One step further on PERA reform

How to build on proposals from Colorado PERA and Governor Hickenlooper to eliminate unfunded liabilities and reduce burdens on state, local and school budgets

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About the REMI Partnership

A partnership of public and private organizations announced in July 2013 the formation of a collaboration to provide Colorado lawmakers, policy makers, business leaders, and citizens, with greater insight into the economic impact of public policy decisions that face the state and surrounding regions. The current partners include the Common Sense Policy Roundtable, the Colorado Association of REALTORS®, Colorado Concern, Colorado Bankers Association and the Denver South Economic Development Partnership. The partnership meets monthly to discuss pressing economic issues impacting the state and to prioritize and manage its independent research efforts.

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Executive summary

For the fourth time in less than 20 years, Colorado's public pension system has reached a major inflection point. The long-term fiscal health of the state is on the line, and the situation cries out for determined, pragmatic and far-sighted leadership from our elected leaders. The threat is serious: Failure to control retirement costs has dragged down states like Illinois, where pensions consume one quarter of the budget, and bankrupted giants of U.S. industry like General Motors.

Currently, the Colorado Public Employees' Retirement Association (PERA) has an estimated $32 billion unfunded liability. The problem is a massive imbalance between the generous benefits offered by PERA and what state agencies, local governments and school districts can afford.

The PERA Board and Colorado Governor John Hickenlooper have recognized the urgency of the situation and have put major reform proposals on the table, urging action this year. Both the Governor and PERA deserve credit for their forward-leaning posture. But the Hickenlooper Administration has gone further, acknowledging a largely overlooked issue in the PERA debate: The escalating impact of taxpayer-funded employer contributions on state agencies, local governments and school districts, and how rising pension costs are crowding out other budget demands.

Last year, those taxpayer-funded state, local and school district employer contributions to PERA likely exceeded $1.6 billion, a number that has almost doubled over the past 10 years. This budget dilemma is not unique to Colorado. Eight years ago, a top official under New York Mayor Michael Bloomberg stated the problem in the following way:

> *"We've seen how General Motors became a pension fund that also made cars. Unless we make real changes, New York City's government is in danger of becoming a pension fund that occasionally delivers city services to the people who live here."*

No one wants to see Colorado become a giant pension fund that occasionally provides basic services to the people of our state, of course. But if we refuse to acknowledge the growing burden of pension costs on state agencies, local governments and school districts, and if we fail to explore the alternatives, that is the direction our state will be headed.

As a state, we must change course while we still can. Pension costs should not be allowed to crowd out funding for essential public services, including road maintenance and construction, new and expanded schools, police and fire departments, and more. We must put PERA on a sound financial footing, but not at the expense of other essential budget priorities in Colorado. This is common sense.

To foster a comprehensive and productive debate over public pension reforms in Colorado, the REMI Partnership has closely examined the PERA and Hickenlooper Administration reform proposals. Using these proposals as a foundation, we built a series of new scenarios that tackle the long-term solvency challenges of PERA while providing real savings for state agencies, local governments, school districts and, ultimately, Colorado taxpayers.

Developing and testing new reform scenarios is not intended to express support or opposition in relation to the proposals already offered by the PERA Board and Hickenlooper Administration. Rather, we seek to promote a thorough debate by informing the public and policymakers about a wider range of options and tradeoffs they can consider.

The table below outlines the major elements of the existing reform proposals, followed by a series of new "Hickenlooper Plus" scenarios developed for this report that build on the Governor's response to the PERA Board's proposal:

Major Elements of PERA Board, Hickenlooper and 'Hickenlooper Plus' Reform Scenarios

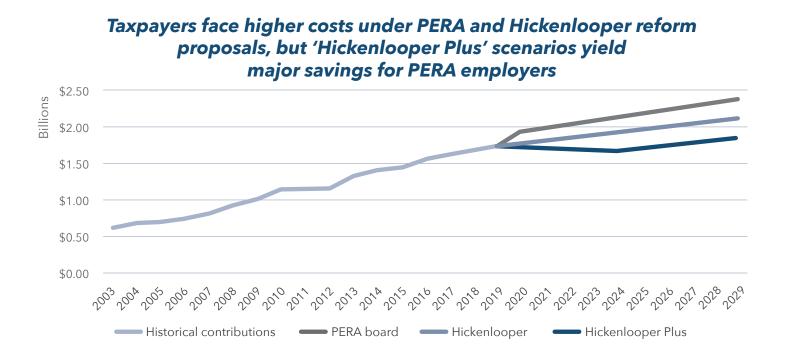| Scenario	Retirement Age for New Hires	Highest Average Salary	Annual Increase Suspension	New Annual Increase	Employee Contribution	Taxpayer Contribution	Assumed Rate of Return
PERA Board	65 (except state troopers)	5-year HAS	2 years	1.5%	+3% (existing) +2% (new)	+2%	7.25%
Hickenlooper	65 (except state troopers)	5-year HAS	2 years	1.25%	+2% (existing) +2% (new)	No change	7.25%
Hickenlooper Plus 1	65 (except state troopers)	5-year HAS	2 years	0.5%	+2% (existing) +2% (new)	-0.5% per year over 5 years	7%
Hickenlooper Plus 2	65 (except state troopers)	5-year HAS	5 years	0.5%	+2% (existing) +2% (new)	-0.5% per year over 5 years	6.8%
Hickenlooper Plus 3	65 (except state troopers)	7-year HAS	2 years	0.5%	+3% (existing) +2% (new)	-0.5% per year over 5 years	6.8%
Hickenlooper Plus 4	65 (except state troopers)	5-year HAS	2 years	0%	+2% (existing) +2% (new)	-0.5% per year over 5 years	6.5%

To develop the Hickenlooper Plus scenarios, we were granted permission to view PERA's forecasting tools, but our analysis was carried out independently of PERA. In developing these additional scenarios, we began with the following core objectives:

- Eliminate the $32 billion unfunded liability in Colorado's public pension system.

- Restructure PERA benefits to reflect economic realities, including a retirement age consistent with the federal Social Security program and other state-level defined benefit programs, base benefits that are more representative of a retiree's salary history in the workforce, and lower automatic annual increases in benefit payments.

- Use a lower assumed rate of return for PERA's investments, reflecting separate research that suggests we should prepare for lower rates of return over the long-term.

- Reduce the burden of PERA employer contributions on the state budget, local governments and school districts, by using a whole-of-government approach that recognizes other worthy budget priorities instead of viewing PERA's unfunded liability in a vacuum.

The Hickenlooper Plus scenarios were created to reach these objectives via multiple pathways, using different combinations of the Highest Average Salary (HAS) calculation, Annual Increase, employee contribution rates and the assumed rate of return.

After testing the Hickenlooper Plus scenarios, we observed large cost reductions from just a few adjustments to the reform proposals developed by PERA and the Hickenlooper Administration. These focused and strategic alternatives produce major savings, which could be put towards other pressing needs at all levels of government across the state, including schools, roads and public safety.

Taxpayers face higher costs under PERA and Hickenlooper reform proposals, but 'Hickenlooper Plus' scenarios yield major savings for PERA employers

Legend: Historical contributions — PERA board — Hickenlooper — Hickenlooper Plus

Potential Savings Available to PERA Employers From 'Hickenlooper Plus' Scenarios
(millions of dollars)

	2020	2024	2028	2029	5-year sum	10-year total
Hickenlooper Plus savings Against PERA Board Plan	$220.31	$439.77	$480.10	$490.75	$1,638.94	$3,988.49
Hickenlooper Plus savings Against Governor Plan and Current Baseline	$45.63	$249.07	$271.91	$277.94	$725.93	$2,056.63

Note: Cost estimates using a 5-year weighted average of 2.2% for the 10-year increase in total compensation across all divisions. If using the PERA assumption of 4% annual increase in compensation, then our cumulative savings estimates would increase by over 20%.

In its first year, the Hickenlooper Plus scenarios would reduce the cost to taxpayers, the general fund and school districts by more than a combined $220 million compared to the PERA Board's proposal, and $45.6 million when compared to the Hickenlooper Administration's plan. Over 10 years, the cumulative savings to taxpayers, state agencies, local governments and school districts would be almost $4 billion when compared to the PERA Board's proposal, and over $2 billion when compared to the plan offered by the Hickenlooper Administration.

Based on our own analysis, we anticipate the Hickenlooper Plus scenarios will erase the state pension system's $32 billion unfunded liability on a similar amortization timetable, within 30 years, as the PERA Board and Hickenlooper reform proposals. At the same time, we would urge lawmakers and other stakeholders to request from PERA more detailed forecasts on these scenarios and other alternatives to understand the exact amortization timeframe and to better inform the pension reform debate this year.

