2009 Multiplier
State of Colorado	$4,556	$7,132	$3,390	$1,799	28,525	1.56	1.45
Metro Denver	2,303	3,627	1,804	992	14,466	1.58	1.41
Colorado Springs	545	704	270	136	2,697	1.29	1.27
Pueblo-Southern Mountains	382	451	149	73	1,539	1.18	1.22
San Luis Valley	54	66	21	10	241	1.22	1.20
Southwest Mountain	78	103	39	20	420	1.33	1.29
Western	305	395	143	73	1,522	1.29	1.33
Mountain	151	182	67	32	579	1.21	1.19
Northern	580	708	235	116	2,401	1.22	1.32
Eastern	159	180	48	19	503	1.13	1.19

[3] *Notably, and importantly, state impacts are not the sum of the impacts of individual regions/counties. That is, because households make some of their purchases for goods and services outside a certain region/county and, as such, those expenditures are not counted in the economic activity of the region/county where the retirement distribution recipient resides. Given that the state encompasses a larger geographic and, therefore, larger economic area, it will include more economic activity and, hence, the economic impact for the state will be larger than the sum of the counties/regions.*

Figure 13

Total Economic Output Per Capita (from PERA Retirement Distributions) by County



Fiscal Impact

Fiscal impact is a component of total economic impact but measures only the government tax revenues generated by PERA retirement distributions. PERA recipients pay a portion of the PERA retirement distribution in income taxes and pay additional taxes on goods and services which are subject to sales, use, or property taxes as well as fees for licenses or permits. There are additional taxes and fees paid on the subsequent rounds of spending generated by the multiplier effect. Fiscal impact recognizes expenditures made by state and local governments to hire additional workers, make purchases in the local community for equipment needs, etc. Fiscal impact measures include the income and property taxes paid on the first round of spending plus other taxes and fees paid on subsequent rounds of spending which generates revenues for state and local government budgets.

The fiscal impacts from PERA retirement distributions as measured via the IMPLAN model are noted in Table D. The total annual impact to state/local governments amounts to $381.8 million with regions ranging from $3.4 million in San Luis Valley to $188.4 million in Metro Denver.

Table D

Fiscal Impact to the State and Regions (Dollars in millions)

State/Region	Sales Tax	Property Tax	Other Tax (including Income Tax)	Total State/Local Tax Impact
State of Colorado	$133.6	$125.8	$122.4	$381.8
Metro Denver	62.6	62.1	63.7	188.4
Colorado Springs	15.8	8.5	11.6	35.9
Pueblo-Southern Mountains	9.5	6.6	6.2	22.3
San Luis Valley	1.5	1.0	0.9	3.4
Southwest Mountain	1.9	1.5	1.5	5.0
Western	8.3	6.5	5.5	20.4
Mountain	2.9	2.9	2.9	8.7
Northern	10.1	13.3	11.3	34.8
Eastern	3.0	3.3	2.2	8.5

Interestingly, the trend in fiscal impact over the past 14 years (since the 2009 study) finds the Metro Denver region capturing a greater share of this impact, with the Mountain, Southwest Mountain, Eastern and San Luis Valley regions maintaining their shares and other regions falling slightly behind since 2009.

Economic Impact by Industry Sector

The economic impact measures vary depending on the composition of industry sectors across the state, regional, and local economies. This research first identifies state Gross Domestic Product (GDP) and annual payroll by industry sector in millions of dollars to provide an overall understanding of the Colorado economy, noted in Table E below.

Colorado has three industry sectors that stand out—Real Estate and Rental; Professional, Scientific and Tech; plus, Government—comprising over a third (38%) of the state's GDP but, importantly, the state has substantial diversity in its economy as noted by the strength of seven other industry sectors that account for another 40% of Colorado GDP.

Table E

Industry Sectors of the Colorado Economy (Dollars in millions)

Sector	2023 Gross Domestic Product	Annual Payroll (Adjusted to 2023 $)
Finance and Insurance	$26,197	$13,664
Health Care and Social Assistance	30,667	21,644
Government	58,280	n/a[4]
Real Estate and Rental	81,798	3,788
Retail Trade	31,085	11,656
Accommodation and Food Services	21,366	7,994
Information	31,071	13,108
Wholesale Trade	27,975	10,576
Manufacturing	29,094	10,234
Professional, Scientific, and Tech	58,034	24,623
Transportation and Warehousing	19,222	6,192
Administrative and Waste Services	15,109	8,286
Utilities	6,814	1,192
Arts, Entertainment, and Recreation	7,730	2,619
Management of Companies	10,130	7,495
Educational Services	4,490	2,513
Construction	31,205	14,242
Agriculture, Forestry, Fishing, and Hunting	1,631	92
Mining	16,349	2,104
Other	12,143	5,182
Unknown	n/a	13
All Industry Total	**$520,389**	**$167,217**

[4] *Data from the Bureau of Census - County Business Patterns excludes most government employees.*

Source: Gross Domestic Product data is from the Regional Economic Accounts, Bureau of Economic Analysis. Payroll data is from the Bureau of Census - 2021 County Business Patterns (publicly released April 2023) and adjusted by the consumer price index.

Table F

Industry Sectors in the Colorado Economy

Table F provides industry sectors and includes the percent of GDP nationally for comparative purposes. A notable increase in the Transportation and Warehousing, Accommodation and Food Services and Mining sectors occurred between the 2022 study and this study. Also, Colorado is noted for attracting clean energy industries as represented by the Information sector and the Professional, Scientific and Tech sector being substantially greater than the national average. Another observation finds the Manufacturing sector is less prominent in the Colorado economy than for the United States economy.

Government is a large sector due, in part, to Denver being a "branch" for several federal government and government-related agencies (e.g., the Denver Federal Center in Lakewood, U.S. Mint in Denver, etc.).

