COLORADO PERA
PERA.

COLORADO PERA'S
ECONOMIC AND FISCAL IMPACTS
2020

PREPARED BY PACEY ECONOMICS, INC.

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 2020 study is a follow-up to the earlier reports performed in August 2009 and subsequent studies in 2011, 2015, 2016, and 2018. We also include a perspective on the changes in the impacts after a decade of study. Although the recent worldwide health emergency has changed the future outlook for all economies down significantly, the stability and size of PERA's monthly benefit payments will continue to grow and help Colorado's economy weather and recover more quickly than if this 89-year investment by Colorado wasn't continued and secured on behalf of the citizens of the state and for our civil servants who help us all to continue to make our wonderful home of Colorado better.

EXECUTIVE SUMMARY

Colorado PERA is the retirement plan for more than 411 public entities and government agencies within the State of Colorado. There has been a nominal change in the number of organizations served since 2009.

PERA is comprised of five divisions as identified below. School and State dominate PERA recipients and the proportion of recipients within each division has remained consistent over the last decade with a slight decrease in the School and State divisions, mostly due to the addition of Denver Public Schools (DPS) to PERA rolls. If considering DPS, the drop in School and State Divisions is less severe.

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

PERA is important to the state as well as the regional and local (county) economies.

- ▸ The Association provides retirement distributions of $4.11 billion annually to Colorado residents (based on monthly retirement distributions as of January 2020 annualized). This annual amount is up 68% 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, understating 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 2020 average some $732 per person at the state level to more than $1,445 per person in the Pueblo-Southern Mountains Region, highlighting the importance of PERA retirement payments in rural areas.
- ▸ When measured against total payroll, retirement distributions amount to 3.1% at the state level (vis-à-vis 2.7% in 2009), but for rural areas, such as the Pueblo-Southern Mountains and San Luis Valley Regions, amount to 13.2% and 12.6% of local area payroll in 2020, respectively. Again, 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 $4.11 billion annual PERA distributions to Colorado residents results in the following:

- ▸ **$6.66 billion** in output (all goods and services transactions), an increase from $6.47 billion in 2018 and from $6.09 billion in 2016 (up 10% in four years), further stabilizing state and local economies
- ▸ **$3.15 billion** in value-added (state gross domestic product)
- ▸ **$1.71 billion** in labor income (which measures worker impact in wages)
- ▸ **32,772** jobs
- ▸ **360.1 million** in state and local tax revenues

When the impact results are analyzed on an industry sector basis, there are five major sectors (Real Estate and Rental and Leasing; Health Care and Social Assistance; Finance and Insurance; Retail Trade; and Information) and these five sectors continue to account for more than 60% of the value added to our state economy from PERA retirement distributions.

There is particularly obvious variation in impacts on a county level with the largest variation in the value-added and labor income impacts, where rural counties benefit more from PERA retirement distributions as measured on a per capita basis. This is likely due to differences in county population and their retail purchase opportunities along with the geographic expansiveness of the state.

Contributions from both employees and employers are utilized by PERA to provide a healthy return on investment. Since the Great Recession, 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 9.1% return on investment over the last decade, which has exceeded the current expected rate of return of 7.25%.

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 411 government agencies and public entities within the State of Colorado including all Colorado school districts, state judicial systems, 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's contribution for the second half of 2019 and the first half of 2020 is 8.75% for most members and is set to increase to 10.00% in July 2020; the employer's contribution in the early 2000's was approximately 10% but in 2004 and 2006 legislation was passed that required employers to remit additional contributions to PERA. Now, most division employers contribute 20.40% plus 1.02% for the health care fund. (But in reality, of the 20.40%, 5.5% is to be funded by moneys otherwise available for employee wage increases. Thus, the employer's contribution is approximately 14.9%, while the employee's contribution is approximately 14.25% for the school division.)

▶ PERA provides retirement distributions to members at retirement (or if disabled or to a survivor upon a member's death). Most PERA members do not participate in Social Security and thus are not earning Social Security retirement income. Although some members have or will participate in Social Security, they and their spouses will receive a much-reduced Social Security benefit due to two separate Social Security provisions, the Windfall Elimination Provision and the Government Pension Offset provision. Therefore, the PERA retirement distribution is designed and funded to provide total retirement moneys consistent with the private sector where retirement is based on a combination of a private plan and Social Security.

▶ As of December 31, 2019, PERA's membership included 213,294 active members, 122,568 retirement distribution recipients, and 2,450 survivor benefit recipients (similar to the ratio of active workers to retirees in the general population). The total PERA retirement distributions to recipients amounted to $4.6 billion (including in-state and out-of-state residents) with an average (per recipient) monthly distribution of $3,179, and $3,232 for residents. This monthly distribution allows PERA recipients with more than 30 years of service to receive approximately 75% of their pre-retirement income from retirement distributions, a 'replacement ratio' recommended by financial experts. Since 2009, the number of retirement beneficiaries has increased over 45% with only a 27% increase in active members, key issues that have been addressed over the past decade in order to maintain the financial sustainability of PERA.

▶ 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, 2019, the time-weighted net-of-fees annualized rate of return for the pooled investment assets over the last 10 years was 9.1% which is some 25% above the target rate of return of 7.25%. Not surprisingly, this 9.1% return includes four years with lower than target returns and six years with returns above or substantially above 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 411 government agencies and entities within the State of Colorado including all Colorado school districts, the state judicial system, and many municipal and local governments. Denver Public Schools has joined PERA since the August 2009 economic and fiscal impact report. As of December 31, 2019, PERA included 213,294 active members and 122,568 retirement distribution recipients with approximately $4.6 billion in annual retirement distributions (including in-state and out-of-state residents). The average beneficiary payment is $3,179 per month in 2019, an increase of 16% since the average 2009 benefit of $2,739 per month, an amount which has barely kept pace with inflation for the average retiree.

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, etc.

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

	State Division	School Division	Local Government Division	Judicial Division	Denver Public Schools Division	Total
Active Members	55,252	128,938	13,086	339	15,679	213,294
Inactive Members	88,424	150,526	28,951	20	15,510	283,431
Recipients receiving retirement distributions	40,219	67,192	7,757	388	7,012	122,568
Average monthly benefit (retirement benefits)	$3,360	$3,050	$3,160	$5,984	$3,252	$3,179
Recipients receiving survivor benefits	962	1,170	176	11	131	2,450

From a longer-term perspective, the number of active members and retirement distribution recipients has increased over the past two and a half decades from 106,898 active members with 30,537 retirement distribution recipients in 1990 to 213,294 active members with 122,568 retirement distribution recipients in 2018. This is consistent with the state population more than doubling over this same timeframe and the approximately doubling of the state, school, and judicial systems to support this population. 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. (The number of survivor benefit recipients has decreased nominally from 2,458 to 2,450 over the same time frame.)
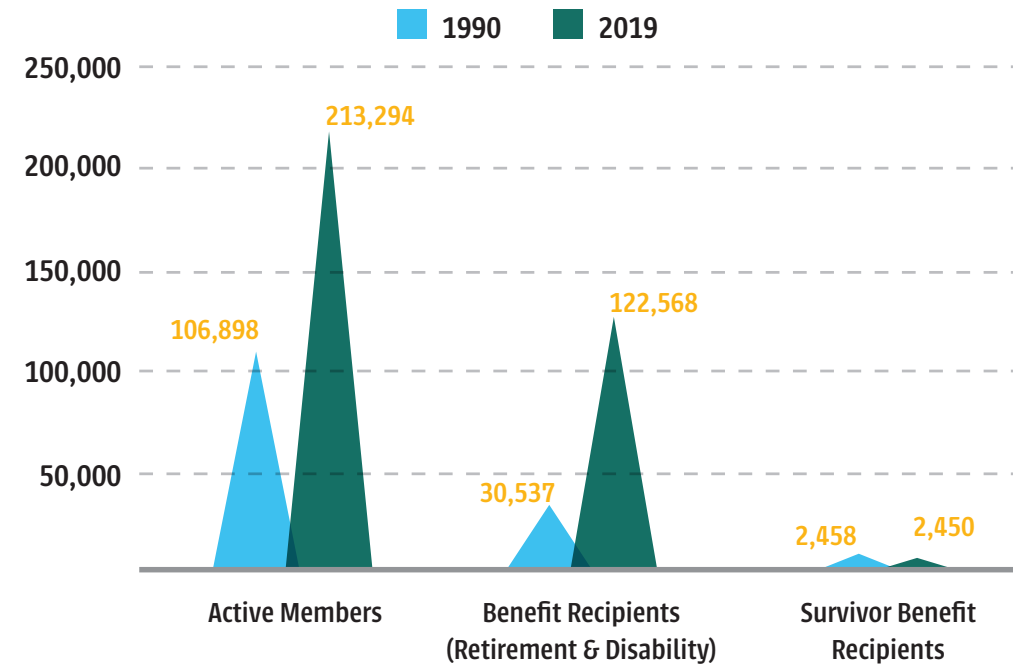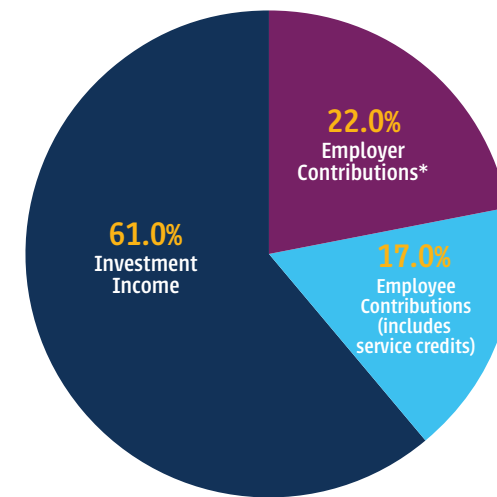

1990 **2019**

Figure 1

Number of PERA Active Members and Retirement Distribution Recipients, 1990 and 2019

Source: Colorado PERA Comprehensive Annual Financial Reports.