Past reforms have increased pension costs for taxpayers

Colorado is far from alone in grappling with the escalating cost of public pensions, of course. The debate, iterative and seemingly unending, continues to play out in statehouses across the country.

In Colorado, major reforms passed by the state legislature in 2004, 2006 and 2010 reduced benefits and provided multiple new taxpayer-funded revenue streams to bolster the finances of the PERA. But these reforms, while made in good faith, were overwhelmed by more powerful demographic and economic trends. Retirees are living longer, and the investment community is bracing for lower long-term returns, forcing policymakers to once again revisit old assumptions about Colorado's retirement system for state, local and school district employees.

Starting in the mid-2000s, taxpayer-funded state, local and school district contributions to PERA started a dramatic climb. Today, the taxpayer contribution from state, local and school district budgets into PERA is just over 20 percent of salary for most active public employees, much higher than private sector workers typically see, with 19.13 percent going towards retirement benefits and 1.02 percent going to PERA's Health Care Trust Fund. The increase came in the form of two new taxpayer-funded contributions, on top of the preexisting statutory employer contribution rate of 10.15 percent for most public employees. These extra

taxpayer-funded contributions, known as the Amortization Equalization Disbursement (AED) and Supplemental Amortization Equalization Disbursement (SAED), were created to pay off PERA's unfunded liability.

In the years since the AED and SAED were introduced, PERA's unfunded liability has gotten worse, not better, and state, local, and school district budgets are now saddled with the costs of higher taxpayer contribution rates. In 2016, the contributions to the AED and SAED alone totaled $720 million. With the full increase in the AED and SAED, going forward this annual figure will likely exceed $800 million.

It must be noted that the AED and SAED contributions were approved by the state legislature with a good motive, i.e. closing the gap between the cost of benefits and PERA's ability to continue to pay those benefits. But as we know today, when taxpayer-funded state, local and school district contributions to PERA climbed, the cost of benefits grew even faster, creating today's $32 billion unfunded liability.

More than a decade of escalating employer contributions to PERA have put a significant strain on state, local and school district budgets and crowded out other major priorities. For example:

- $720 million per year could support roughly $8 billion in bonds for transportation infrastructure projects, erasing most of the state's $9 billion backlog for road, bridge and transit investments.

- The same amount could pay for a 10-fold increase in state support for school construction projects, through the Building Excellent Schools Today program.

- With an extra $720 million a year, state agencies, local governments and school districts could give every public employee in the PERA program a raise of almost $3,500.
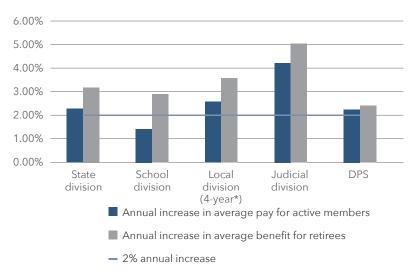
On the issue of pay raises, the budget squeeze created by escalating PERA costs has been tough on teachers, state agency workers and other public employees. Under state law, money slated for pay raises has been redirected to fund the increase in PERA contributions from taxpayers. As a result, active public employees have lost as much as 5.5 percent of total pay, according to recent comments from PERA officials to the state legislature.

Retirement pay is growing faster than member pay

The restrictions on pay increases for active PERA members, when combined with escalating benefit costs, have produced a strange outcome. Average pay for active PERA members has increased at 2.2 percent per year over the past five years, while average benefit payments for PERA retirees have increased 2.98 percent per year. In the School Division, the average increase in annual pay is lower than the 2 percent Annual Increase paid to most PERA retirees each year.

Therefore, retired public employees are receiving larger raises, in the form of Annual Increase payments, than many public employees who are still working and contributing a percentage of their salaries into the PERA system.

Past 5-year average annual increase

- Annual increase in average pay for active members
- Annual increase in average benefit for retirees
- 2% annual increase

PERA investments grow – but below the assumed rate or return

To make matters even more challenging, PERA's investment returns have on average come in below the assumed rate of return. From 2001 to 2016, a period that included two major recessions, the average rate of return has been 6.14 percent per year, compared to the 8 percent or higher target in place for most of that timeframe. In late 2016, PERA lowered its assumed rate of return to 7.25 percent.

The problem is not PERA's investment strategy. Instead, there is significant research suggesting the environment for long-term investing is growing tougher. For example, the McKinsey Global Institute published a study in 2016 predicting an end to the "golden era" of investment and warning of significantly lower returns in the decades to come. The experience and expectations of many investors are derived from the period of 1985 to 2014, when "an extraordinarily beneficial confluence of economic and business factors" helped boost returns, according to McKinsey. But many of those factors, including sharp declines in inflation and interest rates, strong global GDP growth, and higher corporate profits from investments in emerging markets, appear to have "run their course."

Lower than expected investment returns, together with longer average life expectancies for retirees, are making it harder for PERA to cover the rising cost of past service from public employees in Colorado. This reality has prompted the current debate over what will be the fourth round of public pension reforms since 2000.

PERA and Governor Hickenlooper open the debate with similar proposals

Both the PERA Board of Trustees and the administration of Gov. John Hickenlooper have stepped forward to propose a series of public pension reforms. There is a great deal of overlap between these proposals on issues such as raising the retirement age, reducing the rising cost of Annual Increase payments, and recalibrating the calculation of base benefits by using a percentage of an employee's five-year Highest Average Salary (HAS) instead of a three-year HAS. Both proposals continue with PERA's new assumed rate of return of 7.25 percent per year, adopted in late 2016.

The Hickenlooper plan contains some differences. It rejects PERA's proposed 2 percent increase in taxpayer-funded state, local and school district employer contribution rates, noting that "public employer contributions have grown substantially in recent years and would remain at 20.15 percent of payroll for most covered employees." The Hickenlooper plan would ask for an additional 2 percent contribution from existing employees, not 3 percent as requested by PERA. To further curb the growth in benefit costs, the Hickenlooper plan would cap Annual Increase payments at 1.25 percent per year instead of the 1.5 percent proposed by PERA.

To this end, using data and forecasting tools from PERA, we developed and tested the Hickenlooper Plus scenarios. As previously noted, we identified an opportunity to potentially lower the cost by $2 billion to $4 billion over the next 10 years for taxpayers, state agencies, local governments school districts compared to the other reform proposals on a similar amortization timetable. The Hickenlooper Plus scenarios used different values for the HAS, Annual Increase, employee contribution, and assumed rate of return to illustrate the choices and tradeoffs available to policymakers who want to reduce PERA costs to taxpayers rather than increase them.

The results of our analysis show that the PERA and Hickenlooper reform proposals serve as an excellent starting point for negotiations over the coming round of reforms to the state's public pension system. At the same time, there is a clear opportunity to take these proposals a step further, assuming there is interest on the part of state legislators, concerned citizens and other stakeholders.

Conclusion

In light of these findings, we believe state legislators, PERA officials, the Hickenlooper Administration and other stakeholders should evaluate additional pension reform scenarios that achieve solvency in a way that reduces the cost of taxpayer-funded state, local and school district employer contributions.

By asking the right questions and making full use of the financial tools and expertise available at PERA, lawmakers have the chance to find ways to stabilize Colorado's public pension system over a reasonable amortization timeframe while providing some relief to PERA member agencies and taxpayers after many years of escalating costs. Moreover, by freeing up resources for state agencies, local governments and school districts to put towards other pressing needs, the State of Colorado can invest in the future of all its citizens while also maintaining retirement security for public employees.

About PERA

Background

The Public Employees' Retirement Association (PERA) was created by the Colorado legislature in 1931. For more than 80 years, most Colorado public employees have used PERA instead of the federal Social Security program and the personal retirement accounts used by many private sector workers.

Today, PERA provides retirement and other benefits to public employees across more than 500 state and local government entities. In 2016, there were roughly 207,000 active public employees participating in PERA, accruing future benefits. In the same year, close to $4.3 billion was paid to more than 114,000 retirees (Colorado PERA , 2016). There were also over 244,000 inactive members or terminated employees that are owed some benefit in the future.

To understand how PERA works, it's first important to review the two broad categories of employer-supported retirement savings plans: Defined contribution and defined benefit.

In a defined contribution plan, the worker determines how much of their salary to contribute, with the employer possibly contributing an additional amount. The sum of these contributions, plus investment returns, determine how much will be paid to the worker in retirement. The 401(k) retirement accounts commonly used by private sector workers are probably the best-known example of a defined contribution plan, which allow people to contribute to their retirement with pre-tax income.