	2022 STUDY PERCENT OF GDP		2024 STUDY PERCENT OF GDP	
Sector	Colorado	United States	Colorado	United States
Real Estate and Rental and Leasing	12.0%	12.8%	15.7%	13.4%
Government	10.5%	12.1%	11.2%	11.4%
Professional, Scientific, and Tech	10.4%	7.7%	11.2%	8.0%
Construction	5.8%	4.2%	6.0%	4.4%
Retail Trade	5.8%	6.0%	6.0%	6.4%
Information	6.1%	5.7%	6.0%	5.4%
Health Care and Social Assistance	6.2%	7.3%	5.9%	7.4%
Manufacturing	6.6%	11.1%	5.6%	10.3%
Wholesale Trade	6.1%	6.0%	5.4%	5.9%
Finance and Insurance	6.3%	8.5%	5.0%	7.3%
Accommodation and Food Services	3.3%	2.8%	4.1%	3.3%
Transportation and Warehousing	2.4%	2.8%	3.7%	3.5%
Mining	2.6%	1.2%	3.1%	1.4%
Administrative and Waste Services	3.2%	3.3%	2.9%	3.1%
Other	2.1%	1.9%	2.3%	2.2%
Management of Companies	2.2%	1.9%	1.9%	1.8%
Arts, Entertainment, and Recreation	1.3%	0.9%	1.5%	1.2%
Utilities	1.4%	1.7%	1.3%	1.6%
Educational Services	0.8%	1.1%	0.9%	1.2%
Agriculture, Forestry, Fishing, and Hunting	0.7%	1.1%	0.3%	0.9%

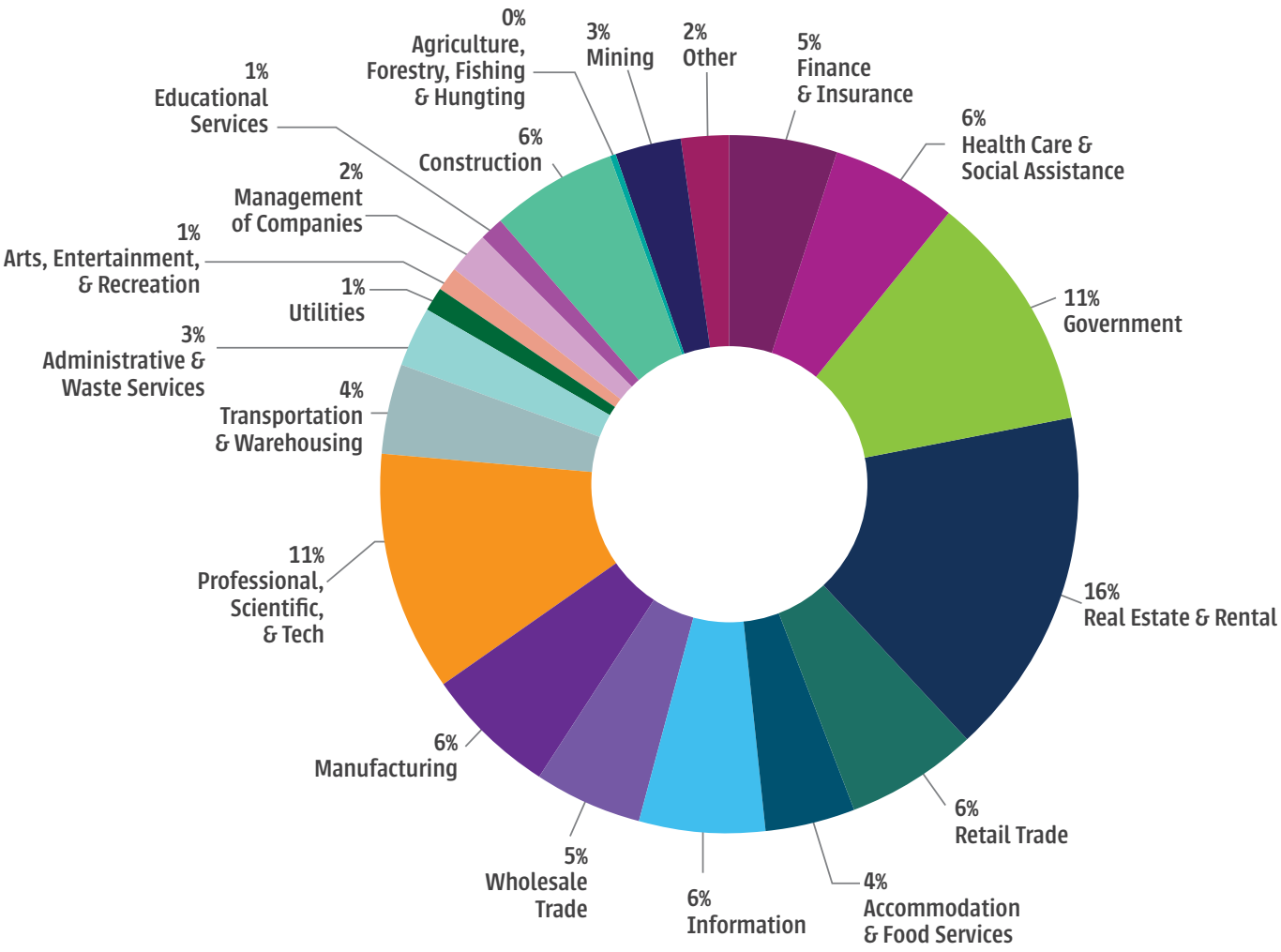
Source: Bureau of Economic Analysis

Of the top ten Colorado industries responsible for 78% of the state's GDP, the top three account for 38% and the next seven account for 40%. The remaining industry sectors account for 22% of state GDP. This distribution is illustrated in Figure 14.