Figure 2

Additions to the PERA Trust Funds, 1988-2019

61.0% Investment Income

22.0% Employer Contributions*

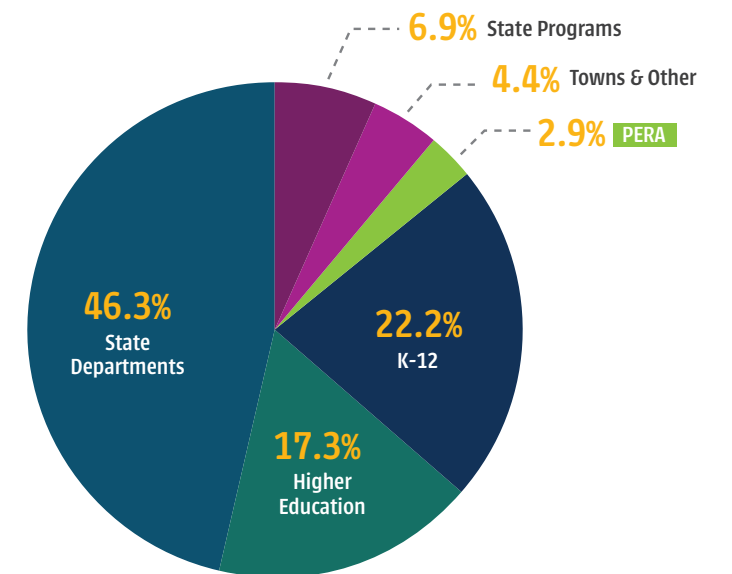**17.0%** Employee Contributions (includes service credits)

Source: Colorado PERA Comprehensive Annual Financial Reports.

*Includes $450M from SB 18-200.

A key element of PERA funding is the ability to generate income from the investment of employer and employee contributions. A summary of the source of PERA assets is provided in Figure 2. Over the last 30 years, the largest portion of additions to the trust fund has been investment income amounting to 61% of additions, even when including the dramatic downturn in investment moneys from the Great Recession.

Figure 3

Colorado State Expenses by Department

6.9% State Programs
4.4% Towns & Other
2.9% PERA
46.3% State Departments
22.2% K-12
17.3% Higher Education

Source: Pacey Economics, Inc. calculations and consistent with information from National Association of State Retirement Administrators (NASRA).

Figure 3 above provides perspective on the relative expense of PERA compared to other state expenditures. PERA employer contributions in 2016 accounted for only 2.9% of the overall budgets of its participating employers, down from the 3.1% noted by NASRA for 2015 and, also, per NASRA lower than average when compared to other states. Given the growth in other sectors of the Colorado economy over the past two years, this share is likely to remain near this 3%.

The nine regions identified in this research consist of the same counties and designations as utilized by the Colorado Legislative Council for its economic forecasts. The map to the right shows the number of PERA retirement distribution recipients and the total annual PERA payments for each region. Since 2009, the annual PERA payments for each region has increased more than 50%, with the exception of the Pueblo-Southern region. Notably, the number of PERA recipients in the Metro Denver and Mountain regions increased by approximately 61% increase.

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 earlier and will be further discussed in this study.
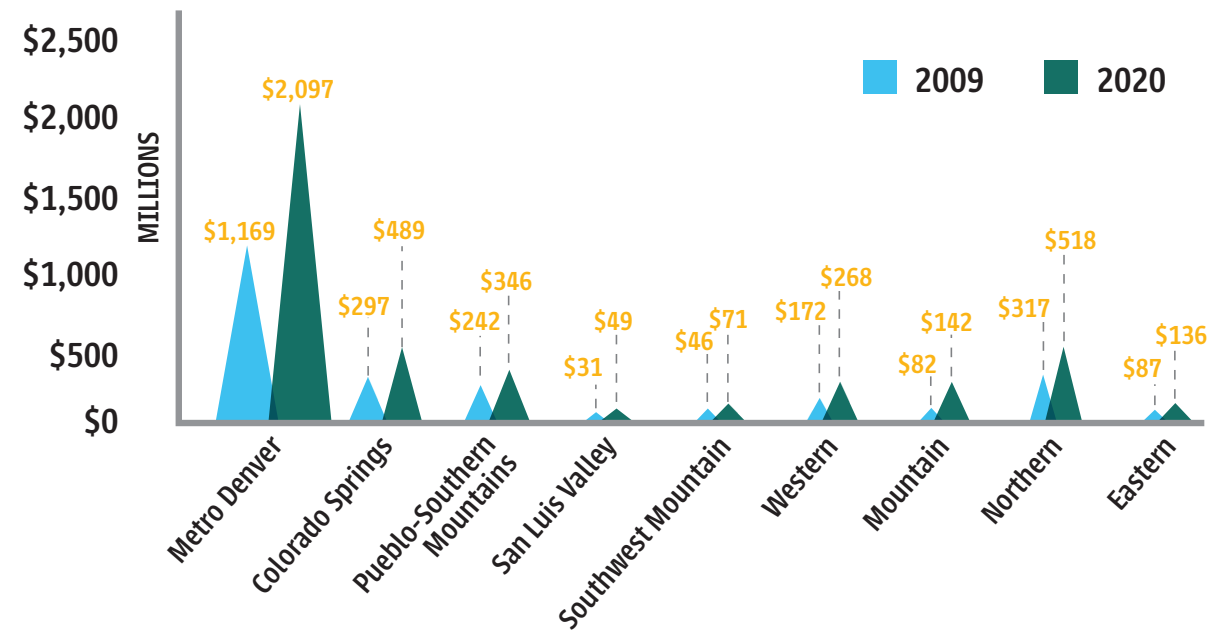
Figure 4

Number of PERA Recipients and Annual PERA Payments by Region (PERA payments shown in millions)
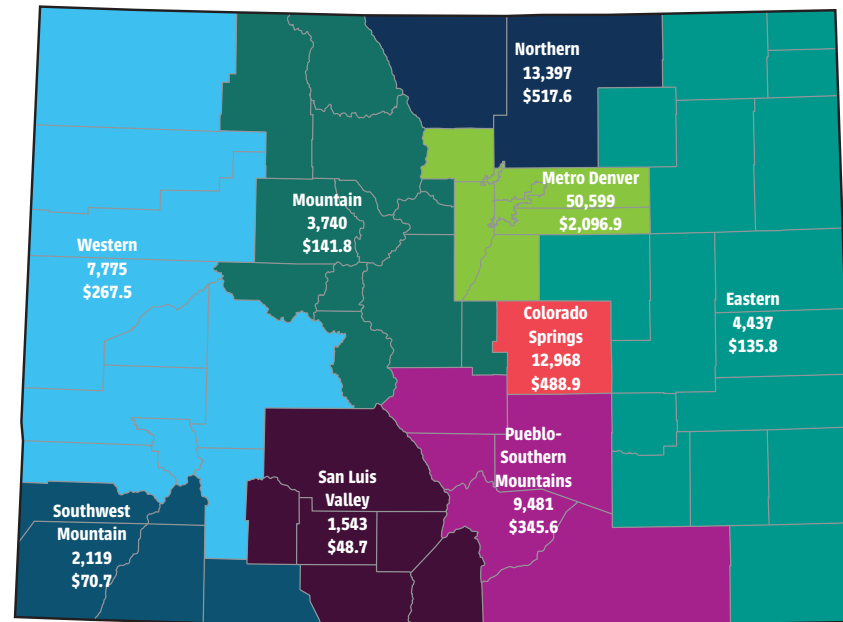
Source: Data from Colorado PERA as of January 2020. Retirement distributions have been annualized.

Figure 5

*PERA Retirement Distributions by Region (in millions)*

Source: Data from Colorado PERA as of January 2020. Retirement distributions have been annualized.

As of January 2020, approximately $4.11 billion dollars (on an annualized basis) will be paid by PERA to recipients who continue to reside in Colorado by the end of the year. The 2020 geographic dispersal of PERA retirement distributions by regions is illustrated in Figure 5 above. Not surprisingly, due to the population growth and redistribution in Colorado over the past decade, the urban areas (Metro Denver and/or the Front Range) have grown at a faster rate than the rural areas (Pueblo-Southern Mountains) since 2009. 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 PERA retirement distributions on a per capita basis and demonstrates the relative importance of the PERA payments to each region. The per capita PERA moneys are especially important in rural regions such as the Pueblo-Southern Mountains where these payments amount to over $1,400 per year per person (i.e., when measured by all persons in the region, not only PERA recipients). Since 2009, PERA retirement distributions on a per capita basis have increased similarly in the Metro Denver, San Luis Valley, Western, and Eastern regions. However, the Mountain region has experienced a much larger increase in PERA retirement distributions of over 65% in the past decade.

Figure 6

Regional Per Capita PERA Retirement Distributions
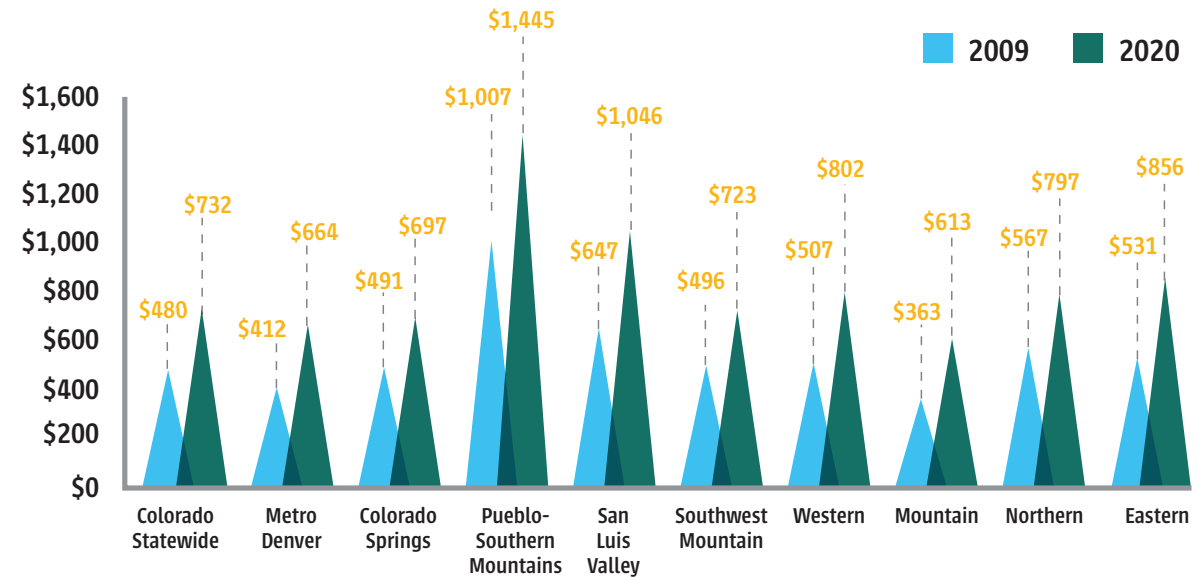
Source: Data from Colorado PERA as of January 2020.

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. Annual PERA recipient payments to Colorado residents of $4.11 billion amount to approximately 3.1% of statewide payroll. This data further confirms that PERA payments are especially important in rural regions and less critical, but still important, in the Metro Denver and Mountain regions. Notably, PERA benefit recipients, for the state of Colorado, now contribute approximately 15% more as a percentage of payroll to the Colorado economy than in 2009.