In a defined benefit plan, a lifetime annuity, often measured as a percentage of salary, is promised to a worker when they reach retirement. The level of this annuity, commonly called a pension, is usually based on the employee's years of service and salary history. Pensions are financed by a combination of contributions from employers and employees, and in the case of public sector workers, this means taxpayer funding. Outside the public sector, defined benefit plans are increasingly rare, due to the rising use of 401(k) and other defined contribution plans.

PERA describes itself as a "hybrid defined benefit plan," which operates in the following manner: As with a defined benefit plan, public employees that are part of PERA are promised pensions in retirement, based on their years of service and an average of several years of their highest salaries depending on the division. To finance these pensions there is also a defined contribution amount, where employees and their employers contribute a separate percentage of each worker's salary into an investment fund. Most PERA employers and members do not contribute into social security and are therefore not eligible for that benefit upon retirement.

Structure and governance

PERA is managed by a 16-member Board of Trustees. Three members are appointed by the Governor and confirmed by the Senate, nine members are public employees, and two members are retired public employees. The State Treasurer is an ex officio member of the board with voting rights. A 10th public employee, representing Denver Public Schools, also sits on the board, but as a non-voting member. The 12 board members representing current or retired public employees are elected by PERA members to four-year terms.

While the PERA board manages the operation of the state's public pension system, the rules for that system are governed by statute. Therefore, the state legislature oversees and determines the overall structure of the PERA system, including taxpayer and employee contribution rates, eligibility of membership and rules for calculating benefit levels.
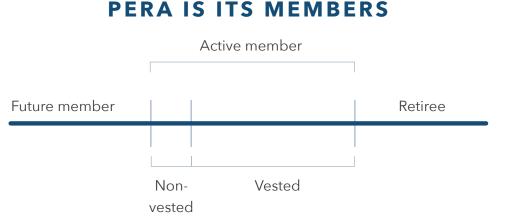
PERA IS ITS MEMBERS

Figure 1: PERA is its members – PERA manages the retirement benefits of thousands of Coloradans. The financial composition of PERA is determined by the composition of its members who initially help pay into the system as active members, and a upon retirement draw a pension.

In retirement, PERA provides pension income and health care benefits. However, the majority of PERA benefits are in the form of pensions. In 2016, pension benefits amounted to $4.26 billion, while health care benefits totaled $256 million.

While often talked about as a single pension plan, PERA has five major divisions reflecting the various categories of public agencies and employees it represents. These funds range in size from hundreds of millions of dollars to billions of dollars. While maintaining a similar basic structure, these divisions are funded separately, pay benefits separately and have their own specific formulas for taxpayer and employee contributions benefits.

Division	Description	Active members (2016)	2016 assets
State	Employees of the State of Colorado, General Assembly and state departments, boards, commissions, bureaus, agencies, institutions, state universities, state colleges, community colleges etc.	54,889	$13,626,180,000
State troopers	Employees of the Colorado State Patrol and Colorado Bureau of Investigation	836	
School	Employees of all school districts and charters schools (except Denver Public Schools)	121,945	$22,581,046,000
Local government	Employees of any city, municipality, county, housing authority, special district, library district, regional planning commission, public hospital, district health department of local public agency	12,736	$3,773,506,000
Judicial	Judges of the Supreme, Appeals, District and County Courts, and Denver Probate and Juvenile Courts	335	$288,904,000
Denver public schools	Employees of Denver Public Schools and associated charter schools	15,950	$3,125,977,000

Figure 2: PERA divisions, members and assets (Colorado PERA , 2016)

Making a defined benefits plan work

PERA's annual financial report succinctly describes the bedrock principle behind the successful operation of a defined benefit retirement system: "At the most basic level, in the long run, a retirement plan must balance the money coming in through investment earnings and contributions against the money going out through benefit and expense payments." (Colorado PERA , 2016)

This principle can also be expressed as an equation:
Contributions + Investment Income = Benefits Paid + Expenses
(C + I = B + E)

Contributions are the principal, dictated as a percentage of pay, that is paid directly into the system each year by employees, known as members, and their employers. PERA can then invest that contribution to seek a return, that grows the amount of money available to retirees when they begin to draw their pension.

While not directly mentioned in the $C + I = B + E$ equation, there is another critical element in understanding the solvency of a pension system: The element of time. In any given year, contributions and investment income will not equal the benefits paid and expenses. But looking ahead, there are ways to understand how well the $C + I = B + E$ equation balances over the long term, using data and assumptions drawn from the present and historical financial condition of PERA. The long-term future, measured in decades, is the timeframe that guides most of the discussion among legislators, administrators, PERA members and taxpayers about the status of the state's public pension system.
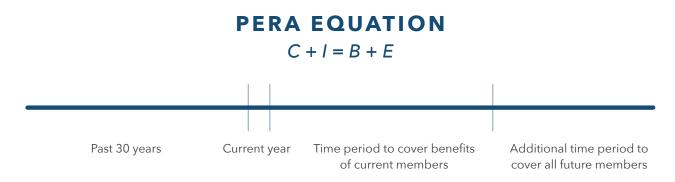
PERA EQUATION
$C + I = B + E$

| Past 30 years | Current year | Time period to cover benefits of current members | Additional time period to cover all future members |

Figure 3: PERA Equation – While PERA pays out benefits and collections contributions in a single year, it must prove it can balance this equation over the long-term to ensure it can pay future benefits. 100% funded status means that actuarial projection of C+I will equal the actuarial projection of B+E

To evaluate future solvency, PERA commissions an external actuarial audit each year. A third-party firm creates a financial picture of the PERA divisions over time, using a model that includes all the variables of the $C + I = B + E$ equation, along with a series of important assumptions about the future.

In a later section, this report will review several of the key solvency measures that are derived from each actuarial audit. But before doing so, some further background on each item in the $C + I = B + E$ formula is warranted.

Contributions

PERA trust funds draw contributions from public employees and their employers, i.e. schools, state agencies, taxpayers. The contribution rates, especially those coming from taxpayers, vary between the divisions and have changed significantly over the history of PERA.

The vast majority of PERA members currently contribute 8 percent of their salaries, with State Troopers contributing 10 percent. Next comes the Statutory Employer Contribution, which currently ranges from 10 percent to 13.66 percent.

Starting in 2004 and 2006, the state legislature passed two measures to significantly increase the level of taxpayer support for PERA trust fund contributions. The 2004 measure was called the Amortization Equalization Disbursement (AED) and the 2006 measure was called the Supplemental Amortization Equalization Disbursement (SAED). These additional contributions from taxpayers started in 2006 and have steadily grown since then under a schedule set by the legislature.

In 2018, the AED ranges from 2.2 percent to 5 percent across the various PERA trust funds, while the SAED ranges between 1.5 percent and 5.5 percent. All but one of the pension funds managed by PERA – the Judicial Division – will hit their maximum AED and SAED levels this year. Under current law, these AED and SAED contributions will continue at their maximum levels until the funding status reaches over 103%.

The AED and SAED payments, and the additional taxpayer support they represent, are critically important. Since 2006, the AED and SAED payments have effectively boosted the employer contribution into the range of 13.7 percent to 22.85 percent, compared to employee contribution rates of between 8 percent and 10 percent. In fact, for most active PERA members, the taxpayer-funded contribution as a percentage of their salary has almost doubled in 12 years.

At first glance, taxpayer-funded employer contributions in the range of 13.7 percent to 22.85 percent would appear very generous to current and future public employees. A 2016 report from the U.S. Bureau of Labor Statistics found only 62 percent of American workers receive any kind of employer match when they save for retirement, and those employer contributions range between 3 percent and 6 percent of salary (Stoltzfus, 2016).

However, there are some hidden drawbacks for public employees, especially early- to mid-career professionals and those who will join their ranks in the future. As we discuss in more detail later in this report, all of the recent increase in employer contributions is going to pay for unfunded liability on past service. Rather than investing these increased employer contributions to pay the future benefits of the employees in whose name they were collected, PERA officials have, out of necessity, used AED and SAED payments to supplement investment returns and keep pace with the rising cost of benefits earned for past service.

The AED and SAED payments have also dramatically reduced the amount of money available for pay raises. This reduces economic security and purchasing power for current public employees, but the long-term impacts are also problematic. Pay raises that are blocked or delayed have a cascading effect, reducing an employee's earning capacity over his or her entire career. Therefore, because PERA benefits are determined based on an employee's highest earning years, depressing their income today could also depress their income in retirement.