Figure 14

Components of the Colorado Economy

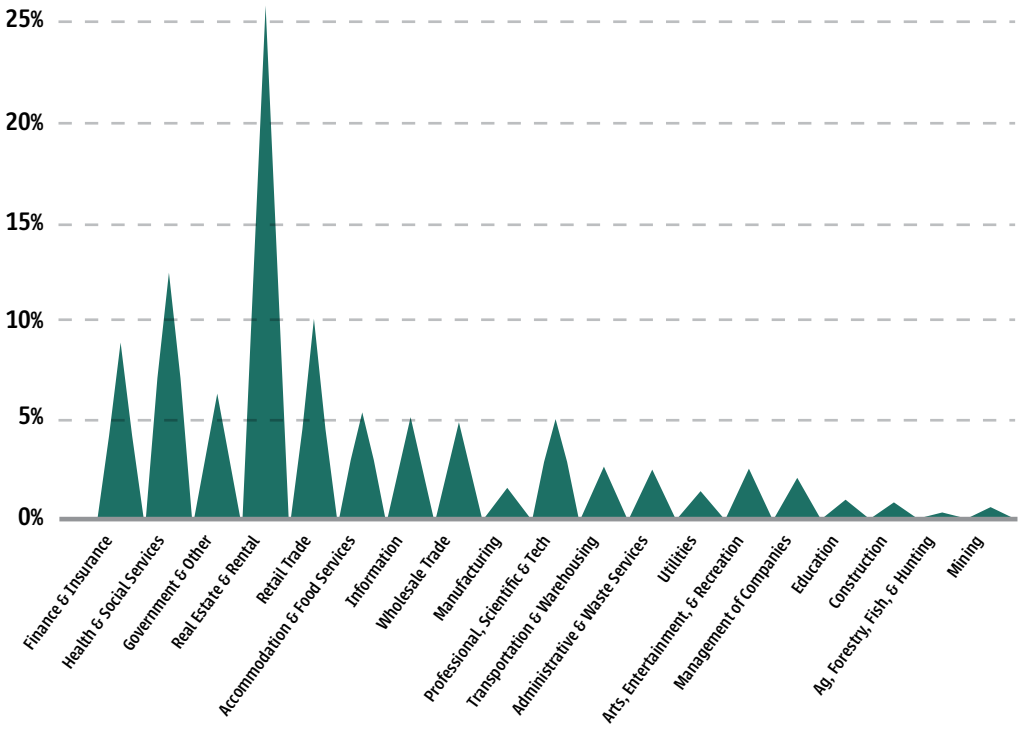
Source: Bureau of Economic Analysis



Figures 15 through 17 demonstrate the statewide impacts by industry sector. (The data used for these figures are found in Appendix C.) The economic impact by industry sector for Value-Added (i.e., state GDP) is illustrated in Figure 17 below. Although Real Estate and Rental and Leasing, Government, Professional, Scientific, and Tech, and Manufacturing account for approximately 40 percent of the 2023 state GDP, the economic impact as measured by value-added is greatest in the Real Estate and Rental and Leasing, Health Care and Social Services, Finance and Insurance, Retail Trade, and Professional, Scientific, and Tech sectors. In fact, only these five sectors account for approximately 62% of the Value-Added impact (i.e., contribution to GDP). (The output impact is not illustrated although it has a somewhat broader distribution.) Note, impacts are likely concentrated in the health care sector given that PERA retirement distributions drive household final demand while other sectors of state GDP (Real Estate, Professional Services, etc.) are largely driven by business-to-business transactions.

Figure 15

Value-Added by Industry Sector for the State of Colorado



Real Estate and Rental have surged to the top of the value-added roster of industry significance since 2009 and the Great Recession.

Figure 16 demonstrates the economic impact on labor income at the state level from PERA recipients, highlighting that spending is heavily concentrated in Health Care and Social Services (21%), with Retail Trade, Finance and Insurance, and Professional, Scientific, and Tech generating an additional 28% of labor income.

As in 2009, Health and Social Services continue to be a leading industry sector for the provision of labor income and employment for the state.

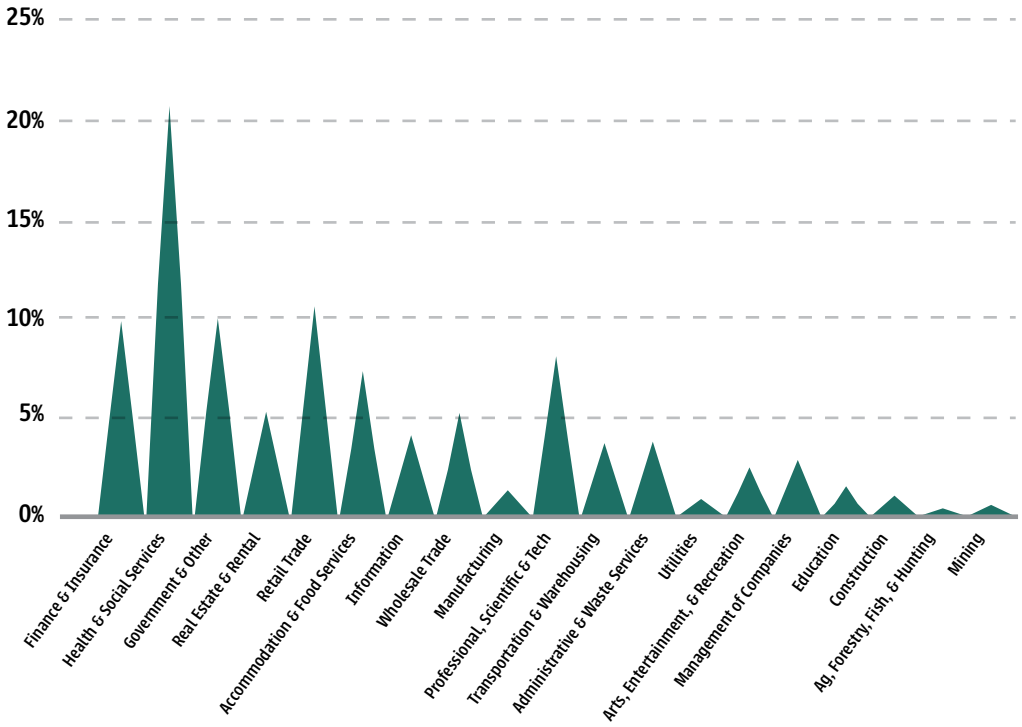


Figure 16

Labor Income by Industry Sector for the State of Colorado

Figure 17 identifies the employment impact by sector and shows that three sectors, Health and Social Services, Retail Trade, and Accommodation and Food Services account for some 45% of total employment impacts, a slight decrease over the last two studies perhaps due to our economy becoming more diverse and/or a somewhat slower recovery in some of these sectors due to the pandemic. This is consistent with these sectors' importance to the value-added component. Together, Government and Other Services, Real Estate and Rental, and Finance and Insurance account for an additional 26% of employment impacts.