Table B

PERA Recipient Payments as Percentage of Payroll (dollars in millions)

State/Region	2020 Retirement Distributions	State Annual Payroll[1] (adjusted to 2020)	PERA Payments as Percentage of Payroll
State of Colorado	$4,113.9	$130,619.0	3.1%
Metro Denver	2,097.0	91,398.2	2.3%
Colorado Springs	488.9	12,456.8	3.9%
Pueblo-Southern Mountains	345.7	2,625.5	13.2%
San Luis Valley	48.8	387.0	12.6%
Southwest Mountain	70.7	1,499.2	4.7%
Western	267.5	5,007.7	5.3%
Mountain	141.8	4,739.8	3.0%
Northern	517.6	11,103.8	4.7%
Eastern	135.8	1,401.1	9.7%

Source: Data from January 2020 Colorado PERA. Payroll data from 2017 County Business Patterns, U.S. Census Bureau adjusted to 2020 dollars.

[1]*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.*

Figure 7 illustrates PERA retirement distributions as a percent of county payroll and shows PERA 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 San Luis Valley, Pueblo-Southern Mountains, and Eastern.

▶ In more affluent or urban areas, this percentage is less than 10%; 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 (36.1%), Costilla (33.5%), Conejos (31.4%), Fremont (24.7%), and Washington (20.9%).

▶ PERA retirement distributions are an important source of financial stability in the state economy, especially during times of recession.

▶ Appendix A provides a county-by-county detailed table.

Figure 7

PERA Retirement Distributions Relative to Payroll by County

Over 25 percent of Payroll | 15-25 percent of Payroll | 10-15 percent of Payroll | Less than 10 percent of Payroll

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 $4.11 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 on the right.

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.
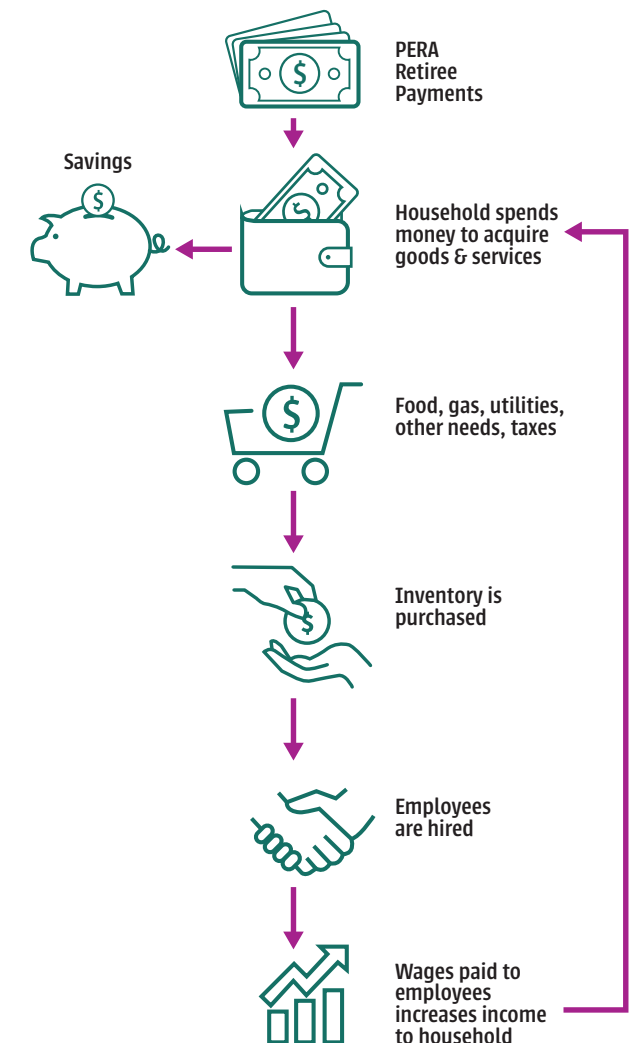
To measure the multiplier effect, sophisticated mathematical procedures (generally referred to as input-output models) are created to track the flow of dollars through an economy. These input-output models recognize the relationships between industries and institutions (households, business, and government 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.

Figure 8

The Multiplier Effect of Household Expenditures

PERA Retiree Payments

Savings

Household spends money to acquire goods & services

Food, gas, utilities, other needs, taxes

Inventory is purchased

Employees are hired

Wages paid to employees increases income to household

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).

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).

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.

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**

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: from the Federal Government, the Bureau of Economic Analysis (BEA) and the Federal Reserve; from the State Government, Colorado Department of Labor and Employment; both University of Colorado and Colorado State University; and from the local private sector, Development Research Partners.)

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 $4.11 billion in annual PERA retirement distributions to Colorado residents results in $6.66 billion in output, up 88% from 2009, while both value-added and labor income has more than doubled over the past decade to $3.15 billion and $1.71 billion, respectively, with an increase from 20,635 jobs in 2009 to 32,772 jobs in 2020. Such an economic output amounts to

1.8% of 2018 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 $360.1 million, up from the 2018 study of $343.4 million

The total output multiplier can be derived by dividing the total economic output ($6.66 billion) by the initial retirement distributions ($4.11 billion) amounting to a multiplier of 1.62. This means that for every dollar spent by a PERA recipient an additional 62 cents are generated in the economy through additional rounds of spending.

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 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 1.62. Of note, the Pensionomics 2018 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 somewhat smaller multiplier of 1.51 for the State of Colorado, although in their 2014 study found a larger multiplier than the 1.59. This is likely related to the NIRS study inclusion of pension and trade flow data.

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 1.30, and the simple average multiplier for the 64 counties is 1.17. 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.

Notably, although PERA distributions have increased since the 2018 study, the impact of these distributions on employment is slightly down from 2018. This is likely due to an increase in the cost of labor (i.e., higher wages) given the increasing employment in Colorado over the last several years. Therefore, more money is required to obtain the same employment impacts generated by the IMPLAN model.

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 $4.11 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.
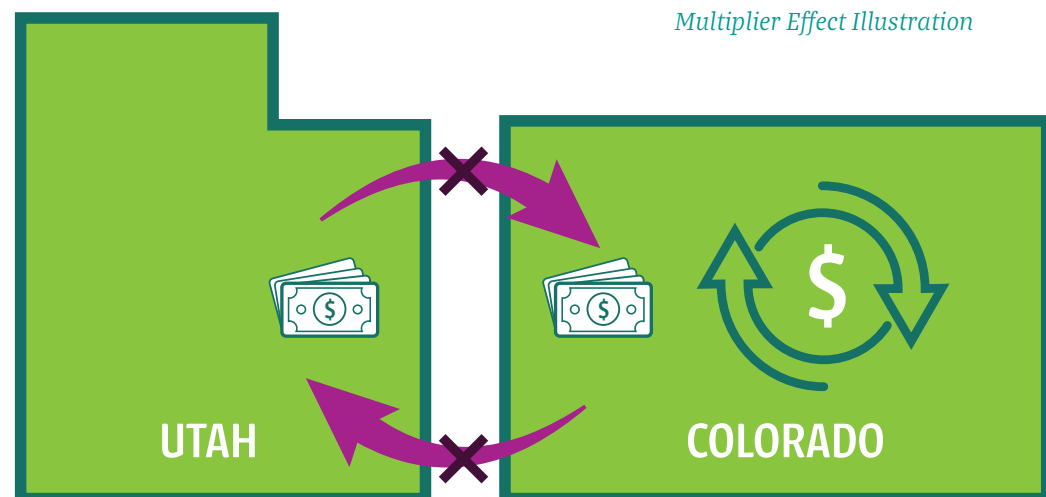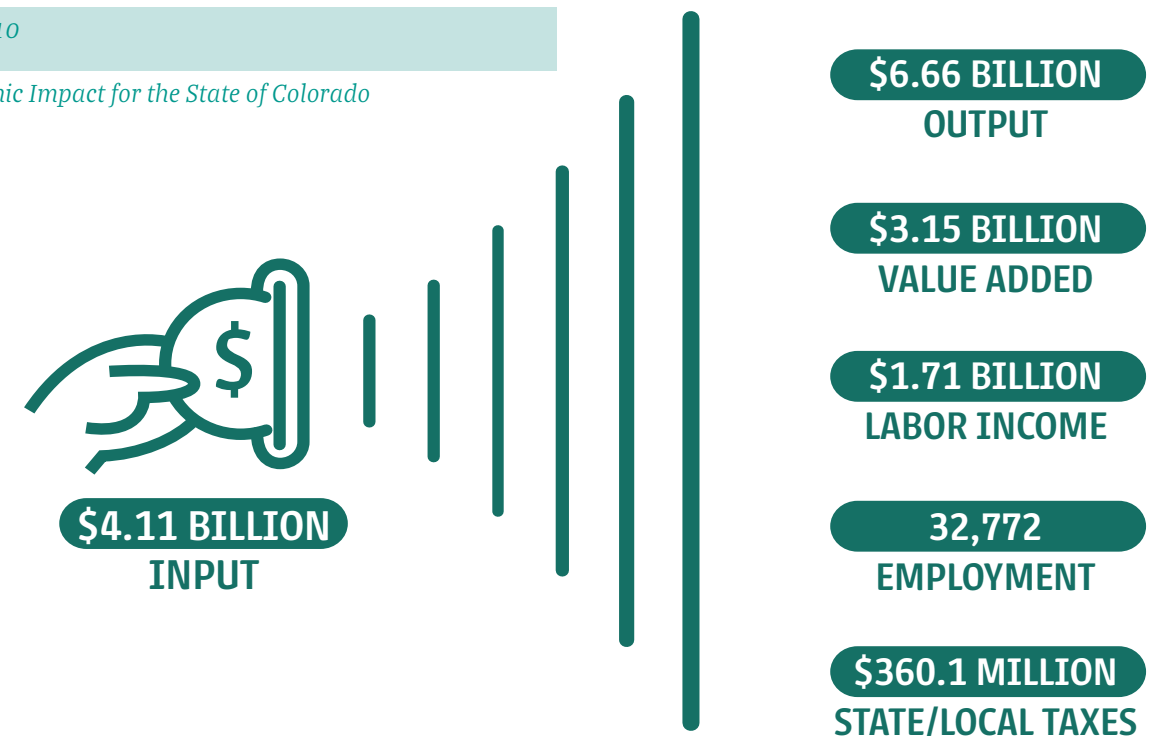
Figure 9

Multiplier Effect Illustration

UTAH

COLORADO

$6.66 BILLION
OUTPUT

$3.15 BILLION
VALUE ADDED

$1.71 BILLION
LABOR INCOME

32,772
EMPLOYMENT

$360.1 MILLION
STATE/LOCAL TAXES

$4.11 BILLION
INPUT

Figures 11 through 14 identify value-added and labor income for the total and per capita impacts for the state and regions. The following figures show that 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 decade:

▶ Naturally, total impacts are greater in the more populated regions.