For taxpayers, there is also a significant consequence from the AED and SAED payments as they crowd out other possible spending opportunities by raising the non-wage cost of labor. For example, the retirement costs for public employees in the State Division and the School Division – which represent the vast majority of PERA's membership – are now more than 19.13 percent of payroll, compared to just over 10 percent a little more than a decade ago. Put another way, before taxpayers can hire a new state employee or school teacher, they must find an additional 19.13 percent of the worker's salary to cover PERA contributions to their retirement alone not to mention other insurance, healthcare and overhead costs.

Fund Name	Employee Contribution	Statutory Employer Contribution	AED	SAED	Total Employer Contribution*
State Division Trust Fund	8.00%	10.15%	5.00%	5.00%	20.15%
State Division (for State Troopers)	10.00%	12.85%	5.00%	5.00%	22.85%
School Division Trust Fund	8.00%	10.15%	4.50%	5.50%	20.15%
Local Government Division Trust Fund	8.00%	10.00%	2.20%	1.50%	13.70%
Judicial Division Trust Fund	8.00%	13.66%	2.20%	1.50%	17.36%
Denver Public Schools Division Trust Fund	8.00%	10.15%	4.50%	5.50%	20.15%

Figure 4: Current 2018 statutory contributions
*Currently 1.02% of employer contributions go to the Health Care Trust Fund and not directly to retirement benefits

Across all PERA divisions, in dollar terms, employer contributions are significant for taxpayers – more than $1.4 billion in 2016. As noted earlier, employer contributions have grown at a much faster rate than employee contributions. For example, from 2007 to 2016, taxpayer contributions to the State Division Trust Fund rose by 124 percent, while employee contributions increase by just 24 percent. Similarly, employer contributions from taxpayer-funded school districts outside Denver rose 116 percent, while employee contributions also increased by 24 percent.

Trust fund	Employer Contributions	Employee Contributions	Ratio Employer/ Employee
State Division Trust Fund	$521,804	$223,005	2.3
School Division Trust Fund	$812,740	$359,059	2.3
Local Government Division Trust Fund	$75,132	$48,470	1.6
Judicial Division Trust Fund	$8,024	$3,928	2.0
Denver Public Schools Trust Fund*	$17,071*	$69,811	0.3
Total	$1,434,771	$687,202	2.1

Figure 5: 2016 Contribution Amounts ($Thousands)

* Employer Contributions to the DPS division adjust based on a statute to equalize the funded status of the School and the DPS division by 2040. There is a true-up calculation every 5-years which could cause the employer rate to potentially go up or down significantly.

Investment income

The heart of what PERA can offer members is strength in numbers and a massive investment fund that pools all contributions within each division and therefore wields significant leverage in capital markets. Unlike a 401(k) account, in which an employee has their own individual retirement fund, PERA members collectively participate in a series of investment funds totaling over $43 billion (Colorado PERA , 2016). With such a large pool of capital, PERA's administrators can pursue a wider array of investments across the global economy, including potentially higher-risk and higher-return assets that are usually not available to individual investors.

While PERA achieves unique returns across each type investment, we can broadly use two investment rates of return to evaluate historical performance and inform predictions of future solvency.

First is the actual rate of return, which measures how each PERA fund has performed in the past. The second is the target rate of return, which is an assumed annual rate of growth for future years – and one of the crucial assumptions for PERA's annual external actuarial audits.

Currently, PERA's target rate of return is set at 7.25 percent, having recently been lowered from 7.5 percent.
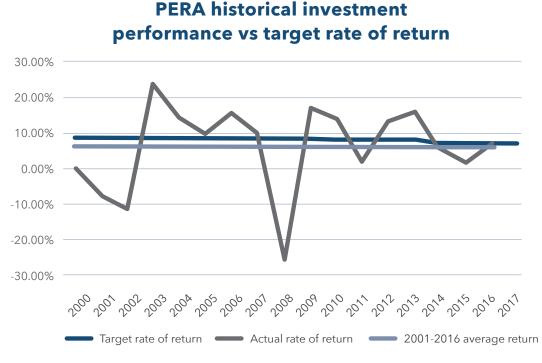
PERA historical investment performance vs target rate of return

Figure 6: PERA historical investment performance

Benefits

While retirement income is the principal benefit offered by PERA, it also manages and administers disability and some health care benefits. As with any retirement plan, PERA benefits are designed to replace a significant portion of an employee's monthly income once they leave the workforce. As a defined benefit plan, PERA uses a formula to determine the amount of the monthly retirement benefit.

The inputs for this formula include:

- Highest salaries

- Years of service

- Age at retirement

Upon retirement, a baseline called the Highest Average Salary (HAS) is determined for each PERA member. In layman's terms, the HAS equals the average of an employee's three highest annual salaries during their career in public service. PERA retirees are paid a percentage of their HAS, based on their years of service and age at retirement. It can be as high as 100% percent depending on these criteria.

It is difficult to generalize these calculations, because different rules have been developed for different groups of employees, depending on when they joined the PERA program. However, for example, a state employee who joined the PERA system before June 2005 could retire after 25 years of service and at the age of 50 and receive 44.7 percent of their HAS in retirement. If the same employee stayed in the job for another five years, retiring at the age of 55, they would be paid a retirement benefit equal to 75 percent of their HAS. If they keep working until 60, they will receive 87.5 percent of their HAS.

Simply stated, therefore, the longer a PERA member works as a public employee, the higher percentage of their income will be replaced in retirement, and the sooner they will be eligible to claim retirement benefits.

PERA benefits have another component, the Annual Increase (AI), which raises the base benefit that members receive in retirement every year. For retirees who joined PERA before 2007, the AI is fixed at 2 percent, unless PERA experiences a negative investment year. In that event, the AI is the lesser of 2 percent or the average of the monthly Consumer Price Index for Urban Wage Earners and Clerical Workers from the prior calendar year. The AI for employees who joined PERA in 2007 or later will be the lesser of 2 percent or the CPI-W average, regardless of PERA's investment performance.

In any discussion about long-term solvency, the AI component of the PERA pension system is important because of its dual effect. First, a lower AI keeps more money in the investment account now, so that on an actuarial basis it can grow at the target rate of return and cover more of the unfunded liability. Second, it lowers the projected liability by immediately lowering the benefits, without changing the base benefit structure or guarantee. This has compounding effects which helps the financials and impacts retirees. For example, over the course of 10 years, a 2 percent AI will effectively increase a PERA retiree's base benefit by 21.9 percent. Over 20 years, the increase is 48.6 percent.

For this reason, the AI was reduced from 3.5 percent to 2 percent in 2010 by state lawmakers and former Gov. Bill Ritter (D). A group of four PERA retirees mounted a legal challenge against the move, arguing the AI – sometimes called a cost-of-living adjustment, or COLA – is a contract that cannot be altered by the legislature. But in 2014, the Colorado Supreme Court rejected this argument and ruled:

> *"We hold that the PERA legislation providing for cost of living adjustments does not establish any contract between PERA and its members entitling them to perpetual receipt of the specific COLA formula in place on the date each became eligible for retirement or on the date each actually retires." (Justus v. State of Colorado, 2014)*

Today, the AI once again plays a prominent role in reform proposals, with PERA proposing a 1.5 percent maximum and Gov. John Hickenlooper (D) proposing 1.25 percent maximum.

Overall, PERA benefits differ from private sector retirement programs in many important ways. First, participants in a 401(k) program effectively take a lifetime average of their salaries, invest those funds and live off the proceeds, whatever they end up being. To the extent they receive any guaranteed income, it will come in the form of federal Social Security payments, which most PERA members are not eligible for.

Also, private sector employees have much less flexibility in terms of choosing a retirement age. To access 401(k) savings without major tax penalties, private sector workers must wait until they have reached the age of 59 ½. Barring a disability that prematurely ends their working career, private sector workers must wait until the age of 62 to claim Social Security benefits. If claimed at 62, the worker will receive 75 percent of their full benefit. To get 100 percent of their Social Security benefit, a private sector worker must wait until the age of 66.

On the question of benefits, therefore, PERA members have much more flexibility in when they choose to retire and much more certainty about their level of retirement income than private sector workers in Colorado. This is meant to help attract and retain employees to public service in Colorado.

Expenses

There is, of course, a cost to managing investments and administering benefits for a program the size of PERA. In 2016, PERA's administrative expenses totaled $64 million. The vast majority of these expenses came from staff salaries, staff benefits, and professional services needed to carry out PERA's responsibilities, including investment services, legal counsel, auditing and actuarial advice.