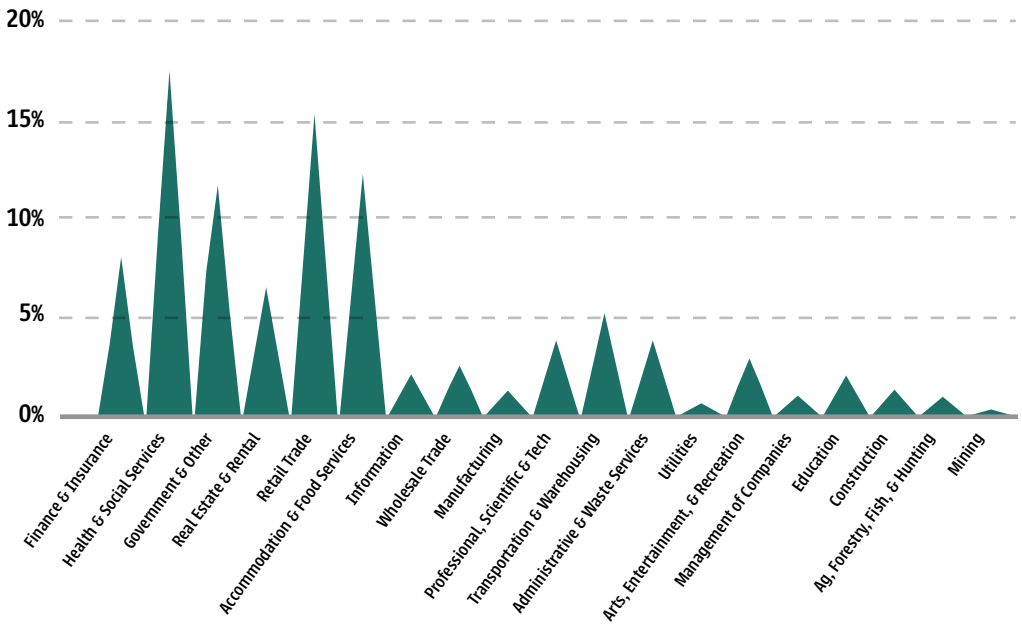


Figure 17

Employment by Industry Sector for the State of Colorado

ABOUT THE AUTHORS

Pacey Nehls Economic Consuting

Pacey Economics, Inc. (DBA Pacey Nehls Economic Consulting), located in Boulder, Colorado, has over 35 years of experience providing consulting services and analyses on an array of economic, public policy, and business issues. We are a small boutique firm, focused on providing economic analyses for state agencies and private or publicly held companies. In addition, we offer economic reports or opinions and expert witness testimony in legal matters. Over the past decades, the firm has been awarded many government contracts through a number of different agencies to forecast, analyze, and evaluate programs and legislative changes. These agencies include the Colorado Department of Education (DOE) and the Corporation for Public Broadcasting (CPB).

Patricia L. Pacey, PhD

Dr. Pacey is the President of Pacey Nehls. In addition to her diverse experience testifying as an expert witness, Dr. Pacey has conducted several education funding studies, cost-of-living and economic impact analyses, and for nearly two decades assisted Boulder Municipal Employee's Association in their wage and benefit contract negotiations, an ongoing relationship her colleague now leads on her behalf. She received her Ph.D. in economics and a Bachelor of Arts in mathematics from the University of Florida, both with honors. She held academic positions with the University of Colorado before forming her own firm, Pacey Economics, Inc., in the early 1980s. Prior to moving to Colorado in the late 1970s, she was an associate for the Congressional Budget Office.

Jeffrey E. Nehls, MA

Mr. Nehls has been with Pacey Nehls since 2009 and was the key contributor to this analysis. In addition to his expert witness testimony experience, Mr. Nehls develops databases, designs studies and reports, and conducts quantitative and qualitative research for public policy projects. Mr. Nehls obtained a bachelor's degree in 2007 from University of Puget Sound, Tacoma, with a major in economics and minor in mathematics and a master's degree in economics from University of Colorado Denver in May 2015. Mr. Nehls is a member of several local and national professional organizations and has taught as an adjunct economics professor at Front Range Community College.

Hannah J. Suarez, MS

Ms. Suarez started working at Pacey Nehls as an analyst/research assistant in 2018 shortly after graduating from University of Colorado Boulder with a bachelor's degree in quantitative economics. She has since obtained a Master of Science in data analytics and developed extensive skills in data collection, data analysis and visualization, machine learning, and professional writing. In addition to her work with Pacey Nehls, Ms. Suarez served as a board member with the Denver Association for Business Economists (a chapter of the National Association for Business Economics) from 2022-2023. She is instrumental in the research and quantitative analyses for the firm's public policy projects.

Jake M. Zieba, B.A.

Mr. Zieba joined Pacey Nehls in the summer of 2022. He is fresh out of college with a bachelor's degree in economics from the University of California Santa Barbara. While in school, Jake acquired solid training and skills in R and Excel and has already demonstrated his ability to manage data, data analyses, and most importantly, critical thinking skills in addressing the tasks assigned to him. In addition to his research assistance, Mr. Zieba provides supplemental analysis and case support to the expert witnesses at Pacey Nehls.

APPENDICES

APPENDIX A—Annual PERA Retirement Distributions as a Percentage of Payroll by County

APPENDIX B—Economic and Fiscal Impacts by County

APPENDIX C—PERA Economic Benefits by Industry Sector – State of Colorado

APPENDIX D—Statewide Comparisons to Previous Studies

APPENDIX E—Economic and Fiscal Impact Analysis Detailed Methodology

APPENDIX A–ANNUAL PERA RETIREMENT DISTRIBUTIONS AS A PERCENTAGE OF PAYROLL BY COUNTY

(sorted by percentage of payroll)

COUNTY	REGION	RETIREMENT DISTRIBUTIONS ANNUALIZED (IN THOUSANDS)	ANNUAL PAYROLL (ADJUSTED TO 2023 DOLLARS) (IN THOUSANDS)	PERA RETIREMENT DISTRIBUTIONS AS PERCENTAGE OF PAYROLL
Custer	Pueblo-Southern	$7,520	$23,635	31.8%
Conejos	San Luis Valley	10,111	37,980	26.6%
Costilla	San Luis Valley	3,709	14,278	26.0%
Fremont	Pueblo-Southern	78,828	351,886	22.4%
Washington	Eastern	5,182	24,458	21.2%
Baca	Eastern	3,787	22,436	16.9%
Huerfano	Pueblo-Southern	8,260	50,549	16.3%
Crowley	Eastern	3,993	25,112	15.9%
Bent	Eastern	4,058	26,660	15.2%
Elbert	Eastern	22,652	160,422	14.1%
Park	Mountain	11,057	78,634	14.1%
Otero	Eastern	24,285	178,641	13.6%
Sedgwick	Eastern	2,118	15,774	13.4%
Kiowa	Eastern	1,934	15,194	12.7%
Logan	Eastern	26,997	222,821	12.1%
Lincoln	Eastern	7,237	61,582	11.8%
Las Animas	Pueblo-Southern	16,979	146,345	11.6%
Delta	Western	31,964	285,604	11.2%
Prowers	Eastern	11,796	108,882	10.8%
Hinsdale	Western	685	6,334	10.8%
Rio Grande	San Luis Valley	13,004	120,896	10.8%
Saguache	San Luis Valley	3,929	37,379	10.5%
Dolores	Southwest Mountain	1,538	14,653	10.5%
Pueblo	Pueblo-Southern	270,505	2,606,183	10.4%
Mineral	San Luis Valley	1,016	10,551	9.6%
Chaffee	Mountain	30,580	320,510	9.5%
Jackson	Mountain	1,246	13,725	9.1%
Lake	Mountain	5,134	58,927	8.7%
Teller	Mountain	25,723	295,266	8.7%
Phillips	Eastern	4,374	55,783	7.8%
Alamosa	San Luis Valley	22,077	300,780	7.3%
Montezuma	Southwest Mountain	20,323	300,304	6.8%
Clear Creek	Mountain	9,175	135,876	6.8%
Kit Carson	Eastern	6,330	94,758	6.7%
Montrose	Western	44,283	666,107	6.6%
Ouray	Western	5,320	90,564	5.9%
Yuma	Eastern	7,173	123,463	5.8%
Mesa	Western	154,642	2,895,137	5.3%
Cheyenne	Eastern	1,620	31,075	5.2%
Morgan	Eastern	25,535	527,831	4.8%
Jefferson	Metro Denver	615,741	12,772,025	4.8%
Moffat	Western	8,784	186,791	4.7%
Rio Blanco	Western	6,791	144,689	4.7%
San Juan	Southwest Mountain	460	10,307	4.5%
Archuleta	Southwest Mountain	7,320	164,201	4.5%
Larimer	Northern	347,327	8,503,858	4.1%
Gunnison	Western	12,783	315,109	4.1%
Weld	Northern	232,992	6,157,016	3.8%
Grand	Mountain	12,493	352,535	3.5%
La Plata	Southwest Mountain	47,863	1,353,658	3.5%
El Paso	Colorado Springs	544,550	15,901,504	3.4%
Garfield	Western	36,372	1,258,893	2.9%
Douglas	Metro Denver	241,600	9,267,189	2.6%
Routt	Mountain	16,755	679,637	2.5%
Boulder	Metro Denver	320,324	13,235,505	2.4%
Adams	Metro Denver	242,741	11,745,959	2.1%
Gilpin	Mountain	3,935	200,690	2.0%
Arapahoe	Metro Denver	437,766	24,873,240	1.8%
San Miguel	Western	3,518	238,066	1.5%
Summit	Mountain	13,124	968,182	1.4%
Broomfield	Metro Denver	58,276	4,299,269	1.4%
Denver	Metro Denver	386,077	41,078,837	0.9%
Eagle	Mountain	16,280	2,020,212	0.8%
Pitkin	Mountain	5,125	932,200	0.5%