▶ 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. PERA also plays a particularly important role in the local economies of the Western, Northern, and Eastern regions.

▶ 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.

▶ Of note, output and employment impacts attributable to PERA recipient spending exhibit similar patterns at both the state and regional levels.

On the following pages, Figures 11 and 12 identify the total and per capita value-added dollar impact, respectively; while Figures 13 and 14 identify the total and per capita labor income dollar impact, respectively.

▶ Notably, Figures 11 and 12 have not distinguishably changed over the past two years with the exception of the Southwest Mountain region, which has grown somewhat slower than other regions.

▶ Figures 13 and 14 show that outside of the Front Range and Northern regions, no real total growth in Labor Income has occurred when compared to 2018 Labor Income impacts; however, all regions have experienced an increase in per capita Labor Income.

▶ 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.

Figure 12

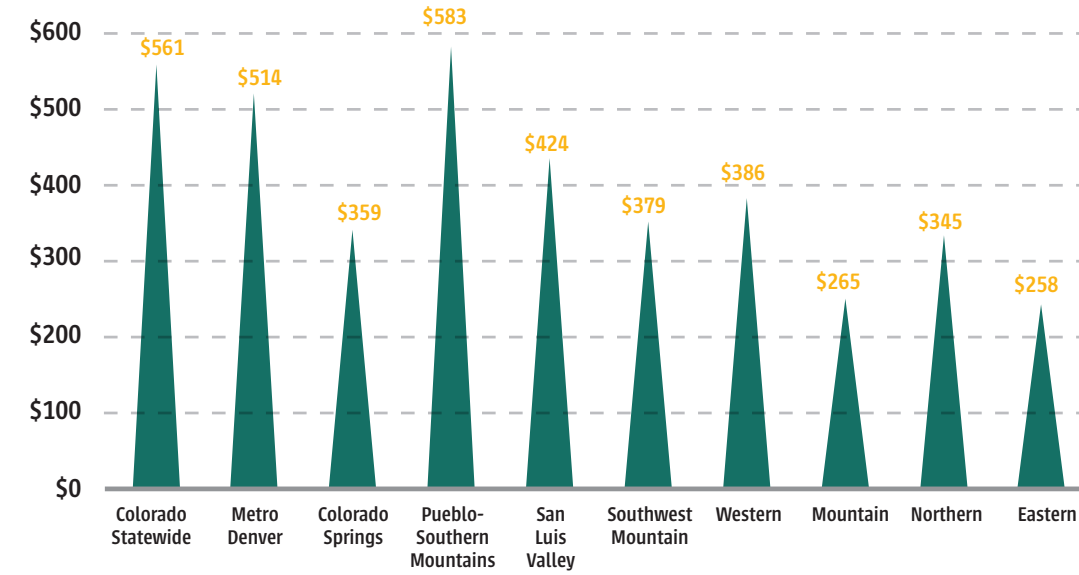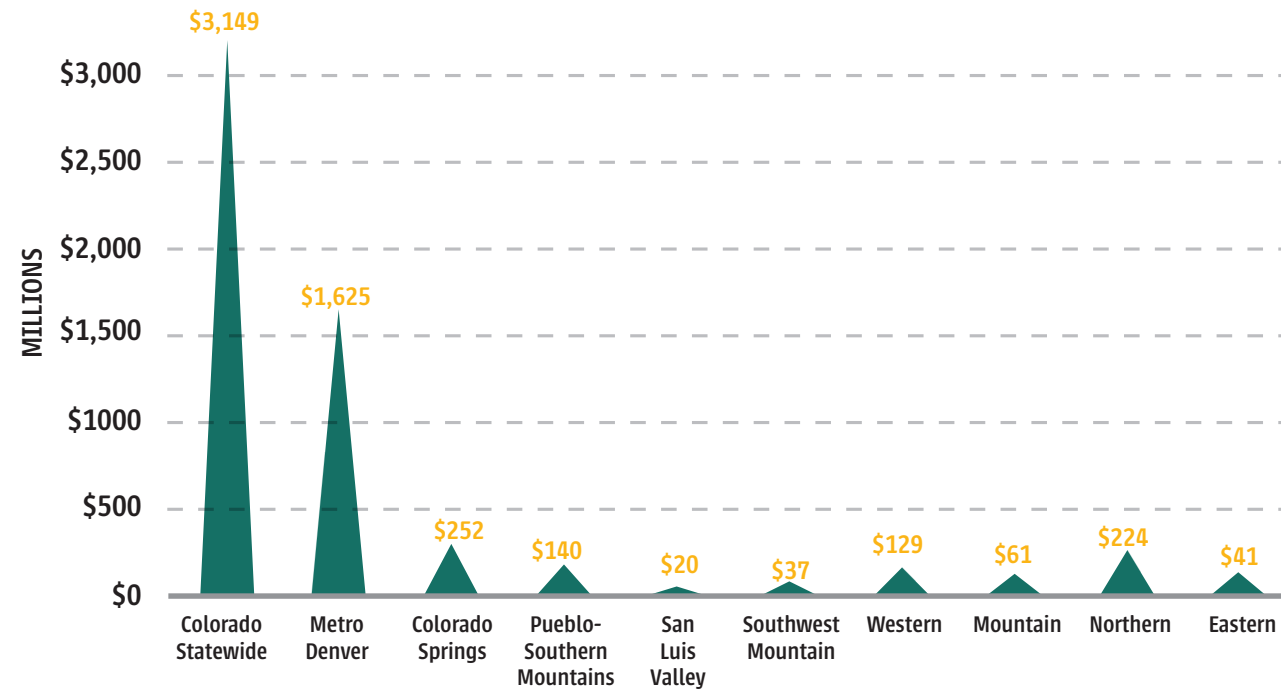*Per Capita Value-Added for State and Regions*

Figure 11

Total Value-Added for State and Regions (in millions)
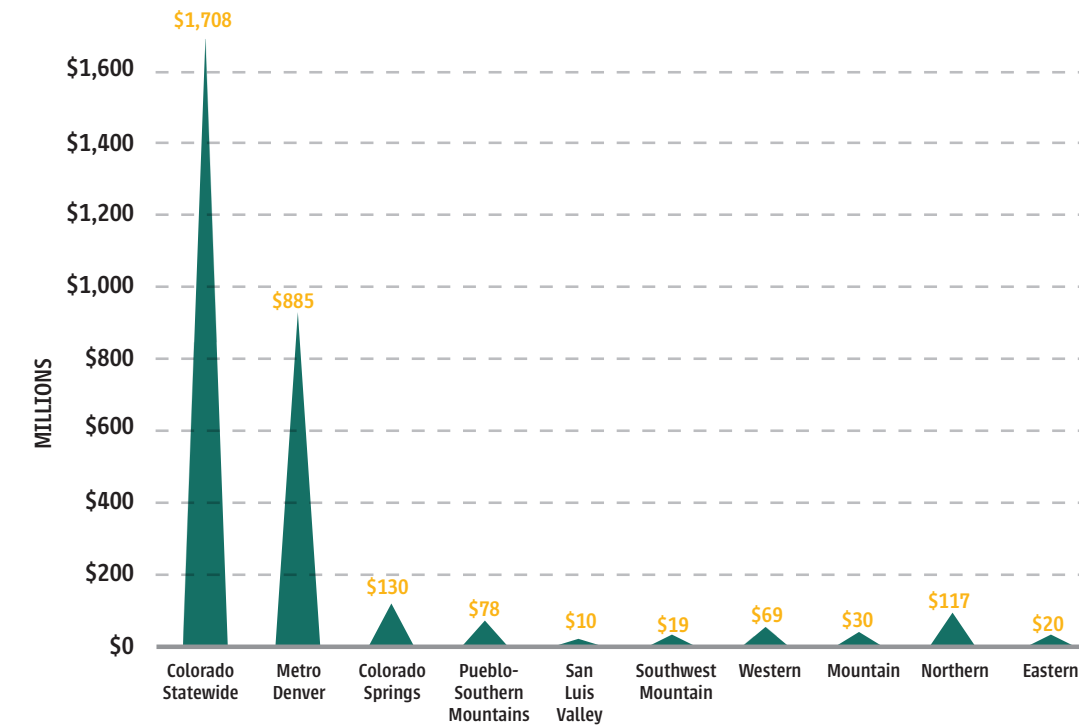

Figure 13

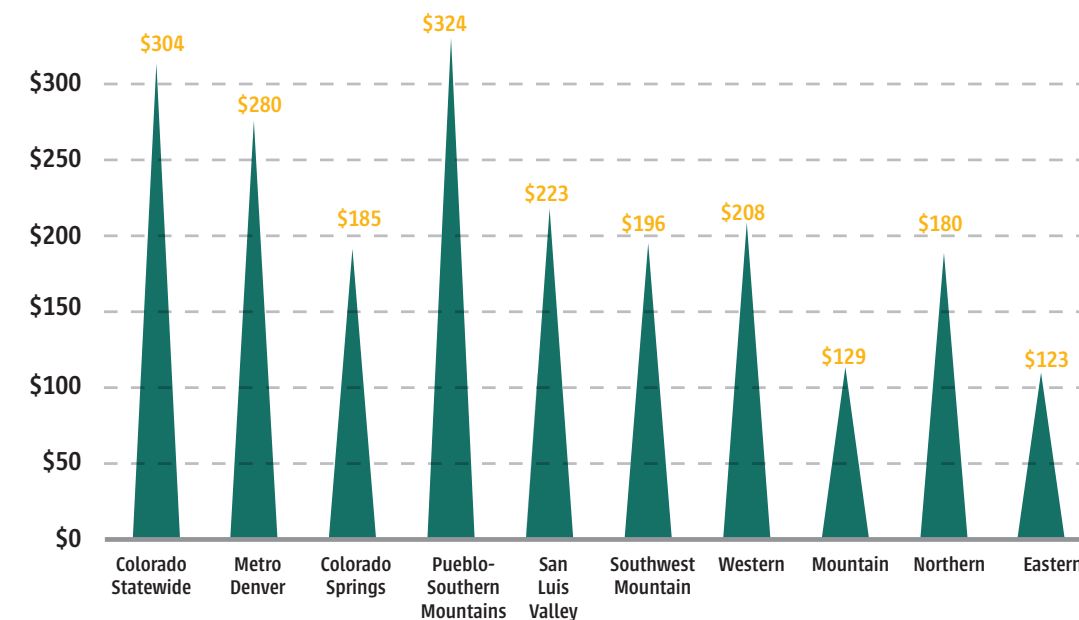*Total Labor Income for State and Regions (in millions)*

Figure 14

Per Capita Labor Income for State and Regions

A summary of the economic impacts identified in Figures 11 to 14 for the state as well as the impacts for each region is provided below in Table C. County-level impacts are provided by displaying economic output per-capita in Figure 15. 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.