For perspective, $64 million is just over 1 percent of benefits paid in 2016 and 2 percent of PERA's investment income over the same period. While it may be possible to find cost savings and efficiencies to reduce PERA's administrative expenses, they appear reasonable given the demands of managing the state pension system. Moreover, these expenses are not decisive in terms of the long-term solvency of the PERA system, and therefore not the focus of this report.

NEED FOR REFORM

Why does PERA have an issue now?
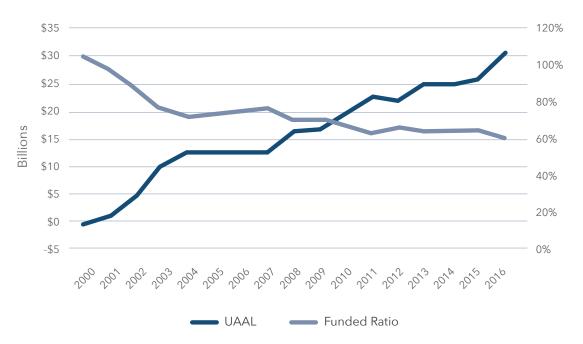
UAAL vs funded ratio

Figure 7: All divisions UAAL vs Funded Ratio – 2000 was the last year PERA was fully funded. Since then the UAAL has consistently grown, dropping the funded ratio. The ability for state agencies to borrow has been threatened as credit rating agencies have pointed to a dropping funded ratio which threatens the ability of PERA to fulfill its future commitments.

Since 2001, the amount of money PERA estimates will be needed to pay future benefits has grown faster than the amount of money PERA has received in contributions and expects to achieve in investment returns.

As shown in Figure 7, PERA's funded ratio has fallen from close to 100 percent in 2001 down to below 60 percent in the 2016 annual financial report. This has resulted in an Unfunded Actuarial Accrued Liability, UAAL, of roughly $32 billion. In effect, the UAAL estimates the gap between the value of promised retirement benefits and the amount of money that PERA has collected to pay those benefits growing at the target rate of return.

There are several factors behind this trend, to be discussed in more detail in this section. Overall, these factors include:

- From 2000 to 2016, the number of retirees receiving benefits has increased 111 percent, but the value of benefit payments has risen even faster – by 289 percent – over the same period.

- Since 2001, investment returns have been less than anticipated, averaging 6.14 percent instead of the target rate at the time of 8.5 percent. This target rate of return was recently lowered to 7.25 percent.

- Even after major increases in employer contributions in the form of the AED and SAED payments, the growth in contribution rates hasn't kept pace with the rising long-term benefit costs.

- PERA's mortality tables have been updated to reflect longer life expectancies. This increases the amount of time that retirement benefits will be paid, and therefore the amount of money paid to retirees over the long term.

To fully appreciate the scale of the challenge, consider how much contributions increased between 2000 and 2016. During this period, combined contribution rates from employees and employers jumped more than one-third, from roughly 20% to 27% on average across all PERA divisions. But the increase was not evenly shared between public employees and taxpayers.

Over the same period, the average employee contribution fell from 8.5% to just over 8.3%, while the total taxpayer-funded employer share climbed from 11.4% to 18.4% on average. Put another way, taxpayers increased their contribution rate by more than 60% from 2000 to 2016.

ALL DIVISION AVERAGE CONTRIBUTION RATES

Figure 8: Growing contribution rates

To be clear, these escalating PERA contribution rates from taxpayers were authorized by the state legislature, in the name of paying down PERA's unfunded liability and balancing the C + I = B + E equation. But despite the best intentions of all involved, in the time since the last round of reforms, PERA has lowered its target rate of return and increased its assumptions on how long people are living. Both changes caused the cost to increase beyond the scheduled increase in the PERA AED and SAED contributions.

Together, the extra employer contributions in the form of the AED and SAED payments exceeded $720 million in 2016. In 2017, that figure likely approached, and may have surpassed, $800 million and PERA's unfunded liability continues to climb.

In effect, the vast majority of Colorado taxpayers are unknowingly part of a contract that dramatically boosted their contribution to the state's public pension system. At the same time, taxpayers are still on the hook for a large and growing unfunded liability – a liability that was supposed to shrink after the introduction the AED and SAED payments. Simply put, this not what Colorado taxpayers signed up for.
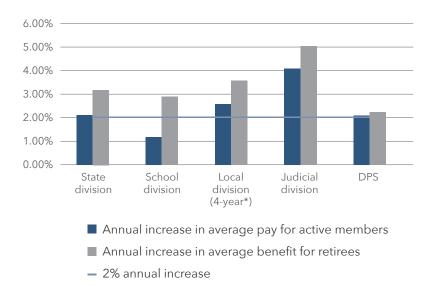

Rising cost hurts teachers and state employees now and in future

As noted in the earlier section on contributions, the amount of money required to fund AED and SAED payments have significant drawbacks for many public employees and their employers.

For public employees, rising AED and SAED contributions from taxpayers reduce the amount of money available for pay raises. In the case of the SAED, state law even requires the additional taxpayer contributions to be funded with money that otherwise would have been used to raise the pay of state and local workers, school teachers and other public employees. Recent comments by PERA officials to the state legislature suggest as much as 5.5 percent of pay has been lost due to slower pay increases following the introduction of the AED and SAED contributions.

In fact, the average payment to PERA retirees is rising faster than the average salary paid to active PERA members who are still in the workforce. Over the past five years, average benefit payments have increased by an annual average of 2.98 percent across all divisions. At the same time, pay increases for active PERA members have been lower, increasing just 2.22 percent per year across all divisions. This is highly significant, because it means retired public employees are effectively receiving larger raises – in the form of AI payments – than many public employees who are still working and contributing a percentage of their salaries into the PERA system.

PAST 5-YEAR AVERAGE ANNUAL INCREASE

Figure 9: Growth in member pay vs retiree benefits

The above table show the average annual increase over the past 5 years, for the average pay for active members compared to the average benefit for retirees. A ten-year window shows lower increases in average member pay and a 3-year window shows larger increases in average member pay. However, in each time-period the relationship of relatively fast growth in average retirement benefits holds.

*We only provide a 4-year estimate for the Local Division given the DPS Division was separated from the Local Division the year before the 5-year window, making the estimates appear worse than they were.

It is difficult to say how PERA employers would otherwise use the money needed to fund AED and SAED contributions into the PERA system. But using 2016 data, it is clear the budget impacts are very significant. For example, the AED and SAED payments would be enough to fund annual salary increase for state and local workers and public-school teachers of almost $3,500 each. Alternatively, Colorado could hire more than 17,000 state and local workers or almost 10,800 additional teachers.

The AED and SAED totals for 2016, $720 million, could also pay for a 10-fold increase in state spending on school construction projects, through the Building Excellent Schools Today program. In the states' current transportation funding debate part of the legislature is signaling a need for $300 million in funding, less than 42% of the total cost of the AED and SAED. At an assumed interest rate of just 5.5% an annual increase in $720 million could leverage an $8 billion bond. We recognize the budgetary restrictions in achieving these alternative uses for the funds and are not recommending policy prescription. These examples are simply meant to illustrate the size and scope of the impacts of the increases in the AED and SAED contributions.

2016 SNAPSHOT

AED + SAED	8.62% average across all division
	$720M in total contributions
AED + SAED $ Per Member	$3,484.48
AED+ SAED $/Average Salary	17,808 jobs that could be created
Normal Cost(weighted across all divisions)	11.83%
Total Contribution(weighted across all divisions)	26.78%

Figure 10: Rising cost is not good for active members

The longer that the issue surrounding the unfunded liability continues, the further and further the cuts to active and future members will have to go. Since 2007, the target rate of return assumption has been pulled down from 8.5 percent to 7.25 percent. At the same time the life expectancy of members has gone up. All else equal these two factors would cause the normal cost of active members to go up. That has not been the case, as benefits have been reformed to attempt to rebalance the scale. As this issue grows, it will only force greater and greater cuts to benefits, that will begin to severely cut into the replacement ratio, and make it harder and harder for retirees to maintain the standards of living they are accustomed to.

NORMAL COST AGAINST TARGET RATE OF RETURN

Figure 11: Normal cost vs target rate of return

Not good for economic growth

It is certainly true that PERA benefit payments are important to the Colorado economy. According to a 2016 study commissioned by PERA (Pacey Economics, Inc., December 2016), payments to retirees support more than $6 billion in goods and services transactions across the Colorado economy, which in turn supports almost 33,000 jobs. However, if the cost of maintaining those benefits grows relative to the benefit itself, that growing cost is crowding out other economic activity.