APPENDIX B–ECONOMIC AND FISCAL IMPACTS BY COUNTY[5]

(actual dollars)

COUNTY	REGION	LABOR INCOME	VALUE-ADDED	INDIRECT EFFECT	INDUCED EFFECT
Adams	Metro Denver	$39,487,570	$84,629,891	$17,403,144	$8,276,090
Alamosa	San Luis Valley	4,868,199	10,054,735	2,758,289	1,894,730
Arapahoe	Metro Denver	127,965,390	242,736,553	82,278,701	37,044,954
Archuleta	Southwest Mountain	1,013,450	2,595,054	813,858	424,859
Baca	Eastern	214,923	709,046	257,186	55,413
Bent	Eastern	257,381	1,015,076	153,720	58,177
Boulder	Metro Denver	98,238,147	183,021,298	61,828,850	38,460,755
Broomfield	Metro Denver	10,591,995	23,789,447	7,843,355	1,681,902
Chaffee	Mountain	4,623,394	10,689,898	3,315,110	1,954,217
Cheyenne	Eastern	100,425	318,986	105,874	21,510
Clear Creek	Mountain	686,903	1,935,723	482,790	158,245
Conejos	San Luis Valley	997,614	2,526,958	1,006,346	343,633
Costilla	San Luis Valley	280,633	722,626	233,236	75,023
Crowley	Eastern	304,177	1,031,428	171,195	41,395
Custer	Pueblo-Southern	521,507	1,747,868	514,834	149,347
Delta	Western	3,976,972	9,977,215	3,272,859	1,457,743
Denver	Metro Denver	140,757,538	259,685,111	98,274,034	41,143,200
Dolores	Southwest Mountain	95,447	302,884	83,215	24,266
Douglas	Metro Denver	52,453,029	101,487,771	29,547,400	17,106,432
Eagle	Mountain	5,132,118	9,449,728	2,739,789	1,988,588
El Paso	Colorado Springs	135,850,410	270,278,140	86,323,457	72,878,437
Elbert	Eastern	1,252,337	4,220,921	1,092,646	280,607
Fremont	Pueblo-Southern	9,648,093	22,509,034	4,922,994	3,182,867
Garfield	Western	7,040,442	14,166,362	4,322,558	2,518,430
Gilpin	Mountain	201,924	690,287	98,424	23,126
Grand	Mountain	1,712,974	4,464,460	1,206,261	653,266
Gunnison	Western	2,039,357	4,615,702	1,645,803	819,922
Hinsdale	Western	46,384	142,546	74,470	14,258
Huerfano	Pueblo-Southern	857,040	2,044,065	583,023	286,760
Jackson	Mountain	107,157	280,678	73,468	27,500
Jefferson	Metro Denver	138,225,654	265,410,097	67,954,830	43,275,083
Kiowa	Eastern	126,114	375,243	99,824	26,034
Kit Carson	Eastern	740,367	1,980,034	526,277	247,408
La Plata	Southwest Mountain	14,126,369	26,177,474	9,791,595	7,842,363
Lake	Mountain	680,261	1,540,205	352,752	194,350
Larimer	Northern	82,558,181	163,470,522	58,074,676	39,559,408
Las Animas	Pueblo-Southern	2,214,895	5,015,467	1,127,604	794,454
Lincoln	Eastern	750,534	1,946,595	422,179	180,124
Logan	Eastern	4,854,019	9,993,336	2,584,975	1,920,586
Mesa	Western	41,728,330	77,084,812	26,094,247	24,016,815
Mineral	San Luis Valley	100,546	238,223	63,701	28,744
Moffat	Western	1,365,126	2,937,146	831,957	530,109
Montezuma	Southwest Mountain	3,648,805	7,507,804	2,454,179	1,663,726
Montrose	Western	8,177,991	17,635,485	5,970,684	3,657,839
Morgan	Eastern	3,518,159	7,986,422	2,024,525	1,245,824
Otero	Eastern	3,742,384	8,336,448	2,233,691	1,480,254
Ouray	Western	695,062	1,497,355	609,395	240,676
Park	Mountain	731,591	2,332,834	748,349	187,355
Phillips	Eastern	448,484	1,112,809	301,455	126,017
Pitkin	Mountain	1,138,112	2,337,956	738,511	190,699
Prowers	Eastern	1,683,369	3,926,880	1,239,333	633,096
Pueblo	Pueblo-Southern	56,283,144	111,057,360	26,224,344	24,915,313
Rio Blanco	Western	513,342	1,510,070	419,711	143,787
Rio Grande	San Luis Valley	1,908,902	4,373,035	1,393,304	640,287
Routt	Mountain	3,862,537	8,047,751	2,542,901	1,497,997
Saguache	San Luis Valley	207,119	728,001	178,484	48,074
San Juan	Southwest Mountain	45,773	112,813	36,207	13,171
San Miguel	Western	597,485	1,299,206	392,794	163,497
Sedgwick	Eastern	134,809	415,683	140,794	37,342
Summit	Mountain	2,975,546	6,330,586	1,712,692	1,132,424
Teller	Mountain	2,784,564	6,946,714	2,479,958	911,654
Washington	Eastern	317,312	976,975	275,672	79,875
Weld	Northern	31,968,307	68,426,011	15,512,989	9,329,064
Yuma	Eastern	789,811	1,933,825	635,965	258,582