Table C

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

State/Region	2020 Retirement Distributions	Output	Value-Added	Labor Income	Employment	Multiplier
State of Colorado	$4,114	$6,662	$3,149	$1,708	32,772	1.62
Metro Denver	2,097	3,359	1,625	885	16,014	1.60
Colorado Springs	489	650	252	130	3,039	1.33
Pueblo-Southern Mountains	346	425	140	78	2,014	1.23
San Luis Valley	49	60	20	10	294	1.24
Southwest Mountain	71	96	37	19	491	1.36
Western	268	356	129	69	1,786	1.33
Mountain	142	172	61	30	678	1.21
Northern	518	656	224	117	2,916	1.27
Eastern	136	156	41	20	576	1.15

Economic output per capita by county is identified in figure 15 on the right. The per capita output is the highest in Pueblo County at approximately $1,805 person.

Figure 15

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

Over $1,500 per Person | $1,000-$1,499 per Person | $500-999 per Person | Less Than $500 per Person
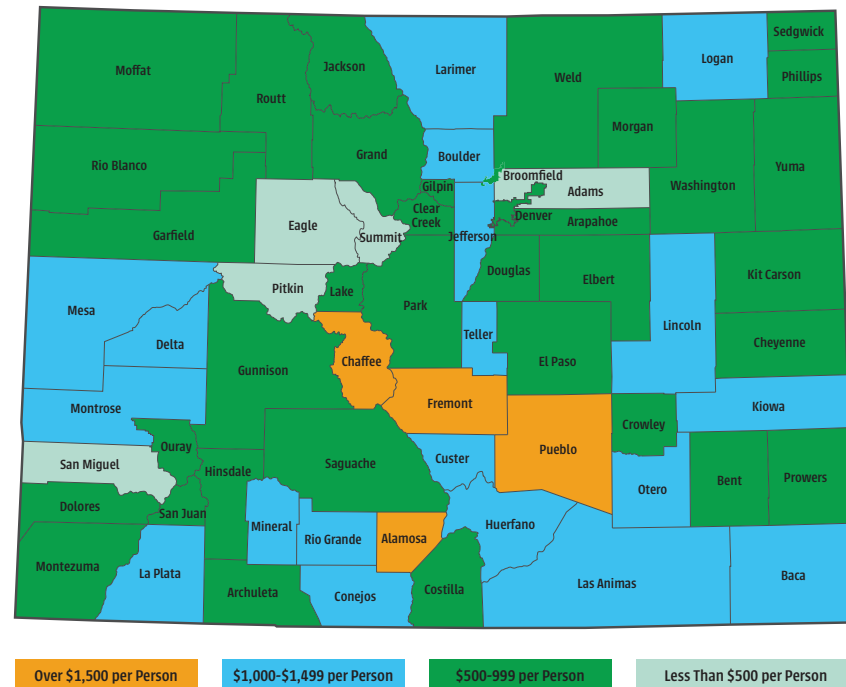
FISCAL IMPACT

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 ands 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 $360.1 million with regions ranging from $3.1 million in San Luis Valley to $181.2 million in Metro Denver.

Table D

Fiscal Impact to the State and Regions (in millions)

State/Region	Sales Tax	Property Tax	Other Tax (including Income Tax)	Total State/Local Tax Impact
State of Colorado	$120.6	$102.6	$136.9	$360.1
Metro Denver	59.7	48.6	73.0	181.2
Colorado Springs	13.6	6.9	13.1	33.5
Pueblo-Southern Mountains	7.4	6.0	7.3	20.7
San Luis Valley	1.0	1.0	1.0	3.1
Southwest Mountain	1.4	2.1	1.8	5.3
Western	6.1	6.5	6.8	19.4
Mountain	2.6	2.9	3.8	9.2
Northern	10.4	10.2	13.9	34.5
Eastern	2.0	2.6	2.5	7.1

Interestingly, the trend in fiscal impact over the past decade (since the 2009 study) finds the Metro Denver region capturing a greater share of this impact, with the Mountain, Southwest Mountain, 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 will 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 the State's economy.

Table E

Industry Sectors of the Colorado Economy (in millions)

Source: *Regional Economic Accounts, Bureau of Economic Analysis; Bureau of Census – 2017 County Business Patterns*

Sector	2018 Gross Domestic Product	Annual Payroll (2018)
Finance and Insurance	$21,935	$9,799
Health Care and Social Assistance	23,434	16,148
Government	44,220	n/a[2]
Real Estate and Rental	55,192	2,466
Retail Trade	19,124	8,445
Accommodation and Food Services	12,836	6,045
Information	20,176	8,475
Wholesale Trade	20,499	7,652
Manufacturing	25,751	7,615
Professional, Scientific, and Tech	35,591	16,594
Transportation and Warehousing	14,394	3,971
Administrative and Waste Services	11,566	12,540[3]
Utilities	4,107	987
Arts, Entertainment, and Recreation	6,254	1,932
Management of Companies	7,488	6,546
Educational Services	3,219	1,705
Construction	21,197	9,751
Agriculture, Forestry, Fishing, And Hunting	2,155	78
Mining	14,232	2,256
Other	8,379	3,780
Unknown	n/a	4
All Industry Total	$371,750	$126,786

[2] *Data from the Bureau of Census - County Business Patterns excludes most government employees.*
[3] *Includes some government administration allowing payroll to be greater than GDP.*

Table E on previous page illustrates GDP for Colorado by industry sector. The top five industries continue to account for nearly 50% of the state's GDP. The table to the right provides top five industries and includes the percent of GDP nationally for comparative purposes.

A notable downturn in the Agriculture, Forestry, Fishing, and Hunting sector occurred between 2018 and this study. Colorado is noted for attracting clean energy industries as represented by the Information and Professional, Scientific and Tech sectors being substantially greater than the national average and a less prominent manufacturing sector than the United States economy.

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

An additional 31 plus percent of the state's GDP is provided by the information, finance and insurance, wholesale trade, retail trade, construction, and transportation and warehousing sectors. The remaining industry sectors account for approximately 19% of state GDP. This distribution is illustrated in Figure 16.

Table F

Top Five Industry Sectors of the Colorado Economy

TOP FIVE INDUSTRIES	PERCENT OF GDP	
Sector	Colorado	United States
Real Estate	14.8%	13.3%
Government	11.9%	12.4%
Professional, Scientific, and Tech	9.6%	7.5%
Manufacturing	6.9%	11.3%
Health Care and Social Assistance	6.3%	7.5%

Source: *Bureau of Economic Analysis*

Figure 16

Components of the Colorado Economy
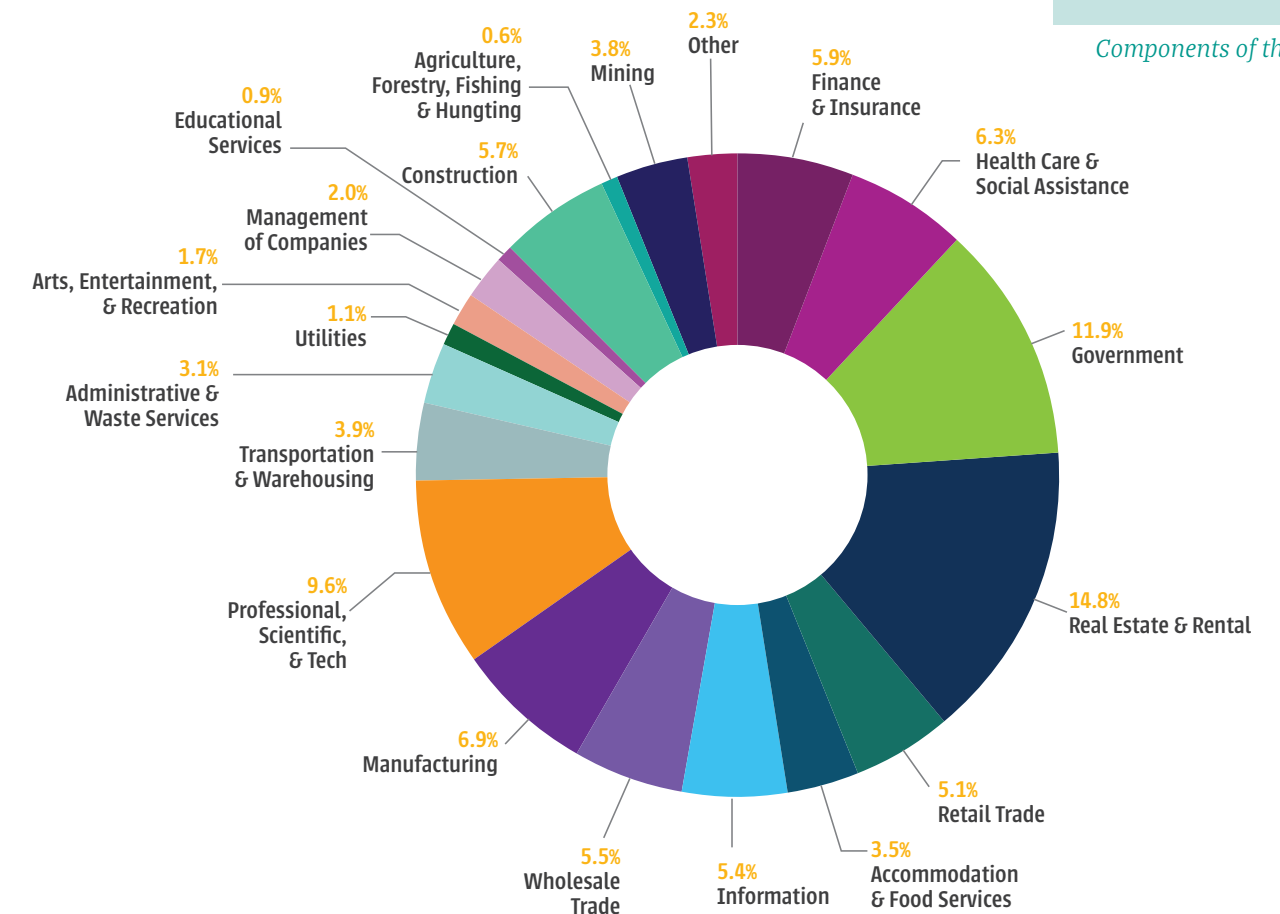
Figures 17 through 19 demonstrate the statewide impacts by industry sector. (The data used for these figures are found in Appendix C.) The economic impact by industry sector for Value-Added (i.e., state GDP) is illustrated in Figure 17 below. Although Real Estate and Rental and Leasing, Government, Professional and Business Services and Manufacturing account for approximately 43% of the 2018 state GDP, the economic impact as measured by value-added is greatest in the Finance and Insurance Services, Public Sector Government Enterprises, Health Care and Social Services, Retail Trade, and Real Estate and Rental and Leasing. In fact, only five sectors (Finance and Insurance, Public Sector Government Enterprises, Health Care and Social Assistance, Retail Trade, and Real Estate and Rental and Leasing) account for approximately 63% 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.
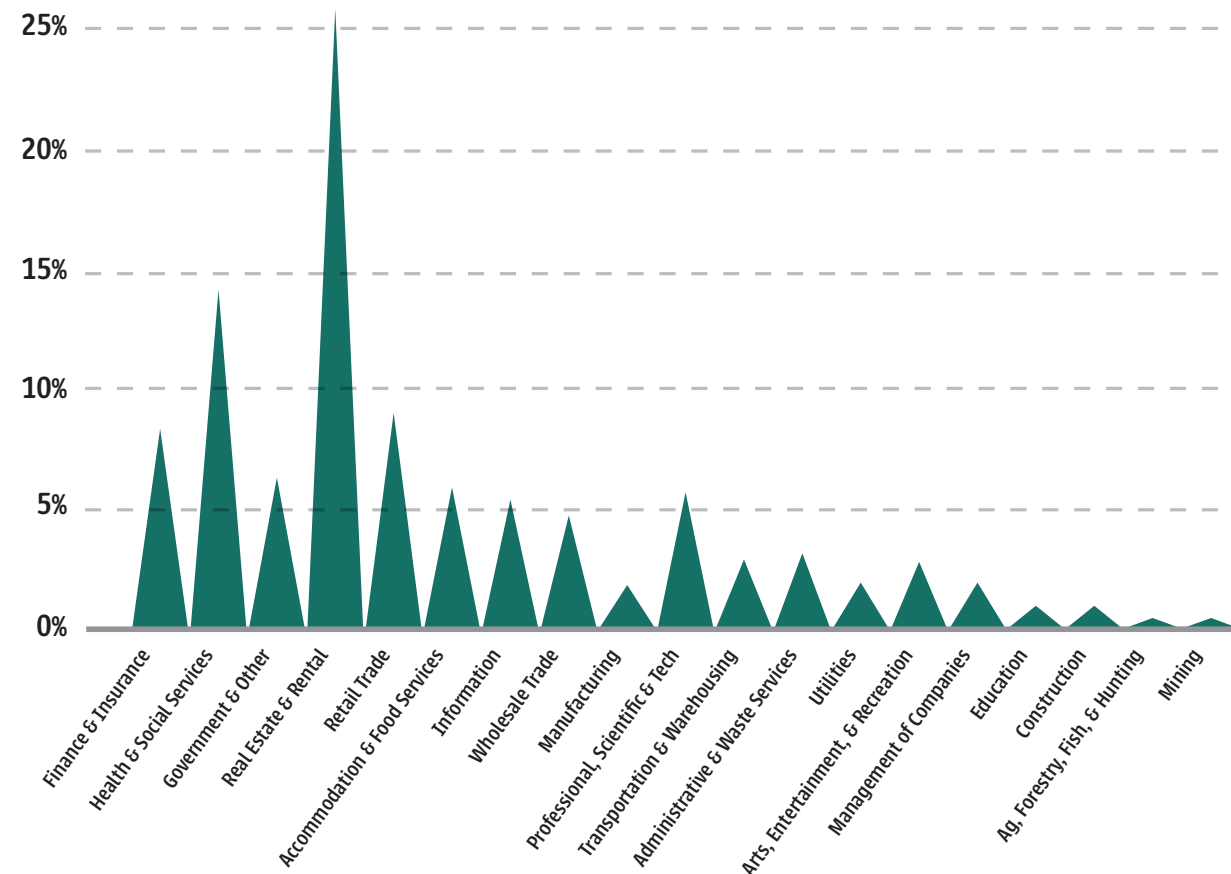
Figure 17