As earlier noted, the cost of taxpayer-funded AED and SAED payments into the PERA system reached $720 million in 2016. Using the Tax-PI model, developed by REMI, we can simulate the dynamic impacts to the state of Colorado's economy resulting from the crowding out of other government services. We find that if this amount was available for general spending across government services in Colorado, including labor and intermediate goods, it could have boosted state GDP growth by almost 0.5 percent in 2016. Likewise, if personal taxes were lowered by $720 million in 2016, it would have spurred real income growth of $1.026 billion and increased disposable income per capita by $148.

The purpose of these examples is not to advocate for additional government spending or a reduction in income taxes. Rather, they demonstrate there are costs associated with the increased level of taxpayer support for PERA now seen in Colorado. Given how far the total contribution is from the normal cost, there is a strong argument that the full amount of money that is being crowded out away from other public expenses or not returned to the public is closer to $1.5 billion or 18 percent of total pay. Whether these costs make sense for the future is a matter for lawmakers and taxpayers to decide, but at the very least, these costs should be part of any debate over reforming the PERA system.

Can't wait for returns to pick up

In theory, another way to balance the C + I = B + E equation is by obtaining higher investment returns. In practice, however, investment returns are the hardest variable in the equation to predict, much less control. Therefore, while higher-than-expected investment returns are always welcome and may provide a measure of relief from PERA's unfunded liability, they cannot be counted on. While PERA has enjoyed a near 9 percent investment return over the last 40 years, there is no indication that returns should be expected to be nearly that strong in the future.

As noted earlier, the PERA board has recently lowered the assumed rate of return for its various pension funds from 7.5 percent to 7.25 percent. This decision, taken in late 2016, was the latest acknowledgment of a tougher environment ahead for institutional investors like PERA

Earlier that same year, the McKinsey Global Institute published a study predicting an end to the "golden era" of investment and significantly lower returns in the coming decades. Between 1985 and

2014, real total returns for equities investors in the U.S. and Western Europe averaged 7.9 percent per year, the McKinsey study found. This was significantly higher than the 100-year average of 6.5 percent for U.S. investors and 4.9 percent for Western Europe. Returns for bond investors between 1985 and 2014 were even more impressive: 5 percent in the U.S. and 5.6 percent in Western Europe compared to the 100-year average for both regions of 1.7 percent.

"These returns were lifted by an extraordinarily beneficial confluence of economic and business factors, many of which appear to have run their course," the McKinsey study found. These factors included sharp declines in inflation and interest rates after the 1970s and early 1980s, strong global GDP growth, stronger corporate profits fueled by revenue growth in new markets, declining corporate taxes, and cost savings from automation and global supply chain management. Looking ahead, "investment returns over the next 20 years are likely to fall short of the returns of the 1985–2014 period," the study concluded.

Investors should brace for equity returns in the range of 4 percent to 5 percent and fixed-income returns between zero and 1 percent, McKinsey predicted.

Considering the concerns highlighted in the McKinsey study, it is worth examining the anticipated future performance of PERA's investment portfolio, along with some alternatives. PERA has many more opportunities to seek better performance than do smaller funds, including the ability to invest in private ventures and less-liquid assets that offer higher returns.

Our case for evaluating future performance has little to do with PERA's investment management practices, but rather our understanding of the future landscape of investment markets globally. In the tables below, we look at PERA's current publicly-reported asset allocation and apply return projections from the research divisions of three major investment advisor firms to get a sense of what PERA's long term investment returns may be. The projected returns from each firm represent an average outlook over the long term (ten years or more).

Given the ability of PERA to attract and retain top asset managers, it is possible that the fund would generate higher returns than those projected for the average investor. Nevertheless, the expectation for lower returns over the long term is a warning that PERA may need to reposition its future portfolio in order to achieve its desired performance.

PERA Reported Asset Classes as of Sept 2017 (CO PERA, 2017)	PERA asset classes mapped to advisor categories:	J.P. Morgan outlook horizon: 10-15 years	BlackRock outlook horizon: 15+ years	State Street Global Advisors outlook horizon: 10+ years	Average
Global equity - 57.7%	51.1% = equity - developed	6.4%	6.1%	6.0%	6.2%
	6.6% = equity - emerging	9.3%	5.7%	8.2%	7.7%
Fixed income - 22.5%	21.3% = fixed income - developed	2.7%	3.0%	2.5%	2.7%
	1.3% = fixed income - emerging	5.5%	5.1%	5.0%	5.2%
Private equity - 7.5%	1.3% = fixed income - emerging	8.0%	6.8%	7.1%	7.3%
Real estate - 8.5%	8.5% = real estate	5.5%	4.1%	5.2%	4.9%
Opportunity fund - 3.3%	3.3% = opportunity fund (hedge funds)	3.5%	3.4%	5.8%	4.2%
Cash - 0.4%	0.4% = cash & equivalents	2.0%	2.0%	2.6%	2.2%
	Total expected annualized return	5.7%	5.2%	5.4%	5.4%

Figure 13: PERA investment outlook
**The stocks and bonds aspects of the portfolio are dated through 9/30/2017
and the Private Equity, Real Estate and Opportunity Fund are through 6/30/2017*

As detailed in the McKinsey report and echoed in the above projections, the largest classes of investments for PERA, developed market stocks and bonds, are expected to see significantly lower returns than the return the fund is targeting. Only two asset classes, emerging market equity and private equity, see higher returns than the current target 7.25 percent rate, and together make up just 14.1 percent of the total portfolio.

Going forward, PERA's investment strategy will likely have to change if it wants to continue to seek high returns. While moving into private equity or other less-liquid vehicles could help, it would also require additional investment in top managers and experts in the space. The difference in returns between a top-quartile private equity fund and the median private equity fund is substantial, and tends to be much larger than the gap found in stocks, bonds, or other conventional asset classes. As such, PERA would want to acquire the expertise necessary to identify top illiquid funds and ensure that manager compensation is aligned with strong, top-quartile performance on an ongoing basis.

Using the same methodology as above, the following table compares projected rates of return for PERA's current asset allocation, its reported long-term target allocation, and a more aggressive allocation weighted more heavily toward private equity and emerging markets.

PERA asset class:	Current allocation		PERA stated long-term allocation		Potential more aggressive allocation	
	Share of portfolio	**Average returns**	PERA long term asset allocation	**Average returns**	PERA potential asset allocation	**Average returns**
Equity - developed	51.1%	6.2%	47.0%	6.2%	40%	6.2%
Equity - emerging	6.6%	7.7%	6.0%	7.7%	12%	7.7%
Fixed Income - developed	21.3%	2.7%	21.8%	2.7%	15%	2.7%
Fixed Income - emerging	1.3%	5.2%	1.2%	5.2%	1%	5.2%
Private equity	7.5%	7.3%	8.5%	7.3%	20%	7.3%
Real estate	8.5%	4.9%	8.5%	4.9%	9%	4.9%
Opportunity fund (hedge funds)	3.3%	4.2%	6.0%	4.2%	3%	4.2%
Cash & equivalents	0.4%	2.2%	1.0%	2.2%	0%	2.2%
Total expected annualized return	100.0%	**5.4%**	100%	**5.3%**	100%	**5.9%**

Figure 14: PERA investment outlook with alternative allocations

The presentation and discussion of these scenarios is not a recommendation of where the assumed rate of return for PERA's pension funds should be set. Rather, it is intended to show that a change in asset allocation may be necessary to achieve PERA's long-term target return, and that in any case investment returns are highly unlikely to overcome the challenge of PERA's unfunded liability on their own. Therefore, lawmakers and PERA officials will need to focus their energies on other variables in the C + I = B + E to help put the fund on a more sustainable path.

OPTIONS FOR REFORM

What are the options?

The two sides of the C + I = B + E equation can be called "money in" and "money out." That is, contributions and investment returns represent "money in," and benefits and expenses represent "money out." Over the long term, to avoid unfunded liabilities and the risk of insolvency, the "money in" side of the equation must be equal to or greater than the "money out" side of the equation.

When faced with an unfunded liability, the easiest solution is increasing the "money in" side of the equation. Since you cannot legislate investment returns, increased "money in" means an increase in contributions. That has been the experience in Colorado, with contribution levels dominating the discussion for more than a decade. For most PERA members, taxpayer-funded contribution rates have almost doubled, but all the extra "money in" still is not keeping pace with the "money out."

In political terms, it is much harder to tackle the "money out" side of the equation. To their credit, policymakers in Colorado have taken steps to limit the growth in benefit payments, principally through the 2010 decision to cut AI payments from 3.5 percent to a maximum of 2 percent. But clearly, further action is needed to bring the "money out" side of the equation back into balance.