[5] *As noted previously, county-level impacts do not include inter-county economic activity, so the county-by-county impacts presented here should not be added to derive state or regional totals; state and regional impact measures are identified elsewhere in this report.*

APPENDIX B–ECONOMIC AND FISCAL IMPACTS BY COUNTY[5] (CONTINUED)

(actual dollars)

COUNTY	REGION	SALES TAX	PROPERTY TAX	OTHER TAXES (INCLUDING INCOME TAX)	TOTAL STATE AND LOCAL TAX
Adams	Metro Denver	$ 4,289,617	$4,641,706	$3,678,895	$12,610,218
Alamosa	San Luis Valley	766,781	370,976	346,932	1,484,689
Arapahoe	Metro Denver	8,688,670	9,984,709	8,303,917	26,977,296
Archuleta	Southwest Mountain	174,156	128,286	91,990	394,432
Baca	Eastern	34,105	92,002	32,594	158,700
Bent	Eastern	43,404	74,447	39,949	157,799
Boulder	Metro Denver	6,099,304	8,158,192	6,845,064	21,102,560
Broomfield	Metro Denver	1,512,302	530,900	983,213	3,026,416
Chaffee	Mountain	839,966	540,151	458,252	1,838,368
Cheyenne	Eastern	7,919	31,959	15,682	55,560
Clear Creek	Mountain	78,735	186,017	114,975	379,727
Conejos	San Luis Valley	224,615	137,422	118,463	480,500
Costilla	San Luis Valley	11,619	73,368	38,634	123,621
Crowley	Eastern	50,126	61,619	37,926	149,671
Custer	Pueblo-Southern	113,434	138,953	103,533	355,920
Delta	Western	833,803	437,998	461,964	1,733,765
Denver	Metro Denver	8,611,270	6,736,867	8,370,399	23,718,535
Dolores	Southwest Mountain	9,058	39,629	11,422	60,109
Douglas	Metro Denver	4,263,134	4,510,704	4,723,414	13,497,253
Eagle	Mountain	346,676	371,435	346,216	1,064,328
El Paso	Colorado Springs	15,767,344	8,496,979	11,601,494	35,865,816
Elbert	Eastern	240,634	344,220	292,226	877,080
Fremont	Pueblo-Southern	1,803,608	1,037,994	1,034,556	3,876,157
Garfield	Western	623,881	852,600	568,284	2,044,766
Gilpin	Mountain	29,943	27,668	62,979	120,591
Grand	Mountain	211,945	264,247	203,538	679,729
Gunnison	Western	262,001	232,458	201,445	695,905
Hinsdale	Western	8,265	16,028	10,080	34,372
Huerfano	Pueblo-Southern	89,516	120,241	107,981	317,739
Jackson	Mountain	19,124	24,455	12,977	56,556
Jefferson	Metro Denver	10,862,655	12,664,793	11,295,073	34,822,521
Kiowa	Eastern	17,640	40,805	16,981	75,425
Kit Carson	Eastern	106,207	193,722	78,038	377,967
La Plata	Southwest Mountain	1,261,647	962,758	1,038,527	3,262,933
Lake	Mountain	17,542	156,832	60,543	234,917
Larimer	Northern	7,975,810	7,732,284	6,974,034	22,682,128
Las Animas	Pueblo-Southern	414,637	184,181	226,846	825,664
Lincoln	Eastern	156,956	159,283	80,768	397,006
Logan	Eastern	676,377	555,865	420,264	1,652,506
Mesa	Western	4,798,971	2,527,113	2,980,552	10,306,636
Mineral	San Luis Valley	14,409	20,151	11,807	46,367
Moffat	Western	208,830	175,577	117,849	502,257
Montezuma	Southwest Mountain	322,002	266,331	355,297	943,630
Montrose	Western	1,431,087	677,516	710,779	2,819,382
Morgan	Eastern	369,981	559,655	370,695	1,300,332
Otero	Eastern	597,959	337,686	328,704	1,264,349
Ouray	Western	81,467	99,960	72,501	253,927
Park	Mountain	131,620	168,959	130,293	430,872
Phillips	Eastern	97,519	97,913	59,032	254,464
Pitkin	Mountain	90,977	78,104	108,051	277,132
Prowers	Eastern	361,726	187,334	176,486	725,547
Pueblo	Pueblo-Southern	6,700,672	4,814,060	4,556,790	16,071,522
Rio Blanco	Western	40,638	180,929	71,736	293,302
Rio Grande	San Luis Valley	311,785	188,910	206,677	707,371
Routt	Mountain	360,941	317,007	341,791	1,019,739
Saguache	San Luis Valley	32,013	49,669	38,905	120,587
San Juan	Southwest Mountain	11,116	7,403	5,804	24,323
San Miguel	Western	58,300	65,529	49,250	173,079
Sedgwick	Eastern	11,478	51,676	16,293	79,447
Summit	Mountain	344,294	253,773	279,262	877,330
Teller	Mountain	442,231	441,665	365,304	1,249,200
Washington	Eastern	43,654	104,616	49,700	197,971
Weld	Northern	2,582,264	4,879,353	3,889,662	11,351,280
Yuma	Eastern	100,773	186,355	81,220	368,347