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 18 demonstrates the economic impact on labor income at the state level from PERA recipients highlighting that spending is heavily concentrated in Health and Social Services (23%), with Retail Trade and Finance and Insurance generating an additional 20% 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.
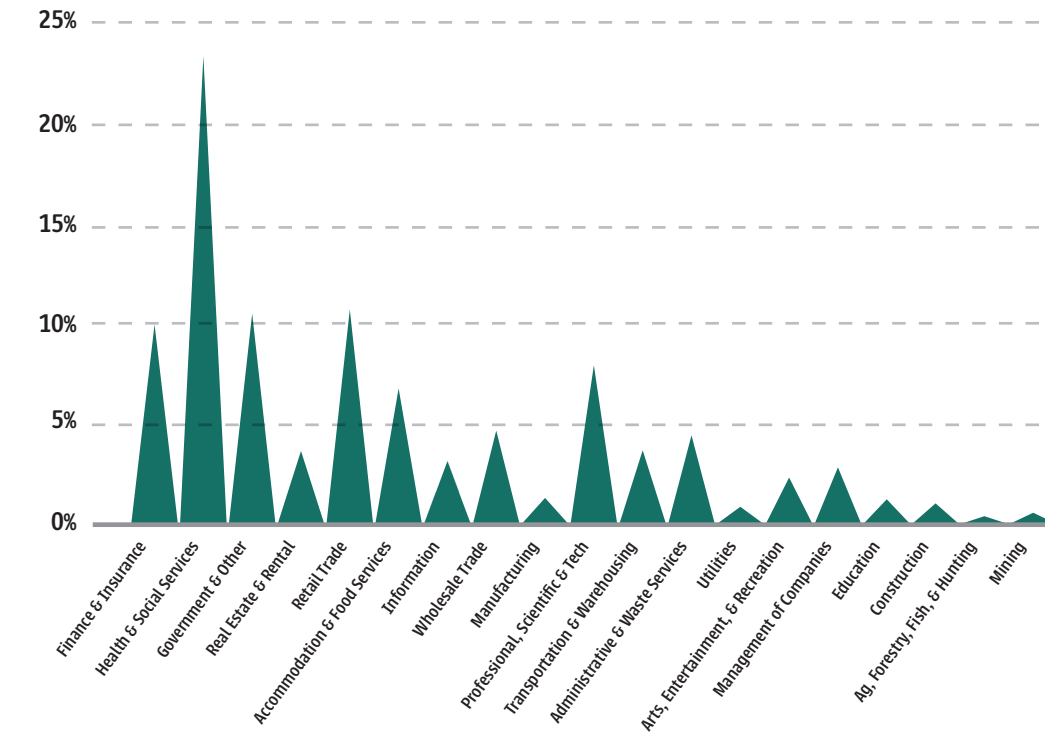
Figure 18

Labor Income by Industry Sector for the State of Colorado

Figure 19 identifies the employment impact by sector and shows that three sectors, Health and Social Services, Retail Trade, and Accommodation and Food Services account for more than 47% of total employment impacts, a slight decrease from 2018. This is consistent with their importance to the value-added. Together, Government and Other Services and Finance and Insurance account for an additional 18% of employment impacts.
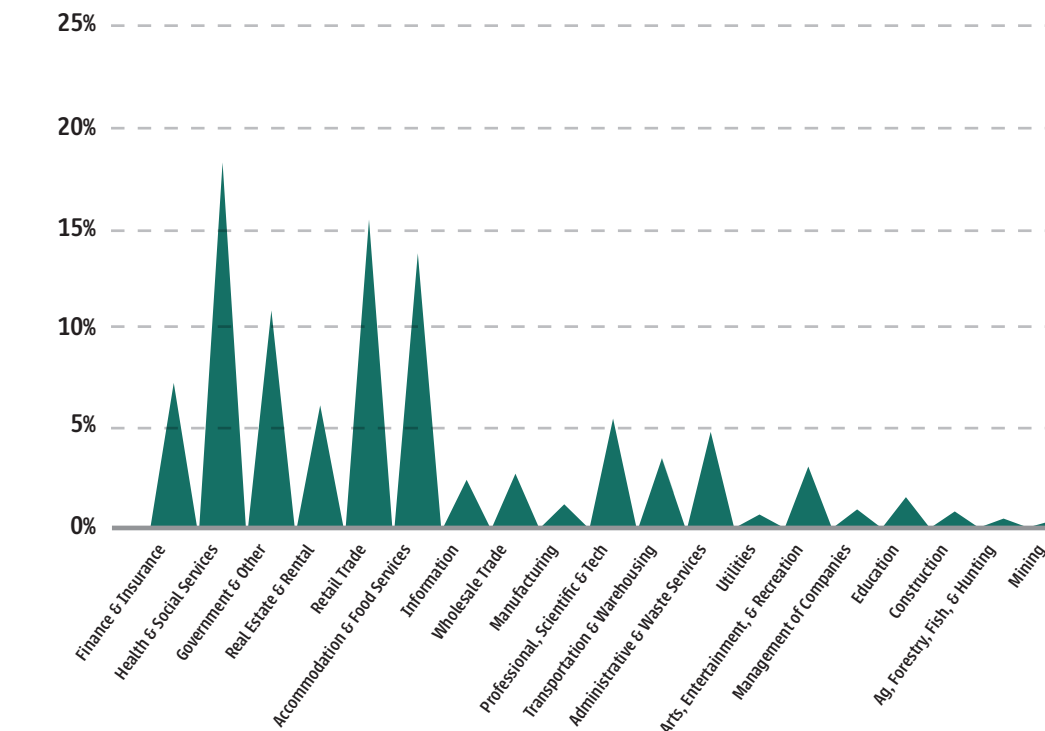
Figure 19

Employment by Industry Sector for the State of Colorado

ABOUT THE RESEARCHERS

Pacey Economics, Inc., located in Boulder, Colorado, has over 25 years of providing consulting services and analyses on an array of economic and public policy issues. We are a small boutique firm, focused on providing economic analyses for state agencies and private or publicly held companies plus offering economic reports or opinions and expert witness testimony in legal matters. Over the past decade, Pacey Economics, Inc. has been awarded many state government contracts through a number of different agencies to forecast, analyze, and evaluate programs and legislative changes. Most recently, Pacey Economics, Inc. was awarded a year-long contract with Corporation for Public Broadcasting (CPB) to analyze and evaluate components critical to their community service grants (CSG) and was recently renewed to provide additional analyses. The staff contributing to this report are described below.

Patricia L. Pacey, PhD
Dr. Pacey is President of Pacey Economics, Inc. and Principal Investigator on the PERA project. She received her PhD in economics and BA in mathematics from the University of Florida and held positions with the Congressional Budget Office and the University of Colorado before forming her own firm, Pacey Economics, Inc.

Jeffrey E. Nehls, MA
Mr. Nehls has been with Pacey Economics, Inc. since 2009. 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.

Anna C.V. Flores, MS, MA
Ms. Flores began working at Pacey Economics, Inc. as an analyst in 2015 shortly after she received her bachelor's degrees in economics and political science from University of Colorado Boulder. She has since completed her master's degrees in economics and finance in December 2018. She was a key contributor to the impact analysis.