To be sure, PERA's unfunded liability of $32 billion is not the product of bad faith on anyone's part. A combination of factors created the current situation, including contributions that are still lower than determined by actuarial methods despite recent increases, investment returns that are lower than the long-term target rate, a larger liability on the benefits side as the life-expectancy of retirees has increased, and actuarial trends on wages and member growth that differed from assumptions. Moreover, due to the nature of a defined benefit plan, passing meaningful reforms is difficult, even in the face of growing solvency problems that threaten the long-term viability of the PERA system.

But bold action is needed to find a solution that is fair to current and future public employees, retired PERA members and the Colorado taxpayers who provide the bulk of the funding for the state's pension system. The challenge before the Colorado state legislature is determining the best way to bring the PERA equation back into balance. It is much easier to identify the problems than it is to agree to what the solution should be, however several guiding principles need to drive the debate to improve PERA's solvency.

1. The taxpayer must be protected.
    a. There must be a strategy to bring the overall contribution level back down towards the level of normal costs for each fund. Should the system face continued growing unfunded liability, the taxpayer must be protected. The public is unknowingly part of the contract with PERA and cannot be left with the full escalation of a growing bill.

2. There must be binding commitments to improve solvency.
   a. Regarding the amortization period, three things should occur;
      i. An amortization time-frame must be agreed upon not just by the PERA board, but by the state legislature.
      ii. The actuarially determined contribution needs to be met each year. The cost of continued underfunding is too high, and returns cannot be counted on to correct the system.
      iii. A starting year must be established, so that the amortization period can move downward each following year.
3. Benefits must be addressed, and to the extent possible, be lowered for the member categories who are most contributing to the unfunded liability.

If statutory rates remain fixed where they are, or increase again in the future, taxpayers and PERA employers will see no relief from the high contribution rates for decades to come. If statutory contributions remain where they are, and benefits are not reduced, each division of PERA will remain more susceptible to the threat of lower than expected investment returns. Over 50 percent of contributions will continue to pay down unfunded liability and with no commitments to maintain a fixed amortization period, each year the amount of time it will take to pay off the unfunded liability will jump around. From the 2016 CAFR, the largest divisions of PERA, the State and the School Division, have a projected 65-year and 128-year amortization period respectively, even after the 2010 attempt to pay off the liability in 30 years.

To their credit, both the PERA Board of Trustees and the administration of Gov. John Hickenlooper have stepped forward to propose a series of public pension reforms. There is a great deal of overlap between these proposals, with two important exceptions; taxpayer contributions and AI caps. Figure 15 shows the major elements of each plan and highlights the Hickenlooper administration's points of difference with the PERA reform proposal.

	PERA proposal	**Gov. Hickenlooper proposal**
Taxpayer contributions	Increase by 2% of salary	No change
Current employee contribution	Increase by 3% of salary	Increase by 2% of salary
New employee contribution	Increase by 2% of salary	Increase by 2% of salary
Highest average salary	Change from average of 3 years to average of 5 years (except judges)	Change from average of 3 years to average of 5 years (except judges)
Retirement age	For new employees, increase retirement age to 65 or 40 years of service (except state troopers)	For new employees, increase retirement age to 65 or 40 years of service (except state troopers)
Annual increase suspension	For current retirees, suspend increase for two years. For new retirees, suspend for three years	For current retirees, suspend increase for two years. For new retirees, suspend for three years
Annual increase levels	Cap increases at 1.5%, down from 2%	Cap increases at 1.25%, down from 2%

Figure 15: Major provisions of PERA board and Hickenlooper administration plans

The PERA and Hickenlooper Administration proposals make changes on both sides of the C + I = B + E equation. For C + I, or "money in," both plans ask for higher contributions from public employees still in the workforce, and from future public employees. The Hickenlooper Administration, however, rejects the idea of an additional 2 percent contribution from taxpayers. In its 2017-18 budget proposal, state officials addressed this point of disagreement with PERA:

> *"We note that the public employer contributions have grown substantially in recent years and would remain at 20.15 percent of payroll for most covered employees."*

On the B + E side of the equation, or "money out," both PERA and the Hickenlooper Administration propose changes to the calculation of a retiree's HAS, which determines their base benefit, and increasing the retirement age to 65 for future PERA members. Both changes are intended to slow the growth in benefit expenditures but don't reduce the liability in the near-term or directly address where the current growth in UAAL is coming from.

Both plans also tackle the AI payments which currently increase benefit payments to existing retirees by as much as 2 percent per year. PERA and the Hickenlooper administration would suspend the AI for existing retirees for a period of two years. For new beneficiaries, the AI would effectively be reduced to zero for their first three years of retirement. But PERA and the Hickenlooper Administration disagree over what should happen next, after the AI suspensions are lifted.

Under the PERA plan, the AI would then be capped at 1.5 percent per year, down from the current 2 percent. The Hickenlooper Administration would cap the AI at a lower 1.25 percent. By reducing the AI, both PERA and the Hickenlooper Administration are limiting the flow of "money out" in order to invest those funds longer, generate greater returns, and pay down the system's unfunded liability faster.

The reform proposals put forth by the PERA Board and the Governor should not be seen as an exhaustive list of options. While substantive, these proposed reforms maintain the framework of a defined benefit pension system, with some modifications to support its future solvency.

This report takes a similar approach, examining ways to work within PERA's existing structure to eliminate a $32 billion unfunded liability. But this is not a prescription intended to discourage other potential solutions from being proposed, debated and potentially implemented. Of all the lessons to be learned from pension reform debates across the country, perhaps the most obvious is a "one-size-fits-all" approach does not work.

Therefore, we support the serious consideration of alternatives outside the current PERA framework. For example, policymakers may wish to explore closing off legacy plans that have large liabilities and creating new plans for future members. To be clear, there could significant transition costs, because policymakers would have to find a way to pay off the liability of existing members without set contributions tied to new active member's pay. But a new plan for future members would provide much greater design flexibility, including a choice between the defined benefit and defined contribution models and assumptions regarding future investment return rates.

It may also be the case that the legislature could decide to increase the funded ratio as quickly as possible, and implement at set of reforms that would enact major cost reductions in near-term in order or to quickly boost the solvency to, say, a 75% funded ratio and then set the plan on a 30-year fixed amortization period. While outside the scope of this report, such alternatives are worthy of consideration. A detailed cost estimate would need to be developed, of course, to determine whether it would be a viable option for Colorado at the present time.

Hickenlooper Plus Scenarios

In light of the $32 billion unfunded liability in Colorado's public pension system, the PERA Board and Hickenlooper Administration have proposed keeping the current defined-benefit structure with a series of adjustments to bring the C + I = B+ E equation back into balance.

After reviewing both reform proposals, it is clear that reducing the AI rate is a key lever to managing taxpayer costs. For example, with just an additional 0.25 percent reduction in the AI, from 1.5 percent to 1.25 percent, Gov. Hickenlooper's plan avoids a 2 percent increase in the taxpayer contribution rate and avoids an additional 1 percent increase in the member contribution rate. In dollar terms, we found the additional 0.25 percent cut in the AI would save state agencies, local governments and school districts approximately $172 million in just the first year.

Therefore, as we developed a series of additional reform scenarios, we focused on lowering the AI even further, along with a few other potential changes, in order to alleviate the financial cost to PERA employers and be able to bring down the target rate of return.

The table below outlines the major elements of the existing reform proposals, followed by a series of new "Hickenlooper Plus" scenarios developed for this report that build on the Governor's response to the PERA Board's proposal:

Scenario	Retirement Age for New Hires	Highest Average Salary	Annual Increase Suspension	New Annual Increase	Employee Contribution	Taxpayer Contribution	Assumed Rate of Return
PERA Board	65 (except state troopers)	5-year HAS	2 years	1.5%	+3% (existing) +2% (new)	+2%	7.25%
Hickenlooper	65 (except state troopers)	5-year HAS	2 years	1.25%	+2% (existing) +2% (new)	No change	7.25%
Hickenlooper Plus 1	65 (except state troopers)	5-year HAS	2 years	0.5%	+2% (existing) +2% (new)	-0.5% per year over 5 years	7%
Hickenlooper Plus 2	65 (except state troopers)	5-year HAS	5 years	0.5%	+2% (existing) +2% (new)	-0.5% per year over 5 years	6.8%
Hickenlooper Plus 3	65 (except state troopers)	7-year HAS	2 years	0.5%	+3% (existing) +2% (new)	-0.5% per year over 5 years	6.8%
Hickenlooper Plus 4	65 (except state troopers)	5-year HAS	2 years	0%	+2% (existing) +2% (new)	-0.5% per year over 5 years	6.5%

Figure 16: Major elements of PERA Board, Hickenlooper and Hickenlooper Plus reform scenarios

In developing the Hickenlooper Plus scenarios, we were granted permission to view PERA's forecasting tools. In particular, we reviewed PERA's analysis of Governor Hickenlooper's reform proposal, and used those findings to inform our work on designing alternatives.