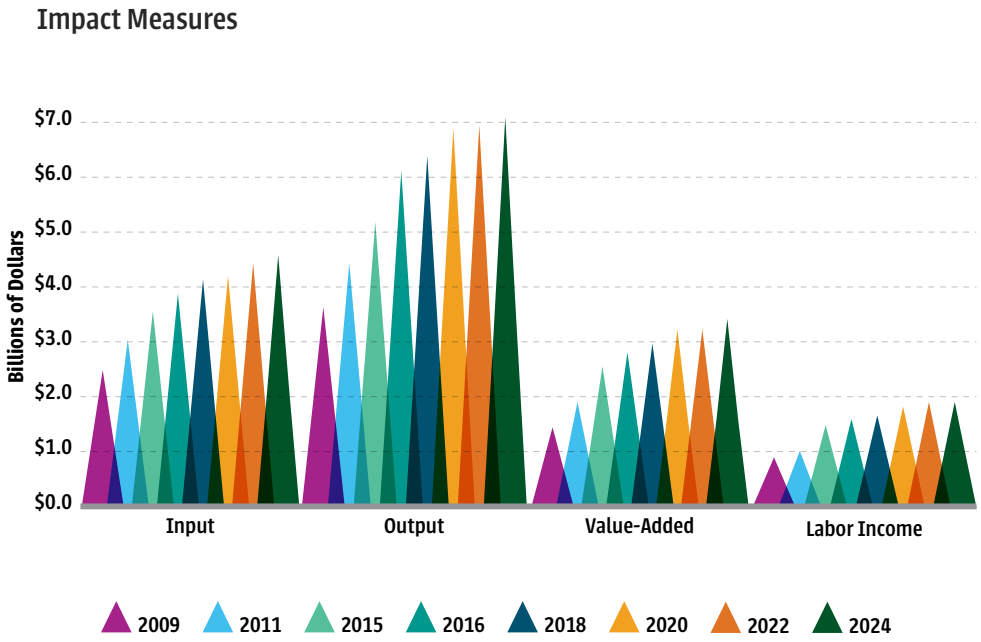
[5] *As noted previously, county-level impacts do not include inter-county economic activity, so the county-by-county impacts presented here should not be added to derive state or regional totals; state and regional impact measures are identified elsewhere in this report.*

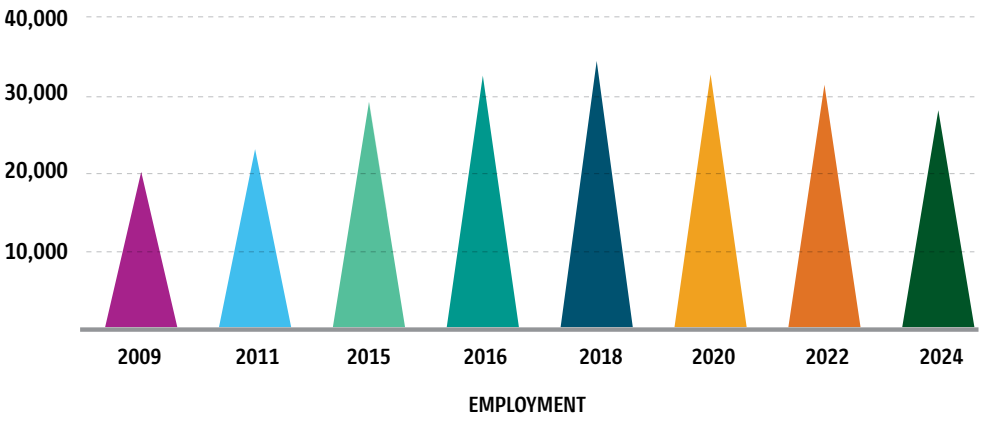
APPENDIX C–PERA ECONOMIC BENEFITS BY INDUSTRY SECTOR–STATE OF COLORADO

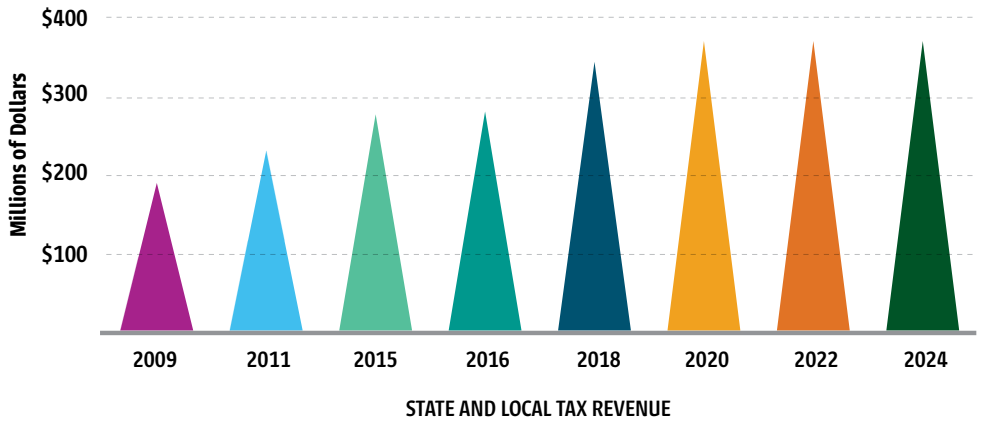
(dollars in millions, except for employment)

SECTOR	VALUE-ADDED	LABOR INCOME	EMPLOYMENT
Finance and Insurance	$287.2	$177.2	2,263
Health and Social Services	420.4	383.6	4,995
Government and Other	206.3	180.7	3,156
Real Estate and Rental	883.1	92.6	1,857
Retail trade	354.1	191.6	4,383
Accommodation and Food Services	197.1	127.6	3,588
Information	190.4	80.1	658
Wholesale Trade	172.5	92.3	791
Manufacturing	48.8	26.3	341
Professional- Scientific and Tech	171.5	131.6	1,279
Transportation and Warehousing	110.1	72.7	1,443
Administrative and Waste Services	89.7	75.9	1,293
Utilities	47.9	15.0	72
Arts Entertainment and Recreation	78.6	41.3	1,097
Management of Companies	58.9	51.7	327
Education	30.2	28.6	585
Construction	23.1	14.5	206
Ag, Forestry, Fish & Hunting	4.8	5.5	169
Mining	15.4	10.0	20
Total	$3,389.8	$1,798.6	28,525
2009 Total	$1,446.6	$834.7	20,636

APPENDIX D–STATEWIDE COMPARISIONS TO PREVIOUS STUDIES







APPENDIX E–ECONOMIC AND FISCAL IMPACT ANALYSIS DETAILED METHODOLOGY

PERA retirement distribution information as of December 2023 was used in the input-output modeling software, IMPLAN, to determine the economic impact of the retirement distributions by county, region, and the State of Colorado. IMPLAN was initially developed in the 1970's for use by the US Forest Service, in cooperation with other federal agencies, to assist in land and resource management planning. The University of Minnesota was also involved in the development of the model in the 1980's and, in 1993, the Minnesota IMPLAN Group, Inc. (MIG) was formed to privatize the development of the data and software. IMPLAN is widely used by federal, state, and local governments as well as academic institutions and businesses to assess the economic and fiscal impacts of a variety of developments, including numerous analyses of the retirement distributions of publicly funded pension plans.

An input-output model, such as IMPLAN, accounts for the relationships in the economy of a certain geographic area (for example, the State of Colorado, a region, or a county). This is accomplished through a Social Accounting Matrix (SAM) framework which captures all industry and institution (including household and government) transactions in a local economy. The SAM traces the flow of dollars from purchasers to producers while also accounting for taxes paid by households and business.