Hannah J. Suarez, BA
Ms. Suarez commenced working at Pacey Economics, Inc. as an analyst in May 2018 after she received her bachelor's degree in quantitative economics from the University of Colorado Boulder. She began her master's degree program in data analytics in September 2019 with an anticipated completion in November 2021.

APPENDICIES

APPENDIX A—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—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 2020 DOLLARS) (IN THOUSANDS)	PERA RETIREMENT DISTRIBUTIONS AS PERCENTAGE OF PAYROLL
Custer	Pueblo-Southern	$ 6,529	$18,096	36.08%
Costilla	San Luis Valley	3,355	10,021	33.48%
Conejos	San Luis Valley	9,046	28,774	31.44%
Fremont	Pueblo-Southern	71,343	288,781	24.70%
Washington	Eastern	4,414	21,109	20.91%
Park	Mountain	11,426	55,953	20.42%
Huerfano	Pueblo-Southern	7,111	39,850	17.84%
Baca	Eastern	3,371	19,141	17.61%
Crowley	Eastern	3,429	20,413	16.80%
Bent	Eastern	3,523	21,339	16.51%
Elbert	Eastern	18,773	114,681	16.37%
Kiowa	Eastern	1,469	9,238	15.90%
Las Animas	Pueblo-Southern	16,171	105,455	15.33%
Otero	Eastern	20,506	150,990	13.58%
Sedgwick	Eastern	2,109	15,618	13.51%
Rio Grande	San Luis Valley	11,804	96,332	12.25%
Hinsdale	Western	638	5,298	12.04%
Dolores	Southwest Mountain	1,474	12,298	11.99%
Logan	Eastern	23,268	196,634	11.83%
Chaffee	Mountain	28,737	243,007	11.83%
Delta	Western	27,932	239,362	11.67%
Lincoln	Eastern	5,960	52,525	11.35%
Lake	Mountain	4,615	40,697	11.34%
Pueblo	Pueblo-Southern	244,531	2,173,303	11.25%
Saguache	San Luis Valley	3,383	31,523	10.73%
Prowers	Eastern	10,172	95,868	10.61%
Teller	Mountain	23,011	233,438	9.86%
Mineral	San Luis Valley	860	8,792	9.78%
Alamosa	San Luis Valley	20,313	211,528	9.60%
Jackson	Mountain	1,230	12,846	9.58%
Ouray	Western	4,045	48,415	8.36%
Clear Creek	Mountain	8,537	104,142	8.20%
Phillips	Eastern	3,540	45,445	7.79%
Kit Carson	Eastern	5,716	74,208	7.70%
Montrose	Western	36,027	513,995	7.01%
Montezuma	Southwest Mountain	18,842	297,551	6.33%
Yuma	Eastern	6,305	107,559	5.86%
Jefferson	Metro Denver	573,961	10,264,619	5.59%
Archuleta	Southwest Mountain	6,076	108,927	5.58%
Mesa	Western	136,629	2,458,002	5.56%
Gunnison	Western	13,041	235,256	5.54%
Cheyenne	Eastern	1,547	28,836	5.37%
San Juan	Southwest Mountain	386	7,536	5.13%
Morgan	Eastern	21,707	427,467	5.08%
Rio Blanco	Western	5,555	111,386	4.99%
Larimer	Northern	311,608	6,385,293	4.88%
Moffat	Western	8,015	174,927	4.58%
Weld	Northern	206,024	4,718,508	4.37%
La Plata	Southwest Mountain	43,933	1,072,845	4.09%
Grand	Mountain	11,499	289,659	3.97%
El Paso	Colorado Springs	488,947	12,456,785	3.93%
Garfield	Western	32,512	1,031,178	3.15%
Routt	Mountain	15,901	559,540	2.84%
Boulder	Metro Denver	283,918	10,266,836	2.77%
Douglas	Metro Denver	191,431	7,372,556	2.60%
Adams	Metro Denver	216,153	9,391,325	2.30%
Arapahoe	Metro Denver	406,549	19,626,621	2.07%
Gilpin	Mountain	3,953	203,309	1.94%
San Miguel	Western	3,127	189,854	1.65%
Summit	Mountain	11,330	758,909	1.49%
Broomfield	Metro Denver	49,797	3,365,554	1.48%
Denver	Metro Denver	375,160	31,110,701	1.21%
Eagle	Mountain	16,635	1,472,604	1.13%
Pitkin	Mountain	4,969	765,740	0.65%

APPENDIX B—ECONOMIC AND FISCAL IMPACTS BY COUNTY[4]

(actual dollars)

COUNTY	REGION	LABOR INCOME	VALUE-ADDED	INDIRECT EFFECT	INDUCED EFFECT
Adams	Metro Denver	$39,522,557	$77,700,032	$15,537,181	$15,267,940
Alamosa	San Luis Valley	5,062,412	9,437,565	3,197,431	2,432,959
Arapahoe	Metro Denver	131,489,980	247,404,138	83,520,475	69,892,712
Archuleta	Southwest Mountain	888,835	2,227,677	741,445	412,284
Baca	Eastern	204,262	585,497	203,630	57,181
Bent	Eastern	178,274	573,823	120,105	42,230
Boulder	Metro Denver	84,338,159	160,020,851	55,527,984	42,052,785
Broomfield	Metro Denver	11,091,604	23,121,857	7,790,481	4,259,490
Chaffee	Mountain	4,760,609	10,158,399	3,366,239	2,179,028
Cheyenne	Eastern	80,243	247,507	75,008	16,270
Clear Creek	Mountain	797,306	1,948,994	412,725	233,328
Conejos	San Luis Valley	818,623	1,867,760	450,574	254,537
Costilla	San Luis Valley	189,629	508,448	122,330	44,691
Crowley	Eastern	231,211	593,529	69,590	43,214
Custer	Pueblo-Southern	401,385	1,192,271	461,323	115,790
Delta	Western	3,596,256	7,534,966	3,100,306	1,312,490
Denver	Metro Denver	150,908,696	273,744,502	110,194,910	64,337,868
Dolores	Southwest Mountain	73,325	217,255	68,352	17,934
Douglas	Metro Denver	41,457,605	80,624,559	25,630,737	18,009,228
Eagle	Mountain	5,039,533	9,411,152	2,701,542	2,326,289
El Paso	Colorado Springs	129,744,044	251,537,948	87,213,221	74,330,743
Elbert	Eastern	943,512	2,978,781	762,481	232,842
Fremont	Pueblo-Southern	11,417,063	22,090,593	6,514,916	4,867,094
Garfield	Western	6,757,033	13,192,128	4,002,964	2,771,556
Gilpin	Mountain	249,028	771,314	115,671	54,407
Grand	Mountain	1,597,847	4,096,545	1,311,433	699,663
Gunnison	Western	2,153,010	4,676,132	1,908,998	1,003,570
Hinsdale	Western	46,634	122,771	49,159	13,592
Huerfano	Pueblo-Southern	704,384	1,695,686	508,734	246,837
Jackson	Mountain	84,072	214,791	42,308	20,979
Jefferson	Metro Denver	138,111,769	257,554,248	76,873,972	65,085,073
Kiowa	Eastern	88,577	232,648	53,793	16,524
Kit Carson	Eastern	742,787	1,760,305	567,141	286,524
La Plata	Southwest Mountain	12,676,980	23,602,451	9,381,752	7,479,291
Lake	Mountain	603,786	1,252,268	276,743	224,487
Larimer	Northern	80,571,689	155,684,402	62,304,363	45,800,835
Las Animas	Pueblo-Southern	2,797,798	5,199,870	1,401,080	1,103,412
Lincoln	Eastern	685,875	1,899,114	500,486	209,134
Logan	Eastern	4,818,881	8,509,506	2,383,794	1,882,531
Mesa	Western	39,921,619	71,329,720	27,174,056	24,335,896
Mineral	San Luis Valley	62,555	169,847	46,903	14,120
Moffat	Western	1,355,873	2,601,785	746,133	608,627
Montezuma	Southwest Mountain	3,808,566	7,328,436	2,557,005	1,884,975
Montrose	Western	7,837,544	15,161,478	6,317,171	4,186,640
Morgan	Eastern	3,585,883	6,955,678	1,929,981	1,373,761
Otero	Eastern	3,611,384	7,060,015	1,977,823	1,482,297
Ouray	Western	545,871	1,174,903	471,204	200,768
Park	Mountain	747,114	2,131,436	719,752	214,291
Phillips	Eastern	414,362	880,658	233,567	115,489
Pitkin	Mountain	963,473	2,079,641	649,393	209,120
Prowers	Eastern	1,524,482	3,259,974	1,176,699	572,159
Pueblo	Pueblo-Southern	58,772,210	104,017,125	27,398,206	29,795,181
Rio Blanco	Western	413,219	1,214,687	304,742	111,090
Rio Grande	San Luis Valley	1,783,307	3,766,879	1,249,800	609,920
Routt	Mountain	3,373,739	6,847,639	2,446,579	1,359,452
Saguache	San Luis Valley	205,831	690,203	140,769	58,766
San Juan	Southwest Mountain	39,702	93,760	33,692	14,141
San Miguel	Western	516,147	1,074,985	341,250	157,789
Sedgwick	Eastern	147,547	379,478	127,416	34,988
Summit	Mountain	2,594,368	5,369,476	1,528,906	1,160,120
Teller	Mountain	2,767,475	6,433,591	2,221,402	1,092,209
Washington	Eastern	283,381	744,408	196,575	75,815
Weld	Northern	34,582,661	67,648,107	17,033,643	13,353,620
Yuma	Eastern	913,014	1,779,958	626,688	233,623

[4] 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[4] (CONTINUED)

(actual dollars)