All these estimates should be considered preliminary, and only PERA has the ability to provide definitive figures on what the costs and amortization periods will be under alternative reforms scenarios. Given the stakes, and the magnitude of any change, a clear understanding of the impacts is essential.

Hickenlooper Plus 1

Preliminary modeling results provided by PERA suggest that with the Governor's plan as a starting point, reducing the annual increase to 0.5 percent annually would force a 24-year amortization period. The 30-year fixed Actuarially Determined Contribution (ADC), a measure of the combined contributions from taxpayers and public employees necessary to pay off the unfunded liability, would naturally decline from roughly 27 percent to 22 percent under this scenario. Under the Governor's plan, however, the combined taxpayer and employee contribution rate is just over 31 percent. If the Governor's plan, with a fixed total contribution level of just over 31 percent and a 1.25 percent AI, has a 30-year amortization period, then we understand a lower AI cap of 0.5 percent provides room to lower employer contribution rates and lower the target rate of return, while remaining in a 30-year amortization window.

Lowering the taxpayer-funded employer contribution rate by 0.5 percent each year over 5 years brings the total contribution level to around 28.5 percent. From the estimates provided by PERA, we know that this contribution level is above the 30-year fixed ADC. From the scenarios provided in the 2016 PERA Annual Financial report (see page 167), lowering the assumed rate of return by 0.25 percent to 7 percent results in a 1.3 percent increase in the actuarially determined cost.

Therefore, it is our understanding that the combination of reforms outlined in the Hickenlooper Plus 1 scenario, if fully simulated by the PERA actuarial model, would produce an amortization around 30 years.

Hickenlooper Plus 2

With Hickenlooper Plus 1 as the starting point, this scenario freezes the AI for an additional 3 years. In doing so, PERA is able to retain those expenditures and generate additional years of investment returns from that money. The resulting savings allow the assumed rate of return to be lowered an additional 0.2 percent to 6.8 percent with the amortization period remaining roughly the same.

Hickenlooper Plus 3

This scenario is very similar to Hickenlooper Plus 1, however it would increase the HAS by 2 additional years and would increase the member contribution rate by an additional 1 percent. The change to a 7-year HAS does not create large savings, however, approximately lowering the ADC by 0.2 percent. With the combined increase in contribution and lower cost, the assumed rate of return could be lowered to 6.8 percent while still remaining in a similar amortization window.

Hickenlooper Plus 4

This fourth scenario, would bring down the AI to 0% until PERA's funded status reaches 100 percent. By maintaining similar contribution rate changes and base benefit structure as Hickenlooper Plus 1, the additional reduction of costs could allow for the assumed rate of return to come down by an additional 0.5% to 6.5% and likely remain in a fixed 30-year amortization window.
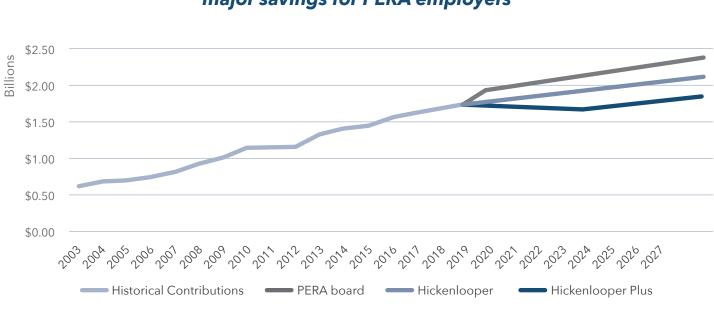
From a cost standpoint, our Hickenlooper Plus scenario would lower the cost of contributions to PERA roughly $2 billion over 10 years against current baseline and $4 billion against the PERA Board's proposal. This would mean schools and state agencies see real benefits much sooner. And in the case the future returns do come in lower than the current target rate, more of the liability will have been paid off more quickly and will not require more significant future contribution increases.

In Figure 17, Figure 18 and Figure 19, we illustrate how the Hickenlooper Plus scenarios compare to the reform proposals put forward by the PERA Board and the Governor's office.

Figure 17: Employer contribution rates history and alternatives

Taxpayers face higher costs under PERA and Hickenlooper reform proposals, but 'Hickenlooper Plus' scenarios yield major savings for PERA employers

Figure 18: Employer contribution levels history and alternatives ($billions)

Potential Savings Available to PERA Employers From 'Hickenlooper Plus' Scenarios

	2020	2024	2028	2029	5-year sum	10-year total
Hickenlooper Plus Savings Against PERA Board Plan	$220.31	$439.77	$480.10	$490.75	$1,638.94	$3,988.49
Hickenlooper Plus Savings Against Governor Plan and Current Baseline	$45.63	$249.07	$271.91	$277.94	$725.93	$2,056.63

Figure 19: Potential cost savings from Hickenlooper Plus Scenarios ($millions)

Note: Cost estimates using a 5-year weighted average of 2.2% for the 10-year increase in total compensation across all divisions. If using the PERA assumption of 4% annual increase in compensation, then our cumulative savings estimates would increase by over 20%.

CONCLUSION

This report has outlined the structure of PERA, Colorado's pension system for public employees, and explained the structural challenges it currently faces. Despite a series of well-intentioned reforms since the mid-2000s, the C + I = B + E equation remains unbalanced, with a long-term unfunded liability currently estimated at $32 billion.

Previous reforms have dramatically increased the amount of money paid by taxpayers into PERA, via state, local and school district budgets. Employer contributions have doubled, in fact, to roughly $1.6 billion a year over the past decade. These additional contributions from taxpayers, combined with previous rounds of benefit reforms, were supposed to eliminate PERA's unfunded liability. Instead, the unfunded liability has grown, as benefits continue to grow much faster than total contributions and investment returns. This is crowding out other worthy budget priorities, including pay raises for public employees.

To bring the C + I = B + E equation back into balance, the PERA Board and Governor John Hickenlooper have presented serious and thoughtful reform proposals. They overlap in many respects, calling for an increase in the retirement age, higher contribution rates from existing employees, revisions to the formula for calculating base benefits based on salary history, and a brief suspension in annual automatic increases in base benefits for PERA retirees. Both reform proposals rely on an assumed rate of return on PERA's investments of 7.25 percent per year.

There are differences, however. While both plans call for capping Annual Increase payments, the Governor's plan would cap the growth in payments at a lower level than PERA proposes. On the issue of taxpayer contribution rates, PERA proposes another increase, while the Governor's plan would keep them at their current levels.

These reform proposals are an excellent starting point for a discussion about bringing long-term stability to PERA, but more ideas can and should be part of the debate. In this report, for example, we built on the PERA and Hickenlooper proposals to show that taxpayer contribution rates can be lowered, rather than maintained or even increased, to free up resources for other pressing needs.

For example, by capping the Annual Increase in base benefits to 0.5 percent, instead of 1.5 percent or 1.25 percent as proposed by PERA and the Governor, the taxpayer-funded employer contribution rate can be lowered by 2.5 percent over five years. This is just one of the Hickenlooper Plus scenarios developed for the purposes of this report, which with a variety of approaches, would all reduce the cost to taxpayers, the general fund and school districts between $2 billion and $4 billion over 10 years.

The Hickenlooper Plus scenarios also allow for a lower assumed rate of return, between 6.5 percent and 7 percent, while eliminating the $32 billion unfunded liability on a similar amortization timetable as the reform proposals put forward by PERA and Governor Hickenlooper.

To be clear, the purpose of this report is not to endorse one PERA reform plan or another. Rather, we seek to foster a comprehensive and productive debate by demonstrating that policymakers and the public have options beyond what PERA and Governor Hickenlooper have proposed, if they choose to explore those options. In this case, by taking one step further on PERA benefits, it is possible to provide some relief to taxpayers, state agencies, local governments and school districts after many years of escalating pension-related costs, even with a lower assumed rate of return.

Because PERA was created under state statute, legislators will play a pivotal role in shaping any future reforms. By asking the right questions and making full use of the financial tools and expertise available at PERA, we believe lawmakers have the chance to find ways to stabilize Colorado's public pension system over a reasonable amortization timeframe at a lower cost to taxpayers.

Moreover, by freeing up resources for state agencies, local governments and school districts to put towards other pressing needs, the State of Colorado can invest in the future of all its citizens while also maintaining retirement security for public employees.

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