The IMPLAN model measures the impact of the flow of dollars through a regional economy by estimating the direct effect, indirect effect, induced effect, and total effect. The distinction between these effects is best illustrated by applying them to the task at hand although only the total effect is reported in the results section of this report.

- The **direct effect**, the initial event, is the spending of PERA benefits by households at businesses or taxes paid to the state and local governments.
- The **indirect effect** identifies the impact on the economy when the businesses and government purchase inventory and hire employees.
- When employees of the businesses and government spend their wages and profits, this impact is considered to be an **induced effect**.
- The **total effect** is the sum of the direct, indirect, and induced effects.

It should be noted that state impacts are not the sum of the impacts of individual regions/counties. This is because households make some of their purchases for goods and services outside a certain region/county and, as such, those expenditures are not counted in the economic activity of the region/county where the retirement distribution recipient resides. Given that the state encompasses a larger geographic and, therefore, larger economic area, it will include more economic activity and, hence, the economic impact for the state will be larger than the sum of the counties/regions.

Of note, since the August 2009 study, MIG has incorporated modifications to the methodology used to calculate the proportion of each dollar of local demand that is purchased from local producers and the proportion purchased from producers in other regions. Version 2.0 of IMPLAN, used in the August 2009 study, utilizes an econometric approach to calculate these proportions. Since that time, IMPLAN began using a trade flow methodology believed to be superior to the prior methodology. Notably, IMPLAN recently transitioned to an online platform and discontinued all of its desktop platforms. IMPLAN continues to make improvements to its software over time.

RETIREMENT DISTRIBUTIONS

This analysis recognizes that not all PERA beneficiaries continue to reside in Colorado. Those recipients that are no longer in the state are likely spending their retirement distributions in their new locale. As such, payments for recipients who reside out-of-state were not included in this analysis. By not including any out-of-state PERA recipients, we assume that the expenditures by these recipients have no effect on economic impacts within the state.

For the county/regional analyses, only recipients residing in the respective county/region are included.

HOUSEHOLD EXPENDITURE PATTERN

The typical expenditure pattern of a household will vary, in part, due to their income level. For example, a higher income household may spend more on entertainment than a lower income household. IMPLAN recognizes this and has several different household expenditure groups.

Regional and County impacts were analyzed using the expenditure patterns for four household income groups: $15,000–$30,000, $30,000–$40,000, $40,000–$50,000, $50,000–$70,000, and $70,000–$100,000. These income ranges were chosen after reviewing average PERA benefit payment information and median household income data from the U.S. Census Bureau (2020 American Community Survey conducted by U.S. Census Bureau).

The household expenditure pattern of the income range $30,000–40,000 was used for the Eastern and San Luis Valley regions. The household expenditure pattern of the income range $40,000–$50,000 was used for the Southwest Mountain, Western, and Pueblo-Southern regions, and the State of Colorado. For the Colorado Springs, Metro Denver, Mountain, and Northern regions the $50,000–$70,000 household spending pattern was used.

For the counties, the income range for the household expenditure pattern, slightly differed from the respective region. For the counties in the Eastern and Pueblo-Southern Mountains regions, the income range for household expenditure was between $29,500 and $49,300 with Elbert County as the outlier with a median income of $67,500. The household expenditure pattern of the income range $48,600–$85,200 was used for counties in the Metro Denver, Colorado Springs, and Mountain regions. The household expenditure pattern of the income range $27,600–$39,800 was used for counties in the San Luis Valley region, with the outlier of Mineral County

APPENDIX E–ECONOMIC AND FISCAL IMPACT ANALYSIS DETAILED METHODOLOGY (CONTINUED)

at an average income of 56,800. For counties in the Northern region, the $47,600–$58,200 household spending pattern was used. A range of $27,900–$63,700 was used for counties in the Southwest Mountain and Western districts for the household expenditure pattern. Notably, due to a lack of observations there was no income data available for San Juan County (in the Southwest Mountain region), therefore an income was imputed which fell within the range noted above.

The actual expenditure pattern of the PERA households may differ somewhat from the IMPLAN average as more than 98% of the PERA recipients are age 55 and older. Data from the Consumer Expenditure Survey showed that households with older individuals spend proportionately more on certain items (e.g., health care) and less on other items (e.g., education) than the average household although total spending dollars were relatively comparable within income levels.

TAXES AND SAVING

Households spend out of their disposable income. That is, purchases of goods and services are made once adjusted for income taxes and savings. Therefore, subtracting income taxes and savings from gross retirement distributions is important to accurately estimate the local economic impacts. (IMPLAN assumes the dollars inputted are to be spent.) The income taxes do not go unspent and the impacts on state and local governments are included in this analysis.

Of note, data from the Colorado Department of Revenue regarding average federal and Colorado taxes paid in 2019 (based on the most recently available data published November 2022) by income classes for residents 65 and older is utilized. This data provides the effective tax rate, recognizing the amount of tax an individual actually pays includes tax deductions and exemptions, credits, etc. For the household income $30,000–$40,000, taxes paid as a percentage of federal adjusted gross income were 5.1% for federal taxes. For the household income $40,000–$50,000, the rate is 6.7% for federal taxes. Because state income taxes more directly affect the fiscal impact to the state Colorado, 10 effective tax brackets were applied to individual disbursements. All tax rates are likely low as they do not consider likely spousal or other income which would result in increased tax rates.

Information from the Consumer Expenditure Survey was evaluated to derive the savings rate. For individuals over age 55 in the lower household expenditure pattern ($30,000–$40,000), essentially no monies were devoted to savings and, as such, a 0.0% rate was incorporated into the analysis; however, for the higher household expenditure pattern ($40,000–$50,000), a 5.0% rate is used given the expenditure data.

STATE AND LOCAL TAX GENERATION

To calculate state and local tax generation, state income taxes paid by recipients on retirement distributions are added to taxes paid in all subsequent rounds of spending. For the first, the state taxes are included as described above while IMPLAN calculates corporate, personal income, sales, property, etc. taxes generated from each subsequent round of spending.

ADJUSTMENTS

Retirement distributions data provided by PERA is as of December 2023 while IMPLAN's data used to determine the economic impact is primarily 2022 data. IMPLAN incorporates the producer price index (PPI) to adjust 2022 dollars to 2024 dollars.

NOTES ON IMPACTS

As described above, a number of assumptions were made regarding household expenditures, taxes, and savings. As such, a range of outcomes is likely appropriate, and an exact dollar figure is not feasible although results provided here reflect a reasonable measure of the economic and fiscal impacts of the PERA retirement distributions.

Also, an economic impact study can never capture the exact benefit as economies are always in a state of flux.

COLORADO PERA®