COUNTY	REGION	SALES TAX	PROPERTY TAX	OTHER TAXES (INCLUDING INCOME TAX)	TOTAL STATE AND LOCAL TAX
Adams	Metro Denver	$3,948,040	$3,364,977	$5,235,290	$12,548,307
Alamosa	San Luis Valley	622,590	336,973	421,316	1,380,879
Arapahoe	Metro Denver	8,690,662	8,127,375	12,296,301	29,114,338
Archuleta	Southwest Mountain	125,495	125,167	121,869	372,531
Baca	Eastern	24,717	62,953	43,761	131,431
Bent	Eastern	24,400	44,943	46,971	116,314
Boulder	Metro Denver	6,051,451	6,459,756	8,129,738	20,640,945
Broomfield	Metro Denver	1,121,229	393,495	1,601,616	3,116,340
Chaffee	Mountain	686,578	438,123	642,718	1,767,419
Cheyenne	Eastern	9,895	25,263	22,915	58,073
Clear Creek	Mountain	43,853	184,443	180,667	408,963
Conejos	San Luis Valley	130,822	89,953	141,034	361,809
Costilla	San Luis Valley	11,313	56,216	45,146	112,675
Crowley	Eastern	25,259	31,315	45,575	102,149
Custer	Pueblo-Southern	67,850	84,087	129,602	281,539
Delta	Western	494,958	341,093	541,910	1,377,961
Denver	Metro Denver	9,979,930	5,514,569	12,268,684	27,763,183
Dolores	Southwest Mountain	317	38,782	17,503	56,602
Douglas	Metro Denver	3,439,395	3,490,128	5,238,185	12,167,708
Eagle	Mountain	340,907	361,417	547,687	1,250,011
El Paso	Colorado Springs	13,565,727	6,904,743	13,076,349	33,546,819
Elbert	Eastern	150,796	220,194	395,392	766,382
Fremont	Pueblo-Southern	1,500,105	943,395	1,311,077	3,754,577
Garfield	Western	464,974	836,258	818,784	2,120,016
Gilpin	Mountain	34,793	21,160	104,386	160,339
Grand	Mountain	166,389	269,248	253,722	689,359
Gunnison	Western	241,008	285,380	314,788	841,176
Hinsdale	Western	6,198	10,710	15,040	31,948
Huerfano	Pueblo-Southern	73,176	124,180	112,761	310,117
Jackson	Mountain	12,258	16,762	18,676	47,696
Jefferson	Metro Denver	10,860,557	10,775,006	16,178,025	37,813,588
Kiowa	Eastern	7,819	27,954	19,654	55,427
Kit Carson	Eastern	74,943	135,841	88,747	299,531
La Plata	Southwest Mountain	1,180,044	922,948	1,201,061	3,304,053
Lake	Mountain	14,879	131,659	91,753	238,291
Larimer	Northern	8,184,736	6,018,060	8,752,677	22,955,473
Las Animas	Pueblo-Southern	252,661	256,017	304,428	813,106
Lincoln	Eastern	100,946	124,956	94,794	320,696
Logan	Eastern	481,256	350,233	456,973	1,288,462
Mesa	Western	3,897,542	2,545,769	3,606,204	10,049,515
Mineral	San Luis Valley	11,367	12,490	15,426	39,283
Moffat	Western	109,682	190,129	149,217	449,028
Montezuma	Southwest Mountain	344,070	378,068	407,321	1,129,459
Montrose	Western	1,056,598	608,008	752,689	2,417,295
Morgan	Eastern	279,510	449,266	396,703	1,125,479
Otero	Eastern	422,128	259,590	377,369	1,059,087
Ouray	Western	61,027	82,276	83,649	226,952
Park	Mountain	70,425	188,668	231,283	490,376
Phillips	Eastern	39,536	65,541	56,067	161,144
Pitkin	Mountain	92,212	79,454	122,240	293,906
Prowers	Eastern	260,397	134,087	174,727	569,211
Pueblo	Pueblo-Southern	5,354,914	4,309,411	5,313,706	14,978,031
Rio Blanco	Western	28,435	142,526	121,145	292,106
Rio Grande	San Luis Valley	168,178	244,301	229,551	642,030
Routt	Mountain	334,993	281,947	433,846	1,050,786
Saguache	San Luis Valley	21,873	46,812	49,430	118,115
San Juan	Southwest Mountain	5,494	6,617	7,438	19,549
San Miguel	Western	39,876	60,902	75,269	176,047
Sedgwick	Eastern	11,723	35,257	31,223	78,203
Summit	Mountain	263,260	218,315	323,396	804,971
Teller	Mountain	409,321	370,374	504,160	1,283,855
Washington	Eastern	30,231	68,431	61,135	159,797
Weld	Northern	2,702,251	3,955,740	5,050,106	11,708,097
Yuma	Eastern	77,792	155,630	102,668	336,090

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

(dollars in millions, except for employment)

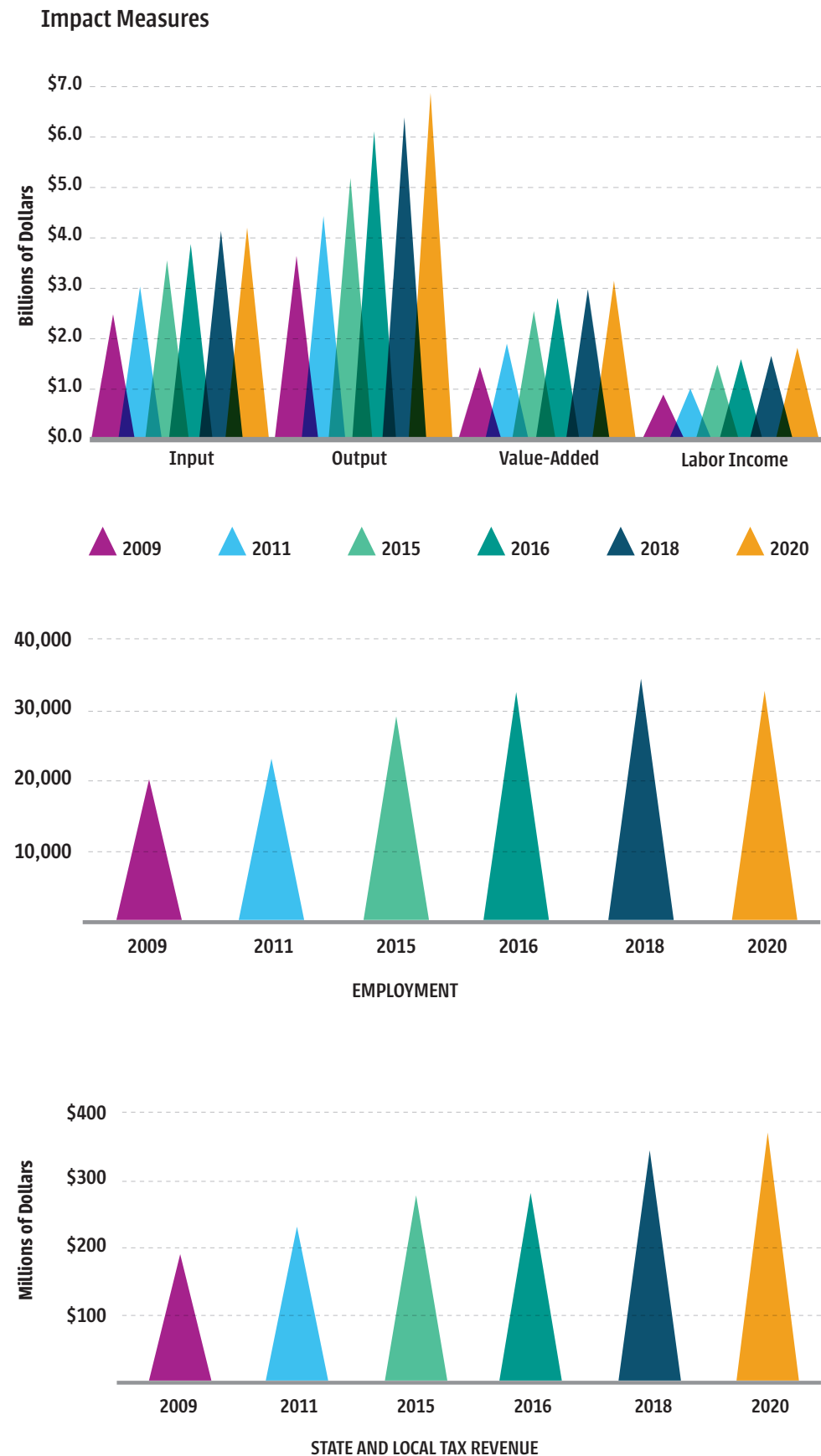| SECTOR	VALUE-ADDED	LABOR INCOME	EMPLOYMENT
Finance and Insurance	$258.6	$170.7	2,423
Health and Social Services	449.1	400.6	6,043
Government and Other	195.8	175.1	3,581
Real Estate and Rental	792.5	65.3	2,014
Retail Trade	281.2	176.2	5,060
Accommodation and Food Services	184.5	120.6	4,488
Information	168.3	52.5	746
Wholesale Trade	150.8	78.8	820
Manufacturing	54.9	25.7	431
Professional, Scientific, and Tech	171.0	137.5	1,745
Transportation and Warehousing	88.4	65.2	1,166
Administrative and Waste Services	94.5	77.2	1,608
Utilities	55.6	17.4	144
Arts, Entertainment, and Recreation	81.2	43.3	1,080
Management of Companies	55.3	49.3	362
Education	23.2	20.6	541
Construction	25.1	17.2	260
Ag, Forestry, Fish, and Hunting	8.7	7.1	208
Mining	10.5	7.9	52

[4] 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 D—STATEWIDE COMPARISIONS TO PREVIOUS STUDIES

Impact Measures

EMPLOYMENT

STATE AND LOCAL TAX REVENUE

APPENDIX E—ECONOMIC AND FISCAL IMPACT ANALYSIS DETAILED METHODOLOGY

PERA retirement distribution information as of January 2020 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. Version 3.1 of IMPLAN, used in this study and the 2018 study, utilizes a trade flow methodology believed to be superior to the econometric implementation. Version 3.0 of IMPLAN was used for all studies conducted between 2011 and 2016. A detailed explanation of this new model can be found online.

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 (2018 American Community Survey conducted by U.S. Census Bureau).

APPENDIX E—ECONOMIC AND FISCAL IMPACT ANALYSIS DETAILED METHODOLOGY

The household expenditure pattern of the income range $30,000–40,000 was used for the Eastern, Pueblo-Southern Mountains, 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 Northern regions and the State of Colorado. For the Metro Denver, Colorado Springs, and Mountain 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 $27,700 and $49,400 with Elbert County as the outlier with a median income of $66,800. The household expenditure pattern of the income range $39,000–$74,700 was used for counties in the Metro Denver, Colorado Springs, and Mountain regions. The household expenditure pattern of the income range $26,600–$39,600 was used for counties in the San Luis Valley region, with the outlier of Mineral County at an average income of 63,100. For counties in the Northern region, the $47,700–$51,800 household spending pattern was used. A range of $30,500–$60,200 was used for counties in the Southwest Mountain and Western districts for the household expenditure pattern.

The actual expenditure pattern of the PERA households may differ somewhat from the IMPLAN average as approximately 97% 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 2016 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 5.4% for federal taxes. For the household income $40,000–$50,000, the rate is 6.9% 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 in 2020 dollars while IMPLAN's data is in 2018 dollars. IMPLAN incorporates the producer price index (PPI) to adjust 2018 dollars to 2020 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 of note, an economic impact study can never capture the exact benefit as economies are always in a state of flux.